PERMIT #2026 2513934- CM 05-REV TO CM 02 | RSN:1991301

# QTS DATA CENTER
# QTS DEN1 DC2
# 1140 N. GUN CLUB ROAD
# AURORA, COLORADO 80018
# FIRE ALARM VOICE EVACUATION SYSTEM

## DEVICE LEGEND

| SYM | PARTNAME | MFGCODE | PARTCODE | SPEC | SYSTEM |
|---|---|---|---|---|---|
| | MANUAL PULL STATION | EDWARDS | SIGA-278 | | FIRE |
| (S)P | SMOKE DETECTOR | EDWARDS | SIGA-OSD | | FIRE |
| | STANDARD BASE | EDWARDS | SIGA-SB4 | | FIRE |
| CO | CARBON MONOXIDE DETECTOR | EDWARDS | SIGA-COD | | FIRE |
| | STANDARD BASE | EDWARDS | SIGA-SB4 | | FIRE |
| | HEAT DETECTOR | EDWARDS | SIGA-HFD | | FIRE |
| | STANDARD BASE | EDWARDS | SIGA-SB4 | | FIRE |
| (S)— | DUCT DETECTOR HOUSING | EDWARDS | SIGA-SD | | FIRE |
| | AIR SAMPLING TUBE | EDWARDS | SD-T60 | | FIRE |
| T | TEST STATION (KEYED) | EDWARDS | SD-TRK | | FIRE |
| IM | ISOLATION MODULE | EDWARDS | SIGA-IM | | FIRE |
| CR | CONTROL MODULE | EDWARDS | SIGA-CR | | FIRE |
| CRH | CONTROL MODULE (HIGH RATING) | EDWARDS | SIGA-CR(H) | | FIRE |
| CT1 | SINGLE INPUT MODULE | EDWARDS | SIGA-CT1 | | FIRE |
| CT2 | DUAL INPUT MODULE | EDWARDS | SIGA-CT2 | | FIRE |
| CC1 | SINGLE INPUT (RISER) MODULE | EDWARDS | SIGA-CC1 | | FIRE |
| CC1S | SINGLE INPUT (RISER) MODULE | EDWARDS | SIGA-CC1(S) | | FIRE |
| MCT2 | UIO-DUAL INPUT MODULE | EDWARDS | SIGA-MCT2 | | FIRE |
| MCC1 | UIO-SINGLE INPUT (RISER) MOD | EDWARDS | SIGA-MCC1 | | FIRE |
| MCC1S | UIO-SINGLE INPUT (RISER) MOD | EDWARDS | SIGA-MCC1(S) | | FIRE |
| MCR | UIO-CONTROL MODULE | EDWARDS | SIGA-MCR | | FIRE |
| RM1 | RISER MONITOR MODULE | EDWARDS | SIGA-RM1 | | FIRE |
| UIO6R | UNIVERSAL I/O MODULE | EDWARDS | SIGA-UIO6R | | FIRE |
| S | WALL STYLE SPEAKER/STROBE | EDWARDS | G4SVWF | | FIRE |
| S C | CEILING SPEAKER/STROBE | EDWARDS | GCSVMF | | FIRE |
| S | WALL STYLE SPEAKER ONLY | EDWARDS | G4SWF | | FIRE |
| S C | CEILING STYLE SPEAKER ONLY | EDWARDS | GCSWF | | FIRE |
| S WP | WEATHERPROOF SPEAKER/STROBE WALL MOUNT | EDWARDS | WG4RF-SVMHC | | FIRE |
| S WP | WEATHERPROOF SPEAKER ONLY | EDWARDS | WG4WA-S | | FIRE |
| WP | WEATHERPROOF HORN/STROBE | EDWARDS | WG4RF-HVMC | | FIRE |
| | WEATHERPROOF BACKBOX | EDWARDS | 449/74347U | | FIRE |
| | WALL- STROBE UNIT | EDWARDS | G4VWF, G1VWF | | FIRE |
| C | CEILING- STROBE UNIT | EDWARDS | GCVWF | | FIRE |
| FAMCP | MAIN CONTROL PANEL | EDWARDS | 3-CAB14B/4-CAB24D | | FIRE |
| | POWER SUPPLY | EDWARDS | 4-PPS/M | | FIRE |
| | CONTROL PROCESSOR | EDWARDS | 4-CPU | | FIRE |
| | AUX. POWER SUPPLY | EDWARDS | 4-PPS/M | | FIRE |
| | DISPLAY UNIT | EDWARDS | 4-LCDLE | | FIRE |
| | AUDIO SOURCE/PHONE UNIT | EDWARDS | 4-AUDTELS/4-MIC | | FIRE |
| | 95W AMPILIFIER | EDWARDS | 3-ZA95 | | FIRE |
| | SINGLE (SLC) LOOP CARD | EDWARDS | 3-SSDC2 | | FIRE |
| | NETWORK COMMUNICATION | EDWARDS | 4-NET-TP | | FIRE |
| | BATTERY CABINET | EDWARDS | BC-1 | | FIRE |
| FAMSP | SLAVE CONTROL PANEL | EDWARDS | 3-CAB14B/4-CAB24D | | FIRE |
| | POWER SUPPLY | EDWARDS | 4-PPS/M | | FIRE |
| | CONTROL PROCESSOR | EDWARDS | 4-CPU | | FIRE |
| | AUX. POWER SUPPLY | EDWARDS | 4-PPS/M | | FIRE |
| | DISPLAY UNIT | EDWARDS | 4-LCDLE | | FIRE |
| | 95W AMPILIFIER | EDWARDS | 3-ZA95 | | FIRE |
| | DUAL (SLC) LOOP CARD | EDWARDS | 3-SDDC2 | | FIRE |
| | NETWORK COMMUNICATION | EDWARDS | 4-NET-TP | | FIRE |
| | BATTERY CABINET | EDWARDS | BC-1 | | FIRE |
| APS | BOOSTER POWER SUPPLY PANEL | EDWARDS | APS10A | | FIRE |
| | 12V, 7.2AH BATTERIES | EDWARDS | 12V6A5 | | FIRE |
| ANN | REMOTE ANNUNICATOR | EDWARDS | 4-4ANNMT/4-4ANN | | FIRE |
| | REMOTE MIC UNIT | EDWARDS | 4-MIC | | FIRE |
| | 12SWITCH,24LED UNIT | EDWARDS | 4-24L12S | | FIRE |
| | AUDIO SOURCE UNIT | EDWARDS | 4-ANNAUDTEL | | FIRE |
| | NETWORK COMMUNICATION | EDWARDS | 4-NET-TP | | FIRE |
| ASSDM | MODULASER-COMMAND MASTER | EDWARDS | FHSDB320-ULF | | FIRE |
| ASSD | MODULASER- STANDARD UNIT | EDWARDS | FHSDB310-ULF | | FIRE |
| (S)BT (S)BR | END TO END BEAM DETECTOR | EDWARDS | EC3000 | | FIRE |
| | FLOW SWITCH | BY OTHERS | BY OTHERS | | FIRE |
| | TAMPER SWITCH | BY OTHERS | BY OTHERS | | FIRE |
| | PRESSURE SWITCH | BY OTHERS | BY OTHERS | | FIRE |
| | LOW AIR SWITCH (HIGH/LOW) | BY OTHERS | BY OTHERS | | FIRE |
| | FIRE/SMOKE DAMPER | BY OTHERS | BY OTHERS | | FIRE |
| TERM BOX | TERMINAL CABINET | SPACE AGE ELECTRONICS | TC SERIES | | FIRE |
| REFUGE STATION | AREA-OF-RESCUE- CALL BOX | RATH | 2100-958SSRC2 | | FIRE |
| REFUGE MAIN | AREA-OF-RESCUE COMMAND CENTER | RATH | 2500-205PSS 2500-PWR24 | | FIRE |

REV 7

## DRAWING INDEX


FC01 – COVER SHEET
FR01 – FIRE ALARM ONE-LINE RISER DIAGRAM
FS01 – FIRE ALARM SEQUENCE OF OPERATION – WORK NOTES
FF01 – FIRE ALARM 1ST LEVEL (AREA-A) FLOOR PLAN
FF02 – FIRE ALARM 1ST LEVEL (AREA-B) FLOOR PLAN
FF03 – FIRE ALARM 1ST LEVEL (AREA-C) FLOOR PLAN
FF04 – FIRE ALARM 1ST LEVEL (AREA-D) FLOOR PLAN
FF05 – FIRE ALARM 1ST LEVEL (AREA-E) FLOOR PLAN
FF06 – FIRE ALARM 1ST LEVEL (AREA-F) FLOOR PLAN
FF07 – FIRE ALARM 1ST LEVEL (AREA-G) FLOOR PLAN
FF08 – FIRE ALARM 1ST LEVEL (AREA-H) FLOOR PLAN
FF09 – FIRE ALARM 1ST LEVEL (AREA-I) FLOOR PLAN
FF10 – FIRE ALARM 1ST LEVEL (AREA-J) FLOOR PLAN
FF11 – FIRE ALARM 2ND LEVEL (AREA-A) FLOOR PLAN
FF12 – FIRE ALARM 2ND LEVEL (AREA-B) FLOOR PLAN
FF13 – FIRE ALARM 2ND LEVEL (AREA-C) FLOOR PLAN
FF14 – FIRE ALARM 2ND LEVEL (AREA-D) FLOOR PLAN
FF15 – FIRE ALARM 2ND LEVEL (AREA-E) FLOOR PLAN
FF16 – FIRE ALARM 2ND LEVEL (AREA-F) FLOOR PLAN
FF17 – FIRE ALARM 2ND LEVEL (AREA-G) FLOOR PLAN
FF18 – FIRE ALARM 2ND LEVEL (AREA-H) FLOOR PLAN
FF19 – FIRE ALARM 2ND LEVEL (AREA-I) FLOOR PLAN
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FP02 – FIRE ALARM SLAVE CONTROL PANEL (FAMSP1), LAYOUT/CALC'S
FP03 – FIRE ALARM SLAVE CONTROL PANEL (FAMSP2), LAYOUT/CALC'S
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FE01 – REMOTE BOOSTER POWER SUPPLY BATTERY CALCS & VOLTAGE DROP CALCS
FE02 – REMOTE BOOSTER POWER SUPPLY BATTERY CALCS & VOLTAGE DROP CALCS
FE03 – REMOTE BOOSTER POWER SUPPLY BATTERY CALCS & VOLTAGE DROP CALCS
FE04 – REMOTE BOOSTER POWER SUPPLY BATTERY CALCS & VOLTAGE DROP CALCS
FE05 – REMOTE BOOSTER POWER SUPPLY BATTERY CALCS & VOLTAGE DROP CALCS
FE06 – REMOTE BOOSTER POWER SUPPLY BATTERY CALCS & VOLTAGE DROP CALCS
FT01 – DEVICE TYPICAL MOUNTING AND WIRING DETAILS
FT02 – DEVICE TYPICAL MOUNTING AND WIRING DETAILS
FT03 – DEVICE TYPICAL MOUNTING AND WIRING DETAILS
FG01 – FIRE ALARM COMPUTER GRAPHIC LAYOUT


Provide a full size set of legible approved construction documents **PRINTED IN COLOR** for review by the Field Inspector.

Field Inspection consultation is available upon request; call (303) 739-7420 to schedule a consultation.

***COA Adopted Codes for this project:***
***ICC-2021 - NEC-2023***
***NFPA 13-2019 - NFPA 72-2019***
***COA Amendments 22 & 66***

Code violations that are found during the inspection are required to be corrected. Permit issuance does not grant approval of code violations.

**Plan revision.** Only Clouded revisions reviewed under this permit. All other areas reviewed under Original permit RSN# 1945938

City of Aurora Building Division
Reviewed for Code Compliance
Approved as Noted: chorst
Date: *Aug 14, 2026*
2021 INTERNATIONAL CODES & 2023 NEC

## WIRE SCHEDULE

| CODE | NO. OF CONDUCTORS | AWG OR COAX SIZE | TYPE: SHELD | TWISTED | SOLID | STRANDED | COAXAL SHLD ※ | MANUFACTURER /MODEL NO. RECOMMENDED | COLOR POS(+)-NEG(-) | WIRE USE | NOMINAL O.D. NO. | AREA |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| A | 2 | 18 | | | X | | | | RED, BLACK | INITIATING DEVICE CIRCUIT | | |
| B | 2 | 16 | | | X | | | | RED ,WHITE | SIGNALING LINE CIRCUIT | | |
| F | 2 | 14 | | | X | | | | ORANGE, BROWN | SPEAKER CIRCUIT | | |
| E | 2 | 14 | | | X | | | | YELLOW, BLUE | STROBE CIRCUIT | | |
| Y | 2 | 14 | | | X | | | | BLUE, GREY | DATA/AUDIO CIRCUIT | | |
| R | 2 | 14 | | | X | | | | RED, BLACK | DAMPER CONTROL | | |
| P | 2 | 14 | | | X | | | | RED, BLACK | AHU SHUTDOWN CIRCUIT | | |
| Z | 2 | 14 | | | X | | | | WHITE, BLACK | 24VDC POWER CIRCUIT | | |
| W | 2 | 18 | | | X | | | | RED, BLACK | FIRE ALARM REMOTE LIGHT CIRCUIT | | |
| X | 8 | 24 | | X | | | | | CAT5e | NETWORK CABLE | | |
| K | 2 | 14 | | | X | | | | RED, BLACK | HIGH LEVEL AUDIO RISER CIRCUIT | | |
| M | 3 | 12 | | | X | | | | BLACK,WHITE,GREEN 120VAC | DOOR HOLDER CIRCUIT | | |

TO VERIFY COMPATIBILITY WITH CIRCUITS SEE SHT.FT03 FOR A MATRIX

### GENERAL NOTES:

1. SPEAKERS ARE COMPLETE WITH A DC BLOCKING CAPACITOR TO PERMIT ELECTRICAL SUPERVISION OF THE AUDIO DISTRIBUTION CIRCUIT. WATTAGE TAPS FROM 1/4W, 1/2W, 1W, AND 2W. THE FOLLOWING SPEAKER TAPS ARE TO BE SET @ 1/2W UNLESS OTHERWISE NOTED. FIELD VERIFY SOUND LEVEL AFTER INSTALLATION.
2. SPEAKERS INTENDED FOR OPERATION IN THE PUBLIC MODE SHALL HAVE A SOUND LEVEL OF NOT LESS THAN 75DBA @ 10FT(3M) OR MORE THAN 110DBA @ THE MINIMUM HEARING DISTANCE FROM THE AUDIBLE APPLIANCE.
3. MECHANICAL EQUIPMENT AREAS, THE AVERAGE AMBIENT SOUND LEVEL SHALL BE AT LEAST 85DBA.
4. LABELING:
   1. OBSERVE FIRE ALARM COLOR CODE GUIDE PER SPECIFICATION.
   2. LABEL EACH DEVICE WITH CORRECT INFORMATION
   3. LABEL EACH INITIATING DEVICE WITH CORRECT DEVICE ADDRESS. USE KROY LABELER OR EQUIVALENT.
   4. DEVICE ADDRESS INFORMATION MUST BE OBTAINED FROM THE VENDOR.
   5. ALL JUNCTION BOXES TO HAVE COVERS LABELED FIRE ALARM
   6. FINAL, CORRECT ROOM NUMBERS (NOT CONSTRUCTION ROOM NUMBERS) MUST BE PROVIDED FOR CORRECT PROGRAMMING.
   7. ALL DETECTORS SHALL BE INSTALL AFTER CLEAN-UP IS COMPLETE.
   8. ALL DETECTORS TO HAVE FACTORY DUST COVERS INSTALLED UNTIL AFTER THE FINAL INSPECTION AND CLEAN-UP IS COMPLETE.
   9. ALL DUCT DETECTORS TO HAVE INDIVIDUAL REMOTE LE/TEST STATIONS INSTALLED. MOUNT AT 6'-0" AFF IN MAIN CORRIDOR ADJACENT TO AREA SERVED. FIELD COORDINATE EXACT LOCATION OF REMOTE LED.
   10. ALL SHIELD WIRING TO BE BONDED TOGETHER AT EACH DEVICE AND INSULATED FROM CONTACT WITH THE CONDUIT OR BOX.
   11. AVOID LOCATING DETECTORS ABOVE COUNTERTOPS AND/OR SHELVING.
   12. LOCATE DETECTORS AT LEAST THREE FEET FROM SUPPLY OR RETURN AIR DIFFUSERS.
   13. ALL FIRE ALARM WIRING WILL BE INSTALLED IN CONDUIT OR FLEX, TO MEET APPLICABLE FEDERAL, STATE AND LOCAL CODES AND REGULATIONS, INCLUDING THE CURRENT UNIFORM BUILDING CODE, NATIONAL ELECTRIC CODE, AND THE CURRENT NFPA LIFE SAFETY CODE.
   14. NO AC CIRCUITS OR OTHER WIRING SHALL BE INSTALLED WITH FIRE ALARM WIRING.

## CODE ANALYSIS

### FIRE PROTECTION CODES

ALL WORK SHALL CONFORM TO THE CURRENT EDITIONS OF NATIONAL, STATE AND LOCAL CODES, AND OTHER REGULATING AGENCIES WHICH HAVE AUTHORITY OVER ANY PORTIONS OF THE WORK. ALL CONTRACTORS AND SUBCONTRACTORS PERFORMING GENERAL CONSTRUCTION, MECHANICAL, ELECTRICAL, PLUMBING OR RELATED WORK SHALL COMPLY WITH APPLICABLE SECTIONS OF THE CODES THAT HAVE JURISDICTION.

### CLASS STYLE

| CIRCUIT | CLASS | STYLE | DESCRIPTION |
|---|---|---|---|
| I.D.C. | B | B | INITIATION DEVICE CIRCUIT |
| S.L.C. | B | 4 | SIGNALING LINE CIRCUIT |
| N.A.C. | B | Y | NOTIFICATION APPLICANCE CIRCUIT |

### APPLICABLE CODES:

| | |
|---|---|
| 2023 NEC | NATIONAL ELECTRICAL CODE |
| 2013 NFPA 72 | FIRE ALARM CODE (STANDARD) |
| 2021 IBC | INTERNATIONAL BUILDING CODE |
| 2021 IFC | INTERNATIONAL FIRE CODE |

### EXISTING OVERVIEW OF THE JOB

THE INTENT OF THE PROJECT IS TO PROVIDE, A NEW FIRE ALARM VOICE EVACUATION SYSTEM, INSTALL ALL NECESSARY DEVICES NEEDED FOR THE PROJECT, CONNECT ADDRESSABLE DEVICES, SENSORS, AND SPRINKLER DEVICES, AND OTHER MATERIALS AND EQUIPMENT TO THE NEW FIRE ALARM MASS NOTIFICATION CONTROL SYSTEM.
FURNISH ALL MATERIAL AND LABOR TO PROVIDE A COMPLETE AND FUNCTIONAL SYSTEM, WHICH OPERATES IN ACCORDANCE WITH THE REQUIREMENTS OF (NFPA,IBC,UFC).
ALL WIRING SHALL BE APPROPRIATELY COLOR-CODED, AND PERMANENT WIRE MARKERS SHALL BE USED TO IDENTIFY THE TERMINATIONS FOR EACH CIRCUIT AT THE CONTROL PANEL. STRAP OR BUNDLE ALL CABLES AND WIRES INSIDE EQUIPMENT ENCLOSURES AND TERMINAL CABINETS, PARALLEL TO THE ENCLOSURE SIDES. SPLICES SHALL BE KEPT AT A MINIMUM. SPLICES SHALL BE MADE IN OUTLET BOXES, JUNCTION BOXES, AND PULL BOXES.

1. PROVIDE NEW EST (EST-4) VOICE EVACUATION SYSTEM, FOR THE QTS-DEN1-DC2 FACILITY
   CONNECTION OF BEAM DETECTORS, SPEAKER/STROBES, SPRINKLER SYSTEM, FAN CONTROL, ETC.
   AND ALL MONITORING DEVICES WILL CONNECT TO THE NEW (EST-4) CONTROL PANEL.
2. FIRE ALARM CONTROL PANEL WILL BE CERTIFIED
   BY A FACTORY CERTIFIED INSTALLER TO INCLUDE HEAD END EQUIPMENT, (FAMCP) AND ALL DEVICES.

### TOTAL DEVICES – SCOPE OF WORK

DETECTORS
SMOKE DETECTORS –41
HEAT DETECTORS –23
DUCT DETECTORS –77
LINEAR HEAT –0

NAC
STROBES WALL –28
STROBES CEILING –0
SPEAKER-WALL –69
SPEAKER/STROBES-WALL –138
SPEAKER/STROBES-WP –5
SPEAKER/STROBES-CEILING –84
HORN/STROBE-WALL –0
HORN/STROBE-WP –1
REMOTE LIGHTS –77

MODULES
SINGLE MONITOR MODULES –14
DUAL MONITOR MODULE –74
CONTROL MODULES –121
MANUAL PULL STATIONS –28
RISER/SYNC MODULE –1
RISER MONITOR MODULE –4
UNIVERSAL MODULE –8
UNIVER RISER/SYNC MODULE –22
UNIVER RISER/SYNC (S) MOD–8
ISOLATION MODULES –9

BOOSTER POWER SUPPLIES –17
REMOTE ANNUNCIATOR –1
MODULASER MODULES –9
COMPUTER GRAPHIC –1

DAMPERS –15

RESCUE CALL STATION –4

**Code Analysis**

| | |
|---|---|
| Occupancy: | B, S-2 |
| Number of Stories: | 2 stories |
| SPRINKLERED? | FULLY SPRINKLERED |

### OVERVIEW CHANGE TO EXISTING SCOPE OF WORK

THE INTENT OF THIS SCOPE CHANGE FOR THE PROJECT IS TO PROVIDE:

1. PROVIDE NEW RATH EMERGENCY RESCUE TWO-WAY COMMUNICATION SYSTEM. (AREA OF REFUGE)-FOR DETAIL LOCATION (FF11,FF12,FF19,FF20)
2. ADDED THE ROOF LEVEL FOR THE COMPLEX ON SEE PAGE (FF20) FOR DETAILS
3. REMOVAL OF THE BEAM DETECTORS IN THE DATA HALL.

ALL MODIFICATION WILL BE REFERENCE TO REV 7



SUMMIT FIRE PROTECTION
10200 E. Easter Avenue
Centennial, Colorado 80112
Phone: (303) 790-2520
Fax: (303) 790-2528

THESE DRAWINGS ARE SCHEMATIC AND DO NOT ATTEMPT TO SHOW SHOW CONDUIT ROUTING.

ARCHITECT:

GENERAL CONTRACTOR:

ENGINEER:

INSTALLER:

| PROJECT | PROJECT DESCRIPTION | PROJECT LOCATION |
|---|---|---|
| QTS DATA CENTER<br>QTS DEN1 DC2 | FIRE ALARM & DETECTION SYSTEM | 1140 N. GUN CLUB ROAD<br>AURORA, COLORADO 80018 |

MERIDIAN PROJECT
JOB#: 2025-24

NICET CERTIFIED

TRAVIS COOK- NICET#113375
COMMENTS AND STAMP

THESE DRAWINGS ARE SCHEMATIC AND DO NOT ATTEMPT TO SHOW SHOW CONDUIT ROUTING.

KEY PLAN
N.T.S.

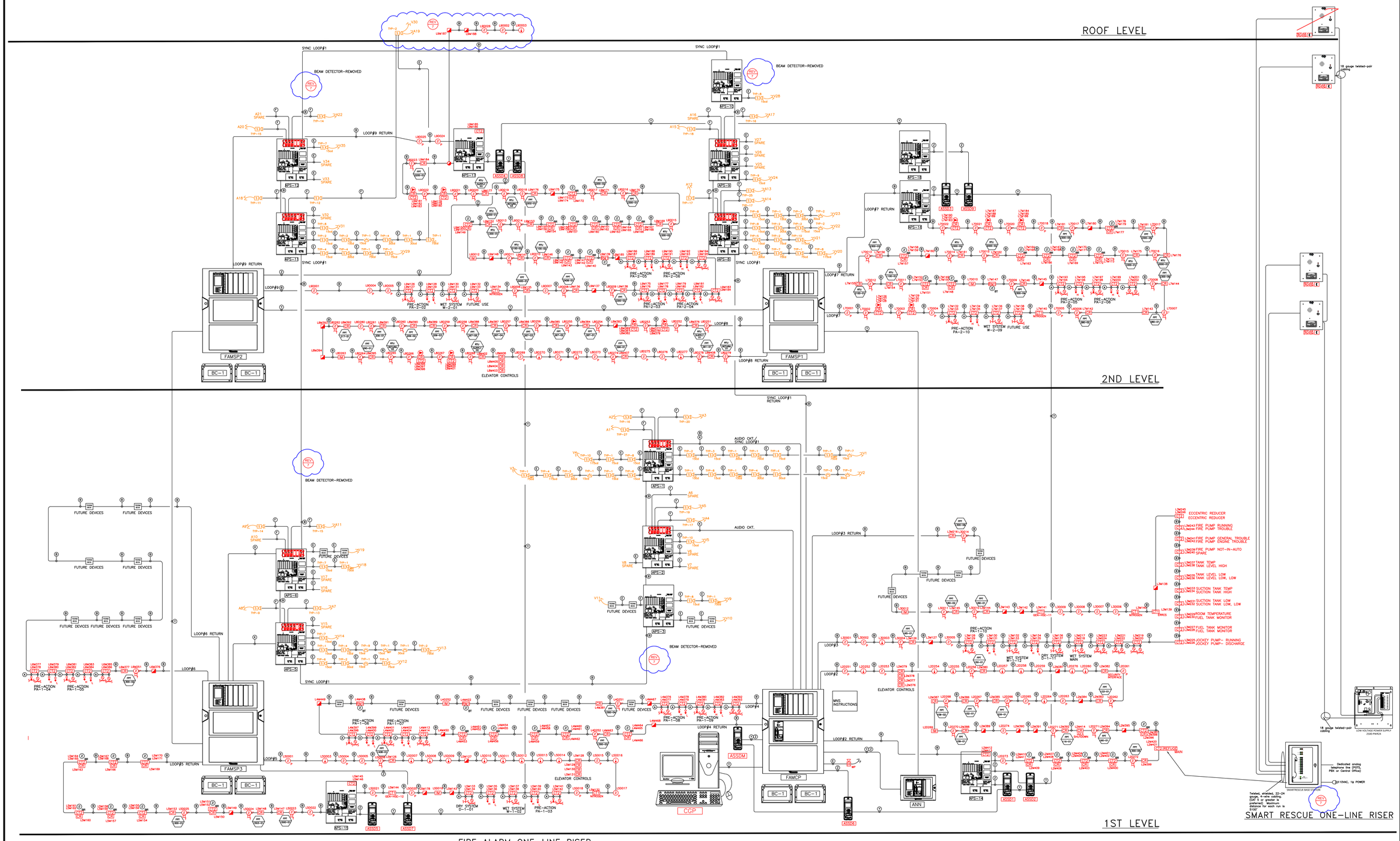
| REVISION | DATE |
|---|---|
| SUBMITTAL | 07/07/25 |
| REVISIONS | 09/22/25 |
| DATA HALL BUILDOUT | 12/13/25 |
| COMMENTS | 02/25/26 |
| COMMENTS (REV 2) | 04/2/26 |
| COMMENTS (REV 3) | 06/3/26 |
| RFI#696 (REV 4) | 07/24/26 |

CAD FILE: COVER SHEET
DRAWN BY: B.ALLEN
DATE: 5/23/25
ENG. APPROVAL:
DATE:
REVIEW BY:
SCALE: N.T.S.

FIRE ALARM SYSTEM EST-4

FIRE ALARM COVER SHEET

SHEET FC01




SUMMIT FIRE PROTECTION
10200 E. Easter Avenue
Centennial, Colorado 80112
Phone: (303) 790-2520
Fax: (303) 790-2528

THESE DRAWINGS ARE SCHEMATIC AND DO NOT ATTEMPT TO SHOW SHOW CONDUIT ROUTING.

ARCHITECT:

GENERAL CONTRACTOR:

ENGINEER:

INSTALLER:

| | |
|---|---|
| PROJECT | QTS DATA CENTER<br>QTS DENI DC2 |
| PROJECT DESCRIPTION | FIRE ALARM & DETECTION SYSTEM |
| PROJECT LOCATION | 1140 N. GUN CLUB ROAD<br>AURORA, COLORADO 80018 |

MERIDIAN PROJECT

JOB#: 2025-24

NICET CERTIFIED

TRAVIS COOK- NICET#113375

COMMENTS AND STAMP

THESE DRAWINGS ARE SCHEMATIC AND DO NOT ATTEMPT TO SHOW SHOW CONDUIT ROUTING.

KEY PLAN
N.T.S.

| REVISION | DATE |
|---|---|
| SUBMITTAL | 07/07/25 |
| REVISIONS | 09/22/25 |
| DATA HALL BUILDOUT | 12/13/25 |
| COMMENTS | 02/25/26 |
| COMMENTS (REV 1) | 04/2/26 |
| COMMENTS (REV 2) | 06/3/26 |
| RFI#696 | 07/24/26 |

CAD FILE: ONE-LINE

DRAWN BY: B. ALLEN

DATE: 5/24/25

ENG. APPROVAL:

DATE:

REVIEW BY:

SCALE: N.T.S.

FIRE ALARM SYSTEM EST-4

FIRE ALARM ONE-LINE RISER DIAGRAM

SHEET FR01

City of Aurora Building Division
Reviewed for Code Compliance
Approved as Noted: chorst
Date: Aug 14, 2026
2021 INTERNATIONAL CODES & 2023 NEC

# MANUFACTURER RECOMMENDED WIRE PROCEDURE

NETWORK SIGNALING LINE (DATA) CIRCUIT

THE NETWORK SIGNAL LINE CIRCUIT CABLE MUST BE A MINIMUM OF 18 GAUGE TWISTED PAIR WITH 6 TWISTS PER FOOT. THIS CABLE MAY BE UNSHIELDED OR SHIELDED AS REQUIRED. SHIELDED CABLE IS RECOMMENDED WHERE ELECTRICAL NOISE MIGHT INTERFERE WITH DATA TRANSMISSION. DISTANCE LIMITS ARE DETERMINED USING THE MAXIMUM ALLOWABLE CIRCUIT RESISTANCE AND CAPACITANCE, AND MANUFACTURERS CABLE SPECIFICATIONS.

RS-485 FORMAT

MAXIMUM CIRCUIT RESISTANCE 90 ohm
MAXIMUM CIRCUIT CAPACITANCE .09 µF
CIRCUIT LENGTH: 5,000FT (1,524M) BETWEEN ANY 3 PANELS
CIRCUIT INSTALLATION: TWISTED PAIR BETWEEN DROPS.
NO T TAPPING PERMITTED.
SUPERVISED AND POWER-LIMITED

INITIATING DEVICE CIRCUITS

CIRCUIT INSTALLATION: "T" TAPPING IS PERMITTED.

TRADITIONAL INITIATING DEVICE CIRCUIT MODULE ARE DESIGNED TO OPERATE ALL COMPATIBLE 2 WIRE DETECTORS AT THE END OF AN INITIATING DEVICE CIRCUIT WITH A TOTAL CIRCUIT RESISTANCE OF 100 ohms.

USING WIRE RESISTANCE TABLE 1, THE MAXIMUM ALLOWABLE LENGTH OF ANY WIRE GAUGE PAIR MAY BE DETERMINED AS FOLLOWS:

$$D = \frac{R_{MAX}}{R_{/1000'\ PAIR}} \times 1000$$

TABLE 5 SHOWS THE LENGTH OF VARIOUS WIRE PAIR SIZES WHICH MAKE UP 100 ohm RESISTANCE.

| TABLE 5 – MAXIMUM INITIATING DEVICE CIRCUIT LENGTH (100 ohms) | |
|---|---|
| WIRE SIZE | MAX. LENGTH, FEET |
| #18 | 7,692 |
| #16 | 10,000* |

* ELECTRICAL NOISE LIMITS THE PRACTICAL MAXIMUM LENGTH OF 10,000.

24VDC INDICATING APPLIANCE CIRCUIT SPECIFICATIONS

THE INDICATING APPLIANCE CIRCUIT CABLE MUST BE A MINIMUM 18 GAUGE PAIR. DISTANCE LIMITS ARE DETERMINED USING THE MAXIMUM ALLOWABLE CIRCUIT RESISTANCE AND CABLE MANUFACTURERS SPECIFICATIONS.

CIRCUIT INSTALLATION: NO "T" TAPPING PERMITTED.

THE FOLLOWING RESTRICTIONS APPLY WHEN CALCULATING THE WIRE SIZE FOR THE INDICATING APPLIANCE CIRCUITS:
1. MINIMUM SUPPLY VOLTAGE AVAILABLE IS 20.4V.
2. MINIMUM REQUIRED CIRCUIT VOLTAGE AT ANY INDICATING APPLIANCE IS 17VDC.
3. MAXIMUM ALARM CURRENT REQUIRED FOR THE INDICATING APPLIANCE CIRCUIT.

USING OHMS LAW, THE INDICATING APPLIANCE CIRCUIT CURRENT REQUIREMENT, AND AN ALLOWABLE VOLTAGE DROP OF 3.4 VOLTS (20.4 – 17), THE MAXIMUM ALLOWABLE INDICATING APPLIANCE CIRCUIT RESISTANCE IS DETERMINED AS FOLLOWS:

$$R_{MAX} = \frac{V_{DROP}}{I_{MAX}}$$

WHERE:
$R_{MAX}$ = MAXIMUM ALLOWABLE INDICATING APPLIANCE CIRCUIT RESISTANCE.
$V_{DROP}$ = MAXIMUM ALLOWABLE VOLTAGE DRIP FROM POWER SUPPLY TO INDICATING APPLIANCE.
$I_{MAX}$ = MAXIMUM INDICATING APPLIANCE CIRCUIT CURRENT REQUIREMENT.

USING THIS FORMULA, THE MAXIMUM PERMISSIBLE CIRCUIT RESISTANCE FOR A FULLY LOADED (3.5 A) CIRCUIT USING #14 AWG WIRE IS DETERMINED TO BE 0.97 ohm AS FOLLOWS:

$$0.97\ \text{ohm} = \frac{3.4V}{3.5A}$$

SLC CIRCUITS

| | |
|---|---|
| SIGNATURE LOOP CONTROLLER CARD OPERATING VOLTAGE: | 24VDC @ 300 mA (FULLY LOADED)<br>24VDC @ 90 mA (NO LOAD)<br>5VDC @ 15mA |
| 2-WIRE SMOKE POWER OUTPUT SUPERVISED AND POWER-LIMITED | 22.8-25.2VDC @ 250mA (MAX) |
| SIGNATURE SERIES SYSTEM CIRCUIT: | |
| OPERATING VOLTAGE | 18.05-19.95VDC |
| MAXIMUM RESISTANCE (DEPENDS ON CAPACITANCE) | 79ohm @ 50 mA (FULL LOAD) |
| MAXIMUM CAPACITANCE (PER SIGNALING LINE) | 0.05 µF |
| MINIMUM CABLE TWIST RATE | 6 TWISTS/ft (305mm) |
| MAXIMUM NUMBER OF T-TAPS | 124 |
| OPERATING TEMPERATURE RANGE | 32-120° F (0-49° C) |
| OPERATING HUMIDITY RANGE | 0-93% RH |

| NON-TWISTED, NON-SHIELDED WIRE FOR SLC CIRCUITS | | | | | |
|---|---|---|---|---|---|
| DEVICE TYPE DETECTOR ADDRESSES | # OF DETECTOR ADDRESSES | # OF MODULE ADDRESSES | #14 AWG (1.5 mm2) (@ 20 pf/foot) | #16 AWG (1.0 mm2) (@ 20 pf/foot) | #18 AWG (0.75 mm2) (@ 20 pf/foot) |
| DETECTORS ONLY | 125 | 0 | 20,000' (6,096 m) | 20,000' (6,096 m) | 20,000' (6,096 m) |
| MODULES ONLY | 0 | 125 | 20,000' (6,096 m) | 20,000' (6,096 m) | 20,000' (6,096 m) |
| DETECTORS/MODULES MAXIMUM WIRE- (TWISTED PAIR,NONSHIELDED) | 125 | 125 | 13,157' (4,010 m) | 13888' (4,233 m) | 20,000' (6,096 m) |
| DETECTORS/MODULES MAXIMUM WIRE- (TWISTED PAIR,SHIELDED) | 125 | 125 | 5,952' (1,814 m) | 6,098' (1,859 m) | 8,621' (2,628 m) |
| DETECTORS/MODULES MAXIMUM WIRE-(NONTWISTED PAIR-NONSHIELDED) | 125 | 125 | 20,000' (6,096 m) | 20,000' (6,096 m) | 20,000' (6,096 m) |

**SEQUENCE OF OPERATION**

| Devices | ACTIVATE COMMON ALARM SIGNAL | ACTIVATE AUDIBLE ALARM SIGNAL | ACTIVATE COMMON SUPERVISORY SIGNAL | ACTIVATE AUDIBLE SUPERVISORY SIGNAL | ACTIVATE COMMON TROUBLE SIGNAL | ACTIVATE AUDIBLE TROUBLE SIGNAL | ACTIVATE AUDIBLE BASE PER THE SLEEPING ROOM | DISPLAY @ MAIN FIRE COMMAND CENTER (FAMCP) | DISPLAY @ REMOTE ANNUNCIATORS (ANN) | ACTUATE SPEAKER/STROBE SIGNAL THROUGHOUT THE BUILDING | TRANSMIT ALARM SIGNAL TO SUPERVISING CENTRAL STATION | TRANSMIT SUPERVISORY SIGNAL TO SUPERVISING CENTRAL STATION | TRANSMIT TROUBLE SIGNAL TO SUPERVISING CENTRAL STATION | SHUTDOWN AFFECTED HVAC UNIT | ACTIVATE OUTSIDE HORN/STROBE UNIT | CLOSE FIRE/SMOKE DAMPER | LIGHT ELEVATOR CAB WARNING LIGHT | SHUNT TRIP ELEVATOR POWER | SECONDARY ELEVATOR RECALL | PRIMARY ELEVATOR RECALL | ACTIVATE INTERFACE WITH THE (BAS) CONTROLS | ACTIVATE INTERFACE WITH THE SECURITY ACCESS SYSTEM | SHUTDOWN (HVLS) UNITS | AUDIBLES SILENCE- STROBES CONTINUE UNTIL SYSTEM RESET |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | CONTROL UNIT ANNUNICATION | | | | | | | | | CONTROLS | | | | | SUPPLEMENTARY | | | | | | | | | | |
| MANUAL PULL STATIONS | X | X | | | | | | X | X | X | X | | | | X | | | | | | X | X | X | |
| SMOKE DETECTORS- ABOVE FAMCP/FAMSP | X | X | | | | | | X | X | X | X | | | | X | | | | | | X | X | X | |
| DUCT DETECTOR- FIRE/SMOKE DAMPER | | | X | X | | | | X | X | | | X | | | | X | | | | | X | | | |
| DUCT DETECTOR- RTU UNITS | | | X | X | | | | X | X | | | X | | X | | | | | | | X | | | |
| SMOKE DETECTOR - 1ST FLOOR ELEVATOR LOBBY | X | X | | | | | | X | X | X | X | | | | X | | | | X | | X | X | X | |
| SMOKE DETECTOR - ELEVATOR EQUIPMENT ROOM | X | X | | | | | | X | X | X | X | | | | X | | X | | | X | X | X | X | |
| SMOKE DETECTOR - 2ND ELEVATOR LOBBY | X | X | | | | | | X | X | X | X | | | | X | | | | | X | X | X | X | |
| HEAT DETECTOR- ELEVATOR EQUIPMENT ROOM | X | X | | | | | | X | X | X | X | | | | X | | | X | | | X | X | X | |
| HEAT DETECTOR- ELEVATOR SHAFT | X | X | | | | | | X | X | X | X | | | | X | | | X | | X | X | X | X | |
| BEAM DETECTOR- ALARM | X | X | | | | | | X | X | X | X | | | | X | | | | | | X | X | X | |
| BEAM DETECTOR-TROUBLE | | | | | X | X | | X | X | | | | X | | | | | | | | | | | |
| MAIN WATERFLOW SWITCH | X | X | | | | | | X | X | X | X | | | | X | | | | | | X | X | X | |
| WATERFLOW SWITCH | X | X | | | | | | X | X | X | X | | | | X | | | | | | X | X | X | |
| PRESSURE SWITCH | X | X | | | | | | X | X | X | X | | | | X | | | | | | X | X | X | |
| TAMPER SWITCH | | | X | X | | | | X | X | | | X | | | | | | | | | | | | |
| LOW AIR SWITCH | | | X | X | | | | X | X | | | X | | | | | | | | | | | | |
| MODULASER-ALARM | X | X | | | | | | X | X | X | X | | | | X | | | | | | X | X | X | |
| MODULASER-SUPERVISORY | | | X | X | | | | X | X | | | | X | | | | | | | | | | | |
| MODULASER-TROUBLE | | | | | X | X | | X | X | | | | | X | | | | | | | | | | |
| INITIATING DEVICE CIRCUIT -OPEN | | | | | X | X | | X | X | | | | | X | | | | | | | | | | |
| INITIATING DEVICE CIRCUIT -SHORT | | | | | X | X | | X | X | | | | | X | | | | | | | | | | |
| INITIATING DEVICE CIRCUIT -GROUND | | | | | X | X | | X | X | | | | | X | | | | | | | | | | |
| NOTIFICATION APPLICANCE CIRCUIT - OPEN | | | | | X | X | | X | X | | | | | X | | | | | | | | | | |
| NOTIFICATION APPLICANCE CIRCUIT - SHORT | | | | | X | X | | X | X | | | | | X | | | | | | | | | | |
| NOTIFICATION APPLICANCE CIRCUIT - GROUND | | | | | X | X | | X | X | | | | | X | | | | | | | | | | |
| FIRE ALARM AC POWER FAILURE | | | | | X | X | | X | X | | | | | X | | | | | | | | | | |
| TEST MODE | | | | | X | X | | X | X | | | | | X | | | | | | | | | | |
| FIRE ALARM BATTERY TROUBLE | | | | | X | X | | X | X | | | | | X | | | | | | | | | | |
| SYSTEM SILENT | | | | | X | X | | X | X | | | | | X | | | | | | | | | | X |
| SYSTEM RESET | | | | | X | X | | X | X | | | | | X | | | | | | | | | | |

# FIRE ALARM SEQUENCE OF OPERATIONS

Break glass manual fire alarm stations shall not be used.

Over-voltage and surge protection shall be provided at the input power of all panels. We will be using a Ditek (DTK-120HW).

Provide a remote LCD annunciator and graphic map at main entrance to facility showing the zone of coverage for the fire alarm system. Provide a graphic map at the main fire alarm panel. When the system is in alarm condition, the system shall annunciate the type and location of each alarm initiating device. Sprinkler water flow alarms shall be zoned by building and by floor. Supervisory alarm initiating devices, such as valve supervisory switches, fire pump running alarm, low-air pressure on dry sprinkler system, etc., shall be zoned by type and by room location.

Provide an exterior speaker/strobe at main entrance to the facility.

This project shall provide new addressable fire alarm and mass notification systems and panels (FMCP) to all buildings shown in the drawing set. All new circuits to the addressable type fire alarm system shall comply with NFPA 72, UFC 3-600-01, and NFPA 101. Contractor shall install new detectors and initiating devices as required. Provide appropriate interfaces at the new panel to allow all new alarm detection, new fire alarm devices, new initiation devices, as well as all existing fire alarm and fire suppression components to be connected to the addressable panel. Provide a new transmission device to send fire alarm and mass notification signals to the Monaco D-21 receiving equipment located at the base fire department.

The system shall be addressable to each reporting device and with turnkey MNS. MNS devices shall be combination speaker/strobe on ceiling or walls. The system shall be complete with the control panel in the building and required devices. The addressable system shall transmit and receive addresses and data between the control panel and the new devices.

The useful life of the system's standby batteries and the electronics components may be adversely affected by extreme temperature ranges and humidity. The system and its peripherals shall be installed in an environment with a normal room temperature of 15° C-27°C / 60° F-80°F and relative humidity not exceeding 85% at 80°F.

The new system shall include addressable manual pull stations, addressable heat detectors, addressable duct smoke detectors, addressable spot type smoke detectors, addressable carbon monoxide detectors and audible and visual notification appliances that comply with ADA requirements.

Provide a new Mass Notification System for the building. Provide a mass notification system (MNS) designed and installed in accordance with UFC 4-021-01. MNS shall utilize fire alarm panels required by the AHJ. A CIS valve of 0.8 shall be provided in all areas where coverage is required by NFPA 72, UFC 3-600-01, UFC 4-021-01.
The fire alarm system is to be interfaced with the mass notification system. Common speakers/visual alarms are to be used. In addition, near the fire alarm panel or as part of the fire alarm panel. a deactivation switch is to be provided. This switch allows fire alarm personnel to disable the mass notification signal and turn the fire alarm speakers and strobes back on.

Interface to Other Systems, system shall shut down appropriate air handling equipment, smoke dampers, and release magnetic door holding devices, and activate lighting along egress paths (as required by NFPA 101) as necessary for proper operation of the facilities. All systems shall be interfaced with all fire suppression zones, monitoring switches, fire pumps, as well as other new and existing fire suppression components requiring monitoring. Generators shall be monitored as required per NFPA 72. Panels shall capable of communicating with Elevators where applicable. Provide a Sequence of Operation Matrix to coordinate with alarm functions. The Sequence of Operation matrix shall be approved by the COR.

Duct smoke detectors shall be provided on all new air handling supply fans over 2000 CFM, and all new return fans over 15,000 CFM. Smoke detectors shall be provided where electromagnetic door holders are used. Audible and visual notification appliances shall be provided to meet these specifications. This includes the new interior egress doors. Design shall comply with ADA requirements, NFPA 101 and NFPA 72. Provide an audible notification appliances on the exterior at each exit door. Addressable initiating device circuits modules shall be provided for each non-addressable device, excluding notification appliances. Visual strobes shall be in every space within the building.

The fire alarm submittals shall be reviewed and approved by the Base Fire Chief or designated representatives as well as USACE Omaha District Fire Protection Engineer. All submittals shall be stamped and sealed by a Registered Fire Protection Engineer.

## WORK NOTES:

Power Supply Source:
1.) Power supply sources, at least two independent and reliable power supplies shall be provided, one primary, and one secondary, each of which shall be of adequate capacity for the installation.
Primary power supply- shall be one of the following:
a.) commercial light and power
b.) an engine-driven generator
Secondary power supply- shall be one of the following:
a.) Storage battery dedicated to the fire alarm.
b.) A dedicated branch circuit of an automatic- starting engine-driven generator.
Capacity-
a.) The secondary power supply for emergency voice/alarm communication service shall be capable of operating the system under quiescent load for a minimum of 24 hours and then shall be capable of operating the system during a fire or other emergency condition for a period of 15 minutes at maximum connected load.
Battery Charging-
a.) Adequate facilities shall be provided to automatically maintain battery fully charged under all condition of normal operation. Adequate facilities shall be provided to recharge batteries within 48 hours after fully charged batteries have been subject to a single discharge cycle.

Performance and Limitation:
1.) Voltage, temperature, and humidity variation, equipment shall be capable of performing its intended functions under the following conditions
a.) At 95 percent and at 110 percent of the nameplate primary (main) and secondary (standby) input voltage.
b.) At ambient temperatures of 0°C (32°F) and 49°C (120°F)
c.) At a relative humidity of 85 percent and an ambient temperature of 30°C (86°F).
Equipment shall be installed in locations where conditions do not exceed the voltage, temperature, and humidity limits.
Protection of Fire Alarm Control Units:
1.) In areas that are not continuously occupied, automatic some detection shall be provided at the location of each fire alarm control unit(s) to provide notification of fire at that location.

Fire Alarm Control Unit:
1.) Maintain the integrity of the fire alarm system function, the provision for removal, replacement, failure, or maintenance procedure on any supplementary hardware, software, or circuit(s) shall not impair the required operation of the fire alarm system.
2.) Actuation of alarm notification appliance or emergency voice communications, fire safety functions, and annunciation at the protected premises shall occur within 10 seconds after the activation of an initiating device.
3.) Monitoring integrity of installation conductors and other signaling channels, all means of interconnecting equipment, devices, and appliances and wiring connections shall be monitored for the integrity of the interconnecting conductors or equivalent path so that the occurrence of a single open or a single ground-fault condition in the installation conductors or other signaling channels and their restoration to normal shall be automatically indicated within 200 seconds.

Smoke Detectors:
1.) Selective coverage, where codes, standards, laws, or authorities having jurisdiction require the protection of selected area only, the specified areas shall be protected in accordance with NFPA code.
2.) Where smoke detectors are being installed to control the spread of smoke, initiate control of fans, dampers, doors, and other equipment as required.
3.) The selection and placement of smoke detectors shall take into account both performance characteristics of the detector and the areas in to which the detectors are to be installed to prevent nuisance alarms or improper operation after installation. Smoke detectors shall not be installed if any one of the following ambient conditions exist:
a.) Temperature below 0°C (32°F)
b.) Temperature above 38°C (100°F)
c.) Relative humidity above 93 percent
d.) Air velocity greater than 1.5m/sec. (300 ft/min)
The location of smoke detectors shall be based on an evaluation of potential ambient sources of smoke, moisture, dust, or fumes, and electrical or mechanical influences to minimize nuisance alarms where environmental conditions do not allow installation of smoke detectors where normally required, approved alternatives devices shall be provided to afford equivalent protection.

Duct Detectors:
1.) Air duct detectors shall be installed in such a way as to obtain a representative sample of the airstream.
e.) rigid mounting within the duct
f.) rigid mounting to the wall of the duct with the sensing element protruding in to the duct.
g.) Installation outside the duct with rigidly mounted sampling tubes protruding in to the duct.

Sprinkler Water Flow Alarm- Initiating Devices:
1.) Initiation of the alarm signal shall occur within 45 seconds of waterflow at the alarm-initiating device when flow occurs that is equal to or greater than that from a single sprinkler of the smallest orifice size installed in the system.
2.) Movement of water due to waste, surges, or variable pressure shall not initiate an alarm signal.
3.) The number of waterflow switches permitted to be connected to a single initiating device circuit shall not exceed one.

Manual Fire Alarm Boxes:
1.) Manual fire alarm boxes shall be used only for fire alarm-initiating purposes. Operable part of each manual fire alarm box shall be 42 inches and 48 inches to the center of the handle.ed
2.) Manual fire alarm boxes shall be located throughout the protected area so that they are conspicuous, unobstructed, and accessible.
3.) Manual fire alarm boxes shall be located within 1.5m (5ft) of the exit doorway opening at each exit on each floor.

Notification Appliances:
Purpose-Notification appliances for fire alarm systems shall contribute to fire protection by providing stimuli for initiating emergency action and by providing information to users, emergency response personnel, and occupants.
Appliance Location, wall mounted appliances shall be mounted such that the entire lens is not less than 2.0m (80in.) and not greater than 2.4m (96in.) above the finished floor.
Visible notification appliances shall be installed in accordance using one of the following.
1.) A single visible notification appliance
2.) Two visible notification appliances located on opposite walls
3.) More than two visible notification appliances in the same room or adjacent space within the field of view that flash in synchronization.
Public Mode:
1.) To ensure that audible public mode signals are clearly heard, they shall have a sound level at least 15dB above the average ambient sound level or 5dB above the maximum sound level having a duration of at least 60 seconds, whichever is greater, measured 1.5m (5ft) above the floor in the occupiable area.
2.) Audible alarm notification appliances installed in elevator cars shall be permitted to use the private mode criteria.
Visible Characteristics:
1.) In a corridor applications, visible appliances shall be rated not less than 15cd.
2.) Corridors greater than 6.1m (20ft) wide shall comply with the spacing requirements for rooms in accordance with NFPA 72.
3.) Visible notification appliances shall be located not more than 4.57m (15ft) from the end of the corridor with a separation not greater than 30.4m (100ft) between appliances.



SUMMIT FIRE PROTECTION
10200 E. Easter Avenue
Centennial, Colorado 80112
Phone: (303) 790-2520
Fax: (303) 790-2528

THESE DRAWINGS ARE SCHEMATIC AND DO NOT ATTEMPT TO SHOW SHOW CONDUIT ROUTING.

ARCHITECT:

GENERAL CONTRACTOR:

ENGINEER:

INSTALLER:

PROJECT: QTS DATA CENTER QTS DENI DC2
PROJECT DESCRIPTION: FIRE ALARM & DETECTION SYSTEM
PROJECT LOCATION: 1140 N. GUN CLUB ROAD AURORA, COLORADO 80018

MERIDIAN PROJECT
JOB#: 2025-24

NICET CERTIFIED

TRAVIS COOK- NICET#113375
COMMENTS AND STAMP

THESE DRAWINGS ARE SCHEMATIC AND DO NOT ATTEMPT TO SHOW SHOW CONDUIT ROUTING.

KEY PLAN
N.T.S.

| REVISION | DATE |
|---|---|
| SUBMITTAL | 07/07/25 |
| REVISIONS | 09/22/25 |
| DATA HALL BUILDOUT | 12/13/25 |
| COMMENTS | 02/25/26 |
| COMMENTS (REV 1) | 04/2/26 |
| COMMENTS (REV 2) | 06/3/26 |
| RFI#696 (REV 3) | 07/24/26 |

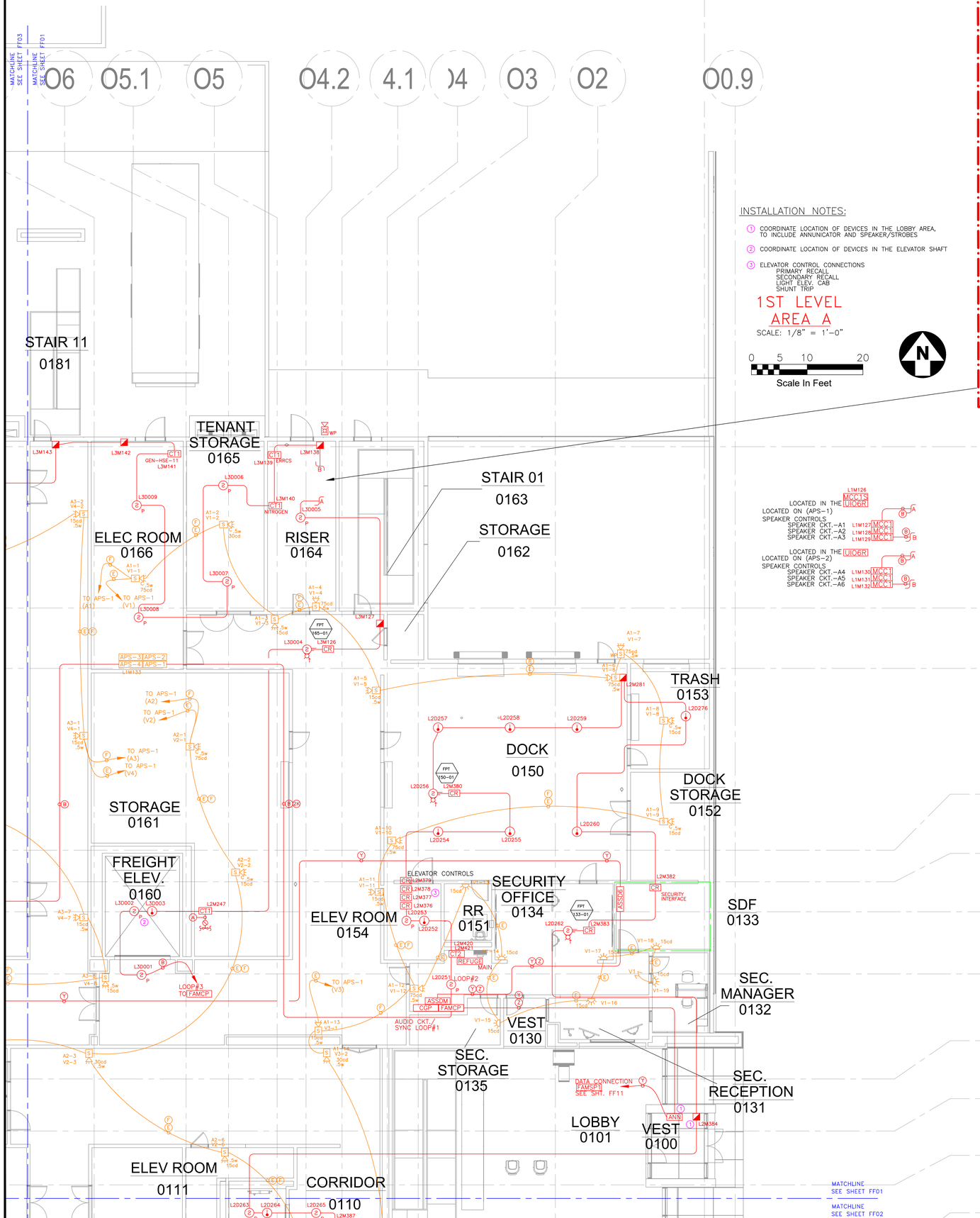
CAD FILE: SEQUENCE OF OPS
DRAWN BY: B. ALLEN — DATE: 5/23/25
ENG. APPROVAL: — DATE:
REVIEW BY: B. ALLEN — SCALE: N.T.S.

FIRE ALARM SYSTEM EST-4

FIRE ALARM SEQUENCE OF OPERATIONS- WORK NOTES

SHEET FS01

PERMIT #2026 2513934- CM 05-REV TO CM 02 | RSN:1991301




## INSTALLATION NOTES:

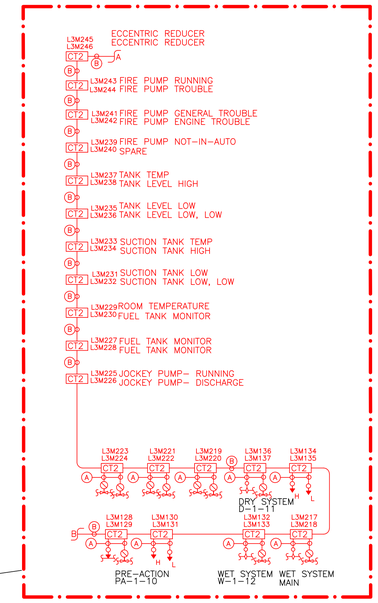
1. COORDINATE LOCATION OF DEVICES IN THE LOBBY AREA, TO INCLUDE ANNUNICATOR AND SPEAKER/STROBES
2. COORDINATE LOCATION OF DEVICES IN THE ELEVATOR SHAFT
3. ELEVATOR CONTROL CONNECTIONS
   - PRIMARY RECALL
   - SECONDARY RECALL
   - LIGHT ELEV. CAB
   - SHUNT TRIP

## 1ST LEVEL AREA A

SCALE: 1/8" = 1'-0"

0 5 10 20

Scale In Feet







| | |
|---|---|
| FAMCP | FIRE ALARM/MASS NOTIFICATION CONTROL PANEL |
| FAMSP | FIRE ALARM SLAVE/MASS NOTIFICATION CONTROL |
| ANN | REMOTE ANNUNCIATOR PANEL |
| MAP | GRAPHIC MAP W/INSTRUCTIONS FOR MNS |
| ASSDM | MASTER VESDA UNIT. |
| ASSD | SLAVE VESDA UNIT. |
| VCGW | COMPUTER GRAPHIC WORKSTATION |
| TVSS 120AC | TRANSIENT VOLTAGE SURGE SUPPRESSOR |
| APS-1 | REMOTE BOOSTER POWER |
| 2 P | SMOKE DETECTOR |
| L | LINEAR HEAT DETECTION |
| CO | CARBON MONOXIDE DETECTOR |
| | HEAT DETECTOR |
| | DUCT DETECTOR |
| | REMOTE LIGHT/TEST STATION |
| BT | BEAM DETECTOR- TRANSMITTER |
| BR | BEAM DETECTOR- RECEIVER |
| | MANUAL PULL STATION |
| CT1 | SINGLE MONITOR MODULE |
| CT2 | DUAL MONITOR MODULE |
| CR | RELAY MODULE |
| RM1 | RISER MODULE |
| IO | I/O MODULE |
| IM | ISOLATION MODULE |
| S | FIRE ALARM SPEAKER/STROBE WALL MOUNT |
| S C | FIRE ALARM SPEAKER/STROBE CEILING MOUNT |
| S WP | FIRE ALARM SPEAKER/STROBE WALL MOUNT/WEATHERPROOF |
| S | FIRE ALARM SPEAKER ONLY WALL MOUNT |
| S C | FIRE ALARM SPEAKER ONLY CEILING MOUNT |
| S LS | FIRE ALARM LOUD SPEAKER |
| S DD | FIRE ALARM DIRECTIONAL SPEAKER |
| S WP | FIRE ALARM SPEAKER ONLY WALL MOUNT/WEATHERPROOF |
| | FIRE ALARM STROBE WALL MOUNT |
| C | FIRE ALARM STROBE CEILING MOUNT |
| H | FIRE ALARM HORN/STROBE |
| WP H | FIRE ALARM HORN/STROBE WALL MOUNT/WEATHERPROOF |
| | FLOW SWITCH |
| | TAMPER SWITCH |
| | PRESSURE SWITCH |
| | LOW AIR SWITCH |
| FDC | FIRE DEPARTMENT CONNECTION |
| KNOX BOX | KNOX BOX |
| | FIRE SMOKE DAMPER |
| | RISER UP/DOWN |
| TERM BOX | FIRE ALARM TERMINAL CABINET |
| REFUGE STATION | AREA-OF-RESCUE- CALL BOX |
| REFUGE MAIN | AREA-OF-RESCUE COMMAND CENTER |

## GENERAL NOTES:

ALL BREAKERS THAT SUPPLY POWER TO FIRE ALARM RELATED EQUIPMENT, MUST BE PAINTED RED TO RENDER THE BREAKER EASILY IDENTIFIABLE.

### FIRE ALARM WIRE TYPE CHART

| Color | Label | Description | Wire Type |
|---|---|---|---|
| | AC | 120VAC Power Wiring | 3#12 AWG Solid (w/Ground) |
| | Y | Data/Network Wiring | #14 AWG Solid |
| | B | Signaling Line Circuit | #16 AWG Solid |
| | Z | 24VDC Power Wiring | 2#14 AWG Solid |
| | E | Notification Appliance (Strobe) Wiring | 2#14 AWG Solid |
| | F | Notification Appliance (Speaker) Wiring | 2#14 AWG Solid |
| | A | Indicating device Circuit (Zone) Wiring | 2#16 AWG Solid |
| | | ModuLaser (Zone) | |
| | | Beam Detector (Line) | |

### CIRCUIT CLASS, STYLE NOTES

NAC - Notification Appliance Circuits
STROBES: Class B
SPEAKERS: Class B
SLC - Signaling Line Circuits
Class A, MAKE SURE TO FOLLOW THE SEPARATE CONDUIT (REQUIREMENTS)
IDC - Initiating Device Circuit (i.e. at flow/tamper switches to modules)
Class B

## DEVICE/ CIRCUIT DESIGNATION:

SLC L1D XXX

LOOP # — D-DETECTORS M-MODULES — DEVICE #

SENSOR ADDRESS RANGE 001-125
MODULE ADDRESS RANGE 126-250
1ST SLC CIRCUIT ON SLC CARD

SENSOR ADDRESS RANGE 251-375
MODULE ADDRESS RANGE 376-500
2ND SLC CIRCUIT ON SLC CARD

NAC AX- XX SPEAKER
NAC VX- XX STROBE
DEVICE #
NAC CIRCUIT #

NOTE: SLC CARDS RESIDE INSIDE FIRE ALARM CONTROL PANELS. MODEL 3-SSDC SUPPORTS 1 SLC CIRCUIT, MODEL 3-SSDC SUPPORTS 2 SLC CIRCUITS. SEE PANEL SHEET FOR ADDITIONAL INFORMATION.

City of Aurora Building Division
Reviewed for Code Compliance
Approved as Noted::chorst
Date:Aug 14, 2026
2021 INTERNATIONAL CODES & 2023 NEC



SUMMIT FIRE PROTECTION
10200 E. Easter Avenue
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Fax: (303) 790-2528

THESE DRAWINGS ARE SCHEMATIC AND DO NOT ATTEMPT TO SHOW SHOW CONDUIT ROUTING.

ARCHITECT:

GENERAL CONTRACTOR:

ENGINEER:

INSTALLER:

| PROJECT | PROJECT DESCRIPTION | PROJECT LOCATION |
|---|---|---|
| QTS DATA CENTER QTS DENI DC2 | FIRE ALARM & DETECTION SYSTEM | 1140 N. GUN CLUB ROAD AURORA, COLORADO 80018 |

MERIDIAN PROJECT

JOB#: 2025-24

NICET CERTIFIED

TRAVIS COOK- NICET#113375

COMMENTS AND STAMP

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KEY PLAN
N.T.S.

| REVISION | | DATE |
|---|---|---|
| SUBMITTAL | | 07/07/25 |
| REVISIONS | | 09/22/25 |
| DATA HALL BUILDOUT | | 12/13/25 |
| COMMENTS | | 02/25/26 |
| COMMENTS | CC1 | 04/2/26 |
| COMMENTS | CC2 | 06/3/26 |
| RFI#696 | RFI 6 | 07/24/26 |

CAD FILE: 1ST LEVEL

DRAWN BY: T.COOK — DATE: 06/12/25

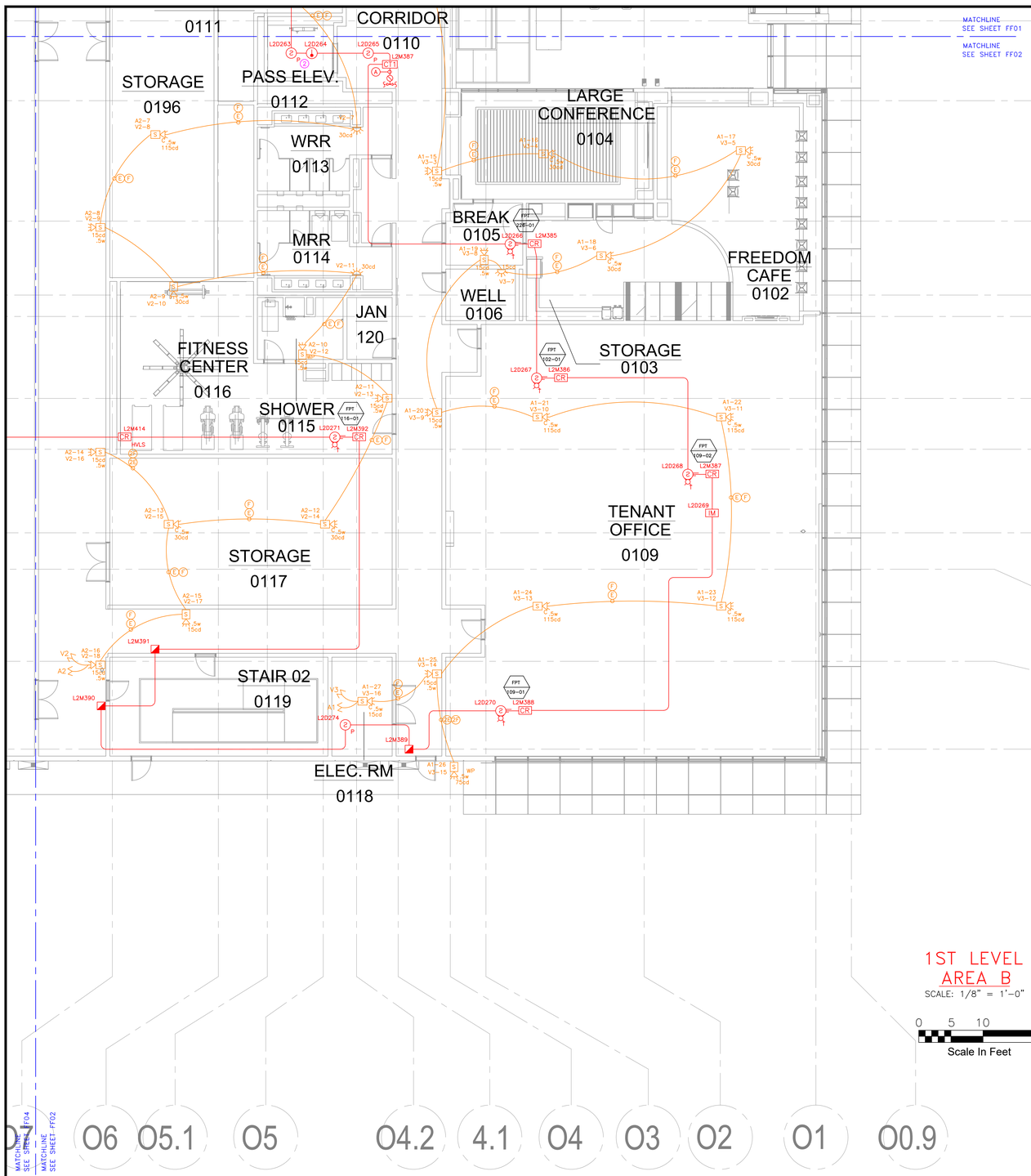
ENG. APPROVAL: — DATE:

REVIEW BY: — SCALE: 1/8"=1'-0"

FIRE ALARM SYSTEM EST-4

FIRE ALARM 1ST LEVEL (AREA-A) FLOOR PLAN

SHEET FF01




1ST LEVEL
AREA B
SCALE: 1/8" = 1'-0"

0 5 10 20
Scale In Feet

| | |
|---|---|
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| CO | CARBON MONOXIDE DETECTOR |
| | HEAT DETECTOR |
| | DUCT DETECTOR |
| | REMOTE LIGHT/TEST STATION |
| BT | BEAM DETECTOR– TRANSMITTER |
| BR | BEAM DETECTOR– RECEIVER |
| | MANUAL PULL STATION |
| CT1 | SINGLE MONITOR MODULE |
| CT2 | DUAL MONITOR MODULE |
| CR | RELAY MODULE |
| RM1 | RISER MODULE |
| IO | I/O MODULE |
| IM | ISOLATION MODULE |
| S | FIRE ALARM SPEAKER/STROBE WALL MOUNT |
| S C | FIRE ALARM SPEAKER/STROBE CEILING MOUNT |
| S WP | FIRE ALARM SPEAKER/STROBE WALL MOUNT/WEATHERPROOF |
| S | FIRE ALARM SPEAKER ONLY WALL MOUNT |
| S C | FIRE ALARM SPEAKER ONLY CEILING MOUNT |
| S LS | FIRE ALARM LOUD SPEAKER |
| S DS | FIRE ALARM DIRECTIONAL SPEAKER |
| S WP | FIRE ALARM SPEAKER ONLY WALL MOUNT/WEATHERPROOF |
| | FIRE ALARM STROBE WALL MOUNT |
| C | FIRE ALARM STROBE CEILING MOUNT |
| H | FIRE ALARM HORN/STROBE |
| WP H | FIRE ALARM HORN/STROBE WALL MOUNT/WEATHERPROOF |
| FS | FLOW SWITCH |
| TS | TAMPER SWITCH |
| PS | PRESSURE SWITCH |
| | LOW AIR SWITCH |
| FDC | FIRE DEPARTMENT CONNECTION |
| KNOX BOX | KNOX BOX |
| | FIRE SMOKE DAMPER |
| | RISER UP/DOWN |
| TERM BOX | FIRE ALARM TERMINAL CABINET |
| REFUGE E | AREA-OF-RESCUE- CALL BOX |
| REFUGE MAIN | AREA-OF-RESCUE COMMAND CENTER |

## GENERAL NOTES:

ALL BREAKERS THAT SUPPLY POWER TO FIRE ALARM RELATED EQUIPMENT, MUST BE PAINTED RED TO RENDER THE BREAKER EASILY IDENTIFIABLE.

FIRE ALARM WIRE TYPE CHART

| Color | Label | Description | Wire Type |
|---|---|---|---|
| | AC | 120VAC Power Wiring | 3#12 AWG Solid (w/Ground) |
| | Y | Data/Network Wiring | #14 AWG Solid |
| | B | Signaling Line Circuit | #16 AWG Solid |
| | Z | 24VDC Power Wiring | 2#14 AWG Solid |
| | E | Notification Appliance (Strobe) Wiring | 2#14 AWG Solid |
| | F | Notification Appliance (Speaker) Wiring | 2#14 AWG Solid |
| | A | Indicating device Circuit (Zone) Wiring | 2#16 AWG Solid |
| | | ModuLaser (Zone) | |
| | | Beam Detector (Line) | |

CIRCUIT CLASS, STYLE NOTES

NAC - Notification Appliance Circuits
STROBES: Class B
SPEAKERS: Class B
SLC - Signaling Line Circuits
Class A, MAKE SURE TO FOLLOW THE SEPARATE CONDUIT (REQUIREMENTS)
IDC - Initiating Device Circuit (i.e. at flow/tamper switches to modules)
Class B

## DEVICE/ CIRCUIT DESIGNATION:

SLC L1D XXX
LOOP # D–DETECTORS M–MODULES
DEVICE #
SENSOR ADDRESS RANGE 001–125
MODULE ADDRESS RANGE 126–250
1ST SLC CIRCUIT ON SLC CARD
SENSOR ADDRESS RANGE 251–375
MODULE ADDRESS RANGE 376–500
2ND SLC CIRCUIT ON SLC CARD

NAC AX– XX SPEAKER
VX– XX STROBE
DEVICE #
NAC CIRCUIT #

NOTE: SLC CARDS RESIDE INSIDE FIRE ALARM CONTROL PANELS. MODEL 3–5IDC SUPPORTS 1 SLC CIRCUIT, MODEL 3–5IDC SUPPORTS 2 SLC CIRCUITS. SEE PANEL SHEET FOR ADDITIONAL INFORMATION.

SUMMIT FIRE PROTECTION
10200 E. Easter Avenue
Centennial, Colorado 80112
Phone: (303) 790–2520
Fax: (303) 790–2528

THESE DRAWINGS ARE SCHEMATIC AND DO NOT ATTEMPT TO SHOW SHOW CONDUIT ROUTING.

ARCHITECT:

GENERAL CONTRACTOR:

ENGINEER:

INSTALLER:

| PROJECT | PROJECT DESCRIPTION | PROJECT LOCATION |
|---|---|---|
| QTS DATA CENTER QTS DENI DC2 | FIRE ALARM & DETECTION SYSTEM | 1140 N. GUN CLUB ROAD AURORA, COLORADO 80018 |

MERIDIAN PROJECT

JOB#: 2025–24

NICET CERTIFIED

TRAVIS COOK- NICET#113375

COMMENTS AND STAMP

THESE DRAWINGS ARE SCHEMATIC AND DO NOT ATTEMPT TO SHOW SHOW CONDUIT ROUTING.

KEY PLAN
N.T.S.

| REVISION | DATE |
|---|---|
| SUBMITTAL | 07/07/25 |
| REVISIONS | 09/22/25 |
| DATA HALL BUILDOUT | 12/13/25 |
| COMMENTS | 02/25/26 |
| COMMENTS (RFI) | 04/2/26 |
| COMMENTS (RFI) | 06/3/26 |
| RFI#696 (RFI) | 07/24/26 |

CAD FILE: 1ST LEVEL

DRAWN BY: T.COOK — DATE: 06/12/25

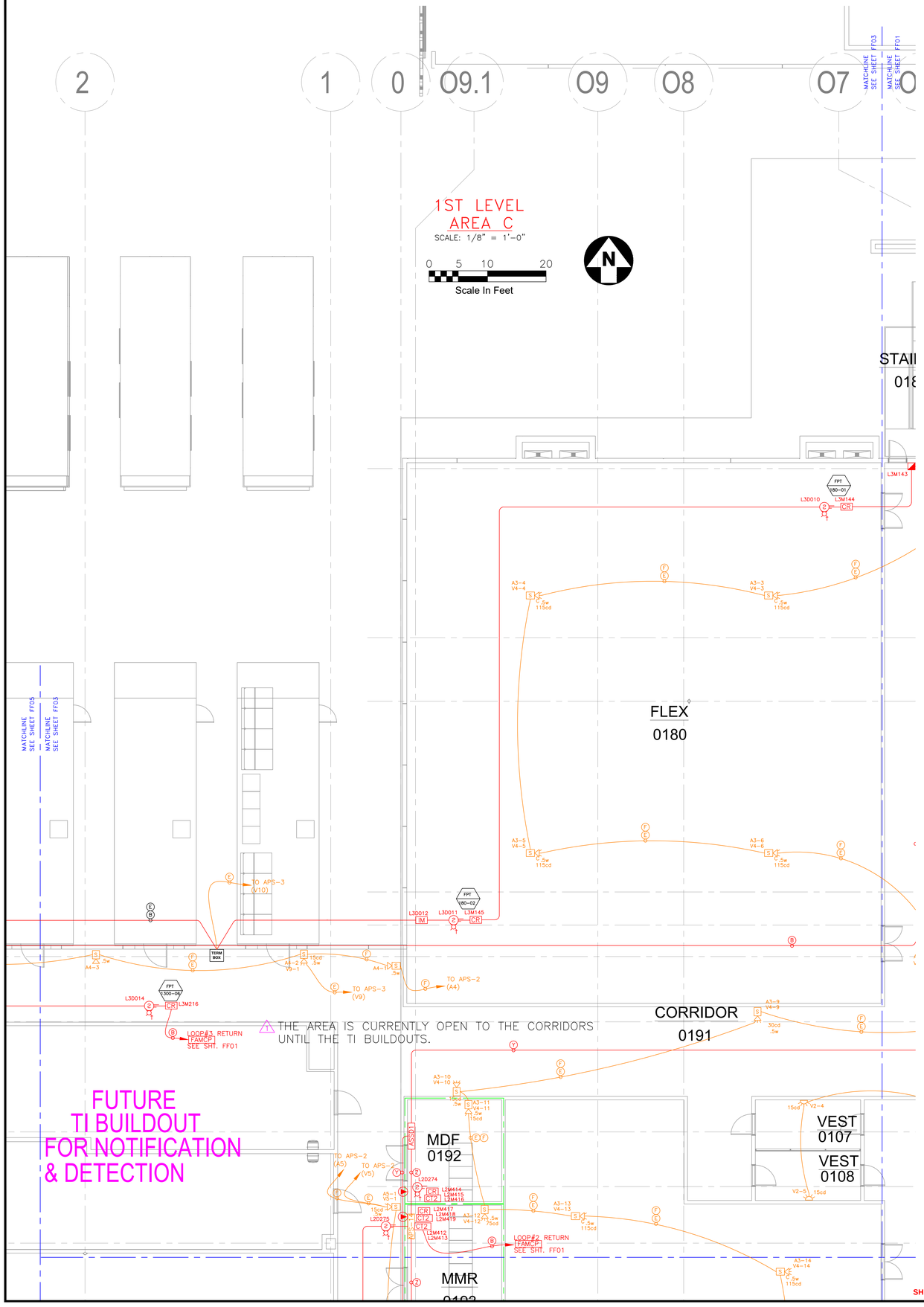
ENG. APPROVAL: — DATE:

REVIEW BY: — SCALE: 1/8"=1'-0"

FIRE ALARM SYSTEM EST-4

FIRE ALARM 1ST LEVEL (AREA-B) FLOOR PLAN

SHEET FF02




| | |
|---|---|
| FAMCP | FIRE ALARM/MASS NOTIFICATION CONTROL PANEL |
| FAMSP | FIRE ALARM SLAVE/MASS NOTIFICATION CONTROL |
| ANN | REMOTE ANNUNCIATOR PANEL |
| MAP | GRAPHIC MAP W/INSTRUCTIONS FOR MNS |
| ASSDM | MASTER VESDA UNIT. |
| ASSD— | SLAVE VESDA UNIT. |
| VCGW | COMPUTER GRAPHIC WORKSTATION |
| TVSS 120AC | TRANSIENT VOLTAGE SURGE SUPPRESSOR |
| APS—1 | REMOTE BOOSTER POWER |
| 2 P | SMOKE DETECTOR |
| L | LINEAR HEAT DETECTION |
| CO | CARBON MONOXIDE DETECTOR |
| | HEAT DETECTOR |
| | DUCT DETECTOR |
| | REMOTE LIGHT/TEST STATION |
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| BR | BEAM DETECTOR– RECEIVER |
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| CR | RELAY MODULE |
| RM1 | RISER MODULE |
| IO | I/O MODULE |
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| S C | FIRE ALARM SPEAKER/STROBE CEILING MOUNT |
| S WP | FIRE ALARM SPEAKER/STROBE WALL MOUNT/WEATHERPROOF |
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| S LS | FIRE ALARM LOUD SPEAKER |
| S DS | FIRE ALARM DIRECTIONAL SPEAKER |
| S WP | FIRE ALARM SPEAKER ONLY WALL MOUNT/WEATHERPROOF |
| | FIRE ALARM STROBE WALL MOUNT |
| C | FIRE ALARM STROBE CEILING MOUNT |
| H | FIRE ALARM HORN/STROBE |
| WP H | FIRE ALARM HORN/STROBE WALL MOUNT/WEATHERPROOF |
| | FLOW SWITCH |
| | TAMPER SWITCH |
| | PRESSURE SWITCH |
| | LOW AIR SWITCH |
| FDC | FIRE DEPARTMENT CONNECTION |
| KNOX BOX | KNOX BOX |
| | FIRE SMOKE DAMPER |
| | RISER UP/DOWN |
| TERM BOX | FIRE ALARM TERMINAL CABINET |
| REFUGE STATION | AREA–OF–RESCUE– CALL BOX |
| REFUGE MAIN | AREA–OF–RESCUE COMMAND CENTER |

## GENERAL NOTES:

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| | F | Notification Appliance (Speaker) Wiring | 2#14 AWG Solid |
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| | | ModuLaser (Zone) | |
| | | Beam Detector (Line) | |

### CIRCUIT CLASS, STYLE NOTES

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STROBES: Class B
SPEAKERS: Class B
SLC - Signaling Line Circuits
Class A, MAKE SURE TO FOLLOW THE SEPARATE CONDUIT (REQUIREMENTS)
IDC - Initiating Device Circuit (i.e. at flow/tamper switches to modules)
Class B

## DEVICE/ CIRCUIT DESIGNATION:

SLC L1D XXX
- L1D: LOOP # D–DETECTORS M–MODULES
- XXX: DEVICE #
  - SENSOR ADDRESS RANGE 001–125 / MODULE ADDRESS RANGE 126–250 — 1ST SLC CIRCUIT ON SLC CARD
  - SENSOR ADDRESS RANGE 251–375 / MODULE ADDRESS RANGE 376–500 — 2ND SLC CIRCUIT ON SLC CARD

NAC AX– XX SPEAKER / VX– XX STROBE
- XX: DEVICE #
- AX/VX: NAC CIRCUIT #

NOTE: SLC CARDS RESIDE INSIDE FIRE ALARM CONTROL PANELS. MODEL 3–5SDC SUPPORTS 1 SLC CIRCUIT, MODEL 3–5DDC SUPPORTS 2 SLC CIRCUITS. SEE PANEL SHEET FOR ADDITIONAL INFORMATION.

SUMMIT FIRE PROTECTION
10200 E. Easter Avenue
Centennial, Colorado 80112
Phone: (303) 790–2520
Fax: (303) 790–2528

THESE DRAWINGS ARE SCHEMATIC AND DO NOT ATTEMPT TO SHOW SHOW CONDUIT ROUTING.

ARCHITECT:

GENERAL CONTRACTOR:

ENGINEER:

INSTALLER:

| | | |
|---|---|---|
| PROJECT | PROJECT DESCRIPTION | PROJECT LOCATION |
| QTS DATA CENTER QTS DENI DC2 | FIRE ALARM & DETECTION SYSTEM | 1140 N. GUN CLUB ROAD AURORA, COLORADO 80018 |

MERIDIAN PROJECT

JOB#: 2025–24

NICET CERTIFIED

TRAVIS COOK- NICET#113375

COMMENTS AND STAMP

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KEY PLAN
N.T.S.

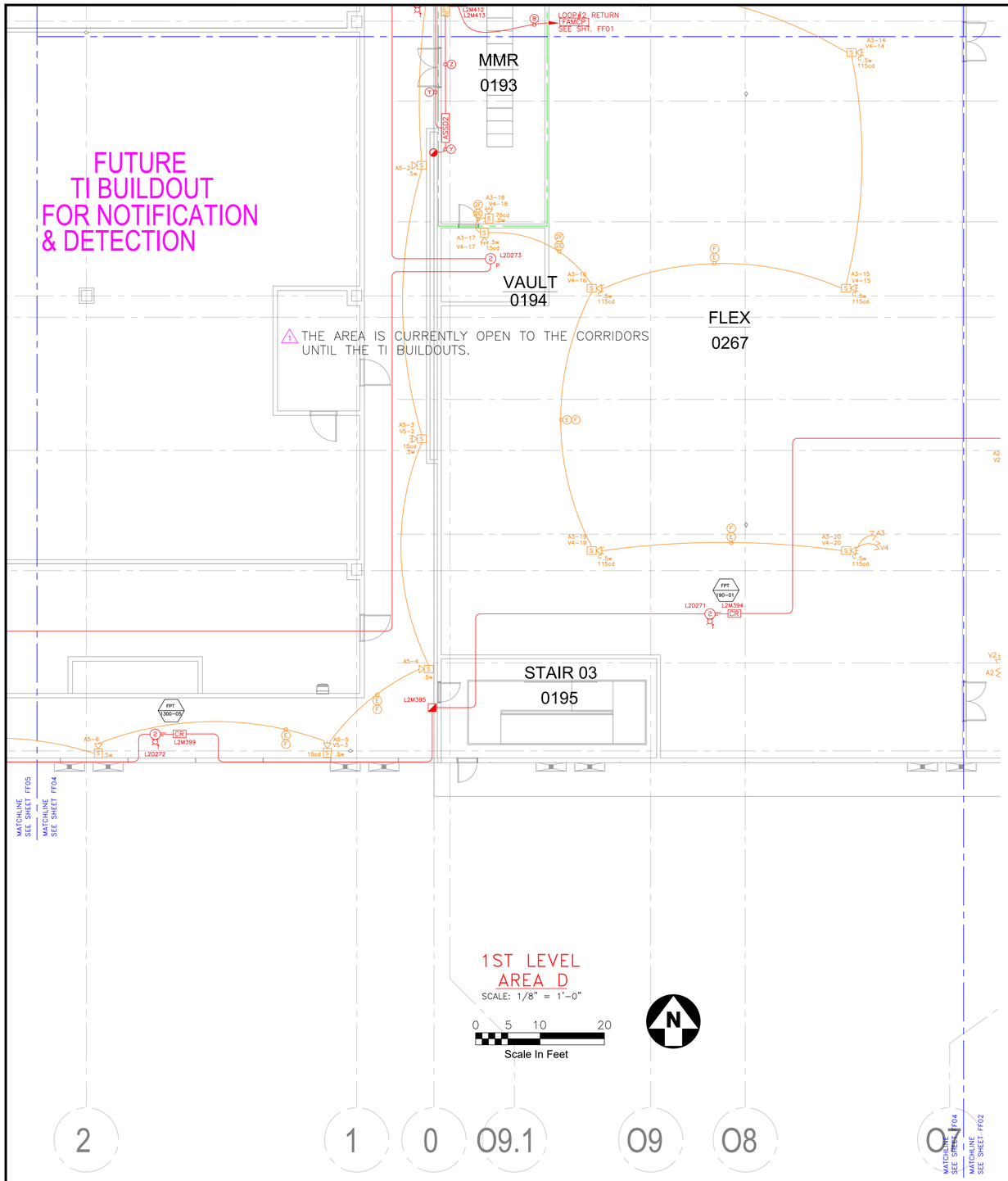
| REVISION | | DATE |
|---|---|---|
| SUBMITTAL | | 07/07/25 |
| REVISIONS | | 09/22/25 |
| DATA HALL BUILDOUT | | 12/13/25 |
| COMMENTS | | 02/25/26 |
| COMMENTS | (02) | 04/2/26 |
| COMMENTS | (03) | 06/3/26 |
| RFI#696 | (01) | 07/24/26 |

| | |
|---|---|
| CAD FILE: 1ST LEVEL | |
| DRAWN BY: T.COOK | DATE: 06/12/25 |
| ENG. APPROVAL: | DATE: |
| REVIEW BY: | SCALE: 1/8"=1'-0" |

FIRE ALARM SYSTEM EST–4

FIRE ALARM 1ST LEVEL (AREA–C) FLOOR PLAN

SHEET FF03




| | |
|---|---|
| FAMCP | FIRE ALARM/MASS NOTIFICATION CONTROL PANEL |
| FAMSP | FIRE ALARM SLAVE/MASS NOTIFICATION CONTROL |
| ANN | REMOTE ANNUNCIATOR PANEL |
| MAP | GRAPHIC MAP W/INSTRUCTIONS FOR MNS |
| ASSDM | MASTER VESDA UNIT. |
| ASSD→ | SLAVE VESDA UNIT. |
| VCGW | COMPUTER GRAPHIC WORKSTATION |
| TVSS 120AC | TRANSIENT VOLTAGE SURGE SUPPRESSOR |
| APS—1 | REMOTE BOOSTER POWER |
| (2)P | SMOKE DETECTOR |
| (2)L | LINEAR HEAT DETECTION |
| CO | CARBON MONOXIDE DETECTOR |
| | HEAT DETECTOR |
| (2) | DUCT DETECTOR |
| | REMOTE LIGHT/TEST STATION |
| (2)BT | BEAM DETECTOR– TRANSMITTER |
| (2)BR | BEAM DETECTOR– RECEIVER |
| | MANUAL PULL STATION |
| CT1 | SINGLE MONITOR MODULE |
| CT2 | DUAL MONITOR MODULE |
| CR | RELAY MODULE |
| RM1 | RISER MODULE |
| IO | I/O MODULE |
| IM | ISOLATION MODULE |
| S | FIRE ALARM SPEAKER/STROBE WALL MOUNT |
| S C | FIRE ALARM SPEAKER/STROBE CEILING MOUNT |
| S WP | FIRE ALARM SPEAKER/STROBE WALL MOUNT/WEATHERPROOF |
| S | FIRE ALARM SPEAKER ONLY WALL MOUNT |
| S C | FIRE ALARM SPEAKER ONLY CEILING MOUNT |
| S LS | FIRE ALARM LOUD SPEAKER |
| S DS | FIRE ALARM DIRECTIONAL SPEAKER |
| S WP | FIRE ALARM SPEAKER ONLY WALL MOUNT/WEATHERPROOF |
| | FIRE ALARM STROBE WALL MOUNT |
| C | FIRE ALARM STROBE CEILING MOUNT |
| H | FIRE ALARM HORN/STROBE |
| WP H | FIRE ALARM HORN/STROBE WALL MOUNT/WEATHERPROOF |
| | FLOW SWITCH |
| | TAMPER SWITCH |
| | PRESSURE SWITCH |
| | LOW AIR SWITCH |
| FDC | FIRE DEPARTMENT CONNECTION |
| KNOX BOX | KNOX BOX |
| | FIRE SMOKE DAMPER |
| | RISER UP/DOWN |
| TERM BOX | FIRE ALARM TERMINAL CABINET |
| REFUGE ASSISTANCE | AREA-OF-RESCUE- CALL BOX |
| REFUGE MAIN | AREA-OF-RESCUE COMMAND CENTER |

## GENERAL NOTES:

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### FIRE ALARM WIRE TYPE CHART

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| | Z | 24VDC Power Wiring | 2#14 AWG Solid |
| | E | Notification Appliance (Strobe) Wiring | 2#14 AWG Solid |
| | F | Notification Appliance (Speaker) Wiring | 2#14 AWG Solid |
| | A | Indicating device Circuit (Zone) Wiring | 2#16 AWG Solid |
| | | ModuLaser (Zone) | |
| | | Beam Detector (Line) | |

### CIRCUIT CLASS, STYLE NOTES

NAC - Notification Appliance Circuits
STROBES: Class B
SPEAKERS: Class B
SLC - Signaling Line Circuits
Class A, MAKE SURE TO FOLLOW THE SEPARATE CONDUIT (REQUIREMENTS)
IDC - Initiating Device Circuit (i.e. at flow/tamper switches to modules)
Class B

## DEVICE/ CIRCUIT DESIGNATION:

SLC L1D XXX
LOOP #
D–DETECTORS
M–MODULES
DEVICE #
SENSOR ADDRESS RANGE 001–125
MODULE ADDRESS RANGE 126–250
1ST SLC CIRCUIT ON SLC CARD
SENSOR ADDRESS RANGE 251–375
MODULE ADDRESS RANGE 376–500
2ND SLC CIRCUIT ON SLC CARD
NAC AX– XX SPEAKER
VX– XX STROBE
DEVICE #
NAC CIRCUIT #

NOTE: SLC CARDS RESIDE INSIDE FIRE ALARM CONTROL PANELS. MODEL 3–SSDC SUPPORTS 1 SLC CIRCUIT, MODEL 3–5DDC SUPPORTS 2 SLC CIRCUITS. SEE PANEL SHEET FOR ADDITIONAL INFORMATION.

SUMMIT FIRE PROTECTION
10200 E. Easter Avenue
Centennial, Colorado 80112
Phone: (303) 790–2520
Fax: (303) 790–2528

THESE DRAWINGS ARE SCHEMATIC AND DO NOT ATTEMPT TO SHOW SHOW CONDUIT ROUTING.

ARCHITECT:

GENERAL CONTRACTOR:

ENGINEER:

INSTALLER:

| PROJECT | PROJECT DESCRIPTION | PROJECT LOCATION |
|---|---|---|
| QTS DATA CENTER<br>QTS DENI DC2 | FIRE ALARM & DETECTION SYSTEM | 1140 N. GUN CLUB ROAD<br>AURORA, COLORADO 80018 |

MERIDIAN PROJECT

JOB#: 2025–24

NICET CERTIFIED

TRAVIS COOK- NICET#113375

COMMENTS AND STAMP

THESE DRAWINGS ARE SCHEMATIC AND DO NOT ATTEMPT TO SHOW SHOW CONDUIT ROUTING.

KEY PLAN
N.T.S.

| REVISION | DATE |
|---|---|
| SUBMITTAL | 07/07/25 |
| REVISIONS | 09/22/25 |
| DATA HALL BUILDOUT | 12/13/25 |
| COMMENTS | 02/25/26 |
| COMMENTS (#2) | 04/2/26 |
| COMMENTS (#3) | 06/3/26 |
| RFI#696 (#4) | 07/24/26 |

CAD FILE: 1ST LEVEL
DRAWN BY: T.COOK
DATE: 06/12/25
ENG. APPROVAL:
DATE:
REVIEW BY:
SCALE: 1/8"=1'–0"

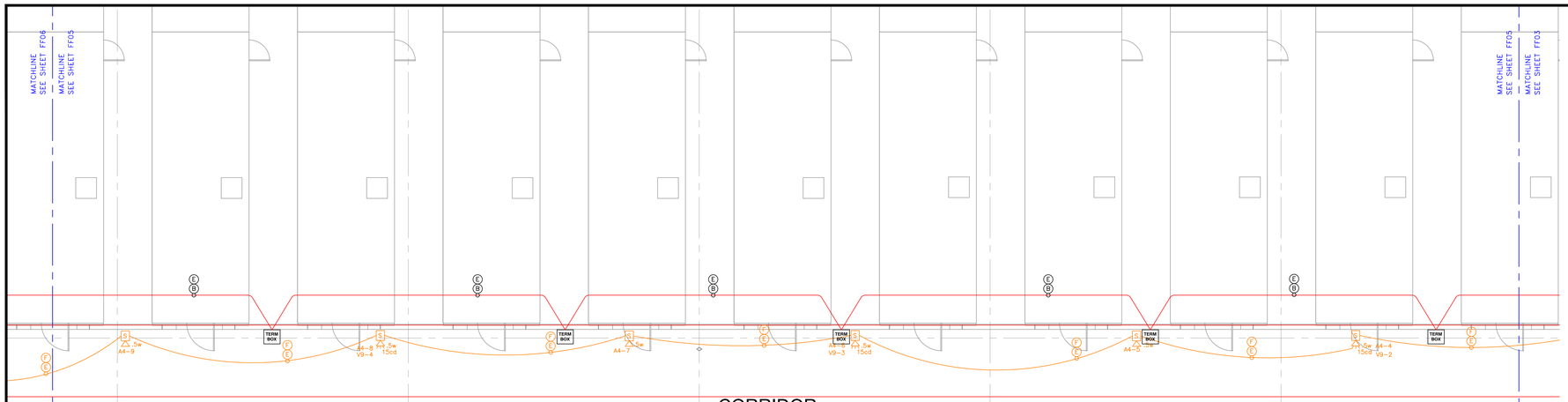
FIRE ALARM SYSTEM
EST–4

FIRE ALARM
1ST LEVEL
(AREA–D)
FLOOR PLAN

SHEET
FF04

MATCHLINE SEE SHEET FF06

MATCHLINE SEE SHEET FF05




CORRIDOR
1300

⚠1 THE AREA IS CURRENTLY OPEN TO THE CORRIDORS UNTIL THE TI BUILDOUTS.

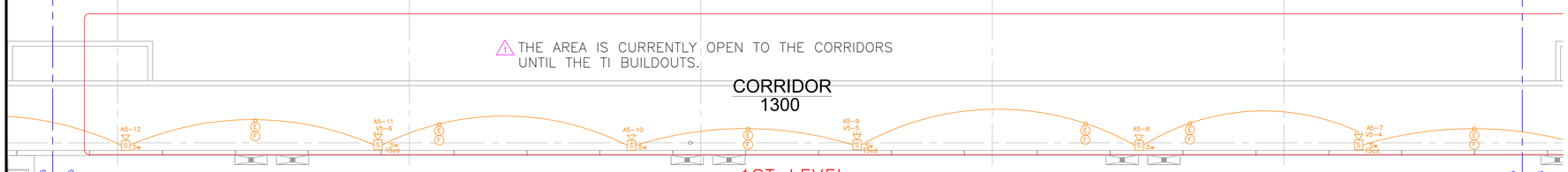
⚠1 THE AREA IS CURRENTLY OPEN TO THE CORRIDORS UNTIL THE TI BUILDOUTS.

MATCHLINE SEE SHEET FF05

MATCHLINE SEE SHEET FF03

# FUTURE TI BUILDOUT FOR NOTIFICATION & DETECTION

DATA HALL
1000




⚠1 THE AREA IS CURRENTLY OPEN TO THE CORRIDORS UNTIL THE TI BUILDOUTS.

CORRIDOR
1300

MATCHLINE SEE SHEET FF06

MATCHLINE SEE SHEET FF05

MATCHLINE SEE SHEET FF05

MATCHLINE SEE SHEET FF04

## 1ST LEVEL AREA E

SCALE: 1/8" = 1'-0"

0 5 10 20
Scale In Feet

GENERAL NOTES:

1 ENSURE THAT ALL CEILING MOUNTED NOTIFICATION DEVICES ARE INSTALLED IN CORRECT LOCATION FOR FUTURE DATA HALL FIT OUT. COORDINATE FINAL PLACEMENT

VERIFY PLACEMENT OF SUPPLY AND RETURN DUCT DETECTORS

| | |
|---|---|
| FAMCP | FIRE ALARM/MASS NOTIFICATION CONTROL PANEL |
| FAMSP | FIRE ALARM SLAVE/MASS NOTIFICATION CONTROL |
| ANN | REMOTE ANNUNCIATOR PANEL |
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| ASSDM | MASTER VESDA UNIT. |
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| VCGW | COMPUTER GRAPHIC WORKSTATION |
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| APS—1 | REMOTE BOOSTER POWER |
| (S) P | SMOKE DETECTOR |
| (H) L | LINEAR HEAT DETECTION |
| CO | CARBON MONOXIDE DETECTOR |
| (H) | HEAT DETECTOR |
| (D) | DUCT DETECTOR |
| (R) | REMOTE LIGHT/TEST STATION |
| (B) BT | BEAM DETECTOR– TRANSMITTER |
| (B) BR | BEAM DETECTOR– RECEIVER |
| | MANUAL PULL STATION |
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| S WP | FIRE ALARM SPEAKER ONLY WALL MOUNT/WEATHERPROOF |
| | FIRE ALARM STROBE WALL MOUNT |
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| | FLOW SWITCH |
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| | PRESSURE SWITCH |
| | LOW AIR SWITCH |
| FDC | FIRE DEPARTMENT CONNECTION |
| KNOX BOX | KNOX BOX |
| | FIRE SMOKE DAMPER |
| | RISER UP/DOWN |
| TERM BOX | FIRE ALARM TERMINAL CABINET |
| C REFUGE STATION | AREA-OF-RESCUE- CALL BOX |
| REFUGE MAIN | AREA-OF-RESCUE COMMAND CENTER |

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- XXX: DEVICE #
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NAC AX– XX SPEAKER
NAC VX– XX STROBE
- XX: DEVICE #
- A/V: NAC CIRCUIT #

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Centennial, Colorado 80112
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Fax: (303) 790-2528

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ARCHITECT:

GENERAL CONTRACTOR:

ENGINEER:

INSTALLER:

| PROJECT | PROJECT DESCRIPTION | PROJECT LOCATION |
|---|---|---|
| QTS DATA CENTER QTS DENI DC2 | FIRE ALARM & DETECTION SYSTEM | 1140 N. GUN CLUB ROAD AURORA, COLORADO 80018 |

MERIDIAN PROJECT

JOB#: 2025-24

NICET CERTIFIED

TRAVIS COOK- NICET#113375

COMMENTS AND STAMP

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KEY PLAN
N.T.S.

| REVISION | DATE |
|---|---|
| SUBMITTAL | 07/07/25 |
| REVISIONS | 09/22/25 |
| DATA HALL BUILDOUT | 12/13/25 |
| COMMENTS | 02/25/26 |
| COMMENTS (A2) | 04/2/26 |
| COMMENTS (A3) | 06/3/26 |
| RFI#696 (A4) | 07/24/26 |

CAD FILE: 1ST LEVEL

DRAWN BY: T.COOK — DATE: 06/12/25

ENG. APPROVAL: — DATE:

REVIEW BY: — SCALE: 1/8"=1'-0"

FIRE ALARM SYSTEM EST-4

FIRE ALARM 1ST LEVEL (AREA-E) FLOOR PLAN

SHEET FF05

PERMIT #2026 2513934- CM 05-REV TO CM 02 | RSN:1991301

MATCHLINE SEE SHEET FF07

MATCHLINE SEE SHEET FF06

L4M392 L4M393 CT2

L4M376 L4M377 CT2

L4M378 L4M379 CT2

L4M380 L4M381 CT2

L4M382 L4M383 CT2

PRE-ACTION PA-1-08

PRE-ACTION PA-1-09

STAIR 10
1307

MATCHLINE SEE SHEET FF04

MATCHLINE SEE SHEET FF05

TO APS-3 (V11)

A4-11 V9-6 .5w 175cd WP

L4M467

A4-10 V9-5 .5w 15cd

V10

TERM BOX

A4-16 .5w

A4-15 V9-8 .5w 15cd

A4-14 .5w

A4-13 V9-7 .5w 15cd

A4-12 .5w

L4D251 2 CR L4M394

FPT 1300-04

GALLERY
1300

⚠1 THE AREA IS CURRENTLY OPEN TO THE CORRIDORS UNTIL THE TI BUILDOUTS.

⚠1 THI UN

LOOP#4 FEED FAMCP SEE SHT. FF01

# FUTURE TI BUILDOUT FOR NOTIFICATION & DETECTION

DATA HALL
1100

⚠1 THE AREA IS CURRENTLY OPEN TO THE CORRIDORS UNTIL THE TI BUILDOUTS.

GALLERY
1300

A5-18 .5w

A5-17 V5-9 .5w 15cd

A5-16 .5w

A5-15 V5-8 .5w 15cd

FPT 1300-03

L4D252 2 CR L4M463

A5-14 .5w

L4M468

A5-13 V5-7 .5w

LOOP#4 RETURN FAMCP SEE SHT. FF01

STAIR 04
1301

MATCHLINE SEE SHEET FF07

MATCHLINE SEE SHEET FF06

MATCHLINE SEE SHEET FF06

MATCHLINE SEE SHEET FF05

GENERAL NOTES:

1 ENSURE THAT ALL CEILING MOUNTED NOTIFICATION DEVICES ARE INSTALLED IN CORRECT LOCATION FOR FUTURE DATA HALL FIT OUT. COORDINATE FINAL PLACEMENT

VERIFY PLACEMENT OF SUPPLY AND RETURN DUCT DETECTORS

1ST LEVEL AREA F

SCALE: 1/8" = 1'-0"

0 5 10 20

Scale In Feet

N

| | |
|---|---|
| FAMCP | FIRE ALARM/MASS NOTIFICATION CONTROL PANEL |
| FAMSP | FIRE ALARM SLAVE/MASS NOTIFICATION CONTROL |
| ANN | REMOTE ANNUNCIATOR PANEL |
| MAP | GRAPHIC MAP W/INSTRUCTIONS FOR MNS |
| ASSDM | MASTER VESDA UNIT. |
| ASSD | SLAVE VESDA UNIT. |
| VCGW | COMPUTER GRAPHIC WORKSTATION |
| TVSS 120AC | TRANSIENT VOLTAGE SURGE SUPPRESSOR |
| APS-1 | REMOTE BOOSTER POWER |
| 2 P | SMOKE DETECTOR |
| L | LINEAR HEAT DETECTION |
| CO | CARBON MONOXIDE DETECTOR |
| | HEAT DETECTOR |
| 2 | DUCT DETECTOR |
| | REMOTE LIGHT/TEST STATION |
| 2 BT | BEAM DETECTOR- TRANSMITTER |
| 2 BR | BEAM DETECTOR- RECEIVER |
| | MANUAL PULL STATION |
| CT1 | SINGLE MONITOR MODULE |
| CT2 | DUAL MONITOR MODULE |
| CR | RELAY MODULE |
| RM1 | RISER MODULE |
| IO | I/O MODULE |
| IM | ISOLATION MODULE |
| S | FIRE ALARM SPEAKER/STROBE WALL MOUNT |
| S C | FIRE ALARM SPEAKER/STROBE CEILING MOUNT |
| S WP | FIRE ALARM SPEAKER/STROBE WALL MOUNT/WEATHERPROOF |
| S | FIRE ALARM SPEAKER ONLY WALL MOUNT |
| S C | FIRE ALARM SPEAKER ONLY CEILING MOUNT |
| S LS | FIRE ALARM LOUD SPEAKER |
| S DS | FIRE ALARM DIRECTIONAL SPEAKER |
| S WP | FIRE ALARM SPEAKER ONLY WALL MOUNT/WEATHERPROOF |
| | FIRE ALARM STROBE WALL MOUNT |
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| H | FIRE ALARM HORN/STROBE |
| WP H | FIRE ALARM HORN/STROBE WALL MOUNT/WEATHERPROOF |
| FS | FLOW SWITCH |
| TS | TAMPER SWITCH |
| PS | PRESSURE SWITCH |
| | LOW AIR SWITCH |
| FDC | FIRE DEPARTMENT CONNECTION |
| KNOX BOX | KNOX BOX |
| | FIRE SMOKE DAMPER |
| | RISER UP/DOWN |
| TERM BOX | FIRE ALARM TERMINAL CABINET |
| REFUGE STATION | AREA-OF-RESCUE- CALL BOX |
| REFUGE MAIN | AREA-OF-RESCUE COMMAND CENTER |

GENERAL NOTES:

ALL BREAKERS THAT SUPPLY POWER TO FIRE ALARM RELATED EQUIPMENT, MUST BE PAINTED RED TO RENDER THE BREAKER EASILY IDENTIFIABLE.

FIRE ALARM WIRE TYPE CHART

| Color | Label | Description | Wire Type |
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| | AC | 120VAC Power Wiring | 3#12 AWG Solid (w/Ground) |
| | Y | Data/Network Wiring | #14 AWG Solid |
| | B | Signaling Line Circuit | #16 AWG Solid |
| | Z | 24VDC Power Wiring | 2#14 AWG Solid |
| | E | Notification Appliance (Strobe) Wiring | 2#14 AWG Solid |
| | F | Notification Appliance (Speaker) Wiring | 2#14 AWG Solid |
| | A | Indicating device Circuit (Zone) Wiring | 2#16 AWG Solid |
| | | ModuLaser (Zone) | |
| | | Beam Detector (Line) | |

CIRCUIT CLASS, STYLE NOTES

NAC - Notification Appliance Circuits
STROBES: Class B
SPEAKERS: Class B
SLC - Signaling Line Circuits
Class A, MAKE SURE TO FOLLOW THE SEPARATE CONDUIT (REQUIREMENTS)
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DEVICE/ CIRCUIT DESIGNATION:

SLC L1D XXX
L = LOOP #
D = DETECTORS
M = MODULES
XXX = DEVICE #

NAC AX- XX SPEAKER
NAC VX- XX STROBE
X = NAC CIRCUIT #
XX = DEVICE #

SENSOR ADDRESS RANGE 001-125
MODULE ADDRESS RANGE 126-250
1ST SLC CIRCUIT ON SLC CARD

SENSOR ADDRESS RANGE 251-375
MODULE ADDRESS RANGE 376-500
2ND SLC CIRCUIT ON SLC CARD

NOTE: SLC CARDS RESIDE INSIDE FIRE ALARM CONTROL PANELS. MODEL 3-SSDC SUPPORTS 1 SLC CIRCUIT, MODEL 3-5DDC SUPPORTS 2 SLC CIRCUITS. SEE PANEL SHEET FOR ADDITIONAL INFORMATION.

SUMMIT FIRE PROTECTION
10200 E. Easter Avenue
Centennial, Colorado 80112
Phone: (303) 790-2520
Fax: (303) 790-2528

THESE DRAWINGS ARE SCHEMATIC AND DO NOT ATTEMPT TO SHOW SHOW CONDUIT ROUTING.

ARCHITECT:

GENERAL CONTRACTOR:

ENGINEER:

INSTALLER:

| PROJECT | PROJECT DESCRIPTION | PROJECT LOCATION |
|---|---|---|
| QTS DATA CENTER QTS DENI DC2 | FIRE ALARM & DETECTION SYSTEM | 1140 N. GUN CLUB ROAD AURORA, COLORADO 80018 |

MERIDIAN PROJECT

JOB#: 2025-24

NICET CERTIFIED

TRAVIS COOK- NICET#113375

COMMENTS AND STAMP

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KEY PLAN
N.T.S.

| REVISION | DATE |
|---|---|
| SUBMITTAL | 07/07/25 |
| REVISIONS | 09/22/25 |
| DATA HALL BUILDOUT | 12/13/25 |
| COMMENTS | 02/25/26 |
| COMMENTS (#1) | 04/2/26 |
| COMMENTS (#2) | 06/3/26 |
| RFI#696 (#3) | 07/24/26 |

CAD FILE: 1ST LEVEL

DRAWN BY: T.COOK

DATE: 06/12/25

ENG. APPROVAL:

DATE:

REVIEW BY:

SCALE: 1/8"=1'-0"

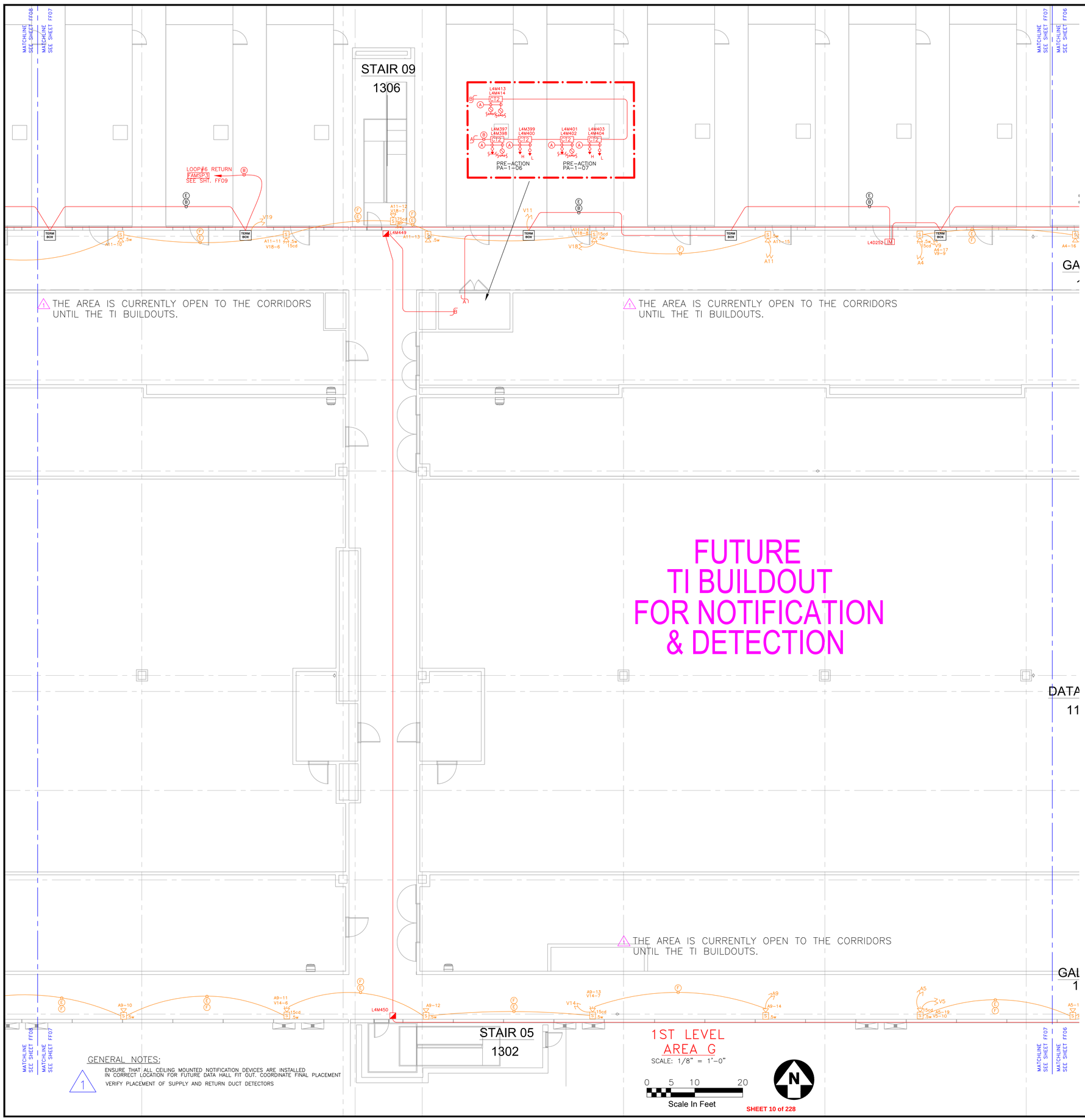
FIRE ALARM SYSTEM EST-4

FIRE ALARM 1ST LEVEL (AREA-F) FLOOR PLAN

SHEET

FF06

PERMIT #2026 2513934- CM 05-REV TO CM 02 | RSN:1991301




GENERAL NOTES:

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VERIFY PLACEMENT OF SUPPLY AND RETURN DUCT DETECTORS

1ST LEVEL
AREA G
SCALE: 1/8" = 1'-0"

0 5 10 20
Scale In Feet



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- MAP GRAPHIC MAP W/INSTRUCTIONS FOR MNS
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- APS-1 REMOTE BOOSTER POWER
- SMOKE DETECTOR
- LINEAR HEAT DETECTION
- CO CARBON MONOXIDE DETECTOR
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- CT1 SINGLE MONITOR MODULE
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- CR RELAY MODULE
- RM1 RISER MODULE
- IO I/O MODULE
- IM ISOLATION MODULE
- S FIRE ALARM SPEAKER/STROBE WALL MOUNT
- S C FIRE ALARM SPEAKER/STROBE CEILING MOUNT
- S WP FIRE ALARM SPEAKER/STROBE WALL MOUNT/WEATHERPROOF
- S FIRE ALARM SPEAKER ONLY WALL MOUNT
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- S WPS FIRE ALARM SPEAKER ONLY WALL MOUNT/WEATHERPROOF
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- KNOX BOX KNOX BOX
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| | F | Notification Appliance (Speaker) Wiring | 2#14 AWG Solid |
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| | | ModuLaser (Zone) | |
| | | Beam Detector (Line) | |

CIRCUIT CLASS, STYLE NOTES

NAC - Notification Appliance Circuits
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DEVICE/ CIRCUIT DESIGNATION:

SLC L1D XXX
- LOOP # D-DETECTORS M-MODULES
- DEVICE #
  - SENSOR ADDRESS RANGE 001-125 / MODULE ADDRESS RANGE 126-250 — 1ST SLC CIRCUIT ON SLC CARD
  - SENSOR ADDRESS RANGE 251-375 / MODULE ADDRESS RANGE 376-500 — 2ND SLC CIRCUIT ON SLC CARD

NAC AX- XX SPEAKER / VX- XX STROBE
- DEVICE #
- NAC CIRCUIT #

NOTE: SLC CARDS RESIDE INSIDE FIRE ALARM CONTROL PANELS. MODEL 3-SSDC SUPPORTS 1 SLC CIRCUIT, MODEL 3-5DDC SUPPORTS 2 SLC CIRCUITS. SEE PANEL SHEET FOR ADDITIONAL INFORMATION.

SUMMIT FIRE PROTECTION
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Centennial, Colorado 80112
Phone: (303) 790-2520
Fax: (303) 790-2528

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ARCHITECT:

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ENGINEER:

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| PROJECT | PROJECT DESCRIPTION | PROJECT LOCATION |
|---|---|---|
| QTS DATA CENTER QTS DENI DC2 | FIRE ALARM & DETECTION SYSTEM | 1140 N. GUN CLUB ROAD AURORA, COLORADO 80018 |

MERIDIAN PROJECT

JOB#: 2025-24

NICET CERTIFIED

TRAVIS COOK- NICET#113375

COMMENTS AND STAMP

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KEY PLAN
N.T.S.

| REVISION | DATE |
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| SUBMITTAL | 07/07/25 |
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| COMMENTS | 02/25/26 |
| COMMENTS (#2) | 04/2/26 |
| COMMENTS (#3) | 06/3/26 |
| RFI#696 (#4) | 07/24/26 |

CAD FILE: 1ST LEVEL

DRAWN BY: T.COOK — DATE: 06/12/25

ENG. APPROVAL: — DATE:

REVIEW BY: — SCALE: 1/8"=1'-0"

FIRE ALARM SYSTEM
EST-4

FIRE ALARM
1ST LEVEL
(AREA-G)
FLOOR PLAN

SHEET
FF07

MATCHLINE SEE SHEET FF09

MATCHLINE SEE SHEET FF08

MATCHLINE SEE SHEET FF08

MATCHLINE SEE SHEET FF07

CORRIDOR
1300

1 THE AREA IS CURRENTLY OPEN TO THE CORRIDORS UNTIL THE TI BUILDOUTS.

# FUTURE TI BUILDOUT FOR NOTIFICATION & DETECTION

DATA HALL
1200

1 THE AREA IS CURRENTLY OPEN TO THE CORRIDORS UNTIL THE TI BUILDOUTS.

CORRIDOR
1300

MATCHLINE SEE SHEET FF10

MATCHLINE SEE SHEET FF08

MATCHLINE SEE SHEET FF08

MATCHLINE SEE SHEET FF07

1ST LEVEL
AREA H
SCALE: 1/8" = 1'-0"

0 5 10 20
Scale In Feet

N

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1ST SLC CIRCUIT ON SLC CARD
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MODULE ADDRESS RANGE 376-500
2ND SLC CIRCUIT ON SLC CARD
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NOTE: SLC CARDS RESIDE INSIDE FIRE ALARM CONTROL PANELS. MODEL 3=5IDC SUPPORTS 1 SLC CIRCUIT, MODEL 3=5IDC SUPPORTS 2 SLC CIRCUITS. SEE PANEL SHEET FOR ADDITIONAL INFORMATION.

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MERIDIAN PROJECT

JOB#: 2025-24

NICET CERTIFIED

TRAVIS COOK- NICET#113375

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N.T.S.

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| COMMENTS | 02/25/26 |
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| COMMENTS 2 | 06/3/26 |
| RFI#696 3 | 07/24/26 |

CAD FILE: 1ST LEVEL

DRAWN BY: T.COOK — DATE: 06/12/25

ENG. APPROVAL: — DATE:

REVIEW BY: — SCALE: 1/8"=1'-0"

FIRE ALARM SYSTEM EST-4

FIRE ALARM 1ST LEVEL (AREA-H) FLOOR PLAN

SHEET FF08

PERMIT #2026 2513934- CM 05-REV TO CM 02 | RSN:1991301

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## GENERAL NOTES:

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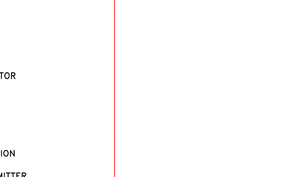
## INSTALLATION NOTES:

1. COORDINATE LOCATION OF DEVICES IN THE ELEVATOR SHAFT
2. ELEVATOR CONTROL CONNECTIONS
PRIMARY RECALL
SECONDARY RECALL
LIGHT ELEV. CAB
SHUNT TRIP

## 1ST LEVEL AREA I

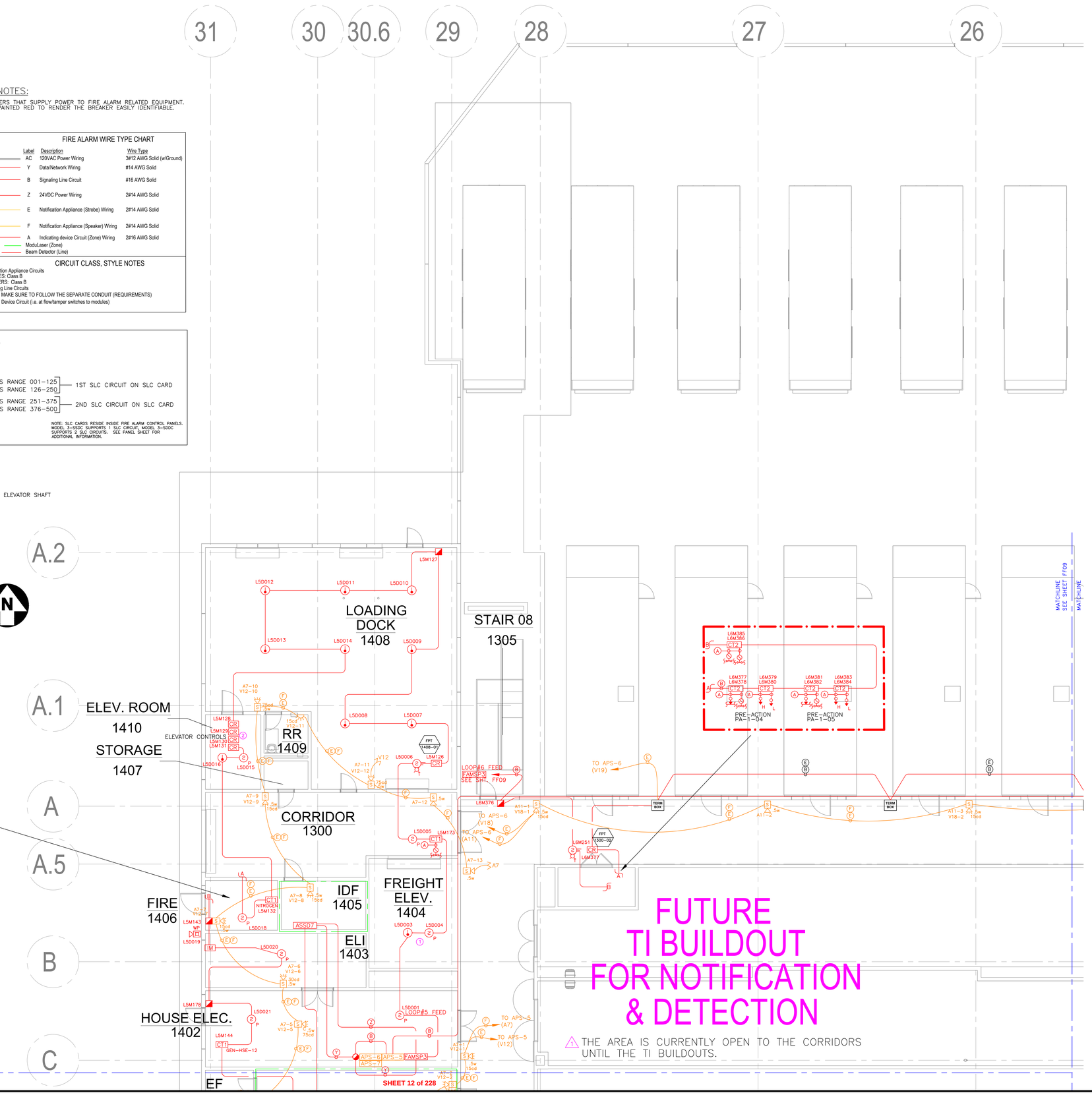
SCALE: 1/8" = 1'-0"

0 5 10 20
Scale In Feet




LOCATED IN THE U06R
LOCATED ON (APS-5)
SPEAKER CONTROLS
SPEAKER CKT.-A7 L1M135 MCC1
SPEAKER CKT.-A8 L1M136 MCC1

LOCATED IN THE U06R
LOCATED ON (APS-6)
SPEAKER CONTROLS
SPEAKER CKT.-A9 L1M137 MCC1
SPEAKER CKT.-A10 L1M138 MCC1
SPEAKER CKT.-A11 L1M139 MCC1




FUTURE
TI BUILDOUT
FOR NOTIFICATION
& DETECTION

1 THE AREA IS CURRENTLY OPEN TO THE CORRIDORS UNTIL THE TI BUILDOUTS.



SUMMIT FIRE PROTECTION
10200 E. Easter Avenue
Centennial, Colorado 80112
Phone: (303) 790-2520
Fax: (303) 790-2528

THESE DRAWINGS ARE SCHEMATIC AND DO NOT ATTEMPT TO SHOW SHOW CONDUIT ROUTING.

ARCHITECT:
GENERAL CONTRACTOR:
ENGINEER:
INSTALLER:

| PROJECT | PROJECT DESCRIPTION | PROJECT LOCATION |
|---|---|---|
| QTS DATA CENTER QTS DENI DC2 | FIRE ALARM & DETECTION SYSTEM | 1140 N. GUN CLUB ROAD AURORA, COLORADO 80018 |

MERIDIAN PROJECT
JOB#: 2025-24

NICET CERTIFIED
TRAVIS COOK- NICET#113375
COMMENTS AND STAMP

THESE DRAWINGS ARE SCHEMATIC AND DO NOT ATTEMPT TO SHOW SHOW CONDUIT ROUTING.

KEY PLAN
N.T.S.

| REVISION | DATE |
|---|---|
| SUBMITTAL | 07/07/25 |
| REVISIONS | 09/22/25 |
| DATA HALL BUILDOUT | 12/13/25 |
| COMMENTS | 02/25/26 |
| COMMENTS (1) | 04/2/26 |
| COMMENTS (2) | 06/3/26 |
| RFI#696 (3) | 07/24/26 |

CAD FILE: 1ST LEVEL
DRAWN BY: T.COOK
DATE: 06/12/25
ENG. APPROVAL:
DATE:
REVIEW BY:
SCALE: 1/8"=1'-0"

FIRE ALARM SYSTEM EST-4

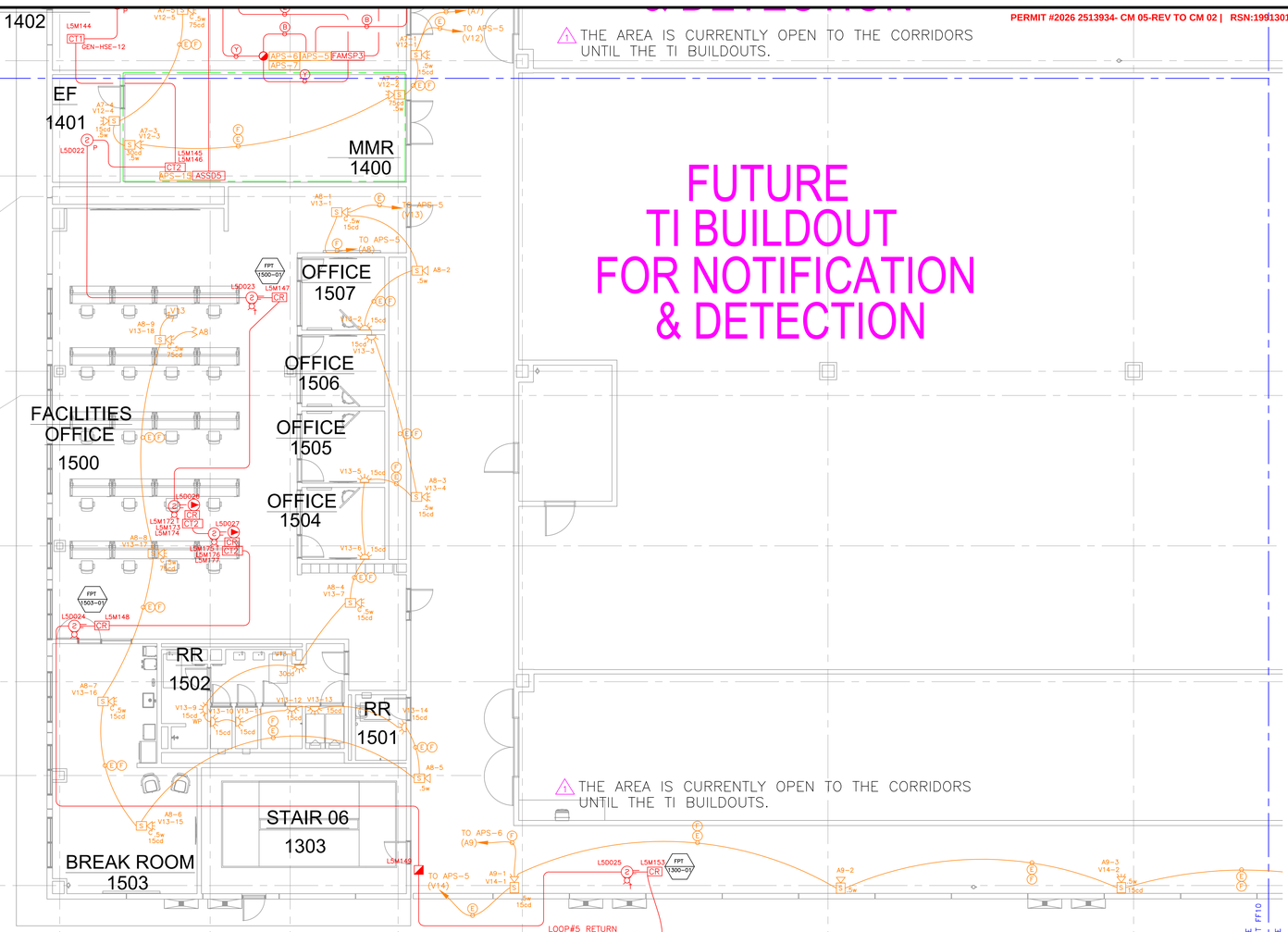
FIRE ALARM 1ST LEVEL (AREA-I) FLOOR PLAN

SHEET FF09

PERMIT #2026 2513934- CM 05-REV TO CM 02 | RSN:1991301

MATCHLINE
SEE SHEET FF09

MATCHLINE
SEE SHEET FF10




| | |
|---|---|
| FAMCP | FIRE ALARM/MASS NOTIFICATION CONTROL PANEL |
| FAMSP | FIRE ALARM SLAVE/MASS NOTIFICATION CONTROL |
| ANN | REMOTE ANNUNCIATOR PANEL |
| MAP | GRAPHIC MAP W/INSTRUCTIONS FOR MNS |
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| | MANUAL PULL STATION |
| CT1 | SINGLE MONITOR MODULE |
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| IO | I/O MODULE |
| IM | ISOLATION MODULE |
| S | FIRE ALARM SPEAKER/STROBE WALL MOUNT |
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| FDC | FIRE DEPARTMENT CONNECTION |
| KNOX BOX | KNOX BOX |
| | FIRE SMOKE DAMPER |
| | RISER UP/DOWN |
| TERM BOX | FIRE ALARM TERMINAL CABINET |
| REFUGE STATION | AREA–OF–RESCUE– CALL BOX |
| REFUGE MAIN | AREA–OF–RESCUE COMMAND CENTER |

## GENERAL NOTES:

ALL BREAKERS THAT SUPPLY POWER TO FIRE ALARM RELATED EQUIPMENT. MUST BE PAINTED RED TO RENDER THE BREAKER EASILY IDENTIFIABLE.

### FIRE ALARM WIRE TYPE CHART

| Color | Label | Description | Wire Type |
|---|---|---|---|
| | AC | 120VAC Power Wiring | 3#12 AWG Solid (w/Ground) |
| | Y | Data/Network Wiring | #14 AWG Solid |
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| | Z | 24VDC Power Wiring | 2#14 AWG Solid |
| | E | Notification Appliance (Strobe) Wiring | 2#14 AWG Solid |
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| | A | Indicating device Circuit (Zone) Wiring | 2#16 AWG Solid |
| | | ModuLaser (Zone) | |
| | | Beam Detector (Line) | |

### CIRCUIT CLASS, STYLE NOTES

NAC - Notification Appliance Circuits
STROBES: Class B
SPEAKERS: Class B
SLC - Signaling Line Circuits
Class A, MAKE SURE TO FOLLOW THE SEPARATE CONDUIT (REQUIREMENTS)
IDC - Initiating Device Circuit (i.e. at flow/tamper switches to modules)
Class B

## DEVICE/ CIRCUIT DESIGNATION:

SLC L1D XXX
LOOP # D–DETECTORS M–MODULES
DEVICE #
SENSOR ADDRESS RANGE 001–125
MODULE ADDRESS RANGE 126–250
1ST SLC CIRCUIT ON SLC CARD
NAC
AX– XX SPEAKER
VX– XX STROBE
SENSOR ADDRESS RANGE 251–375
MODULE ADDRESS RANGE 376–500
2ND SLC CIRCUIT ON SLC CARD
DEVICE #
NAC CIRCUIT #

NOTE: SLC CARDS RESIDE INSIDE FIRE ALARM CONTROL PANELS. MODEL 3–5SDC SUPPORTS 1 SLC CIRCUIT, MODEL 3–5DDC SUPPORTS 2 SLC CIRCUITS. SEE PANEL SHEET FOR ADDITIONAL INFORMATION.

## GENERAL NOTES:

1 ENSURE THAT ALL CEILING MOUNTED NOTIFICATION DEVICES ARE INSTALLED IN CORRECT LOCATION FOR FUTURE DATA HALL FIT OUT. COORDINATE FINAL PLACEMENT
VERIFY PLACEMENT OF SUPPLY AND RETURN DUCT DETECTORS

## 1ST LEVEL AREA J

SCALE: 1/8" = 1'–0"

0 5 10 20
Scale In Feet

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Fax: (303) 790–2528

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GENERAL CONTRACTOR:

ENGINEER:

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MERIDIAN PROJECT
JOB#: 2025–24

NICET CERTIFIED
TRAVIS COOK- NICET#113375
COMMENTS AND STAMP

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KEY PLAN
N.T.S.

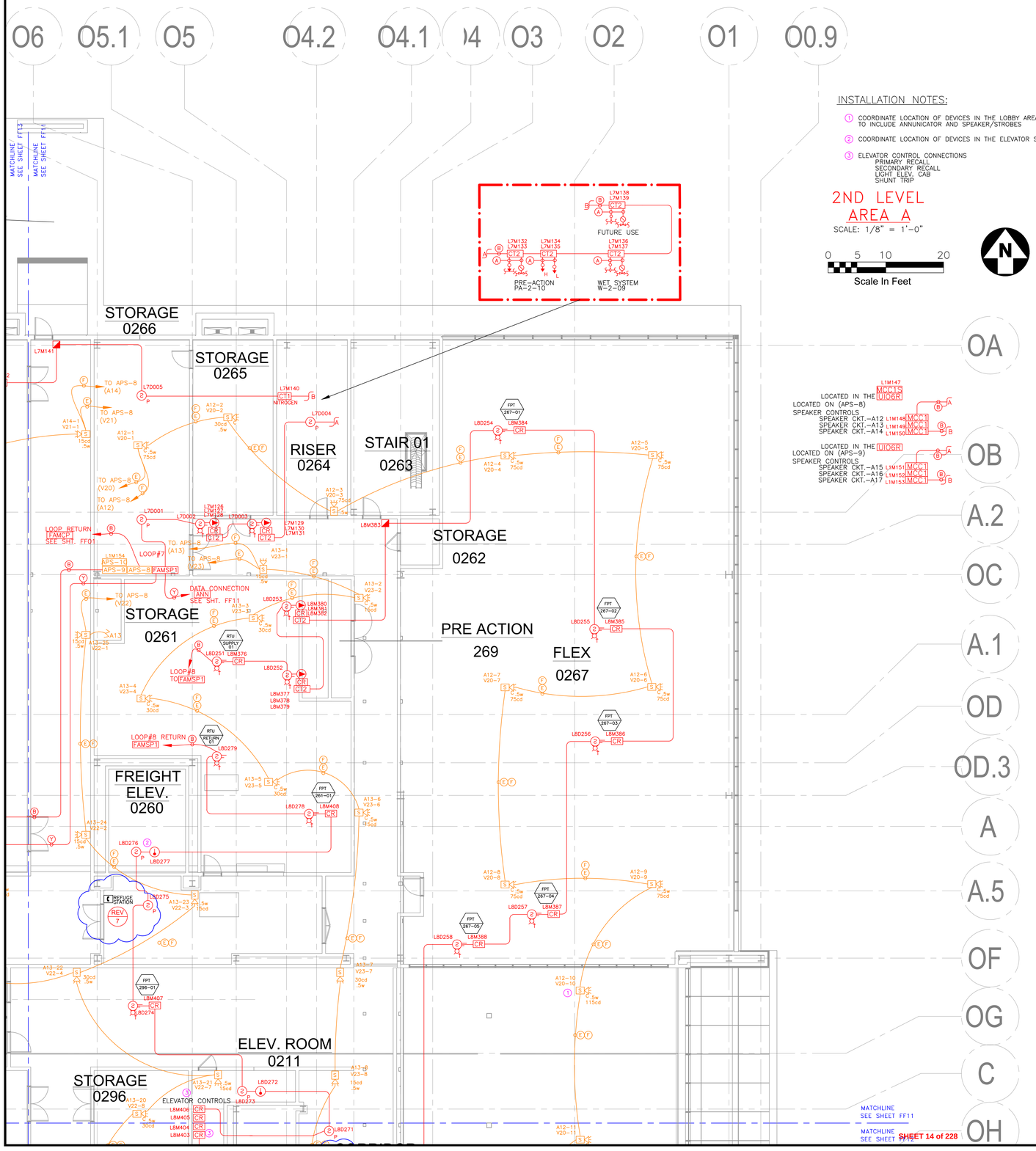
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| DATA HALL BUILDOUT | 12/13/25 |
| COMMENTS | 02/25/26 |
| COMMENTS (01) | 04/2/26 |
| COMMENTS (02) | 06/3/26 |
| RFI#696 (01) | 07/24/26 |

CAD FILE: 1ST LEVEL
DRAWN BY: T.COOK
DATE: 06/12/25
ENG. APPROVAL:
DATE:
REVIEW BY:
SCALE: 1/8"=1'–0"

FIRE ALARM SYSTEM EST–4

FIRE ALARM 1ST LEVEL (AREA–J) FLOOR PLAN

SHEET
FF10




INSTALLATION NOTES:

1. COORDINATE LOCATION OF DEVICES IN THE LOBBY AREA, TO INCLUDE ANNUNICATOR AND SPEAKER/STROBES
2. COORDINATE LOCATION OF DEVICES IN THE ELEVATOR SHAFT
3. ELEVATOR CONTROL CONNECTIONS
   PRIMARY RECALL
   SECONDARY RECALL
   LIGHT ELEV. CAB
   SHUNT TRIP

## 2ND LEVEL AREA A

SCALE: 1/8" = 1'-0"

0 5 10 20
Scale In Feet

N

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- FAMSP FIRE ALARM SLAVE/MASS NOTIFICATION CONTROL
- ANN REMOTE ANNUNCIATOR PANEL
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- ASSDM MASTER VESDA UNIT.
- ASSD— SLAVE VESDA UNIT.
- VCGW COMPUTER GRAPHIC WORKSTATION
- TVSS 120AC TRANSIENT VOLTAGE SURGE SUPPRESSOR
- APS—1 REMOTE BOOSTER POWER
- SMOKE DETECTOR
- LINEAR HEAT DETECTION
- CO CARBON MONOXIDE DETECTOR
- HEAT DETECTOR
- DUCT DETECTOR
- REMOTE LIGHT/TEST STATION
- BEAM DETECTOR- TRANSMITTER
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- CT1 SINGLE MONITOR MODULE
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- RM1 RISER MODULE
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- FIRE ALARM SPEAKER ONLY WALL MOUNT/WEATHERPROOF
- FIRE ALARM STROBE WALL MOUNT
- FIRE ALARM STROBE CEILING MOUNT
- FIRE ALARM HORN/STROBE
- FIRE ALARM HORN/STROBE WALL MOUNT/WEATHERPROOF
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- PRESSURE SWITCH
- LOW AIR SWITCH
- FDC FIRE DEPARTMENT CONNECTION
- KNOX BOX KNOX BOX
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- RISER UP/DOWN
- REFUGE STATION AREA-OF-RESCUE- CALL BOX
- REFUGE MAIN AREA-OF-RESCUE COMMAND CENTER

GENERAL NOTES:

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| | F | Notification Appliance (Speaker) Wiring | 2#14 AWG Solid |
| | A | Indicating device Circuit (Zone) Wiring | 2#16 AWG Solid |
| | | ModuLaser (Zone) | |
| | | Beam Detector (Line) | |

CIRCUIT CLASS, STYLE NOTES

NAC - Notification Appliance Circuits
STROBES: Class B
SPEAKERS: Class B
SLC - Signaling Line Circuits
Class A, MAKE SURE TO FOLLOW THE SEPARATE CONDUIT (REQUIREMENTS)
IDC - Initiating Device Circuit (i.e. at flow/tamper switches to modules)
Class B

DEVICE/ CIRCUIT DESIGNATION:

SLC L1D XXX
- L1D: LOOP # / D-DETECTORS / M-MODULES
- XXX: DEVICE #
  - SENSOR ADDRESS RANGE 001-125 / MODULE ADDRESS RANGE 126-250 — 1ST SLC CIRCUIT ON SLC CARD
  - SENSOR ADDRESS RANGE 251-375 / MODULE ADDRESS RANGE 376-500 — 2ND SLC CIRCUIT ON SLC CARD

NAC AX- XX SPEAKER / VX- XX STROBE
- AX-/VX-: NAC CIRCUIT #
- XX: DEVICE #

NOTE: SLC CARDS RESIDE INSIDE FIRE ALARM CONTROL PANELS. MODEL 3-SSDC SUPPORTS 1 SLC CIRCUIT, MODEL 3-SSDC SUPPORTS 2 SLC CIRCUITS. SEE PANEL SHEET FOR ADDITIONAL INFORMATION.

City of Aurora Building Division
Reviewed for Code Compliance
Approved as Noted: chorst
Date: Aug 14, 2026
2021 INTERNATIONAL CODES & 2023 NEC



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| QTS DATA CENTER QTS DENI DC2 | FIRE ALARM & DETECTION SYSTEM | 1140 N. GUN CLUB ROAD AURORA, COLORADO 80018 |

MERIDIAN PROJECT

JOB#: 2025-24

NICET CERTIFIED

TRAVIS COOK- NICET#113375

COMMENTS AND STAMP

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KEY PLAN
N.T.S.

| REVISION | | DATE |
|---|---|---|
| SUBMITTAL | | 07/07/25 |
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| DATA HALL BUILDOUT | | 12/13/25 |
| COMMENTS | | 02/25/26 |
| COMMENTS | CM 03 | 04/2/26 |
| COMMENTS | CM 04 | 06/3/26 |
| RFI#696 | CM 05 | 07/24/26 |

CAD FILE: 1ST LEVEL

DRAWN BY: T.COOK — DATE: 06/12/25

ENG. APPROVAL: — DATE:

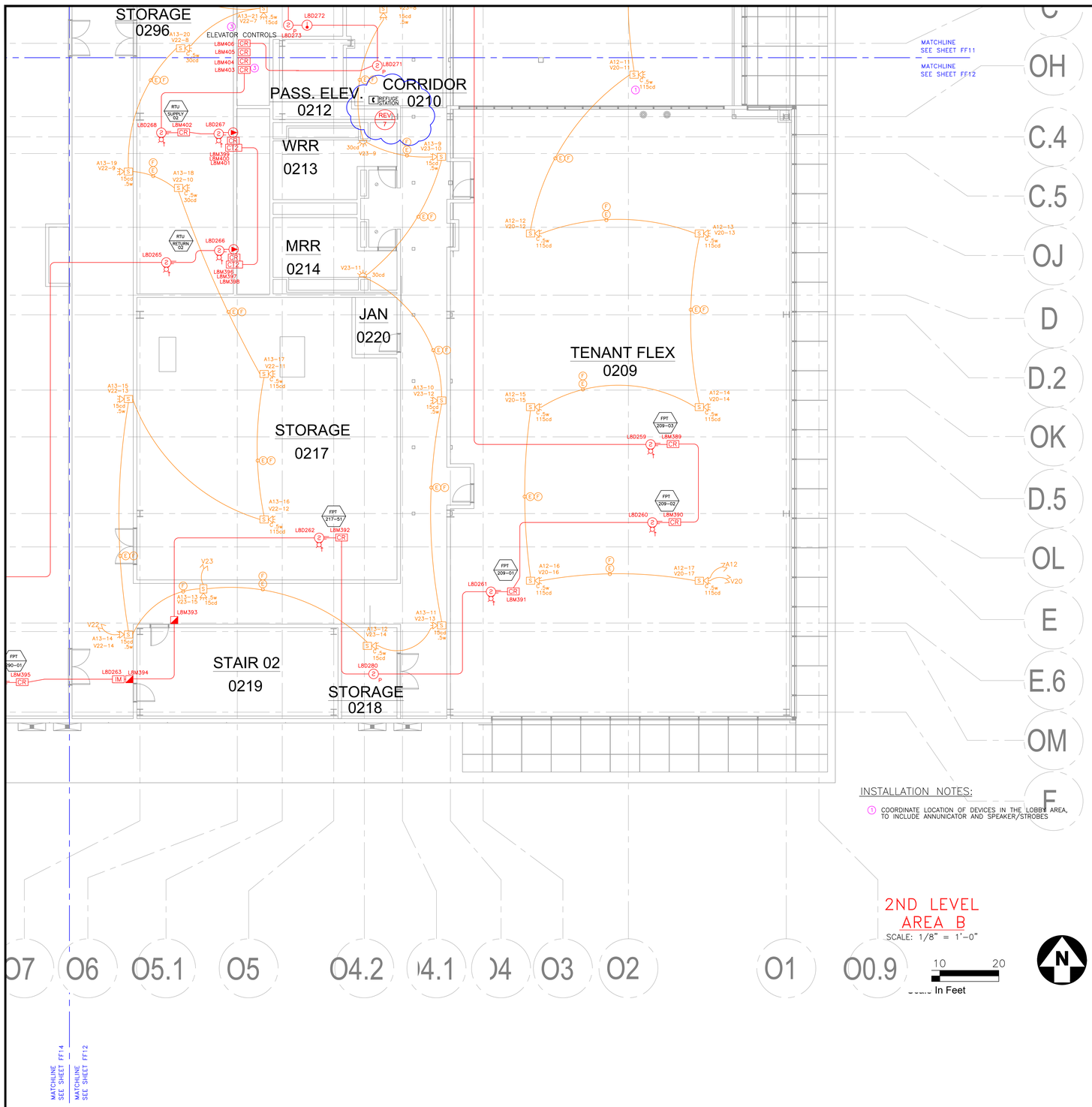
REVIEW BY: — SCALE: 1/8"=1'-0"

FIRE ALARM SYSTEM EST-4

FIRE ALARM 2ND LEVEL (AREA-A) FLOOR PLAN

SHEET

FF11




## INSTALLATION NOTES:

1. COORDINATE LOCATION OF DEVICES IN THE LOBBY AREA, TO INCLUDE ANNUNICATOR AND SPEAKER/STROBES

## 2ND LEVEL AREA B

SCALE: 1/8" = 1'-0"

| | |
|---|---|
| FAMCP | FIRE ALARM/MASS NOTIFICATION CONTROL PANEL |
| FAMSP | FIRE ALARM SLAVE/MASS NOTIFICATION CONTROL |
| ANN | REMOTE ANNUNCIATOR PANEL |
| MAP | GRAPHIC MAP W/INSTRUCTIONS FOR MNS |
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| (P) | SMOKE DETECTOR |
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| CO | CARBON MONOXIDE DETECTOR |
| | HEAT DETECTOR |
| | DUCT DETECTOR |
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| (BT) | BEAM DETECTOR– TRANSMITTER |
| (BR) | BEAM DETECTOR– RECEIVER |
| | MANUAL PULL STATION |
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| | FIRE ALARM STROBE WALL MOUNT |
| C | FIRE ALARM STROBE CEILING MOUNT |
| H | FIRE ALARM HORN/STROBE |
| WP H | FIRE ALARM HORN/STROBE WALL MOUNT/WEATHERPROOF |
| FS | FLOW SWITCH |
| TS | TAMPER SWITCH |
| PS | PRESSURE SWITCH |
| | LOW AIR SWITCH |
| FDC | FIRE DEPARTMENT CONNECTION |
| KNOX BOX | KNOX BOX |
| | FIRE SMOKE DAMPER |
| | RISER UP/DOWN |
| REFUGE STATION | AREA-OF-RESCUE– CALL BOX |
| REFUGE MAIN | AREA-OF-RESCUE COMMAND CENTER |

## GENERAL NOTES:

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### CIRCUIT CLASS, STYLE NOTES

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STROBES: Class B
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SLC - Signaling Line Circuits
Class A, MAKE SURE TO FOLLOW THE SEPARATE CONDUIT (REQUIREMENTS)
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## DEVICE/ CIRCUIT DESIGNATION:

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  - → 1ST SLC CIRCUIT ON SLC CARD
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NAC AX– XX SPEAKER
NAC VX– XX STROBE
- XX: DEVICE #
- A / V: NAC CIRCUIT #

NOTE: SLC CARDS RESIDE INSIDE FIRE ALARM CONTROL PANELS. MODEL 3–5SDC SUPPORTS 1 SLC CIRCUIT, MODEL 3–5DDC SUPPORTS 2 SLC CIRCUITS. SEE PANEL SHEET FOR ADDITIONAL INFORMATION.

City of Aurora Building Division
Reviewed for Code Compliance
Approved as Noted: *chorst*
Date: *Aug 14, 2026*
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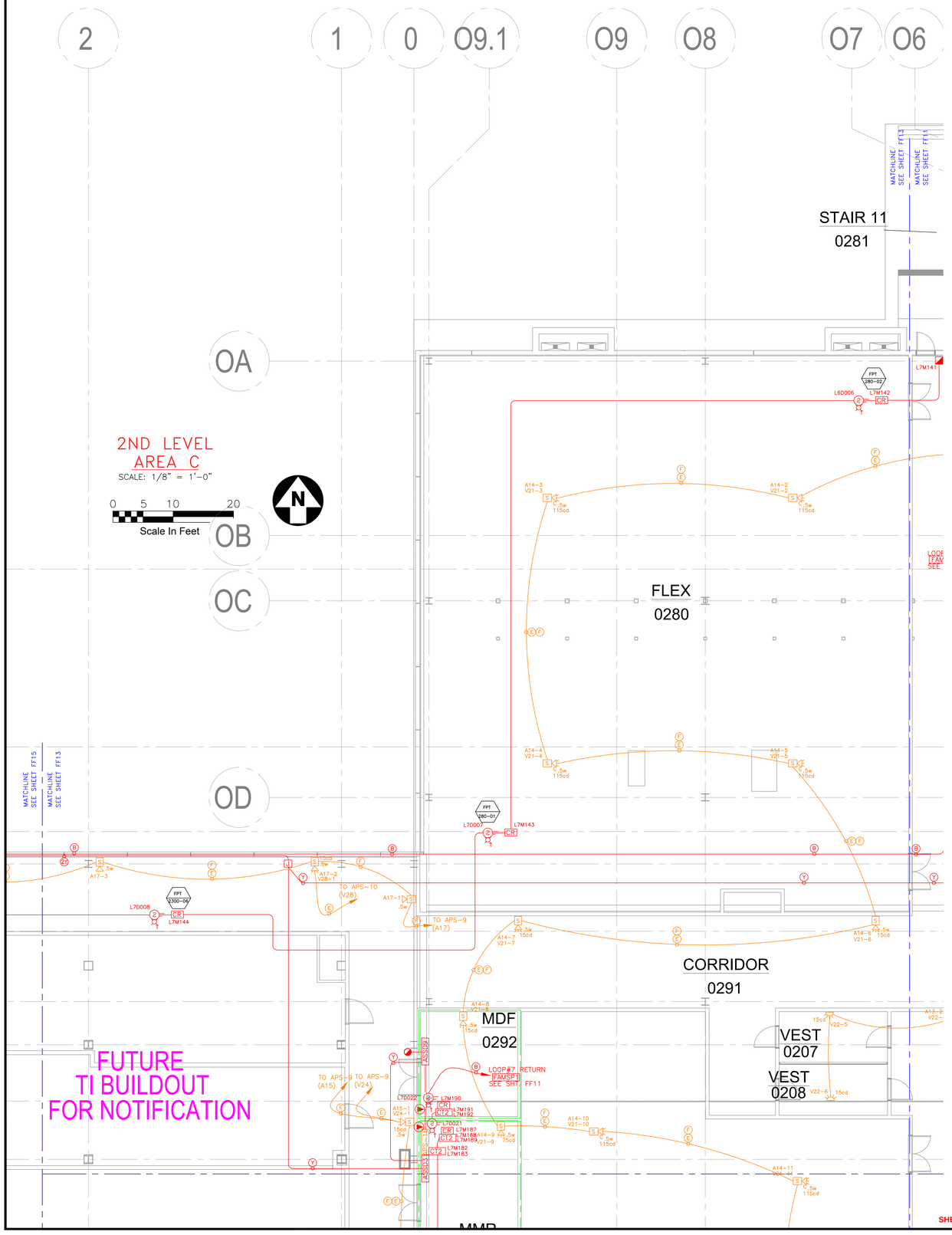
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CAD FILE: 1ST LEVEL
DRAWN BY: T.COOK
DATE: 06/12/25
ENG. APPROVAL:
DATE:
REVIEW BY:
SCALE: 1/8"=1'–0"

FIRE ALARM SYSTEM EST–4

FIRE ALARM 2ND LEVEL (AREA–B) FLOOR PLAN

SHEET FF12




| | | |
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NAC AX— XX SPEAKER
NAC VX— XX STROBE
AX/VX: NAC CIRCUIT #
XX: DEVICE #

NOTE: SLC CARDS RESIDE INSIDE FIRE ALARM CONTROL PANELS. MODEL 3-SSDC SUPPORTS 1 SLC CIRCUIT, MODEL 3-SDDC SUPPORTS 2 SLC CIRCUITS. SEE PANEL SHEET FOR ADDITIONAL INFORMATION.



SUMMIT FIRE PROTECTION
10200 E. Easter Avenue
Centennial, Colorado 80112
Phone: (303) 790-2520
Fax: (303) 790-2528

THESE DRAWINGS ARE SCHEMATIC AND DO NOT ATTEMPT TO SHOW SHOW CONDUIT ROUTING.

ARCHITECT:

GENERAL CONTRACTOR:

ENGINEER:

INSTALLER:

| PROJECT | PROJECT DESCRIPTION | PROJECT LOCATION |
|---|---|---|
| QTS DATA CENTER QTS DENI DC2 | FIRE ALARM & DETECTION SYSTEM | 11140 N. GUN CLUB ROAD AURORA, COLORADO 80018 |

MERIDIAN PROJECT
JOB#: 2025-24

NICET CERTIFIED
TRAVIS COOK- NICET#113375
COMMENTS AND STAMP

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KEY PLAN
N.T.S.

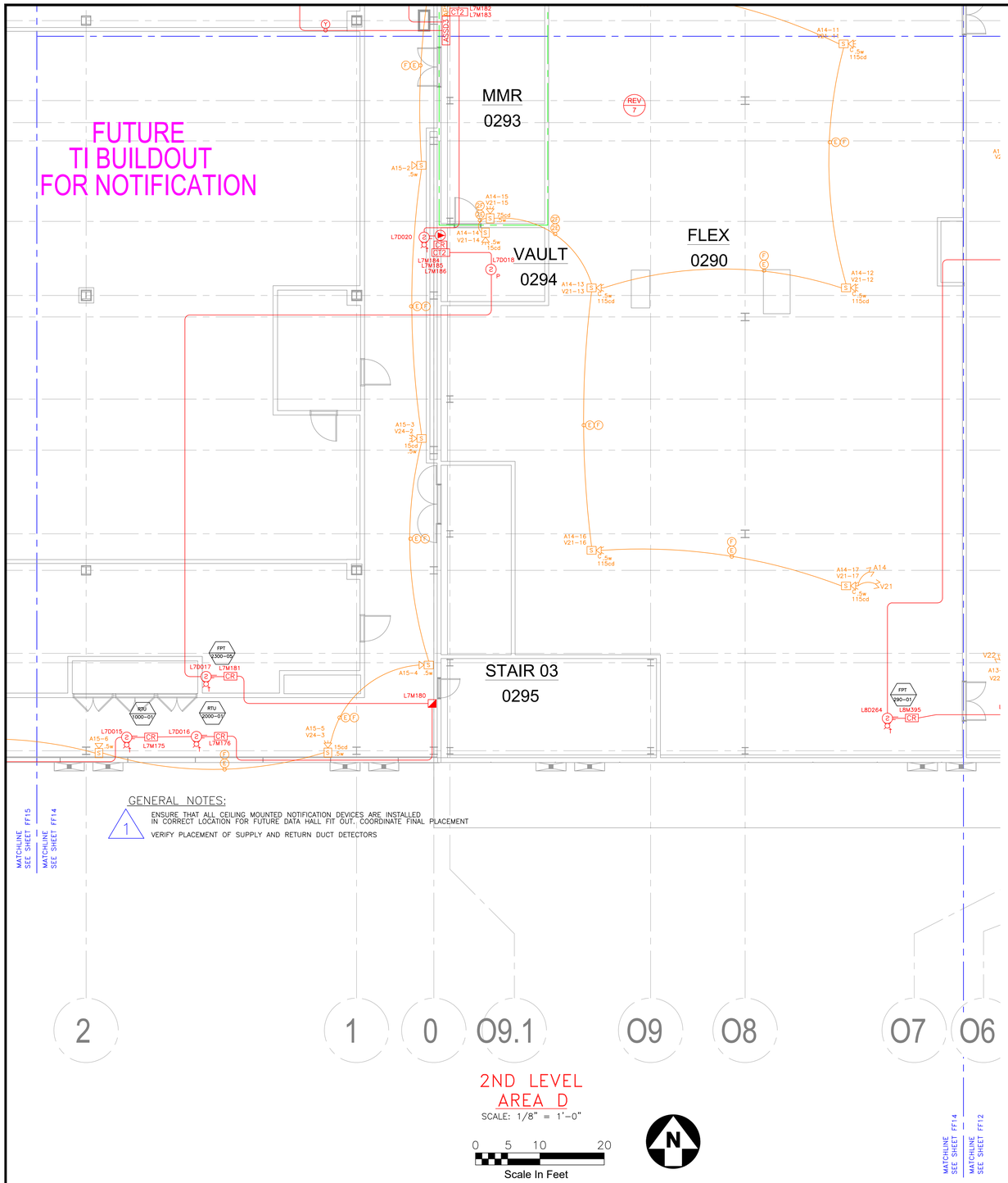
| REVISION | DATE |
|---|---|
| SUBMITTAL | 07/07/25 |
| REVISIONS | 09/22/25 |
| DATA HALL BUILDOUT | 12/13/25 |
| COMMENTS | 02/25/26 |
| COMMENTS (CM 01) | 04/2/26 |
| COMMENTS (CM 02) | 06/3/26 |
| RFI#696 (CM 02) | 07/24/26 |

CAD FILE: 1ST LEVEL
DRAWN BY: T.COOK
DATE: 06/12/25
ENG. APPROVAL:
DATE:
REVIEW BY:
SCALE: 1/8"=1'-0"

FIRE ALARM SYSTEM EST-4

FIRE ALARM 2ND LEVEL (AREA-C) FLOOR PLAN

SHEET
FF13




GENERAL NOTES:

1. ENSURE THAT ALL CEILING MOUNTED NOTIFICATION DEVICES ARE INSTALLED IN CORRECT LOCATION FOR FUTURE DATA HALL FIT OUT. COORDINATE FINAL PLACEMENT
   VERIFY PLACEMENT OF SUPPLY AND RETURN DUCT DETECTORS

## 2ND LEVEL AREA D

SCALE: 1/8" = 1'-0"

0 5 10 20

Scale In Feet

- FAMCP FIRE ALARM/MASS NOTIFICATION CONTROL PANEL
- FAMSP FIRE ALARM SLAVE/MASS NOTIFICATION CONTROL
- ANN REMOTE ANNUNCIATOR PANEL
- MAP GRAPHIC MAP W/INSTRUCTIONS FOR MNS
- ASSDM MASTER VESDA UNIT.
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- TVSS 120AC TRANSIENT VOLTAGE SURGE SUPPRESSOR
- APS—1 REMOTE BOOSTER POWER
- SMOKE DETECTOR
- LINEAR HEAT DETECTION
- CO CARBON MONOXIDE DETECTOR
- HEAT DETECTOR
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- FIRE ALARM STROBE WALL MOUNT
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- FDC FIRE DEPARTMENT CONNECTION
- KNOX BOX KNOX BOX
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GENERAL NOTES:

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| | | ModuLaser (Zone) | |
| | | Beam Detector (Line) | |

### CIRCUIT CLASS, STYLE NOTES

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STROBES: Class B
SPEAKERS: Class B
SLC - Signaling Line Circuits
Class A, MAKE SURE TO FOLLOW THE SEPARATE CONDUIT (REQUIREMENTS)
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ARCHITECT:

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ENGINEER:

INSTALLER:

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|---|---|---|
| QTS DATA CENTER<br>QTS DENI DC2 | FIRE ALARM & DETECTION SYSTEM | 1140 N. GUN CLUB ROAD<br>AURORA, COLORADO 80018 |

MERIDIAN PROJECT

JOB#: 2025-24

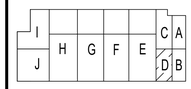
NICET CERTIFIED

TRAVIS COOK- NICET#113375

COMMENTS AND STAMP

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KEY PLAN
N.T.S.



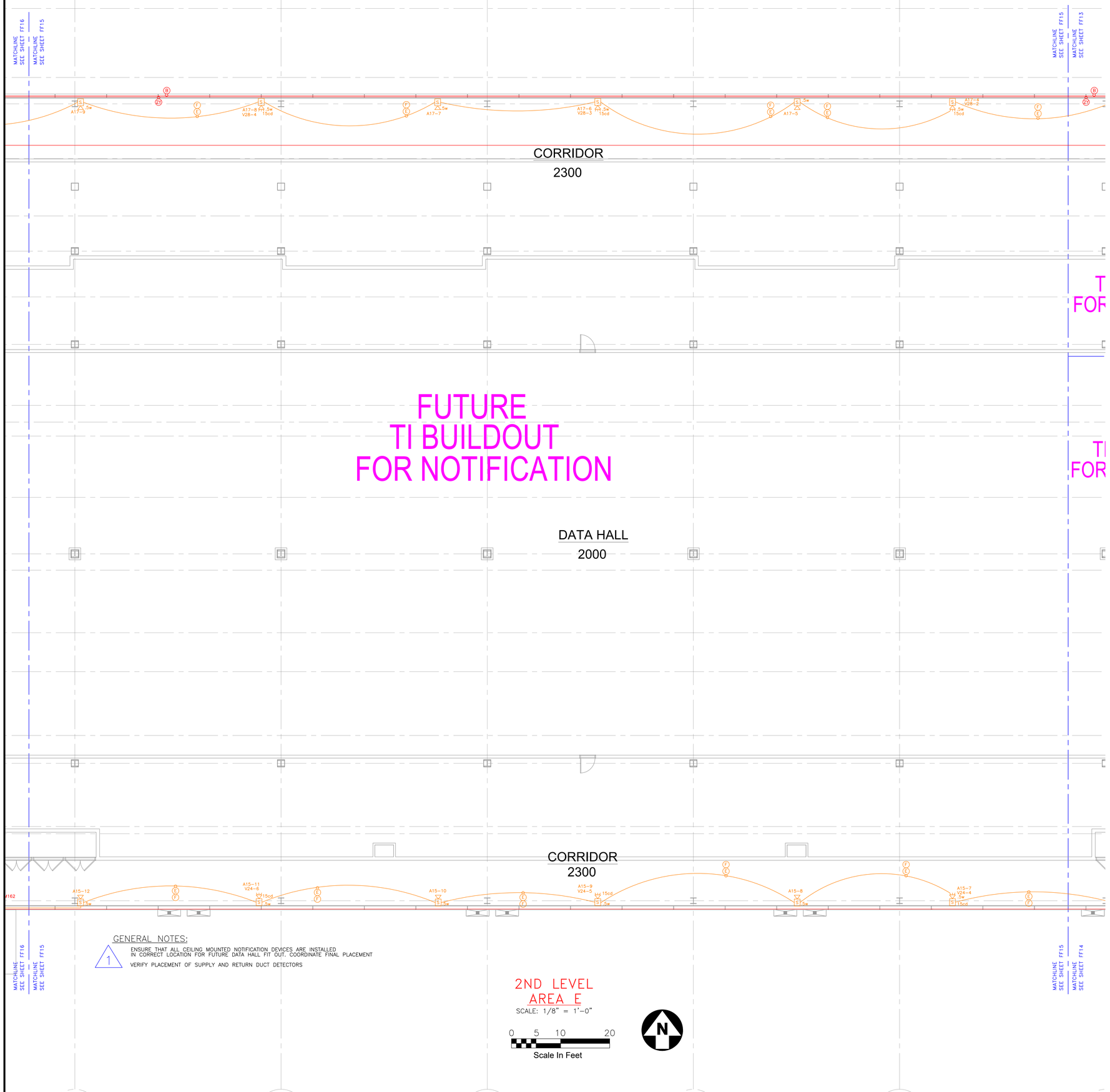

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| COMMENTS | 02/25/26 |
| COMMENTS | 04/2/26 |
| COMMENTS | 06/3/26 |
| RFI#696 | 07/24/26 |

CAD FILE: 1ST LEVEL
DRAWN BY: T.COOK
DATE: 06/12/25
ENG. APPROVAL:
DATE:
REVIEW BY:
SCALE: 1/8"=1'-0"

FIRE ALARM SYSTEM
EST-4

FIRE ALARM
2ND LEVEL
(AREA-D)
FLOOR PLAN

SHEET
FF14




GENERAL NOTES:

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   VERIFY PLACEMENT OF SUPPLY AND RETURN DUCT DETECTORS

2ND LEVEL
AREA E
SCALE: 1/8" = 1'-0"

0 5 10 20
Scale In Feet

| | |
|---|---|
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| H | HEAT DETECTOR |
| D | DUCT DETECTOR |
| R | REMOTE LIGHT/TEST STATION |
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| | MANUAL PULL STATION |
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| CT2 | DUAL MONITOR MODULE |
| CR | RELAY MODULE |
| RM1 | RISER MODULE |
| IO | I/O MODULE |
| IM | ISOLATION MODULE |
| S | FIRE ALARM SPEAKER/STROBE WALL MOUNT |
| SC | FIRE ALARM SPEAKER/STROBE CEILING MOUNT |
| SWP | FIRE ALARM SPEAKER/STROBE WALL MOUNT/WEATHERPROOF |
| S | FIRE ALARM SPEAKER ONLY WALL MOUNT |
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| SDS | FIRE ALARM DIRECTIONAL SPEAKER |
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| SVDC S | TAMPER SWITCH |
| PS | PRESSURE SWITCH |
| | LOW AIR SWITCH |
| FDC | FIRE DEPARTMENT CONNECTION |
| KNOX BOX | KNOX BOX |
| | FIRE SMOKE DAMPER |
| | RISER UP/DOWN |
| E REFUGE STATION | AREA-OF-RESCUE- CALL BOX |
| REFUGE MAIN | AREA-OF-RESCUE COMMAND CENTER |

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| | | ModuLaser (Zone) | |
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Centennial, Colorado 80112
Phone: (303) 790-2520
Fax: (303) 790-2528

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ARCHITECT:

GENERAL CONTRACTOR:

ENGINEER:

INSTALLER:

| PROJECT | PROJECT DESCRIPTION | PROJECT LOCATION |
|---|---|---|
| QTS DATA CENTER QTS DENI DC2 | FIRE ALARM & DETECTION SYSTEM | 11140 N. GUN CLUB ROAD AURORA, COLORADO 80018 |

MERIDIAN PROJECT

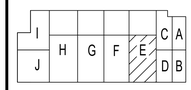
JOB#: 2025-24

NICET CERTIFIED

TRAVIS COOK- NICET#113375

COMMENTS AND STAMP

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KEY PLAN
N.T.S.

| REVISION | DATE |
|---|---|
| SUBMITTAL | 07/07/25 |
| REVISIONS | 09/22/25 |
| DATA HALL BUILDOUT | 12/13/25 |
| COMMENTS | 02/25/26 |
| COMMENTS (RFI #696) | 04/2/26 |
| COMMENTS (RFI #696) | 06/3/26 |
| RFI #696 | 07/24/26 |

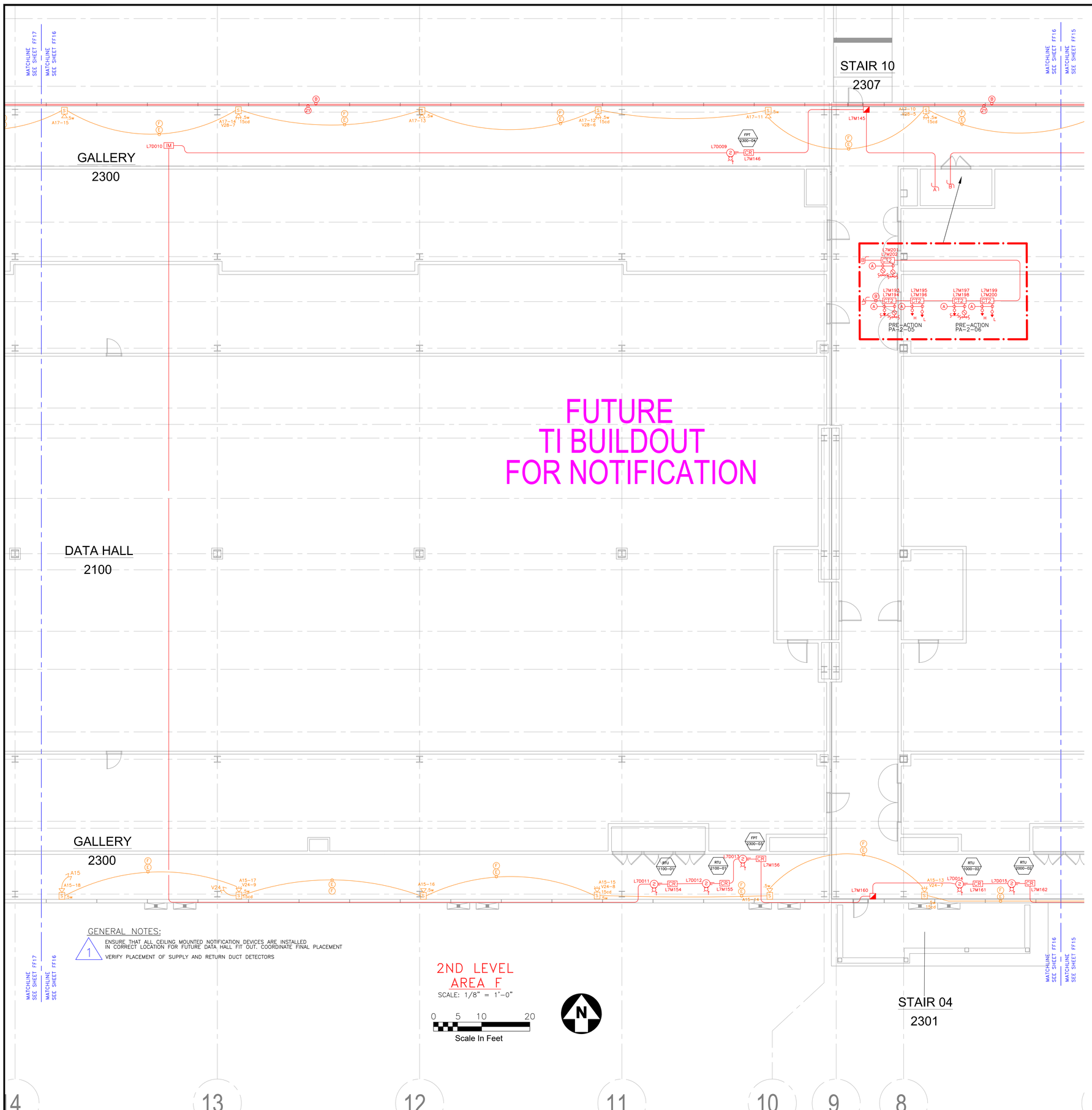
CAD FILE: 1ST LEVEL

| DRAWN BY: | DATE: |
|---|---|
| T.COOK | 06/12/25 |
| ENG. APPROVAL: | DATE: |
| REVIEW BY: | SCALE: 1/8"=1'-0" |

FIRE ALARM SYSTEM
EST-4

FIRE ALARM
2ND LEVEL
(AREA-E)
FLOOR PLAN

SHEET
FF15




FAMCP FIRE ALARM/MASS NOTIFICATION CONTROL PANEL
FAMSP FIRE ALARM SLAVE/MASS NOTIFICATION CONTROL
ANN REMOTE ANNUNCIATOR PANEL
MAP GRAPHIC MAP W/INSTRUCTIONS FOR MNS
ASSDM MASTER VESDA UNIT.
ASSD— SLAVE VESDA UNIT.
VCGW COMPUTER GRAPHIC WORKSTATION
TVSS 120AC TRANSIENT VOLTAGE SURGE SUPPRESSOR
APS— REMOTE BOOSTER POWER
SMOKE DETECTOR
LINEAR HEAT DETECTION
CO CARBON MONOXIDE DETECTOR
HEAT DETECTOR
DUCT DETECTOR
REMOTE LIGHT/TEST STATION
BEAM DETECTOR— TRANSMITTER
BEAM DETECTOR— RECEIVER
MANUAL PULL STATION
CT1 SINGLE MONITOR MODULE
CT2 DUAL MONITOR MODULE
CR RELAY MODULE
RM1 RISER MODULE
IO I/O MODULE
IM ISOLATION MODULE
FIRE ALARM SPEAKER/STROBE WALL MOUNT
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TAMPER SWITCH
PRESSURE SWITCH
LOW AIR SWITCH
FIRE DEPARTMENT CONNECTION
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FIRE SMOKE DAMPER
RISER UP/DOWN
AREA-OF-RESCUE- CALL BOX
AREA-OF-RESCUE COMMAND CENTER

## GENERAL NOTES:

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DEVICE #
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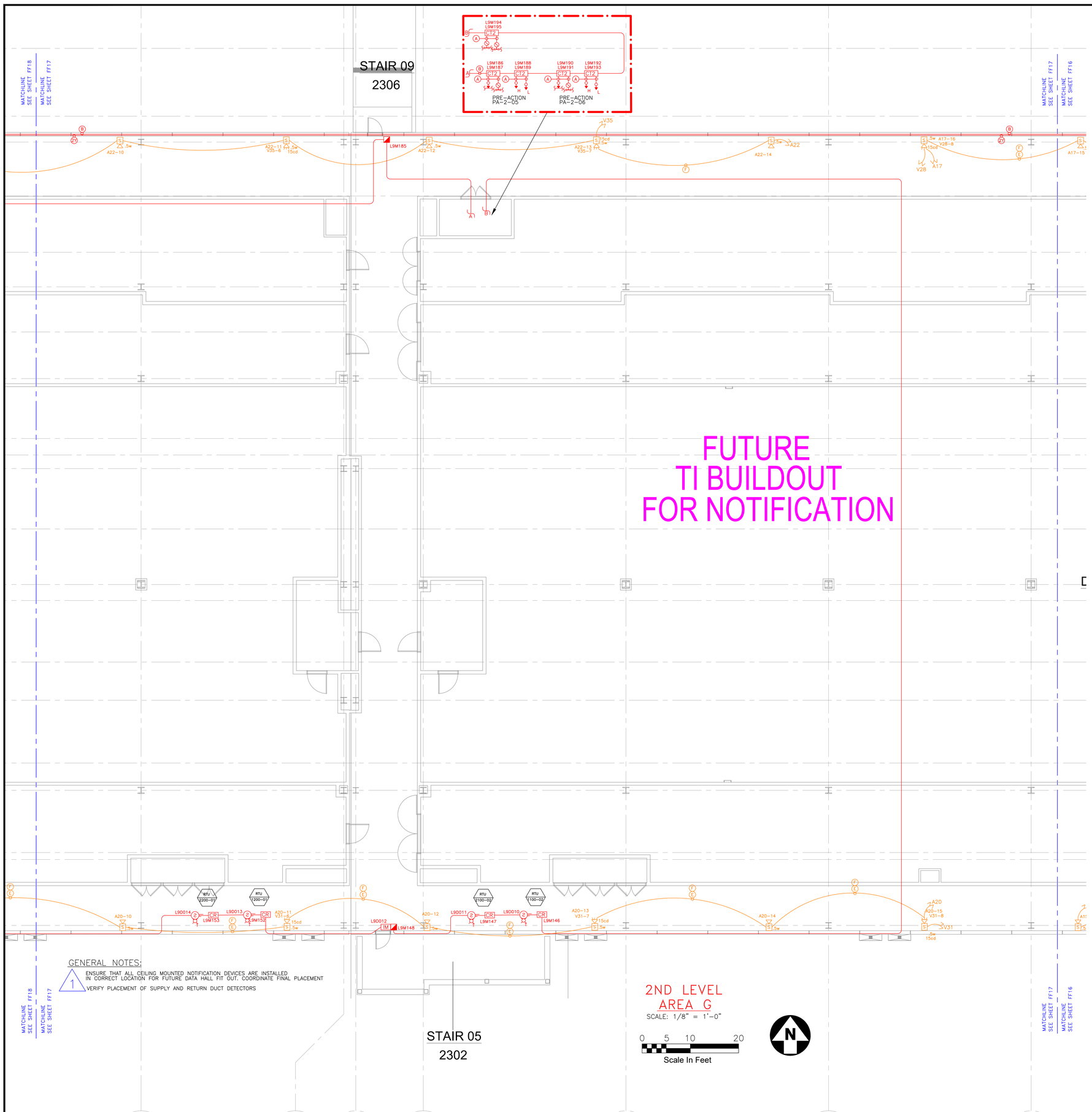
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CAD FILE: 1ST LEVEL
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DATE: 06/12/25
ENG. APPROVAL:
DATE:
REVIEW BY:
SCALE: 1/8"=1'-0"

FIRE ALARM SYSTEM EST-4

FIRE ALARM 2ND LEVEL (AREA-F) FLOOR PLAN

SHEET FF16




| | |
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| KNOX BOX | KNOX BOX |
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NAC AX- XX SPEAKER
VX- XX STROBE
- AX-/VX-: NAC CIRCUIT #
- XX: DEVICE #

NOTE: SLC CARDS RESIDE INSIDE FIRE ALARM CONTROL PANELS. MODEL 3-5SDC SUPPORTS 1 SLC CIRCUIT, MODEL 3-5DDC SUPPORTS 2 SLC CIRCUITS. SEE PANEL SHEET FOR ADDITIONAL INFORMATION.

SUMMIT FIRE PROTECTION
10200 E. Easter Avenue
Centennial, Colorado 80112
Phone: (303) 790-2520
Fax: (303) 790-2528

THESE DRAWINGS ARE SCHEMATIC AND DO NOT ATTEMPT TO SHOW SHOW CONDUIT ROUTING.

ARCHITECT:

GENERAL CONTRACTOR:

ENGINEER:

INSTALLER:

| PROJECT | PROJECT DESCRIPTION | PROJECT LOCATION |
|---|---|---|
| QTS DATA CENTER QTS DENI DC2 | FIRE ALARM & DETECTION SYSTEM | 1140 N. GUN CLUB ROAD AURORA, COLORADO 80018 |

MERIDIAN PROJECT

JOB#: 2025-24

NICET IV CERTIFIED

TRAVIS COOK- NICET#113375

COMMENTS AND STAMP

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KEY PLAN
N.T.S.

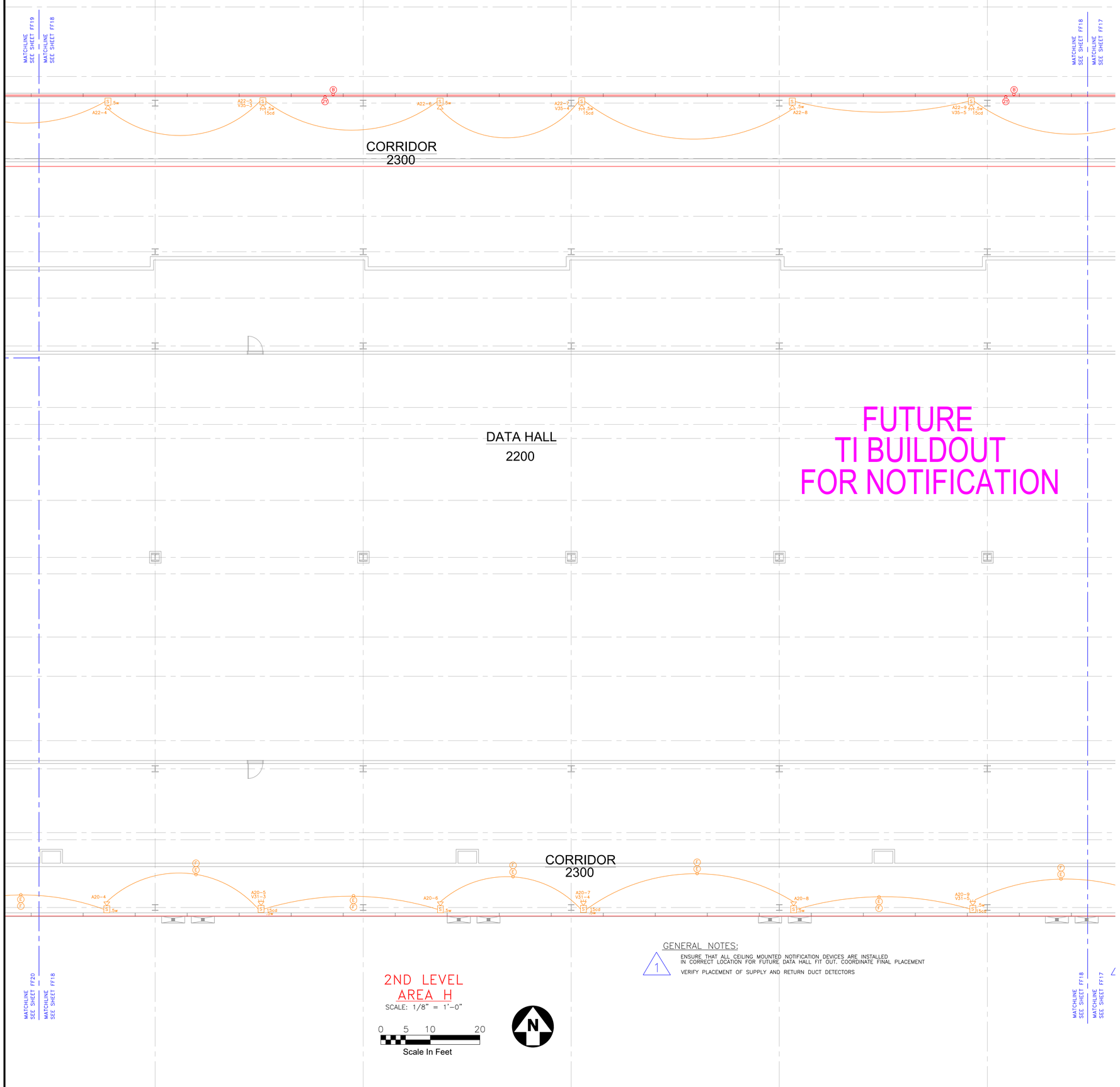
| REVISION | DATE |
|---|---|
| SUBMITTAL | 07/07/25 |
| REVISIONS | 09/22/25 |
| DATA HALL BUILDOUT | 12/13/25 |
| COMMENTS | 02/25/26 |
| COMMENTS (RFI #696) | 04/2/26 |
| COMMENTS (RFI #696) | 06/3/26 |
| RFI#696 | 07/24/26 |

CAD FILE: 1ST LEVEL
DRAWN BY: T.COOK
DATE: 06/12/25
ENG. APPROVAL:
DATE:
REVIEW BY:
SCALE: 1/8"=1'-0"

FIRE ALARM SYSTEM EST-4

FIRE ALARM 2ND LEVEL (AREA-G) FLOOR PLAN

SHEET FF17




FAMCP FIRE ALARM/MASS NOTIFICATION CONTROL PANEL
FAMSP FIRE ALARM SLAVE/MASS NOTIFICATION CONTROL
ANN REMOTE ANNUNCIATOR PANEL
MAP GRAPHIC MAP W/INSTRUCTIONS FOR MNS
ASSDM MASTER VESDA UNIT.
ASSD- SLAVE VESDA UNIT.
VCGW COMPUTER GRAPHIC WORKSTATION
TVSS 120AC TRANSIENT VOLTAGE SURGE SUPPRESSOR
APS-1 REMOTE BOOSTER POWER
SMOKE DETECTOR
LINEAR HEAT DETECTION
CO CARBON MONOXIDE DETECTOR
HEAT DETECTOR
DUCT DETECTOR
REMOTE LIGHT/TEST STATION
BEAM DETECTOR- TRANSMITTER
BEAM DETECTOR- RECEIVER
MANUAL PULL STATION
CT1 SINGLE MONITOR MODULE
CT2 DUAL MONITOR MODULE
CR RELAY MODULE
RM1 RISER MODULE
IO I/O MODULE
IM ISOLATION MODULE
FIRE ALARM SPEAKER/STROBE WALL MOUNT
FIRE ALARM SPEAKER/STROBE CEILING MOUNT
FIRE ALARM SPEAKER/STROBE WALL MOUNT/WEATHERPROOF
FIRE ALARM SPEAKER ONLY WALL MOUNT
FIRE ALARM SPEAKER ONLY CEILING MOUNT
FIRE ALARM LOUD SPEAKER
FIRE ALARM DIRECTIONAL SPEAKER
FIRE ALARM SPEAKER ONLY WALL MOUNT/WEATHERPROOF
FIRE ALARM STROBE WALL MOUNT
FIRE ALARM STROBE CEILING MOUNT
FIRE ALARM HORN/STROBE
FIRE ALARM HORN/STROBE WALL MOUNT/WEATHERPROOF
FLOW SWITCH
TAMPER SWITCH
PRESSURE SWITCH
LOW AIR SWITCH
FDC FIRE DEPARTMENT CONNECTION
KNOX BOX KNOX BOX
FIRE SMOKE DAMPER
RISER UP/DOWN
REFUGE STATION AREA-OF-RESCUE- CALL BOX
REFUGE MAIN AREA-OF-RESCUE COMMAND CENTER

## GENERAL NOTES:

ALL BREAKERS THAT SUPPLY POWER TO FIRE ALARM RELATED EQUIPMENT. MUST BE PAINTED RED TO RENDER THE BREAKER EASILY IDENTIFIABLE.

FIRE ALARM WIRE TYPE CHART

| Color | Label | Description | Wire Type |
|---|---|---|---|
| | AC | 120VAC Power Wiring | 3#12 AWG Solid (w/Ground) |
| | Y | Data/Network Wiring | #14 AWG Solid |
| | B | Signaling Line Circuit | #16 AWG Solid |
| | Z | 24VDC Power Wiring | 2#14 AWG Solid |
| | E | Notification Appliance (Strobe) Wiring | 2#14 AWG Solid |
| | F | Notification Appliance (Speaker) Wiring | 2#14 AWG Solid |
| | A | Indicating device Circuit (Zone) Wiring | 2#16 AWG Solid |
| | | ModuLaser (Zone) | |
| | | Beam Detector (Line) | |

CIRCUIT CLASS, STYLE NOTES

NAC - Notification Appliance Circuits
STROBES: Class B
SPEAKERS: Class B
SLC - Signaling Line Circuits
Class A, MAKE SURE TO FOLLOW THE SEPARATE CONDUIT (REQUIREMENTS)
IDC - Initiating Device Circuit (i.e. at flow/tamper switches to modules)
Class B

## GENERAL NOTES:

1 ENSURE THAT ALL CEILING MOUNTED NOTIFICATION DEVICES ARE INSTALLED IN CORRECT LOCATION FOR FUTURE DATA HALL FIT OUT. COORDINATE FINAL PLACEMENT

VERIFY PLACEMENT OF SUPPLY AND RETURN DUCT DETECTORS

## DEVICE/ CIRCUIT DESIGNATION:

SLC L1D XXX
LOOP # D-DETECTORS M-MODULES
-DEVICE #
SENSOR ADDRESS RANGE 001-125 — 1ST SLC CIRCUIT ON SLC CARD
MODULE ADDRESS RANGE 126-250
SENSOR ADDRESS RANGE 251-375 — 2ND SLC CIRCUIT ON SLC CARD
MODULE ADDRESS RANGE 376-500
NAC AX- XX SPEAKER
VX- XX STROBE
DEVICE #
NAC CIRCUIT #

NOTE: SLC CARDS RESIDE INSIDE FIRE ALARM CONTROL PANELS. MODEL 3-SSDC SUPPORTS 1 SLC CIRCUIT, MODEL 3-5DDC SUPPORTS 2 SLC CIRCUITS. SEE PANEL SHEET FOR ADDITIONAL INFORMATION.

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ARCHITECT:

GENERAL CONTRACTOR:

ENGINEER:

INSTALLER:

| | |
|---|---|
| PROJECT | QTS DATA CENTER QTS DENI DC2 |
| PROJECT DESCRIPTION | FIRE ALARM & DETECTION SYSTEM |
| PROJECT LOCATION | 1140 N. GUN CLUB ROAD AURORA, COLORADO 80018 |

MERIDIAN PROJECT

JOB#: 2025-24

NICET CERTIFIED

TRAVIS COOK- NICET#113375

COMMENTS AND STAMP

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KEY PLAN
N.T.S.

| REVISION | DATE |
|---|---|
| SUBMITTAL | 07/07/25 |
| REVISIONS | 09/22/25 |
| DATA HALL BUILDOUT | 12/13/25 |
| COMMENTS | 02/25/26 |
| COMMENTS (2) | 04/2/26 |
| COMMENTS (3) | 06/3/26 |
| RFI#696 (4) | 07/24/26 |

CAD FILE: 1ST LEVEL
DRAWN BY: T.COOK
DATE: 06/12/25
ENG. APPROVAL:
DATE:
REVIEW BY:
SCALE: 1/8"=1'-0"

FIRE ALARM SYSTEM EST-4

FIRE ALARM 2ND LEVEL (AREA-H) FLOOR PLAN

SHEET FF18

FAMCP FIRE ALARM/MASS NOTIFICATION CONTROL PANEL
FAMSP FIRE ALARM SLAVE/MASS NOTIFICATION CONTROL
ANN REMOTE ANNUNCIATOR PANEL
MAP GRAPHIC MAP W/INSTRUCTIONS FOR MNS
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FIRE ALARM SPEAKER/STROBE WALL MOUNT
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FIRE ALARM HORN/STROBE
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| | | ModuLaser (Zone) | |
| | | Beam Detector (Line) | |

### CIRCUIT CLASS, STYLE NOTES

NAC - Notification Appliance Circuits
STROBES: Class B
SPEAKERS: Class B
SLC - Signaling Line Circuits
Class A. MAKE SURE TO FOLLOW THE SEPARATE CONDUIT (REQUIREMENTS)
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SLC L1D XXX
LOOP # — D—DETECTORS M—MODULES
—DEVICE #
SENSOR ADDRESS RANGE 001—125 / MODULE ADDRESS RANGE 126—250 — 1ST SLC CIRCUIT ON SLC CARD
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SENSOR ADDRESS RANGE 251—375 / MODULE ADDRESS RANGE 376—500 — 2ND SLC CIRCUIT ON SLC CARD
DEVICE #
NAC CIRCUIT #

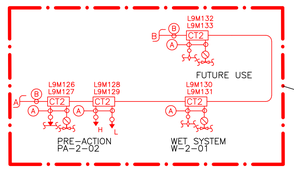
NOTE: SLC CARDS RESIDE INSIDE FIRE ALARM CONTROL PANELS. MODEL 3—5SDC SUPPORTS 1 SLC CIRCUIT, MODEL 3—5DDC SUPPORTS 2 SLC CIRCUITS. SEE PANEL SHEET FOR ADDITIONAL INFORMATION.

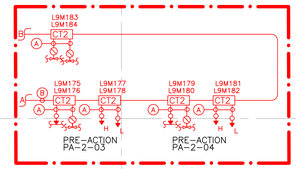
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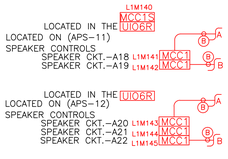
A.2 A.1 OD.3 A A.5 OF OG C OH

2ND LEVEL
AREA I
SCALE: 1/8" = 1'-0"
0 5 10 20
Scale In Feet

N







City of Aurora Building Division
Reviewed for Code Compliance
Approved as Noted: zchorst
Date: Aug 14, 2026
2021 INTERNATIONAL CODES & 2023 NEC

INSTALLATION NOTES:



SUMMIT FIRE PROTECTION
10200 E. Easter Avenue
Centennial, Colorado 80112
Phone: (303) 790-2520
Fax: (303) 790-2528

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ARCHITECT:
GENERAL CONTRACTOR:
ENGINEER:
INSTALLER:

| PROJECT | PROJECT DESCRIPTION | PROJECT LOCATION |
|---|---|---|
| QTS DATA CENTER QTS DENI DC2 | FIRE ALARM & DETECTION SYSTEM | 1140 N. GUN CLUB ROAD AURORA, COLORADO 80018 |

MERIDIAN PROJECT
JOB#: 2025-24

NICET CERTIFIED
TRAVIS COOK- NICET#113375
COMMENTS AND STAMP

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KEY PLAN
N.T.S.

| REVISION | DATE |
|---|---|
| SUBMITTAL | 07/07/25 |
| REVISIONS | 09/22/25 |
| DATA HALL BUILDOUT | 12/13/25 |
| COMMENTS | 02/25/26 |
| COMMENTS (RFI #696) | 04/2/26 |
| COMMENTS (RFI #696) | 06/3/26 |
| RFI#696 | 07/24/26 |

CAD FILE: 1ST LEVEL
DRAWN BY: T.COOK — DATE: 06/12/25
ENG. APPROVAL: — DATE:
REVIEW BY: — SCALE: 1/8"=1'-0"

FIRE ALARM SYSTEM EST-4

FIRE ALARM 2ND LEVEL (AREA-I) FLOOR PLAN

SHEET
FF19

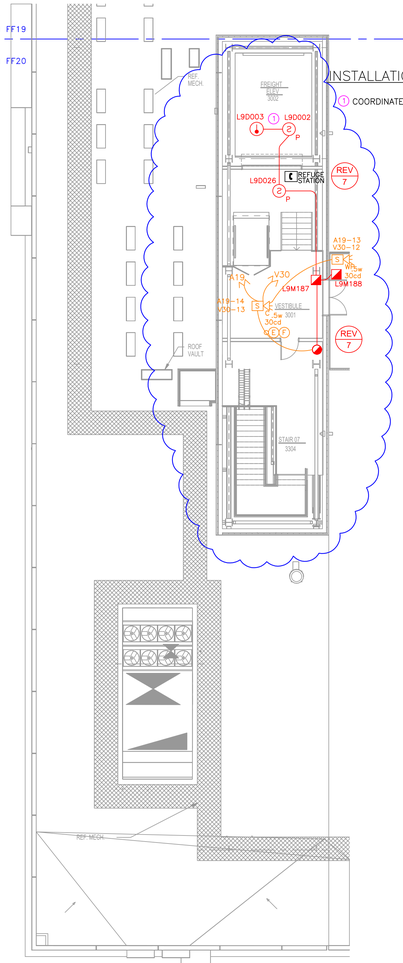
SPEAKER CKT.-A21 L1M144 MCC-1 B
SPEAKER CKT.-A22 L1M145 MCC-1 B

MATCHLINE SEE SHEET FF19

MATCHLINE SEE SHEET FF20

INSTALLATION NOTES:

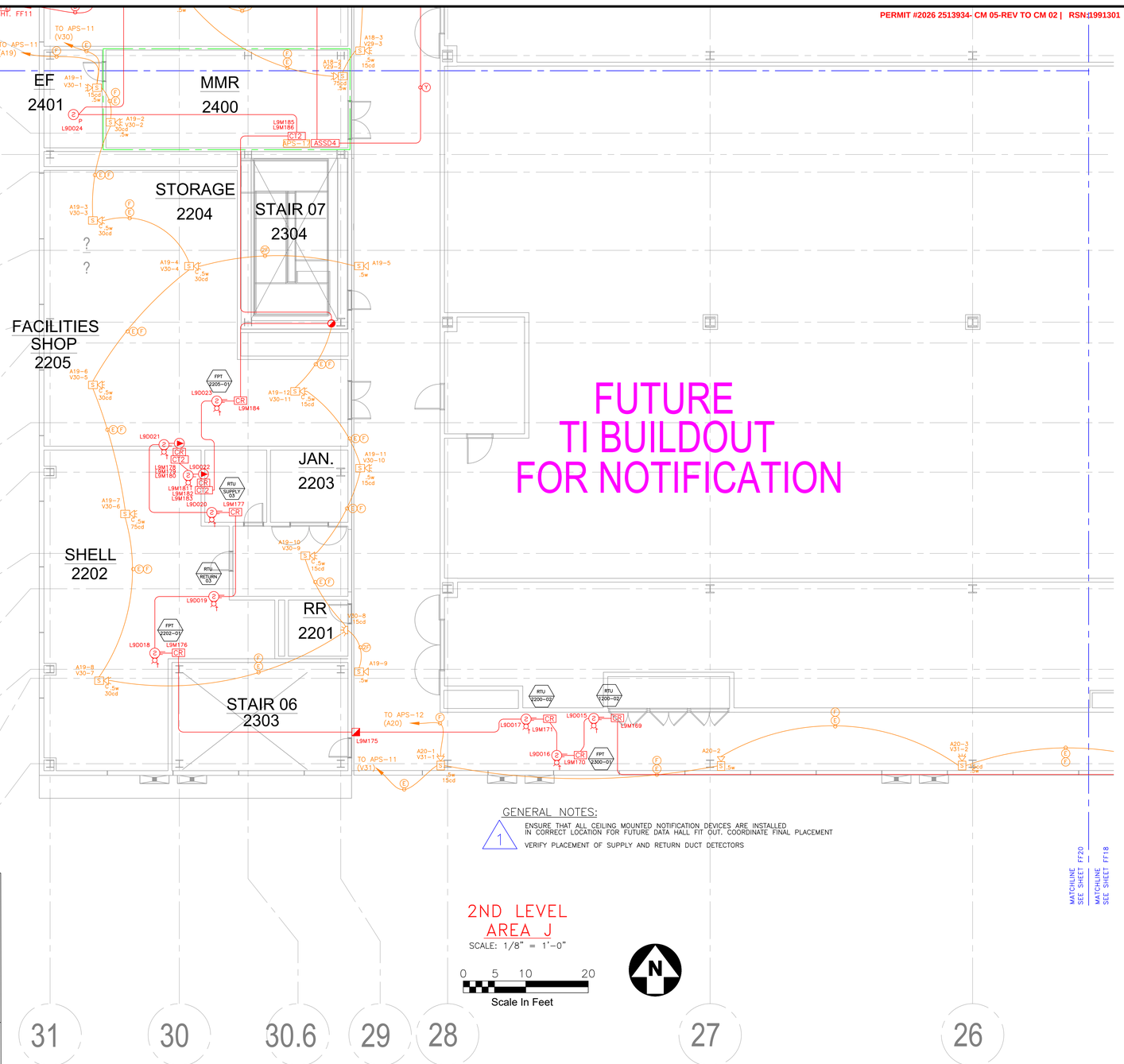
1. COORDINATE LOCATION OF DEVICES IN THE ELEVATOR SHAFT




ROOF LEVEL
AREA J
SCALE: 1/8" = 1'-0"

0 5 10 20
Scale In Feet

C
OH
C.4
C.5
OJ
D
D.2
OK
D.5
OL
E
E.6
OM
F




GENERAL NOTES:

1. ENSURE THAT ALL CEILING MOUNTED NOTIFICATION DEVICES ARE INSTALLED IN CORRECT LOCATION FOR FUTURE DATA HALL FIT OUT. COORDINATE FINAL PLACEMENT
   VERIFY PLACEMENT OF SUPPLY AND RETURN DUCT DETECTORS

2ND LEVEL
AREA J
SCALE: 1/8" = 1'-0"

0 5 10 20
Scale In Feet

MATCHLINE SEE SHEET FF20

MATCHLINE SEE SHEET FF18

31 30 30.6 29 28 27 26

FIRE ALARM WIRE TYPE CHART

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|---|---|---|---|
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| | Y | Data/Network Wiring | #14 AWG Solid |
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CIRCUIT CLASS, STYLE NOTES

NAC - Notification Appliance Circuits
STROBES: Class B
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SLC - Signaling Line Circuits
Class A, MAKE SURE TO FOLLOW THE SEPARATE CONDUIT (REQUIREMENTS)
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DEVICE/ CIRCUIT DESIGNATION:

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- L1D: LOOP # D-DETECTORS M-MODULES
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NAC
- AX- XX SPEAKER
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  - XX: DEVICE #
  - X: NAC CIRCUIT #

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|---|---|---|
| QTS DATA CENTER QTS DENI DC2 | FIRE ALARM & DETECTION SYSTEM | 1140 N. GUN CLUB ROAD AURORA, COLORADO 80018 |

MERIDIAN PROJECT
JOB#: 2025-24

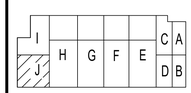
NICET CERTIFIED

TRAVIS COOK- NICET#113375

COMMENTS AND STAMP

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KEY PLAN
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| REVISION | DATE |
|---|---|
| SUBMITTAL | 07/07/25 |
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| DATA HALL BUILDOUT | 12/13/25 |
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| COMMENTS (RS) | 04/2/26 |
| COMMENTS (RS) | 06/3/26 |
| RFI#696 (RS) | 07/24/26 |

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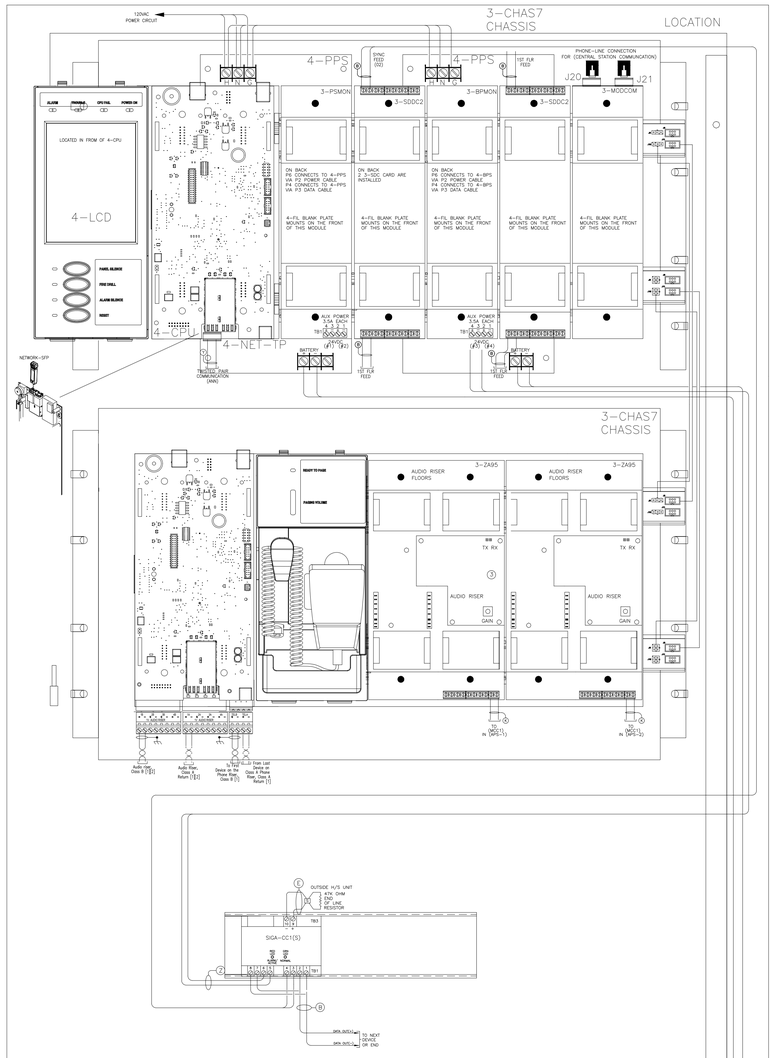
FIRE ALARM SYSTEM EST-4

FIRE ALARM 2ND LEVEL (AREA-J) FLOOR PLAN

SHEET FF20

City of Aurora Building Division
Reviewed for Code Compliance
Approved as Noted:chorst
Date:Aug 14, 2026
2021 INTERNATIONAL CODES & 2023 NEC

# EST4 FIRE ALARM CONTROL PANEL DETAIL - ENCLOSURE #1



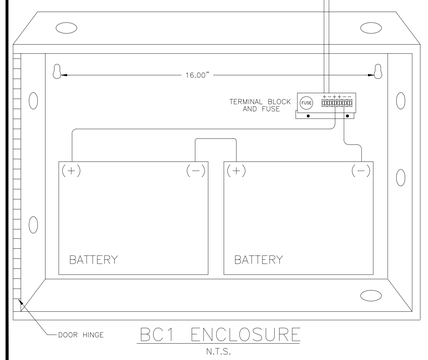

## 25% SPARE CAPACITY LIST:

| DEVICE | TOTAL WATTS | 25% SPARE | TOTAL WATTS TO USE BEFORE SPARE |
|---|---|---|---|
| AMP | 40W | 10W | 30W |
| AMP | 95W | 23.75W | 71.25W |

BATTERY AREA
DO NOT INSTALL CONDUIT

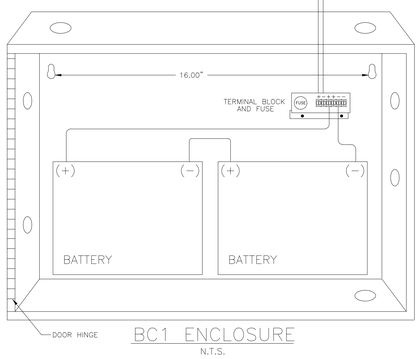
FAMCP BACKBOX MOUNTING DETAIL (E.S.T. EST4)

N.T.S.



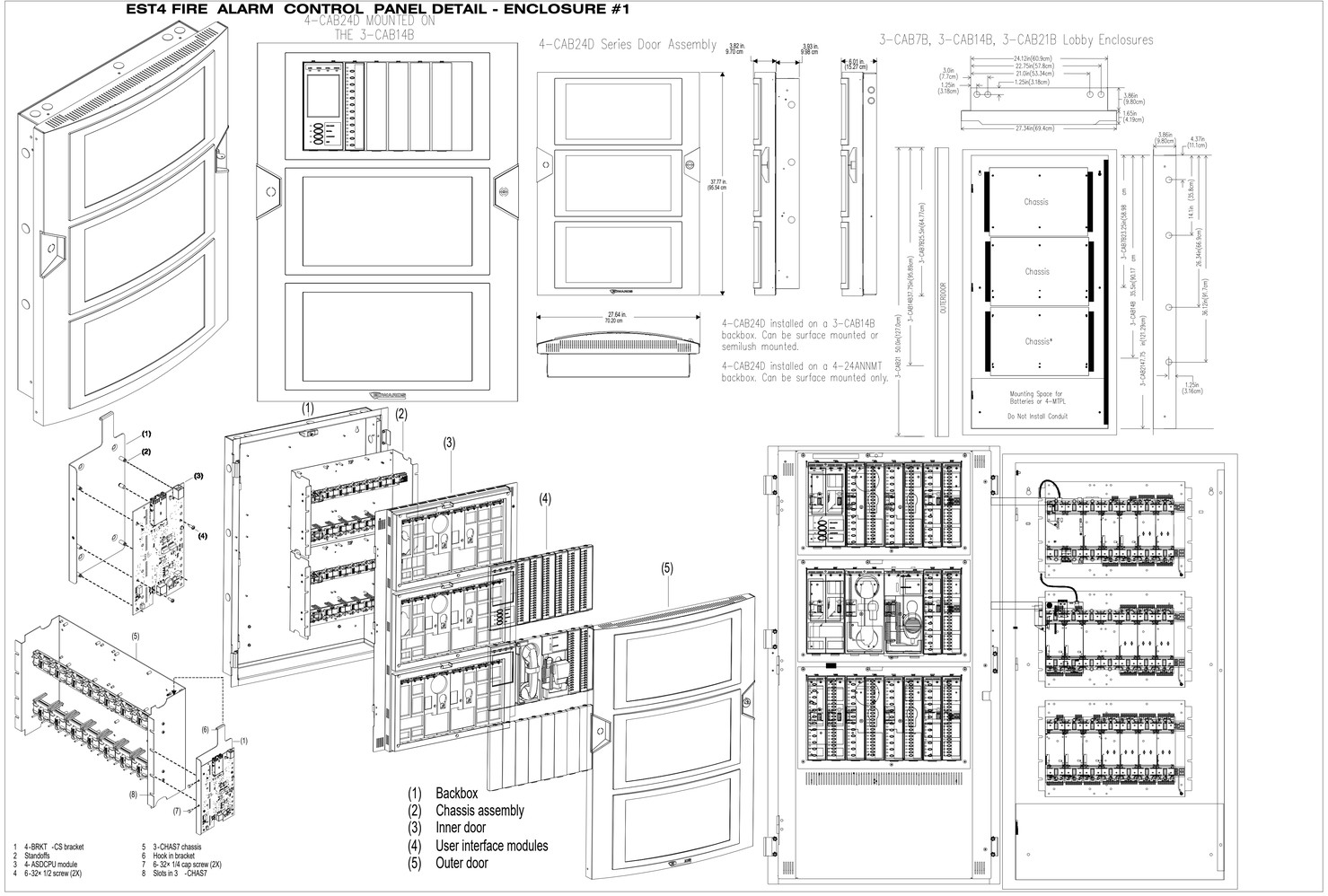

BC1 ENCLOSURE

N.T.S.




BC1 ENCLOSURE

N.T.S.




(1) Backbox
(2) Chassis assembly
(3) Inner door
(4) User interface modules
(5) Outer door

1 4-BRKT -CS bracket
2 Standoffs
3 4- ASDCPU module
4 6-32x 1/2 screw (2X)
5 3-CHAS7 chassis
6 Hook in bracket
7 6- 32x 1/4 cap screw (2X)
8 Slots in 3 -CHAS7

FLAG NOTE
125 SIGNATURE SERIES DETECTORS AND 125 SIGNATURE SERIES MODULES PER CIRCUIT "T-TAPS" NOT PERMITTED

## FAMCP CIRCUIT SCHEDULE

| REFERENCE | DESCRIPTION | QUANTITY OF ADDRESSES/DEVICES | DEVICE SPARES | DEVICE MAXIMUM | ESTIMATED DISTANCE | |
|---|---|---|---|---|---|---|
| SLC-#1 | SIGNAL LOOP CIRCUIT - DETECTORS-SYNC CKT. | 000 | 058 | (125MAX) | 1125'FT | |
| SLC-#1 | SIGNAL LOOP CIRCUIT - MODULES-SYNC CKT. | 029 | 096 | (125MAX) | 1125'FT | |
| SLC-#2 | SIGNAL LOOP CIRCUIT - DETECTORS-1ST LEVEL | 024 | 101 | (125MAX) | 1125'FT | |
| SLC-#2 | SIGNAL LOOP CIRCUIT - MODULES-1ST LEVEL | 040 | 085 | (125MAX) | 1125'FT | |
| SLC-#3 | SIGNAL LOOP CIRCUIT - DETECTORS-1ST LEVEL | 014 | 111 | (125MAX) | 1125'FT | |
| SLC-#3 | SIGNAL LOOP CIRCUIT - MODULES-1ST LEVEL | 033 | 092 | (125MAX) | 1125'FT | |
| SLC-#4 | SIGNAL LOOP CIRCUIT - DETECTORS-1ST LEVEL | 003 | 122 | (125MAX) | 1125'FT | |
| SLC-#4 | SIGNAL LOOP CIRCUIT - MODULES-1ST LEVEL | 036 | 089 | (125MAX) | 1125'FT | |

## 24VDC POWER CIRCUIT SCHEDULE

| REFERENCE | DESCRIPTION |
|---|---|
| #1 | 24VDC TO ANN |
| #2 | 24VDC OUTSIDE H/S CKT. |
| #3 | MODULASER COMMAND DISPLAY UNIT |
| #4 | MODULASER (ASSD6) RM.0133 |

## QTS-DEN1-DC2 95W #1 Amplifer Speaker Circuit dB Loss Calculations- (FAMCP)

Constant Voltage 70.7 (Enter 25 or 70.7)

| Speaker Ckt # | Description | Speakers tapped at .25W | Speakers tapped at .5W | Speakers tapped at 1W | Speakers tapped at 2W | Length (Feet) | Circuit Device Draw (Watts) | Wire Gauge | Tot Wire Resist (Ohms) | Tot dB Loss (-3 dB max) |
|---|---|---|---|---|---|---|---|---|---|---|
| A1 | Speaker CKT #A1 1st Level | 0 | 27 | 0 | 0 | 825 | 13.50 | 14 | 3.07 | -0.06 |
| A2 | Speaker CKT #A2 1st level | 0 | 16 | 0 | 0 | 545 | 8.00 | 14 | 3.07 | -0.02 |
| A3 | Speaker CKT #A3 1st level | 0 | 20 | 0 | 0 | 675 | 10.00 | 14 | 3.07 | -0.04 |
| | TOTALS | | 63 | | | | 31.5000 | WATTS | | |

| Wire Resistance in amps | Circuit Load in amps |
|---|---|
| 2.533 | 0.191 |
| 1.673 | 0.113 |
| 2.072 | 0.141 |

2 conductor one-way

## QTS-DEN1-DC2 95W #2 Amplifer Speaker Circuit dB Loss Calculations- (FAMCP)

Constant Voltage 70.7 (Enter 25 or 70.7)

| Speaker Ckt # | Description | Speakers tapped at .25W | Speakers tapped at .5W | Speakers tapped at 1W | Speakers tapped at 2W | Length (Feet) | Circuit Device Draw (Watts) | Wire Gauge | Tot Wire Resist (Ohms) | Tot dB Loss (-3 dB max) |
|---|---|---|---|---|---|---|---|---|---|---|
| A4 | Speaker CKT #A4 1st Level | 0 | 17 | 0 | 0 | 815 | 8.50 | 14 | 3.07 | -0.04 |
| A5 | Speaker CKT #A5 1st level | 0 | 19 | 0 | 0 | 978 | 9.50 | 14 | 3.07 | -0.05 |
| A6 | Speaker CKT #A6 1st level-SPARE | 0 | 0 | 0 | 0 | 650 | 0.00 | 14 | 3.07 | #DIV/0! |
| | TOTALS | | 36 | | | | 18.0000 | WATTS | | |

| Wire Resistance in amps | Circuit Load in amps |
|---|---|
| 2.502 | 0.120 |
| 3.002 | 0.134 |
| 1.996 | 0.000 |

2 conductor one-way

## BATTERY CALCULATIONS

FOR

**PROJECT:** QTS-DEN1-DC2
**Panel Number:** FAMCP

**DESIGN PARAMETERS:** Standby Hours - 24; Alarm Minutes - 15

| Qty | Description | STANDBY CURRENT EACH | | STANDBY CURRENT TOTAL | Qty | ALARM CURRENT EACH | | ALARM CURRENT TOTAL | |
|---|---|---|---|---|---|---|---|---|---|
| | **CONTROL PANEL** | | | | | | | | |
| 1 | 4-PPS/M - Primary Power Supply | x | 0.045 = | 0.045 | 1 x | 0.045 = | | 0.045 | |
| 1 | 4-LCDLE -Liquid Crystal Display Module | x | 0.05 = | 0.05 | 1 x | 0.11 = | | 0.11 | |
| 1 | 4-NET-TP - Network Communication Card | x | 0.032 = | 0.032 | 1 x | 0.032 = | | 0.032 | |
| 1 | 4-AUDTELS - Audio Source Unit-IO | x | 0.085 = | 0.085 | 1 x | 0.101 = | | 0.101 | |
| 1 | 4-MIC Paging Microphone | x | 0.008 = | 0.008 | 1 x | 0.038 = | | 0.038 | |
| 1 | 4-CPU-Central Processor Module | x | 0.23 = | 0.23 | 1 x | 0.23 = | | 0.23 | |
| 2 | 3-SSDC2- Dual (SIGA) Driver Controller | x | 0.144 = | 0.288 | 2 x | 0.204 = | | 0.408 | |
| 1 | 4-PPS/M - Booster Power Supply | x | 0.045 = | 0.045 | 1 x | 0.045 = | | 0.045 | |
| 1 | 4-ASDCPU-Aspirating Smoke Detector | x | 0.128 = | 0.128 | 1 x | 0.129 = | | 0.129 | |
| 2 | 3-ZA95 - 95 Watt Zoned Amplifier, Class B/A | x | 0.085 = | 0.17 | 2 x | 5.54 = | | 11.08 | |
| 2 | 4-24L12S Control Display 24 LED, 12 switches | x | 0.004 = | 0.008 | 2 x | 0.01 = | | 0.02 | |
| 1 | 3-MODCOM | x | 0.06 = | 0.06 | 1 x | 0.09 = | | 0.09 | |
| | | | | | | | Sub-Total a | | 12.328 |
| | **INITIATING DEVICES** | | | | | | | | |
| 37 | SIGA Series Detectors (any type Base) | x | 0.000045 = | 0.001665 | 37 x | 0.000045 = | | 0.001665 | |
| 4 | SIGA-IM | x | 0.000045 = | 0.00018 | 4 x | 0.000045 = | | 0.00018 | |
| 13 | SIGA-278 | x | 0.000396 = | 0.005148 | 13 x | 0.00068 = | | 0.00884 | |
| 4 | SIGA-CT1 | x | 0.00025 = | 0.001 | 4 x | 0.0004 = | | 0.0016 | |
| 39 | SIGA-CT2/MCT2 | x | 0.000396 = | 0.015444 | 39 x | 0.00068 = | | 0.02652 | |
| 15 | SD-TRK | x | 0 | 0 | 15 x | 0.002 = | | 0.03 | |
| 2 | SIGA-RM1 | x | 0.00025 = | 0.0005 | 2 x | 0.0004 = | | 0.0008 | |
| | | | | | | | Sub-Total b | | 0.010685 |
| | **OUTPUT DEVICES** | | | | | | | | |
| 1 | SIGA-CC1(S) | x | 0.000223 = | 0.000223 | 1 x | 0.0001 = | | 0.0001 | |
| 6 | SIGA-MCC1 | x | 0.000223 = | 0.001338 | 6 x | 0.0001 = | | 0.0006 | |
| 22 | SIGA-MCC1(S) | x | 0.000223 = | 0.004906 | 22 x | 0.0001 = | | 0.0022 | |
| 30 | SIGA-CR/MCR | x | 0.0001 = | 0.003 | 30 x | 0.0001 = | | 0.003 | |
| | | | | | | | Sub-Total c | | 0.0059 |
| | **INDICATING APPLIANCES** | | | | | | | | |
| 1 | WG4RD-HVMC | x | = | | 1 x | 0.351 = | | 0.351 | |
| | **Misc. Devices** | | | | | | | | |
| 1 | Modulaser Command Display Module | x | 0.266 = | 0.266 | 1 x | 0.266 = | | 0.266 | |
| 1 | Modulaser Standard Display Module | x | 0.266 = | 0.266 | 1 x | 0.266 = | | 0.266 | |
| 1 | Modulaser Detector Module | x | 0.387 = | 0.387 | 1 x | 0.387 = | | 0.387 | |
| 1 | 4-ANNCPU | x | 0.125 = | 0.125 | 1 x | 0.125 = | | 0.125 | |
| 1 | 4-LCDANN- Remote Annuc. | x | 0.205 = | 0.205 | 1 x | 0.205 = | | 0.205 | |
| 3 | 4-NET-TP - Network Communication Card | x | 0.032 = | 0.096 | 3 x | 0.032 = | | 0.096 | |
| 1 | 4-24L12S Control Display 24 LED, 12 switches | x | 0.04 = | 0.04 | 1 x | 0.01 = | | 0.01 | |
| 1 | 4-MIC Paging Microphone | x | 0.008 = | 0.008 | 1 x | 0.038 = | | 0.038 | |
| 1 | 4-ANNAUDTEL- Interface Module | x | 0.098 = | 0.098 | 1 x | 0.098 = | | 0.098 | |
| | | | | | | | Sub-Total e | | 1.491 |
| | Total Standby Current | | | 2.67 | | | | | |
| | Standby Hours | | x | 24.00 | | | | | |
| | Standby AH Required | | | 64.16 | | | | | |
| | Total Panel Component Alarm Current | | | | | | a | | 12.328 |
| | Total for 10% of Initiating Devices | [Subtotal b ( | 0.010685 | x 10] | | | b | | 0.0069605 |
| | Total Output Device Alarm Current | | | | | | c | | 0.0059 |
| | Total Indicating Appliance Alarm Current | | | | | | d | | 0.351 |
| | Total Miscellaneous Device Alarm Current | | | | | | e | | 1.491 |
| | Total Alarm Current | | | | | | | | 14.182861 |
| | | Alarm Hours( | 15 min. ÷ 60 min.) | | | | x | | 0.25 |
| | Alarm AH Required | | | 3.55 <——— | | | | | 3.55 |
| | Standby AH Required | | + | 64.16 | | | | | |
| | Total Current Needs | | = | 67.71 | | | | | |
| | Derate by .25% | | x | 1.25 | | | | | |
| | Battery Size Required | | = | 84.63 Amp Hours | | | | | |

Summit Fire. will Furnish Four **60** Ampere Hour Batteries @ Panel FAMCP

PROVIDE (4) 12V WHICH IS A TOTAL OF (120AH) BATTERIES



SUMMIT FIRE PROTECTION
10200 E. Easter Avenue
Centennial, Colorado 80112
Phone: (303) 790-2520
Fax: (303) 790-2528

THESE DRAWINGS ARE SCHEMATIC AND DO NOT ATTEMPT TO SHOW SHOW CONDUIT ROUTING.

ARCHITECT:

GENERAL CONTRACTOR:

ENGINEER:

INSTALLER:

| | |
|---|---|
| PROJECT | QTS DATA CENTER QTS DENI DC2 |
| PROJECT DESCRIPTION | FIRE ALARM & DETECTION SYSTEM |
| PROJECT LOCATION | 1140 N. GUN CLUB ROAD AURORA, COLORADO 80018 |

MERIDIAN PROJECT

JOB#: 2025-24

NICET CERTIFIED

TRAVIS COOK- NICET#113375

COMMENTS AND STAMP

THESE DRAWINGS ARE SCHEMATIC AND DO NOT ATTEMPT TO SHOW SHOW CONDUIT ROUTING.

KEY PLAN
N.T.S.

| REVISION | DATE |
|---|---|
| SUBMITTAL | 07/07/25 |
| REVISIONS | 09/22/25 |
| DATA HALL BUILDOUT | 12/13/25 |
| COMMENTS | 02/25/26 |
| COMMENTS (REV 1) | 04/2/26 |
| COMMENTS (REV 2) | 06/3/26 |
| RFI#696 (REV 3) | 07/24/26 |

CAD FILE: FIRE ALARM PANEL

| | |
|---|---|
| DRAWN BY: B. ALLEN | DATE: 5/24/25 |
| ENG. APPROVAL: | DATE: |
| REVIEW BY: | SCALE: N.T.S. |

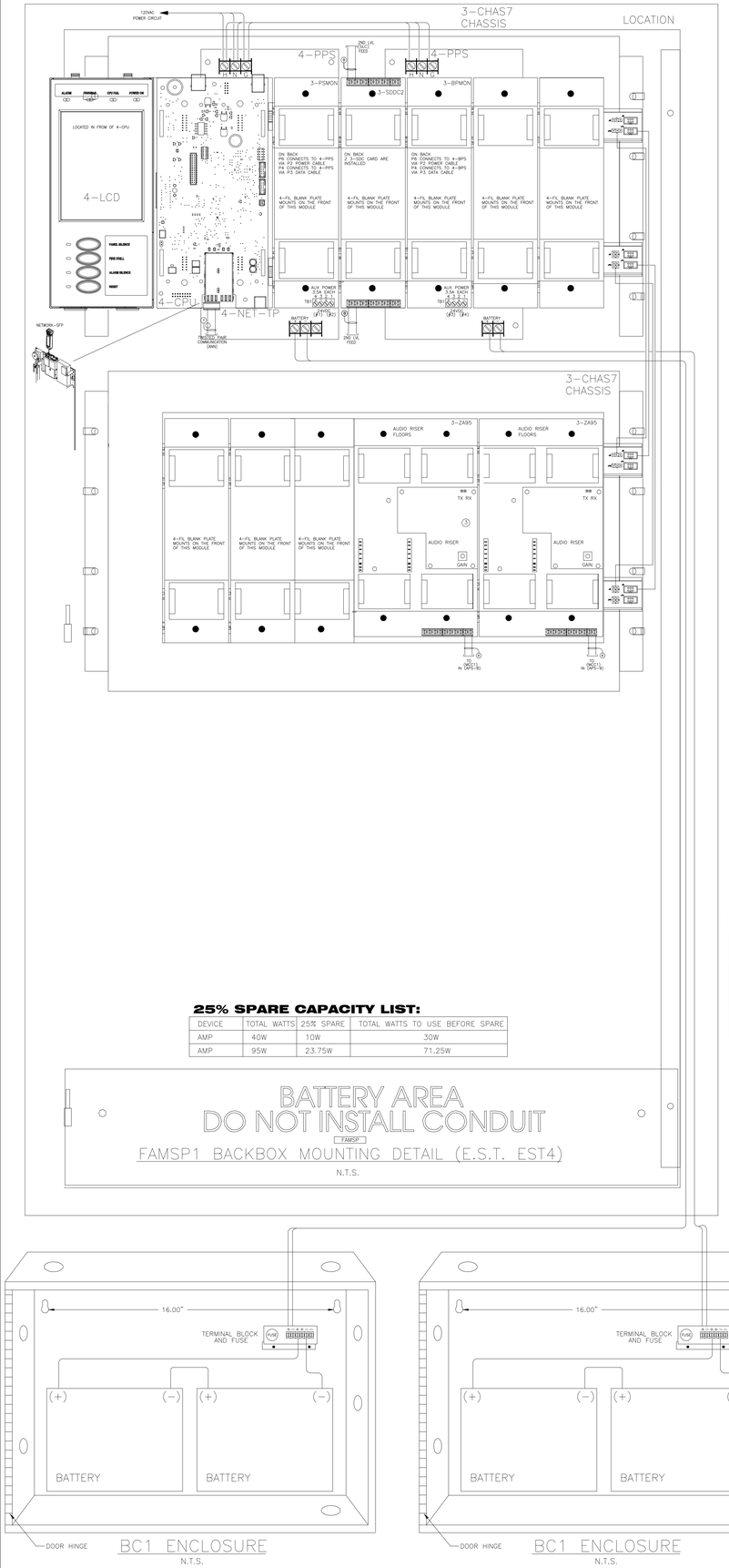
FIRE ALARM SYSTEM EST-4

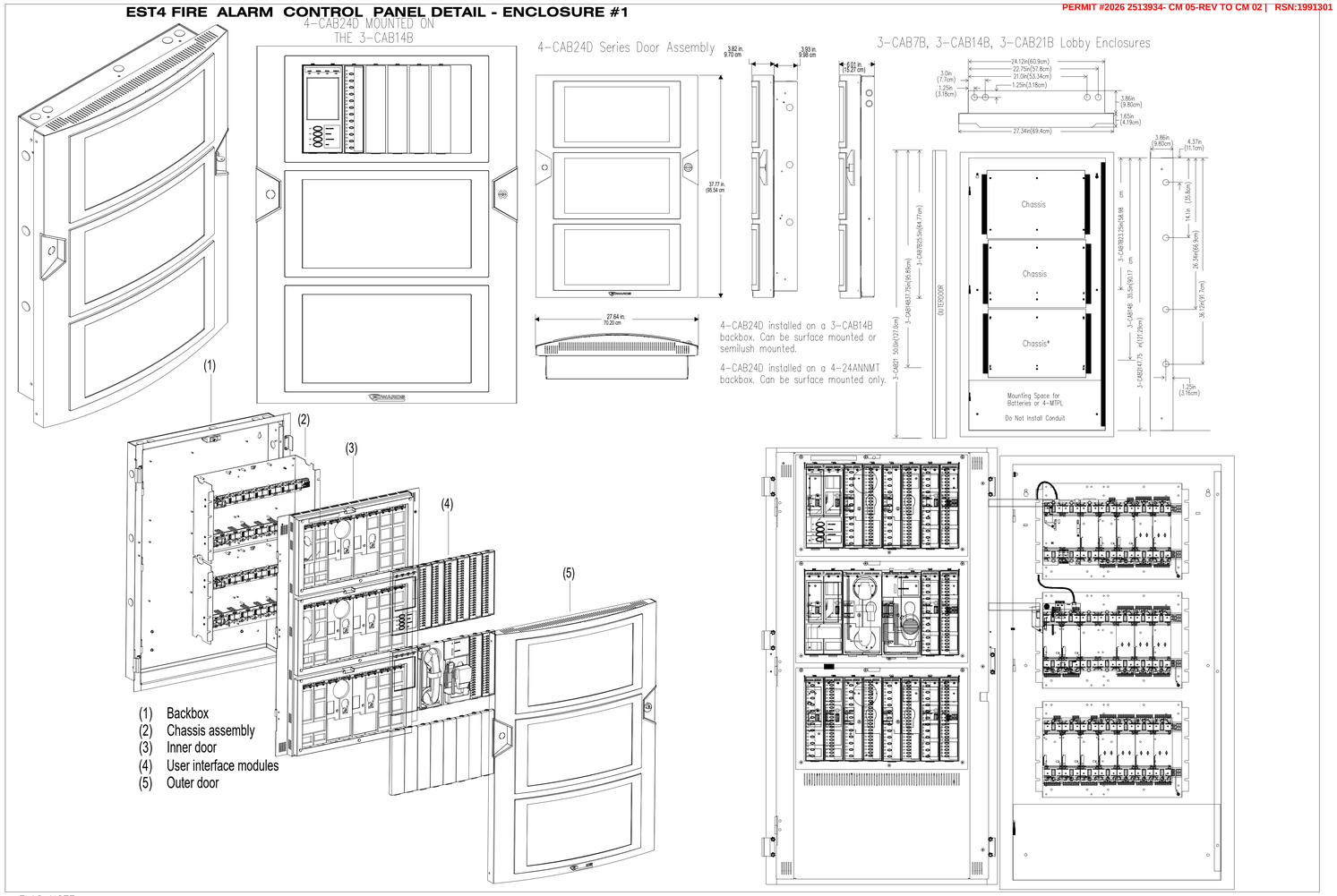
FIRE ALARM CONTROL PANEL (FAMCP) LAYOUT/CALC'S

SHEET FP01

PERMIT #2026 2513934- CM 05-REV TO CM 02 | RSN:1991301

# EST4 FIRE ALARM CONTROL PANEL DETAIL - ENCLOSURE #1







(1) Backbox
(2) Chassis assembly
(3) Inner door
(4) User interface modules
(5) Outer door



FLAG NOTE
125 SIGNATURE SERIES DETECTORS AND 125 SIGNATURE SERIES MODULES PER CIRCUIT "T-TAPS" ARE PERMITTED

## FAMSP#1 CIRCUIT SCHEDULE

| REFERENCE | DESCRIPTION | QUANTITY OF ADDRESSES/DEVICES | DEVICE SPARES | DEVICE MAXIMUM | ESTIMATED DISTANCE | |
|---|---|---|---|---|---|---|
| SLC-#7 | SIGNAL LOOP CIRCUIT – DETECTORS-2ND LEVEL | 019 | 106 | (125MAX) | 1023'FT | |
| SLC-#7 | SIGNAL LOOP CIRCUIT – MODULES- 2ND LEVEL | 063 | 062 | (125MAX) | 1023'FT | |
| SLC-#8 | SIGNAL LOOP CIRCUIT – DETECTORS-2ND LEVEL | 029 | 096 | (125MAX) | 925'FT | |
| SLC-#8 | SIGNAL LOOP CIRCUIT – MODULES- 2ND LEVEL | 033 | 092 | (125MAX) | 925'FT | |

## 24VDC POWER CIRCUIT SCHEDULE

| REFERENCE | DESCRIPTION |
|---|---|
| #1 | 24VDC SPARE |
| #2 | 24VDC SPARE |
| #3 | 24VDC SPARE |
| #4 | 24VDC SPARE |

**25% SPARE CAPACITY LIST:**

| DEVICE | TOTAL WATTS | 25% SPARE | TOTAL WATTS TO USE BEFORE SPARE |
|---|---|---|---|
| AMP | 40W | 10W | 30W |
| AMP | 95W | 23.75W | 71.25W |

BATTERY AREA
DO NOT INSTALL CONDUIT
FAMSP
FAMSP1 BACKBOX MOUNTING DETAIL (E.S.T. EST4)
N.T.S.




BC1 ENCLOSURE
N.T.S.




BC1 ENCLOSURE
N.T.S.

## QTS-DEN1-DC2 95W #1 Amplifer Speaker Circuit dB Loss Calculations- (FAMSP1)

Constant Voltage 70.7 (Enter 25 or 70.7)

| Speaker Ckt # | Description | Speakers tapped at .25W | Speakers tapped at .5W | Speakers tapped at 1W | Speakers tapped at 2W | Length (Feet) | Circuit Device Draw (Watts) | Wire Gauge | Tot Wire Resist (Ohms) | Tot dB Loss (-3 dB max) | Wire Resistance in amps | Circuit Load in amps |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| A12 | Speaker CKT 2nd Level | 0 | 17 | 0 | 0 | 658 | 8.50 | 14 | 3.07 | -0.03 | 2.020 | 0.120 |
| A13 | Speaker CKT 2nd Level | 0 | 25 | 0 | 0 | 915 | 12.50 | 14 | 3.07 | -0.06 | 2.809 | 0.177 |
| A14 | Speaker CKT 2nd Level | 0 | 17 | 0 | 0 | 725 | 8.50 | 14 | 3.07 | -0.03 | 2.226 | 0.120 |
| | TOTALS | | 59 | | | | 29.5000 | WATTS | | | 2 conductor one-way | |

## QTS-DEN1-DC2 95W #2 Amplifer Speaker Circuit dB Loss Calculations- (FAMSP1)

Constant Voltage 70.7 (Enter 25 or 70.7)

| Speaker Ckt # | Description | Speakers tapped at .25W | Speakers tapped at .5W | Speakers tapped at 1W | Speakers tapped at 2W | Length (Feet) | Circuit Device Draw (Watts) | Wire Gauge | Tot Wire Resist (Ohms) | Tot dB Loss (-3 dB max) | Wire Resistance in amps | Circuit Load in amps |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| A15 | Speaker CKT 2nd Level | 0 | 18 | 0 | 0 | 1025 | 9.00 | 14 | 3.07 | -0.05 | 3.147 | 0.127 |
| A16 | Speaker CKT 2nd Level-SPARE | 0 | 0 | 0 | 0 | 825 | 0.00 | 14 | 3.07 | #DIV/0! | 2.533 | 0.000 |
| A17 | Speaker CKT 2nd Level | 0 | 16 | 0 | 0 | 925 | 8.00 | 14 | 3.07 | -0.04 | 2.840 | 0.113 |
| | TOTALS | | 34 | | | | 17.0000 | WATTS | | | 2 conductor one-way | |

## BATTERY CALCULATIONS

FOR

**PROJECT:** QTS-DEN1-DC2
**Panel Number:** FAMSP1

**DESIGN PARAMETERS:** Standby Hours - 24; Alarm Minutes - 15

| Qty | Description | STANDBY CURRENT EACH | | STANDBY CURRENT TOTAL | Qty | ALARM CURRENT EACH | | ALARM CURRENT TOTAL | |
|---|---|---|---|---|---|---|---|---|---|
| | **CONTROL PANEL** | | | | | | | | |
| 1 | 4-PPS/M - Primary Power Supply | x | 0.045 = | 0.045 | 1 | x | 0.045 = | 0.045 | |
| 1 | 4-LCDLE -Liquid Crystal Display Module | x | 0.05 = | 0.05 | 1 | x | 0.11 = | 0.11 | |
| 1 | 4-NET-TP - Network Communication Card | x | 0.032 = | 0.032 | 1 | x | 0.032 = | 0.032 | |
| 1 | 4-CPU-Central Processor Module | x | 0.23 = | 0.23 | 1 | x | 0.23 = | 0.23 | |
| 1 | 3-SDDC2- Dual (SIGA) Driver Controller | x | 0.264 = | 0.264 | 1 | x | 0.336 = | 0.336 | |
| 1 | 4-PPS/M - Booster Power Supply | x | 0.045 = | 0.045 | 1 | x | 0.045 = | 0.045 | |
| 2 | 3-ZA95 - 95 Watt Zoned Amplifier, Class B/A | x | 0.085 = | 0.17 | 2 | x | 5.54 = | 11.08 | |
| | | | | | | | Sub-Total a | | 11.878 |
| | **INITIATING DEVICES** | | | | | | | | |
| 47 | SIGA Series Detectors (any type Base) | x | 0.000045 = | 0.002115 | 47 | x | 0.000045 = | 0.002115 | |
| 2 | SIGA-IM | x | 0.000045 = | 0.00009 | 2 | x | 0.000045 = | 0.00009 | |
| 7 | SIGA-278 | x | 0.000396 = | 0.002772 | 7 | x | 0.00068 = | 0.00476 | |
| 1 | SIGA-CT1 | x | 0.00025 = | 0.00025 | 1 | x | 0.0004 = | 0.0004 | |
| 24 | SIGA-CT2/MCT2 | x | 0.000396 = | 0.009504 | 24 | x | 0.00068 = | 0.01632 | |
| 34 | SD-TRK | x | 0 | 0 | 34 | x | 0.002 = | 0.068 | |
| 1 | SIGA-RM1 | x | 0.00025 = | 0.00025 | 1 | x | 0.0004 = | 0.0004 | |
| | | | | | | | Sub-Total b | | 0.006965 |
| | **OUTPUT DEVICES** | | | | | | | | |
| 44 | SIGA-CR/MCR | x | 0.0001 = | 0.0044 | 44 | x | 0.0001 = | 0.0044 | |
| | | | | | | | Sub-Total c | | 0.0044 |
| | Total Standby Current | | | 0.86 | | | | | |
| | Standby Hours | | x | 24.00 | | | | | |
| | Standby AH Required | | | 20.53 | | | | | |
| | Total Panel Component Alarm Current | | | | | | a | | 11.878 |
| | Total for 10% of Initiating Devices | [Subtotal b ( 0.006965 | | x.10] | | | b | | 0.0092085 |
| | Total Output Device Alarm Current | | | | | | c | | 0.0044 |
| | Total Alarm Current | | | | | | | | 11.891609 |
| | | Alarm Hours( | | 15 min. + 60 min.) | | | x | | 0.25 |
| | Alarm AH Required | | | 2.97 <——— | | | | | 2.97 |
| | Standby AH Required | | + | 20.53 | | | | | |
| | Total Current Needs | | = | 23.50 | | | | | |
| | Derate by 25% | | x | 1.25 | | | | | |
| | Battery Size Required | | = | 29.38 Amp Hours | | | | | |
| | Summit Fire. will Furnish Two | | | **24** Ampere Hour Batteries @ Panel FAMSP1 | | | | | |

PROVIDE (4) 12V WHICH IS A TOTAL OF (40AH) BATTERIES

SUMMIT FIRE PROTECTION
10200 E. Easter Avenue
Centennial, Colorado 80112
Phone: (303) 790-2520
Fax: (303) 790-2528

THESE DRAWINGS ARE SCHEMATIC AND DO NOT ATTEMPT TO SHOW SHOW CONDUIT ROUTING.

ARCHITECT:

GENERAL CONTRACTOR:

ENGINEER:

INSTALLER:

| PROJECT | PROJECT DESCRIPTION | PROJECT LOCATION |
|---|---|---|
| QTS DATA CENTER QTS DENI DC2 | FIRE ALARM & DETECTION SYSTEM | 1140 N. GUN CLUB ROAD AURORA, COLORADO 80018 |

MERIDIAN PROJECT
JOB#: 2025-24

NICET CERTIFIED
TRAVIS COOK- NICET#113375
COMMENTS AND STAMP

THESE DRAWINGS ARE SCHEMATIC AND DO NOT ATTEMPT TO SHOW SHOW CONDUIT ROUTING.

KEY PLAN
N.T.S.
I H G F E C A J D B

| REVISION | DATE |
|---|---|
| SUBMITTAL | 07/07/25 |
| REVISIONS | 09/22/25 |
| DATA HALL BUILDOUT | 12/13/25 |
| COMMENTS | 02/25/26 |
| COMMENTS (REV 1) | 04/2/26 |
| COMMENTS (REV 2) | 06/3/26 |
| RFI#696 (REV 3) | 07/24/26 |

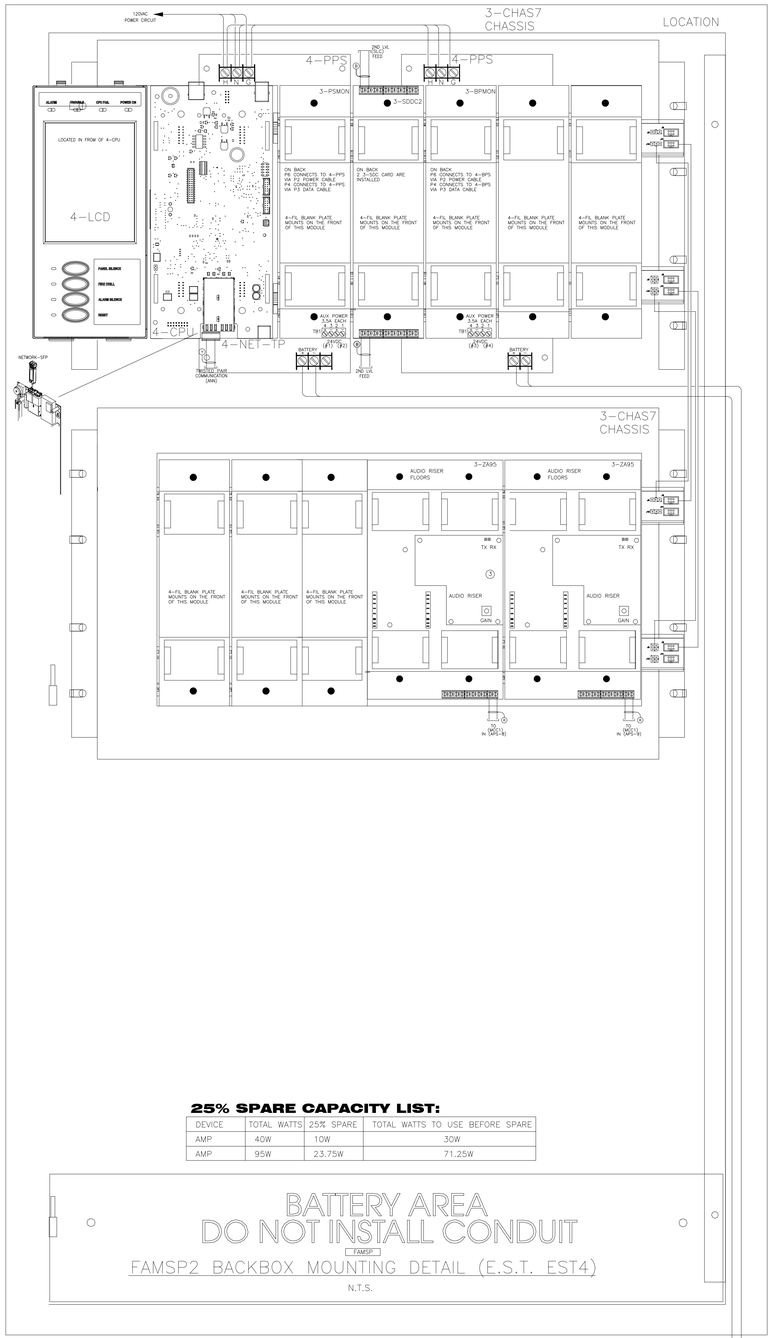
CAD FILE: FIRE ALARM PANEL
DRAWN BY: B. ALLEN — DATE: 7/03/25
ENG. APPROVAL: — DATE:
REVIEW BY: — SCALE: N.T.S.

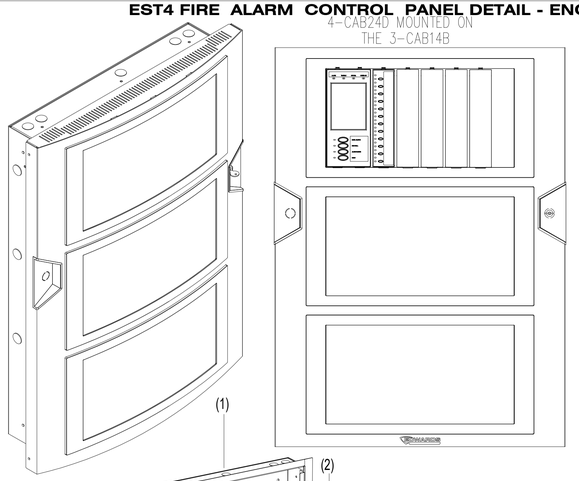
FIRE ALARM SYSTEM EST-4

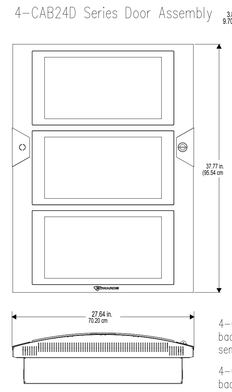
FIRE ALARM CONTROL PANEL (FAMSP.1) LAYOUT/CALC'S

SHEET FP02

# EST4 FIRE ALARM CONTROL PANEL DETAIL - ENCLOSURE #1

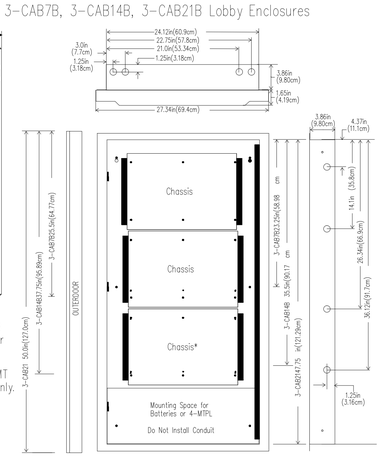


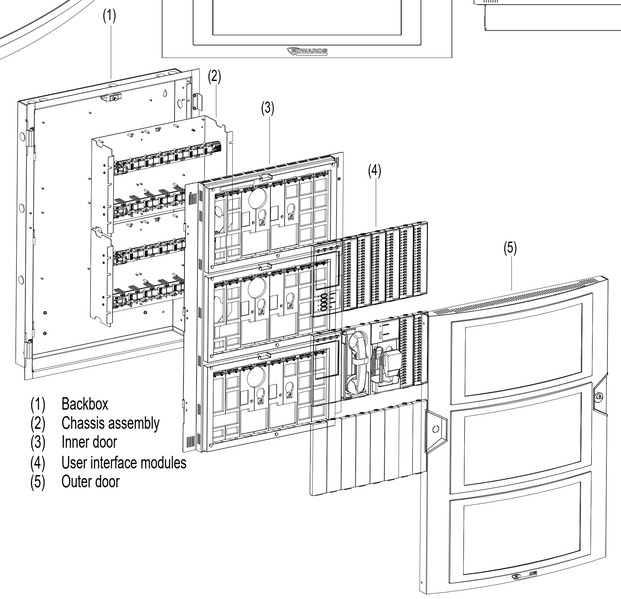



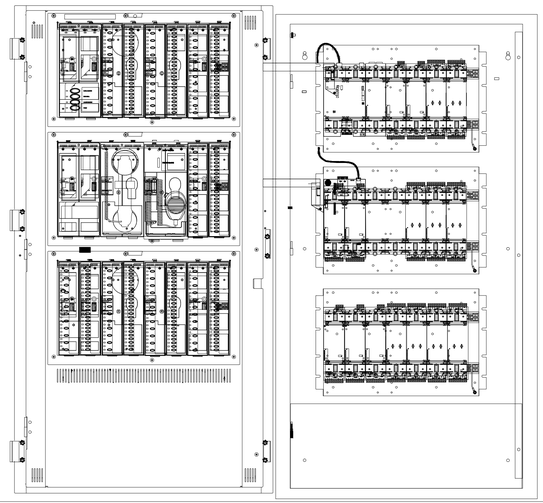

4-CAB24D installed on a 3-CAB14B backbox. Can be surface mounted or semiflush mounted.

4-CAB24D installed on a 4-24ANNMT backbox. Can be surface mounted only.




(1) Backbox
(2) Chassis assembly
(3) Inner door
(4) User interface modules
(5) Outer door



FLAG NOTE
125 SIGNATURE SERIES DETECTORS AND 125 SIGNATURE SERIES MODULES PER CIRCUIT "T-TAPS" ARE PERMITTED

## FAMSP#2 CIRCUIT SCHEDULE

| REFERENCE | DESCRIPTION | QUANTITY OF ADDRESSES/DEVICES | DEVICE SPARES | DEVICE MAXIMUM | ESTIMATED DISTANCE | |
|---|---|---|---|---|---|---|
| SLC-#9 | SIGNAL LOOP CIRCUIT – DETECTORS-2ND LEVEL | 025 | 100 | (125MAX) | 1013'FT | |
| SLC-#9 | SIGNAL LOOP CIRCUIT – MODULES- 2ND LEVEL | 071 | 054 | (125MAX) | 1013'FT | |
| SLC-#10 | SIGNAL LOOP CIRCUIT – DETECTORS-2ND LEVEL | 000 | 125 | (125MAX) | 0'FT | |
| SLC-#10 | SIGNAL LOOP CIRCUIT – MODULES- 2ND LEVEL | 000 | 125 | (125MAX) | 0'FT | |

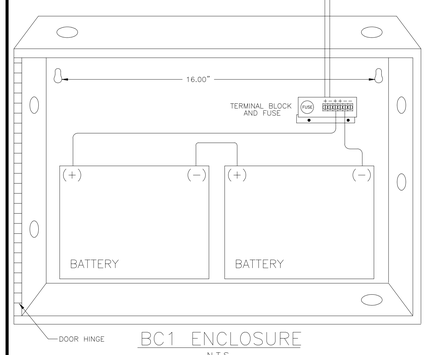
## 24VDC POWER CIRCUIT SCHEDULE

| REFERENCE | DESCRIPTION |
|---|---|
| #1 | 24VDC SPARE |
| #2 | 24VDC SPARE |
| #3 | 24VDC SPARE |
| #4 | 24VDC SPARE |

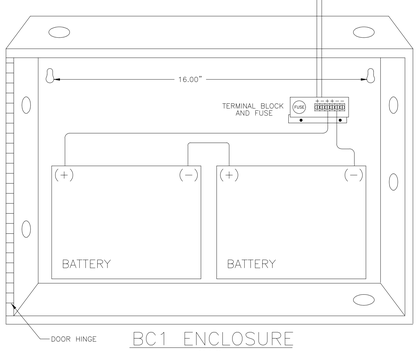
**25% SPARE CAPACITY LIST:**

| DEVICE | TOTAL WATTS | 25% SPARE | TOTAL WATTS TO USE BEFORE SPARE |
|---|---|---|---|
| AMP | 40W | 10W | 30W |
| AMP | 95W | 23.75W | 71.25W |

BATTERY AREA
DO NOT INSTALL CONDUIT
FAMSP
FAMSP2 BACKBOX MOUNTING DETAIL (E.S.T. EST4)
N.T.S.




BC1 ENCLOSURE
N.T.S.




BC1 ENCLOSURE
N.T.S.

## QTS-DEN1-DC2 95W #1 Amplifer Speaker Circuit dB Loss Calculations- (FAMSP2)

Constant Voltage 70.7 (Enter 25 or 70.7)

| Speaker Ckt # | Description | Speakers tapped at .25W | Speakers tapped at .5W | Speakers tapped at 1W | Speakers tapped at 2W | Length (Feet) | Circuit Device Draw (Watts) | Wire Gauge | Tot Wire Resist (Ohms) | Tot dB Loss (-3 dB max) | Wire Resistance in amps | Circuit Load in amps |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| A18 | Speaker CKT 2nd Level | 0 | 11 | 0 | 0 | 458 | 5.50 | 14 | 3.07 | -0.01 | 1.406 | 0.078 |
| A19 | Speaker CKT 2nd Level | 0 | 14 | 0 | 0 | 615 | 7.00 | 14 | 3.07 | -0.02 | 1.888 | 0.099 |
| | TOTALS | | 25 | | | | 12.5000 | WATTS | | | 2 conductor one-way | |

## QTS-DEN1-DC2 95W #2 Amplifer Speaker Circuit dB Loss Calculations- (FAMSP2)

Constant Voltage 70.7 (Enter 25 or 70.7)

| Speaker Ckt # | Description | Speakers tapped at .25W | Speakers tapped at .5W | Speakers tapped at 1W | Speakers tapped at 2W | Length (Feet) | Circuit Device Draw (Watts) | Wire Gauge | Tot Wire Resist (Ohms) | Tot dB Loss (-3 dB max) | Wire Resistance in amps | Circuit Load in amps |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| A20 | Speaker CKT 2nd Level | 0 | 15 | 0 | 0 | 1015 | 7.50 | 14 | 3.07 | -0.04 | 3.116 | 0.106 |
| A21 | Speaker CKT 2nd Level-SPARE | 0 | 0 | 0 | 0 | 845 | 0.00 | 14 | 3.07 | #DIV/0! | 2.594 | 0.000 |
| A22 | Speaker CKT 2nd Level | 0 | 14 | 0 | 0 | 956 | 7.00 | 14 | 3.07 | -0.04 | 2.935 | 0.099 |
| | TOTALS | | 29 | | | | 14.5000 | WATTS | | | 2 conductor one-way | |

## BATTERY CALCULATIONS

FOR

**PROJECT:** QTS-DEN1-DC2
**Panel Number:** FAMSP2

**DESIGN PARAMETERS:** Standby Hours - 24; Alarm Minutes - 15

| Qty | Description | STANDBY CURRENT EACH | | STANDBY CURRENT TOTAL | Qty | ALARM CURRENT EACH | | ALARM CURRENT TOTAL | |
|---|---|---|---|---|---|---|---|---|---|
| | **CONTROL PANEL** | | | | | | | | |
| 1 | 4-PPS/M - Primary Power Supply | x | 0.045 = | 0.045 | 1 x | 0.045 = | | 0.045 | |
| 1 | 4-LCDLE -Liquid Crystal Display Module | x | 0.05 = | 0.05 | 1 x | 0.11 = | | 0.11 | |
| 1 | 4-NET-TP - Network Communication Card | x | 0.032 = | 0.032 | 1 x | 0.032 = | | 0.032 | |
| 1 | 4-CPU-Central Processor Module | x | 0.23 = | 0.23 | 1 x | 0.23 = | | 0.23 | |
| 1 | 3-SDDC2- Dual (SIGA) Driver Controller | x | 0.264 = | 0.264 | 1 x | 0.336 = | | 0.336 | |
| 1 | 4-PPS/M - Booster Power Supply | x | 0.045 = | 0.045 | 1 x | 0.045 = | | 0.045 | |
| 2 | 3-ZA95 - 95 Watt Zoned Amplifier, Class B/A | x | 0.085 = | 0.17 | 2 x | 5.54 = | | 11.08 | |
| | | | | | | Sub-Total | a | 11.878 | |
| | **INITIATING DEVICES** | | | | | | | | |
| 25 | SIGA Series Detectors (any type Base) | x | 0.000045 = | 0.001125 | 25 x | 0.000045 = | | 0.001125 | |
| 1 | SIGA-IM | x | 0.000045 = | 0.000045 | 1 x | 0.000045 = | | 0.000045 | |
| 4 | SIGA-278 | x | 0.000396 = | 0.001584 | 4 x | 0.00068 = | | 0.00272 | |
| 1 | SIGA-CT1 | x | 0.00025 = | 0.00025 | 1 x | 0.0004 = | | 0.0004 | |
| 26 | SIGA-CT2/MCT2 | x | 0.000396 = | 0.010296 | 26 x | 0.00068 = | | 0.01768 | |
| 16 | SD-TRK | x | 0 | 0 | 16 x | 0.002 = | | 0.032 | |
| 1 | SIGA-RM1 | x | 0.00025 = | 0.00025 | 1 x | 0.0004 = | | 0.0004 | |
| | | | | | | Sub-Total | b | 0.00389 | |
| | **OUTPUT DEVICES** | | | | | | | | |
| 24 | SIGA-CR/MCR | x | 0.0001 = | 0.0024 | 24 x | 0.0001 = | | 0.0024 | |
| | | | | | | Sub-Total | c | 0.0024 | |
| | **Misc. Devices** | | | | | | | | |
| 1 | Modulaser Standard Display Module | x | 0.266 = | 0.266 | 1 x | 0.266 = | | 0.266 | |
| 1 | Modulaser Detector Module | x | 0.387 = | 0.387 | 1 x | 0.387 = | | 0.387 | |
| | | | | | | Sub-Total | e | 0.653 | |
| | Total Standby Current | | | 1.50 | | | | | |
| | Standby Hours | | x | 24.00 | | | | | |
| | Standby AH Required | | | 36.12 | | | | | |
| | Total Panel Component Alarm Current | | | | | | a | 11.878 | |
| | Total for 10% of Initiating Devices | [Subtotal b ( | 0.00389 | x.10] | | | b | 0.005437 | |
| | Total Output Device Alarm Current | | | | | | c | 0.0024 | |
| | Total Miscellaneous Device Alarm Current | | | | | | e | 0.653 | |
| | Total Alarm Current | | | | | | | 12.538837 | |
| | | Alarm Hours( | | 15 min. ÷ 60 min.) | | | x | 0.25 | |
| | Alarm AH Required | | | 3.13 <——— | | | | 3.13 | |
| | Standby AH Required | | + | 36.12 | | | | | |
| | Total Current Needs | | = | 39.25 | | | | | |
| | Derate by 25% | | x | 1.25 | | | | | |
| | Battery Size Required | | = | 49.07 Amp Hours | | | | | |

Summit Fire. will Furnish Four **30** Ampere Hour Batteries @ Panel FAMSP2

PROVIDE (4) 12V WHICH IS A TOTAL OF (60AH) BATTERIES



SUMMIT FIRE PROTECTION
10200 E. Easter Avenue
Centennial, Colorado 80112
Phone: (303) 790-2520
Fax: (303) 790-2528

THESE DRAWINGS ARE SCHEMATIC AND DO NOT ATTEMPT TO SHOW SHOW CONDUIT ROUTING.

ARCHITECT:

GENERAL CONTRACTOR:

ENGINEER:

INSTALLER:

PROJECT: QTS DATA CENTER QTS DENI DC2
PROJECT DESCRIPTION: FIRE ALARM & DETECTION SYSTEM
PROJECT LOCATION: 1140 N. GUN CLUB ROAD AURORA, COLORADO 80018

MERIDIAN PROJECT
JOB#: 2025-24

NICET CERTIFIED
TRAVIS COOK- NICET#113375
COMMENTS AND STAMP

THESE DRAWINGS ARE SCHEMATIC AND DO NOT ATTEMPT TO SHOW SHOW CONDUIT ROUTING.

KEY PLAN
N.T.S.
I J H G F E C A D B

| REVISION | DATE |
|---|---|
| SUBMITTAL | 07/07/25 |
| REVISIONS | 09/22/25 |
| DATA HALL BUILDOUT | 12/13/25 |
| COMMENTS | 02/25/26 |
| COMMENTS (REV 1) | 04/2/26 |
| COMMENTS (REV 2) | 06/3/26 |
| RFI#696 (REV 3) | 07/24/26 |

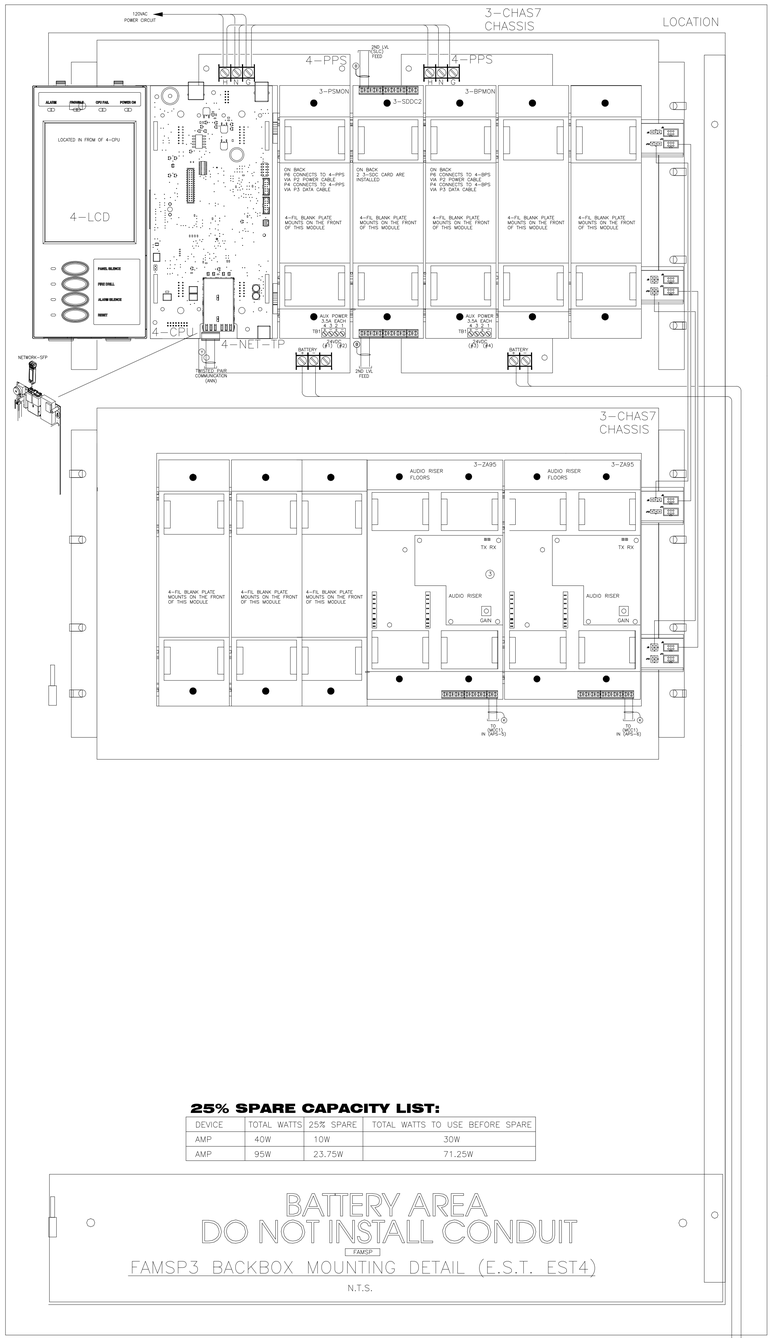
CAD FILE: FIRE ALARM PANEL
DRAWN BY: B. ALLEN
DATE: 5/24/25
ENG. APPROVAL:
DATE:
REVIEW BY:
SCALE: N.T.S.

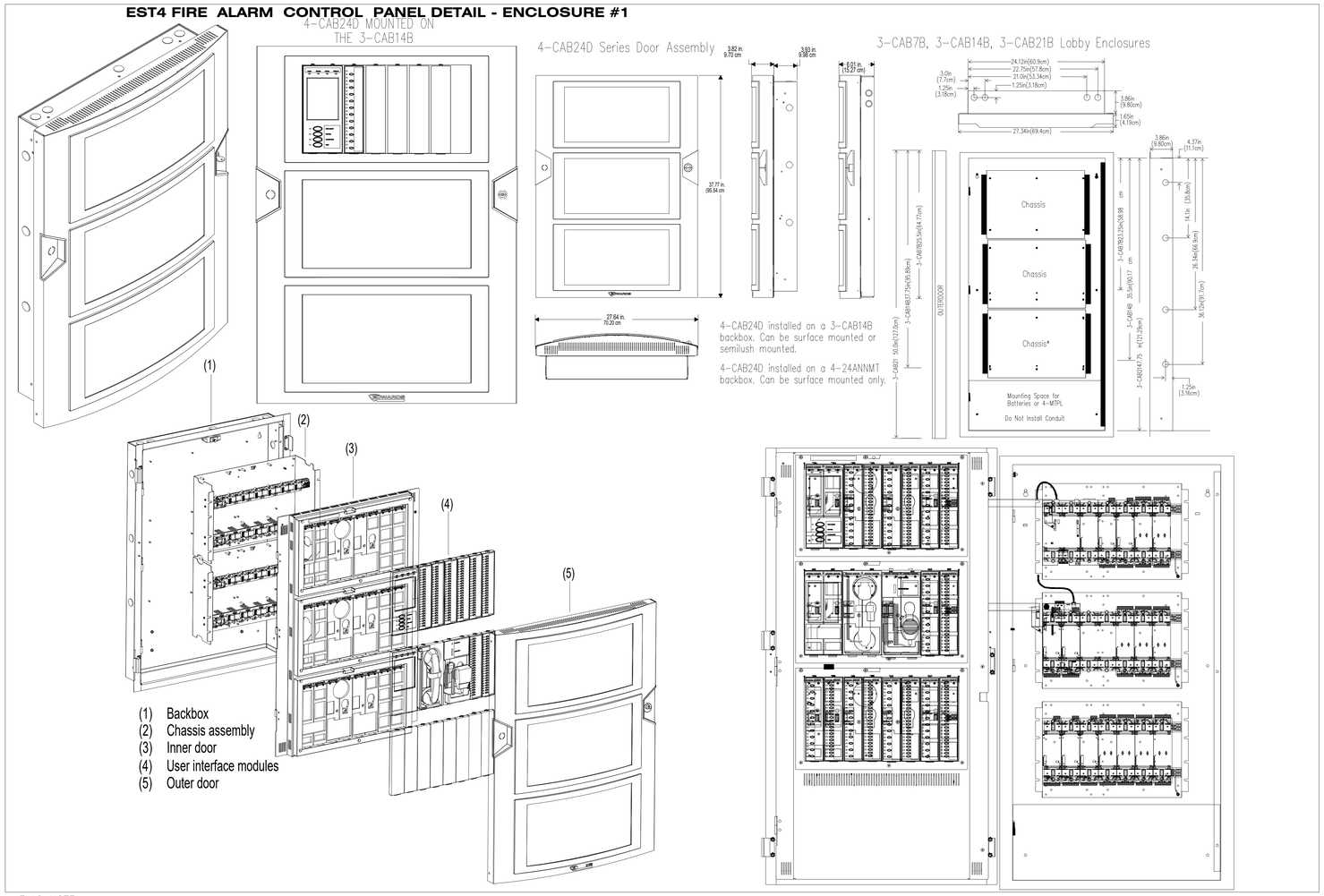
FIRE ALARM SYSTEM EST-4

FIRE ALARM CONTROL PANEL (FAMSP2) LAYOUT/CALC'S

SHEET
FP03

# EST4 FIRE ALARM CONTROL PANEL DETAIL - ENCLOSURE #1







(1) Backbox
(2) Chassis assembly
(3) Inner door
(4) User interface modules
(5) Outer door



FLAG NOTE
125 SIGNATURE SERIES DETECTORS AND 125 SIGNATURE SERIES MODULES PER CIRCUIT "T-TAPS" ARE PERMITTED

## FAMSP#3 CIRCUIT SCHEDULE

| REFERENCE | DESCRIPTION | QUANTITY OF ADDRESSES/DEVICES | DEVICE SPARES | DEVICE MAXIMUM | ESTIMATED DISTANCE | |
|---|---|---|---|---|---|---|
| SLC-#5 | SIGNAL LOOP CIRCUIT - DETECTORS-1ST LEVEL | 024 | 101 | (125MAX) | 1013'FT | |
| SLC-#5 | SIGNAL LOOP CIRCUIT - MODULES- 1ST LEVEL | 046 | 079 | (125MAX) | 1013'FT | |
| SLC-#6 | SIGNAL LOOP CIRCUIT - DETECTORS-1ST LEVEL | 001 | 124 | (125MAX) | 925'FT | |
| SLC-#6 | SIGNAL LOOP CIRCUIT - MODULES- 1ST LEVEL | 007 | 118 | (125MAX) | 925'FT | |

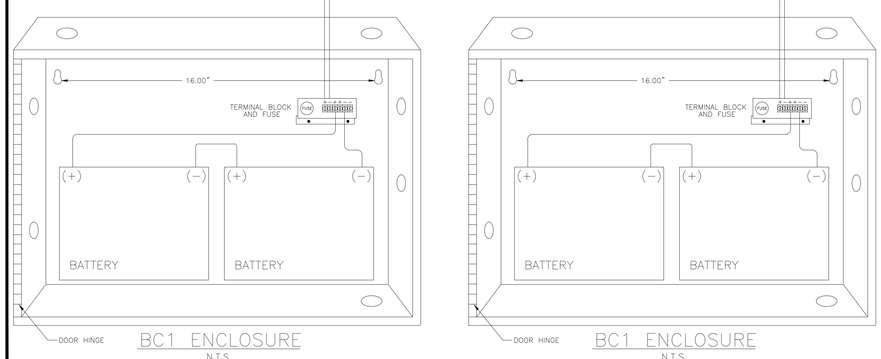
## 24VDC POWER CIRCUIT SCHEDULE

| REFERENCE | DESCRIPTION |
|---|---|
| #1 | 24VDC SPARE |
| #2 | 24VDC SPARE |
| #3 | 24VDC SPARE |
| #4 | 24VDC SPARE |

**25% SPARE CAPACITY LIST:**

| DEVICE | TOTAL WATTS | 25% SPARE | TOTAL WATTS TO USE BEFORE SPARE |
|---|---|---|---|
| AMP | 40W | 10W | 30W |
| AMP | 95W | 23.75W | 71.25W |

BATTERY AREA
DO NOT INSTALL CONDUIT
FAMSP
FAMSP3 BACKBOX MOUNTING DETAIL (E.S.T. EST4)
N.T.S.




## QTS-DEN1-DC2 95W #1 Amplifer Speaker Circuit dB Loss Calculations- (FAMSP3)

Constant Voltage 70.7 (Enter 25 or 70.7)

| Speaker Ckt # | Description | Speakers tapped at .25W | Speakers tapped at .5W | Speakers tapped at 1W | Speakers tapped at 2W | Length (Feet) | Circuit Device Draw (Watts) | Wire Gauge | Tot Wire Resist (Ohms) | Tot dB Loss (-3 dB max) | Wire Resistance in amps | Circuit Load in amps |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| A7 | Speaker CKT 1st Level | 0 | 13 | 0 | 0 | 458 | 6.50 | 14 | 3.07 | -0.02 | 1.406 | 0.092 |
| A8 | Speaker CKT 1st Level | 0 | 9 | 0 | 0 | 412 | 4.50 | 14 | 3.07 | -0.01 | 1.265 | 0.064 |
| | TOTALS | | 22 | | | | 11.0000 | WATTS | | | 2 conductor one-way | |

## QTS-DEN1-DC2 95W #2 Amplifer Speaker Circuit dB Loss Calculations- (FAMSP3)

Constant Voltage 70.7 (Enter 25 or 70.7)

| Speaker Ckt # | Description | Speakers tapped at .25W | Speakers tapped at .5W | Speakers tapped at 1W | Speakers tapped at 2W | Length (Feet) | Circuit Device Draw (Watts) | Wire Gauge | Tot Wire Resist (Ohms) | Tot dB Loss (-3 dB max) | Wire Resistance in amps | Circuit Load in amps |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| A9 | Speaker CKT 1st Level | 0 | 14 | 0 | 0 | 986 | 7.00 | 14 | 3.07 | -0.04 | 3.027 | 0.099 |
| A10 | Speaker CKT 1st Level-SPARE | 0 | 0 | 0 | 0 | 842 | 0.00 | 14 | 3.07 | #DIV/0! | 2.585 | 0.000 |
| A11 | Speaker CKT 1st Level | 0 | 15 | 0 | 0 | 985 | 7.50 | 14 | 3.07 | -0.04 | 3.024 | 0.106 |
| | TOTALS | | 29 | | | | 14.5000 | WATTS | | | 2 conductor one-way | |

## BATTERY CALCULATIONS

FOR

PROJECT: QTS-DEN1-DC2
Panel Number: FAMSP3

DESIGN PARAMETERS: Standby Hours - 24; Alarm Minutes - 15

| Qty | Description | STANDBY CURRENT EACH | | STANDBY CURRENT TOTAL | Qty | ALARM CURRENT EACH | | ALARM CURRENT TOTAL |
|---|---|---|---|---|---|---|---|---|
| | **CONTROL PANEL** | | | | | | | |
| 1 | 4-PPS/M - Primary Power Supply | x | 0.045 = | 0.045 | 1 | x | 0.045 = | 0.045 |
| 1 | 4-LCDLE -Liquid Crystal Display Module | x | 0.05 = | 0.05 | 1 | x | 0.11 = | 0.11 |
| 1 | 4-NET-TP - Network Communication Card | x | 0.032 = | 0.032 | 1 | x | 0.032 = | 0.032 |
| 1 | 4-CPU-Central Processor Module | x | 0.23 = | 0.23 | 1 | x | 0.23 = | 0.23 |
| 1 | 3-SDDC2- Dual (SIGA) Driver Controller | x | 0.264 = | 0.264 | 1 | x | 0.336 = | 0.336 |
| 1 | 4-PPS/M - Booster Power Supply | x | 0.045 = | 0.045 | 1 | x | 0.045 = | 0.045 |
| 2 | 3-ZA95 - 95 Watt Zoned Amplifier, Class B/A | x | 0.085 = | 0.17 | 2 | x | 5.54 = | 11.08 |
| | | | | | | | Sub-Total a | 11.878 |
| | **INITIATING DEVICES** | | | | | | | |
| 26 | SIGA Series Detectors (any type Base) | x | 0.000045 = | 0.00117 | 26 | x | 0.000045 = | 0.00117 |
| 2 | SIGA-IM | x | 0.000045 = | 0.00009 | 2 | x | 0.000045 = | 0.00009 |
| 4 | SIGA-278 | x | 0.000396 = | 0.001584 | 4 | x | 0.00068 = | 0.00272 |
| 20 | SIGA-CT1 | x | 0.00025 = | 0.005 | 20 | x | 0.0004 = | 0.008 |
| 54 | SIGA-CT2/MCT2 | x | 0.000396 = | 0.021384 | 54 | x | 0.00068 = | 0.03672 |
| 5 | SD-TRK | x | 0 | 0 | 5 | x | 0.002 = | 0.01 |
| 1 | SIGA-RM1 | x | 0.00025 = | 0.00025 | 1 | x | 0.0004 = | 0.0004 |
| | | | | | | | Sub-Total b | 0.00398 |
| | **OUTPUT DEVICES** | | | | | | | |
| 16 | SIGA-CR/MCR | x | 0.0001 = | 0.0016 | 16 | x | 0.0001 = | 0.0016 |
| | | | | | | | Sub-Total c | 0.0016 |
| | **Misc. Devices** | | | | | | | |
| 1 | Modulaser Standard Display Module | x | 0.266 = | 0.266 | 1 | x | 0.266 = | 0.266 |
| 1 | Modulaser Detector Module | x | 0.387 = | 0.387 | 1 | x | 0.387 = | 0.387 |
| | | | | | | | Sub-Total e | 0.653 |
| | Total Standby Current | | | 1.52 | | | | |
| | Standby Hours | | x | 24.00 | | | | |
| | Standby AH Required | | | 36.48 | | | | |
| | Total Panel Component Alarm Current | | | | | | a | 11.878 |
| | Total for 10% of Initiating Devices | [Subtotal b ( | 0.00398 | x.10] | | | b | 0.00591 |
| | Total Output Device Alarm Current | | | | | | c | 0.0016 |
| | Total Miscellaneous Device Alarm Current | | | | | | e | 0.653 |
| | Total Alarm Current | | | | | | | 12.53851 |
| | | Alarm Hours( | | 15 min. ÷ 60 min.) | | | x | 0.25 |
| | Alarm AH Required | | | 3.13 <---------- | | | | 3.13 |
| | Standby AH Required | | + | 36.48 | | | | |
| | Total Current Needs | | = | 39.62 | | | | |
| | Derate by 25% | | x | 1.25 | | | | |
| | Battery Size Required | | = | 49.52 Amp Hours | | | | |

Summit Fire will Furnish Four **30** Ampere Hour Batteries @ Panel FAMSP3

PROVIDE (4) 12V WHICH IS A TOTAL OF (60AH) BATTERIES



SUMMIT FIRE PROTECTION
10200 E. Easter Avenue
Centennial, Colorado 80112
Phone: (303) 790-2520
Fax: (303) 790-2528

THESE DRAWINGS ARE SCHEMATIC AND DO NOT ATTEMPT TO SHOW SHOW CONDUIT ROUTING.

ARCHITECT:

GENERAL CONTRACTOR:

ENGINEER:

INSTALLER:

| | |
|---|---|
| PROJECT | QTS DATA CENTER QTS DENI DC2 |
| PROJECT DESCRIPTION | FIRE ALARM & DETECTION SYSTEM |
| PROJECT LOCATION | 1140 N. GUN CLUB ROAD AURORA, COLORADO 80018 |

MERIDIAN PROJECT
JOB#: 2025-24

NICET CERTIFIED
TRAVIS COOK- NICET#113375
COMMENTS AND STAMP

THESE DRAWINGS ARE SCHEMATIC AND DO NOT ATTEMPT TO SHOW SHOW CONDUIT ROUTING.

KEY PLAN
N.T.S.
I J H G F E C A D B

| REVISION | DATE |
|---|---|
| SUBMITTAL | 07/07/25 |
| REVISIONS | 09/22/25 |
| DATA HALL BUILDOUT | 12/13/25 |
| COMMENTS | 02/25/26 |
| COMMENTS (REV. A) | 04/2/26 |
| COMMENTS (REV. B) | 06/3/26 |
| RFI#696 (REV. C) | 07/24/26 |

CAD FILE: FIRE ALARM PANEL
DRAWN BY: B. ALLEN
DATE: 5/24/25
ENG. APPROVAL:
DATE:
REVIEW BY:
SCALE: N.T.S.

FIRE ALARM SYSTEM EST-4

FIRE ALARM CONTROL PANEL (FAMSP3) LAYOUT/CALC'S

SHEET
FP04

# BATTERY CALCULATIONS

FOR

**PROJECT:** QTS DEN1 DC2
**Panel Number:** APS-14

**DESIGN PARAMETERS:** **Standby Hours -** 24 **Alarm Minutes -** 15

| Qty | Description | STANDBY CURRENT EACH | | STANDBY CURRENT TOTAL | Qty | ALARM CURRENT EACH | | ALARM CURRENT TOTAL |
|---|---|---|---|---|---|---|---|---|
| | **CONTROL PANEL** | | | | | | | |
| 1 | APS6/10 BOOSTER POWER SUPPLY | x 0.07 | = | 0.07 | 1 | x 0.19 | = | 0.19 |
| | | | | | | | **Sub-Total a** | 0.19 |
| | **Misc. Devices** | | | | | | | |
| 2 | Modulaser (Standard Display Unit) | x 0.266 | = | 0.532 | 2 | x 0.266 | = | 0.532 |
| 2 | Modulaser Detector Module | x 0.387 | = | 0.774 | 2 | x 0.387 | = | 0.774 |
| | | | | | | | **Sub-Total e** | 1.306 |
| | Total Standby Current | | | 1.38 | | | | |
| | Standby Hours | | x | 24.00 | | | | |
| | Standby AH Required | | | 33.02 | | | | |
| | Total Panel Component Alarm Current | | | | | | **a** | 0.19 |
| | Total Miscellaneous Device Alarm Current | | | | | | **e** | 1.306 |
| | Total Alarm Current | | | | | | | 1.496 |
| | | Alarm Hours( 15 min. ÷ 60 min.) | | | | | x | 0.25 |
| | Alarm AH Required | | | 0.37 <---------- | | | | 0.37 |
| | Standby AH Required | | + | 33.02 | | | | |
| | Total Current Needs | | = | 33.40 | | | | |
| | Derate by 20% | | x | 1.25 | | | | |
| | Battery Size Required | | = | 41.75 Amp Hours | | | | |

Summit Fire. will Furnish Two **50** Ampere Hour Batteries @ Panel APS-14

# BATTERY CALCULATIONS

FOR

**PROJECT:** QTS DEN1 DC2
**Panel Number:** APS-15

**DESIGN PARAMETERS:** **Standby Hours -** 24 **Alarm Minutes -** 15

| Qty | Description | STANDBY CURRENT EACH | | STANDBY CURRENT TOTAL | Qty | ALARM CURRENT EACH | | ALARM CURRENT TOTAL |
|---|---|---|---|---|---|---|---|---|
| | **CONTROL PANEL** | | | | | | | |
| 1 | APS6/10 BOOSTER POWER SUPPLY | x 0.07 | = | 0.07 | 1 | x 0.19 | = | 0.19 |
| | | | | | | | **Sub-Total a** | 0.19 |
| | **Misc. Devices** | | | | | | | |
| 1 | Modulaser (Standard Display Unit) | x 0.266 | = | 0.266 | 1 | x 0.266 | = | 0.266 |
| 1 | Modulaser Detector Module | x 0.387 | = | 0.387 | 1 | x 0.387 | = | 0.387 |
| | | | | | | | **Sub-Total e** | 0.653 |
| | Total Standby Current | | | 0.72 | | | | |
| | Standby Hours | | x | 24.00 | | | | |
| | Standby AH Required | | | 17.35 | | | | |
| | Total Panel Component Alarm Current | | | | | | **a** | 0.19 |
| | Total Miscellaneous Device Alarm Current | | | | | | **e** | 0.653 |
| | Total Alarm Current | | | | | | | 0.843 |
| | | Alarm Hours( 15 min. ÷ 60 min.) | | | | | x | 0.25 |
| | Alarm AH Required | | | 0.21 <---------- | | | | 0.21 |
| | Standby AH Required | | + | 17.35 | | | | |
| | Total Current Needs | | = | 17.56 | | | | |
| | Derate by 20% | | x | 1.25 | | | | |
| | Battery Size Required | | = | 21.95 Amp Hours | | | | |

Summit Fire. will Furnish Two **26** Ampere Hour Batteries @ Panel APS-15

# BATTERY CALCULATIONS

FOR

**PROJECT:** QTS DEN1 DC2
**Panel Number:** APS-16

**DESIGN PARAMETERS:** **Standby Hours -** 24 **Alarm Minutes -** 15

| Qty | Description | STANDBY CURRENT EACH | | STANDBY CURRENT TOTAL | Qty | ALARM CURRENT EACH | | ALARM CURRENT TOTAL |
|---|---|---|---|---|---|---|---|---|
| | **CONTROL PANEL** | | | | | | | |
| 1 | APS6/10 BOOSTER POWER SUPPLY | x 0.07 | = | 0.07 | 1 | x 0.19 | = | 0.19 |
| | | | | | | | **Sub-Total a** | 0.19 |
| | **Misc. Devices** | | | | | | | |
| 2 | Modulaser (Standard Display Unit) | x 0.266 | = | 0.532 | 2 | x 0.266 | = | 0.532 |
| 2 | Modulaser Detector Module | x 0.387 | = | 0.774 | 2 | x 0.387 | = | 0.774 |
| | | | | | | | **Sub-Total e** | 1.306 |
| | Total Standby Current | | | 1.38 | | | | |
| | Standby Hours | | x | 24.00 | | | | |
| | Standby AH Required | | | 33.02 | | | | |
| | Total Panel Component Alarm Current | | | | | | **a** | 0.19 |
| | Total Miscellaneous Device Alarm Current | | | | | | **e** | 1.306 |
| | Total Alarm Current | | | | | | | 1.496 |
| | | Alarm Hours( 15 min. ÷ 60 min.) | | | | | x | 0.25 |
| | Alarm AH Required | | | 0.37 <---------- | | | | 0.37 |
| | Standby AH Required | | + | 33.02 | | | | |
| | Total Current Needs | | = | 33.40 | | | | |
| | Derate by 20% | | x | 1.25 | | | | |
| | Battery Size Required | | = | 41.75 Amp Hours | | | | |

Summit Fire. will Furnish Two **50** Ampere Hour Batteries @ Panel APS-16

# BATTERY CALCULATIONS

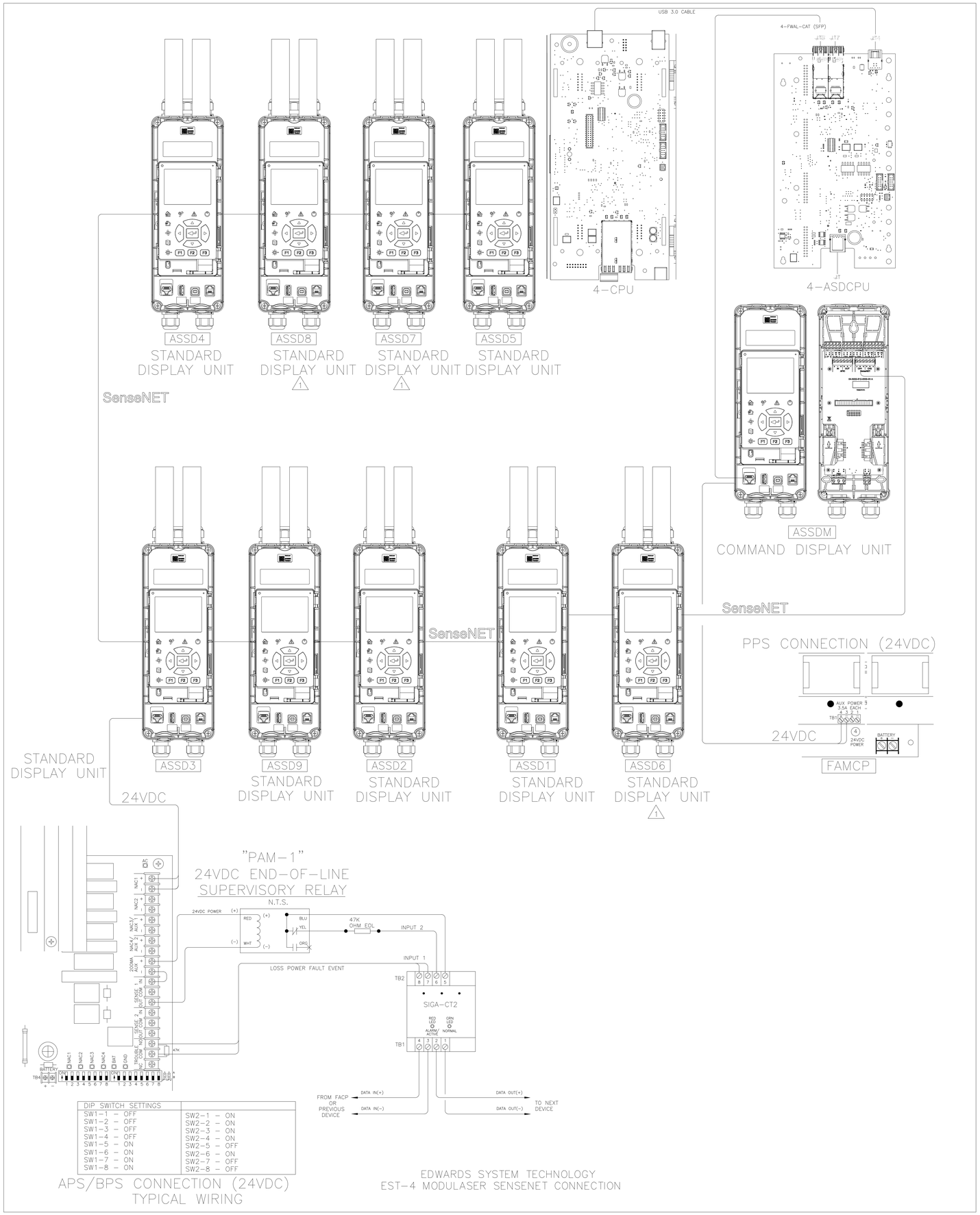
FOR

**PROJECT:** QTS DEN1 DC2
**Panel Number:** APS-17

**DESIGN PARAMETERS:** **Standby Hours -** 24 **Alarm Minutes -** 15

| Qty | Description | STANDBY CURRENT EACH | | STANDBY CURRENT TOTAL | Qty | ALARM CURRENT EACH | | ALARM CURRENT TOTAL |
|---|---|---|---|---|---|---|---|---|
| | **CONTROL PANEL** | | | | | | | |
| 1 | APS6/10 BOOSTER POWER SUPPLY | x 0.07 | = | 0.07 | 1 | x 0.19 | = | 0.19 |
| | | | | | | | **Sub-Total a** | 0.19 |
| | **Misc. Devices** | | | | | | | |
| 1 | Modulaser (Standard Display Unit) | x 0.266 | = | 0.266 | 1 | x 0.266 | = | 0.266 |
| 1 | Modulaser Detector Module | x 0.387 | = | 0.387 | 1 | x 0.387 | = | 0.387 |
| | | | | | | | **Sub-Total e** | 0.653 |
| | Total Standby Current | | | 0.72 | | | | |
| | Standby Hours | | x | 24.00 | | | | |
| | Standby AH Required | | | 17.35 | | | | |
| | Total Panel Component Alarm Current | | | | | | **a** | 0.19 |
| | Total Miscellaneous Device Alarm Current | | | | | | **e** | 0.653 |
| | Total Alarm Current | | | | | | | 0.843 |
| | | Alarm Hours( 15 min. ÷ 60 min.) | | | | | x | 0.25 |
| | Alarm AH Required | | | 0.21 <---------- | | | | 0.21 |
| | Standby AH Required | | + | 17.35 | | | | |
| | Total Current Needs | | = | 17.56 | | | | |
| | Derate by 20% | | x | 1.25 | | | | |
| | Battery Size Required | | = | 21.95 Amp Hours | | | | |

Summit Fire. will Furnish Two **26** Ampere Hour Batteries @ Panel APS-17




SUMMIT FIRE PROTECTION
10200 E. Easter Avenue
Centennial, Colorado 80112
Phone: (303) 790-2520
Fax: (303) 790-2528

THESE DRAWINGS ARE SCHEMATIC AND DO NOT ATTEMPT TO SHOW SHOW CONDUIT ROUTING.

ARCHITECT:

GENERAL CONTRACTOR:

ENGINEER:

INSTALLER:

QTS DATA CENTER
QTS DENI DC2

FIRE ALARM & DETECTION SYSTEM

1140 N. GUN CLUB ROAD
AURORA, COLORADO 80018

PROJECT

PROJECT DESCRIPTION

PROJECT LOCATION

MERIDIAN PROJECT

JOB#: 2025-24

NICET CERTIFIED

TRAVIS COOK- NICET#113373

COMMENTS AND STAMP

THESE DRAWINGS ARE SCHEMATIC AND DO NOT ATTEMPT TO SHOW SHOW CONDUIT ROUTING.

KEY PLAN
N.T.S.

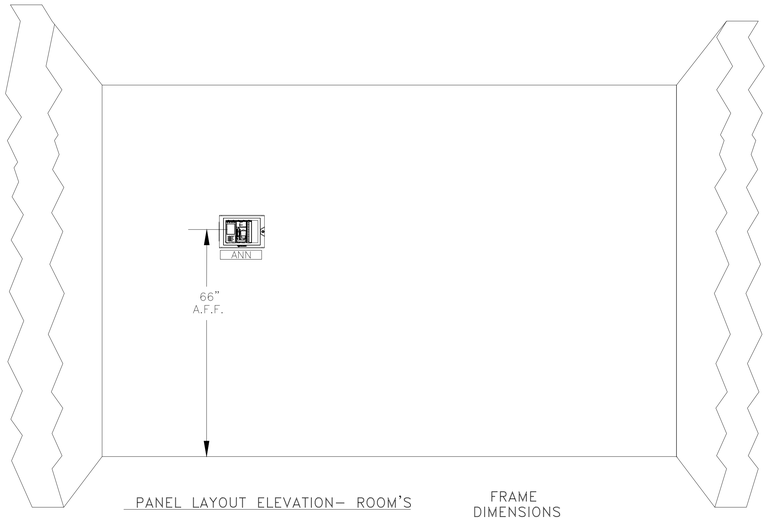
| REVISION | DATE |
|---|---|
| SUBMITTAL | 07/07/25 |
| REVISIONS | 09/22/25 |
| DATA HALL BUILDOUT | 12/13/25 |
| COMMENTS | 02/25/26 |
| COMMENTS (REV 1) | 04/2/26 |
| COMMENTS (REV 2) | 06/3/26 |
| RFI#696 (REV 3) | 07/24/26 |

CAD FILE: TYPICALS
DRAWN BY: B.ALLEN
DATE: 7/04/25
ENG. APPROVAL:
DATE:
REVIEW BY:
SCALE: N.T.S.

FIRE ALARM SYSTEM
EST-4

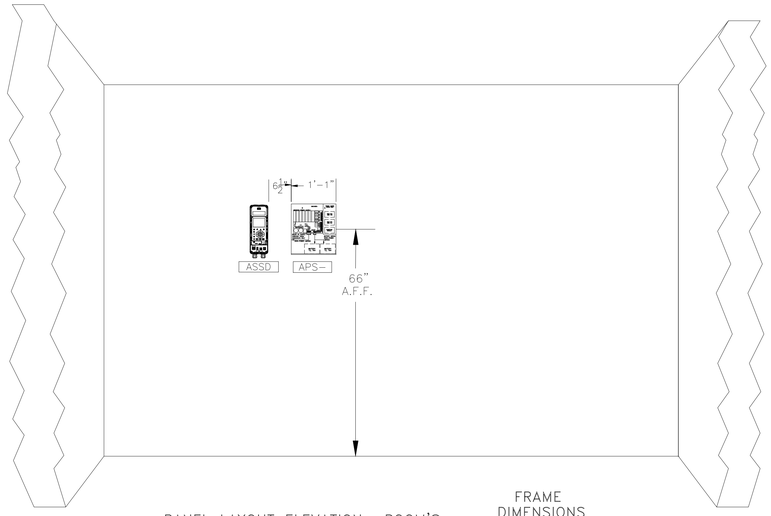
FIRE ALARM MODULASER LAYOUT AND WIRING TYPICALS DIAGRAM

SHEET
FP05



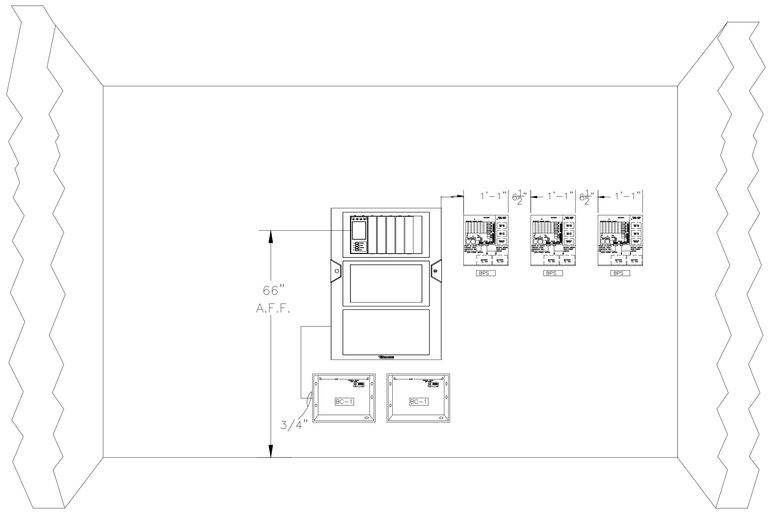

PANEL LAYOUT ELEVATION– ROOM'S

FRAME DIMENSIONS
0' 1' 2' 3'
Scale In Feet

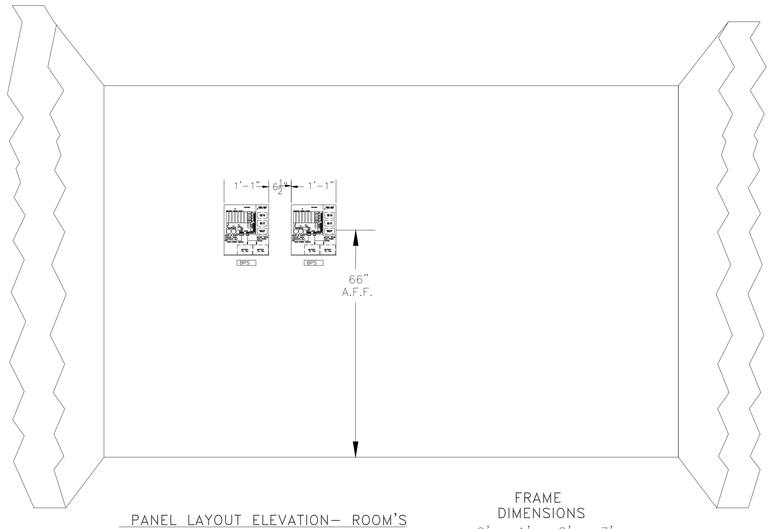



PANEL LAYOUT ELEVATION– ROOM'S

FRAME DIMENSIONS
0' 1' 2' 3'
Scale In Feet

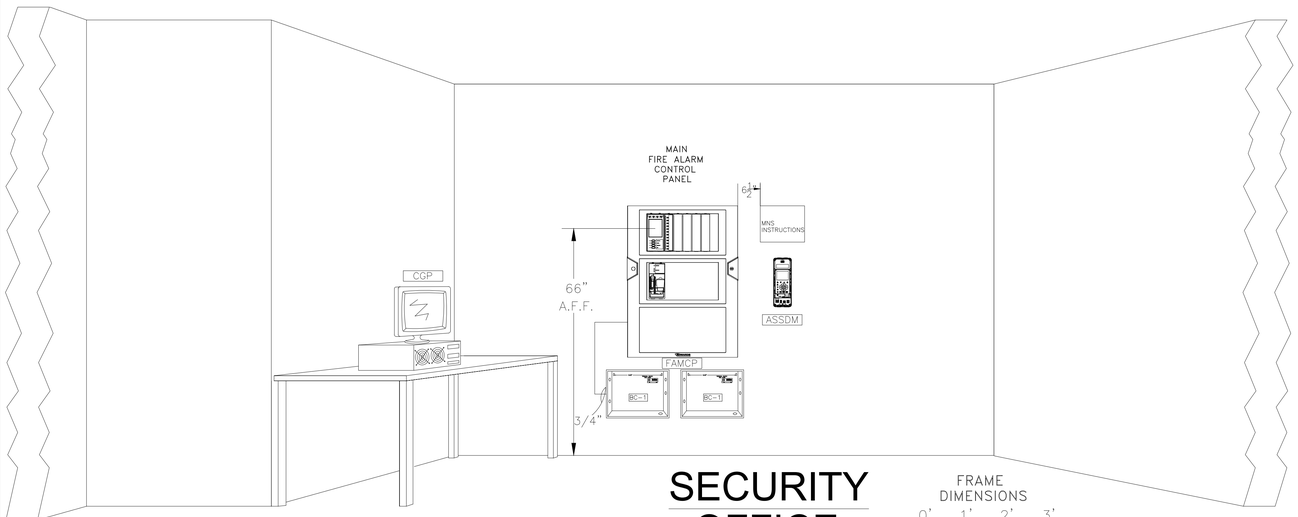



PANEL LAYOUT ELEVATION



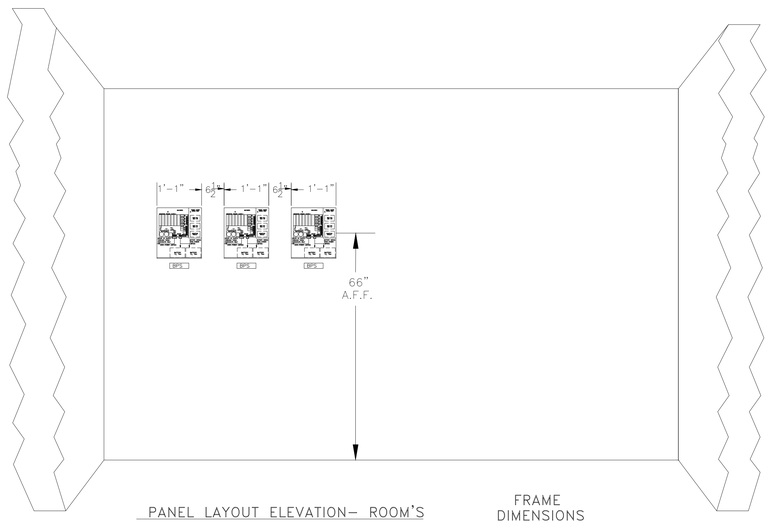

PANEL LAYOUT ELEVATION– ROOM'S

FRAME DIMENSIONS
0' 1' 2' 3'
Scale In Feet




SECURITY OFFICE 0134

FRAME DIMENSIONS
0' 1' 2' 3'
Scale In Feet




PANEL LAYOUT ELEVATION– ROOM'S

FRAME DIMENSIONS
0' 1' 2' 3'
Scale In Feet

SUMMIT FIRE PROTECTION
10200 E. Easter Avenue
Centennial, Colorado 80112
Phone: (303) 790–2520
Fax: (303) 790–2528

THESE DRAWINGS ARE SCHEMATIC AND DO NOT ATTEMPT TO SHOW SHOW CONDUIT ROUTING.

ARCHITECT:

GENERAL CONTRACTOR:

ENGINEER:

INSTALLER:

| | |
|---|---|
| PROJECT | QTS DATA CENTER<br>QTS DENI DC2 |
| PROJECT DESCRIPTION | FIRE ALARM & DETECTION SYSTEM |
| PROJECT LOCATION | 1140 N. GUN CLUB ROAD<br>AURORA, COLORADO 80018 |

MERIDIAN PROJECT

JOB#: 2025–24

NICET CERTIFIED

TRAVIS COOK- NICET#113375

COMMENTS AND STAMP

THESE DRAWINGS ARE SCHEMATIC AND DO NOT ATTEMPT TO SHOW SHOW CONDUIT ROUTING.

KEY PLAN
N.T.S.

| REVISION | DATE |
|---|---|
| SUBMITTAL | 07/07/25 |
| REVISIONS | 09/22/25 |
| DATA HALL BUILDOUT | 12/13/25 |
| COMMENTS | 02/25/26 |
| COMMENTS (REV 1) | 04/2/26 |
| COMMENTS (REV 2) | 06/3/26 |
| RFI#696 (REV 3) | 07/24/26 |

CAD FILE: TYPICALS

DRAWN BY: B.ALLEN

DATE: 5/23/25

ENG. APPROVAL:

DATE:

REVIEW BY:

SCALE: N.T.S.

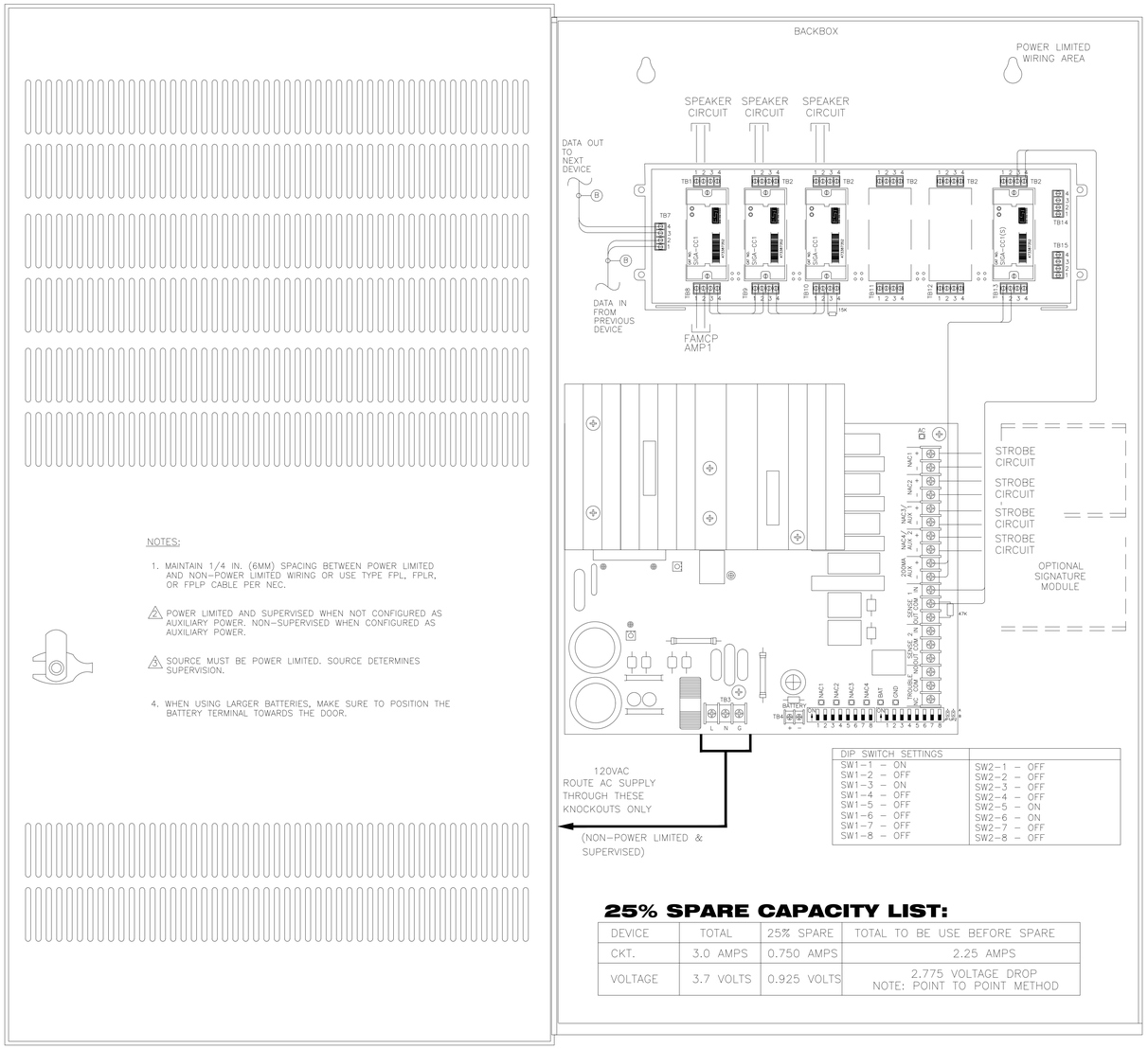
FIRE ALARM SYSTEM EST–4

FIRE ALARM TYPICAL PANEL ELEVATION LAYOUT DIAGRAM

SHEET

FP06

PERMIT #2026 2513934 CM 05 REV TO CM 02 | RSN:1991301




NOTES:

1. MAINTAIN 1/4 IN. (6MM) SPACING BETWEEN POWER LIMITED AND NON-POWER LIMITED WIRING OR USE TYPE FPL, FPLR, OR FPLP CABLE PER NEC.
2. POWER LIMITED AND SUPERVISED WHEN NOT CONFIGURED AS AUXILIARY POWER. NON-SUPERVISED WHEN CONFIGURED AS AUXILIARY POWER.
3. SOURCE MUST BE POWER LIMITED. SOURCE DETERMINES SUPERVISION.
4. WHEN USING LARGER BATTERIES, MAKE SURE TO POSITION THE BATTERY TERMINAL TOWARDS THE DOOR.

## 25% SPARE CAPACITY LIST:

| DEVICE | TOTAL | 25% SPARE | TOTAL TO BE USE BEFORE SPARE |
|---|---|---|---|
| CKT. | 3.0 AMPS | 0.750 AMPS | 2.25 AMPS |
| VOLTAGE | 3.7 VOLTS | 0.925 VOLTS | 2.775 VOLTAGE DROP NOTE: POINT TO POINT METHOD |

BACKBOX DIMENSIONS: 17"H X 13"W X 3 1/2"D

# 10 AMP AUXILIARY POWER SUPPLY

N.T.S.

City of Aurora Building Division
Reviewed for Code Compliance
Approved as Noted:shorst
Date:Aug 14, 2026
2021 INTERNATIONAL CODES & 2023 NEC

## BATTERY CALCULATIONS

FOR

**PROJECT:** QTS DEN1 DC2
**Panel Number:** APS's (if not noted)

**DESIGN PARAMETERS:** Standby Hours - 24; Alarm Minutes - 15

| Qty | Description | STANDBY CURRENT EACH | | STANDBY CURRENT TOTAL | Qty | ALARM CURRENT EACH | | ALARM CURRENT TOTAL |
|---|---|---|---|---|---|---|---|---|
| | **CONTROL PANEL** | | | | | | | |
| 1 | APS6/10 BOOSTER POWER SUPPLY | x 0.07 | = | 0.07 | 1 | x 0.19 | = | 0.19 |
| | | | | | | | **Sub-Total a** | 0.19 |
| | **INDICATING APPLIANCES** | | | | | | | |
| 4 | Fully Loaded NAC Circuits | x | = | | 4 | x 2.5 | = | 10 |
| | | | | | | | **Sub-Total d** | 10 |
| | Total Standby Current | | | 0.07 | | | | |
| | Standby Hours | | x | 24.00 | | | | |
| | Standby AH Required | | | 1.68 | | | | |
| | Total Panel Component Alarm Current | | | | | | **a** | 0.19 |
| | Total Indicating Appliance Alarm Current | | | | | | **d** | 10 |
| | Total Alarm Current | | | | | | | 10.19 |
| | | Alarm Hours( | 15 | min. ÷ 60 min.) | | | x | 0.25 |
| | Alarm AH Required | | | 2.55 <--------- | | | | 2.55 |
| | Standby AH Required | | + | 1.68 | | | | |
| | Total Current Needs | | = | 4.23 | | | | |
| | Derate by 20% | | x | 1.25 | | | | |
| | Battery Size Required | | = | 5.28 Amp Hours | | | | |

Summit Fire. will Furnish Two **7** Ampere Hour Batteries @ Panel APS's (if not noted)

## BATTERY CALCULATIONS

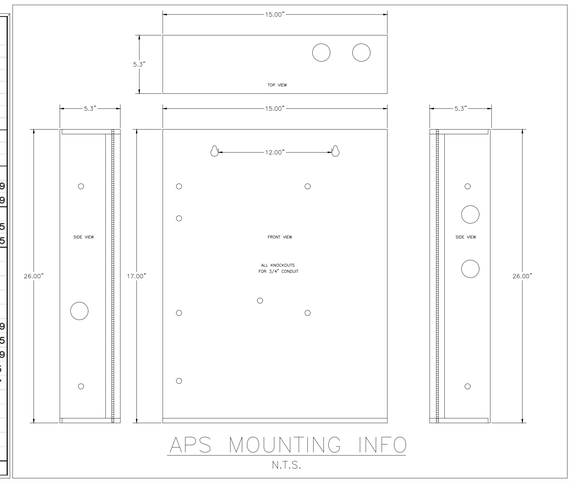
FOR

**PROJECT:** QTS DEN1 DC2
**Panel Number:** APS-10

**DESIGN PARAMETERS:** Standby Hours - 24; Alarm Minutes - 15

| Qty | Description | STANDBY CURRENT EACH | | STANDBY CURRENT TOTAL | Qty | ALARM CURRENT EACH | | ALARM CURRENT TOTAL |
|---|---|---|---|---|---|---|---|---|
| | **CONTROL PANEL** | | | | | | | |
| 1 | APS6/10 BOOSTER POWER SUPPLY | x 0.07 | = | 0.07 | 1 | x 0.19 | = | 0.19 |
| | | | | | | | **Sub-Total a** | 0.19 |
| | **INDICATING APPLIANCES** | | | | | | | |
| 1 | Fully Loaded NAC Circuits | x | = | | 1 | x 2.5 | = | 2.5 |
| | | | | | | | **Sub-Total d** | 2.5 |
| | Total Standby Current | | | 0.07 | | | | |
| | Standby Hours | | x | 24.00 | | | | |
| | Standby AH Required | | | 1.68 | | | | |
| | Total Panel Component Alarm Current | | | | | | **a** | 0.19 |
| | Total Indicating Appliance Alarm Current | | | | | | **d** | 2.5 |
| | Total Alarm Current | | | | | | | 2.69 |
| | | Alarm Hours( | 15 | min. ÷ 60 min.) | | | x | 0.25 |
| | Alarm AH Required | | | 0.67 <--------- | | | | 0.67 |
| | Standby AH Required | | + | 1.68 | | | | |
| | Total Current Needs | | = | 2.35 | | | | |
| | Derate by 20% | | x | 1.25 | | | | |
| | Battery Size Required | | = | 2.94 Amp Hours | | | | |

Summit Fire. will Furnish Two **7** Ampere Hour Batteries @ Panel APS-10




# APS MOUNTING INFO

N.T.S.



SUMMIT FIRE PROTECTION
10200 E. Easter Avenue
Centennial, Colorado 80112
Phone: (303) 790-2520
Fax: (303) 790-2528

THESE DRAWINGS ARE SCHEMATIC AND DO NOT ATTEMPT TO SHOW SHOW CONDUIT ROUTING.

ARCHITECT:

GENERAL CONTRACTOR:

ENGINEER:

INSTALLER:

| PROJECT | PROJECT DESCRIPTION | PROJECT LOCATION |
|---|---|---|
| QTS DATA CENTER<br>QTS DENI DC2 | FIRE ALARM & DETECTION SYSTEM | 11140 N. GUN CLUB ROAD<br>AURORA, COLORADO 80018 |

MERIDIAN PROJECT

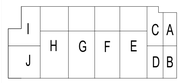
JOB#: 2025-24

NICET CERTIFIED

TRAVIS COOK- NICET#113375

COMMENTS AND STAMP

THESE DRAWINGS ARE SCHEMATIC AND DO NOT ATTEMPT TO SHOW SHOW CONDUIT ROUTING.




KEY PLAN
N.T.S.

| REVISION | DATE |
|---|---|
| SUBMITTAL | 07/07/25 |
| REVISIONS | 09/22/25 |
| DATA HALL BUILDOUT | 12/13/25 |
| COMMENTS | 02/25/26 |
| COMMENTS (RFI) | 04/2/26 |
| COMMENTS (RFI) | 06/3/26 |
| RFI#696 (RFI) | 07/24/26 |

CAD FILE: BOOSTER POWER SUPPLY
DRAWN BY: B. ALLEN
DATE: 6/3/25
ENG. APPROVAL:
DATE:
REVIEW BY:
SCALE: N.T.S

FIRE ALARM SYSTEM EST-4

REMOTE BOOSTER POWER BATTERY CALC'S & PANEL LAYOUT

SHEET FE01

| | |
|---|---|
| Project Name | Q7S DEN1 DC2 |
| Date | 7/4/2025 |
| Circuit Number | V1 |
| Area Covered | 1st level |
| Nominal System Voltage | 19.7 See chart |
| Minimum Device Voltage | 16 |
| Load Factor | See chart |
| Starting voltage w/ load factor | 19.7 |
| Total Circuit Current | 0.790 |

| | Wire Gauge | Ohm's Per 1000 |
|---|---|---|
| Distance from source to 1st device | 50 | 14 3.07 |
| Wire Gauge for balance of circuit | | 14 3.07 |

Enter current in amps. .045 = 45 ma

| Device Number | Device Current | Distance from previous device | At Device | Voltage Drop from source | Percent Drop |
|---|---|---|---|---|---|
| 1 | 0.045 | 50 | 19.46 | 0.243 | 1.23% |
| 2 | 0.045 | 50 | 19.23 | 0.473 | 2.39% |
| 3 | 0.056 | 55 | 18.99 | 0.708 | 3.59% |
| 4 | 0.056 | 65 | 18.73 | 0.973 | 4.94% |
| 5 | 0.056 | 55 | 18.52 | 1.185 | 6.01% |
| 6 | 0.056 | 50 | 18.33 | 1.366 | 6.94% |
| 7 | 0.106 | 50 | 18.16 | 1.537 | 7.80% |
| 8 | 0.045 | 51 | 18.02 | 1.678 | 8.52% |
| 9 | 0.045 | 65 | 17.86 | 1.840 | 9.34% |
| 10 | 0.056 | 25 | 17.81 | 1.895 | 9.62% |
| 11 | 0.056 | 45 | 17.72 | 1.984 | 10.07% |
| 12 | 0.056 | 40 | 17.64 | 2.055 | 10.43% |
| 13 | 0.056 | 35 | 17.59 | 2.109 | 10.71% |
| 14 | 0.056 | 40 | 17.54 | 2.162 | 10.98% |
| 15 | 0.056 | 30 | 17.50 | 2.196 | 11.15% |
| 16 | 0.056 | 35 | 17.47 | 2.227 | 11.30% |
| 17 | 0.056 | 30 | 17.45 | 2.246 | 11.40% |
| 18 | 0.056 | 20 | 17.44 | 2.255 | 11.45% |
| 19 | 0.056 | 25 | 17.44 | 2.261 | 11.48% |
| END | | | 17.44 | 2.261 | 11.48% |
| END | | | 17.44 | 2.261 | 11.48% |
| END | | | 17.44 | 2.261 | 11.48% |
| END | | | 17.44 | 2.261 | 11.48% |
| END | | | 17.44 | 2.261 | 11.48% |
| END | | | 17.44 | 2.261 | 11.48% |
| END | | | 17.44 | 2.261 | 11.48% |
| END | | | 17.44 | 2.261 | 11.48% |
| Totals | 0.790 | 816 | End of Line Voltage | | 17.44 |

**Point to Point Method**
**CIRCUIT IS WITHIN LIMITS**

| Totals Current | Distance | Voltage Drop |
|---|---|---|
| 0.790 | 816 | **2.26** |
| End of Line Voltage | | **17.44** |

Percent Drop 11.48%

End of Line Method uses only the wire guage for the first device to source
Standard Wire Resistance in Ohms per 1000 feet.
18=7.77 16=4.89 14=3.07 12=1.93
18-12 Awg = Solid Conductors

Notes:
Wire resistance is doubled in the calculations for two wires (Positive and Negative)
The voltage calculated to the last device in any method must not be lower than the manufacturers listed minimum operating voltage (IE: rated operating voltage 16-33 VDC).

**Which Method to use?**

**Point-to-Point**: Calculates the load from NAC device to NAC device, but also assumes this is exactly how the circuit is wired. This is the most accurate method of determining a NAC curruit draw but assumes correct installed distances.

**End of Line**: Calculates the load as if all the NAC devices are located at the end of the circuit (worst case).

**Current Draw @16VDC with High Horn Setting** — **Edwards Start Voltages** — **Load Factor**

ES73,EST

Genesis 3X, 3P5- IO, V5, FX-

| Horn Strobe | Candela | VOC | FWR | | IO64, VS1, FX64 | 20.4 | 0.20 |
|---|---|---|---|---|---|---|---|
| G1 | 15 | 0.129 | 0.176 | | IO1000, VS4, FX1000 | 20.4 | 0.24 |
| G1 | 30 | 0.167 | 0.230 | | 8PS/APS boosters | 19.7 | 0.59 |
| G1 | 75 | 0.281 | 0.397 | | ES73 | 20.4 | 0.37 |
| G1 | 110 | 0.337 | 0.443 | | ES73X or VM | 22.4 | 0.00 |
| New! G1 LED | 15, 30 or 75 | 0.045 | 0.055 | | FX5 | 20.4 | 0.40 |
| New! G4LED | 15,30,75,110 | 0.050 | 0.060 | | FX10 | 20.4 | 0.20 |
| New! GCLED | 15,30,75,115 | 0.060 | 0.075 | | ES74 | 20.4 | 0.37 |

Genesis
Strobe

| | | |
|---|---|---|
| 15 | 0.103 | 0.125 |
| 30 | 0.141 | 0.179 |
| 75 | 0.255 | 0.346 |
| 110 | 0.311 | 0.392 |
| New! G1 LED 15, 30 or 75 | 0.024 | 0.032 |
| New! G4LED 15,30,75,110 | 0.028 | 0.036 |
| New! GCLED 15,30,75,115 | 0.035 | 0.045 |

| | |
|---|---|
| Project Name | Q7S DEN1 DC2 |
| Date | 7/4/2025 |
| Circuit Number | V2 |
| Area Covered | 1st level |
| Nominal System Voltage | 19.7 See chart |
| Minimum Device Voltage | 16 |
| Load Factor | See chart |
| Starting voltage w/ load factor | 19.7 |
| Total Circuit Current | 0.772 |

| | Wire Gauge | Ohm's Per 1000 |
|---|---|---|
| Distance from source to 1st device | 25 | 14 3.07 |
| Wire Gauge for balance of circuit | | 14 3.07 |

Enter current in amps. .045 = 45 ma

| Device Number | Device Current | Distance from previous device | At Device | Voltage Drop from source | Percent Drop |
|---|---|---|---|---|---|
| 1 | 0.045 | 25 | 19.58 | 0.119 | 0.61% |
| 2 | 0.045 | 65 | 19.29 | 0.409 | 2.07% |
| 3 | 0.056 | 55 | 19.06 | 0.639 | 3.24% |
| 4 | 0.045 | 25 | 18.95 | 0.738 | 3.75% |
| 5 | 0.056 | 35 | 18.83 | 0.867 | 4.40% |
| 6 | 0.045 | 65 | 18.61 | 1.093 | 5.55% |
| 7 | 0.056 | 60 | 18.41 | 1.288 | 6.54% |
| 8 | 0.045 | 51 | 18.26 | 1.442 | 7.32% |
| 9 | 0.056 | 40 | 18.15 | 1.552 | 7.88% |
| 10 | 0.056 | 35 | 18.06 | 1.641 | 8.33% |
| 11 | 0.056 | 40 | 17.97 | 1.733 | 8.80% |
| 12 | 0.106 | 55 | 17.85 | 1.848 | 9.38% |
| 13 | 0.056 | 40 | 17.79 | 1.905 | 9.67% |
| 14 | 0.045 | 65 | 17.72 | 1.984 | 10.07% |
| 15 | 0.045 | 65 | 17.65 | 2.045 | 10.38% |
| 16 | 0.056 | 50 | 17.62 | 2.078 | 10.55% |
| 17 | 0.056 | 40 | 17.60 | 2.096 | 10.64% |
| 18 | 0.056 | 40 | 17.60 | 2.105 | 10.69% |
| END | | | 17.60 | 2.105 | 10.69% |
| END | | | 17.60 | 2.105 | 10.69% |
| END | | | 17.60 | 2.105 | 10.69% |
| END | | | 17.60 | 2.105 | 10.69% |
| END | | | 17.60 | 2.105 | 10.69% |
| END | | | 17.60 | 2.105 | 10.69% |
| END | | | 17.60 | 2.105 | 10.69% |
| END | | | 17.60 | 2.105 | 10.69% |
| Totals | 0.772 | 851 | End of Line Voltage | | 17.60 |

**Point to Point Method**
**CIRCUIT IS WITHIN LIMITS**

| Totals Current | Distance | Voltage Drop |
|---|---|---|
| 0.772 | 851 | **2.10** |
| End of Line Voltage | | **17.60** |

Percent Drop 10.69%

End of Line Method uses only the wire guage for the first device to source
Standard Wire Resistance in Ohms per 1000 feet.
18=7.77 16=4.89 14=3.07 12=1.93
18-12 Awg = Solid Conductors

Notes:
Wire resistance is doubled in the calculations for two wires (Positive and Negative)
The voltage calculated to the last device in any method must not be lower than the manufacturers listed minimum operating voltage (IE: rated operating voltage 16-33 VDC).

**Which Method to use?**

**Point-to-Point**: Calculates the load from NAC device to NAC device, but also assumes this is exactly how the circuit is wired. This is the most accurate method of determining a NAC curruit draw but assumes correct installed distances.

**End of Line**: Calculates the load as if all the NAC devices are located at the end of the circuit (worst case).

**Current Draw @16VDC with High Horn Setting** — **Edwards Start Voltages** — **Load Factor**

ES73,EST

Genesis 3X, 3P5- IO, V5, FX-

| Horn Strobe | Candela | VOC | FWR | | IO64, VS1, FX64 | 20.4 | 0.20 |
|---|---|---|---|---|---|---|---|
| G1 | 15 | 0.129 | 0.176 | | IO1000, VS4, FX1000 | 20.4 | 0.24 |
| G1 | 30 | 0.167 | 0.230 | | 8PS/APS boosters | 19.7 | 0.59 |
| G1 | 75 | 0.281 | 0.397 | | ES73 | 20.4 | 0.37 |
| G1 | 110 | 0.337 | 0.443 | | ES73X or VM | 22.4 | 0.00 |
| New! G1 LED | 15, 30 or 75 | 0.045 | 0.055 | | FX5 | 20.4 | 0.40 |
| New! G4LED | 15,30,75,110 | 0.050 | 0.060 | | FX10 | 20.4 | 0.20 |
| New! GCLED | 15,30,75,115 | 0.060 | 0.075 | | ES74 | 20.4 | 0.37 |

Genesis
Strobe

| | | |
|---|---|---|
| 15 | 0.103 | 0.125 |
| 30 | 0.141 | 0.179 |
| 75 | 0.255 | 0.346 |
| 110 | 0.311 | 0.392 |
| New! G1 LED 15, 30 or 75 | 0.024 | 0.032 |
| New! G4LED 15,30,75,110 | 0.028 | 0.036 |
| New! GCLED 15,30,75,115 | 0.035 | 0.045 |

| | |
|---|---|
| Project Name | Q7S DEN1 DC2 |
| Date | 7/4/2025 |
| Circuit Number | V3 |
| Area Covered | 1st level |
| Nominal System Voltage | 19.7 See chart |
| Minimum Device Voltage | 16 |
| Load Factor | See chart |
| Starting voltage w/ load factor | 19.7 |
| Total Circuit Current | 0.619 |

| | Wire Gauge | Ohm's Per 1000 |
|---|---|---|
| Distance from source to 1st device | 104 | 14 3.07 |
| Wire Gauge for balance of circuit | | 14 3.07 |

Enter current in amps. .045 = 45 ma

| Device Number | Device Current | Distance from previous device | At Device | Voltage Drop from source | Percent Drop |
|---|---|---|---|---|---|
| 1 | 0.056 | 104 | 19.29 | 0.408 | 2.07% |
| 2 | 0.056 | 30 | 19.18 | 0.519 | 2.64% |
| 3 | 0.056 | 40 | 19.04 | 0.658 | 3.34% |
| 4 | 0.056 | 35 | 18.93 | 0.772 | 3.92% |
| 5 | 0.056 | 65 | 18.73 | 0.970 | 4.92% |
| 6 | 0.045 | 40 | 18.62 | 1.083 | 5.50% |
| 7 | 0.045 | 60 | 18.45 | 1.235 | 6.27% |
| 8 | 0.045 | 54 | 18.34 | 1.358 | 6.89% |
| 9 | 0.056 | 40 | 18.25 | 1.457 | 7.39% |
| 10 | 0.056 | 25 | 18.22 | 1.481 | 7.52% |
| 11 | 0.056 | 55 | 18.13 | 1.567 | 7.95% |
| 12 | 0.045 | 55 | 18.06 | 1.639 | 8.32% |
| 13 | 0.045 | 55 | 18.00 | 1.697 | 8.62% |
| 14 | 0.045 | 65 | 17.95 | 1.747 | 8.87% |
| 15 | 0.045 | 65 | 17.92 | 1.780 | 9.03% |
| 16 | 0.056 | 45 | 17.91 | 1.790 | 9.09% |
| END | | | 17.91 | 1.790 | 9.09% |
| END | | | 17.91 | 1.790 | 9.09% |
| END | | | 17.91 | 1.790 | 9.09% |
| END | | | 17.91 | 1.790 | 9.09% |
| END | | | 17.91 | 1.790 | 9.09% |
| END | | | 17.91 | 1.790 | 9.09% |
| END | | | 17.91 | 1.790 | 9.09% |
| END | | | 17.91 | 1.790 | 9.09% |
| END | | | 17.91 | 1.790 | 9.09% |
| Totals | 0.619 | 833 | End of Line Voltage | | 17.91 |

**Point to Point Method**
**CIRCUIT IS WITHIN LIMITS**

| Totals Current | Distance | Voltage Drop |
|---|---|---|
| 0.619 | 833 | **1.79** |
| End of Line Voltage | | **17.91** |

Percent Drop 9.03%

End of Line Method uses only the wire guage for the first device to source
Standard Wire Resistance in Ohms per 1000 feet.
18=7.77 16=4.89 14=3.07 12=1.93
18-12 Awg = Solid Conductors

Notes:
Wire resistance is doubled in the calculations for two wires (Positive and Negative)
The voltage calculated to the last device in any method must not be lower than the manufacturers listed minimum operating voltage (IE: rated operating voltage 16-33 VDC).

**Which Method to use?**

**Point-to-Point**: Calculates the load from NAC device to NAC device, but also assumes this is exactly how the circuit is wired. This is the most accurate method of determining a NAC curruit draw but assumes correct installed distances.

**End of Line**: Calculates the load as if all the NAC devices are located at the end of the circuit (worst case).

**Current Draw @16VDC with High Horn Setting** — **Edwards Start Voltages** — **Load Factor**

ES73,EST

Genesis 3X, 3P5- IO, V5, FX-

| Horn Strobe | Candela | VOC | FWR | | IO64, VS1, FX64 | 20.4 | 0.20 |
|---|---|---|---|---|---|---|---|
| G1 | 15 | 0.129 | 0.176 | | IO1000, VS4, FX1000 | 20.4 | 0.24 |
| G1 | 30 | 0.167 | 0.230 | | 8PS/APS boosters | 19.7 | 0.59 |
| G1 | 75 | 0.281 | 0.397 | | ES73 | 20.4 | 0.37 |
| G1 | 110 | 0.337 | 0.443 | | ES73X or VM | 22.4 | 0.00 |
| New! G1 LED | 15, 30 or 75 | 0.045 | 0.055 | | FX5 | 20.4 | 0.40 |
| New! G4LED | 15,30,75,110 | 0.050 | 0.060 | | FX10 | 20.4 | 0.20 |
| New! GCLED | 15,30,75,115 | 0.060 | 0.075 | | ES74 | 20.4 | 0.37 |

Genesis
Strobe

| | | |
|---|---|---|
| 15 | 0.103 | 0.125 |
| 30 | 0.141 | 0.179 |
| 75 | 0.255 | 0.346 |
| 110 | 0.311 | 0.392 |
| New! G1 LED 15, 30 or 75 | 0.024 | 0.032 |
| New! G4LED 15,30,75,110 | 0.028 | 0.036 |
| New! GCLED 15,30,75,115 | 0.035 | 0.045 |

| | |
|---|---|
| Project Name | Q7S DEN1 DC2 |
| Date | 7/4/2025 |
| Circuit Number | V4 |
| Area Covered | 1st level |
| Nominal System Voltage | 19.7 See chart |
| Minimum Device Voltage | 16 |
| Load Factor | See chart |
| Starting voltage w/ load factor | 19.7 |
| Total Circuit Current | 0.810 |

| | Wire Gauge | Ohm's Per 1000 |
|---|---|---|
| Distance from source to 1st device | 35 | 14 3.07 |
| Wire Gauge for balance of circuit | | 14 3.07 |

Enter current in amps. .045 = 45 ma

| Device Number | Device Current | Distance from previous device | At Device | Voltage Drop from source | Percent Drop |
|---|---|---|---|---|---|
| 1 | 0.056 | 35 | 19.53 | 0.174 | 0.88% |
| 2 | 0.056 | 65 | 19.22 | 0.483 | 2.45% |
| 3 | 0.045 | 40 | 19.04 | 0.664 | 3.37% |
| 4 | 0.045 | 65 | 18.76 | 0.941 | 4.78% |
| 5 | 0.045 | 55 | 18.54 | 1.160 | 5.89% |
| 6 | 0.045 | 45 | 18.37 | 1.326 | 6.73% |
| 7 | 0.056 | 30 | 18.27 | 1.429 | 7.25% |
| 8 | 0.056 | 54 | 18.10 | 1.602 | 8.13% |
| 9 | 0.056 | 65 | 17.90 | 1.796 | 9.12% |
| 10 | 0.056 | 25 | 17.83 | 1.865 | 9.47% |
| 11 | 0.056 | 35 | 17.75 | 1.954 | 9.92% |
| 12 | 0.056 | 40 | 17.65 | 2.047 | 10.39% |
| 13 | 0.045 | 55 | 17.54 | 2.162 | 10.98% |
| 14 | 0.045 | 65 | 17.42 | 2.281 | 11.58% |
| 15 | 0.045 | 50 | 17.34 | 2.358 | 11.97% |
| 16 | 0.045 | 40 | 17.29 | 2.409 | 12.23% |
| 17 | 0.056 | 25 | 17.27 | 2.434 | 12.36% |
| 18 | 0.056 | 55 | 17.22 | 2.477 | 12.57% |
| 19 | 0.045 | 65 | 17.19 | 2.513 | 12.75% |
| 20 | 0.045 | 55 | 17.17 | 2.526 | 12.83% |
| END | | | 17.17 | 2.526 | 12.83% |
| END | | | 17.17 | 2.526 | 12.83% |
| END | | | 17.17 | 2.526 | 12.83% |
| END | | | 17.17 | 2.526 | 12.83% |
| END | | | 17.17 | 2.526 | 12.83% |
| END | | | 17.17 | 2.526 | 12.83% |
| END | | | 17.17 | 2.526 | 12.83% |
| Totals | 0.810 | 564 | End of Line Voltage | | 17.17 |

**Point to Point Method**
**CIRCUIT IS WITHIN LIMITS**

| Totals Current | Distance | Voltage Drop |
|---|---|---|
| 0.810 | 564 | **2.53** |
| End of Line Voltage | | **17.17** |

Percent Drop 12.83%

End of Line Method uses only the wire guage for the first device to source
Standard Wire Resistance in Ohms per 1000 feet.
18=7.77 16=4.89 14=3.07 12=1.93
18-12 Awg = Solid Conductors

Notes:
Wire resistance is doubled in the calculations for two wires (Positive and Negative)
The voltage calculated to the last device in any method must not be lower than the manufacturers listed minimum operating voltage (IE: rated operating voltage 16-33 VDC).

**Which Method to use?**

**Point-to-Point**: Calculates the load from NAC device to NAC device, but also assumes this is exactly how the circuit is wired. This is the most accurate method of determining a NAC curruit draw but assumes correct installed distances.

**End of Line**: Calculates the load as if all the NAC devices are located at the end of the circuit (worst case).

**Current Draw @16VDC with High Horn Setting** — **Edwards Start Voltages** — **Load Factor**

ES73,EST

Genesis 3X, 3P5- IO, V5, FX-

| Horn Strobe | Candela | VOC | FWR | | IO64, VS1, FX64 | 20.4 | 0.20 |
|---|---|---|---|---|---|---|---|
| G1 | 15 | 0.129 | 0.176 | | IO1000, VS4, FX1000 | 20.4 | 0.24 |
| G1 | 30 | 0.167 | 0.230 | | 8PS/APS boosters | 19.7 | 0.59 |
| G1 | 75 | 0.281 | 0.397 | | ES73 | 20.4 | 0.37 |
| G1 | 110 | 0.337 | 0.443 | | ES73X or VM | 22.4 | 0.00 |
| New! G1 LED | 15, 30 or 75 | 0.045 | 0.055 | | FX5 | 20.4 | 0.40 |
| New! G4LED | 15,30,75,110 | 0.050 | 0.060 | | FX10 | 20.4 | 0.20 |
| New! GCLED | 15,30,75,115 | 0.060 | 0.075 | | ES74 | 20.4 | 0.37 |

Genesis
Strobe

| | | |
|---|---|---|
| 15 | 0.103 | 0.125 |
| 30 | 0.141 | 0.179 |
| 75 | 0.255 | 0.346 |
| 110 | 0.311 | 0.392 |
| New! G1 LED 15, 30 or 75 | 0.024 | 0.032 |
| New! G4LED 15,30,75,110 | 0.028 | 0.036 |
| New! GCLED 15,30,75,115 | 0.035 | 0.045 |

| | |
|---|---|
| Project Name | Q7S DEN1 DC2 |
| Date | 7/4/2025 |
| Circuit Number | V5 |
| Area Covered | 1st level |
| Nominal System Voltage | 19.7 See chart |
| Minimum Device Voltage | 16 |
| Load Factor | See chart |
| Starting voltage w/ load factor | 19.7 |
| Total Circuit Current | 0.360 |

| | Wire Gauge | Ohm's Per 1000 |
|---|---|---|
| Distance from source to 1st device | 220 | 14 3.07 |
| Wire Gauge for balance of circuit | | 14 3.07 |

Enter current in amps. .045 = 45 ma

| Device Number | Device Current | Distance from previous device | At Device | Voltage Drop from source | Percent Drop |
|---|---|---|---|---|---|
| 1 | 0.036 | 200 | 19.26 | 0.142 | 2.24% |
| 2 | 0.036 | 75 | 19.11 | 0.295 | 3.00% |
| 3 | 0.036 | 70 | 18.98 | 0.715 | 3.63% |
| 4 | 0.036 | 65 | 18.88 | 0.816 | 4.14% |
| 5 | 0.036 | 65 | 18.80 | 0.902 | 4.58% |
| 6 | 0.036 | 65 | 18.73 | 0.974 | 4.94% |
| 7 | 0.036 | 65 | 18.67 | 1.031 | 5.23% |
| 8 | 0.036 | 65 | 18.63 | 1.074 | 5.45% |
| 9 | 0.036 | 65 | 18.60 | 1.103 | 5.60% |
| 10 | 0.036 | 65 | 18.58 | 1.117 | 5.67% |
| END | | | 18.58 | 1.117 | 5.67% |
| END | | | 18.58 | 1.117 | 5.67% |
| END | | | 18.58 | 1.117 | 5.67% |
| END | | | 18.58 | 1.117 | 5.67% |
| END | | | 18.58 | 1.117 | 5.67% |
| END | | | 18.58 | 1.117 | 5.67% |
| END | | | 18.58 | 1.117 | 5.67% |
| END | | | 18.58 | 1.117 | 5.67% |
| END | | | 18.58 | 1.117 | 5.67% |
| END | | | 18.58 | 1.117 | 5.67% |
| END | | | 18.58 | 1.117 | 5.67% |
| END | | | 18.58 | 1.117 | 5.67% |
| END | | | 18.58 | 1.117 | 5.67% |
| END | | | 18.58 | 1.117 | 5.67% |
| END | | | 18.58 | 1.117 | 5.67% |
| END | | | 18.58 | 1.117 | 5.67% |
| Totals | 0.360 | 800 | End of Line Voltage | | 18.58 |

**Point to Point Method**
**CIRCUIT IS WITHIN LIMITS**

| Totals Current | Distance | Voltage Drop |
|---|---|---|
| 0.360 | 800 | **1.12** |
| End of Line Voltage | | **18.58** |

Percent Drop 5.67%

End of Line Method uses only the wire guage for the first device to source
Standard Wire Resistance in Ohms per 1000 feet.
18=7.77 16=4.89 14=3.07 12=1.93
18-12 Awg = Solid Conductors

Notes:
Wire resistance is doubled in the calculations for two wires (Positive and Negative)
The voltage calculated to the last device in any method must not be lower than the manufacturers listed minimum operating voltage (IE: rated operating voltage 16-33 VDC).

**Which Method to use?**

**Point-to-Point**: Calculates the load from NAC device to NAC device, but also assumes this is exactly how the circuit is wired. This is the most accurate method of determining a NAC curruit draw but assumes correct installed distances.

**End of Line**: Calculates the load as if all the NAC devices are located at the end of the circuit (worst case).

**Current Draw @16VDC with High Horn Setting** — **Edwards Start Voltages** — **Load Factor**

ES73,EST

Genesis 3X, 3P5- IO, V5, FX-

| Horn Strobe | Candela | VOC | FWR | | IO64, VS1, FX64 | 20.4 | 0.20 |
|---|---|---|---|---|---|---|---|
| G1 | 15 | 0.129 | 0.176 | | IO1000, VS4, FX1000 | 20.4 | 0.24 |
| G1 | 30 | 0.167 | 0.230 | | 8PS/APS boosters | 19.7 | 0.59 |
| G1 | 75 | 0.281 | 0.397 | | ES73 | 20.4 | 0.37 |
| G1 | 110 | 0.337 | 0.443 | | ES73X or VM | 22.4 | 0.00 |
| New! G1 LED | 15, 30 or 75 | 0.045 | 0.055 | | FX5 | 20.4 | 0.40 |
| New! G4LED | 15,30,75,110 | 0.050 | 0.060 | | FX10 | 20.4 | 0.20 |
| New! GCLED | 15,30,75,115 | 0.060 | 0.075 | | ES74 | 20.4 | 0.37 |

Genesis
Strobe

| | | |
|---|---|---|
| 15 | 0.103 | 0.125 |
| 30 | 0.141 | 0.179 |
| 75 | 0.255 | 0.346 |
| 110 | 0.311 | 0.392 |
| New! G1 LED 15, 30 or 75 | 0.024 | 0.032 |
| New! G4LED 15,30,75,110 | 0.028 | 0.036 |
| New! GCLED 15,30,75,115 | 0.035 | 0.045 |

| | |
|---|---|
| Project Name | Q7S DEN1 DC2 |
| Date | 7/4/2025 |
| Circuit Number | V6-SPARE |
| Area Covered | 1st level |
| Nominal System Voltage | 19.7 See chart |
| Minimum Device Voltage | 16 |
| Load Factor | See chart |
| Starting voltage w/ load factor | 19.7 |
| Total Circuit Current | 0.000 |

| | Wire Gauge | Ohm's Per 1000 |
|---|---|---|
| Distance from source to 1st device | 0 | 14 3.07 |
| Wire Gauge for balance of circuit | | 14 3.07 |

Enter current in amps. .045 = 45 ma

| Device Number | Device Current | Distance from previous device | At Device | Voltage Drop from source | Percent Drop |
|---|---|---|---|---|---|
| END | | | 19.70 | 0.000 | 0.00% |
| END | | | 19.70 | 0.000 | 0.00% |
| END | | | 19.70 | 0.000 | 0.00% |

| | |
|---|---|
| Project Name | QTS DEN1 DC2 |
| Date | 7/4/2025 |
| Circuit Number | V11- SPARE-FUTURE DEVICES |
| Area Covered | 1st level |
| Nominal System Voltage | 19.7 See chart |
| Minimum Device Voltage | 16 |
| Load Factor | See chart |
| Starting voltage w/ load factor | 19.7 |
| Total Circuit Current | 0.000 |

Wire Gauge / Per 1000

| | | | |
|---|---|---|---|
| Distance from source to 1st device | 385 | 14 | 3.07 |
| Wire Gauge for balance of circuit | | 14 | 3.07 |

Enter current in amps / .045 = 45 ma

| Device Number | Device Current | Distance from previous device | At Device | Voltage Drop from source | Percent Drop |
|---|---|---|---|---|---|
| END | | 385 | 19.70 | 0.000 | 0.00% |
| END | | | 19.70 | 0.000 | 0.00% |
| END | | | 19.70 | 0.000 | 0.00% |
| END | | | 19.70 | 0.000 | 0.00% |
| END | | | 19.70 | 0.000 | 0.00% |
| END | | | 19.70 | 0.000 | 0.00% |
| END | | | 19.70 | 0.000 | 0.00% |
| END | | | 19.70 | 0.000 | 0.00% |
| | | | | | |
| END | | | 19.70 | 0.000 | 0.00% |
| END | | | 19.70 | 0.000 | 0.00% |
| END | | | 19.70 | 0.000 | 0.00% |
| END | | | 19.70 | 0.000 | 0.00% |
| END | | | 19.70 | 0.000 | 0.00% |
| END | | | 19.70 | 0.000 | 0.00% |
| END | | | 19.70 | 0.000 | 0.00% |
| END | | | 19.70 | 0.000 | 0.00% |
| END | | | 19.70 | 0.000 | 0.00% |
| | | | | | |
| END | | | 19.70 | 0.000 | 0.00% |
| END | | | 19.70 | 0.000 | 0.00% |
| END | | | 19.70 | 0.000 | 0.00% |
| END | | | 19.70 | 0.000 | 0.00% |
| END | | | 19.70 | 0.000 | 0.00% |
| END | | | 19.70 | 0.000 | 0.00% |
| END | | | 19.70 | 0.000 | 0.00% |
| END | | | 19.70 | 0.000 | 0.00% |
| END | | | 19.70 | 0.000 | 0.00% |
| Totals | 0.000 | 385 | End of Line Voltage | | 19.70 |

**Point to Point Method**

**CIRCUIT IS WITHIN LIMITS**

| Totals | | Voltage |
|---|---|---|
| Current | Distance | Drop |
| 0.000 | 385 | **0.00** |
| End of Line Voltage | | **19.70** |

Percent Drop 0.00%

End of Line Method uses only the wire guage for the first device to source

Standard Wire Resistance in Ohms per 1000 feet.

18=7.77 16=4.89 14=3.07 12=1.93

18-12 Awg = Solid Conductors

Notes:

Wire resistance is doubled in the calculations for two wires (Positive and Negative)

The voltage calculated to the last device in any method must not be lower than the manufacturers listed minimum operating voltage (IE: rated operating voltage 16-33 VDC).

**Which Method to use?**

**Point-to-Point**: Calculates the load from NAC device to NAC device, but also assumes this is exactly how the circuit is wired. This is the most accurate method of determining a NAC curcuit draw but assumes correct installed distances.

**End of Line**: Calculates the load as if all the NAC devices are located at the end of the circuit (worst case).

**Current Draw @16VDC with High Horn Setting** — ET3,EST — **Edwards Start Voltages** — **Load Factor**

Genesis 3X, 3P5- IO, V5, FX-

| Horn Strobe | Candela | VDC | FWR | | Edwards Start Voltages | | Load Factor |
|---|---|---|---|---|---|---|---|
| G1 | 15 | 0.129 | 0.176 | | IO64, VS1, FX64 | 20.4 | 0.20 |
| G1 | 30 | 0.167 | 0.230 | | IO1000, VS4, FX1000 | 20.4 | 0.24 |
| G1 | 75 | 0.281 | 0.397 | | BPS/APS boosters | 19.7 | 0.59 |
| G1 | 110 | 0.337 | 0.443 | | ET3 | 20.4 | 0.37 |
| New! G1 LED | 15, 30 or 75 | 0.045 | 0.055 | | ET3TX or VM | 22.4 | 0.00 |
| New! G4LED | 15,30,75,110 | 0.050 | 0.060 | | FX5 | 20.4 | 0.40 |
| New! GCLED | 15,30,75,115 | 0.060 | 0.075 | | FX10 | 20.4 | 0.20 |
| | | | | | ET4 | 20.4 | 0.37 |

Genesis

Strobe

| | | |
|---|---|---|
| 15 | 0.103 | 0.125 |
| 30 | 0.141 | 0.179 |
| 75 | 0.255 | 0.346 |
| 110 | 0.311 | 0.392 |
| New! G1 LED 15, 30 or 75 | 0.024 | 0.032 |
| New! G4LED 15,30,75,110 | 0.028 | 0.036 |
| New! GCLED 15,30,75,115 | 0.035 | 0.045 |

| | |
|---|---|
| Project Name | QTS DEN1 DC2 |
| Date | 7/4/2025 |
| Circuit Number | V12 |
| Area Covered | 1st level |
| Nominal System Voltage | 19.7 See chart |
| Minimum Device Voltage | 16 |
| Load Factor | See chart |
| Starting voltage w/ load factor | 19.7 |
| Total Circuit Current | 0.441 |

Wire Gauge / Per 1000

| | | | |
|---|---|---|---|
| Distance from source to 1st device | 45 | 14 | 3.07 |
| Wire Gauge for balance of circuit | | 14 | 3.07 |

Enter current in amps / .045 = 45 ma

| Device Number | Device Current | Distance from previous device | At Device | Voltage Drop from source | Percent Drop |
|---|---|---|---|---|---|
| 1 | 0.036 | 45 | 19.58 | 0.122 | 0.62% |
| 2 | 0.036 | 40 | 19.48 | 0.221 | 1.12% |
| 3 | 0.036 | 65 | 19.33 | 0.369 | 1.87% |
| 4 | 0.036 | 55 | 19.26 | 0.440 | 2.23% |
| 5 | 0.045 | 40 | 19.19 | 0.513 | 2.60% |
| 6 | 0.036 | 35 | 19.13 | 0.567 | 2.88% |
| 7 | 0.036 | 50 | 19.07 | 0.634 | 3.22% |
| 8 | 0.036 | 45 | 19.02 | 0.683 | 3.47% |
| | | | | | |
| 9 | 0.036 | 50 | 18.97 | 0.727 | 3.69% |
| 10 | 0.036 | 40 | 18.95 | 0.754 | 3.83% |
| 11 | 0.036 | 35 | 18.93 | 0.769 | 3.91% |
| 12 | 0.036 | 40 | 18.92 | 0.778 | 3.95% |
| END | | | 18.92 | 0.778 | 3.95% |
| END | | | 18.92 | 0.778 | 3.95% |
| END | | | 18.92 | 0.778 | 3.95% |
| END | | | 18.92 | 0.778 | 3.95% |
| END | | | 18.92 | 0.778 | 3.95% |
| | | | | | |
| END | | | 18.92 | 0.778 | 3.95% |
| END | | | 18.92 | 0.778 | 3.95% |
| END | | | 18.92 | 0.778 | 3.95% |
| END | | | 18.92 | 0.778 | 3.95% |
| END | | | 18.92 | 0.778 | 3.95% |
| END | | | 18.92 | 0.778 | 3.95% |
| END | | | 18.92 | 0.778 | 3.95% |
| END | | | 18.92 | 0.778 | 3.95% |
| END | | | 18.92 | 0.778 | 3.95% |
| Totals | 0.441 | 520 | End of Line Voltage | | 18.92 |

**Point to Point Method**

**CIRCUIT IS WITHIN LIMITS**

| Totals | | Voltage |
|---|---|---|
| Current | Distance | Drop |
| 0.441 | 520 | **0.78** |
| End of Line Voltage | | **18.92** |

Percent Drop 3.95%

End of Line Method uses only the wire guage for the first device to source

Standard Wire Resistance in Ohms per 1000 feet.

18=7.77 16=4.89 14=3.07 12=1.93

18-12 Awg = Solid Conductors

Notes:

Wire resistance is doubled in the calculations for two wires (Positive and Negative)

The voltage calculated to the last device in any method must not be lower than the manufacturers listed minimum operating voltage (IE: rated operating voltage 16-33 VDC).

**Which Method to use?**

**Point-to-Point**: Calculates the load from NAC device to NAC device, but also assumes this is exactly how the circuit is wired. This is the most accurate method of determining a NAC curcuit draw but assumes correct installed distances.

**End of Line**: Calculates the load as if all the NAC devices are located at the end of the circuit (worst case).

**Current Draw @16VDC with High Horn Setting** — ET3,EST — **Edwards Start Voltages** — **Load Factor**

Genesis 3X, 3P5- IO, V5, FX-

| Horn Strobe | Candela | VDC | FWR | | Edwards Start Voltages | | Load Factor |
|---|---|---|---|---|---|---|---|
| G1 | 15 | 0.129 | 0.176 | | IO64, VS1, FX64 | 20.4 | 0.20 |
| G1 | 30 | 0.167 | 0.230 | | IO1000, VS4, FX1000 | 20.4 | 0.24 |
| G1 | 75 | 0.281 | 0.397 | | BPS/APS boosters | 19.7 | 0.59 |
| G1 | 110 | 0.337 | 0.443 | | ET3 | 20.4 | 0.37 |
| New! G1 LED | 15, 30 or 75 | 0.045 | 0.055 | | ET3TX or VM | 22.4 | 0.00 |
| New! G4LED | 15,30,75,110 | 0.050 | 0.060 | | FX5 | 20.4 | 0.40 |
| New! GCLED | 15,30,75,115 | 0.060 | 0.075 | | FX10 | 20.4 | 0.20 |
| | | | | | ET4 | 20.4 | 0.37 |

Genesis

Strobe

| | | |
|---|---|---|
| 15 | 0.103 | 0.125 |
| 30 | 0.141 | 0.179 |
| 75 | 0.255 | 0.346 |
| 110 | 0.311 | 0.392 |
| New! G1 LED 15, 30 or 75 | 0.024 | 0.032 |
| New! G4LED 15,30,75,110 | 0.028 | 0.036 |
| New! GCLED 15,30,75,115 | 0.035 | 0.045 |

| | |
|---|---|
| Project Name | QTS DEN1 DC2 |
| Date | 7/4/2025 |
| Circuit Number | V13 |
| Area Covered | 1st level |
| Nominal System Voltage | 19.7 See chart |
| Minimum Device Voltage | 16 |
| Load Factor | See chart |
| Starting voltage w/ load factor | 19.7 |
| Total Circuit Current | 0.702 |

Wire Gauge / Per 1000

| | | | |
|---|---|---|---|
| Distance from source to 1st device | 75 | 14 | 3.07 |
| Wire Gauge for balance of circuit | | 14 | 3.07 |

Enter current in amps / .045 = 45 ma

| Device Number | Device Current | Distance from previous device | At Device | Voltage Drop from source | Percent Drop |
|---|---|---|---|---|---|
| 1 | 0.036 | 75 | 19.58 | 0.323 | 1.64% |
| 2 | 0.036 | 55 | 19.55 | 0.545 | 2.77% |
| 3 | 0.036 | 30 | 19.04 | 0.660 | 3.35% |
| 4 | 0.036 | 65 | 18.81 | 0.893 | 4.53% |
| 5 | 0.036 | 30 | 18.71 | 0.994 | 5.05% |
| 6 | 0.036 | 25 | 18.63 | 1.073 | 5.45% |
| 7 | 0.045 | 20 | 18.57 | 1.131 | 5.74% |
| 8 | 0.036 | 35 | 18.48 | 1.224 | 6.22% |
| | | | | | |
| 9 | 0.036 | 45 | 18.37 | 1.334 | 6.77% |
| 10 | 0.036 | 15 | 18.33 | 1.367 | 6.94% |
| 11 | 0.036 | 15 | 18.30 | 1.397 | 7.09% |
| 12 | 0.036 | 20 | 18.27 | 1.432 | 7.27% |
| 13 | 0.036 | 15 | 18.24 | 1.455 | 7.39% |
| 14 | 0.036 | 35 | 18.20 | 1.502 | 7.62% |
| 15 | 0.045 | 65 | 18.13 | 1.574 | 7.99% |
| 16 | 0.045 | 55 | 18.06 | 1.619 | 8.22% |
| 17 | 0.045 | 65 | 18.04 | 1.655 | 8.40% |
| | | | | | |
| 18 | 0.045 | 75 | 18.02 | 1.676 | 8.51% |
| END | | | 18.02 | 1.676 | 8.51% |
| END | | | 18.02 | 1.676 | 8.51% |
| END | | | 18.02 | 1.676 | 8.51% |
| END | | | 18.02 | 1.676 | 8.51% |
| END | | | 18.02 | 1.676 | 8.51% |
| END | | | 18.02 | 1.676 | 8.51% |
| END | | | 18.02 | 1.676 | 8.51% |
| END | | | 18.02 | 1.676 | 8.51% |
| Totals | 0.702 | 740 | End of Line Voltage | | 18.02 |

**Point to Point Method**

**CIRCUIT IS WITHIN LIMITS**

| Totals | | Voltage |
|---|---|---|
| Current | Distance | Drop |
| 0.702 | 740 | **1.68** |
| End of Line Voltage | | **18.02** |

Percent Drop 8.51%

End of Line Method uses only the wire guage for the first device to source

Standard Wire Resistance in Ohms per 1000 feet.

18=7.77 16=4.89 14=3.07 12=1.93

18-12 Awg = Solid Conductors

Notes:

Wire resistance is doubled in the calculations for two wires (Positive and Negative)

The voltage calculated to the last device in any method must not be lower than the manufacturers listed minimum operating voltage (IE: rated operating voltage 16-33 VDC).

**Which Method to use?**

**Point-to-Point**: Calculates the load from NAC device to NAC device, but also assumes this is exactly how the circuit is wired. This is the most accurate method of determining a NAC curcuit draw but assumes correct installed distances.

**End of Line**: Calculates the load as if all the NAC devices are located at the end of the circuit (worst case).

**Current Draw @16VDC with High Horn Setting** — ET3,EST — **Edwards Start Voltages** — **Load Factor**

Genesis 3X, 3P5- IO, V5, FX-

| Horn Strobe | Candela | VDC | FWR | | Edwards Start Voltages | | Load Factor |
|---|---|---|---|---|---|---|---|
| G1 | 15 | 0.129 | 0.176 | | IO64, VS1, FX64 | 20.4 | 0.20 |
| G1 | 30 | 0.167 | 0.230 | | IO1000, VS4, FX1000 | 20.4 | 0.24 |
| G1 | 75 | 0.281 | 0.397 | | BPS/APS boosters | 19.7 | 0.59 |
| G1 | 110 | 0.337 | 0.443 | | ET3 | 20.4 | 0.37 |
| New! G1 LED | 15, 30 or 75 | 0.045 | 0.055 | | ET3TX or VM | 22.4 | 0.00 |
| New! G4LED | 15,30,75,110 | 0.050 | 0.060 | | FX5 | 20.4 | 0.40 |
| New! GCLED | 15,30,75,115 | 0.060 | 0.075 | | FX10 | 20.4 | 0.20 |
| | | | | | ET4 | 20.4 | 0.37 |

Genesis

Strobe

| | | |
|---|---|---|
| 15 | 0.103 | 0.125 |
| 30 | 0.141 | 0.179 |
| 75 | 0.255 | 0.346 |
| 110 | 0.311 | 0.392 |
| New! G1 LED 15, 30 or 75 | 0.024 | 0.032 |
| New! G4LED 15,30,75,110 | 0.028 | 0.036 |
| New! GCLED 15,30,75,115 | 0.035 | 0.045 |

| | |
|---|---|
| Project Name | QTS DEN1 DC2 |
| Date | 7/4/2025 |
| Circuit Number | V14 |
| Area Covered | 1st level |
| Nominal System Voltage | 19.7 See chart |
| Minimum Device Voltage | 16 |
| Load Factor | See chart |
| Starting voltage w/ load factor | 19.7 |
| Total Circuit Current | 0.252 |

Wire Gauge / Per 1000

| | | | |
|---|---|---|---|
| Distance from source to 1st device | 165 | 14 | 3.07 |
| Wire Gauge for balance of circuit | | 14 | 3.07 |

Enter current in amps / .045 = 45 ma

| Device Number | Device Current | Distance from previous device | At Device | Voltage Drop from source | Percent Drop |
|---|---|---|---|---|---|
| 1 | 0.036 | 165 | 19.44 | 0.255 | 1.30% |
| 2 | 0.036 | 65 | 19.36 | 0.342 | 1.73% |
| 3 | 0.036 | 65 | 19.29 | 0.413 | 2.10% |
| 4 | 0.036 | 65 | 19.23 | 0.471 | 2.39% |
| 5 | 0.036 | 65 | 19.19 | 0.514 | 2.61% |
| 6 | 0.036 | 65 | 19.16 | 0.543 | 2.75% |
| 7 | 0.036 | 65 | 19.14 | 0.557 | 2.83% |
| END | | | 19.14 | 0.557 | 2.83% |
| END | | | 19.14 | 0.557 | 2.83% |
| END | | | 19.14 | 0.557 | 2.83% |
| END | | | 19.14 | 0.557 | 2.83% |
| END | | | 19.14 | 0.557 | 2.83% |
| END | | | 19.14 | 0.557 | 2.83% |
| END | | | 19.14 | 0.557 | 2.83% |
| END | | | 19.14 | 0.557 | 2.83% |
| END | | | 19.14 | 0.557 | 2.83% |
| END | | | 19.14 | 0.557 | 2.83% |
| END | | | 19.14 | 0.557 | 2.83% |
| END | | | 19.14 | 0.557 | 2.83% |
| END | | | 19.14 | 0.557 | 2.83% |
| END | | | 19.14 | 0.557 | 2.83% |
| END | | | 19.14 | 0.557 | 2.83% |
| Totals | 0.252 | 555 | End of Line Voltage | | 19.14 |

**Point to Point Method**

**CIRCUIT IS WITHIN LIMITS**

| Totals | | Voltage |
|---|---|---|
| Current | Distance | Drop |
| 0.252 | 555 | **0.56** |
| End of Line Voltage | | **19.14** |

Percent Drop 2.83%

End of Line Method uses only the wire guage for the first device to source

Standard Wire Resistance in Ohms per 1000 feet.

18=7.77 16=4.89 14=3.07 12=1.93

18-12 Awg = Solid Conductors

Notes:

Wire resistance is doubled in the calculations for two wires (Positive and Negative)

The voltage calculated to the last device in any method must not be lower than the manufacturers listed minimum operating voltage (IE: rated operating voltage 16-33 VDC).

**Which Method to use?**

**Point-to-Point**: Calculates the load from NAC device to NAC device, but also assumes this is exactly how the circuit is wired. This is the most accurate method of determining a NAC curcuit draw but assumes correct installed distances.

**End of Line**: Calculates the load as if all the NAC devices are located at the end of the circuit (worst case).

**Current Draw @16VDC with High Horn Setting** — ET3,EST — **Edwards Start Voltages** — **Load Factor**

Genesis 3X, 3P5- IO, V5, FX-

| Horn Strobe | Candela | VDC | FWR | | Edwards Start Voltages | | Load Factor |
|---|---|---|---|---|---|---|---|
| G1 | 15 | 0.129 | 0.176 | | IO64, VS1, FX64 | 20.4 | 0.20 |
| G1 | 30 | 0.167 | 0.230 | | IO1000, VS4, FX1000 | 20.4 | 0.24 |
| G1 | 75 | 0.281 | 0.397 | | BPS/APS boosters | 19.7 | 0.59 |
| G1 | 110 | 0.337 | 0.443 | | ET3 | 20.4 | 0.37 |
| New! G1 LED | 15, 30 or 75 | 0.045 | 0.055 | | ET3TX or VM | 22.4 | 0.00 |
| New! G4LED | 15,30,75,110 | 0.050 | 0.060 | | FX5 | 20.4 | 0.40 |
| New! GCLED | 15,30,75,115 | 0.060 | 0.075 | | FX10 | 20.4 | 0.20 |
| | | | | | ET4 | 20.4 | 0.37 |

Genesis

Strobe

| | | |
|---|---|---|
| 15 | 0.103 | 0.125 |
| 30 | 0.141 | 0.179 |
| 75 | 0.255 | 0.346 |
| 110 | 0.311 | 0.392 |
| New! G1 LED 15, 30 or 75 | 0.024 | 0.032 |
| New! G4LED 15,30,75,110 | 0.028 | 0.036 |
| New! GCLED 15,30,75,115 | 0.035 | 0.045 |

| | |
|---|---|
| Project Name | QTS DEN1 DC2 |
| Date | 7/4/2025 |
| Circuit Number | V15-SPARE |
| Area Covered | 1st level |
| Nominal System Voltage | 19.7 See chart |
| Minimum Device Voltage | 16 |
| Load Factor | See chart |
| Starting voltage w/ load factor | 19.7 |
| Total Circuit Current | 0.000 |

Wire Gauge / Per 1000

| | | | |
|---|---|---|---|
| Distance from source to 1st device | 0 | 14 | 3.07 |
| Wire Gauge for balance of circuit | | 14 | 3.07 |

Enter current in amps / .045 = 45 ma

| Device Number | Device Current | Distance from previous device | At Device | Voltage Drop from source | Percent Drop |
|---|---|---|---|---|---|
| END | | | 19.70 | 0.000 | 0.00% |
| END | | | 19.70 | 0.000 | 0.00% |
| END | | | 19.70 | 0.000 | 0.00% |
| END | | | 19.70 | 0.000 | 0.00% |
| END | | | 19.70 | 0.000 | 0.00% |
| END | | | 19.70 | 0.000 | 0.00% |
| END | | | 19.70 | 0.000 | 0.00% |
| END | | | 19.70 | 0.000 | 0.00% |
| | | | | | |
| END | | | 19.70 | 0.000 | 0.00% |
| END | | | 19.70 | 0.000 | 0.00% |
| END | | | 19.70 | 0.000 | 0.00% |
| END | | | 19.70 | 0.000 | 0.00% |
| END | | | 19.70 | 0.000 | 0.00% |
| END | | | 19.70 | 0.000 | 0.00% |
| END | | | 19.70 | 0.000 | 0.00% |
| END | | | 19.70 | 0.000 | 0.00% |
| END | | | 19.70 | 0.000 | 0.00% |
| | | | | | |
| END | | | 19.70 | 0.000 | 0.00% |
| END | | | 19.70 | 0.000 | 0.00% |
| END | | | 19.70 | 0.000 | 0.00% |
| END | | | 19.70 | 0.000 | 0.00% |
| END | | | 19.70 | 0.000 | 0.00% |
| END | | | 19.70 | 0.000 | 0.00% |
| END | | | 19.70 | 0.000 | 0.00% |
| END | | | 19.70 | 0.000 | 0.00% |
| END | | | 19.70 | 0.000 | 0.00% |
| Totals | 0.000 | 0 | End of Line Voltage | | 19.70 |

**Point to Point Method**

**CIRCUIT IS WITHIN LIMITS**

| Totals | | Voltage |
|---|---|---|
| Current | Distance | Drop |
| 0.000 | 0 | **0.00** |
| End of Line Voltage | | **19.70** |

Percent Drop 0.00%

End of Line Method uses only the wire guage for the first device to source

Standard Wire Resistance in Ohms per 1000 feet.

18=7.77 16=4.89 14=3.07 12=1.93

18-12 Awg = Solid Conductors

Notes:

Wire resistance is doubled in the calculations for two wires (Positive and Negative)

The voltage calculated to the last device in any method must not be lower than the manufacturers listed minimum operating voltage (IE: rated operating voltage 16-33 VDC).

**Which Method to use?**

**Point-to-Point**: Calculates the load from NAC device to NAC device, but also assumes this is exactly how the circuit is wired. This is the most accurate method of determining a NAC curcuit draw but assumes correct installed distances.

**End of Line**: Calculates the load as if all the NAC devices are located at the end of the circuit (worst case).

**Current Draw @16VDC with High Horn Setting** — ET3,EST — **Edwards Start Voltages** — **Load Factor**

Genesis 3X, 3P5- IO, V5, FX-

| Horn Strobe | Candela | VDC | FWR | | Edwards Start Voltages | | Load Factor |
|---|---|---|---|---|---|---|---|
| G1 | 15 | 0.129 | 0.176 | | IO64, VS1, FX64 | 20.4 | 0.20 |
| G1 | 30 | 0.167 | 0.230 | | IO1000, VS4, FX1000 | 20.4 | 0.24 |
| G1 | 75 | 0.281 | 0.397 | | BPS/APS boosters | 19.7 | 0.59 |
| G1 | 110 | 0.337 | 0.443 | | ET3 | 20.4 | 0.37 |
| New! G1 LED | 15, 30 or 75 | 0.045 | 0.055 | | ET3TX or VM | 22.4 | 0.00 |
| New! G4LED | 15,30,75,110 | 0.050 | 0.060 | | FX5 | 20.4 | 0.40 |
| New! GCLED | 15,30,75,115 | 0.060 | 0.075 | | FX10 | 20.4 | 0.20 |
| | | | | | ET4 | 20.4 | 0.37 |

Genesis

Strobe

| | | |
|---|---|---|
| 15 | 0.103 | 0.125 |
| 30 | 0.141 | 0.179 |
| 75 | 0.255 | 0.346 |
| 110 | 0.311 | 0.392 |
| New! G1 LED 15, 30 or 75 | 0.024 | 0.032 |
| New! G4LED 15,30,75,110 | 0.028 | 0.036 |
| New! GCLED 15,30,75,115 | 0.035 | 0.045 |

| | |
|---|---|
| Project Name | QTS DEN1 DC2 |
| Date | 7/4/2025 |
| Circuit Number | V16-SPARE |
| Area Covered | 1st level |
| Nominal System Voltage | 19.7 See chart |
| Minimum Device Voltage | 16 |
| Load Factor | See chart |
| Starting voltage w/ load factor | 19.7 |
| Total Circuit Current | 0.000 |

Wire Gauge / Per 1000

| | | | |
|---|---|---|---|
| Distance from source to 1st device | 0 | 14 | 3.07 |
| Wire Gauge for balance of circuit | | 14 | 3.07 |

Enter current in amps / .045 = 45 ma

| Device Number | Device Current | Distance from previous device | At Device | Voltage Drop from source | Percent Drop |
|---|---|---|---|---|---|
| END | | | 19.70 | 0.000 | 0.00% |
| END | | | 19.70 | 0.000 | 0.00% |
| END | | | 19.70 | 0.000 | 0.00% |
| END | | | 19.70 | 0.000 | 0.00% |
| END | | | 19.70 | 0.000 | 0.00% |
| END | | | 19.70 | 0.000 | 0.00% |
| END | | | 19.70 | 0.000 | 0.00% |
| END | | | 19.70 | 0.000 | 0.00% |
| | | | | | |
| END | | | 19.70 | 0.000 | 0.00% |
| END | | | 19.70 | 0.000 | 0.00% |
| END | | | 19.70 | 0.000 | 0.00% |
| END | | | 19.70 | 0.000 | 0.00% |
| END | | | 19.70 | 0.000 | 0.00% |
| END | | | 19.70 | 0.000 | 0.00% |
| END | | | 19.70 | 0.000 | 0.00% |
| END | | | 19.70 | 0.000 | 0.00% |
| END | | | 19.70 | 0.000 | 0.00% |
| | | | | | |
| END | | | 19.70 | 0.000 | 0.00% |
| END | | | 19.70 | 0.000 | 0.00% |
| END | | | 19.70 | 0.000 | 0.00% |
| END | | | 19.70 | 0.000 | 0.00% |
| END | | | 19.70 | 0.000 | 0.00% |
| END | | | 19.70 | 0.000 | 0.00% |
| END | | | 19.70 | 0.000 | 0.00% |
| END | | | 19.70 | 0.000 | 0.00% |
| END | | | 19.70 | 0.000 | 0.00% |
| Totals | 0.000 | 0 | End of Line Voltage | | 19.70 |

**Point to Point Method**

**CIRCUIT IS WITHIN LIMITS**

| Totals | | Voltage |
|---|---|---|
| Current | Distance | Drop |
| 0.000 | 0 | **0.00** |
| End of Line Voltage | | **19.70** |

Percent Drop 0.00%

End of Line Method uses only the wire guage for the first device to source

Standard Wire Resistance in Ohms per 1000 feet.

18=7.77 16=4.89 14=3.07 12=1.93

18-12 Awg = Solid Conductors

Notes:

Wire resistance is doubled in the calculations for two wires (Positive and Negative)

The voltage calculated to the last device in any method must not be lower than the manufacturers listed minimum operating voltage (IE: rated operating voltage 16-33 VDC).

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**Current Draw @16VDC with High Horn Setting** — ET3,EST — **Edwards Start Voltages** — **Load Factor**

Genesis 3X, 3P5- IO, V5, FX-

| Horn Strobe | Candela | VDC | FWR | | Edwards Start Voltages | | Load Factor |
|---|---|---|---|---|---|---|---|
| G1 | 15 | 0.129 | 0.176 | | IO64, VS1, FX64 | 20.4 | 0.20 |
| G1 | 30 | 0.167 | 0.230 | | IO1000, VS4, FX1000 | 20.4 | 0.24 |
| G1 | 75 | 0.281 | 0.397 | | BPS/APS boosters | 19.7 | 0.59 |
| G1 | 110 | 0.337 | 0.443 | | ET3 | 20.4 | 0.37 |
| New! G1 LED | 15, 30 or 75 | 0.045 | 0.055 | | ET3TX or VM | 22.4 | 0.00 |
| New! G4LED | 15,30,75,110 | 0.050 | 0.060 | | FX5 | 20.4 | 0.40 |
| New! GCLED | 15,30,75,115 | 0.060 | 0.075 | | FX10 | 20.4 | 0.20 |
| | | | | | ET4 | 20.4 | 0.37 |

Genesis

Strobe

| | | |
|---|---|---|
| 15 | 0.103 | 0.125 |
| 30 | 0.141 | 0.179 |
| 75 | 0.255 | 0.346 |
| 110 | 0.311 | 0.392 |
| New! G1 LED 15, 30 or 75 | 0.024 | 0.032 |
| New! G4LED 15,30,75,110 | 0.028 | 0.036 |
| New! GCLED 15,30,75,115 | 0.035 | 0.045 |

| | |
|---|---|
| Project Name | QTS DEN1 DC2 |
| Date | 7/4/2025 |
| Circuit Number | V17-SPARE |
| Area Covered | 1st level |
| Nominal System Voltage | 19.7 See chart |
| Minimum Device Voltage | 16 |
| Load Factor | See chart |
| Starting voltage w/ load factor | 19.7 |
| Total Circuit Current | 0.000 |

Wire Gauge / Per 1000

| | | | |
|---|---|---|---|
| Distance from source to 1st device | 0 | 14 | 3.07 |
| Wire Gauge for balance of circuit | | 14 | 3.07 |

Enter current in amps / .045 = 45 ma

| Device Number | Device Current | Distance from previous device | At Device | Voltage Drop from source | Percent Drop |
|---|---|---|---|---|---|
| END | | | 19.70 | 0.000 | 0.00% |
| END | | | 19.70 | 0.000 | 0.00% |
| END | | | 19.70 | 0.000 | 0.00% |
| END | | | 19.70 | 0.000 | 0.00% |
| END | | | 19.70 | 0.000 | 0.00% |
| END | | | 19.70 | 0.000 | 0.00% |
| END | | | 19.70 | 0.000 | 0.00% |
| END | | | 19.70 | 0.000 | 0.00% |
| | | | | | |
| END | | | 19.70 | 0.000 | 0.00% |
| END | | | 19.70 | 0.000 | 0.00% |
| END | | | 19.70 | 0.000 | 0.00% |
| END | | | 19.70 | 0.000 | 0.00% |
| END | | | 19.70 | 0.000 | 0.00% |
| END | | | 19.70 | 0.000 | 0.00% |
| END | | | 19.70 | 0.000 | 0.00% |
| END | | | 19.70 | 0.000 | 0.00% |
| END | | | 19.70 | 0.000 | 0.00% |
| | | | | | |
| END | | | 19.70 | 0.000 | 0.00% |
| END | | | 19.70 | 0.000 | 0.00% |
| END | | | 19.70 | 0.000 | 0.00% |
| END | | | 19.70 | 0.000 | 0.00% |
| END | | | 19.70 | 0.000 | 0.00% |
| END | | | 19.70 | 0.000 | 0.00% |
| END | | | 19.70 | 0.000 | 0.00% |
| END | | | 19.70 | 0.000 | 0.00% |
| END | | | 19.70 | 0.000 | 0.00% |
| Totals | 0.000 | 0 | End of Line Voltage | | 19.70 |

**Point to Point Method**

**CIRCUIT IS WITHIN LIMITS**

| Totals | | Voltage |
|---|---|---|
| Current | Distance | Drop |
| 0.000 | 0 | **0.00** |
| End of Line Voltage | | **19.70** |

Percent Drop 0.00%

End of Line Method uses only the wire guage for the first device to source

Standard Wire Resistance in Ohms per 1000 feet.

18=7.77 16=4.89 14=3.07 12=1.93

18-12 Awg = Solid Conductors

Notes:

Wire resistance is doubled in the calculations for two wires (Positive and Negative)

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Genesis 3X, 3P5- IO, V5, FX-

| Horn Strobe | Candela | VDC | FWR | | Edwards Start Voltages | | Load Factor |
|---|---|---|---|---|---|---|---|
| G1 | 15 | 0.129 | 0.176 | | IO64, VS1, FX64 | 20.4 | 0.20 |
| G1 | 30 | 0.167 | 0.230 | | IO1000, VS4, FX1000 | 20.4 | 0.24 |
| G1 | 75 | 0.281 | 0.397 | | BPS/APS boosters | 19.7 | 0.59 |
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| New! GCLED | 15,30,75,115 | 0.060 | 0.075 | | FX10 | 20.4 | 0.20 |
| | | | | | ET4 | 20.4 | 0.37 |

Genesis

Strobe

| | | |
|---|---|---|
| 15 | 0.103 | 0.125 |
| 30 | 0.141 | 0.179 |
| 75 | 0.255 | 0.346 |
| 110 | 0.311 | 0.392 |
| New! G1 LED 15, 30 or 75 | 0.024 | 0.032 |
| New! G4LED 15,30,75,110 | 0.028 | 0.036 |
| New! GCLED 15,30,75,115 | 0.035 | 0.045 |

| | |
|---|---|
| Project Name | QTS DEN1 DC2 |
| Date | 7/4/2025 |
| Circuit Number | V18 |
| Area Covered | 1st level |
| Nominal System Voltage | 19.7 See chart |
| Minimum Device Voltage | 16 |
| Load Factor | See chart |
| Starting voltage w/ load factor | 19.7 |
| Total Circuit Current | 0.288 |

Wire Gauge / Per 1000

| | | | |
|---|---|---|---|
| Distance from source to 1st device | 80 | 14 | 3.07 |
| Wire Gauge for balance of circuit | | 14 | 3.07 |

Enter current in amps / .045 = 45 ma

| Device Number | Device Current | Distance from previous device | At Device | Voltage Drop from source | Percent Drop |
|---|---|---|---|---|---|
| 1 | 0.036 | 80 | 19.56 | 0.141 | 0.72% |
| 2 | 0.036 | 65 | 19.46 | 0.242 | 1.23% |
| 3 | 0.036 | 65 | 19.37 | 0.328 | 1.67% |
| 4 | 0.036 | 65 | 19.30 | 0.400 | 2.03% |
| 5 | 0.036 | 65 | 19.24 | 0.458 | 2.32% |
| 6 | 0.036 | 65 | 19.20 | 0.501 | 2.54% |
| 7 | 0.036 | 40 | 19.18 | 0.518 | 2.63% |
| 8 | 0.036 | 55 | 19.17 | 0.530 | 2.69% |
| | | | | | |
| END | | | 19.17 | 0.530 | 2.69% |
| END | | | 19.17 | 0.530 | 2.69% |
| END | | | 19.17 | 0.530 | 2.69% |
| END | | | 19.17 | 0.530 | 2.69% |
| END | | | 19.17 | 0.530 | 2.69% |
| END | | | 19.17 | 0.530 | 2.69% |
| END | | | 19.17 | 0.530 | 2.69% |
| | | | | | |
| END | | | 19.17 | 0.530 | 2.69% |
| END | | | 19.17 | 0.530 | 2.69% |
| END | | | 19.17 | 0.530 | 2.69% |
| END | | | 19.17 | 0.530 | 2.69% |
| END | | | 19.17 | 0.530 | 2.69% |
| END | | | 19.17 | 0.530 | 2.69% |
| END | | | 19.17 | 0.530 | 2.69% |
| END | | | 19.17 | 0.530 | 2.69% |
| END | | | 19.17 | 0.530 | 2.69% |
| Totals | 0.288 | 500 | End of Line Voltage | | 19.17 |

**Point to Point Method**

**CIRCUIT IS WITHIN LIMITS**

| Totals | | Voltage |
|---|---|---|
| Current | Distance

| | |
|---|---|
| Project Name | Q7S DEN1 DC2 |
| Date | 7/4/2025 |
| Circuit Number | V21 |
| Area Covered | 2nd Level |
| Nominal System Voltage | 19.7 See chart |
| Minimum Device Voltage | 16 |
| Load Factor | See chart |
| Starting voltage w/ load factor | 19.7 |
| Total Circuit Current | 0.702 |

| | Wire Gauge | Ohm's Per 1000 |
|---|---|---|
| Distance from source to 1st device | 45 | 14 3.07 |
| Wire Gauge for balance of circuit | | 14 3.07 |

Point to Point Method

CIRCUIT IS WITHIN LIMITS

| Totals | Voltage |
|---|---|
| Current Distance | Drop |
| 0.702 870 | **1.91** |
| End of Line Voltage | **17.79** |

Percent Drop 9.71%

End of Line Method uses only the wire guage for the first device to source

Standard Wire Resistance in Ohms per 1000 feet.

| 18-7.77 | 16-4.89 | 14-3.07 | 12-1.93 |
|---|---|---|---|

18-12 Awg = Solid Conductors

Enter current in amps. .045 = 45 ma

| Device Number | Device Current | Distance from previous device | Voltage At Device | Voltage Drop from source | Voltage Percent Drop |
|---|---|---|---|---|---|
| 1 | 0.036 | 45 | 19.51 | 0.194 | 0.98% |
| 2 | 0.045 | 40 | 19.34 | 0.358 | 1.81% |
| 3 | 0.045 | 40 | 19.19 | 0.510 | 2.59% |
| 4 | 0.045 | 55 | 19.00 | 0.705 | 3.58% |
| 5 | 0.045 | 45 | 18.85 | 0.851 | 4.32% |
| 6 | 0.036 | 65 | 18.65 | 1.045 | 5.31% |
| 7 | 0.036 | 55 | 18.50 | 1.197 | 6.08% |
| 8 | 0.036 | 55 | 18.36 | 1.337 | 6.79% |
| 9 | 0.036 | 40 | 18.27 | 1.430 | 7.26% |
| 10 | 0.045 | 40 | 18.13 | 1.574 | 7.68% |
| 11 | 0.045 | 55 | 18.00 | 1.614 | 8.19% |
| 12 | 0.045 | 65 | 17.99 | 1.715 | 8.70% |
| 13 | 0.045 | 55 | 17.92 | 1.785 | 9.06% |
| 14 | 0.036 | 35 | 17.88 | 1.819 | 9.24% |
| 15 | 0.036 | 50 | 17.84 | 1.858 | 9.43% |
| 16 | 0.045 | 65 | 17.81 | 1.894 | 9.61% |
| 17 | 0.045 | 65 | 17.79 | 1.912 | 9.71% |
| END | | | 17.79 | 1.912 | 9.71% |
| END | | | 17.79 | 1.912 | 9.71% |
| END | | | 17.79 | 1.912 | 9.71% |
| END | | | 17.79 | 1.912 | 9.71% |
| END | | | 17.79 | 1.912 | 9.71% |
| END | | | 17.79 | 1.912 | 9.71% |
| END | | | 17.79 | 1.912 | 9.71% |
| END | | | 17.79 | 1.912 | 9.71% |
| END | | | 17.79 | 1.912 | 9.71% |
| Totals | 0.702 | 870 | End of Line Voltage | | **17.79** |

Notes:

Wire resistance is doubled in the calculations for two wires (Positive and Negative)

The voltage calculated to the last device in any method must not be lower than the manufacturers listed minimum operating voltage (IE: rated operating voltage 16-33 VDC).

**Which Method to use?**

**Point-to-Point**: Calculates the load from NAC device to NAC device, but also assumes this is exactly how the circuit is wired. This is the most accurate method of determining a NAC curcuit draw but assumes correct installed distances.

**End of Line**: Calculates the load as if all the NAC devices are located at the end of the circuit (worst case).

Current Draw @ L6VDC with High Horn Setting — Edwards Start Voltages — Load Factor

ET3,ET

Genesis 3X, BPS - IO, VS, FX-

| Horn Strobe | Candela | VDC | FWR | | | |
|---|---|---|---|---|---|---|
| G1 | 15 | 0.129 | 0.176 | IO1000, VS4, FX1000 | 20.4 | 0.20 |
| G1 | 30 | 0.167 | 0.230 | BPS/APS boosters | 19.7 | 0.59 |
| G1 | 75 | 0.281 | 0.397 | ET3 | 20.4 | 0.37 |
| G1 | 110 | 0.337 | 0.443 | ET3TX or VM | 22.4 | 0.00 |
| New! G1 LED | 15, 30 or 75 | 0.045 | 0.055 | FX5 | 20.4 | 0.40 |
| New! G4LED | 15,30,75,110 | 0.050 | 0.060 | FX10 | 20.4 | 0.20 |
| New! GCLED | 15,30,75,115 | 0.060 | 0.075 | ET4 | 20.4 | 0.37 |

Genesis

Strobe

| | | |
|---|---|---|
| 15 | 0.103 | 0.125 |
| 30 | 0.141 | 0.179 |
| 75 | 0.255 | 0.346 |
| 110 | 0.311 | 0.392 |
| New! G1 LED 15, 30 or 75 | 0.024 | 0.032 |
| New! G4LED 15,30,75,110 | 0.028 | 0.036 |
| New! GCLED 15,30,75,115 | 0.035 | 0.045 |

| | |
|---|---|
| Project Name | Q7S DEN1 DC2 |
| Date | 7/4/2025 |
| Circuit Number | V22 |
| Area Covered | 2nd Level |
| Nominal System Voltage | 19.7 See chart |
| Minimum Device Voltage | 16 |
| Load Factor | See chart |
| Starting voltage w/ load factor | 19.7 |
| Total Circuit Current | 0.540 |

| | Wire Gauge | Ohm's Per 1000 |
|---|---|---|
| Distance from source to 1st device | 40 | 14 3.07 |
| Wire Gauge for balance of circuit | | 14 3.07 |

Point to Point Method

CIRCUIT IS WITHIN LIMITS

| Totals | Voltage |
|---|---|
| Current Distance | Drop |
| 0.540 720 | **1.22** |
| End of Line Voltage | **18.48** |

Percent Drop 6.18%

End of Line Method uses only the wire guage for the first device to source

Standard Wire Resistance in Ohms per 1000 feet.

| 18-7.77 | 16-4.89 | 14-3.07 | 12-1.93 |
|---|---|---|---|

18-12 Awg = Solid Conductors

Enter current in amps. .045 = 45 ma

| Device Number | Device Current | Distance from previous device | Voltage At Device | Voltage Drop from source | Voltage Percent Drop |
|---|---|---|---|---|---|
| 1 | 0.036 | 40 | 19.57 | 0.133 | 0.67% |
| 2 | 0.036 | 35 | 19.45 | 0.241 | 1.22% |
| 3 | 0.036 | 40 | 19.34 | 0.356 | 1.81% |
| 4 | 0.036 | 55 | 19.20 | 0.502 | 2.55% |
| 5 | 0.036 | 45 | 19.09 | 0.611 | 3.10% |
| 6 | 0.045 | 65 | 18.95 | 0.755 | 3.83% |
| 7 | 0.036 | 55 | 18.84 | 0.861 | 4.37% |
| 8 | 0.036 | 55 | 18.74 | 0.955 | 4.85% |
| 9 | 0.045 | 45 | 18.68 | 1.023 | 5.19% |
| 10 | 0.045 | 50 | 18.62 | 1.083 | 5.50% |
| 11 | 0.045 | 55 | 18.56 | 1.135 | 5.76% |
| 12 | 0.036 | 65 | 18.52 | 1.178 | 5.98% |
| 13 | 0.036 | 65 | 18.49 | 1.207 | 6.13% |
| 14 | 0.036 | 50 | 18.48 | 1.218 | 6.18% |
| END | | | 18.48 | 1.218 | 6.18% |
| END | | | 18.48 | 1.218 | 6.18% |
| END | | | 18.48 | 1.218 | 6.18% |
| END | | | 18.48 | 1.218 | 6.18% |
| END | | | 18.48 | 1.218 | 6.18% |
| END | | | 18.48 | 1.218 | 6.18% |
| END | | | 18.48 | 1.218 | 6.18% |
| END | | | 18.48 | 1.218 | 6.18% |
| END | | | 18.48 | 1.218 | 6.18% |
| END | | | 18.48 | 1.218 | 6.18% |
| END | | | 18.48 | 1.218 | 6.18% |
| END | | | 18.48 | 1.218 | 6.18% |
| Totals | 0.540 | 720 | End of Line Voltage | | **18.48** |

Notes:

Wire resistance is doubled in the calculations for two wires (Positive and Negative)

The voltage calculated to the last device in any method must not be lower than the manufacturers listed minimum operating voltage (IE: rated operating voltage 16-33 VDC).

**Which Method to use?**

**Point-to-Point**: Calculates the load from NAC device to NAC device, but also assumes this is exactly how the circuit is wired. This is the most accurate method of determining a NAC curcuit draw but assumes correct installed distances.

**End of Line**: Calculates the load as if all the NAC devices are located at the end of the circuit (worst case).

Current Draw @ L6VDC with High Horn Setting — Edwards Start Voltages — Load Factor

ET3,ET

Genesis 3X, BPS - IO, VS, FX-

| Horn Strobe | Candela | VDC | FWR | | | |
|---|---|---|---|---|---|---|
| G1 | 15 | 0.129 | 0.176 | IO1000, VS4, FX1000 | 20.4 | 0.20 |
| G1 | 30 | 0.167 | 0.230 | BPS/APS boosters | 19.7 | 0.59 |
| G1 | 75 | 0.281 | 0.397 | ET3 | 20.4 | 0.37 |
| G1 | 110 | 0.337 | 0.443 | ET3TX or VM | 22.4 | 0.00 |
| New! G1 LED | 15, 30 or 75 | 0.045 | 0.055 | FX5 | 20.4 | 0.40 |
| New! G4LED | 15,30,75,110 | 0.050 | 0.060 | FX10 | 20.4 | 0.20 |
| New! GCLED | 15,30,75,115 | 0.060 | 0.075 | ET4 | 20.4 | 0.37 |

Genesis

Strobe

| | | |
|---|---|---|
| 15 | 0.103 | 0.125 |
| 30 | 0.141 | 0.179 |
| 75 | 0.255 | 0.346 |
| 110 | 0.311 | 0.392 |
| New! G1 LED 15, 30 or 75 | 0.024 | 0.032 |
| New! G4LED 15,30,75,110 | 0.028 | 0.036 |
| New! GCLED 15,30,75,115 | 0.035 | 0.045 |

| | |
|---|---|
| Project Name | Q7S DEN1 DC2 |
| Date | 7/4/2025 |
| Circuit Number | V23 |
| Area Covered | 2nd Level |
| Nominal System Voltage | 19.7 See chart |
| Minimum Device Voltage | 16 |
| Load Factor | See chart |
| Starting voltage w/ load factor | 19.7 |
| Total Circuit Current | 0.576 |

| | Wire Gauge | Ohm's Per 1000 |
|---|---|---|
| Distance from source to 1st device | 28 | 14 3.07 |
| Wire Gauge for balance of circuit | | 14 3.07 |

Point to Point Method

CIRCUIT IS WITHIN LIMITS

| Totals | Voltage |
|---|---|
| Current Distance | Drop |
| 0.576 678 | **1.26** |
| End of Line Voltage | **18.44** |

Percent Drop 6.39%

End of Line Method uses only the wire guage for the first device to source

Standard Wire Resistance in Ohms per 1000 feet.

| 18-7.77 | 16-4.89 | 14-3.07 | 12-1.93 |
|---|---|---|---|

18-12 Awg = Solid Conductors

Enter current in amps. .045 = 45 ma

| Device Number | Device Current | Distance from previous device | Voltage At Device | Voltage Drop from source | Voltage Percent Drop |
|---|---|---|---|---|---|
| 1 | 0.036 | 28 | 19.60 | 0.099 | 0.50% |
| 2 | 0.036 | 40 | 19.47 | 0.232 | 1.18% |
| 3 | 0.045 | 45 | 19.33 | 0.371 | 1.88% |
| 4 | 0.045 | 55 | 19.17 | 0.526 | 2.67% |
| 5 | 0.045 | 65 | 19.01 | 0.691 | 3.51% |
| 6 | 0.036 | 40 | 18.92 | 0.782 | 3.97% |
| 7 | 0.036 | 65 | 18.79 | 0.915 | 4.64% |
| 8 | 0.036 | 55 | 18.72 | 0.978 | 4.97% |
| 9 | 0.036 | 40 | 18.66 | 1.043 | 5.29% |
| 10 | 0.036 | 45 | 18.60 | 1.105 | 5.61% |
| 11 | 0.036 | 40 | 18.55 | 1.151 | 5.84% |
| 12 | 0.036 | 40 | 18.51 | 1.189 | 6.03% |
| 13 | 0.036 | 40 | 18.48 | 1.217 | 6.18% |
| 14 | 0.036 | 65 | 18.45 | 1.250 | 6.34% |
| 15 | 0.045 | 35 | 18.44 | 1.259 | 6.39% |
| END | | | 18.44 | 1.259 | 6.39% |
| END | | | 18.44 | 1.259 | 6.39% |
| END | | | 18.44 | 1.259 | 6.39% |
| END | | | 18.44 | 1.259 | 6.39% |
| END | | | 18.44 | 1.259 | 6.39% |
| END | | | 18.44 | 1.259 | 6.39% |
| END | | | 18.44 | 1.259 | 6.39% |
| END | | | 18.44 | 1.259 | 6.39% |
| END | | | 18.44 | 1.259 | 6.39% |
| END | | | 18.44 | 1.259 | 6.39% |
| END | | | 18.44 | 1.259 | 6.39% |
| END | | | 18.44 | 1.259 | 6.39% |
| Totals | 0.576 | 678 | End of Line Voltage | | **18.44** |

Notes:

Wire resistance is doubled in the calculations for two wires (Positive and Negative)

The voltage calculated to the last device in any method must not be lower than the manufacturers listed minimum operating voltage (IE: rated operating voltage 16-33 VDC).

**Which Method to use?**

**Point-to-Point**: Calculates the load from NAC device to NAC device, but also assumes this is exactly how the circuit is wired. This is the most accurate method of determining a NAC curcuit draw but assumes correct installed distances.

**End of Line**: Calculates the load as if all the NAC devices are located at the end of the circuit (worst case).

Current Draw @ L6VDC with High Horn Setting — Edwards Start Voltages — Load Factor

ET3,ET

Genesis 3X, BPS - IO, VS, FX-

| Horn Strobe | Candela | VDC | FWR | | | |
|---|---|---|---|---|---|---|
| G1 | 15 | 0.129 | 0.176 | IO1000, VS4, FX1000 | 20.4 | 0.20 |
| G1 | 30 | 0.167 | 0.230 | BPS/APS boosters | 19.7 | 0.59 |
| G1 | 75 | 0.281 | 0.397 | ET3 | 20.4 | 0.37 |
| G1 | 110 | 0.337 | 0.443 | ET3TX or VM | 22.4 | 0.00 |
| New! G1 LED | 15, 30 or 75 | 0.045 | 0.055 | FX5 | 20.4 | 0.40 |
| New! G4LED | 15,30,75,110 | 0.050 | 0.060 | FX10 | 20.4 | 0.20 |
| New! GCLED | 15,30,75,115 | 0.060 | 0.075 | ET4 | 20.4 | 0.37 |

Genesis

Strobe

| | | |
|---|---|---|
| 15 | 0.103 | 0.125 |
| 30 | 0.141 | 0.179 |
| 75 | 0.255 | 0.346 |
| 110 | 0.311 | 0.392 |
| New! G1 LED 15, 30 or 75 | 0.024 | 0.032 |
| New! G4LED 15,30,75,110 | 0.028 | 0.036 |
| New! GCLED 15,30,75,115 | 0.035 | 0.045 |

| | |
|---|---|
| Project Name | Q7S DEN1 DC2 |
| Date | 7/4/2025 |
| Circuit Number | V24 |
| Area Covered | 2nd Level |
| Nominal System Voltage | 19.7 See chart |
| Minimum Device Voltage | 16 |
| Load Factor | See chart |
| Starting voltage w/ load factor | 19.7 |
| Total Circuit Current | 0.324 |

| | Wire Gauge | Ohm's Per 1000 |
|---|---|---|
| Distance from source to 1st device | 207 | 14 3.07 |
| Wire Gauge for balance of circuit | | 14 3.07 |

Point to Point Method

CIRCUIT IS WITHIN LIMITS

| Totals | Voltage |
|---|---|
| Current Distance | Drop |
| 0.324 742 | **0.95** |
| End of Line Voltage | **18.75** |

Percent Drop 4.84%

End of Line Method uses only the wire guage for the first device to source

Standard Wire Resistance in Ohms per 1000 feet.

| 18-7.77 | 16-4.89 | 14-3.07 | 12-1.93 |
|---|---|---|---|

18-12 Awg = Solid Conductors

Enter current in amps. .045 = 45 ma

| Device Number | Device Current | Distance from previous device | Voltage At Device | Voltage Drop from source | Voltage Percent Drop |
|---|---|---|---|---|---|
| 1 | 0.036 | 207 | 19.29 | 0.412 | 2.09% |
| 2 | 0.036 | 75 | 19.16 | 0.544 | 2.76% |
| 3 | 0.036 | 70 | 19.05 | 0.653 | 3.31% |
| 4 | 0.036 | 65 | 18.96 | 0.739 | 3.75% |
| 5 | 0.036 | 65 | 18.89 | 0.811 | 4.12% |
| 6 | 0.036 | 65 | 18.83 | 0.868 | 4.41% |
| 7 | 0.036 | 65 | 18.79 | 0.911 | 4.63% |
| 8 | 0.036 | 65 | 18.76 | 0.940 | 4.77% |
| 9 | 0.036 | 65 | 18.75 | 0.954 | 4.84% |
| END | | | 18.75 | 0.954 | 4.84% |
| END | | | 18.75 | 0.954 | 4.84% |
| END | | | 18.75 | 0.954 | 4.84% |
| END | | | 18.75 | 0.954 | 4.84% |
| END | | | 18.75 | 0.954 | 4.84% |
| END | | | 18.75 | 0.954 | 4.84% |
| END | | | 18.75 | 0.954 | 4.84% |
| END | | | 18.75 | 0.954 | 4.84% |
| END | | | 18.75 | 0.954 | 4.84% |
| END | | | 18.75 | 0.954 | 4.84% |
| END | | | 18.75 | 0.954 | 4.84% |
| END | | | 18.75 | 0.954 | 4.84% |
| END | | | 18.75 | 0.954 | 4.84% |
| Totals | 0.324 | 742 | End of Line Voltage | | **18.75** |

Notes:

Wire resistance is doubled in the calculations for two wires (Positive and Negative)

The voltage calculated to the last device in any method must not be lower than the manufacturers listed minimum operating voltage (IE: rated operating voltage 16-33 VDC).

**Which Method to use?**

**Point-to-Point**: Calculates the load from NAC device to NAC device, but also assumes this is exactly how the circuit is wired. This is the most accurate method of determining a NAC curcuit draw but assumes correct installed distances.

**End of Line**: Calculates the load as if all the NAC devices are located at the end of the circuit (worst case).

Current Draw @ L6VDC with High Horn Setting — Edwards Start Voltages — Load Factor

ET3,ET

Genesis 3X, BPS - IO, VS, FX-

| Horn Strobe | Candela | VDC | FWR | | | |
|---|---|---|---|---|---|---|
| G1 | 15 | 0.129 | 0.176 | IO1000, VS4, FX1000 | 20.4 | 0.20 |
| G1 | 30 | 0.167 | 0.230 | BPS/APS boosters | 19.7 | 0.59 |
| G1 | 75 | 0.281 | 0.397 | ET3 | 20.4 | 0.37 |
| G1 | 110 | 0.337 | 0.443 | ET3TX or VM | 22.4 | 0.00 |
| New! G1 LED | 15, 30 or 75 | 0.045 | 0.055 | FX5 | 20.4 | 0.40 |
| New! G4LED | 15,30,75,110 | 0.050 | 0.060 | FX10 | 20.4 | 0.20 |
| New! GCLED | 15,30,75,115 | 0.060 | 0.075 | ET4 | 20.4 | 0.37 |

Genesis

Strobe

| | | |
|---|---|---|
| 15 | 0.103 | 0.125 |
| 30 | 0.141 | 0.179 |
| 75 | 0.255 | 0.346 |
| 110 | 0.311 | 0.392 |
| New! G1 LED 15, 30 or 75 | 0.024 | 0.032 |
| New! G4LED 15,30,75,110 | 0.028 | 0.036 |
| New! GCLED 15,30,75,115 | 0.035 | 0.045 |

| | |
|---|---|
| Project Name | Q7S DEN1 DC2 |
| Date | 7/4/2025 |
| Circuit Number | V25-SPARE |
| Area Covered | 2nd Level |
| Nominal System Voltage | 19.7 See chart |
| Minimum Device Voltage | 16 |
| Load Factor | See chart |
| Starting voltage w/ load factor | 19.7 |
| Total Circuit Current | 0.000 |

| | Wire Gauge | Ohm's Per 1000 |
|---|---|---|
| Distance from source to 1st device | 0 | 14 3.07 |
| Wire Gauge for balance of circuit | | 14 3.07 |

Point to Point Method

CIRCUIT IS WITHIN LIMITS

| Totals | Voltage |
|---|---|
| Current Distance | Drop |
| 0.000 0 | **0.00** |
| End of Line Voltage | **19.70** |

Percent Drop 0.00%

End of Line Method uses only the wire guage for the first device to source

Standard Wire Resistance in Ohms per 1000 feet.

| 18-7.77 | 16-4.89 | 14-3.07 | 12-1.93 |
|---|---|---|---|

18-12 Awg = Solid Conductors

Enter current in amps. .045 = 45 ma

| Device Number | Device Current | Distance from previous device | Voltage At Device | Voltage Drop from source | Voltage Percent Drop |
|---|---|---|---|---|---|
| END | | | 19.70 | 0.000 | 0.00% |
| END | | | 19.70 | 0.000 | 0.00% |
| END | | | 19.70 | 0.000 | 0.00% |

| | |
|---|---|
| Project Name | QTS DEN1 DC2 |
| Date | 7/4/2025 |
| Circuit Number | V31 |
| Area Covered | 2nd Level |
| Nominal System Voltage | 19.7 See chart |
| Minimum Device Voltage | 16 |
| Load Factor | See chart |
| Starting voltage w/ load factor | 19.7 |
| Total Circuit Current | 0.288 |

| | Wire Gauge | Ohm's Per 1000 |
|---|---|---|
| Distance from source to 1st device: 185 | 14 | 3.07 |
| Wire Gauge for balance of circuit | 14 | 3.07 |

18-7.77 16=4.89 14=3.07 12=1.93

18-12 Awg = Solid Conductors

Enter current in amps. .045 = 45 ma

| Device Number | Device Current | Distance from previous device | Voltage At Device | Drop from source | Percent Drop |
|---|---|---|---|---|---|
| 1 | 0.026 | 185 | 19.37 | 0.327 | 1.66% |
| 2 | 0.026 | 65 | 19.27 | 0.428 | 2.17% |
| 3 | 0.026 | 65 | 19.18 | 0.514 | 2.61% |
| 4 | 0.026 | 65 | 19.11 | 0.586 | 2.97% |
| 5 | 0.026 | 65 | 19.06 | 0.643 | 3.27% |
| 6 | 0.026 | 65 | 19.01 | 0.686 | 3.48% |
| 7 | 0.026 | 65 | 18.98 | 0.715 | 3.63% |
| 8 | 0.026 | 65 | 18.97 | 0.729 | 3.70% |
| END | | | 18.97 | 0.729 | 3.70% |
| END | | | 18.97 | 0.729 | 3.70% |
| END | | | 18.97 | 0.729 | 3.70% |
| END | | | 18.97 | 0.729 | 3.70% |
| END | | | 18.97 | 0.729 | 3.70% |
| END | | | 18.97 | 0.729 | 3.70% |
| END | | | 18.97 | 0.729 | 3.70% |
| END | | | 18.97 | 0.729 | 3.70% |
| END | | | 18.97 | 0.729 | 3.70% |
| END | | | 18.97 | 0.729 | 3.70% |
| END | | | 18.97 | 0.729 | 3.70% |
| END | | | 18.97 | 0.729 | 3.70% |
| END | | | 18.97 | 0.729 | 3.70% |
| END | | | 18.97 | 0.729 | 3.70% |
| END | | | 18.97 | 0.729 | 3.70% |
| Totals | 0.288 | 640 | End of Line Voltage | | 18.97 |

**Point to Point Method**

**CIRCUIT IS WITHIN LIMITS**

| Totals Current | Distance | Voltage Drop |
|---|---|---|
| 0.288 | 640 | **0.73** |
| End of Line Voltage | | **18.97** |

Percent Drop 3.70%

End of Line Method uses only the wire guage for the first device to source

Standard Wire Resistance in Ohms per 1000 feet.

18-7.77 16=4.89 14=3.07 12=1.93

18-12 Awg = Solid Conductors

Notes:
Wire resistance is doubled in the calculations for two wires (Positive and Negative)
The voltage calculated to the last device in any method must not be lower than
the manufacturers listed minimum operating voltage (IE: rated operating voltage 16-33 VDC).

**Which Method to use?**

**Point-to-Point**: Calculates the load from NAC device to NAC device, but also assumes this is exactly how the circuit is wired. This is the most accurate method of determining a NAC curcuit draw but assumes correct installed distances.

**End of Line**: Calculates the load as if all the NAC devices are located at the end of the circuit (worst case).

**Current Draw @ 16VDC with High Horn Setting** — **Edwards Start Voltages** — **Load Factor**

| | | EST3,EST Genesis 3X, 3PS - IO, VS, FX- Horn Strobe | Candela | VDC | FWR | Edwards Start Voltages | | Load Factor |
|---|---|---|---|---|---|---|---|---|
| | | G1 | 15 | 0.129 | 0.176 | IO1000, VS4, FX1000 | 20.4 | 0.24 |
| | | G1 | 30 | 0.167 | 0.230 | 3PS/APS boosters | 19.7 | 0.59 |
| | | G1 | 75 | 0.281 | 0.397 | EST3 | 20.4 | 0.37 |
| | | G1 | 110 | 0.337 | 0.443 | EST3X or VM | 22.4 | 0.00 |
| New! | G1 LED | 15, 30 or 75 | 0.045 | 0.055 | FX5 | | 20.4 | 0.40 |
| New! | G4LED | 15,30,75,110 | 0.050 | 0.060 | FX10 | | 20.4 | 0.20 |
| New! | GCLED | 15,30,75,115 | 0.060 | 0.075 | EST4 | | 20.4 | 0.37 |

Genesis Strobe

| | | |
|---|---|---|
| 15 | 0.103 | 0.125 |
| 30 | 0.141 | 0.179 |
| 75 | 0.255 | 0.346 |
| 110 | 0.311 | 0.392 |

| | | | | | |
|---|---|---|---|---|---|
| New! | G1 LED | 15, 30 or 75 | 0.024 | 0.032 | |
| New! | G4LED | 15,30,75,110 | 0.028 | 0.036 | |
| New! | GCLED | 15,30,75,115 | 0.035 | 0.045 | |

| | |
|---|---|
| Project Name | QTS DEN1 DC2 |
| Date | 7/4/2025 |
| Circuit Number | V32-SPARE |
| Area Covered | 2nd Level |
| Nominal System Voltage | 19.7 See chart |
| Minimum Device Voltage | 16 |
| Load Factor | See chart |
| Starting voltage w/ load factor | 19.7 |
| Total Circuit Current | 0.000 |

| | Wire Gauge | Ohm's Per 1000 |
|---|---|---|
| Distance from source to 1st device: 0 | 14 | 3.07 |
| Wire Gauge for balance of circuit | 14 | 3.07 |

18-7.77 16=4.89 14=3.07 12=1.93

18-12 Awg = Solid Conductors

Enter current in amps. .045 = 45 ma

| Device Number | Device Current | Distance from previous device | Voltage At Device | Drop from source | Percent Drop |
|---|---|---|---|---|---|
| END | | | 19.70 | 0.000 | 0.00% |
| END | | | 19.70 | 0.000 | 0.00% |
| END | | | 19.70 | 0.000 | 0.00% |
| END | | | 19.70 | 0.000 | 0.00% |
| END | | | 19.70 | 0.000 | 0.00% |
| END | | | 19.70 | 0.000 | 0.00% |
| END | | | 19.70 | 0.000 | 0.00% |
| END | | | 19.70 | 0.000 | 0.00% |
| END | | | 19.70 | 0.000 | 0.00% |
| END | | | 19.70 | 0.000 | 0.00% |
| END | | | 19.70 | 0.000 | 0.00% |
| END | | | 19.70 | 0.000 | 0.00% |
| END | | | 19.70 | 0.000 | 0.00% |
| END | | | 19.70 | 0.000 | 0.00% |
| END | | | 19.70 | 0.000 | 0.00% |
| END | | | 19.70 | 0.000 | 0.00% |
| END | | | 19.70 | 0.000 | 0.00% |
| END | | | 19.70 | 0.000 | 0.00% |
| END | | | 19.70 | 0.000 | 0.00% |
| END | | | 19.70 | 0.000 | 0.00% |
| END | | | 19.70 | 0.000 | 0.00% |
| END | | | 19.70 | 0.000 | 0.00% |
| END | | | 19.70 | 0.000 | 0.00% |
| Totals | 0.000 | 0 | End of Line Voltage | | 19.70 |

**Point to Point Method**

**CIRCUIT IS WITHIN LIMITS**

| Totals Current | Distance | Voltage Drop |
|---|---|---|
| 0.000 | 0 | **0.00** |
| End of Line Voltage | | **19.70** |

Percent Drop 0.00%

End of Line Method uses only the wire guage for the first device to source

Standard Wire Resistance in Ohms per 1000 feet.

18-7.77 16=4.89 14=3.07 12=1.93

18-12 Awg = Solid Conductors

Notes:
Wire resistance is doubled in the calculations for two wires (Positive and Negative)
The voltage calculated to the last device in any method must not be lower than
the manufacturers listed minimum operating voltage (IE: rated operating voltage 16-33 VDC).

**Which Method to use?**

**Point-to-Point**: Calculates the load from NAC device to NAC device, but also assumes this is exactly how the circuit is wired. This is the most accurate method of determining a NAC curcuit draw but assumes correct installed distances.

**End of Line**: Calculates the load as if all the NAC devices are located at the end of the circuit (worst case).

**Current Draw @ 16VDC with High Horn Setting** — **Edwards Start Voltages** — **Load Factor**

| | | EST3,EST Genesis 3X, 3PS - IO, VS, FX- Horn Strobe | Candela | VDC | FWR | Edwards Start Voltages | | Load Factor |
|---|---|---|---|---|---|---|---|---|
| | | G1 | 15 | 0.129 | 0.176 | IO1000, VS4, FX1000 | 20.4 | 0.24 |
| | | G1 | 30 | 0.167 | 0.230 | 3PS/APS boosters | 19.7 | 0.59 |
| | | G1 | 75 | 0.281 | 0.397 | EST3 | 20.4 | 0.37 |
| | | G1 | 110 | 0.337 | 0.443 | EST3X or VM | 22.4 | 0.00 |
| New! | G1 LED | 15, 30 or 75 | 0.045 | 0.055 | FX5 | | 20.4 | 0.40 |
| New! | G4LED | 15,30,75,110 | 0.050 | 0.060 | FX10 | | 20.4 | 0.20 |
| New! | GCLED | 15,30,75,115 | 0.060 | 0.075 | EST4 | | 20.4 | 0.37 |

Genesis Strobe

| | | |
|---|---|---|
| 15 | 0.103 | 0.125 |
| 30 | 0.141 | 0.179 |
| 75 | 0.255 | 0.346 |
| 110 | 0.311 | 0.392 |

| | | | | | |
|---|---|---|---|---|---|
| New! | G1 LED | 15, 30 or 75 | 0.024 | 0.032 | |
| New! | G4LED | 15,30,75,110 | 0.028 | 0.036 | |
| New! | GCLED | 15,30,75,115 | 0.035 | 0.045 | |

| | |
|---|---|
| Project Name | QTS DEN1 DC2 |
| Date | 7/4/2025 |
| Circuit Number | V33-SPARE |
| Area Covered | 2nd Level |
| Nominal System Voltage | 19.7 See chart |
| Minimum Device Voltage | 16 |
| Load Factor | See chart |
| Starting voltage w/ load factor | 19.7 |
| Total Circuit Current | 0.000 |

| | Wire Gauge | Ohm's Per 1000 |
|---|---|---|
| Distance from source to 1st device: 0 | 14 | 3.07 |
| Wire Gauge for balance of circuit | 14 | 3.07 |

18-7.77 16=4.89 14=3.07 12=1.93

18-12 Awg = Solid Conductors

Enter current in amps. .045 = 45 ma

| Device Number | Device Current | Distance from previous device | Voltage At Device | Drop from source | Percent Drop |
|---|---|---|---|---|---|
| END | | | 19.70 | 0.000 | 0.00% |
| END | | | 19.70 | 0.000 | 0.00% |
| END | | | 19.70 | 0.000 | 0.00% |
| END | | | 19.70 | 0.000 | 0.00% |
| END | | | 19.70 | 0.000 | 0.00% |
| END | | | 19.70 | 0.000 | 0.00% |
| END | | | 19.70 | 0.000 | 0.00% |
| END | | | 19.70 | 0.000 | 0.00% |
| END | | | 19.70 | 0.000 | 0.00% |
| END | | | 19.70 | 0.000 | 0.00% |
| END | | | 19.70 | 0.000 | 0.00% |
| END | | | 19.70 | 0.000 | 0.00% |
| END | | | 19.70 | 0.000 | 0.00% |
| END | | | 19.70 | 0.000 | 0.00% |
| END | | | 19.70 | 0.000 | 0.00% |
| END | | | 19.70 | 0.000 | 0.00% |
| END | | | 19.70 | 0.000 | 0.00% |
| END | | | 19.70 | 0.000 | 0.00% |
| END | | | 19.70 | 0.000 | 0.00% |
| END | | | 19.70 | 0.000 | 0.00% |
| END | | | 19.70 | 0.000 | 0.00% |
| END | | | 19.70 | 0.000 | 0.00% |
| END | | | 19.70 | 0.000 | 0.00% |
| Totals | 0.000 | 0 | End of Line Voltage | | 19.70 |

**Point to Point Method**

**CIRCUIT IS WITHIN LIMITS**

| Totals Current | Distance | Voltage Drop |
|---|---|---|
| 0.000 | 0 | **0.00** |
| End of Line Voltage | | **19.70** |

Percent Drop 0.00%

End of Line Method uses only the wire guage for the first device to source

Standard Wire Resistance in Ohms per 1000 feet.

18-7.77 16=4.89 14=3.07 12=1.93

18-12 Awg = Solid Conductors

Notes:
Wire resistance is doubled in the calculations for two wires (Positive and Negative)
The voltage calculated to the last device in any method must not be lower than
the manufacturers listed minimum operating voltage (IE: rated operating voltage 16-33 VDC).

**Which Method to use?**

**Point-to-Point**: Calculates the load from NAC device to NAC device, but also assumes this is exactly how the circuit is wired. This is the most accurate method of determining a NAC curcuit draw but assumes correct installed distances.

**End of Line**: Calculates the load as if all the NAC devices are located at the end of the circuit (worst case).

**Current Draw @ 16VDC with High Horn Setting** — **Edwards Start Voltages** — **Load Factor**

| | | EST3,EST Genesis 3X, 3PS - IO, VS, FX- Horn Strobe | Candela | VDC | FWR | Edwards Start Voltages | | Load Factor |
|---|---|---|---|---|---|---|---|---|
| | | G1 | 15 | 0.129 | 0.176 | IO1000, VS4, FX1000 | 20.4 | 0.24 |
| | | G1 | 30 | 0.167 | 0.230 | 3PS/APS boosters | 19.7 | 0.59 |
| | | G1 | 75 | 0.281 | 0.397 | EST3 | 20.4 | 0.37 |
| | | G1 | 110 | 0.337 | 0.443 | EST3X or VM | 22.4 | 0.00 |
| New! | G1 LED | 15, 30 or 75 | 0.045 | 0.055 | FX5 | | 20.4 | 0.40 |
| New! | G4LED | 15,30,75,110 | 0.050 | 0.060 | FX10 | | 20.4 | 0.20 |
| New! | GCLED | 15,30,75,115 | 0.060 | 0.075 | EST4 | | 20.4 | 0.37 |

Genesis Strobe

| | | |
|---|---|---|
| 15 | 0.103 | 0.125 |
| 30 | 0.141 | 0.179 |
| 75 | 0.255 | 0.346 |
| 110 | 0.311 | 0.392 |

| | | | | | |
|---|---|---|---|---|---|
| New! | G1 LED | 15, 30 or 75 | 0.024 | 0.032 | |
| New! | G4LED | 15,30,75,110 | 0.028 | 0.036 | |
| New! | GCLED | 15,30,75,115 | 0.035 | 0.045 | |

| | |
|---|---|
| Project Name | QTS DEN1 DC2 |
| Date | 7/4/2025 |
| Circuit Number | V34-SPARE |
| Area Covered | 2nd Level |
| Nominal System Voltage | 19.7 See chart |
| Minimum Device Voltage | 16 |
| Load Factor | See chart |
| Starting voltage w/ load factor | 19.7 |
| Total Circuit Current | 0.000 |

| | Wire Gauge | Ohm's Per 1000 |
|---|---|---|
| Distance from source to 1st device: 0 | 14 | 3.07 |
| Wire Gauge for balance of circuit | 14 | 3.07 |

18-7.77 16=4.89 14=3.07 12=1.93

18-12 Awg = Solid Conductors

Enter current in amps. .045 = 45 ma

| Device Number | Device Current | Distance from previous device | Voltage At Device | Drop from source | Percent Drop |
|---|---|---|---|---|---|
| END | | | 19.70 | 0.000 | 0.00% |
| END | | | 19.70 | 0.000 | 0.00% |
| END | | | 19.70 | 0.000 | 0.00% |
| END | | | 19.70 | 0.000 | 0.00% |
| END | | | 19.70 | 0.000 | 0.00% |
| END | | | 19.70 | 0.000 | 0.00% |
| END | | | 19.70 | 0.000 | 0.00% |
| END | | | 19.70 | 0.000 | 0.00% |
| END | | | 19.70 | 0.000 | 0.00% |
| END | | | 19.70 | 0.000 | 0.00% |
| END | | | 19.70 | 0.000 | 0.00% |
| END | | | 19.70 | 0.000 | 0.00% |
| END | | | 19.70 | 0.000 | 0.00% |
| END | | | 19.70 | 0.000 | 0.00% |
| END | | | 19.70 | 0.000 | 0.00% |
| END | | | 19.70 | 0.000 | 0.00% |
| END | | | 19.70 | 0.000 | 0.00% |
| END | | | 19.70 | 0.000 | 0.00% |
| END | | | 19.70 | 0.000 | 0.00% |
| END | | | 19.70 | 0.000 | 0.00% |
| END | | | 19.70 | 0.000 | 0.00% |
| END | | | 19.70 | 0.000 | 0.00% |
| END | | | 19.70 | 0.000 | 0.00% |
| Totals | 0.000 | 0 | End of Line Voltage | | 19.70 |

**Point to Point Method**

**CIRCUIT IS WITHIN LIMITS**

| Totals Current | Distance | Voltage Drop |
|---|---|---|
| 0.000 | 0 | **0.00** |
| End of Line Voltage | | **19.70** |

Percent Drop 0.00%

End of Line Method uses only the wire guage for the first device to source

Standard Wire Resistance in Ohms per 1000 feet.

18-7.77 16=4.89 14=3.07 12=1.93

18-12 Awg = Solid Conductors

Notes:
Wire resistance is doubled in the calculations for two wires (Positive and Negative)
The voltage calculated to the last device in any method must not be lower than
the manufacturers listed minimum operating voltage (IE: rated operating voltage 16-33 VDC).

**Which Method to use?**

**Point-to-Point**: Calculates the load from NAC device to NAC device, but also assumes this is exactly how the circuit is wired. This is the most accurate method of determining a NAC curcuit draw but assumes correct installed distances.

**End of Line**: Calculates the load as if all the NAC devices are located at the end of the circuit (worst case).

**Current Draw @ 16VDC with High Horn Setting** — **Edwards Start Voltages** — **Load Factor**

| | | EST3,EST Genesis 3X, 3PS - IO, VS, FX- Horn Strobe | Candela | VDC | FWR | Edwards Start Voltages | | Load Factor |
|---|---|---|---|---|---|---|---|---|
| | | G1 | 15 | 0.129 | 0.176 | IO1000, VS4, FX1000 | 20.4 | 0.24 |
| | | G1 | 30 | 0.167 | 0.230 | 3PS/APS boosters | 19.7 | 0.59 |
| | | G1 | 75 | 0.281 | 0.397 | EST3 | 20.4 | 0.37 |
| | | G1 | 110 | 0.337 | 0.443 | EST3X or VM | 22.4 | 0.00 |
| New! | G1 LED | 15, 30 or 75 | 0.045 | 0.055 | FX5 | | 20.4 | 0.40 |
| New! | G4LED | 15,30,75,110 | 0.050 | 0.060 | FX10 | | 20.4 | 0.20 |
| New! | GCLED | 15,30,75,115 | 0.060 | 0.075 | EST4 | | 20.4 | 0.37 |

Genesis Strobe

| | | |
|---|---|---|
| 15 | 0.103 | 0.125 |
| 30 | 0.141 | 0.179 |
| 75 | 0.255 | 0.346 |
| 110 | 0.311 | 0.392 |

| | | | | | |
|---|---|---|---|---|---|
| New! | G1 LED | 15, 30 or 75 | 0.024 | 0.032 | |
| New! | G4LED | 15,30,75,110 | 0.028 | 0.036 | |
| New! | GCLED | 15,30,75,115 | 0.035 | 0.045 | |

| | |
|---|---|
| Project Name | QTS DEN1 DC2 |
| Date | 7/4/2025 |
| Circuit Number | V35 |
| Area Covered | 2nd Level |
| Nominal System Voltage | 19.7 See chart |
| Minimum Device Voltage | 16 |
| Load Factor | See chart |
| Starting voltage w/ load factor | 19.7 |
| Total Circuit Current | 0.252 |

| | Wire Gauge | Ohm's Per 1000 |
|---|---|---|
| Distance from source to 1st device: 83 | 14 | 3.07 |
| Wire Gauge for balance of circuit | 14 | 3.07 |

18-7.77 16=4.89 14=3.07 12=1.93

18-12 Awg = Solid Conductors

Enter current in amps. .045 = 45 ma

| Device Number | Device Current | Distance from previous device | Voltage At Device | Drop from source | Percent Drop |
|---|---|---|---|---|---|
| 1 | 0.036 | 83 | 19.57 | 0.128 | 0.65% |
| 2 | 0.036 | 65 | 19.49 | 0.215 | 1.09% |
| 3 | 0.036 | 65 | 19.41 | 0.286 | 1.45% |
| 4 | 0.036 | 65 | 19.36 | 0.344 | 1.75% |
| 5 | 0.036 | 65 | 19.31 | 0.387 | 1.96% |
| 6 | 0.036 | 65 | 19.28 | 0.415 | 2.11% |
| 7 | 0.036 | 65 | 19.27 | 0.430 | 2.18% |
| END | | | 19.27 | 0.430 | 2.18% |
| END | | | 19.27 | 0.430 | 2.18% |
| END | | | 19.27 | 0.430 | 2.18% |
| END | | | 19.27 | 0.430 | 2.18% |
| END | | | 19.27 | 0.430 | 2.18% |
| END | | | 19.27 | 0.430 | 2.18% |
| END | | | 19.27 | 0.430 | 2.18% |
| END | | | 19.27 | 0.430 | 2.18% |
| END | | | 19.27 | 0.430 | 2.18% |
| END | | | 19.27 | 0.430 | 2.18% |
| END | | | 19.27 | 0.430 | 2.18% |
| END | | | 19.27 | 0.430 | 2.18% |
| END | | | 19.27 | 0.430 | 2.18% |
| END | | | 19.27 | 0.430 | 2.18% |
| END | | | 19.27 | 0.430 | 2.18% |
| END | | | 19.27 | 0.430 | 2.18% |
| END | | | 19.27 | 0.430 | 2.18% |
| END | | | 19.27 | 0.430 | 2.18% |
| END | | | 19.27 | 0.430 | 2.18% |
| Totals | 0.252 | 473 | End of Line Voltage | | 19.27 |

**Point to Point Method**

**CIRCUIT IS WITHIN LIMITS**

| Totals Current | Distance | Voltage Drop |
|---|---|---|
| 0.252 | 473 | **0.43** |
| End of Line Voltage | | **19.27** |

Percent Drop 2.18%

End of Line Method uses only the wire guage for the first device to source

Standard Wire Resistance in Ohms per 1000 feet.

18-7.77 16=4.89 14=3.07 12=1.93

18-12 Awg = Solid Conductors

Notes:
Wire resistance is doubled in the calculations for two wires (Positive and Negative)
The voltage calculated to the last device in any method must not be lower than
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**End of Line**: Calculates the load as if all the NAC devices are located at the end of the circuit (worst case).

**Current Draw @ 16VDC with High Horn Setting** — **Edwards Start Voltages** — **Load Factor**

| | | EST3,EST Genesis 3X, 3PS - IO, VS, FX- Horn Strobe | Candela | VDC | FWR | Edwards Start Voltages | | Load Factor |
|---|---|---|---|---|---|---|---|---|
| | | G1 | 15 | 0.129 | 0.176 | IO1000, VS4, FX1000 | 20.4 | 0.24 |
| | | G1 | 30 | 0.167 | 0.230 | 3PS/APS boosters | 19.7 | 0.59 |
| | | G1 | 75 | 0.281 | 0.397 | EST3 | 20.4 | 0.37 |
| | | G1 | 110 | 0.337 | 0.443 | EST3X or VM | 22.4 | 0.00 |
| New! | G1 LED | 15, 30 or 75 | 0.045 | 0.055 | FX5 | | 20.4 | 0.40 |
| New! | G4LED | 15,30,75,110 | 0.050 | 0.060 | FX10 | | 20.4 | 0.20 |
| New! | GCLED | 15,30,75,115 | 0.060 | 0.075 | EST4 | | 20.4 | 0.37 |

Genesis Strobe

| | | |
|---|---|---|
| 15 | 0.103 | 0.125 |
| 30 | 0.141 | 0.179 |
| 75 | 0.255 | 0.346 |
| 110 | 0.311 | 0.392 |

| | | | | | |
|---|---|---|---|---|---|
| New! | G1 LED | 15, 30 or 75 | 0.024 | 0.032 | |
| New! | G4LED | 15,30,75,110 | 0.028 | 0.036 | |
| New! | GCLED | 15,30,75,115 | 0.035 | 0.045 | |



SUMMIT FIRE PROTECTION
10200 E. Easter Avenue
Centennial, Colorado 80112
Phone: (303) 790-2520
Fax: (303) 790-2528

THESE DRAWINGS ARE SCHEMATIC AND DO NOT ATTEMPT TO SHOW SHOW CONDUIT ROUTING.

ARCHITECT:

GENERAL CONTRACTOR:

ENGINEER:

INSTALLER:

| PROJECT | PROJECT DESCRIPTION | PROJECT LOCATION |
|---|---|---|
| QTS DATA CENTER QTS DENI DC2 | FIRE ALARM & DETECTION SYSTEM | 1140 N. GUN CLUB ROAD AURORA, COLORADO 80018 |

MERIDIAN PROJECT

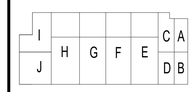
JOB#: 2025-24

NICET CERTIFIED

TRAVIS COOK- NICET#113375

COMMENTS AND STAMP

THESE DRAWINGS ARE SCHEMATIC AND DO NOT ATTEMPT TO SHOW SHOW CONDUIT ROUTING.




KEY PLAN
N.T.S.

| REVISION | DATE |
|---|---|
| SUBMITTAL | 07/07/25 |
| REVISIONS | 09/22/25 |
| DATA HALL BUILDOUT | 12/13/25 |
| COMMENTS | 02/25/26 |
| COMMENTS (REV. 1) | 04/2/26 |
| COMMENTS (REV. 2) | 06/3/26 |
| RFI#696 (REV. 3) | 07/24/26 |

CAD FILE: BOOSTER POWER SUPPLY

DRAWN BY: B. ALLEN — DATE: 6/3/25

ENG. APPROVAL: — DATE:

REVIEW BY: — SCALE: N.T.S

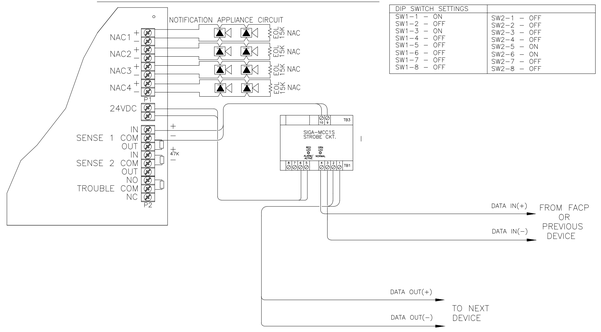
FIRE ALARM SYSTEM EST-4

REMOTE BOOSTER POWER BATTERY CALC'S & PANEL LAYOUT

SHEET

FE05

## REMOTE POWER SUPPLY



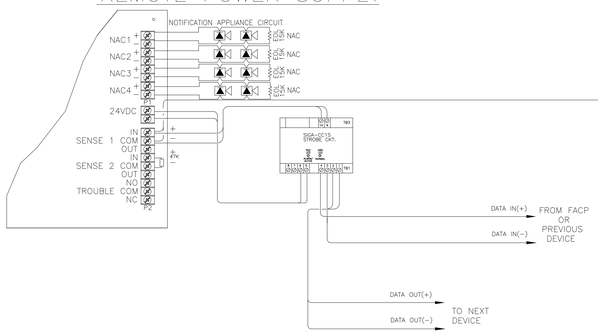

| DIP SWITCH SETTINGS | |
|---|---|
| SW1-1 – ON | SW2-1 – OFF |
| SW1-2 – OFF | SW2-2 – OFF |
| SW1-3 – ON | SW2-3 – OFF |
| SW1-4 – OFF | SW2-4 – OFF |
| SW1-5 – OFF | SW2-5 – ON |
| SW1-6 – OFF | SW2-6 – ON |
| SW1-7 – OFF | SW2-7 – OFF |
| SW1-8 – OFF | SW2-8 – OFF |

REMOTE BOOSTER POWER SUPPLIES
MOUNTING DETAIL (APS10A)

N.T.S.

GENERAL NOTE:
ALL VOLTAGE DROP CALCULATION ARE BASED ON WORST CASE

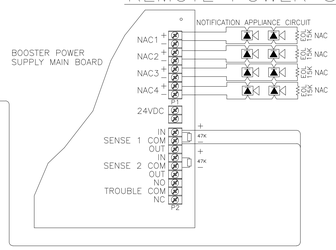
## REMOTE POWER SUPPLY




REMOTE BOOSTER POWER SUPPLIES
MOUNTING DETAIL (BPS10A)

N.T.S.

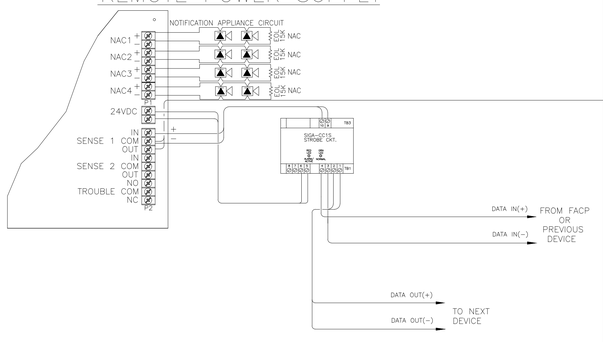
## REMOTE POWER SUPPLY




REMOTE BOOSTER POWER SUPPLIES
MOUNTING DETAIL (BPS10A)

N.T.S.

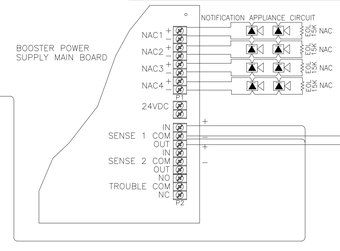
## REMOTE POWER SUPPLY




REMOTE BOOSTER POWER SUPPLIES
MOUNTING DETAIL (BPS10A)

N.T.S.

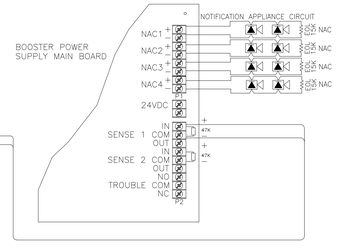
## REMOTE POWER SUPPLY




REMOTE BOOSTER POWER SUPPLIES
MOUNTING DETAIL (BPS10A)

N.T.S.

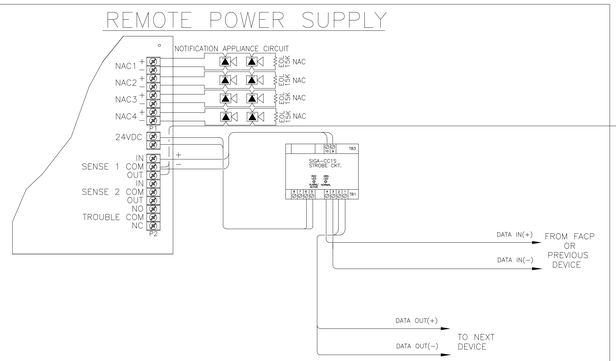
## REMOTE POWER SUPPLY




REMOTE BOOSTER POWER SUPPLIES
MOUNTING DETAIL (BPS10A)

N.T.S.

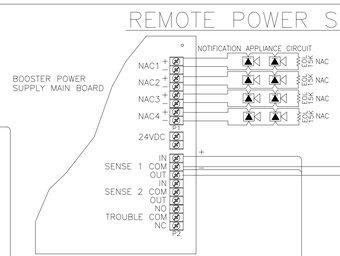
## REMOTE POWER SUPPLY




REMOTE BOOSTER POWER SUPPLIES
MOUNTING DETAIL (BPS10A)

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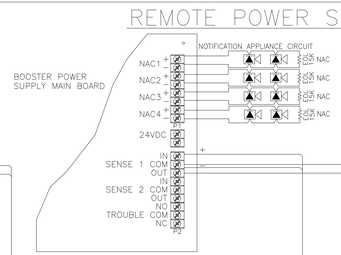
## REMOTE POWER SUPPLY




REMOTE BOOSTER POWER SUPPLIES
MOUNTING DETAIL (BPS10A)

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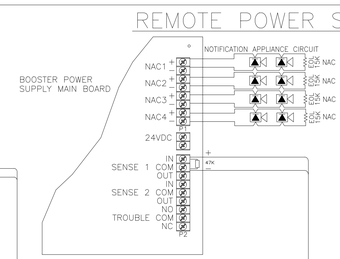
## REMOTE POWER SUPPLY




REMOTE BOOSTER POWER SUPPLIES
MOUNTING DETAIL (BPS10A)

N.T.S.

## REMOTE POWER SUPPLY




REMOTE BOOSTER POWER SUPPLIES
MOUNTING DETAIL (BPS10A)

N.T.S.

SUMMIT FIRE PROTECTION
10200 E. Easter Avenue
Centennial, Colorado 80112
Phone: (303) 790-2520
Fax: (303) 790-2528

THESE DRAWINGS ARE SCHEMATIC AND DO NOT ATTEMPT TO SHOW SHOW CONDUIT ROUTING.

ARCHITECT:

GENERAL CONTRACTOR:

ENGINEER:

INSTALLER:

| | |
|---|---|
| PROJECT | QTS DATA CENTER<br>QTS DENI DC2 |
| PROJECT DESCRIPTION | FIRE ALARM & DETECTION SYSTEM |
| PROJECT LOCATION | 1140 N. GUN CLUB ROAD<br>AURORA, COLORADO 80018 |

MERIDIAN PROJECT

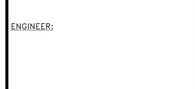
JOB#: 2025-24

NICET CERTIFIED

TRAVIS COOK- NICET#113375

COMMENTS AND STAMP

THESE DRAWINGS ARE SCHEMATIC AND DO NOT ATTEMPT TO SHOW SHOW CONDUIT ROUTING.




KEY PLAN
N.T.S.

| REVISION | DATE |
|---|---|
| SUBMITTAL | 07/07/25 |
| REVISIONS | 09/22/25 |
| DATA HALL BUILDOUT | 12/13/25 |
| COMMENTS | 02/25/26 |
| COMMENTS (REV. 1) | 04/2/26 |
| COMMENTS (REV. 2) | 06/3/26 |
| RFI#696 (REV. 3) | 07/24/26 |
| | |
| | |

CAD FILE:
BOOSTER POWER SUPPLY

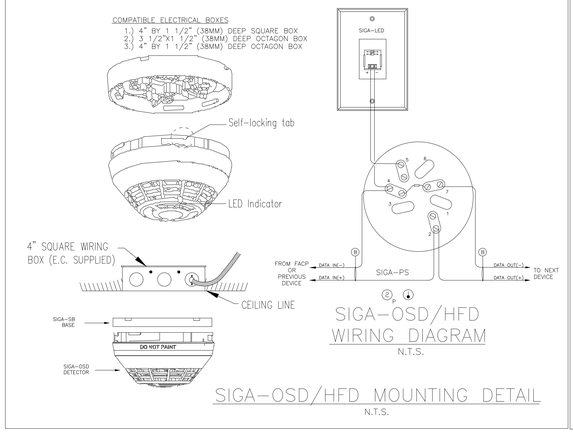
| DRAWN BY: | DATE: |
|---|---|
| B. ALLEN | 6/3/25 |
| ENG. APPROVAL: | DATE: |
| REVIEW BY: | SCALE: N.T.S |

FIRE ALARM SYSTEM
EST-4

REMOTE BOOSTER POWER BATTERY CALC'S & PANEL LAYOUT

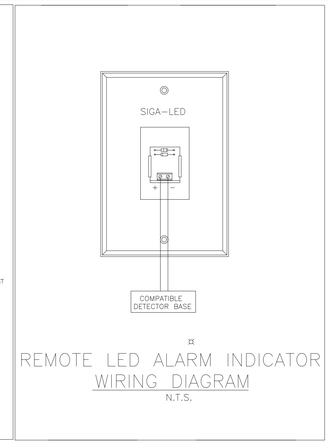
SHEET
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PERMIT #2026 2513934-CM 05-REV TO CM 02 | RSN:1991301

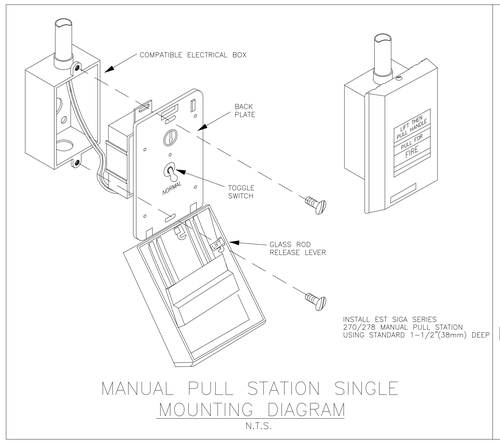



SIGA–OSD/HFD MOUNTING DETAIL
N.T.S.

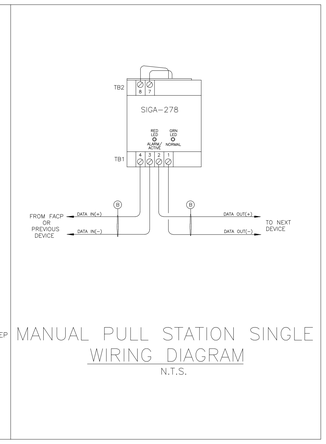
SIGA–OSD/HFD WIRING DIAGRAM
N.T.S.



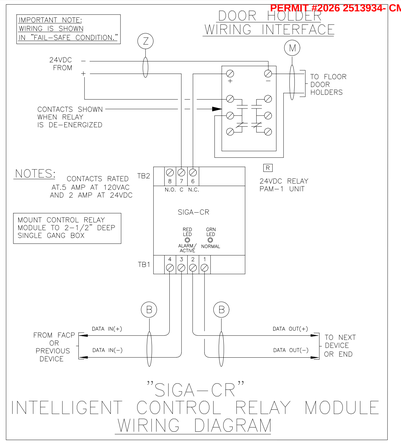

REMOTE LED ALARM INDICATOR WIRING DIAGRAM
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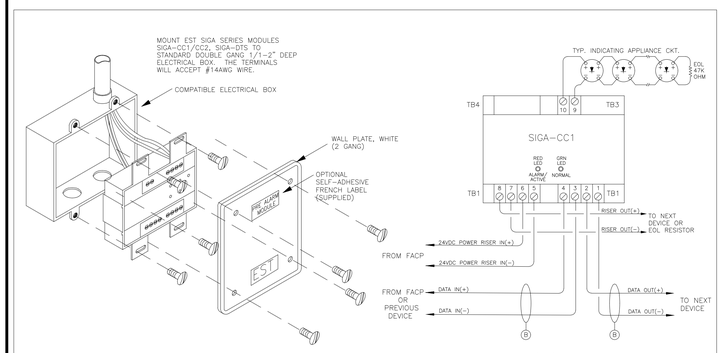

MANUAL PULL STATION SINGLE MOUNTING DIAGRAM
N.T.S.




MANUAL PULL STATION SINGLE WIRING DIAGRAM
N.T.S.



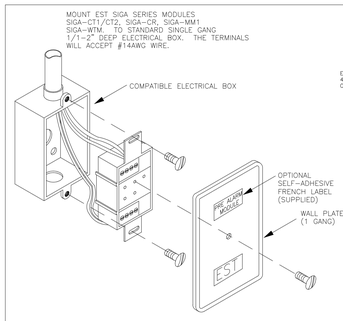

"SIGA–CR"
INTELLIGENT CONTROL RELAY MODULE
WIRING DIAGRAM



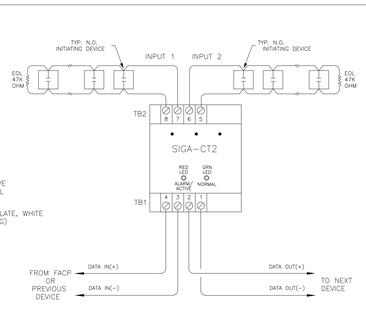

SIGA–CC1(S) MODULE
WIRING DIAGRAM
N.T.S.



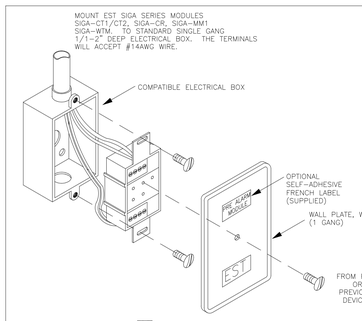

SINGLE INPUT SIGNAL
MODULE WIRING DIAGRAM
N.T.S.



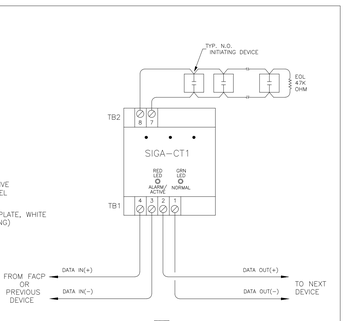

SIGA–CT2
MOUNTING DETAIL
N.T.S.



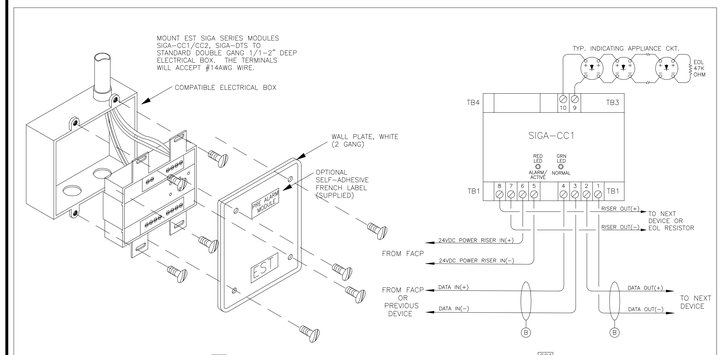

DUAL INPUT MODULE
WIRING DIAGRAM
N.T.S.




SIGA–CT1
MOUNTING DETAIL
N.T.S.



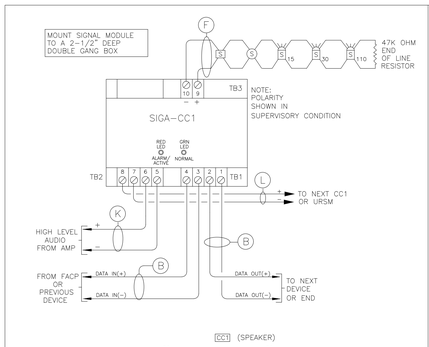

SINGLE INPUT MODULE
WIRING DIAGRAM
N.T.S.



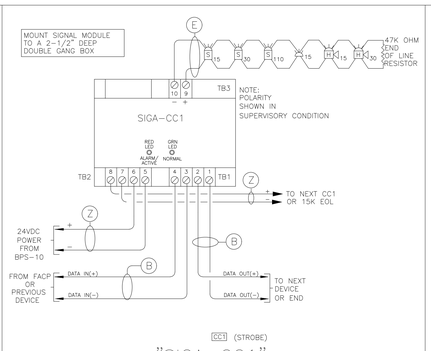

SIGA–CC1 MODULE
WIRING DIAGRAM
N.T.S.



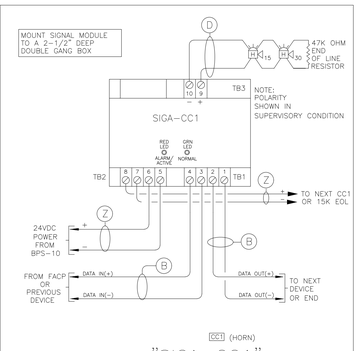

SINGLE INPUT SIGNAL
MODULE WIRING DIAGRAM
N.T.S.



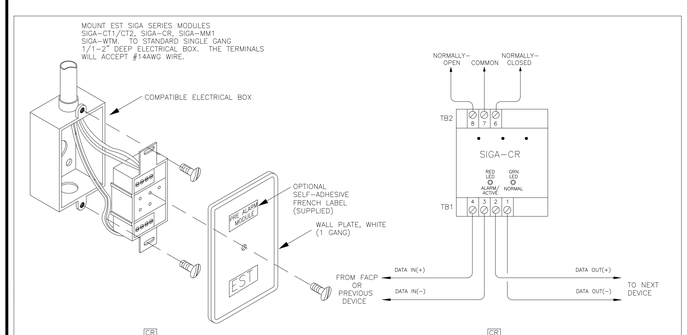

"SIGA–CC1"
INTELLIGENT
SINGLE INPUT SIGNAL
MODULE WIRING DIAGRAM




"SIGA–CC1"
INTELLIGENT
SINGLE INPUT SIGNAL
MODULE WIRING DIAGRAM



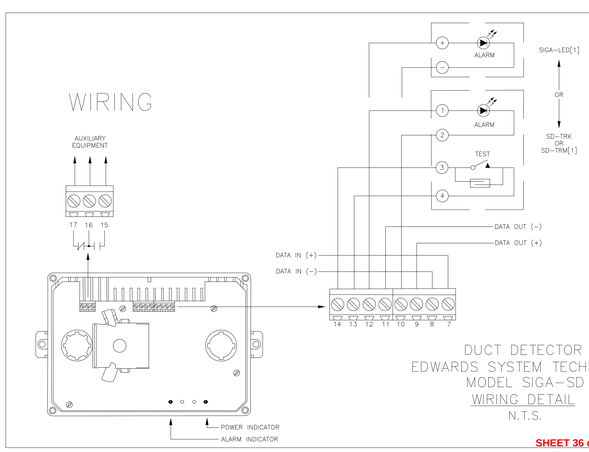

"SIGA–CC1"
INTELLIGENT
SINGLE INPUT SIGNAL
MODULE WIRING DIAGRAM



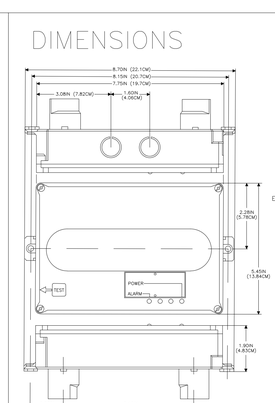

SIGA–CR
MOUNTING DETAIL
N.T.S.

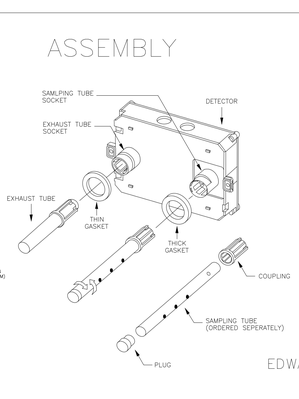



CONTROL RELAY MODULE
WIRING DIAGRAM
N.T.S.

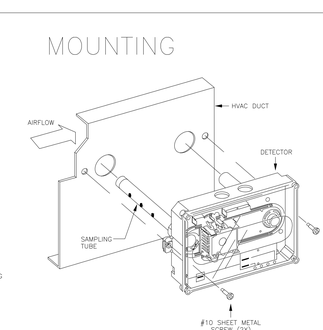



DUCT DETECTOR
EDWARDS SYSTEM TECHNOLOGY
MODEL SIGA–SD
WIRING DETAIL
N.T.S.




EDWARDS SYSTEM TECHNOLOGY
MODEL SIGA–SD
MOUNTING DETAIL
N.T.S.






SUMMIT FIRE PROTECTION
10200 E. Easter Avenue
Centennial, Colorado 80112
Phone: (303) 790-2520
Fax: (303) 790-2528

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ARCHITECT:

GENERAL CONTRACTOR:

ENGINEER:

INSTALLER:

| PROJECT | PROJECT DESCRIPTION | PROJECT LOCATION |
|---|---|---|
| QTS DATA CENTER QTS DENI DC2 | FIRE ALARM & DETECTION SYSTEM | 1140 N. GUN CLUB ROAD AURORA, COLORADO 80018 |

MERIDIAN PROJECT
JOB#: 2025–24

NICET CERTIFIED
TRAVIS COOK- NICET#113375
COMMENTS AND STAMP

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KEY PLAN
N.T.S.

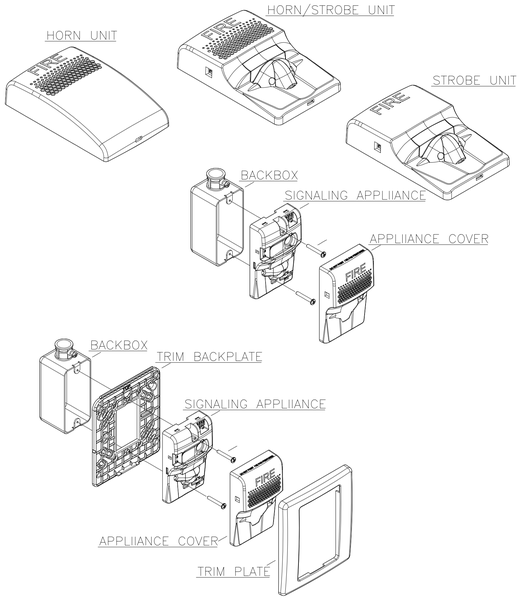
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|---|---|---|
| SUBMITTAL | | 07/07/25 |
| REVISIONS | | 09/22/25 |
| DATA HALL BUILDOUT | | 12/13/25 |
| COMMENTS | | 02/25/26 |
| COMMENTS | (1) | 04/2/26 |
| COMMENTS | (2) | 05/3/26 |
| RFI#696 | (3) | 07/24/26 |

| | |
|---|---|
| CAD FILE: TYPICALS | |
| DRAWN BY: B.ALLEN | DATE: 5/23/25 |
| ENG. APPROVAL: | DATE: |
| REVIEW BY: | SCALE: N.T.S. |

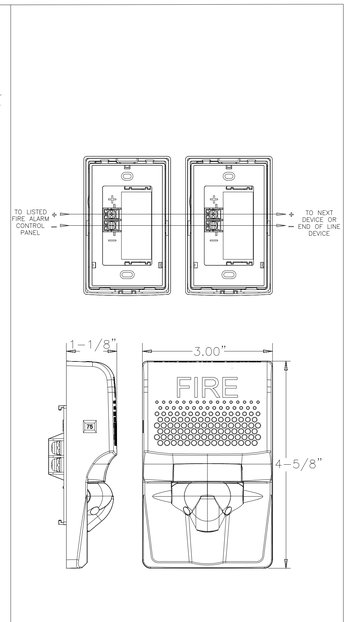
FIRE ALARM SYSTEM EST–4

FIRE ALARM DEVICE MOUNTING AND WIRING TYPICALS DIAGRAM

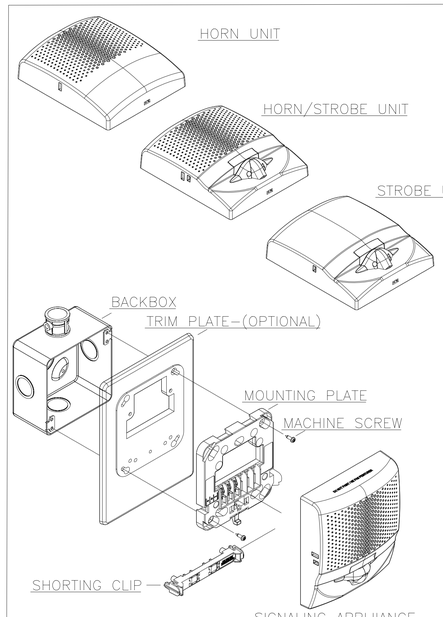
SHEET
FT01



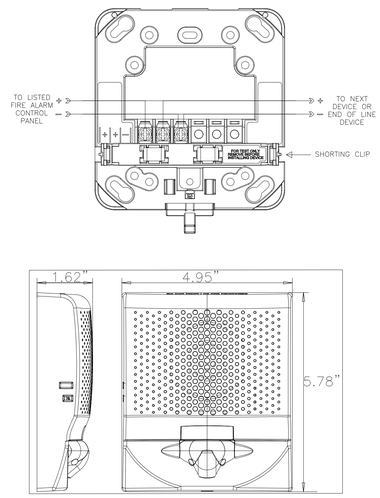

EST WALL (G1) HORN-STROBES
MODEL G1AVRF, G1AVWF
EST WALL (G1) STROBES
MODEL G1VRF, G1VWF
EST WALL (G1) HORN
MODEL G1ARF, G1AWF
MOUNTING DETAIL
N.T.S.



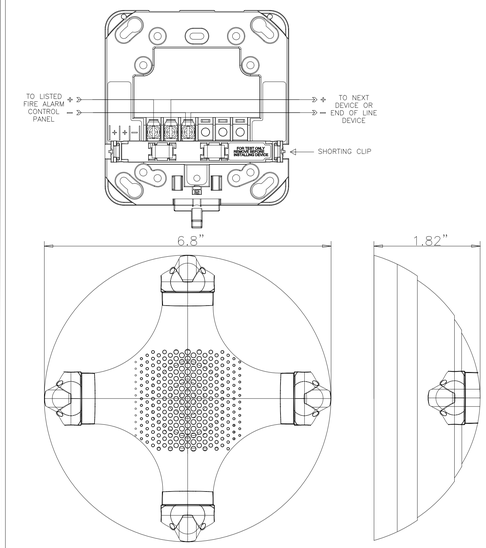

EST WALL (G1) HORN-STROBES
MODEL G1AVRF, G1AVWF
EST WALL (G1) STROBES
MODEL G1VRF, G1VWF
EST WALL (G1) HORN
MODEL G1ARF, G1AWF
WIRING DETAIL
N.T.S.



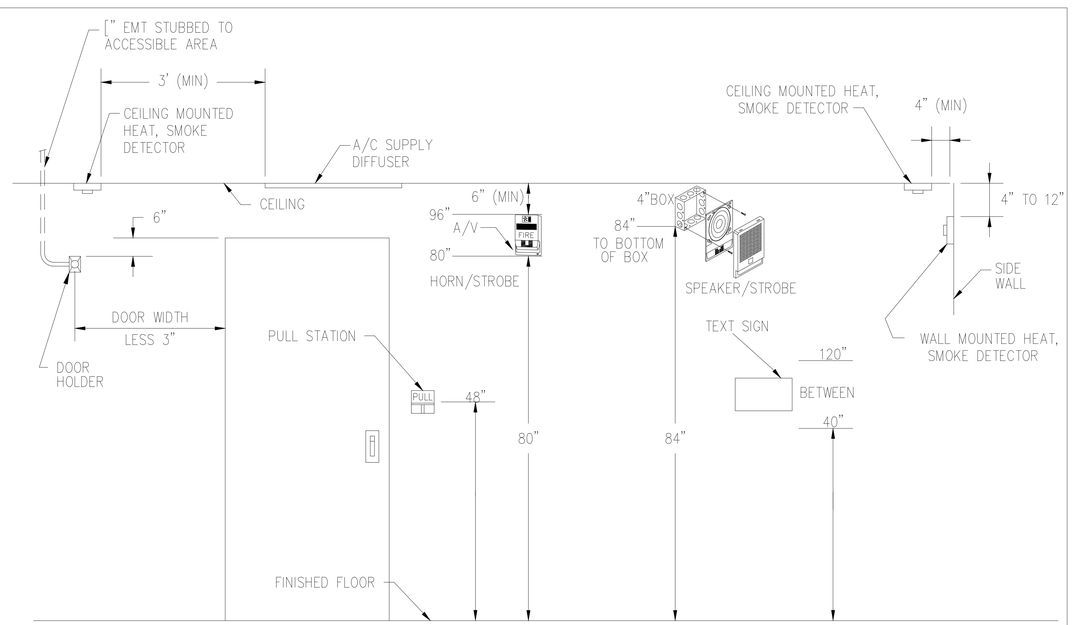

EST WALL (G4) HORN-STROBES
MODEL G4AVRF, G4AVWF
EST WALL (G4) STROBES
MODEL G4VRF, G4VWF
EST WALL (G4) HORN
MODEL G4ARF, G4AWF
MOUNTING DETAIL
N.T.S.




EST WALL (G4) HORN-STROBES
MODEL G4AVRF, G4AVWF
EST WALL (G4) STROBES
MODEL G4VRF, G4VWF
EST WALL (G4) HORN
MODEL G4ARF, G4AWF
WIRING DETAIL
N.T.S.

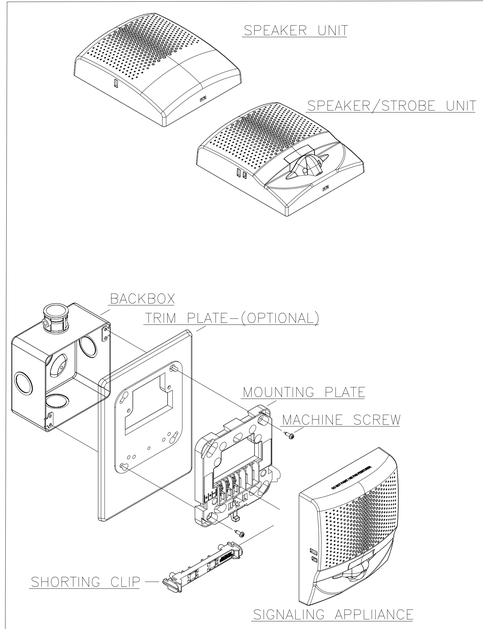



EST CEILING (GC) HORN-STROBES
MODEL GCAVRF, GCAVWF
EST CEILING (GC) STROBES
MODEL GCVRF, GCVWF
EST CEILING (GC) HORN
MODEL GCARF, GCAWF
WIRING DETAIL
N.T.S.

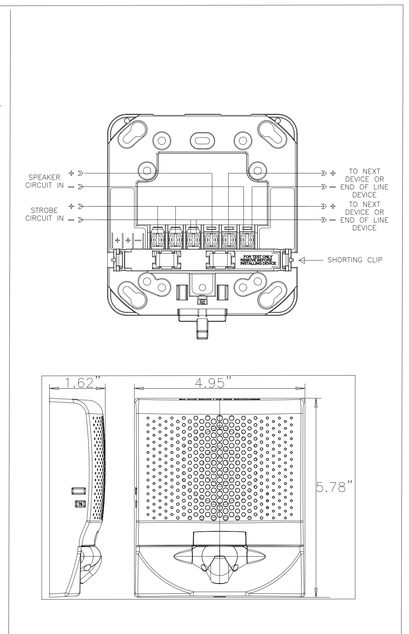



# PULL STATION, STROBE & HORN/STROBE SPEAKER/STROBE UNIT ELEVATION DETAIL

SCALE: N.T.S.




EST WALL (G4) SPEAKER-STROBES
MODEL G4SVRF, G4SVWF
EST WALL (G4) SPEAKER
MODEL G4SRF, G4SWF
MOUNTING DETAIL
N.T.S.




EST WALL (G4) SPEAKER-STROBES
MODEL G4SVRF, G4SVWF
EST WALL (G4) SPEAKER
MODEL G4SRF, G4SWF
WIRING DETAIL
N.T.S.

SUMMIT FIRE PROTECTION
10200 E. Easter Avenue
Centennial, Colorado 80112
Phone: (303) 790-2520
Fax: (303) 790-2528

THESE DRAWINGS ARE SCHEMATIC AND DO NOT ATTEMPT TO SHOW SHOW CONDUIT ROUTING.

ARCHITECT:

GENERAL CONTRACTOR:

ENGINEER:

INSTALLER:

PROJECT: QTS DATA CENTER / QTS DENI DC2
PROJECT DESCRIPTION: FIRE ALARM & DETECTION SYSTEM
PROJECT LOCATION: 1140 N. GUN CLUB ROAD AURORA, COLORADO 80018

MERIDIAN PROJECT
JOB#: 2025-24

NICET CERTIFIED
TRAVIS COOK- NICET#113375
COMMENTS AND STAMP

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KEY PLAN
N.T.S.

| REVISION | DATE |
|---|---|
| SUBMITTAL | 07/07/25 |
| REVISIONS | 09/22/25 |
| DATA HALL BUILDOUT | 12/13/25 |
| COMMENTS | 02/25/26 |
| COMMENTS (REV 1) | 04/2/26 |
| COMMENTS (REV 2) | 06/3/26 |
| RFI#696 (REV 3) | 07/24/26 |

CAD FILE: TYPICALS
DRAWN BY: B.ALLEN
DATE: 5/23/25
ENG. APPROVAL:
DATE:
REVIEW BY:
SCALE: N.T.S.

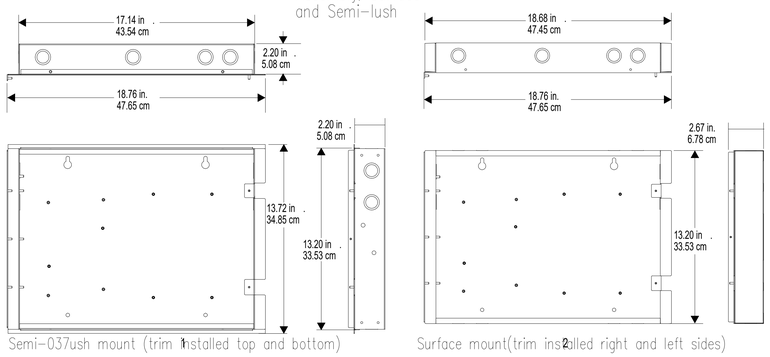
FIRE ALARM SYSTEM
EST-4

FIRE ALARM DEVICE MOUNTING AND WIRING TYPICALS DIAGRAM

SHEET FT02

PERMIT #2026 2513934- CM 05-REV TO CM 02 | RSN:1991301

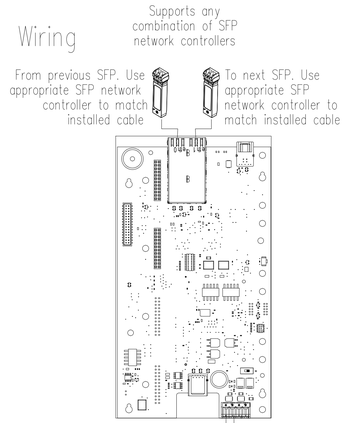
## 4-6ANNMT Wallbox Assembly, Surface and Semi-lush




Semi-flush mount (trim installed top and bottom)

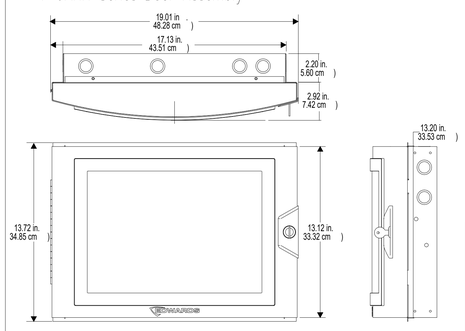
Surface mount(trim installed right and left sides)

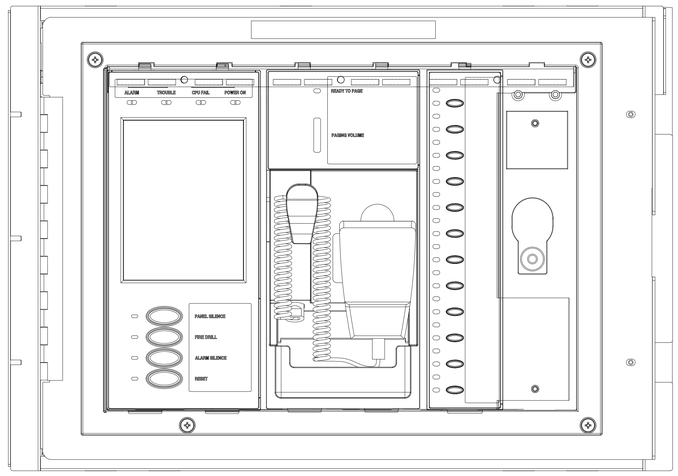
## Wiring




## Dimensions, door assemblies

### 4-6ANN Series Door Assembly



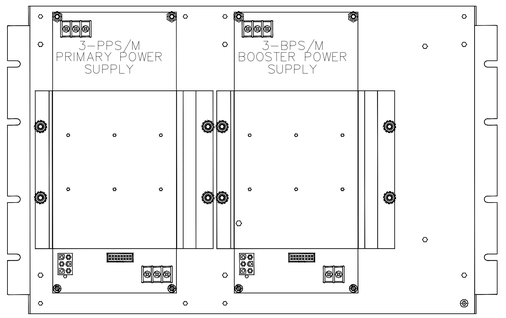

LOC ANN

REMOTE MIRCOPHONE CABINET
EDWARDS SYSTEM TECHNOLOGY
MODEL 4-6ANN
MOUNTING DETAIL
N.T.S.

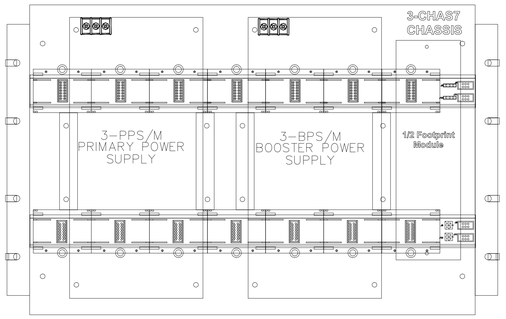
## Circuit compatibility

Legend
1 = No restrictions
2 = Twisted -pair cable
3 = Twisted -pair, shielded cable
4 = CAT4 or better
= Do not combine
Gray box = Power -limited circuit
White box = Allowed in same conduit by manufacturer [1]
1 \ 1 = Top number
Bottom number

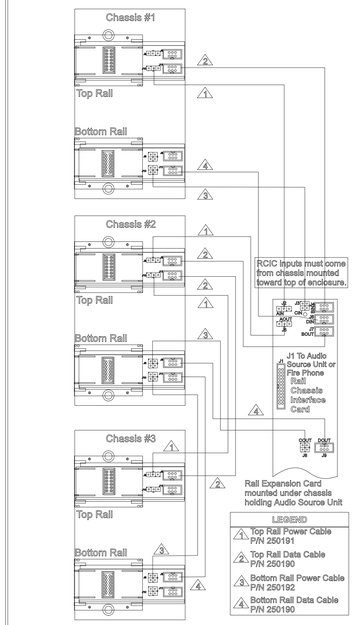
| | 24 VDC power -limited | 4-NET- TP twisted -paircuit | 4-NET-TP -HC twisted -pair circuit | 4-NET- CATCat5x circuit | 25 VRMS audio power -limited | 25 VRMS audio nonpower ri-limited | 70 VRMS audio power -limited | 70 VRMS audio nonpower -limited | Signature signaling line circuit | Traditional two -wire IDC | 4- AUDTELS firephone riser | AC mains, nonpower -limited | 4- NET series fiber -optic circuit | Circuit wiring specifications |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 24 VDC power -limited | 1 1 | 1 2 | 1 2 | 1 4 | 1 2 | | 1 2 | | 1 1 | 1 1 | 1 3 | | 1 1 | Size conductors per acceptable voltage drop and load |
| 4-NET-twisted -circuit [2] | 2 1 | 2 2 | 2 2 | 2 4 | 2 2 | | 2 2 | | 2 1 | 2 1 | 2 3 | | 2 1 | Circuit resistance: 90 Ω max Circuit |
| 4-NET -TP -HC twisted -pair circuit [2] | 2 1 | 2 2 | 2 2 | 1 4 | 2 2 | | 2 2 | | 2 1 | 2 1 | 2 3 | | 2 1 | Circuit resistance: 90 Ω max. Circuit capacitance: 0.3 µF max. |
| 4-NET -CATCAT5x circuit | 4 1 | 4 2 | 4 2 | 4 4 | 4 2 | 4 2 | 4 2 | 4 2 | 4 1 | 4 1 | 4 3 | | 4 1 | CAT5e or greater |
| 25 VRMS audio power -limited | 2 1 | 2 2 | 2 2 | 2 4 | 2 2 | | 2 2 | | 2 1 | 2 1 | 2 3 | | 2 1 | Size conductors per acceptable voltage drop |
| 25 VRMS audio nonpower -limited | | | | | 2 2 | | 2 2 | | | | | | 2 1 | Size conductors per acceptable voltage drop |
| 70 VRMS audio power -limited | 2 1 | 2 2 | 2 2 | 2 4 | 2 2 | | 2 2 | | 2 1 | 2 1 | 2 3 | | 2 1 | Size conductors per acceptable voltage drop |
| 70 VRMS audio nonpower -limited | | | | | 2 2 | | 2 2 | | | | | | 2 1 | Size conductors per acceptable voltage drop |
| Signature signaling line circuit | 1 1 | 1 2 | 1 2 | 1 4 | 1 2 | | 1 2 | | 1 1 | 1 1 | 1 3 | | 1 1 | Circuit resistance: 76 Ω max. Circuit capacitance: 0.5 µF max. |
| Traditional two -wire IDC | 1 1 | 1 2 | 1 2 | 1 4 | 1 2 | | 1 2 | | 1 1 | 1 1 | 1 3 | | 1 1 | Circuit resistance: 50 Ω max. |
| 4-AUDTELS firephone riser | 3 1 | 3 2 | 3 2 | 3 4 | 3 3 | | 3 3 | | 3 1 | 3 1 | 3 3 | | 3 1 | Wire type: Twisted -pair, shielded cable |
| AC mains, nonpower -limited | | | | | | | | | | | | 1 1 | | available |
| 4-NET series fiber-optics circuit | 1 1 | 1 2 | 1 2 | 1 4 | 1 2 | 1 2 | 1 2 | 1 2 | 1 1 | 1 1 | 1 3 | | 1 1 | Single mode and multimode |




INSTALLATION BEHIND THE CHASSIS

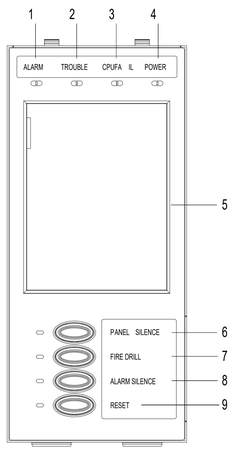



POWER SUPPLY MOUNTING DETAIL
N.T.S.




PANEL (CHASSIS-RAIL) CONNECTION WIRING DIAGRAM
N.T.S.

## Control and Display Functions




The EST4 LCD display simplifies the user interface. Up front and at the top of the display are four easy-to-read and understand status lights.

1 Alarm LED
The Alarm LED serves as a common alarm event indicator. The LED illuminates when there is am Alarm type event on the system. The specific Alarm event displays in its queue on the LCD where a count of alarm events is displayed along with a visual indicator if there are new events that have not been viewed.

2 Trouble LED
This LED serves as a common trouble event indicator. The LED illuminates when there are events in the trouble event queue located on the LCD display. The trouble event queue provides a count of trouble events and highlights if there are new events that have

3 CPU Fail LED
The LED indicates that the CPU has detected a processor failure. Processor failures must be reset manually using the Reset button.

4 Power LED
The LED indicates the power status. The LED operation is selectable in the panel coniguration utility and supports local power display requirements including: On if there is primary or standby power present; On when primary power present, off during primary power loss; On when the panel has primary power and standby power, off if either standby or primary power are absent.

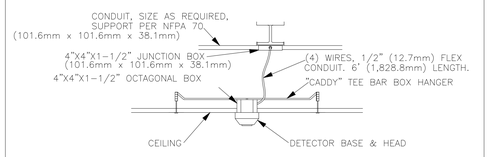
5 LCD screen
The heart of the 4-LCD is the color Liquid Crystal Display located in the center of the module. In the System Normal condition the date and time plus system wallpaper image are displayed on the LCD.

6 Panel Silence button and LED
The factory default for this programmable button and LED indicator is Panel Silence. Pressing Panel Silence turns off the system?s internal audible signal. The switch indicator has two statuses: white when the switch is pressed, yellow on when panel silence is active.

7 Fire Drill button and LED
The factory default for this programmable button and LED indicator is Fire Drill. Pressing Fire Drill turns on the drill LED and all signals sound evacuation. Drill does not activate city tie connections. Auxiliary relays will not activate unless programmed to do so with drill.

8 Alarm Silence button and LED
The factory default for this programmable button and LED indicator is Alarm Silence. Pressing Alarm Silence turns off all Notiication Appliance Circuits deined as audible. The switch indicator has two statuses: white when the switch is pressed, yellow when silence is active via the Alarm Silence switch or via alarm silence software timers.

9 Reset button and LED
The factory default for this programmable button and LED indicator is Reset. Pressing Reset starts the system?s reset operation. The switch indicator has four statuses: white when the switch is pressed; fastlashing green during the smoke power down phase of reset; slowlashing green during the restart phase; and, on steady green during the restoral phase. The Reset LED is off when the system is not in the reset process.




DETECTOR MOUNTING
CEILING MOUNTING
N.T.S.



SUMMIT FIRE PROTECTION
10200 E. Easter Avenue
Centennial, Colorado 80112
Phone: (303) 790-2520
Fax: (303) 790-2528

THESE DRAWINGS ARE SCHEMATIC AND DO NOT ATTEMPT TO SHOW SHOW CONDUIT ROUTING.

ARCHITECT:

GENERAL CONTRACTOR:

ENGINEER:

INSTALLER:

| PROJECT | PROJECT DESCRIPTION | PROJECT LOCATION |
|---|---|---|
| QTS DATA CENTER<br>QTS DENI DC2 | FIRE ALARM & DETECTION SYSTEM | 1140 N. GUN CLUB ROAD<br>AURORA, COLORADO 80018 |

MERIDIAN PROJECT

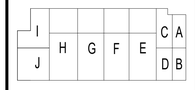
JOB#: 2025-24

NICET CERTIFIED

TRAVIS COOK- NICET#113375

COMMENTS AND STAMP

THESE DRAWINGS ARE SCHEMATIC AND DO NOT ATTEMPT TO SHOW SHOW CONDUIT ROUTING.




KEY PLAN
N.T.S.

| REVISION | DATE |
|---|---|
| SUBMITTAL | 07/07/25 |
| REVISIONS | 09/22/25 |
| DATA HALL BUILDOUT | 12/13/25 |
| COMMENTS | 02/25/26 |
| COMMENTS (REV 1) | 04/2/26 |
| COMMENTS (REV 2) | 06/3/26 |
| RFI#696 (REV 3) | 07/24/26 |

| | |
|---|---|
| CAD FILE: TYPICALS | |
| DRAWN BY: BALLEN | DATE: 5/23/25 |
| ENG. APPROVAL: | DATE: |
| REVIEW BY: | SCALE: N.T.S. |

FIRE ALARM SYSTEM EST-4

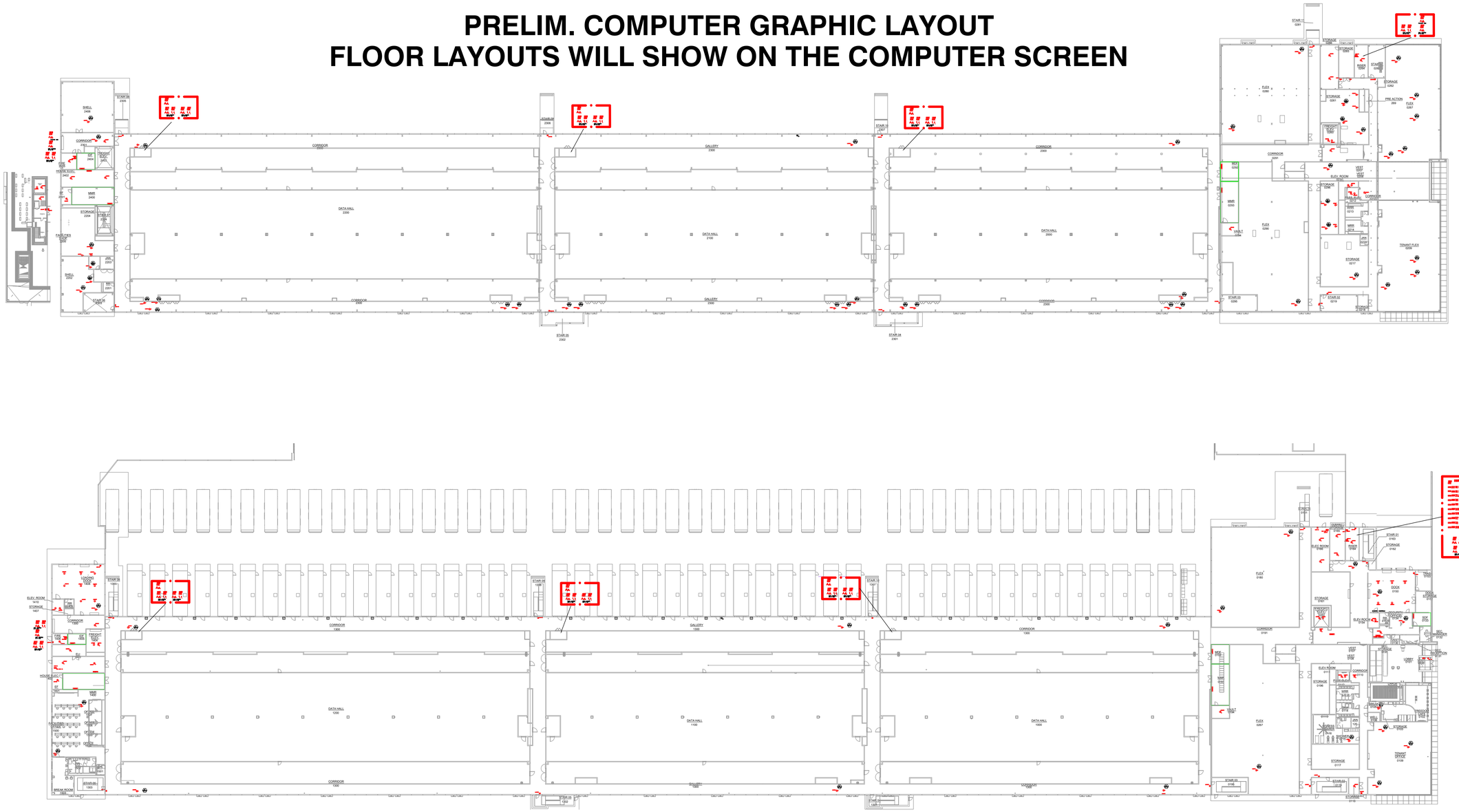
FIRE ALARM DEVICE MOUNTING AND WIRING TYPICALS DIAGRAM

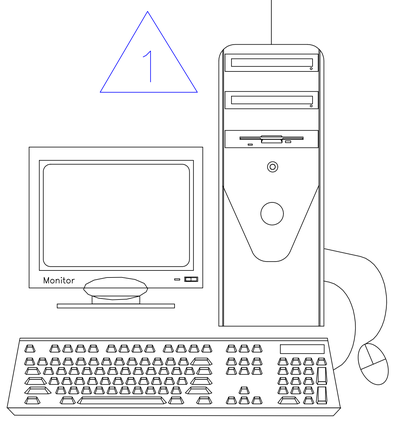
SHEET

FT03

PERMIT #2026 2513934- CM 05-REV TO CM 02 | RSN:1991301

# PRELIM. COMPUTER GRAPHIC LAYOUT
# FLOOR LAYOUTS WILL SHOW ON THE COMPUTER SCREEN




FIREWORK COMPUTER GRAPHIC UNIT



SUMMIT FIRE PROTECTION
10200 E. Easter Avenue
Centennial, Colorado 80112
Phone: (303) 790-2520
Fax: (303) 790-2528

THESE DRAWINGS ARE SCHEMATIC AND DO NOT ATTEMPT TO SHOW SHOW CONDUIT ROUTING.

ARCHITECT:

GENERAL CONTRACTOR:

ENGINEER:

INSTALLER:

| | | |
|---|---|---|
| PROJECT | QTS DATA CENTER<br>QTS DENI DC2 | 11140 N. GUN CLUB ROAD<br>AURORA, COLORADO 80018 |
| PROJECT DESCRIPTION | FIRE ALARM & DETECTION SYSTEM | |
| PROJECT LOCATION | | |

MERIDIAN PROJECT

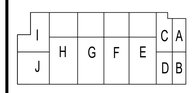
JOB#: 2025-24

NICET CERTIFIED

TRAVIS COOK- NICET#113375

COMMENTS AND STAMP

THESE DRAWINGS ARE SCHEMATIC AND DO NOT ATTEMPT TO SHOW SHOW CONDUIT ROUTING.




KEY PLAN
N.T.S.

| REVISION | DATE |
|---|---|
| SUBMITTAL | 07/07/25 |
| REVISIONS | 09/22/25 |
| DATA HALL BUILDOUT | 12/13/25 |
| COMMENTS | 02/25/26 |
| COMMENTS | 04/2/26 |
| COMMENTS | 06/3/26 |
| RFI#696 | 07/24/26 |

CAD FILE: GRAPHIC LAYOUT

DRAWN BY: B.ALLEN — DATE: 5/23/25

ENG. APPROVAL: — DATE:

REVIEW BY: — SCALE: N.T.S.

FIRE ALARM SYSTEM
EST-4

FIRE ALARM COMPUTER GRAPHIC LAOUT DIAGRAM

SHEET

FG01

LIFE SAFETY & INCIDENT MANAGEMENT

# EST4

## Emergency Communications Platform



FM APPROVED | NYC FIRE DEPT. COA # 2022-TMCOAP-008086-RENL | UL | ULC | EN54

## Overview

EST4 is the premier emergency communications system from EDWARDS. Though it represents a small change in name from its predecessor, EST4's leap forward in capability is anything but diminutive. This exciting flagship system features a whole new network architecture that makes fire alarm, mass notification, and building integration easy to implement, quick to service, and secure in the face of today's cyberthreats.

From its thoughtfully-crafted interface to its advanced connectivity and extensive system capacity, EST4 demonstrates that form and function are inseparable elements of good system design. It provides systems engineers with the tools they need to create projects that exceed expectations and have plenty of room to grow, all while respecting facility budgets and construction schedules. The net result is an emergency communications system equally suited to new and retrofit projects; a platform that keeps property safe and steers people clear of danger.

## Features

- **Investment-forward Platform Designed for the Future**
  Protects the past with backwards compatibility for EST3 retrofits, flexible feature set.
- **On-board Webserver**
  Remote device-independent access to system status reports.
- **Built-in E-mail and E-mail-to-SMS Messaging**
  Instant notification of specific event types sent to appropriate personnel.
- **Large Full-color LCD Touch Screen with Tactile Buttons**
  Fast, intuitive access to service and first responder functions.
- **Five-color LED Indicators**
  System status at a glance, select the color needed during programming, reduces replacement part inventory, maximizes use of available infrastructure.
- **Network data, audio data, and telephone data share a single twisted pair or single fiber strand**
  Up to 75 percent less cabling, substantial cost savings in material and labor.
- **Backwards Compatibility with EST3**
  Wiring, devices, and most local rail modules are backward compatible, providing easy migration paths, economical transition to new technology.
- **Existing Systems Supporting only Network Data can also Support Voice Audio**
  Upgrades add value and extend capabilities in retrofit situations.

*continued on next page...*

## Application

From the moment the control panel is powered up it is apparent that EST4 is designed for ease of use. Its powerful user interface bears this out by allowing operators to use the system with a level of fluidity that naturally guides them through high and low level system operations with efficiency and confidence.

EST4 does this by combining the simplicity of color LCD touchscreen technology with at-a-glance programmable color display strips and tactile direct-access control buttons. These input points, together with meticulously-engineered first responder and service functionality, allow EST4's interface to provide clear navigation paths, instant-access shortcuts, and context-sensitive display screens. This means that first responders have quick access to vital system event information and control functions, while service personnel can dive deeply into system programming unencumbered by complicated operational routines.

EST4's LCD large touch-screen display is the window into system operation and maintenance functions. It is large enough to support a graphical tree view of the system. The tree closely matches the system's physical layout, so there's no need for look-up tables to find specific devices. This is invaluable to technicians and building service personnel who can pinpoint the location of an off-normal device with a glance at the on-screen tree.

The EST4 LCD is capable of displaying 262,144 colors, EST4's LCD display screen will display eight events without scrolling. In addition to touch-screen capability, the display assembly includes four dedicated easy-access rubber buttons for control functions most needed for emergency response.

Up to 576 tactile switches and 576 LED indicators may be mounted in a single EST4 cabinet for control and annunciation purposes. Control Display Modules (CDMs), comprise a column of programmable buttons accompanied by one or two LED indicator positions per button. Indicator-only modules comprise up to 24 indicators. Switch and indicator module LEDs can be set to any of five colors, providing an additional level of feedback.

Print-anywhere slide-in label inserts give control/display strips context with color-coded shading and other effects. They can be localized for regional language requirements, and printed on-the-fly to accommodate system changes as they are implemented.

## Features (continued from page 1)

- **Self-configuring Network**
  No intervention by system admin personnel required.
- **Hot Swappable Network Connections**
  Change from copper to fiber with no system down-time.
- **480 Mbps USB Ports on Panels**
  Fast configuration updates, local printing.
- **Advanced Upload/download Protocol**
  No system down-time during updates.
- **Firewalls meet the latest Advanced Encryption Standards**
  Front-line defense against threats carried by outside networks. NIST - AES Validation #4806.
- **Extended Paging Groups**
  Audio reaches occupants based on location and movement.
- **Local and Remote Reporting**
  Generate reports on-site, at system printers, or remotely via webserver.
- **20,000-event History**
  Invaluable timeline data for service and investigative purposes.
- **Cabinet Doors may be used for Nodes and Annunciators**
  Cabinet Doors may be used for Panels and Annunciators giving a consistent appearance, fewer cabinet parts.

## Remote access and notification

System access to EST4 doesn't end when the cabinet door swings shut. A webserver in each EST4 panel allows authenticated users to gain access to day-to-day reporting. EST4 webservices are device-independent and support all major browsers on PC and MAC operating systems, including mobile platforms – without the need for special apps or other software. Users can log into the secure EST4 webserver and run system reports. Like any web page, system reports can be copied, printed, saved, and e-mailed. The system report data can also be saved in XML form and used in external spreadsheet applications for further processing.

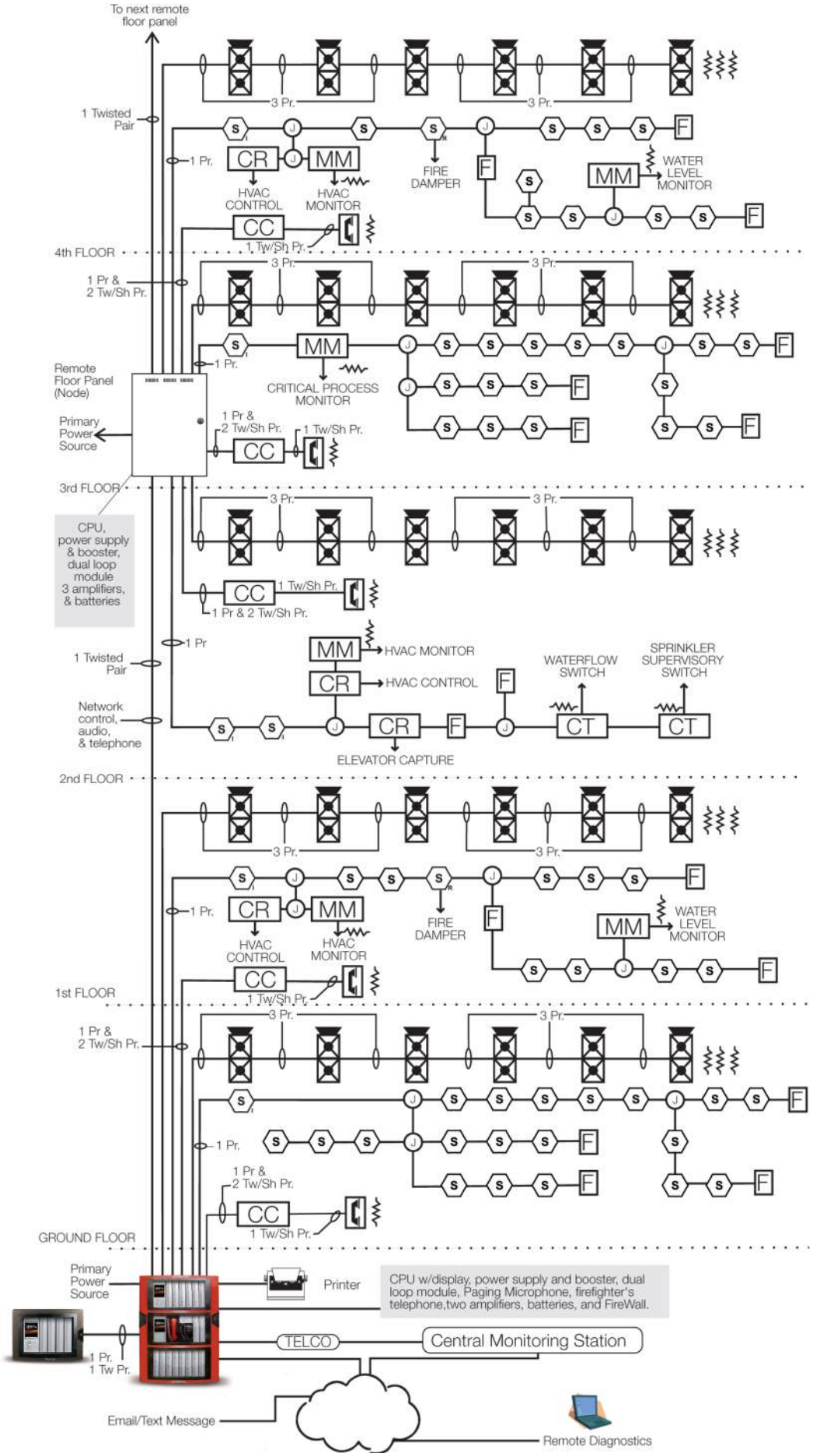
EST4 keeps up with the fast pace of mobile computing with its built-in e-mail services and e-mail-to-text-message capabilities. These ensure that key personnel receive instant notification of relevant changes of system state. Technicians can be dispatched to the site within minutes of a service event, while safety and security personnel can arrive concurrently with first responders should the system go into alarm.

## Networking

Supporting these important interface developments is a robust system underpinned by solid networking and exceptional security. Thanks to its self-configuring network, EST4 easily deploys and configures without intervention by network administration personnel. It adapts to a wide range of network configurations, including rings, stars, redundant segment, and full mesh topology. The network even allows changes in the physical layer from copper to fiber, and employs hot-swappable network connections at control panels and annunciators. All this improves network reliability and saves money at installation time and throughout the equipment's life cycle.

The advanced technology behind EST4's network is powerful enough to drive the biggest installations viable today. It pushes wire runs into miles, and addressable points into the many of thousands. A single IPv6 or mesh network, for example, can support copper wire runs of nearly a mile between nodes puts detection, alarm, notification, and audio into the furthest reaches of the tallest buildings and broadest campuses. Fiber optic cable handles multiple miles between nodes, while carrying all system data on a single fiber strand.

## Riser Diagram



System design benefits greatly from this huge capacity. Minimal cabling requirements take scalability a step further. With EST4 a single copper pair or single fiber supports panel network data, audio data, as well as telephone data. This cuts cable counts by up to 75 percent. Meanwhile, multiple firefighter's telephones risers are accommodated on the network, which allows them to be deployed at much further distances compared with analog audio transmission methods.

Reduced network cabling not only boosts system efficiency by requiring fewer physical connections, it also saves money by reducing material and labor costs. This means that new EST4 installations benefit from lower cable counts, while retrofits may be able to be upgraded to support audio and telephones without the need to pull additional cable.

For new installations EST4 delivers flexibility. It can use twisted pair wire, Multi-mode fiber, Single Mode fiber, and even CAT5 cable. In fact CAT5 is not restricted to Class N applications. It also meets the stringent requirements of Class A, Class B, and Class X. When using CAT5, distances are not limited to 328 ft. (100 m). EST4's CAT5 support includes a solution that allow up to 3,280 ft. (1 km) of cable length.

## Cybersecurity

The security and integrity of the EST4 network is paramount to its ability to maintain systems operations in the face of outside threats. The most vulnerable point of contact for any integrated building system is where it meets the facility owner's existing TCP/IP network. Ironically it is this gateway, which enhances and expands system capability beyond the communications network, that also exposes the system to some of its most critical vulnerabilities.

To combat outside threats, every EST4 panel can deploy proxy firewalls that effectively insulate the internal fire network from external Intranet or internet connections and the malware, ransom ware, and denial-of-services attacks that may be raging beyond. The EST4 proxy firewall uses Advanced Encryption Standard (AES) encryption and secure protocols making it FIPS Pub 197 certified. The FIPS, Federal Information Processing Standards, are the most current and most advanced encryption protocols administered by the National Institute of Standards and Technology (NIST).

EDWARDS recommends the installation of robust commercial firewall between the facilities intra-net and the Internet. To further enhance network security, an optional tamper switch may be installed on EST4 cabinet doors. This alerts the system when equipment enclosures are accessed.

## Programming

EST4 is an open book for authorized programmers. Configuration data travels in both directions: it can be downloaded to the panel and uploaded to a laptop. This two-way movement of configuration files allows technicians to upload and backup programming before making changes to the system. By doing so, the tech ensures that trustworthy restore points are available at all times. Also, should the building owner change service companies, up-to-date system programming data can be retrieved with proper authorization, from the panel by the new maintenance personnel in minutes.

Adding to the integrity of panel configuration is an advanced data transfer routine that does not compromise or interrupt normal system operation. This keeps the system fully functional during configuration data exchange – logging events and executing programming during the entire process.

EST4's high-performance Configuration Utility (CU) depicts the system in a graphical tree view, which matches the system's physical layout. This provides a familiar format in which to find programming for specific devices, and also does away with the need for look-up lists when, for example, devices need to be taken out of service because of site specific activities. The programming tool also features a context-sensitive Intellisense rule editor, which checks for syntax and semantic programming errors in real time.

The EST4 Configuration Utility (CU) also makes short work of configuration downloads to the control panel. It does this through a single firmware download for all modules, and a single database download for all node databases.

EST4's on-board USB ports also make it easy to connect with external devices. The USB ports do away with special cables and RS232-to-USB conversion dongles. It allows direct high-speed connection with laptops for the exchange of configuration data at transfer rates of up to 480 Mbps. Printers can be connected to panels or remote annunciators for on-site event and report printouts.

## Audio

Nothing informs building occupants better than the spoken word, and EST4's highly intelligible voice audio ensures that those words are heard loud and clear. This high fidelity messaging, across EST4's impressive capacity of 200 channels, provides the flexibility that responders need to get messages out clearly and concisely.

EST4 live paging capabilities ensure that those messages reach the right people at the right time. In addition to standard paging functions (Page to Evacuation, Page to Alert, All Call, and All Call Minus), EST4 introduces Page to Other and Page to Emergency.

Page to Other is a quick way to reach people in stairwells and elevators, while Page to Emergency is for Mass Notification purposes. This added live paging capability allows responders to reach occupants based not only on their proximity to danger, but also based on their potential to move inadvertently towards specific danger points.

EST4 live paging also lets responders select individual paging groups as well as combinations of groups. This allows them to reach people in Alert and Evacuation zones simultaneously without having to page one group, and then page the other.

## Reporting System Snapshots

EST4 can generate an abundance of stock reports, and users may also design their own within the configuration utility. Printed reports can be generated locally at any control panel, node, or annunciator. Familiar USB connections allow for quick uploading to laptops or transfer to locally-connected printers. Reports can also be sent from any of these locations to system printers elsewhere on the network.

EST4 allows the selection of report data right down to the device level by means of pre-built templates, custom reports, or even on-the-fly using the CU configuration tool. Report content is information rich, detailed, and meaningful. This meticulous report formatting and organization results in highly understandable system overviews and useful deep dives into underlying system configuration data.

## Event History Timelines

While system status reports are invaluable for generating snapshots of important data, EST4's event history can paint a vivid picture of the system over time. A giant 20,000-event repository comprises EST4's history, which could span back as far as the system's commissioning. Half of the history can be set aside exclusively for Alarms, ensuring that records of the most important events are preserved. To support forensic investigations, up to 10,000 events can be locked and preserved so as not to be overwritten.

A large variety of pre-built history reports are available for quick access to vital records filtered by day, week, month or year. Custom reports help pinpoint records by date, time, location, device type and more. Together EST4's large history capacity and flexible history reporting serve to create vital timelines that aid in system maintenance and forensic investigations.

## Value-added Forward Migration

Easy migration paths ensure an economical transition from EST3 platforms to EST4's next-generation technology. To start, configuration data is easily transferable from an existing EST3 project to an EST4 upgrade. Hardware is also easy to migrate: all Signature Series devices, modules, and service tools are fully supported by EST4, as are Genesis series notification appliances – no rewiring is required.

Existing network cabling is also reusable for upgrades. EST4 even supports network messaging plus live paging with legacy wiring. In fact, simple twisted pair wiring, previously useable only for panel-to-panel data communications can, with EST4, support panel data, paging, as well as telephone. This means that voice audio capability may be added to a system originally wired only for network panel to panel communications – without pulling any additional wire.

EST4 also employs EST3 power supplies, audio amplifiers, MNEC equipment, CAB Series wallboxes, and most local rail modules. This makes the move to EST4 a cost-effective choice for existing installations, and new projects alike. It is a move that will benefit system efficiency and scalability now and for many years into the future.

## Agency Approvals

UL864 10th edition - UOJZ, UUKL, SYZV, UOQY

UL2017 2nd edition - FSZI

UL2572 2nd edition - PGWM

ULC-S527-11 3rd edition - UOJZ, UULK7, SYXV7

ULC-S576-14 1st edition - PGWM7

ULCS-S559-13 2nd edition - DYR7

FM

CE

EN54

EDWARDS

LIFE SAFETY & INCIDENT MANAGEMENT

**Contact us**

Phone: 800-655-4497 (Option 4)
Email: edwards.fire@carrier.com
Website: edwardsfiresafety.com

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Bradenton, FL 34202

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EDWARDS

LIFE SAFETY & INCIDENT MANAGEMENT

# EST4 Cabinets and Chassis

## 4-CAB Series, 3-CAB Series 3-RCC series, BC-1



4-CAB Series shown with optional equipment.

FM APPROVED | NYC FIRE DEPT. COA # 2022-TMCOAP-008086-RENL | UL | ULC | CE | EN54

## Overview

EST4 has a wide selection of cabinet arrangements allowing the greatest use of EST4's flexible modular design.

Cabinets support more interfaces and display modules than earlier systems, which means smaller or fewer cabinets need to be installed to provide the same display capacity. Cabinets also support optional mounting of Signature Series modules, which is another way to reduce the use of external cabinets.

Lobby enclosure wallboxes and doors are made from sturdy 14-gauge rolled steel. Wallboxes have a black baked enamel finish. Lobby enclosure doors feature a modern contoured door design and integral viewing windows. They come with metallic bronze (Pantone Coated PMS# P 171-16 C, Pantone RGB# 81 75 67, and RAL Classic/RAL Design# 7022) or red baked enamel finishes. The door designs and colors ensure that there is a match to system annunciators and battery cabinets for a consistent look throughout the facility.

Doors may be mounted as remote annunciators without the need to have large CAB enclosures behind. This allows larger equipment to be mounted remotely, minimizing wall penetrations in lobbies and public spaces, and removing the need to home-run all field wiring.

The EST4 lobby enclosures backboxes, doors and chassis units are ordered and shipped separately for easy staging on project sites. With a variety of sizes available, customized installations offer the flexibility to support up to two color LCD touch screens, and LED and switch modules offering configurations of 576 five color LED indicators, as well as 576 control switches along with microphone and firefighters' telephone options.

## Standard Features

- **Left or Right-hand Hinging Doors**
  Allows the mounting of two cabinets side-by-side with full access while both doors are open.
- **Lag and Keyway Holes**
  Makes mounting of enclosures quicker and easier.
- **Attractive Contour Door Design**
  Lobby enclosures, annunciators, with their contour door designs, feature color-matched black wallboxes that complement distinctive metallic bronze doors.
- **Combination Flush or Surface Mounting Lobby Enclosure**
  Quicker installation with semi-flush trim built-in.
- **RCC Series House up to 65 Amp Hour Batteries**
  Remote Closet Cabinets support larger battery sizes reducing the number of boxes required.
- **Maximum Space for optional Control Display Modules**
  Inner doors not only support the user interface layer, but also acts as a deadfront so field wiring remains protected during system operation.
- **Optional Earthquake Hardening**
  OSHPD Seismic Pre-Approval For Component Importance Factor 1.5
- **Knockouts for 3/4-inch Conduit**
- **BC Series Support up to 40 AH Batteries**

## Application

### Lobby Enclosures

EST4 lobby enclosures provide space for control, monitoring and display modules where they remain visible even with the door closed and secure. Ideal for mounting in lobbies where appearance is important, doors will mount for right or left hand opening. Lobby enclosures come in several sizes to match individual project requirements.

The **3-CAB5B** mounts semi-flush or surface. A built-in rail assembly provides space for up to five local rail modules, no chassis assembly needed. Back space for 1-1/2 footprints provides room for a power supply, a 1/2 footprint module, and 10 AH batteries. The local rail module spaces provide room for amplifiers, SLC, and other modules. The 4-CAB8D or 4-CAB8DR door mounts to the 3-CAB5B providing eight spaces for user interface modules.

The **3-CAB7B** mounts semi-flush or surface, and with the contoured front door, 4-CAB16D(R) provides 16 spaces for common control and annunciation modules. Space is provided for two 17 AH batteries and one chassis assembly providing seven local rail module spaces. The door may be mounted with hinges on the left or on the right.

The **3-CAB14B** mounts semi-flush or surface, and with the contoured front door, 4-CAB24D(R) provides 24 spaces for common control and annunciation modules. Space is provided in the cabinet for two 17 AH batteries and two chassis assemblies providing 14 local rail module spaces. The door may be mounted with hinges on the left or on the right.

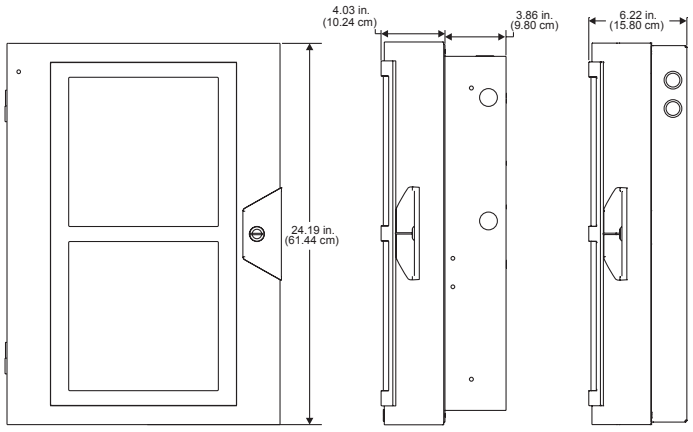
The **3-CAB21B** mounts semi-flush or surface, and with the contoured front door, 4-CAB24D(R)L provides 24 spaces for common control and annunciation modules. Space is provided for two 17 AH batteries and three chassis assemblies for 21 local rail module spaces. The door may be mounted with hinges on the left or on the right.

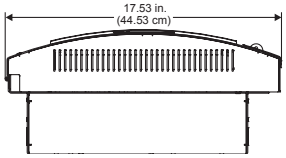
### Remote Closet Cabinets

Remote Closet Cabinets provide an efficient way of installing equipment in locations such as electrical closets. An optional color LCD display module for system diagnostics can be mounted behind the front door. The LCD display module will not be visible with the door closed. Remote closet cabinets are surface-mounting and come in sizes providing space for one to three chassis with room for standby batteries. The Remote Closet Cabinets designs allow them to be used as remote battery cabinets and their red door and black wallbox match exactly the red and black of lobby cabinets for a clean finished installation.

## Installation and Mounting, 4-CAB Door Assemblies

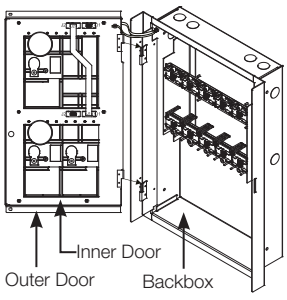
### 4-CAB8D Series Door Assembly

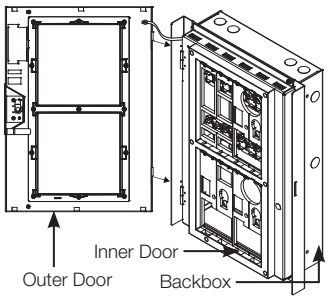


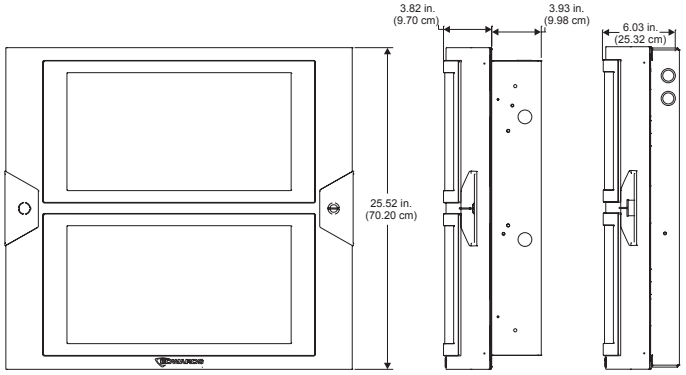

4-CAB8D installed on a 3-CAB5B back-box. Can be surface mounted or semiflush mounted.

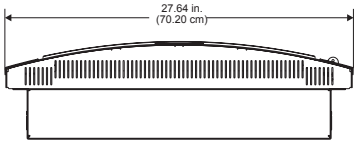
(2) 4-CAB8D installed on a 4-8ANNMT back-box. Can be surface mounted only



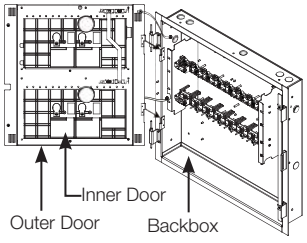

### 4-CAB16D Series Door Assembly

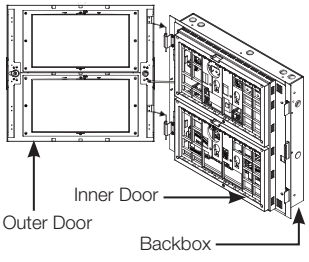


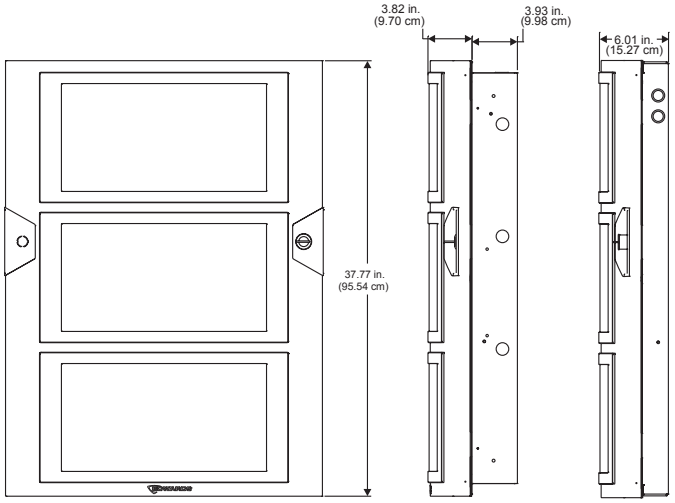

4-CAB16D installed on a 3-CAB7B backbox. Can be surface mounted or semiflush mounted.

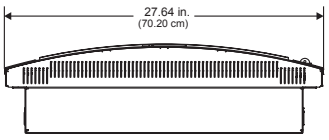
4-CAB16D installed on a 4-16AN-NMT backbox. Can be surface mounted only.



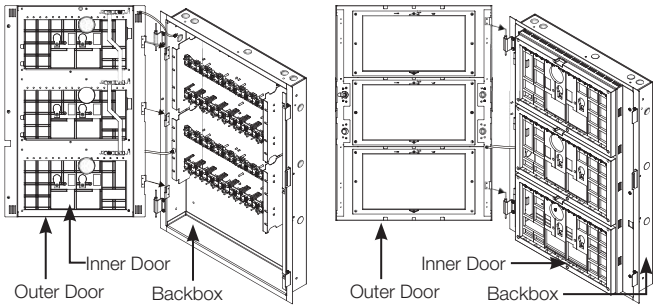
## 4-CAB24D Series Door Assembly



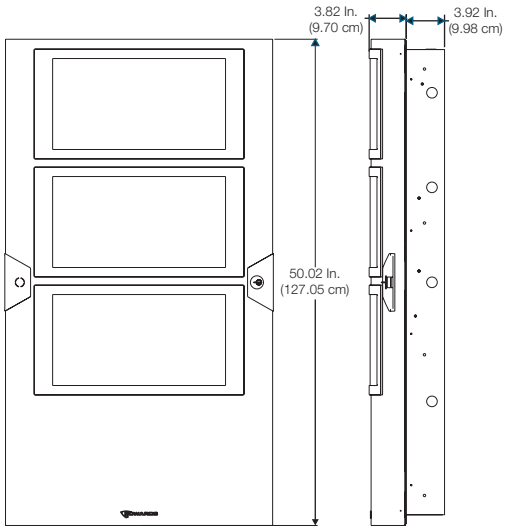



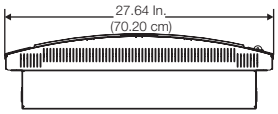

4-CAB24D installed on a 3-CAB14B backbox. Can be surface mounted or semiflush mounted.

4-CAB24D installed on a 4-24ANNMT backbox. Can be surface mounted only.



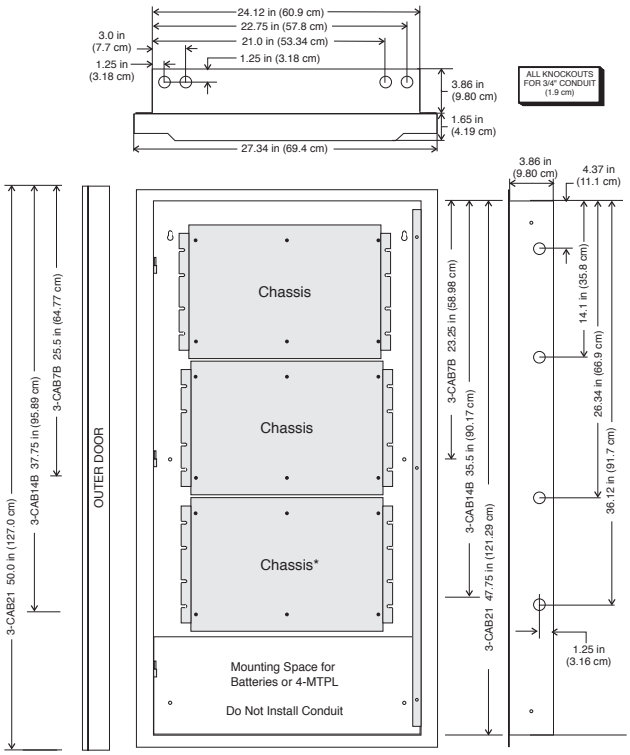

## 4-CAB24DL Dimensions



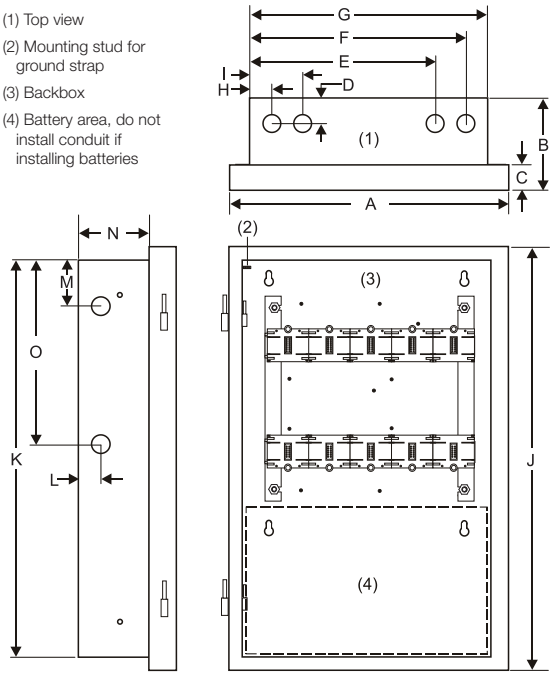

# 3-CAB Lobby Enclosures

## 3-CAB7B, 3-CAB14B, 3-CAB21B Lobby Enclosures




## 3-CAB5B Lobby Enclosure

(1) Top view
(2) Mounting stud for ground strap
(3) Backbox
(4) Battery area, do not install conduit if installing batteries




| | | | | | |
|---|---|---|---|---|---|
| **A** | 16.4 in (41.66 cm) | **F** | 12.70 in. (32.26 cm) | **K** | 22.37 in. (56.82 cm) |
| **B** | 3.86 in (9.80 cm) | **G** | 14.00 in. (35.56 cm) | **L** | 1.11 in. (2.82 cm) |
| **C** | 1.65 in. (4.19 cm) | **H** | 1.30 in. (3.30 cm) | **M** | 2.6 in. (6.6 cm) |
| **D** | 1.34 in. (3.40 cm) | **I** | 3.1 in. (7.87 cm) | **N** | 3.86 in. (9.80 cm) |
| **E** | 10.90 in. (27.69 cm) | **J** | 23.87 in. (60.63 cm) | **O** | 10.4 in. (26.42 cm) |

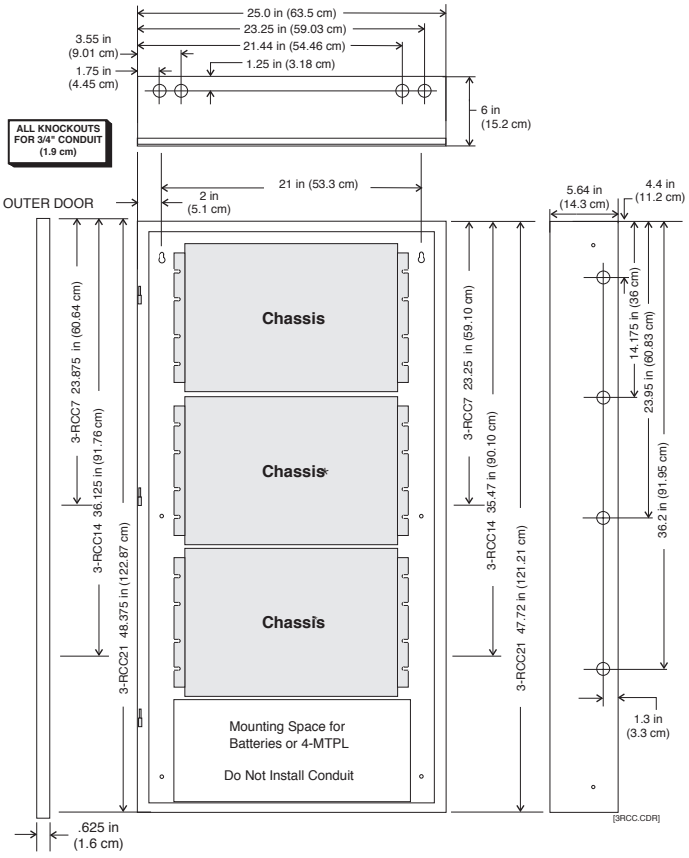
# 3-RCC Remote Closet Cabinets

## Surface Mounted Remote Closet Cabinets
## 3-RCC7R, 3-RCC14R, 3-RCC21R



3-RCC Remote Closet Cabinet

The EST4 remote closet cabinet design allows the installation of control panel electronics in electrical closets. The remote closet cabinets have left-hand hinged doors and are available with red door finish and black wallbox only. Optional color display for system diagnostics can mount behind the closet cabinet door and is not visible with the door closed.

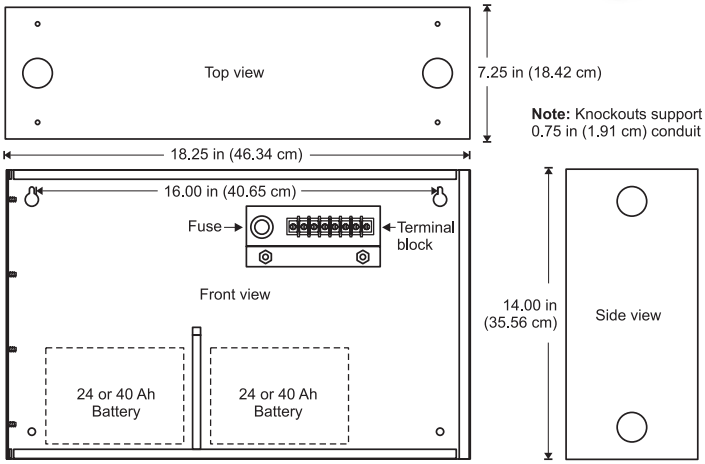



* The lower mounting space can be used for an MN-BRKT1 bracket, which holds MNEC interface equipment including an MN-NETSW1 Ethernet network switch, an MN-ABPM Audio bridge, an MN-FVPN VoIP module, and an MN-COM1S Communications module.

# BC-1 Battery Cabinet

BC-1 Battery Cabinet





## Ordering Information

| Model # (SKU) | Description | Shipping Weight |
|---|---|---|
| **Backboxes** | | |
| 3-CAB5B | Backbox, black. Supports five Local Rail Modules. Not approved for EN54 applications. | 20.0lb (9.07kg) |
| 3-CAB7B | Backbox, black. Supports seven Local Rail Modules. Comes with space for one 3-CHAS7 and room for up to two 17 AH batteries. When batteries are mounted remotely, battery space may be used for 4-MPLT for mounting of optional equipment. | 29.5lb (13.4kg) |
| 3-CAB14B | Backbox, black. Supports 14 Local Rail Modules. Comes with space for one or two 3-CHAS7s and room for up to two 17 AH batteries. When batteries are mounted remotely, battery space may be used for 4-MPLT allowing mounting of optional equipment. | 40.8lb (18.5kg) |
| 3-CAB21B | Backbox, black. Supports 21 Local Rail Modules. Comes with space for one, two or three 3-CHAS7s and room for up to two 17AH batteries. When batteries are mounted remotely, battery space may be used for 4-MPLT allowing mounting of optional equipment. | 51.3lb (23.3kg) |
| **Door Assemblies, Eight User Interface Spaces (mount to 3-CAB5B backbox)** | | |
| 4-CAB8D | Door Assembly – Metallic bronze outer door and black inner door with 8 user interface spaces, mounts to 3-CAB5B wallbox. Not approved for EN54 applications. | 23.0lb (10.43kg) |
| 4-CAB8DR | Door Assembly – Red outer door and black inner door with 8 user interface spaces, mounts to 3-CAB5B wallbox. Not approved for EN54 applications. | 23.0lb (10.43kg) |
| **Door Assemblies, 16 User Interface Spaces (mount to 3-CAB7B backbox)** | | |
| 4-CAB16D | Door Assembly – Metallic bronze, comes with 16 User Interface spaces, mounts to 3-CAB7B wallbox. | 36.0lb (16.33kg) |
| 4-CAB16D-E | Door Assembly – Metallic bronze, comes with 16 User Interface spaces, mounts to 3-CAB7B wallbox. For EN54 applications. | 36.0lb (16.33kg) |
| 4-CAB16DR | Door Assembly – Red, comes with 16 User Interface spaces, mounts to 3-CAB7B wallbox. | 36.0lb (16.33kg) |
| 4-CAB16DR-E | Door Assembly – Red, comes with 16 User Interface spaces, mounts to 3-CAB7B wallbox. For EN54 applications. | 36.0lb (16.33kg) |
| **Door Assemblies, 24 User Interface Spaces (mount to 3-CAB14B backbox)** | | |
| 4-CAB24D | Door Assembly – Metallic bronze outer door and black inner door with 24 user interface spaces, mounts to 3-CAB14B wallbox. | 51.0lb (23.13kg) |
| 4-CAB24D-E | Door Assembly – Metallic bronze outer door and black inner door with 24 user interface spaces, mounts to 3-CAB14B wallbox. For EN54 applications. | 51.0lb (23.13kg) |
| 4-CAB24DR | Door Assembly – Red outer door and black inner door with 24 user interface spaces, mounts to 3-CAB14B wallbox. | 51.0lb (23.13kg) |
| 4-CAB24DR-E | Door Assembly – Red outer door and black inner door with 24 user interface spaces, mounts to 3-CAB14B wallbox. For EN54 applications. | 51.0lb (23.13kg) |
| **Door Assemblies, 24 User Interface Spaces (mounts to 3-CAB21B backbox)** | | |
| 4-CAB24DL | Door Assembly – Metallic bronze outer door and black inner door with 24 user interface spaces, mounts to 3-CAB21B wallbox. | 65.0lb (29.48kg) |
| 4-CAB24DL-E | Door Assembly – Metallic bronze outer door and black inner door with 24 user interface spaces, mounts to 3-CAB21B wallbox. For EN54 applications. | 65.0lb (29.48kg) |
| 4-CAB24DRL | Door Assembly – Red outer door and black inner door with 24 user interface spaces, mounts to 3-CAB21B wallbox. | 65.0lb (29.48kg) |
| 4-CAB24DRL-E | Door Assembly – Red outer door and black inner door with 24 user interface spaces, mounts to 3-CAB21B wallbox. For EN54 applications. | 65.0lb (29.48kg) |
| **Equipment Wallboxes** | | |
| 3-RCC7R | Cabinet with Red door and Black wallbox. Supports up to one 3-CHAS7 and Two - 12V10A or Two - 12V17A, or Two - 12V50A. When batteries are mounted remotely, battery space may be used for 4-MPLT allowing mounting other optional equipment. | 45.9lb (22.6kg) |
| 3-RCC14R | Cabinet with Red door and Black wallbox. Supports up to two 3-CHAS7 and Two - 12V10A or Two - 12V17A, or Two - 12V50A or Two - 12V65 (See note 1). When batteries are mounted remotely, battery space may be used for 4-MPLT allowing mounting other optional equipment. | 62.1lb (28.2kg) |
| 3-RCC21R | Cabinet with Red door and Black wallbox. Supports up to three 3-CHAS7 and Four - 6V8A, or Two - 12V10A, or Two - 12V17A, or Two - 12V50A, or Two - 12V65 (See note 1). When batteries are mounted remotely, battery space may be used for 4-MPLT allowing mounting other optional equipment. | 79.0lb (35.8kg) |
| **Battery Cabinets** | | |
| BC-1 | Battery Cabinet – Black back box, Metallic bronze door. Supports up to 40AH batteries | 19.8lb (9kg) |
| BC-1R | Battery Cabinet – Black backbox, red door. Supports up to 40AH batteries. | 19.8lb (9kg) |

*Note 1: Remote closet cabinets will support 65 AH batteries with the use of the 3-BATS Battery Shelf, which reduces the enclosure's chassis capacity by one chassis.*

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**Contact us**

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Email: edwards.fire@carrier.com
Website: edwardsfiresafety.com

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Bradenton, FL 34202

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## Accessories and Related Equipment

| Model # (SKU) | Description | Shipping Weight |
|---|---|---|
| 4-LOCK2KEY | Replacement door lock and two keys | 1.0lb (0.45kg) |
| 4-HNG714 | Replacement Hinge Assembly CAB7 or 14 | 1.5lb (0.68kg) |
| 4-HNG21 | Replacement Hinge Assembly CAB21 | 2.0lb (0.91kg) |
| 3-CHAS7 | Takes one chassis space in wallbox, provides space for seven local rail modules, up to two power supplies, and a 1/2 footprint module. | 9.4lb (4.2kg) |
| 3-CHAS7-I | Takes one chassis space in wallbox, provides space for seven local rail modules, up to two power supplies, and a 1/2 footprint module. For EN54 applications. | 9.4lb (4.2kg) |
| 4-MPLT | Mounting Plate mounts in chassis space or in the battery space of cabinets in place of batteries. | 4.3lb (1.95kg) |
| 4-BRKT-CB | Mounting Bracket provides space for mounting any one of 4-ANNCPU, 4-FWAL-1, 4-FWAL-2, 4-FWAL-3, 4-FWAL-4, or a 4-NET-AD module. Mounts on the back plane of a 3-CHAS7. | 1.1lb (0.5kg) |
| 4-BRKT-CS | Mounting Bracket provides space for mounting any one of 4-FWAL-1, 4-FWAL-2, 4-FWAL-3, 4-FWAL-4, or a 4-NET-AD module. The bracket mounts to the side of a 3-CHAS7. | 1.2lb (0.54kg) |
| 3-BTSEN | Battery sensor/distribution module. | 2.0lb (0.9kg) |
| 3-BTSEN-E | Remote battery cabinet interlace, temperature sensing. For EN54 applications. | 1.0lb. (0.45kg) |
| 3-BATS | Battery Shelf for RCC Enclosures. Takes one chassis space. Room for up to one 65 AH or two 50 AH batteries. | 3.9lb (1.8kg) |
| BC-1EQ | BC-1 - Seismic Battery hold down for BC-1. Supports up to two 40 Ahr batteries. Order BC-1 Separately. | 2.1lb (1kg) |
| 3-CABEQ | 3-CAB - Seismic Battery hold-down for 3-CAB 7, 14 or 21. Supports two 1 2V batteries from 10 Ah up to 18 AH. Comes with EST3 Chassis hardening hardware and instructions. Order 3-CAB7, 3-CAB14 or 3-CAB21 separately. See Note 1. | 2.5lb (1.1kg) |
| 3-RCCEQ50 | 3-RCC series - Seismic Battery hold-down. Supports one set of two 50 Ah batteries. Comes with EST3 Chassis hardening hardware and instructions. Order 3-RCCxxR separately. See Note 1. | 1.6lb (0.7kg) |
| 3-RCCEQ65 | 3-RCC series cabinet - Seismic Battery hold-down. Supports one set of two 65 Ah batteries (one battery in bottom of cabinet, one battery mounted on 3-BATS). Order 3-RCCxxR cabinet and 3-BATS separately. See Note 1. | 4.3lb (2kg) |
| 4-TAMP | Tamper switch for 3-CAB7B, 3-CAB14B and 3-CAB21B cabinets with 4-CABXXD series doors. Mounts to side of cabinet. | 0.45lb (0.2kg) |
| 3-TAMPRCC | 3-TAMPRCC Tamper Switch for RCC series cabinets. Mounts to side of cabinet. | 0.5lb (0.2kg) |
| 3-TAMP5 | Tamper switch for 3-CAB5B. Mounts to side of cabinet. | 0.3lb (0.1kg) |
| 4-CABLUSBLG | Long USB 3.0 Cable w/ A and B connector Types | 0.3lb (0.14kg) |

*The above enclosures and doors are fully listed to UL-864 and ULC-S527 standards.*

*Note 1: For earthquake anchorage, including detailed mounting weights and center of gravity detail, please refer to the Seismic Application Guide. Approval of panel anchorage to site structure may require local AHJ, structural, or civil engineer review.*

*Note 2: Unless otherwise specified, all SKUs may be used in EN54/UL/ULC applications.*

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# EST4 Central Processing Unit

## 4-CPU



FM APPROVED | NYC FIRE DEPT. COA # 2022-TMCOAP-008086-RENL | UL | ULC | CE | EN54

## Overview

EST4's Central Processing Unit, the 4-CPU, is a control panel card that manages data generated by local modules and acts as a nexus for system-wide network communication. It accomplishes this by pulling data from local rail modules in real time and facilitating both intra-module data exchange, and inter-node communications with remarkable speed and efficiency.

The 4-CPU is, in essence, the gatekeeper for events reported to modules from field devices; it is the controller of audio data; the caretaker of event logs; the guardian of security; and, the link to central monitoring facilities. The EST4 Emergency Communications Platform is built upon system nodes, and the 4-CPU is controller of the nodes.

The hardware that supports 4-CPU operation is robust enough to handle the complex and critical tasks it is assigned. The 4-CPU's eight gigabytes of on-board memory storage holds nearly two hours of pre-recorded audio messaging, as well as an expansive project database. It also holds a large on-board history – large enough to handle more than 10,000 alarm events – and room to store up to 10,000 locked or frozen events held for investigative purposes.

Thanks to its self-configuring network, EST4 nodes easily deploy and configure without intervention by network administration personnel. They adapt to a wide range of network configurations, including rings, stars, redundant segment, and full mesh topology. The 4-CPU even allows changes in the physical layer from copper to fiber, and employs hot-swappable network connections. All this improves network reliability and saves money at installation time and throughout the equipment's life cycle.

## Standard Features

- **20,000 event history**
  Large history ensures system events are captured plus additional 10,000 event EST4 *History Freeze* function.
- **SFP style Network Communications Media Options**
  Supported media types include, twisted pair, CAT5, Single and Multimode Fiber in any combination.
- **Up to 750 Minutes of Stored Voice Messages**
  Memory is standard on-board. No need for additional modules.
- **USB V2.0 Type A Host Port**
  High speed connection for printers and hubs.
- **USB V2.0 Type B Device Port**
  High speed connection supports laptops.
- **Integrated Audio Synchronization**
  The 4-CPU synchronizes audio signals across the network, ensuring clear messaging over long distances.
- **Optional Form C Alarm, Supervisory, Trouble Contacts**
  Space for the 4-COMREL Common Relay Module. Relays are rated 30Vdc at 1A. Supports wire sizes from 18 to 12AWG.
- **Optional USB Hub**
  Expands the USB capability of the CPU to meet application needs, comes with RS-232 port.
- **Optional Audio Support**
  Space provided for the 4-AUDTELS Audio I/O and Telephone Riser source module.
- **Simple Plug-in Design**
  Easy installation, no special tools required, CPU simply plugs onto the panel rail.

## Application

The 4-CPU makes EST4 an extremely powerful and flexible system. Systems may comprise a single standalone node, while larger installations comprise an integrated network. These may include many nodes communicating via IPv6 over several different types of fire-listed wiring, including fiber optics, twisted pair, and CAT5 cabling. Regardless of the system size, a single 4-CPU node controls up to 19 additional local rail modules.

The 4-CPU controls all local panel responses to automatic, user initiated, or network-reported events. As a network node, it is an equal among peers: there is no master on the network. This gives exceptional response times of less than three seconds.

### Intra-module Communications

Upon power-up the processor automatically learns all local rail module attributes and locations; it negotiates with other life safety CPUs at nodes on the IPv6 network; and, it automatically enables the full support for cyber security protocols tested to meet FIPS Publication 197. This security applies optionally to a single panel, or throughout the entire EST4 network. The 4-CPU automatically configures the EST4 network thanks to integrated plug-and-play setup and auto address. No IT network administrator is required.

The EST4, 4-CPU on-board USB ports make inner panel wiring simple. The majority of interconnections are made with standard USB 3.0 cables supplied as standard with most option modules. The USB interconnect runs at speeds of up to 480 Mbps, ensuring fast system data transmission.

This fast data transmission is used, not only for inner panel communication, but also for external communications through a 4-FWAL to the FireWorks graphical user interface, printers, and other systems needing integration to the life safety system.

### Inter-Panel Neworking

Each 4-CPU provides two SFP slots supporting hot-swappable modules that determine the media type in use at the panel. The 4-CPU also supports the 4-AUDTELS Audio Telephone Riser Module. This enables audio, local microphone connection, and firefighter telephone connection. The 4-CPU supports connection of optional common relays, 1 Vrms audio in- and out-terminals, and firephone riser connection — all of which provide removable field wiring terminal blocks.

For enhanced survivability, SFP network controller modules are hot swappable and mount to the slots on the 4-CPU. The network connection supports panel-to-panel data, voice audio, and firefighters telephone all on the same cabling – no separate interconnections needed. Should the application call for it, cabling can be installed that allows all inter-panel network data – including panel data, voice audio, and firefighters telephone – to be transmitted on a single twisted pair or single fiber optic fiber. This helps speed setup time and cuts installation costs.

Network physical interconnection options offer a range of solutions from twisted pair running at 2 Mbps and supporting distances of up to 5,000 ft. (1.5 km) between any two panels. When running at 0.2 Mbps, even longer distances are possible – up to 50,000 ft. (15 km).

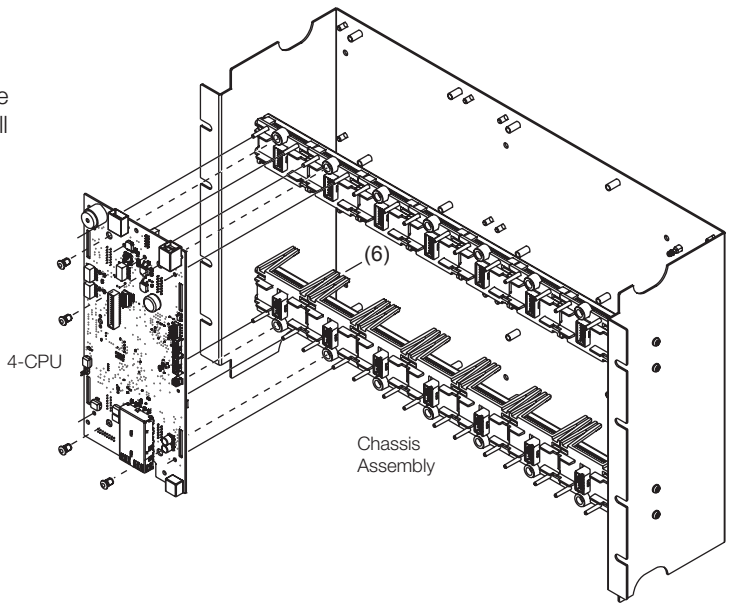
Single-mode, multimode, and even CAT5 cabling options are possible with EST4. The 4-CPU also meets redundancy and survivability requirements of many cabling needs, including Class A, Class B, Class X, and Class N. CAT5 installations are not limited to Class N wiring style: the network can be engineered to meet Class A, Class B, and Class X configuration when the project requires distances of up to 3,280 ft.

Network messages received by the network communications controllers are re-transmitted to the next network panel. This re-transmission maximizes the wire run lengths between panels.

Should the related central processor stop operating to specifications, fail-safe protocols built into EST4 network controller cards connect the data input directly to the output ports. This operation provides a back-to-back passthrough mode for most media type to media type and maintains network connectivity, not only during a catastrophic failure of a single panel, but also in the event that the panel is powered down for servicing. This keeps the fire network up and running at all times. For greater serviceability, any powered-down panel maintains its real time clock for up to 30 minutes — even if the panel has all power sources removed, including main and standby sources.

## Installation

The 4-CPU mounts in the first two local rail spaces of the upper 3-CHAS7 module chassis. Options for the 4-CPU include a color LCD display and user interface, a wide selection of small form-factor pluggable (SFP) network controller modules, USB internal panel connections, common relays, audio, and fire fighters telephone communication cards.



## Engineering Specification

It must be possible to support a single standalone node or multiple nodes communicating on a TCP/IP, IPv6 network that supports mesh configuration. The network shall support physical media connections via fiber, twisted pair or CAT 5 in any combination. The Network shall support data transmission of panel-to-panel data, voice audio and firefighter telephone data on a single twisted pair or single fiber optic cable. The Network shall be configured as Class A or Class B or Class X configuration. Networks restricted to Class N wiring shall not be acceptable. Network shall support a back-to-back pass-through mode that shall maintain network connectivity on power down or catastrophic failure of a single panel. The network shall support twisted pair links to 5,000 ft., CAT 5 links to 3,280 ft., and fiber links to 130,994 ft.

The network shall support hard copy report printing to a system printer connected to any panel in the network, systems that require reports be run from the panel that has a printer connection shall not be considered equal. The systems LCD display shall provide color graphics display of maintenance and sensitivity reports.

The system shall support multiple languages/dialects and Unicode character set.

The Control panel and network shall not use easily removable devices, such as SD cards or external storage devices for storage of system critical information including programming and project files. Communications outside the life safety network shall meet the requirements of FIPS Publication 197.

Security-relevant information, such as: failed login attempts, failed unauthorized accesses, and user modification shall be logged to panel history. Unsuccessful authentication attempts shall not leak information regarding the presence of the system or users. Credentials shall only be transmitted that are encrypted. The system shall provide for multiple users, roles shall be provided for users to ensure proper access by user for the role they perform on the system. All passwords shall use a cypher algorithm for security purposes to protect any sensitive information. No passwords shall be visible as plain text within the database or entire system.

Sensitive information shall not be logged to history or displayed on service tools (e.g. passwords, PINs etc.).

The system shall support configuration of multiple IP connections to external services including, central stations, email servers, web interfaces, reports, and third party integration.

Email messages shall support multiple languages in native characters that match the languages supported in the panel. Email messages shall support symbolic and color alarm event highlighting.

The system shall support logging of up to 20,000 chronological events using FIFO. Is shall be possible to freeze or store the most recent 10,000 events separately from the FIFO log.

It shall be supported to download all applications and firmware from the configuration computer at a single location on the fire network. The system shall support upload of a project file from any location on the fire network.

## Technical Specifications

| | |
|---|---|
| Current<br>Standby<br>Alarm | 230 mA at 24 VDC |
| Common relays | See the 4-COMREL Common Relay Module Installation Sheet (P/N 3102284- EN) |
| Universal Serial Bus (USB) ports | 1 USB 3.0, Type A – female port<br>1 USB 3.0, Type B – female port |
| USB cables[1] | 4-CABLUSBSM – 3.0 USB, 29.5 in.(0.75 m), included.<br>4-CABLUSBLG – 3.0 USB, 59.0 in.(1.5 m), sold separately. |
| SFP modules | Refer to the SFP catalog sheet E85014-0008 for a list of compatible SFP modules. |
| Agency Approvals | UL, ULC, FM, CSFM, EN54, CE, NYC Fire Dept. [2] |
| Wire size<br>TB1 network backup power connection | 12 to 18 AWG (2.5 to 1.0 $mm^2$) |
| Ground fault impedance | 5 kΩ or less |
| Operating environment<br>Temperature<br>Relative humidity | 32 to 120°F (0 to 49°C)<br>0 to 93% noncondensing |

[1] Only use listed USB cables. Retail USB cabling is not sufficient for this application.
[2] CE compliant product add suffix -E to model (e.g. 4-CPU-E)

## Ordering Information

| Model # (SKU) | Description | Shipping Weight |
|---|---|---|
| 4-CPU | Central Processor Module | 0.95lb (0.43kg) |
| 4-CPU-E | Central Processor Module, EN54 compliant model | 0.95lb (0.43kg) |
| 4-AUDTELS-E | Audio and Telephone Interface/Riser Source Module, EN54 compliant model | 0.95lb (0.43kg) |
| **Accessories and related equipment** | | |
| 4-AUDTELS | Audio and Telephone Interface/Riser Source Module | 0.65lb (0.29kg) |
| 4-COMREL | Common Relay Module | 0.25lb (0.11kg) |
| 4-NET-MM | SFP Network Controller, Multimode, Dual-Fiber, 100Base-FX 1310nm | 0.248lb (0.112kg) |
| 4-NET-SM | SFP Network Controller, Single-Mode, Dual-Fiber, 100Base-LX10 1310nm | 0.248lb (0.112kg) |
| 4-NET-SMH | SFP Network Controller, Single-Mode, high power output, Dual-Fiber, 100Base-LX40 1310nm | 0.248lb (0.112kg) |
| 4-NET-TP | SFP Network Controller, 2Mbps Shared TX/RX, Twisted Pair | 0.2lb (0.091kg) |
| 4-NET-TP-HC (Not approved for EN54 applications) | SFP Network Controller, 0.3Mbps Shared TX/RX, High Capacitance Twisted Pair | 0.2lb (0.091kg) |
| 4-NET-CAT | SFP Network Controller, CAT5 UTP Copper, 100Base-TX | 0.2lb (0.091kg) |
| 4-NET-SMD | SFP Network Controller, Single-Mode, Single-Fiber, Downlink, 100Base-BX10-D 1550nm/1310nm Tx/Rx | 0.248lb (0.112kg) |
| 4-NET-SMU | SFP Network Controller, Single-Mode, Single-Fiber, Uplink, 100Base-BX10-U 1310nm/1550nm Tx/Rx, | 0.248lb (0.112kg) |
| 4-USBHUB | USB Multiport Hub Module | 0.85lb (0.39kg) |
| 4-CABLUSBLG | Cable, USB 3.0 A-B, Male, Long | 0.31lb (0.14kg) |
| 4-CABL0542 | Cable interconnects the 4-CPU to the inner door rail when no 4-LCD display is installed in the cabinet. | 0.58lb (0.26kg) |

Note 1: Unless otherwise specified, all SKUs may be used in EN54/UL/ULC applications.

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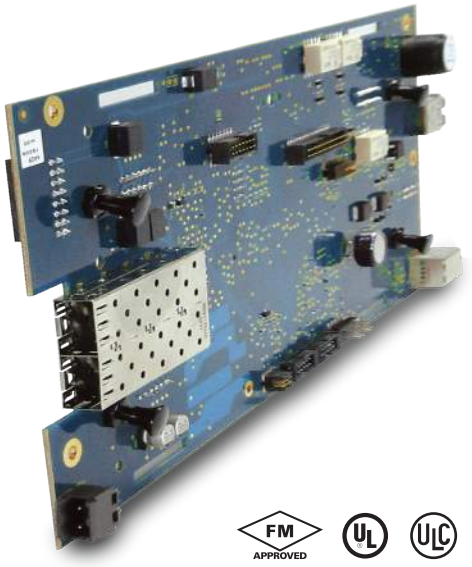
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LIFE SAFETY & INCIDENT MANAGEMENT

# EST4 Aspirating Smoke Detector Central Processing Unit

## 4-ASDCPU



FM APPROVED

7170-1657:
0508

## Overview

The 4-ASDCPU is the gateway between EST4's Emergency Communications Platform and ModuLaser's network using the FHSD8320-ULF Command Display Module or Xtralis™ VESDAnet network using the FW-HSSX1 high level interface (HLI) device.

The 4-ASDCPU interprets/translates ModuLaser/VESDAnet event information while displaying it across any LCD that resides on an EST4 network. This integration allows programmers to trigger outputs associated with ModuLaser/VESDA detector input events, which includes reporting them to a central monitoring station (CMS).

The 4-ASDCPU resides within EST4 enclosures, making them an integral part of the EST4 network, while supervising connection to Command modules or FW-HSSX1 high level interface devices.

Using the 4-ASDCPU as the gateway to ModuLaser/VESDAnet, allows EST4 to reset, disable and silence detector's local buzzer (where applicable), directly from any LCD.

Event notifications from up to 112 ModuLaser detectors or 61 VESDA detectors per 4-ASDCPU are displayed on EST4 with up to a maximum of 30 or 25 4-ASDCPUs respectively, per EST4 network.

## Standard Features

### ModuLaser

- Fully supervised connection from the 4-ASDCPU to ModuLaser's Command Module(s) utilizing one (eth0) or two (eth0 and eth1) Ethernet ports with corresponding quantity of 4-FWAL-CAT SFP communication adapters
- Supports up to 112 ModuLaser detectors per 4-ASDCPU
- Up to 30 4-ASDCPUs connected to ModuLaser detectors may reside on a single EST4 network
- Allows reset, disable and enable commands from EST4's LCD display
- Allows ModuLaser events to be programmed to activate output events on EST4

### VESDA

- Leverages the existing 4-USBHUB module to communicate to the FW-HSSX1 HLI using an RS-232 connection
- Fully supervised connection from the 4-ASDCPU to the FW-HSSX1
- Supports up to 61 VESDA detectors per 4-ASDCPU
- Up to 25 4-ASDCPUs may reside on a single EST4 network
- Allows reset, disable and silence commands from EST4's LCD display and FireWorks
- Allows VESDA events to be programmed to activate output events on EST4

## Application

### ModuLaser

EST4 integrates ModuLaser detectors with the use of the 4-ASDCPU. The 4-ASDCPU is the gateway that provides communication while supervising the connection to ModuLaser Command Modules.

EST4's LCD annunciates ModuLaser detector events that indicate Fire 2, Fire 1, Pre-Alarm, Aux, General Fault, General Warning and Isolate/Disable faults, individually, while providing the ability to enable, disable, and reset ModuLaser detectors.

### VESDA

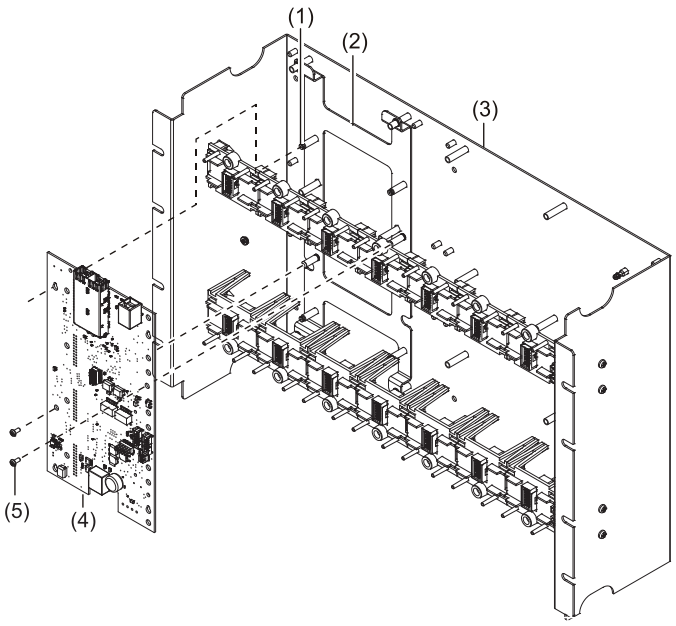
The 4-ASDCPU in combination with the 4-USBHUB adds integration capability with VESDAnet network devices and EST4.

The 4-ASDCPU is the gateway that provides communication while supervising the connection to the FW-HSSX1 high-level interface card. EST4's LCD annunciates VESDA detector events that indicate Alert, Action, Fire 1, Fire 2, Urgent Fault, Minor Fault, and Isolate/Disable Fault individually, while providing the ability to silence, disable and reset VESDA detectors.

## Installation

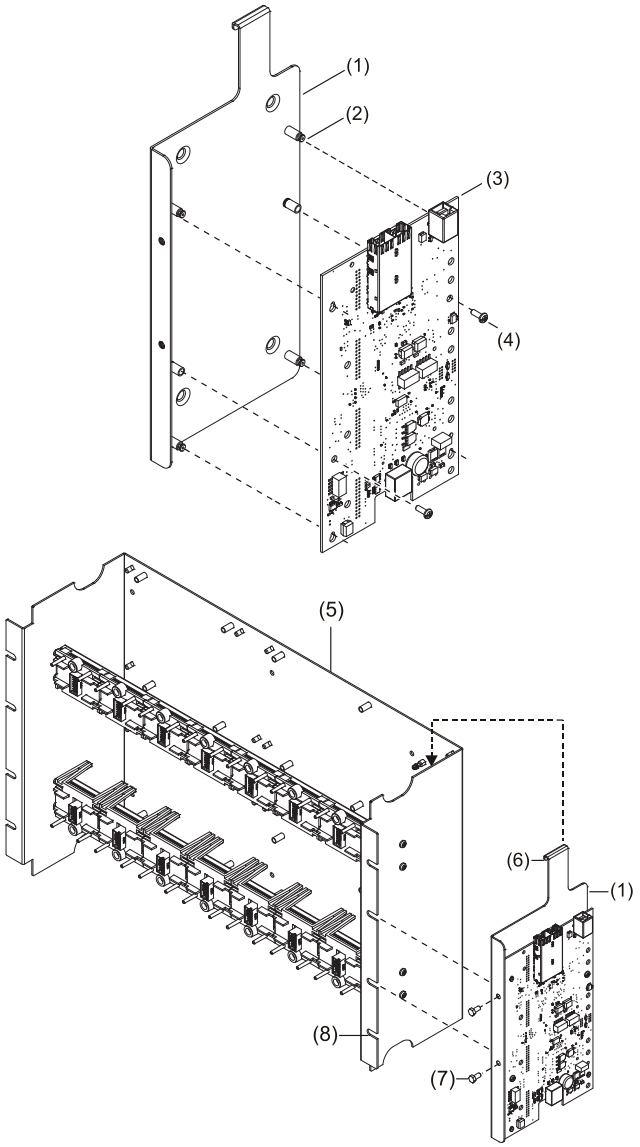
The 4-ASDCPU has several mounting installation options. It can be mounted to the back of a chassis utilizing mounting bracket 4-BRKT-CB, and can also be mounted on the side of a chassis with mounting bracket 4-BRKT-CS. The other mounting option is at the bottom of a main enclosure using the mounting plate 4-MPLT. Finally, it can also be mounted onto a 4-24ANNMT mounting enclosure directly to the back of the backbox.

**Figure 1: 4-ASDCPU module on 4-BRKT-CB**



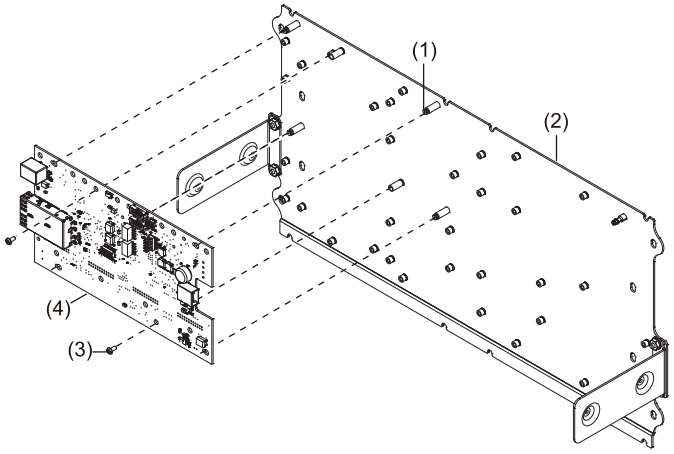

(1) Standoffs (4X)
(2) 4-BRKT-CB bracket
(3) 3-CHAS7 chassis
(4) 4-ASDCPU module
(5) 6-32 × 1/2 screw (2X)

**Figure 2: 4-ASDCPU module on 4-BRKT-CS**



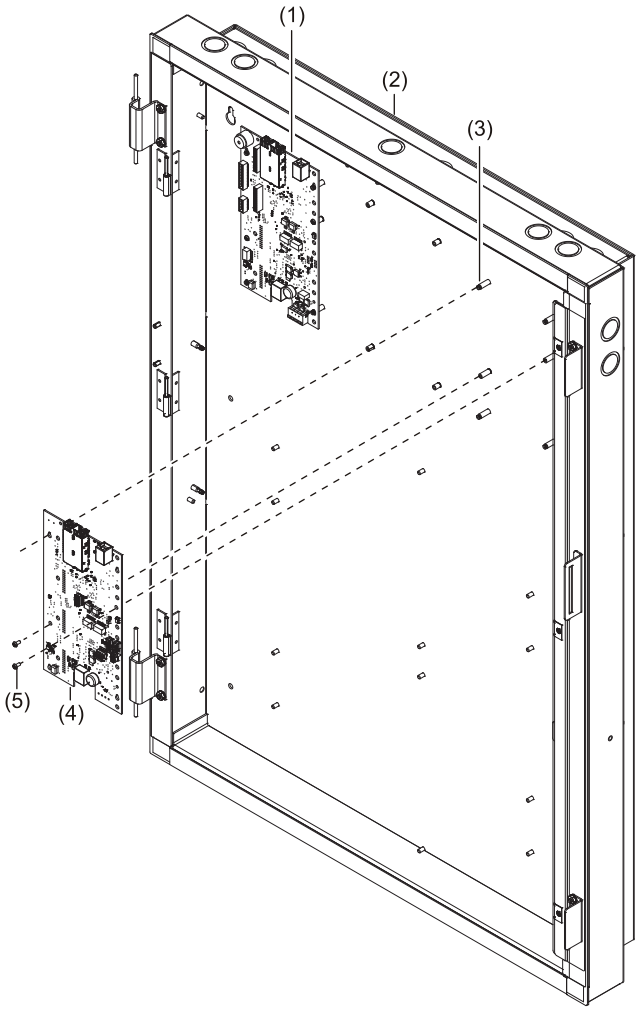

(1) 4-BRKT-CS bracket
(2) Standoffs
(3) 4-ASDCPU module
(4) 6-32 × 1/2 screw (2X)
(5) 3-CHAS7 chassis
(6) Hook in bracket
(7) 6-32 × 1/4 cap screw (2X)
(8) Slots in 3-CHAS7

**Figure 3: 4-ASDCPU module Installation on 4-MPLT**




(1) Standoffs (4X)
(2) 4-MPLT plate
(3) 6-32 x 1/2 screw (2X)
(4) 4-ASDCPU module

**Figure 4: 4-ASDCPU module in a 4-24ANNMT**




(1) 4-ANNCPU
(2) 4-24ANNMT
(3) Standoffs (4X)
(4) 4-ASDCPU module
(5) 6-32 × 1/2 screw (2X)

# Engineering Specification

**ModuLaser**

The system shall provide integration with ModuLaser networks that consist of FHSD8300-ULF, FHSD8310-ULF, FHSD8320-ULF and FHSD8330-ULF or any combination thereof.

The integration shall be accomplished through the use of a minimum of one 4-ASDCPU and one FHSD8320-ULF Command Module.

The system shall have the capability of annunciating ModuLaser detector events that originate from the Fire 2, Fire1, Pre-Alarm, Aux, General Fault, General Warning and Isolate/Disable fault categories.

The system shall also have the capability of delivering disable commands to ModuLaser devices, annunciating the disablement status on EST4's LCD display, while including the ability to deliver reset commands to them.

**VESDA**

The system shall provide integration with VESDAnet network with VEP-A00-1P, VEP-A00-P, VEP-A10-P, VEU-A00, VEU-A10, VEA-40-A00, VEA-040-A10, VES-A00-P, and VES-A10-P VESDA detectors.

The integration shall be accomplished through the use of a 4-ASDCPU and one 4-USBHUB connected to a FW-HSSX1 high level interface card.

The system shall have the capability of annunciating VESDA detector events that originate from the Alert, Action, Fire 1, Fire 2, Urgent Fault, Minor Fault, and Isolate/Disable Fault categories.

The system shall also have the capability of delivering silence commands to the detector's local buzzer when one is integrated onto the detectors, disablement capability of detectors that shall annunciate as such on the panel's LCD display and include the ability to deliver reset commands to the VESDA devices.

# Technical Specifications

| | |
|---|---|
| Current<br>Standby | 128 mA at 16 VDC<br>92 mA at 24 VDC<br>77 mA at 32 VDC |
| Alarm/active | 129 mA at 16 VDC<br>92 mA at 24 VDC<br>79 mA at 32 VDC |
| Universal Serial Bus (USB) ports | 1 USB 3.0, Type A – female port<br>1 USB 3.0, Type B – female port |
| USB cables | P/N 4-CABLUSBSM – 3.0 USB, 29.5 in.(0.75 m), included.<br>P/N 4-CABLUSBLG – 3.0 USB, 59.0 in. (1.5 m), sold separately.<br>J1, Figure 6 [1]: Only use 4-CABLUSBSM or 4-CABLUSBLG cables.<br>J14, Figure 6: 4-CABLUSBSM or 4-CABLUSBLG cables. |
| Agency Approvals | FM, UL, ULC, CFSM 7170-1657:0508 |
| Operating environment<br>Temperature<br>Relative humidity | 32 to 120°F (0 to 49°C)<br>0 to 93% noncondensing |

[1] Only use listed USB cables. Retail USB cabling is not sufficient for this application.

# Ordering Information

| Model # (SKU) | Description | Shipping Weight |
|---|---|---|
| 4-ASDCPU | Aspirating Smoke Detector CPU module | 0.95lb (0.43kg) |
| **Accessories and related equipment** | | |
| 4-USBHUB | USB Multiport Hub Module | 0.85lb (0.39kg) |
| 4-CABLUSBLG | Cable, USB 3.0 A-B, Male, Long | 0.31lb (0.14kg) |
| 4-CABL0542 | Cable interconnects the 4-CPU to the inner door rail when no 4-LCD display is installed in the cabinet. | 0.58lb (0.26kg) |
| 4-FWAL-CAT | SFP Network Firewall Adapter, CAT5 UTP Copper, 100Base-TX, 100Mbps, for use in EN54/UL/ULC markets | 0.2lb (0.09kg) |

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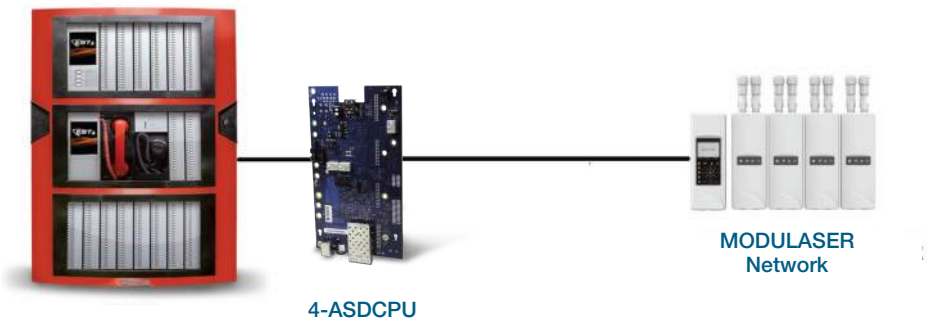
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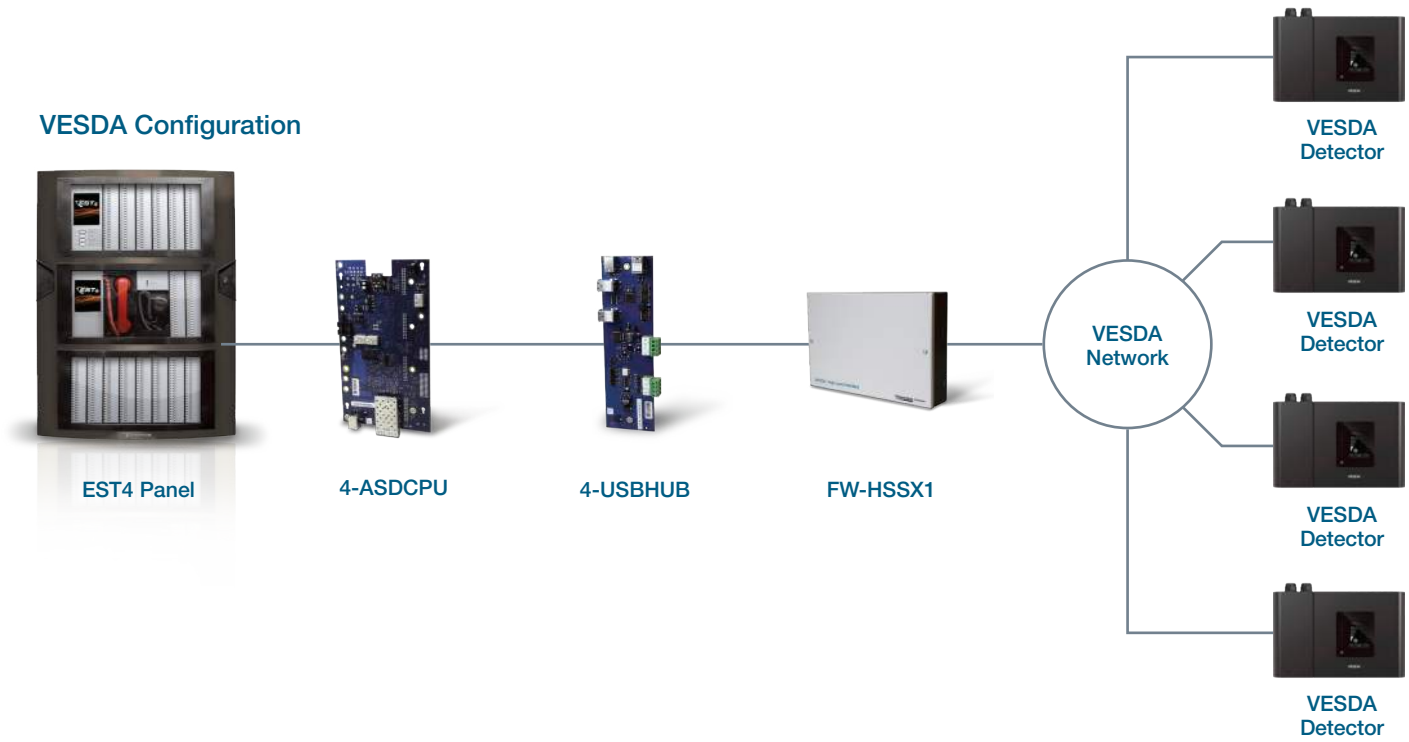
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## ModuLaser Configuration




## VESDA Configuration



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# EST4 LCD Display Module

## 4-LCD Series



FM APPROVED | NYC FIRE DEPT. COA # 2022-TMCOAP-008086-RENL | UL | ULC | CE | EN54

## Overview

EST4's LCD large color touch-screen display is the window into system operation and maintenance functions. It is large enough to support a graphical tree view of the system. The tree closely matches the system's physical layout, so there's no need for look-up tables to find specific devices. This is invaluable to technicians and building service personnel who can pinpoint the location of an off-normal device with a glance at the on-screen tree.

The EST4 LCD screen will display eight events without scrolling. In addition to touch-screen capability, the display assembly includes four dedicated easy-access rubber buttons for main control functions.

On the display, device events automatically sort into classification queues with event counts for easy identification and response. When new events are present that have yet to be reviewed, each queue is highlighted with an visual marking.

## Standard Features

- **Large Easy-to-Read Display Area**
  Displays eight events, 768 10-point characters.
- **Full Color for Detail-rich User Experience**
  262,144 colors with support for custom wallpaper.
- **Displays System Tree View on One Screen Page**
  Quick drill-downs to find devices, no look-up tables required.
- **Context-sensitive User Interface**
  One sign-in determines user privileges and available devices.
- **Color-coded Event Queue, History Log, Status Report**
  At-a-glance identification of priorities.
- **User Configurable Image Display**
  Displays a customized image that appears on the LCD's home screen when no active events are present.

## Application

Ensuring information clarity, the 4-LCD uses a 262,144 color touch screen LCD display. The display's design layout provides not only emergency information in a useful format, but also the ability to view other system operations including reports. A single button press will route the report to a configured network printer for hardcopy record of the report.

The 4-LCD always displays the last highest priority event. Further message flexibility is provided with EST4's message routing ability. Messages from a panel can display at every LCD on the network, or messages can route to specific LCDs only. Routing can be initiated at a specific time/shift change. There is no need to have messages display in areas that are not affected by an event.

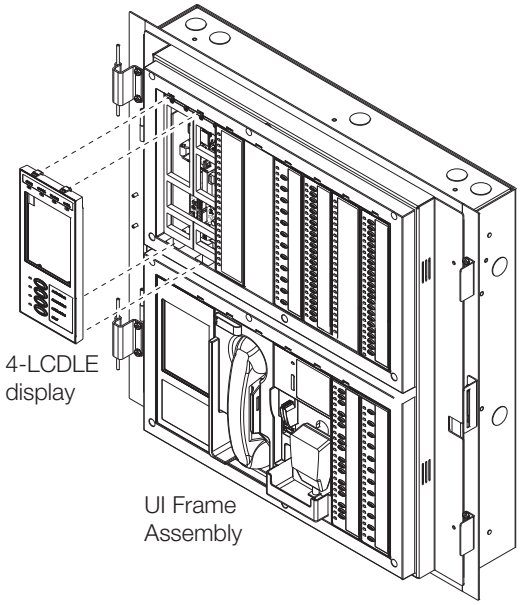
The 4-LCD can display system messages in any two of the EST4-supported languages and dialects. Choice of language is selected by the marketplace setting in EST4, any two of the available languages for a marketplace can be displayed as the primary language, and a second language can be displayed simply by selecting the language button on the LCD display. The display supports a set of Unicode symbols for example: ☢ ☣ ⚰ ☠ . These symbols can provide a heightened visual element to a messages importance.

## Assembly and Installation

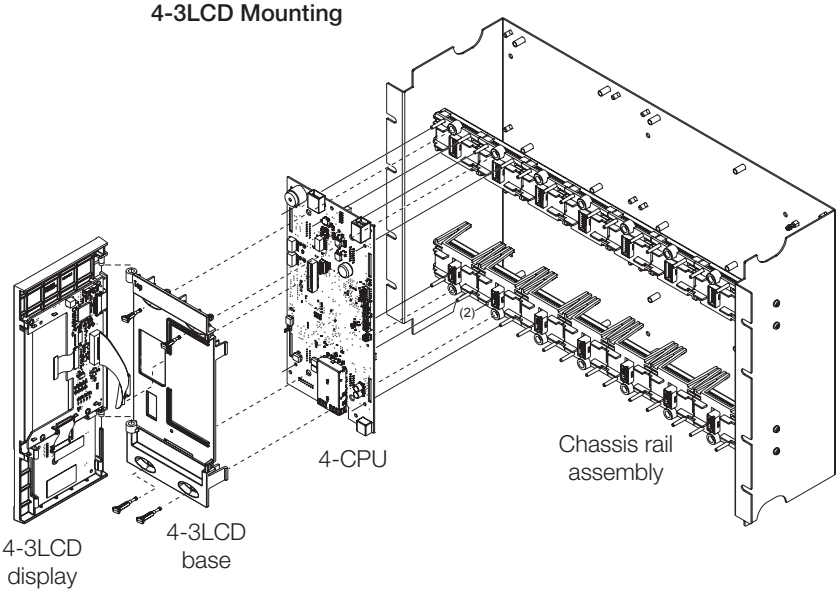
The 4-LCD display mounts onto the inner door frame of EST4 control panels. The inner door also acts as a deadfront, separating users from field wiring located behind it.

The 4-3LCD display mounts into EST3 enclosures that do not contain audio control components. This allows reuse of EST3 user interface layers in these applications. The 4-3LCD mounts onto the top of the 4-CPU in EST3 retrofit applications, providing all the benefits of the 4-LCD, while matching closely the EST3 look.

**4-LCD Mounting**




**4-3LCD Mounting**




## Engineering Specification

The system shall provide a user interface that displays system events on a color touch screen display in a text format. The display must be capable of supporting a minimum of two languages including but not limited to English, Spanish, Portuguese or French. The display design shall be simplified for emergency users so that main common controls are provided as switches/buttons that provide positive feedback of operation, common control buttons shall not be part of the touch screen display area. The Common Control Switches and LEDs provided through tactile buttons with indicators shall be; Reset switch and LED, Alarm Silence switch and LED, Panel Silence switch and LED, Acknowledge switch and LED. In addition the following LEDs shall be provided as discrete indicators, Alarm Indicator, CPU Fail Indicator, Trouble Indicator and Power Indicator. It must be possible to add additional common controls as required through the use of modular display units. The user interface must provide a color touchscreen LCD display with minimum resolution of VGA 640 x 480. The display shall provide a minimum of seven events displayed concurrently and support >200,000 colors. The system shall be capable of displaying custom images on the panel's LCD screen when no active events are present. Hands free operations shall be provided for viewing the first eight highest priority events. Events of different priorities shall be automatically placed in easy to access queues. It shall be possible to view specific event types separately. Having to scroll through a mixed list of event types is not acceptable. The total number of active events by type must be displayed. Visual indication must be provided of any event type which has not been acknowledged or viewed. It must be possible to customize the designation of all user interface LEDs and Switches for local language requirements. The color LCD display must support scripts & ideograph style font types. It shall be possible to have a custom message for each device in addition to zone messages. Custom device messages must support a minimum of 42 characters each. Instructional text messages support a maximum of 2,000 characters each.

# Control and Display Functions

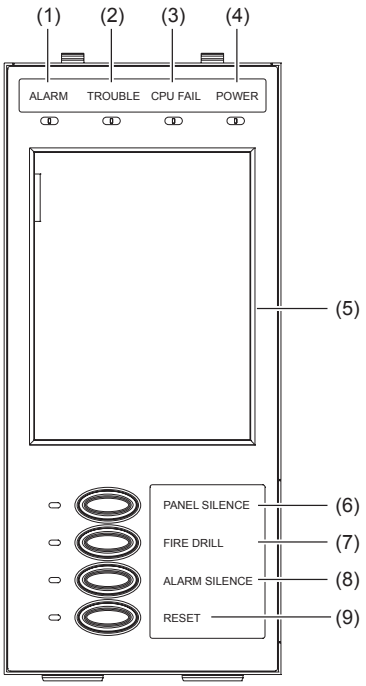
The EST4 LCD display simplifies the user interface. Up front and at the top of the display are four easy-to-read and understand status lights.

### 1 Alarm LED

The Alarm LED serves as a common alarm event indicator. The LED illuminates when there is am Alarm type event on the system. The specific Alarm event displays in its queue on the LCD where a count of alarm events is displayed along with a visual indicator if there are new events that have not been viewed.

### 2 Trouble LED

This LED serves as a common trouble event indicator. The LED illuminates when there are events in the trouble event queue located on the LCD display. The trouble event queue provides a count of trouble events and highlights if there are new events that have not been viewed (local systems operation) or acknowledged (proprietary systems operation).




### 3 CPU Fail LED

The LED indicates that the CPU has detected a processor failure. Processor failures must be reset manually using the Reset button.

### 4 Power LED

The LED indicates the power status. The LED operation is selectable in the panel configuration utility and supports local power display requirements including: On if there is primary or standby power present; On when primary power present, off during primary power loss; On when the panel has primary power and standby power, off if either standby or primary power are absent.

### 5 LCD screen

The heart of the 4-LCD is the color Liquid Crystal Display located in the center of the module. In the System Normal condition the date and time plus system wallpaper image are displayed on the LCD.

### Control Buttons

Four easy to find rubber buttons are located at the bottom of the display. These provide simple-to-understand common control functions. The switch design gives tactile feedback when operated, but EST4 offers additional user feedback by also providing a visual indication of switch activation through the associated LED. When a switch is activated the LED beside the switch will illuminate in a contrasting color. This gives a visual indication that the system has seen the switch push. The LED will change to its programmed color when the switch command has been executed.

The versatility of EST4 allows system designers to define the features affecting particular areas of a building. These are known as Notification Control Areas (NCAs), which are defined areas of an installation. A network may have several NCAs. This feature is very useful when configuring systems with multiple buildings on one network. For example, operating the Reset function in one building may have an adverse effect in other buildings. As a solution to this, audio paging may be programmed to affect the defined NCA and no other NCAs. This means that with EST4, having operational differences between buildings on the same network is not a problem. This feature can save wiring and reduce inter panel overhead.

### 6 Panel Silence button and LED

The factory default for this programmable button and LED indicator is Panel Silence. Pressing Panel Silence turns off the system's internal audible signal. The switch indicator has two statuses: white when the switch is pressed, yellow on when panel silence is active.

### 7 Fire Drill button and LED

The factory default for this programmable button and LED indicator is Fire Drill. Pressing Fire Drill turns on the drill LED and all signals sound evacuation. Drill does not activate city tie connections. Auxiliary relays will not activate unless programmed to do so with drill.

### 8 Alarm Silence button and LED

The factory default for this programmable button and LED indicator is Alarm Silence. Pressing Alarm Silence turns off all Notification Appliance Circuits defined as audible. The switch indicator has two statuses: white when the switch is pressed, yellow when silence is active via the Alarm Silence switch or via alarm silence software timers.

### 9 Reset button and LED

The factory default for this programmable button and LED indicator is Reset. Pressing Reset starts the system's reset operation. The switch indicator has four statuses: white when the switch is pressed; fast flashing green during the smoke power down phase of reset; slow flashing green during the restart phase; and, on steady green during the restoral phase. The Reset LED is off when the system is not in the reset process.



**a. Date and Time:** Date format is selectable in the 4-CU.

**b. Event Indicators:** The event indicators provide a quick view of the event types active in the system. It indicates a count of the number of events in each group, and highlights new events that have not been viewed.

**c. List Bar:** The List Bar shows the event queues with active points. By simply selecting a queue the events for that queue are displayed in a list on the screen. In this example, the alarm queue is displayed.

**d. Action Bar:** The Action Bar allows the selection of specific actions that can be initiated via the LCD. Among those actions are gaining access to higher function levels (with proper accreditation), changing to the graphical Tree View, or accessing information such as panel firmware versions, CU and hardware configurations, licensing and contact information.

**LCD screen**

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# Technical Specifications

| | 4-LCD | 4-3 LCD |
|---|---|---|
| Rail Spaces | Two inner door spaces | Two user interfaces spaces. |
| Mounting | Mounts on inner door | Mounts on UI layer above 4-CPU |
| Current | | |
| Standby | 50 mA at 24 VDC | |
| Alarm/active | 110 mA at 24 VDC | |
| Display | 18 bit color. 640 x 480 pixels, resistive touch screen | |
| System status indicators | | |
| ALARM | Red indicator | |
| TROUBLE | Yellow indicator | |
| CPU FAIL | Yellow indicator | |
| POWER ON | Green indicator | |
| Common controls and indicators [1] | | |
| PANEL SILENCE button | Yellow indicator integrated with the Panel Silence button | |
| FIRE DRILL button | Yellow indicator integrated with the Fire Drill button | |
| ALARM SILENCE button | Yellow indicator integrated with the Alarm Silence button | |
| RESET button | Green indicator integrated with the Reset button | |
| Operating environment Temperature | 32 to 120°F (0 to 49°C) | |
| Relative humidity | 0 to 93% noncondensing | |
| Custom Background Image | Size: 480 x 640 pixels or greater with as aspect ratio of 3:4 (e.g., 600 x 800, 768 x 1024, or 960 x 1280)<br>Resolution: 141 dpi or greater<br>Color depth: 18-bit color or greater (24-bit is RGB; 32-bit is CMYK)<br>Format: JPG, JPEG, or PNG | |

[1] Factory default for the common controls and indicators are listed here. These common controls can be reprogrammed using the Configuration Utility (4-CU). The associated indicators can also be reprogrammed as red, green, yellow, blue or white colors.

# Ordering Information

| Model # (SKU) | Description | Shipping Weight |
|---|---|---|
| 4-LCD | Main color touchscreen LCD display | 1.25lb (0.57kg) |
| 4-LCDANN | 4-LCD w/ cable for Annunciator enclosure 4-4ANN, 4-6ANN mounting | 1.9lb (0.85kg) |
| 4-LCDLE | 4-LCD w/ cable for 3-CAB5B, 7B, 14B, 21B, 4-8ANN, 16ANN and 24ANN mounting | 1.9lb (0.85kg) |
| 4-3LCD | LCD display for use in EST3 panels, allows reuse of EST3 UI layer in retrofit applications. The 4-3LCD can be mounted in remote closet cabinets where an LCD display is needed. The display mounts on the 4-CPU module. | 1.5lb (0.66kg) |
| 4-3LCD-E | LCD display for use in EST3 panels, allows reuse of EST3 UI layer in retrofit applications. The 4-3LCD can be mounted in remote closet cabinets where an LCD display is needed. The display mounts on the 4-CPU module. EN54 compliant model. | 1.5lb (0.66kg) |
| **Accessories and related equipment** | | |
| 4-CABL0502 | Service replacement cable, 4-LCD to 4-CPU flex interconnect cable for CAB5, 7, 14, 21. | 0.38lb (0.17kg) |
| 4-CABL0504 | Service replacement cable 4-LCD to 4-ANNCPU cable for use in 4-2ANN, 4ANN, 6ANN annunciator configuration. | 0.37lb (0.17kg) |
| 4-CABL0541 | Service replacement cable 4-3LCD to 4-CPU cable for use in 3-CAB5B, 7B, 14B, 21B, RCC series. | 0.1lb (0.04kg) |
| 4-CABL0505 | Cable, Door Rail to Rail, 13 Inch for 4-CAB16D(R), 4-CAB24D(R), or 4-CAB24D(R)L. | 0.5lb (0.23kg) |
| 4-CABL0507 | Cable, Door Rail to Rail, 11.3 Inch for 4-CAB8D(R). | 0.5lb (0.23kg) |
| 4-CABL0542 | Cable, for use with 4-CPU or 4-ANNCPU where no LCD is installed on Inner Door. | 0.6lb (0.26kg) |
| 4-LKIT-ES | Language Kit, 4-LKIT-ES, Panel door, Spanish, Edwards | 25lbs (.11) |
| 4-LKIT-FR | Language Kit, 4-LKIT-FR, Panel door, French, Edwards | 25lbs (.11) |
| 4-LKIT-PT | Language Kit, 4-LKIT-ES, Panel door, Portuguese, Edwards | 25lbs (.11) |
| 4-LKIT-ZH | Language Kit, 4-LKIT-ES, Panel door, Chinese, Edwards | 25lbs (.11) |

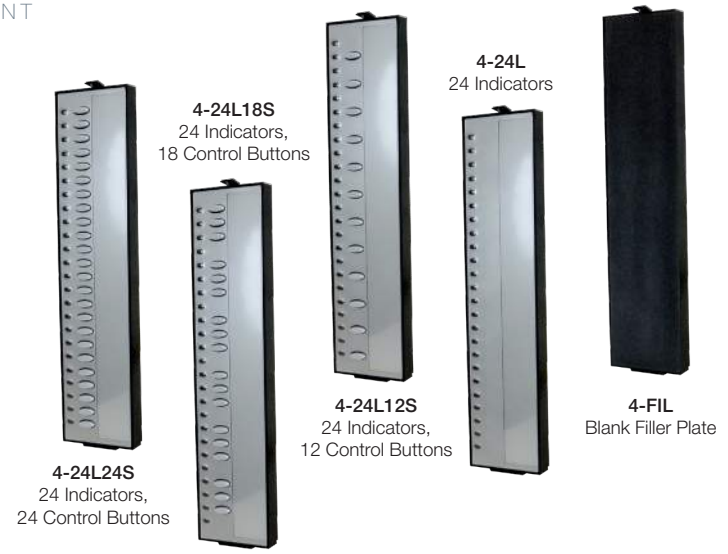
*Note 1: Unless otherwise specified, all SKUs may be used in EN54/UL/ULC applications.*

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# EST4 Control Display Modules

## 4-24L Series




FM APPROVED | NYC FIRE DEPT. COA # 2022-TMCOAP-008086-RENL | UL | ULC | CE | EN54

## Overview

EST4 Control-Display Modules provide first responders and emergency users with easy-to-operate controls and at-a-glance indication when time is of the essence and event information is critical.

Control-Display Modules come with 24 LED indicators and are available with 0, 12, 18, or 24 control buttons. LED indicators are actually comprised of five individual LEDs, each of a different color. Programmers configure indicators to display their pre-selected color according to the type of information conveyed by the indicator. This offers a level of design efficiency that can reduce the number of display strips necessary for an application. In addition to color selection, the flash rate of the LED may be programmed to provide even more information. Examples include: damper and fan status, or audio zone notification status, alert, evaluation or paging.

Control display modules simply snap into place on the inner door of control panels or annunciators, and can mount in any unused display location. They can be positioned according to use, and spaced to create a physical separation between different control functions.

Control modules feature large and easy-to-see buttons. They provide tactile feedback when pressed, and visual feedback by means of the associated indicator, which flashes briefly when the button is activated.

Printable slide-in label inserts give control-display modules context with color-coded shading and other effects. They can be localized for regional language requirements, and printed on-the-fly to accommodate system changes as they are implemented.

Up to 576 tactile switches and 576 indicators may be mounted in a single EST4 cabinet. Module lamp test can be programmed to any spare control switch, or by selecting the Lamp Test feature from the LCD display.

## Standard Features

- **Modules Mount on Inner Door of Cabinet**
  Simple snap-in modules speed installation, provides a clean look.
- **Rubber Buttons for Switch Control**
  Provides durability with great tactile feedback of switch operation.
- **Selectable LED Colors**
  Minimizes the inventory needed to support operations.
- **Slide-in Customizable Labeling**
  Print color-coded and regional languages from the Configuration Utility.
- **Stable Frame Assembly**
  Ensures positive switch operation.
- **Switch Radio Groups**
  Allows up to 24 switches in a group.
- **Synchronized Indicator Flash Rates Across Network**
  Consistent indication between nodes.
- **Visual Feedback of Switch Activation**
  Visual feedback of a switch press by status LED color change.

## Application

Life Safety Systems require only occasional operation. Yet, in an emergency the user must be able to identify system operation and status quickly and without hesitation. LCD screen displays are excellent for identifying specific information, but even a large LCD display cannot convey overall system status as effectively as individual LEDs and switches.

### Simple design, sophisticated operation

EST4 control-display modules are designed to provide simple identification and operation of system functions for the emergency user. They offer positive feedback of control activity with flexibility for selection of display configurations and mounting location options. This configuration flexibility means that there are fewer models needed to cover a wide array of applications. In fact, just four models handle all the control and display options needed for EST4 operation.

At each indicator location, display modules have five individual LEDs: red, yellow, blue, green and white. At configuration time the system designer matches the color of the LED to the needs of the system design. This allows maximum use of indicator and switch locations on each module, making it unnecessary to skip or leave indicator spaces blank because the color is wrong for the application.

### Multi-use modules increase efficiency

Flexible multi-use design allows the same control-display model to be used for several different applications. For example, the 24-indicator 4-24L may be used for displaying zone annunciation, or zone annunciation with disable indicator, or zone annunciation with trouble, or a combination of all three.

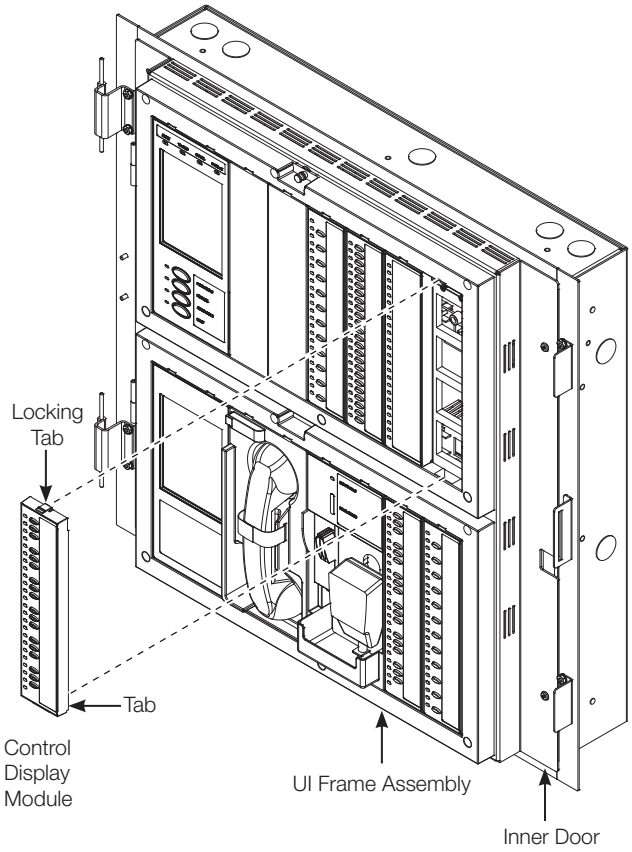
Switches can also work independently, or they can be grouped into a latching-interlock to support operations that must be kept separated, such as fan and damper control. The interlock is controlled by software, so only one switch is active at a given time. EST4 offers further flexibility by supporting the interlock of not just two or three switches in a group, but the interlock of any combination – right up to the full module complement of 24 switches.

Radio switch groups are also an option with EST4 control modules, as are On-Off-Auto configurations, and a variety of HVAC and building control system operations. In fact, the EST4 command and control interface is much more than the sum of its constituent parts, and its design flexibility is sure to inspire new and creative ways to make buildings safer.

## Engineering Specification

The Life Safety system shall incorporate annunciation of Alarm, Supervisory, Trouble and Monitor operations. Annunciation must be through the use of LED display strips, complete with a means to custom label each LED/Switch position as to its function. The labels must support the ability to allow visual custom grouping of LEDs and switches. Where applicable, control of remote smoke control devices must be made available at the control center. Switches with LEDs must provide positive feedback to the operator of remote equipment status. All individual indicator LEDs shall be configurable for color including Red, Yellow, Blue, Green or White to facilitate identification from a distance and maximize display location usage. Where voice audio is required, a means of paging individual zones must be available. The status of each paging zone must be annunciated. It must be possible to selectively page into specific zones. It shall be possible to manipulate the evacuation of the building from the main control center. It must be possible for the emergency operator to put specific zones into evacuation manually. When being serviced or when it is necessary to disable switches, the system shall not 'remember' if a disabled switch is pressed. Switches' must be rubber to provide tactile feedback as well as a visual indication when a switch is activated.

## Installation



## Technical Specifications

| | 4-24L | 4-24L12S | 4-24L18S | 4-24L24S |
|---|---|---|---|---|
| Indicators | 24 | 24 | 24 | 24 |
| Switches | 0 | 12 | 18 | 24 |
| Current<br>Standby<br>Alarm | <br>4.0 mA at 24 VDC<br>10.0 mA at 24 VDC | | | |
| Mounting | Display modules mount on the inner door of the following door assemblies:<br>4-CAB8D, 4-CAB16D, 4-CAB24D, 4-CAB24DL, 4-4ANND, and 4-6ANND | | | |
| Operating environment | Temperature: 32 to 120°F (0 to 49°C).<br>Relative humidity: 0 to 93% noncondensing. | | | |
| Agency Listings | UL, ULC, FM, CSFM, CE and NYC Fire Dept. | | | |

Agency approvals: UL864 10th edition - UOJZ, UUKL, SYZV, UOQY, UL2017 2nd edition - FSZI, UL2572 2nd edition - PGWM; ULC-S527-11 3rd edition - UOJZ, UULK7, SYXV7, ULC-S576-14 1st edition - PGWM7, ULCS-S559-13 2nd edition - DYR7

*Note 1: Unless otherwise specified, all SKUs may be used in EN54/UL/ULC applications.*

## Ordering Information

| Model # (SKU) | Description | Shipping Weight |
|---|---|---|
| 4-24L | 24 Indicator Display Module | 0.6lb (0.27kg) |
| 4-24L-E | 24 Indicator Display Module, EN54 compliant model | 0.6lb (0.27kg) |
| 4-24L12S | 24 Indicator 12 Control Display Module | 0.65lb (0.29kg) |
| 4-24L12S-E | 24 Indicator 12 Control Display Module, EN54 compliant model | 0.65lb (0.29kg) |
| 4-24L18S | 24 Indicator 18 Control Display Module | 0.65lb (0.29kg) |
| 4-24L18S-E | 24 Indicator 18 Control Display Module, EN54 compliant model | 0.65lb (0.29kg) |
| 4-24L24S | 24 Indicator 24 Control Display Module | 0.65lb (0.29kg) |
| 4-24L24S-E | 24 Indicator 24 Control Display Module, EN54 compliant model | 0.65lb (0.29kg) |
| 4-FIL | Blank Filler Plate | 0.1lb (0.04kg) |

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# EST4 Network Controllers

## 4-NET Series



FM APPROVED | NYC FIRE DEPT. COA # 2022-TMCOAP-008086-RENL | UL | ULC | CE | EN54

## Overview

4-NET Series controllers are a series of small form factor pluggable (SFP) transceivers that provide physical media options for EST4 network cabling. The selection of the controller determines the media type. Eight models are available, each one offers a different kind of physical connection.

EST4 network controllers are easy to install and provide flexible solutions for system changes and upgrades. They mount into any EST4 panel on the life safety network by simply plugging into either of the two slots found on the 4-CPU, 4-ANNCPU, 4-CPUGRPH and 4-NET-AD modules. The controllers are hot-swappable and may be used in any combination of fiber, copper or CAT 5e or better cable.

Controllers allow vast distances between panels and thousands of addressable points. For example, a single IPv6 network can support up to an astonishing 375,000 addressable devices. Copper wire runs of nearly a mile between nodes puts detection, alarm, notification, and audio into the furthest reaches of the tallest buildings and broadest campuses.

EST4 gives the flexibility to configure the network to the needs of the installation, including no network redundancy (Class B), a single redundant connection (Class A/X), or any combination of styles including multiple redundant paths.

EST4 network controllers are used for panel-to-panel communications only. Connections to external networks are handled by 4-FWAL Series adapters. See the relevant literature for more information concerning firewalls and external network connections.

## Standard Features

- **Multiple Connection Options**
  Hot pluggable SFP-style network controllers allow selection of twisted pair, fiber optic and CAT cables.
- **Supports multiple network configurations**
  Networks can be configured in Class B, Class A, Class X and Class N.
- **IPv6 Support**
  Autoconfiguring network for simple setup and easy network configuration.

## Application

EST4 life safety communication is built on a self-configuring IPv6 network. 4-NET series SFP network controller modules provide the connection to physical inter-panel cabling. All SFPs are hot-swappable and mount in either of the two SFP slots found on 4-CPU, 4-ANNCPU, 4-CPUGRPH and 4-NET-AD modules.

### Capacity for Large Projects

Robust physical interconnections facilitate a range of liberating network capacities. Twisted pair copper at 2 Mbps supports distances of up to 5,000 ft. (1.5 km) between any two panels; up to 50,000 ft. (15 km) at 0.2 Mbps when used with the 4-NET-XT. Single-mode, multimode, and even CAT 5 (or better) cable solutions are also available.

A single network cable carries all panel-to-panel services: data, voice audio, and firefighters' telephone. No separate interconnections are needed. This powerful feature reduces cable costs and installation time.

### Powerful Network Security and Survivability

Cabling options satisfy even the most demanding redundancy and survivability requirements. The EST4 network can be configured for Class A, Class B, Class X, and Class N wiring. CAT5 installations are not limited to Class N wiring style: the network can be designed to meet Class A, Class B, and Class X configuration with CAT5 cable.

Network messages received by 4-NET controllers are routed by the CPU to the appropriate network link. As each link is an independent point-to-point connection wire run lengths between nodes are maximized.

Failsafe mechanisms are built right into EST4 network controllers. Should a connected CPU module go offline, the input and output ports automatically connect directly to one another. This operation provides a pass-through mode that maintains basic connectivity in the event of something as mundane as a routine power-down for servicing, or as catastrophic as the failure of a control panel.

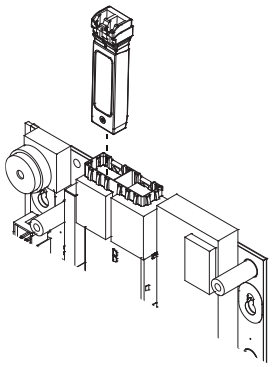
The EST4 life safety network is a self-configuring IPv6 network that enables the full support for cybersecurity tested to meet FIPS publication 197. Salted Hashing of passwords, authentication and encryption of sensitive data (user PINs, node authentication) are all standard features. This security applies to a single panel or the full complement of nodes that the EST4 network can support.

**SFP Passthrough Support, eth0 to eth1**

| | 4-NET-CAT | 4-NET-(fiber type) | 4-NET-TP | 4-NET-TP-HC |
|---|---|---|---|---|
| 4-NET-CAT | ✓ | ✓ | ✓ | ✓ |
| 4-NET-(fiber type) | ✓ | ✓ | ✓ | ✓ |
| 4-NET-TP | ✓ | ✓ | ✓ | |
| 4-NET-TP-HC | ✓ | ✓ | | ✓ |

## Installation

4-NET controllers mount into any EST4 panel on the life safety network by simply plugging into either of the two slots found on the 4-CPU, 4-ANNCPU, 4-CPUGRPH or 4-NET-AD modules. The controllers are hot-swappable and may be combined to provide fiber, twisted-pair, or CAT5/6 connections as needed.



## Engineering Specification

The system shall support communicating on a TCP/IP, IPv6 network that supports multiple network topologies including any mix of ring, bus, star and mesh. The network shall support physical media connections via fiber, twisted pair or CAT5 in any combination. The Network shall support data transmission of panel-to-panel data, voice audio and firefighters' telephone data on a single twisted pair or single optical fiber. The Network shall be configured as <Class A> <Class B> <Class X>. Networks restricted to Class N wiring shall not be acceptable. Network shall support a back-to-back pass through mode that maintains network connectivity on power down for servicing or catastrophic failure of a single panel.

For retrofit of existing installations the system shall support reuse of existing network wiring that meets the minimum wiring specification of the specified SFP controller, is electrically sound and is acceptable to the Authority Having Jurisdiction.

## Technical Specifications

### SFP Twisted Pair Specifications

| | 4-NET-TP | 4-NET-TP-HC |
|---|---|---|
| Current | 32mA at 24Vdc | |
| Circuit Capacitance | 0.09 µF max. between two nodes | 0.3 µF max. between two nodes |
| Data speed | 2 Mbps TX/RX | 0.3 Mbps TX/RX |
| Maximum Resistance | 90 ohms | |
| Operating Temperature | 32 to 120 °F (0 to 49 °C) | |
| Operating relative humidity | 0 to 93% noncondensing | |
| Wire Size | One twisted pair, six twists per foot minimum, 16 to 24 AWG (1.3 to 0.20 mm²) | |
| Cable Connector type | Push-in, self clamping terminal block | |
| Agency Listings | UL, ULC, FM, CSFM, EN54, CE, NYC Fire Dept. | UL, ULC, FM, CSFM, NYC Fire Dept. |
| Circuit Length | 5,000 ft. (1,524 m) between any two nodes | |
| Data supported | Network, Voice Audio, Firefighters' Telephone, Pre-recorded messages. | Network, One channel Voice Audio, Pre-recorded messages. |

## SFP CAT Cabling Specifications

| 4-NET-CAT | |
|---|---|
| Voltage | |
| Current | 45 mA at 24 VDC |
| Data Speed | 100 Mbps TX/RX |
| Operating Temperature | 32 to 120°F (0 to 49°C) |
| Operating Relative Humidity | 0 to 93% noncondensing |
| Cable Supported | Cat 5e or better |
| Cable Connector Type | RJ-45 |
| Agency Listings | UL, ULC, FM, CSFM, EN54, CE, NYC Fire Dept. |
| Circuit Length | 328 ft. (100 m) max. |
| Data supported | Network, Voice Audio, Firefighters' Telephone |
| Cable Rating | Fire or plenum |

| 4-NET-TP using CAT 5e or better cable | |
|---|---|
| Voltage | |
| Current | 45 mA at 24 VDC |
| Circuit Capacitance | N/A |
| Circuit Resistance | N/A |
| Data Speed | 2 Mbps TX and RX |
| Operating Temperature | 32 to 120 °F (0 to 49 °C) |
| Operating Relative Humidity | 0 to 93% noncondensing |
| Wire size | 22 to 24 AWG |
| Cable Connector Type | terminal block |
| Agency Listing | UL, ULC, FM, CSFM, EN54, CE, NYC Fire Dept. |
| Circuit Length | 3280 ft (1,000m) |
| Data Support | Network, Voice Audio, Firefighters' Telephone |
| Cable Rating | Fire or plenum |

## SFP Cabling Specifications

| SFP network controller | Wavelength (nm) | Fiber type | Core size (microns) [1] | Modal bandwidth (Mhz/km) [2] | Cable distance Miles (km) |
|---|---|---|---|---|---|
| 4-NET-MM [2] | 1310 | OM1/OM2 | 62.5um/50um | 500 | 1.24 miles (2 km) |
| 4-NET-SM | 1310 | G.652 | 9 | N/A | 8.7 miles (14 km) |
| 4-NET-SMH | 1310 | G.652 | 9 | N/A | 24.8 miles (40 km) |
| 4-NET-SMU | 1310 | G.652 | 9 | N/A | 6.2 miles (10 km) |
| 4-NET-SMD | 1550 | G.652 | 9 | N/A | 6.2 miles (10 km) |

**[1]** G.652, listed under core size for single mode fiber (SMF), refers to an ITU-T standard of commonly deployed non-dispersion-shifted single mode fiber with a core size of approximately 8 to 10 microns (µm).

**[2]** The maximum cable distance will be reduced when using fibers with less than 500 MHz/km bandwidth. For example, a 62.5u/125u step-index fiber may have a modal bandwidth as low as 160 MHz/km. This translates to a maximum 100Base link length of about 640 m. If 100u core fiber is installed, the length could be reduced to about 150 m.

## SFP Optical Specifications

| SFP network controller | Transceiver type | Transmit power (dBm) | | Receive power (dBm) | | Max channel insertion loss in dB (by fiber type) [1] | Transmit and receive wavelength (nm) |
|---|---|---|---|---|---|---|---|
| | | Min | Max | Min | Max | | |
| 4-NET-MM | 100Base-FX | -20 | -14 | -31 | -14 | 10 (62.5/125um OM1) | 1300/1300 |
| 4-NET-MM | 100Base-FX | -20 | -14 | -31 | -14 | 5 (50/125um OM2) | 1300/1300 |
| 4-NET-SM | 100Base-LX10 | -15 | -8 | -25 | -8 | 5 | 1310/1310 |
| 4-NET-SMH [2] | 100Base-LX40 | -5 | 0 | -33 | -10 | 25 (10 dB min) | 1310/1310 |
| 4-NET-SMU | 100Base-BX10-U | -14 | -8 | -27 | -8 | 5 | 1310/1550 |
| 4-NET-SMD | 100Base-BX10-D | -14 | -8 | -27 | -8 | 5 | 1550/1310 |

**[1]** Maximum channel insertion loss is defined for maximum distance guaranteed as specified in the Cabling Specifications table above and by fiber type/core diameter. When links are deployed over shorter distances, additional channel insertion loss may be allowed. Actual performance may allow greater insertion loss.

**[2]** 4-NET-SMH requires a minimum 10db insertions loss. If the insertion loss is less than 10db, a single mode attenuator is required to obtain the minimum 10db loss.

| 4-NET- fiber optic SFPs | |
|---|---|
| Current | |
| Standby/Alarm | 5 mA at 24 VDC |
| Data speed | 100 Mbps TX/RX |
| Operating Temperature | 32 to 120°F (0 to 49°C) |
| Operating Relative humidity | 0 to 93% noncondensing |
| Cable Specification | See *SFP Cabling Specifications* above. |
| Cable Connector type | LC simplex for 4-NET-SMU and 4-NET-SMD, LC duplex, for all other fiber controllers |
| Agency Listings | UL, ULC, FM, CSFM, EN54, CE, NYC Fire Dept. |

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## Ordering Information

| Model # (SKU) | Description | Shipping Weight |
|---|---|---|
| 4-NET-TP | SFP Network Controller, 2Mbps Shared TX/RX, Twisted Pair or Cat 5. | 0.2lb (0.091kg) |
| 4-NET-TP-HC[1] (Not approved for EN54 applications) | SFP Network Controller, 0.3Mbps Shared TX/RX, High Capacitance Twisted Pair | 0.2lb (0.091kg) |
| 4-NET-MM | SFP Network Controller, Multimode, Dual-Fiber, 100Base-FX 1310nm | 0.248lb (0.112kg) |
| 4-NET-SM | SFP Network Controller, Single-Mode, Dual-Fiber, 100Base-LX10 1310nm | 0.248lb (0.112kg) |
| 4-NET-SMD | SFP Network Controller, Single-Mode, Single-Fiber, Downlink, 100Base-BX10-D 1550nm/1310nm Tx/Rx, works with 4-NET-SMU | 0.248lb (0.112kg) |
| 4-NET-SMU | SFP Network Controller, Single-Mode, Single-Fiber, Uplink, 100Base-BX10-U 1310nm/1550nm Tx/Rx works with 4-NET-SMD | 0.248lb (0.112kg) |
| 4-NET-SMH | SFP Network Controller, Single-Mode, Dual-Fiber, 100Base-High Output 1310nm, | 0.248lb (0.112kg) |
| 4-NET-CAT | SFP Network Controller, CAT5 UTP Copper, 100Base-TX, 100Mbps | 0.2lb (0.091kg) |

[1] Not for use with new installations.
Note 1: Unless otherwise specified, all SKUs may be used in EN54/UL/ULC applications

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# EST4 Audio Units and Interfaces

## 4-MIC, 4-FT, 4-LCDAUDTEL




FM APPROVED | NYC FIRE DEPT. COA # 2022-TMCOAP-008086-RENL | UL | ULC | CE EN54

## Overview

Nothing connects with building occupants better than spoken words, and EST4's highly intelligible voice audio ensures that those words are heard loud and clear. This high-fidelity messaging, across EST4's impressive capacity of 200 channels, provides the flexibility needed to get messages out clearly and concisely.

EST4's voice audio function is built modularly from a collection of components finely tuned to the needs of small and large facilities alike. System designers can specify an ideal voice audio system by pinpointing the right components for the project, and selecting only equipment needed to get the job done. All audio components are standard modules that fit together easily. Each is an integrated part of EST4, allowing the use of the same cabinets, power supplies, and even network cabling as other EST4 components.

EST4 microphones and telephone handsets, along with their controllers, are used to create Notification Control Areas (NCAs) that can contain one or more Command Centers. EST4 allows both mass notification and emergency communications to be addressed, delivering live paging and pre-recorded messaging where its needed. EST4 supports configurations with Central Control Stations (CCSs), Autonomous Control Units (ACUs), and Local Operations Consoles (LOCs). Together, these options provide the opportunity to find an efficient yet economical Emergency Communications audio solution for any size installation.

## Standard Features

- **Annunciator or Cabinet Mounting**
  One SKU for mounting in any cabinet configuration.
- **Paging Priority Automatically Set**
  Ensures highest priority paging location has control.
- **Color Touch-screen Audio Interface**
  LCD touch-screen interface for paging circuit selection.
- **Customizable Switch Modules, Multi-color LEDs**
  Tactile and visual feedback with printable slide-in labels.
- **200 Audio Channels per Network**
  100 Channels per Notification Control Area (NCA). Eight channels for audio source selection.
- **Use Twisted Copper Wires or Fiber Optic Cables for Audio**
  Network data, audio and firefighter telephone are transmitted on the same cables, helping reduce installation cost and complexity.
- **Listed for Mass Notification**
  Listed to UL2572 as CCS or ACU or LOC.
- **Supports Low Frequency Signaling in Sleeping Areas**
- **Auxiliary inputs, telephone interface**
  Auxiliary inputs allow other audio systems to be interconnected
- **Digital Transmission of Audio Signals**
  Greater noise immunity, high quality signal transmission.
- **On-Board Storage of Programmed Messages and Tones**
  Distributed storage helps overcome a single point of failure.
- **Optional LCD Display of Fire Phone Calls**
- **Optional Earthquake Hardening**
  OSHPD seismic pre-approval for Component Importance Factor 1.5.

## Application

EST4 integrated audio is a modular group of components that install in standard fire alarm cabinet assemblies. The Audio Command Center, which holds audio control equipment, provides an emergency user interface for live and recorded paging, and optionally, a firefighters' master telephone or microphone. Zoned amplifiers mount in the main control panel or in remote cabinets, allowing distribution of the system, reducing the need to home run speaker wiring. Remote cabinets are easy to install because only a single twisted pair is required between cabinets, carrying not only audio, but network data and firefighters' telephone audio as well.

EST4 goes beyond standard emergency systems, ensuring that audio can provide the resources needed to cover the applications of even the largest and complex life safety applications. EST4 supports connection of local and network microphones, multiple telephone voice lines, and Mass Notification audio. It also expands the potential of these capabilities with 200 audio voice channels – an industry first. In fact, up to 100 audio channels per NCA support any combination of eight channels at the panel. These 100 channels for Paging, Alert, Evacuation signalling and automatic messages are delivered simultaneously to the parts of a building or buildings that need the information.

### Efficient deployment

EST4 supports high fidelity digital audio, providing intelligibility that is not compromised at any point in the system. A dramatically simplified interconnect architecture handles up to 100 audio channels per NCA, and audio data can be transmitted over the same inter-panel cabling as other EST4 data. This means that paging, firefighters' telephone, and panel data can all share the same cable – significantly reducing project material expenses and installation labor costs for new installations and allowing audio to be added to many retrofit applications without the need of additional cables.

EST4 audio applications benefit from the inherent reliability and performance of zoned amplifiers, along with simplified user interface options, network interconnection flexibility, and several layers of survivability. All this combines to provide a flexible, cost-effective, and reliable audio solution.

### Effective Control

The 4-LCDAUDTEL LCD module provides a dedicated color touchscreen user interface option for selecting page circuits, and placing and receiving calls over the Firefighter Telephone Handset. The LCD module mounts to the inner door of cabinets or annunciators.

LED-Switch Modules may be used exclusively for audio control, or used in conjunction with the LCD user interface. These modules offer convenient slide-in strips for custom and color-coded labeling. Switch modules provide both tactile and visual feedback when a switch selection is made, offering instant verification that the command has been received by the system.

The 4-MIC Microphone assembly works with LED-Switch modules and the LCD touch-screen user interface. It also comes standard with a VU volume level that shows the signal level provided by the microphone during the page process.

### Survivable Distributed Audio

EST4's true distributed audio ensures the survivability of emergency messaging functions even in the face of catastrophic events. All pre-recorded messages are stored at the control panel, and programmed audio channel selection is made locally as well. This means that programmed messages will become active when a locally generated alarm is initiated — even if a network failure has occurred. Zoned amplifiers also have integrated 1000 Hz temporal tone generators that will produce a backup signal should the control panel CPU go offline. For additional system redundancy, a single standby amplifier can back up any zoned amplifier installed in the same cabinet.

Network wiring can also be configured in several ways to bolster the survivability of live paging and event notification throughout the network. These layers of redundancy provide audio system survivability that keeps life safety measures in place. There is no need to rely on network data transmissions of pre-recorded messaging. The panel always plays the message for events based on the event. This ensures fast selection and reliable playback even under the harshest conditions.

### Uncomplicated Plug-and-Play Configuration

Adding a microphone or firefighters' telephone at any EST4 control panel is as easy as plugging in a module. The 4-AUDTELS and 4-ANNAUDTEL interface modules mount to the back of the 4-CPU main processor unit or to a 4-ANNCPU annunciator CPU. The interface modules accept connections from locally-mounted microphones or telephones. Pre-recorded messages are stored at each panel that have zone amplifiers so there is no need to have a microphone or telephone at every panel. Nonetheless, EST4 does support multiple paging microphone masters and fire fighter telephone masters with programmable request-grant-deny function. This ensures that messaging is provided by those in control of the system.

# Audio Components

### 4-AUDTELS Audio-Telephone Interface Module



The 4-AUDTELS enables and processes information from connected microphone or telephone units mounted directly to the right of the CPU. The 4-AUDTELS also provides audio input-output, and is the source for a telephone riser that supports remote handsets and up to four line-level balanced audio input/output connections are available. The four balanced audio connections can be individually programmed as inputs or outputs, each rated for 1 Vrms nominal signal level. Multiple 4-AUDTELS may be installed in an EST4 network, providing support for multiple telephone riser applications and multiple low-level audio inputs/ outputs.

### 4-ANNAUDTEL Annunciator, Audio, and Telephone Interface Module



The 4-ANNAUDTEL mounts to the top of the 4-ANNCPU. The 4-ANNAUDTEL enables and processes information from connected microphone or telephone units. The module mounts in remote annunciators as well as in lobby cabinets.

### 4-LCDAUDTEL LCD Display Module for Audio and Telephone Control



The optional 4-LCDAUDTEL LCD module provides a dedicated color touch-screen user interface for selecting page circuits and for placing and receiving calls over the Firefighters' Telephone Handset. The LCD module mounts to the inner door of cabinets or annunciators. The interface does not have common control push buttons. The 4-LCDAUDTEL touch screen LCD may be used as the only method of making audio and telephone selections, or it may be used in combination with LED-Switch modules. For a complete list of LCD options please see the Ordering Information table.

### 4-MIC - Paging Microphone



The 4-MIC paging microphone mounts to the inner door of cabinets and annunciators, taking only two spaces. The 4-MIC is easy to use. It provides a hand-held microphone with push-to-talk switch and a multi-color amber-green-red volume meter on the assembly. The 4-MIC can be used for general alarm paging. Where no zoning is needed, simply pick up the mic, press the push-to-talk switch, and make the page to the entire system. Use an LED-Switch Module or 4-LCDAUDTEL color touch-screen interface where zoning or specific messaging operations are needed.

### 4-FT - Firefighter Master Handset



The 4-FT firefighter master handset mounts to the inner door of cabinets and annunciators, taking only two spaces. The 4-FT is used in conjunction with the 4-AUDTELS or 4-ANNAUDTEL interface modules. The 4-AUDTELS provides a firefighter telephone riser connection for remote warden stations. Telephone call-in selection may be annunciated at the control center via standard EST4 LED-Switch modules or the 4-LCDAUDTEL color touch-screen. Where multiple command centers are deployed, EST4 easily configures for request-grant-deny operation, ensuring that one command center is in control at one time, but allowing for changes in control if required.

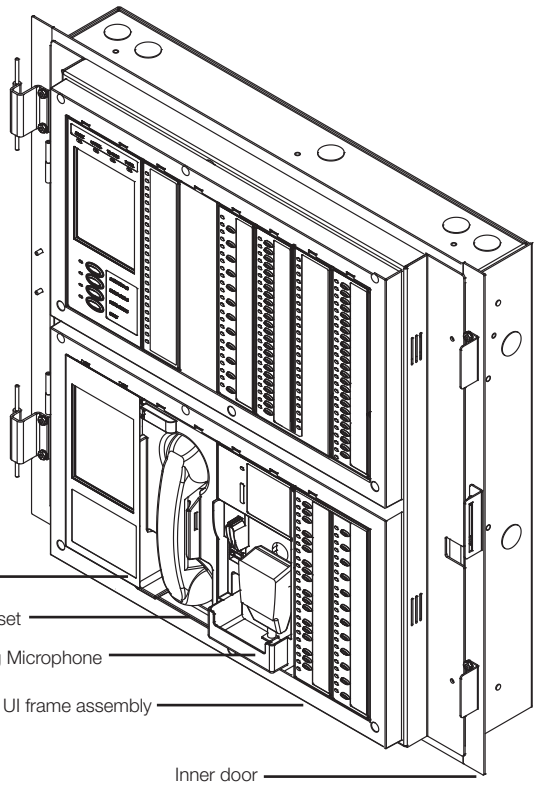
## Assembly

The 4-LCDAUDTEL, 4-FT, and 4-MIC modules each occupy two slots on the UI frame assembly.

To install the audio units, insert the tabs at the bottom of the module into the slots at the bottom of the UI frame assembly. Push the top of the module toward the UI frame assembly until the two locking tabs at the top of it lock into place on the UI frame assembly.

For a more secure installation, install two 4-40 x 7/16 screws from the back side of the UI frame assembly into the standoffs on the back side of the module.

Note: The 4-FT installs on the UI frame assembly shown in slots 3 and 4, when mounting the 4-FT above a 3-CHAS chassis assembly, the two spaces directly behind the 4-FT on the chassis must not contain other equipment.




## Engineering Specification

Provide emergency audio as part of the main fire alarm control panel. The emergency audio shall contain a paging microphone, pre-recorded messages <fire fighter telephone> and zoned amplifiers capable of delivering multi-channel audio messages. The system shall support a minimum of 100 audio channels. Transmission of audio shall be over the same data network wiring as the fire panel data. The network shall be over a dedicated <single copper pair> <dual multimode fibers>, <dual Single mode fibers><one single mode fiber> to remote parts of the facility.

For systems requiring multiple locations for paging, the ability to Request/Grant/Deny page privileges shall be supported. Priorities shall be configured in software covering projects operational priorities between Autonomous Control Units (ACU), Central Control Station (CCS) and Local Operators Consoles (LOCs).

Each panel shall store digitally up to 750 minutes of pre-recorded audio messages as WAV files without the need to add additional memory storage devices. These messages shall be automatically played in various areas of a facility under program control. The system shall have the capacity to store up to 200 individual audio messages. Each audio channel shall support up to 200 individual messages. Each panel shall simultaneously play back any of seven (7) different message channels in addition to a live page message of the 100 available.

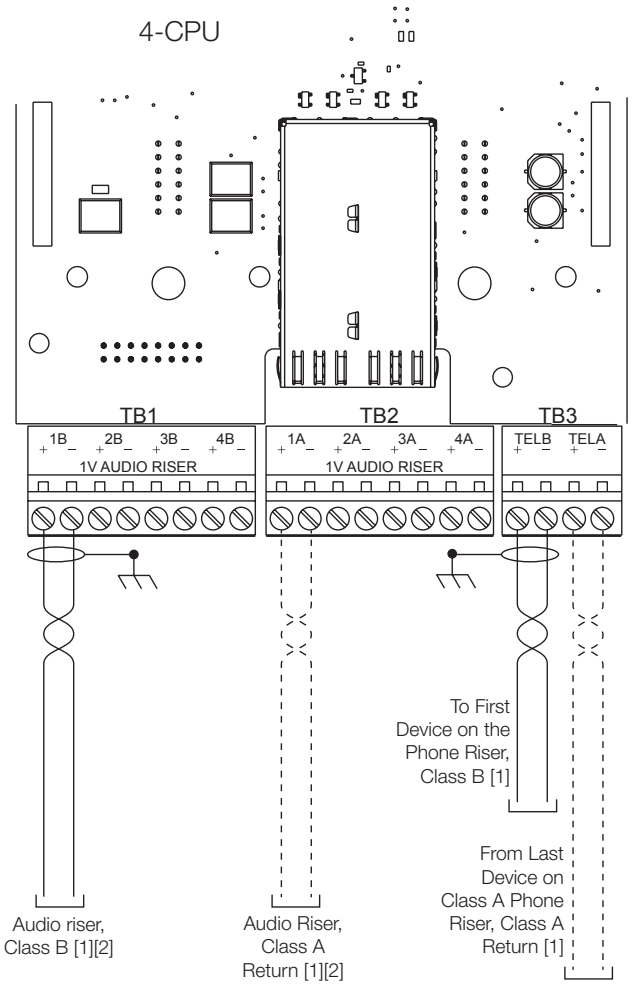
The system must provide operation to 25Vrms or 70.7Vrms speakers. The system must provide as a minimum the following paging common controls and indicators: Ready to page LED, three color VU display shows signal level provided by the microphone, single switch function for paging to all — Alert zones, Evacuation zones, and areas not programmed for signaling. The system must provide high quality analog to digital conversion of paging sources. Digital transmission of paging must be provided between system nodes over the same cabling as other system data. The analog sources must be sampled and converted to digital across the network.

System amplifiers must be distributed zoned type. Centrally banked systems are not acceptable. The circuit must carry a minimum rating of 3.5 Amps for operating 24 Vdc signals.

The system shall provide fully integrated fire fighters' telephone system that shall provide two-way communication between the fire alarm control panel and any firefighters' telephone station. << Audio and Firefighters' Telephone shall be installed so that a seismic component Importance Factor of 1.5 is achieved.>> <<The system shall include a dedicated color LCD touch screen user display and controls. When a telephone is activated, a call-in buzzer shall sound, and the location of the phone shall be shown on the LCD display. The display shall be capable of bilingual operation, displaying English, French, Spanish, or Portuguese messages.

All incoming calls and all connected phones shall be selected by touching the LCD screen. All subsequent telephone call locations shall be displayed in full text. The system shall display all incoming calls, all connected phone(s) on the color LCD display. The system shall be configured so that page messages may be issued from any firefighter's telephone connected to the system, as directed by the emergency operator.

## Wiring, 4-AUDTELS




[1] For Class B risers, install a 15 kΩ EOLR at the last device on the riser. Do not install an end-of-line resistor if the riser is wired Class A.

[2] Audio riser connections can be programmed as inputs or outputs using the 4-CU configuration utility.

## Technical Specifications

### 4-LCDAUDTEL Audio and Firefighter Telephone Control Display

| | |
|---|---|
| Current | Connected to 4-ANNCPU |
| Active | 93mA |
| Standby | 40mA @ 20% brightness |
| Display | 18 bit color. 640 x 480 pixels, resistive touch screen |
| Agency Approvals | UL, ULC, FM, CSFM and NYC Fire Dept. |
| Operating environment | Temperature: 32 to 120°F (0 to 49°C)<br>Relative Humidity:0 to 93% noncondensing |

### 4-MIC Paging Microphone

| | |
|---|---|
| Current | |
| Active | 38mA |
| Standby | 8mA |
| Common controls/ indicators | |
| VU meter | Represents the signal level from the microphone input |
| Ready To Page | Flashes during preannouncement tone, steady when ready to page |
| Agency Approvals | UL, ULC, FM, CSFM, CE and NYC Fire Dept. |
| Operating environment | Temperature: 32 to 120°F (0 to 49°C)<br>Relative Humidity:0 to 93% noncondensing |

### 4-FT Firefighter Telephone Master Handset

| | |
|---|---|
| Current | Connected to 4-ANNCPU |
| Active | 168mA |
| Standby | 9mA |
| Optional telephone riser | See 4-AUDTELS specifications. |
| Agency Approvals | UL, ULC, FM, CSFM and NYC Fire Dept. |
| Operating environment | Temperature: 32 to 120°F (0 to 49°C)<br>Relative Humidity:0 to 93% noncondensing |

### 4-AUDTELS Audio and Telephone Interface/Riser Module

| | |
|---|---|
| Current | |
| Standby | 85 mA at 24 VDC |
| Alarm/active | 101 mA at 24 VDC |
| Ground fault impedance | 5k Ω |
| Wire size | 22 to 12 AWG (0.5 to 2.5 mm²) |

| **Telephone Riser specification** | |
|---|---|
| EOL resistor | 15k Ω (P/N EOL-15) |
| Active telephones | Five plus the master headset or six without the master handset |
| Wire type | Twisted pair, shielded |
| Configuration | Class A or Class B |
| Line impedance | 52 Ω, 0.2 µF, max. |

| **Audio Riser Specification** | |
|---|---|
| EOL Resistor Class B | 15KΩ (P/N EOL-15) |
| Wire type | Twisted pair, shielded |
| Voltage | 1VRMS |
| Audio inputs/outputs | Up to four, configurable using the 4-CU |
| Operating environment | Temperature: 32 to 120°F (0 to 49°C)<br>Relative Humidity:0 to 93% noncondensing |
| Agency Approvals | UL, ULC, FM, CSFM and NYC Fire Dept. |

### 4-ANNAUDTEL Annunciator, Audio, and Telephone Interface Module

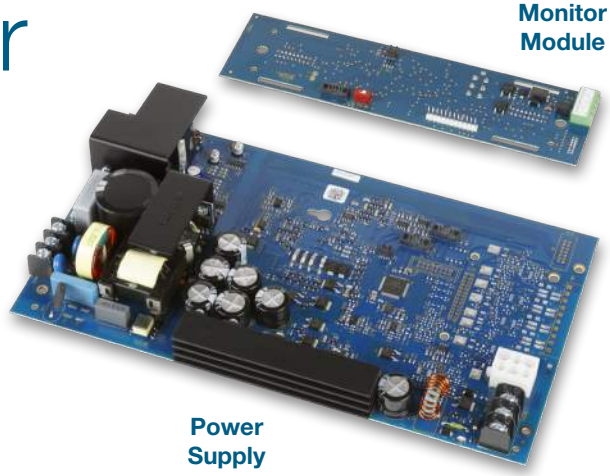
| | |
|---|---|
| Current | |
| Standby/active | 98mA @ 24VDC |
| Operating environment | |
| Temperature | 32 to 120°F (0 to 49°C) |
| Humidity | 0 to 93% noncondensing |
| Agency Approvals | UL, ULC, FM, CSFM and NYC Fire Dept. |

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# System Power Supplies

## 4-PPS/M series




Approvals

| EST4 | EST3 |
|---|---|
| UL / ULC S3000 | UL / ULC S3000 |
| CE | CE |
| FM APPROVED | FM APPROVED |
| EN54 | EN54 |

## Overview

System power supplies consist of two assemblies, a high efficiency switch mode power supply card and a power supply monitor module. The monitor module mounts to the local rail and distributes the power from its supply to the local rail. The local rail distributes power from all power supplies to other local rail modules and user interface cards resulting in “Shared Power” throughout the system. The 4-PPS/M can be configured as a primary power supply (PPS), booster power supply (BPS), or booster charger (BBC).

A 4-PPS/M configured as the PPS provides filtered, regulated power to the rail chassis modules as well as 24 VDC for operating ancillary equipment. The PPS consists of a power supply unit (PSU) mainboard and a monitor (MON) module.

Each booster power supply consists of the PSU mainboard and MON module. The booster power supply MON module provides the interface between the booster and the panel, making the required data and power connections to and from the rail chassis.

Maximum use of available power is achieved by configuring the power supplies in parallel. This results in a potential reduction in the number of power supplies necessary to meet requirements.

As many as four power supplies combined in a single enclosure provide up to 28 amps of available power. Battery backup is provided using one to four sets of batteries, depending on standby power requirements.

System power supplies mount to the back of the chassis units or wallboxes. Access to auxiliary power is via easily accessible terminal blocks located on the power supply monitor module. Each power supply produces 7 Amps of filtered and regulated power.

With four power supplies located in an enclosure (one primary and three booster power supplies) 28 amps of current is available for local rail modules, control display modules and the eight auxiliary 3.5 amp power outputs (two per supply).

## Standard Features

- High efficiency switch mode
- Increased power distribution efficiency - power supplies parallel allowing up to 28 amps in a single node
- Universal 120 to 240 VAC Operation
- 7 AMP filtered and regulated
- Two 3.5 AMP outputs
- Temperature compensated, dual rated battery charger
- Electronic power limiting
- Automatic load testing of batteries
- Fully approved to UL/ULC and EN54 standards

## Application

The primary power supply provides the system with battery charging and voltage regulation. Software configures the charger to either 10-24 AH batteries or 30-65 AH batteries and controls the high/low charge rates. Batteries mounted in the same enclosure as the power supply, have their charge rate monitored and adjusted based on the local enclosure temperature, keeping charging rates within battery specification. For remote batteries a temperature probe is monitored in the remote battery cabinet and charge rates are adjusted automatically. Battery damage is unlikely to occur when environmental short term conditions are outside of normal operating ranges.

The 4-PPS power supplies automatically load test batteries by shutting down the battery charger and placing a load across the battery. If the battery voltage is outside the specification range the power supply reports a trouble. The trouble clears if the battery is able to recover and pass future load tests.

Battery leads are electronically short circuit protected. If a short occurs in the battery leads the charger automatically disables itself and causes a trouble. The system will constantly look to see if the short has cleared. If the short clears, the system automatically restores.

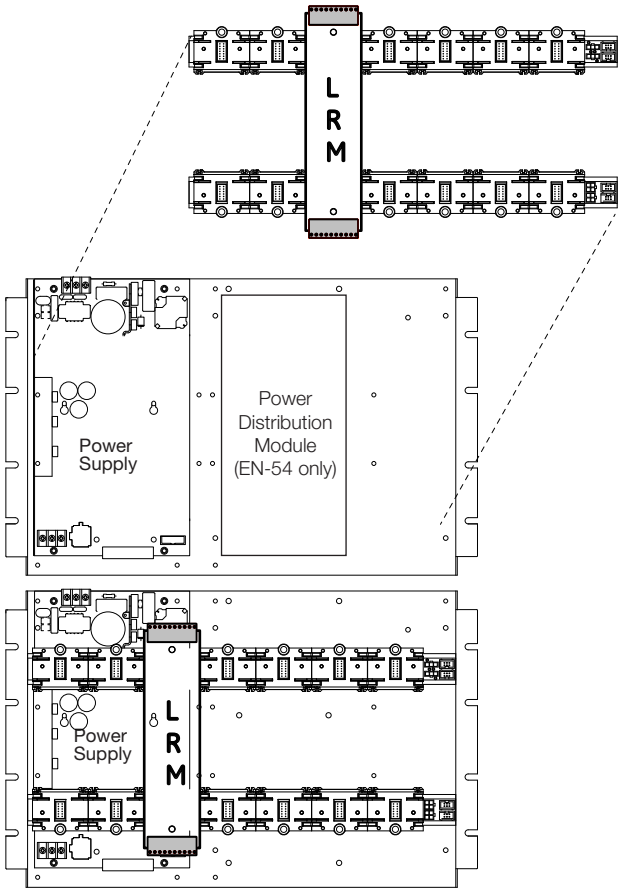
During operation on standby batteries, battery voltage is constantly monitored. A trouble is reported if the battery voltage falls below a specified value.

4-PPS power supplies provide specific information back to the CPU designed to help speed trouble shooting of system functions. Should a power supply detect a fault, specific diagnostic codes are available to speed trouble shooting. The LCD will display the power supplies address, a specific trouble code, and a text message describing the specific trouble. Text messages are easy to understand and include items like: Battery Trouble, Aux Power Overload Circuit 1, Aux Power Overload Circuit 2.

## Engineering Specification

The fire alarm power supplies must be capable of being paralleled and to load share. Multiple power supplies must be capable of being backed up with a single 24 volt battery set. Each power supply shall be capable of charging up to 65 AH batteries. The power supply must be able to perform an automatic load test of batteries and return a trouble if the batteries fall outside a predetermined range. Power supplies must incorporate the ability to adjust the charge rate of batteries based on ambient temperatures. It shall be possible to adjust for ambient temperature changes in local cabinets as well as remote cabinets.

## Installation and Mounting




## Power Supply Rules

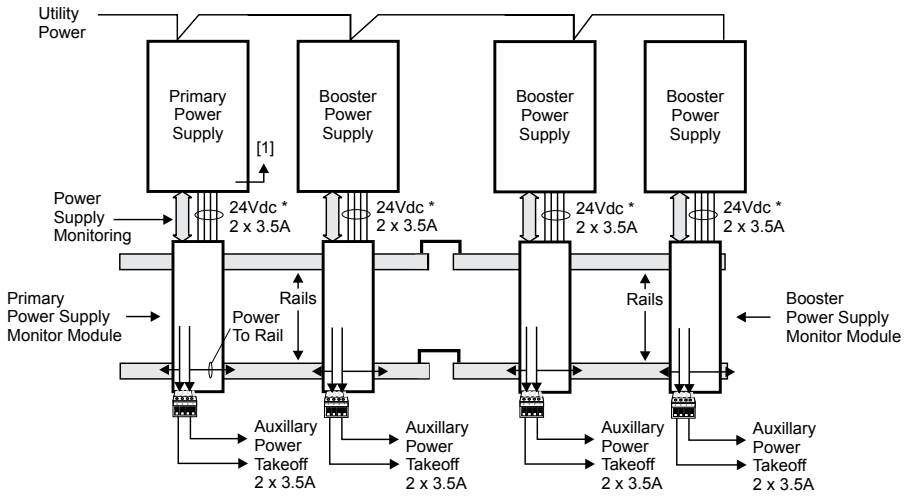
1. **<u>Equipment damage</u>: Do not install the 4-PPS/M in the same cabinet as a 3-PPS/M, 3-BPS/M, or 3-BBC/M. Combining the 4-PPS/M with legacy power supplies will cause damage to the power supply.**
2. Each battery set needs one charger.
3. Each power supply must be connected to a battery set using an identical length and gauge of wire to keep voltage drops identical.
4. Distribute power supplies and loads evenly across rails.
5. **All battery sets for a panel must be the same capacity (AH), same manufacturer, and same manufacturing date code.**

The Table below illustrates the combinations of power supplies and batteries that meet all the power supply rules.

**24 VDC Power Supply Output Current**

| | 7A | 14A | 21A | 28A |
|---|---|---|---|---|
| Battery Requirements | One Set, 65 AH max | Two Identical Sets, 65 AH max | Three Identical Sets, 65 AH max | Four Identical Sets, 65 AH max |
| Required 4-PPS/M Modules | 1 | 2 | 3 | 4 |

## Typical Wiring




[1] From battery temperature probe terminals.

* Nominal Voltage

## Specifications

| Catalog Number † | 4-PPS/M and 4-PPS-M-E |
|---|---|
| Agency Approvals | UL, ULC, CE, EN54 |
| Input Voltage | 4-PPS-M: 120-240 Vac (+10%, -15%), 50-60 Hz<br>4-PPS-M-E: 120-230 VAC, +10%, –15%, 3.0 A, 50 to 60 Hz |
| Brownout Level | < or = 99 Vac |
| Current Requirements | PPS Included with CPU current requirements<br>BPS/BBC Alarm: 45mA; Standby: 45mA |
| Input Current | 3.0 A |
| Total Output | Special applications Total Internal DC Auxiliary DC* |
| Battery Charging Capacity | 65 AH Sealed Lead-Acid |
| Low Battery Trouble | 22.5 Vdc |
| Deep Discharge Cutoff | 19.5 Vdc |
| Mounting Requirements | 1 LRM space, 1 chassis footprint |
| Wire size (TB1 and TB3) | 12 AWG to 20 AWG (4.0 $mm^2$ to 0.75 $mm^2$) |
| Output Protection | Electronic power limiting & heat sink temperature |
| Ground Fault Detection | < 10K Ohms |

*Regulated applications Total Auxiliary DC 24 VDC at 7.0 A (internal and auxiliary outputs) 24 VDC at 7.0 A max. Two 24 VDC at 3.5 A max. Power-limited and supervised for ground faults and shorts For special applications, see the panel compatibility list. 24 VDC at 4.5 A (internal and auxiliary outputs) Two: One 24 VDC at 3.5 A maximum for all circuits except the regulated NAC; one 24 VDC at 1.0 A max. for regulated NACs to 3-IDC8/4 modules only Power-limited and supervised for ground faults and shorts

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## Ordering Information

| Catalog Number | Description | Ship Wt., lb. (kg) |
|---|---|---|
| 4-PPS/M | Primary Power Supply w/ local rail module 120-240V 50/60 Hz | 5 (2.3) |
| 4-PPS/M-E | Primary Power Supply w/ local rail module 120-230V 50/60 Hz, EN54 Certified, CE | 5 (2.3) |
| 3-BTSEN | Distribution Module required when battery installed in remote cabinet | .5 (.22) |
| 3-BTSEN-E | Distribution module required when battery installed in a remote cabinet, (See EST4 European Marketplace Manual for wiring instructions) | .5 (.22 |
| 4-FIL | Blank EST4 filler plate (order separately when no LED or LED/Switch module is installed on the inner door) For use in EN54/UL/ULC markets | 0.1 (0.05) |
| 3-FP | Filler Plate, order separately when no LED or LED/Switch module installed. For use in EN54/UL/ULC markets | 0.1 (0.05) |
| 3-PPSKIT | Power supply distribution board required with EST3 systems | 5 (2.27) |
| 4-PPSKIT | Power supply distribution board required with EST4 systems (See EST4 European Marketplace Manual for wiring instructions) | 6 (2.7) |
| 3-FR8 | Ferrite kit includes 8 ferrites for EN54 applications, (See EST4 European Marketplace Manual for wiring instructions) | 1.5 (.68) |
| 4-FERKIT1 | FERKIT1 Ferrite kit includes 1 ferrite required for EN54 applications, (See EST4 European Marketplace Manual for wiring instructions) | 1 (.45) |
| 4-FERKIT2S | Ferrite kit includes 2 small ferrites required for EN54 applications, (See EST4 European Marketplace Manual for wiring instructions) | 0.5 (.23) |
| 4-FERKITS2L | Ferrite kit includes 2 large ferrite kits required for EN54 applications, (See EST4 European Marketplace Manual for wiring instructions) | 1 (.45) |
| 4-PWRDIST | PWR DSTRIBUTION,EMI FLTR BD, required for EN54 applications, (See EST4 European Marketplace Manual for wiring instructions) | 2 (.90) |

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# Signature Driver Controller Modules

## 3-SSDC2, 3-SDDC2, 3-SDC1



Approvals

| EST4 | EST3 |
|---|---|
| S3000 | S3000 |
| EN54 | EN54 |

## Overview

The 3-SSDC2 and 3-SDDC2 Signature Driver Controller modules provide an intelligent interface between the CPU module and Signature Series devices. Each module contains its own microprocessor used to coordinate, process and interpret information received from and sent to Signature devices. Power and communications is received directly from the control panel rail assembly. The 3-SSDC2 Single Signature Driver Controller module supports one Signature Data circuit, while the 3-SDDC2 Signature Dual Driver Controller module supports two Signature circuits. Both modules occupy one rail space in the fire alarm control cabinet and provide removable field wiring terminals to aid installation.

Innovative design gives the 3-SSDC2/3-SDDC2 and Signature devices truly “distributed intelligence”. Signature detectors and modules have their own on-board microprocessor communicating with the loop controller in a fully digital communication format. This increases the accuracy of the information coming to and from the loop controller by reducing the effects of capacitance and noise.

With decentralized intelligence much of the decision making moves from the loop controller to the devices. Advanced fire detection algorithms processed within the Signature devices effectively end unwanted alarms. Environmental compensation and multiple sensing element decision making operations are resident in the devices. Intelligent devices allow the Signature Controllers to execute communication and system functions with greater speed and low baud rates, increasing the accuracy of information transmitted between the loop controller and devices.

## Standard Features

- One or two circuit versions
- Dedicated microprocessor control
- Full digital communication
- Specialized communication protocol
  – Less sensitive to cable characteristics
  – Utilize existing wiring in most applications
- Device location supervision
  – Unexpected additional device addresses
  – Missing device addresses
  – Switched device locations
  – Programmed device parameters
- Automatic nonvolatile as-built mapping
  – Stores “actual” and “expected” device data
  – Stores physical connection sequence including “T” taps
- Automatic day/night sensitivity
- Supports up to 250 intelligent Signature detectors and 250 Intelligent Signature Modules
- Up to five 3-SDDC2s or ten 3-SSDC2s per node
  – Maximum of 10 signature circuits per cabinet
- Removable field wiring terminal blocks
- Multiple survival modes — stand alone
- Fully backward compatible with 3-SSDC, 3-SDDC, 3-SSDC1, and 3-SDDC1
- Supports the full line of Signature devices, including carbon monoxide detection

## Application

Up to 125 detectors and 125 modules are supported over a single pair of wires by the 3-SDC1 Signature Cards that plug into the Signature controller modules. Loop distances over 11,000 feet (3300m) are possible. Class B wiring, Class A and Class X wiring are supported.

The 3-SSDC2 and 3-SDDC2 use advanced communication formats that provide exceptional response. Using a “BROADCAST POLL” the loop controller checks the entire device circuit for any changes of state. Should one or more devices report a change the 3-SSDC2/3-SDDC2 uses “DIRECT ADDRESS SEARCH” to find reporting device(s). Devices that have entered the alarm state or become active are located nearly instantaneously.

The unique use of “BROADCAST POLLING” combined with “DIRECT ADDRESS SEARCH” ensures that only new information is transmitted allowing a reduced baud rate with fast response time. The low baud rate is ideal for retrofit applications since in most applications existing wiring can be used.

To enhance survivability of the system the 3-SSDC2/3-SDDC2 supports a standalone mode for Signature devices. Two catastrophic failure modes are supported. If the CPU fails, the loop controller will continue to poll its devices. If an alarm is detected it will be sent on the local rail communication bus and received by other local rail modules. A common alarm condition throughout the panel will result. If the local rail module (3-SSDC2/3-SDDC2) fails, and a device (smoke or module) detects an alarm, specialized circuitry will make the node aware of the alarm condition. The CPU will communicate the alarm condition to the rest of the network. Having multiple redundant modes is paramount in a life safety system.

Every time the 3-SSDC2/3-SDDC2 communicates with a detector a green LED on the detector flashes. Normal green LED activity is not disturbing to building occupants, but can be quickly spotted by a maintenance technician. A red LED on the detector turns on only in the alarm condition.

The 3-SSDC2/3-SDDC2 also supervises the device wiring, physical location of each device and the programmed device characteristics. This EDWARDS/Signature Series unique characteristic is accomplished by “MAPPING” the Signature circuit and committing the map to memory. Upon power up the loop controller will scan device serial numbers and map their physical location sequence on the loop, including “T” taps. After mapping is complete the controller automatically addresses each detector and module through downloading over the loop. There are no switches or dials to set. Each device is assigned a unique soft address generated by the site specific program.

The 3-SSDC2/3-SDDC2 then compares the “Actual” physical device data to the “Expected” site specific program data. If any correlations are different, the loop controller issues a trouble to the CPU identifying the devices which do not match and posting a map fault. Through the CPU port a graphical map of the loop can be uploaded depicting each device’s location on the loop, including branches (T-Taps) and all of the physical attributes associated with the device. This diagnostic information is unparalleled in the fire detection industry and vital for keeping accurate records on how the system was installed.

During installation a common problem with analog/ addressable systems is locating ground faults. The 3-SSDC2 and 3-SDDC2 controllers have the ability to locate ground faults by specific module, speeding up the troubleshooting process. Another significant advantage of the 3-SSDC2/3-SDDC2 controllers during commissioning is electronic addressing and mapping. This eliminates duplicate addresses, which are also very difficult for most systems to locate.

During maintenance, should groups of detector heads be removed for service and returned into the wrong smoke detector base (location), the 3-SSDC2/3-SDDC2 will automatically detect the problem. If the attributes of the switched devices are the same, the system will automatically download the correct soft addresses and algorithms to the devices (maintaining location supervision).

If the attributes are not the same the 3-SSDC2/3-SDDC2 will send a map fault indication to the CPU and post a trouble indicating the specific devices in fault.

The 3-SSDC2/3-SDDC2 also monitors the Signature Series devices for maintenance and trouble conditions. Each smoke detector contains intelligence to adjust with environmental changes. This expands the amount of time required between cleaning while maintaining a constant alarm threshold. As the detector begins to exhaust the environmental compensation, and reaches the 80% level, the 3-SSDC2/3-SDDC2 will indicate a maintenance alert or dirty condition to the CPU and indicate the specific device requiring cleaning. If cleaning is not performed the detector will continue to operate until all of its environmental compensation is utilized. At this point the 3-SSDC2/3-SDDC2 sends a dirty trouble indication to the CPU and posts a trouble condition.

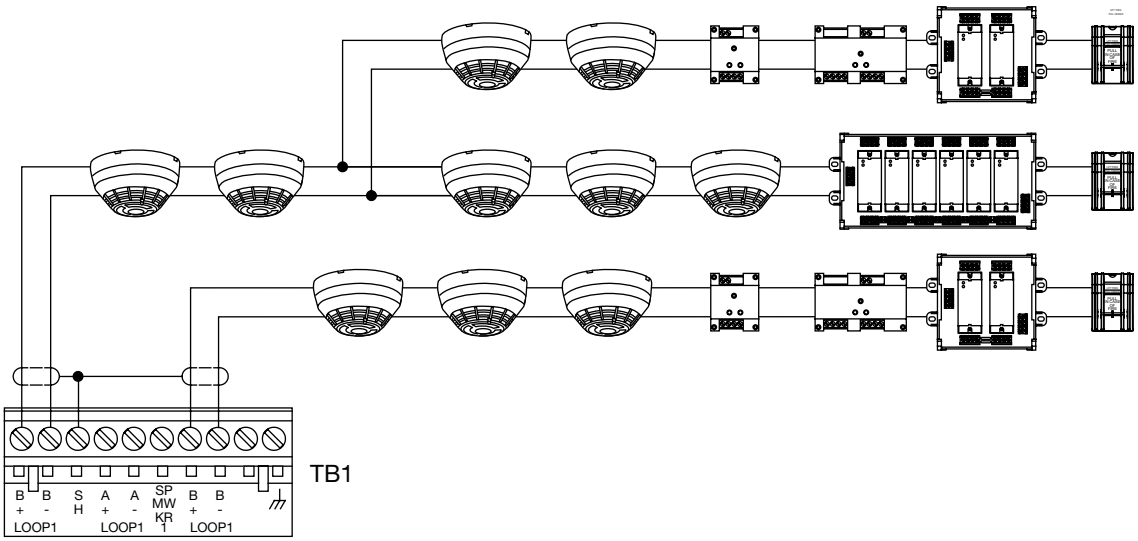
When a detector includes carbon monoxide (CO) detection, the detector monitors its CO life remaining for the CO sensor element and provides this information automatically to the panel. For maintenance of the system the CO life remaining is also available by simply running a maintenance report at the panel or through the FireWorks graphical interface. A unique CO maintenance signal is automatically generated by the panel approximately 6 months before the CO sensor reaches its end of life to allow for time to plan maintenance and replacement of the CO detector before it reports a CO sensor ‘End of Life’ trouble.

Remote test capability permits devices to be put in alarm, pre-alarm, supervisory, monitor, or security alarm, or trouble from the panel menu or controls. This facilitates testing of smoke and heat detectors as well as monitor and security devices. Fast test is also provided for CO detectors allowing these devices to be tested quickly in the field.

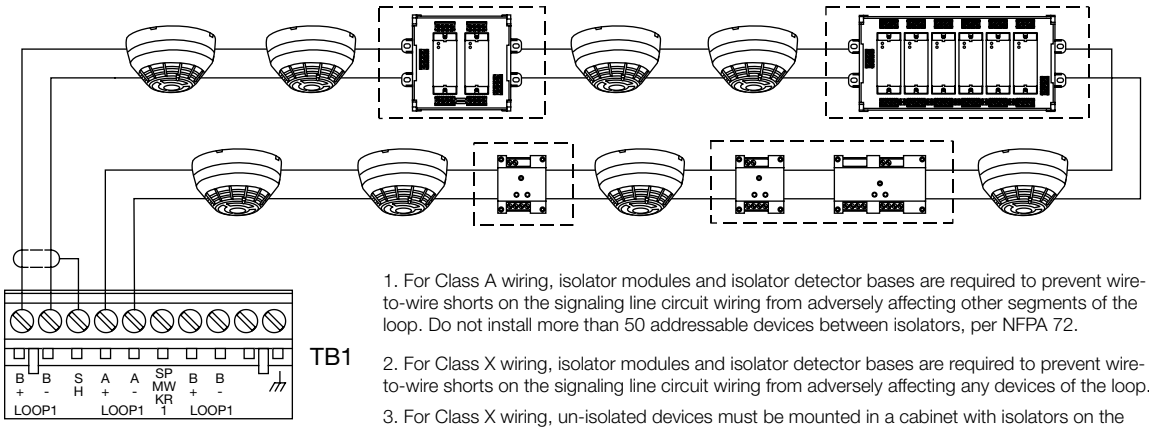
The 3-SSDC2 and 3-SDDC2 local rail modules are fully backwards compatible with the 3-SSDC, 3-SDDC, 3-SSDC1, and 3-SDDC1 respectively local rail modules. 3-SSDC2 and 3-SDDC2 modules provide additional onboard memory to facilitate future Synergy functions. To upgrade a 3-SSDC/3-SDDC, 3-SSDC1/3-SDDC1 to a 3-SSDC2/3-SDDC2 respectively, replace the 3-SSDC1/3-SDDC1 Local Rail Module with a 3-SSDC2-MB Local Rail Module and reuse the 3-SDC1 Signature Device Cards and filters.

## Typical Wiring

### 3-SSDC2 and 3-SDDC2 Class B wiring




### 3-SSDC2 and 3-SDDC2 Class A and Class X wiring




1. For Class A wiring, isolator modules and isolator detector bases are required to prevent wire-to-wire shorts on the signaling line circuit wiring from adversely affecting other segments of the loop. Do not install more than 50 addressable devices between isolators, per NFPA 72.
2. For Class X wiring, isolator modules and isolator detector bases are required to prevent wire-to-wire shorts on the signaling line circuit wiring from adversely affecting any devices of the loop.
3. For Class X wiring, un-isolated devices must be mounted in a cabinet with isolators on the incoming and outgoing wiring.

## Engineering Specification

The communication format between the control panel and analog devices shall be 100% digital.

Loop alarm recognition must be within 750 milliseconds of a device going into the alarm state, with system response time no greater than 3 seconds. All devices shall support remote testing.

It must be possible to wire the circuit as Class B, Class A or Class X with non-shielded, non-twisted wire. It must be possible to wire branches (T-taps) with Class B wiring.

The driver controller must be manufactured in accordance with ISO 9001 standards.

The system must have tolerance to multiple failures. There must be a standalone mode of operation that will ensure the system is aware of alarms even if the local rail or main CPU fails.

# Specifications (Signature Circuits)

Charts assume wire and devices are evenly distributed over length of circuit

**Non-twisted, non shielded wire**

| Device type | # of Detectors | # of Module Addresses | #14 AWG / 2.08mm2 (20pf/foot) (2.53 Ohm/1000ft) | #16 AWG / 1.31 mm2 (20pf/foot) (4.02 Ohm/1000ft) | #18 AWG / 0.823 mm2 (20pf/foot) (6.38 Ohm/1000ft) |
|---|---|---|---|---|---|
| Detectors only | 125 | 0 | 14,752 feet (4,497 meters) | 9,275 feet (2,827 meters) | 5,839 feet (1,780 meters) |
| Modules only | 0 | 125 | 12,599 feet (3,840 meters) | 7,921 feet (2,414 meters) | 4,986 feet (1,520 meters) |
| Detectors and Modules | 125 | 125 | 5,738 feet (1,749 meters) | 3,608 feet (1,100 meters) | 2,271 feet (692 meters) |
| Detectors and Modules with 2-wire smokes | 63 | 55 + 9 SIGA-UM | 7,623 feet (2,324 meters) | 4,793 feet (1,461 meters) | 3,017 feet (920 meters) |
| Modules with 2-wire smokes | 0 | 107 + 9 SIGA-UM | 3,798 feet (1,158 meters) | 2,388 feet (728 meters) | 1,503 feet (458 meters) |

**Twisted pair non shielded wire**

| Device Type | # of Detectors | # of Module Addresses | #14 AWG (38pf/foot) (2.53 Ohm/1000ft) | 1.5mm² (36pf/foot) (3.75 Ohm/1000ft) | #16 AWG (36pf/foot) (4.02 Ohm/1000ft) | 1.0mm² (25pf/foot) (5.51 Ohm/1000ft) | #18 AWG (25pf/foot) (6.38 Ohm/1000ft) |
|---|---|---|---|---|---|---|---|
| Detectors only | 125 | 0 | 13,157 feet (4,010 m) | 9,933 feet (3,028 m) | 9,275 feet (2,827 m) | 6,760 feet (2,061 m) | 5,839 feet (1,780 m) |
| Modules Only | 0 | 125 | 12,599 feet (3,840 m) | 8,483 feet (2,586 m) | 7,921 feet (2,414 m) | 5,774 feet (1,760 m) | 4,986 feet (1,520 m) |
| Detectors & Modules | 125 | 125 | 5,738 feet (1,749 m) | 3,864 feet (1,178 m) | 3,608 feet (1,100 m) | 2,630 feet (802 m) | 2,271 feet (692 m) |
| Detectors and modules with 2-wire smokes | 63 | 55 + 9 SIGA-UM | 7,623 feet (2,324 m) | 5,133 feet (1,565 m) | 4,793 feet (1,461 m) | 3,494 feet (1,065 m) | 3,017 feet (920 m) |
| Modules with 2-wire smokes | 0 | 107 + 9 SIGA-UM | 3,798 feet (1,158 m) | 2,558 feet (780 m) | 2,388 feet (728 m) | 1,741 feet (531 m) | 1,503 feet (458 m) |

**Twisted pair shielded wire**

| Device Type | # of Detectors | # of Module Addresses | #14 AWG / 2.08mm2 (20pf/foot) (2.53 Ohm/1000ft) | #16 AWG / 1.31 mm2 (20pf/foot) (4.02 Ohm/1000ft) | #18 AWG / 0.823 mm2 (20pf/foot) (6.38 Ohm/1000ft) |
|---|---|---|---|---|---|
| Detectors only | 125 | 0 | 5,952 feet (1,814 meters) | 6,098 feet (1,859 meters) | 5,839 feet (1,780 meters) |
| Modules Only | 0 | 125 | 5,952 feet (1,814 meters) | 6,098 feet (1,859 meters) | 4,986 feet (1,520 meters) |
| Detectors & Modules | 125 | 125 | 5,738 feet (1,749 meters) | 3,608 feet (1,100 meters) | 2,271 feet (692 meters) |
| Detectors and modules with 2-wire smokes | 63 | 55 + 9 SIGA-UM | 5,952 feet (1,814 meters) | 4,793 feet (1,461 meters) | 3,017 feet (920 meters) |
| Modules with 2-wire smokes | 0 | 107 + 9 SIGA-UM | 2,558 feet (780 meters) | 2,388 feet (728 meters) | 1,503 feet (458 meters) |

*Note 1: Maximum number of 170 SIGI devices (built-in isolators) per loop*

## Specifications (controllers)

| Catalog Number | 3-SSDC2 | 3-SDDC2 |
|---|---|---|
| Installation | 1 LRM Space | 1 LRM Space |
| Module Configuration | 1 Addressable circuit (3-SDC1 Card) expandable to 2 circuits. | 2 Addressable circuits (3-SDC1 Cards) |
| Operating Current [Note 2] | Standby 144 mA Alarm 204 mA | Standby 264 mA Alarm 336 mA |
| Operating Voltage | 24 Vdc, Nominal | |
| Address Requirements | Automatic | |
| Detectors Supported | 125 per 3-SDC1 Card | |
| Modules Supported | 125 Module Addresses per 3-SDC1 Card | |
| 2-Wire Smoke Power Output | 100 mA per 3-SDC1 Card (not included in *Operating Current* above | |
| Conventional detectors supported | Refer to FACU compatibility lists for compatible devices | |
| Signature Circuit Voltage | 20 VDC +/- 5% | |
| Maximum Signature Circuit Resistance | 100 Ohms | |
| Maximum Signature Circuit Capacitance | 0.5 µF | |
| Communications Format | 100% Digital | |
| Circuit Wiring Styles | Class B, Class A or Class X | |
| Termination | Removable plug-in terminal strip(s) on module | |
| Permissible Wire Size | 18 to 12 AWG (0.75 to 2.5 mm²) | |
| Agency Listings | UL, ULC (see Note 1), EN54, CE, FM | |
| Operating Environment | 32 °F (0 °C) to 120 °F (49 °C) 93% RH, non-condensing | |

Note 1: Other EST3 components are modularly listed under the following standards:
UL 864 categories: UOJZ, UOXX, UUKL and SYZV, UL 294 category ALVY, UL 609 category AOTX, UL 636 category ANET, UL 1076 category APOU, UL 365 category APAW, UL 1610 category AMCX, UL 1635 category AMCX
ULC-S527, ULC-S301, ULC-S302, ULC-S303, ULC-S306, ULC/ORD-C1076, ULC/ORD-C693
Please refer to EST3 Installation and Service Manual for complete system requirements.

Note 2: Current shown Includes full loop of SIGA devices.

## Ordering Information

| Catalog Number | Description | Shipping Wt. lb (kg) |
|---|---|---|
| 3-SSDC2 | Single Signature Driver Controller. Comes with one 3-SDC1 Device Card. Mounts to Local Rail. | 0.5 (0.23) |
| 3-SSDC2-E | Single Signature Driver Controller. Comes with one 3-SDC1 Device Card. Mounts to Local Rail. EN54 compliant model | 0.5 (0.23) |
| 3-SDDC2 | Dual Signature Driver Controller. Comes with two 3-SDC1s. Mounts to Local Rail. | 0.5 (0.23) |
| 3-SDDC2-E | Dual Signature Driver Controller. Comes with two 3-SDC1 Device Cards. Mounts to Local Rail. EN54 compliant model | 0.5 (0.23) |
| 3-SDC1 | Signature Device Card - upgrades a 3-SSDC2 to a 3-SDDC2. | 0.25 (0.11) |
| 3-SDC1-E | Signature Device Card - upgrades a 3-SSDC2-E to 3-SDDC2-E. EN54 compliant model | 0.25 (0.11) |
| 4-FIL | *Blank EST4 filler plate (order separately when no LED or LED/Switch module is installed on the inner door).* For use in EN54/UL/ULC markets | 0.1 (0.05) |
| 3-FP | Filler Plate, order separately when no LED or LED/Switch module installed. For use in EN54/UL/ULC markets | 0.1 (0.05) |

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# Zoned Audio Amplifiers

## 3-ZA20A, 3-ZA40A, 3-ZA95



FM APPROVED · NYC FIRE DEPT. COA # 6314 · UL · ULC · 7165-1657: 0186

## Overview

EST4 audio amplifiers take full advantage of proven digital technology to deliver highly intelligible voice audio for evacuation and Mass Notification purposes. Pre-Recorded digital messages and live paging messages are multiplexed into separate channels. Each zoned amplifier contains integrated de-multiplexing circuitry that allows eight digital audio channels, designated from the 100 system-supported channels, to be placed on the amplifier's built-in speaker circuit.

Audio channel selection is made at the control panel with all pre-recorded messages stored locally. This means there is no need to rely on network data transmissions of prerecorded messaging. The panel always plays the message for events based on the event, which ensures fast selection and reliable playback.

Audio amplifiers mount in the same enclosures as other EST4 equipment. Power for the amplifiers comes from standard system power supplies through the local rail.

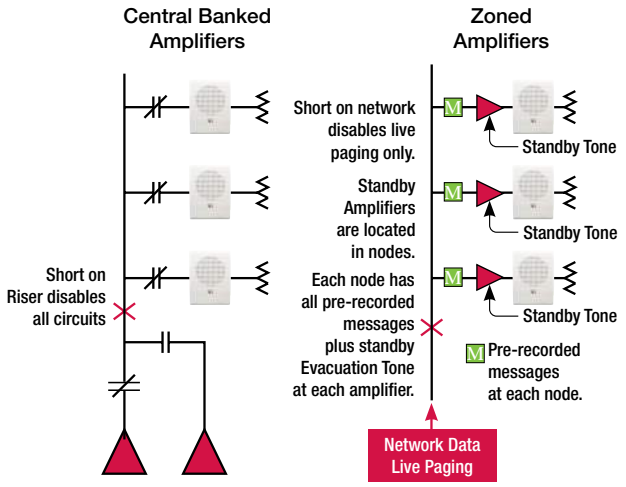
Field wiring connects to removable terminal blocks on the amplifier module. Amplifiers support either 25 VRMS or 70 VRMS power limited speaker circuits. For visual signalling, each 20 or 40 watt amplifier comes standard with one 24 Vdc power limited Notification Appliance Circuit.

## Standard Features

- **Three Sizes Available**
  -20 Watts
  -40 Watts
  -95 Watts
- **Simultaneous eight channel digital audio**
  - Superior sound quality
  - Each amplifier does it's own decoding
- **Speaker circuit built into amplifier**
  - Selectable for 70 or 25 VRMS output
  - Class A or Class B output
  - Power limited
- **3.5 amp 24 Vdc notification appliance circuit on 20 and 40 watt amplifiers**
  - Class A or Class B output
  - Power limited
- **Integral backup tone generator**
  - 1 KHz temporal (3-3-3) tone evac
- **Part of an end-to-end 520 Hz signaling solution**
  - UL 464/864 approved for use in sleeping rooms

## Application

EST4 zoned amplifier configurations offer improved reliability and performance. Configuration provides improved survivability in the event of wiring faults that result in a loss of signalling. In the example shown in the diagram, a fault on the system using a central backed-up amplifier disables multiple signal/page circuits, and the standby amplifier is not able to bypass the fault. With EST4, the same fault cannot occur, as there is no audio riser. All prerecorded messaging resides in the node where the amplifiers are mounted.

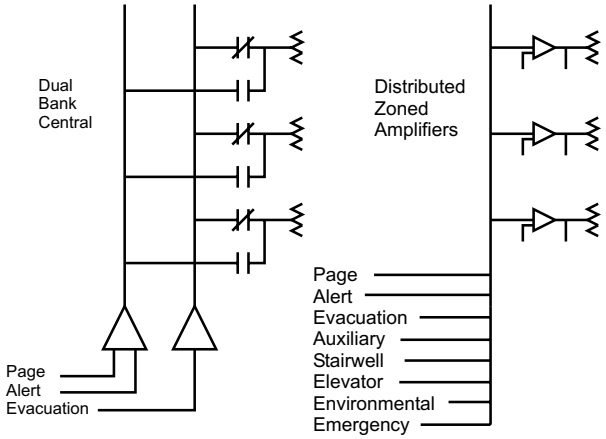



Because all EST4 nodes store their pre-recorded messages locally, programmed messages will become active when a locally generated alarm is initiated — even when a catastrophic network failure has taken place. Additionally, zoned amplifiers have integrated 1000 Hz temporal tone generators that will produce a backup signal should the main CPU suffer a catastrophic panel failure. Meanwhile, a single standby amplifier can backup any zoned amplifier in the same cabinet. These layers of redundancy provide a level of system survivability that keeps life safety measures in place, even under the harshest conditions.

EST4 easily outperforms banked audio systems and many zoned amplifier systems with its ability to simultaneously deliver up to eight of a possible 100 audio channels to each node. When using centrally-banked amplifiers, paging and alert channels typically share a common amplifier. Consequently, when paging, the alert signal goes silent in all alerted areas when a Page is issued. At the end of the Page, the alert signal resumes in the alert area. This could cause confusion because occupants will not have received the page message and do not know why the alert signal was interrupted. In zoned amplifier systems that support fewer channels, it is possible to run short of available channels — particularly in large campus networks or high rise networks where there is a need to support larger numbers of specific messaging.

With EST4, simultaneous Page, Alert, and Evacuation signal capability is engineered into the system. With 100 channels to choose from, up to eight channels can be delivered to a single node, allowing dedicated messages to be delivered to stairwells, elevator cabs, etc., while Alert, Evacuation, and Page instructions are simultaneously being sent to other areas.

Eight specific audio channels can be selected for each node. This allows messages to be automatically routed and programmed to provide specific instructions based on the alarm's location. At the same time, other areas can access and play a different eight audio messages.




For example, with an alarm on Floor Eight, the following automatic message instructions could be given concurrently. **Note:** A Page could also be sent to any other location in the building – without interrupting any of the messages below.

**FLOOR 9 HEARS**: "A fire alarm has been reported on the floor below. Please evacuate using the stairwell."

**FLOOR 8 HEARS:** "A fire alarm has been reported on this floor. Please evacuate using the stairwell."

**OTHER FLOORS HEAR:** "An emergency has been reported on floor 8. Please remain in the building and await further instructions."

**ELEVATOR:** "A fire alarm has been reported in the building. The elevator is being returned to the ground floor for emergency use. Please evacuate the building."

**STAIRWELLS:** "Please remain calm and walk down the stairs to evacuate the building in a safe manner."

In addition to robust paging, EST4 provides UL-listed Mass Notification, which overrides fire alarm functions. This capability allows emergency response commanders to advise building occupants of the safest action to take while an emergency is unfolding. Occupants can be instructed to leave, relocate, or seek immediate shelter, depending on the situation. This provides the flexibility for communications to mesh with the facility's risk analysis needs — without an unexpected fire alarm or general evacuation signal interfering with established emergency response protocols.

For buildings designed to allow elevators to be used for Occupant Evacuation Operation (OEO), EST4 can integrate with elevator controllers to provide specific messaging associated with the use of elevators for evacuation.

### Sleeping Areas

3-ZA Series Amplifiers are part of an end-to-end low frequency solution listed to UL 464 and UL 864. It is approved for code-compliant 520 Hz signalling in sleeping areas when used in conjunction with:

- an EST4 control panel
- a factory-supplied 520 Hz audio file
- one or more Genesis High Fidelity speakers

Consult the EST4 System Compatibility List for full details of compatible devices.

## Engineering Specification

Provide emergency audio as part of the main fire alarm control panel. The emergency audio shall contain a paging microphone and zoned amplifiers capable of delivering multi-channel audio messages. The system shall support a minimum of 100 audio channels. Transmission of live paging audio shall be over the same data network wiring as the fire panel data. The network data transmission shall be over a dedicated <single copper pair> <dual multi-mode fibers>, <dual Single mode fibers><one single mode fiber> to remote parts of the facility. Prerecorded messages shall be stored locally at each node. Transmission of prerecorded audio across the network during alarm events is not acceptable.

For systems requiring multiple locations for paging, the ability to Request/Grant/Deny page privileges shall be supported. Priorities shall be configured in software covering the operational priorities between Autonomous Control Units (ACU), Central Control Station (CCS) and Local Operators Consoles (LOCs). As a minimum the system shall consist of: Local Page, Emergency Communication, Multiple Evacuation, Alert, Auxiliary, and General Signalling. Channels shall support hierarchical operation and be controllable from system programming. The audio system shall also provided Elevator, Stairwell and Auxiliary signalling. Systems that cause signalling devices to go silent while performing any signalling functions will not be accepted. The system shall support repeat counts of audio messages, as well as stacking of audio messages in a FIFO configuration.

The audio system zoned amplifiers must be able to operate 25 VRMS or 70 VRMS speakers. The amplifier output must be power limited, and wired in a <Class A> <Class B> configuration. The amplifiers shall source prerecorded messages locally, and shall not have to rely on network communications to receive prerecorded messaging. Should local audio be unavailable the amplifiers shall provide an integral backup 1000 KHz temporal tone generator which shall operate in the event primary audio signals are lost and the amplifier is instructed to broadcast alarm information. It shall be possible to backup multiple zoned amplifiers with a common backup amplifier.

## Technical Specifications

| | 3-ZA20A | 3-ZA40A | 3-ZA95 |
|---|---|---|---|
| Agency Listing | UL, ULC, FM, CSFM | | |
| Environmental | 0°C - 49°C (32°F - 120°F) 93% RH, Non-condensing | | |
| Frequency Response | 400Hz to 4KHz @ +/- 3dB | | |
| Output Voltage | 25 VRMS or 70 VRMS | | |
| THD (distortion) | < 7% | | |
| Wire Size | 18 to 12 AWG (1.0 to 2.5 mm²) | | |
| Internal Tone Generator | 1KHz Temporal (3-3-3) Tone (evacuation); 20 PPM (alert) | | |
| SIGA-CC1/2 Support | 10 Units, Maximum | | |
| Standby Current | 62mA for 20 and 40 watt amps;<br>64mA for the 3-ZA95 watt amp | | |
| Alarm Current | 1120mA | 2480mA | 5540mA |
| Pwr. Ltd. Audio Output<br>Wiring Configuration<br>EOL Resistor | Class A or B<br>15K Ohms in Class B | Class A or B<br>15K Ohms in Class B | Class A or B<br>15K Ohms in Class B |
| Pwr. Ltd. 24 Vdc NAC<br>Wiring Configuration<br><br>Line Resistance, Max.*<br>EOL Resistor Line<br>Capacitance, Max | Class A or B<br>(Style Z or Y)<br><br>50 Ohms, Max.<br>N/A<br>0.33µF | Class A or B<br>(Style Z or Y)<br><br>50 Ohms, Max.<br>N/A<br>0.33µF | N/A |
| Space Requirements | 1 LRM Space | | 2 LRM Spaces |

**Maximum Speaker Circuit Distance at 0.5 dB loss***

| 70 VRMS Output | 3-ZA20A | 3-ZA40A | 3-ZA95 |
|---|---|---|---|
| #12 AWG<br>(3.2 Ohm/1000 ft pair) | 4,536 ft (1,382 m) | 2,268 ft (691 m) | 955 ft (290 m) |
| #14 AWG<br>(5.2 Ohm/1000 ft pair) | 2,792 ft (850 m) | 1,396 ft (425 m) | 588 ft (179 m) |
| #16 AWG<br>(8.0 Ohm/1000 ft pair) | 1,815 ft (553 m) | 907 ft (276 m) | 382 ft (116 m) |
| #18 AWG<br>(13 Ohm/1000 ft pair) | 1,117 ft (340 m) | 558 ft (170 m) | 235 ft (71 m) |

| 25 VRMS Output | 3-ZA20A | 3-ZA40A | 3-ZA95 |
|---|---|---|---|
| #12 AWG<br>(3.2 Ohm/1000 ft pair) | 579 ft (176 m) | 289 ft (88 m) | 122 ft (37 m) |
| #14 AWG<br>(5.2 Ohm/1000 ft pair) | 356 ft (108 m) | 178 ft (54 m) | 75 ft (22 m) |
| #16 AWG<br>(8.0 Ohm/1000 ft pair) | 231 ft (70 m) | 116 ft (35 m) | 49 ft (14 m) |
| #18 AWG<br>(13 Ohm/1000 ft pair) | 142 ft (43 m) | 71 ft (21 m) | Not supported<br>by 18 AWG |

* Refer to product manual for wire run calculations.

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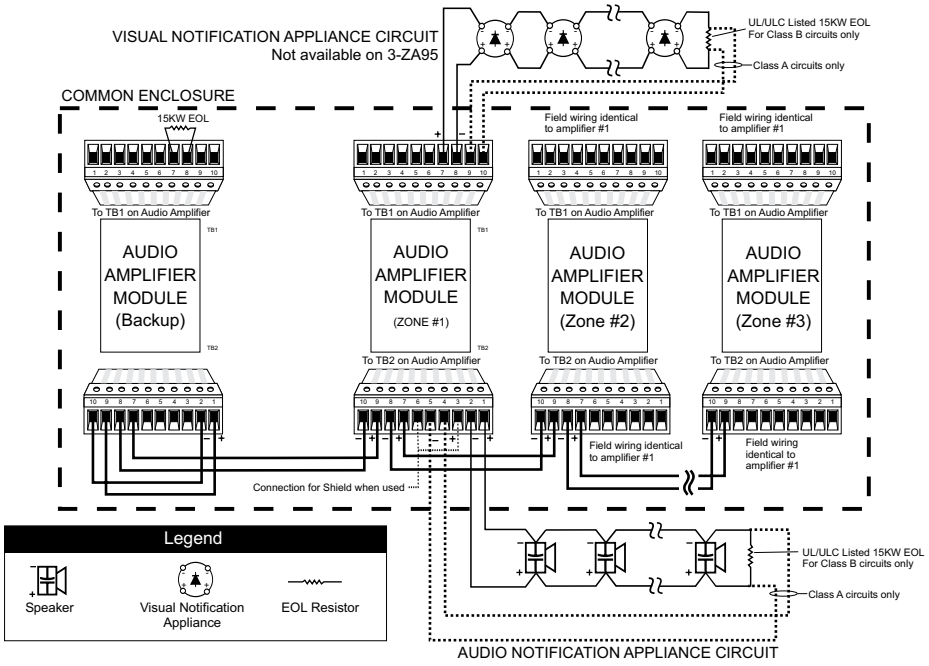
**Contact us**

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Website: edwardsfiresafety.com

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Bradenton, FL 34202

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## Typical Wiring




## Ordering Information

| Model # (SKU) | Description | Shipping Weight |
|---|---|---|
| 3-ZA20A | 20 Watt Zoned Amplifier w/Class A/B (Style Z/Y) Audio & Class A/B (Style Z/Y) 24 VDC outputs. Add suffix “-E” for EN54 compliant versions. | 1.55lb (0.7kg) |
| 3-ZA40A | 40 Watt Zoned Amplifier w/Class A/B (Style Z/Y) Audio & Class A/B (Style Z/Y) 24 VDC outputs. Add suffix “-E” for EN54 compliant versions. | 1.55lb (0.7kg) |
| 3-ZA95 | 95 Watt Zoned Amplifier w/Class A/B (Style Z/Y) Audio output | 3.0lb (1.5kg) |
| 4-FIL | Blank EST4 filler plate (order separately when no LED or LED/Switch module is installed on the inner door). | 0.1lb (0.05kg) |

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# Modem Communicator

## 3-MODCOM, 3-MODCOMP




Approvals

| EST4 | EST3 |
|---|---|
| UL, ULC S3000 | UL, ULC S3000 |
| 7165-1657: 0186/0306 | 7165-1657: 0186/0306 |
| NYC FIRE DEPT. COA # 6314 | FDNY APPROVED |
| FM APPROVED | FM APPROVED |

## Overview

The Modem Communicator is a two-way local rail module that performs a variety of off-premise communications functions for the system.

Using the latest in digital signal processing (DSP) techniques, the Modcom provides off premise communication features unavailable on any other system.

The module has provisions for supervising two loop-start telephone lines. The module features a modular jack for telephone line connections. The Modcom's configuration and firmware can also be updated from any network node.

Modcom series modules occupy a single local rail space and can be mounted in any panel on the network. Most system Control/Display modules can be mounted in front of the Modcom series module. Power for the Modcom is supplied by the system power supply.

The Modcom provides an enhanced level of survivability in the event of a network CPU failure by notifying the Central Monitoring Station of the failure and entering a degraded mode of operation. In degraded mode, the Modcom can transmit a default fire alarm message during a fire alarm condition.

## Standard Features

- Listed for fire and security
- V.32bis 14.4K full duplex modem
- Digital alarm communicator transmitter supporting: SIA DCS protocol, Contact ID protocol, 3/1 and 4/2 pulse format protocol
- Supports "tap" alphanumeric pager protocol
- Fully programmable messages
- Alarm override of upload/download
- Two phone line capability
- Field upgradable firmware
- Split and multiple reporting to as many as 80 different receivers
- 255 subscriber accounts
- Supports control/display modules
- Supervised by the network controller
- Supports Cellular communications

## Application

Two versions of the Modcom are available:

**3-MODCOM** - Has an internal V.32bis 14.4K baud full duplex modem. The modem permits upload and download of system data remotely via a telephone line. In addition, the 3-MODCOM has a Digital Alarm Communications Transmitter (DACT) or dialer function that transmits network status information to Central Monitoring Stations (CMS) via telephone. Four DACT protocols are available:

1. Digital Communicator Standard (DCS) “SIA format” Dialer – 300 baud format, which transmits alphanumeric system status data to the CMS;
2. Contact ID;
3. SIA 3/1 dialer; and,
4. SIA 4/2 dialer.

Note: SIA 3/1 and SIA 4/2 are not supported when 3-MODCOM series is used with EST4.

Alarm code content is determined by system rules.

**3-MODCOMP** – In addition to all modem and dialer (DACT) functions of the 3-MODCOM, the 3-MODCOMP can dial directly into paging systems using Telelocator Alphanumeric Protocol (TAP). Alphanumeric system data can be sent to a single pager or group(s) of pagers. Some pager services can forward messages via e-mail and Fax.

### Multiple Priority

Each Modcom can buffer up to 500 events in its event queue. It reviews all active events in the queue and identifies the highest priority event and dials the associated receiver. When the receiver is contacted, the MODCOM will transmit the highest priority message for that receiver. If the message is successfully received, the MODCOM identifies the next highest priority message and the process repeats.

### Phone Line Friendly

The Modcom series has been designed for installation on the same phone lines with other devices such as phones and faxes. The module makes its first dial out attempt on either of the two phone lines that is not in use. This prevents unnecessary interruption of calls in progress by the line seizure relays. In the event that both lines are busy, the module seizes line one.

A fixed DACT testing time can be set at an off-hour, e.g. 2:00am, again minimizing interruptions and phone line costs. The call time is programmable, and allows testing of the DACT with the central station.

The Modcom series also has the ability to detect Type 1, Type 2 and Type 3 distinctive ringing patterns, permitting it to share its phone lines with other devices and still have a unique phone number for incoming modem calls.

### Multiple Modcoms per Network

Multiple Modcoms can be installed in a single cabinet or located in nodes throughout the network to provide added availability and enhanced redundancy of off premise communications.

### Multiple Receiver Capability

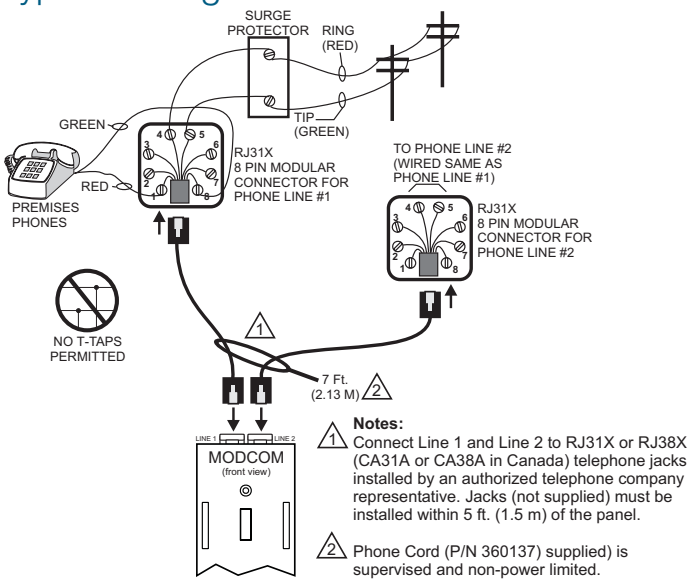
In large system applications, partitioning is supported so that a number of different customers — each using different Central Monitoring Stations and/or paging companies — can use the same Modcom hardware. The Modcom can accommodate up to 255 different accounts using up to 80 different receivers.

The Modcom supports split reporting, a process where the system directs the Modcom to send some events or event types to one receiver, and different events to alternate receivers. The module’s multi-dial reporting capability permits an individual event to be transmitted to multiple receivers, including pagers.

## Engineering Specification

The system shall provided an off premise communications module capable of transmitting system events to multiple Central Monitoring Station (CMS) receivers. The module shall provide the CMS with point identification of system events via 4/2, Contact ID or SIA DCS protocols. <The module shall also be capable of transmitting alphanumeric system activity by event to a commercial paging system using TAP Pager protocol.> The dialer shall have the capability to support up to 255 individual accounts and to send account information to eighty (80) different receivers, each having a primary and secondary telephone access number. System events shall be capable of being directed to one or more receivers depending on event type or location as specified by the system designer. The module shall have a degrade mode capable of transmitting fire alarm signals to the CMS in the event of system CPU failure. The module shall provide a high speed (V.32bis or greater) modem function in order to upload and download system data to/from a remote location.

## Typical Wiring




*For cellular dialer capture module wiring refer to the installation manual received with the cellular capture module.*

## Specifications

| | |
|---|---|
| Installation | Takes up one LRM space in 3-CHAS7 |
| Input Power | 24 Vdc @ 60mA standby, 95 mA active |
| Modem Protocol | ITU - V.32bis 14.4K baud full duplex using standard PC modem compatible data |
| Dialer Protocol [1] | SIA 3/1 (format P2) and 4/2 (format P3): 20 pulses per second, double round Contact ID (DTMF format)<br>Digital Communications Standard (DCS) “SIA format”: Level 2 (300 baud, Bell 103) |
| Pager Protocol (3-MODCOMP only) | Telocator Alphanumeric Protocol (TAP), Version 1.8, 300 baud, Bell 103 |
| Telephone | |
| Dialing | Pulse or Tone (DTMF) |
| Connector | Two 8-position modular phone jacks |
| CMS Telephone Numbers | |
| Quantity | Two per receiver - 160 max. |
| Available Digits | Up to 24 digits per number |
| Receivers | Supports up to 80 individual receivers. |
| Event Buffer | 500 events |
| Operating Environment | 32°F (0°C) to 120°F (49°C), 93% RH Non-condensing |
| Agency Listings, EST4 | UL, FCC Part 68 / CFR 47, ULC. See Note 1 |
| Agency Listings, EST3 | UL, FCC Part 68 / CFR 47, ULC. See Note 1. |

Note 1: SIA 3/1 and SIA 4/2 are not supported when 3-MODCOM series is used with EST4.

**Receivers Tested**

| Format | Manufacturer | Model | Receiver Card |
|---|---|---|---|
| 4/2 and 3/1 | Ademco | 685 | 685-1 or 685-8 |
| | FBI (Fire Burglary Instruments) | CP220 | |
| | Osborne-Hoffman | OH2000 | |
| | Radionics | D6600 | |
| | Silent Knight | 9000 | 9032 |
| | Sur-Gard | MLR2, SG-SLR | |
| | MCDI | TLR, TLR+ | |
| Contact ID | Ademco | 685 | 685-8 |
| | Osborne-Hoffman | OH2000 | |
| | Sur-Gard | MLR2, SG-SLR | |
| | Radionics | D6600 | |
| | Silent Knight | 9000 | 9032 |
| | MCDI | TLR, TLR+ | |
| SIA DCS | Sur-Gard | MLR2, SG-SLR | |

**Note 1:**
EST3 is modularly listed under the following standards:
UL 864 categories: UOJZ, UOXX, UUKL and SYZV, UL 294 category ALVY, UL 609 category AOTX, UL 636 category ANET, UL 1076 category APOU, UL 365 category APAW, UL 1610 category AMCX, UL 1635 category AMCX
ULC-S527, ULC-S301, ULC-S302, ULC-S303, ULC-S306, ULC/ORD-C1076 and ULC/ORD-C693
Please refer to EST3 Installation and Service Manual for complete system requirements.
For EST4, please refer to the EST4 Installation and Service Manual for complete systems requirements and listings.

**Compatible Dialer Capture Modules**
*Telguard TG-7FS* - UL approved Cellular Alarm Communicator for Commercial Fire applications over 3G/4G networks.
*DSC 3G3070* - ULC approved Cellular Alarm Communicator for commercial fire applications.

## Ordering Information

| Catalog Number | Description | Ship Wt. lb (kg) |
|---|---|---|
| 3-MODCOM | Modem/Dialer (DACT) version | 0.5 (0.23) |
| 3-MODCOMP | Modem/Dialer (DACT) w/TAP Pager Protocol | 0.5 (0.23) |
| 4-FIL | Blank EST4 filler plate<br>(order separately when no LED or LED/Switch module is installed on the inner door). | 0.1 (0.05) |
| 3-FP | Filler Plate, order separately when no LED or LED/Switch module installed. | 0.1 (0.05) |

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**Contact us**

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EDWARDS

LIFE SAFETY & INCIDENT MANAGEMENT

# EST4 Remote Annunciators

## 4-xxANN Series




4-2ANN and 4-4ANN shown with optional equipment.

FM APPROVED | NYC FIRE DEPT. COA # 2022-TMCOAP-008086-RENL | CE | UL | ULC | EN54

## Overview

EST4 Remote Annunciators provide front panel system status and control functions located conveniently anywhere on the EST4 network. Annunciators can be as simple as a couple of LED indicator strips, or complex enough to support up to two LCD displays, an audio telephone interface, and hundreds of control points and indicators — all in a single enclosure.

Up to 576 tactile switches and 576 LED indicators may be mounted in a single EST4 annunciator cabinet. Control Display Modules (CDMs), comprise a column of programmable buttons accompanied by one or two LED indicator positions per button. Indicator-only modules hold up to 24 indicators. Switch and indicator module LEDs can be set to any of five colors, providing an additional level of feedback.

All remote annunciators feature color-matched cabinets and distinctive metallic bronze (Pantone Coated PMS# P 171-16 C, Pantone RGB# 81 75 67, and RAL Classic/RAL Design# 7022) doors for a readily-identifiable and consistent look throughout the facility.

Thanks to EST4's ingenious communications protocol, network data — as well as telephone and audio data — is carried on a single fiber optic cable or twisted wire pair. This multi-use capacity has an enormous cost-savings potential compared with conventional audio transmission, reducing not only installation costs, but also simplifying ongoing system maintenance.

Slide-in LED and switch labeling makes it easy to incorporate right into the annunciator design such information aids as descriptive text, color-coding, icons, and local languages. For custom floorplans or facility maps, EST4 offers LED driver boards perfectly suited to operate in most graphic annunciators.

## Standard Features

- **Connection Over High-speed Life Safety Network**
  Annunciator network and audio data carried on a single fiber or twisted pair.
- **Optional Color LCD Display**
  Touch screen capability supplements control buttons for quick, intuitive access to key system status and control functions.
- **Wide Range of Annunciator Configurations**
  From a two-slot model holding a single LCD display to 24-slot cabinets for complex annunciation.
- **Supports Two LCD Displays**
  Providing users with a simplified sequence of operations.
- **Convenient Programming**
  Built-in support for radio groups of up to 24 switches in size.
- **Slide-in Switch and Indicator Labels**
  A simple, effective means to customize annunciator appearance and messaging.
- **Programmable LED Flash Rates and Colors**
  Easy to see, quick to understand.
- **Clean and robust door designs**
- **Support for all Common Networking Media**
  Annunciators connect over any combination of twisted pair wire, Multi-mode fiber, Single Mode fiber, and even CAT5 cable.

## Application

Use EST4 remote annunciators where a compact system status display is needed. Annunciator configuration can range from a couple of LED indicator strips, to complex arrangements supporting in a single enclosure up to two LCD displays, paging microphone, firefighter telephone and hundreds of control points and indicators.

EST4 annunciators support a range of options that make them ideal for Mass Notification, Life Safety and other emergency communications purposes. They can be used as Central Control Stations (CCS), Autonomous Control Units (ACU), Local Operating Console (LOC), and combination units from which initiated Mass Notification functions can be controlled.

Cabinets may be surface or semi-flush mounted for installation expediency and aesthetic appeal.

Annunciators connect over the high-speed EST4 network, which supports copper or fiber-optic communications in any combination. Network data and audio data share the same cabling. This results in more efficient deployment with fewer cables needed and fewer connections to be made.

The 2 wide, 4 wide, and 6 wide, 4-xANNMT series, annunciator wallboxes come standard with surface mounting trims and semi-flush mounting trims.

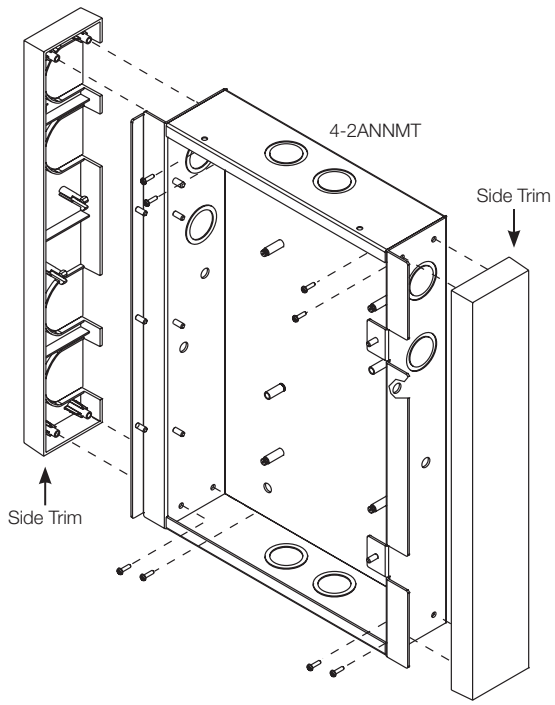
The 8 space, 16 space and 24 space 4-xxANNMT series wallboxes are designed for surface mount applications. Their depth is kept to a minimum to allow the least amount of room penetration. When semi-flush mounting is required, order the standard 3-CAB5B, 7B, or 14B wallbox.

## Engineering Specification

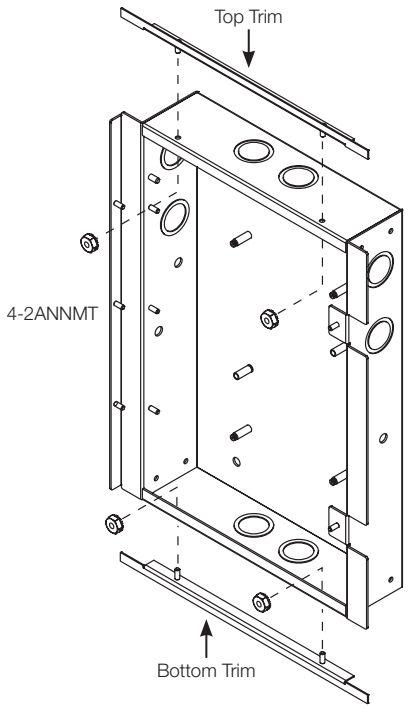
The Life Safety system shall incorporate annunciation of Alarm, Supervisory, Trouble and Monitor operations. Annunciation must be through the use of both LED display strips complete with a means to custom label each LED as to its function. LED color shall be selectable at configuration time. Where applicable control switches must be provided. Switches with LEDs must provide positive feed back to the operator of remote equipment status. A color touchscreen LCD display with basic common control LEDs and switches shall be provided. Optionally a second color touchscreen display may be added to support audio and telephone operations. The Common Control Switches and LEDs provided as minimum will be: Reset switch and LED, Alarm Silence switch and LED, Panel Silence switch and LED, Drill switch and LED. It must be possible to add additional common controls as required through the use of modular display / control units. The LCD must provide the emergency user, hands free viewing of the first highest priority event. System events must automatically be placed in queues. It shall be possible to view specific event types separately. The total number of active events by type must be displayed. It must be possible to customize the designations of all user interface LEDs and switches for local language requirements. It must be possible to route system event messages to specific annunciator locations. It must be possible for the annunciator to contain a paging microphone and fire fighter telephone.

## Installation and Mounting

**4-2ANNMT, 4-4ANNMT, and 4-6ANNMT included side trim installation for surface mount applications**



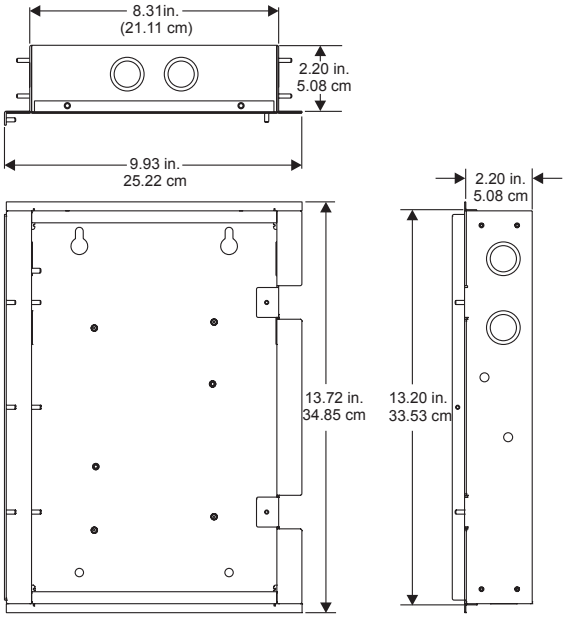

**4-2ANNMT, 4-4ANNMT, and 4-6ANNMT included trim installation for semi-flush mount applications**



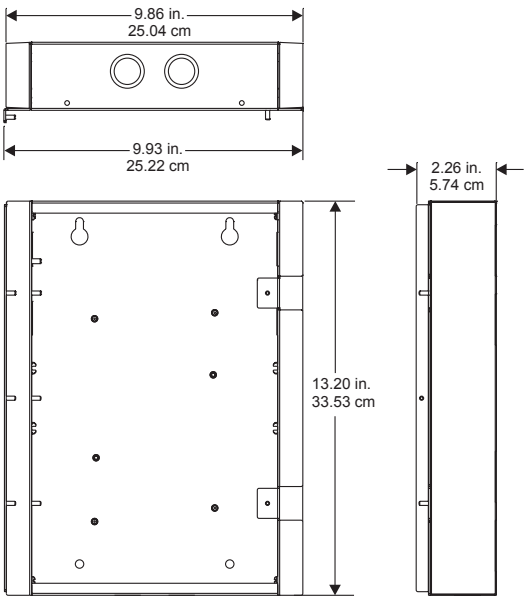

*See Specifications Table for 4-8ANNMT, 4-16ANNMT, 4-24ANNMT mounting options.*

# Dimensions, wallboxes

## 4-2ANNMT Wallbox Assembly, Surface and Semi-flush Mounting (both trims are included)

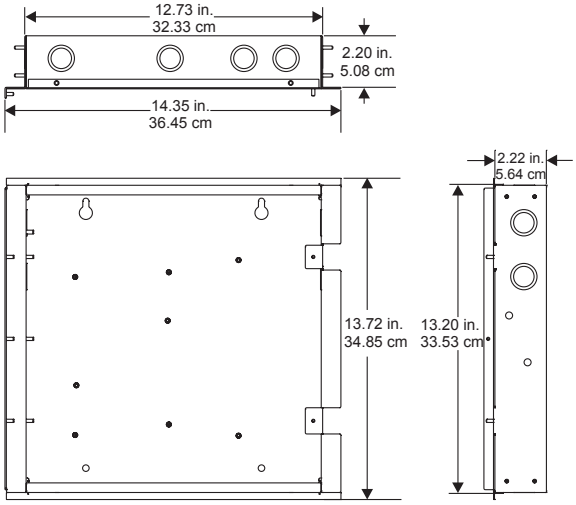



Semi-flush mount (trim installed top and bottom)

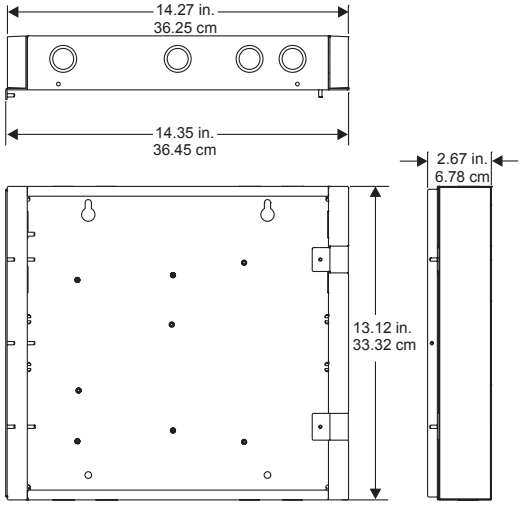



Surface mount (trim installed right and left sides)

## 4-4ANNMT Wallbox Assembly, Surface and Semi-flush Mounting (both trims are included)

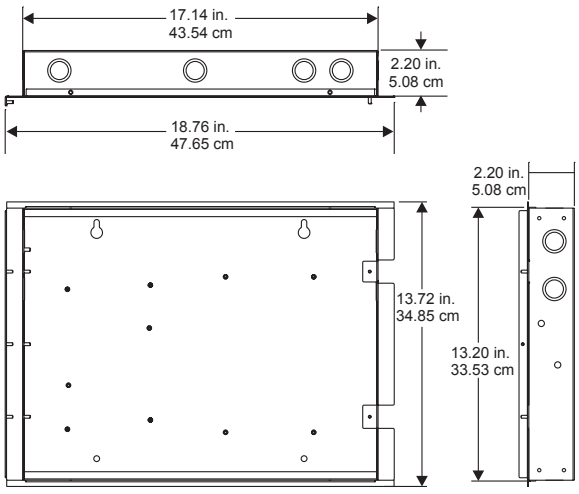



Semi-flush mount (trim installed top and bottom)

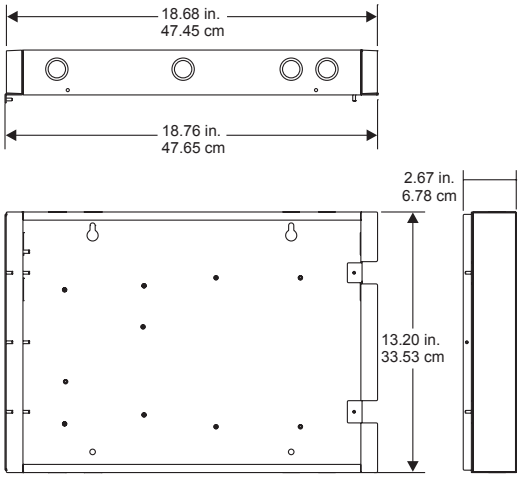



Surface mount (trim installed right and left sides)

## 4-6ANNMT Wallbox Assembly, Surface and Semi-flush Mounting (both trims are included)




Semi-flush mount (trim installed top and bottom)

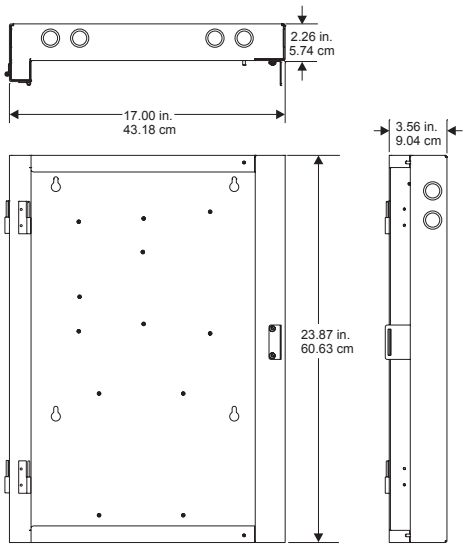



Surface mount (trim installed right and left sides)

# Dimensions, wallboxes

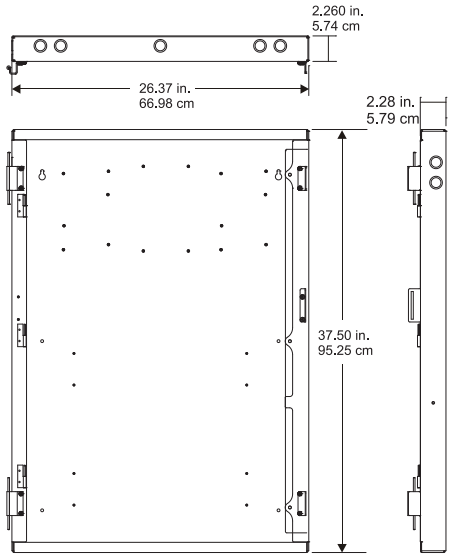
### 4-8ANNMT Wallbox Assembly, Surface Mount

*For semi-flush mounting, use a 3-CAB5B wallbox.*



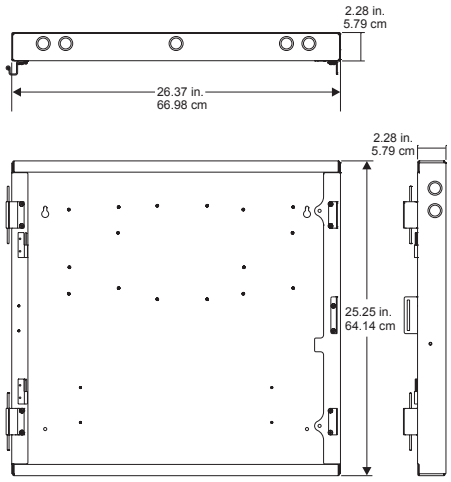

### 4-24ANNMT Wallbox Assembly, Surface Mount

*For semi-flush mounting, use a 3-CAB14B wallbox.*



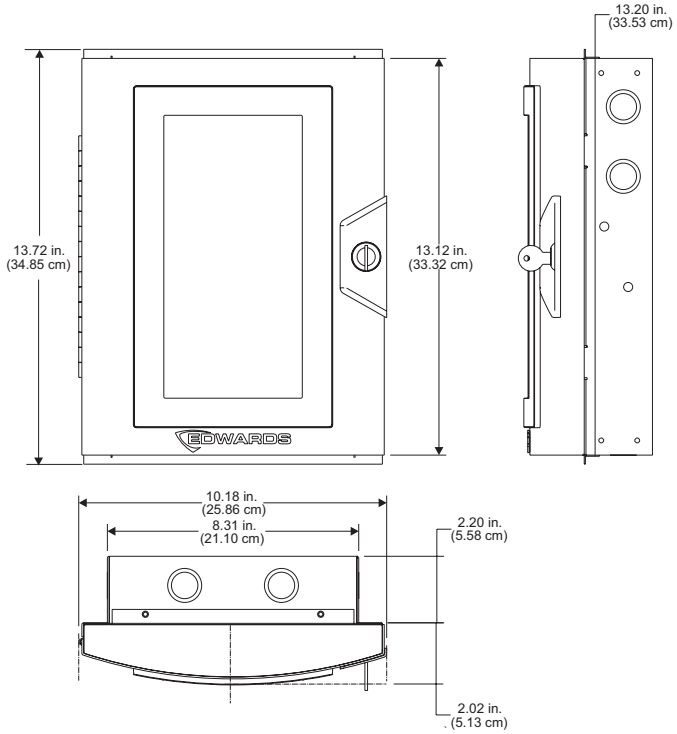

### 4-16ANNMT Wallbox Assembly, Surface Mount

*For semi-flush mounting, use a 3-CAB7B wallbox.*

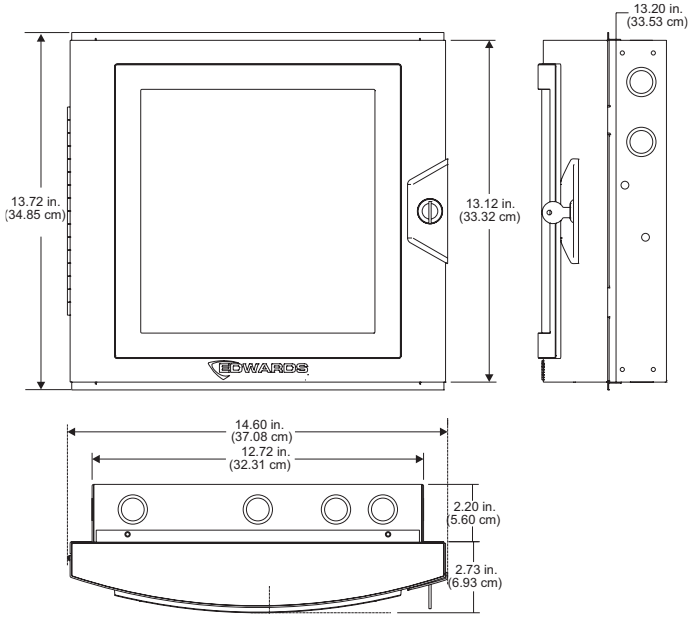



# Dimensions, door assemblies

### 4-2ANN Series Door Assembly

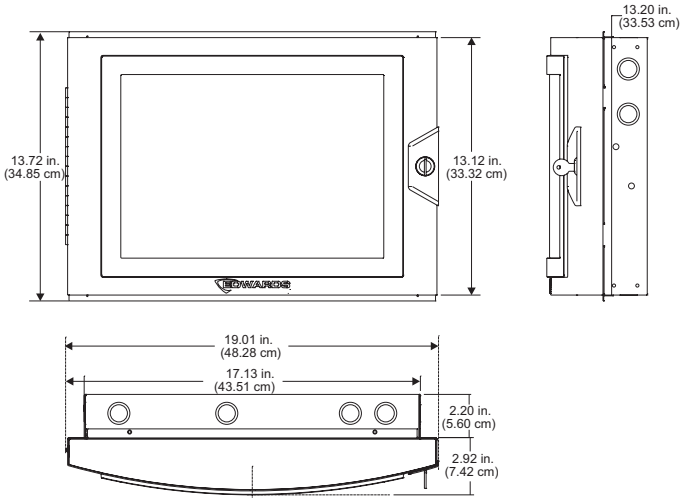



### 4-4ANN Series Door Assembly

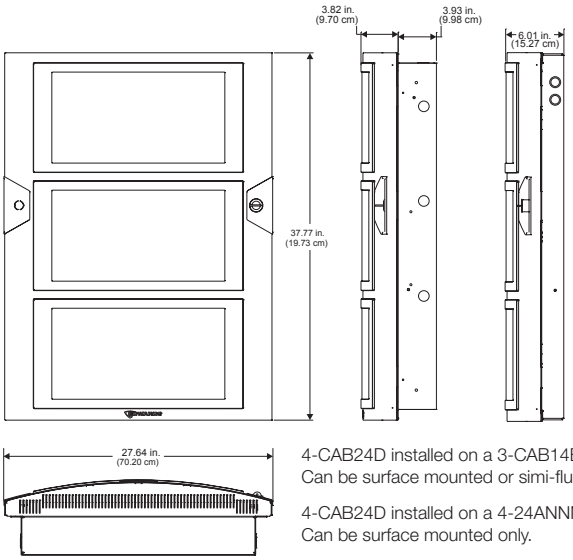


# Dimensions, door assemblies continued

## 4-6ANN Series Door Assembly



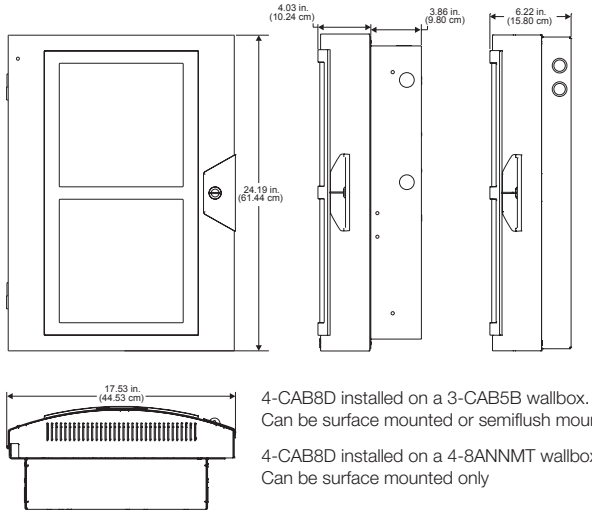

## 4-CAB24D Series Door Assembly




4-CAB24D installed on a 3-CAB14B wallbox.
Can be surface mounted or simi-flush mounted.

4-CAB24D installed on a 4-24ANNMT wallbox.
Can be surface mounted only.

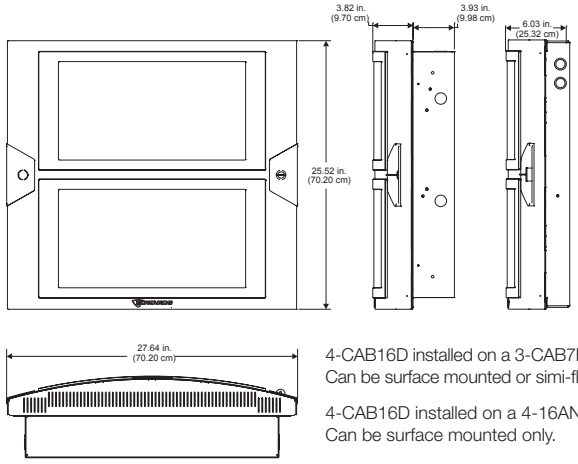
## 4-CAB8D Series Door Assembly




4-CAB8D installed on a 3-CAB5B wallbox.
Can be surface mounted or semiflush mounted.

4-CAB8D installed on a 4-8ANNMT wallbox.
Can be surface mounted only

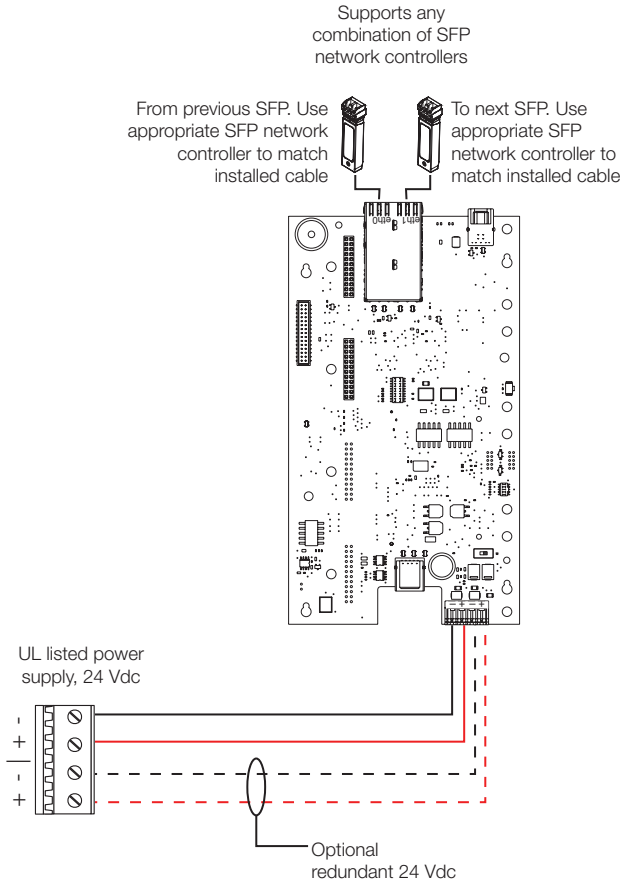
## 4-CAB16D Series Door Assembly




4-CAB16D installed on a 3-CAB7B wallbox.
Can be surface mounted or simi-flush mounted.

4-CAB16D installed on a 4-16ANNMT wallbox.
Can be surface mounted only.

# Wiring



## SFP Network Controllers

| Model # | Description | Network Interconnection Media Supported |
|---|---|---|
| 4-NET-CAT | 100 Mbps SFP Network Controller | Cable type - Cat 5e or better<br>Connector type - RJ-45<br>Distance 328 ft. (100 m) max |
| 4-NET-MM | Multi-mode fiber-optic SFP Network Controller | SFP network media interface, multi-mode fiber-optic, supports 50/125 µ (OM3/OM4) fiber pair up to 1.24 mi. (2 km), 62.5/125 µ (OM1) fiber pair up to 0.62 mi. (1 km), or a 100/140 µ fiber pair up to 150 m. Order one 4-NET-MM for “in” wiring and one for "out" wiring for connections from previous node and to next node as required. Each 4-NET-MM supports one multi-mode fiber pair between network cards. |
| 4-NET-SM | Single-mode fiber-optic SFP Network Controller | Single mode 9/125 µ (G.652) fiber pair up to 6.2 miles (10 km). Order one 4-NET-SM for “in” wiring from the previous node and a second 4-NET-SM for “out” network wiring to the next node. Each 4-NET-SM supports one single-mode fiber pair between network cards |
| 4-NET-SMH | Single-mode fiber-optic SFP Network Controller High output | Single-mode fiber-optic, high-power output, with a 9/125 µ (G.652) fiber pair up to 24.8 mi (40km). Order one 4-NET-SMH for “in” wiring from the previous node and a second 4-NET-SMH for “out” network wiring to the next node. Each 4-NET-SMH supports one single-mode fiber pair between network cards. |
| 4-NET-SMU | Single-mode fiber-optic SFP Network Controller Bi-Directional | Bi-directional, single-mode fiber-optic with a 9/125 µ (G.652) fiber up to 6.2 miles (10 km). The 4-NET-SMU must be paired with a 4-NET-SMD over one single-mode fiber between network cards. |
| 4-NET-SMD | Single-mode fiber-optic SFP Network Controller Bi-Directional | Bi-directional, single-mode fiber-optic with a 9/125 µ (G.652) fiber up to 6.2 miles (10 km). The 4-NET-SMD must be paired with a 4-NET-SMU over one single-mode fiber between network cards. |
| 4-NET-TP | 2 Mbps Twisted Pair SFP Network Controller | Twisted pair. Following specifications are between any two panels.<br>• 16 to 22 AWG (1.3 to 0.33 mm²)<br>• Six twists per foot minimum<br>• Circuit Capacitance 0.09 µF max.<br>• 5,000 ft. (1,524 m) between any two panels<br>• Circuit resistance 90 Ω max. |
| 4-NET-TP-HC | 0.3 Mbps Twisted Pair SFP Network Controller | Twisted pair or Shielded twisted pair. Following specifications are between any two panels.<br>• 16 to 24 AWG (1.3 to 0.20 mm²)<br>• Six twists per foot minimum<br>• 5,000 ft. (1,524 m) between any two nodes with unshielded twisted pair<br>• Circuit capacitance 0.3 µF max.<br>• 3280 ft. (1,000 m) between any two nodes shielded twisted pair<br>• Circuit resistance 90 Ω max.<br>• For UL/ULC applications only |

Refer to Data Sheet E85014-0008 for additional details on SFP network controllers.

## Technical Specifications

**Annunciator Assemblies**

Each annunciator space holds a control-display module. LCD displays, 4-MIC and 4-FT take two spaces.

| | 4-2ANN | 4-4ANN | 4-6ANN | 4-8ANN | 4-16ANN | 4-24ANN |
|---|---|---|---|---|---|---|
| Number of Spaces | Two | Four | Six | Eight | Sixteen | Twenty-four |
| Wallbox, Surface Mounting | 4-2ANNMT | 4-4ANNMT | 4-ANNMT | 4-8ANNMT | 4-16ANNMT | 4-24ANNMT |
| Wallbox, Semi-flush Mounting | | | | 3-CAB5B | 3-CAB7B | 3-CAB14B |
| Agency Approvals: | UL, ULC, FM, CSFM, CE, EN54 and NYC Fire Dept. | | | UL, ULC, FM, CSFM and NYC Fire Dept. | UL, ULC, FM, CSFM, CE, EN54 and NYC Fire Dept. | |
| Door Color | Metallic Bronze (Pantone Coated PMS# P 171-16 C, Pantone RGB# 81 75 67, and RAL Classic/RAL Design# 7022) | | | | | |
| Wallbox Color | Black | | | | | |

**4-ANNCPU Central Processor**

Comes standard with annunciator assemblies.

| | |
|---|---|
| Voltage | 16 to 32Vdc |
| Current draw<br>Standby<br>Alarm/Active | <br>205 mA at 16 VDC; 145 mA at 24 VDC; 125 mA at 32 VDC;<br>205 mA at 16 VDC; 145 mA at 24 VDC; 125 mA at 32 VDC |
| USB support | One USB 3.0, Type A – female port<br>One USB 3.0, Type B – female port |
| SFP support | Supports all 4-NET series SFPs. Refer to EST4 Network Controllers Catalog sheet 85014-0008 for details. |
| Wire Size | TB1 backup power connection 12 to 18 AWG (2.5 to 1.0 mm²) |
| Operating Temperature | 32 to 120°F (0 to 49°C) |
| Operating relative Humidity | 0 to 93% noncondensing |
| Option modules | 4-ANNAUDTEL: Annunciator Audio/Telephone interface module. Adds audio and telephone processing capabilities to the 4-ANNCPU, required for the use of the 4-MIC and/or 4-FT with the 4-ANNCPU. |

# Ordering Information, annunciators and accessories

| Model # (SKU) | Description | Shipping Weight |
|---|---|---|
| 4-2ANN | LCD Annunciator - Comes with 4-LCDANN color touchscreen display, 4-ANNCPU, metallic bronze outer door and black inner door. Order wallbox assembly model 4-2ANNMT and required network Controllers 4-NET-XX separately (see Notes 1 and 4). | 10.3lb (4.67kg) |
| 4-4ANN | Metallic bronze Annunciator supports 4 slots (1 row of 4). Comes with 4-ANNCPU, metallic bronze outer door and black inner door. Order wall Mounting assembly 4-4ANNMT, required network controllers 4-NET-XX series (See Notes 1 and 4), any user interfaces and filler plates separately. | 11.5lb (5.22kg) |
| 4-6ANN | Metallic bronze Annunciator, 6 slots (1 row of 6). Comes with 4-ANNCPU, metallic bronze outer door and black inner door. Order wall Mounting assembly 4-6ANNMT, required network Controllers 4-NET-XX series (see Notes 1 and 4), any user interfaces and required filler plates separately. | 12.5lb (5.67kg) |
| 4-8ANN | Metallic bronze Annunciator, 8 slots (2 rows of 4). Comes with 4-ANNCPU, metallic bronze outer and black inner doors. Order wall Mounting assembly 4-8ANNMT (surface mounting), or 3-CAB5B (Semi-flush mounting) required network Controllers 4-NET-XX series (see Notes 1 and 4), End User interfaces and required filler plates separately. Not approved for EN54 applications. | 24.5lb (11.11kg) |
| 4-16ANN | Metallic bronze Annunciator, 16 slots (2 rows of 8). Comes with 4-ANNCPU, metallic bronze outer and black inner doors. Order wall Mounting assembly 4-16ANNMT (Surface mount) or 3-CAB7B (semi-flush mount), required network Controllers 4-NET-XX series (see Notes 1 and 4), end user interfaces and required filler plates separately. | 37.9lb (17.19kg) |
| 4-24ANN | Metallic bronze Annunciator, 24 slots (3 rows of 8). Comes with 4-ANNCPU, metallic bronze outer and black inner doors. Order wall mounting assembly 4-24ANNMT, required network Controllers 4-NET-XX series (see Notes 1 and 4), and End User interfaces and required filler plates separately. | 52.9lb (24.02kg) |
| **Accessories and Related Equipment** | | |
| 4-LCDANN | Color LCD display, includes silicon rubber common control buttons, mounts in remote annunciators, communicates to 4-ANNCPU. Comes with interconnect cable. LCD ordered separately for mounting in 4-4ANN or 4-6ANN. 4-2ANN comes with one 4-LCDANN. | 1.90lb (0.85kg) |
| 4-LCDLE | Color LCD display, includes silicon rubber common control buttons, mounts in remote annunciators sizes 4-8ANN, 4-16ANN or 4-24ANN, communicates to 4-ANNCPU. Comes with interconnect cable | 1.9lb (0.85kg) |
| 4-LCDAUD TELANN | LCD display for control of paging and fire fighter telephone. Comes with one 4-LCDAUDTEL and mounting and cabling hardware for mounting in 4-16ANNMT or 4-24ANNMT enclosures where separate LCD display of Audio and Telephone is required. Is not supported in other annunciator sizes. Order annunciator application specific equipment separately. | 1.8lb (0.81kg) |
| 4-ANNCPU | Annunciator Central Processor Unit (CPU), provides mounting for up to two network controllers (see Notes 1 and 4), one USB device port, one USB host port and one 4-ANNAUDTEL module. | 1.0lb (0.45kg) |
| 4-24L | Control Display Module with 24 indicators. See Notes 2 and 4. | 0.6lb (0.27kg) |
| 4-24L12S | Control Display Module with 24 indicators and 12 switches. See Notes 2 and 4. | 0.7lb (0.29kg) |
| 4-24L18S | Control Display Module with - 24 indicators and 18 switches See Notes 2 and 4. | 0.7lb (0.29kg) |
| 4-24L24S | Control Display Module with - 24 indicators and 24 switches. See Notes 2 and 4. | 0.7lb (0.29kg) |
| 4-FIL | Fills one indicator/switch space on inner doors when no Switch or LED strips are installed. | 0.1lb (0.04kg) |
| 4-MIC | Audio paging microphone. Requires 4-ANNAUDTEL support card be installed on the 4-ANNCPU card. Can be mounted in 4-4ANN through 4-24ANN annunciators. See Note 4. | 1.2lb (0.54kg) |
| 4-FT | Master Fire Fighters telephone. Requires a 4-ANNAUDTEL support card be installed on the 4-ANNCPU card. Can be mounted in 4-4ANN through 4-24ANN annunciators. | 1.4lb (0.64kg) |
| 4-ANN AUDTEL | Annunciator Audio/Telephone interface module. Adds audio and telephone processing capabilities to the 4-ANNCPU, required for the use of the 4-MIC and/or 4-FT with the 4-ANNCPU. | 0.3lb (0.14kg) |
| 4-CPUGRPH | Graphic Annunciator Central Processor Module. See Notes 3 and 4. | 1.5lb (0.68kg) |
| 3-EVDVR | LED/SWITCH Driver Module Assembly for ENVOY graphics. See Note 3. | 0.4lb (0.18kg) |
| 3-EVDVRA | LED/SWITCH Driver Module Assembly for Third-party Graphics. See Note 3. | 0.7lb (0.32kg) |
| 3-EVPWR | Power Supply Assembly space for one 4-CPUGRPH for ENVOY Graphics. See Note 3. | 0.2lb (0.09kg) |
| 3-EVPWRA | Power Supply Assembly c/w 19 inch rail mounting chassis assembly space for one 4-CPUGRPH for Third-party Graphics. See Note 3. | 2.9lb (1.34kg) |
| 3-EVDVRX | Plastic mounting extrusion 19” mounting - for up to 3 3-EVDVRAs. See Note 3. | 0.9lb (0.41kg) |

Note 1: Refer to Catalog Sheet part number E85014-0008 for a complete list and description of available Network Controllers.
Note 2: Refer to Catalog Sheet part number E85014-0006 for a complete description of Control Display Modules.
Note 3: SKU not FM approved.
Note 4: Add suffix “-E” for EN54 compliant versions.

## Ordering Information, wallboxes and replacement parts

| Model # (SKU) | Description | Shipping Weight |
|---|---|---|
| **Wallboxes** | | |
| 4-2ANNMT | Mounting assembly for 4-2ANN, two wide annunciator. Supports surface or semi-flush mounting. Comes with black wallbox, surface mounting plastic fillers and semi-flush trim. | 6.4lb (2.9kg) |
| 4-4ANNMT | Mounting assembly for 4-4ANN, four wide annunciator. Supports surface or semi-flush mounting. Comes with black wallbox, surface mounting plastic fillers and semi-flush trim. | 9.0lb (4.08kg) |
| 4-6ANNMT | Mounting assembly for 4-6ANN, six wide annunciator. Supports surface or semi-flush mounting. Comes with wallbox, surface mounting plastic fillers and semi-flush trip. | 10.3lb (4.67kg) |
| 4-8ANNMT | Mounting assembly for 4-8ANN, four wide x two row high annunciator. Supports surface mounting. Not approved for EN54 applications. | 19.0lb (8.62kg) |
| 3-CAB5B | Wallbox – Black Semi-flush wallbox, ideal for use when semi-flush mounting 4-8ANN annunciators. Not approved for EN54 applications. | 20.0lb (9.07kg) |
| 4-16ANNMT | Surface Mount Wall box assembly for eight wide by two high annunciators (16 spaces) | 27.0lb(12.25kg) |
| 3-CAB7B | Wallbox – Black Semi-flush wallbox, ideal for use when semi-flush mounting 4-16ANN annunciators. Add suffix "-E" for EN54 compliant versions. | 29.5lb (13.38kg) |
| 4-24ANNMT | Surface mount wallbox assembly for eight wide by three high annunciator (24 spaces). | 37.0lb (16.78kg) |
| 3-CAB14B | Wallbox – Black Semi-flush wallbox, ideal for use when semi-flush mounting 4-24ANN annunciators. | 40.8lb (18.5kg) |
| **Service Replacement Parts** | | |
| 4-2ANND | Service replacement metallic bronze Annunciator Door for 4-2ANN annunciators includes the inner and outer doors. | 7.7lb (3.5kg) |
| 4-2ANND-E | Service replacement metallic bronze Annunciator Door for 4-2ANN annunciators includes the inner and outer doors. For EN54 market only. | |
| 4-4ANND | Service replacement metallic bronze Annunciator Door for 4-4ANN annunciators includes the inner and outer doors. | 10lb (4.5kg) |
| 4-4ANND-E | Service replacement metallic bronze Annunciator Door for 4-2ANN annunciators includes the inner and outer doors. For EN54 market only. | |
| 4-6ANND | Service replacement metallic bronze Annunciator Door for 4-6ANN annunciators, includes the inner and outer door | 11lb (5kg) |
| 4-6ANND-E | Service replacement metallic bronze Annunciator Door for 4-2ANN annunciators includes the inner and outer doors. For EN54 market only. | |
| 4-CAB8D | Service replacement metallic bronze door for 3-CAB5B or 4-8ANNMT - four spaces wide by two high (8 spaces) Includes inner (black) door and outer metallic bronze door. Not approved for EN54 applications. | 23lb (10.4kg) |
| 4-CAB8DR | Red door for 3-CAB5B - four spaces wide by two high (8 spaces). Includes inner (black) door and outer red door. May be used to provide a red door for 4-8ANN annunciators. Not approved for EN54 applications. | 23lb (10.4kg) |
| 4-CAB16DR | Red door for 3-CAB7B - eight spaces wide by two high (16 spaces). Includes inner (black) door and outer red door. May be used to provide a red door for 4-16ANN annunciators. | 36lb (16.3kg) |
| 4-CAB16DR-E | Red door for 3-CAB7B - eight spaces wide by two high (16 spaces). Includes inner (black) door and outer red door. May be used to provide a red door for 4-16ANN annunciators. For EN54 market only. | |
| 4-CAB24DR | Red door for 3-CAB14B - eight spaces wide by three high (24 spaces). Includes inner (black) door and outer red door. May be used to provide a red door for 4-24ANN annunciators | 51lb (23.1kg) |
| 4-CAB24DR-E | Red door for 3-CAB14B - eight spaces wide by three high (24 spaces). Includes inner (black) door and outer red door. May be used to provide a red door for 4-24ANN annunciators. For EN54 market only. | |
| 4-2ANNFA | Service replacement part - plastic frame assembly with mounting screws for 4-2ANN annunciators. Not approved for EN54 application. | 1.5lb (0.68kg) |
| 4-4ANNFA | Service replacement part - plastic frame assembly with mounting screws for 4-4ANN annunciators. | 2lb (0.91kg) |
| 4-6ANNFA | Service replacement part - plastic frame assembly with mounting screws for 4-6ANN annunciators. | 2lb (0.91kg) |
| 4-4X2ANNFA | Service replacement part – plastic frame assembly with mounting screws for 4-8ANN annunciators and 4-CAB5D door assemblies. | 3lb (1.36kg) |
| 4-8ANNFA | Service replacement part - plastic frame assembly with mounting screws for 4-CAB16D and 4-CAB21D(L) door assemblies. | 3lb (1.36kg) |

*Note 1: Unless otherwise specified, all SKUs may be used in EN54/UL/ULC applications*

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LIFE SAFETY & INCIDENT MANAGEMENT

# Auxiliary Power Supplies

## APS6A, APS10A



FM APPROVED

**NYC Fire Dept.**
COA 2022-TMCOAP-005856-RENL

7300-1657:
0229

S3424

## Overview

The Auxiliary Power Supply (APS) is a UL 864, 10th-Edition-listed power supply. It is a 24-Vdc filtered-regulated and supervised unit that can easily be configured to provide additional notification appliance circuits (NACs) or auxiliary power for Mass Notification/ Emergency Communication (MNEC), as well as life safety applications.

The APS contains the circuitry to monitor and charge internal or external batteries. Its steel enclosure has room for up to two 24 ampere-hour batteries. The APS has four Class B (convertible to two Class A) NACs. These can be activated in one or two groups from the APS's unique dual-input circuits. The APS has a door-mounted AC power indicator LED.

The APS also has room for and can power a number of different modules. These can be Signature AA-30 or AA-50 dual-channel audio amplifiers, SIGA-UIO modules and/or SIGA-RELs. An MN-BRKT3F can also be installed. This bracket can accommodate an MN-FNS4C2F3 or MN-FNS8C2F3 Ethernet network switch, an MN-FVPN VoIP module and an MN-COM1S Communications module.

The APS is available in 6.5 or 10 ampere models. Each output circuit has a capacity of three amperes; total current draw cannot exceed the unit's rating.

## Features

- Allows for reliable filtered and regulated power to be installed where needed
- Cost-effective system expansion
- Provides for Genesis and Enhanced Integrity notification appliance synchronization
- Supports coded output operation
- Self-restoring overcurrent protection
- Multiple signal rates
- Can be cascaded or controlled independently
- Easy field configuration
- On-board diagnostic LEDs identify wiring or internal faults
- Standard EDWARDS keyed lockable steel cabinet with removable door
- 110 and 230 Vac models available
- Accommodates 18 to 12 AWG wire sizes
- Optional tamper switch
- Dual-battery charging rates
- Optional earthquake hardening: OSHPD seismic pre-approval for component Importance Factor 1.5

The APS meets current UL requirements and is listed under the following standards:

| Standard (CCN) | Description |
|---|---|
| UL864 10th-Edition (UOXX) | Fire Alarm Systems |
| UL636 (ANET, UEHX7) | Holdup Alarm Units and Systems |
| UL609 (AOTX, AOTX7) | Local Burglar Alarm Units and Systems |
| UL365 (APAW, APAW7) | Police Station Connected Burglar Alarm Units and Systems |
| UL1076 (APOU, APOU7) | Proprietary Burglar Alarm System Units |
| UL1610 (AMCX) | Central Station Alarm Unit |
| ULC-S527 (UOXXC) | Control Units, Fire Alarm (Canada) |
| ULC-S303 (AOTX7) | Local Burglar Alarm Units and Systems (Canada) |
| C22.2 No. 205 | Signaling Equipment (Canada) |

## Application

The APS provides additional power and circuits for notification appliances and other 24 Vdc loads. It is listed for indoor dry locations and can easily be installed where needed.

Fault conditions are indicated on the on-board diagnostic LEDs, opening the BPS input sense circuit and the trouble relay (if programmed). While this provides indication to the host system, the APS can still be activated upon command. A separate AC Fail contact is available on the APS circuit board, which can be programmed for trouble or AC Fail. There are seven on-board diagnostic LEDs: one for each NAC fault, one for battery fault, one for ground fault and one for AC power.

The unique dual-input activation circuits of the APS can be activated by any voltage from 6 to 45 Vdc (filtered-regulated) or 11 to 33 Vdc (full-wave rectified, unfiltered). The first input circuit can be configured to activate 1-4 of the four possible outputs. The second input circuit can be configured to control circuits 3 and 4. When outputs are configured for auxiliary operation, these circuits can be configured to stay on or automatically deactivate 30 seconds after AC power is lost. This feature makes these circuits ideal for door holder applications. The APS also has a separate 200 mA 24 Vdc output that can be used to power internal activation modules.

APS NACs can be configured for a 3-3-3 temporal or continuous output. This makes the APS ideal for applications requiring signaling rates that are not available from the main system.

In addition to the internally generated signal rates, the APS can also be configured to follow the coded signal rate of the main system NACs. This allows for the seamless expansion of existing NACs.

At the top of the steel enclosure, the APS has space and mounting bosses for:

- Up to two SIGA-AA30 or SIGA-AA50 dual-channel audio amplifiers
- One MN-BRKT3F with one MN-FNS4C2F3 or MN-FNS8C2F3 Ethernet switch, one MN-FVPN VoIP module, and one MN-COM1S communication module
- One SIGA-UIO6 or SIGA-UIO6R module motherboard
- Up to two SIGA-UIO2R module motherboards
- Up to two SIGA-REL releasing modules
- Up to two SIGA MP2L mounting plates modules

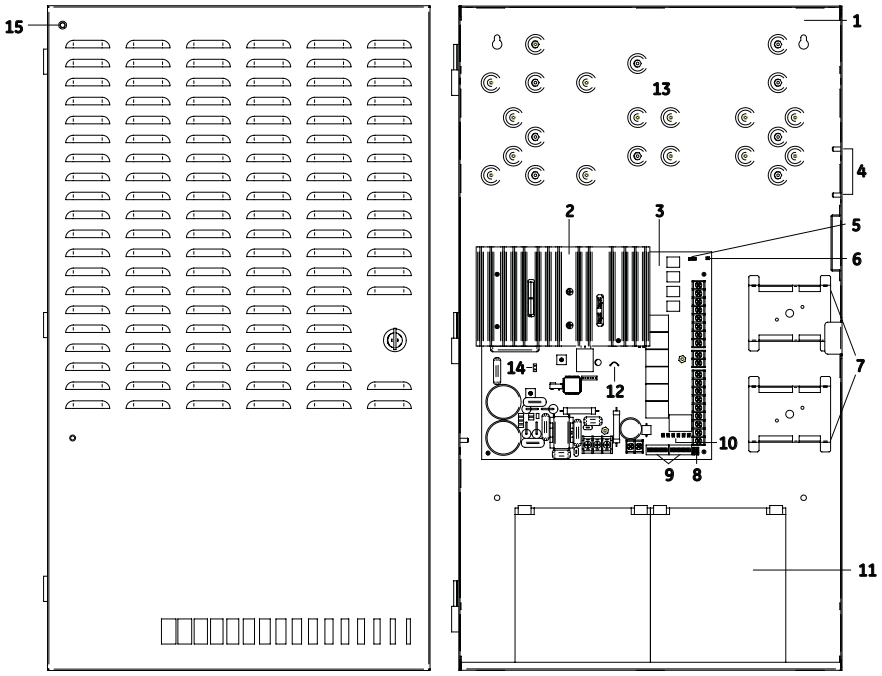
The above devices are in addition to the three factory-installed Signature module mounting brackets to the right of the APS circuit board.

## Engineering Specification

Supply, where needed, EDWARDS APS Series Auxiliary Power Supplies (APS) that are interconnected to and supervised by the main system. The APS shall function as a stand-alone auxiliary power supply with its own fully-supervised battery complement. The APS battery complement shall be sized to match the requirements of the main system. The APS shall be capable of supervising and charging batteries having the capacity of 65 ampere-hours for Mass Notification/Emergency Communication (MNEC), life safety and security applications.

<<The APS shall be capable of installation for a seismic component Importance Factor of 1.5.>>The APS shall provide a minimum of four independent, fully supervised Class B circuits that can be field-configurable for notification appliance circuits or auxiliary 24 Vdc power circuits. APS NACs shall be convertible to a minimum of two Class A NACs. Each APS output circuit shall be rated at 3 amperes at 24 Vdc. Each output circuit shall be provided with automatically restoring overcurrent protection. The APS shall be operable from the main system NAC and/or EDWARDS Signature Series control modules. APS NACs shall be configurable for continuous, 3-3-3 temporal rate. Fault conditions on the APS shall not impede operation of main system NAC. The APS shall be provided with ground fault detection circuitry and a separate AC fail relay.

## Cabinet Layout




**1** Enclosure: Houses the electronics and two standby batteries

**2** Heat sink: Distributes heat away from the circuit board

**3** Circuit board: Provides connections for all circuits

**4** Tamper switch standoffs: 3-TAMP mounting standoffs

**5** Jumper JP3: Ground fault enable or disable option

**6** AC LED: AC power on

**7** Mounting brackets: Option module mounting brackets

**8** Jumpers JP1 and JP2: Class A or Class B NAC option

**9** DIP switches: Two eight-position DIP switches used for configuration

**10** Circuit LEDs: NAC, battery and ground fault trouble LEDs

**11** Batteries: Up to two 12 V 24 Ah batteries fit in the enclosure. For larger batteries, use an external battery cabinet (BC-1 or BC-2).

**12** Jumper JP4: Battery charging jumper

**13** Option module (SIGA-REL, SIGA-UIO6/6R/2, SIGA-MP2L) and MN-BRKT3F mounting area

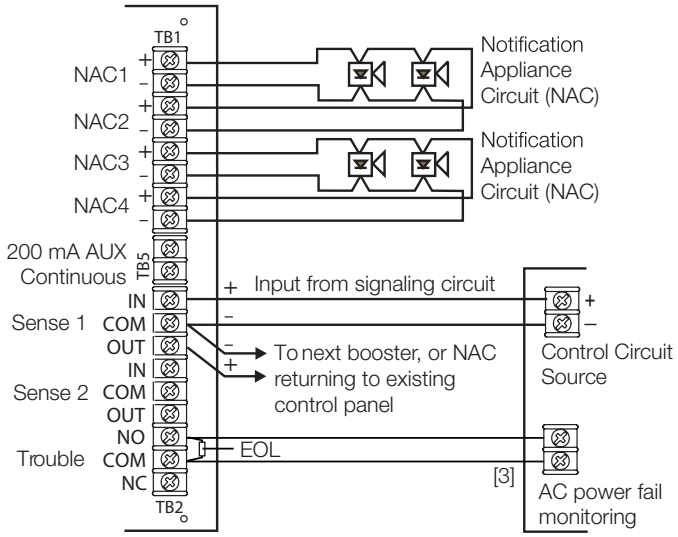
**14** Remote LED wiring harness connection

**15** Remote LED: Indicates AC power is on

# Typical Wiring

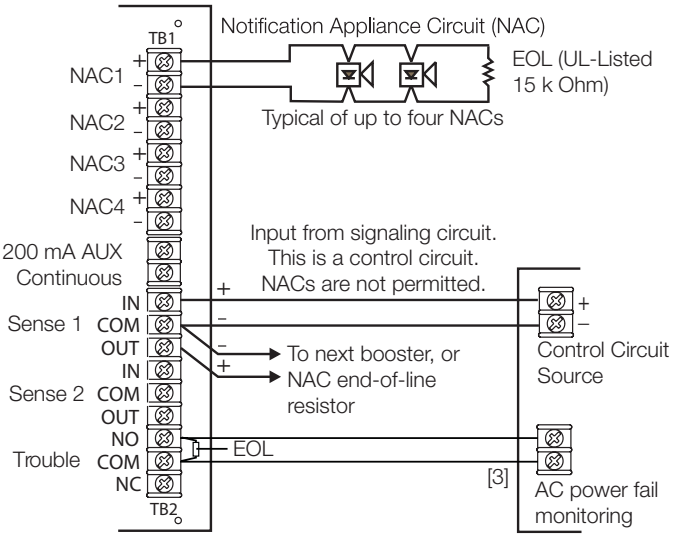
### NAC Class A wiring

Connect one NAC circuit to one NAC output, either NAC1 or NAC3. Terminate the circuit at the NAC2 or NAC4 terminal screw, respectively.




### NAC Class B wiring

Connect a single NAC circuit to one NAC output. Terminate the circuit with a 15 k Ohm EOL resistor.




**NAC wiring notes:**

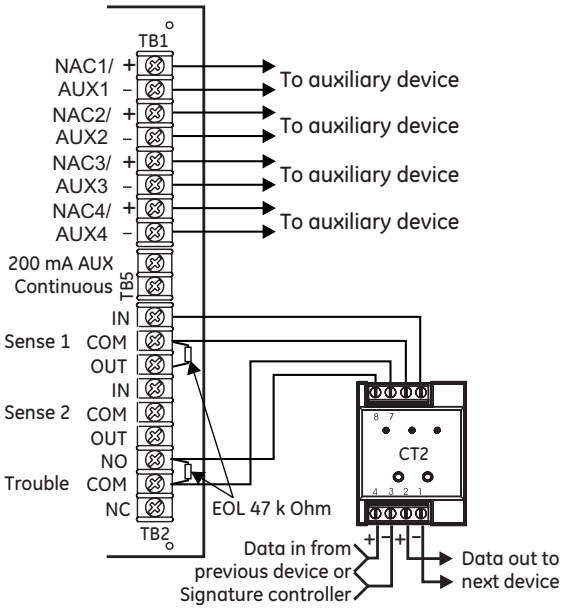
1. A trouble on the APS is sensed on the existing control panel's NAC circuit causing an NAC trouble on that panel. This removes the need to separately monitor the trouble contact except for AC power failure (see [3] below).

   In an alarm condition, the APS allows NAC current to move downstream to devices connected to the existing control panel's NAC circuit.
2. Refer to the connected control panel's documentation for more details on NAC wiring.

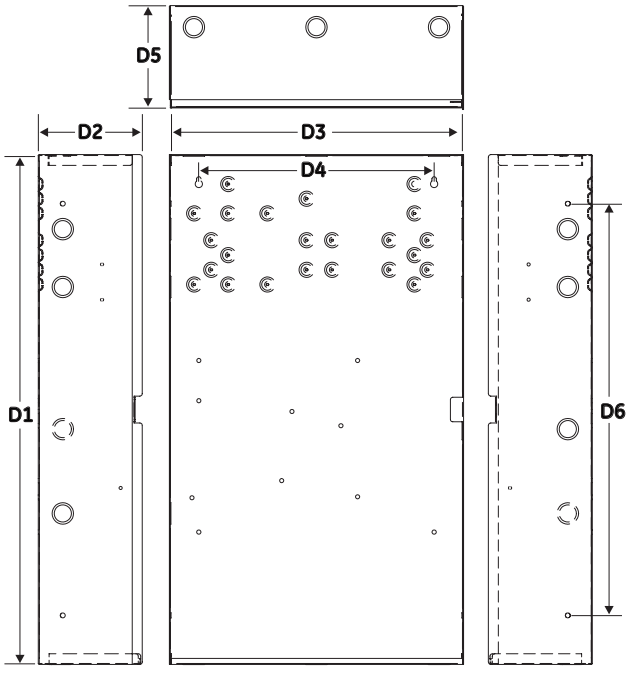
[3] The AC power failure panel connection annunciates at the panel but does not report off-premises for a predetermined time period in U.S. fire applications.

### Trouble relay wiring with four AUX circuits

For providing AUX power only, set DIP switch SW2-6 to OFF, connect the auxiliary device as shown and monitor the trouble relay for immediate signal for all troubles. If AC power loss is required to be monitored separately, set DIP switch SW2-6 to ON, use a SIGA-CT2 module to monitor the Sense 1 trouble contacts for all troubles except AC power loss and the trouble relay for AC power loss after a 30-second delay.




# Dimensions




| D1 | D2 | D3 | D4 | D5 | D6 |
|---|---|---|---|---|---|
| 26.0 in (66 cm) | 5.3 in (13.5 cm) | 15.0 in (38.1 cm) | 12 in (30.5 cm) | 5.3 in (13.5 cm) | 21.0 in (53.3 cm) |

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## Specifications

| Model | 6.5 amp APS | 10 amp APS |
|---|---|---|
| AC Line Voltage | 120VAC or 220-240VAC 50/60Hz<br>390 watts | 120VAC or 220-240VAC 50/60Hz<br>580 watts |
| Sense voltage (input) | 6 to 45 Vdc, 11 to 33 Vrms (FWR and unfiltered DC) | |
| Sense current (input) | 6 mA @ 24 Vdc, 3 mA @ 12 Vdc, 12 mA @ 45 Vdc | |
| Input Current (from an existing NAC) | 3mA @ 12Vdc, 6mA @ 24Vdc | |
| Booster Internal Supervisory Current | 70mA + 35 mA for each circuit set to AUX | |
| Booster Internal Alarm Current | 270mA | |
| NAC/AUX output voltage | 19.1 to 26.85 Vdc | |
| NAC/AUX output current | 3.0 A max. per circuit (10 A or 6.5 A max. total for all NACs)<br>(10 A or 6.5 A max. total for all AUXs) [2] | |
| NAC/AUX class | Class B or Class A | |
| Wire size | 18 to 12 AWG (0.75 to 2.5 sq mm) | |
| NAC EOL | UL: 15 k Ohm (P/N EOL-15)<br>ULC: Use P/N EOL-P1 and select the 15 k Ohm resistor | |
| Auxiliary output (continuous) | 1 dedicated 200 mA auxiliary output, not supervised by APS, included in total current | |
| Common trouble relay | Form C, 1 A, 30 Vdc (resistive) | |
| Battery requirements [1][3] | 6.5 to 65 Ah for fire applications<br>Under 10 Ah, cut JP4. 10 Ah or above, do not cut JP4. | |
| Battery charger current limit | 1.2 A when the battery jumper wire is cut<br>2.1 A when the battery jumper wire is not cut | |
| Operating environment<br>Temperature<br>Humidity | 32 to 120 °F (0 to 49 °C)<br>0 to 93% RH, noncondensing | |
| Ground fault impedance | 10 k Ohm | |
| Intended installation environment | Indoor-dry | |

[1] The maximum battery size the panel can charge is 65 Ah (12V65A or equivalent).
[2] The maximum current is 8 amps for auxiliary circuits that operate when the panel is in standby.
[3] For FM listing, maximum battery size is 24 Ah (12V24A or equivalent).

## Ordering Information

| Catalog Number | Description | Shipping Wt. lb (kg) |
|---|---|---|
| APS6A | 6.5-Amp Auxiliary Power Supply | 26 (11.8) |
| APS6A/230 | 6.5-Amp Auxiliary Power Supply (220V) | |
| APS10A | 10-Amp Auxiliary Power Supply | |
| APS10A/230 | 10-Amp Auxiliary Power Supply (220V) | |

| Related Equipment | | |
|---|---|---|
| 3-TAMP | Tamper switch | 1.0 (0.6) |
| BC-1 | Battery Cabinet (up to 2 - 40 Amp Hour Batteries) | 58 (26.4) |
| MN-BRKT3F | MN-FVP series mounting bracket for APS-(6)(10)A power supplies | |
| BPS-CVR | Electronics Protective Cover | |
| BC-1EQ | Seismic Kit for BC-1. Order BC-1 separately (see note 2) | |
| APSEQ | Seismic Kit for APS6A or APS10 Auxiliary Power Supplies (see note 2) | |
| 12V6A5 | 12 V, 7.2-Amp Hour Battery, two required | 3.4 (1.6) |
| 12V10A | 12 V, 10-Amp Hour Battery, two required | 9.5 (4.3) |
| 12V17A | 12 V, 18-Amp Hour Battery, two required | 13 ( 5.9) |
| 12V24A | 12 V, 24-Amp Hour Battery, two required | 20 (9.07) |
| 12V40A | 40 Ah Sealed Lead Acid Battery, two required (see note 1) | 32 (14.51) |
| 12V50A | 50 Ah Sealed Lead Acid Battery, two required (see note 1) | 40 (18.14) |
| 12V65A | 65 Ah Sealed Lead Acid Battery, two required (see note 1) | 49 (22.23) |

Notes
1. Requires installation of separate battery cabinet.
2. For earthquake anchorage, including detailed mounting weights and center of gravity detail, refer to Seismic Application Guide 3101676. Approval of panel anchorage to site structure may require local AHJ, structural or civil engineer review.

EST™
Life Safety & Communications

# Sealed Lead-Acid Batteries



## Overview

Rechargeable sealed lead-acid batteries are ideal for use as a secondary (standby) power source as defined by NFPA 72. Their low maintenance and high energy density make them ideal for fire alarm signaling applications.

## Standard Features

- Rechargeable
- Non-spillable
- Non-hazardous
- Low maintenance
- High energy density

## Application

When multiple power supplies are provided, each power supply's battery requirements should be calculated individually. Consult the specific system manual to determine battery capacity requirements.

**Safety Information**
Due to a battery's low internal resistance and high power density, high levels of short circuit current can develop across battery terminals. Put on protective eye covering and remove all jewelry before working on batteries. Do not rest tools or cables on the battery, and only use insulated tools. Follow all manufacturers installation instructions and diagrams when installing or maintaining batteries.

EDWARDS
A UTC Fire & Security Company

**Detection & alarm since 1872**

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F +32 2 721 86 13

Latin America
T 305 593 4301
F 305 593 4300

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## Specifications

| | |
|---|---|
| Case Material | ABS Thermoplastic |
| Regulatory Information | DOT Class 60, Batteries, non-hazardous, non-spillable |
| Operating Environment | 32° F to 120° F (0° C to 49° C) 0 to 93% RH, Non-condensing |

## Ordering Information

| Catalog Number | Description | Shipping Weight, lb (kg) |
|---|---|---|
| 12V1A2 | 1.2 Ah Sealed Lead Acid Battery - 12 Vdc | 1.25 (0.57) |
| 12V4A | 4.5 Ah Sealed Lead Acid Battery - 12 Vdc | 5 (2.27) |
| 12V6A5 | 7.2 Ah Sealed Lead Acid Battery - 12 Vdc | 6 (2.72) |
| 6V8A | 8 Ah Sealed Lead Acid Battery - 6 Vdc | 4 (1.81) |
| 6V10A | 12 Ah Sealed Lead Acid Battery - 6 Vdc | 5 (2.27) |
| 12V10A | 11 Ah Sealed Lead Acid Battery - 12 Vdc | 10 (4.45) |
| 12V17A | 18 Ah Sealed Lead Acid Battery - 12 Vdc | 13 (5.90) |
| 12V24A | 26 Ah Sealed Lead Acid Battery - 12 Vdc | 20 (9.07) |
| 12V40A | 40 Ah Sealed Lead Acid Battery - 12 Vdc | 32 (14.51) |
| 12V50A | 50 Ah Sealed Lead Acid Battery - 12 Vdc | 40 (18.14) |
| 12V65A | 65 Ah Sealed Lead Acid Battery - 12 Vdc | 49 (22.23) |

TBD
BATTERY SIZE

LIFE SAFETY & INCIDENT MANAGEMENT

# Intelligent Smoke Detector

## SIGA-OSD



FM APPROVED

7272-1657: 0511

## Overview

The Signature Optica Series SIGA-OSD smoke detector brings advanced optical (photoelectric) technology to a practical design that increases efficiency, saves installation time, cuts costs, and extends life safety and property protection capabilities. Continuous self-diagnostics ensure reliability over the long-haul, while environmental compensation helps reduce maintenance costs.

Like all Signature Optica Series detectors, the SIGA-OSD is an intelligent device that gathers analog information from multiple optical sensors, converting this data into digital signals. Utilizing dual optical wavelengths combined with multiple detection angles, the SIGA-OSD differentiates particles that are not representative of actual smoke. Particle data is input into digital filters which feed a series of ratios removing signal patterns that are typical of nuisance sources, thus reducing unwanted alarms. To make an alarm decision, the detector's on-board microprocessor measures and analyzes all optical sensor readings and compares this information to preprogrammed settings.

## Standard Features

- Multi-criteria optical smoke sensing technology
- Wide 0.5 to 4.36 %/ft. (1.6 to 13.6 %/m) smoke obscuration
- Uses Existing Wiring
- Integrated nuisance rejection reducing unwanted alarms from general cooking particulates
- Listed to UL 268 7th edition
- Automatic Device Mapping
- Up To 250 Total Signature Addresses Per Loop
- Two Levels of Environmental Compensation
- Two Levels of Dirty Detector Warning
- Twenty Pre-Alarm Settings
- Five Sensitivity Settings
- Non-Volatile Memory
- Electronic Addressing
- Automatic Day/Night Sensitivity Adjustment
- Bicolor (Green/Red) Status LED
- Standard, Relay, Fault Isolator, and Audible Mounting Bases
- Sensor Markings Provide Easy Testing Identification

Note: Some features described here may not be supported by all control systems. Check your control panel's Installation and Operation Guide for details.

## Application

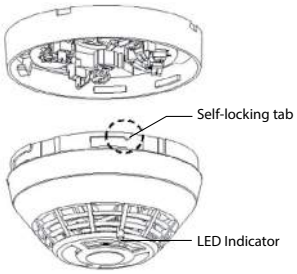
The SIGA-OSD detects particles from a wide range of combustion sources and will trigger an alarm when smoke density in the chamber reaches preprogrammed level. Thanks to its high-performance reflective response technology, the smoke sensor responds quickly and reliably to a wide range of fire types, including both fast and slow burning fires fueled by combustibles typically found in modern multi-use buildings.

## Compatibility

The SIGA-OSD detector is compatible only with control panels using a Signature Loop controller.

## Installation

Signature Series detectors mount to North American 1-gang boxes, 3-1/2 inch or 4 inch octagon boxes, and to 4 inch square electrical boxes 1-1/2 inches (38 mm) deep. They mount to European BESA and 1-gang boxes with 60.3 mm fixing centers. See mounting base installation and wiring for more information.




## Sensing and reporting technology

The microprocessor in each detector provides additional benefits – Self-diagnostics and History Log, Automatic Device Mapping, and Fast, Stable Communication.

Self-diagnostics and History Log - Each Signature Series detector constantly runs self-checks to provide important maintenance information. The results of the self-check are automatically updated and permanently stored in the detector's non-volatile memory

Automatic Device Mapping - The loop controller learns where each device's serial number address is installed relative to other devices on the circuit. The mapping feature provides supervision of each device's installed location to prevent a detector from being reinstalled (after cleaning, etc.) in a different location from where it was originally.

Fast Stable Communication - On-board intelligence means less information needs to be sent between the detector and the loop controller. Other than regular supervisory polling response, the detector only needs to communicate with the loop controller when it has something new to report.

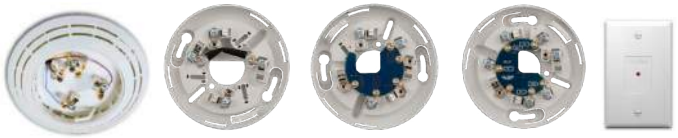
## Testing & Maintenance

Each detector automatically identifies when it is dirty or defective and causes a "dirty detector" message. The detector's sensitivity measurement can also be transmitted to the loop controller. A sensitivity report may be printed to satisfy NFPA sensitivity measurements, which must be conducted at the end of the first year and every two years thereafter.

The user-friendly maintenance program shows the current state of each detector and other pertinent messages. Single detectors may be turned off temporarily from the control panel. Availability of maintenance features is dependent on the fire alarm system used.

## Accessories

Detector mounting bases have wiring terminals that are accessible from the "room-side" after mounting the base to the electrical box. The bases mount to North American 1-gang boxes and to 3½ inch or 4 inch octagon boxes, 1½ inches (38 mm) deep. They also mount to European BESA and 1-gang boxes with 60.3 mm fixing centers. The SIGA-SB4, SIGA-RB4, and SIGA-IB4 mount to North American 4 inch sq. electrical boxes in addition to the above boxes. They include the SIGA-TS4 Trim Skirt, which is used to cover the "mounting ears" on the base. The SIGA-AB4G mounts to a 4 inch square box only.



SIGA-AB4G/T/LF Audible Base | SIGA-SB Standard Base | SIGA-IB Isolator Base | SIGA-RB Relay Base | SIGA-LED Remote LED

Remote LED SIGA-LED - The remote LED connects to the SIGA-SB or SIGA-SB4 Standard Base only. It features a North American size 1-gang plastic faceplate with a white finish and red alarm LED.

SIGA-TS4 Trim Skirt - Supplied with 4 inch bases, it can also be ordered separately to use with the other bases to help hide surface imperfections not covered by the smaller bases.

Sounder Bases - Signature Series sounder bases are designed for use where localized or group alarm signaling is required.

- SIGA-AB4G bases provide sounder capability to Signature Series to heat and smoke detectors. They are not intended for use with combination carbon monoxide detectors in Fire-plus-CO mode.
- SIGA-AB4GT bases provide sounder capability to Signature Series smoke and heat detectors, as well as carbon monoxide detectors when used with a SIGA-TCDR Temporal Pattern Generator.
- SIGA-AB4G-LF bases provide 520 Hz low frequency sounder capability to Signature Series smoke and heat detectors, as well as carbon monoxide detectors when used with a SIGA-TCDR Temporal Pattern Generator. The SIGA-AB4G-LF is suitable for applications requiring low frequency audible tones.

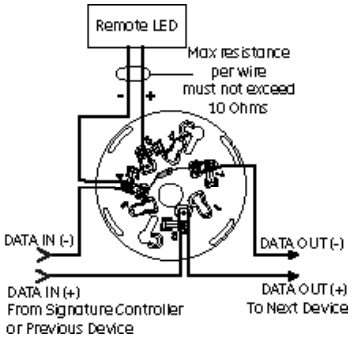
# Typical Wiring

The detector mounting bases accept #18 AWG (0.75mm²), #16 (1.0mm²), #14 AWG (1.5mm²), and #12 AWG (2.5mm²) wire sizes. Sizes #16 AWG (1.0mm²) and #18 AWG (0.75mm²) are preferred for ease of installation.

## Standard Detector Base, SIGA-SB, SIGA-SB4

This is the basic mounting base for EDWARDS Signature Series detectors. The SIGA-LED Remote LED is supported by this Base.

| Term | Description |
|---|---|
| 1 | Not Used |
| 2 | DATA IN/OUT (+) |
| 3 | Not Used |
| 4 | DATA IN (-) |
| 4 | Remote LED (-) |
| 5 | Remote LED (+) |
| 6 | Not Used |
| 7 | DATA OUT (-) |



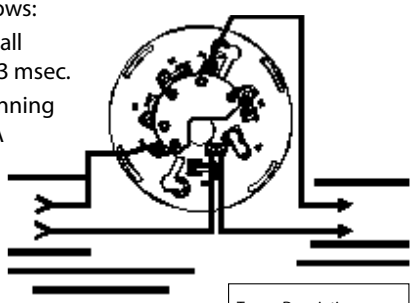

## Isolator Detector Base, SIGA-IB, SIGA-IB4

This base includes a built-in line fault isolator for use on Class A circuits. A detector must be installed for it to operate. The isolator base does not support the SIGA-LED Remote LED.

The isolator operates as follows:

- a short on the line causes all isolators to open within 23 msec.
- at 10 msec intervals,beginning on one side of the Class A circuit nearest the loop controller, the isolators close to provide the next isolator down the line with power.
- when the isolator next to the short closes, it reopens within 10 msec.

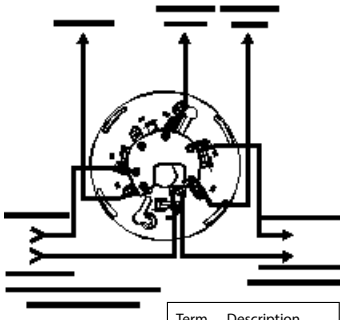
The process repeats beginning on the other side of the loop controller.



| Term | Description |
|---|---|
| 1 | Not Used |
| 2 | DATA IN/OUT (+) |
| 3 | DATA IN (-) |
| 4 | Not Used |
| 5 | Not Used |
| 6 | DATA OUT (-) |
| 7 | Not Used |

## Relay Detector Base, SIGA-RB, SIGA-RB4

This base includes a relay. Normally Open or Normally Closed operation is selected during installation. The dry contact is rated for 1 amp (pilot duty) @ 30 Vdc. The relay's position is supervised to avoid accidentally jarring it out of position. The SIGA-RB can be operated as a control relay if programmed to do so at the control panel. The relay base does not support the SIGA-LED Remote LED.

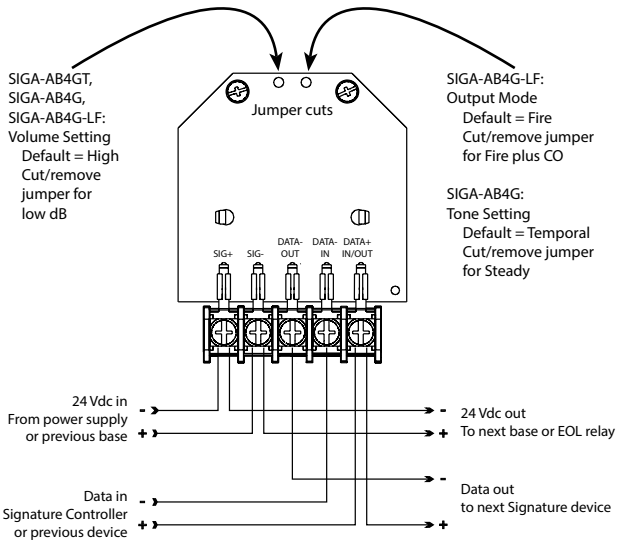


CONTACT RATING
1.0 Amp @ 30 VDC
(Pilot Duty)

| Term | Description |
|---|---|
| 1 | Normally Open |
| 2 | DATA IN/OUT (+) |
| 3 | Common |
| 4 | DATA IN (-) |
| 5 | Not Used |
| 6 | Normally-Closed |
| 7 | DATA OUT (-) |

## Audible Sounder Bases, Fire Mode

AB4GT, AB4G, AB4G-LF sounder bases




# Warnings & Cautions

- This detector does not operate without electrical power. As fires frequently cause power interruption, discuss further safeguards with the local fire protection specialist.
- This detector does not sense fires in areas where smoke cannot reach the detector. Smoke from fires in walls, roofs, or on the opposite side of closed doors may not reach the detector.
- In Canada, install according to CAN/ULC-S524 Standard for the Installation of Fire Alarm Systems, CSA C22.1 Canadian Electrical Code, and the local authority having jurisdiction.

LIFE SAFETY & INCIDENT MANAGEMENT

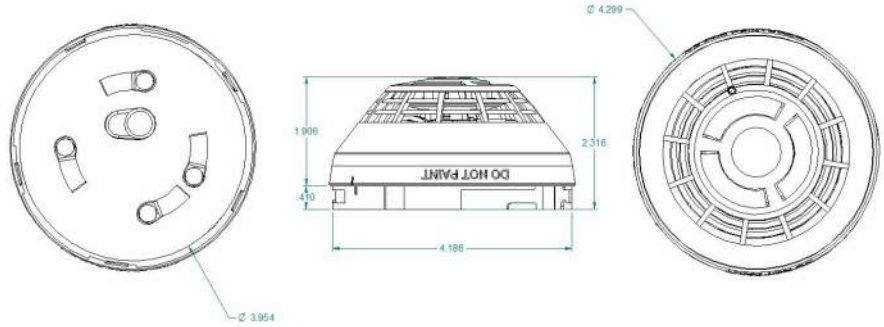
Contact us

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Website: edwardsfiresafety.com

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## Dimensions




## Specifications

| | |
|---|---|
| Operating voltage | 15.20 to 19.95 VDC |
| Normal operating current | 32 µA |
| Alarm current | 45 µA |
| Smoke Sensitivity Range | UL/ULC: 0.5 to 4.36 %/ft. (1.6 to 13.6 %/m) obscuration |
| Vibration level | 10 to 35 Hz, with an amplitude of 0.01 in. |
| Air velocity | 0 to 4,000 ft./min (0 to 20 m/s) |
| Wall mounting | 12 in. (305 mm) max. from ceiling |
| Compatible bases | See Ordering Information |
| Compatible detector testers | Testifire 1000, Testifire 2000 |
| Operating environment | 32 to 120°F (0 to 49°C), 0 to 93% RH, noncondensing |
| Construction | High Impact Engineering Polymer, White |
| Storage temperature | -4 to 140°F (-20 to 60°C) |
| Environmental compensation | Automatic |
| Agency Listings | CAN/ULC-S529, UL 268-7, UL 268A, CSFM |

## Ordering Information

| Catalog Number | Description | Ship Wt. lbs (kg) |
|---|---|---|
| SIGA-OSD | Intelligent Optical Smoke Detector | 0.4 (0.16) |
| **Accessories** | | |
| SIGA-SB | Detector Mounting Base - Standard | 0.2 (.09) |
| SIGA-SB4 | 4-inch Detector Mounting Base c/w Trim Skirt | |
| SIGA-RB | Detector Mounting Base w/Relay | |
| SIGA-RB4 | 4-inch Detector Mounting Base w/Relay, c/w Trim Skirt | |
| SIGA-IB | Detector Mounting Base w/Fault Isolator | |
| SIGA-IB4 | 4-inch Detector Mounting Base w/ Fault Isolator, c/w Trim Skirt | |
| SIGA-LED | Remote Alarm LED (not for EN54 applications) | |
| SIGA-AB4G | Audible (Sounder) Base for Fire Detectors | 0.3 (0.15) |
| SIGA-AB4G-LF | Low Frequency Audible (Sounder) Base for CO and/or Fire Detectors | 0.3 (0.15) |
| SIGA-AB4GT | Audible (Sounder) Base for CO and/or Fire Detectors | 0.3 (0.15) |
| SIGA-TS4 | Trim Skirt (supplied with 4-inch bases) | 0.1 (0.04) |
| SIGA-TS | Trim Skirt - (optional for non 4-inch bases) | 0.1 (0.04) |
| SIGA-DMP | Detector Mounting Plate | 3.0 (1.4) |
| SIGA-RTA | Detector Removal Tool | |
| SIGA-VA | Detector Cleaning Tool | |

LIFE SAFETY & INCIDENT MANAGEMENT

# Intelligent CO Detector

## SIGA-COD



S853

## Overview

The Signature Series SIGA-COD carbon monixide detector brings advanced sensing technology to a practical design that increases efficiency, saves installation time, cuts costs, and extends life safety capabilities. Continuous self-diagnostics ensures reliability over the long-haul, while advanced electrochemical CO sensing technology provides performance benefits that keep occupants safe from carbon monoxide, the “silent killer”.

Like all Signature Series detectors, the SIGA-COD is an intelligent device that gathers analog information from its CO sensor, converting this data into digital signals. To make an alarm decision, the detector’s on-board microprocessor measures and analyzes sensor readings over time. Digital filters remove signal patterns that are not typical of life safety events, thus virtually eliminating unwanted alarms.

The SIGA-COD includes an advanced carbon monoxide sensor. When the electrochemical cell reaches its end of life after approximately ten years, the detector signals a trouble condition to the control panel. Refer to the control panel documentation for specific end of life timing.

## Standard Features

***Note:*** *Some features described here may not be supported by all control systems. Check your control panel’s Installation and Operation Guide for details.*

- Next Generation CO Sensing Technology
- Advanced electrochemical carbon monoxide sensing technology
- Uses existing wiring
- Automatic device mapping
- Sensor Markings Provide Easy Testing Identification
- Up To 250 Total Signature Adresses Per Loop
- Non-volatile memory
- Electronic addressing
- Automatic day/night sensitivity adjustment
- Bicolor (green/red) status LED
- Standard, relay, fault isolator, and audible mounting bases

## Application

CO detection has rapidly become a standard part of life safety strategies everywhere. Monitored CO detection is mandated with increasing frequency in all types of commercial applications, but particularly in occupancies such as hotels, rooming houses, dormitories, day care facilities, schools, hospitals, assisted living facilities, and nursing homes. In fact, more than half of the U.S. population already lives in states requiring the installation of CO detectors in some commercial occupancies. This is because carbon monoxide is the leading cause of accidental poisoning deaths in America. Known as the "Silent Killer," CO is odorless, tasteless, and colorless. It claims nearly 500 lives, and results in more than 15,000 hospital visits annually.

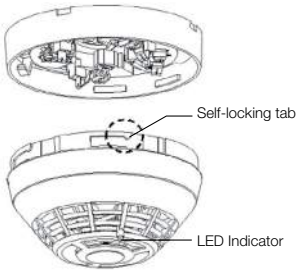
| Concentration | Symptoms | Duration of Exposure |
|---|---|---|
| 35PPM | None | <=8 hours |
| 150PPM | Mild Headache | 2 – 3 hours |
| 400PPM | Headache/Nausea | 1 – 2 hours |
| 800 PPM | Headache/nausea/dizziness/ Progressing to unconscious | 45 min. to 2 hours |
| 6,400 PPM | Headache/nausea & dizziness | 1 – 2 min. |
| 12,800 PPM | Immediately dangerous to life or health | |

## Compatibility

The SIGA-COD detector is compatible only with the Signature Loop Controller.

## Installation

Signature Series detectors mount to North American 1-gang boxes, 3-1/2 inch or 4 inch octagon boxes, and to 4 inch square electrical boxes 1-1/2 inches (38 mm) deep. They mount to European BESA and 1-gang boxes with 60.3 mm fixing centers. See mounting base installation and wiring for more information.




## Testing & Maintenance

The user-friendly maintenance program shows the current state of each detector and other pertinent messages. Single detectors may be turned off temporarily from the control panel. Availability of maintenance features is dependent on the fire alarm system used. When the CO sensor's electrochemical cell reaches its end of life, the detector signals a Trouble condition to the control panel. Scheduled maintenance (regular or selected) for proper detector operation should be planned to meet the requirements of the Authority Having Jurisdiction (AHJ). Refer to current NFPA 72, NFPA 720, and ULC CAN/ULC 536 standards.

### Sensor Life

The CO sensor has a 10-year life from the date of manufacture or when the control panel indicates a sensor end-of-life condition, whichever comes first. The detector signals a "COMMON TRBL ACT" condition on the control panel when the CO sensor reaches its end of life. Pressing the Details button on the control panel displays "END OF LIFE ACT" providing verification that it is an end-of-life trouble of the CO sensor. This trouble remains active until the detector is replaced, even if the panel is reset.

## Sensing and reporting technology

The microprocessor in each detector provides additional benefits - Self-diagnostics and History Log, Automatic Device Mapping, and Fast, Stable Communication.

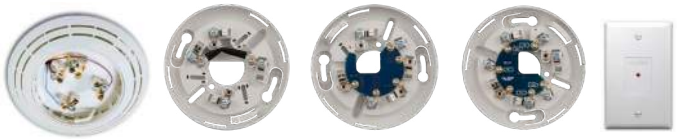
**Self-diagnostics and History Log** - Each Signature Series detector constantly runs self-checks to provide important maintenance information. The results of the self-check are automatically updated and permanently stored in the detector's non-volatile memory.

**Automatic Device Mapping** - The loop controller learns where each device's serial number address is installed relative to other devices on the circuit. The mapping feature provides supervision of each device's installed location to prevent a detector from being reinstalled (after cleaning etc.) in a different location from where it was originally.

**Fast Stable Communication** - On-board intelligence means less information needs to be sent between the detector and the loop controller. Other than regular supervisory polling response, the detector only needs to communicate with the loop controller when it has something new to report.

## Accessories

**Detector mounting bases** have wiring terminals that are accessible from the "room-side" after mounting the base to the electrical box. The bases mount to North American 1-gang boxes and to 3½ inch or 4 inch octagon boxes, 1½ inches (38 mm) deep. They also mount to European BESA and 1-gang boxes with 60.3 mm fixing centers. The SIGA-SB4, SIGA-RB4, and SIGA-IB4 mount to North American 4 inch sq. electrical boxes in addition to the above boxes. They include the SIGA-TS4 Trim Skirt, which is used to cover the "mounting ears" on the base. The SIGA-AB4G mounts to a 4 inch square box only.



**SIGA-AB4G/T/LF** Audible Base | **SIGA-SB** Standard Base | **SIGA-IB** Isolator Base | **SIGA-RB** Relay Base | **SIGA-LED** Remote LED

**Remote LED SIGA-LED** - The remote LED connects to the SIGA-SB or SIGA-SB4 Standard Base only. It features a North American size 1-gang plastic faceplate with a white finish and red alarm LED.

**SIGA-TS4 Trim Skirt** - Supplied with 4 inch bases, it can also be ordered separately to use with the other bases to help hide surface imperfections not covered by the smaller bases.

**Sounder Bases** - Signature Series sounder bases are designed for use where localized or group alarm signaling is required.

- **SIGA-AB4GT** bases provide sounder capability to the SIGA-COD when used with a SIGA-TCDR Temporal Pattern Generator to produce the appropriate CO (TC4) tone pattern.
- **SIGA-AB4G-LF** bases provide 520 Hz low frequency sounder capability to the SIGA-COD when used with a SIGA-TCDR Temporal Pattern Generator to produce the appropriate CO (TC4) tone pattern. The SIGA-AB4G-LF is suitable for applications requiring low frequency audible tones.

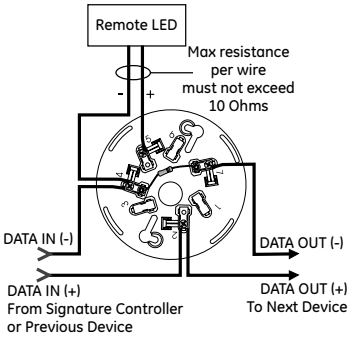
# Typical Wiring

The detector mounting bases accept #18 AWG (0.75mm²), #16 (1.0mm²), #14 AWG (1.5mm²), and #12 AWG (2.5mm²) wire sizes. Sizes #16 AWG (1.0mm²) and #18 AWG (0.75mm²) are preferred for ease of installation.

## Standard Detector Base, SIGA-SB, SIGA-SB4

This is the basic mounting base for EDWARDS Signature Series detectors. The SIGA-LED Remote LED is supported by this Base.

| Term | Description |
|---|---|
| 1 | Not Used |
| 2 | DATA IN/OUT (+) |
| 3 | Not Used |
| 4 | DATA IN (-) |
| 4 | Remote LED (-) |
| 5 | Remote LED (+) |
| 6 | Not Used |
| 7 | DATA OUT (-) |



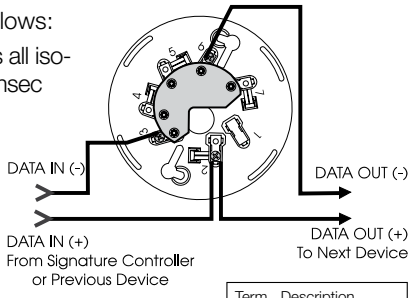

## Isolator Detector Base, SIGA-IB, SIGA-IB4

This base includes a built-in line fault isolator for use on Class A circuits. A detector must be installed for it to operate. The isolator base does not support the SIGA-LED Remote LED.

The isolator operates as follows:

- a short on the line causes all isolators to open within 23 msec
- at 10 msec intervals, beginning on one side of the Class A circuit nearest the loop controller, the isolators close to provide the next isolator down the line with power
- when the isolator next to the short closes, it reopens within 10 msec.

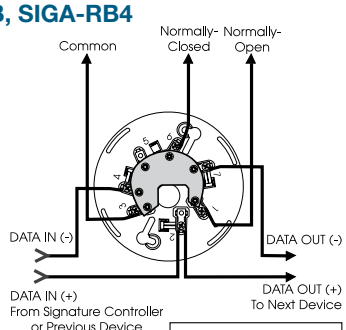
The process repeats beginning on the other side of the loop controller.




| Term | Description |
|---|---|
| 1 | Not Used |
| 2 | DATA IN/OUT (+) |
| 3 | DATA IN (-) |
| 4 | Not Used |
| 5 | Not Used |
| 6 | DATA OUT (-) |
| 7 | Not Used |

## Relay Detector Base, SIGA-RB, SIGA-RB4

This base includes a relay. Normally Open or Normally Closed operation is selected during installation. The dry contact is rated for 1 amp (pilot duty) @ 30 Vdc. The relay's position is supervised to avoid accidentally jarring it out of position. The SIGA-RB can be operated as a control relay if programmed to do so at the control panel. The relay base does not support the SIGA-LED Remote LED.




CONTACT RATING
1.0 Amp @ 30 VDC
(Pilot Duty)

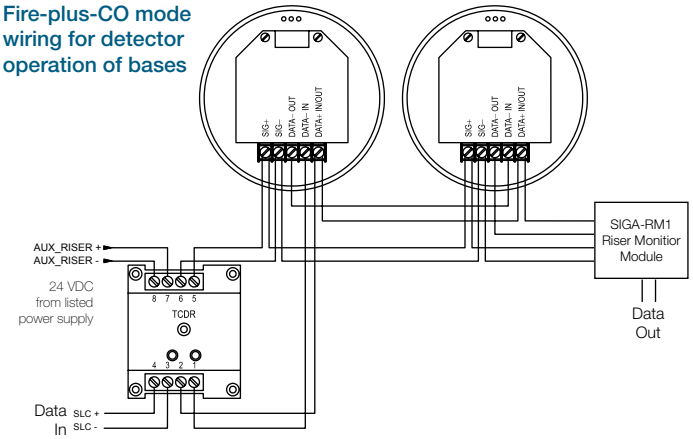
| Term | Description |
|---|---|
| 1 | Normally Open |
| 2 | DATA IN/OUT (+) |
| 3 | Common |
| 4 | DATA IN (-) |
| 5 | Not Used |
| 6 | Normally-Closed |
| 7 | DATA OUT (-) |

## Audible Sounder Bases, Fire-plus-CO Mode

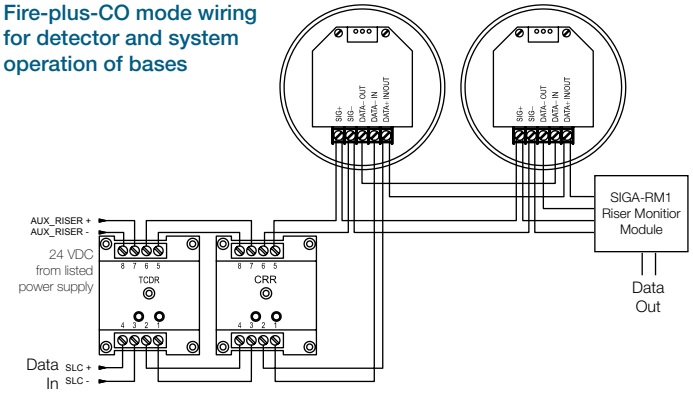
*AB4GT and AB4G-LF sounder bases.*

These configurations require a SIGA-TCDR Temporal Pattern Generator to produce the appropriate CO (TC4) tone pattern.

**Fire-plus-CO mode wiring for detector operation of bases**




**Fire-plus-CO mode wiring for detector and system operation of bases**




# Warnings & Cautions

- This detector is designed to protect individuals from the acute affects of CO exposure. It will not fully safeguard individuals with specific medical conditions. People with special medical problems should consider using specialized detection devices with less than 30 ppm (parts per million) alarming capabilities. If in doubt, consult a medical practitioner.
- If the detector is in trouble or at the end of its life, it may not sense CO and cannot be relied upon to monitor CO levels. Replace the detector every ten years from the date of manufacture or when the control panel indicates a sensor end-of-life condition, whichever comes first.
- A detector installed outside a bedroom may not awaken a sleeper.
- Normal noise due to stereos, television, etc. may also prevent the detector from being heard if distance or closed or partly closed doors muffle the sounder. This unit is not designed for the hearing impaired.
- CO detectors are not a substitute for life safety. Though these detectors will warn against increasing CO levels, we do not warrant or imply in any way that they will protect lives from CO poisoning. They should only be considered as an integral part of a comprehensive safety program.

LIFE SAFETY & INCIDENT MANAGEMENT

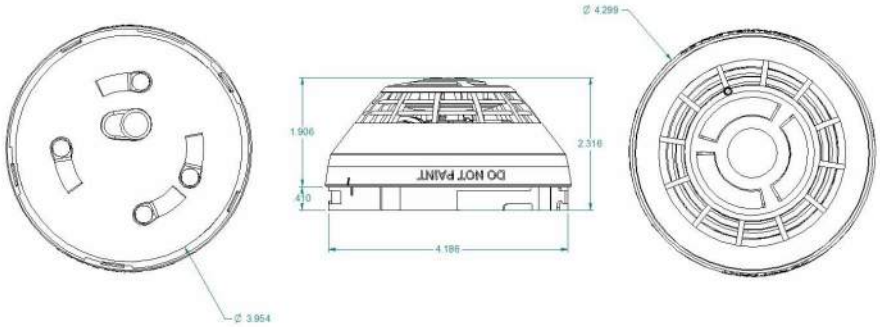
**Contact us**

Phone: 800-655-4497 (Option 4)
Email: edwards.fire@carrier.com
Website: edwardsfiresafety.com

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Bradenton, FL 34202

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## Dimensions




## Specifications

| | |
|---|---|
| Operating voltage | 15.20 to 19.95 VDC |
| Normal operating current | 51 µA |
| Alarm current | 68 µA |
| Vibration level | 10 to 35 Hz, with an amplitude of 0.01 in. |
| Compatible bases | See Ordering Information |
| Compatible detector testers | Testifire 1000, Testifire 2000 |
| Operating environment | 32 to 120°F (0 to 49°C), 0 to 90% RH, noncondensing |
| Construction | High Impact Engineering Polymer, White |
| Storage temperature | -4 to 140°F (-20 to 60°C) |
| UL CO alarm level<br>per UL 2034, CAN/CSA 6.19 | 70 ppm 60 to 240 minutes<br>150 ppm 10 to 50 minutes<br>400 ppm 4 to 15 minutes |
| UL CO false alarm level<br>per UL 2034, CAN/CSA 6.19 | 30 ppm 30 days<br>70 ppm 60 minutes |
| Agency Listings, SIGA-COD | UL 2075. Evaluated to the CO alarm sensitivity limits of UL 2034. |
| Agency Listings, SIGA-COD-CA | ULC Listed to CAN/CSA 6.19. |

## Ordering Information

| Catalog Number | Description | Ship Wt. lbs (kg) |
|---|---|---|
| SIGA-COD | Intelligent Carbon Monoxide Detector | 0.4 (0.16) |
| SIGA-COD-CA | Intelligent Carbon Monoxide Detector, Canadian Market | 0.4 (0.16) |

| Compatible Bases | | |
|---|---|---|
| SIGA-SB | Detector Mounting Base - Standard | 0.2 (.09) |
| SIGA-SB4 | 4-inch Detector Mounting Base c/w Trim Skirt | |
| SIGA-RB | Detector Mounting Base w/Relay | |
| SIGA-RB4 | 4-inch Detector Mounting Base w/Relay, c/w Trim Skirt | |
| SIGA-IB | Detector Mounting Base w/Fault Isolator | |
| SIGA-IB4 | 4-inch Detector Mounting Base w/ Fault Isolator, c/w Trim Skirt | |
| SIGA-LED | Remote Alarm LED (not for EN54 applications) | |
| SIGA-TCDR | Tone Generator for Detector Sounder Bases with CO mode | 0.2 (0.1) |
| SIGA-AB4G-LF | Low Frequency Audible (Sounder) Base for CO and Fire Detectors | 0.3 (0.15) |
| SIGA-AB4GT | Audible (Sounder) Base for CO and Fire Detectors | 0.3 (0.15) |
| SIGA-TS4 | Trim Skirt (supplied with 4-inch bases) | 0.1 (.04) |
| SIGA-RTA | Detector Removal Tool | |

PERMIT #2026 2513934- CM 05-REV TO CM 02 | RSN:1991301



LIFE SAFETY & INCIDENT MANAGEMENT

# Intelligent Heat Detectors

## SIGA-HRD, SIGA-HFD




FM APPROVED

S1122

7270-1657: 0333

## Overview

The Signature Series smoke detectors bring advanced sensing technology to a practical design that increases efficiency, saves installation time, cuts costs, and extends property protection capabilities. Continuous self-diagnostics ensure reliability over the long haul, while the latest thermister technology makes these detectors ideal wherever dependable heat detection is required.

**The SIGA-HRD** is an intelligent fixed-temperature/rate-of-rise fire detector. It monitors the temperature of the surrounding air and analyzes the data from the sensor to determine whether to initiate an alarm. The rate-of-rise heat function quickly detects a fast, flaming fire. The fixed-temperature heat function detects fire when the air temperature near the detector exceeds the alarm point.

**The SIGA-HFD** is an intelligent fixed-temperature heat detector that contains a fixed-temperature heat sensor rated at 135 °F (57.2 °C). It does not have a rate-of-rise function. The heat sensor monitors the temperature of the air in its surroundings and the detector analyzes the data to determine when the air temperature near the detector exceeds the device's alarm point.

## Standard Features

***Note:*** *Some features described here may not be supported by all control systems. Check your control panel's Installation and Operation Guide for details.*

- Next-Generation Heat Sensing Technology
- 135°F (57°C) fixed-temperature alarm point (HRD and HFD)
- 15°F (8°C) per minute rate-of-rise alarm point (HRD)
- Uses existing wiring
- Automatic device mapping
- Sensor Markings Provide Easy Testing Identification
- Up To 250 Total Signature Devices Per Loop
- Non-volatile memory
- Electronic addressing
- Bicolor (green/red) status LED
- Standard, relay, fault isolator, and audible mounting bases
- 50-foot (15.2 meter) spacing

## Application

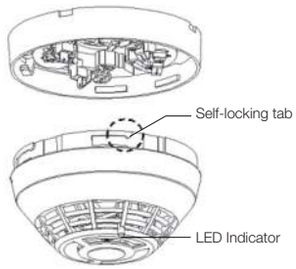
The SIGA-HRD combination fixed-temperature/rate-of-rise heat detector provides a 15 °F (9 °C) per minute rate-of-rise heat sensor for the detection of fast-developing fires, as well as a 135°F (57°C) fixed-temperature sensor for slow-building fires. The SIGA-HFD fixed-temperature detector provides a 135°F (57°C) fixed-temperature sensor for slow-building fires.

## Compatibility

Signature Series heat detectors are compatible only with the Signature Loop Controller.

## Installation

Signature Series detectors mount to North American 1-gang boxes, 3-1/2-inch or 4-inch octagon boxes, and to 4-inch-square electrical boxes 1-1/2 inches (38 mm) deep. They mount to European BESA and 1-gang boxes with 60.3 mm fixing centers. See mounting base installation and wiring for more information.




## Sensing and reporting technology

The microprocessor in each detector provides additional benefits - Self-diagnostics and History Log, Automatic Device Mapping, and Fast, Stable Communication.

**Self-diagnostics and History Log** - Each Signature Series detector constantly runs self-checks to provide important maintenance information. The results of the self-check are automatically updated and permanently stored in the detector's non-volatile memory.

**Automatic Device Mapping** - The loop controller learns where each device's serial number address is installed relative to other devices on the circuit. The mapping feature provides supervision of each device's installed location to prevent a detector from being reinstalled (after cleaning ,etc.) in a different location from where it was originally.

**Fast, Stable Communication** - On-board intelligence means less information needs to be sent between the detector and the loop controller. Other than regular supervisory polling response, the detector only needs to communicate with the loop controller when it has something new to report.

## Accessories

**Detector mounting bases** have wiring terminals that are accessible from the "room-side" after mounting the base to the electrical box. The bases mount to North American 1-gang boxes and to 3½-inch or 4-inch octagon boxes, 1½ inches (38 mm) deep. They also mount to European BESA and 1-gang boxes with 60.3 mm fixing centers. The SIGA-SB4, SIGA-RB4, and SIGA-IB4 mount to North American 4-inch-square electrical boxes in addition to the above boxes. They include the SIGA-TS4 Trim Skirt, which is used to cover the "mounting ears" on the base. The SIGA-AB4G mounts to a 4-inch-square box only.



**SIGA-AB4G/T/LF** Audible Base | **SIGA-SB** Standard Base | **SIGA-IB** Isolator Base | **SIGA-RB** Relay Base | **SIGA-LED** Remote LED

**Remote LED SIGA-LED** - The remote LED connects to the SIGA-SB or SIGA-SB4 Standard Base only. It features a North American size 1-gang plastic faceplate with a white finish and red alarm LED.

**SIGA-TS4 Trim Skirt** - Supplied with 4-inch bases, it can also be ordered separately to use with the other bases to help hide surface imperfections not covered by the smaller bases.

**Sounder Bases** - Signature Series sounder bases are designed for use where localized or group alarm signaling is required.

- **SIGA-AB4G** bases provide sounder capability to Signature Series heat and smoke detectors. They are not intended for use with combination carbon monoxide detectors in Fire-plus-CO mode.
- **SIGA-AB4GT** bases provide sounder capability to Signature Series smoke and heat detectors, as well as carbon monoxide detectors when used with a SIGA-TCDR Temporal Pattern Generator.
- **SIGA-AB4G-LF** bases provide 520 Hz low-frequency sounder capability to Signature Series smoke and heat detectors, as well as carbon monoxide detectors when used with a SIGA-TCDR Temporal Pattern Generator. The SIGA-AB4G-LF is suitable for applications requiring low-frequency audible tones.

## Warnings & Cautions

- This detector does not operate without electrical power. As fires frequently cause power interruption, discuss further safeguards with the local fire protection specialist.
- This detector does not sense fires in areas where heat cannot reach the detector. Heat from fires in walls, roofs, or on the opposite side of closed doors may not reach the detector.
- This heat detector by itself does not provide life safety protection Use this detector with ionization and/or photoelectric smoke detectors.
- This detector does not detect oxygen levels, smoke, toxic gases, or flames. Use this device as part of a broad-based life safety program which includes a variety of information sources pertaining to heat and smoke levels, extinguishment systems, visual and audible devices, and other safety measures.
- Independent studies indicate that heat detectors should only be used when property protection alone is involved. Never rely on heat detectors as the sole means of fire protection.

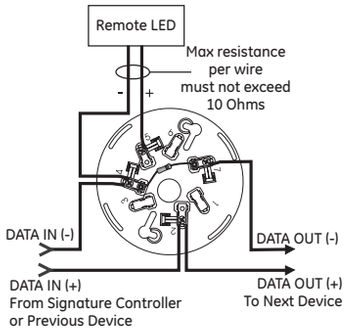
# Typical Wiring

The detector mounting bases accept #18 AWG (0.75mm$^2$), #16 AWG (1.0mm$^2$), #14 AWG (1.5mm$^2$), and #12 AWG (2.5mm$^2$) wire sizes. Sizes #16 AWG (1.0mm$^2$) and #18 AWG (0.75mm$^2$) are preferred for ease of installation.

## Standard Detector Base, SIGA-SB, SIGA-SB4

This is the basic mounting base for the EDWARDS Signature Series detectors. The SIGA-LED Remote LED is supported by this base.

| Term | Description |
|---|---|
| 1 | Not Used |
| 2 | DATA IN/OUT (+) |
| 3 | Not Used |
| 4 | DATA IN (-) |
| 4 | Remote LED (-) |
| 5 | Remote LED (+) |
| 6 | Not Used |
| 7 | DATA OUT (-) |



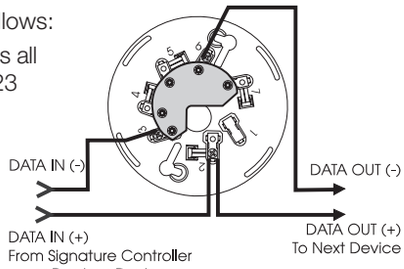

## Isolator Detector Base, SIGA-IB, SIGA-IB4

This base includes a built-in line fault isolator for use on Class A circuits. A detector must be installed for it to operate. The isolator base does not support the SIGA-LED Remote LED.

The isolator operates as follows:

- a short on the line causes all isolators to open within 23 msec
- at 10 msec intervals, beginning on one side of the Class A circuit nearest the loop controller, the isolators close to provide the next isolator down the line with power
- when the isolator next to the short closes, it reopens within 10 msec.

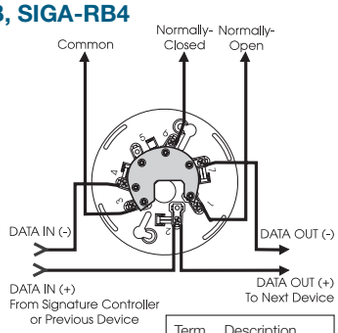
The process repeats beginning on the




| Term | Description |
|---|---|
| 1 | Not Used |
| 2 | DATA IN/OUT (+) |
| 3 | DATA IN (-) |
| 4 | Not Used |
| 5 | Not Used |
| 6 | DATA OUT (-) |
| 7 | Not Used |

## Relay Detector Base, SIGA-RB, SIGA-RB4

This base includes a relay. Normally Open or Normally Closed operation is selected during installation. The dry contact is rated for 1 amp (pilot duty) @ 30 Vdc. The relay's position is supervised to avoid accidentally jarring it out of position. The SIGA-RB can be operated as a control relay if programmed to do so at the control panel. The relay base does not support the SIGA-LED Remote LED.

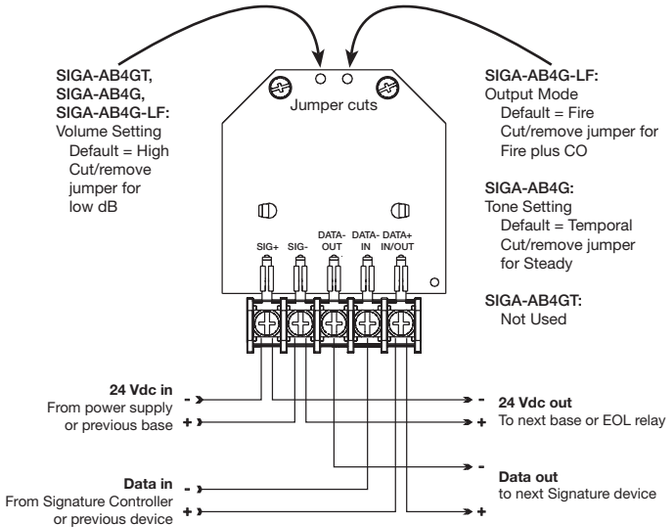



CONTACT RATING
1.0 Amp @ 30 VDC
(Pilot Duty)

| Term | Description |
|---|---|
| 1 | Normally Open |
| 2 | DATA IN/OUT (+) |
| 3 | Common |
| 4 | DATA IN (-) |
| 5 | Not Used |
| 6 | Normally-Closed |
| 7 | DATA OUT (-) |

## Audible Sounder Bases, Fire Mode

*AB4GT, AB4G, AB4G-LF sounder bases*



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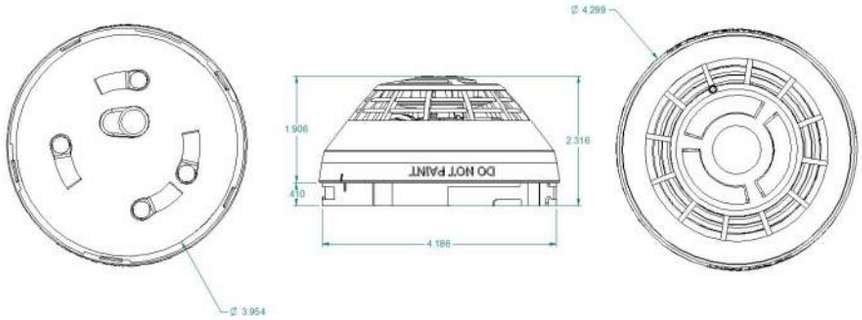
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Website: edwardsfiresafety.com

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## Dimensions




## Specifications

| | FSIGA- HRD | SIGA-HFD |
|---|---|---|
| Operating voltage | 15.20 to 19.95 VDC | |
| Normal operating current | 51 µA | |
| Alarm current | 68 µA | |
| Vibration level | 10 to 35 Hz, with an amplitude of 0.01 in. | |
| Rate-of-rise rating | 15°F/min (8°C/min) | NA |
| Fixed-temperature rating | 135°F (57.2°C). Actual alarm point 129 to 141°F (53.9 to 60.6°C). | |
| Maximum spacing | 50 ft. (15.2 m) centers | |
| Compatible bases | See Ordering Information | |
| Compatible detector testers | Testifire 1000, Testifire 2000 | Testifire 2000 |
| Operating environment | 32 to 100°F (0 to 38°C), 0 to 93% RH, noncondensing | |
| Construction | High Impact Engineering Polymer, White | |
| Storage temperature | -4 to 140°F (-20 to 60°C) | |
| Agency Listings | CAN/ULC-S530, UL 521<br>FM | CAN/ULC-S530-M91, UL 521<br>CSFM |

## Ordering Information

| Catalog Number | Description | Ship Wt. lbs (kg) |
|---|---|---|
| SIGA-HRD | Intelligent fixed-temperature/Rate-of-rise heat detector | 0.4 (0.16) |
| SIGA-HFD | Intelligent fixed-temperature heat detector | |
| SIGA-HRD-NL | Intelligent fixed-temperature/Rate-of-rise-heat detector, no visible logo | |
| SIGA-HFD-NL | Intelligent fixed-temperature heat detector, no visible logo | |
| **Compatible Bases** | | |
| SIGA-SB | Detector Mounting Base - Standard | 0.2 (.09) |
| SIGA-SB4 | 4-inch Detector Mounting Base c/w Trim Skirt | |
| SIGA-RB | Detector Mounting Base w/Relay | |
| SIGA-RB4 | 4-inch Detector Mounting Base w/Relay, c/w Trim Skirt | |
| SIGA-IB | Detector Mounting Base w/Fault Isolator | |
| SIGA-IB4 | 4-inch Detector Mounting Base w/ Fault Isolator, c/w Trim Skirt | |
| SIGA-AB4G | Audible (Sounder) Base for Fire Detectors | 0.3 (0.15) |
| SIGA-AB4G-LF | Low Frequency Audible (Sounder) Base for CO and Fire Detectors | |
| SIGA-AB4GT | Audible (Sounder) Base for CO and Fire Detectors | |
| SIGA-LED | Remote Alarm LED (not for EN54 applications) | 0.1 (0.04) |
| SIGA-TS4 | Trim Skirt (supplied with 4-inch bases) | |
| SIGA-TS | Trim Skirt (optional for non 4-inch bases) | |
| SIGA-RTA | Detector Removal Tool | |

EDWARDS
United Technologies
LIFE SAFETY & INCIDENT MANAGEMENT

# Signal Modules

## SIGA-CC1, SIGA-MCC1, SIGA-CC2 & SIGA-MCC2


SIGA-MCC


SIGA-CC

FM APPROVED MEA 7300-1657: 0121 UL UL S3424

## Overview

SIGA-CC1/MCC1 Single Input Signal Modules and SIGA-CC2/MCC2 Dual Input Signal Modules are part of EDWARDS's Signature Series system. They are intelligent analog addressable devices used for connecting, upon command from the loop controller, supervised Class B signal or telephone circuits to their respective power inputs. The power inputs may be polarized 24 Vdc to operate audible and visible signal appliances or 25 and 70 VRMS to operate audio evacuation speakers and firefighter's telephones.

The actual operation of the SIGA-CC1/MCC1 and SIGA-CC2/MCC2 is determined by the "personality code" selected by the installer. It is downloaded to the module from the Signature loop controller during system configuration.

**The SIGA-CC1 and SIGA-CC2** mount to standard North American two-gang electrical boxes, making them ideal for locations where only one module is required. Separate I/O and data loop connections are made to each module.

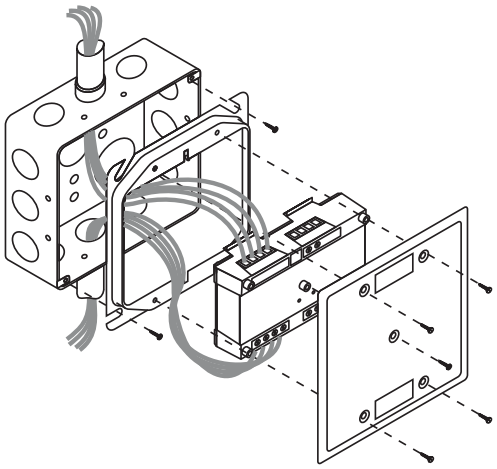
**The SIGA-MCC1 and SIGA-MCC2** are part of the UIO family of plug-in Signature Series modules. They function identically to the SIGA-CC1 and SIGA-CC2, but take advantage of the modular flexibility and easy installation that characterize all UIO modules. Two- and six-module UIO motherboards are available. These can accommodate individual risers for each on-board module, or risers that are shared by any combination of its UIO modules. All wiring connections are made to terminal blocks on the motherboard. UIO assemblies may be mounted in EDWARDS enclosures.

## Standard Features

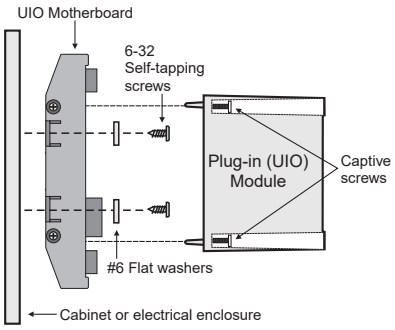
- **Single and Dual input (riser) select**
  Use for connecting supervised 24 Vdc Audible/Visible signal circuits, or 25 and 70 VRMS Audio Evacuation and Telephone circuits to their power inputs.
- **Ring-tone generator**
  When configured for telephone circuits, the SIGA-CC1 generates its own ring-tone signal eliminating the need for a separate ring-tone circuit.
- **Plug-in (UIO) or standard 2-gang mount**
  UIO versions allow quick installation where multiple modules are required. The 2-gang mount version is ideal for remote locations that require a single module.
- **Automatic device mapping**
  Signature modules transmit information to the loop controller regarding their circuit locations with respect to other Signature devices on the wire loop.
- **Electronic addressing**
  Programmable addresses are downloaded from the loop controller, a PC, or the SIGA-PRO Signature Program/Service Tool; there are no switches or dials to set.
- **Intelligent device with microprocessor**
  All decisions are made at the module to allow lower communication speed with substantially improved control panel response time and less sensitivity to line noise and loop wiring properties; twisted or shielded wire is not required.
- **Ground fault detection by address**
  Detects ground faults right down to the device level.

## Installation

**The SIGA-CC1 and SIGA-CC2:** mount to North American 2-1/2 inch (64 mm) deep two-gang boxes and 1-1/2 inch (38 mm) deep 4-inch square boxes with two-gang covers and SIGA-MP mounting plates. The terminals are suited for #12 to #18 AWG (2.5 $mm^2$ to 0.75 $mm^2$) wire size.



**SIGA-MCC1 and SIGA-MCC2:** mount the UIO motherboard inside a suitable EDWARDS enclosure with screws and washers provided. Plug the SIGA-MCC1 or SIGA-MCC2 into any available position on the motherboard and secure the module to the motherboard with the captive screws. Wiring connections are made to the terminals on the motherboard (see wiring diagram). UIO motherboard terminals are suited for #12 to #18 AWG (2.5 $mm^2$ to 0.75 $mm^2$) wire size.




EDWARDS recommends that this module be installed according to latest recognized edition of national and local fire alarm codes.

**Electronic Addressing** - The loop controller electronically addresses each module saving valuable time during system commissioning. Setting complicated switches or dials is not required. Each module has its own unique serial number stored in its onboard memory. The loop controller identifies each device on the loop and assigns a “soft” address to each serial number. If desired, the modules can be addressed using the SIGA-PRO Signature Program/Service Tool.

Personality Codes 5 and 6 apply to the SIGA-CC1/MCC1 only and are assigned by the installer. Code 7 applies to the SIGA-CC2/MCC2 only. It is factory assigned; no user configuration is required.

## Application

The operation of the SIGA-CC1/MCC1 and SIGA-CC2/MCC2 is determined by their sub-type code or “Personality Code”. The code is selected by the installer depending upon the desired application and is down-loaded from the loop controller. Codes 5 and 6 apply to the SIGA-CC1/MCC1 only. Code 7 is assigned to the SIGA-CC2/MCC2 only and automatically applies to both circuits (A and B).

**Personality Code 5: SIGNAL POWER or AUDIO EVACUATION (SINGLE RISER).** Valid for the SIGA-CC1/MCC1 only. Configures the module for use as a Class B Audible/Visible Signal power (24 Vdc polarized) or Audio Evacuation (25 or 70 VRMS) power selector. The ring-tone generator is disabled. The output circuit is monitored for open or shorted wiring. If a short exists, the control panel inhibits the activation of the audible/visible signal circuit to prevent connection to the power circuit.

**Personality Code 6: TELEPHONE w/RING-TONE (SINGLE RISER).** Valid for the SIGA-CC1/MCC1 only. Configures the module for use as a Telephone power selector. When a telephone handset is plugged into its jack or lifted from its hook, the module generates its own Ring-Tone signal. A separate ring-tone circuit is not needed. The module sends this signal to the control panel to indicate that an off-hook condition is present. When the system operator responds to the call, the ring-tone signal is disabled.

**Personality Code 7: SIGNAL POWER or AUDIO EVACUATION (DUAL RISER)**. Valid for the SIGA-CC2/MCC2 only. Configures the module for use as a two circuit Class B Audible/Visible Signal power (24 Vdc polarized) or Audio Evacuation (25 or 70 VRMS) power selector. The single output circuit is monitored for open or shorted wiring. If a short exists, the control panel inhibits the activation of the audible/visible signal circuit to prevent connection to the power circuit.

## Warnings & Cautions

This module will not operate without electrical power. As fires frequently cause power interruption, we suggest you discuss further safeguards with your fire protection specialist.

## Compatibility

The Signature Series modules are compatible only with EDWARDS's Signature Loop Controller.

## Testing & Maintenance

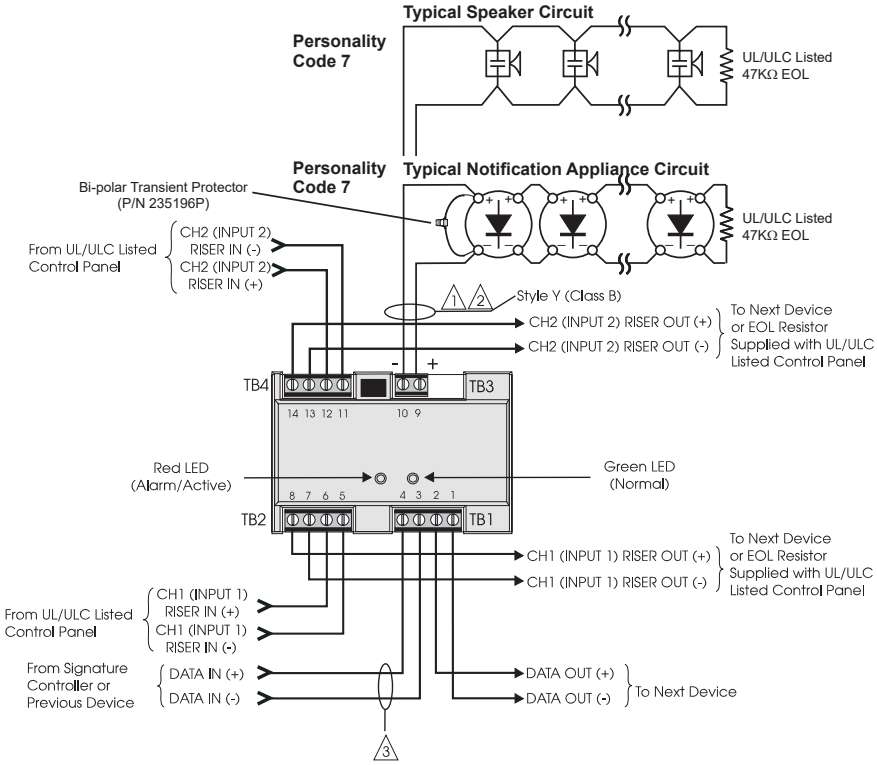
The module’s automatic self-diagnosis identifies when it is defective and causes a trouble message. The user-friendly maintenance program shows the current state of each module and other pertinent messages. Single modules may be turned off (de-activated) temporarily, from the control panel.

Scheduled maintenance (Regular or Selected) for proper system operation should be planned to meet the requirements of the Authority Having Jurisdiction (AHJ). Refer to current NFPA 72 and ULC CAN/ULC 536 standards.

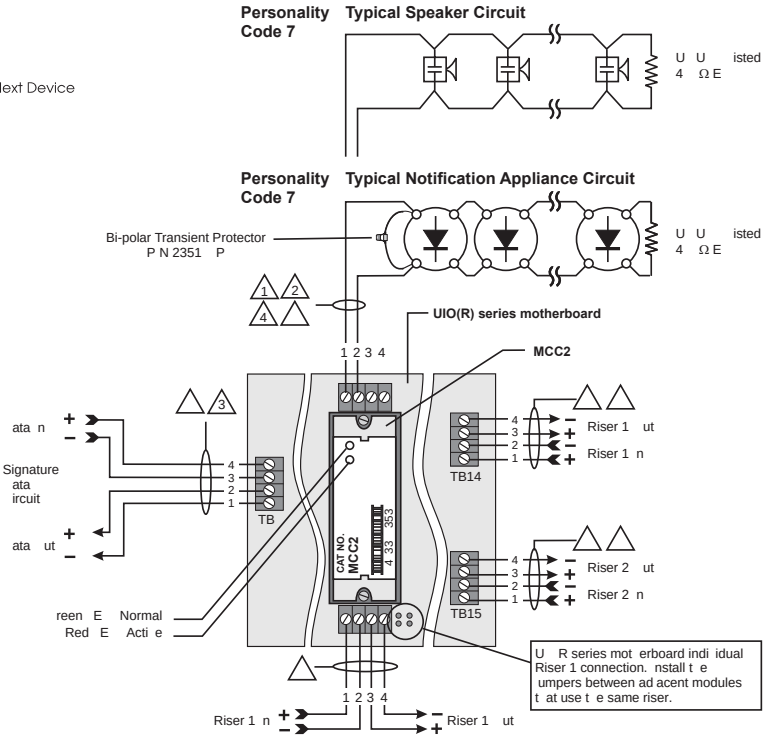
# Typical Wiring (SIGA-CC2/MCC2)

Modules will accept #18 AWG (0.75mm²), #16 (1.0mm²), #14 AWG (1.50mm²) and #12 AWG (2.5mm²) wire sizes.

Note: Sizes #16 AWG (1.0mm²) and #18 AWG (0.75mm²) are preferred for ease of installation. See Signature Loop Controller catalog sheet for detailed wiring requirement specifications.




**SIGA-CC2**




**SIGA-MCC2**

| Maximum Output Load | | |
|---|---|---|
| **24Vdc** | **25V** | **70V** |
| Signals | Audio | Audio |
| 2A | 50W | 35W |

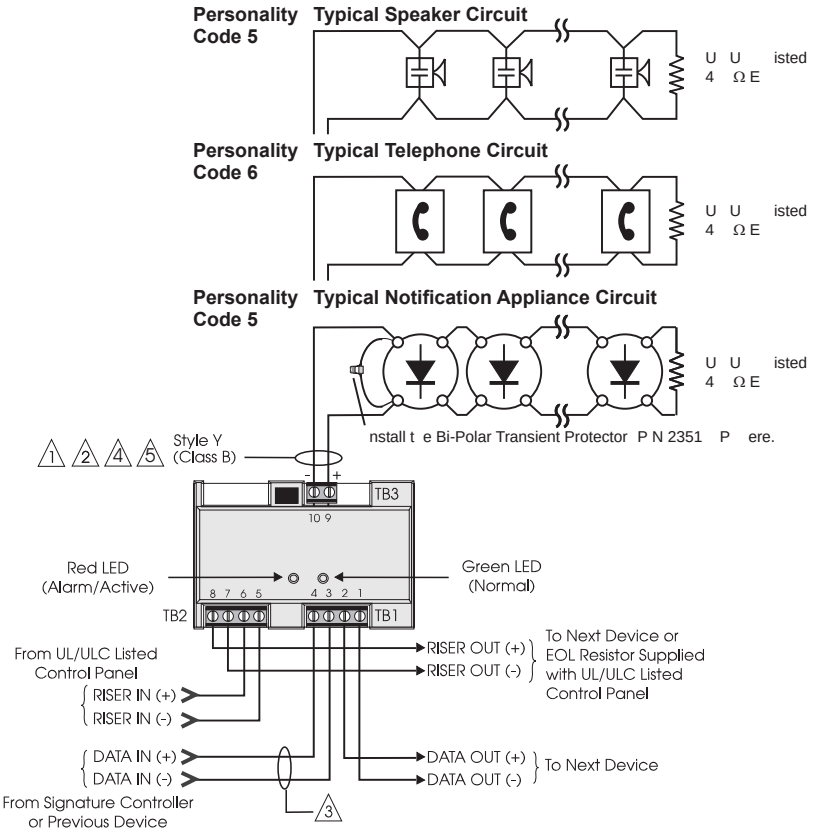
**Notes**

1. For maximum wire resistance and maximum wire distances, refer to IOMC Manual (P/N 270144).
2. Maximum #12 AWG (2.5mm²) wire. Min. #18 (0.75mm²).
3. Refer to Signature Loop Controller Installation Sheet for wiring specifications.
4. These modules will NOT support two-wire smoke detectors.
5. All wiring power limited and supervised. If the input source is non-power limited, then maintain spacing of 1/4 inch or use FPL, FPLP, FPLR or equivalent in accordance with NEC.
6. The SIGA-UIO6 does not come with TB8 through TB13.
7. Supervised and power-limited.
8. Supervised and power-limited when connected to a power-limited source. If the source is nonpower-limited, maintain a space of 1/4 inch from power-limited wiring or use FPL, FPLP, FPLR, or an equivalent in accordance with the National Electrical Code.
9. The input for this riser is common to all modules.

## Typical Wiring (SIGA-CC1/MCC1)

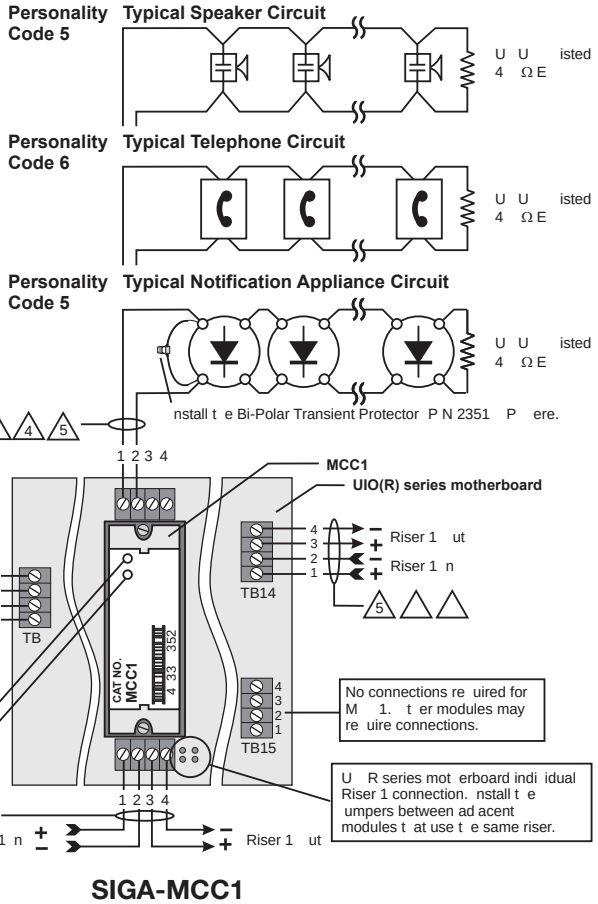
Modules will accept #18 AWG (0.75mm²), #16 (1.0mm²), #14 AWG (1.50mm²) and #12 (2.5mm²) wire sizes.

Note: Sizes #16 AWG (1.0mm²) and #18 AWG (0.75mm²) are preferred for ease of installation. See Signature Loop Controller catalog sheet for detailed wiring requirement specifications.




**SIGA-CC1**

| Maximum Output Load | | |
|---|---|---|
| **24Vdc** | **25V** | **70V** |
| Signals | Audio | Audio |
| 2A | 50W | 35W |




**SIGA-MCC1**

### Notes

2. Maximum #12 AWG (2.5mm²) wire. Min. #18 (0.75mm²).
3. Refer to Signature Loop Controller Installation Sheet for wiring specifications.
4. These modules will NOT support two-wire smoke detectors.
5. All wiring power limited and supervised. If the input source is non-power limited, then maintain spacing of 1/4 inch or use FPL, FPLP, FPLR or equivalent in accordance with NEC.
6. The SIGA-UIO6 does not come with TB8 through TB13.
7. Supervised and power-limited.
8. If the source is nonpower-limited, maintain a space of 1/4 inch from power-limited wiring or use FPL, FPLP, FPLR, or an equivalent in accordance with the National Electrical Code.
9. The input for this riser is common to all modules.

## Signature Series Overview

The Signature Series intelligent analog-addressable system from EDWARDS is an entire family of multi-sensor detectors and mounting bases, multiple-function input and output modules, network and non-network control panels, and user-friendly maintenance and service tools. Analog information from equipment connected to Signature devices is gathered and converted into digital signals. An onboard microprocessor in each Signature device measures and analyzes the signal and decides whether or not to input an alarm. The microprocessor in each Signature device provides four additional benefits – Self-diagnostics and History Log, Automatic Device Mapping, and Fast, Stable Communication.

**Self-diagnostics and History Log** – Each Signature Series device constantly runs self-checks to provide important maintenance information. The results of the self-check are automatically updated and permanently stored in its non-volatile memory. This information is accessible for review any time at the control panel, PC, or using the SIGA-PRO Signature Program/Service Tool. The information stored in device memory includes:

- Device serial number, address, and type
- Time and date of last alarm (EST3 V 2 only.)
- Most recent trouble code logged by the detector — 32 possible trouble codes may be used to diagnose faults.

**Automatic Device Mapping** –The Signature Data Controller (SDC) learns where each device's serial number address is installed relative to other devices on the circuit. The SDC keeps a map of all Signature Series devices connected to it. The Signature Series Data Entry Program also uses the mapping feature. With interactive menus and graphic support, the wired circuits between each device can be examined. Layout or "as-built" drawing information showing branch wiring (T-taps), device types and their address are stored on disk for printing hard copy. This takes the mystery out of the installation. The preparation of as-built drawings is fast and efficient.

Device mapping allows the Signature Data Controller to discover:

- Unexpected additional device addresses
- Missing device addresses
- Changes to the wiring in the circuit.

Most Signature modules use a personality code selected by the installer to determine their actual function. Personality codes are downloaded from the SDC during system configuration and are indicated during device mapping.

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Contact us...

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Mebane, NC 27302

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## Specifications

| Catalog Number | SIGA-CC1 | SIGA-MCC1 | SIGA-CC2 | SIGA-MCC2 |
|---|---|---|---|---|
| Description | Single Input (Riser) Signal Module | | Dual Input (Riser) Signal Module | |
| Type Code | 50 (factory set) Two sub-types (personality codes) are available | | 51 (factory set) One sub-type (personality code) is available (factory set) | |
| Address Requirements | Uses one module address | | Uses two module addresses | |
| Wiring Terminations | Suitable for #12 to #18 AWG (2.5 mm² to 0.75mm²) | | | |
| Mounting | North American 2½ inch (64 mm) deep two-gang boxes and 1½ inch (38 mm) deep 4 inch square boxes with 2-gang covers and SIGA-MP mounting plates | Plugs into UIO2R, UIO6R or UIO6 Motherboards | North American 2½ inch (64 mm) deep two-gang boxes and 1½ inch (38 mm) deep 4 inch square boxes with 2-gang covers and SIGA-MP mounting plates | Plugs into UIO2R, UIO6R or UIO6 Motherboards |
| Operating Current | Standby = 223µA Activated = 100µA | | | |
| Operating Voltage | 15.2 to 19.95 Vdc (19 Vdc nominal) | | | |
| Output Rating | 24 Vdc = 2 amps 25 V Audio = 50 watts 70 V Audio = 35 watts | | | |
| Construction | High Impact Engineering Polymer | | | |
| Storage & Operating Environment | Operating Temperature: 32°F to 120°F (0°C to 49°C) Storage Temperature: -4°F to 140°F (-20°C to 60°C) Humidity: 0 to 93% RH | | | |
| LED Operation | On-board Green LED - Flashes when polled On-board Red LED - Flashes when in alarm/active | | | |
| Compatibility | Use with: Signature Loop Controller | | | |
| Agency Listings | UL, ULC, CSFM, MEA, FM | | | |

## Ordering Information

| Catalog Number | Description | Ship Wt. lbs (kg) |
|---|---|---|
| SIGA-CC1 | Single Input Signal Module (Standard Mount) - UL/ULC Listed | 0.5 (0.23) |
| SIGA-MCC1 | Single Input Signal Module (UIO Mount) - UL/ULC Listed | 0.18 (0.08) |
| SIGA-CC2 | Dual Input Signal Module (Standard Mount) - UL/ULC Listed | 0.5 (0.23) |
| SIGA-MCC2 | Dual Input Signal Module (UIO Mount) - UL/ULC Listed | 0.18 (0.08) |

| Related Equipment | | |
|---|---|---|
| 27193-21 | Surface Mount Box - Red, 2-gang | 2 (1.2) |
| 27193-26 | Surface Mount Box - White, 2-gang | 2 (1.2) |
| SIGA-UIO2R | Universal Input-Output Module Board w/Riser Inputs - Two Module Positions | 0.32 (0.15) |
| SIGA-UIO6R | Universal Input-Output Module Board w/Riser Inputs - Six Module Positions | 0.62 (0.28) |
| SIGA-UIO6 | Universal Input-Output Module Board - Six Module Positions | 0.56 (0.25) |
| 235196P | Bi-polar Transient Protector | 0.01 (0.05) |

| Accessories | | |
|---|---|---|
| MFC-A | Multifunction Fire Cabinet - Red, supports Signature Module Mounting Plates | 7.0 (3.1) |
| SIGA-MP1 | Signature Module Mounting Plate, 1 footprint | 1.5 (0.70) |
| SIGA-MP2 | Signature Module Mounting Plate, 1/2 footprint | 0.5 (0.23) |
| SIGA-MP2L | Signature Module Mounting Plate, 1/2 extended footprint | 1.02 (0.46) |

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# Synchronization Output Module

## SIGA-CC1S, MCC1S



Patented

FM APPROVED MEA 7300-1657: 0121 S3424

## Overview

SIGA-CC1S and MCC1S Synchronization Output Modules are intelligent analog addressable devices that form part of EDWARDS's Signature line of products. The actual operation of the SIGA-CC1S and MCC1S is determined by the "personality code" selected by the installer, which is downloaded to the module from the Signature loop controller during system configuration.

Depending on their assigned personality, Synchronization Output Modules may be used as a signal power riser selector to provide synchronization of fire alarm signals across multiple zones, or for connecting, upon command from the loop controller, supervised Class B signal or telephone circuits to their respective power inputs. The power inputs may be polarized 24 Vdc to operate audible and visible signal appliances or 25 and 70 VRMS to operate audio evacuation speakers and firefighter's telephones.

## Standard Features

- **Provides UL 1971-compliant auto-sync output for visual signals**
  Use for connecting a supervised output circuit to a supervised 24 Vdc riser input and synchronizing multiple notification appliance circuits.
- **Functions as an audible signal riser selector**
  Use as a synch module or for connecting supervised 24 Vdc Audible/Visible signal circuits, or 25 and 70 VRMS Audio Evacuation and Telephone circuits to their power inputs.
- **Built-in ring-tone generator**
  When configured for telephone circuits, the SIGA-CC1S generates its own ring-tone signal, eliminating the need for a separate ring-tone circuit.
- **Automatic device mapping**
  Signature modules transmit information to the loop controller regarding their circuit locations with respect to other Signature devices on the wire loop.
- **Electronic addressing**
  Programmable addresses are downloaded from the loop controller, a PC, or the SIGA-PRO Signature Program/Service Tool; there are no switches or dials to set.
- **Intelligent device with microprocessor**
  All decisions are made at the module to allow lower communication speed with substantially improved control panel response time and less sensitivity to line noise and loop wiring properties; twisted or shielded wire is not required.

## Application

**The SIGA-CC1S** mounts to a standard North American two-gang electrical box, making it ideal for locations where only one module is required. Separate I/O and data loop connections are made to each module.

**The SIGA-MCC1S** is part of the UIO family of plug-in Signature Series modules. It functions identically to the SIGA-CC1S, but takes advantage of the modular flexibility and easy installation that characterize all UIO modules. Two- and six-module UIO motherboards are available. These can accommodate individual risers for each on-board module, or risers that are shared by any combination of its UIO modules. All wiring connections are made to terminal blocks on the motherboard. UIO assemblies may be mounted in EDWARDS enclosures.

## Personality Codes

The operation of the SIGA-CC1S is determined by their sub-type code or "Personality Code". The code is selected by the installer depending upon the desired application and is downloaded from the loop controller.

**Personality Code 5: Signal Power or Audio Evacuation (single riser).** Configures the module for use as a Class B Audible/Visible Signal power (24 Vdc polarized) or Audio Evacuation (25 or 70 VRMS) power selector. The ring-tone generator is disabled. The output circuit is monitored for open or shorted wiring. If a short exists, the control panel inhibits the activation of the audible/visible signal circuit to prevent connection to the power circuit.

**Personality Code 6: Telephone with ring-tone (single riser).** Configures the module for use as a Telephone power selector. When a telephone handset is plugged into its jack or lifted from its hook, the module generates its own Ring-Tone signal. A separate ring-tone circuit is not needed. The module sends this signal to the control panel to indicate that an off-hook condition is present. When the system operator responds to the call, the ring-tone signal is disabled.

**Personality Code 25: Visual Signal Synchronization.** This personality code configures the module to provide synchronization of fire alarm signals across multiple zones. It functions as a signal power (24 Vdc) riser selector. The output wiring is monitored for open circuits and short circuits. A short circuit will cause the fire alarm control panel to inhibit the activation of the audible/visual signal circuit so the riser is not connected to the wiring fault.

## Warnings & Cautions

This module will not operate without electrical power. As fires frequently cause power interruption, we suggest you discuss further safeguards with your fire protection specialist.

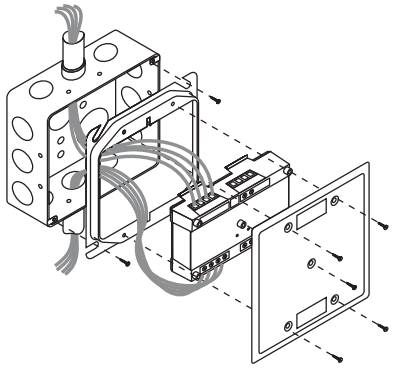
EDWARDS recommends that these modules be installed according to latest recognized edition of national and local fire alarm codes.

## Compatibility

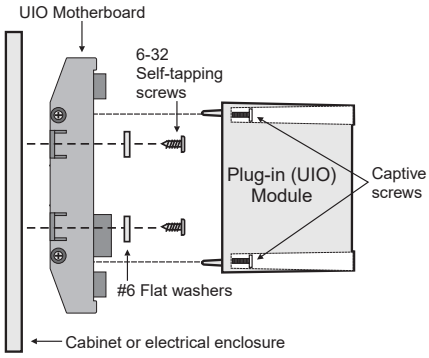
These modules are part of EDWARDS's Signature Series intelligent processing and control platform. They are compatible with EST3, EST3X and iO Series control panels.

## Installation

**The SIGA-CC1S:** mounts to North American 2-1/2 inch (64 mm) deep 2-gang boxes and 1-1/2 inch (38 mm) deep 4 inch square boxes with 2-gang covers and SIGA-MP mounting plates. The terminals are suited for #12 to #18 AWG (2.5 $mm^2$ to 0.75 $mm^2$) wire size.



**SIGA-MCC1S:** mount the UIOxR motherboard inside a suitable EDWARDS enclosure with screws and washers provided. Plug the module into any available position on the motherboard and secure the module to the motherboard with the captive screws. Wiring connections are made to the terminals on the motherboard (see wiring diagram). UIOxR motherboard terminals are suited for #12 to #18 AWG (2.5 $mm^2$ to 0.75 $mm^2$) wire size.




## Electronic Addressing

The loop controller electronically addresses each module saving valuable time during system commissioning. Setting complicated switches or dials is not required. Each module has its own unique serial number stored in its "on-board memory". The loop controller identifies each device on the loop and assigns a "soft" address to each serial number. If desired, the modules can be addressed using the SIGA-PRO Signature Program/Service Tool.

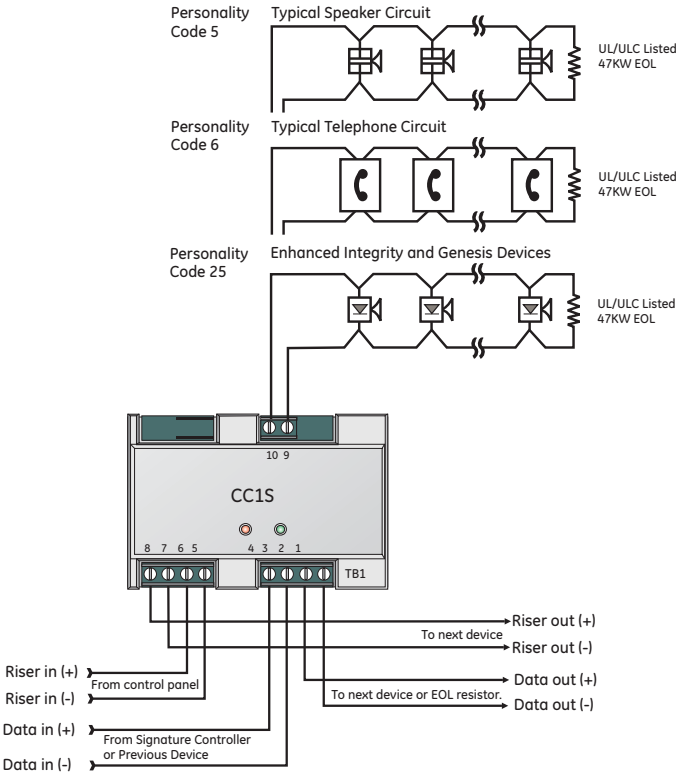
## Testing & Maintenance

The module's automatic self-diagnosis identifies when it is defective and causes a trouble message. The user-friendly maintenance program shows the current state of each module and other pertinent messages. Single modules may be turned off (de-activated) temporarily, from the control panel.

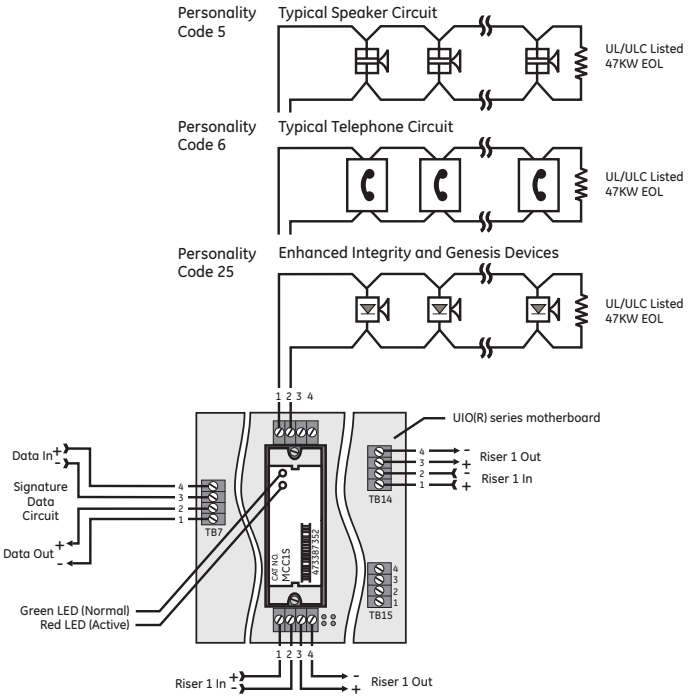
Scheduled maintenance (Regular or Selected) for proper system operation should be planned to meet the requirements of the Authority Having Jurisdiction (AHJ). Refer to current NFPA 72 and ULC CAN/ULC 536 standards.

# Typical Wiring

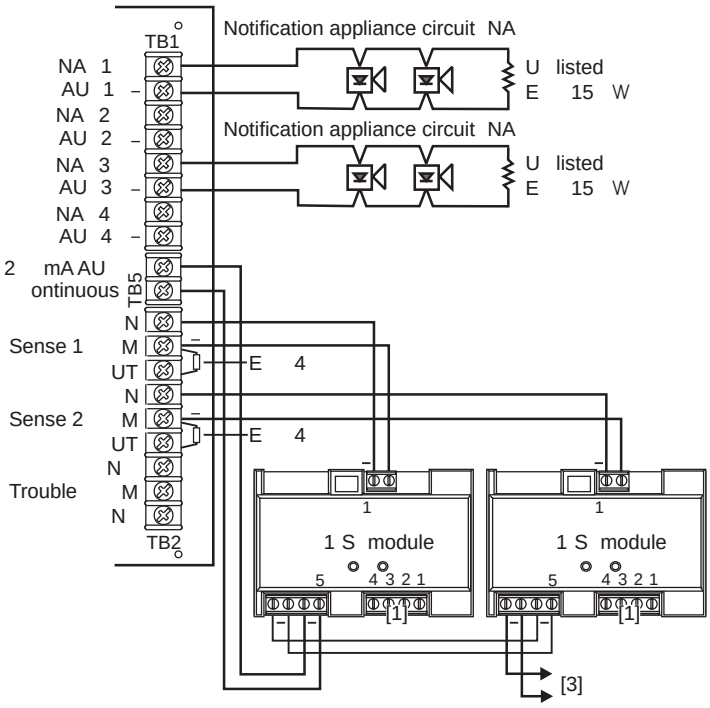
## SIGA-CC1S (Standard Mount)




## SIGA-MCC1S (UIO Mount)




## Multiple CC1(S) modules using the BPS's sense inputs



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## Specifications

| Catalog Number | SIGA-CC1S | SIGA-MCC1S |
|---|---|---|
| Mounting | North American 2½ inch (64 mm) deep two-gang boxes and 1½ inch (38 mm) deep 4 inch square boxes with 2-gang covers and SIGA-MP mounting plates | Plugs into UIO2R, UIO6R or UIO6 Motherboards |
| Description | Synchronization Output Module | |
| Type Code | 50 (factory set) | |
| Address Requirements | Uses one module address | |
| Wiring Terminations | Suitable for #12 to #18 AWG (2.5 $mm^2$ to 0.75$mm^2$) | |
| Operating Current | Standby = 223µA<br>Activated = 100µA | |
| Operating Voltage | 15.2 to 19.95 Vdc (19 Vdc nominal) | |
| Output Rating | 24 Vdc = 2 amps<br>25 V Audio = 50 watts<br>70 V Audio = 35 watts | |
| Construction | High Impact Engineering Polymer | |
| Storage and Operating Environment | Operating: 32°F to 120°F (0°C to 49°C)<br>Storage: -4°F to 140°F (-20°C to 60°C)<br>Humidity: 0 to 93% RH | |
| LED Operation | Green LED - Flashes when polled Red LED - Flashes when in alarm/ active | |
| Compatibility | Use with: Signature Loop Controller under EST3 version 2.0 or higher | |
| Agency Listings | UL, ULC, CSFM, MEA | |

## Ordering Information

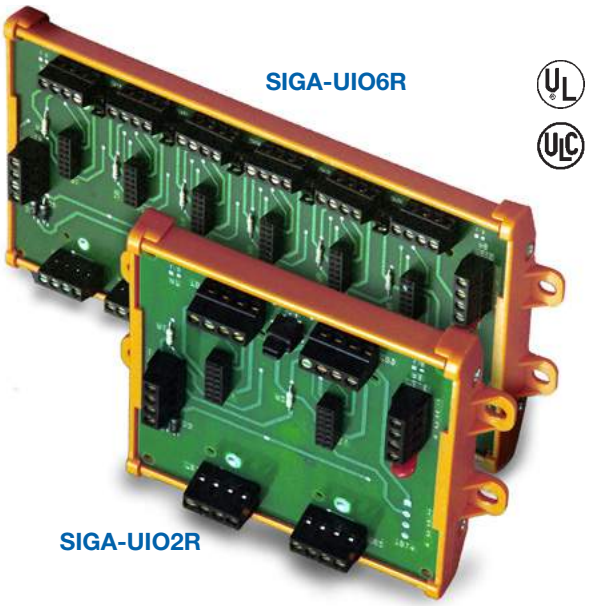
| Catalog Number | Description | Shipping Wt. lbs (kg) |
|---|---|---|
| SIGA-CC1S | Synchronization Output Module (Standard Mount) - UL/ULC Listed | 0.5 (0.23) |
| SIGA-MCC1S | Synchronization Output Module (UIO Mount) - UL/ULC Listed | 0.18 (0.08) |

| Related Equipment | | |
|---|---|---|
| 27193-21 | Surface Mount Box - Red, 2-gang | 2 (1.2) |
| 27193-26 | Surface Mount Box - White, 2-gang | 2 (1.2) |
| SIGA-UIO2R | Universal Input-Output Module Board w/Riser Inputs - Two Module Positions | 0.32 (0.15) |
| SIGA-UIO6R | Universal Input-Output Module Board w/Riser Inputs - Six Module Positions | 0.62 (0.28) |
| SIGA-UIO6 | Universal Input-Output Module Board - Six Module Positions | 0.56 (0.25) |
| 235196P | Bi-polar Transient Protector | 0.01 (0.05) |
| MFC-A | Multifunction Fire Cabinet - Red, supports Signature Module Mounting Plates | 7.0 (3.1) |
| SIGA-MP1 | Signature Module Mounting Plate, 1 footprint | 1.5 (0.70) |
| SIGA-MP2 | Signature Module Mounting Plate, 1/2 footprint | 0.5 (0.23) |
| SIGA-MP2L | Signature Module Mounting Plate, 1/2 extended footprint | 1.02 (0.46) |

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# Universal Input/ Output Module Motherboards

## SIGA-UIO2R, SIGA-UIO6R,




## Overview

Signature Series Universal Input-Output Module Motherboards provide mounting and wiring terminations for up to six Signature Series plug-in UIO (SIGA-"M" series) modules. UIO motherboards slide into a rigid extruded track (included) with mounting pads for convenient mounting into a variety of equipment enclosures. UIO modules plug into the board and are held securely in place with captive machine screws. All field wiring connects to terminal blocks on the motherboard, which permits rapid removal and replacement of modules for troubleshooting.

The **SIGA-UIO2R** provides mounting and wiring terminations for up to two UIO modules, and the **SIGA-UIO6R** provides mounting and wiring terminations for up to six UIO modules. Both mother-boards feature a riser #1 input and a riser #2 input bus. Jumpers on riser #1 input, between modules, facilitate sharing a single riser among more than one module. This significantly reduces wiring requirements. Removing the jumpers provide separate riser inputs to each adjacent module. Riser #2 input is fixed to each module position and cannot be split.

The **SIGA-UIO6** provides mounting and wiring terminations for up to six UIO modules. This motherboard provides two riser inputs that are common to all modules.

## Standard Features

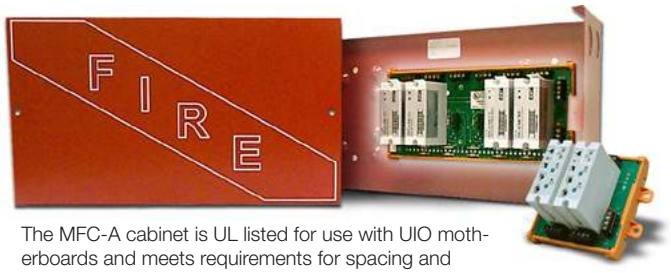
- **Modular flexibility**
  Wide assortment of multi-function plug-in modules provides total flexibility.
- **Minimum wiring requirements**
  Integral jumpers between modules allow sharing of risers to reduce installation wiring.
- **Easy installation**
  #12 AWG (2.5 mm2) terminal blocks and sturdy mounting pads ensure quick installation into Edwards enclosures.
- **Supports automatic device mapping**
  All compatible UIO modules transmit information to the loop controller regarding their circuit locations with respect to other Signature devices on the wire loop.
- **Supports intelligent devices**
  On-board modules make decisions and input an alarm from initiating devices connected to them even if the loop controller's polling interrogation stops.
- **Twisted or shielded wire not required**
  Because all decisions are made at the on-board modules, lower communication speeds are possible. This results in substantially improved control panel response time and less sensitivity to line noise and loop wiring properties.
- **Supports electronic addressing**
  Programmable addresses are downloaded to compatible UIO modules from the loop controller, a PC, or the SIGA-PRO Signature Program/Service Tool. There are no switches or dials to set.

## Mounting and Installation

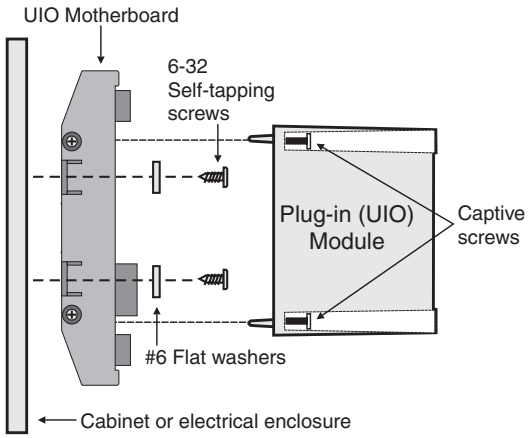
Mount the UIO motherboard inside a Edwards MFC-A cabinet or other suitable electrical enclosure with screws and washers provided. Each MFC-A will hold one UIO2R motherboard or one UIO6 or UIO6R motherboard complete with their full complement of modules.

Plug a Signature Series UIO module into any available position on the motherboard and secure the module to the motherboard with the captive screws. Wiring connections are made to the terminals on the motherboard (see wiring diagram). UIO motherboard terminals are suited for #12 to #18 AWG (2.5 $mm^2$ to 0.75 $mm^2$) wire size.

Edwards recommends that all boards and modules be installed according to latest recognized edition of national and local fire alarm codes.




The MFC-A cabinet is UL listed for use with UIO motherboards and meets requirements for spacing and clearance around the components.




## Testing & Maintenance

The module's automatic self-diagnosis identifies when it is defective and causes a trouble message. The user-friendly maintenance program shows the current state of each module and other pertinent messages. Single modules may be turned off (de-activated) temporarily, from the control panel.

Scheduled maintenance (Regular or Selected) for proper system operation should be planned to meet the requirements of the Authority Having Jurisdiction (AHJ). Refer to current NFPA 72 and ULC CAN/ULC 536 standards.

## Compatibility

Signature Series Universal Input/Output Module Boards are compatible only with SIGA-"M" Series I/O Modules, which require a Signature Data Controller.

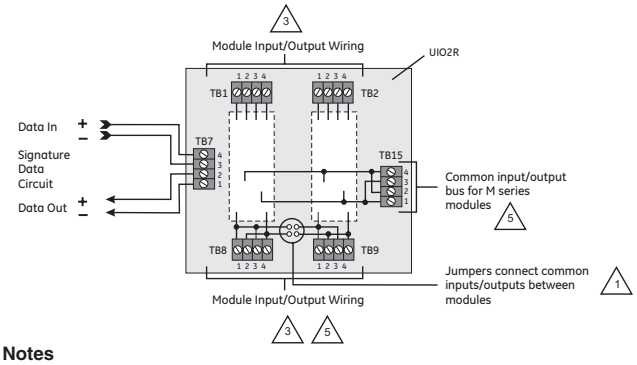
## Warnings & Cautions

Signature devices will not operate without electrical power. As fires frequently cause power interruption, we suggest you discuss further safeguards with your fire protection specialist.

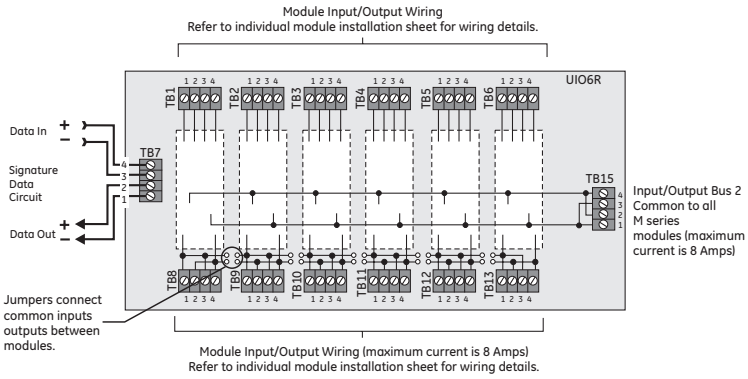
# Typical Wiring

Signature Series Universal Input/Output Motherboards have terminal blocks to accept #18 AWG (0.75mm$^2$), #16 AWG (1.0mm$^2$), #14 AWG (1.5mm$^2$), and #12 AWG (2.5mm$^2$) wire sizes. See Signature Data Controller catalog sheets for detailed wiring requirements and specifications.

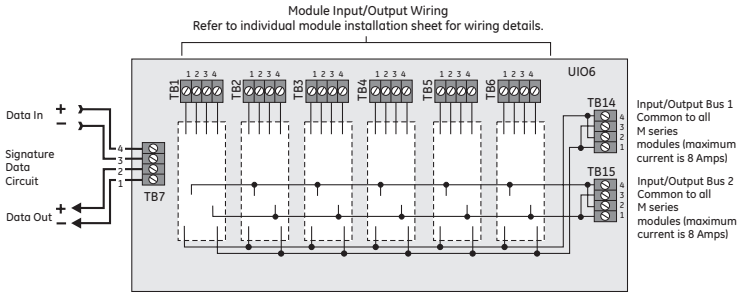
## SIGA-UIO2R




## SIGA-UIO6R




## SIGA-UIO6




**Notes**

1) Jumpers may be used to make the inputs/outputs between modules common.

2) Not all modules use the SIGA-UIO2R terminals for the same functions.

3) Refer to individual SIGA-M series installation sheets for jumper settings and wiring information. Installations with multiple SIGA-UIO motherboards or enclosures (which include other wiring) require FPL, FPLR, FPLP, or equivalent NEC-approved wire for all power limited wiring. Observe the details of supervision and power limited versus non-power limited circuits. Refer to the SIGA-M series installation sheets.

4) Do not mix incompatible signals.

5) Maximum current is 8 Amps.

7) Refer to Signature Data Controller Installation Sheets for wiring specifications.

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## Specifications

| Catalog Number | SIGA-UIO2R | SIGA-UIO6R | SIGA-UIO6 |
|---|---|---|---|
| Module Capacity | Two | Six | Six |
| Dimensions (with module installed) | 5.4 inch L (across mounting feet) x 4.3 inch W x 3.2 inch H | 9.56 inch L (across mounting feet) x 4.3 inch W x 3.2 inch H | |
| Address Requirements | no address required | | |
| Type Code | none | | |
| Compatible Modules | All SIGA-Mxxx Signature Series | | |
| Operating Voltage | 15.2 to 19.95 Vdc (19 Vdc nominal) | | |
| Mounting (cabinets) | Directly into suitable enclosures (e.g.: MFC-A) - Notes 1, 2, 3. | | |
| Wiring Terminals | #12 AWG (2.5mm²) to #18 AWG (0.75mm²) | | |
| Storage and Operating Environment | Operating Temperature: 32°F to 120°F (0°C to 49°C)<br>Storage Temperature: -4°F to 140°F (-20°C to 60°C)<br>Operating and Storage Humidity: 0 to 93% RH | | |
| Agency Listing | UL, ULC, MEA, CSFM | | |

**Notes:**

1. Allow a minimum clearance of one inch around all sides of the UIO motherboard.
2. On-site drilling of mounting holes may be required. Self-tapping mounting screws are provided.
3. Suitable cabinets: MFC-A, 2-WB, 2-WB3, 2-WB7, CAB2, 3-CAB5, 3-CAB7, 3-CAB14, 3-CAB21, 3-RCC series, RACC series.

## Ordering Information

| Catalog Number | Description | Ship Wt. - lb (kg) |
|---|---|---|
| SIGA-UIO2R | Universal Input-Output Module Board w/Riser Inputs - Two Module Positions | 0.32 (0.15) |
| SIGA-UIO6R | Universal Input-Output Module Board w/Riser Inputs - Six Module Positions | 0.62 (0.28) |
| SIGA-UIO6 | Universal Input-Output Module Board - Six Module Positions | 0.56 (0.25) |
| MFC-A | UL listed cabinet for mounting UIO motherboards, red with white “FIRE” 8 inch H X 14 inch W X 3.5 inch D (203 mmH X 356 mm W X 89 mm D) | 7.0 (3.1) |

EDWARDS

LIFE SAFETY & INCIDENT MANAGEMENT

# Input Modules

## SIGA-CT1, SIGA-CT1HT, SIGA-CT2, SIGA-MCT2



SIGA-MCT2



SIGA-CT1/2

FM APPROVED MEA

7300-1657: 0121

S3424

## Overview

The SIGA-CT1 Single Input Module, SIGA-CT1HT High Temperature Single Input Module and SIGA-CT2/SIGA-MCT2 Dual Input Modules are intelligent analog addressable devices used to connect one or two Class B normally-open Alarm, Supervisory, or Monitor type dry contact Initiating Device Circuits (IDC).

The actual function of these modules is determined by the "personality code" selected by the installer. This code is downloaded to the module from the Signature loop controller during system configuration.

The input modules gather analog information from the initiating devices connected to them and convert it into digital signals. The module's on-board microprocessor analyzes the signal and decides whether or not to input an alarm.

**The SIGA-CT1, SIGA-CT1HT and SIGA-CT2** mount to standard North American 1-gang electrical boxes, making them ideal for locations where only one module is required. Separate I/O and data loop connections are made to each module.

The SIGA-CT1HT module operates at an expanded temperature range of 32 ºF to 158 ºF (0 ºC to 70 ºC) for those applications requiring more extreme environmental temperature variation.

**The SIGA-MCT2** is part of the UIO family of plug-in Signature Series modules. It functions identically to the SIGA-CT2, but takes advantage of the modular flexibility and easy installation that characterizes all UIO modules. Two- and six-module UIO motherboards are available. All wiring connections are made to terminal blocks on the motherboard. UIO assemblies may be mounted in EDWARDS enclosures.

## Standard Features

- **Multiple applications**
  Including Alarm, Alarm with delayed latching (retard) for waterflow applications, Supervisory, and Monitor. The installer selects one of four "personality codes" to be downloaded to the module through the loop controller.
- **SIGA-CT1HT rated for high temperature environments**
  Suitable for attic installation and monitoring high temperature heat detectors.
- **Plug-in (UIO) or standard 1-gang mount**
  UIO versions allow quick installation where multiple modules are required. The 1-gang mount version is ideal for remote locations that require a single module.
- **Automatic device mapping**
  Signature modules transmit information to the loop controller regarding their circuit locations with respect to other Signature devices on the wire loop.
- **Electronic addressing**
  Programmable addresses are downloaded from the loop controller, a PC, or the SIGA-PRO Signature Program/Service Tool. There are no switches or dials to set.
- **Ground fault detection by address**
  Detects ground faults right down to the device level.

## Signature Series Overview

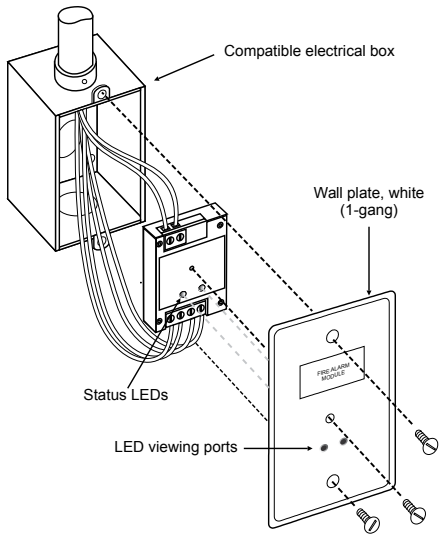
The Signature Series intelligent analog-addressable system from EDWARDS Security is an entire family of multi-sensor detectors and mounting bases, multiple-function input and output modules, network and non-network control panels, and user-friendly maintenance and service tools. Analog information from equipment connected to Signature devices is gathered and converted into digital signals. An onboard microprocessor in each Signature device measures and analyzes the signal and decides whether or not to input an alarm. The microprocessor in each Signature device provides four additional benefits – Self-diagnostics and History Log, Automatic Device Mapping, and Fast, Stable Communication.

**Self-diagnostics and History Log** – Each Signature Series device constantly runs self-checks to provide important maintenance information. The results of the self-check are automatically updated and permanently stored in its non-volatile memory. This information is accessible for review any time at the control panel, PC, or using the SIGA-PRO Signature Program/ Service Tool.

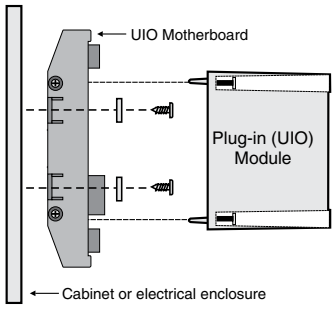
**Automatic Device Mapping** –The Signature Data Controller (SDC) learns where each device's serial number address is installed relative to other devices on the circuit. The SDC keeps a map of all Signature Series devices connected to it. The Signature Series Data Entry Program also uses the mapping feature. With interactive menus and graphic support, the wired circuits between each device can be examined. Layout or "as-built" drawing information showing branch wiring (T-taps), device types and their address are stored on disk for printing hard copy.

## Installation

**SIGA-CT1, SIGA-CT1HT and SIGA-CT2:** modules mount to North American 2½ inch(64 mm) deep 1-gang boxes and 1½ inch (38 mm) deep 4 inch square boxes with 1-gang covers and SIGA-MP mounting plates. The terminals are suited for #12 to #18 AWG (2.5 $mm^2$ to 0.75 $mm^2$) wire size.




**SIGA-MCT2:** mount the UIO motherboard inside a suitable EDWARDS enclosure with screws and washers provided. Plug the SIGA-MCT2 into any available position on the motherboard and secure the module to the motherboard with the captive screws. Wiring connections are made to the terminals on the motherboard (see wiring diagram). UIO motherboard terminals are suited for #12 to #18 AWG (2.5 $mm^2$ to 0.75 $mm^2$) wire size.




**Electronic Addressing** - The loop controller electronically addresses each module, saving valuable time during system commissioning. Setting complicated switches or dials is not required. Each module has its own unique serial number stored in its on-board memory. The loop controller identifies each device on the loop and assigns a "soft" address to each serial number. If desired, the modules can be addressed using the SIGA-PRO Signature Program/Service Tool.

EDWARDS recommends that this module be installed according to latest recognized edition of national and local fire alarm codes.

## Application

The duty performed by the SIGA-CT1 and SIGA-CT2/MCT2 is determined by their sub-type code or "Personality Code". The code is selected by the installer depending upon the desired application and is downloaded from the loop controller.

One personality code can be assigned to the SIGA-CT1. Two personality codes can be assigned to the SIGA-CT2/MCT2. Codes 1, 2, 3 and 4 can be mixed on SIGA-CT2/MCT2 modules only. For example, personality code 1 can be assigned to the first address (circuit A) and code 4 can be assigned to the second address (circuit B).

**NORMALLY-OPEN ALARM - LATCHING (Personality Code 1) -** Assign to one or both circuits. Configures either circuit A or B or both for Class B normally open dry contact initiating devices such as Pull Stations, Heat Detectors, etc. An ALARM signal is sent to the loop controller when the input contact is closed. The alarm condition is latched at the module.

**NORMALLY-OPEN ALARM - DELAYED LATCHING (Personality Code 2) -** Assign to one or both circuits. Configures either circuit A or B or both for Class B normally-open dry contact initiating devices such as Waterflow Alarm Switches. An ALARM signal is sent to the loop controller when the input contact is closed for approximately 16 seconds. The alarm condition is latched at the module.

**NORMALLY-OPEN ACTIVE - NON-LATCHING (Personality Code 3) -** Assign to one or both circuits. Configures either circuit A or B or both for Class B normally-open dry contact monitoring input such as from Fans, Dampers, Doors, etc. An ACTIVE signal is sent to the loop controller when the input contact is closed. The active condition is not latched at the module.

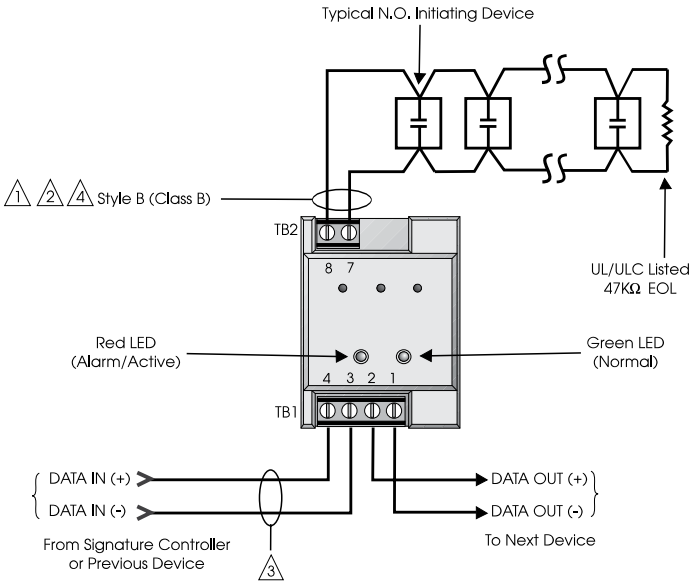
**NORMALLY-OPEN ACTIVE - LATCHING (Personality Code 4) -** Assign to one or both circuits. Configures either circuit A or B or both for Class B normally open dry contact monitoring input such as from Supervisory and Tamper Switches. An ACTIVE signal is sent to the loop controller when the input contact is closed. The active condition is latched at the module.

## Typical Wiring

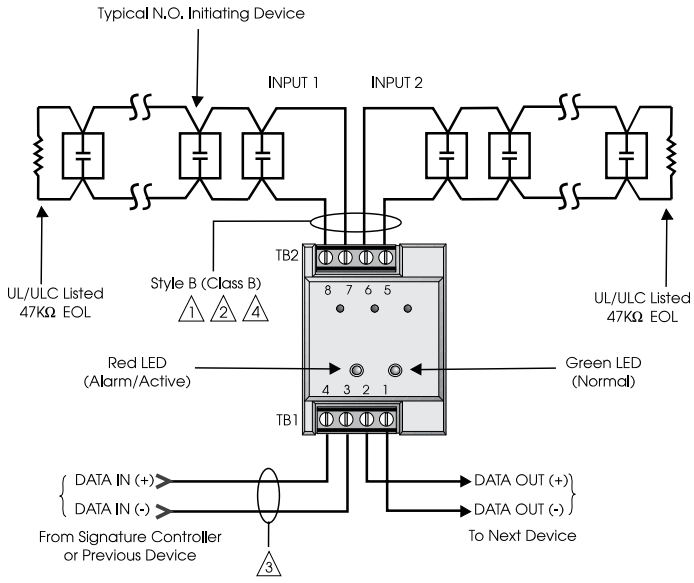
Modules will accept #18 AWG (0.75mm²), #16 (1.0mm²), and #14AWG (1.50mm²), and #12 AWG (2.50mm²) wire sizes.

Note: Sizes #16 AWG (1.0mm²) and #18 AWG (0.75mm²) are preferred for ease of installation. See Signature Loop Controller catalog sheet for detailed wiring requirement specifications.

| Initiating (Slave) Device Circuit Wire Specifications | | |
|---|---|---|
| Maximum Allowable Wire Resistance | 50 ohms (25 ohms per wire) per Circuit | |
| Maximum Allowable Wire Capacitance | 0.1µF per Circuit | |
| For Design Reference: | **Wire Size** | **Maximum Distance to EOLR** |
| | #18 AWG (0.75 mm²) | 4,000 ft (1,219 m) |
| | #16 AWG (1.00 mm²) | |
| | #14 AWG (1.50 mm²) | |
| | #12 AWG (1.50 mm²) | |



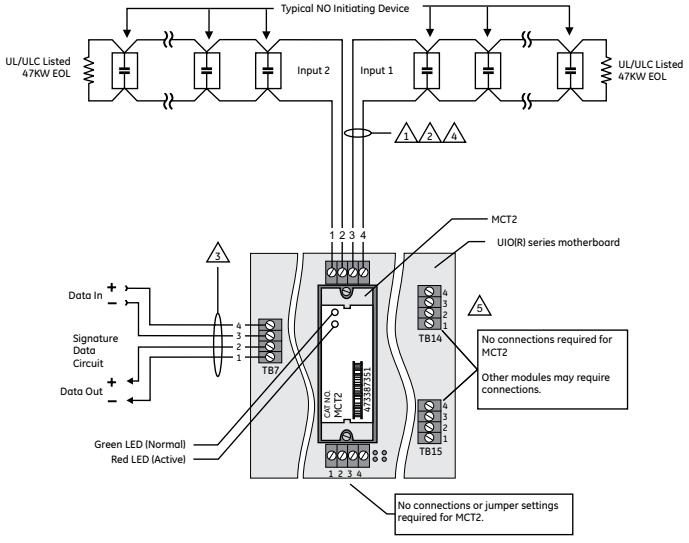

SIGA-CT1, SIGA-CT1HT




SIGA-CT2

**NOTES**

1. **Maximum 25 Ohm resistance per wire.**
2. **Maximum #12 AWG (2.5 mm² ) wire; Minimum #18 AWG (0.75 mm2).**
3. **Refer to Signature controller installation sheet for wiring specifications.**
4. **Maximum 10 Vdc @ 350 µA**
5. **The SIGA-UIO6R and the SIGA-UIO2R do not come with TB14.**
6. **All wiring is supervised and power-limited.**
7. **These modules will not support 2-wire smoke detectors.**




SIGA-MCT2

## Warnings & Cautions

This module will not operate without electrical power. As fires frequently cause power interruption, we suggest you discuss further safeguards with your local fire protection specialist.

## Compatibility

These modules are part of EDWARDS's Signature Series intelligent processing and control platform. They are compatible with EST3, EST3X and iO Series control panels.

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## Specifications

| Catalog Number | SIGA-CT1HT | SIGA-CT1 | SIGA-CT2 | SIGA-MCT2 |
|---|---|---|---|---|
| Description | Single Input Module | | Dual Input Module | |
| Type Code | 48 (factory set) Four sub-types (personality codes) are available | | 49 (factory set) Four sub-types (personality codes) are available | |
| Address Requirements | Uses One Module Address | | Uses Two Module Addresses | |
| Operating Current | Standby = 250µA; Activated = 400µA | | Standby = 396µA; Activated = 680µA | |
| Operating Voltage | 15.2 to 19.95 Vdc (19 Vdc nominal) | | | |
| Construction | High Impact Engineering Polymer | | | |
| Mounting | North American 2½ inch (64 mm) deep one-gang boxes and 1½ inch (38 mm) deep 4 inch square boxes with one-gang covers and SIGA-MP mounting plates | | | UIO2R/6R/6 Motherboard |
| Operating Environment | 32°F to 158°F (0°C to 70°C) | 32°F to 120°F (0°C to 49°C) | | |
| Storage Environment | -4°F to 140°F (-20°C to 60°C); Humidity: 0 to 93% RH | | | |
| LED Operation | On-board Green LED - Flashes when polled; On-board Red LED - Flashes when in alarm/active. | | | |
| Compatibility | Use with Signature Loop Controller | | | |
| Agency Listings | UL, ULC, MEA, CSFM | | | |

## Ordering Information

| Catalog Number | Description | Ship Wt. lbs (kg) |
|---|---|---|
| SIGA-CT1 | Single Input Module — UL/ULC Listed | 0.4 (0.15) |
| SIGA-CT1HT | Single Input Module High Temperature Operation UL/ULC Listed | 0.4 (0.15) |
| SIGA-CT2 | Dual Input Module — UL/ULC Listed | 0.4 (0.15) |
| SIGA-MCT2 | Dual Input Plug-in (UIO) Module — UL, ULC Listed | 0.1 (0.05) |

| Related Equipment | | |
|---|---|---|
| 27193-11 | Surface Mount Box - Red, 1-gang | 1.0 (0.6) |
| 27193-16 | Surface Mount Box - White, 1-gang | 1.0 (0.6) |
| SIGA-UIO2R | Universal Input-Output Module Board w/Riser Inputs — Two Module Positions | 0.32 (0.15) |
| SIGA-UIO6R | Universal Input-Output Module Board w/Riser Inputs — Six Module Positions | 0.62 (0.28) |
| SIGA-UIO6 | Universal Input-Output Module Board — Six Module Positions | 0.56 (0.25) |
| MFC-A | Multifunction Fire Cabinet — Red, supports Signature Module Mounting Plates | 7.0 (3.1) |
| SIGA-MB4 | Transponder Mounting Bracket (allows for mounting two 1-gang modules in a 2-gang box) | 0.4 (0.15) |
| SIGA-MP1 | Signature Module Mounting Plate, 1 footprint | 1.5 (0.70) |
| SIGA-MP2 | Signature Module Mounting Plate, 1/2 footprint | 0.5 (0.23) |
| SIGA-MP2L | Signature Module Mounting Plate, 1/2 extended footprint | 1.02 (0.46) |

LIFE SAFETY & INCIDENT MANAGEMENT

# Intelligent Duct Smoke Detector

## SIGA-SD




FM APPROVED MEA 3242-1657: 0223 UL ULC S853

## Overview

The EDWARDS *SuperDuct* Signature Series smoke detector is the most advanced and most reliable device in its class. Designed for easy installation and superb reliability, *SuperDuct* represents the perfect balance of practical design and advanced technology.

***SuperDuct* detectors** feature a unique design that speeds installation and simplifies maintenance. Removable dust filters, conformally coated circuit boards, and optional water-resistant gaskets keep contaminants away from components, ensuring years of trouble-free service. When cleaning is required, the assemblies come apart easily and snap back together in seconds.

**A Signature Series photoelectric sensor** is incorporated into the design of each SIGA-SD duct smoke detector. This sensor inherits the power and benefits of this exceptional line of intelligent devices.

Signature Series sensors gather analog information from their smoke sensing elements and convert it into digital signals. The sensor measures and analyses these signals and compares the information to historical readings and time patterns to make an alarm decision. Digital filters remove signal patterns that are not typical of fires, which virtually eliminates unwanted alarms.

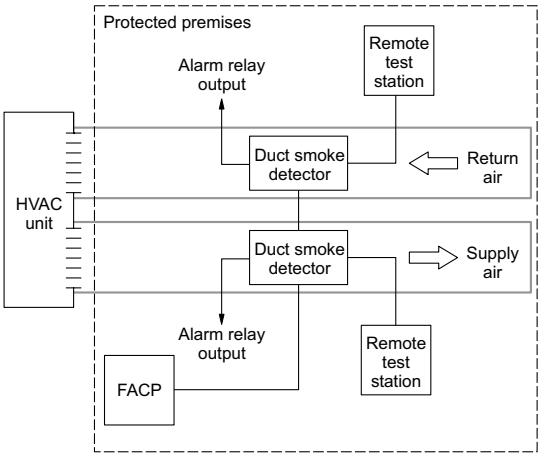
**WARNING:** Duct detectors have specific limitations. Duct detectors are not a substitute for an open area smoke detector. Duct detectors are not a substitute for early warning detection or a replacement for a building's regular fire detection system. Smoke detectors are not designed to detect toxic gases which can build up to hazardous levels in some fires. These devices will not operate without electrical power. As fires frequently cause power interruptions, EDWARDS suggests you discuss further safeguards with your local fire protection specialist.

## Standard Features

- Less than 2" deep for easy installation and applications where space is tight
- -20°F to 158°F (-29°C to 70°C) operating range with 100 ft/min. to 4,000 ft/min air velocity rating assures reliability under harsh environmental conditions
- Status LEDs remain visible through clear assembly cover
- Cover monitor switch for added security
- Standard sampling tube spacing for easy drop-in migration from other detectors
- Sampling tube can be installed with or without the cover in place and can be rotated in 45-degree increments to ensure proper alignment with duct airflow
- 15.2 to 19.95 Vdc operation
- Magnet-activated test switch
- One Form C auxiliary alarm relay for controlling ancillary equipment (e.g., HVAC controls)
- No special tools required for easy access to field connections
- Signature Series intelligence
- Environmental compensation with differential sensing for reliable, stable, and drift-free sensitivity
- Wide 0.79% to 2.46% obscuration/ft. smoke sensitivity
- Identification of dirty or defective detectors

## Application

*SuperDuct* detectors are ideally suited to duct smoke detection applications where early indication of combustion is required within the confined space of ventilation ductwork. Its primary purpose is to provide early warning of an impending fire and to prevent smoke from circulating throughout the building. It is typically used to detect smoke in the supply side of the HVAC system but can provide supervision of the return side as well.




*SuperDuct* detectors continually sample air flow in the HVAC duct and initiate an alarm condition whenever smoke is detected. An alarm is activated when the quantity (percent obscuration) of combustion products in that air sample exceeds the detector's sensitivity setting.

### Signature Series Intelligence

Like all Signature detectors, the SIGA-SD features electronic addressing and issues a dirty sensor warning when it reaches its preset limit. The dirty sensor warning indicates the sensor is operating within its specified limits but is in need of servicing. When the detector's ability to compensate for environmental changes has reached its limit, the duct smoke detector signals a trouble condition.

The SIGA-SD also uses differential sensing to prevent gradual environmental changes from triggering unwanted alarms. A rapid change in environmental conditions, such as smoke from a fire, causes the detector to signal an alarm state, but dust and debris accumulated over time does not change alarm sensitivity.

Each Signature Series SuperDuct detector contains a microprocessor that performs comprehensive self-diagnostics and stores the results in nonvolatile memory. Stored results include details such as hours of operation, last maintenance date, and number of alarms and troubles. This information can be retrieved and reviewed when desired.

### Detector Configuration

The detector assembly cover provides easy access to the smoke sensor, its wiring connections, sample and exhaust tubes, and the smoke chamber itself.

Air enters the detector's sensing chamber through a sampling tube (ordered separately) that extends into the duct and is directed back into the ventilation system through an exhaust tube (included). The difference in air pressure between the two tubes pulls the sampled air through the sensing chamber. When a sufficient amount of smoke is detected in the sensing chamber, the detector initiates an alarm.

The sampling tube may be installed from either the duct side of the assembly or from inside the sensor compartment, as preferred by the installer. (The exhaust tube must be installed from the duct side.) Sampling tubes may be rotated in 45-degree increments so that air-holes can be aligned to allow the unit to be mounted at virtually any angle relative to the air flow.

In installations where the duct smoke detector's controls and indicators are hidden from view, a remote test station or an LED indicator can be connected to the detector to provide these functions.

### Remote Test Stations

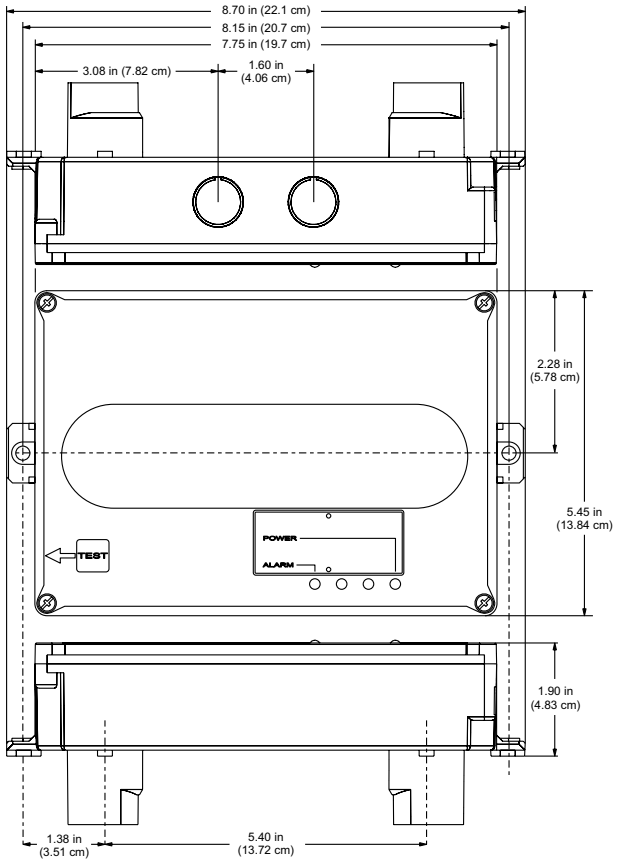


Labor-saving Remote Test/Reset stations provide alarm testing from the convenience of a remote location. Tests can be performed quickly and safely – without having to climb to the roof. Magnetically-operated and key-operated one-gang models are available. Signature SuperDuct detectors are also compatible with SIGA-LED remote alarm LED.

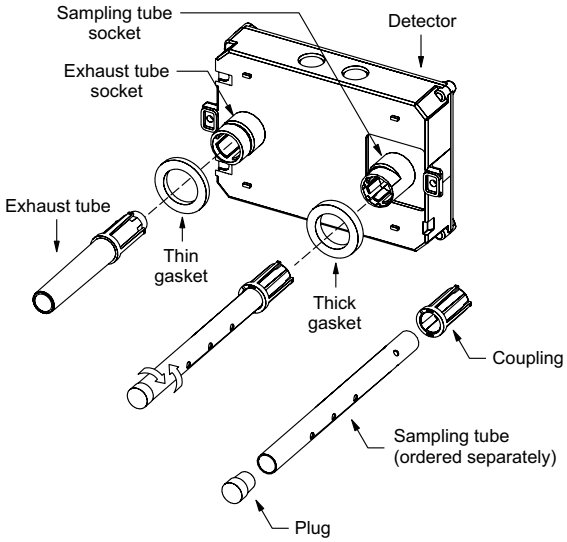
Air velocity in the duct as low as 100 ft/min. maintains adequate air flow into the sensor smoke chamber through air holes in the air sampling tube and discharges through the exhaust tube. *SuperDuct* air sampling tubes must be installed with the inlet holes facing the airstream. Sampling tubes may be rotated in 45-degree increments so that air-holes can be aligned to allow the unit to be mounted in virtually any angle relative to the airflow.

*SuperDuct* sensors are engineered to operate optimally under the harsh environmental conditions frequently found in HVAC ductwork. Nonetheless, before installing the detector, test the duct air velocity, temperature, and humidity to verify that it is within the operating range of the *SuperDuct* detector. Consult the *SuperDuct* installation sheet for details.

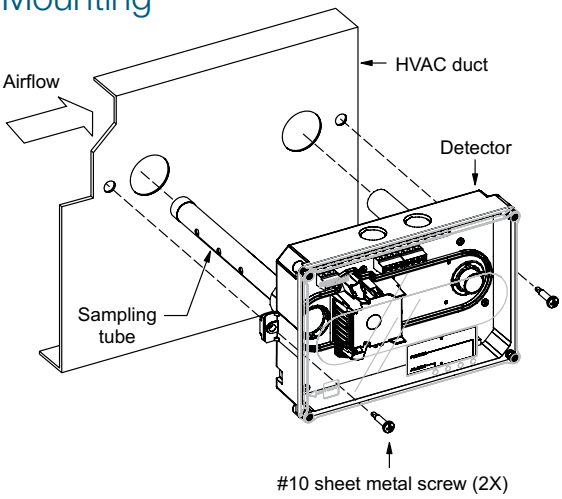
## Dimensions



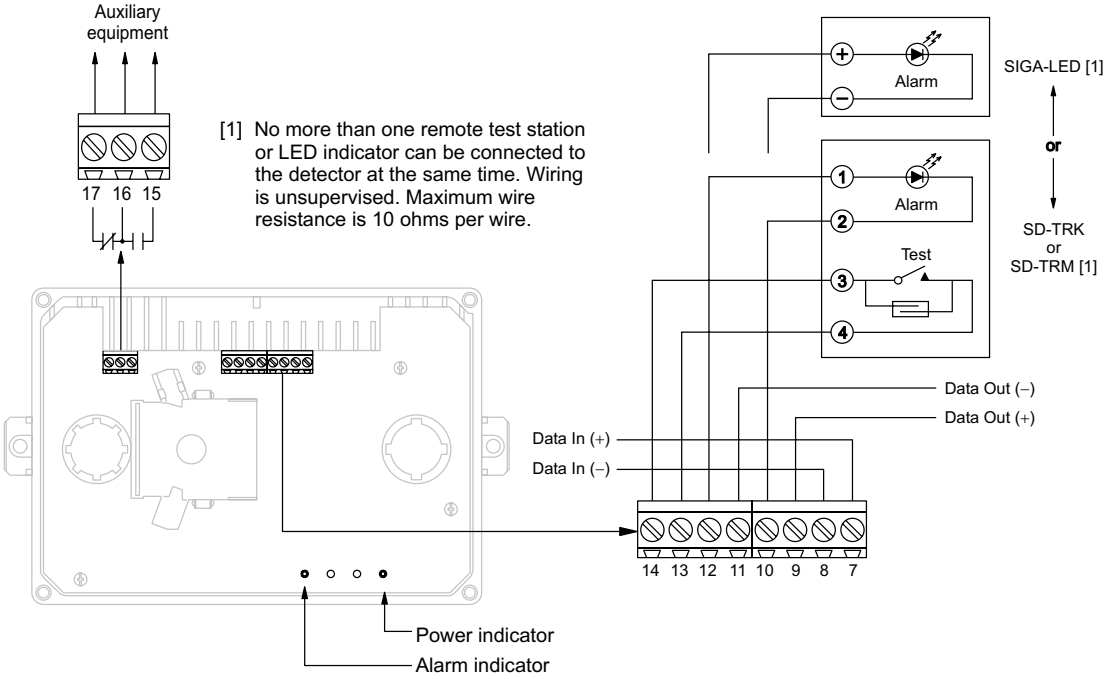
## Assembly




## Mounting

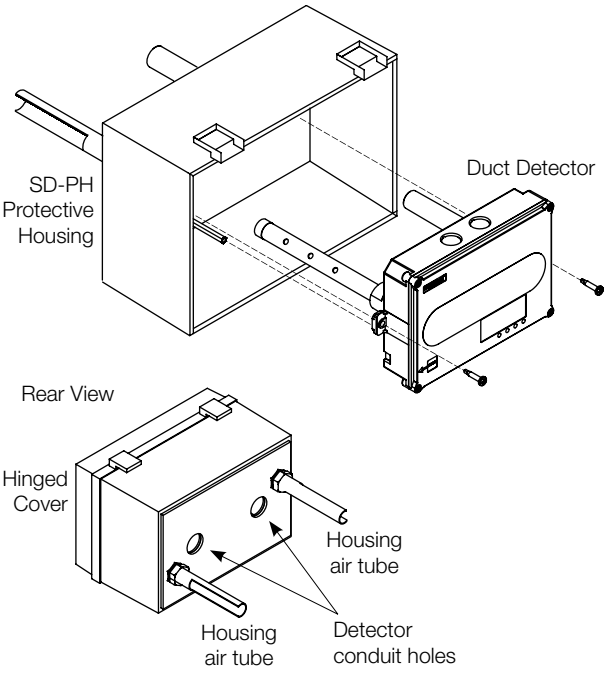



## Wiring




## High-humidity environments

Use the SD-PH Protective Housing when installing SuperDuct detectors in high-humidity environments. The SD-PH is a weatherized housing that prevents condensation on the device by insulating the detectors and providing circulated air from the monitored HVAC duct. The SD-PH also adds a layer of protection against physical damage to the unit.




The SD-PH is easy to install and service. The hinged and transparent cover provides ready access to the detector, while keeping its status indicators visible at all times.

Note: The SD-PH Protective Housing is weatherized against outdoor air, but it is not intended for direct outdoor exposure.

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Website: edwardsfiresafety.com

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Bradenton, FL 34202

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## Specifications, detector

| | |
|---|---|
| Dimensions | 8.70 x 5.45 x 1.90 inches (221 x 138 x 48 mm) |
| Wire size | 14 to 22 AWG |
| Detection method | Photoelectric (light scattering principle) |
| Air velocity rating | 100 to 4,000 ft/min and meets the required minimum air pressure differential |
| Air pressure differential | 0.005 to 1.00 inches of water |
| Sensitivity | 0.79 to 2.46 %/ft obscuration |
| Alarm test response time | 5 seconds |
| LED indicators | Alarm (red), Power (green) |
| Common alarm relay | Unsupervised and power-limited<br>Quantity: 1<br>Type: Form C<br>Ratings: 2.0 A at 30 Vdc (resistive) |
| Operating voltage | 15.2 to 19.95 Vdc |
| Operating current | Standby: 45 µA Alarm: 45 µA Inrush: 1 mA Standalone alarm: 18 mA |
| Operating environment | Temperature (UL): -20 to 158 °F (-29 to 70 °C). Temperature (ULC): -4 to 120 °F (-29 to 49 °C) Relative humidity: 10 to 93%, noncondensing |
| Agency listings | UL, ULC, CSFM, FM, MEA |

## Specifications, test stations

Remote Test/Reset Stations provide alarm test, trouble indication, and reset capability from a remote location. They include a one-gang plate, momentary SPST switch, red alarm LED, and terminal block. Magnetically-operated models (TRM) or key-operated models (TRK) are available.

| | |
|---|---|
| Compatible electrical boxes | North American 1-gang box Standard 4-in square box, 1-1/2 inches deep, with 1-gang cover |
| LED indicators | Alarm (red) |
| LED type | Clear lens |
| Wire size | 14 to 22 AWG |
| Resistance per wire | 10 Ohms, max. |
| Current requirements | See controller specifications |
| LED circuit ratings | Voltage: 3 Vdc, max. Current: 30 mA, max. |
| Switch ratings (SD-TRK) | Voltage: 125 Vdc, max. Current: 4 A, max. |
| Switch ratings (SD-TRM) | Voltage: 200 Vdc, max. Current: 0.5 A, max. |
| Compatible detectors | SuperDuct conventional two-wire and Signature duct smoke detectors |
| Operating environment | -4°F to 158°F (-20°C to 70°C) Humidity: 93% RH, noncondensing |
| Storage temperature | -4 to 140 °F (-20 to 60 °C) |
| Agency listings | UL, ULC, MEA, CSFM |

## Ordering Information

| Catalog Number | Description | Ship Wt., lb. (kg) |
|---|---|---|
| SIGA-SD | Intelligent SuperDuct Detector | 2.4 (1.1) |
| **Accessories** | | |
| SD-T8 | 8-inch sampling tube | 0.5 (0.2) |
| SD-T18 | 18-inch sampling tube | 1.5 (0.7) |
| SD-T24 | 24-inch sampling tube | 2.7 (1.2) |
| SD-T36 | 36-inch sampling tube | 3.0 (1.4) |
| SD-T42 | 42-inch sampling tube | 3.5 (1.6) |
| SD-T60 | 60-inch sampling tube | 5.8 (2.6) |
| SD-T78 | 78-inch sampling tube | 7.5 (3.4) |
| SD-T120 | 120-inch sampling tube | 11.5 (5.2) |
| SD-PH | Protective housing for high humidity environments | 5.5 (2.5) |
| SIGA-LED | Remote alarm LED | 1.0 (0.5) |
| SD-TRM | Remote test station, magnetic | 1.0 (0.5) |
| SD-TRK | Remote test station, keyed | 1.0 (0.5) |
| SD-VTK | Air velocity test kit (stoppers only, etc) | 1.0 (0.5) |
| SD-GSK | Cover gasket kit | 0.5 (0.2) |
| SD-MAG | Test magnet kit | 0.5 (0.2) |
| SIGA-SDPCB | Replacement PCB/Signature sensor kit | 1.0 (0.5) |

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LIFE SAFETY & INCIDENT MANAGEMENT

# End-to-End Beam Smoke Detector

## EC3000



S3417

7260-1508-105

## Description

The EC3000 is an end-to-end infrared optical beam smoke detector that comprises an infrared transmitter, receiver, and controller. The transmitter and receiver are installed near the ceiling of the protected area up to 393 feet (120 m) apart, while the controller is mounted at ground level where it remains accessible for maintenance and setup functions. Each controller will handle up to two transmitter/receiver pairs, each with separate fire and fault relays.

The EC3000 is typically used in situations where it is impractical, inappropriate or not cost-effective to use point-type detectors. It also enables coverage of a large protected area at minimal cost, and is ideally suited for situations that might include high ceilings, dusty and dirty environments, or environments that are prone to temperature extremes.

The EC3000 features integrated laser alignment, which simplifies installation, and configurable detector sensitivity and drift compensation, which reduces nuisance alarms. These features and capabilities make the EC3000 a practical and effective wide area detection solution.

## Standard Features

- Separate Transmitter and Receiver Heads
- Range 16.5 to 393 feet (5 m to 120 m), configurable per set of Detectors
- Lateral Spacing per NFPA 72 is 60 feet
- Integral Laser Alignment in Receiver
- 2-wire Interface between Controller and Receiver
- Single and Twin Channel capability
- Separate Fire and Fault Relays per Detector
- Low Level Controller with LCD display
- Programmable Sensitivity and Fire Threshold
- Automatic Gain Control (AGC) for drift compensation
- Built-in electronic UL/ULC obscuration-acceptance fire test
- Knockouts for ease of installation and wiring
- Built-in 1/2-inch/M-20 conduit knockouts on detectors and system controller

## Application

Beam smoke detectors are ideal for large open areas such as warehouses, hotel atrium, industrial plants and school gymnasiums. End-to-end beam smoke detectors are particularly useful where line of sight for the infrared detection path is narrow and where the building structure employs reflective surfaces.

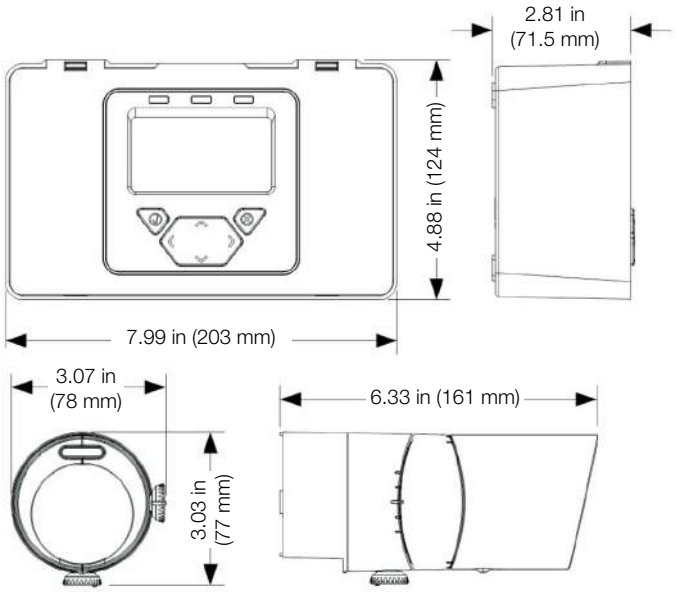
The EC300 is designed to be aesthetically pleasing making it equally suitable for modern architectural buildings, as well as historical sites – particularly where ornate ceilings exist.

Smoke stratification may be overcome by mounting pairs of receivers and transmitters at different heights, one of which will project an infrared beam below the heat layer and into the smoke layer.

Detection time will be longer in a building with a peaked roof if a fire occurs at the fringes of the protected area. If in doubt conduct appropriate smoke tests.

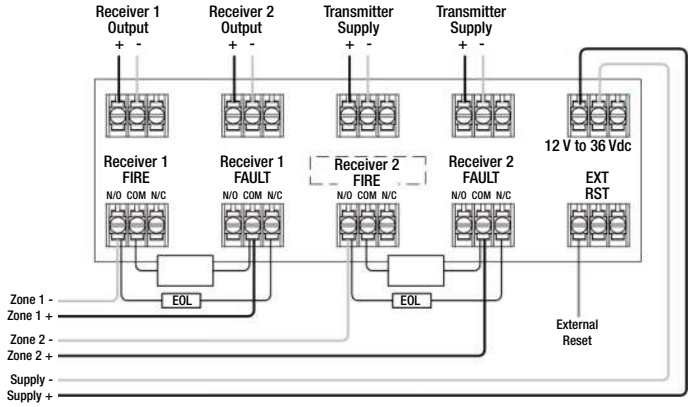
The ideal location and spacing of the detector is critical in a properly installed and operating fire alarm system. It is recommended that the detectors be located and spaced in accordance with NFPA 72, which allows for lateral spacing of up to 60 ft (18.3 m).

## Dimensions

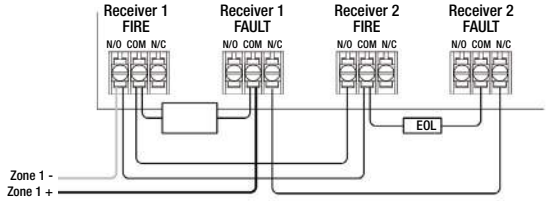



## Typical Wiring

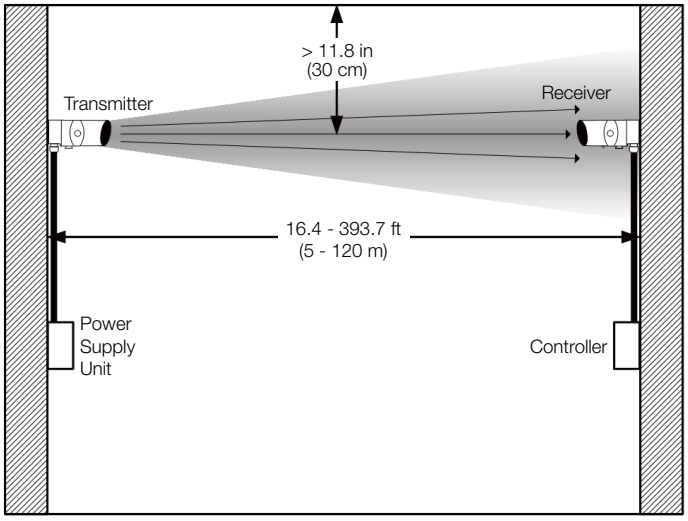
**Two Receivers, two zones...**




**Two Receivers, one zone...**

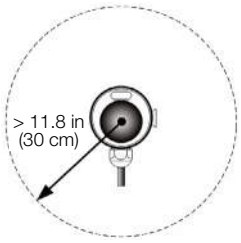



## Installation




The distance between the ceiling and transmitter/receiver must be no more than 10 percent of the distance between floor and ceiling.

Leave at least 11.8 inches (30 cm) unobstructed space around the receiver and transmitter.



## Technical Specifications

| | |
|---|---|
| Operating Voltage Range | 12 to 36V DC ±10% |
| Operating Controller Current (with 1 or 2 Receivers) | 14mA (constant) |
| Operating Transmitter Current | 8mA (per Transmitter) |
| Alarm Threshold | 25%-60% |
| Power Down Reset Time | >20 seconds |
| Fire and Fault Relay Contacts | Resistive VFCO 2A @ 30 Volts DC |
| Operating Temperature (non-condensing): | -4°F to +131°F (-20°C to +55°C) |
| Optical Wavelength | 850nm |
| Operating Range | 16.5 to 393 feet (5-120m) |
| Maximum Cable Distance Between Receiver and Controller | 330 Feet (100m) |
| Cabling between each Receiver and Controller | 18-14 AWG 1-Pair – Twisted, Jacketed |
| IP Rating | IP54 |
| Relative Humidity (non-condensing) | 93% |
| Dimensions and Weight, Control Unit | 7.99 x 4.88 x 2.81in<br>(203 x 124 x 71.5mm)<br>1.34lbs (0.607kg) |
| Dimensions and Weight, Transmitter & Receiver | 3.07 x 3.03 x 6.33in<br>(78 x 77 x 161mm)<br>0.456lbs (0.206kg) |
| Agency Listings | UL/ULC S3417, FM Pending,<br>CSFM 7260-1508-105 |
| LED Indications<br>Control Unit:<br>Receiver: | <br>Red = Fire, Amber = Fault, Green = System OK<br>Red = Fire, Alignment LEDs for single person alignment |

## Ordering Information

| | |
|---|---|
| EC3000-103 | End to End beam smoke detector 16.5ft. to 393ft. (5 m to 120 m). System includes one transmitter, one receiver, and one system control unit. |
| EC3000-016 | Additional Detector Pack (set of transmitter and receiver heads). Use up to one additional Detector Pack per EC3000-103. |
| 3000-201 | Adjustment Bracket |
| 3000-202 | Surface Mount Adapter |
| 3000-203 | 4-inch Square Cover Plate |
| 5000-011 | Surface Mount Detector Back Box (Requires one 3000-202 Surface Mount Adaptor for each head - ordered separately). |
| 3000-209 | Controller Backbox |
| 3000-210 | Semi Flush Trim Plate |
| 1000-018 | Wire Cage for EC3000 when used with the 5000-011 Detector Backbox and 3000-202 (ordered separately). |

## Engineering Specification

The projected beam type smoke detector shall be listed to U.L. 268 and shall consist of up to two transmitters, two receivers and a single low level remote control unit. The detector shall operate between a range of 16.5 ft. to 393 ft. (5m to 120m). The temperature range of the system shall be -4°F to 131°F (-20°C to 55°C). The receiver shall include an integral built-in laser pointer to assist in optimum alignment.

The beam detector shall feature automatic gain control, which will compensate for gradual signal deterioration from dirt accumulation on the lenses. The receiver heads shall incorporate a Wide Field of View to ensure the unit is always receiving maximum signal available. The system shall include a low level remote display and control unit with LCD read-out for set-up, reporting and testing of up to two separate sets of heads. The system shall be capable of sending separate Trouble and Alarm signals for each of the sets of heads. The system shall be capable of programming alarm thresholds of 25% to 60% in 1% increments.

The system shall be capable of programming delay to fault and delay to alarm from 2 seconds to 30 seconds in 1 second increments.

Test and acceptance of the system shall be carried out by using the UL/ULC approved internal electronic obscuration fire test. The projected beam type smoke detector shall be a 4-wire 24 VDC device to be used with a Nationally Recognized Testing Laboratory's Listed and separately supplied 4- wire control panel. The End to End beam type smoke detector shall be an EDWARDS EC3000.

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LIFE SAFETY & INCIDENT MANAGEMENT

# Manual Pull Stations

## SIGA-270, SIGA-270P, SIGA-278




SIGA-270 SERIES

SIGA-278

Patented

MEA FM APPROVED 7150-1657: 0129 S2318

## Overview

The SIGA-270 and SIGA-278 series Manual Pull Stations are part of EDWARDS's Signature Series system. The SIGA-270 Fire Alarm Manual Pull Stations feature our very familiar teardrop shape. They are made from die-cast zinc and finished with red epoxy powder-coat paint complemented by aluminum colored stripes and markings. With positive pull-lever operation, one pull on the station handle breaks the glass rod and turns in a positive alarm, ensuring protection plus fool-proof operation. Presignal models (SIGA-270P) are equipped with a general alarm (GA) keyswitch for applications where two stage operation is required. The up-front highly visible glass rod discourages tampering, but is not required for proper operation.

EDWARDS's double action single stage SIGA-278 station is a contemporary style manual station made from durable red colored lexan. To initiate an alarm, first lift the upper door marked "LIFT THEN PULL HANDLE", then pull the alarm handle.

## Standard Features

***Note:*** *Some features described here may not be supported by all control systems. Check your control panel's Installation and Operation Guide for details.*

- **Traditional familiar appearance**
  SIGA-270 models feature our familiar teardrop design with simple positive pull action and sturdy die-cast metal body.
- **One stage (GA), two stage (pre-signal), and double action models**
  SIGA-270 models are available for one or two stage alarm systems. The single stage double action SIGA-278 features a rugged Lexan housing with keyed reset mechanism.
- **Break glass operation**
  An up-front visible glass rod on the SIGA-270 discourages tampering.
- **Intelligent device with integral microprocessor**
  All decisions are made at the station allowing lower communication speed while substantially improving control panel response time. Less sensitive to line noise and loop wiring properties; twisted or shielded wire is not required.
- **ADA Compliant**
  Meets ADA requirements for manual pull stations.
- **Electronic Addressing with Non-volatile memory**
  Permanently stores programmable address, serial number, type of device, and job number. Automatically updates historic information including hours of operation, last maintenance date, number of alarms and troubles, and time and date of last alarm.
- **Automatic device mapping**
  Each station transmits wiring information to the loop controller regarding its location with respect to other devices on the circuit.
- **Diagnostic LEDs**
  Status LEDs; flashing GREEN shows normal polling; flashing RED shows alarm state.
- **Designed for high ambient temperature operation**
  Install in ambient temperatures up to 120 °F (49 °C).

## Application

The operating characteristics of the fire alarm stations are determined by their sub-type code or "Personality Code". NORMALLY-OPEN ALARM - LATCHING (Pesonality Code 1**)** is assigned by the factory; no user configuration is required. The device is configured for Class B IDC operation. An ALARM signal is sent to the loop controller when the station's pull lever is operated. The alarm condition is latched at the station.

## Compatibility

Signature Series manual stations are compatible only with EDWARDS's Signature Loop Controller.

## Warnings & Cautions

This device will not operate without electrical power. As fires frequently cause power interruption, we suggest you discuss further safeguards with your local fire protection specialist.

## Testing & Maintenance

To test (or reset) the station simply open the station and operate the exposed switch. The SIGA-270 series are opened with a tool; the SIGA-278 requires the key which is supplied with that station.

The station's automatic self-diagnosis identifies when it is defective and causes a trouble message. The user-friendly maintenance program shows the current state of each Signature series device and other pertinent messages. Single devices may be deactivated temporarily, from the control panel. Availability of maintenance features is dependent on the fire alarm system used.

Scheduled maintenance (Regular or Selected) for proper system operation should be planned to meet the requirements of the Authority Having Jurisdiction (AHJ). Refer to current NFPA 72 and ULC CAN/ULC 536 standards.

## Typical Wiring

The fire alarm station's terminal block accepts #18 AWG (0.75mm$^2$) to #12 AWG (2.5mm$^2$) wire sizes. See Signature Loop Controller catalog sheet for detailed wiring requirement specifications.

### Wiring Notes

1. Refer to Signature Loop Controller manual for maximum wire distance.
2. All wiring is power limited and supervised.

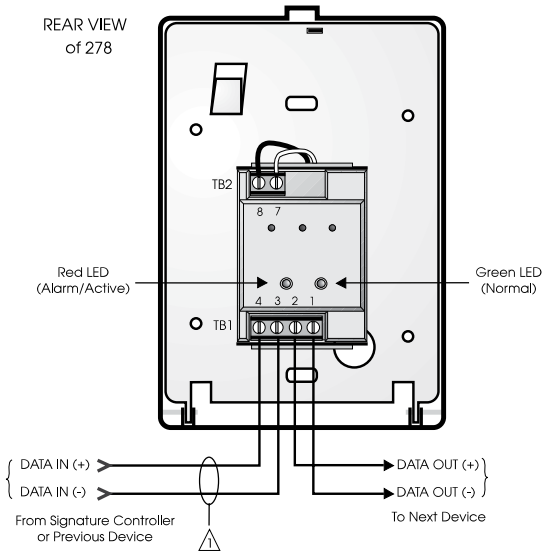



**Figure 4. Single Stage Systems**

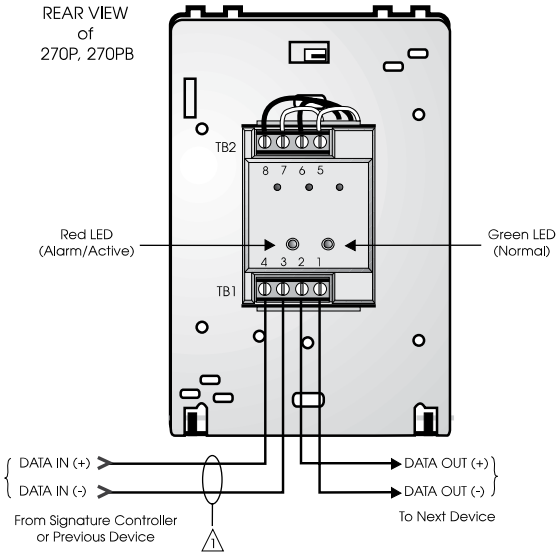



**Figure 5. Two Stage Systems**

## Installation

**Single-stage** Signature Series fire alarm manual pull stations mount to North American 2½ inch (64 mm) deep 1-gang boxes.

**Two stage** presignal (270P) models require 1½ inch (38 mm) deep 4-inch square boxes with 1-gang, ½-inch raised covers. Openings must be angular. *Rounded openings are not acceptable.* Recommended box: Steel City Model 52-C-13; in Canada, use Iberville Model CI-52-C-49-1/2.

**All models** include terminals are suited for #12 to #18 AWG (2.5 $mm^2$ to 0.75 $mm^2$) wire size. EDWARDS recommends that these fire alarm stations be installed according to latest recognized edition of national and local fire alarm codes.

**Electronic Addressing:** The loop controller electronically addresses each manual station, saving valuable time during system commissioning. Setting complicated switches or dials is not required. Each station has its own unique serial number stored in its on-board memory. The loop controller identifies each device on the loop and assigns a "soft" address to each serial number. If desired, the stations can be addressed using the SIGA-PRO Signature Program/Service Tool.

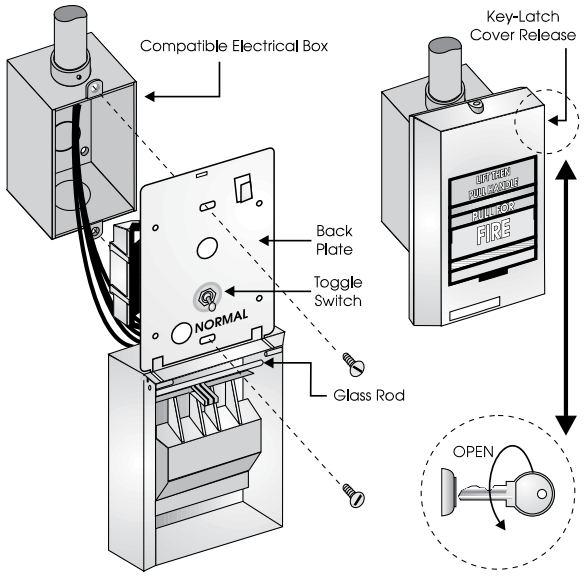



**Figure 1. SIGA-278 installation**

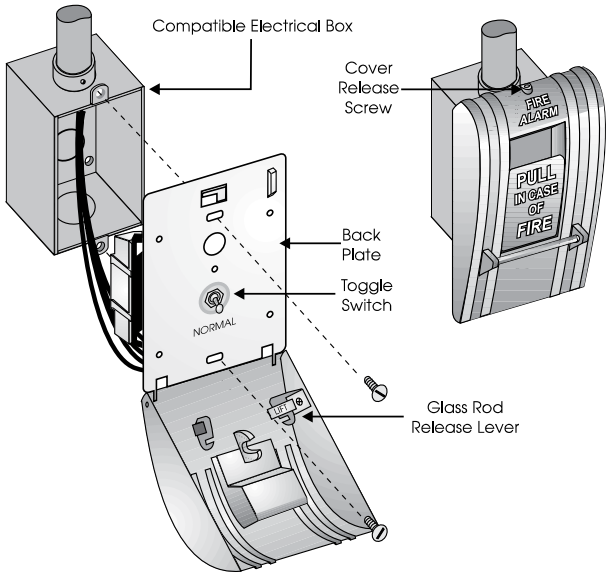



**Figure 2. SIGA-270, SIGC-270F, SIGC-270B installation**

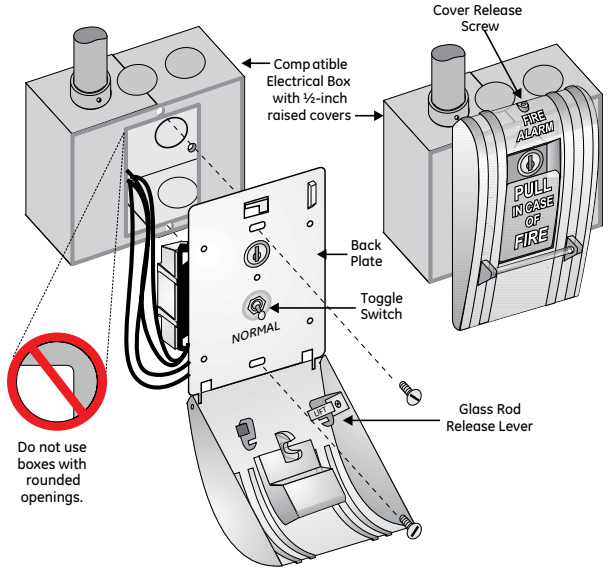



**Figure 3. SIGA-270P, SIGC-270PB installation**

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## Specifications

| Catalog Number | SIGA-270, SIGC-270F, SIGC-270B | SIGA-270P, SIGC-270PB | SIGA-278 |
|---|---|---|---|
| Description | Single Action - One Stage | Single Action -Two Stage (Presignal) | Double Action - One Stage |
| Addressing Requirements | Uses 1 Module Address | Uses 2 Module Addresses | Uses 1 Module Address |
| Operating Current | Standby = 250µA Activated = 400µA | Standby = 396µA Activated = 680µA | Standby = 250µA Activated = 400µA |
| Construction & Finish | Diecast Zinc - Red Epoxy with aluminum markings | | Lexan - Red with white markings |
| Type Code | Factory Set | | |
| Operating Voltage | 15.2 to 19.95 Vdc (19 Vdc nominal) | | |
| Storage and Operating Environment | Operating Temperature: 32ºF to 120ºF (0ºC to 49ºC) Storage Temperature: -4ºF to 140ºF (-20ºC to 60ºC) Humidity: 0 to 93% RH | | |
| LED Operation | On-board Green LED - Flashes when polled On-board Red LED - Flashes w hen in alarm | | |
| Compatibility | Use With: Signature Loop Controller | | |
| Agency Listings | UL, ULC (note 1), MEA, CSFM, FM | | |

***Note:*** *SIGC-270F, SIGC-270B and SIGC-270PB are ULC listed only. Suffix "F" indicates French markings. Suffix "B" indicates English/French biling ual markings.*

## Ordering Information

| Catalog Number | Description | Ship Wt. lbs (kg) |
|---|---|---|
| SIGA-270 | One Stage Fire Alarm Station, English Markings - UL/ULC Listed | 1 (0.5) |
| SIGC-270F | One Stage Fire Alarm Station, French Markings - ULC Listed | |
| SIGC-270B | One Stage Fire Alarm Station, French/English Markings - ULC Listed | |
| SIGA-270P | Two Stage (Presignal) Fire Alarm Station, English Markings - UL/ULC Listed | |
| SIGC-270PB | Two Stage (Presignal) Fire Alarm Station, French/English Markings - ULC Listed | |
| SIGA-278 | Double Action (One Stage) Fire Alarm Station, English Markings - UL/ULC Listed | |

| Accessories | | |
|---|---|---|
| 32997 | GA Key w/Tag - for pre-signal station (CANADA ONLY) | 0.1 (.05) |
| 276-K2 | GA Key - for pre-signal station (USA ONLY) | |
| 276-K1 | Station Reset Key, Supplied with all Key Reset Stations | |
| 27165 | 12 Glass Rods - for SIGA-270 series (CANADA ONLY) | |
| 270-GLR | 20 Glass Rods - for SIGA-270 series (USA ONLY) | |
| 276-GLR | 20 Glass Rods - for SIGA-278 series | |
| 276B-RSB | Surface Mount Box, Red - for SIGA pull stations | 1 (0.6) |

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# Isolator Module

## SIGA-IM



S3424

7300-1657: 0121

FM APPROVED

MEA

## Overview

The SIGA-IM Isolator Module is part of EDWARDS's Signature Series system. This intelligent device enables part of the Signature data loop to continue operating should a short circuit occur. The module can be wired into a Class A data loop at any point.

If a fault occurs, the isolator cuts power to all devices beyond the isolator on the loop as follows:

- a short on the line causes all isolators to open within 23 msec.
- at 10 msec intervals, beginning on one side of the Class A circuit nearest the loop controller, the isolators close to provide the next isolator down the line with power.
- when the isolator next to the short closes, it reopens within 10 msec.

Once activated, the line fault isolator continuously checks the faulted side of the loop to determine if the short still exists. When the fault is corrected and system reset, the module automatically restores the entire data loop to the normal condition.

The microprocessor in every Signature module provides at least three important benefits — Self-diagnostics and History Log, Automatic Device Mapping, and Fast, Stable Communication.

**Self-diagnostics and History Log** - Each Signature Series module constantly runs self-checks to provide important maintenance information. This information is automatically updated and permanently stored in the module's non-volatile memory and is accessible for review any time using the SIGA-PRO Signature Program / Service Tool.

**Automatic Device Mapping** - The Signature loop controller learns keeps a map where each device's serial number address is installed relative to other devices on the data circuit.

**Fast Stable Communication** - Built-in intelligence means less information needs to be sent between the module and the loop controller. Other than regular supervisory polling response, the module only needs to communicate with the loop controller when it has something new to report.

## Standard Features

- **Automatic device mapping**
  Each module transmits wiring information to the loop controller regarding its location with respect to other devices on the circuit.
- **Electronic addressing**
  Addresses are downloaded and permanently stored from a PC, or the SIGA-PRO Signature Program / Service Tool. There are no switches or dials to set.
- **Ground fault detection by address**
  Detects ground faults right down to the device level.
- **2-gang mounting**
- **Designed to ISO 9001 standards**

## Testing & Maintenance

The module's automatic self-diagnosis identifies when it is defective and causes a trouble message. The user-friendly maintenance program shows the current state of each module and other pertinent messages. Single modules may be turned off (deactivated) temporarily, from the control panel. Availability of maintenance features is dependent on the fire alarm system used. Scheduled maintenance (Regular or Selected) for proper system operation should be planned to meet the requirements of the Authority Having Jurisdiction (AHJ). Refer to current NFPA 72 and ULC CAN/ ULC 536 standards.

**Warnings & Cautions**
This module will not operate without electrical power. As fires frequently cause power interruption, we suggest you discuss further safeguardwith your fire protection specialist.

## Typical Wiring and Installation

The SIGA-IM module mounts to North American 2-1/2 inch (64 mm) deep 2-gang boxes and 1-1/2 inch (38 mm) deep 4 inch square boxes with 2 gang covers and SIGA-MP mounting plates. The module will accept #18 AWG (0.75mm$^2$), #16 (1.0mm$^2$), #14 AWG (1.50mm$^2$), and #12 AWG (2.50mm$^2$) wire sizes. *Note: Sizes #16 AWG (1.0mm$^2$) and #18 AWG (0.75mm$^2$) are preferred for ease of installation. See Signature Loop Controller catalog sheet for detailed wiring requirement specifications.*

EDWARDS recommends that this module be installed according to latest recognized edition of national and local fire alarm codes.

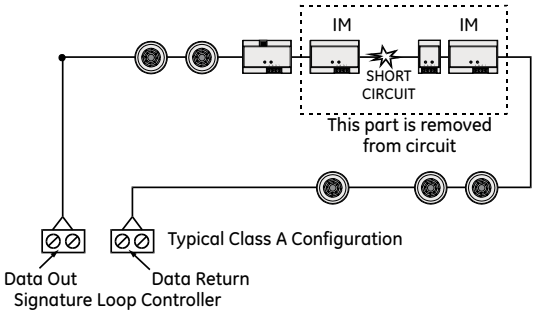
## Application

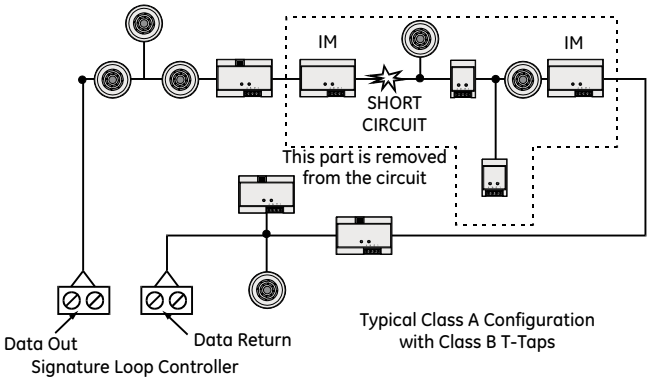
**This module should only be used on Class A circuits.** The operation of the SIGA-IM is determined by its hardware type code and is assigned at the factory. No user configuration is required.

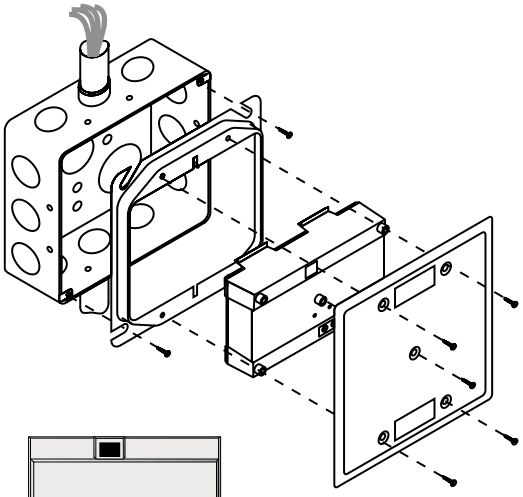
## Compatibility

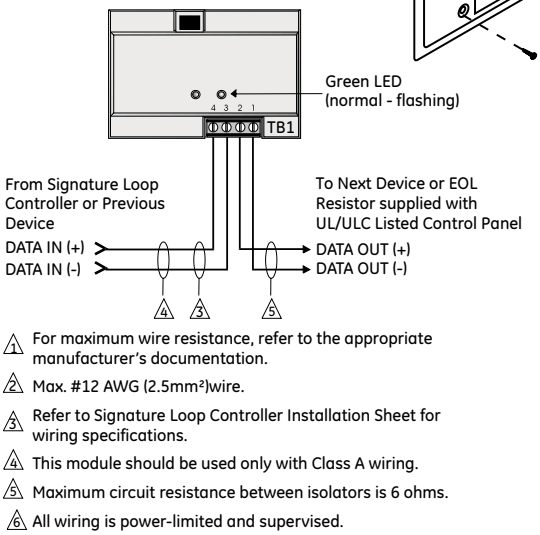
These modules are part of EDWARDS's Signature Series intelligent processing and control platform. They are compatible with EST3, EST3X and iO Series control panels.

## Typical Wiring






1. For maximum wire resistance, refer to the appropriate manufacturer's documentation.
2. Max. #12 AWG (2.5mm²)wire.
3. Refer to Signature Loop Controller Installation Sheet for wiring specifications.
4. This module should be used only with Class A wiring.
5. Maximum circuit resistance between isolators is 6 ohms.
6. All wiring is power-limited and supervised.

## Specifications

| | |
|---|---|
| Description | Isolator Module - factory set hardware type code |
| Address Requirements | Uses One Detector Address |
| Circuit Resistance | Six ohms maximum between isolators |
| Operating Current | Standby = 45µA; Activated = 45µA |
| Operating Voltage | 15.2 to 19.95 Vdc (19 Vdc nominal) |
| Construction & Finish | High Impact Engineering Polymer 2-gang front plate - White Finish |
| Storage Environment | Temperature: -4°F to 140°F (-20°C to 60°C) |
| Operating Environment | Temperature: 32°F to 120°F (0°C to 49°C); Humidity: 0 to 93% RH |
| LED Operation | On-board Green LED - Flashes when polled (normal) |
| Compatibility | Use with: Signature Loop Controller |
| Agency Listings | UL, ULC, CSFM, MEA, FM |

## Ordering Information

| Catalog Number | Description | Ship Wt. lb (kg) |
|---|---|---|
| SIGA-IM | Fault Isolator Module - UL/ULC Listed | .5 (.23) |
| **Accessories** | | |
| 27193-21 | Surface Mount Box - 2-gang RED | 1 (.4) |
| 27193-26 | Surface Mount Box - 2-gang WHITE | |
| MFC-A | Multifunction Fire Cabinet - Red, supports Signature Module Mounting Plates | 7.0 (3.1) |
| SIGA-MP1 | Signature Module Mounting Plate, 1 footprint | 1.5 (0.70) |
| SIGA-MP2 | Signature Module Mounting Plate, 1/2 footprint | 0.5 (0.23) |
| SIGA-MP2L | Signature Module Mounting Plate, 1/2 extended footprint | 1.02 (0.46) |

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# Control Relay Modules

## SIGA-CR, SIGA-MCR, SIGA-CRR, SIGA-MCRR



SIGA-MCR



SIGA-CR

FM APPROVED MEA 7300-1657: 0121 S3424

## Overview

The Control Relay Module and the Polarity Reversal Relay Module are part of the Signature Series system. They are intelligent analog addressable devices available in either plug-in (UIO) versions, or standard 1-gang mount versions.

**The SIGA-CR/MCR** Control Relay Module provides a Form "C" dry relay contact to control external appliances such as door closers, fans, dampers etc. This device does not provide supervision of the state of the relay contact. Instead, the on-board microprocessor ensures that the relay is in the proper ON/OFF state. Upon command from the loop controller, the SIGA-CR/MCR relay activates the normally open or normally-closed contact.

**The SIGA-CRR/MCRR** Polarity Reversal Relay Module provides a Form "C" dry relay contact to power and activate a series of SIGA-AB4G Audible Sounder Bases. Upon command from the Signature loop controller, the SIGA-CRR reverses the polarity of its 24 Vdc output, thus activating all Sounder Bases on the data loop.

**Standard-mount versions (SIGA-CR and SIGA-CRR)** are installed to standard North American 1-gang electrical boxes, making them ideal for locations where only one module is required. Separate I/O and data loop connections are made to each module.

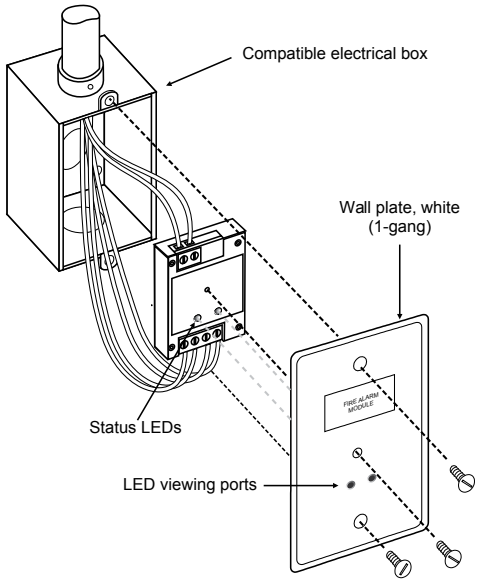
**Plug-in UIO versions (SIGA-MCR and SIGA-MCRR)** are part of the UIO family of plug-in Signature Series modules. They function identically to the standard mount versions, but take advantage of the modular flexibility and easy installation that characterizes all UIO modules. Two- and six-module UIO motherboards are available. All wiring connections are made to terminal blocks on the motherboard. UIO assemblies may be mounted in EDWARDS enclosures.

## Standard Features

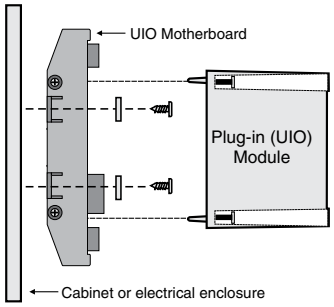
- **Provides one no/nc contact (SIGA-CR/MCR)**
  Form "C" dry relay contact can be used to control external appliances such as door closers, fans, dampers etc.
- **Allows group operation of sounder bases**
  The SIGA-CRR/MCRR reverses the polarity of its 24 Vdc output, thus activating all Sounder Bases on the data loop.
- **Plug-in (UIO) or standard 1-gang mount**
  UIO versions allow quick installation where multiple modules are required. The 1-gang mount version is ideal for remote locations that require a single module.
- **Automatic device mapping**
  Signature modules transmit information to the loop controller regarding their circuit locations with respect to other Signature devices on the wire loop.
- **Electronic addressing**
  Programmable addresses are downloaded from the loop controller, a PC, or the SIGA-PRO Signature Program/Service Tool; there are no switches or dials to set.
- **Intelligent device with microprocessor**
  All decisions are made at the module to allow lower communication speed with substantially improved control panel response time and less sensitivity to line noise and loop wiring properties; twisted or shielded wire is not required.

## Installation

**SIGA-CR and SIGA-CRR:** modules mount to North American 2½ inch (64 mm) deep 1-gang boxes and 1½ inch (38 mm) deep 4 inch square boxes with 1-gang covers and SIGA-MP mounting plates. The terminals are suited for #12 to #18 AWG (2.5 $mm^2$ to 0.75 $mm^2$) wire size.




**SIGA-MCR and SIGA-MCRR:** mount the UIO motherboard inside a suitable EDWARDS enclosure with screws and washers provided. Plug the module into any available position on the motherboard and secure the module to the motherboard with the captive screws. Wiring connections are made to the terminals on the motherboard (see wiring diagram). UIO motherboard terminals are suited for #12 to #18 AWG (2.5 $mm^2$ to 0.75 $mm^2$) wire size.




**Electronic Addressing** - The loop controller electronically addresses each module, saving valuable time during system commissioning. Setting complicated switches or dials is not required. Each module has its own unique serial number stored in its on-board memory. The loop controller identifies each device on the loop and assigns a "soft" address to each serial number. If desired, the modules can be addressed using the SIGA-PRO Signature Program/Service Tool.

EDWARDS recommends that this module be installed according to latest recognized edition of national and local fire alarm codes.

## Application

The operation of Signature Series control relays is determined by their sub-type code or "Personality Code."

**Personality Code 8: CONTROL RELAY (SIGA-CR/MCR) - Dry Contact Output**. This setting configures the module to provide one Form "C" DRY RELAY CONTACT to control Door Closers, Fans, Dampers, etc. Contact rating is 2.0 amp @ 24 Vdc; 0.5 amp @ 120 Vac (or 0.25A @ 220 Vac for non-UL applications). Personality Code 8 is assigned at the factory. No user configuration is required.

**Personality Code 8: POLARITY REVERSAL RELAY MODULE (SIGA-CRR/MCRR).** This setting configures the module to reverse the polarity of its 24 Vdc output. Contact rating is 2.0 amp @ 24 Vdc (pilot duty). Personality Code 8 is assigned at the factory. No user configuration is required.

## Compatibility

These modules are part of EDWARDS's Signature Series intelligent processing and control platform. They are compatible with EST3, EST3X and iO Series control panels.

## Warnings & Cautions

This module will not operate without electrical power. As fires frequently cause power interruption, we suggest you discuss further safeguards with your local fire protection specialist.

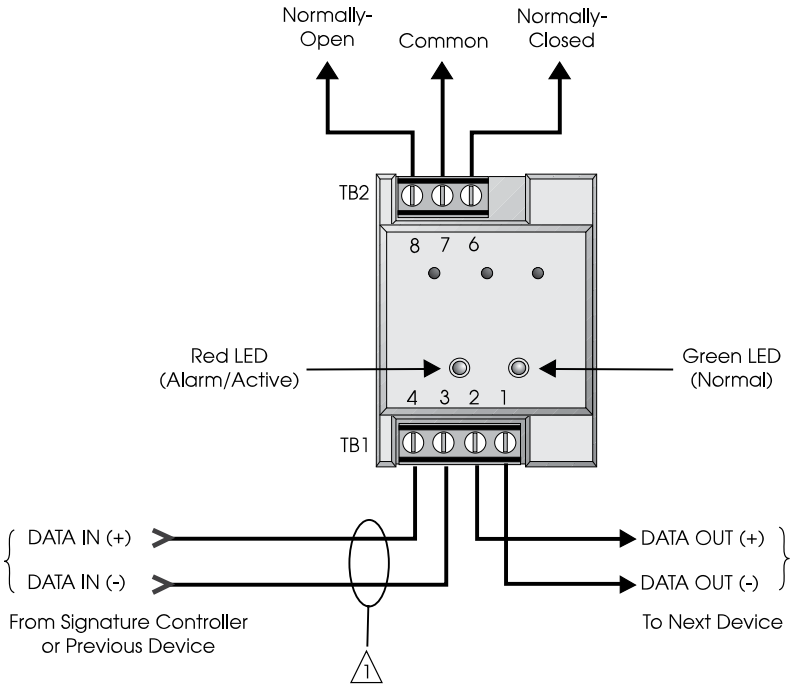
## Testing & Maintenance

The module's automatic self-diagnosis identifies when it is defective and causes a trouble message. The user-friendly maintenance program shows the current state of each module and other pertinent messages. Single modules may be turned off (deactivated) temporarily, from the control panel. Availability of maintenance features is dependent on the fire alarm system used. Scheduled maintenance (Regular or Selected) for proper system operation should be planned to meet the requirements of the Authority Having Jurisdiction (AHJ). Refer to current NFPA 72 and ULC CAN/ULC 536 standards.

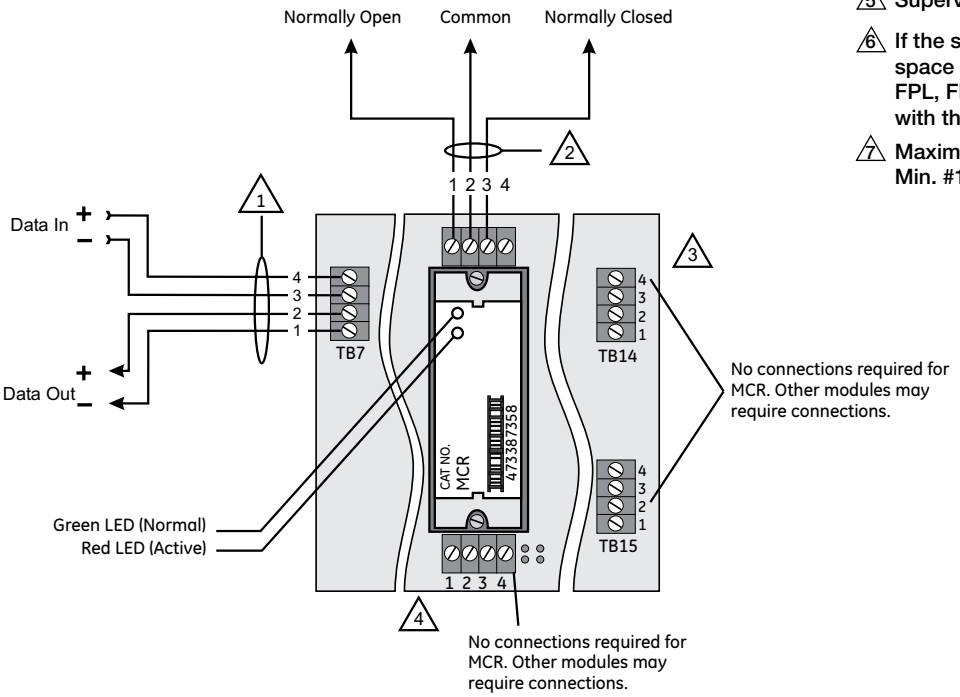
## Typical Wiring

Modules will accept #18 AWG (0.75mm²), #16 (1.0mm²), #14 AWG (1.50mm²) and #12 AWG (2.5mm²) wire sizes.

Note: Sizes #16 AWG (1.0mm²) and #18 AWG (0.75mm²) are preferred for ease of installation. See Signature Loop Controller catalog sheet for detailed wiring requirement specifications.




**SIGA-CR Control Relay**




**SIGA-MCR Control Relay**

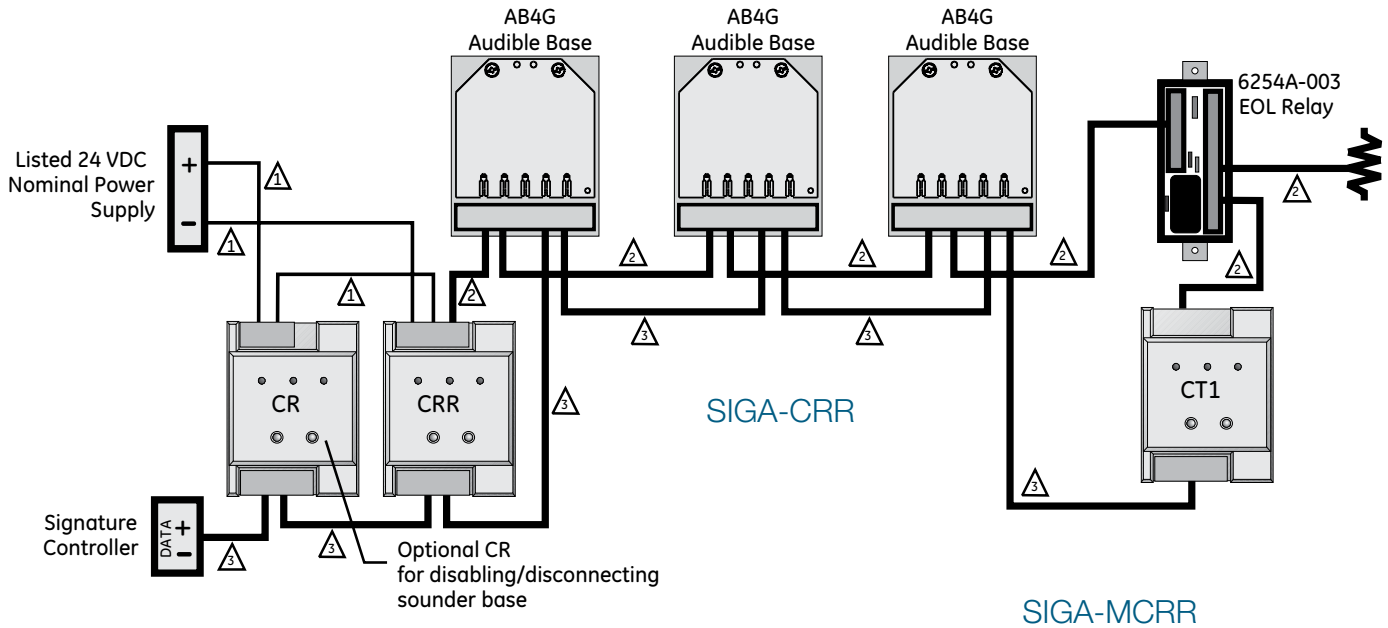
### Notes

1. Refer to Signature Loop Controller Installation Sheet for wiring specifications.
2. NFPA 72 requires that the SIGA-CR/SIGA-MCR be installed in the same room as the device it is controlling. This requirement may not apply in all markets. Check with your local AHJ for details.
3. The SIGA-UIO6R and the SIGA-UIO2R do not come with TB14.
4. The SIGA-UIO6 does not come with TB8 through TB13.
5. Supervised and power-limited.
6. If the source is nonpower-limited, maintain a space of 1/4 inch from power-limited wiring or use FPL, FPLP, FPLR, or an equivalent in accordance with the National Electrical Code.
7. Maximum #12 AWG (2.5mm²) wire. Min. #18 (0.75mm²).

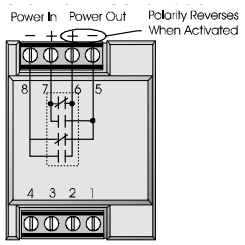
## Typical Wiring

Modules will accept #18 AWG (0.75mm²), #16 (1.0mm²), #14 AWG (1.50mm²) and #12 AWG (2.50mm²) wire sizes.

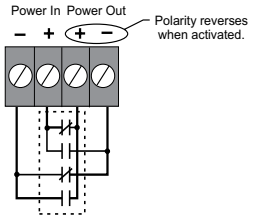
Note: Sizes #16 AWG (1.0mm²) and #18 AWG (0.75mm²) are preferred for ease of installation. See Signature Loop Controller catalog sheet for detailed wiring requirement specifications.



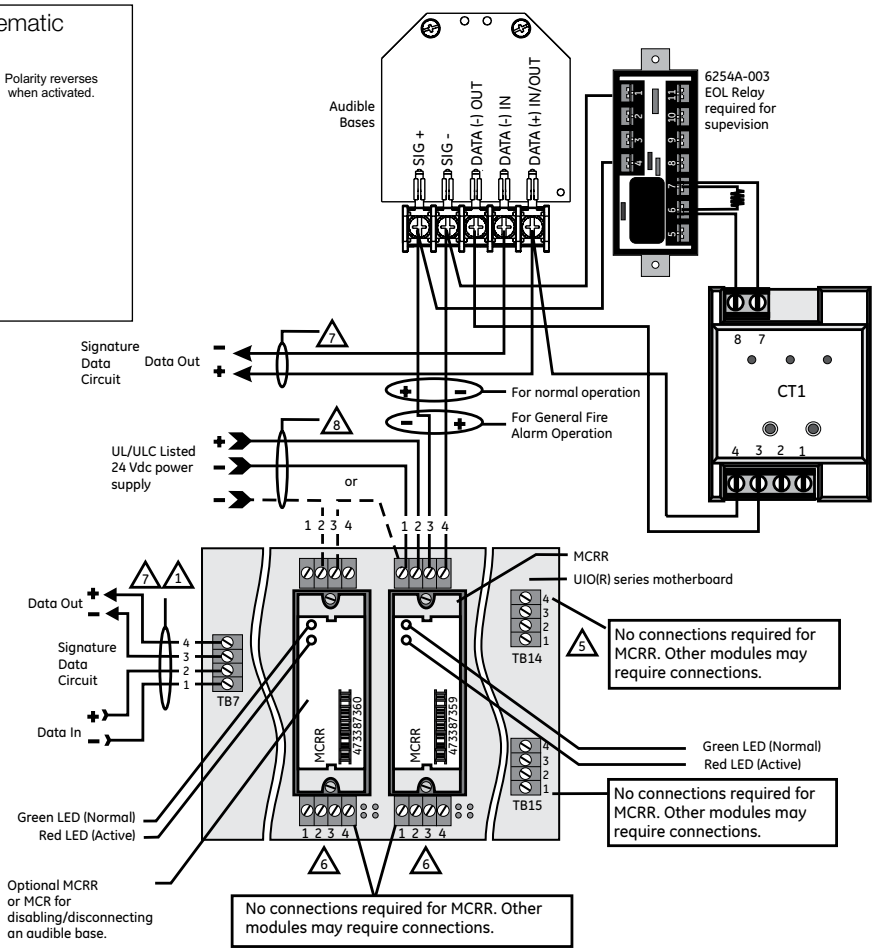

SIGA-CRR Schematic




SIGA-MCRR Schematic




SIGA-MCRR




### Notes

1. Refer to the Signature controller installation sheet for wiring.
2. One Pair of Wires (24 Vdc power).
3. One Pair of Wires (Signature Data).
4. Single Wire (24 Vdc power).
5. The SIGA-UIO6R and the SIGA-UIO2R do not come with TB14.
6. The SIGA-UIO6 does not come with TB8 through TB13.
7. Supervised and power-limited.
8. If the source is nonpower-limited, maintain a space of 1/4 inch from power-limited wiring or use FPL, FPLP, FPLR, or an equivalent in accordance with the National Electrical Code.
9. Maximum #12 AWG (2.5 mm² ) wire; Minimum #18 AWG (0.75 mm² ).
10. End-of-Line Relay must monitor and report power supply trouble to control panel.
11. Class B Data wiring may be “T-tapped.”

## Specifications

| Catalog Number | SIGA-CR | SIGA-MCR | SIGA-CRR | SIGA-MCRR |
|---|---|---|---|---|
| Description | Control Relay | | Polarity Reversal Relay | |
| Type Code | Personality Code 8 (Factory Set) | | Personality Code 8 (Factory Set) | |
| Address Requirements | Uses 1 Module Address | | | |
| Operating Current | Standby = 75 µA Activated = 75 µA | | | |
| Operating Voltage | 15.2 to 19.95 Vdc (19 Vdc nominal) | | | |
| Relay Type and Rating | Form C, 2 Amps @ 24 Vdc (pilot duty), 0.5 Amps @ 120 Vac and 0.25 Amps @ 220 Vac (220 Vac is non-UL) Not rated for capacitive loads. | | | |
| Mounting | North American 2½ inch (64 mm) deep 1-gang boxes and 1½ inch (38 mm) deep 4 inch square boxes with 1-gang covers and SIGA-MP mounting plates | Plugs into UIO2R, UIO6R or UIO6 Motherboards | North American 2½ inch (64 mm) deep 1-gang boxes and 1½ inch (38 mm) deep 4 inch square boxes with 1-gang covers and SIGA-MP mounting plates | Plugs into UIO2R, UIO6R or UIO6 Motherboards |
| Construction & Finish | High Impact Engineering Polymer | | | |
| Storage and Operating Environment | Operating Temperature: 32°F to 120°F (0°C to 49°C) Storage Temperature: -4°F to 140°F (-20°C to 60°C) Humidity: 0 to 93% RH | | | |
| LED Operation | On-board Green LED - Flashes when polled On-board Red LED - Flashes when in alarm/active | | | |
| Compatibility | Use With: Signature Loop Controller | | | |
| Agency Listings | UL, ULC, CSFM, MEA | | | |

## Ordering Information

| Catalog Number | Description | Ship Weight - lbs (kg) |
|---|---|---|
| SIGA-CR | Control Relay Module (Standard Mount) | 0.4 (0.15) |
| SIGA-MCR | Control Relay Module (UIO Mount) | 0.18 (0.08) |
| SIGA-CRR | Polarity Reversal Relay Module (Standard Mount) | 0.4 (0.15) |
| SIGA-MCRR | Polarity Reversal Relay Module (UIO Mount) | 0.18 (0.08) |
| **Related Equipment** | | |
| 27193-11 | Surface Mount Box - Red, 1-gang | 1 (0.6) |
| 27193-16 | Surface Mount Box - White, 1-gang | 1 (0.6) |
| SIGA-UIO2R | Universal Input-Output Module Board w/Riser Inputs - Two Module Positions | 0.32 (0.15) |
| SIGA-UIO6R | Universal Input-Output Module Board w/Riser Inputs - Six Module Positions | 0.62 (0.28) |
| SIGA-UIO6 | Universal Input-Output Module Board - Six Module Positions | 0.56 (0.25) |
| SIGA-AB4G | Audible (Sounder) Detector Base | 0.3 (0.15) |
| **Accessories** | | |
| MFC-A | Multifunction Fire Cabinet - Red, supports Signature Module Mounting Plates | 7.0 (3.1) |
| SIGA-MB4 | Transponder Mounting Bracket (allows for mounting two 1-gang modules in a 2-gang box) | 0.4 (0.15) |
| SIGA-MP1 | Signature Module Mounting Plate, 1 footprint | 1.5 (0.70) |
| SIGA-MP2 | Signature Module Mounting Plate, 1/2 footprint | 0.5 (0.23) |
| SIGA-MP2L | Signature Module Mounting Plate, 1/2 extended footprint | 1.02 (0.46) |

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**Contact us**

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## Signature Series Overview

The Signature Series intelligent analog-addressable system from EDWARDS is an entire family of multi-sensor detectors and mounting bases, multiple-function input and output modules, network and non-network control panels, and user-friendly maintenance and service tools. Analog information from equipment connected to Signature devices is gathered and converted into digital signals. An onboard microprocessor in each Signature device measures and analyzes the signal and decides whether or not to input an alarm. The microprocessor in each Signature device provides four additional benefits – Self-diagnostics and History Log, Automatic Device Mapping, and Fast, Stable Communication.

**Self-diagnostics and History Log** – Each Signature Series device constantly runs self-checks to provide important maintenance information. The results of the self-check are automatically updated and permanently stored in its non-volatile memory. This information is accessible for review any time at the control panel, PC, or using the SIGA-PRO Signature Program/Service Tool. The information stored in device memory includes:

- Device serial number, address, and type
- Time and date of last alarm
- Most recent trouble code logged by the detector — 32 possible trouble codes may be used to diagnose faults.

**Automatic Device Mapping** –The Signature Data Controller (SDC) learns where each device's serial number address is installed relative to other devices on the circuit. The SDC keeps a map of all Signature Series devices connected to it. The Signature Series Data Entry Program also uses the mapping feature. With interactive menus and graphic support, the wired circuits between each device can be examined. Layout or "as-built" drawing information showing branch wiring (T-taps), device types and their address are stored on disk for printing hard copy. This takes the mystery out of the installation. The preparation of as-built drawings is fast and efficient.

Device mapping allows the Signature Data Controller to discover:

- Unexpected additional device addresses
- Missing device addresses
- Changes to the wiring in the circuit.

Most Signature modules use a personality code selected by the installer to determine their actual function. Personality codes are downloaded from the SDC during system configuration and are indicated during device mapping.

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# High Power Control Relay Module

## SIGA-CRH




## Description

The SIGA-CRH High Power Control Relay Module is an addressable device designed for interface applications that require a high voltage, high current relay. Two identical sets of relay terminals are provided. Both sets of relay contacts transfer when the module is activated or restored. The state of the output terminals is not supervised.

The module requires one address on the signaling line circuit (SLC). The address is assigned electronically. There are no address switches to set.

## Standard Features

- **High Power Rating**
  120/240 VAC or 24 VDC rated contact can be used to control external appliances such as door closers, fans, dampers etc.
- **Provides one relay with two Form C contacts**
  Relay accepts 12 to 18 AWG (1.0 to 4.0 mm²) wiring from two sources
- **Automatic device mapping**
  Signature modules transmit information to the loop controller regarding their circuit locations with respect to other Signature devices on the wire loop.
- **Removable terminal blocks**
  Easy wiring and module replacement.
- **Electronic addressing**
  Programmable addresses are downloaded from the loop controller or PC; there are no switches or dials to set.
- **Intelligent device**
  Distributed intelligence allows lower communication speed with substantially improved control panel response time and less sensitivity to line noise and loop wiring properties; twisted or shielded wire is not required.

# Application

## Personality code

Use *Personality Code 8* to configure the SIGA-CRH module:

**Personality code 8:** Signal - dry contact output. Configures the module as a dry relay contact to control external appliances (door closers, fan controllers, dampers) or equipment shutdown.

## Indication

The status LED shows the state of the module through the cover plate:

- Normal: Green LED flashes
- Alarm/active: Red LED flashes

## Compatibility

The SIGA-CRH is part of the Signature Series intelligent processing and control platform. It is compatible with EST3, EST3X, and iO Series control panels.

## Warnings & Cautions

The SIGA-CRH will not operate without electrical power. As fires frequently cause power interruption, we suggest you discuss further safeguards with your local fire protection specialist.

EDWARDS recommends that this module be installed according to latest recognized edition of national and local fire alarm codes.

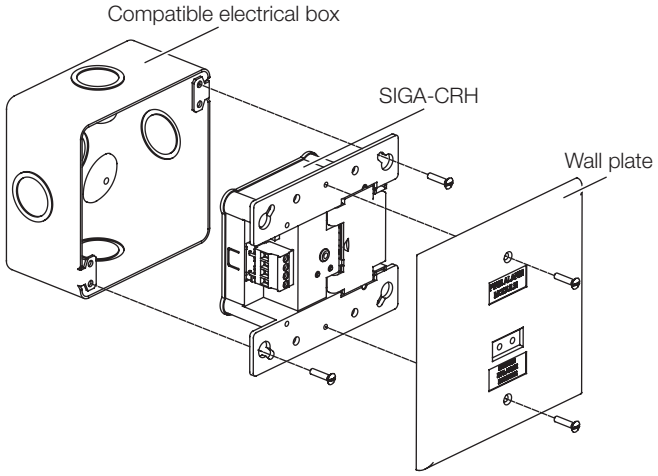
## Testing & Maintenance

SIGA-CRH automatic self-diagnosis identifies when it is defective and causes a trouble message. The user-friendly maintenance program shows the current state of each module and other pertinent messages. Single modules may be turned off (deactivated) temporarily, from the control panel. Availability of maintenance features is dependent on the fire alarm system used. Scheduled maintenance (Regular or Selected) for proper system operation should be planned to meet the requirements of the Authority Having Jurisdiction (AHJ). Refer to current NFPA 72 and ULC CAN/ULC 536 standards.

## Electronic Addressing

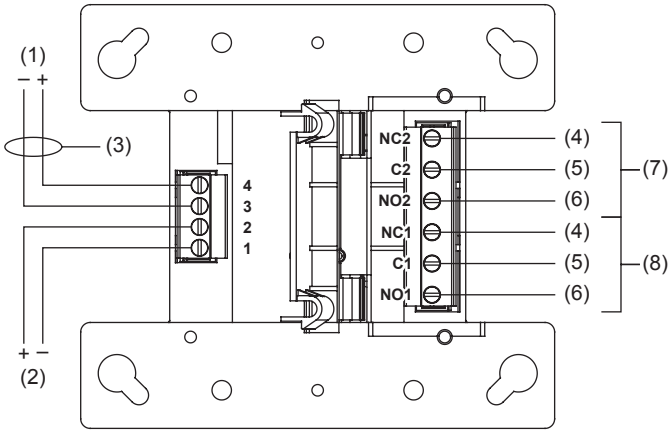
The loop controller electronically addresses the SIGA-CRH, saving valuable time during system commissioning. Setting complicated switches or dials is not required. The module has its own unique serial number stored in its on-board memory.

# Installation




Consult the SIGA-CRH High Power Control Relay Module Installation Sheet for details.

# Wiring




(1) Signaling line circuit (SLC) from previous device

(2) Signaling line circuit (SLC) to next device

(3) Power-limited and supervised

(4) Normally closed contact (NC)

(5) Common contact (C)

(6) Normally open contact (NO)

(7) Relay terminal set 2.
Not supervised. Power-limited unless connected to a nonpowerlimited source. If the source is nonpower-limited, eliminate the power-limited mark and maintain a minimum of 0.25 in. (6.4 mm) space from power-limited wiring. For other mounting methods, see enclosure and bracket installation sheets to maintain separation of power-limited and nonpower-limited wiring. The wire size must be capable of handling fault current from a nonpower-limited source.

— or —

Use type FPL, FPLR, FPLP, or permitted substitute cables, provided these power-limited cable conductors extending beyond the jacket are separated by a minimum of 0.25 in. (6.4 mm) space or by a nonconductive sleeve or nonconductive barrier from all other conductors. Refer to the NFPA 70 National Electrical Code for more details.

(8) Relay terminal set 1. Identical to (7).

## Specifications

| | |
|---|---|
| SLC operating voltage | 15.20 to 19.95 VDC |
| SLC current | |
| Standby | 75 µA max. |
| Activated | 75 µA max. |
| Contact ratings [1][2] | |
| 240 V 50/60 Hz | 7 A (PF 0.75), 1.5 A (PF 0.35) |
| 120 V 50/60 Hz | 7 A (PF 0.75), 3.0 A (PF 0.35) |
| 24 VDC | 6 A resistive |
| Audio switching | 0 to 20 kHz [3] |
| Relay type | 2 Form C, programmable |
| Relay ready delay | |
| From power up | 30 s max. (includes initial state set) |
| From previous activation | 5 s max. (one activation)<br>8 s max. (two activations, 1 s apart) |
| Circuit designation | |
| Signaling line circuits | Class A, Style 6 or Class B, Style 4. Refer to the control panel technical publications for SLC wiring details. |
| Relay circuits | Class E |
| Number of SIGA-CRH per SLC | 60 max. |
| Wire size | 12 to 18 AWG (1.0 to 4.0 $mm^2$) |
| Compatible electrical boxes | North American double-gang × 2-1/8 in. (54 mm) deep box<br>North American standard 4 in. square × 2-1/8 in. (54 mm) deep box |
| Agency Listings | CAN/ULC-S527, UL 864 |
| Operating environment | |
| Temperature | 32 to 120°F (0 to 49°C) |
| Relative humidity | 0 to 93%, noncondensing |
| Storage temperature | –4 to 140°F (–20 to 60°C) |

[1] Provide external fusing and back-EMF mitigation as required by your application. Do not use the SIGA-CRH in a mixed application, where one set of relay terminals has high-power requirements and the other set carries a low-power signal, as this may result in physical contamination of the low-power signal contacts.

[2] The minimum load required in order to avoid long-term contact oxidation is 100 mA and 12 V.

[3] Power must not exceed the contact ratings shown for a given PF (power factor).

## Ordering Information

| Catalog Number | Description | Ship Weight lbs (kg) |
|---|---|---|
| SIGA-CRH | High Power Control Relay Module | 0.4 (0.15) |

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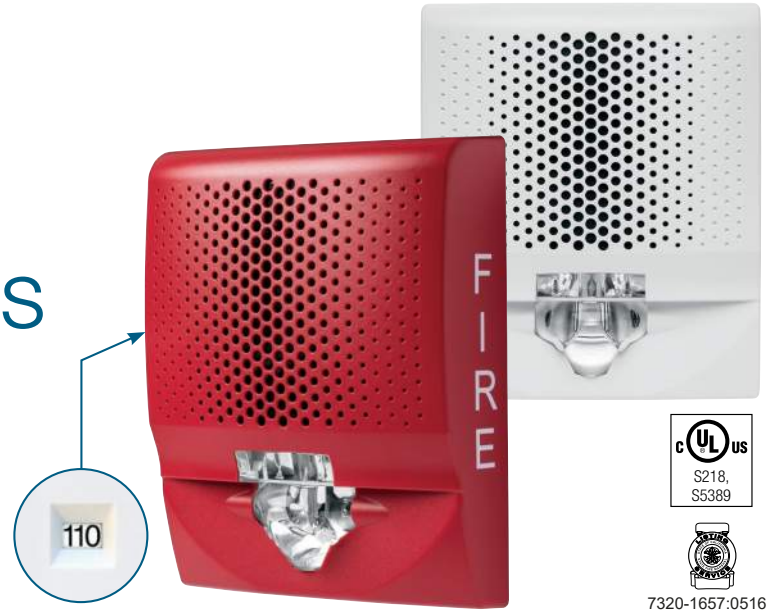
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# Wall Mount Speakers and Speaker-Strobes

## Genesis LED G4S Series




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S218,
S5389

7320-1657:0516

## Overview

Genesis LED G4S Series speakers and speaker-strobes combine high performance output with a sleek low profile design and energy-efficient technology that makes them less expensive to install and operate. High performance LEDs require fewer power supplies, backup power, and batteries. These new appliances are designed with energy-efficiency, and life safety in mind.

Speakers feature selectable wattage taps, while speaker-strobes allow for both wattage and light output levels to be configured in the field. Both settings remain clearly visible — even after final installation. Speakers are also capable of both 25V and 70V and voltage in a single model with a field selectable switch. All this flexibility allows devices to be easily fine-tuned to exactly how they're needed to perform. All Genesis speakers include a DC blocking capacitor to allow electrical supervision of the audio distribution circuit.

Genesis LED G4S Series uses high efficiency optics, combined with patented electronics, to deliver a highly controlled and efficiently focused light distribution pattern in exchange for lower current requirements. Strobes feature field-selectable 15, 30,75, or 110 cd light output.

Compared with Xenon-type strobes, Genesis LED G4S Series appliances offer greatly reduced current draw which provides benefits in longer circuit lengths, more devices per circuit, smaller wire gauge and reduced power supply quantities for an installation. They are also backwards compatible with legacy strobes, so there's no need to replace all your existing devices to upgrade to new LED technology. In fact, G4S strobes can be mixed on the same circuit and used in the same field of view as Xenon-based strobes. This makes Genesis LED G4S Series ideal for new installations and retrofits alike.

Field-configurable sound output levels provide the flexibility modern life safety projects demand, while the Genesis LED control protocol keeps multiple strobes on compatible NAC circuits synchronized to well within NFPA 72 requirements. They also meet NFPA and UL 520Hz requirements for sleeping areas making them ideal for new construction or retrofits.

G4S Series speakers produce crisp, clear voice audio output that is highly intelligible over large areas. In an emergency, intelligibility is critical to life safety. Understanding the content of the message is as important as knowing there is an emergency. Intelligibility is measured in Speech Transmission Index and anything above .76 is considered excellent. G4S Series speakers deliver audio with an STI of .81 ensuring the message is clear.

Serviceability is another area where G4S Series appliances shine. The universal room side wiring plate allows for pre-installation and electrical wiring as well as checking continuity with the included diagnostics check bar. G4S Series devices can then be easily snapped into place with the confidence of knowing the wiring is correct. The innovative under-cover diagnostic test points provide easy access to device circuit testing while mounted.

## Standard Features

- **High Fidelity performance with excellent STI**
  - Increased sound fidelity and audio intelligibility with an STI rating of .81 (More than .76 is excellent)
- **Low Frequency (520Hz) capable**
  - Low frequency output meets NFPA standards for newly constructed commercial sleeping areas
- **High Performance LED Strobe Technology**
  - Ultra low device current consumption allows:
    - More devices per circuit
    - Ability to use lower gauge wire
    - Longer wire runs
    - Fewer booster power supplies
  - High efficiency optics
  - Selectable 15, 30, 75, or 110 cd light output
  - LED devices may be mixed with legacy Xenon strobes on the same circuit and in the same field of view
- **Field flexibility**
  - Speakers are also capable of both 25V and 70V and voltage in a single model with a field selectable switch
  - Speakers feature selectable wattage taps for ¼W, ½W, 1W, and 2W to configure sound output levels in the field
- **Low-profile Design**
  - Ultra-slim... protrudes about 1.5" from the mounting surface
  - Attractive appearance... no visible mounting screws
- **Multiple "FIRE" Marking Options**
  - Order English, French, Spanish or no FIRE markings
  - Change markings at any time with replaceable quick-swap covers
- **Easy to Install**
  - Pre-install and pre-wire with convenient universal room side wiring plate
  - Check electrical continuity on room side wiring plate with included diagnostics check bar
  - Diagnostics port streamlines device circuit testing
  - Fits 2-gang and 4-inch square electrical boxes
  - Optional red and white trim plates available
  - Slide switches for field configuration
  - 12 to 18 AWG in-out screw terminals for quick wiring
- **Current draw is the same for all candela output settings**
  - Easier for new system design
  - Flexible for future changes in light output needs

## Application

### Strobes

Genesis G4S Series strobes are UL 1971-listed for use indoors as wall-mounted public-mode notification appliances for the hearing impaired. Prevailing codes require strobes to be used where ambient noise conditions exceed 105 dBA (87 dBA in Canada), where occupants use hearing protection, and in areas of public accommodation as defined in the *Americans with Disabilities Act*.

Synchronization is important in order to avoid triggering seizures in people with photosensitive epilepsy. All Genesis strobes exceed UL synchronization requirements (within 10 milliseconds over a two-hour period) when used with a synchronization source. See the specifications table for a list of compatible sources.

### Speakers

The suggested sound pressure level for each signaling zone used with alert or alarm signals is a minimum of 15 dB above the average ambient sound level or 5 dB above the maximum sound level having a duration of at least 60 seconds, whichever is greater. This is measured 5 feet (1.5 m) above the floor.

Doubling the distance from the signal to the ear will theoretically cause a 6 dB reduction in the received sound pressure level. The actual effect depends on the acoustic properties of materials in the space. Doubling the power output of a device (e.g.: a speaker from 1W to 2W) will increase the sound pressure level by 3dBA.

### High Fidelity Sound

Genesis LED G4S Series High Fidelity appliances feature 87dB of sound output along with a highly intelligible Speech Transmission Index (STI) rating of .81. An STI rating above .76 is considered excellent for speech intelligibility They are also effective in areas subject to high levels of ambient noise.

These appliances are ideal for hotels, dormitories and other residential occupancies that have sleeping areas that require 520Hz tones. In sleeping areas, always ensure that the wattage tap of the speaker is set sufficiently high so that the sound pressure reaches at least 75 dBA at the pillow.

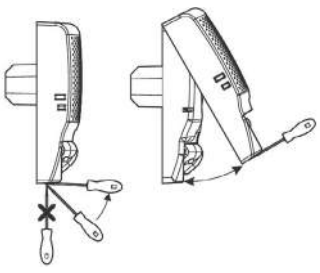
These appliances are part of an end-to-end audio system approved for use in sleeping areas when used in conjunction with approved audio hardware and a factory-supplied 520 Hz tone. Check the System Compatibility List for other 520 Hz signaling requirements.

## Installation

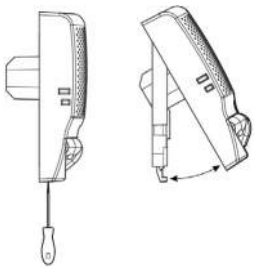
Genesis G4S speakers and speaker-strobes mount to the required GRSW room side wiring plate. The GRSW mounting plate is ordered separately from the G4S device in packs of 10 (GRSW-10) for convenient pre-installing and pre-wiring. The device can be removed easily from the room side wiring plate by pushing up with a screwdriver. The cover can also be removed from the device easily with a screwdriver to access the light and sound output settings and a diagnostics test port for voltage testing.

Genesis LED G4S Series speakers and speaker-strobes mount to any standard two-gang and 4-inch square electrical box. Matching optional G4T trim rings are available to cover oversized openings. Optional color matched double-gang surface boxes are also available.

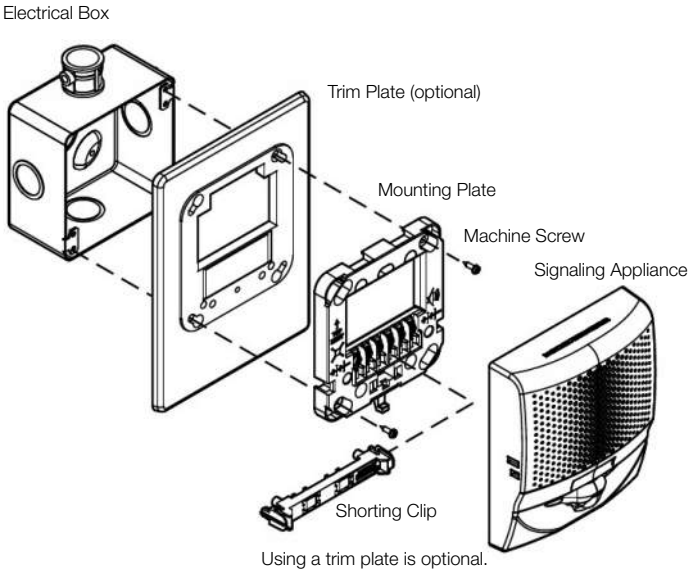
Removing Cover



Removing Device



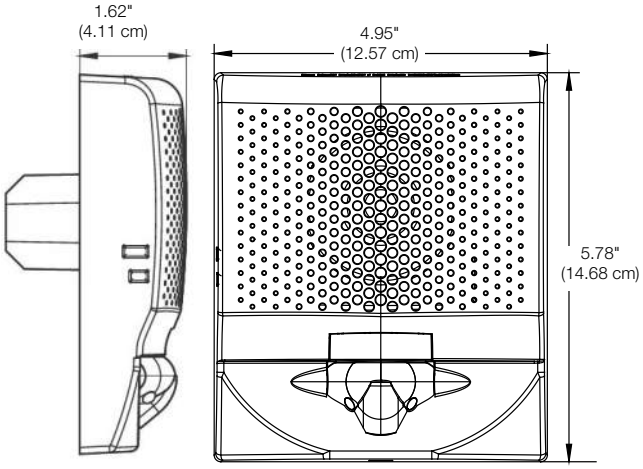
## Installation



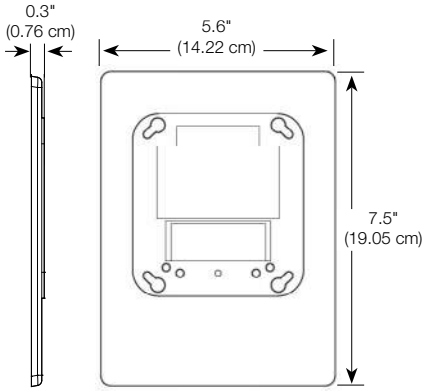

Using a trim plate is optional.

## Dimensions

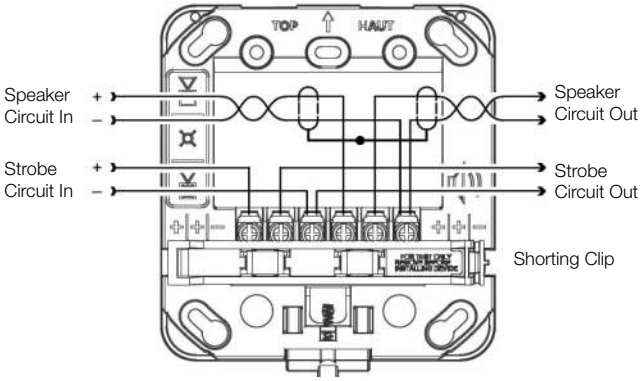
### G4S Notification Appliances




### G4T Trim Plate (optional)

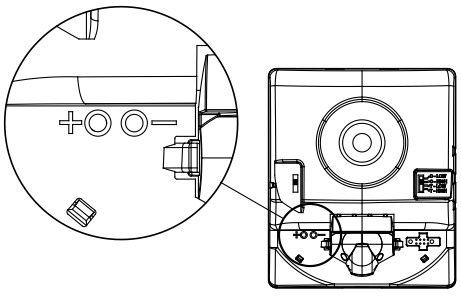



## Wiring

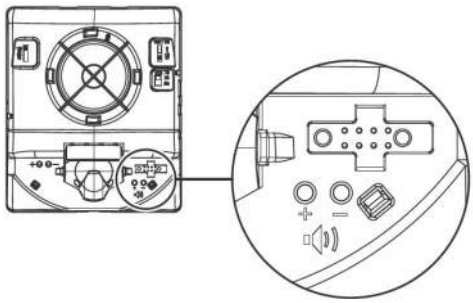



## Diagnostics

### Strobe Circuit Test Points



### Speaker Circuit Test Points



Test points indicated above are used to validate the Notification Appliance Circuit and verify device function.

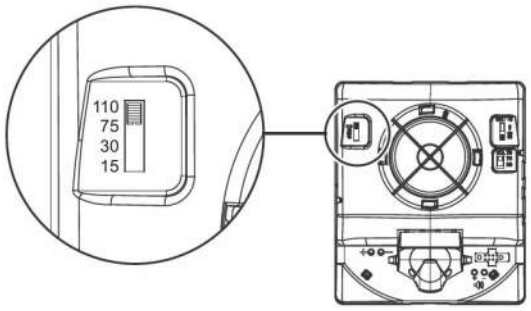
## Field Configuration

Genesis LED speakers are capable of both 25V and 70V operation depending on the system, The voltage is set via a switch under the cover. Speakers also may be set for ¼, ½, 1, or 2 watt operation. The wattage setting is visible through a small window on the side of the device and is changed by simply sliding the switch under the cover until the desired setting appears in the window. The speaker does not have to be removed to change the wattage, only the cover skin.

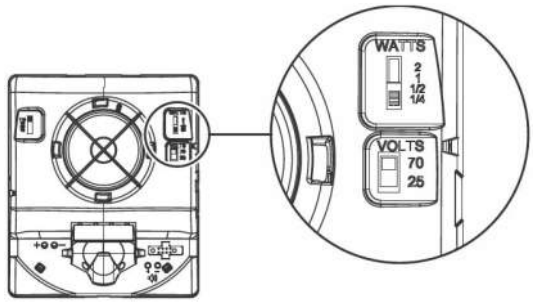
Genesis LED clear strobes and speaker-strobes may be set for 15, 30, 75, or 110 candela output. The output setting is changed by simply removing the cover and sliding the candela switch to the desired setting. The device does not have to be removed from the wall to change the output setting. The setting remains visible through a small window on the left-hand side of the device after the cover is closed.

## Light and Sound Output Settings

### Light Output Setting (Candela)




### Sound Settings (Watts and Volts)




## Operating current

### Strobes

| Strobe setting | 16 to 33 VDC | 16 to 33 VFWR |
|---|---|---|
| 15, 30, 75, 110 | 28 mA | 36 mA |

Note: Current draw is the same for all candela settings

### Sound Level Output

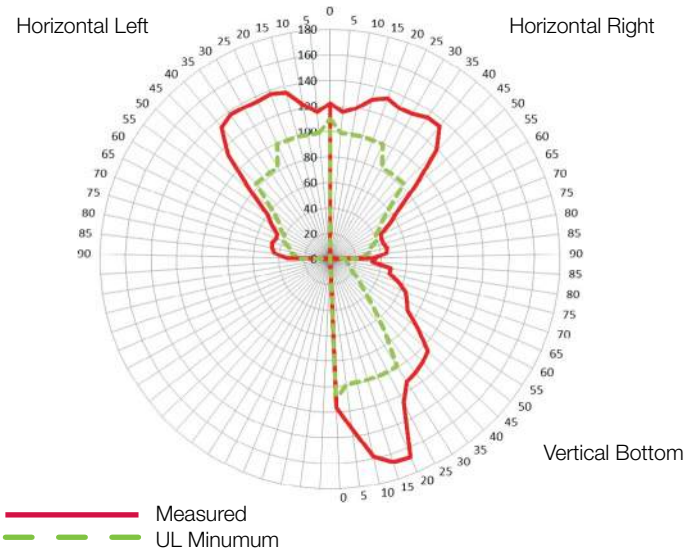
| Voltage setting | Wattage setting | Reverberant (UL 1480) | Anechoic (CAN/ ULC-S541) |
|---|---|---|---|
| 25V / 70V | ¼W | 78 | 78 |
| | ½W | 81 | 81 |
| | 1W | 84 | 84 |
| | 2W | 87 | 87 |

## Sound Output

### Sound pattern (ULC)

| Axis | Angle | Change in output |
|---|---|---|
| Horizontal | 117° and 61° | –3 dBA |
| | 134° and 49° | –6 dBA |
| Vertical | 128° and 68° | –3 dBA |
| | 138° and 52° | –6 dBA |

## Light Distribution




## Specifications

| | |
|---|---|
| Strobe operating voltage | 16 to 33 VDC, 16 to 33 VFWR |
| Speaker operating voltage | 25VRMS of 70VRMS (selectable) |
| Speaker frequency response | 400Hz-4,000Hz |
| Light output | 15, 30, 75, or 110 candela |
| Strobe flash rate | 1 fps (flash per second) approx. |
| Synchronization | 20 Ω max. between any two devices. To determine allowed wire resistance, refer to these specifications, and the specifications for the synchronized signal source. |
| Synchronization Sources | Edwards CC Series Signal Modules, Booster and Auxiliary Power Supplies, Intelligent and Conventional Control Panels |
| Wire size | 12 to 18 AWG (0.75 to 2.50 mm²) |
| Dimensions (W×H×D) | 4.95 x 5.78 x 1.62 in (12.57 x 14.68 x 4.11 cm) |
| Strobe-to-box center offset | -1.70 inches (-4.32 cm) |
| Compatible electrical boxes [1] | 2-gang, 4-inch square |
| Trim plates | G4TR, G4TW (5.6 x 7.5 x 0.3 in (14.22 x 19.05 x 0.76 cm)) |
| Operating environment<br>Temperature<br>Relative humidity | <br>32 to 122°F (0 to 50°C)<br>0 to 93% noncondensing |
| Storage Temperature | -40 to 158 F (-40 to 70 C) |
| RAL Color | Red=RAL 3013<br>White=RAL 9002 |

[1] Electrical boxes must be at least 1-1/2 in. (3.81 cm) deep.
(2) Recommend electrical boxes be mounted at 81 inches AFF

# Ordering Information

FOR REFERENCE ONLY

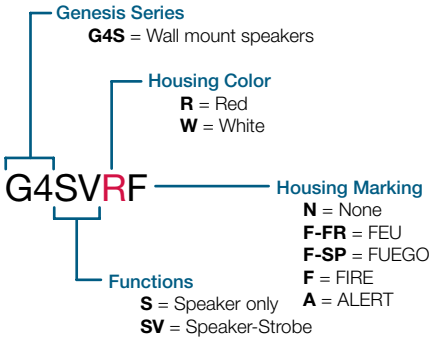
| Notification Appliances | | Color | Marking |
|---|---|---|---|
|  Speakers | G4SRF | Red | FIRE |
| | G4SRF-FR | Red | FEU |
| | G4SRF-SP | Red | FUEGO |
| | G4SRN | Red | None |
| | G4SWF | White | FIRE |
| | G4SWF-FR | White | FEU |
| | G4SWF-SP | White | FUEGO |
| | G4SWN | White | None |
| | G4SWA | White | Alert |
|  Speaker-strobes | G4SVRF | Red | FIRE |
| | G4SVRF-FR | Red | FEU |
| | G4SVRF-SP | Red | FUEGO |
| | G4SVRN | Red | None |
| | G4SVWF | White | FIRE |
| | G4SVWF-FR | White | FEU |
| | G4SVWF-SP | White | FUEGO |
| | G4SVWN | White | None |
| | G4SVWA | White | Alert |

| Replacement Appliance Covers | | Color | Marking |
|---|---|---|---|
|  Speakers | G4SRA-CVR | Red | ALERT |
| | G4SRF-CVR | Red | FIRE |
| | G4SRF-FR-CVR | Red | FEU |
| | G4SRF-SP-CVR | Red | FUEGO |
| | G4SRN-CVR | Red | None |
| | G4SWA-CVR | White | ALERT |
| | G4SWF-CVR | White | FIRE |
| | G4SWF-FR-CVR | White | FEU |
| | G4SWF-SP-CVR | White | FUEGO |
| | G4SWN-CVR | White | None |
|  Speaker-strobe Covers | G4SVRA-CVR | Red | ALERT |
| | G4SVRF-CVR | Red | FIRE |
| | G4SVRF-FR-CVR | Red | FEU |
| | G4SVRF-SP-CVR | Red | FUEGO |
| | G4SVRN-CVR | Red | None |
| | G4SVWA-CVR | White | ALERT |
| | G4SVWF-CVR | White | FIRE |
| | G4SVWF-FR-CVR | White | FEU |
| | G4SVWF-SP-CVR | White | FUEGO |
| | G4SVWN-CVR | White | None |

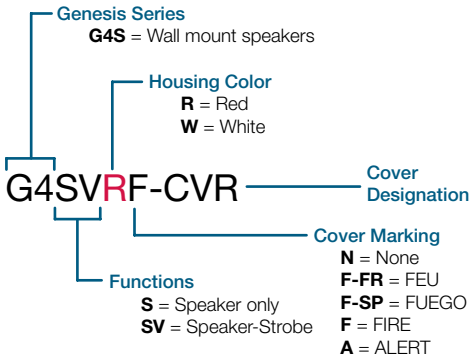
## Accessories

| | | | | | | | |
|---|---|---|---|---|---|---|---|
|  | GRSW-10 | Room Side Wiring Plate (required, ordered separately) |  | G4TR | Trim plate, G4 Series, red |  | G4TW | Trim plate, G4 Series, white |
| | | | | 27193-21 | Two-gang surface mount box, red | | 27193-26 | Two-gang surface mount box, white |

## Model Number Syntax, Appliances




## Model Number Syntax, Replacement Covers



EDWARDS

LIFE SAFETY & INCIDENT MANAGEMENT

**Contact us**

Phone: 800-655-4497 (Option 4)
Email: edwards.fire@carrier.com
Website: edwardsfiresafety.com

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Bradenton, FL 34202

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EDWARDS

LIFE SAFETY & INCIDENT MANAGEMENT

# Wall Mount Signaling Appliances

## Genesis LED G4 Series




c UL us S218, S5389

7125-1657:0504

FC

FM APPROVED

## Overview

Genesis LED G4 Series horns and LED strobes feature a sleek low profile design and energy-efficient technology that makes them less expensive to install and operate by reducing overhead. High performance LEDs require fewer power supplies, backup power, and batteries. These new appliances are designed with, energy-efficiency, and life safety in mind.

Genesis LED G4 Series uses high efficiency optics, combined with patented electronics, to deliver a highly controlled and efficiently focused light distribution pattern in exchange for lower current requirements. Strobes feature field-selectable 15, 30,75, or 110 cd light output.

Compared with Xenon-type strobes, Genesis LED G4 Series appliances need fewer power supplies and often smaller wire gauge, which lightens conduit requirements. They are also backwards compatible with legacy strobes, so there's no need to replace all your existing devices to upgrade to new LED technology. In fact, G4 strobes can be mixed on the same circuit and used in the same field of view as Xenon-based strobes. This makes Genesis LED G4 Series ideal for new installations and retrofits alike.

Field-configurable sound output levels provide the flexibility modern life safety projects demand, while the Genesis LED control protocol keeps multiple strobes on compatible NAC circuits synchronized to well within NFPA 72 requirements.

Serviceability is another area where G4 Series appliances shine. The universal room side wiring plate allows for pre-installation and electrical wiring as well as checking continuity with the included diagnostics check bar. G4 Series devices can then be easily snapped into place with the confidence of knowing the wiring is correct. The innovative under-cover diagnostic test points provide easy access to device circuit testing while mounted.

## Standard Features

- **High Performance LED Strobe Technology**
  - Ultra low device current consumption allows:
    - More devices per circuit
    - Ability to use lower gauge wire
    - Longer wire runs
    - Fewer booster power supplies
  - High efficiency optics
  - Selectable 15, 30, 75, or 110 cd light output
  - LED devices may be mixed with legacy Xenon strobes
- **Efficient Audible Output**
  - Selectable high or low dB horn output
  - Selectable temporal or steady horn output
  - Improved audio frequency range for better wall penetration
- **Low-profile Design**
  - Ultra-slim... protrudes about 1.5" from the mounting surface
  - Attractive appearance... no visible mounting screws
- **Multiple "FIRE" Marking Options**
  - Order English, French, Spanish or no FIRE markings
  - Change markings at any time with replaceable quick-swap covers
- **Easy to Install**
  - Pre-install and pre-wire with convenient universal room side wiring plate
  - Check electrical continuity on room side wiring plate with included diagnostics check bar
  - Diagnostics port streamlines device circuit testing
  - Fits 1-gang, 2-gang, 3.5-inch octagon, and 4-inch square electrical boxes
  - Optional red and white trim plates available
  - Slide switches for field configuration
  - 12 to 18 AWG in-out screw terminals for quick wiring

# Application

### Strobes

Genesis G4 Series strobes are UL 1971-listed for use indoors as wall-mounted public-mode notification appliances for the hearing impaired. Prevailing codes require strobes to be used where ambient noise conditions exceed 105 dBA (87 dBA in Canada), where occupants use hearing protection, and in areas of public accommodation as defined in the Americans with Disabilities Act.

Synchronization is important in order to avoid triggering seizures in people with photosensitive epilepsy. All Genesis strobes exceed UL synchronization requirements (within 10 milliseconds over a two-hour period) when used with a synchronization source. See the specifications table for a list of compatible sources.

### Horns

Genesis horn output reaches as high as 92 dBA and features an improved audio frequency range compared with other Genesis horns. This results in excellent sound penetration through walls and a clear warning of danger. Horn only models may be configured for either coded or non-coded notification appliance circuits. They can also be set for high or low dBA output. This setting reduces horn output by about 6 dBA. Horn-only models may be ceiling-mounted or wall-mounted.

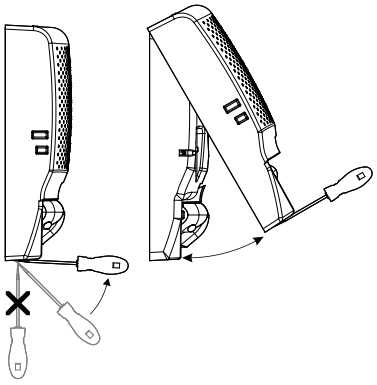
The suggested sound pressure level for each signaling zone used with alarm signals is at least 15 dBA above the average ambient sound level, or 5 dBA above the maximum sound level having a duration of at least 60 seconds, whichever is greater. These values are measured at five feet (1.5 m) above the floor. The average ambient sound level is A-weighted, fast response sound pressure measured over a 24-hour period.

Doubling the distance from the signal to the ear will theoretically result in a 6 dBA reduction of the received sound pressure level. The actual effect depends on the acoustic environment in the space. A 3 dBA difference represents a barely noticeable change in volume.

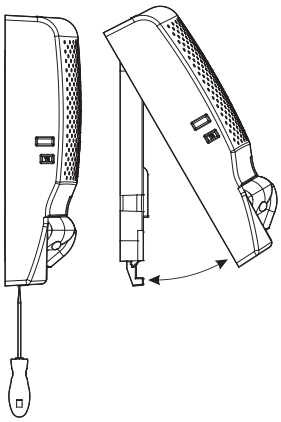
# Installation

Genesis G4 horns and strobes mount to the required GP10 room side wiring plate. The GP10 mounting plate is ordered separately from the G4 device in packs of 10 for convenient pre-installing and pre-wiring. The device can be removed easily from the room side wiring plate by pushing up with a screwdriver. The cover can also be removed from the device easily with a screwdriver to access the light and sound output settings and a diagnostics test port for voltage testing.

Removing Cover

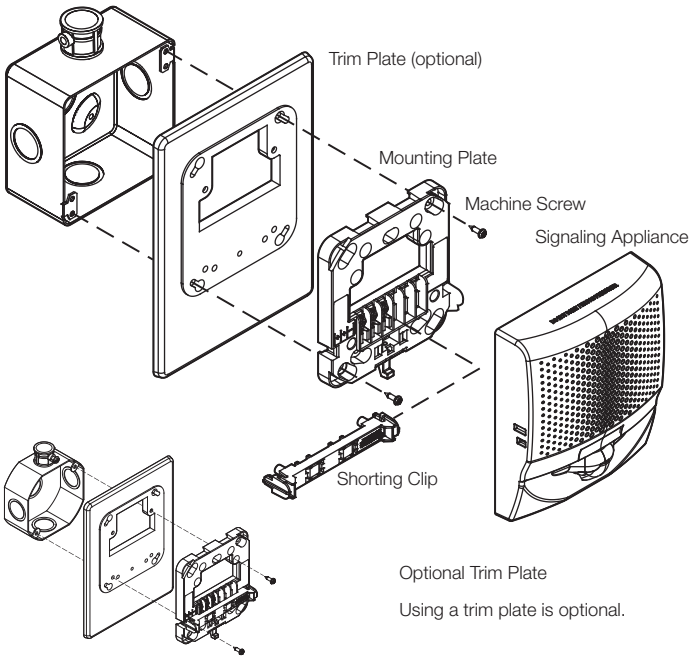


Removing Device



Genesis LED G4 Series horns, strobes, and horn-strobes mount to any standard one-gang, two-gang, 3.5-inch octagon, and 4-inch square electrical box. Matching optional G4T trim rings are available to cover oversized openings. Optional color matched double-gang surface boxes are also available.

Double Gang Electrical Box

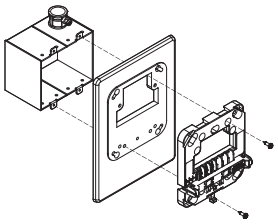




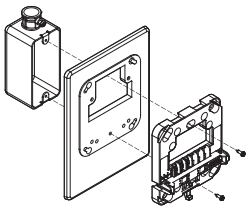

Optional Trim Plate

Using a trim plate is optional.

3.5-inch Octagon Electrical Box

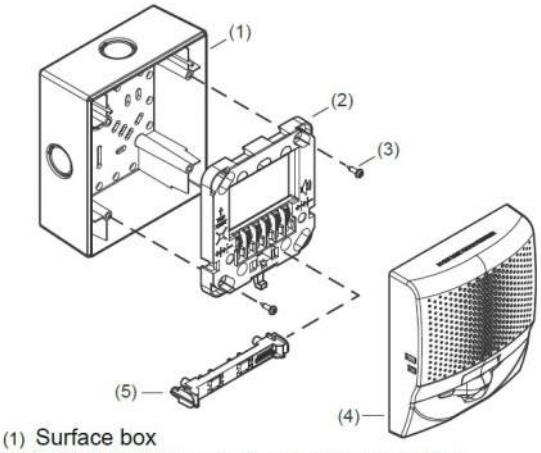


Two-gang Electrical Box



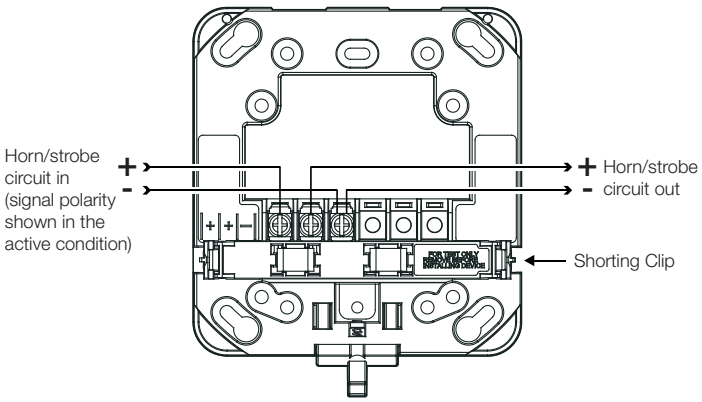
One-gang Electrical Box

Surface Mount Box

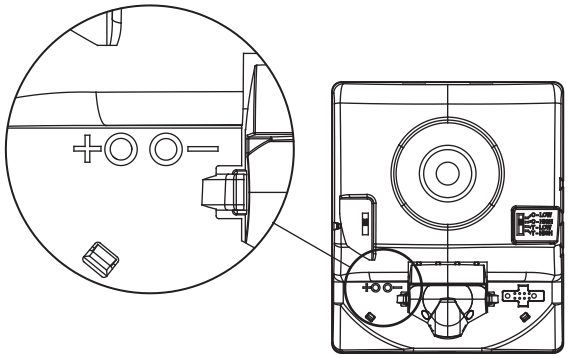



(1) Surface box
(2) Wiring plate (required, ordered separately)
(3) Machine screw (2X, supplied with wiring plate)
(4) Notification appliance
(5) Shorting clip

## Wiring




## Diagnostics



Test points indicated above are used to validate the Notification Appliance Circuit and verify device function.

## Field Configuration

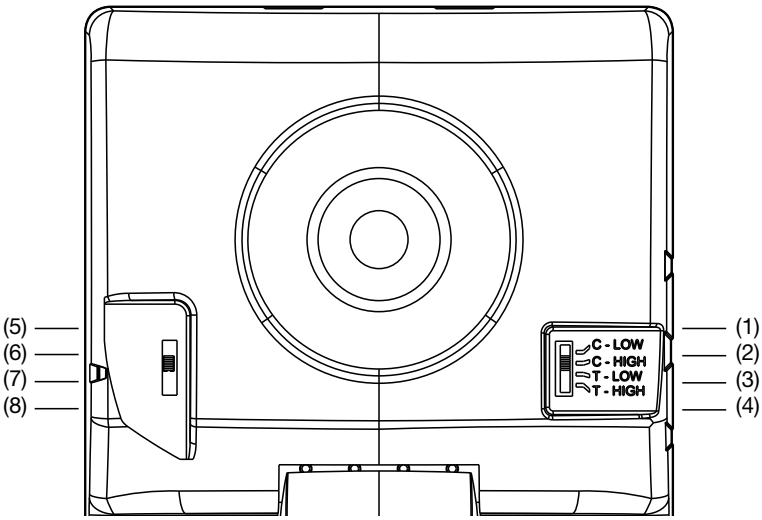
Temporal horn and horn-strobe models are factory set to sound in a three-pulse temporal pattern. By sliding the tone selector switch, horn only models may be configured for constant horn output that can be coded at precise intervals by EDWARDS control panels and control modules.

**Note:** Temporal 3 coding is the required output for fire notification devices per NFPA 72. Any device coding other than temporal 3 is at the discretion and approval of the local authority having jurisdiction (AHJ).

Horns and horn-strobes are factory set for high dB output. Low dB output may be selected by sliding the tone selector switch. This reduces the output by about 6 dBA.

Genesis LED clear strobes and horn-strobes may be set for 15, 30, 75, or 110 candela output. The output setting is changed by simply removing the cover and sliding the candela switch to the desired setting. The device does not have to be removed from the wall to change the output setting. The setting remains visible through a small window on the left-hand side of the device after the cover is closed.

### Light and Sound Output Settings




(1) Constant, low dB
(2) Constant, high dB
(3) T3 temporal, low dB
(4) T3 temporal, high dB
(5) 110 candela
(6) 75 candela
(7) 30 candela
(8) 15 candela

## Operating current

**Horns**

| Sound setting | 16 to 33 VDC | 16 to 33 VFWR |
|---|---|---|
| C-Low, T-Low | 18 mA | 22 mA |
| C-High, T-High | 28 mA | 38 mA |

**Strobes**

| Strobe setting | 16 to 33 VDC | 16 to 33 VFWR |
|---|---|---|
| 15, 30, 75, 110 | 28 mA | 36 mA |

**Horn-Strobes**

| Strobe setting | Sound setting | 16 to 33 VDC | 16 to 33 VFWR |
|---|---|---|---|
| 15, 30, 75, 110 | C-Low, T-Low | 40 mA | 48 mA |
| | C-High, T-High | 50 mA | 60 mA |

## Sound Output

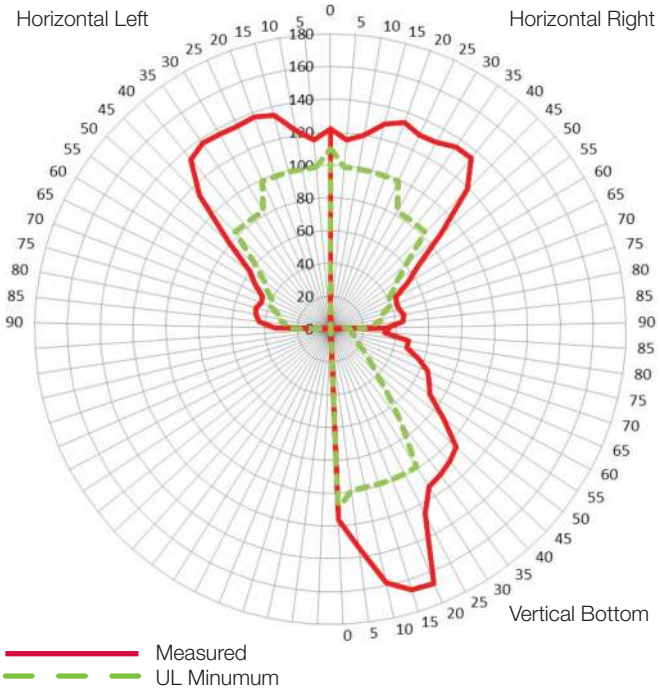
### Horn & Horn-Strobe

| Sound setting | Reverberant (UL464) | Anechoic (CAN/ULC - S525) |
|---|---|---|
| C-Low, T-Low | 80 dBA | 86 dBA |
| C-High, T-High | 85 dBA | 92 dBA |

### Sound pattern (ULC)

| Axis | Angle | Change in output |
|---|---|---|
| Horizontal | 135° and 45° | –3 dBA |
| | 150° and 30° | –6 dBA |
| Vertical | 135° and 40° | –3 dBA |
| | 150° and 30° | –6 dBA |

## Light Distribution




## Specifications

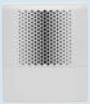
| | |
|---|---|
| Operating voltage | 16 to 33 VDC, 16 to 33 VFWR |
| Horn signal type | Constant or TC3 temporal |
| Light output | 15, 30, 75, or 110 candela |
| Strobe flash rate | 1 fps (flash per second) approx. |
| Synchronization | 20 Ω max. between any two devices. To determine allowed wire resistance, refer to these specifications, and the specifications for the synchronized signal source. |
| Synchronization Sources | Edwards CC Series Signal Modules, Booster and Auxiliary Power Supplies, Intelligent and Conventional Control Panels |
| Wire size | 12 to 18 AWG (0.75 to 2.50 $mm^2$) |
| Dimensions (W×H×D) | 4.95 x 5.78 x 1.62 in (12.57 x 14.68 x 4.11 cm) |
| Strobe-to-box center offset | -1.70 inches (-4.32 cm) |
| Compatible electrical boxes [1] | 1-gang, 2-gang, 3.5-inch octagon, 4-inch square |
| Trim plates | G4TR, G4TW (5.6 x 7.5 x 0.3 in (14.22 x 19.05 x 0.76 cm)) |
| Operating environment | |
| Temperature | 32 to 122°F (0 to 50°C) |
| Relative humidity | 0 to 93% noncondensing |
| Storage Temperature | -40 to 158 F (-40 to 70 C) |

[1] Electrical boxes must be at least 1-1/2 in. (3.81 cm) deep.

# Ordering Information

FOR REFERENCE ONLY

| Notification Appliances | | Color | Marking |
|---|---|---|---|
|  Horns | G4ARF | Red | FIRE |
| | G4ARF-FR | Red | FEU |
| | G4ARF-SP | Red | FUEGO |
| | G4ARN | Red | None |
| | G4AWF | White | FIRE |
| | G4AWF-FR | White | FEU |
| | G4AWF-SP | White | FUEGO |
| | G4AWN | White | None |
|  Strobes | G4VRF | Red | FIRE |
| | G4VRF-FR | Red | FEU |
| | G4VRF-SP | Red | FUEGO |
| | G4VRN | Red | None |
| | G4VWF | White | FIRE |
| | G4VWF-FR | White | FEU |
| | G4VWF-SP | White | FUEGO |
| | G4VWN | White | None |
|  Horn-strobes | G4AVRF | Red | FIRE |
| | G4AVRF-FR | Red | FEU |
| | G4AVRF-SP | Red | FUEGO |
| | G4AVRN | Red | None |
| | G4AVWF | White | FIRE |
| | G4AVWF-FR | White | FEU |
| | G4AVWF-SP | White | FUEGO |
| | G4AVWN | White | None |

| Replacement Appliance Covers | | Color | Marking |
|---|---|---|---|
|  Horn Covers | G4ARA-CVR | Red | ALERT |
| | G4ARF-CVR | Red | FIRE |
| | G4ARF-FR-CVR | Red | FEU |
| | G4ARF-SP-CVR | Red | FUEGO |
| | G4ARN-CVR | Red | None |
| | G4AWA-CVR | White | ALERT |
| | G4AWF-CVR | White | FIRE |
| | G4AWF-FR-CVR | White | FEU |
| | G4AWF-SP-CVR | White | FUEGO |
| | G4AWN-CVR | White | None |
|  Strobe Covers | G4VRA-CVR | Red | ALERT |
| | G4VRF-CVR | Red | FIRE |
| | G4VRF-FR-CVR | Red | FEU |
| | G4VRF-SP-CVR | Red | FUEGO |
| | G4VRN-CVR | Red | None |
| | G4VWA-CVR | White | ALERT |
| | G4VWF-CVR | White | FIRE |
| | G4VWF-FR-CVR | White | FEU |
| | G4VWF-SP-CVR | White | FUEGO |
| | G4VWN-CVR | White | None |
|  Horn-strobe Covers | G4AVRA-CVR | Red | ALERT |
| | G4AVRF-CVR | Red | FIRE |
| | G4AVRF-FR-CVR | Red | FEU |
| | G4AVRF-SP-CVR | Red | FUEGO |
| | G4AVRN-CVR | Red | None |
| | G4AVWA-CVR | White | ALERT |
| | G4AVWF-CVR | White | FIRE |
| | G4AVWF-FR-CVR | White | FEU |
| | G4AVWF-SP-CVR | White | FUEGO |
| | G4AVWN-CVR | White | None |

## Accessories


GP10 — Room Side Wiring Plate (required, ordered separately)


G4TR — Trim plate, G4 Series, red


G4TW — Trim plate, G4 Series, white


G4RSB — Wall 4 inch Surface Mount Box, Red


G4WSB — Wall 4 inch Surface Mount Box, White

## Model Number Syntax, Appliances

**Genesis Series**
**G4** = Wall mount appliances

**Housing Color**
**R** = Red
**W** = White

G4AVRF

**Housing Marking**
**N** = None
**F-FR** = FEU
**F-SP** = FUEGO
**F** = FIRE
**A** = ALERT*

**Functions**
**A** = Horn only
**V** = Strobe only
**AV** = Horn-Strobe

* ALERT Marking available on white strobe model only. See replacement covers for more options.

## Model Number Syntax, Replacement Covers

**Genesis Series**
**G4** = Wall mount appliances

**Housing Color**
**R** = Red
**W** = White

G4AVRF-CVR

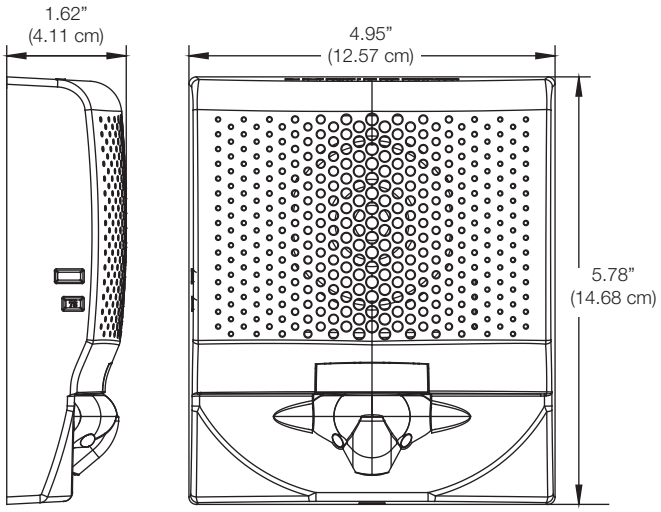
**Cover Designation**

**Cover Marking**
**N** = None
**F-FR** = FEU
**F-SP** = FUEGO
**F** = FIRE
**A** = ALERT

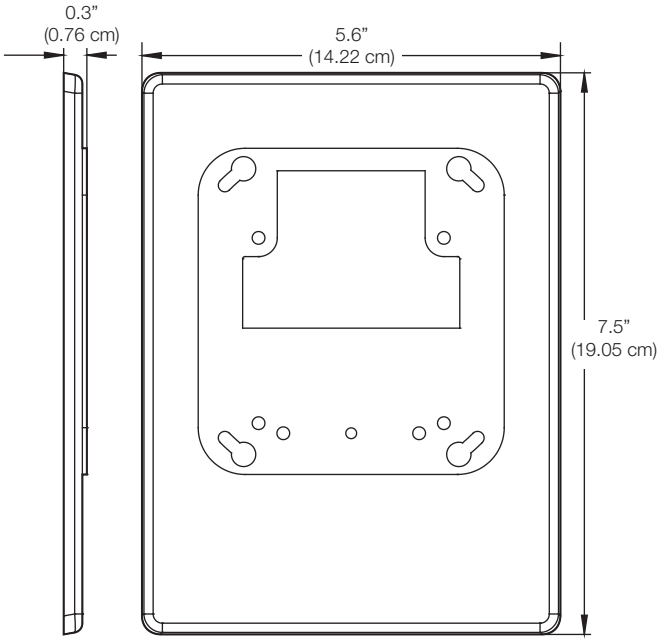
**Functions**
**A** = Horn only
**V** = Strobe only
**AV** = Horn-Strobe

# Dimensions

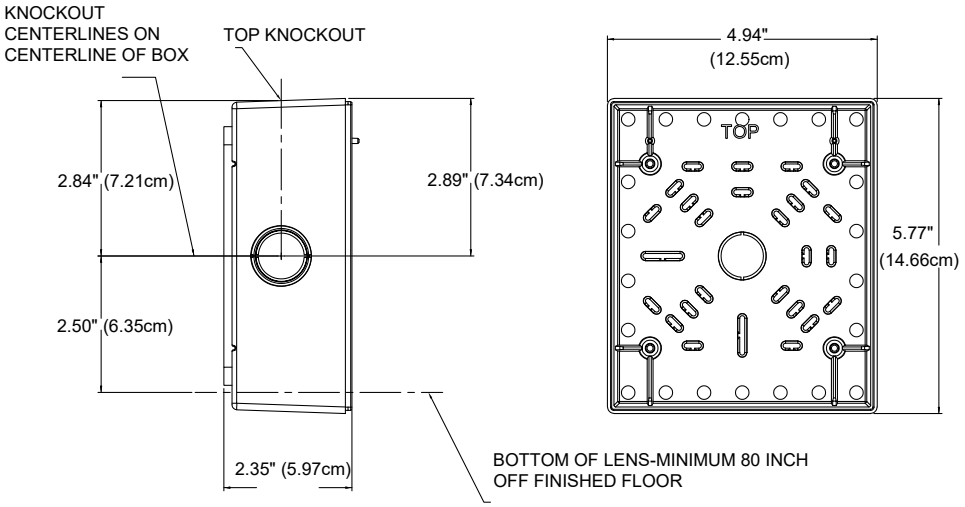
## G4 Notification Appliances




## G4T Trim Plate (optional)




## Surface Mounting Box




EDWARDS

LIFE SAFETY & INCIDENT MANAGEMENT

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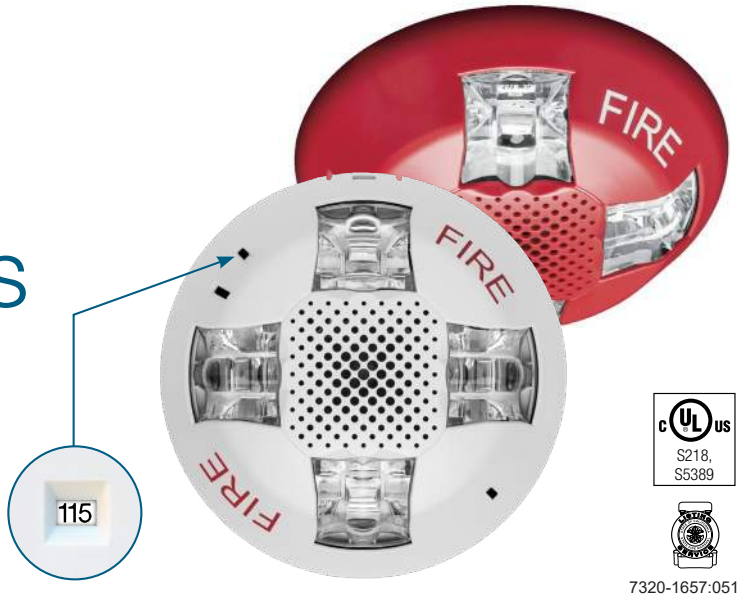
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EDWARDS

LIFE SAFETY & INCIDENT MANAGEMENT

# Ceiling Mount Speakers and Speaker-Strobes

## Genesis LED GCS Series




S218, S5389

7320-1657:0516

## Overview

Genesis LED GCS Series speakers and speaker-strobes combine high performance output with a sleek low profile design and energy-efficient technology that makes them less expensive to install and operate. High performance LEDs require fewer power supplies, backup power, and batteries. These new appliances are designed with energy-efficiency, and life safety in mind.

Speakers feature selectable wattage taps, while speaker-strobes allow for both wattage and light output levels to be configured in the field. Both settings remain clearly visible — even after final installation. Speakers are also capable of both 25V and 70V and voltage in a single model with a field selectable switch. All this flexibility allows devices to be easily fine-tuned to exactly how they're needed to perform. All Genesis speakers include a DC blocking capacitor to allow electrical supervision of the audio distribution circuit.

Genesis LED GCS Series uses high efficiency optics, combined with patented electronics, to deliver a highly controlled and efficiently focused light distribution pattern in exchange for lower current requirements. Strobes feature field-selectable 15, 30,75, or 115 cd light output.

Compared with Xenon-type strobes, Genesis LED GCS Series appliances offer greatly reduced current draw which provides benefits in longer circuit lengths, more devices per circuit, smaller wire gauge and reduced power supply quantities for an installation. They are also backwards compatible with legacy strobes, so there's no need to replace all your existing devices to upgrade to new LED technology. In fact, GCS strobes can be mixed on the same circuit and used in the same field of view as Xenon-based strobes. This makes Genesis LED GCS Series ideal for new installations and retrofits alike.

Field-configurable sound output levels provide the flexibility modern life safety projects demand, while the Genesis LED control protocol keeps multiple strobes on compatible NAC circuits synchronized to well within NFPA 72 requirements. They also meet NFPA and UL 520Hz requirements for sleeping areas making them ideal for new construction or retrofits.

GCS Series speakers produce crisp, clear voice audio output that is highly intelligible over large areas. In an emergency, intelligibility is critical to life safety. Understanding the content of the message is as important as knowing there is an emergency. Intelligibility is measured in Speech Transmission Index and anything above .76 is considered excellent. GCS Series speakers deliver audio with an STI of .81 ensuring the message is clear.

Serviceability is another area where GCS Series appliances shine. The universal room side wiring plate allows for pre-installation and electrical wiring as well as checking continuity with the included diagnostics check bar. GCS Series devices can then be easily snapped into place with the confidence of knowing the wiring is correct. The innovative under-cover diagnostic test points provide easy access to device circuit testing while mounted.

## Standard Features

- **High Fidelity performance with excellent STI**
  - Increased sound fidelity and audio intelligibility with an STI rating of .81 (More than .76 is excellent)
- **Low Frequency (520Hz) capable**
  - Low frequency output meets NFPA standards for newly constructed commercial sleeping areas
- **High Performance LED Strobe Technology**
  - Ultra low device current consumption allows:
    - More devices per circuit
    - Ability to use lower gauge wire
    - Longer wire runs
    - Fewer booster power supplies
  - High efficiency optics
  - Selectable 15, 30, 75, or 115 cd light output
  - LED devices may be mixed with legacy Xenon strobes on the same circuit and in the same field of view
- **Field flexibility**
  - Speakers are also capable of both 25V and 70V and voltage in a single model with a field selectable switch
  - Speakers feature selectable wattage taps for ¼W, ½W, 1W, and 2W to configure sound output levels in the field
- **Low-profile Design**
  - Ultra-slim... protrudes about 1.5" from the mounting surface
  - Attractive appearance... no visible mounting screws
- **Multiple "FIRE" Marking Options**
  - Order English, French, Spanish or no FIRE markings
  - Change markings at any time with replaceable quick-swap covers
- **Easy to Install**
  - Pre-install and pre-wire with convenient universal room side wiring plate
  - Check electrical continuity on room side wiring plate with included diagnostics check bar
  - Diagnostics port streamlines device circuit testing
  - Fits 2-gang and 4-inch square electrical boxes
  - Optional red and white trim plates available
  - Slide switches for field configuration
  - 12 to 18 AWG in-out screw terminals for quick wiring
- **Current draw is the same for all candela output settings**
  - Easier for new system design
  - Flexible for future changes in light output needs

## Application

### Strobes

Genesis GCS Series strobes are UL 1971-listed for use indoors as wall or ceiling public-mode notification appliances for the hearing impaired. Prevailing codes require strobes to be used where ambient noise conditions exceed 105 dBA (87 dBA in Canada), where occupants use hearing protection, and in areas of public accommodation as defined in the *Americans with Disabilities Act*.

Synchronization is important in order to avoid triggering seizures in people with photosensitive epilepsy. All Genesis strobes exceed UL synchronization requirements (within 10 milliseconds over a two-hour period) when used with a synchronization source. See the specifications table for a list of compatible sources.

### Speakers

The suggested sound pressure level for each signaling zone used with alert or alarm signals is a minimum of 15 dB above the average ambient sound level or 5 dB above the maximum sound level having a duration of at least 60 seconds, whichever is greater. This is measured 5 feet (1.5 m) above the floor.

Doubling the distance from the signal to the ear will theoretically cause a 6 dB reduction in the received sound pressure level. The actual effect depends on the acoustic properties of materials in the space. Doubling the power output of a device (e.g.: a speaker from 1W to 2W) will increase the sound pressure level by 3dBA.

### High Fidelity Sound

Genesis LED GCS Series High Fidelity appliances feature 87dB of sound output along with a highly intelligible Speech Transmission Index (STI) rating of .81. An STI rating above .76 is considered excellent for speech intelligibility They are also effective in areas subject to high levels of ambient noise.

These appliances are ideal for hotels, dormitories and other residential occupancies that have sleeping areas that require 520Hz tones. In sleeping areas, always ensure that the wattage tap of the speaker is set sufficiently high so that the sound pressure reaches at least 75 dBA at the pillow.

These appliances are part of an end-to-end audio system approved for use in sleeping areas when used in conjunction with approved audio hardware and a factory-supplied 520 Hz tone. Check the System Compatibility List for other 520 Hz signaling requirements.

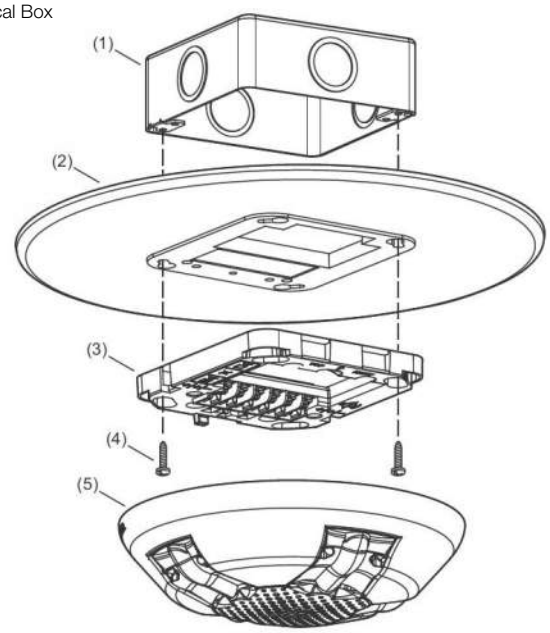
## Installation

Genesis GCS speakers and speaker-strobes mount to the required GRSW room side wiring plate. The GRSW mounting plate is ordered separately from the GCS device in packs of 10 (GRSW-10) for convenient pre-installing and pre-wiring. The device can be removed easily from the room side wiring plate by pushing up with a screwdriver. The cover can also be removed from the device easily with a screwdriver to access the light and sound output settings and a diagnostics test port for voltage testing.

Genesis LED GCS Series speakers and speaker-strobes mount to any standard two-gang and 4-inch square electrical box. Matching optional GCT trim rings are available to cover oversized openings. Optional color matched double-gang surface boxes are also available.

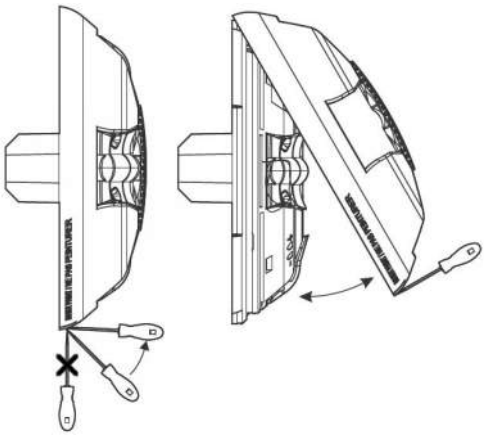
## Installation

Electrical Box

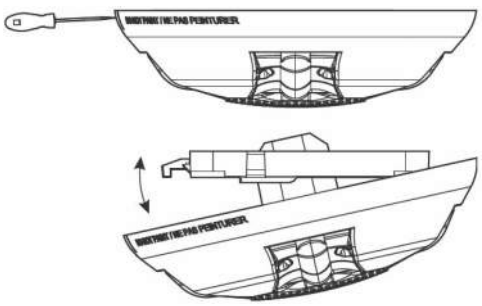



(1) Electrical box
(2) Trim plate (optional)
(3) Wiring plate (required, ordered separately)
(4) Machine screw (2X, supplied with wiring plate)
(5) Notification appliance

Removing Cover

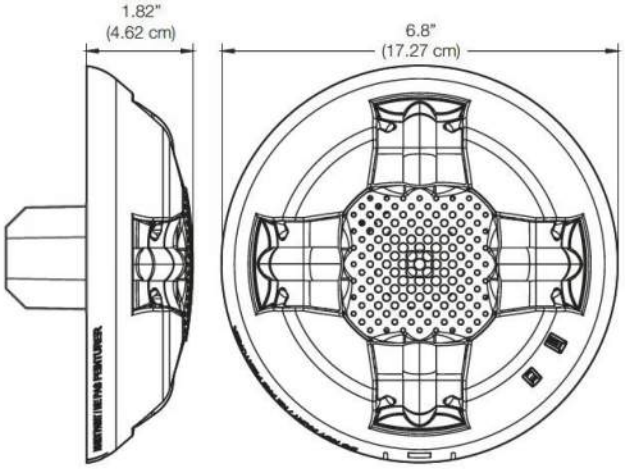


Removing Device

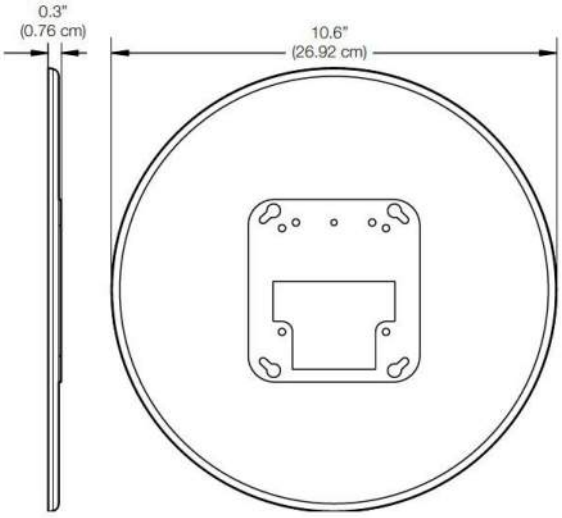


## Dimensions

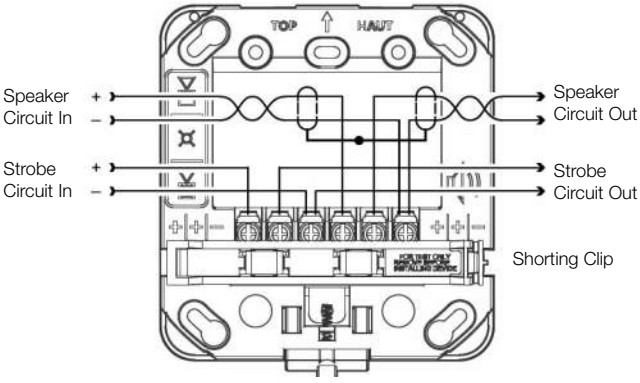
### GCS Notification Appliances




### GCT Trim Plate (optional)



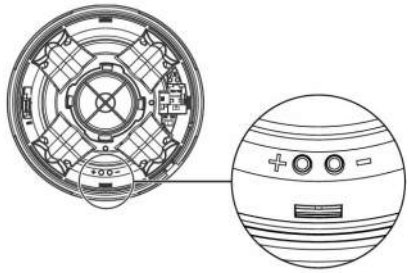

## Wiring



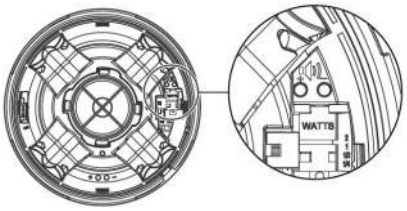

Test points indicated above are used to validate the Notification Appliance Circuit and verify device function.

## Diagnostics

### Strobe Circuit Test Points



### Speaker Circuit Test Points



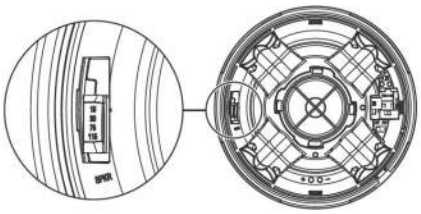

## Field Configuration

Genesis LED speakers are capable of both 25V and 70V operation depending on the system, The voltage is set via a switch under the cover. Speakers also may be set for ¼, ½, 1, or 2 watt operation. The wattage setting is visible through a small window on the side of the device and is changed by simply sliding the switch under the cover until the desired setting appears in the window. The speaker does not have to be removed to change the wattage, only the cover skin.

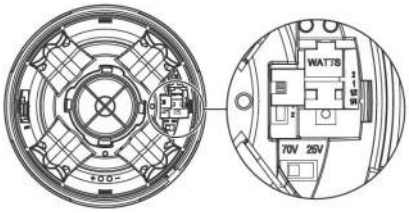
Genesis LED clear strobes and speaker-strobes may be set for 15, 30, 75, or 115 candela output. The output setting is changed by simply removing the cover and sliding the candela switch to the desired setting. The device does not have to be removed from the wall to change the output setting. The setting remains visible through a small window on the left-hand side of the device after the cover is closed.

## Light and Sound Output Settings

### Light Output Setting (Candela)



### Sound Settings (Watts and Volts)




## Operating current

**Strobes**

| Strobe setting | 16 to 33 VDC | 16 to 33 VFWR |
|---|---|---|
| 15, 30, 75, 115 | 35 mA | 45 mA |

Note: Current draw is the same for all candela settings

**Sound Level Output**

| Voltage setting | Wattage setting | Reverberant (UL 1480) | Anechoic (CAN/ ULC-S541) |
|---|---|---|---|
| 25V / 70V | ¼W | 78 | 77 |
| | ½W | 81 | 80 |
| | 1W | 84 | 83 |
| | 2W | 87 | 86 |

## Sound Output

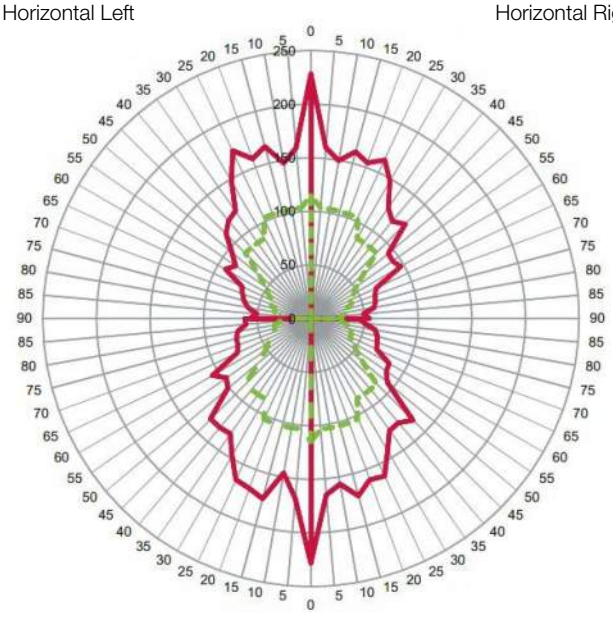
**Sound pattern (ULC)**

| Axis | Angle | Change in output |
|---|---|---|
| Horizontal | 120° and 60° | –3 dBA |
| | 140° and 40° | –6 dBA |
| Vertical | 120° and 60° | –3 dBA |
| | 145° and 40° | –6 dBA |

## Light Distribution

Horizontal Left

Horizontal Right



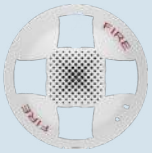

Measured

UL Minimum

Vertical Bottom

## Ordering Information

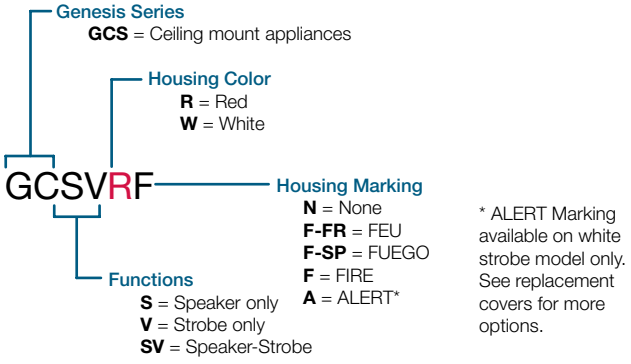
| Notification Appliances | | Color | Marking |
|---|---|---|---|
|  **Speakers** | GCSRF | Red | FIRE |
| | GCSRF-FR | Red | FEU |
| | GCSRF-SP | Red | FUEGO |
| | GCSRN | Red | None |
| | GCSWF | White | FIRE |
| | GCSWF-FR | White | FEU |
| | GCSWF-SP | White | FUEGO |
| | GCSWN | White | None |
| | GCSWA | White | ALERT |
|  **Speaker-strobes** | GCSVRF | Red | FIRE |
| | GCSVRF-FR | Red | FEU |
| | GCSVRF-SP | Red | FUEGO |
| | GCSVRN | Red | None |
| | GCSVWF | White | FIRE |
| | GCSVWF-FR | White | FEU |
| | GCSVWF-SP | White | FUEGO |
| | GCSVWN | White | None |
| | GCSVWA | White | ALERT |

| Replacement Appliance Covers | | Color | Marking |
|---|---|---|---|
|  **Speaker Covers** | GCSRA-CVR | Red | ALERT |
| | GCSRF-CVR | Red | FIRE |
| | GCSRF-FR-CVR | Red | FEU |
| | GCSRF-SP-CVR | Red | FUEGO |
| | GCSRN-CVR | Red | None |
| | GCSWA-CVR | White | ALERT |
| | GCSWF-CVR | White | FIRE |
| | GCSWF-FR-CVR | White | FEU |
| | GCSWF-SP-CVR | White | FUEGO |
| | GCSWN-CVR | White | None |
|  **Speaker-strobe Covers** | GCSVRA-CVR | Red | ALERT |
| | GCSVRF-CVR | Red | FIRE |
| | GCSVRF-FR-CVR | Red | FEU |
| | GCSVRF-SP-CVR | Red | FUEGO |
| | GCSVRN-CVR | Red | None |
| | GCSVWA-CVR | White | ALERT |
| | GCSVWF-CVR | White | FIRE |
| | GCSVWF-FR-CVR | White | FEU |
| | GCSVWF-SP-CVR | White | FUEGO |
| | GCSVWN-CVR | White | None |

### Accessories

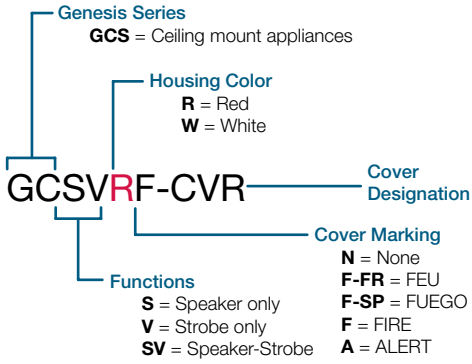
| | | | | | | | |
|---|---|---|---|---|---|---|---|
|  | GRSW-10 | Room Side Wiring Plate 10 pack (required, ordered separately) |  | GCTR | Trim plate, GC Series, red |  | GCTW | Trim plate, GC Series, white |
| | | | | 27193-21 | Two-gang surface mount box, red | | 27193-26 | Two-gang surface mount box, white |

### Model Number Syntax, Appliances




* ALERT Marking available on white strobe model only. See replacement covers for more options.

### Model Number Syntax, Replacement Covers



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Website: edwardsfiresafety.com

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## Specifications

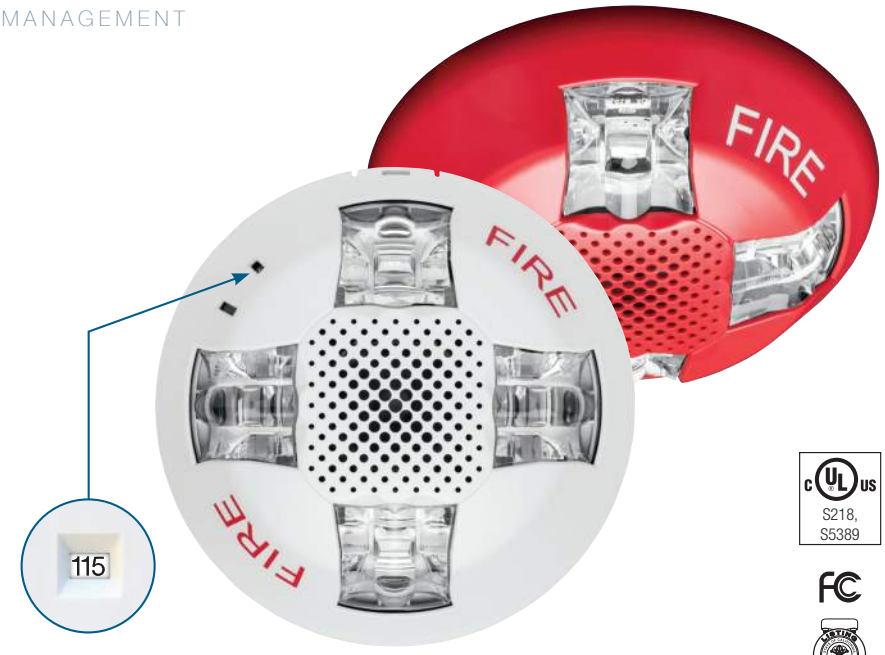
| | |
|---|---|
| Strobe operating voltage | 16 to 33 VDC, 16 to 33 VFWR |
| Speaker operating voltage | 25VRMS of 70VRMS (selectable) |
| Speaker frequency response | 400Hz-4,000Hz |
| Light output | 15, 30, 75, or 115 candela |
| Strobe flash rate | 1 fps (flash per second) approx. |
| Synchronization | 20 Ω max. between any two devices. To determine allowed wire resistance, refer to these specifications, and the specifications for the synchronized signal source. |
| Synchronization Sources | Edwards CC Series Signal Modules, Booster and Auxiliary Power Supplies, Intelligent and Conventional Control Panels |
| Wire size | 12 to 18 AWG (0.75 to 2.50 $mm^2$) |
| Dimensions (Ø × D) | 6.8 x 1.82 in (17.27 x 4.62 cm) |
| Strobe-to-box center offset | -1.70 inches (-4.32 cm) |
| Compatible electrical boxes [1] | 2-gang, 4-inch square |
| Trim plates | GCTR, GCTW 10.6 × 0.3 in. (26.92 × 0.76 cm) |
| Operating environment<br>Temperature<br>Relative humidity | <br>32 to 122°F (0 to 50°C)<br>0 to 93% noncondensing |
| Storage Temperature | -40 to 158 F (-40 to 70 C) |
| RAL Color | Red=RAL 3013<br>White=RAL 9002 |

[1] Electrical boxes must be at least 1-1/2 in. (3.81 cm) deep.
(2) Recommend electrical boxes be mounted at 81 inches AFF

EDWARDS
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LIFE SAFETY & INCIDENT MANAGEMENT

# Genesis LED GC Series

## Ceiling Mount Notification Devices




cULus S218, S5389

FC

## Overview

Genesis LED GC Series horns and LED strobes feature a sleek low profile design and energy-efficient technology that makes them less expensive to install and operate by reducing overhead. High performance LEDs require fewer power supplies, backup power, and batteries. These new appliances are designed with, energy-efficiency, and life safety in mind.

Genesis LED GC Series uses high efficiency optics, combined with patented electronics, to deliver a highly controlled and efficiently focused light distribution pattern in exchange for lower current requirements. Strobes feature field-selectable 15, 30,75, or 115 cd light output.

Compared with Xenon-type strobes, Genesis LED GC Series appliances need fewer power supplies and often smaller wire gauge, which lightens conduit requirements. They are also backwards compatible with legacy strobes, so there's no need to replace all your existing devices to upgrade to new LED technology. In fact, GC strobes can be mixed on the same circuit and used in the same field of view as Xenon-based strobes. This makes Genesis LED GC Series ideal for new installations and retrofits alike.

Field-configurable sound output levels provide the flexibility modern life safety projects demand, while the Genesis LED control protocol keeps multiple strobes on compatible NAC circuits synchronized to well within NFPA 72 requirements.

Serviceability is another area where GC Series appliances shine. The universal room side wiring plate allows for pre-installation and electrical wiring as well as checking continuity with the included diagnostics check bar. GC Series devices can then be easily snapped into place with the confidence of knowing the wiring is correct. The innovative under-cover diagnostic test points provide easy access to device circuit testing while mounted.

## Standard Features

- **High Performance LED Strobe Technology**
  - Ultra low device current consumption allows:
    - More devices per circuit
    - Ability to use lower gauge wire
    - Longer wire runs
    - Fewer booster power supplies
  - High efficiency optics
  - Selectable 15, 30, 75, or 115 cd light output
  - LED devices may be mixed with legacy Xenon strobes
- **Efficient Audible Output**
  - Selectable high or low dB horn output
  - Selectable temporal or steady horn output
  - Improved audio frequency range for better wall penetration
- **Low-profile Design**
  - Ultra-slim... protrudes about 1.5" from the mounting surface
  - Attractive appearance... no visible mounting screws
- **Multiple "FIRE" Marking Options**
  - Order English, French, Spanish or no FIRE markings
  - Change markings at any time with replaceable quick-swap covers
- **Easy to Install**
  - Pre-install and pre-wire with convenient universal room side wiring plate
  - Check electrical continuity on room side wiring plate with included diagnostics check bar
  - Diagnostics port streamlines device circuit testing
  - Fits 1-gang, 2-gang, 4-inch octagon, and 4-inch square electrical boxes
  - Optional red and white trim plates available
  - Slide switches for field configuration
  - 12 to 18 AWG in-out screw terminals for quick wiring

## Application

### Strobes

Genesis GC Series strobes are UL 1971-listed for use indoors as ceiling-mounted public-mode notification appliances for the hearing impaired. Prevailing codes require strobes to be used where ambient noise conditions exceed 105 dBA (87 dBA in Canada), where occupants use hearing protection, and in areas of public accommodation as defined in the *Americans with Disabilities Act*.

Synchronization is important in order to avoid triggering seizures in people with photosensitive epilepsy. All Genesis strobes exceed UL synchronization requirements (within 10 milliseconds over a two-hour period) when used with a synchronization source. See the specifications table for a list of compatible sources.

### Horns

Genesis horn output reaches as high as 92 dBA and features an improved audio frequency range compared with other Genesis horns. This results in excellent sound penetration through walls and a clear warning of danger. Horn only models may be configured for either coded or non-coded notification appliance circuits. They can also be set for high or low dBA output. This setting reduces horn output by about 6 dBA.

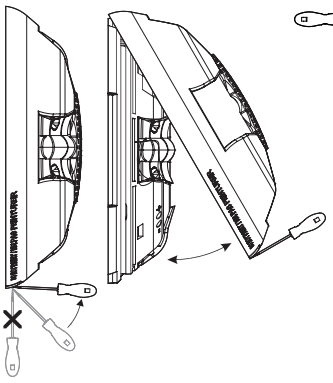
The suggested sound pressure level for each signaling zone used with alarm signals is at least 15 dBA above the average ambient sound level, or 5 dBA above the maximum sound level having a duration of at least 60 seconds, whichever is greater. These values are measured at five feet (1.5 m) above the floor. The average ambient sound level is A-weighted, fast response sound pressure measured over a 24-hour period.

Doubling the distance from the signal to the ear will theoretically result in a 6 dBA reduction of the received sound pressure level. The actual effect depends on the acoustic environment in the space. A 3 dBA difference represents a barely noticeable change in volume.

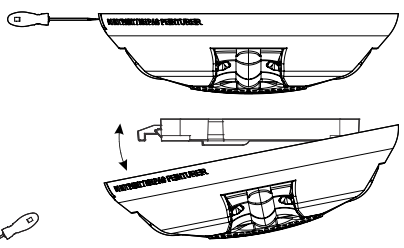
## Installation

Genesis GC horns and strobes mount to the required GP10 room side wiring plate. The GP10 mounting plate is ordered separately from the GC device in packs of 10 for convenient pre-installing and pre-wiring. The device can be removed easily from the room side wiring plate by pushing up with a screwdriver. The cover can also be removed from the device easily with a screwdriver to access the light and sound output settings and a diagnostics test port for voltage testing.

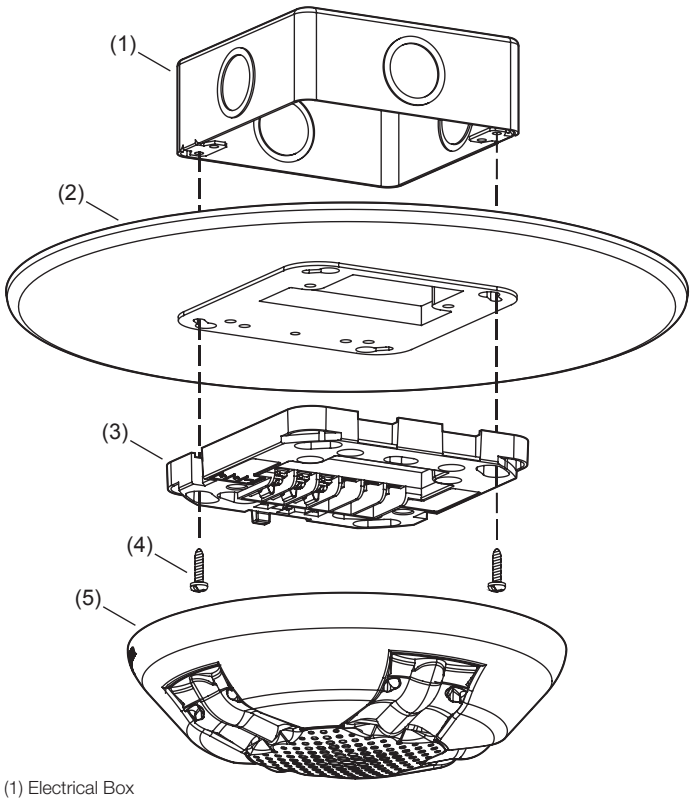
Removing Cover



Removing Device

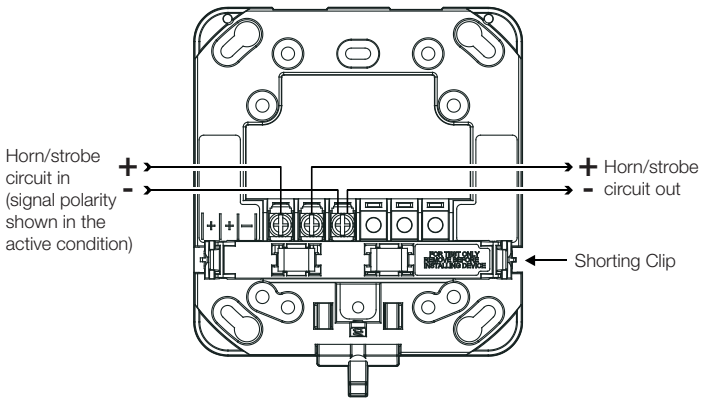


Genesis LED GC Series horns, strobes, and horn-strobes mount to any standard one-gang, two-gang, 4-inch octagon, and 4-inch square electrical box. Matching optional GCT trim rings are available to cover oversized openings. Optional color matched double-gang surface boxes are also available. Genesis LED GC series are listed to be both wall mounted or ceiling mounted.



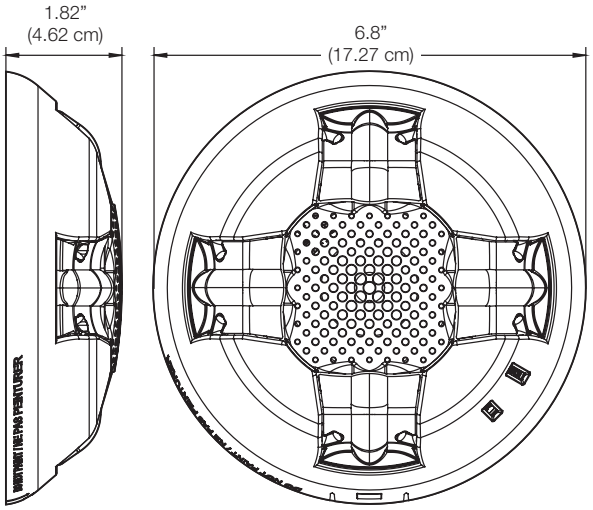

(1) Electrical Box
(2) Trim Plate (optional)
(3) Wiring plate (required, ordered separately)
(4) Machine screw (2X, supplied with wiring plate)
(5) GC signaling appliance

## Wiring

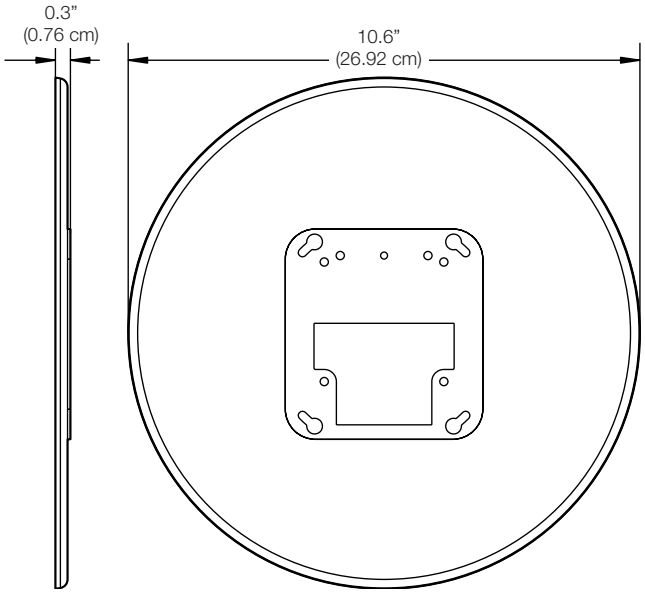


## Dimensions

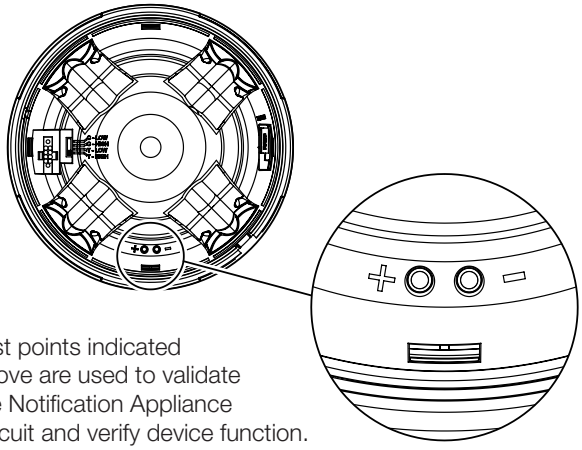
### GC Notification Appliances




### GCT Trim Plate (optional)




## Diagnostics



Test points indicated above are used to validate the Notification Appliance Circuit and verify device function.

## Field Configuration

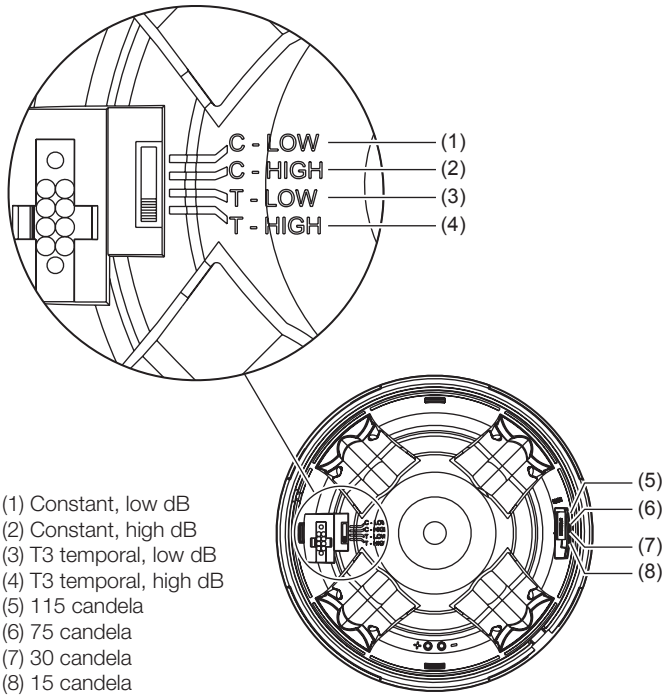
Temporal horn and horn-strobe models are factory set to sound in a three-pulse temporal pattern. By sliding the tone selector switch, horn only models may be configured for constant horn output that can be coded at precise intervals by EDWARDS control panels and control modules.

**Note:** Temporal 3 coding is the required output for fire notification devices per NFPA 72. Any device coding other than temporal 3 is at the discretion and approval of the local authority having jurisdiction (AHJ).

Horns and horn-strobes are factory set for high dB output. Low dB output may be selected by sliding the tone selector switch. This reduces the output by about 6 dBA.

Genesis LED clear strobes and horn-strobes may be set for 15, 30, 75, or 115 candela output. The output setting is changed by simply removing the cover and sliding the candela switch to the desired setting. The device does not have to be removed from the wall to change the output setting. The setting remains visible through a small window on the device after the cover is closed.

### Light and Sound Output Settings




(1) Constant, low dB
(2) Constant, high dB
(3) T3 temporal, low dB
(4) T3 temporal, high dB
(5) 115 candela
(6) 75 candela
(7) 30 candela
(8) 15 candela

## Operating current

**Horns**

| Sound setting | 16 to 33 VDC | 16 to 33 VFWR |
|---|---|---|
| C-Low, T-Low | 20 mA | 25 mA |
| C-High, T-High | 30 mA | 40 mA |

**Strobes**

| Strobe setting | 16 to 33 VDC | 16 to 33 VFWR |
|---|---|---|
| 15, 30, 75, 115 | 35 mA | 45 mA |

**Horn-Strobes**

| Strobe setting | Sound setting | 16 to 33 VDC | 16 to 33 VFWR |
|---|---|---|---|
| 15, 30, 75, 115 | C-Low, T-Low | 50 mA | 60 mA |
| | C-High, T-High | 60 mA | 75 mA |

## Sound Output

### Horn & Horn-Strobe

| Sound setting | Reverberant (UL464) | Anechoic (CAN/ULC - 5925) |
|---|---|---|
| C-Low, T-Low | 80 dBA | 86 dBA |
| C-High, T-High | 86 dBA | 92 dBA |

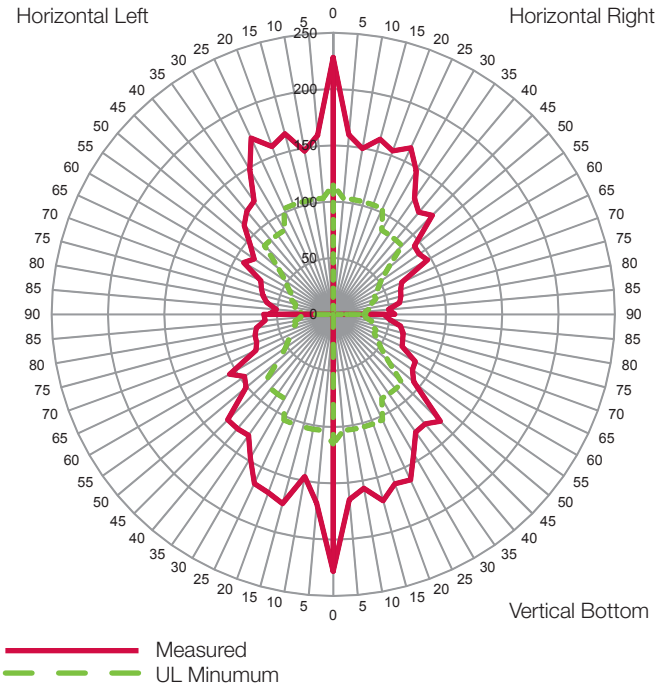
### Sound pattern – Horn Models (ULC)

| Axis | Angle (°) | Output (dBA) |
|---|---|---|
| Horizontal | 115 and 55 | 93.3 |
| Vertical | 125 and 50 | 91.7 |

### Sound pattern – Horn-Strobe Models (ULC)

| Axis | Angle (°) | Output (dBA) |
|---|---|---|
| Horizontal | 145 and 35 | 93.0 |
| | 155 and 35 | 90.8 |
| Vertical | 135 and 35 | 92.0 |
| | 155 and 25 | 85.4 |

## Light Distribution



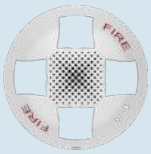

## Specifications

| | |
|---|---|
| Operating voltage | 16 to 33 VDC, 16 to 33 VFWR |
| Horn signal type | Constant or TC3 temporal |
| Light output | 15, 30, 75, or 115 candela |
| Strobe flash rate | 1 fps (flash per second) approx. |
| Synchronization | 20 Ω max. between any two devices. To determine allowed wire resistance, refer to these specifications, and the specifications for the synchronized signal source. |
| Synchronization Sources | Edwards CC Series Signal Modules, Booster and Auxiliary Power Supplies, Intelligent and Conventional Control Panels |
| Wire size | 12 to 18 AWG (0.75 to 2.50 $mm^2$) |
| Mounting | Wall or Ceiling mount |
| Dimensions (Ø × D) | 6.8 × 1.82 in. (17.27 × 4.62 cm) |
| Strobe-to-box center offset | -1.70 inches (-4.32 cm) |
| Compatible electrical boxes [1] | 1-gang, 2-gang, 4-inch octagon, 4-inch square |
| Trim plates | GCTR, GCTW 10.6 × 0.3 in. (26.92 × 0.76 cm) |
| Operating environment | |
| Temperature | 32 to 122°F (0 to 50°C) |
| Relative humidity | 0 to 93% noncondensing |
| Storage Temperature | -40 to 158 F (-40 to 70 C) |

[1] Electrical boxes must be at least 1-1/2 in. (3.81 cm) deep.

# Ordering Information

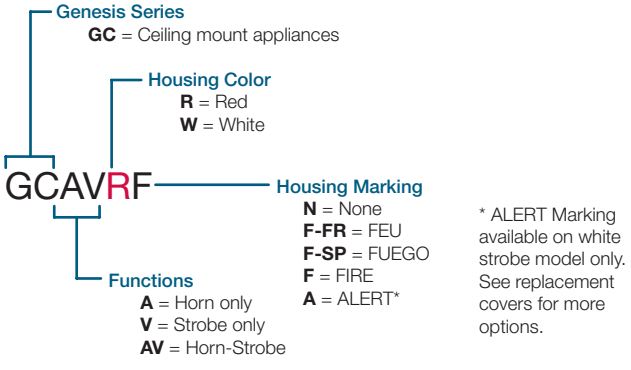
| Notification Appliances | | Color | Marking |
|---|---|---|---|
|  Horns | GCARF | Red | FIRE |
| | GCARF-FR | Red | FEU |
| | GCARF-SP | Red | FUEGO |
| | GCARN | Red | None |
| | GCAWF | White | FIRE |
| | GCAWF-FR | White | FEU |
| | GCAWF-SP | White | FUEGO |
| | GCAWN | White | None |
|  Strobes | GCVRF | Red | FIRE |
| | GCVRF-FR | Red | FEU |
| | GCVRF-SP | Red | FUEGO |
| | GCVRN | Red | None |
| | GCVWF | White | FIRE |
| | GCVWF-FR | White | FEU |
| | GCVWF-SP | White | FUEGO |
| | GCVWN | White | None |
|  Horn-strobes | GCAVRF | Red | FIRE |
| | GCAVRF-FR | Red | FEU |
| | GCAVRF-SP | Red | FUEGO |
| | GCAVRN | Red | None |
| | GCAVWF | White | FIRE |
| | GCAVWF-FR | White | FEU |
| | GCAVWF-SP | White | FUEGO |
| | GCAVWN | White | None |

| Replacement Appliance Covers | | Color | Marking |
|---|---|---|---|
|  Horn Covers | GCARA-CVR | Red | ALERT |
| | GCARF-CVR | Red | FIRE |
| | GCARF-FR-CVR | Red | FEU |
| | GCARF-SP-CVR | Red | FUEGO |
| | GCARN-CVR | Red | None |
| | GCAWA-CVR | White | ALERT |
| | GCAWF-CVR | White | FIRE |
| | GCAWF-FR-CVR | White | FEU |
| | GCAWF-SP-CVR | White | FUEGO |
| | GCAWN-CVR | White | None |
|  Strobe Covers | GCVRA-CVR | Red | ALERT |
| | GCVRF-CVR | Red | FIRE |
| | GCVRF-FR-CVR | Red | FEU |
| | GCVRF-SP-CVR | Red | FUEGO |
| | GCVRN-CVR | Red | None |
| | GCVWA-CVR | White | ALERT |
| | GCVWF-CVR | White | FIRE |
| | GCVWF-FR-CVR | White | FEU |
| | GCVWF-SP-CVR | White | FUEGO |
| | GCVWN-CVR | White | None |
|  Horn-strobe Covers | GCAVRA-CVR | Red | ALERT |
| | GCAVRF-CVR | Red | FIRE |
| | GCAVRF-FR-CVR | Red | FEU |
| | GCAVRF-SP-CVR | Red | FUEGO |
| | GCAVRN-CVR | Red | None |
| | GCAVWA-CVR | White | ALERT |
| | GCAVWF-CVR | White | FIRE |
| | GCAVWF-FR-CVR | White | FEU |
| | GCAVWF-SP-CVR | White | FUEGO |
| | GCAVWN-CVR | White | None |

## Accessories

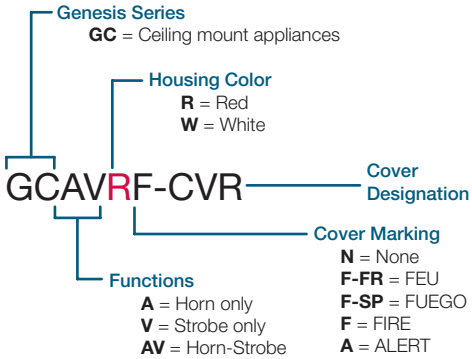
| | | | | | |
|---|---|---|---|---|---|
|  | GP10 Room Side Wiring Plate (required, ordered separately) |  | GCTR Trim plate, GC Series, red |  | GCTW Trim plate, GC Series, white |
| | | 27193-21 | Two-gang surface mount box, red | 27193-26 | Two-gang surface mount box, white |

## Model Number Syntax, Appliances




* ALERT Marking available on white strobe model only. See replacement covers for more options.

## Model Number Syntax, Replacement Covers



LIFE SAFETY & INCIDENT MANAGEMENT

**Contact us...**

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LIFE SAFETY & INCIDENT MANAGEMENT

# Outdoor Rated Speakers and Strobes

## Genesis WG4 Series




Patents pending

## Overview

Genesis WG4 Series speakers and speaker-strobe appliances are among the most versatile emergency appliances of their kind. Rated for indoor or outdoor use, they are suitable for a wide range of wet and harsh environments with a listed operating temperature range of as low as -31°F to as high as 151°F (-35°C to 66°C).

Field-configurable light and sound output settings add to their on-site flexibility, while optional FIRE or ALERT markings and colored lenses make them ideal for either emergency communications/mass notification (ECS/MNS) or fire alarm applications.

These appliances are suitable for indoor and outdoor applications, and are ideal for challenging conditions such as parking garages and process areas. They are listed for mounting on the ceiling or the wall, and thanks to an ingenious full backplane sealing gasket, can be installed to recessed (in-the-pour/block) electrical boxes. WG4 signals also mount to suitable surface boxes served by race-ways. Optional color-matched trim skirts provide a clean, finished appearance. All appliance wiring is accomplished room-side for easy installation.

WG4 Series appliances feature highly intelligible and efficient mylar-cone loudspeakers. These are dual-voltage (25.2V or 70.7V), and have field-selectable output taps ranging from 80.8 dBA to 90.0 dBA. The multi-candela strobes are available with clear or amber lenses and in two output categories – standard and high-output. They are precision-timed to meet UL 1971 synchro-nization standards, and field-configurable for one of four candela intensities. Wattage and candela settings are viewable even after installation through an innovative sealed viewport display.

## Standard Features

- Outdoor and indoor rated
- Low-profile design
- Wall or ceiling mount
- Room-side wiring accepts 18 to 12 AWG (0.75 to 2.5 $mm^2$)
- Wide operating temperature range
- Field-selectable speaker wattage, voltage, and strobe candela settings
- Field-configurable temporal strobe output option
- Clear and amber lenses available
- Fully-compatible with Genesis synchronization protocols
- Standard and high-output strobe intensities
- Speaker only and Speaker/Strobe appliance options

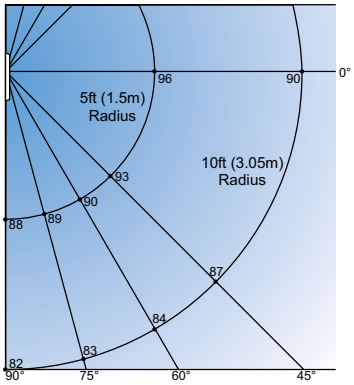
# Application

## Speaker Application

The suggested sound pressure level for each signalling zone used with alert or alarm signals is a minimum of 15 dB above the average ambient sound level or 5 dB above the maximum sound level having a duration of at least 60 seconds, whichever is greater. This is measured 5 feet (1.5 m) above the floor.

Doubling the distance from the signal to the ear will theoretically cause a 6dB reduction in the received sound pressure level. The actual effect depends on the acoustic properties of materials in the space. Doubling the power output of a device (e.g.: a speaker from 1W to 2W) will increase the sound pressure level by 3dBA.

**Typical Sound Output Distribution dBA Measured in anechoic chamber at two watts**




Genesis Series Cone Speaker/strobe

## Strobe Application

Genesis clear-lensed strobes are UL 1971-listed for use indoors as wall- or ceiling-mounted public-mode notification appliances for the hearing impaired, and UL 1638-listed for outdoor applications. Prevailing codes require strobes to be used where ambient noise conditions exceed specified levels, where occupants use hearing protection, and in areas of public accommodation. UL 1638-listed colored lens strobe lights are available for ECS/MNS and outdoor applications.

Visible appliance synchronization is required to avoid causing issues with people who have Photosensitive Epilepsy (PSE). Notification appliance synchronization is also generally required when more than one strobe appliance are in the same field of view from any one location. All Genesis strobes meet UL synchronization requirements (within 10 milliseconds over a two-hour period) when used with a synchronization source.

## ECS/MNS Application

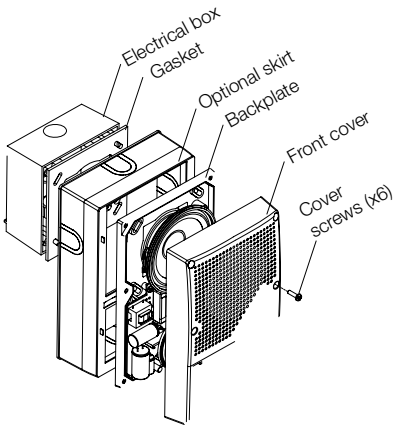


Genesis ECS/MNS appliances bring the same high-performance life safety features and unobtrusive design to mass notification applications. Standard models are available with clear or amber lenses and optional ALERT housing labels, they are ideal for applications that require differentiation between life safety and mass notification alerts. Appliances with red, green or blue lenses are also available. Contact EDWARDS Customer Service for details.

**WARNING:** These devices will not operate without electrical power. As fires frequently cause power interruptions, we suggest you discuss further safeguards with your local fire protection specialist.

EDWARDS recommends that these devices always be installed in accordance with the latest recognized edition of national and local codes. Refer to the appropriate codes and standards for mounting height information.

# Installation and Mounting



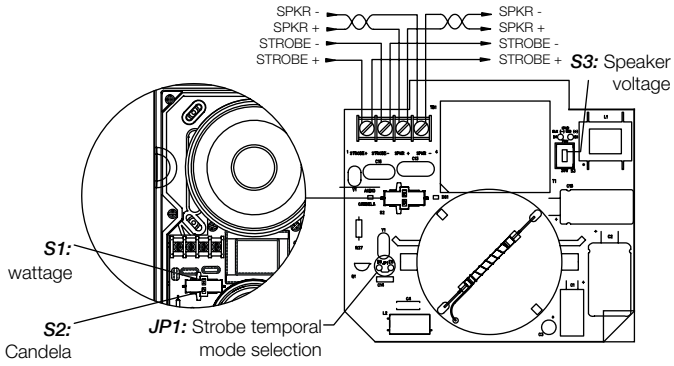

WG4 signals are rated for outdoor use and are suitable for indoor or outdoor applications on walls or ceilings. For surface-mounting in outdoor or wet applications, appliances must be mounted to a 449 or 74347U electrical box. In dry conditions, they are compatible with standard 4-inch by 1½-inch deep electrical boxes. When using the optional WG4WTS or WG4RTS trim skirt, a 449 or 2-1/8" deep box must be used.

The Genesis WG4 Speaker-Strobe may be wall- or ceiling-mounted, and may be placed in one of four positions: strobe above, strobe below, and strobe to either side. The shallow depth of Genesis devices leaves room behind the appliance for extra wiring.

## Field Configuration

Genesis WG4 speakers may be set to 70- or 25-Volt operation, and for ¼, ½, 1, or 2 watt operation. The wattage setting (represented by the letters Z,Y, X, and T) is changed by removing the cover and simply sliding the ***S1*** switch until the desired setting appears. The setting remains visible through a small window on the front of the device after the cover is installed. The voltage setting (70V or 25V) is toggled at ***S3***. This setting is not visible after the cover is replaced.

Genesis WG4 speaker-strobes also feature selectable candela output. The actual light output for a given selection depends on the color of the strobe lens and whether it is a high output model or a standard output model. Refer to the specification tables for corresponding settings. The candela setting (represented by the letters D, C, B, and A) is changed by removing the cover and simply sliding the ***S2*** switch until the desired setting appears. The setting remains visible through a small window on the front of the device after the cover is installed.




Genesis speaker-strobes may also be configured for temporal flash. This power-saving feature is intended for private mode signaling only. To set the device for temporal flash, snip the jumper at ***JP1***.

## Specifications

| | |
|---|---|
| Operating voltage | |
| Speaker | 25 VRMS or 70 VRMS, switch selectable |
| Default | 70 VRMS |
| Strobe | 24 VDC, 24 VFWR nominal |
| Supervisory voltage | 30 V max. |
| Speaker response | 400 to 4,000 Hz |
| Wire size | 12 to 18 AWG (0.75 to 2.50 mm²) |
| Compatible strobe synchronization sources | SIGA-CC1S, SIGA-MCC1S, SIGA-CC2A, SIGA-MCC2A, G1M-RM, BPS6A, BPS10A, APS6A, APS10A, 3X-SFS1, iO64, iO500, Fireshield Plus 3, 5 and 10 zone. |
| Compatible electrical boxes | ***Wet:*** Model 449 (WG4 trim skirt recommended) ***Dry:*** 4" square by 1-1/2" deep box when used without a trim skirt. When trim skirt is used, box must be 4" square by 2-1/8" deep. |
| Operating environment | Wet |
| Temperature | -31 to 151 °F (-35 to 66 °C) |
| Relative humidity | 0 to 95% noncondensing |

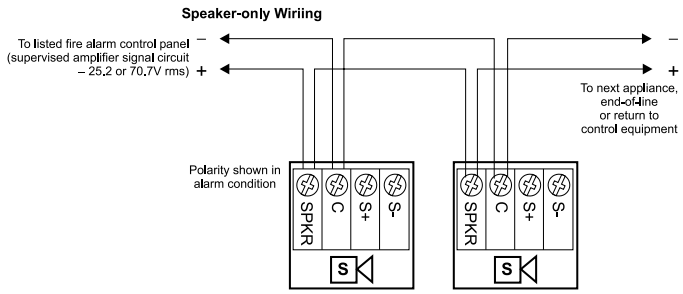
## Sound level output (dBA)

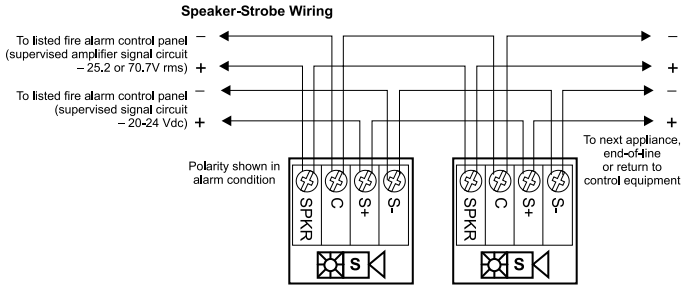
| Wattage | Switch Position | 25 V | 70 V |
|---|---|---|---|
| 2 W | T | 90.0 | 89.7 |
| 1 W | X | 87.1 | 86.9 |
| ½ W | Y | 84.0 | 83.9 |
| ¼ W | Z | 80.8 | 80.8 |

dBA = Decibels, A-weighted.
UL 1480: Sound level output at 10 ft. (3.05 m) measured in a reverberant room using 400 to 4,000 Hz band-limited pink noise.

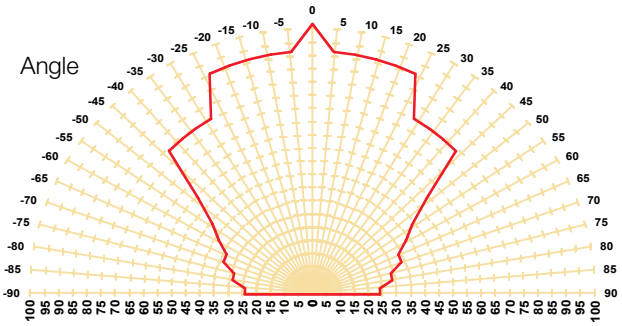
## Wiring

Field wiring is connected to Genesis signals with terminals that accommodate #18 to #12 AWG (0.75 mm² to 2.5 mm²) wiring.




## Light output




UL off-axis candela requirements as a percent of the UL rated output

| Indoor rating per UL 1971 (candela) | | | Strobe Switch Position A | B | C | D |
|---|---|---|---|---|---|---|
| Standard Output Models (-SVMx) | Lens Color | Clear | 87 | 70 | 29 | 15 |
| | | Amber* | 62 | 59 | 25 | 13 |
| | Current (mA) | VDC | 319 | 167 | 144 | 106 |
| | | FWR | 386 | 347 | 178 | 120 |
| High Output Models (-SVMHx) | Lens Color | Clear | 161 | 147 | 123 | 102 |
| | | Amber* | 130 | 125 | 101 | 84 |
| | Current (mA) | VDC | 495 | 494 | 390 | 324 |
| | | FWR | 646 | 607 | 487 | 412 |

* UL 1971 Equivalent candela value

| Outdoor rating per UL 1638 (candela) | | | Strobe Switch Position A | B | C | D |
|---|---|---|---|---|---|---|
| Standard Output Models (-SVMx) | Lens Color | Clear | 35 | 28 | 12 | 6 |
| | | Amber* | 25 | 24 | 10 | 5 |
| | Current (mA) | VDC | 319 | 167 | 144 | 106 |
| | | FWR | 386 | 347 | 178 | 120 |
| High Output Models (-SVMHx) | Lens Color | Clear | 65 | 60 | 50 | 41 |
| | | Amber* | 52 | 51 | 41 | 34 |
| | Current (mA) | VDC | 495 | 494 | 390 | 324 |
| | | FWR | 646 | 607 | 487 | 412 |

* UL 1971 Equivalent candela value

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# Ordering Information




All speakers include field-selectable ¼, ½, 1, or 2 watt taps and selectable 25V or 70V operation.

| Model | Housing | Marking | Lens | Strobe Output* | Ship Wt. |
|---|---|---|---|---|---|
| **Life safety Appliances** | | | | | |
| WG4RF-SVMC | Red | FIRE | Clear | Selectable standard output 15/29/70/87 cd | 1.5 lbs. (0.68 kg) |
| WG4WF-SVMC | White | | | | |
| WG4RN-SVMC | Red | None | | | |
| WG4WN-SVMC | White | | | | |
| WG4RF-SVMHC | Red | FIRE | | Selectable high output 102/123/147/161 cd | |
| WG4WF-SVMHC | White | | | | |
| WG4RN-SVMHC | Red | None | | | |
| WG4WN-SVMHC | White | | | | |
| WG4RF-S | Red | FIRE | Speaker Only | | |
| WG4WF-S | White | | | | |
| WG4RN-S | Red | None | | | |
| WG4WN-S | White | | | | |
| **ECS/MNS Appliances** | | | | | |
| WG4WA-SVMA | White | ALERT | Amber | Selectable standard output 13/25/59/62 cd | 1.5 lbs. (0.68 kg) |
| WG4WN-SVMA | | None | | | |
| WG4WA-SVMC | | ALERT | Clear | 15/29/70/87 cd | |
| WG4WA-SVMHA | | | Amber | Selectable high output 84/101/125/130 cd | |
| WG4WN-SVMHA | | None | | | |
| WG4WN-SVMHC | | | Clear | Selectable high output 102/123/147/161 cd | |
| WG4WA-SVMHC | | ALERT | | | |
| WG4WA-S | | | Speaker Only | | |

* See light output tables for more specific strobe values.

## Accessories

| | |
|---|---|
| WG4WTS | Surface Skirt for Genesis WG4 appliance family, white. |
| WG4RTS | Surface Skirt for Genesis WG4 appliance family, red. |
| WG4GSKT | Replacement Mounting Gasket |
| 74347U | Surface mount box, outdoor rated |
| 449 | Surface mount box, outdoor rated, gray |

EDWARDS

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# Outdoor Rated Horns and Horn-Strobes

## Genesis WG4 Series




## Overview

Genesis WG4 Series horns and horn-strobe appliances are among the most versatile emergency appliances of their kind. Rated for indoor or outdoor use, they are suitable for a wide range of wet and harsh environments with a listed operating temperature range of as low as -40 °F to as high as 151 °F (-40 °C to 66 °C).

Field-configurable light and sound output settings add to their on-site flexibility, while optional FIRE markings make them ideal for fire alarm applications.

These appliances are suitable for indoor and outdoor applications, and are ideal for challenging conditions such as parking garages and process areas. They are available for mounting on the ceiling or the wall, and thanks to an ingenious optional full backplane sealing gasket, can be installed to recessed (in-the-pour/block) electrical boxes. WG4 notification appliances also mount to suitable surface boxes. Optional color-matched trim skirts provide a clean, finished appearance. All appliance wiring is accomplished room-side for easy installation.

WG4 Series appliances feature an efficient and powerful piezo sounder. The multi-candela strobes are available with clear lenses in two output categories – standard and high-output. They are precision-timed to meet UL 1971 synchronization standards, and field-configurable for one of four candela intensities. Candela settings are viewable even after installation through an innovative sealed viewport display.

## Standard Features

- Outdoor and indoor rated
- Low-profile design
- Wall or ceiling mount
- Room-side wiring accepts 18 to 12 AWG (0.75 to 2.5 mm$^2$)
- Wide operating temperature range
- Field-selectable settings
- Fully-compatible with Genesis synchronization protocols
- Standard and high-output strobe intensities
- Horn only and horn-strobe options

# Application

## Horns

Genesis horn output reaches as high as 97 dBA in accordance with UL 464 (104 dBA in accordance with ULC-S525) and features a unique frequency tone that results in excellent sound penetration and an unmistakable warning of danger. Horns may be configured for either coded or non-coded notification circuits. They can also be set for low dB output with a jumper cut that reduces horn output by about 5 dB.

The suggested sound pressure level for each notification zone used with alarm notification appliances is at least 15 dB above the average ambient sound level, or 5 dB above the maximum sound level having a duration of at least 60 seconds, whichever is greater, measured 5 feet (1.5 m) above the floor. The average ambient sound level is A-weighted (fast response) sound pressure measured over a 24-hour period.

Doubling the distance from the notification appliance to the ear will theoretically result in a 6 dB reduction of the received sound pressure level. The actual effect depends on the acoustic properties of materials in the space. A 3 dBA difference represents a barely noticeable change in volume.

## Strobe Application

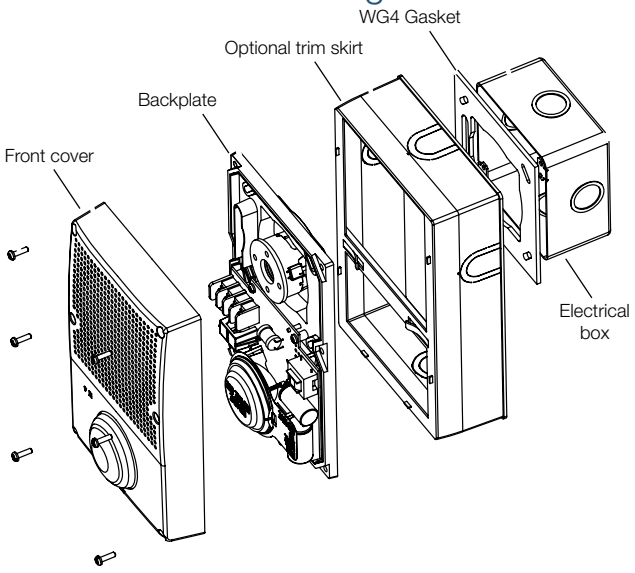
Genesis clear-lensed strobes are UL 1971-listed for use indoors as wall- or ceiling-mounted public-mode notification appliances for the hearing impaired, and UL 1638-listed for outdoor applications. Prevailing codes require strobes to be used where ambient noise conditions exceed specified levels, where occupants use hearing protection, and in areas of public accommodation.

Visible appliance synchronization is required to avoid causing issues with people who have Photosensitive Epilepsy (PSE). Notification appliance synchronization is also generally required when more than two strobe appliances are in the same field of view from any one location. All Genesis strobes meet UL synchronization requirements (within 10 milliseconds over a two-hour period) when used with a synchronization source.

**WARNING:** These devices will not operate without electrical power. As fires frequently cause power interruptions, we suggest you discuss further safeguards with your local fire protection specialist.

EDWARDS recommends that these devices always be installed in accordance with the latest recognized edition of national and local codes. Refer to the appropriate codes and standards for mounting height information.

# Installation and Mounting

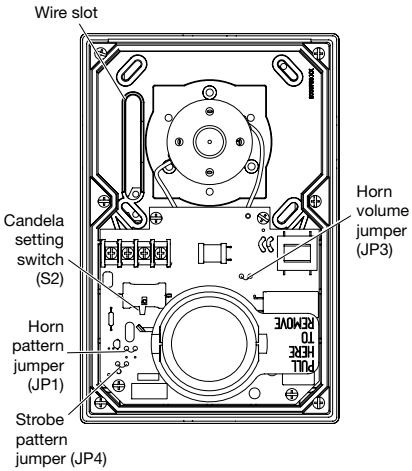



WG4 notification appliances are rated for outdoor use and are suitable for indoor or outdoor applications on walls or ceilings. For surface-mounting in outdoor or wet applications, appliances must be mounted to a 449 or 74347U electrical box. In dry conditions, they are compatible with standard 4-inch square by 1½-inch deep electrical boxes. When using the optional WG4WTS or WG4RTS trim skirt, a 449 or 4-inch square by 2-1/8" deep box must be used.

The Genesis WG4 horn and horn-strobe may be wall- or ceiling-mounted, and may be placed in one of four positions: strobe above, strobe below, and strobe to either side. The shallow depth of Genesis devices leaves room behind the appliance for extra wiring.

## Field Configuration

**Horn pattern:** Audible output for WG4 horns and horn-strobes is factory set to to sound in a three-pulse temporal pattern. Units may be configured for use with coded systems by cutting a JP1 on the circuit board. This results in a steady output that can be turned on and off (coded) as the system applies and removes power to the notification circuit. A Genesis Signal Master is required when horn-strobe models are configured for coded systems.



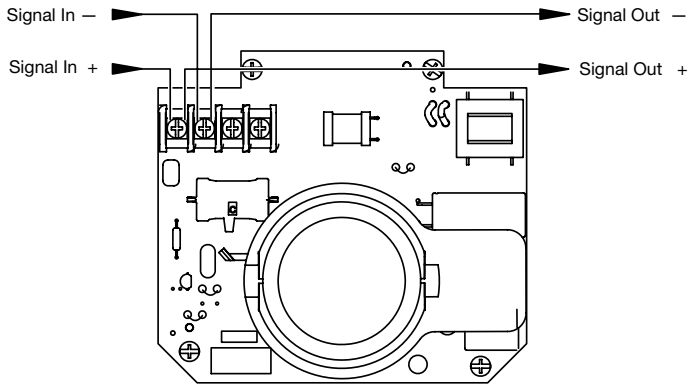

**Horn output:** Horns and horn-strobes are factory set for high dB output. Low dB output may be selected by cutting a jumper on the circuit board. This reduces the output by about 5 dB.

**Strobe pattern:** Genesis WG4 horn-strobes are factory set for use as UL 1971 compliant notification appliances for public mode operation. These notification appliances may be configured for temporal flash by cutting JP4 on the circuit board. This battery-saving feature is intended for private mode signaling only.

**Strobe output:** Genesis WG4 horn-strobes may be set for one of four output intensities.The output setting is changed by simply opening the device and sliding the switch to the desired setting. The device does not have to be removed to change the output setting. The setting remains visible after the cover is closed through a small window on the front of the device.

## Wiring

Field wiring is connected to WG4 notification appliances with terminals that accommodate #18 to #12 AWG (0.75 mm² to 2.5 mm²) wiring.




–/+ designations indicate the signal polarity required to activate the device.

## Specifications

### Horns and Horn-strobes

| | |
|---|---|
| Operating voltage | 24 VDC, 24 VFWR nominal |
| Dimensions (W × H × D) | 5.6 × 8.5 × 1.4 in. (142 × 216 × 36 mm) |
| Horn tone | 3.2 kHz |
| Wire size | 12 to 18 AWG (0.75 to 2.50 mm²) |
| Compatible electrical box | |
| Outdoor | Model 449 or 74347U |
| Indoor | 4 in. square by 1.5 in. deep box |
| Operating environment | |
| Temperature | -40 to 151°F (-40 to 66°C) |
| Relative humidity | 0 to 95% noncondensing |

## Compatible Synchronization Sources

### Horn-strobes

| | |
|---|---|
| Auto-sync Output Modules | SIGA-CC1S, SIGA-CC2A, SIGA-MCC1S, SIGA-MCC2A |
| Genesis Signal Master | G1M-RM |
| Booster & Auxiliary Power Supplies | APS6A, APS10A, BPS6A, BPS10A |
| Control Panels with Genesis Synchronization built-in | FireShield Plus, iO Series, EST3X |

## Sound Output

### Horns and Horn-strobes (dBA)

| Volume Setting | 16V | | 24V | | 33V | |
|---|---|---|---|---|---|---|
| | UL 464 | ULC-S525 | UL 464 | ULC-S525 | UL 464 | ULC-S525 |
| Continuous High | 89.7 | 94.0 | 94.7 | 99.6 | 97.4 | 102.9 |
| Continuous Low | 85.4 | 92.8 | 89.5 | 97.2 | 92.5 | 98.6 |
| Temporal High | 84.2 | 96.5 | 90.5 | 100.5 | 93.5 | 104.2 |
| Temporal Low | 81.7 | 90.3 | 85.4 | 94.2 | 88.1 | 97.0 |

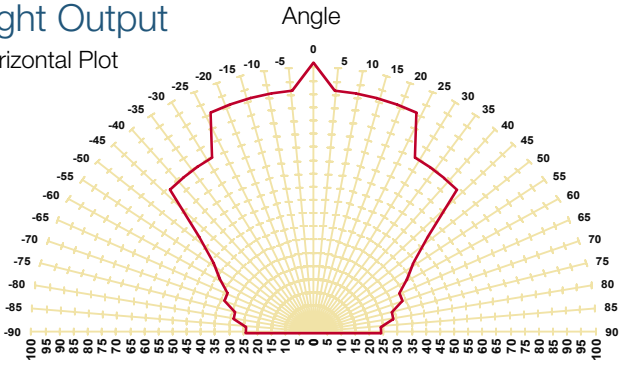
dBA = Decibels, A-weighted.

UL 464: Sound level output measured in a reverberant room at 10 ft. (3.05m).

CAN/ULC-S525: Sound level output measured in an anechoic room at 10ft (3.05m).

## Light Output

Horizontal Plot




### Standard Candela Horn-strobes

| Standard/rating | | Strobe Switch Position | | | |
|---|---|---|---|---|---|
| | | D | C | B | A |
| UL 1971 | Indoor | 15 cd | 29 cd | 70 cd | 87 cd |
| UL 1638 | Outdoor @ -35°C | 6 cd | 12 cd | 28 cd | 35 cd |
| CAN/ULC-S526 | Outdoor @ -40°C | 1 cd | 3 cd | 8 cd | 10 cd |

### High Candela Horn-strobes

| Standard/rating | | Strobe Switch Position | | | |
|---|---|---|---|---|---|
| | | D | C | B | A |
| UL 1971 | Indoor | 102cd | 123cd | 147cd | 161cd |
| UL 1638 | Outdoor @ -35°C | 41cd | 50 cd | 60 cd | 65 cd |
| CAN/ULC-S526 | Outdoor @ -40°C | 11 cd | 14 cd | 17 cd | 18 cd |

## Operating Current

*(UL specifies current ratings at 16 volts)*

### Standard Candela Horn-strobes in RMS (mA), continuous

| Input Voltage | Strobe Switch Position | | | |
|---|---|---|---|---|
| | D | C | B | A |
| 16 VDC | 127 | 168 | 297 | 351 |
| 16 VFWR | 218 | 239 | 393 | 422 |
| 24 VDC | 107 | 130 | 210 | 238 |
| 24 VFWR | 190 | 222 | 325 | 356 |

### High Candela Horn-strobes in RMS (mA), continuous

| Input Voltage | Strobe Switch Position | | | |
|---|---|---|---|---|
| | D | C | B | A |
| 16 VDC | 342 | 408 | 517 | 526 |
| 16 VFWR | 447 | 502 | 614 | 679 |
| 24 VDC | 240 | 271 | 327 | 365 |
| 24 VFWR | 390 | 400 | 486 | 540 |

### Horn only models (mA)

| Setting | 16V RMS, continuous | | 24V, typical | |
|---|---|---|---|---|
| | High dB | Low dB | High dB | Low dB |
| VDC | 69.1 | 41.2 | 49.0 | 32.3 |
| VFWR | 135 | 91.3 | 99.1 | 67.1 |

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## Ordering Information




| Model | Housing | Marking | Strobe Output | Ship Wt. |
|---|---|---|---|---|
| WG4RF-HVMC | Red | FIRE | Selectable standard candela output | 1.5 lbs. (0.68 kg) |
| WG4WF-HVMC | White | | | |
| WG4RN-HVMC | Red | None | | |
| WG4WN-HVMC | White | | | |
| WG4RF-HVMHC | Red | FIRE | Selectable high candela output | |
| WG4WF-HVMHC | White | | | |
| WG4RN-HVMHC | Red | None | | |
| WG4WN-HVMHC | White | | | |
| WG4RF-H | Red | FIRE | Horn Only | |
| WG4WF-H | White | | | |
| WG4RN-H | Red | None | | |
| WG4WN-H | White | | | |

### Accessories

| | |
|---|---|
| WG4WTS | Surface Skirt for Genesis WG4 appliance family, white. |
| WG4RTS | Surface Skirt for Genesis WG4 appliance family, red. |
| WG4GSKT | Full Body Mounting Gasket for smooth surfaces, WG4 appliance family |
| 74347U | Surface mount box, outdoor rated, red |
| 449 | Surface mount box, outdoor rated, gray |

# Fire Alarm Surge Protection




## DTK-2MHLPB / DTK-2MHLPF Series

**Loop Circuit Surge Protectors**

- Modular design, 2 pairs per module
- 20kA surge current, 5-130V configurations
- B series shorts to ground
- F series removes load and opens circuit so it can be easily identified



## DTK-DF120S1

**120V Surge Protector With Rapid-Replacement Modules**

- 120V, 20A series configuration
- Audible alarm & health status indicator
- Dry contacts for remote monitoring
- UL1283 EMI/RFI filtering



## DTK-MRJ31XSCPWP / DTK-2MHTPWB

**Dialer Surge Protectors**

- MRJ31X: single pair, RJ31X connection
- Automatic reset, handles multiple surges
- 2MHTP: 2-Pair, screw terminal connection w/base



## DTK-120HW / DTK-120HWLOK

**AC Power Surge Protector**

- 120V, 20A parallel configuration
- Compact NEMA 4X enclosure
- 50,000A max surge current
- Also available in 120/240VAC & 240VAC
- DTK-120HWLOK includes lockout kit



# DTK-HW Series

## Parallel Connected Surge Protective Device

DITEK® Surge Protection




**DITEK's DTK-HW Series** of surge protective devices are designed and manufactured to meet the standards of the life safety industry. These compact, parallel-mount SPD's are available for 120V, 240V and 120/240V systems; and are widely used to protect fire alarm panels and other dedicated branch circuit loads. Their small footprint enables installation in a variety of locations.

### Product Features

- Approved for 20A circuit breakers
- NEMA 4X Weatherproof enclosure allows for use in harsh environments
- Diagnostic LED indicates ground presence, system power and SPD function
- Complies with ANSI/IEEE C62.41 and C62.45 Category B standards

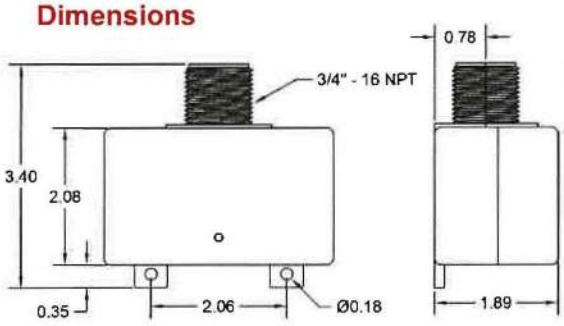
### Applications

- Fire Alarm Control Panels
- Equipment Panels
- Dedicated Branch Circuits
- Pumps, Motors and Lift Pump Stations

### Accessories

- DIN Rail Mounting Kit – DTK-DRK

### Dimensions




### Technical Specifications

| Part Number: | DTK-120HW | DTK-240HW | DTK-120/240HW |
|---|---|---|---|
| Service Voltage: | Single Φ (2W + G), 120VAC | Single Φ (2W + G), 240VAC | Split Φ (3W + G), 120/240VAC |
| MCOV: | 150V | 320V | 150/320V |
| Protection Modes: | L-G, L-N, N-G | L-G, L-N, N-G | L-G, L-L, L-N, N-G |
| Voltage Protection Rating: | 700V L-G<br>700V L-N<br>1,500V N-G | 1,200V L-G,<br>1,200V L-N<br>2,000V N-G | 700V L-G, L-N<br>1,500V L-L,<br>1,500V N-G |
| Surge Current Rating: | 50,000A | 50,000A | 100,000A |
| SCCR: | 10kA | | |
| Nominal Discharge Current Rating ($I_n$): | 10kA | | |

### Mechanical Characteristics

| | |
|---|---|
| Connection Method: | ¾" NPT Parallel Wired |
| Housing: | NEMA 4X |
| Temperature Range: | -31°F - 176°F (-35°C - 80°C) |
| Maximum Humidity: | 95% non-condensing |
| Dimensions: | 3.5"L x 1.89"W x 3.4"H<br>(88.9mm x 48.3mm x 86.4mm) |
| Weight: | 0.55 lb. (0.25 kg) |

### Quality, Standards & Approval

| | |
|---|---|
| Agency Approvals: | UL 1449 4th Edition, cUL |
| SPD Type: | Type 1 SPD |
| Warranty: | Ten Year Limited |

Every precaution has been taken to ensure that this literature is accurate and complete. DITEK Corporation assumes no responsibility and disclaims all liability for damages resulting from the use of this information or for any errors or omissions.

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Doc. Number: SPS-100057-001 Rev 14 05/18
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DITEK Corporation
ONE DITEK CENTER
1720 Starkey Road
Largo, FL 33771

INSTALLATION

# INSTALL INSTRUCTIONS

## DTK-120HW

This Surge Protective Device (SPD) is a high performance device, designed to provide protection for sensitive electronic loads connected to service panels, fire panels, or where the SPD is directly connected to the electronic device. Maximum protection will only be achieved if the SPD is properly installed.

Please read and follow the installation instructions carefully.

**NOTICE:** This SPD should be installed and grounded, by a licensed contractor, per the applicable requirements of the NEC and the following instructions.

### APPLICATION

Type 1 and Type 2 SPD for hardwired parallel installations on 120 VAC single branch circuits.

### INSTRUCTIONS:

Caution: Measure all voltages to insure applied voltage does not exceed the voltage rating of the unit. Improper installation voids the warranty.
Warning: No Serviceable Parts-Attention:Aucune pièce remplaçable ou réparable
For Use Only With A Flexible Conduit System Or Direct Connection To Panel

**NOTE**: Suitable for use on a circuit capable of delivering not more than 10,000 rms symmetrical Amperes, when protected by a 20 Ampere circuit breaker rated 120 Volts minimum.

1. Turn off the power at the circuit breaker or main before beginning installation.
2. Remove front cover from the panel.
3. Remove 3/4" knockout on side of panel box.
4. Unscrew nut from unit.
5. Feed all wires and the DTK-120HW nipple through knockout hole then through nut, tighten nut securing the unit.

6. For **ALARM/CONTROL PANEL INSTALLATION**, refer to diagram #1. In this application, the DTK-120HW's leads must be as short as possible to the connection point. Use a 3-position barrier strip, not provided. Allow the unit reaction time by maintaining no less than 3' of conductor length between the connection point and the equipment it is protecting.

7. For **ELECTRICAL PANEL/DISCONNECT INSTALLATION**, refer to diagram #2. In this application, connect the DTK-120HW to the load side of the fuse or circuit breaker. Ensure the leads are as short as possible with the ground wire being the shortest of all.

8. For **JUNCTION BOX INSTALLATION,** refer to diagram #3. In this application, ensure the DTK-120HW's leads are as short as possible to the connection point. Use a 3-position barrier strip, not provided. Allow the unit reaction time by maintaining no less than 3' of conductor length between the connection point and the equipment it is protecting.

9. After all connections have been made and no hazards exist, restore power.
**NOTE:** The LED must be on, if the LED is off than surge protection is compromised and the unit must be replaced.

**Ground Resistance Rule**: Max ground resistance is 25 ohms, 5 ohms or less is optimum. This cannot be an assumed value and must be measured to assure proper grounding.

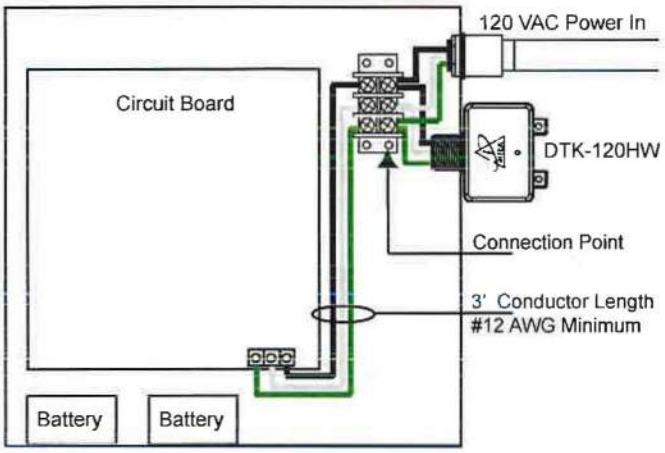
DITEK Corporation
ONE DITEK CENTER
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Largo, FL 33771

# INSTALL INSTRUCTIONS

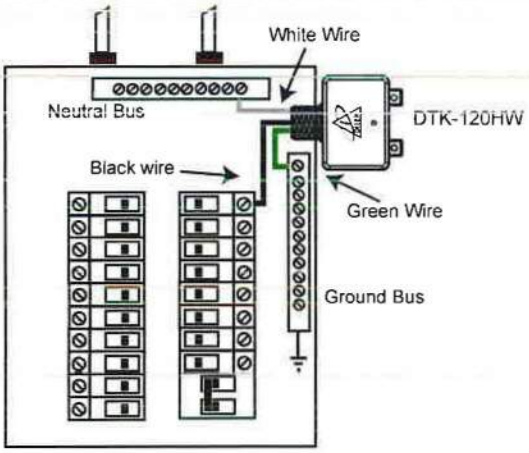
## DTK-120HW

## Illustrations Page

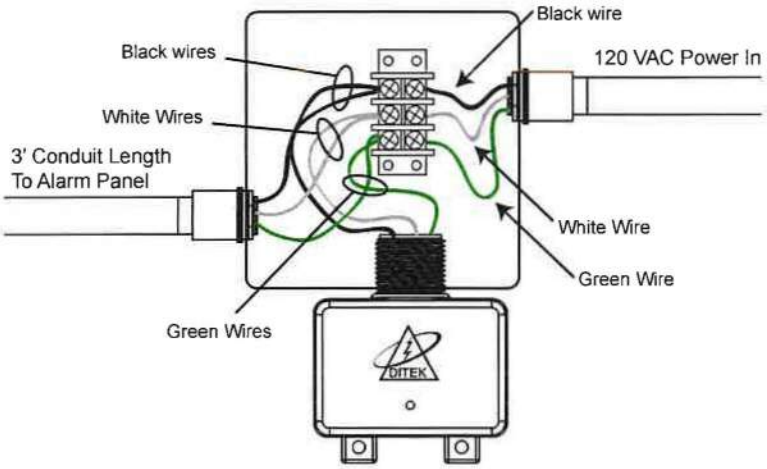
### ALARM PANEL/CONTROL PANEL INSTALLATION DIAGRAM #1




### ELECTRICAL PANEL/DISCONNECT INSTALLATION DIAGRAM #2




### JUNCTION BOX INSTALLATION DIAGRAM #3




**DITEK Technical Support Available 24/7**
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**www.ditekcorp.com**

Updated By: R. Mitchell 11-3-17
Checked By: R. Mitchell 11-3-17

Doc # INT-100008-001
Part No. 191509 Rev. 8

# DTK-2MHLPB Series

## Voice, Data and Signaling Circuit Modular Surge Protection

DITEK® Surge Protection



DTK-2MHLP24B



DTK-2MHLP24BWB

**DITEK's DTK-2MHLPB** series of signal, data and loop circuit surge protectors provide robust protection in a compact package. This series was designed for ease of installation, with convenient field-replaceable modules and a Snap-Track base system, allowing the installer to protect multiple circuits while utilizing a common ground point.

## Product Features

- Protects two pairs per module
- Multi-stage, SAD technology, hybrid design, provides the best possible protection
- Field replaceable, modular edge card connection design with a single point ground for fast installation, saves time
- Six voltage levels available to protect all types of voice/data applications
- Hard-wired multi-base mounting system allows you to protect up to ten pairs with a common ground. See next page for base part numbers
- Suitable for use on both AC and DC circuits

## Applications

- Fire Alarm Panel NAC, SLC, PIV and IDC Circuits
- Burglar Alarm Panels NAC and IDC Circuits
- 70V Speakers and Audio Equipment
- Low-Voltage Landscape Lighting and Lighting Control Circuits
- 4-20mA Current Loops

## Accessories

- To order Module with Base, add "WB" to end of part number
- Test Module Kit – Part Number DTK-2MHLPTM
- DIN Rail Mounting Kit – Part Number DTK-DRK

## Technical Specifications

| DTK-2MHLP | 5B | 12B | 24B | 36B | 48B | 75B |
|---|---|---|---|---|---|---|
| **Service Voltage:** | 5V | 12V | 24V | 36V | 48V | 75V |
| **MCOV:** | 6V | 18V | 33V | 48V | 64V | 90V |
| **Clamping Voltage:** | 6.8V | 21.6V | 39V | 57V | 76V | 108V |
| **Protection Modes:** | Line-Ground (All) | | | | | |
| **Surge Current Rating:** | 20,000 Amps | | | | | |
| **Max Continuous Current:** | 5 Amps | | | | | |
| **Data Rate:** | 200kbps to 2Mbps | | | | | |

## Mechanical Characteristics

| | | |
|---|---|---|
| **Base Connection Method:** | 10AWG max screw terminals | |
| **Module Connection Method:** | Edge card into mounting base | |
| **Housing:** | ABS | |
| **Operating Temperature:** | -40°F - 158°F (-40°C - 70°C) | |
| **Maximum Humidity:** | 95% non-condensing | |
| **Dimensions:** | **Module** 2.1"L x 1.4W x 1.9"H (53mm x 36mm x48mm) | **Module with Base** 3.25L" x 1.5"W x 2.6"H (83mm x 38mm x 66mm) |
| **Weight:** | 1.2 oz (34g) | 2.8 oz (79g) |

## Quality, Standards & Approval

| | |
|---|---|
| **Agency Approvals:** | UL497B |
| **Warranty:** | Ten Year Limited Warranty |

Every precaution has been taken to ensure that this literature is accurate and complete. DITEK Corporation assumes no responsibility and disclaims all liability for damages resulting from the use of this information or for any errors or omissions.

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ISO 9001 NFPA UL LISTED MADE IN U.S.A.

# DTK-2MHLPB Series

## Voice, Data and Signaling Circuit Modular Surge Protection

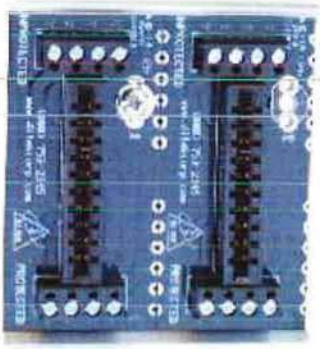
DITEK® Surge Protection

### Base Part Numbers and Dimensions

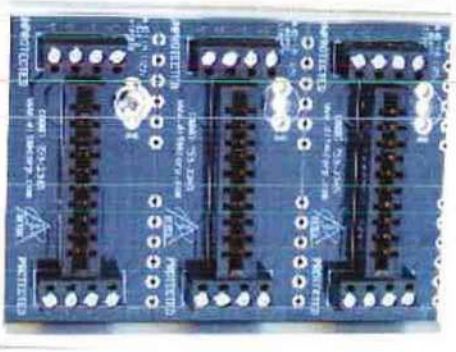
| Part Number | # Pairs Protected | Dimensions |
|---|---|---|
| **DTK-MB10** | 2 | 3.25"H x 1.50"W (82.5mm x 38.1mm) |
| **DTK-2MB** | 4 | 3.25"H x 3.00"W (82.5mm x 76.2mm) |
| **DTK-3MB** | 6 | 3.25"H x 4.50"W (82.5mm x 114.3mm) |
| **DTK- 4MB** | 8 | 3.25"H x 6.00"W (82.5mm x 152.4mm) |
| **DTK- 5MB** | 10 | 3.25"H x 7.50"W (82.5mm x 190.5mm) |



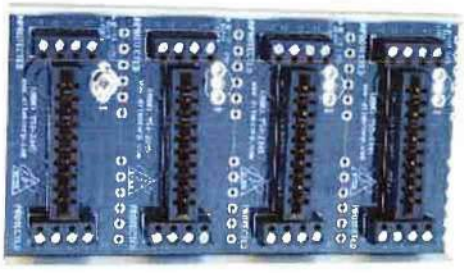
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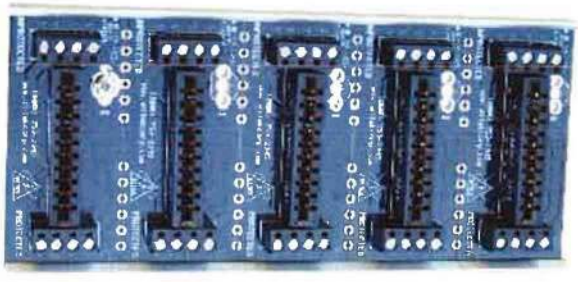
**DTK-2MB**



**DTK-3MB**



**DTK-4MB**



**DTK-5MB**

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1720 Starkey Road
Largo, FL 33771

INSTALLATION

# INSTALL INSTRUCTIONS

## DTK-2MHLPxxFWB Series, DTK-2MHLPxxBWB Series, DTK-2MHTPWB, MB10, 2MB-5MB, and DTK-2MHLP Module

This Surge Protective Device (SPD) is a high performance device, designed to provide protection for sensitive electronic loads connected to communication loop circuits that have been isolated from the public switched telephone network or where the SPD is directly connected to the electronic device. Maximum protection will only be achieved if the SPD is properly installed. Please read and follow the installation instructions carefully.

**NOTICE:** This SPD should be installed and grounded, by a licensed contractor, per the applicable requirements of the NEC and the following instructions. These devices are only to be employed on communication loop circuits which have been isolated from the Public Switched Telephone Network.

### APPLICATION

**DTK-MB10** base can be installed inside a 4"x4" electrical boxes and other locations where there is a space constraint. This base is available as a 1 up array (standard) or 2 through 5 up array for multiple pair terminations at one point of use. Specify DTK-2MB, 3MB, 4MB or 5MB for 2 through 5 up arrays.
**DTK-2MHLPxxFWB** surge module is for hardwired series installations for voltages ranging from 5-75 Volts on circuits that operate at less than 1 Amp.
**DTK-2MHLPxxBWB** surge module is for hardwired series installations for voltages ranging from 5-75 Volts on circuits that operate at less than 5 Amps.
**DTK-2MHTP** surge module is for hardwired series installations for dialer circuits and POTS lines for communication circuits.

### INSTRUCTIONS:

Caution: Measure all voltages to insure applied voltage does not exceed the voltage rating of the unit. Improper installation voids the warranty.

**MB BASE INSTALLATION**

1. Turn off the power at the circuit to be protected before beginning installation.
2. Securely mount the snap track between the field wiring and your equipment to be protected. Use the two #8 screws provided to fasten the snap track.
3. Connect ground to the ground terminal using a minimum of 14 AWG wire, make this conductor as short as possible.

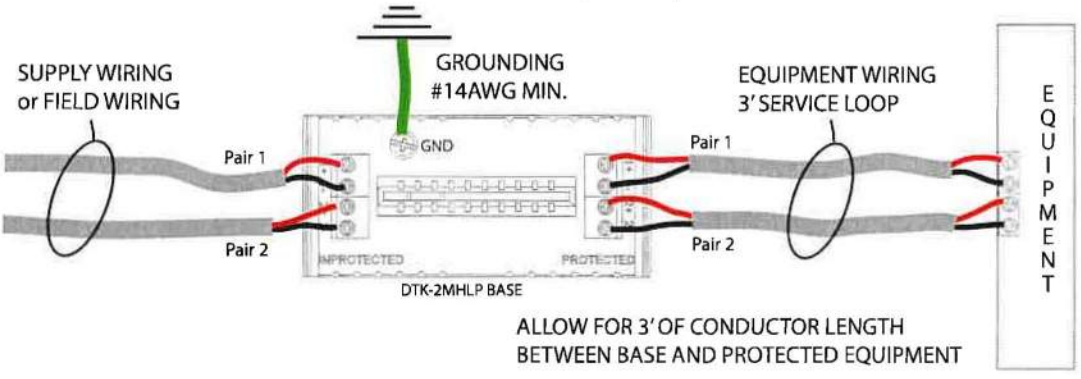
**Ground Resistance Rule:** Max ground resistance is 25 Ohms, 5 Ohms or less is optimum. This cannot be an assumed value and must be measured to assure proper grounding.

4. Connect the supply/field wiring to the **UNPROTECTED** side of the MB base. Connect the 1st pair to position 1+ and 1- , than the 2nd pair to position 2+ and 2-.
5. Connect the equipment wiring to the **PROTECTED** side of the MB base. Connect the 1st pair to position 1+ and 1- , than the 2nd pair to position 2+ and 2-.
6. Make sure the **UNPROTECTED** supply/field wiring and **PROTECTED** equipment wiring conductors do not occupy the same space or conduits.
7. Make sure the wire distance from the base to protected equipment is about 3' of conductor length. This can be a coiled service loop if necessary.

**MODULE INSTALLATION**

Insert the module into the base making sure the polarizing keys in the block are aligned with the notches cut into the edge card printed circuit board.

8. After all connections have been made and no hazards exist, restore power.




Drawn By: RMitchell 3-3-11
Revised By: RMitchell 6-14-16

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**1-888-472-6100 www.ditekcorp.com**

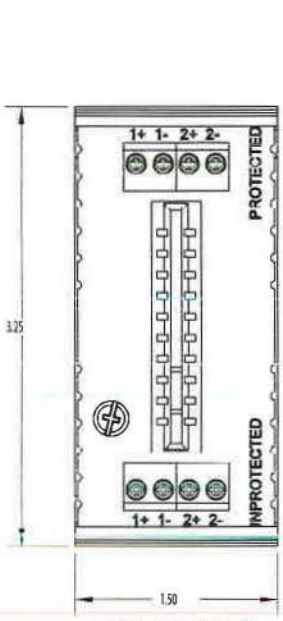
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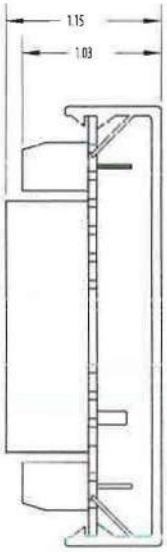
# INSTALL INSTRUCTIONS

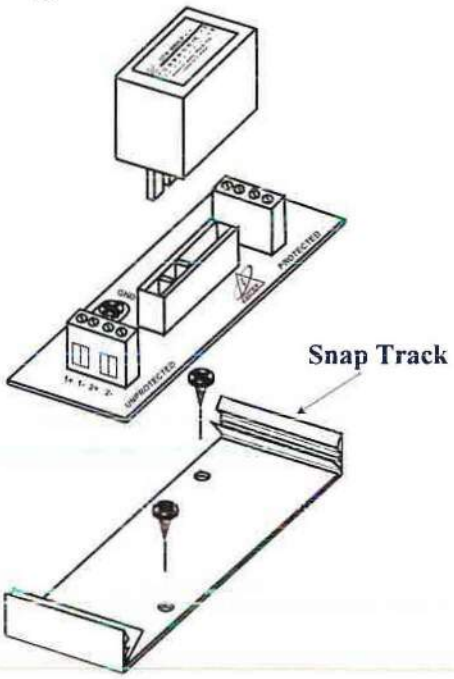
## DTK-2MHLPxxFWB Series, DTK-2MHLPxxBWB Series, DTK-2MHTPWB, MB10, 2MB-5MB, and DTK-2MHLP Module

## Illustrations Page

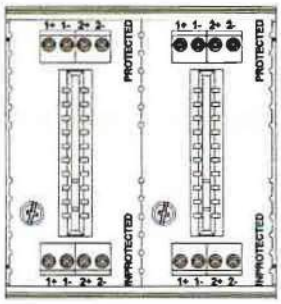



DTK-MB10

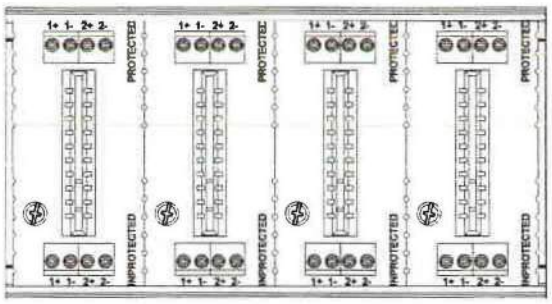


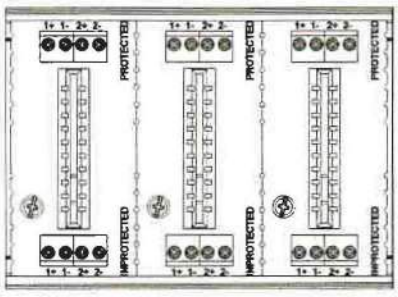

DTK-2MHLPxxFWB
DTK-2MHLPxxBWB
DTK-2MHTPWB



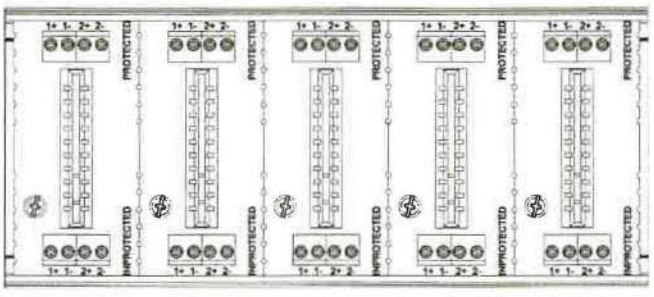
DTK-2MB



DTK-4MB



DTK-3MB



DTK-5MB

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LIFE SAFETY & INCIDENT MANAGEMENT

# FireWorks®

## Hardware Datasheet




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FDNY COA 6228

## Overview

FireWorks is an incident management command and control platform that comprises hardware, software, and networking components that together provide a powerful and cohesive Life Safety solution. Sophisticated networking technology allows it to integrate seamlessly with EDWARDS life safety solutions, yet FireWorks remains fully interoperable with third-party equipment, making it ideal for system upgrades or new installations alike. FireWorks, a powerful incident response system, can automatically trigger programmed responses to facility events, it can act as an operator interface for manual control, or as a versatile Mass Notification system. The FireWorks user interface provides a clear, concise, and coordinated view of any situation by presenting information strategically. Supporting every FireWorks workstation is a sophisticated network backbone—strong enough to handle coordinated critical control functions from as many as 30 client workstations and many other devices, yet flexible enough to manage integration with third-party mass notification systems. Redundant server option gives FireWorks the ability to switch automatically and seamlessly to a reliable backup server. FireWorks can operate on an existing local area network or provide facility access from anywhere in the world via secured Virtual Private Network (VPN) connections.

This datasheet is dedicated to the workstations, server, monitors, accessories, and networking equipment that are used in the FireWorks solution. Please see E85006-0071 FireWorks Incident Management Platform Datasheet for the software features of the solution.

# FireWorks UL 864 Listed Server and Workstations

| | Server | Workstation | Minicomputer |
|---|---|---|---|
| SKU | FW-UL7S-S22 | FW-UL7W | FW-UL7MC |
| FireWorks Configuration | Networked-Redundant | Non-Redundant and Standalone | Standalone |
| PassMark | 21000 | 21000 | 16000 |
| Operating System | Microsoft Server 2022 | Microsoft IoT Enterprise LTSC Win 10 | Microsoft IoT Enterprise LTSC Win 10 |
| Power | 110-240 VAC | 110-240 VAC | 24VDC |
| Chassis | 4U | 4U | Small Form Factor |
| Dimensions | 16.94” x 18.0” x 6.97” | 16.94” x 18.0” x 6.97” | 10" x 8" x 3.25 |
| Motherboard | DFI-Itox Long-Life - 15yr | DFI-Itox Long-Life - 15yr | Mini ITX Long life - 15yr |
| Watchdog | RTG-PCWD7 | RTG-PCWD7 | RTG-PCWD7 |
| CPU | i9 Intel® Processor<br>10 core/20 threads | i9 Intel® Processor<br>10 core/20 threads | i7-10700/E Intel® Processor |
| Hard Drive | 2x 1TB SSD Drives<br>Micron/Crucial - MX500<br>RAID1 Mirroring | 2x 1TB SSD Drives<br>Micron/Crucial - MX500<br>RAID1 Mirroring | 2x 1TB SSD Drives<br>Micron/Crucial - MX500<br>RAID1 Mirroring |
| RAM | 64GB DDR4 Memory | 32GB DDR4 Memory | 32GB DDR4 Memory |
| Trusted Platform Module (TPM) | Yes | Yes | Yes |
| Surge and Polarity Protector | 120/240 VAC 50/60 Hz<br>Auto Ranging | 120/240 VAC 50/60 Hz<br>Auto Ranging | 24V/12A polarity protection |
| Fans | Dual quiet PWM 120mm HC | Dual quiet PWM 120mm HC | Dual quite 80mm HC |
| Power Lock | Key Lock and 2-barrel keys | Key Lock and 2-barrel keys | Key Lock and 2-barrel keys |
| Audio | 3.5mm Stereo Jack | 3.5mm Stereo Jack | 1/4" Panel Stereo Jack |
| Mounting Kits Included | None | None | Wall, CABB, and back of a monitor |
| Video Controller | Intel® HD Gen 9 Graphics | Intel® HD Gen 9 Graphics | Intel® HD Gen 9 Graphics |
| Isolated Video Ports | DP++, 4K, and VGA | DP++, 4K, and VGA | DP++ and 4K |
| Dimensions | 16.94”x18.0”x6.97" | 16.94”x18.0”x6.97" | 10"x8"x3,25" |
| Weight | 22 lbs. | 22 lbs. | 6 lbs. |
| Warranty Included | 1 year | 1 year | 1 year |

## Computers' accessories and replacement parts:

- FW-FILTER: Suitable for FW-UL6W/S, FW-UL7W/S, computers replacement front fan air filter kit
- PT-1S+: System Printer – Desktop Style
- FW-UL6SSSD1TB – 1TB replacement hard drive
- FW-RACKB – Keyboard Rack mount kit - Black
- FW-UL7MC-RACK – 19" Rack mounting kit
- FW-UL7S22MK-9.3 – Server migration kit (Thumb drive), migrating UL7S servers from Windows 10 operating system to Server 2022 operating system
- FW-UL7MC-CP – Cover Plate
- FW-PCWD7 – UL7 replacement watchdog card
- BP1, BP2, and BP3 – 1,2, and 3 Blank Panel space covers for 19-inch Enclosure
- FW-RACKPC – Workstation Rack mount kit for FW-UL6 and UL7 - Black
- MFC-A – Fire Control Accessory, Multi-Function Enclosure, 8" x 14" x 3.5", Red
- VP-1 – Ventilation Panel 1-3/4"
- VP-3 – Ventilation Panel 3-1/2"

## Agency Listing

FireWorks computers shown in this datasheet have been investigated against, and found to be in compliance with, the following standards:

- CAN/ULC-S527-11 Standard for Control Units for Fire Alarm Systems, 2nd edition
- CAN/ULC-S559-04 Standard for Equipment for Fire Signal Receiving Centers and Systems, 1st edition
- CSA C22.1-12 Canadian Electrical Code, Part 1
- UL 864 Standard for Control Units and Accessories for Fire Alarm Systems, 10th edition
- UL 2017 Standard for General Purpose Signaling Devices and Systems, 2nd edition
- UL 2572 Standard for Mass Notification Systems, 1st edition
- NFPA 11 Standard for Low-Expansion Foam Systems, 2010 edition
- NFPA 11A Standard for Medium- and High-Expansion Foam Systems, 2010 edition
- UL 864 UUKL/UUKL7 Graphical Firefighter Smoke Control Station
- UL 864 BSIU Building System Information Unit (FW-UL6W only)
- NFPA 12 Standard on Carbon Dioxide Extinguishing Systems, 2011 edition
- NFPA 12A Standard on Halon 1301 Fire Extinguishing Systems, 2009 edition
- NFPA 12B Standard on Halogenated Fire Extinguishing Agent Systems Halon 1211
- NFPA 13 Standard for the Installation of Sprinkler Systems, 2013 edition
- NFPA 15 Standard for Water Spray Fixed Systems for Fire Protection, 2012 edition
- NFPA 16 Standard for the Installation of Foam-Water Sprinkler and Foam-Water Spray Systems, 2011 edition
- NFPA 17 Standard for Dry Chemical Extinguishing Systems, 2013 edition
- NFPA 17A Standard for Wet Chemical Extinguishing Systems, 2013 edition
- NFPA 70 National Electrical Code
- NFPA 72 National Fire Alarm Signaling Code
- NFPA 2001 Standard on Clean Agent Fire Extinguishing Systems, 2012 edition
- UL 2572 security and data protection
- For UL 2572 first edition applications only
- Approved Security Function for FIPS PUB 140-2: No encryption employed
- Communication Security: Level 1
- Stored Data Security: Level 0
- Access Control Security: Level 2
- Physical Security: Level 1
- Audit Control: Not provided
- FM Approved
- FDNY
- CSFM

# FireWorks UL 864 Listed Monitors

| | FireWorks 24" Touchscreen Monitor | FireWorks 42" Touchscreen Monitor |
|---|---|---|
| SKU | FW-24LCDUL | FW-42LCDWTS |
| Screen Size | 24 inches | 43 inches |
| Touchscreen | Yes/ PCAP | Yes/ PCAP |
| Display Type | LED | LED |
| Max Resolution | 1920 × 1080 at 60 Hz | 1920 × 1080 pixels (1080P) |
| Brightness | 250 nits | 0 to 1500 nits adjustable |
| I/O | (1) DVI, (1) HDMI, (1) SVGA | USB, SVGA, DVI, RCA |
| Listing/ Certifications | UL864 10th Edition | Mini ITX Long life - 15yr |
| Power | 12V DC | 100-240VAC |
| Power Consumption | 2.5 Amp @ 12V DC | ≤1 AMP @ 110V AC |
| External Power Supply | 100-240VAC / 50-60Hz | N/A |
| Dimensions | 23.5" x 14.4" x 1.6" | 40.7" x 25.21" x 4" |
| Weight | 22 lbs. | 80 lbs. |
| Cables Included | See Installation Guide | See Installation Guide |
| Stand | Yes (Adjustable) | N/A |
| Wall Mount Kits (ordered separately) | FW-22LCDRMK1 (VESA 100mm x 100mm) | FW-42LCDHMK1 |
| Warranty Included | 1 year | 1 year |

## Monitor accessories:

- FW-42LCDHMK1 – 42" wall mount bracket kit - single display, horizontal
- FW-2412DC-CONV – 24DC to 12VD Convertor to provide power to the 24” monitor
- FW-22LCDRMK1 – 22" wall mount bracket kit for the 24" monitor

## Monitors’ accessories:

| SKU | Input Voltage nominal | Output Voltage nominal | Output Current max | Efficiency type |
|---|---|---|---|---|
| FW-2412DC-CONV | 24 VDC | 12 VDC | 5,000 mA | 91% |

## FireWorks UL 864 Listed Networking Equipment

FireWorks can operate on dedicated (recommended) or non-dedicated Ethernet networks. EDWARDS offers one of the most robust and powerful UL/ULC Listed/FM Approved Managed Ethernet Networking solutions available. MN-FNS Series Managed Ethernet Solutions are powered by Cisco® technologies.

**Cisco Small Factor Transceivers (SFPs)**

The 1000BASE-ZX SFP operates on standard single-mode or multi-mode fiber-optic link spans of up to approximately 70 km in length. The SFP link span length depends on multiple factors such as fiber quality, number of splices, and connector. See install sheet for more details.

| | Cabling Type | Max Transfer Distance | Transfer Rate | Data Link Protocol | Device Type |
|---|---|---|---|---|---|
| **MN-FNSGBDSM70K** | 1000Base-ZX | 43.5 miles | 1 Gbps | Gigabit Ethernet | LC single-mode x2 |
| **MN-FNSFEMM2K** | 100base-fx | 1.2 Miles | 100Mbps | Gigabit Ethernet | Multi-mode duplex Lc |
| **MN-FNSFEDSM10K** | 100base-lx | 6.2 Miles | 100Mbps | Gigabit Ethernet | Single Mode |
| **MN-FNSGBSSM10KU** | 1000base-bx | 6.2 Miles | 100Mbps | Gigabit Ethernet | Bidirectional Single Fiber |
| **MN-FNSGBSSM10KD** | 1000base-bx | 6.2 Miles | 100Mbps | Gigabit Ethernet | Bidirectional Single Fiber |
| **MN-FNSGBDSM10K** | 1000base-lx, -lh | 6.2 miles | 1 Gbps | Gigabit Ethernet | Full LC Duplex-mode |

## Additional Listed Networking Equipment



**MN-FVPN** - UL/ULC Listed/FM Approved Voice over Internet Protocol (VoIP)

**MN-NETRLY4** - Input/ Output Module

**MN-COM1S** - Communication Module

**FW-SP4I** - Isolated Serial Port card for the FW-UL7W and FW-UL7S Workstation and Server. Provides four serial ports. Cannot be used on FW-UL6S Servers.

LIFE SAFETY & INCIDENT MANAGEMENT

**Contact us**

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Email: edwards.fire@carrier.com
Website: edwardsfiresafety.com

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# FW-NIC Network Interface Card Installation Sheet

## Description

The FW-NIC card is used to connect a FireWorks UL4 (or later) computer to an Ethernet LAN. It is capable of transfer speeds of up to 100 Mbps/sec. Full duplex support means that the card can simultaneously transmit and receive information at these speeds.

The FW-NIC card complies with 10BaseT Ethernet and 100BaseTX Fast Ethernet standards, is capable of full and half-duplex communications, complies with plug-and-play specifications, auto-negotiates to determine the optimal transmission rate, and supports 32-bit PCI Bus Master for high performance and low processor utilization.

## Installation

**WARNING:** To avoid electrical shock, unplug the FireWorks computer from the electrical outlet before removing the computer cover.

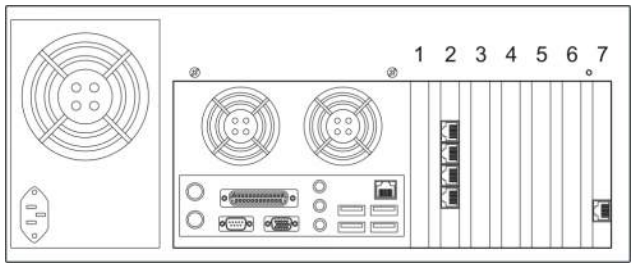
**Caution:** Hold the FW-NIC card by its edges or by its metal mounting bracket. Do no touch the components or the connector contacts.

**To install the FW-NIC card:**

1. Turn off the computer and unplug the AC power cord.
2. Disconnect all peripheral devices (monitor, mouse, etc.) and cables from the rear of the computer.
3. Remove the computer cover.
4. Remove the filler bracket from the expansion (slot 7). See Figure 1. Save the screw for use later.

   If replacing an existing card, remove the card.
5. Position the FW-NIC card above slot 7. Make sure that the card is aligned with the connector and that the bottom of the bracket is aligned with the slot between the computer motherboard and the case.
6. Press the FW-NIC card into slot 7. Make sure the card is fully seated into the connector and the card bracket is flush with the alignment bar.
7. Secure the card to the alignment bar using the screw from the filler bracket.
8. Replace the computer cover.

**Figure 1: FireWorks UL4 computer**




After installing the FW-NIC card, connect the computer to the LAN and turn the computer on. Verify the LED above the cable connector is on or blinking.

If the LED shows no sign of activity, make sure that all devices are turned on and that the network cable is properly connected at both ends. Also make sure that your network cables comply with EIA/TIA568 and Category 5 specifications.

If problems persist, turn off all devices and disconnect all plugs. Wait at least ten seconds then plug the devices back in and turn them back on.

## Specifications

| | |
|---|---|
| Bus type | PCI |
| Form Factor | Standard profile |
| RJ-45 ports | 1 |
| Data rate | 100 Mbps, max. |
| Cable type | Category 5, min. |
| Operating environment | |
| Temperature | 32 to 120°F (0 to 49°C) |
| Relative humidity | 0 to 93% noncondensing |

## Contact information

For contact information, see www.edwardsutcfs.com.

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# TCP/IP to RS-232 interface

## MN-COM1S



S3000 7165-1657: 0186/0306

## Overview

The MN-COM1S is a TCP/IP to RS-232 interface with one RJ-45 port and one RS-232 port. It is used in mass notification settings to connect a FireWorks workstation to an EST3 control panel.

The MN-COM1S mounts on an MN-BRKT1F or an MN-BRKT3F bracket. These install inside the EST3 control panel or Auxiliary Power Supply for a neat and self-contained mass notification solution.

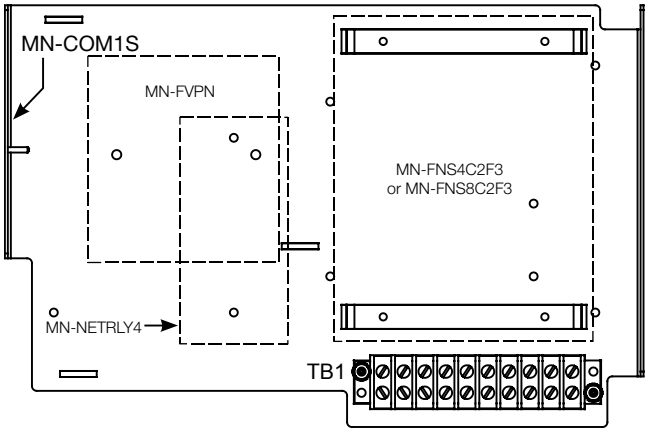
## Standard Features

- Connect a FireWorks workstation to an EST3 control panel.
- RS-232 Serial port for connection to 3-CPU3
- One RJ-45 port
- One RS-232 port
- Browser-based setup and configuration

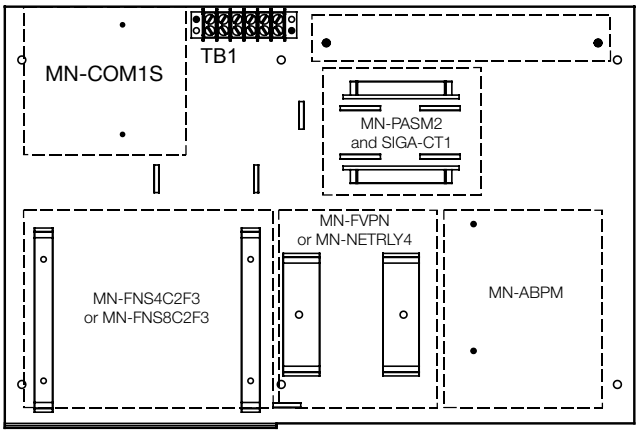
## Mounting

The MN-COM1S mounts on an MN-BRKT1F or an MN-BRKT3F bracket. These install inside the EST3 control panel or Auxiliary Power Supply for a neat and self-contained mass notification solution.

**MN-BRKT3F**

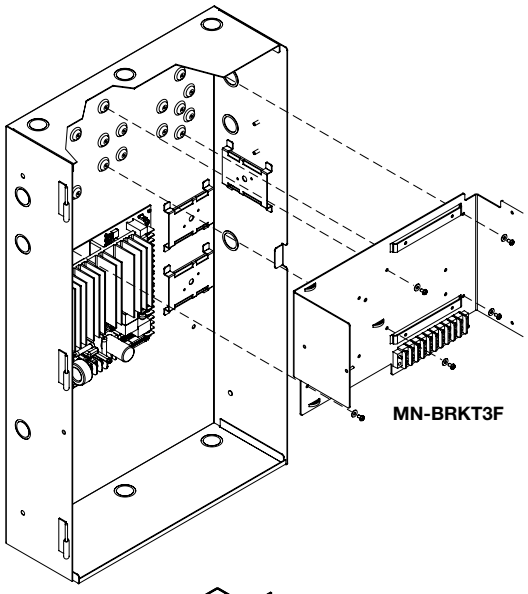


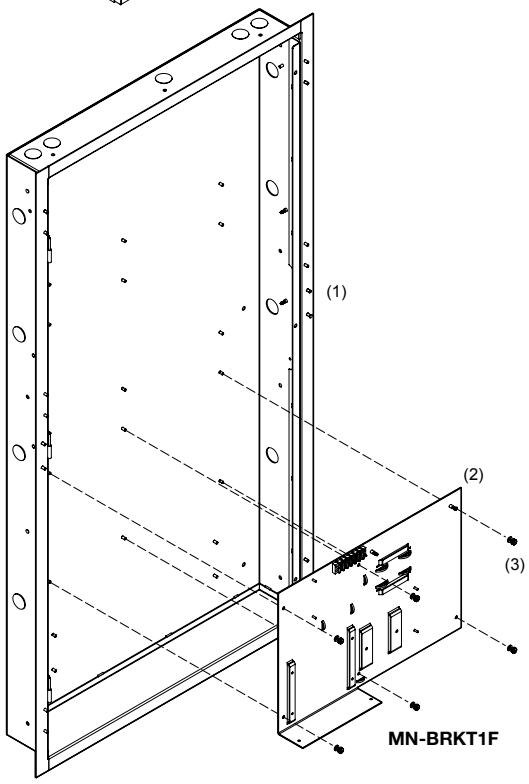

**MN-BRKT1F**




## Component Layout

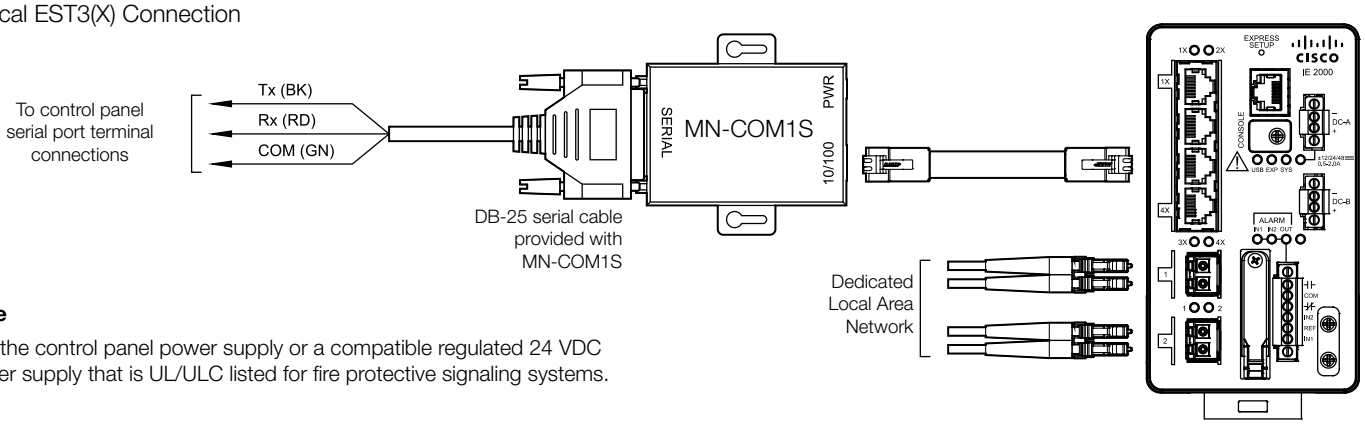
### Compatible Control Panel



## Wiring

Typical EST3(X) Connection




**Note**

Use the control panel power supply or a compatible regulated 24 VDC power supply that is UL/ULC listed for fire protective signaling systems.

**FCC compliance**

This equipment has been tested and found to comply with the limits for a Class A digital device, pursuant to part 15 of the FCC Rules. These limits are designed to provide reasonable protection against harmful interference when the equipment is operated in a commercial environment. This equipment generates, uses, and can radiate radio frequency energy and, if not installed and used in accordance with the instruction manual, may cause harmful interference to radio communications. Operation of this equipment in a residential area is likely to cause harmful interference in which case the user will be required to correct the interference at his own expense.

## Specifications

| | |
|---|---|
| Voltage | 18 to 28 VDC |
| Current | 60 mA |
| Dimensions | (W × H × D) 2.5 × 0.9 × 3.5 in. (6.4 × 2.3 × 9.0 cm) |
| Serial interface | RS-232C |
| Network Interface | |
| Connector | RJ-45 |
| Cable type | Category 5, min. |
| Other | 10/100 Mbps, TCP/IP, autonegotiating |
| Operating environment | |
| Temperature | 32 to 120°F (0 to 49°C) |
| Humidity | 0 to 93% RH, noncondensing at 90°F (32°C) |

## Ordering Information

| | |
|---|---|
| MN-COM1S | UL 864 Listed FireWorks Communications Ethernet Port, Command & Control. Comes with power and RS232 data cables. |

**Related Equipment**

| | |
|---|---|
| MN-BRKT1F | MN-FVP mounting bracket for EST3 enclosures |
| MN-BRKT3F | MN-FVP mounting bracket for APS-(6)(10)A power supplies |
| FW-NCCA4 | Ethernet cable conduit connector assembly for UL4 computer |
| MN-FVPN | Fire VoIP encoder/decoder, includes power and audio cables |
| MN-PASM2 | MN-FVPN preamp signal supervisory booster module (one required per MN-FVPN, along with SIGA-RM1 or SIGA-MRM1). |
| SIGA -RM1/MRM1 | Riser Supervision Module |
| MN-ABPM | Audio Bridge (Panel mount 3-ATPINT) |

EDWARDS

LIFE SAFETY & INCIDENT MANAGEMENT

**Contact us**

Phone: 800-655-4497 (Option 4)
Email: edwards.fire@carrier.com
Website: edwardsfiresafety.com

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Bradenton, FL 34202

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NO EXCUSES!

SIGNALING UL LISTED

# FAD

ACE-11




## FIRE ALARM DOCUMENTS

The FAD is the perfect fit to meet the demanding code requirements today. SAE's number one goal is to manufacture code compliant solutions and this product allows you to do just that. NFPA 72 2007 section 6.2.2.1 states, "A record of installed software and firmware version numbers shall be maintained at the location of the fire alarm control unit."

This durable 16 gauge steel enclosure with a solid piano hinge and key lock will keep all of your code required documents in one safe place. With a 4GB USB flash drive it stores your fire alarm software safe and secure eliminating the occurrences of the software not being on site when technicians arrive to service the system. Along with your fire alarm software you can store your test & inspection documents, service records, manuals & AS built drawings for the system. Using a standard USB B connector it allows you to plug in with any standard SB printer cable to upload or download information.

The FDB is designed to hold critical manuals and documents with a durable steel retainer. It has designated hooks to organize key rings and hold important business cards for easy access and reference. Inside the cover it has a organized note table that allows for documentation for passwords and other critical system information.

## Standard Features:

- Installed with a 4 gig digital flash drive with USB B connector
- 2 Key ring hooks to hold system keys
- Business card holder for key contacts
- Overall Dimensions are 12” x 13” tall and 2 ¼ deep
- 16 gauge steel box and cover for security
- Durable powercoat baked on finish other colors available
- Standard ¾”cat 30 key lock other lock assemblies available
- Solid stainless steel piano hinge
- Permanently screened white ink 1” high “Fire Alarm Documents”
- Legend sheet for passwords and system information

NFPA MEMBER

CAL FIRE SINCE 1885

NEMA

Made In U.S.A.

ISO 9001 REGISTERED COMPANY

ACE BOX
Space Age Electronics, Inc.
www.1sae.com
**800.486.1723** Toll Free
508.485.0966 Local
508.485.4740 Fax

*No Excuses, Just Solutions!*

SPACE AGE ELECTRONICS, INC.

# Specifications:

The fire alarm documents box (FAD) shall be UL Listed, constructed of 18 gauge cold rolled steel. It shall have a red powder coat epoxy finish. The cover shall be permanently screened with 1" high lettering "FIRE ALARM DOCUMENTS "
with white indelible ink. The access door shall be locked with a 3/4" barrel lock and the hinge shall be a solid width 12" stainless steel piano hinge. The enclosure will supply 4 mounting holes. Inside the enclosure will accommodate standard 8 1/2 x 11 manuals and loose document records that will be protected within the enclosure. A legend sheet will be permanently attached to the door for system required documentation, key contacts and system information. The FAD will have securely mounted inside a minimum of 4 Gigabyte digital flash memory drive with a standard USB B connector for uploading and downloading information. The drive shall not be accessible without tools to any person whom gains access to the records. The enclosure shall also provide 2 key ring holders with a location to mount standard business type cards for key contact personnel.






For replacement forms order P/N: EA0316 (Qty. 10)

**Property Information**

Name of property: _____
Address: _____
Description of property: _____
Occupancy type: _____

**Certifications and Approvals**

16.1 System Installation Contractor:
This system, as specified herein, has been installed and tested according to all NFPA standards cited herein.

Signed: _____
Printed name: _____
Date: ___ / ___ / ___
Organization: _____
Title: _____
Phone: _____

16.5 Authority Having Jurisdiction:
I have witnessed a satisfactory acceptance test of this system and find it to be installed and operating properly in accordance with its approved plans and specifications, with its approved sequence of operations, and with all NFPA standards cited herein.

Signed: _____
Printed name: _____
Date: ___ / ___ / ___
Organization: _____
Title: _____
Phone: _____

**Equipment Information**

ID No 1: _____
Serial: _____
Access code: _____

ID No 2: _____
Serial: _____
Access code: _____

**Minimum Required Documentation (SIG-FUN)**
(Reference NFPA-72 2013 Section 7.2.1)

1 Written narrative providing intent and system description
2 Riser diagram
3 Floor plan layout showing location of all devices and control equipment
4 Sequence of operation in either an input/ output matrix or narrative form
5 Equipment technical data sheets
6 Manufacturers published instructions, including operation and maintenance instruction
7 Battery calculations (where batteries are provided)
8 Voltage drop calculations for notification appliance circuits
9 Completed record of inspection and testing in accordance with 7.6.6 and 7.8.2
10 Completed record of completion in accordance with 7.5.6 and 7.8.2
11 Copy of site specific software, where applicable
12 Record (as-built) drawings
13 Periodic inspection, testing, and maintenance documentation in accordance with Section 7.6
14 Records, record retention, and record maintenance in accordance with 7.7

□ N/A □ Enclosed Or Alt. Location _____

Signed: _____ Date: ___ / ___ / ___

Space Age Electronics, Inc. 58 Chocksett Road Sterling, MA 01564 800-486-1723 www.1sae.com LT10644 Rev. 1

Legend sheet for storing system information including contacts, sign-off , maintenance & test information, and alternate locations of additional records.

# Ordering Information:

| Part # | Description |
|---|---|
| **SSU00685** | **Fire Alarm Storage Cabinet RED** |
| **SSU00686** | **Custom screening with your Logo** |

Check out our Infinity line eFAD single gang 2 Gig digital storage solutions (IAMEFAD)

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ACEBOX
BY SPACE AGE ELECTRONICS

# TC Series

## Terminal Cabinets




Offering easy identification of fire alarm wiring junctions for troubleshooting and maintenance of system wiring, the TC Series houses 18 to 128 high barrier termination points in a variety of durable enclosure sizes.

## SPECIFICATIONS

The TC Series Terminal Cabinets are constructed of 16 gauge colled rolled steel and finished with a durable red or black powder coat. The front cover is engineered with a removable formed lift-a-way hinge and displays “FIRE ALARM TERMINAL CABINET” in white screened indelible lettering. The interior of the box has field indentification labels on the inside cover corresponding to the terminal strip’s labeling inside the back box. The cabinets include 18 to 120 high barrier termination points rated for 12 gauge wire. Terminal strips are rated for 20 amp max 250V (Class B/UL) 300V (CSA).

## FEATURES

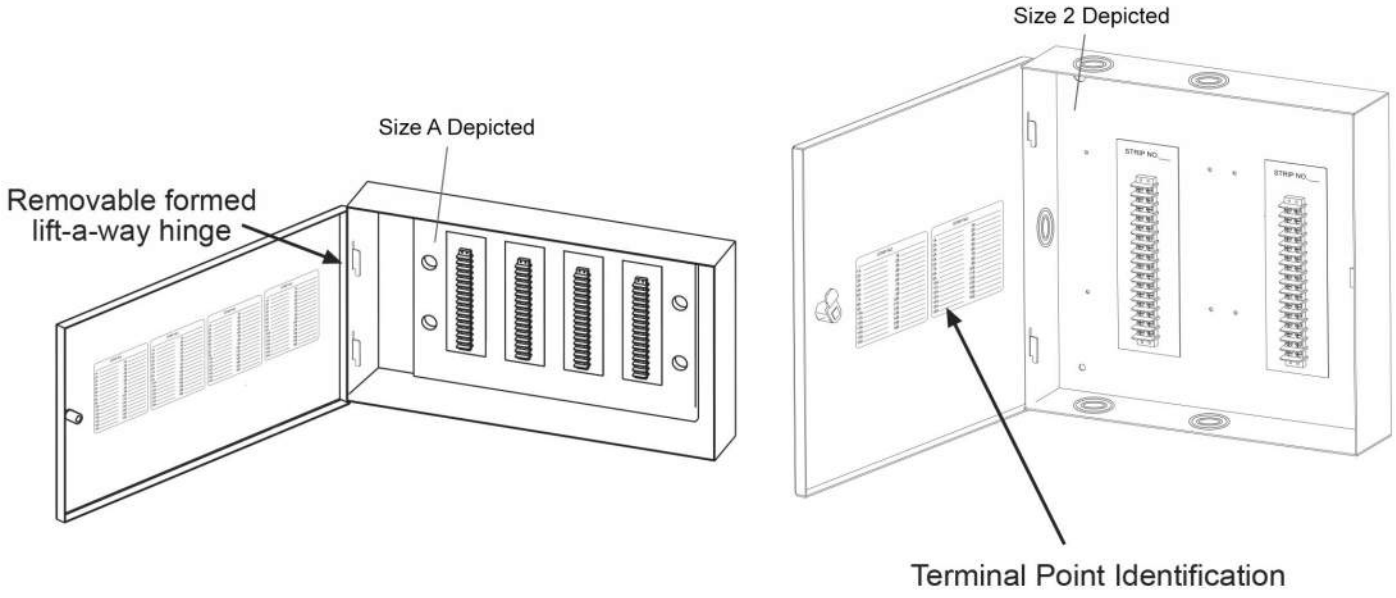
- 16 gauge cold rolled steel construction
- Available in four sizes
- Durable red or black powder coat
- “FIRE ALARM TERMINAL CABINET” in white indelible lettering
- Lift-a-way hinge door
- Interior labeling of terminal strips
- Field indentification label inside cover
- Terminal points rated for 12 gauge wire
- Terminal strip rated for 20 amp max 250V (Class B/UL) 300V (CSA)

## CUSTOM COLORS AND BRANDING AVAILABLE



## ORDERING INFORMATION

| P/N# | Size | Terminations | Color | Width | Height | Depth | Lock |
|---|---|---|---|---|---|---|---|
| SSU00635 | 1 | 18 | Red | 6 1/2” | 8 5/8” | 2 1/2” | Thumb Screw |
| SSU01635 | 1 | 18 | Black | 6 1/2” | 8 5/8” | 2 1/2” | Thumb Screw |
| SSU00536 | 1 | 18 | Red | 6 1/2” | 8 5/8” | 2 1/2” | Keyed |
| SSU00645 | 2 | 32 | Red | 14” | 14” | 3 1/4” | Keyed |
| SSU01645 | 2 | 32 | Black | 14” | 14” | 3 1/4” | Keyed |
| SSU00651 | A | 64 | Red | 23 1/2” | 13” | 5 1/2” | Keyed |
| SSU01651 | A | 64 | Black | 23 1/2” | 13” | 5 1/2” | Keyed |
| SSU00653 | D | 128 | Red | 23 1/2” | 23 1/2” | 5 1/2” | Keyed |
| SSU01653 | D | 128 | Black | 23 1/2” | 23 1/2” | 5 1/2” | Keyed |




## AGENCY APPROVALS

**UOXX.S2580** UL Listed Control Unit Accessories


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# SmartRescue Base Station

In-Building Elevator Two-Way Communcation System

RATH® by AVIRE

## Centralized elevator control for faster, informed emergency response.

- Supports up to 10 elevator phones.
- Audible and visual call indication.
- Built-in 4-hour battery backup.
- Expandable for additional responder call points.
- Compliant with ADA, ASME A17.1/CSA B44, IBC, ISED, IEC 61000, and FCC Part 15 requirements.
- ETL listed.




## Specifications

| | Stainless Surface Mount | Stainless Flush Mount | Cabinet Surface Mount | Cabinet Flush Mount |
|---|---|---|---|---|
| **5 Phone Line Part Number** | 2500-205 | 2500-205PSS | 2500-205B* | 2500-205FM |
| **10 Phone Line Part Number** | 2500-210 | 2500-210PSS | 2500-210B* | 2500-210FM |
| **Dimensions** | 12.56″ x 11.6″ x 1.68″ (4.36″ dept with handset) | **Face:** 13.81″ x 13.81″ x 1.68" (2.67″ depth with handset) **Back box:** 12.56″ x 11.6″ x 1.68″ | 15.07″ x 12.0″ x 6.0″ | **Face:** 16.11″ x 14.0″ x 3.0″ **Back box:** 15.62″ x 12.0″ x 3.0″ |
| **Enclosure** | Stainless Steel | | Powder-Coated Steel | |
| **Weight** | 10 lbs | 11 lbs | 17 lbs | 20 lbs |
| **Communication** | Analog | | | |
| **Power Source** | 100 VAC | | | |
| **Environmental** | 32 - 120°F | | | |

** Fireman's lock and English/French instruction units available by request.*

*Continued on Back*

AVIRE

N56W24720 N Corporate Cir., Sussex, WI 53089
800-451-1460
sales.us@avire-global.com
avire-global.com/en-us

## Specifications Continued

| | Stainless Surface Mount | Stainless Flush Mount | Cabinet Surface Mount | Cabinet Flush Mount |
|---|---|---|---|---|
| **Wiring Requirements** | 2500-205 | 2500-205PSS | 2500-205B* | 2500-205FM |
| **Warranty** | 2500-210 | 2500-210PSS | 2500-210B* | 2500-210FM |
| **Included Components** | SmartRescue in enclosure, Plug-in 24 VDC transformer, Backup battery pack, Phone line cord | | SmartRescue in cabinet enclosure, Plug-in 24 VDC transformer, Backup battery pack, Phone line cord | |
| **Compatible RATH® Products** | 2100 Series Elevator Emergency Communication Phones, 2300-630SM Machine Room Phone | | | |

## Supplementary Information

| **Phone Line Requirements (Mandatory)*** | |
|---|---|
| **Phone Line Voltage On-Hook** | 45 - 54 VDC (nominally 48 VDC) |
| **Phone Line Voltage Off-Hook** | 4 - 8 VDC (nominally 5 VDC) |
| **Operating Loop Current Range** | 18 - 55 mA (20 mA typical) |
| **Dialing** | DTMF (Dual Tone Multi-Frequency) |
| **Frequency Response** | 550 - 3400 Hz, +/- 3 db |
| **Ring Sensitivity** | 30 - 120 VAC RMS |
| **Operational Loop Impedance** | 600 ohms |
| **Open-Loop Disconnect Signal** | @ 500m/s |
| **REN** | 1.0 B |
| **Industry Canada No.** | C22.2 No.60950-1-07, 2nd Ed : 1673A-2500210 |
| **FCC Regulation No.** | US: AW7TE10B2500210 |
| **# Connected Phone Lines** | 1 |
| **Electrical** | |
| **Included AC Adapter (Hardwired)** | 120 - 24 VDC @ min. 1.1 A |
| **Included AC Adapter (Plug-in)** | 120 - 24 VDC @ min. 1.04 A |
| **Battery (Supplied)** | 16.6 VDC @ min 1.4 Ah |

**Requires an analog (POTS, PBX, or central office) phone line. If using VoIP, cellular line, or digital line, the line must be converted to analog and capable of supporting modem modulated devices before connecting.*

Ring-down style phone lines are not compatible with the SmartRescue

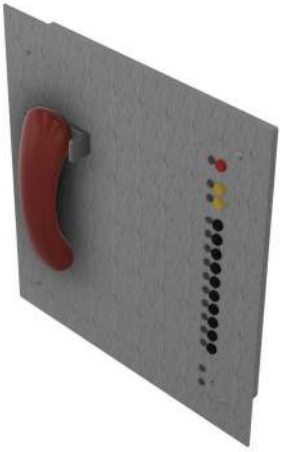
**Note:** Transformer received determined by part number ordered

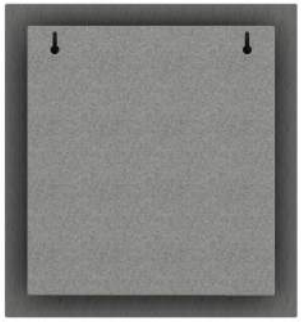
AVIRE
N56W24720 N Corporate Cir., Sussex, WI 53089
800-451-1460
sales.us@avire-global.com
avire-global.com/en-us

# SmartRescue Base Station

2500-210PSS







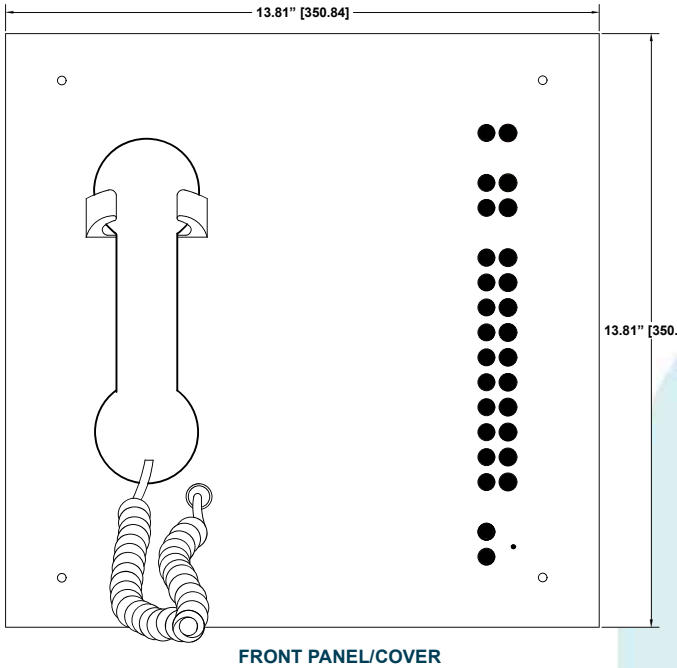
Back View



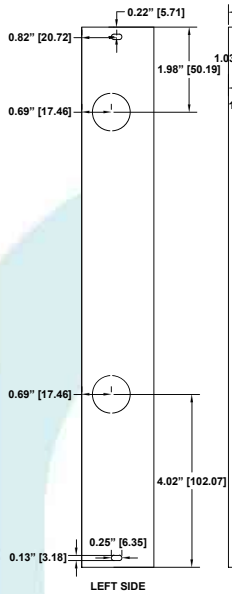
Side View



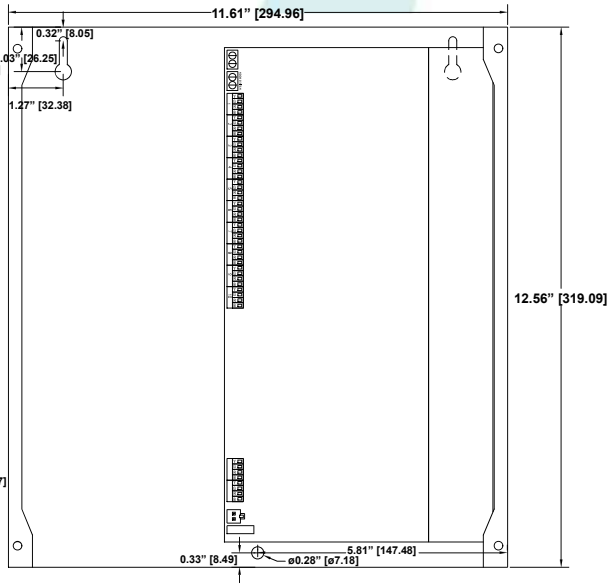
Top View



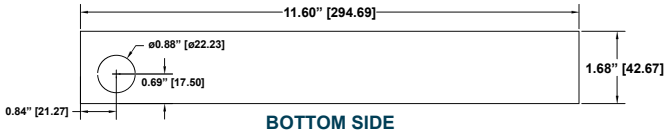

FRONT PANEL/COVER




LEFT SIDE




CONTROL INSIDE




BOTTOM SIDE

# SmartRescue Power Supply

2500-PWR24U



**Part #: 2500-PWR24U**

## CODE COMPLIANCE:

- ETL Recognized Component
- Conforms to UL STD 2017

## POWER:

**Input:**

- 100-120vac, 50/60Hz, 4.0A

**Output:**

- 24vdc @5A total continuous output
- Filtered and electronically regulated output
- 12 PTC protected outputs @0.500A current limited
- Class 2
- 24vdc adjustable output
- 24vdc S1 on/off switch

## ADDITIONAL FEATURES:

- **Protection:** Short Circuit/Overload/Over Voltage
- **Supervision:** DC power failure supervision (form C contacts)

## Specifications:

**Dimensions:** 8.78” H x 12.29” W x 2.81” D

**Environmental:** 32° F to 120° F ambient (for indoor use only)

**Warranty:** 2 Years

# SmartRescue Power Supply

2500-PWR24U





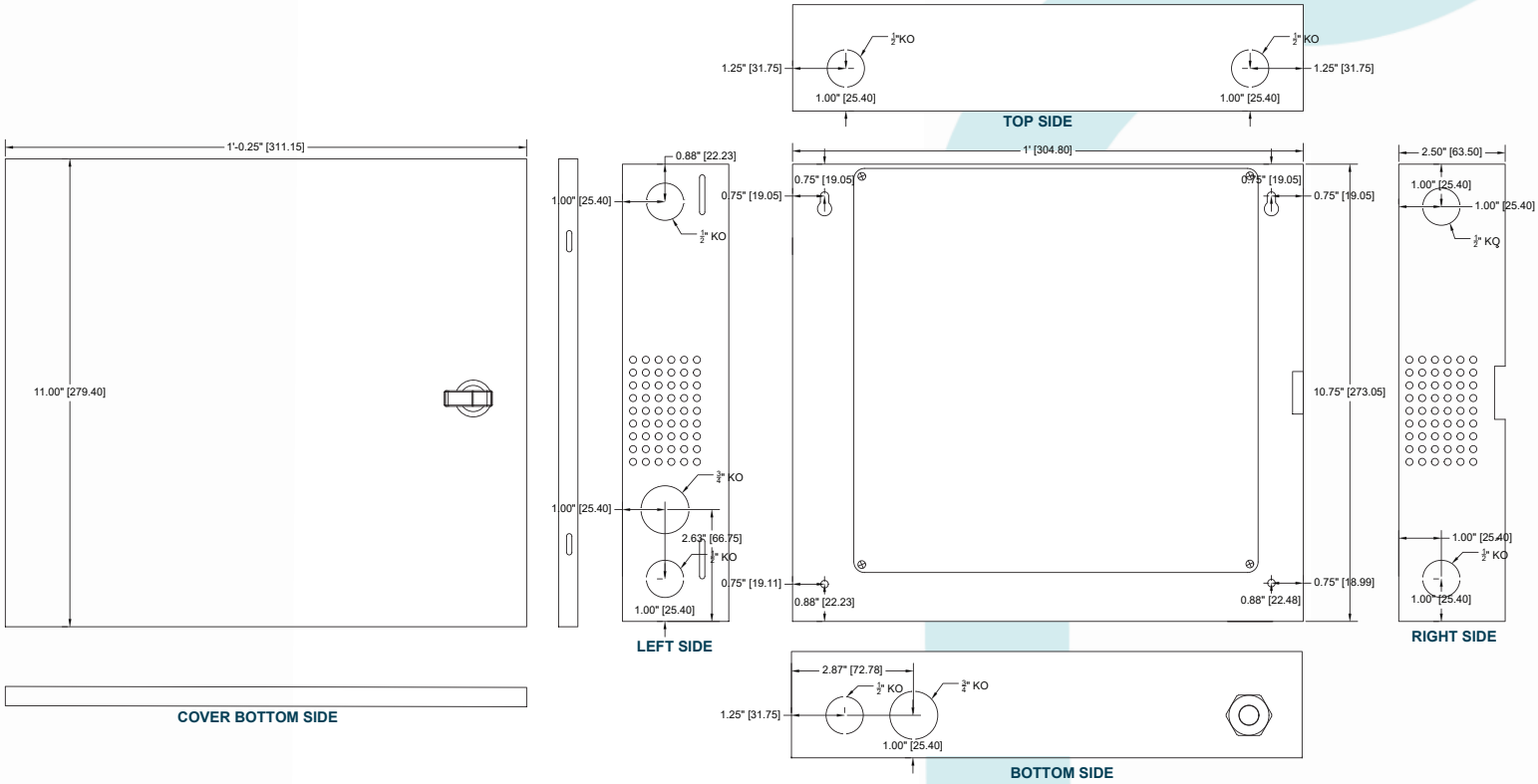
Side View



Back View

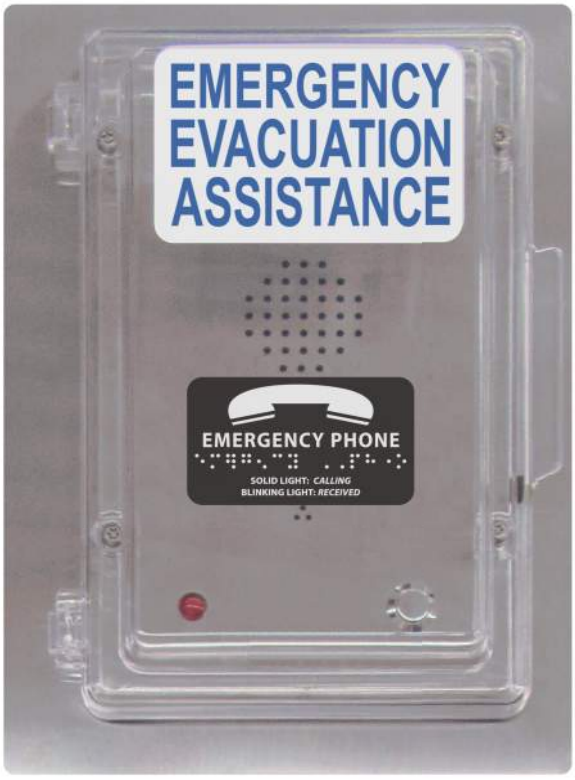


Top View



# SmartRescue System Call Box

2100-958SSRC2




**Part #: 2100-958SSRC2**

## CODE COMPLIANCE:

- International Building Code (IBC)
- National Fire Protection Association (NFPA)
- Americans Disabilities Act (ADA)
- ETL Listing Number: 5013373
- Conforms to UL Standard 2017 for Attendant Monitored Signaling Devices
- Complies with Section 6.4 of UL 60950-1

## POWER REQUIREMENTS:

- 24vdc from part # 2500-PWR24U

## PROGRAMMING FEATURES:

- Programmable with up to 5 emergency numbers
- Recordable location message (18 seconds)
- On-site keypad programming or remote programming

## PHONE CAPABILITIES:

- Requires analog telephone line (POTS, PBX, or central office line)
- Phone checks every 24 hours for an active phone line, if one is not detected, phone will provide a relay trip
- Automatic answer feature with audible ring
- Touch Tone operation only (Touch Tone is an AT&T registered trademark)

## Specifications:

**Dimensions: Face Plate:** 11-3/8” H x 8” W | **Back Box:** 9-7/8” H x 6-1/2” W x 3” D | **Cover:** 9-3/4” H x 6-1/2” W x 1-1/4” D

**Mounting:** Flush Mount

**Design:** Brushed Stainless Steel

**Warranty:** 2 Years

## ADDITIONAL FEATURES:

- Compatible with SmartRescue Base Station or Command Center for in-building rescue coordination
- Built-in 10 phone consolidator feature allows you to install 10 Call Boxes and 1 Base Station on a single telephone line
- Remote or on-site diagnostic test
- Automatic dialer (31 digit programmable memory)
- Built-in battery backup recharges from 24vdc power (allows for a minimum of 4 hours of talk time upon power loss)
- 7.2V 300mAH battery (part # RP7300110)

**Optional Feature:**

- Strobe interface and relay

# SmartRescue System
# Call Box

2100-958SSRC2

RATH by AVIRE









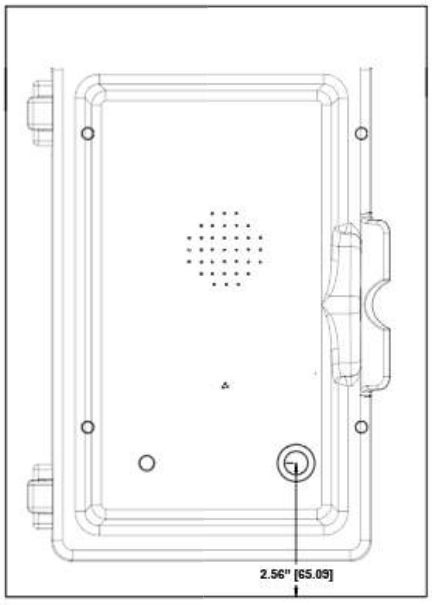
Side View



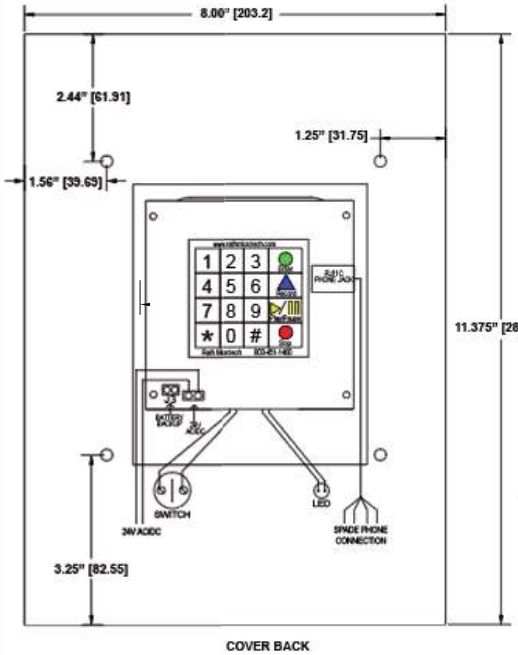
Back View



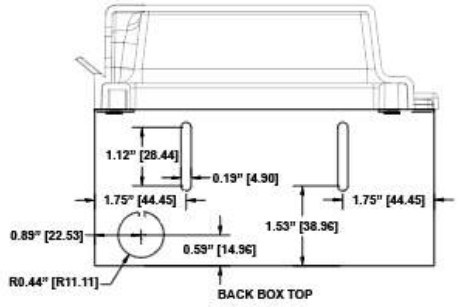
Top View



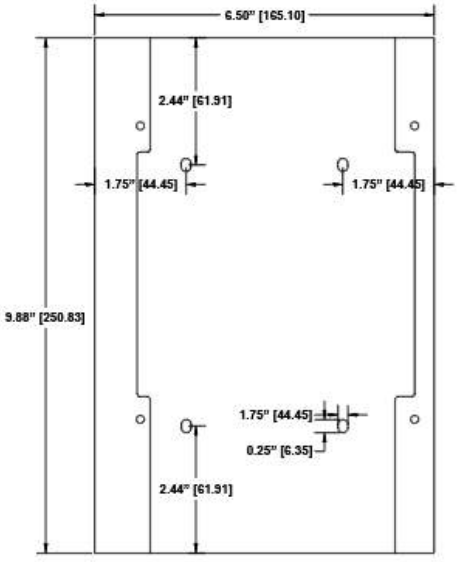

COVER FRONT



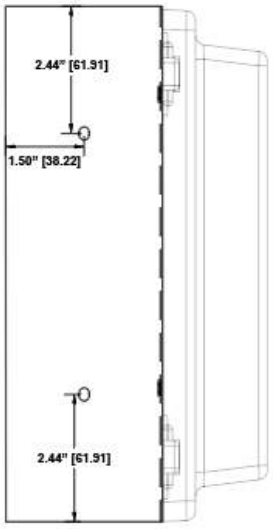

COVER BACK



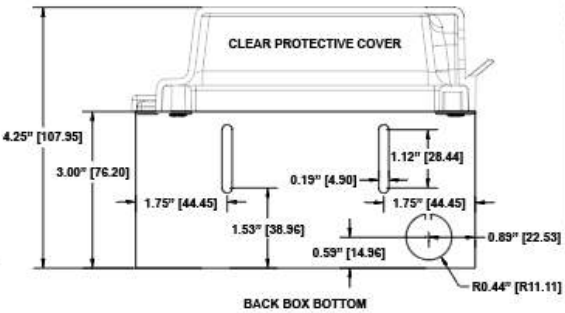

BACK BOX TOP



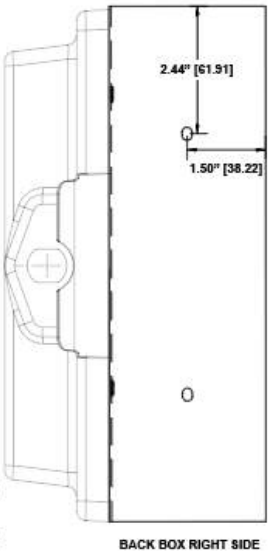

BACK BOX FRONT




BACK BOX LEFT SIDE




BACK BOX BOTTOM




BACK BOX RIGHT SIDE



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