



**Modifications to Existing
EST Addressable System
Portland Main Post Office
Portland, Maine**

Prepared For:
Enterprise Electric, Inc.
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Lisbon Falls, ME 04252
Attn: Jihn Seigars

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**Modifications to Existing
EST Addressable Fire Alarm System
Portland Main Post Office
Portland , Maine**

Click on a Description to View Data Sheet

<u>Item</u>	<u>Qty</u>	<u>Catalog #</u>	<u>Description</u>	<u>Data Sheet</u>
1			IRC3 Control Panels (No Equipment Modifications)	
2			Initiating Devices	
	8	D4120	Duct Smoke Detector (4 Wire)	HVDS00500
	8	DST(x)	Sampling Tube (x = Length sized to Fit Duct Width)	HVDS00500
	8	RTS151Key	Remote Test & Indicating Station - Key Operated	HVDS00500
	10	M500MF	Addressable Monitor Module	A05-1029-004
	9	SSU-RIC-1	Auxiliary Relay	LT10280
3			Supporting Documantation	

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FACP / DGP Battery Calculations
System Operation Narrative
System Operation Matrix
System Service and Warranty
Component Wiring Details
Fire Alarm System Riser Diagram
Fire Alarm Part Plans

**Modifications to Existing
EST3 Addressable Fire Alarm System
Portland Main Post Office
Portland, Maine**

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BATTERY STANDBY CALCULATIONS - Fire Alarm Control Panel

(Modifications shown in **BOLD**)

QTY	Model #	Description	Quiescent Current	Alarm Current	Total Quiescent	Total Alarm		
1	CM1N	Master Controller	0.190000	0.267000	0.190000	0.267000	Amp	
1	ZAS-1	Addressable Loop Controller	0.070000	0.041000	0.070000	0.041000	Amp	
28	Sensors	Addressable Smoke or Heat Detector	0.000200	0.005400	0.005600	0.151200	Amp	
18	M500MF, M500CFS	Addressable Monitor, Supervised Control Module	0.000300	0.005400	0.005400	0.097200	Amp	
3	M500CF	Addressable Relay Module (Non-Supervised)	0.000200	0.005300	0.000600	0.015900	Amp	
1	AA75	Amplifier	0.085000	3.400000	0.085000	3.400000	Amp	
					Total	0.356600	3.972300	Amp

Total Quiescent x Time Required (60 Hours)*: **2.522271** Ah
 Total Alarm x Time Required (15 Minutes): **0.993075** Ah
Total Battery Required: 3.515346 Ah
Total Battery Required (+) 20% Spare Capacity: 4.2184152 Ah
Battery Supplied: 26 Ah

BATTERY STANDBY CALCULATIONS - DGP South

(Modificarions shown in **BOLD**)

QTY	Model #	Description	Quiescent Current	Alarm Current	Total Quiescent	Total Alarm		
1	CM2N	Slave Controller	0.190000	0.267000	0.190000	0.267000	Amp	
2	ZAS-1	Addressable Loop Controller	0.070000	0.041000	0.140000	0.082000	Amp	
81	Sensors	Addressable Smoke or Heat Detector	0.000200	0.005400	0.016200	0.437400	Amp	
26	M500MF, M500CFS	Addressable Monitor, Supervised Control Module	0.000300	0.005400	0.007800	0.140400	Amp	
3	M500CF	Addressable Relay Module (Non-Supervised)	0.000200	0.005300	0.000600	0.015900	Amp	
1	AA75	Amplifier	0.085000	3.400000	0.085000	3.400000	Amp	
8	D4120	Duct Smoke Detector	0.002100	0.065000	0.016800	0.520000	Amp	
8	RTS151KEY	Remote Test & Indicating Station	0.000000	0.012000	0.000000	0.096000	Amp	
9	SSU-RIC-1	Auxiliary Relay (Normally Energized)	0.018000	0.018000	0.162000	0.162000	Amp	
					Total	0.6184	5.1207	Amp

Total Quiescent x Time Required (60 Hours)*: **18.23027** Ah

Total Alarm x Time Required (15 Minutes): **1.280175** Ah

Total Battery Required: 19.510446 Ah

Total Battery Required (+) 20% Spare Capacity: 23.412535 Ah

Battery Supplied: 26 Ah

BATTERY STANDBY CALCULATIONS - DGP North

(Modificarions shown in **BOLD**)

QTY	Model #	Description	Quiescent Current	Alarm Current	Total Quiescent	Total Alarm		
1	CM2N	Slave Controller	0.190000	0.267000	0.190000	0.267000	Amp	
2	ZAS-1	Addressable Loop Controller	0.070000	0.041000	0.140000	0.082000	Amp	
86	Sensors	Addressable Smoke or Heat Detector	0.000200	0.005400	0.017200	0.464400	Amp	
17	M500MF, M500CFS	Addressable Monitor, Supervised Control Module	0.000300	0.005400	0.005100	0.091800	Amp	
4	M500CF	Addressable Relay Module (Non-Supervised)	0.000200	0.005300	0.000800	0.021200	Amp	
1	AA75	Amplifier	0.085000	3.400000	0.085000	3.400000	Amp	
					Total	0.4381	4.3264	Amp

Total Quiescent x Time Required (60 Hours)*: **7.412271** Ah

Total Alarm x Time Required (15 Minutes): **1.0816** Ah

Total Battery Required: 8.493871 Ah

Total Battery Required (+) 20% Spare Capacity: 10.192645 Ah

Battery Supplied: 26 Ah

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System Narrative

In the event of an alarm from an actuated device, the following shall

occur: (All alarm inputs, less Duct Smoke Detectors)

- 1) Notify the Fire Department via the Master Box;
- 2) Activate the exterior Strobe/Beacon
- 3) Activate existing evacuation sequence
- 4) Annunciate audibly, visually, and in plain english the active initiating device at the fire alarm control panel and indicate via LED at Lobby Annunciator
- 5) Duct Smoke Detector, in addition to the above, shall shutdown its associated Air Handling Unit (See Sequence of Operation for more detailed information)

In the event of a supervisory condition from an actuated device, the following shall occur:

(Devices reporting as supervisory: Tamper Switch, Sprinkler
Supervisory Switch, Loss of AHU Shutdown Power)

- 1) Annunciate audibly, visually, and in plain english the active initiating device at the fire alarm control panel.

In the event of a system trouble report, the following shall occur:

- 1) Annunciate audibly, visually, and in plain english the active initiating device at the fire alarm control panel.

SEQUENCE OF OPERATION MATRIX

<i>Alarm Signal to Fire Department via Master Box</i>	<i>Annunciate at Fire Alarm Control Panel & Remote Annunciator</i>	<i>Activate Existing Evacuation Sequence</i>	<i>Activate Exterior Strobe Beacon</i>	<i>Shutdown Associated HVAC Unit via Control Relay Listed</i>	<i>Supervisory Signal to Attended Location</i>	<i>Trouble Signal to Attended Location</i>
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System Inputs	A	B	C	D	E	F	G	System Inputs
Existing System Alarm Inputs (Less DSD's)	x	x	x	x				Existing System Alarm Inputs (Less DSD's)
Existing System Supervisory Inputs		x				x		Existing System Supervisory Inputs
Existing System Trouble Inputs		x					x	Existing System Trouble Inputs
Duct Smoke AHU-1A (Address 0819)	x	x	x	x	0818			Duct Smoke AHU-1A (Address 0819)
Duct Smoke AHU-1B (Address 0820)	x	x	x	x	0818			Duct Smoke AHU-1B (Address 0820)
Duct Smoke AHU-2 (Address 1011)	x	x	x	x	1010			Duct Smoke AHU-2 (Address 1011)
Duct Smoke AHU-3 (Address 1216)	x	x	x	x	1204			Duct Smoke AHU-3 (Address 1216)
Duct Smoke AHU-4 (Address 0812)	x	x	x	x	0817			Duct Smoke AHU-4 (Address 0812)
Duct Smoke AHU-5 (Address 0821)	x	x	x	x	0807			Duct Smoke AHU-5 (Address 0821)
Duct Smoke AHU-6 (Address 1217)	x	x	x	x	1214			Duct Smoke AHU-6 (Address 1217)
Duct Smoke AHU-7 (Address 1218)	x	x	x	x	1215	x		Duct Smoke AHU-7 (Address 1218)
Fire Alarm - AC Failure		x					x	Fire Alarm - AC Failure
Fire Alarm - Low Battery		x					x	Fire Alarm - Low Battery
Signal Line Open Circuit		x					x	Signal Line Open Circuit
Signal Line Ground Fault		x					x	Signal Line Ground Fault
Horn/Strobe Circuit Open		x					x	Horn/Strobe Circuit Open
Horn/Strobe Circuit Ground		x					x	Horn/Strobe Circuit Ground
System Ground Fault		x					x	System Ground Fault
	A	B	C	D	E	F	G	



Service and Warranty

R.B. Allen Co., Inc. is a UL Certified ISO 9001 registered Fire Alarm Distributor since 1966 with offices located in North Hampton, NH and Woonsocket, RI. The service policies of R.B. Allen Company are no charge to the customer for warranty work including parts and labor for one (1) year from the time of final acceptance.

R.B. Allen Company warranty applies only to the equipment it provides and does not cover defective wiring or equipment provided by the Electrical Contractor.

Service calls resulting from acts of nature, acts of vandalism, or acts which are beyond the control of the equipment manufacturer are excluded under the guarantee and shall be considered a billable call.

R.B. Allen Company factory trained and certified technician will provide job site supervision during installation of the system and perform final connections, testing and adjusting of the Fire Alarm System. They also will instruct the owner's personnel on the operation and maintenance of the fire alarm system.

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D4120 Duct Smoke Detector

The InnovairFlex™ Series are the only duct smoke detectors flexible enough to fit configurations from square to rectangular and everything in between.



Innovairflex™

Features

- 4-Wire Photoelectric, integrated low-flow technology
- Air velocity rating from 100 ft/min to 4,000 ft/min (0.5 m/s to 20.32 m/sec)
- Versatile mounting options: square or rectangular configuration
- Plug-in sensor offers superb false alarm immunity and the latest sensor technology
- Broad ranges for operating temperature (-4°F to 158°F) and humidity (0% to 95% non-condensing)
- Patented sampling tube installs from front or back of the detector with no tools required
- Increased wiring space with a newly added 3/4-inch conduit knockout
- One easy-access Test/Reset button and improved LED status
- Patented interconnect feature for multi-fan shutdown
- New high contrast terminal designations
- Built-in short circuit protection from operator wiring errors
- Field selectable settings for configuring the detector
- Two DPDT Form-C relay contacts
- 24 VAC/DC or 120 VAC
- Backward compatibility with existing Innovair products, including remote accessories

Agency Listings



The InnovairFlex D4120 4-wire photoelectric duct smoke detector features a pivoting housing that fits both square and rectangular footprints and mounts to round or rectangular ductwork. This unit senses smoke in the most challenging conditions, operating in airflow speeds of 100 to 4,000 feet per minute, temperatures of -4°F to 158°F, and a humidity range of 0 to 95 percent (non-condensing). A plug-in sensor head offers improved false alarm immunity and simple installation, testing, and maintenance. An improved cover design isolates the sensor head from the low-flow feature for simple maintenance.

The InnovairFlex housing provides ample wiring space, a 3/4-inch conduit knockout, and built-in short circuit protection to prevent damage to sensitive components during installation. High contrast terminal designations make wiring easy. With its 2:1 sensor-to-power capability, the power board of the D4120 may be used to monitor a second sensor, D4S, simultaneously (i.e., supply and return side). As many as 50 InnovairFlex detectors can be interconnected. When one unit senses smoke, all interconnected detectors will switch their relays; only the detector sensing smoke will go into alarm, thus pinpointing the fire source.

An easy-access Test/Reset button makes it possible to test the unit with the cover on. Three DIP switches can be used to configure field selectable settings: cover tamper delay, number of sensors to be controlled, and shut down on trouble option. Each power board has two LEDs that can be used to indicate the status of connected sensors, and a quick reference imprinted on the cover explains the LED status indications (Standby, Maintenance, Trouble, and Alarm). The InnovairFlex duct smoke detector can be customized to meet local codes and specifications without additional wiring. The new InnovairFlex product line is compatible with all previous Innovair models, including remote test accessories.

WARNING: Duct smoke detectors are **NOT** a substitute for open area smoke detectors; **NOT** a substitute for early warning detection; **NOT** a replacement for a building's regular fire detection system. Refer to NFPA 72 and 90A for additional information.

InnovairFlex™ Duct Smoke Detector Specifications

Architectural/Engineering Specifications

The air duct smoke detector shall be a System Sensor InnovairFlex™ D4120 Photoelectric Duct Smoke Detector. The detector housing shall be UL listed per UL 268A specifically for use in air handling systems. The flexible housing of the duct smoke detector fits multiple footprints from square to rectangular. The detector shall operate at air velocities of 100 feet per minute to 4000 feet per minute (0.5 to 20.32 meters/second). The unit shall be capable of controlling up to 50 air handling systems when interconnected with other detectors. The detector shall be capable of providing a trouble signal in the event that the front cover is removed. It shall be capable of local testing via magnetic switch, test button on the cover, or remote testing using the RTS2-AOS Multi-Signaling Accessory or the RTS151KEY Remote Test Station. Terminal connections shall be of the strip and clamp method suitable for 12–18 AWG wiring.

Physical Specifications

Size: (Rectangular Dimensions)	14.38 in (37 cm) Length; 5 in (12.74 cm) Width; 2.5 in (6.36 cm) Depth
Size: (Square Dimensions)	7.75 in (19.7 cm) Length; 9 in (22.9 cm) Width; 2.5 in (6.35 cm) Depth
Weight:	2.5 lbs (1.14 kg)
Operating Temperature Range:	D4120 & D4S: -4° to 158°F (-20° to 70°C); D4P120: -40° to 158°F (-40° to 70°C)
Storage Temperature Range:	D4120 & D4S: -22° to 158°F (-30° to 70°C); D4P120: -40° to 158°F (-40° to 70°C)
Operating Humidity Range:	0% to 95% relative humidity non-condensing
Air Duct Velocity:	100 to 4000 ft/min (0.5 to 20.32 m/sec)

Electrical Ratings

Power supply voltage:	20–29 VDC	24 VAC 50–60 Hz	120 VAC 50–60 Hz
Input capacitance:	270 µF max.	270 µF max.	N/A
Reset voltage:	3.0 VDC min.	2.0 VAC min.	10 VAC min.
Reset time: (with RTS151)	.03 to 0.3 sec.	.03 to 0.3 sec.	.03 to 0.3 sec.
Reset time: (by power down)	0.6 sec. max.	0.6 sec. max.	0.6 sec. max.
Power up time:	35 sec. max.	35 sec. max.	35 sec. max.
Alarm response time:	15 sec.	15 sec.	15 sec.
Sensitivity Test:	See detector label	See detector label	See detector label

Current Requirements: (Using No Accessories)

Max. standby current:	21 mA @ 24VDC	65 mA RMS @ 24VAC 60Hz	20 mA RMS @ 120VAC 60Hz
Max. alarm current:	65 mA @ 24VDC	135 mA RMS @ 24VAC 60Hz	35 mA RMS @ 120VAC 60Hz

Contact Ratings

Alarm initiation contacts: (SPST)	2.0A @ 30 VDC (resistive)
Alarm auxiliary contacts: (DPDT)	10A @ 30 VDC (resistive); 10A @ 250 VAC (resistive); ½ HP @ 240 VAC ; ¼ HP @ 120 VAC

Note: Alarm auxiliary contacts shall not be connected to initiating circuits of control panels. Use the alarm initiation contact for this purpose.

Supervisory contacts: (SPDT) 2.0A @ 30 VDC (resistive); 2.0A @ 125 VAC (resistive)

Accessory Current Loads at 24 VDC

Device	Standby	Trouble	Alarm
APA151	12.5 mA	n/a	30 mA Max.
MHR/MHW	0 mA	n/a	29 mA Max.
RA100Z	0 mA	n/a	12 mA Max.
RTS151/RTS151KEY	0 mA/12 mA	n/a	12 mA Max.
RTS2/RTS2-AOS	3.0mA max	16 mA Max.	with strobe: 55 mA max; without strobe 30 mA max

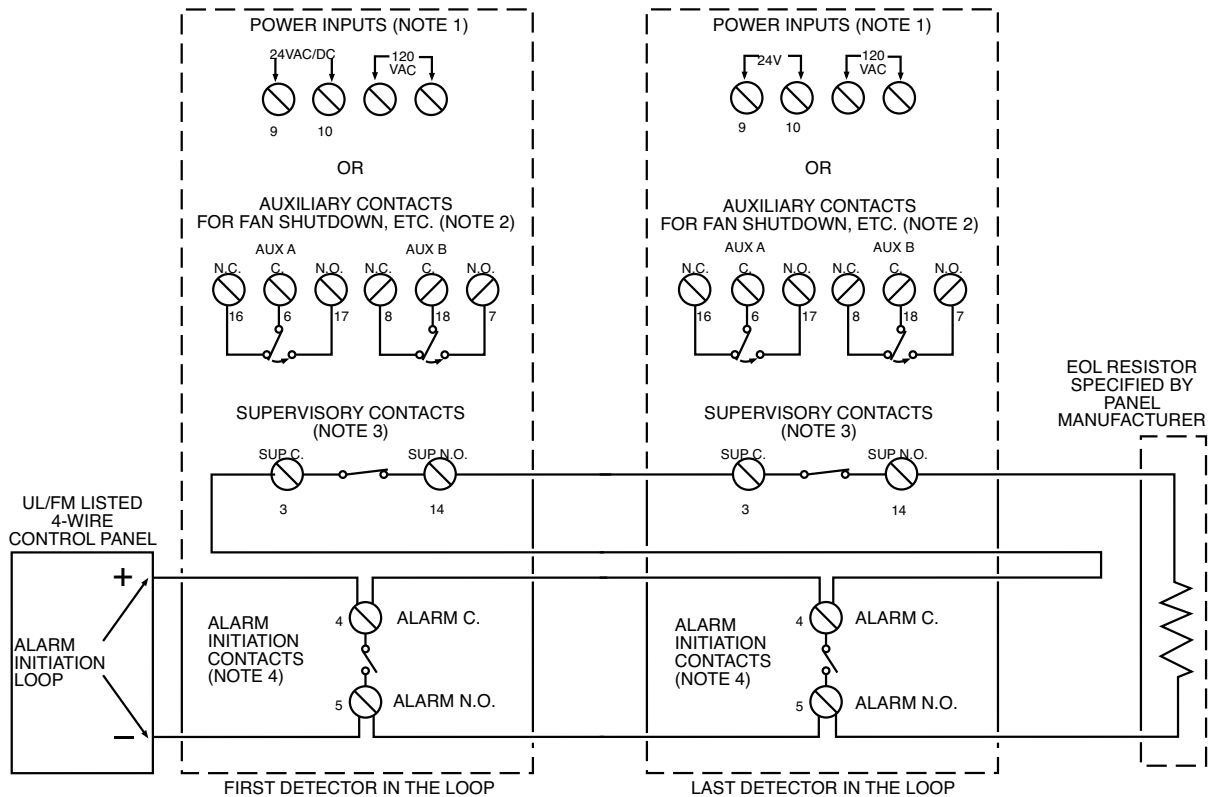
Note: Any combination of accessories may be used such that the given accessory loads are: 110 mA or less at the Aux output, and 50 mA or less at the Alarm output

Installing the InnovairFlex Sampling Tube

The InnovairFlex sampling tube may be installed from the front or back of the detector. The tube locks securely into place and can be removed by releasing the front or rear locking tab (front locking tab shown below right).



Wiring for 4-wire Duct Smoke Detector and Accessories



NOTE 1: 24V Power Inputs accept a non-polarized 24VDC or 24VAC 50-60Hz. 120VAC Power Inputs accept only 120VAC 50-60Hz. Connect power source to appropriate terminals of each detector. See specifications for additional power supply information.

NOTE 2: Auxiliary contacts shown in standby position. Contacts switch during alarm as indicated by arrows. Auxiliary contacts are not to be used for connection to the control panel. See specifications for contact ratings.

*Please refer to the corresponding installation manual for accessory wiring diagrams.

NOTE 3: Supervisory contacts shown in standby position. Open contacts indicate a trouble condition to the panel. See specifications for contact ratings.

NOTE 4: Alarm Initiation contacts shown in standby position. Closed contacts indicate an alarm condition to the panel. See specifications for contact ratings.

Important Notes on 2:1 Sensor-to-Power Capability

- 2:1 sensor-to-power capability is not available for all InnovairFlex models. The feature is only available on the D4120 4-wire conventional models.
- 2:1 sensor-to-power capability can be enabled using one D4120 and one D4S, or two D4S and one D4P120.

Important Interconnect Notes

- When using the interconnect feature, all interconnected units must be powered using the same independent supply.
- Polarity must be maintained throughout the interconnect wiring. Connect the INT+ terminal on unit 1 to the INT+ terminal on unit 2 and so on. Similarly, connect the INT/AUX- terminal on unit 1 to the INT/AUX- terminal on unit 2 and so on.
- Up to 50 D4120 units, 50 D4P120 units, or 50 units of combination may be interconnected.
- Up to 10 DH100ACDC units may be interconnected. Please note that each of the 9 DH100ACDC units interconnected may be replaced by three D4P120 units. Therefore, when using the interconnect feature a single DH100ACDC can drive either 9 DH100ACDCs or 27 D4120 units.

* NOTE: Alarm can be reset only at the initiating device and not at the devices interconnected.

Accessories

System Sensor provides system flexibility with a variety of accessories, including two remote test stations and several different means of visible and audible system annunciation. As with our duct smoke detectors, all duct smoke detector accessories are UL listed.



RTS151 UL S4011



RTS151KEY UL S2522



APA151 UL S4011



RTS2-AOS UL S2522



RA100Z UL S2522



MHW UL S4011



MHR UL S4011



AOS

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Ordering Information

Part No.	Description		
D4120	4-wire photoelectric low-flow duct smoke detector		
Accessories			
D4S	4-wire photoelectric sensor component only	ETX	Metal exhaust tube duct width 1ft (0.3m)
D4P120	4-wire photoelectric power board component only, 24 VAC/DC, 120 VAC	M02-04-00	Test magnet
2D51	4-wire conventional photoelectric sensor head	MHR	Mini Horn, Red
DST1	Metal sampling tube duct width up to 1ft (0.3m)	MHW	Mini Horn, White
DST1.5	Metal sampling tube duct widths 1 ft to 2 ft (0.3 to 0.6 m)	P48-21-00	End cap for metal sampling tubes
DST3	Metal sampling tube duct widths 2 ft to 4 ft (0.6 to 1.2 m)	RA100Z	Remote annunciator alarm LED
DST5	Metal sampling tube duct widths 4 ft to 8 ft (1.2 to 2.4 m)	RTS151	Remote test station
DST10	Metal sampling tube duct widths 8 ft to 12 ft (2.4 to 3.7 m)	RTS151KEY	Remote test station with key lock
APA151	Remote annunciator with piezo alarm	RTS2 - AOS	Multi-signaling accessory with add on strobe
DH400OE-1	Weatherproof enclosure		



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500 Series Intelligent Modules

The System Sensor intelligent module products are designed to meet a wide range of applications.

Features

- SEMS screws for easing wiring
- Panel controlled status LED (except M501M)
- Analog communications
- Rotary address switches (except M500X)
- Low standby current
- Mounts in standard 4" junction box



Monitor and control modules can be used to supervise and activate sounders, strobes, door closers, pull stations, waterflow switches, conventional smoke detectors, and more. Each module is rigorously designed and tested for electromagnetic compatibility and environmental reliability, in many cases exceeding industry standards. Modules are addressed with easy-to-use rotary code switches. Full size modules mount in standard 4 in x 4 in x 2 1/8 in junction box. Wiring terminals are easily accessible for troubleshooting.

M500M Monitor Module, M501M Mini Monitor Module, and M500DM Dual Input Monitor Module

System Sensor monitor modules provide an interface to contact devices, such as security contacts, waterflow switches, or pull stations. They are capable of Styles A and B supervised wiring to the load device (M500M device is capable of Style D). Conventional 4-wire smoke detectors can be monitored through their alarm and trouble contacts, wired as an initiating loop to the module. In addition to transmitting the supervised state of the monitored device (normal, open, or short), the full analog supervision measurement is sent back to the panel. This allows detection of impedance changes in the supervised loop to the monitored device. The M500DM module is capable of monitoring two separate Class B circuits simultaneously, making it ideal for waterflow tamper switch and flow switch monitoring. The compact size of the M501M module allows it to fit inside devices or junction boxes behind devices.

M500X Isolator Module

The M500X Isolator Module is an automatic switch that opens when the line voltage drops below four volts. Isolator modules should be spaced between groups of sensors or modules in a loop to protect the rest of the loop. If a short occurs between any two isolators, then both isolators immediately switch to an open circuit state and isolate the devices between them. The remaining units on the loop continue to fully operate. A maximum of 25 devices are recommended for each group.

M502M Zone Interface Module

The M502M Zone Interface Module allows intelligent panels to interface and monitor 2-wire conventional smoke detectors. All

continued

Agency Listings



continued

2-wire detectors being monitored must be UL or ULC compatible with the module. The M502M module is addressed through the communication line of an intelligent system. It transmits the status of one zone of 2-wire detectors to the fire alarm control panel. Status conditions are reported as normal, open, or alarm. The interface module supervises the zone of detectors and the connection of the external power supply.

M500S Control Module

The M500S Control Module provides supervised monitoring of wiring to load devices that require an external power supply to operate, such as horns, strobes, or bells. It is capable of Styles Y and Z supervision. Upon command from the control panel, the M500S module will disconnect the supervision and connect the external power supply across the load device. The disconnection of the supervision provides a verification to the panel that the control relay actually turned on. The external power supply is always relay isolated from the communication loop, so that a trouble condition on the power supply will never interfere with the rest of the system. Full analog measurement of the supervised wiring is transmitted back to the panel and can be used to detect impedance changes or other special test functions.

M500R Relay Module

The M500R Relay Module contains two isolated sets of Form C contacts, which operate as a DPDT switch. The module allows the control panel to switch these contacts on command. No supervision is provided for the notification appliance circuit.

M500DR Dual Audio Riser Module

The M500DR module is a special applications control module that is designed to supervise a loop of speakers under normal conditions. When commanded by the control panel, the module then connects either of two audio amplifier circuits to the speakers. In this way, two separate audio messages can be broadcast over a single set of speakers with a single module.

M500FP Firefighter Phone Module

The M500FP module is intended to monitor and control a loop of firefighter phones. It has the ability to differentiate between normal, off-hook, and trouble conditions. When taken off-hook, a phone will immediately receive a ringing tone, and the panel will receive an off-hook indication. The panel can then connect that off-hook phone to the main riser for the system.

500 Series Intelligent Module Specifications

General Specifications	
Operating Voltage	15 to 32 VDC
Communication Line Loop Impedance	40 Ω max.
Temperature Range	32°F to 120°F (0° to 49°C)
Relative Humidity	10% to 93% noncondensing
Shipping Weight	M501M: 1.2 oz (37 g) Others: 6.3 oz (196 g)
Dimensions	M501M: 2.7 in W × 1.7 in H × 0.5 in D Others: 4.25 in W × 4.65 in H × 1.1 in D
Specifications, M502M	
Standby Current	300 μA max @ 24 VDC (one communication every 5 sec. with LED enabled)
External Power Supply	18 to 28 VDC (100 mV ripple max.)
End-of-Line Resistance	3.8 kΩ (included)
External Supply Standby Current	11.5 mA @ 24 VDC (nominal)
External Supply Alarm Current	80 mA @ 24 VDC (nominal)
Specifications, M500R	
Standby Current	300 μA max @ 24 VDC (one communication every 5 sec. with LED enabled)
LED Current	5.5 mA (with LED latched on)
Relay Contact Ratings	3.0 A @ 30 VDC resistive 0.9 A @ 110 VDC resistive 0.9 A @ 125 VAC resistive 0.5 A @ 125 VAC inductive (PF=.35) 0.7 A @ 75 VAC inductive (PF=.35)

Specifications, M500X	
Standby Current	450 μA max.
Isolation Impedance	2.25 kΩ to 2.9 kΩ
Fault Detection Delay	250 ms min.
Fault Detection Threshold	4 Volts
Line Restoration Threshold	7 Volts
Specifications, M500DM	
Standby Current	750 μA max. @ 24 VDC (one communication every 5 sec. with 47k EOL)
Alarm Current	970 μA max. (one communication every 5 sec.); 6 mA (with LED latched on)
End-of-Line Resistance	47 kΩ (two included)
Specifications, M500M, M500S, M501M	
Standby Current	400 μA max @ 24 VDC (one communication every 5 sec. with 47k EOL); 550 μA max @ 24 VDC (one communication every 5 sec. with EOL<1k); 5.5 mA (with LED latched on)
End-of-Line Resistance	47 kΩ (included)
Specifications, M500FP	
Standby Current	2.4 mA max. (one communication every 5 sec. with LED enabled)
Comm. Line Current	4.0 mA max. (no communication, LED off, 1200 Ω phone)
Acceptable Phone Resistance	1200 Ω (nominal)
End-of-Line Resistance	3.9 kΩ (included)



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EXCUSES!**



Coil Energized LED

The **SSU-RIC-1** Relay, SPDT, provides 10.0 Amp resistive form C contacts. The relay coil may be energized by one of three input voltages: 24VDC, 24VAC, or 115VAC. **SAE PN# SSU-RIC-1**



Coil Energized LED

The **SSU-RIC-2** Relay, DPDT, provides 10.0 Amp resistive form C contacts. The relay coil may be energized by one of three input voltages: 24VDC, 24VAC, or 115VAC. **SAE PN# SSU-RIC-2**



The **SSU-RIC-3** Relay, SPDT, provides 10.0 Amp resistive form C contacts. The relay coil may be energized by one of two input voltages: 24VDC (non-polarized) or 24VAC. **SAE PN# SSU-RIC-3**

The **SSU-RIC-4** Relay is identical except the 24VDC is polarity sensitive. **SAE PN#**



- Uses UL Recognized Components

**ISO 9001
REGISTERED
COMPANY**



Space Age Electronics, Inc.
www.1sae.com
800.486.1723 voice
508.485.0966 direct
508.485.4740 fax



RIC Series Relays (1 - 4)

The RIC Series is ideal for applications where remote relays are required for control or status feedback. They are suitable for use with HVAC, temperature control, fire alarms, security, energy management and lighting control systems.

The RIC Series Relay Modules are multi-voltage devices providing 10 Amp resistive dry form C contacts. These relays may be energized by one of three input voltages: 24VAC, 24VDC or 115VAC. A red LED is provided which when illuminated, indicates the relay coil is energized on the RIC-1 and RIC-2 only.

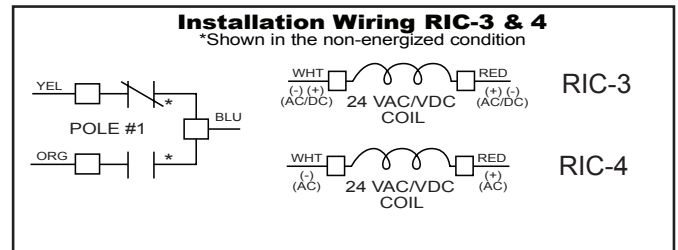
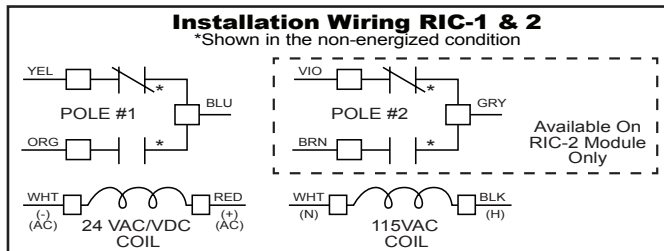
The RIC-3 and RIC-4 have a 2 - 3 Second "drop out" delay that allows the relay to remain actuated on dirty power or if a pulsed input is supplied.

To mount the RIC Series module, simply push the self-clinching spud through a 1/2" (12.7mm) knockout on a junction box and connect via the 12" long "flying" leads.

Standard Features:

- 10 Amp resistive dry form C contacts
- Coil input voltages: 24VAC, 24VDC, or 115VAC
- Contains a red LED which illuminates when the coil is energized (RIC 1 & 2 only)
- Wire nuts included for installation
- UL listed, file # S3403
- 12" wire leads
- Sturdy full plastic enclosure

Model Number	RIC-1	RIC-2	RIC-3	RIC-4
Power Requirements	24VAC, 24VDC, 115VAC	24VAC, 24VDC, 115VAC	24VAC, 24VDC (non-polarized)	24VAC, 24VDC (polarized)
Polarized	No	No	No	Yes (DC Only)
Energized LED Indication	Yes	Yes	No	No
Coil Requirements				
@24VDC	18mA	18mA	32mA	32mA
@24VAC	39mA	39mA	41mA	41mA
@115VAC	26mA	26mA	NA	NA
Delay upon De-Energization	No	No	2 - 3 Seconds	2 - 3 Seconds
Contact Configuration	SPDT	DPDT	SPDT	SPDT
Contact Ratings				
@28VDC	7Amp Resistive	7Amp Resistive	7Amp Resistive	7Amp Resistive
@115VAC	10Amp Resistive / 0.35PF Inductive	10Amp Resistive / 0.35PF Inductive	10Amp Resistive / 0.35PF Inductive	10Amp Resistive / 0.35PF Inductive
Wiring Leads	6 "Flying Leads" 12" - 18 AWG Wire Nuts Provided	6 "Flying Leads" 12" - 18 AWG Wire Nuts Provided	7 "Flying Leads" 12" - 18 AWG Wire Nuts Provided	7 "Flying Leads" 12" - 18 AWG Wire Nuts Provided
Ambient Temperature @85% RH, Non-Condensing	32°F to 120°F 0°C to 40°C	32°F to 120°F 0°C to 40°C	NA NA	NA NA
Ambient Temperature @93% RH, Non-Condensing	NA NA	NA NA	32°F to 120°F 0°C to 40°C	32°F to 120°F 0°C to 40°C
Mounting	Spud Mounting through 1/2" Knockout	Spud Mounting through 1/2" Knockout	Spud Mounting through 1/2" Knockout	Spud Mounting through 1/2" Knockout
Dimensions	2.5" H x 1.75" W x 1.3" D	2.5" H x 1.75" W x 1.3" D	2.5" H x 1.75" W x 1.3" D	2.5" H x 1.75" W x 1.3" D
Listings and Approvals				
UL	UOXX / 7.S3403	UOXX / 7.S3403	UOXX / 7.S3403	UOXX / 7.S3403
MEA	73-92-E Vol. 23	73-92-E Vol. 23	73-92-E Vol. 23	73-92-E Vol. 23
CSFM	7300-1004:101	7300-1004:101	7300-1004:101	7300-1004:101



Ordering Information:

Part # Description

SSU-RIC-1	RIC-1 10 Amp Relay SPDT
SSU-RIC-2	RIC-2 10 Amp Relay DPDT
SSU-RIC-3	RIC-3 10 Amp Relay SPDT
SSU-RIC-4	RIC-4 10 Amp Relay SPDT



Space Age Electronics, Inc.
www.1sae.com
800.486.1723 voice
508.485.0966 direct
508.485.4740 fax

No Excuses, Just Solutions!

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M500M Monitor Module

3825 Ohio Avenue, St. Charles, Illinois 60174
1-800-SENSOR2, FAX: 630-377-6495
www.systemsensor.com

SPECIFICATIONS

Normal Operating Voltage:	15 to 32 VDC
Maximum Current Draw:	5.0mA (LED on)
Average Operating Current:	350 μ A, 1 communication every 5 seconds, 47k EOL
EOL Resistance:	47K Ohms
Maximum IDC wiring resistance:	40 Ohms
Maximum IDC Voltage:	11 Volts
Maximum IDC Current:	400 μ A
Temperature Range:	32°F to 120°F (0°C to 49°C)
Humidity:	10% to 93% Non-condensing
Dimensions:	4 1/2" H x 4" W x 1 1/4" D (Mounts to a 4" square by 2 1/8" deep box.)
Accessories:	SMB500 Electrical Box

BEFORE INSTALLING

This information is included as a quick reference installation guide. Refer to the control panel installation manual for detailed system information. If the modules will be installed in an existing operational system, inform the operator and local authority that the system will be temporarily out of service. Disconnect power to the control panel before installing the modules.

NOTICE: This manual should be left with the owner/user of this equipment.

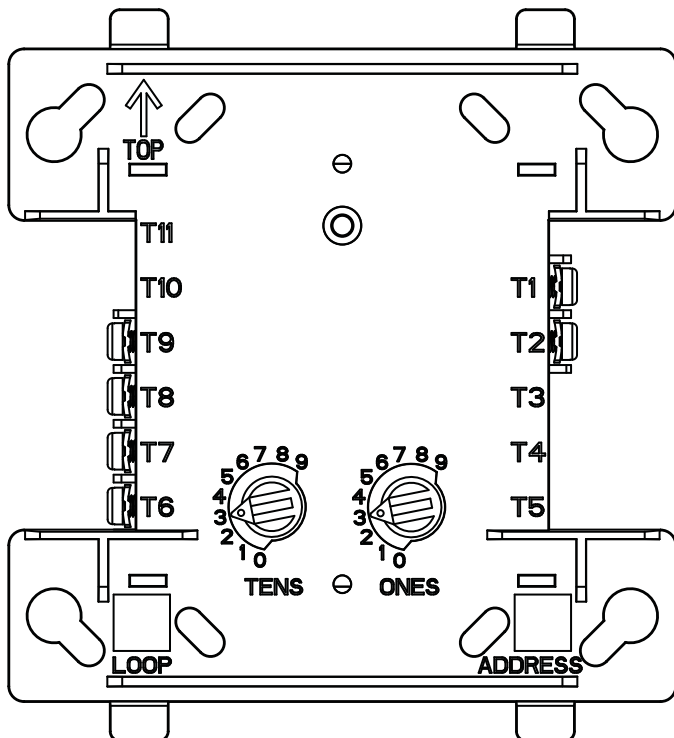
GENERAL DESCRIPTION

The M500M Monitor Module is intended for use in intelligent, two-wire systems, where the individual address of each module is selected using the built-in rotary decade switches. It provides either a 2-wire or 4-wire fault tolerant initiating circuit for normally open contact fire alarm, supervisory, or security devices. The module has a panel controlled LED indicator.

COMPATIBILITY REQUIREMENTS

To ensure proper operation, these modules shall be connected to listed compatible system control panels only.

FIGURE 1. CONTROLS AND INDICATORS:

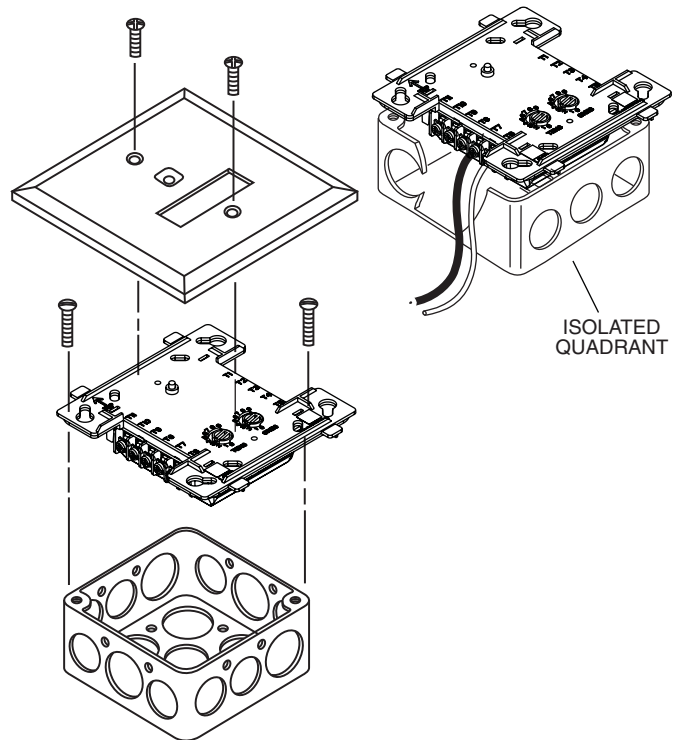


C0917-01

MOUNTING

The M500M mounts directly to 4-inch square electrical boxes (see Figure 2). The box must have a minimum depth of 2 1/8 inches. Surface mounted electrical boxes (SMB500) are available from System Sensor.

FIGURE 2. MODULE MOUNTING:



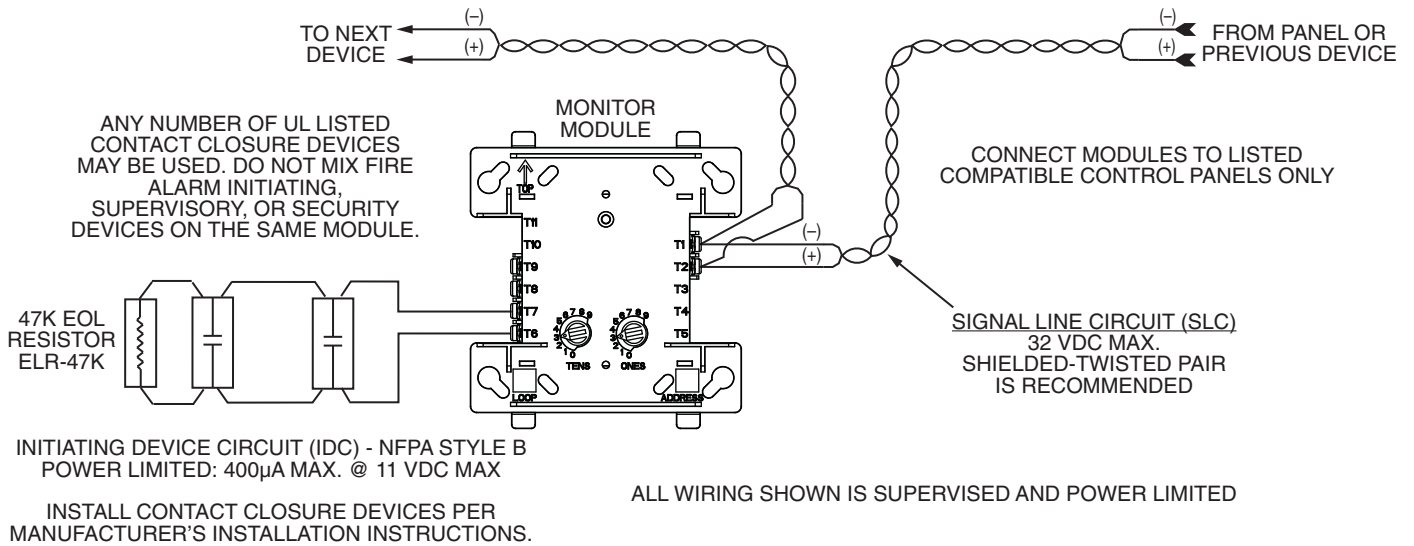
C1044-00

WIRING

NOTE: All wiring must conform to applicable local codes, ordinances, and regulations. This module is intended for power limited wiring only.

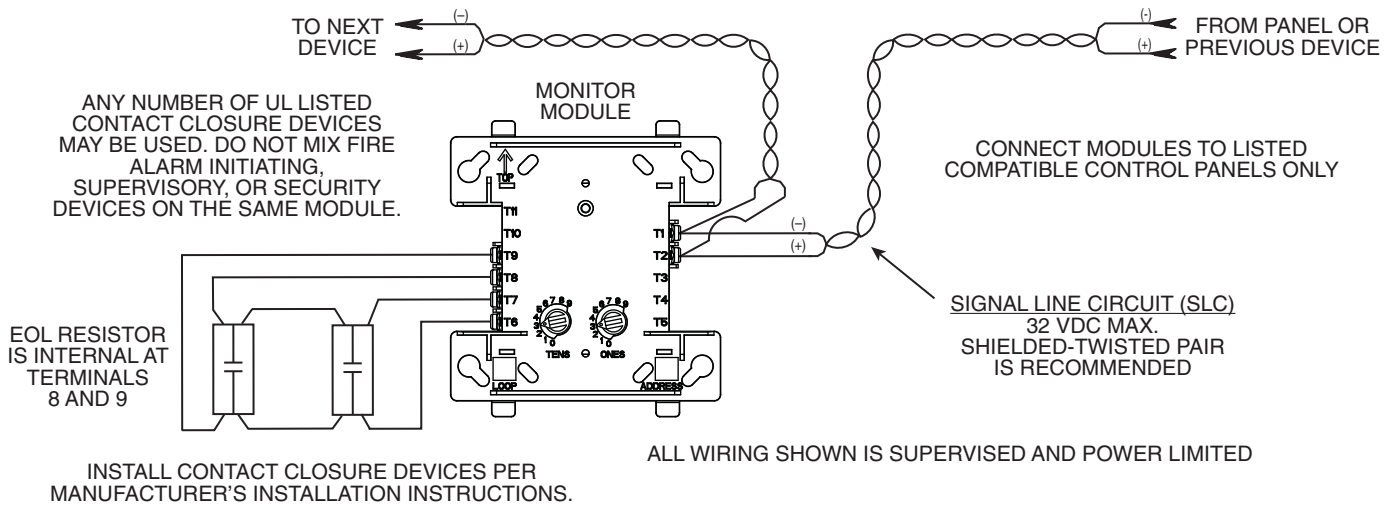
1. Install module wiring in accordance with the job drawings and appropriate wiring diagrams.
2. Set the address on the module per job drawings.
3. Secure module to electrical box (supplied by installer), as shown in Figure 2.

FIGURE 3. TYPICAL 2-WIRE INITIATING CIRCUIT CONFIGURATION, NFPA STYLE B:



C1051-00

FIGURE 4. TYPICAL 4-WIRE FAULT TOLERANT INITIATING CIRCUIT CONFIGURATION, NFPA STYLE D:



C0919-03

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THREE-YEAR LIMITED WARRANTY

System Sensor warrants its enclosed product to be free from defects in materials and workmanship under normal use and service for a period of three years from date of manufacture. System Sensor makes no other express warranty for the enclosed product. No agent, representative, dealer, or employee of the Company has the authority to increase or alter the obligations or limitations of this Warranty. The Company's obligation of this Warranty shall be limited to the replacement of any part of the product which is found to be defective in materials or workmanship under normal use and service during the three year period commencing with the date of manufacture. After phoning System Sensor's toll free number 800-SENSOR2 (736-7672) for a Return Authorization number, send defective units postage prepaid to: System Sensor, Returns Department, RA

_____, 3825 Ohio Avenue, St. Charles, IL 60174. Please include a note describing the malfunction and suspected cause of failure. The Company shall not be obligated to replace units which are found to be defective because of damage, unreasonable use, modifications, or alterations occurring after the date of manufacture. In no case shall the Company be liable for any consequential or incidental damages for breach of this or any other Warranty, expressed or implied whatsoever, even if the loss or damage is caused by the Company's negligence or fault. Some states do not allow the exclusion or limitation of incidental or consequential damages, so the above limitation or exclusion may not apply to you. This Warranty gives you specific legal rights, and you may also have other rights which vary from state to state.

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RTS151KEY(A) Remote Test Station

3825 Ohio Avenue, St. Charles, Illinois 60174
1-800-SENSOR2, FAX: 630-377-6495
www.systemsensor.com

SPECIFICATIONS

Dimensions:	4.6" H × 2.75" W × 1.8" D
Weight:	0.24 Lbs.
Power Requirements	
Power LED (Green):	14 – 35 VDC, 12 mA maximum
Alarm LED (Red):	2.8 – 32 VDC, 12 mA maximum
Alarm Response Time:	40 seconds maximum
Temperature:	-10°C to 60°C (14°F to 140°F)
Humidity:	95% relative humidity, noncondensing Max
Listing:	UL, FM, CE

NOTE: RTS151KEY(A) replaces RTS451KEY.
NOTICE: This manual shall be left with the owner/user of this equipment.
NOTE: A test coil is required only for use with D2/DNR/DH400/DH500 models. For D2 models order part # DCOIL. For DH400/500 models order part #Coil.

GENERAL INFORMATION

The System Sensor RTS151KEY(A) is an automatic fire detector accessory designed to test remotely located duct and beam detectors. For 4-wire detectors, the RTS151KEY(A) features a multi-colored LED that alternates between steady green and red. Green indicates power and that the detector board is in place. Red indicates alarm. For 2-wire detectors, the LED will show red for alarm. Consult the detector installation instructions for additional information.

The National Fire Protection Association has published codes, standards, and recommended practices for the installation and use of this product. It is recommended that the installer be familiar with these requirements, with local codes, and any special requirements of the local authority having jurisdiction.

RTS151 CONTENTS

- 1 RTS151KEY(A) remote test station
- 1 screw pack (2 mounting screws)
- 2 Keys

OPERATION

Test Function

Insert the key and turn clockwise to the "TEST" position.

Alarm Indication

With the key in the "TEST" position, some time will elapse (40 seconds maximum) depending on the detector type, before the alarm indicating LED will turn red.

Reset Function

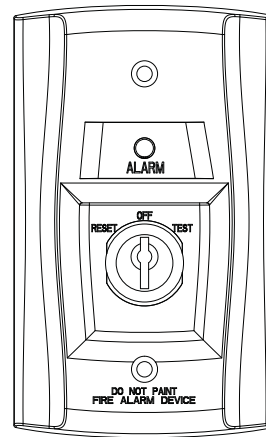
Turn the key counterclockwise to the "RESET" position and hold. The LED should turn off. Then, turn the key back to the "NORMAL" position and remove. The RTS151KEY(A) is capable of resetting only certain models of detectors. Refer to the detector installation instructions for additional information.

Wiring Instructions

Consult the appropriate detector installation instructions for the applicable wiring diagram. The RTS151KEY(A) mounts to a single gang box (2 1/2" minimum depth), or directly to the wall or ceiling.

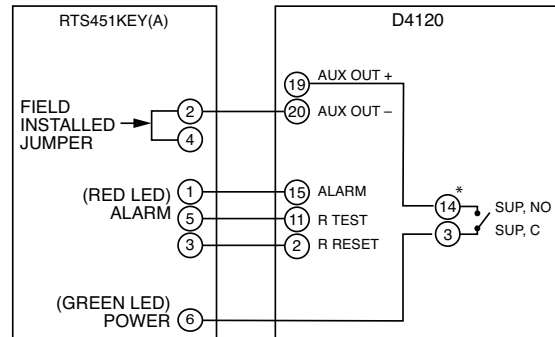
In Canadian applications, the RTS151KEY(A) is intended to be located in the same room as the smoke detector and within 60 feet of the unit.

FIGURE 1. RTS151KEY(A)



H0195-01

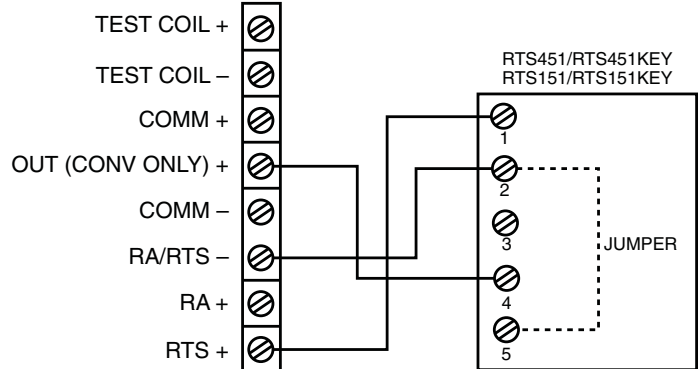
FIGURE 2: WIRING DIAGRAM FOR RTS151KEY(A) TO D4120 4-WIRE DUCT SMOKE DETECTOR:



* Sup. contacts cannot be used if they are wired to control panel.

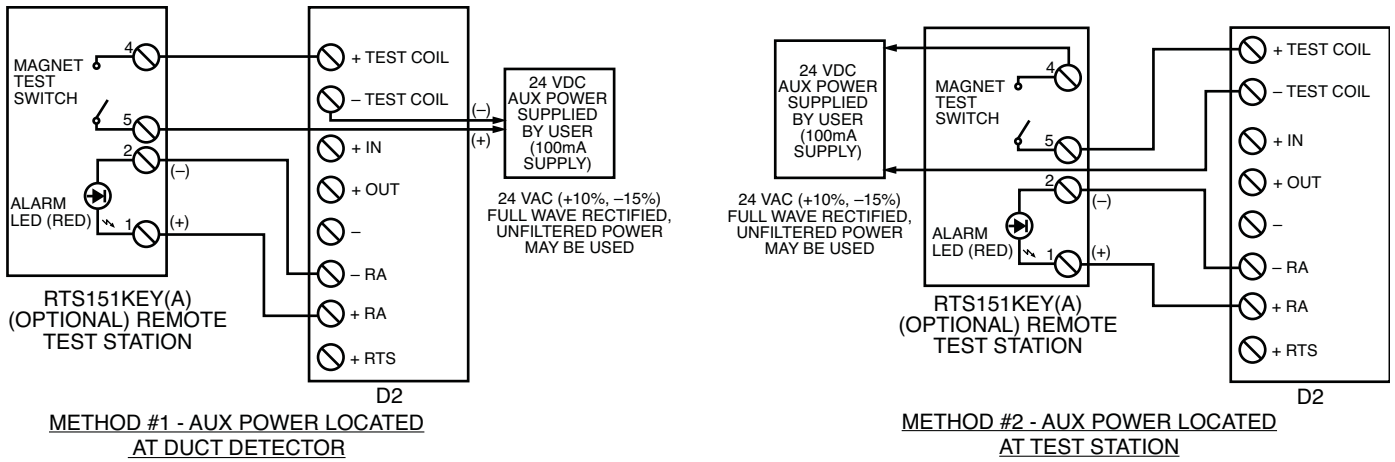
H0582-21

FIGURE 3: WIRING DIAGRAM FOR RTS151KEY(A) TO DNR 2-WIRE DUCT SMOKE DETECTOR WITH REMOTE TEST CAPABLE HEAD:



H0633-00

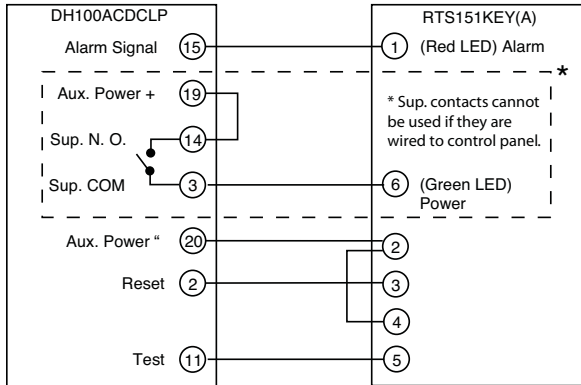
FIGURE 4: WIRING DIAGRAM FOR RTS151KEY(A) TO D2 2-WIRE DUCT SMOKE DETECTOR:



NOTE: THE USE OF THE RTS151KEY(A) REQUIRES THE INSTALLATION OF AN ACCESSORY COIL, DCOIL, SOLD SEPARATELY.

H0612-12

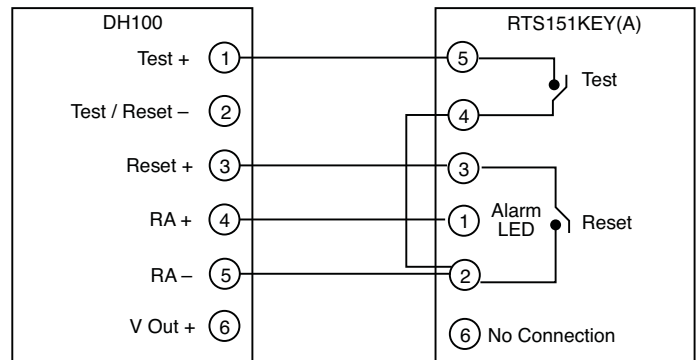
FIGURE 5. WIRING DIAGRAM FOR RTS151KEY(A) TO DH100ACDC 4-WIRE DUCT SMOKE DETECTOR:



H0156-08

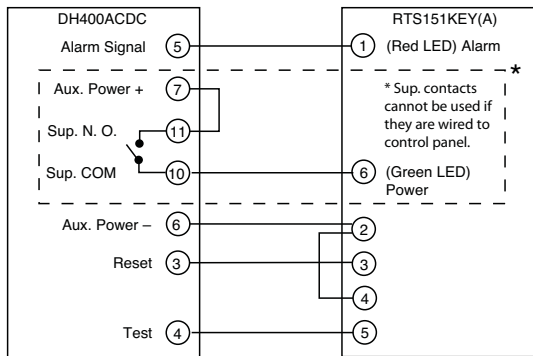
FIGURE 6. WIRING DIAGRAM FOR RTS151KEY(A) TO DH100 2-WIRE DUCT SMOKE DETECTOR:

NOTE: Terminal 6 of the RTS151KEY(A) is not used when wired to a 2-wire detector.



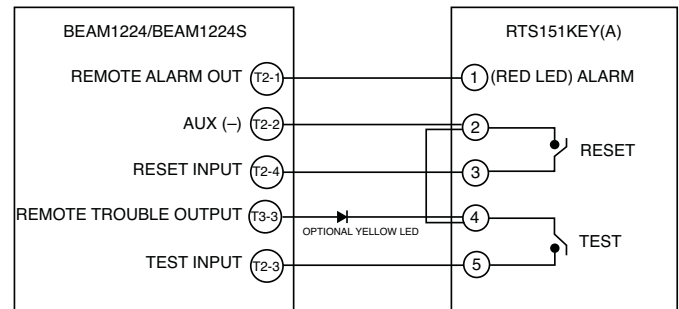
H0193-05

FIGURE 7. WIRING DIAGRAM FOR RTS151KEY(A) TO DH400ACDC DUCT SMOKE DETECTOR:



H0156-09

FIGURE 8. WIRING DIAGRAM FOR RTS151KEY(A) TO BEAM1224/ BEAM1224S SMOKE DETECTOR:



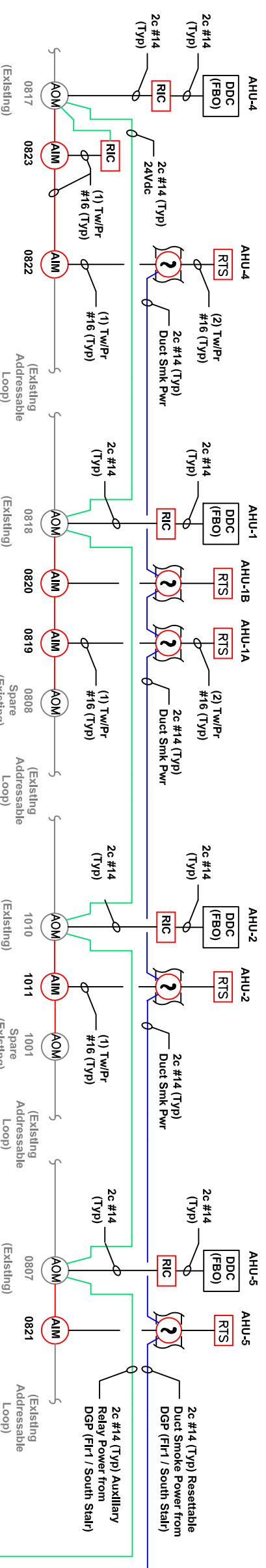
NOTE: RTS151KEY(A) CAN BE USED WITH INTELLIGENT BEAM DETECTOR PRODUCTS. CONSULT INTELLIGENT BEAM DETECTOR MANUAL FOR ADDITIONAL INSTRUCTIONS

H0585-05

THREE-YEAR LIMITED WARRANTY

System Sensor warrants its enclosed product to be free from defects in materials and workmanship under normal use and service for a period of three years from date of manufacture. System Sensor makes no other express warranty for the enclosed product. No agent, representative, dealer, or employee of the Company has the authority to increase or alter the obligations or limitations of this Warranty. The Company's obligation of this Warranty shall be limited to the replacement of any part of the product which is found to be defective in materials or workmanship under normal use and service during the three year period commencing with the date of manufacture. After phoning System Sensor's toll free number 800-SENSOR2 (736-7672) for a Return Authorization number, send defective units postage prepaid to: System Sensor, Returns Department, RA

_____, 3825 Ohio Avenue, St. Charles, IL 60174. Please include a note describing the malfunction and suspected cause of failure. The Company shall not be obligated to replace units which are found to be defective because of damage, unreasonable use, modifications, or alterations occurring after the date of manufacture. In no case shall the Company be liable for any consequential or incidental damages for breach of this or any other Warranty, expressed or implied whatsoever, even if the loss or damage is caused by the Company's negligence or fault. Some states do not allow the exclusion or limitation of incidental or consequential damages, so the above limitation or exclusion may not apply to you. This Warranty gives you specific legal rights, and you may also have other rights which vary from state to state.



LEGEND:

RISER DIAG SYM	CONTRACT DWG SYM	NEMA SYMBOL	DESCRIPTION	CATALOG #
[FAACP]	[FAACP]	[FAACP]	Fire Alarm Control Panel	IRC3
[RTS]	[RTS]	[RTS]	Duct Smoke Detector	D4120
[RIC]	[RIC]	[RIC]	Remote Test Station	RS151Key
[AIM]	[AIM]	[AIM]	Addressable Control Relay Module	M5000CS
[AOM]	[AOM]	[AOM]	Addressable Input Module	M500F
[RIC]	[RIC]	[RIC]	Intermediate Auxiliary Relay	RSU-RC-1

GENERAL NOTES:

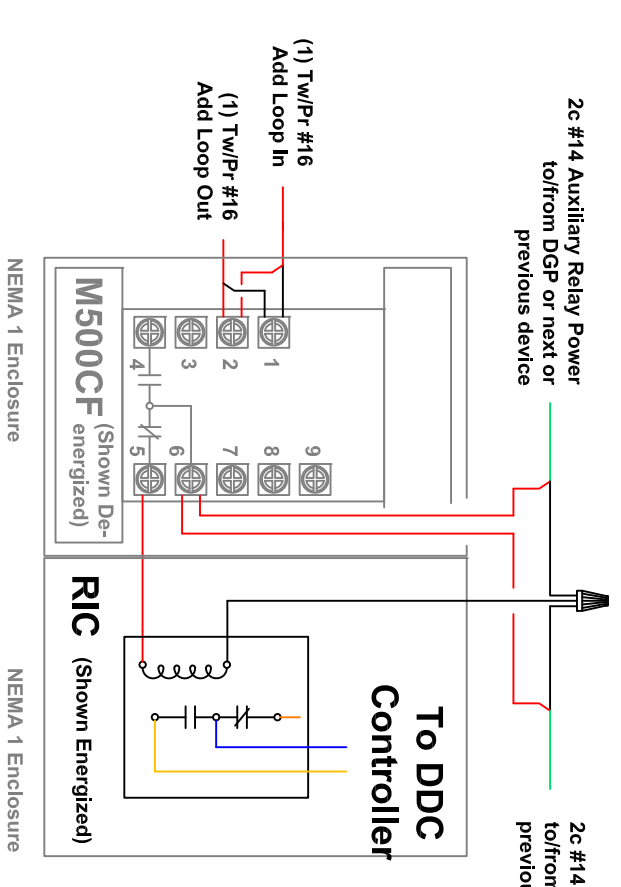
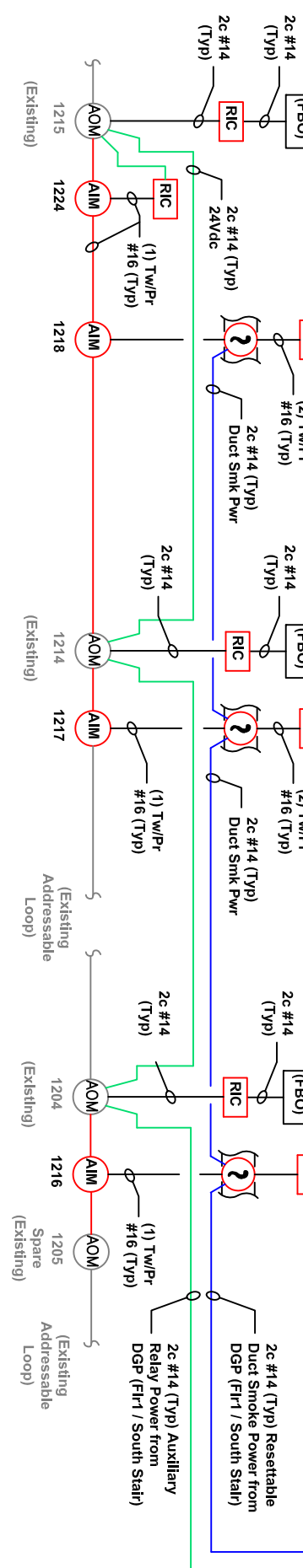
- ALL WIRING IN ACCORDANCE WITH NATIONAL ELECTRIC CODE, CITY OF PORTLAND, AND MANUFACTURER'S REQUIREMENTS & RECOMMENDATIONS.

WIRING NOTES:

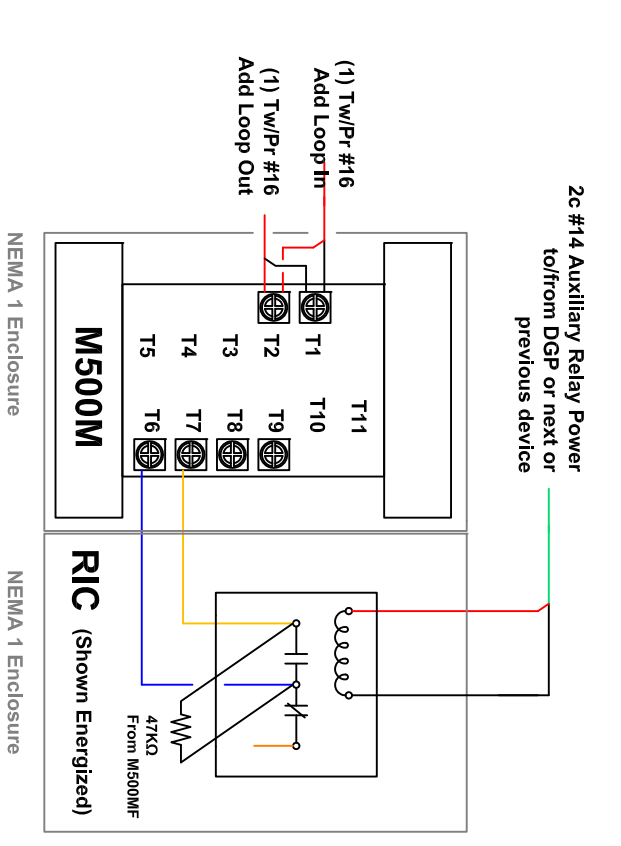
- ALL ADDRESSABLE DEVICES MUST BE INSTALLED IN A HEATED LOCATION.
- Addressable Loop consists of: (1) 2c #16 Twisted Non-shielded from FAACP to 1st device, (1) 2c #16 Twisted Non-shielded through remaining devices on circuit and return to FAACP. **Maintain proper separation between feeds and returns.**

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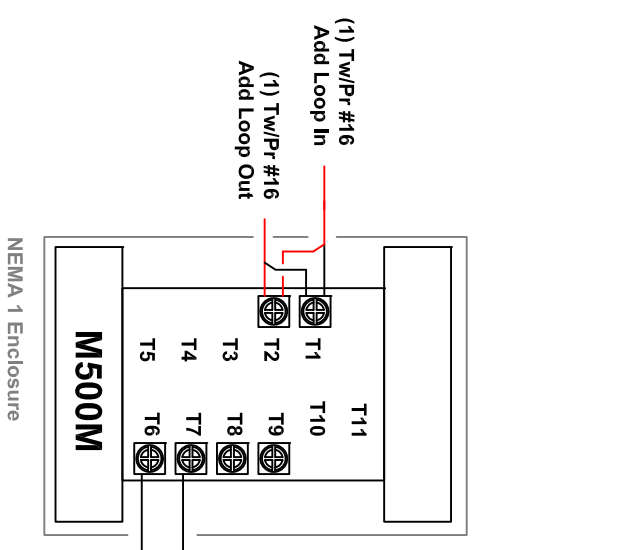
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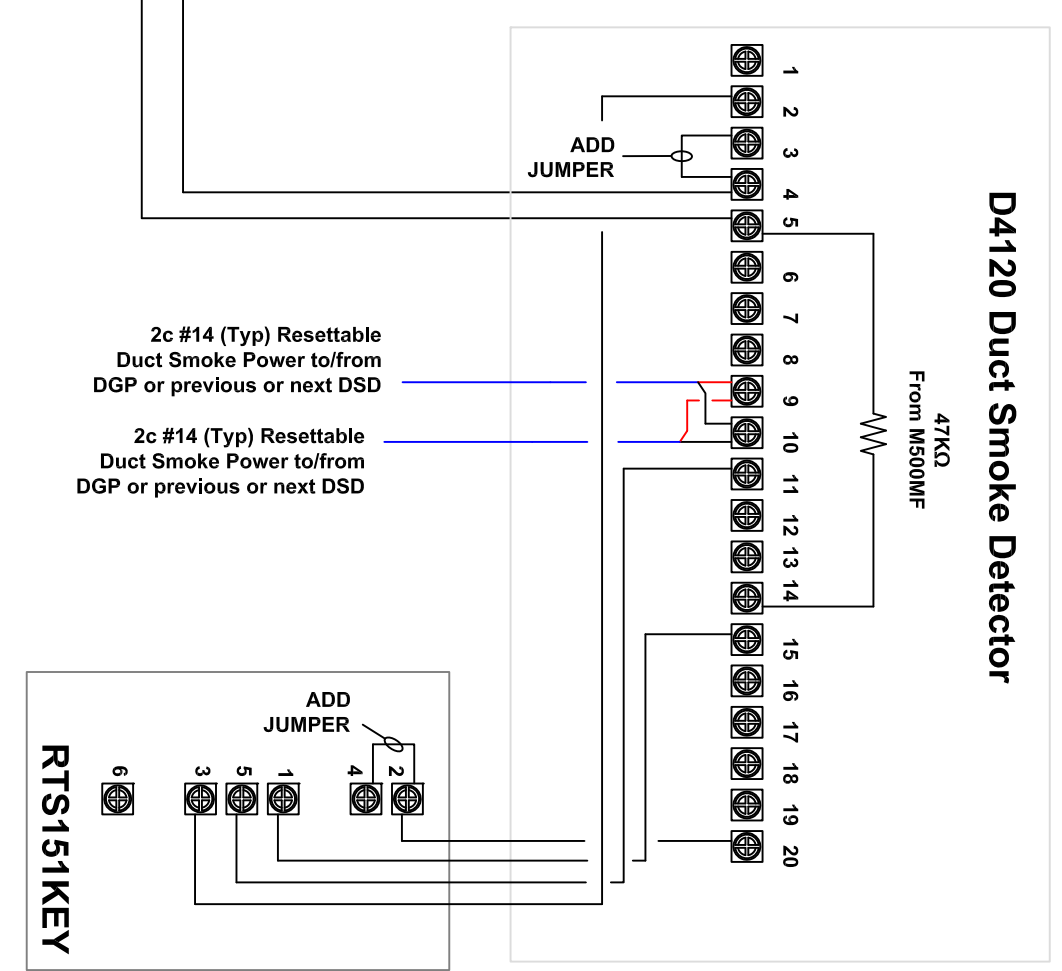
AHU Shutdown Wiring Detail



Auxiliary Relay Power Monitoring Detail



Duct Smoke Detector Wiring Detail



REV.	0	Original Issue	05/12	DH	TD
DATE					
DRWN:					
RWV'D:					

Contractor: **Enterprise Electric, Inc.**

JOB NAME: **Portland Main Post Office
Portland, Maine
Duct Smoke Detector Replacement
Fire Alarm Riser Diagram**

R.B. Allen Co., Inc.
P.O. BOX 770
131 LAFFAYETTE RD
NO. HAMPTON, NH 03862
1-800-258-7264

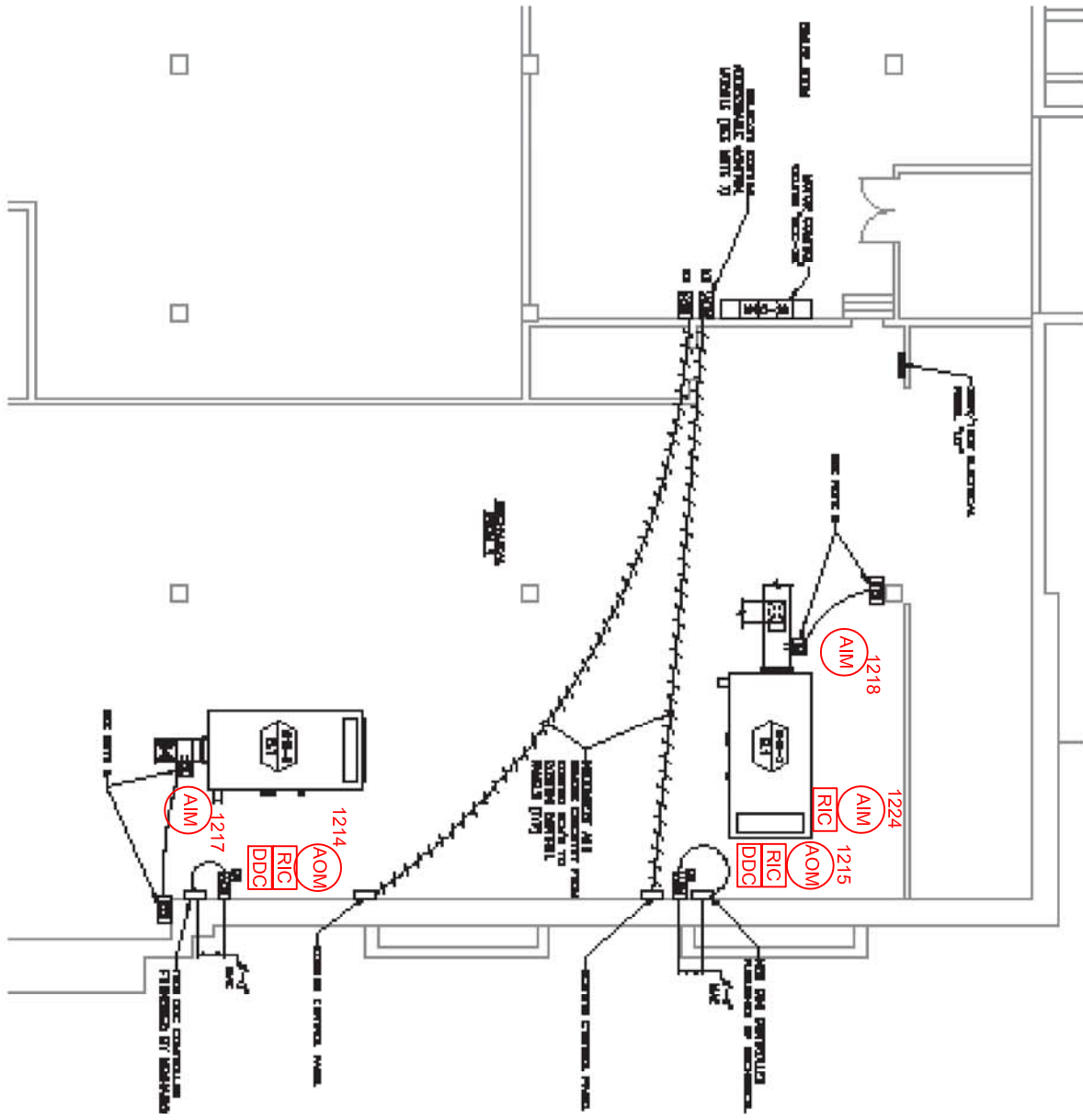
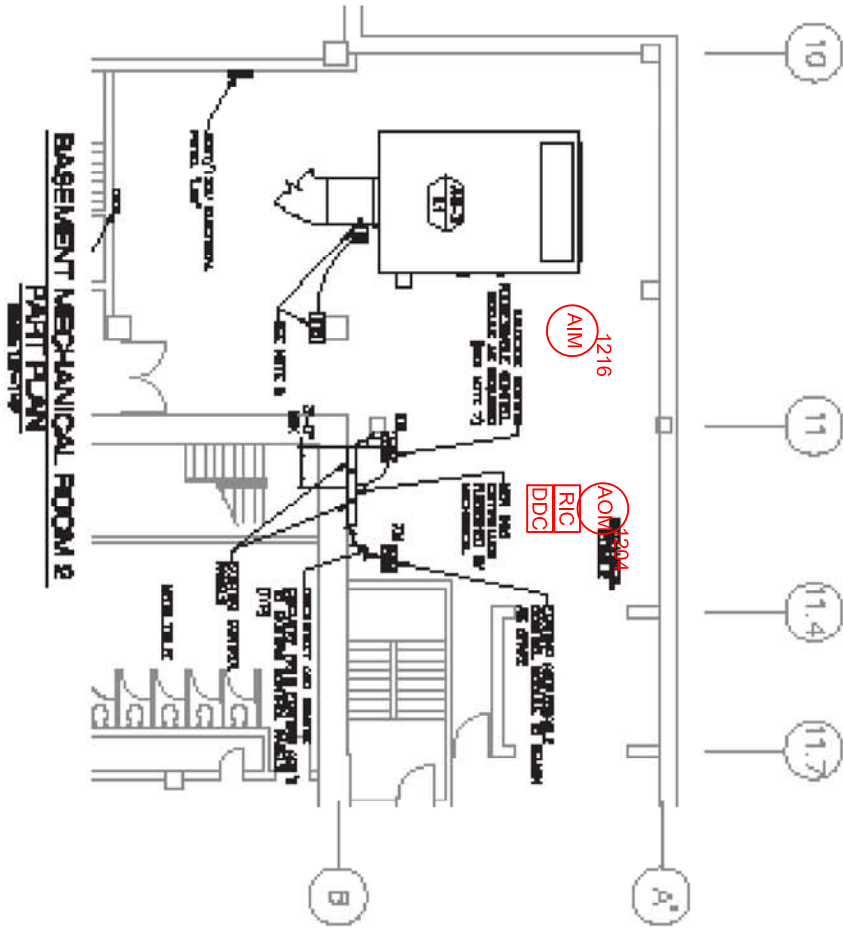
DWG NAME: **Portland MPO
Portland, Maine
Duct Smoke Detctor
Replacement
Fire Alarm Riser Diagram**

DWG NAME: MPO_RSR

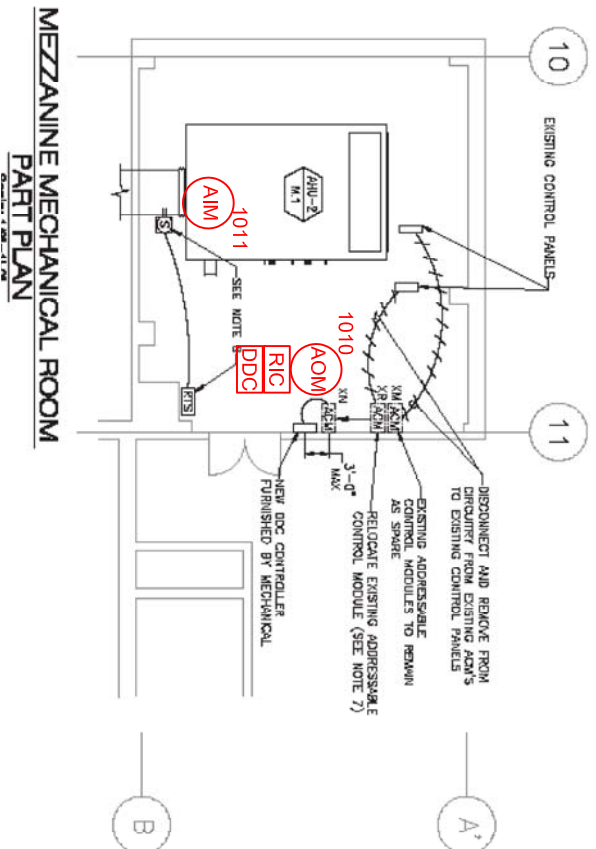
SCALE: NTS

REV. 0 Original Issue 05/12 DH TD

Portland MPO
Duct Smoke Detector
Replacement
Fire Alarm Riser Diagram
DWG No. MPO_RSR



BASMENT MECHANICAL ROOM 1 PART PLAN
SEE SHEETS 1214, 1217, 1218, 1224, 1225, 1226, 1227, 1228, 1229, 1230, 1231, 1232, 1233, 1234, 1235, 1236, 1237, 1238, 1239, 1240



MEZZANINE MECHANICAL ROOM PART PLAN
SEE SHEETS 1010, 1011

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Modifications to Existing EST Addressable Fire Alarm System Portland Main Post Office Portland, Maine

System Narrative

In the event of an alarm from an actuated device, the following shall occur. (All alarm inputs, less Dust Smoke Detectors)

- 1) Notify the Fire Department via the Master Box.
- 2) Activate the exterior Strobe/Beacon
- 3) Activate existing evacuation sequence
- 4) Annunciate audibly/visually, and in plain english the active initiating device at the fire alarm control panel and indicate via LED at Lobby Annunciator
- 5) Dust Smoke Detector, in addition to the above, shall shutdown its associated Air Handling Unit. (See Sequence of Operation for more detailed information)

In the event of a supervisory condition from an actuated device, the following shall occur. (Devices reporting as supervisory: Tamper Switch, Sprinkler Supervisory Switch, Loss of AHU Shutdown Power)

- 1) Annunciate audibly/visually, and in plain english the active initiating device at the fire alarm control panel.

In the event of a system trouble report, the following shall occur:

- 1) Annunciate audibly/visually, and in plain english the active initiating device at the fire alarm control panel.

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SEQUENCE OF OPERATION MATRIX

System Inputs	Alarm Signal to Fire Department via Master Box							System Inputs
	A	B	C	D	E	F	G	
Existing System Alarm Inputs (Less DC2075)	X	X	X	X	X	X	X	Existing System Alarm Inputs (Less DC2075)
Supervisory Inputs								Supervisory Inputs
Existing System Trouble Inputs								Existing System Trouble Inputs
Dust Smoke AHU-1A (Address 0819)	X	X	X	X	X	X	X	Dust Smoke AHU-1A (Address 0819)
Dust Smoke AHU-1B (Address 0819)	X	X	X	X	X	X	X	Dust Smoke AHU-1B (Address 0819)
Dust Smoke AHU-2 (Address 0820)	X	X	X	X	X	X	X	Dust Smoke AHU-2 (Address 0820)
Dust Smoke AHU-3 (Address 1215)	X	X	X	X	X	X	X	Dust Smoke AHU-3 (Address 1215)
Dust Smoke AHU-4 (Address 0817)	X	X	X	X	X	X	X	Dust Smoke AHU-4 (Address 0817)
Dust Smoke AHU-5 (Address 0807)	X	X	X	X	X	X	X	Dust Smoke AHU-5 (Address 0807)
Dust Smoke AHU-6 (Address 1214)	X	X	X	X	X	X	X	Dust Smoke AHU-6 (Address 1214)
Dust Smoke AHU-7 (Address 1218)	X	X	X	X	X	X	X	Dust Smoke AHU-7 (Address 1218)
Dust Smoke AHU-8 (Address 1218)	X	X	X	X	X	X	X	Dust Smoke AHU-8 (Address 1218)
Fire Alarm - AC Failure	X	X	X	X	X	X	X	Fire Alarm - AC Failure
Fire Alarm - Low Battery	X	X	X	X	X	X	X	Fire Alarm - Low Battery
Signal Line Open	X	X	X	X	X	X	X	Signal Line Open
Signal Line Ground	X	X	X	X	X	X	X	Signal Line Ground
Home/Stroke Circuit Open	X	X	X	X	X	X	X	Home/Stroke Circuit Open
Home/Stroke Circuit Ground	X	X	X	X	X	X	X	Home/Stroke Circuit Ground
System Ground Fault	X	X	X	X	X	X	X	System Ground Fault

PO No.	0	Original Issue	05/12	DH	TD
REV.		DESCRIPTION	DATE	DRWN:	RW'D:

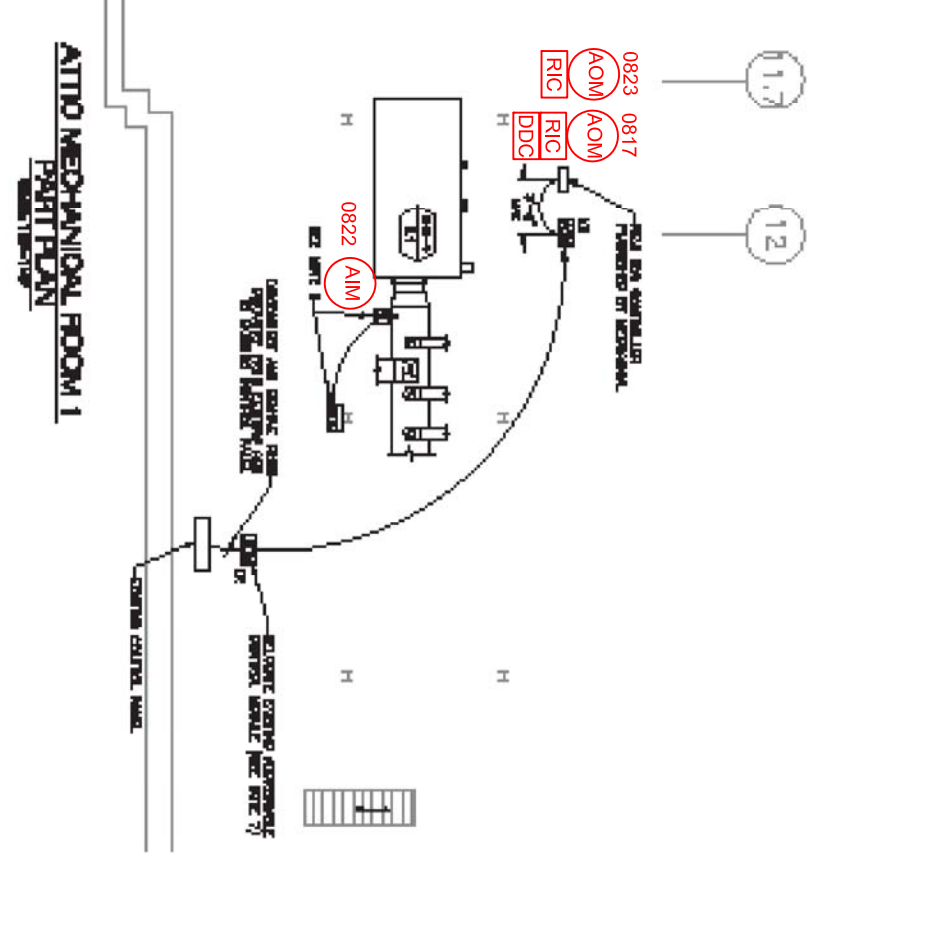
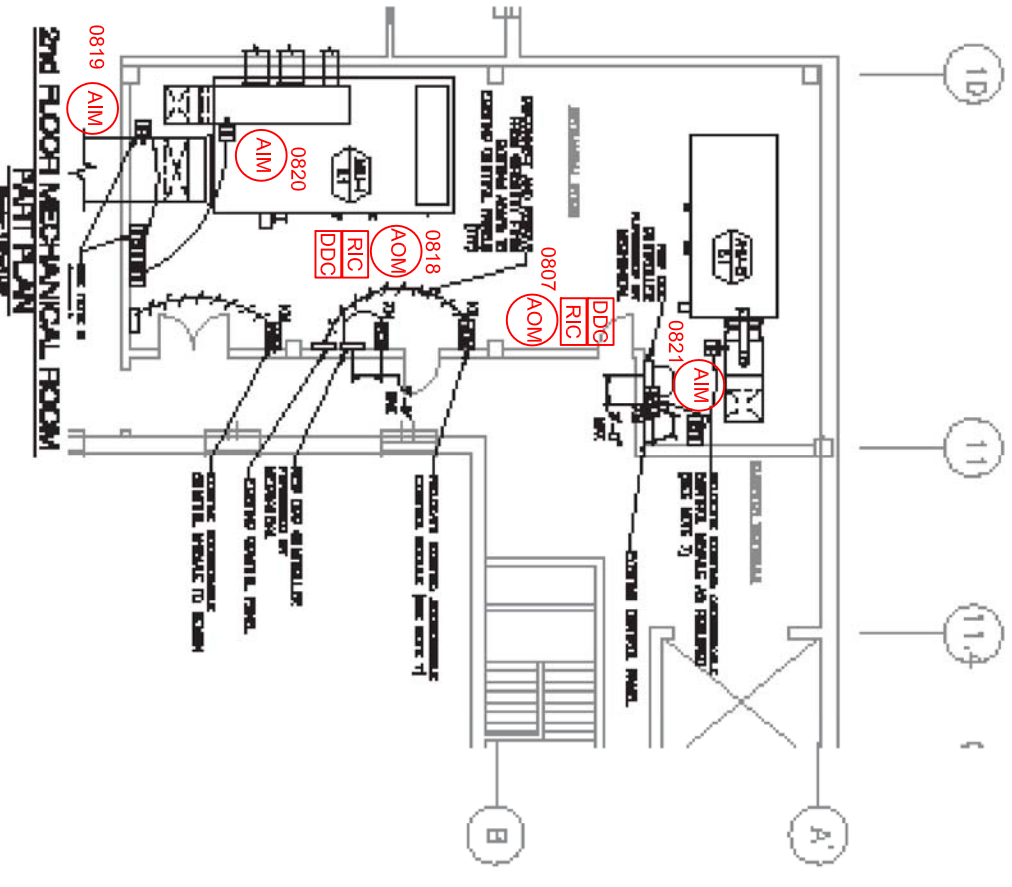
SCALE: NTS

JOB NAME: Portland Main Post Office
 Portland, Maine
 Duct Smoke Detector Replacement
 Fire Alarm Part Plans
 Enterprise Electric, Inc.
 Contractor:

R.B. Allen Co., Inc.
 P.O. BOX 770
 131 LAFAYETTE RD
 NO. HAMPTON, NH 03862
 1-800-258-7264

EST
 EDWARDS SYSTEM TECHNOLOGY

DWG NAME: Portland MPO
 Portland, Maine
 Duct Smoke Detctor Replacement
 Fire Alarm Part Plans
 DWG NAME: MPO_PLN



ATTIC MECHANICAL ROOM 1 PART PLAN
SEE SHEETS 0823, 0824, 0825, 0826, 0827, 0828, 0829, 0830