Honeywell

Gamewell FCI FIRE CONTROL INSTRUMENTS

SLC

Gamewell-FCI

Wiring Manual

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Fire Alarm & Emergency Communication System Limitations

While a life safety system may lower insurance rates, it is not a substitute for life and property insurance!

An automatic fire alarm system—typically made up of smoke detectors, heat detectors, manual pull stations, audible warning devices, and a fire alarm control panel (FACP) with remote notification capability—can provide early warning of a developing fire. Such a system, however, does not assure protection against property damage or loss of life resulting from a fire.

An emergency communication system—typically made up of an automatic fire alarm system (as described above) and a life safety communication system that may include an autonomous control unit (ACU), local operating console (LOC), voice communication, and other various interoperable communication methods—can broadcast a mass notification message. Such a system, however, does not assure protection against property damage or loss of life resulting from a fire or life safety event.

The Manufacturer recommends that smoke and/or heat detectors be located throughout a protected premises following the recommendations of the current edition of the National Fire Protection Association Standard 72 (NFPA 72), manufacturer's recommendations, State and local codes, and the recommendations contained in the Guide for Proper Use of System Smoke Detectors, which is made available at no charge to all installing dealers. This document can be found at http://www.systemsensor.com/appguides/. A study by the Federal Emergency Management Agency (an agency of the United States government) indicated that smoke detectors may not go off in as many as 35% of all fires. While fire alarm systems are designed to provide early warning against fire, they do not guarantee warning or protection against fire. A fire alarm system may not provide timely or adequate warning, or simply may not function, for a variety of reasons:

Smoke detectors may not sense fire where smoke cannot reach the detectors such as in chimneys, in or behind walls, on roofs, or on the other side of closed doors. Smoke detectors also may not sense a fire on another level or floor of a building. A second-floor detector, for example, may not sense a first-floor or basement fire.

Particles of combustion or "smoke" from a developing fire may not reach the sensing chambers of smoke detectors because:

- Barriers such as closed or partially closed doors, walls, chimneys, even wet or humid areas may inhibit particle or smoke flow.
- Smoke particles may become "cold," stratify, and not reach the ceiling or upper walls where detectors are located.
- Smoke particles may be blown away from detectors by air outlets, such as air conditioning vents.
- Smoke particles may be drawn into air returns before reaching the detector.

The amount of "smoke" present may be insufficient to alarm smoke detectors. Smoke detectors are designed to alarm at various levels of smoke density. If such density levels are not created by a developing fire at the location of detectors, the detectors will not go into alarm.

Smoke detectors, even when working properly, have sensing limitations. Detectors that have photoelectronic sensing chambers tend to detect smoldering fires better than flaming fires, which have little visible smoke. Detectors that have ionizing-type sensing chambers tend to detect fast-flaming fires better than smoldering fires. Because fires develop in different ways and are often unpredictable in their growth, neither type of detector is necessarily best and a given type of detector may not provide adequate warning of a fire.

Smoke detectors cannot be expected to provide adequate warning of fires caused by arson, children playing with matches (especially in bedrooms), smoking in bed, and violent explosions (caused by escaping gas, improper storage of flammable materials, etc.).

Heat detectors do not sense particles of combustion and alarm only when heat on their sensors increases at a predetermined rate or reaches a predetermined level. Rate-of-rise heat detectors may be subject to reduced sensitivity over time. For this reason, the rate-of-rise feature of each detector should be tested at least once per year by a qualified fire protection specialist. Heat detectors are designed to protect property, not life.

IMPORTANT! Smoke detectors must be installed in the same room as the control panel and in rooms used by the system for the connection of alarm transmission wiring, communications, signaling, and/or power. If detectors are not so located, a developing fire may damage the alarm system, compromising its ability to report a fire.

Audible warning devices such as bells, horns, strobes, speakers and displays may not alert people if these devices are located on the other side of closed or partly open doors or are located on another floor of a building. Any warning device may fail to alert people with a disability or those who have recently consumed drugs, alcohol, or medication. Please note that:

- An emergency communication system may take priority over a fire alarm system in the event of a life safety emergency.
- Voice messaging systems must be designed to meet intelligibility requirements as defined by NFPA, local codes, and Authorities Having Jurisdiction (AHJ).
- Language and instructional requirements must be clearly disseminated on any local displays.
- Strobes can, under certain circumstances, cause seizures in people with conditions such as epilepsy.
- Studies have shown that certain people, even when they hear a fire alarm signal, do not respond to or comprehend the meaning of the signal. Audible devices, such as horns and bells, can have different tonal patterns and frequencies. It is the property owner's responsibility to conduct fire drills and other training exercises to make people aware of fire alarm signals and instruct them on the proper reaction to alarm signals.
- In rare instances, the sounding of a warning device can cause temporary or permanent hearing loss.

A life safety system will not operate without any electrical power. If AC power fails, the system will operate from standby batteries only for a specified time and only if the batteries have been properly maintained and replaced regularly.

Equipment used in the system may not be technically compatible with the control panel. It is essential to use only equipment listed for service with your control panel.

Alarm Signaling Communications:

- **IP connections** rely on available bandwidth, which could be limited if the network is shared by multiple users or if ISP policies impose restrictions on the amount of data transmitted. Service packages must be carefully chosen to ensure that alarm signals will always have available bandwidth. Outages by the ISP for maintenance and upgrades may also inhibit alarm signals. For added protection, a backup cellular connection is recommended.
- **Cellular connections** rely on a strong signal. Signal strength can be adversely affected by the network coverage of the cellular carrier, objects and structural barriers at the installation location. Utilize a cellular carrier that has reliable network coverage where the alarm system is installed. For added protection, utilize an external antenna to boost the signal.
- **Telephone lines** needed to transmit alarm signals from a premise to a central monitoring station may be out of service or temporarily disabled. For added protection against telephone line failure, backup alarm signaling connections are recommended.

The most common cause of life safety system malfunction is inadequate maintenance. To keep the entire life safety system in excellent working order, ongoing maintenance is required per the manufacturer's recommendations, and UL and NFPA standards. At a minimum, the requirements of NFPA 72 shall be followed. Environments with large amounts of dust, dirt, or high air velocity require more frequent maintenance. A maintenance agreement should be arranged through the local manufacturer's representative. Maintenance should be scheduled as required by National and/or local fire codes and should be performed by authorized professional life safety system installers only. Adequate written records of all inspections should be kept.

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Installation Precautions

Adherence to the following will aid in problem-free installation with long-term reliability:

WARNING - Several different sources of power can be connected to the fire alarm control panel. Disconnect all sources of power before servicing. Control unit and associated equipment may be damaged by removing and/or inserting cards, modules, or interconnecting cables while the unit is energized. Do not attempt to install, service, or operate this unit until manuals are read and understood.

CAUTION - System Re-acceptance Test after Software Changes: To ensure proper system operation, this product must be tested in accordance with NFPA 72 after any programming operation or change in site-specific software. Re-acceptance testing is required after any change, addition or deletion of system components, or after any modification, repair or adjustment to system hardware or wiring. All components, circuits, system operations, or software functions known to be affected by a change must be 100% tested. In addition, to ensure that other operations are not inadvertently affected, at least 10% of initiating devices that are not directly affected by the change, up to a maximum of 50 devices, must also be tested and proper system operation verified.

This system meets NFPA requirements for operation at 0-49º C/32-120º F and at a relative humidity 93% ± 2% RH (non-condensing) at 32°C ± 2°C (90°F ± 3°F). However, the useful life of the system's standby batteries and the electronic components may be adversely affected by extreme temperature ranges and humidity. Therefore, it is recommended that this system and its peripherals be installed in an environment with a normal room temperature of 15-27º C/60-80º F.

Verify that wire sizes are adequate for all initiating and indicating device loops. Most devices cannot tolerate more than a 10% I.R. drop from the specified device voltage.

Like all solid state electronic devices, this system may operate erratically or can be damaged when subjected to lightning induced transients. Although no system is completely immune from lightning transients and interference, proper grounding will reduce susceptibility. Overhead or outside aerial wiring is not recommended, due to an increased susceptibility to nearby lightning strikes. Consult with the Technical Services Department if any problems are anticipated or encountered.

Disconnect AC power and batteries prior to removing or inserting circuit boards. Failure to do so can damage circuits.

Remove all electronic assemblies prior to any drilling, filing, reaming, or punching of the enclosure. When possible, make all cable entries from the sides or rear. Before making modifications, verify that they will not interfere with battery, transformer, or printed circuit board location.

Do not tighten screw terminals more than 9 in-lbs. Over-tightening may damage threads, resulting in reduced terminal contact pressure and difficulty with screw terminal removal.

This system contains static-sensitive components. Always ground yourself with a proper wrist strap before handling any circuits so that static charges are removed from the body. Use static suppressive packaging to protect electronic assemblies removed from the unit.

Units with a touchscreen display should be cleaned with a dry, clean, lint free/microfiber cloth. If additional cleaning is required, apply a small amount of Isopropyl alcohol to the cloth and wipe clean. Do not use detergents, solvents, or water for cleaning. Do not spray liquid directly onto the display.

Follow the instructions in the installation, operating, and programming manuals. These instructions must be followed to avoid damage to the control panel and associated equipment. FACP operation and reliability depend upon proper installation.

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FCC Warning

WARNING: This equipment generates, uses, and can radiate radio frequency energy and if not installed and used in accordance with the instruction manual may cause interference to radio communications. It has been tested and found to comply with the limits for Class A computing devices pursuant to Subpart B of Part 15 of FCC Rules, which is designed to provide reasonable protection against such interference when devices are operated in a commercial environment. Operation of this equipment in a residential area is likely to cause interference, in which case the user will be required to correct the interference at his or her own expense.

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Software Downloads

In order to supply the latest features and functionality in fire alarm and life safety technology to our customers, we make frequent upgrades to the embedded software in our products. To ensure that you are installing and programming the latest features, we strongly recommend that you download the most current version of software for each product prior to commissioning any system. Contact Technical Support with any questions about software and the appropriate version for a specific application.

Documentation Feedback

Your feedback helps us keep our documentation up-to-date and accurate. If you have any comments or suggestions about our online Help or printed manuals, you can email us.

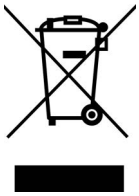
Please include the following information:

- Product name and version number (if applicable)
- Printed manual or online Help
- Topic Title (for online Help)
- Page number (for printed manual)
- Brief description of content you think should be improved or corrected
- Your suggestion for how to correct/improve documentation

Send email messages to:

FireSystems.TechPubs@honeywell.com

Please note this email address is for documentation feedback only. If you have any technical issues, please contact Technical Services.



This symbol (shown left) on the product(s) and / or accompanying documents means that used electrical and electronic products should not be mixed with general household waste. For proper treatment, recovery and recycling, contact your local authorities or dealer and ask for the correct method of disposal.

Electrical and electronic equipment contains materials, parts and substances, which can be dangerous to the environment and harmful to human health if the waste of electrical and electronic equipment (WEEE) is not disposed of correctly.

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Section 1: Introduction

1.1 About This Manual

This document covers the installation and wiring of various Signaling Line Circuit (SLC) devices, when used with the following Fire Alarm Control Panel (FACP): Gamewell GFP Series.

This document also provides basic information that applies to SLC loops in general, such as the branch resistance measurements.

See Section 2.4, “Control Panel Terminal Blocks”, on page 17 for basic panel-end SLC connections. Additional information about each control panel and the modules and detectors referenced in this document, and the part numbers for their manuals, can be found in the respective installation manual as listed in Section 1.3, “Reference Documentation”.

Velociti modules are changing to a new format. Several models are now available in this new format and have replaced the old format illustrations in this manual. While the old format is no longer manufactured for these models, Appendix C has been provided for those who need that wiring information: it contains terminal conversion charts between the old and new formats. In this appendix, the modules are referred to as “h-type” (the new format, which has horizontal rotary dials) and “v-type” (the old format, which has vertical rotary dials). This naming convention is a convenient way to avoid confusion when referring to a particular model, as the name of the model does not indicate the format. Refer to Figure 1.1, “Example of Old and New Module Formats”.

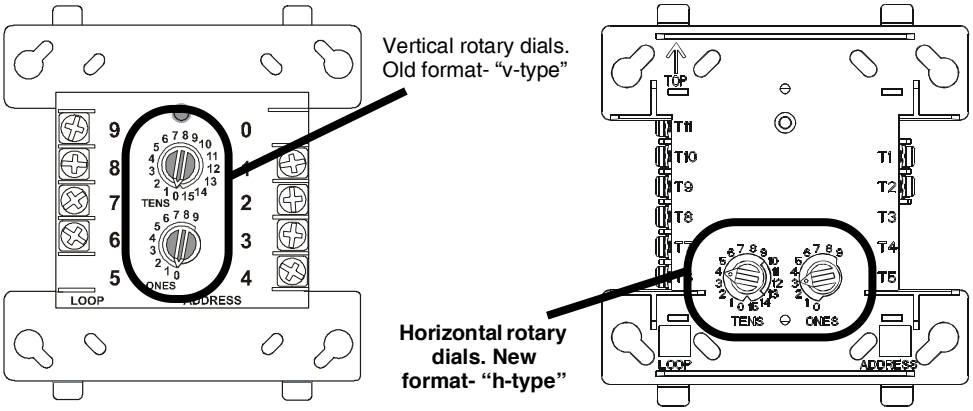


Figure 1.1 Example of Old and New Module Formats

1.2 UL 864 Compliance

1.2.1 Products Subject to AHJ Approval

This SLC Wiring Manual accompanies the user documents for various fire alarm control panels (FACPs). The GFP has been certified to comply with the requirements in the Standard for Control Units and Accessories for Fire Alarm Systems, UL 864 10th Edition.

NOTE: GFP does not support Legacy Type V models of .AMM-2IF

1.2.2 UL 268 7th Edition

The following products “Non UL 268 7th Edition certified” on page 9 have not received UL 268 7th Edition certification and may only be used in retrofit applications. Operation with product not tested for UL 268 7th Edition has not been evaluated and may not comply with NFPA 72 and/or the latest edition of UL 864. These applications will require the approval of the local Authority Having Jurisdiction (AHJ).

Non UL 268 7th Edition certified		
ASD-P	ATD-L2	SS-TH
ASD-PL	ATD-RL2	SSAPT
ASD-PL2	ATD-L2F	SS-L
ASD-PL2F	ATD-RL2F	AMM-2
ASD-PL2FR	ATD-HL2k,	AMM-2I
ASD-PTL	ATD-HL2F	DPID-SS
ASD-PTL2	ASD-LS	AMM-4
ASD-PTL2F	MCS-Acclimate	AMM-4S
ADS-P200	MCS-Acclimate2	MMI-6S
ADS-RP200	MCS-Acclimate2F	MMI-10
ADP	MCS-COF	MMO-6R
ADPF	MCS-4-Warn	MMO-6S
ADP-R	SS-P	AOM-2R
ADPRF	SS-M	AOM-2S
ABD-RT2	SS-PD	MS-7A
ABD-RT2F	SS-PDR	MS-7AF
ABD-2ABD-2FATD	BDT-SS	MS-95-S
ATD-R	BD-SS	AAD-8100
ATD-L	SS-T	AAD-9400X
ATD-RL	SS-TR	AAD-7100X

Table 1.1 Non UL 268 7th Edition certified

1.2.3 Wiring Class Designations

Wiring class designations have been modified from the UL 9th to the UL 10th edition to reflect changes in the NFPA 72 descriptions. The the table below provides a summary for users that are more familiar with the older wiring class designations.

Old Designations						New Designations (NFPA)
IDC	NAC	Signaling Line Circuit (SLC)	Smoke Control	Releasing Devices	Supplementary	
Style B and C (Class B)	Style Y (Class B)	Style 4 (Class B)				Class B
Style D and E (Class A)	Style Z (Class A)	Style 6(Class A)				Class A
		Style 7(Class X)				Class
			End to end verification			Class C

Table 1.2 Wiring Designations - History of Changes

Old Designations						New Designations (NFPA)
IDC	NAC	Signaling Line Circuit (SLC)	Smoke Control	Releasing Devices	Supplementary	
				Fail safe		Class D
					Non-supervised	Class E

Table 1.2 Wiring Designations - History of Changes

1.3 Reference Documentation

The table below provides a list of documents referenced in this manual, as well as documents for selected other compatible devices. The document series chart provides the current document revision. A copy of this document is included in every shipment.

1.3.1 Fire Alarm Control Panel (FACP) and Main Power Supply Installation

	Document Number
Compatible Conventional Devices (Non-addressable)	
Device Compatibility Document	LS10428-000GF-E
Fire Alarm Control Panel (FACP)	
GFP UL Listing Document	LS10239-053GF-E
Power Supplies, Auxiliary Power Supplies & Battery Chargers	
HPF-PS6(E)(B),HPF-PS10(E)(B)	LS10227-003HP-E
System Components	
MMO-6SF Installation Document	I56-2740
MMI-6SF Installation Document	I56-2742
MMO-6F Installation Document	I56-2739
MMI-10F Installation Document	I56-2743
RA100Z and RA100ZA Remote LED Annunciator Installation Document	I56-0508
Intelligent Devices for SLC Loops	
ATD-L3-SELFT	I56-7041
ASD-PL3-SELFT	I56-7039
ASD-PTL3-SELFT	I56-7040
B224BI-WH, B224BI-IV Isolator Base Installation Document (Velociti/CLIP)	I56-3736-004 & higher
SWIFT® Wireless Gateway Instruction Manual	LS10036-000GF-E
Retrofit installations: B224BI B224BIA	I56-0725 / I56-3736-003, I56-1045-002
B224RB-WH, B224RB-IV Relay Base Installation Document	I56-3737-005 & higher
Retrofit installations: B224RB B224RBA	I56-2815 / I56-3737-004 I56-1079-002
B300-6 and B300-6-IV 6" Plug-in Detector Base	I56-6566
B501-WHITE, B501-IV and B501-BL 4" Plug-in Detector Base	I56-3738-003 & higher
Retrofit installations: B501 B501A	I56-3738-002 I56-1042-004
Retrofit installations: B501BH-2 UL 864 Ninth Compliant Sounder Base Installation	I56-2813
Retrofit installations: B501BHT-2 UL 864 Ninth Compliant Temporal Sounder Base Installation	I56-2819
B200S-WH, B200S-IV Addressable Sounder Base Installation document	I56-3392
Retrofit installations: B200S B200SA	I56-3392 I56-3469
B200SR-WH, B200SR-IV Sounder Base Installation document	I56-3387-010 & higher

Table 1.3 Reference Documentation (1 of 2)

	Document Number
Retrofit installations: B200SR B200SRA	I56-3387-009R I56-3470-000
B200S-LF-WH, B200S-LF-IV Intelligent Addressable Low-Frequency Sounder Base Installation document	I56-4151-004 & higher
Retrofit installations: B200S-LF	I56-4151-003R
B200SR-LF-WH, B200S-LF-IV Intelligent Addressable Low-Frequency Sounder Base Installation document	I56-3392-010 & higher
Retrofit installations: B200SR-LF	I56-3392-009R
Retrofit installations: B210LP Flanged Base Installation Documen	I56-0595 / I56-3739
DNR/W InnovairFlex intelligent, non-relay, low-flow photoelectric duct detector housing	I56-3051
AMM-2F Mini monitor Module Installation Document	I56-3554
AMM-2IF Dual Monitor Module Installation Document	I56-2750
AMM-2RIF Dual Monitor/Dual Relay Module Installation Document	I56-3728
AMM-4F Monitor Module Installation Document	I56-3553
AMM-4SF Zone Interface Module Installation Document	I56-3552
AOM-2RF Relay Module Installation Document	I56-3551
AOM-2SF Control Module Installation Document	I56-3550
ISO-X Isolator Module Installation Document	I56-3624/I56-1380
ISO-6 Six Fault Isolator Module	I56-4096
MS-7ASF Pull Station Installation Document	I56-3564
TC810S1000 Control Module Installation Document	I56-3367
ASD-LS3 Intelligent High-Sensitivity Photoelectric Smoke Sensors	I56-4290
ASD-PL3, ASD-PL3-IV Intelligent Photo Smoke Detector	I56-6535
ASD-PL3R, ASD-PL3R-IV Intelligent Photo Smoke w/ Remote Test Capability	I56-6536
ASD-PTL3, ASD-PTL3-IV Intelligent Photo/Temperature Detector	I56-6538
ATD-L3/-IV, ATD-L3H/-IV, ATD-L3R/-IV Intelligent Heat Detector	I56-6537
MCS-CO3 Intelligent Carbon Monoxide Sensor	I56-6683
MCS-COF3, MCS-COF3-IV Carbon Monoxide Sensors	I56-6604
MCS-COP3 Multi-Criteria Photoelectric and CO Sensor	I56-6681
MCS-PTIR, MCS-PTIR-IV Multi-Criteria Photoelectric, Thermal and Infra-Red Sensor	I56-6620
OSI-RI-GW Intelligent Beam Detectors	I56-6586
Manual Releasing Disconnect Switch Product Installation Document	LS10231-000GE-E

Table 1.3 Reference Documentation (2 of 2)

1.4 SLC Overview

Communication between the control panel and intelligent addressable monitor and control devices takes place through a Signaling Line Circuit (SLC), which can be wired to meet the requirements of NFPA Class B, Class A, or Class X.

At least one secondary surge protector must be used with each SLC wiring pair whenever SLC wiring runs outside the building. For detailed information refer to Appendix B, “SLC Surge Suppression”, on page 53.

1.5 Polling Protocols

1.5.1 Available Protocols

Velociti

Velociti® is a patented system (US Patent Number 5,539,389) that greatly enhances the speed of communication between analog intelligent devices. Communication is in a grouped fashion. If one of the devices within the group has new information, the panel CPU stops the group poll and concentrates on single points. Not all panels are Velociti® capable; see 1.5.2, "Protocol Use" below.

CLIP

CLIP (Classic Loop Interface Protocol) polls devices in sequential order. Many but not all Velociti-capable devices can be set to run in CLIP mode; see installation sheet shipped with the device.

1.5.2 Protocol Use

Control Panels can run in Velociti mode or CLIP mode.

Many Velociti devices can be programmed to run in either CLIP or Velociti mode. Use one of the following three options with SLC loops **on most panels**:

SLM-318 loops on the GFP can run in Velociti mode or CLIP mode.

1. Program all modules and detectors on an SLC as Velociti.
2. Program all modules and detectors on an SLC as CLIP.

CAUTION:

DO NOT PROGRAM MORE THAN 99 ADDRESSES ON A CLIP-MODE SLC LOOP, BECAUSE THIS WILL SLOW THE SYSTEM DOWN AND COMPROMISE THE RESPONSE TIME OF THE PANEL TO DISPLAY OFF-NORMAL EVENTS.

3. Program all detectors as CLIP and all modules as Velociti on an SLC.

CAUTION:

DO NOT PROGRAM MODULES AS CLIP AND DETECTORS AS FLASHSCAN ON THE SAME SLC UNLESS SUPPORTED BY PANEL PROGRAMMING. THIS COMBINATION DOES NOT WORK.

1.6 Devices

1.6.1 Monitor/Zone Interface Module

These addressable modules allow the control panel to monitor entire circuits of conventional alarm initiating devices, such as manual pull stations, smoke detectors, heat detectors, waterflow, and supervisory devices.

- **AMM-4F** Monitor Module; or CLIP mode.
- **AMM-2F** Addressable Mini-Monitor Module; Velociti or CLIP mode. mode only.)
- **AMM-4SF** Zone Interface Module; Velociti or CLIP mode.
- **MMI-6SF** Allows an intelligent alarm system to monitor six zones of conventional two-wire detectors; Velociti or CLIP mode.
- **MMI-10F** Supervises ten Class B addressable Initiating Device Circuits (IDC) which monitor normally open contact initiating devices; Velociti or CLIP mode. This module is capable of participating in degraded mode where supported by the FACP.

1.6.2 Control Modules

Through these addressable modules, the control panel can selectively activate Notification Appliance Circuits (NAC).

- **AOM-2SF** Control Module; Velociti or CLIP mode.
- **TC810S1000** Control Module for releasing applications; Velociti mode only. CLIP mode operation will generate a trouble message at the panel
- **MMO-6SF** Controls six NAC or speaker circuits; Velociti or CLIP mode.

1.6.3 Isolator Modules

Isolator Modules permit a short-circuited section of the SLC to be fault isolated from the remainder of the SLC loop, allowing critical components to function in the event of a circuit fault. Isolator modules are required to meet the requirements of an NFPA Class X circuit. *(For Isolator Bases see 1.6.6, "Plug-in Detector Bases".)*

- **ISO-X** Loop Fault Isolator Module; Velociti or CLIP mode.
- **ISO-6** Six Fault isolator module provides six equivalent circuits that allow a portion of the communications loop to continue operating when a short circuit occurs on that loop

1.6.4 Relay Modules

These addressable modules provides the control panel with a dry-contact output for activating a variety of auxiliary devices.

- **AOM-2RF** Relay Module with two Form-C relays;
- **MMO-6RF** Controls six independent Form-C relays; Velociti or CLIP mode.

1.6.5 Multiple Input/Output Modules

These addressable modules offer dual input and/or dual output in a single device.

- **AMM-2IF** Dual Class B Monitor Module; Velociti or CLIP mode.
- **AMM-2RIF** Dual Monitor/Dual Relay Module; functions as two Class B monitor modules and two individual relay modules.

Velociti or CLIP mode.

1.6.6 Plug-in Detector Bases

Plug-in detector bases provide a connection between the SLC and a variety of intelligent detectors which are snapped into place. Standard and isolator bases are used depending upon which NFPA SLC class is required. Sounder and relay bases are similar to standard bases, but have sound or relay capabilities.

Standard Base

- **B501 Series**. 4 inch (10.16 cm) standard small diameter base, commonly used in European installations. For white order **B501-WHITE**. For ivory, order **B501-IV**. For black, order **B501-BL.**
- **B300-6** 6 inch (15.24 cm) plug-in detector base standard large diameter base, commonly used in US installations. White. For ivory, order **B300-6-IV.** Replacement model for B210LP.
- **B210LP** 6 inch (15.24 cm) standard large diameter base, commonly used in US installations. . Legacy ivory.
- **Isolator Base B224BI-WH, B224BI-IV** isolator base. Replaces legacy ivory B224BI.

Sounder Base

- **B501BH** Standard sounder base.
- **B501BH-2** UL 864 9th edition compliant standard sounder base.
- **B501BHT-2** UL 864 9th edition compliant temporal sounder base, replaces **B501BHT**.
- **B200S-WH, B200S-IV**. Intelligent sounder base. (-WH is white; -IV is ivory). Replaces legacy ivory B200S.
- **B200SR-WH, B200SR-IV** Intelligent sounder base, designed to be compatible with existing installations of the B501-Series sounder bases. (-WH is white; -IV is ivory). Replaces legacy ivory B200SR.
- **B200S-LF-WH, B200S-LF-IV** A low-frequency version of the B200S-WH/-IV. (-WH is white; -IV is ivory). Replaces legacy ivory B200S-LF.
- **B200SR-LF-WH, B200S-LF-WH** A low-frequency version of the B200SR-WH/-IV. (-WH is white; -IV is ivory). Replaces legacy ivory B200SR-LF.

Relay Base

- **B224RB-WH, B224RB-IV** (-WH is white; -IV is ivory) Replaces legacy ivory B224RB.

1.6.7 Intelligent Detectors

NOTE: The alarm and threshold limits determined by the control unit interconnected to detectors that employ a special application mode/configuration are designed and shipped from the factory with the detector sensitivity setting set to an acceptable open area protection sensitivity being the default mode of operation.

NOTE:
The special application mode/configuration shall not be activated at the control unit without a deliberate action by the user to initiate the special application mode through an alternate detector sensitivity selection setting. Additionally, the extended label should be modified at this address to include the phrase ‘SPECIAL APPLICATIONS’ or ‘SPECIAL APPS’ for compliance with UL 864 requirements. Refer to the FACP programming/installation instructions for further instructions on altering extended labels.

- **ASD-PL3-SELFT** Self-test photo detector; Velociti
- **ASD-PTL3-SELFT** Self-test photo/heat detector; Velociti
- **ATD-L3-SELFT** Self-test heat detector; Velociti
- **MCS-COF3, MCS-COF3-IV** Addressable intelligent multi-criteria smoke sensors: photo, carbon monoxide (CO), 135°F (57.2°C) fixed-temperature heat detector, and infra-red (IR). Transmits an alarm signal due to heat (135°F/57.2°C) per UL 521. (Main model is white; -IV is ivory.)
- **MCS-COP3** Multi-Criteria Photoelectric and CO Sensor. (White)
- **MCS-PTIR, MCS-PTIR-IV** Multi-Criteria Photoelectric, Thermal and Infra-Red Sensor. (Main model is white; -IV is ivory.)
- **MCS-CO3** Intelligent Carbon Monoxide Sensor. (White)
- **OSI-RI-GW** Addressable, intelligent, single-ended beam smoke detector.
- **ASD-LS3** Intelligent High-sensitivity Photoelectric Smoke Sensors, Velociti. (-IV versions support Velociti and CLIP.)

NOTE: GFP Series panels support CLIP mode on current, dual-protocol devices only. Legacy CLIP-only devices are not compatible.

ASD-PL3/ASD-PL3-IV Analog, addressable intelligent smoke detector that uses a photoelectric sensing chamber. Listed for use in ducts. Designed to provide open area protection. The **ASD-PTL3/ASD-PTL3-IV** adds thermal sensors that will alarm at a fixed temperature of 135° F (57.2°C). The **ASD-PL3R/ASD-PL3R-IV** is a low profile, intelligent photoelectric sensor that is remote test capable, for use with **ASD-PL2, ASD-PTL2**, and **ASD-PL2FR** which all supported DNR(W). Basic models support Velociti mode only; models ending in -IV support Velociti and CLIP mode. These models update and replace Velociti CLIP mode. (Earlier versions named ASD-P and ASD-PTL [both discontinued] also supported Velociti or CLIP mode, but were not listed for use in ducts).

ATD-L3/ATD-L3-IV Intelligent thermistor sensing circuit for fast response. Designed to provide open area protection with 50 foot spacing capability. A fixed temperature sensor with 135°F (57.2°C) fixed temperature alarm. The **ATD-L3R/ATD-L3R-IV** incorporates a thermal rate of rise of 15°F (8.3°C). The **ATD-L3H/ATD-L3H-IV** is a high temperature sensor with 190°F (87.8°C) fixed temperature alarm. Basic models support Velociti mode only; models ending in -IV support Velociti and CLIP mode.**DNR/W** InnovairFlex intelligent, non-relay, low-flow photoelectric duct detector housing. Low Flow refers to the air velocity rating of 100 to 4,000 feet per minute (0.5 to 20.32 m/sec). Use with / photoelectric smoke detector. Accommodates

1.6.8 Addressable Manual Pull Stations

The **MS-7ASF** is a dual-action pull station that, when activated, provides an addressable identification and its location to the control panel. An addressable monitor module is mounted inside the pull station to facilitate servicing and replacement. **Supports Velociti or CLIP mode.**

1.7 SLC Capacity

The protocol selected for an SLC loop determines the maximum number of devices that can be handled by the loop (see Section 1.5, “Polling Protocols”, on page 11). Within those limits, the individual control panel may have additional restrictions. See the specific installation manual for this information.

1.8 SLC Performance

SLC performance (Class B, Class A, or Class X) depends on the configuration of the circuit, the components on the circuit (see Table 1.5), and the power supply if required for auxiliary power (see individual wiring diagrams). SLC operation meeting Class X requirements isolates each addressable device on the SLC from faults that may occur on the SLC.

NOTE: NFPA class configuration must be programmed into GFP Series panels, The panel will check that the physical wiring matches and generate a trouble message if there is a mismatch. See panel documentation for details.

Wiring class requirements are determined by national and local codes. Consult with the Authority Having Jurisdiction before wiring the SLC. The table below (derived from NFPA 72-2002 and NFPA 72-2013) lists the trouble conditions that result when a fault exists on an SLC. Items with asterisks are not applicable to NFPA 72-2013. Additional information is broken out in Section 2, “Wiring Requirements”, on page 15, and Section 3, “Shielded Wire Termination”, on page 17.

Type of Fault	Class B	Class A	Class X
Single Open	Trouble	Alarm, Trouble	Alarm, Trouble
Single Ground	Alarm, Trouble (ground)	Alarm, Trouble (ground)	Alarm, Trouble (ground)
Short	Trouble	Trouble	Alarm, Trouble
Short and open*	Trouble*	Trouble*	Trouble*
Short and ground*	Trouble*	Trouble*	Alarm*, Trouble*
Open and ground	Trouble*	Alarm*, Trouble*	Alarm, Trouble
Communications loss	Trouble	Trouble	Trouble
• Trouble - The control panel will indicate a trouble condition for this type of fault. • Alarm - The control panel must be able to process an alarm input signal in the presence of this type of fault.			
*Removed from NFPA 72-2013; included for legacy support under NFPA 72-2002 only.			

Table 1.5 SLC Circuit Configuration and Performance: Class B, Class A, Class X

1.9 LED Operation

The table below lists the LED operation on the various devices of an SLC in CLIP (Classic Loop Interface Protocol) Mode and Velociti® Mode. When switching from Velociti® to CLIP mode, the loop circuit must be powered down for at least 30 seconds to reset devices to CLIP mode LED operation.

		CLIP Mode		Velociti® Mode	
Control Panel	Device	Standby	Activated	Standby	Activated
GFP	Monitor Module	Blinks RED	RED continuous	Blinks GREEN	RED continuous
	Control Module	Blinks GREEN	GREEN continuous	Blinks GREEN	GREEN continuous
	Detector	Blinks RED	RED continuous	Blinks GREEN	RED continuous

Table 1.6 LED Operations

Section 2: Wiring Requirements

2.1 Recommended SLC Wiring

Depending on the panel, there are two recommended options for SLC wiring:

- Twisted, unshielded pair: GFP

Maximum resistance 50 ohms per branch. See Table 2.1.

Maximum capacitance: 0.5 µFarads per branch.

To maximize distance on the SLC loop, use the recommended type of wire. Using other wiring types makes the SLC circuit more susceptible to electrical interference and thus reduces its maximum loop length.

Refer to Appendix A, “Power Considerations”, on page 49 for proper wiring means for Auxiliary Power.

FACP: Wire Type and Limitations	Recommended Max. Distance	Wire Gauge
RECOMMENDED: Twisted-unshielded pair, 12 to 18 AWG (3.31 mm² to 0.82 mm²). • 50 ohms, maximum per length of Class A and X loops. • 50 ohms per branch maximum for Class B loop. **SLM-318/GFP loops with self-test detectors:** • 35 ohms, maximum per length of Class A and X loops. • 35 ohms per branch maximum for Class B loop.	12,500 ft. (3,810 m) 9,500 ft. (2,895.6 m) 6,000 ft. (1,828.8 m) 3,700 ft. (1,127.76 m)SLM-318 (CLP-2PCB) loops with self-test detectors: 12 AWG - 11000 ft (3353 m) 14 AWG - 6900 ft (2103 m) 16 AWG - 4350 ft (1326 m) 18 AWG - 2700 ft (823 m)	12 AWG (3.31 mm²) 14 AWG (2.08 mm²) 16 AWG (1.31 mm²) 18 AWG (0.82 mm²)
Untwisted, unshielded wire, in conduit or outside of conduit.	5,000 ft. (1,524 m)	12 to 16 AWG (3.31 mm² to 1.31 mm²) 18 AWG (0.82 mm²)
Twisted, shielded pair Note: • Shields must be isolated from ground. • Shields should be broken at each device.	5,000 ft. (1,524 m)	12 to 16 AWG (3.31 mm² to 1.31 mm²) 18 AWG (0.82 mm²)
Note: Maximum total capacitance of all SLC wiring (both between conductors and from any conductor to ground) should not exceed 0.5 microfarads.		

Table 2.1 Wiring Recommendations:

2.2 Two-Wire SLC - Class B

2.2.1 Measuring Loop Resistance

T-tapping of the SLC wiring is permitted for two-wire Class B configurations. The total DC resistance from the control panel to each branch end cannot exceed

- 50 ohms for SLM-318/GFP:

NOTE: 35 ohms for SLM-318 (CLP-2PCB) with self-test detectors installed.

Measure DC resistance as detailed and shown below:

1. With power removed, short the termination point of one branch at a time and measure the DC resistance from the beginning of the SLC to the end of that particular branch.
2. Repeat this procedure for all remaining branches in the SLC.

In Figure 2.1, Branches A, B, and C all begin at the SLC terminal, even though Branch B is T-tapped.

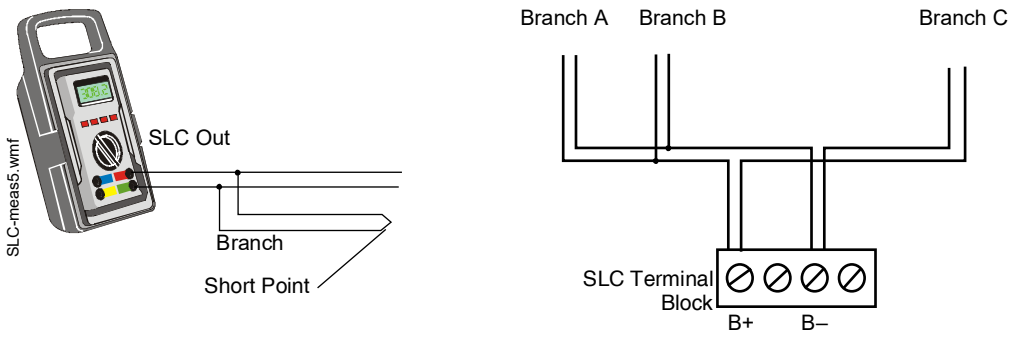


Figure 2.1 Measuring DC Resistance of a Two-Wire SLC

2.2.2 Measuring Total Wire Length

The total wire length of all combined branches of one SLC cannot exceed the limits set forth in each system's instruction manual. Determine the total length in each SLC by summing all wire segments. In Figure 2.1 above, the picture on the right shows an SLC with 3 branches. Figure 2.2 below shows the same SLC divided into segments. The total length of the SLC is determined by adding the lengths of Segment 1 + Segment 2 + Segment 3 + Segment 4 + Segment 5. No segment should be summed twice.

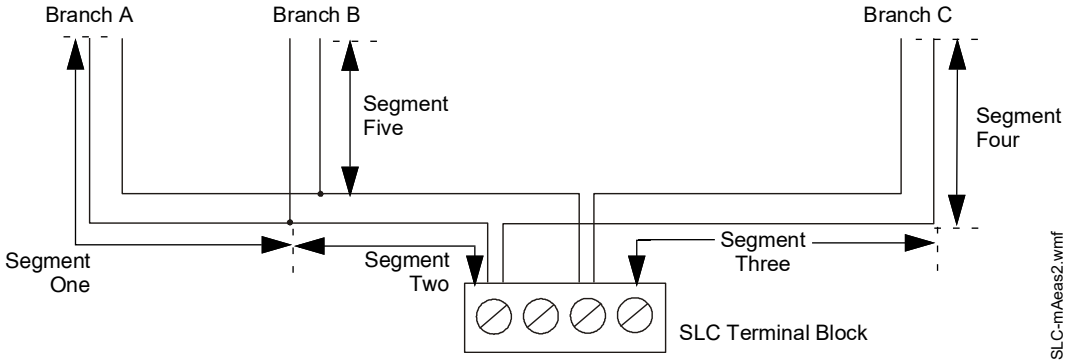


Figure 2.2 Measuring the Total Wire Length of a Two-wire SLC

2.3 Four-Wire SLC Class A and X

2.3.1 Measuring Loop Resistance

The total DC resistance of the SLC pair must not exceed:

- 50 ohms for SLM-318/GFP

NOTE: 35 ohms for SLM-318 (CLP-2PCB) with self-test detectors installed.

Measure DC resistance as detailed and shown below:

1. Disconnect the SLC channel B (Out) and SLC channel A (Return) at the control panel.
2. Short the SLC at the last device and measure the resistance at SLC Out. Record resistance and remove the short. Refer to Figure 2.3.
3. Short the SLC at the first device and measure the resistance at SLC return. Record resistance and remove the short. Refer to Figure 2.3.

The maximum DC resistance of the SLC is the higher of 2 and 3.

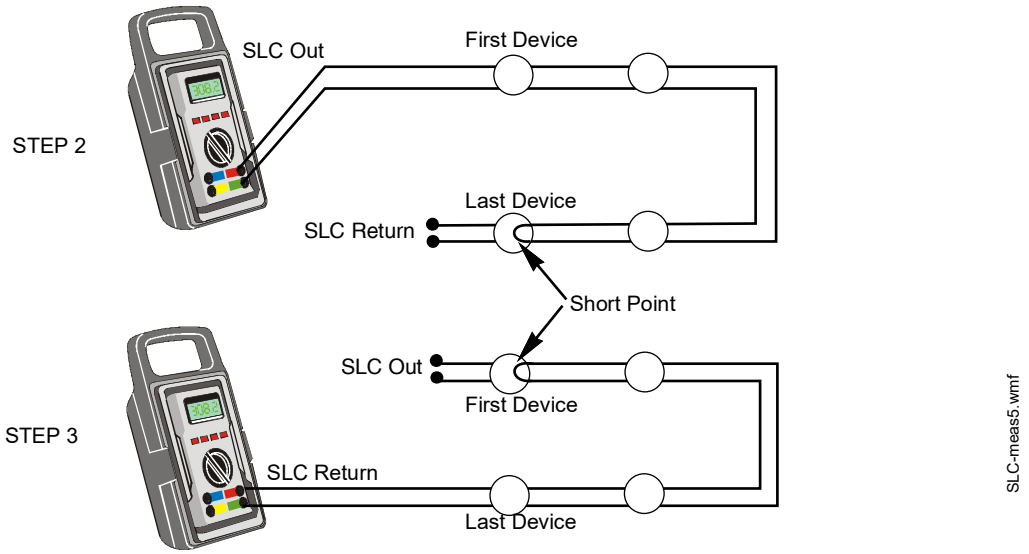


Figure 2.3 Measuring DC Resistance of a Four-Wire SLC

2.3.2 Measuring Total Wire Length

The total wire length in a four-wire SLC cannot exceed the limits set forth in each system's instruction manual. The figure below identifies the output and return loops from SLC terminal on the control panel or loop module:

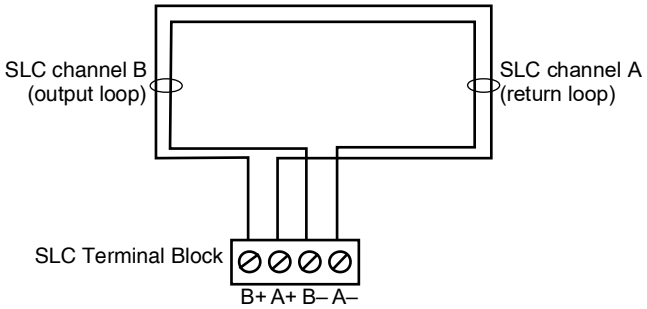


Figure 2.4 Measuring the Wire Length of a Four-Wire SLC

2.4 Control Panel Terminal Blocks

2.4.1 GFP with SLM-318 Signaling Loop Module

GFP supports from one to three SLC loops. Connect from one PMBNL Power Module Boards to the panel, and connect from one to three SLM-318 Signaling Loop Modules to each PMBNL. Loops can be either CLIP mode or Velociti mode. SLC Loops connect to TB1 on the SLM-318.

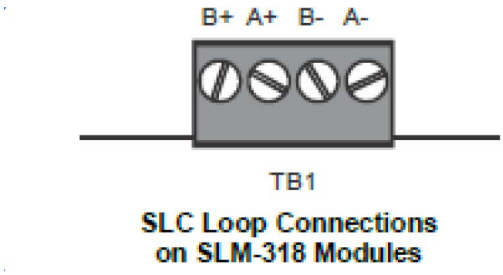


Figure 2.5 GFP with SLM-318: SLC Loop Connections and Wiring

Section 3: SLC Circuits without Isolators

3.1 Overview

This chapter concerns itself with the two classes of circuits that do not require isolation devices:

- NFPA 72 Class B
- NFPA 72 Class A

3.2 NFPA Class B SLC

NFPA Class B requirements can be met by using the diagram below.

- T-tapping of the SLC wiring is allowed for Class B configuration.

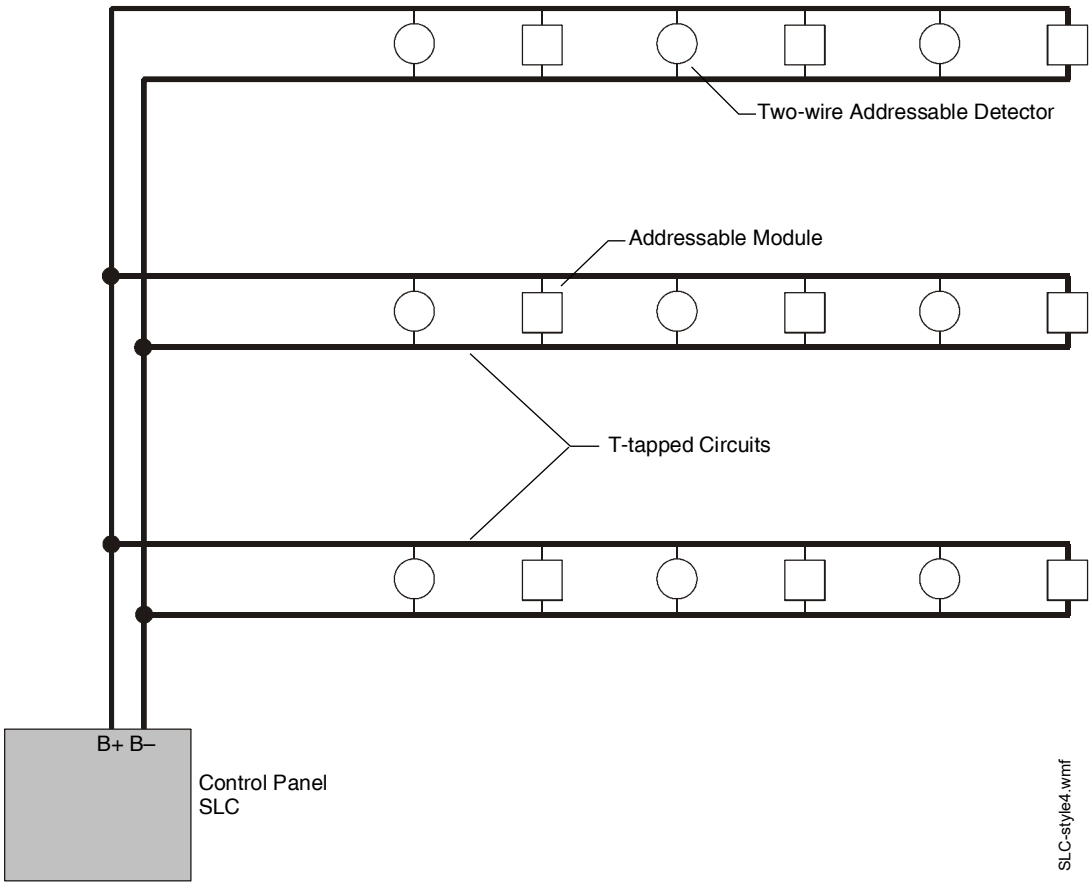


Figure 3.1 Basic NFPA Class B SLC

3.3 NFPA Class A SLC

NFPA Class A requirements can be met by using the diagram below.

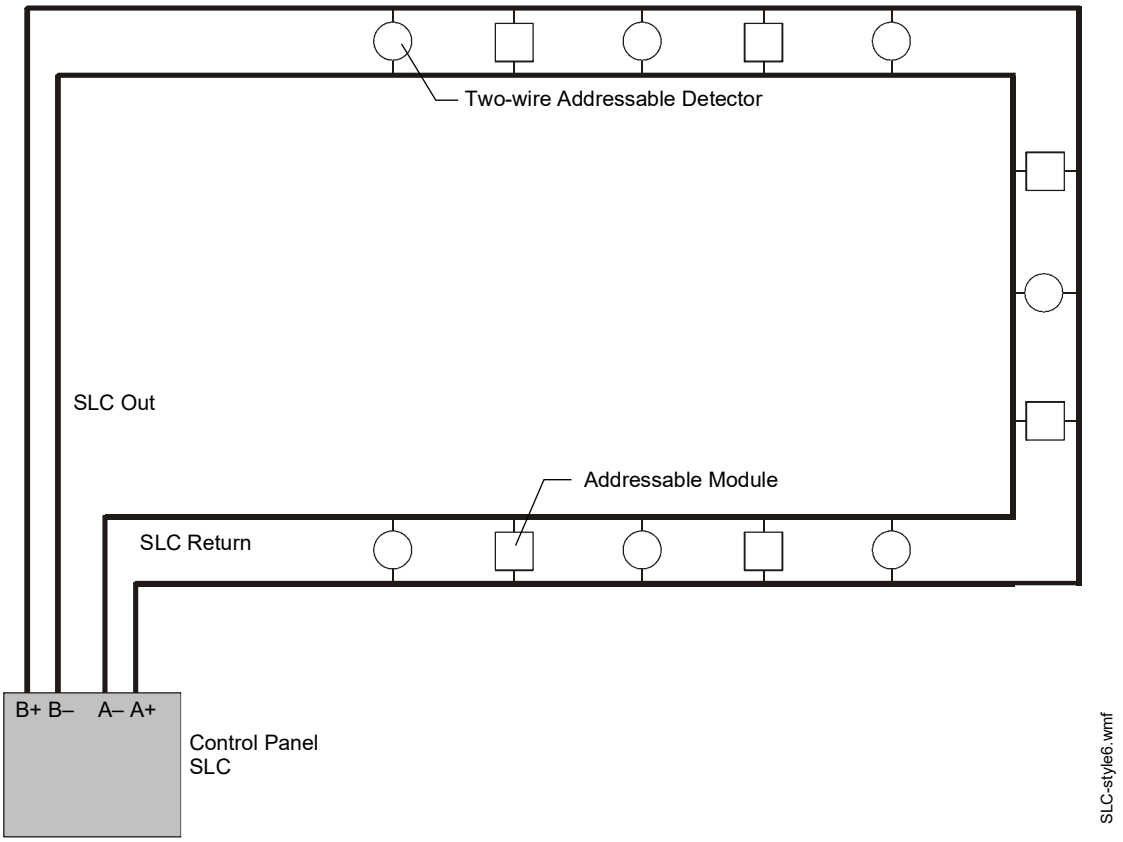


Figure 3.2 Basic NFPA Class A SLC

NOTE: T-tapping of the SLC wiring is NOT allowed for Class A configuration.

Section 4: SLC Circuits with Isolators

4.1 Overview

There are three isolator devices used to protect critical elements of the Velociti-mode or CLIP-mode SLC loop from faults on other SLC branches or segments.

- Fault Isolator Module ISO-X
- Isolator Detector Base B224BI, B224BI-WH, B224BI-IV
- Six fault isolator module ISO-6

To comply with NFPA Class X requirements, one of these devices must be used on both sides of a device: one isolator base and one isolator module, two fault-isolator modules, or two circuits on a six-fault isolator module, for example.

A Fault Isolator Module on both sides of a device, or the combination of an Isolator and Isolator Module are required to comply with NFPA Class X requirements. One isolator of ISO-6 meets the Isolator Module requirements. To comply with NFPA Class X requirements, one of these devices must be used on both sides of a device: two fault isolator modules, one isolator base and one isolator module, for example.

CAUTION: ISOLATOR LIMITS

IF RELAY OR SOUNDER BASES ARE NOT USED, A MAXIMUM OF 25 ADDRESSABLE DEVICES CAN BE CONNECTED BETWEEN ISOLATOR MODULES AND/OR BASES. WHEN RELAY OR SOUNDER BASES ARE USED, THE MAXIMUM NUMBER OF ADDRESSABLE DEVICES THAT CAN BE CONNECTED BETWEEN ISOLATORS IS REDUCED TO SEVEN. ISOLATOR MODULES WILL NOT FUNCTION PROPERLY WHEN THESE LIMITS ARE EXCEEDED.

THE ADDRESS CAPACITY OF THE LOOP IS REDUCED BY TWO (2) ADDRESSES FOR EVERY ISOLATOR DEVICE IN EXCESS OF 200 WHEN THE ISOLATOR MODULES AND/OR ISOLATOR BASES ARE CONNECTED TO THE SLC LOOP FROM THE GFP.

4.2 Fault Isolator Modules

The **ISO-X** module continuously monitors the circuit connected to terminals 3(–) and 4(+). Upon power up, an integral relay is latched on. The module periodically pulses the coil of this relay. A short circuit on the SLC resets the relay. The module detects the short and disconnects the faulted SLC branch or segment by opening the positive side of the SLC (terminal 4). This isolates the faulted branch from the remainder of the loop preventing a communication problem with all other addressable devices on the remaining branches (labeled “Continuation of the SLC” in the figure below). During a fault condition, the control panel registers a trouble condition for each addressable device which is isolated on the SLC segment or branch. Once the fault is removed, the module automatically reapplies power to the SLC branch or segment. Figure 4.1 shows a Class B example for wiring of an Isolator Module. ISO-6 has the same functionality; see Figure 4.2.

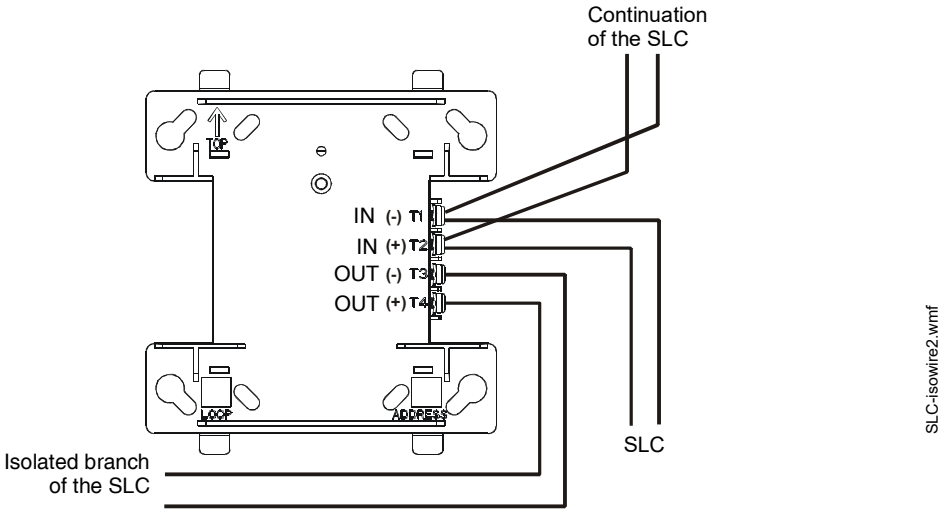


Figure 4.1 Wiring the ISO-X Module

Each of the ISO-6’s six isolator terminals acts as a single ISO-X module. Figure 4.2 shows a Class B example for wiring the ISO-6. Terminal numbers are added for clarification; these do not appear on the physical device.

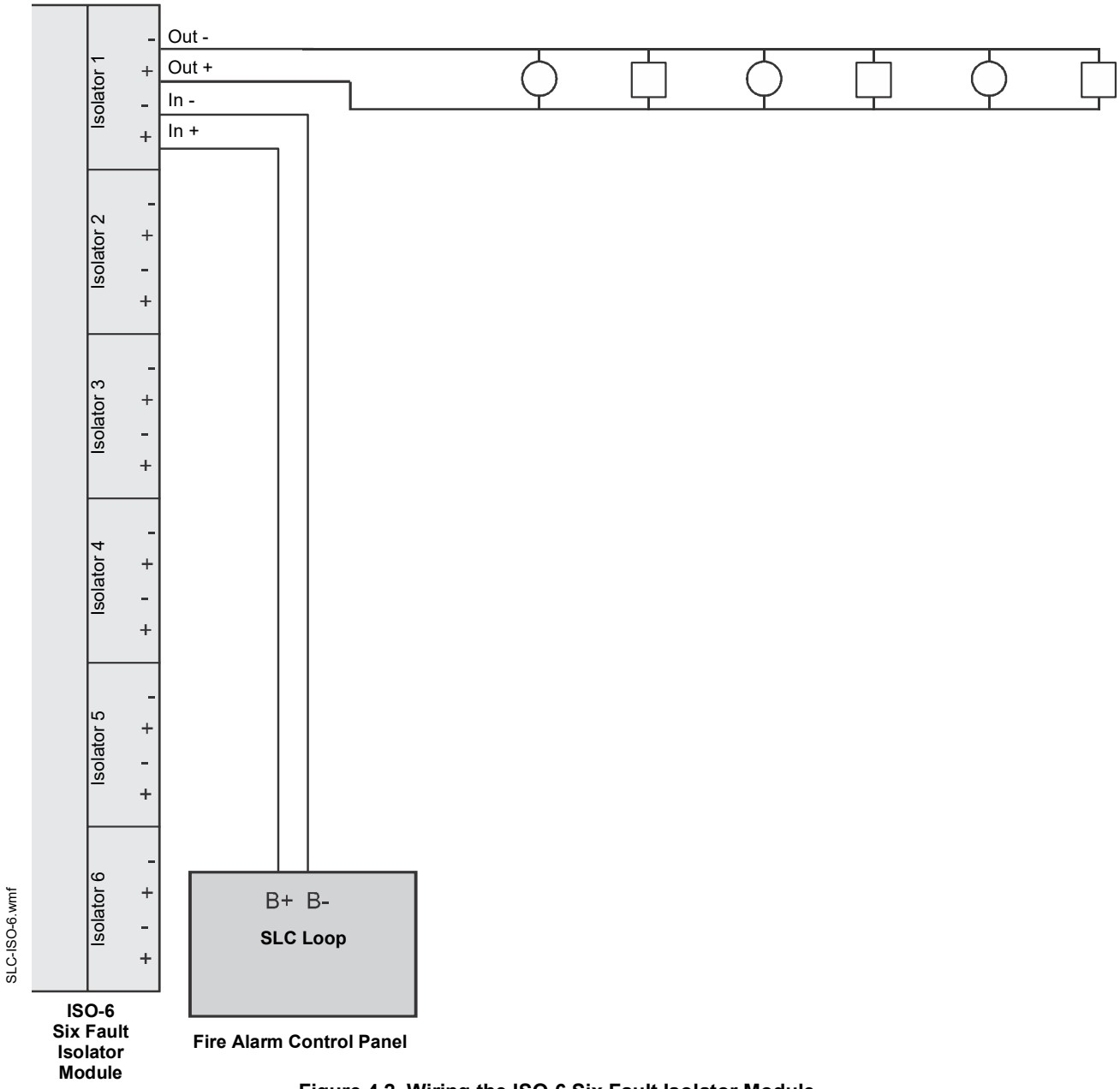


Figure 4.2 Wiring the ISO-6 Six Fault Isolator Module

4.3 Isolator Detector Bases

Isolator detector bases prevent an entire communications loop from being disabled when a short circuit occurs. This is accomplished by isolating that part of the loop containing the short from the remainder of the circuit. These bases also automatically restore the entire loop when the cause of the short circuit is corrected.

B224BI-WH/B224BI-IV intelligent isolator base used with Veloci‌ti® detectors and most CLIP mode detectors. (An older version B224BI had fewer color options.)

4.3.1 How an Isolator Base Works

If a short circuit fault occurs at point “X”, devices A, B, C & detector 2 will cease to function and display a trouble warning at the control panel. Devices D, E, F & detectors 1, 3, 4, and 5 will remain normal as they are served by ‘SLC Return’.

If a short circuit fault occurs at point “Y”, all devices will continue to function. If a short circuit fault occurs at point “Z”, only detector 4 will cease to function.

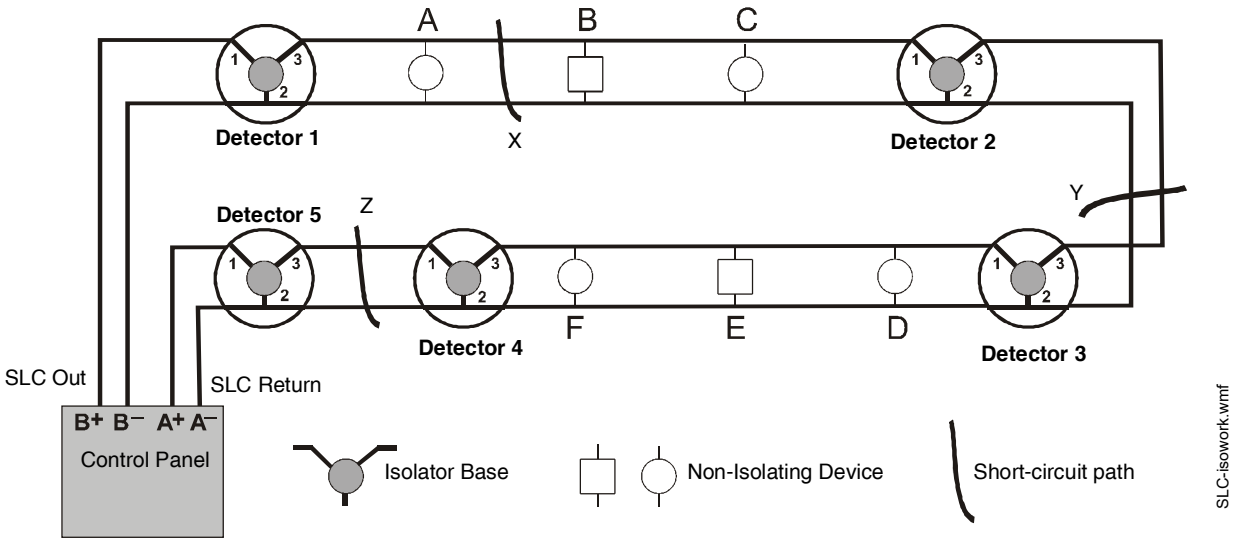


Figure 4.3 Isolator Base Circuit: Sample Class A Wiring

NOTE: For information on wiring an isolator base, refer to Figure 9.3, “Wiring a B224BI-WH/B224BI-IV Isolator Base Mounting Plate” on page 44.

4.4 NFPA Class B SLC Using Isolator Modules

A variation of a Class B operation using isolator modules to protect each branch of the SLC. Refer to Figure 4.1 on page 20 for isolator module wiring and to Section 4, “SLC Circuits with Isolators” for limitations.

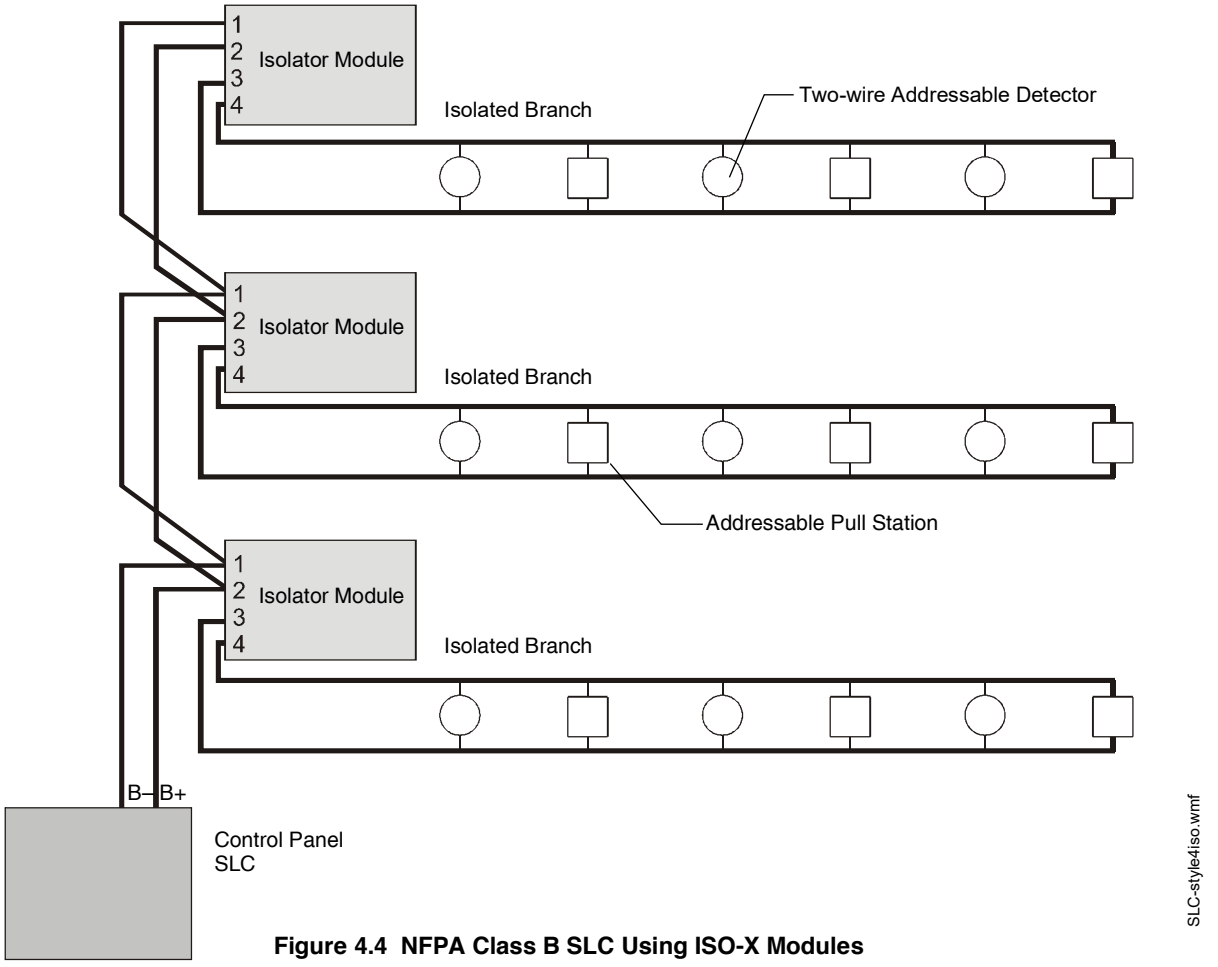


Figure 4.4 NFPA Class B SLC Using ISO-X Modules

Each of the six circuits on ISO-6 functions the same way as ISO-X (discussed earlier). However, ISO-6 cannot accept two wires at one pin. Wire Class B SLC loops as shown in Figure 4.1

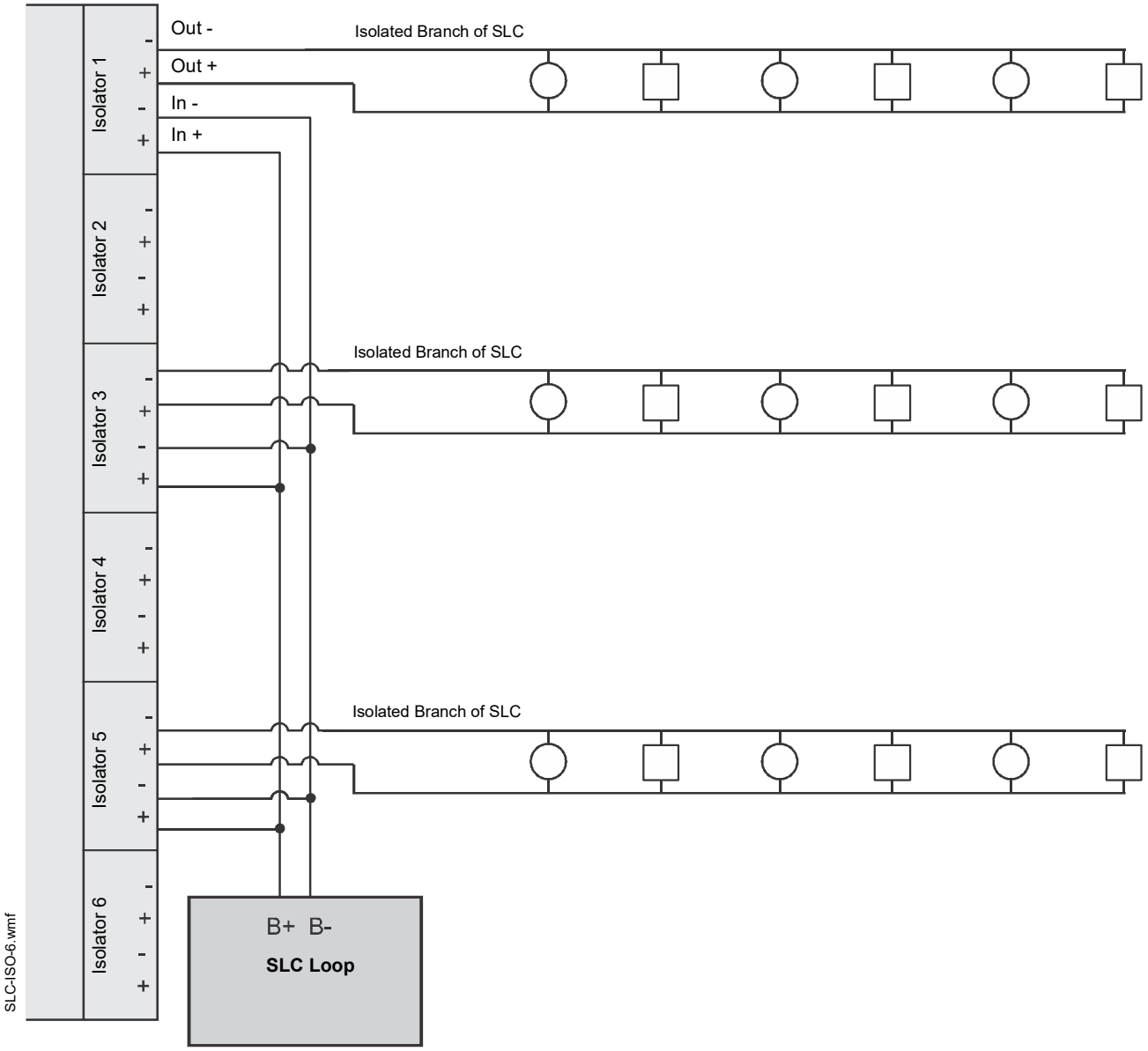


Figure 4.5 NFPA Class B SLC Using the ISO-6 Six Fault Isolator Module

4.5 NFPA Class A SLC Using Isolator Modules

A variation of Class A operation using isolator modules to protect a section of the SLC. By flanking each group of devices with fault isolator modules each group is protected from faults that may occur in the other groups. For example, a fault in Section B will not affect Sections A & C. The isolator modules on either side of Section B will open the loop. Section A will still operate from power on the SLC Out side and Section C will operate from the SLC Return side.

- A combination of isolator modules and isolator bases may be used.
- T-tapping is NOT allowed within the Class A configuration.
- Isolator modules shall be within 20 ft. (6.1 m) of device and the wire must be enclosed in metal conduit.

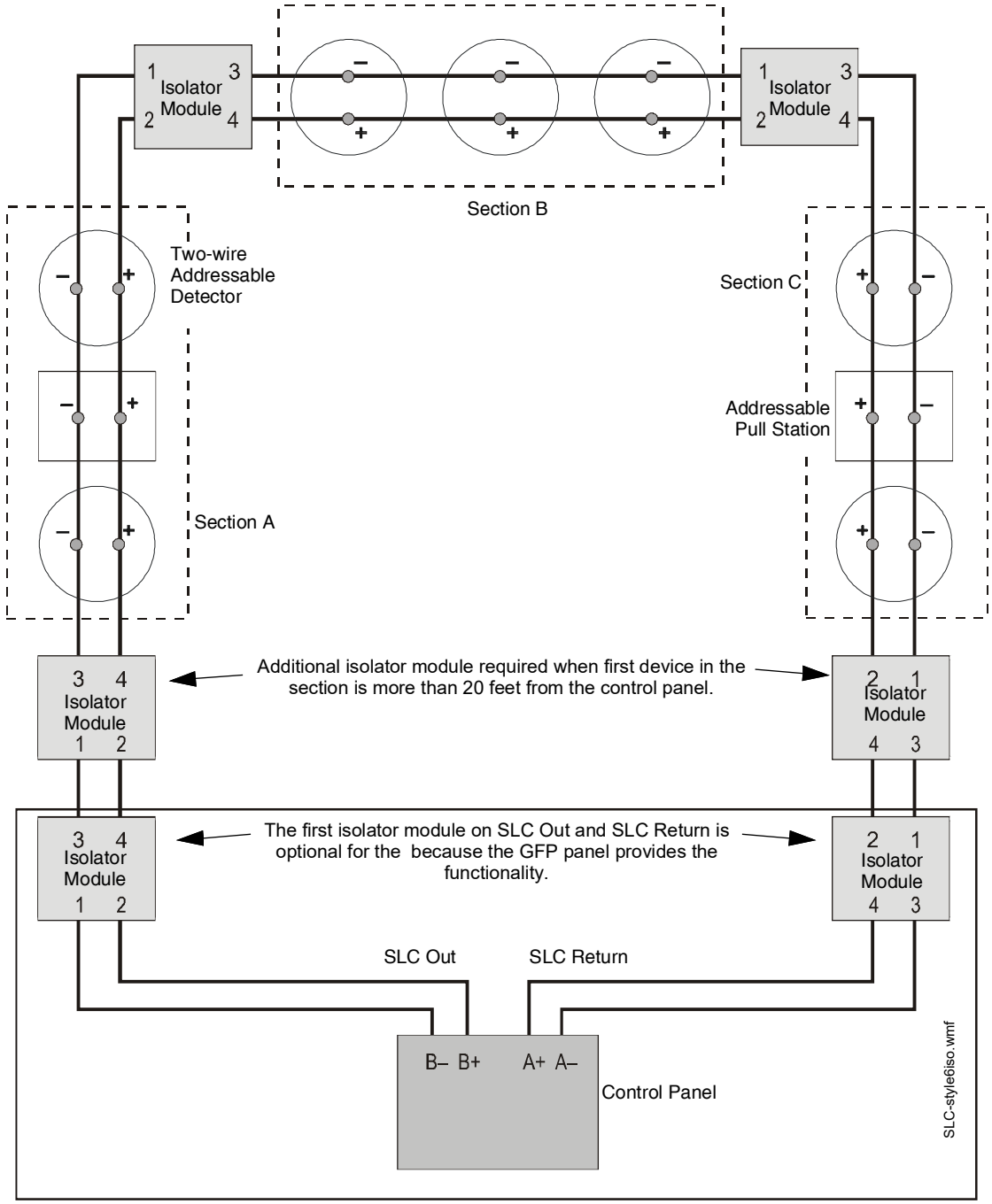


Figure 4.6 NFPA Class A SLC Using Isolator Modules

4.6 NFPA Class X SLC Using an Isolating Device

Class X operation requires using a combination of isolator detector bases and isolator modules or isolator modules before and after a non-isolator device. Flanking each device with an isolator provides fault protection to all other devices on the loop.

- T-tapping is NOT allowed within the Class X wiring configuration.
- When a non-isolator base or pull station is used, install isolator modules on both sides of devices.
- When an isolator base is used in conjunction with an isolator module, install the isolator module as shown in Figure 9.3.
- There must be a close-nipple connection between a device and the isolator bases or modules that protect it.

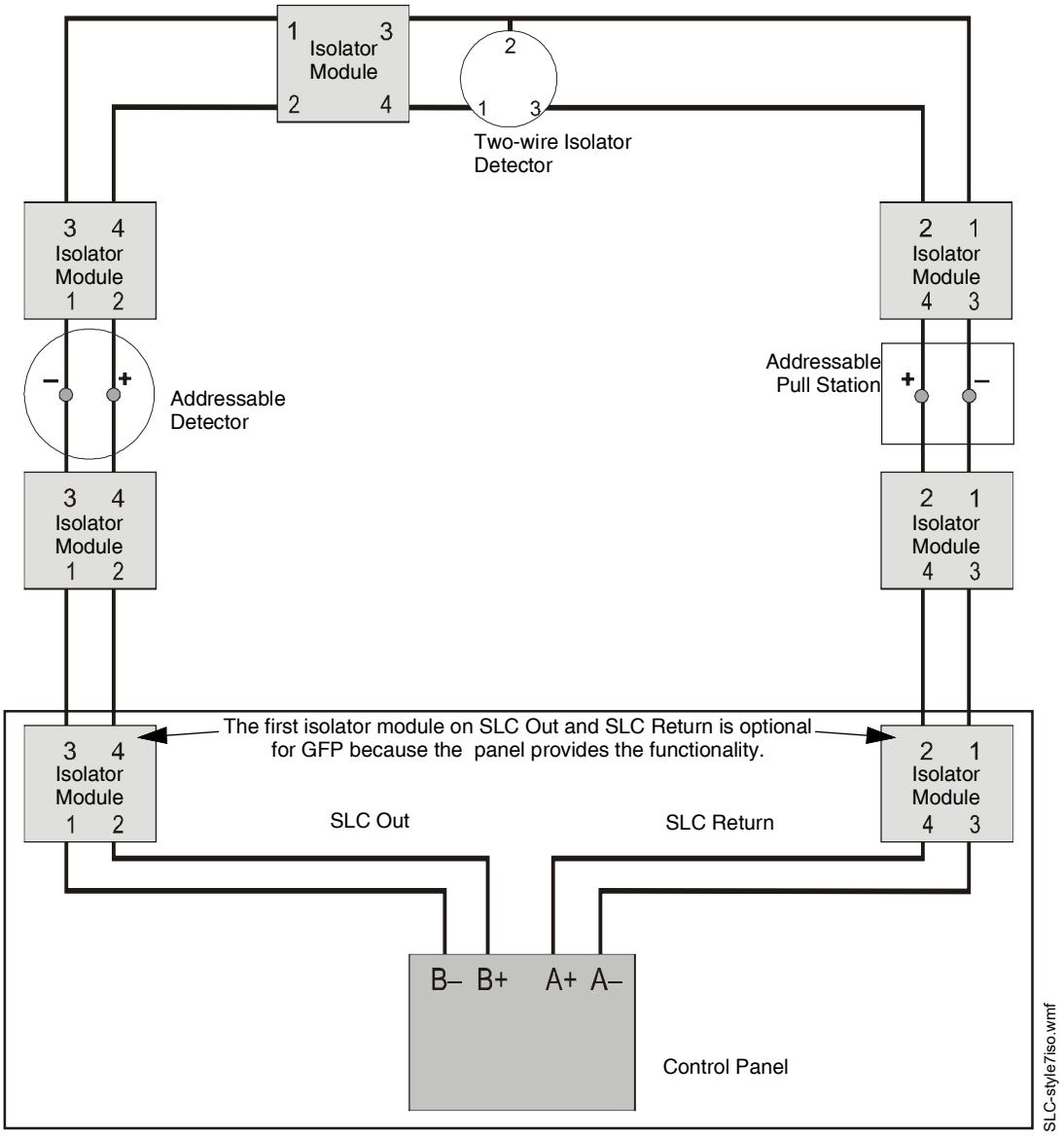


Figure 4.7 NFPA Class X SLC Using Isolator Modules

NOTE: See Figure 9.3, “Wiring a B224BI-WH/B224BI-IV Isolator Base Mounting Plate” on page 44.

Section 5: Monitor Modules

5.1 Description

These addressable modules monitor conventional contact-type alarm initiating devices. You can configure module circuits as NFPA Class B or Class A Initiating Device Circuits (IDC). There is no limit to the number of contact-type devices installed on a monitor module IDC.

For more information on the individual module specifications refer to the *Installation Instructions* that are provided with this device. For information on transponders, refer to the specific transponder manual.

For Class A power-supervision requirements, refer to Appendix A.2, “Supervising 24 VDC Power”, on page 49.

5.1.1 Addressable Monitor Module

The AMM-4F addressable module that monitor either a Class B or Class A IDC of dry-contact input devices. capable of participating in degraded mode where supported by the FACP.

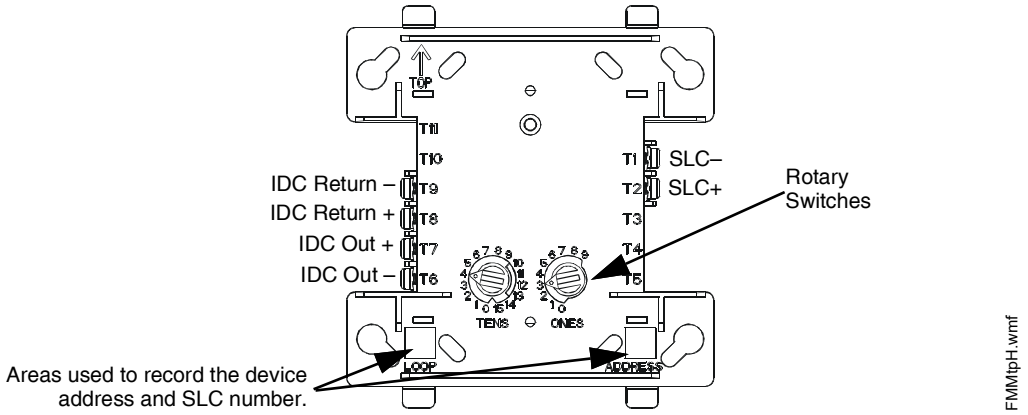


Figure 5.1 AMM-4F Monitor Module

5.1.2 Zone Interface Module

The **AMM-4SF** is similar to the **AMM-4F**, except used to monitor compatible two-wire, 24 volt, conventional (non-addressable) smoke detectors on a Class B or Class A IDC.

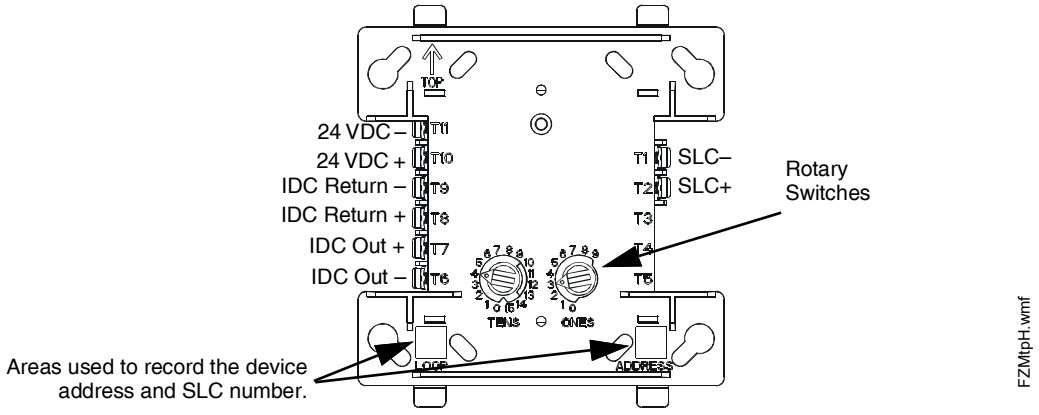


Figure 5.2 AMM-4SF Zone Interface Module

5.1.3 Miniature Monitor Module

The **AMM-2F** is intended to monitor a Class B IDC; It is offered in a smaller package for mounting directly in the electrical box of the device being monitored.

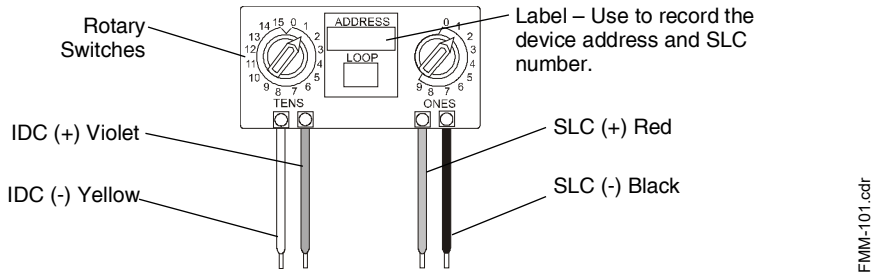


Figure 5.3 AMM-2F Mini Monitor Module

5.2 Setting an SLC Address for a Module

Velociti capable control or relay modules, as well as detectors, can be set to one of 159 addresses (01-159) and are factory preset with an address of “00”. CLIP mode detectors and panels are limited to addresses 01-99.

To set an SLC address, use a common screwdriver to adjust the rotary switches on the module to the desired address. The unit shown in Figure 5.4 is set at address “35”. When finished, mark the address on the module face in the place provided.

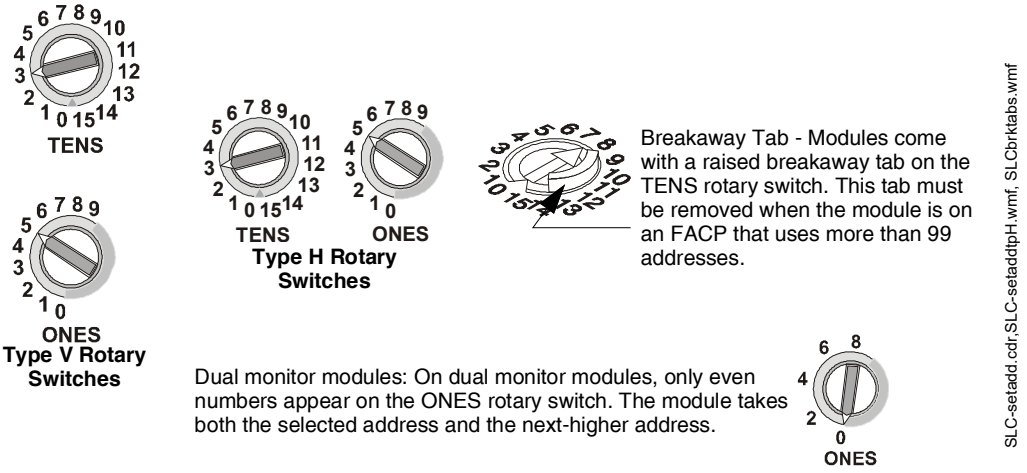


Figure 5.4 Setting the SLC Address on Modules

5.3 NFPA Class B IDC Using Monitor Modules

Connect the SLC wiring to the module terminals 1 (–) and 2 (+). Each AMM-4F module takes one address on the SLC. See the rotary switches to set it to the required SLC address.

Figure 5.5 shows typical wiring for a supervised and power-limited NFPA Class B Initiating Device Circuit using the AMM-4F monitor module.

Module installation notes:

1. The Initiating Device Circuit (IDC) is supervised and current-limited to 210 microamps @ 24 VDC (nominal).
2. The IDC provides the following services (do not mix):
   - Fire alarm service
   - Automatic and manual waterflow alarm service with normally open contact devices
   - Sprinkler supervisory service with normally open contact devices
   - Security service
3. Refer to the *Device Compatibility Document* for compatible smoke detectors.
4. See Appendix A, “Power Considerations”, on page 49 for information on supervising 24 VDC power.

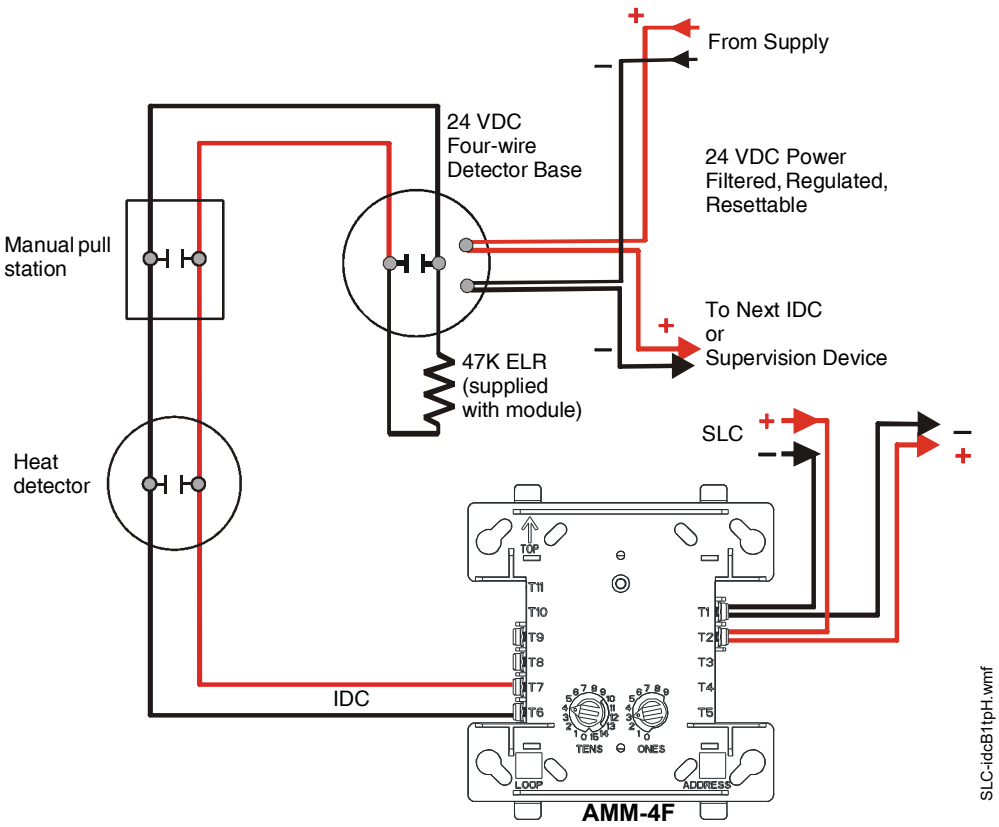


Figure 5.5 Typical Class B IDC Wiring with AMM-4F

5.4 NFPA Class A IDC Using Monitor Modules

Connect the SLC wiring to the module terminals 1 (–) and 2 (+).

Each AMM-4F module takes one address on the SLC. se the rotary switches to set it to the required SLC address.

Figure 5.6 shows typical wiring for a supervised and power-limited NFPA Class A IDC using the AMM-4F module.

Module installation notes:

1. The Initiating Device Circuit (IDC) is supervised and current-limited to 210 microamps @ 24 VDC (nominal). See Appendix A, “Power Considerations”, on page 49 for information on monitoring 24 VDC power.
2. The IDC provides the following services (do not mix):
   - Fire alarm service
   - Automatic and manual waterflow alarm service with normally open contact devices
   - Sprinkler supervisory service with normally open contact devices
   - Security service
3. Refer to the *Device Compatibility Document* for compatible smoke detectors.

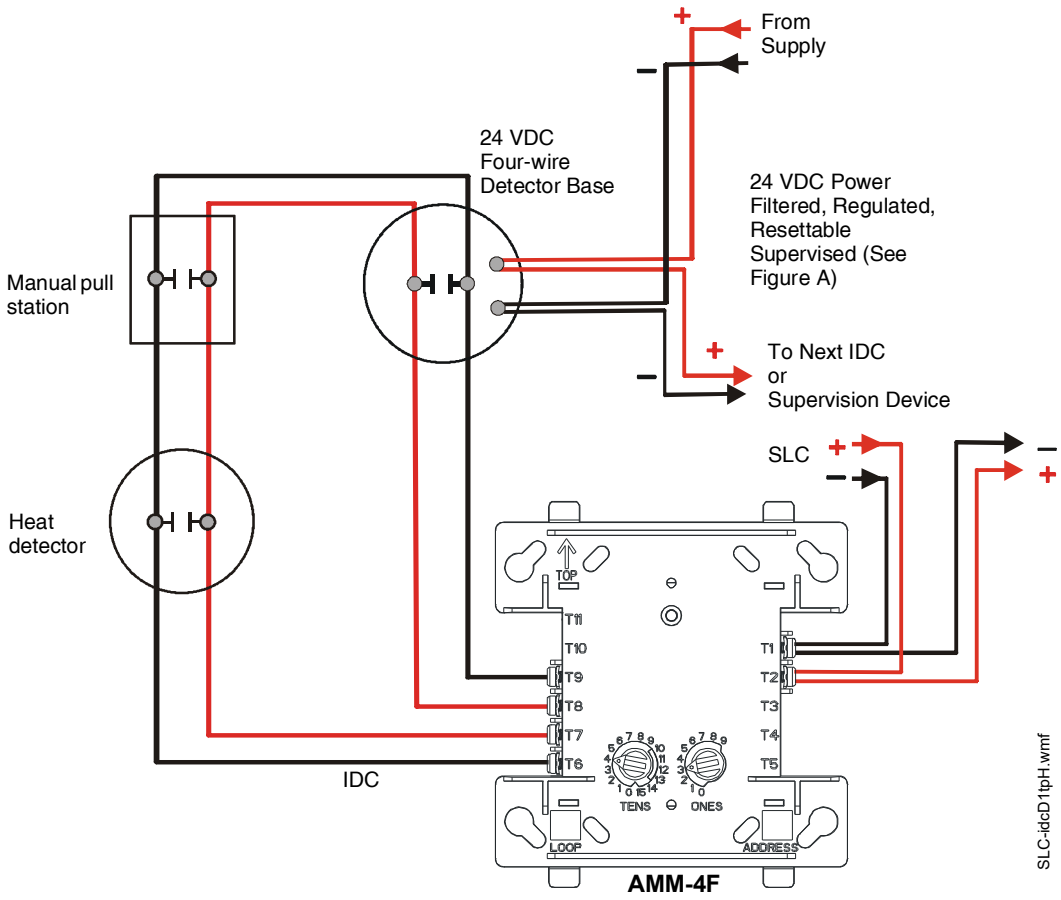


Figure 5.6 Typical Class A IDC Wiring with AMM-4F

5.5 NFPA Class B IDC Using Zone Interface Modules

Connect the SLC wiring to the module terminals 1 (–) and 2 (+).

Each AMM-4SF module takes one address on the SLC. se the rotary switches to set it to the required SLC address.

Figure 5.7 shows typical wiring for a supervised and power-limited NFPA Class B IDC using the AMM-4SF module.

Module installation notes:

1. The Initiating Device Circuit (IDC) is supervised and current-limited to 210 microamps @ 24 VDC (nominal).
2. The IDC provides the following services (do not mix):
   - Fire alarm service
   - Automatic and manual waterflow alarm service with normally open contact devices
   - Sprinkler supervisory service with normally open contact devices
3. Refer to the *Device Compatibility Document* for compatible smoke detectors.

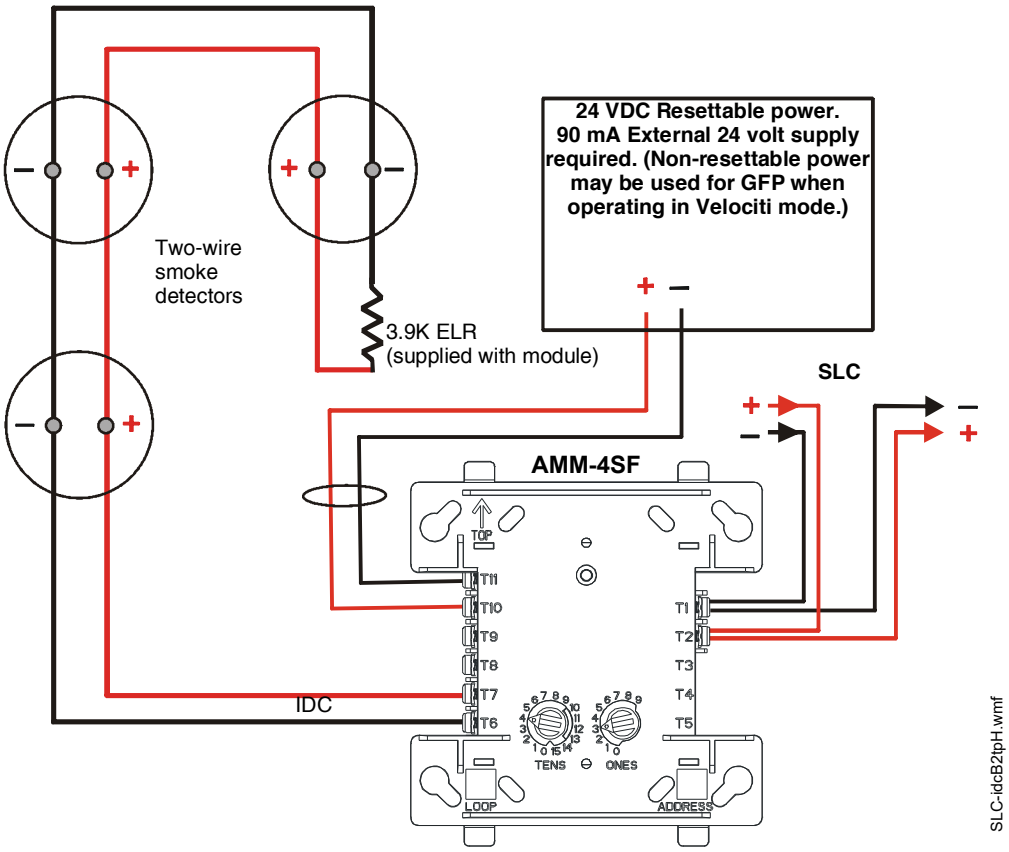


Figure 5.7 Typical Class B IDC Wiring with AMM-4SF

5.6 NFPA Class A IDC Using Zone Interface Modules

Connect the SLC wiring to the module terminals 1 (–) and 2 (+).

Each AMM-4SF module takes one address on the SLC. se the rotary switches to set it to the required SLC address.

Figure 5.8 shows typical wiring for a supervised and power-limited NFPA Class A IDC using the AMM-4SF module.

Module installation notes:

1. The Initiating Device Circuit (IDC) is supervised and current-limited to 210 microamps @ 24 VDC (nominal). See Appendix A, “Power Considerations”, on page 49 for information on monitoring 24 VDC power.
2. The IDC provides the following services (do not mix):
   - Fire alarm service
   - Automatic and manual waterflow alarm service with normally open contact devices
   - Sprinkler supervisory service with normally open contact devices
3. Refer to the *Device Compatibility Document* for compatible smoke detectors.

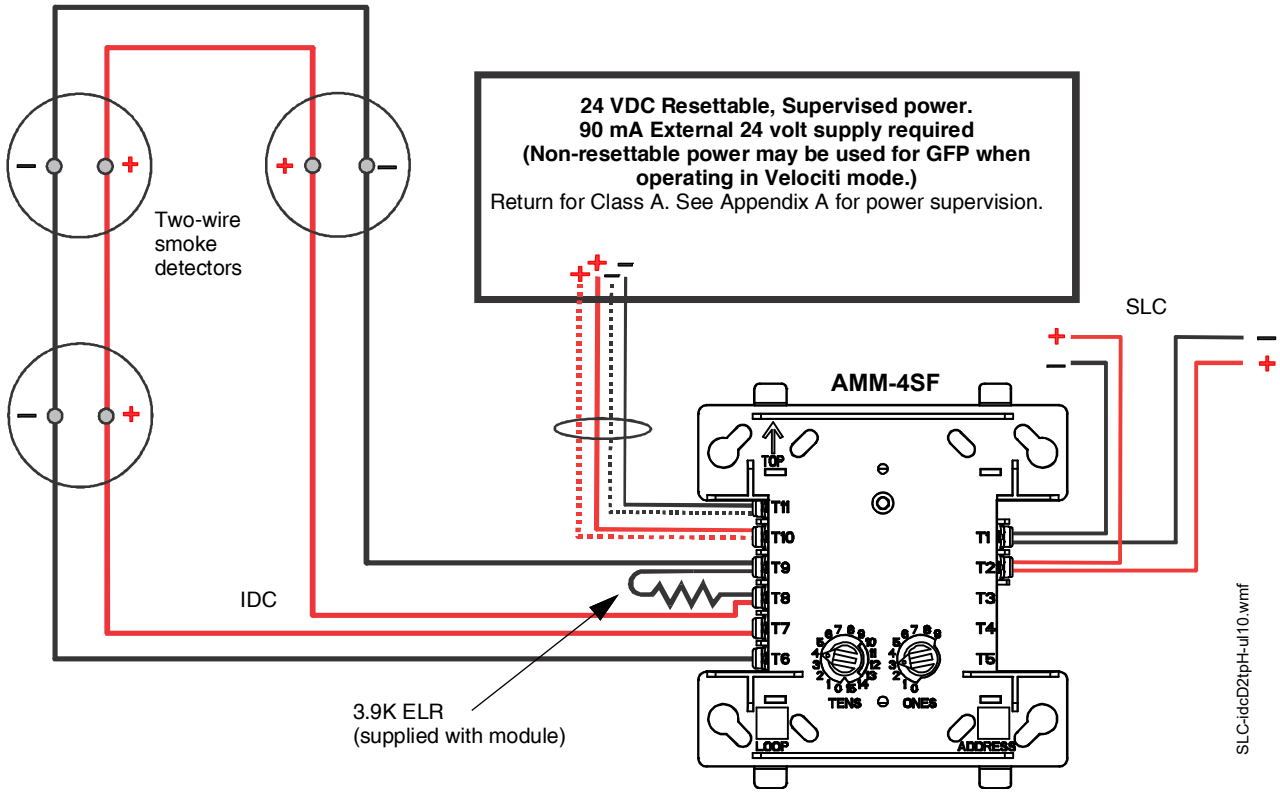


Figure 5.8 Typical Class A IDC Wiring with AMM-4SF

Section 6: Control Modules

6.1 Description

The AOM-2SF module addressable module that can be used for monitoring and switching 24 VDC Notification Appliance Circuit (NAC) power for NFPA Class B and NFPA Class A circuits.

The TC810S1000 is an addressable module used to switch an external power supply to a solenoid. The TC810S1000 can be configured for NFPA Class B or Class A wiring. When using the TC810S1000 for Class B applications, remove jumper J1 on the back. Refer to Figure 6.2.

Refer to the *Device Compatibility Document* for a list of compatible UL Listed Fire Alarm Releasing Solenoids. For more information on the module specifications refer to the *Installation Instructions* provided with these devices.

For Class A power-supervision requirements, refer to Appendix A.2, “Supervising 24 VDC Power”, on page 49.

6.1.1 Setting an SLC Address

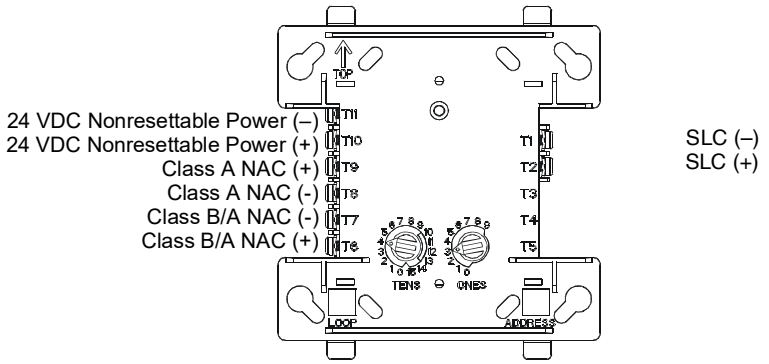
Each module is factory preset with an address of “00.” To set an SLC address refer to “Setting an SLC Address for a Module” on page 27.

6.2 Wiring a NAC with Addressable Control Modules

Connect the SLC wiring to the module terminals 1 (–) and 2 (+).

Each AOM-2SF module takes one address on the SLC. se the rotary switches to set it to the required SLC address.

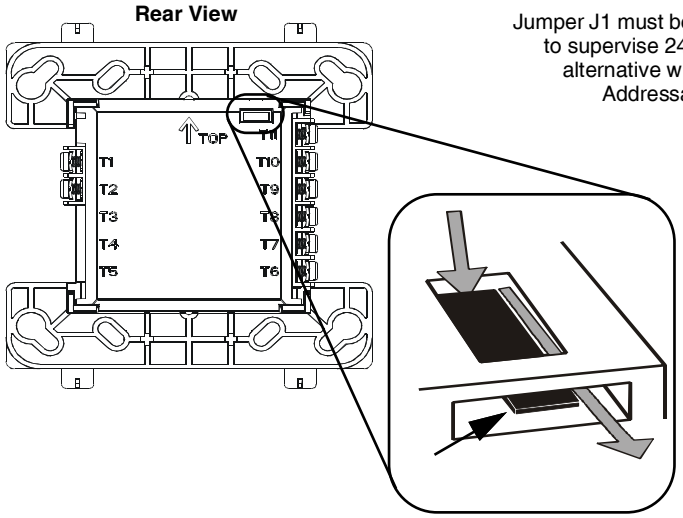
Figure 6.1 shows the connections to wire the module for powering a 24 VDC NAC



FZMFCMtph.wmf

Figure 6.1 AOM-2SF Wiring Connections

To remove jumper J1 from the back of the control module, follow the instructions below.



Jumper J1 must be removed when using the AOM-2SF to supervise 24 VDC NAC power using the no-relay alternative wiring (see Appendix A.2.3, “Using the Addressable Control Module Without Relay”).

To remove J1 from the AOM-2SF:

1. Insert a small prying tool, such as a screwdriver or probe, behind J1.
2. Using the tip of the prying tool, slide J1 toward the rear of the module so that it exits from the slot in the back.

J

FCMBackJump.wmf, FCMBackJumpcl.wmf

Figure 6.2 AOM-2SF Jumper Location

NOTE: When using GFP and the “Control Type” ID, do not remove jumper J1.

6.2.1 Wiring a Solenoid with the TC810S1000

Figure 6.3 shows the connections to wire the TC810S1000 to a solenoid. For UL 864 10th edition applications requiring a manual disconnect switch on the releasing device, see Section 6.5, “Connecting a Releasing Device to the Addressable Control Module”.

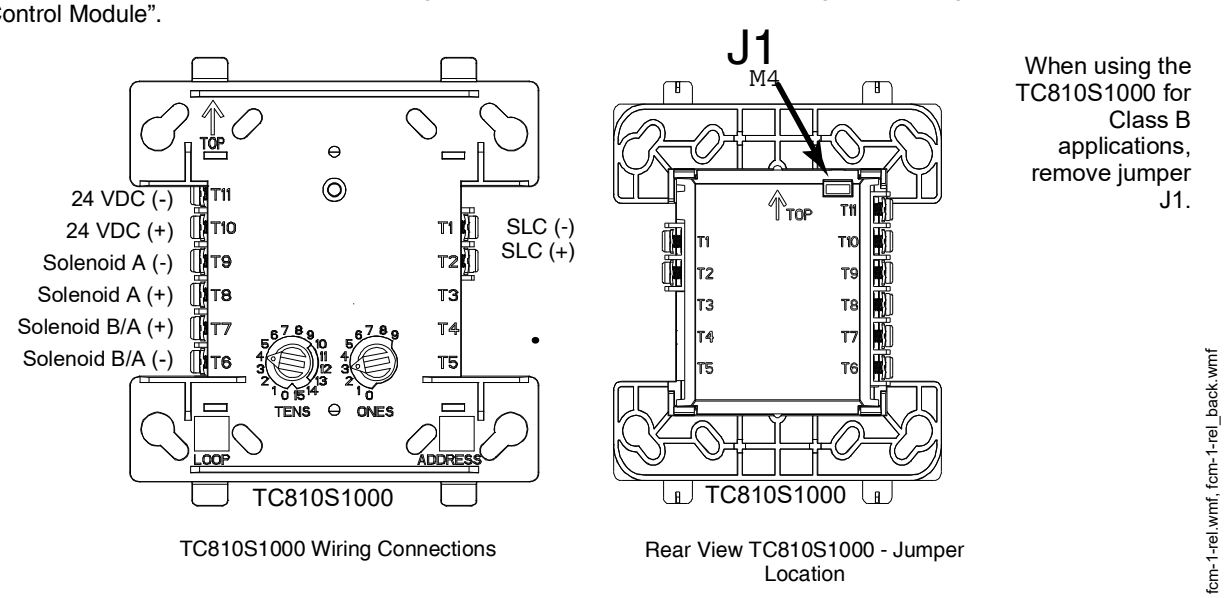


Figure 6.3 Wiring Locations and Rear View - Jumper Location

NOTE: Velociti mode only: The TC810S1000 will not function on an SLC loop that is programmed for CLIP mode.

6.3 Wiring a Class B NAC (Two-Wire) with Addressable Control Modules

Figure 6.4 depicts a supervised and power-limited TC810S1000 Class B Notification Appliance Circuit (NAC) using the AOM-2SF module. In the sample wiring drawing below, polarized alarm notification appliances are shown connected to the module in a two-wire configuration.

1. See Appendix A, “Power Considerations”, on page 49 for information on monitoring 24 VDC power.
2. Each module can control 2 amps of resistive load (on electronic devices) or 1 amp of inductive load (on mechanical bells and horns).
3. A power supervision relay is required only on the last module of the power run unless:
   - using the no-relay alternative wire method; see Figure A.2, “Alternate: 2-Address Method of Supervising a 24 VDC Circuit - Class B”.
   - using a panel with Velociti type IDs that provide built-in power supervision. Refer to the panel’s installation documentation for a list of type codes.
4. Do not T-tap or branch a Class B circuit.
5. Terminate the circuit across the last device using a UL-listed End-of-Line Resistor 47K, 1/2-watt, SSD P/N A2143-00 .
6. Do not loop wiring under the screw terminals of any notification appliance. To maintain supervision, break the wire run at each device.
7. Refer to *Device Compatibility Document* for compatible notification appliances and relays.

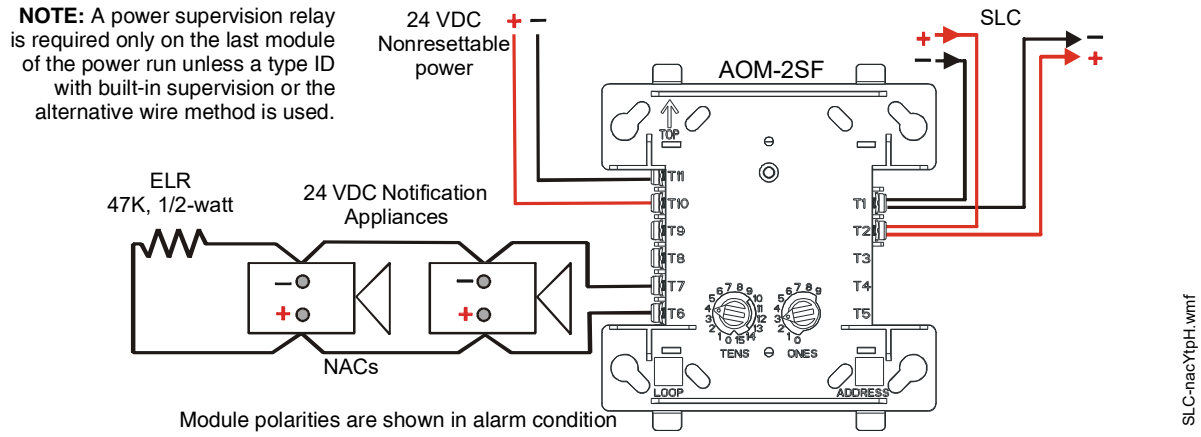


Figure 6.4 NFPA Class B Notification Appliance Circuit with AOM-2SF

6.4 Wiring a Class A NAC (Four-Wire) with Addressable Control Modules

Figure 6.5 depicts a supervised and power-limited NFPA Class A Notification Appliance Circuit (NAC) using the AOM-2SF module. In the sample wiring drawing below, polarized alarm notification appliances are shown connected to the module in a four-wire configuration.

1. See Appendix A, “Power Considerations”, on page 49 for information on supervising 24 VDC power.
2. Each module can control 2 amps of resistive load (on electronic devices) or 1 amp of inductive load (on mechanical bells and horns).
3. A power supervision relay is required only on the last module of the power run unless:
   - using the no-relay alternative wire method; see Figure A.2, “Alternate: 2-Address Method of Supervising a 24 VDC Circuit - Class B”.
   - using a panel with Velociti type IDs that provide built-in power supervision. Refer to the panel installation documentation for a list of type codes.
4. Do not T-Tap or branch a Class A circuit.
5. Do not loop wiring under the screw terminals of any notification appliance. To maintain supervision, break the wire run at each device.
6. Refer to the *Device Compatibility Document* for compatible notification appliances and relays.

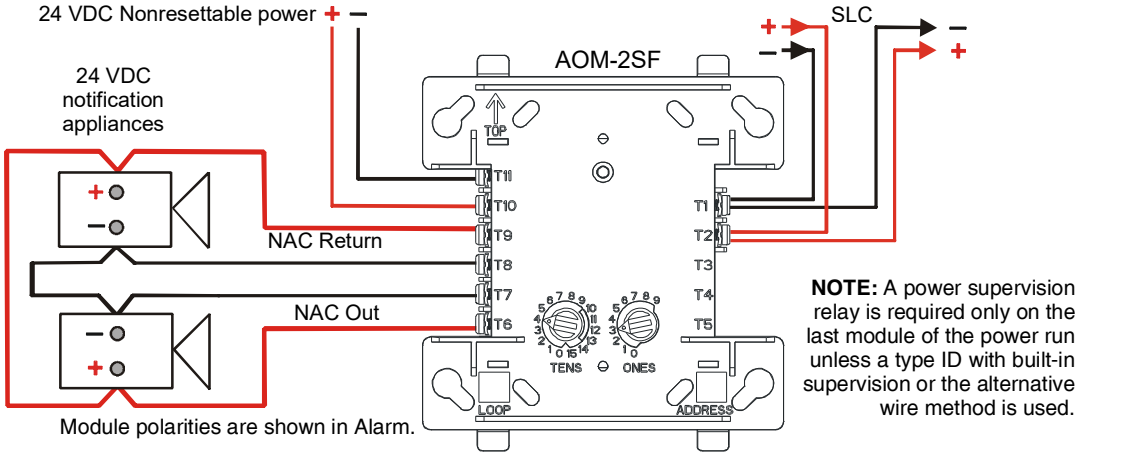


Figure 6.5 NFPA Class A Notification Appliance Circuit with AOM-2SF

6.5 Connecting a Releasing Device to the Addressable Control Module

The **TC810S1000** module can control 2A of current. Make sure to keep total system current within the limits of the power supply. Power for the module must come from the FACP’s main power supply or any UL 864-listed 24 VDC regulated, power-limited power supply for Fire Protective Signaling. For more information, refer to the *Device Compatibility Document.* .

Critical Requirements. When connecting a releasing device to the TC810S1000 module, note the following:

1. See Appendix A, “Power Considerations”, on page 49 for information on monitoring 24 VDC power.
2. Do not T-tap or branch a Class B or Class A circuit.

3. Only one (1) 24V solenoid or two (2) 12V solenoids in series can be connected to the TC810S1000 .
4. Do not loop wiring under the screw terminals. Break the wire run to provide supervision of connections.
5. All applications using the TC810S1000 are power-limited:
   - Program the releasing circuit for Type Code RELEASE CKT.
   - Circuits are supervised against opens and shorts.
6. Refer to your FACP's listing documents for instructions on setting the Soak Timer.
7. The TC810S1000 module must be programmed with the correct releasing type code listed in your FACP's listing documents.
   (* For legacy panels, refer to the FACP programming manual.)
8. Manual releasing disconnect switch and monitor module required for UL 864 10th Edition.

Figure 6.6 shows Class B wiring of the TC810S1000 with MRD-1H with a manual releasing disconnect switch. See Installation Document LS10231-000GE-E for MRD-1 wiring.

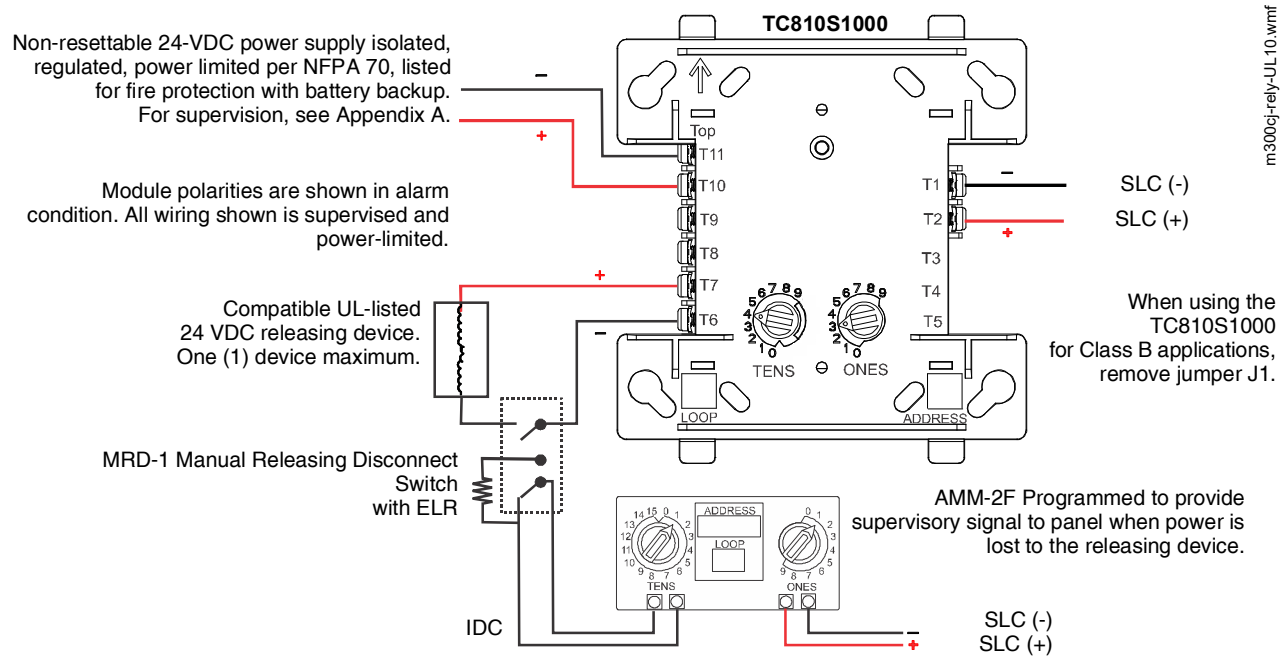


Figure 6.6 NFPA Class B Wiring of the TC810S1000 with MRD-1 Manual Releasing Disconnect Switch and AMM-2F

Figure 6.7 shows Class A wiring of the TC810S1000 with a double-pull/single-throw manual releasing disconnect switch. (For use with See Installation Document LS10231-000GE-E for MRD-1 wiring.)

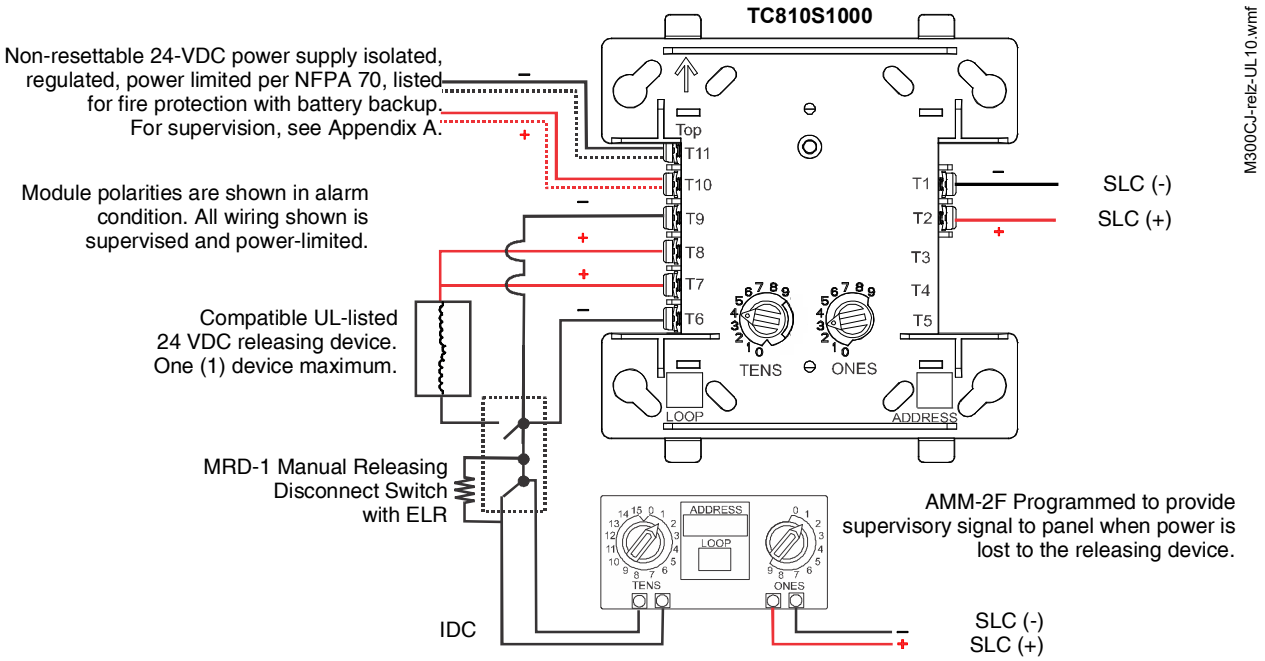


Figure 6.7 NFPA Class A Wiring of the TC810S1000 with MRD-1 Manual Releasing Disconnect Switch and AMM-2F

Section 7: Relay Module

7.1 Description

The AOM-2RF addressable module that provide two isolated sets of Form-C relay contacts.

Ratings for the dry relay contacts on a Form-C module are:

- Resistive – 2 amps @ 30 VDC (e.g. Electronic devices and strobes.)
- Inductive – 1 amp @ 30 VDC (0.6pF) (e.g. Mechanical bells and horns.)
- Pilot Duty – 0.5 amp @ 125 VAC (0.35pF) (e.g. Using a smaller relay to trip another relay.)

For more information on the module specifications refer to the installation instructions provided with this device. For information on transponders, refer to the specific transponder manual.

7.1.1 Setting an SLC Address

Each relay module is factory preset with an address of “00.” To set an SLC address refer to Section 5.2, “Setting an SLC Address for a Module”, on page 27.

7.2 Wiring the Addressable Relay Module (Form-C Relay)

The figure below shows the AOM-2RF module wired to the Control Panel.

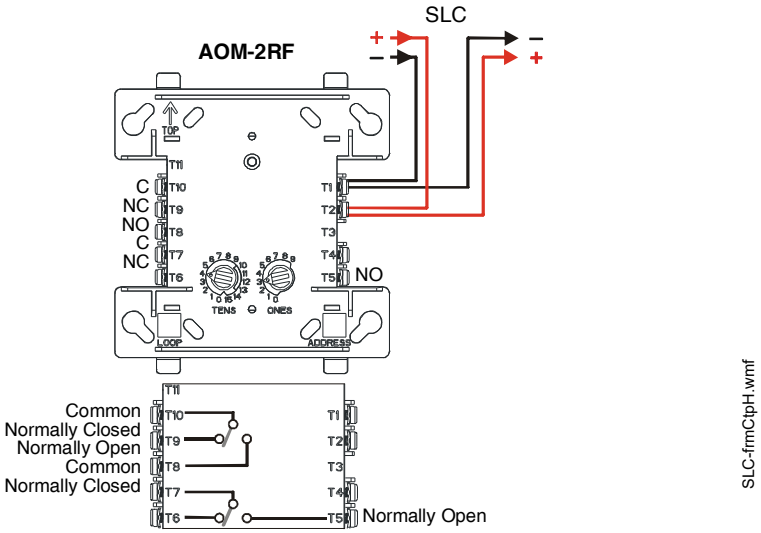


Figure 7.1 AOM-2RF Relay Module Wiring Connections

Section 8: Multiple Input/Output Modules

8.1 Description

The AMM-2IF is similar to the AMM-4F, except intended for use in intelligent two-wire systems providing two independent Class B IDCs at two separate, consecutive addresses. Addresses can start using either an even or odd number.

NOTE: GFP does not support Legacy Type V . (See Appendix C, “Terminal Conversion Charts for V-type and H-type Devices”, on page 54 for identification.)

8.1.1 AMM-2RIF

The AMM-2RIF is an addressable module that functions as two individual relay control modules (two isolated sets of Form-C relay contacts) and two Class B monitor modules.

Ratings for the dry relay contacts on a Form-C module are:

Load Description	Application	Maximum Voltage	Current Rating
Inductive (PF = 0.35)	Non-Coded	25 VAC	2.0 A
Resistive	Non-Coded	30 VDC	3.0 A
Resistive	Coded	30 VDC	2.0 A
Inductive (L/R = 20ms)	Non-Coded	30 VDC	0.46 A
Inductive (PF = 0.35)	Non-Coded	70.7 VAC	0.7 A
Resistive	Non-Coded	125 VDC	0.9 A
Inductive (PF = 0.75)	Non-Coded	125 VAC	0.5 A
Inductive (PF = 0.35)	Non-Coded	125 VAC	0.3 A

Table 8.1

For more information on the module specifications refer to the installation instructions provided with this device.

8.2 Setting the SLC Address

Each multiple input/output module is factory preset with an address of “00”. To set an SLC address, use a screwdriver to adjust the rotary switches on the module to the desired address.

8.2.1 AMM-2IF

Each AMM-2IF module can use up to two (2) addresses. The base address selected via the rotary address switches will be assigned to the first monitored input. The next consecutive address will be assigned to the second monitored input.

8.2.2 AMM-2RIF

Each AMM-2RIF module can use up to four (4) addresses. The base address selected via the rotary address switches will be assigned to relay output #1 from 00 to 156. The module will automatically assign the next three addresses as appropriate to monitored input #1, relay output #2, and monitored input #2.

8.3 Wiring the Dual Monitor Module

The figure below shows the AMM-2IF wired to the control panel.

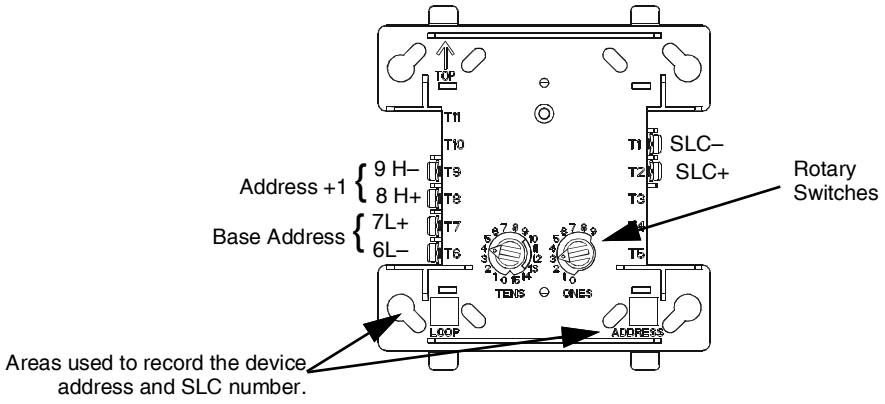


Figure 8.1 AMM-21F Dual Monitor Module

8.4 Wiring the Addressable Dual Monitor/Dual Relay Module

The figure below shows the AMM-2RIF module wired to the control panel.

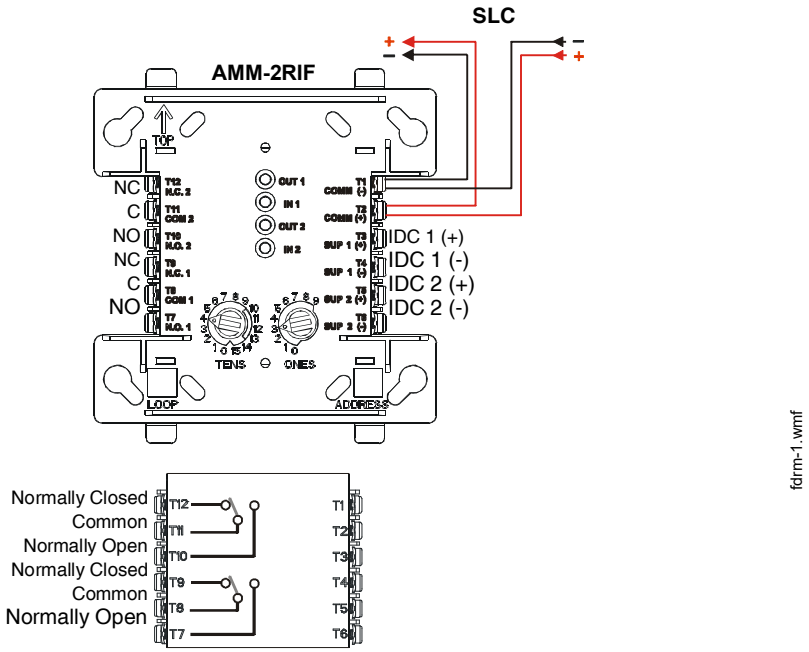


Figure 8.2 AMM-2RIF Multiple Input/Output Module Wiring Connections

8.5 NFPA Class B IDC Wiring Using Dual Monitor Modules

Connect the Velociti or CLIP SLC wiring to the module terminals 1 (–) and 2 (+).

Use the rotary switches on the module to set it to the required SLC address. Each dual module takes two addresses on the SLC. Circuit 'L' corresponds to the address set on rotary switches. Circuit 'H' will automatically respond at the next higher address. The Circuit L "base address" is always an even number; the lowest possible address is 02. The Circuit H "base + 1" address is always odd. Use caution to avoid duplicate addressing of modules on the system.

Each IDC (H & L) is power limited to 230 microamps @ 24 VDC.

Figure 8.3 shows typical wiring for a supervised and power-limited NFPA Class B Initiating Device Circuit using the dual monitor.

Module installation notes:

1. The Initiating Device Circuit (IDC) is supervised and current-limited to 210 microamps @ 24 VDC (nominal).
2. The IDC provides the following services (do not mix):
   - Fire alarm service
   - Automatic and manual waterflow alarm service with normally open contact devices
   - Sprinkler supervisory service with normally open contact devices

Refer to the *Device Compatibility Document* for compatible smoke detectors.

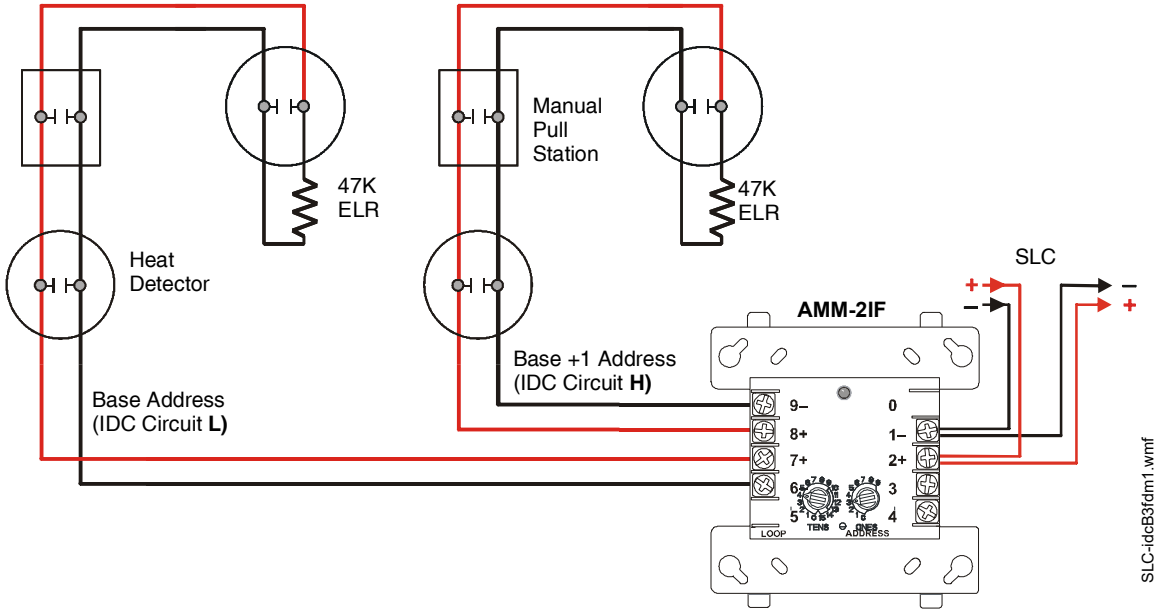


Figure 8.3 Typical Class B IDC Wiring with AMM-2IF

Section 9: Intelligent Detector Bases and Wireless Gateway

9.1 Description

For Class A power-supervision requirements, refer to Appendix A.2, “Supervising 24 VDC Power”, on page 49.

- B501 Series: 4-inch flangeless plug-in detector base. (Velociti/CLIP; Figure 9.1) For white order B501-WHITE. For ivory, order B501-IV. For black, order B501-BL.
- B300-6: 6-inch plug-in detector base. White. For ivory, order B300-6-IV. Replacement model for B210LP. (Velociti/CLIP; Figure 9.1)
- B210LP: 6-inch flanged plug-in detector base. (Velociti/CLIP; Figure 9.1)
- B224BI-WH, B224BI-IV Isolator base (Figure 9.3). (-WH is white; -IV is ivory). (Replaces B224BI, legacy ivory)
- B224RB-WH, B224RB-IV (Velociti/CLIP, plug-in relay detector base; Figure 9.4). (-WH is white; -IV is ivory).
- B200S-WH, B200S-IV: Intelligent sounder base (See Figure 9.5). (-WH is white; -IV is ivory).
- B200S-LF-WH, B200S-LF-IV: Intelligent low-frequency sounder base (See Figure 9.5). (-WH is white; -IV is ivory).
- B200SR-WH, B200SR-IV: Intelligent programmable sounder base (See Figure 9.6). (-WH is white; -IV is ivory).
- B200SR-LF-WH, B200SR-LF-IV: Intelligent programmable low-frequency sounder base (See Figure 9.6). (-WH is white; -IV is ivory).
- B501BH Standard sounder base. *(Discontinued)*
- B501BH-2 UL 864 9th edition compliant standard sounder base. *(Discontinued)*
- B501BHT-2 UL 864 9th edition compliant temporal sounder base, replaces B501BHT. *(Discontinued)*

For more information refer to the *Installation Instructions* documents provided with these devices.

NOTE: White/Ivory/Black bases are color variations only and use the wiring diagrams provided in the SLC Wiring Manual.

9.1.1 Wireless Gateway

The VW-GATE Wireless Gateway acts as a bridge between a group of wireless fire devices, and a Velociti SLC loop on GFP. The gateway can be powered by the SLC loop or by an external 24 VDC, UL-listed power supply. See 9.6, "Wiring the VW-GATE".

NOTE: When a wireless relay is in use, modules device count must be limited to 109 modules per loop. This includes wired and wireless modules that are on the same loop. The module address range must be within 1-109.

For details about the wireless network itself, see the S*WIFT® Wireless Gateway Manual*.

9.2 Wiring a Detector Base

Figure 9.1 shows typical wiring of a standard detector base (B501 is shown) connected to an SLC. An optional RA100Z Remote LED Annunciator is shown connected to the base.

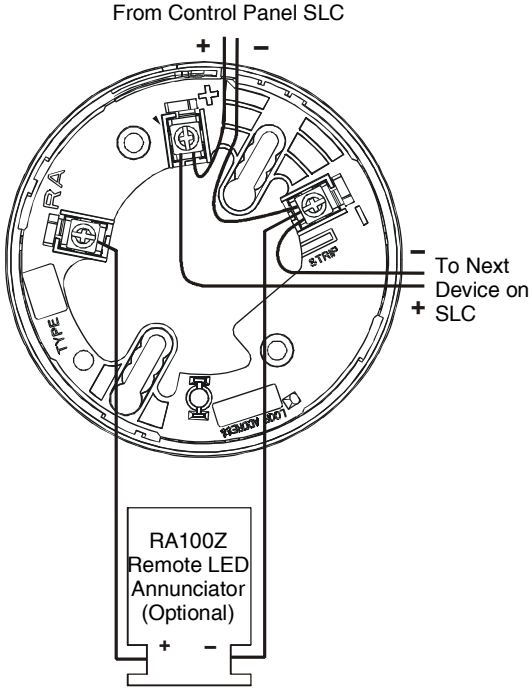


Figure 9.1 Wiring Detector Base B300-6/-IV, B210LP, or B501

NOTE: The base wiring is identical for the flanged B300-6, B210LP, flangeless B501, and color variations.

Figure 9.2 shows typical wiring of the detector base (for use with a HARSH™ detector) connected to an SLC. An optional RA100Z Remote LED Annunciator is shown connected to the base.

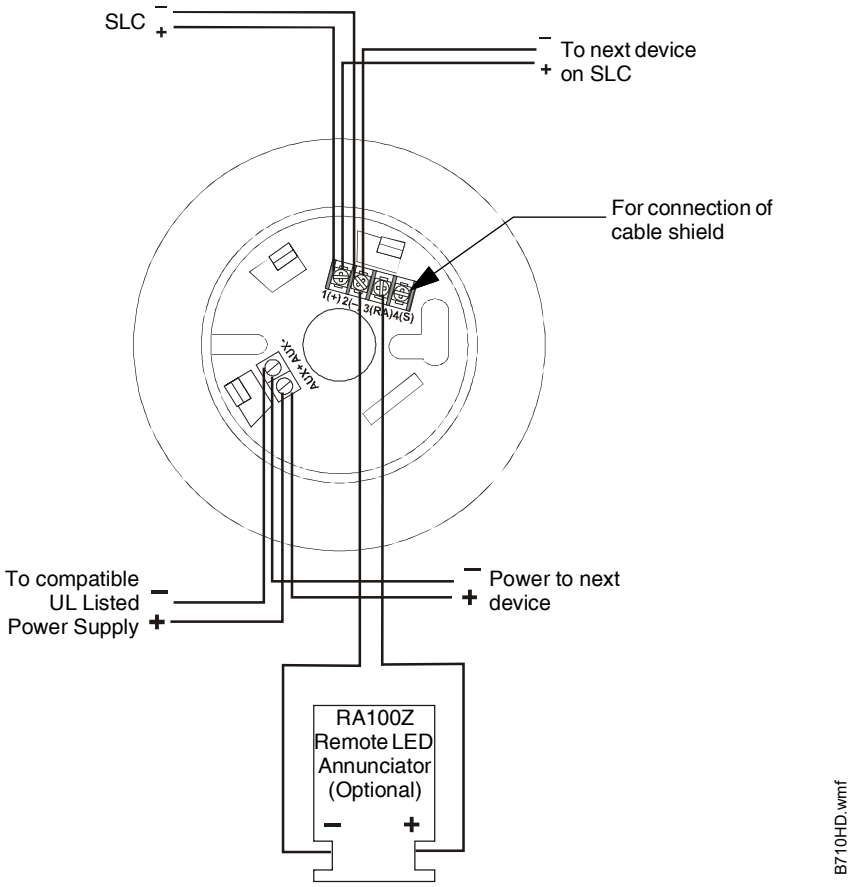


Figure 9.2 Wiring of the Detector Base

NOTE: Use a spade lug to wire the Remote LED Annunciator (–) to Terminal 2 (–).

9.3 Wiring an Isolator Base

The Isolator base will isolate its detector from short circuits that occur on the SLC connected at terminals 3 and 2. It will not isolate its installed detector from short circuits that occur on the SLC connected at terminals 1 and 2. In Class X applications, the loss of a single detector during a short circuit is not acceptable, and an isolator module must be installed as shown in the figure below.

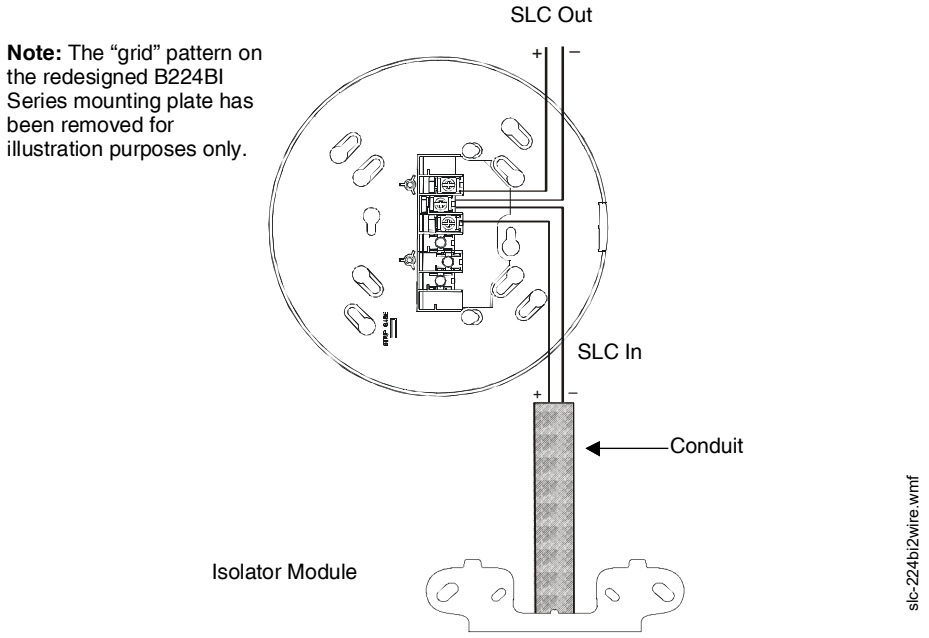


Figure 9.3 Wiring a B224BI-WH/B224BI-IV Isolator Base Mounting Plate

NOTE: The base wiring is identical for color variations.

9.4 Wiring a Relay Base

Figure 9.4 shows typical wiring of the B224RB plug-in relay detector base connected to an SLC.

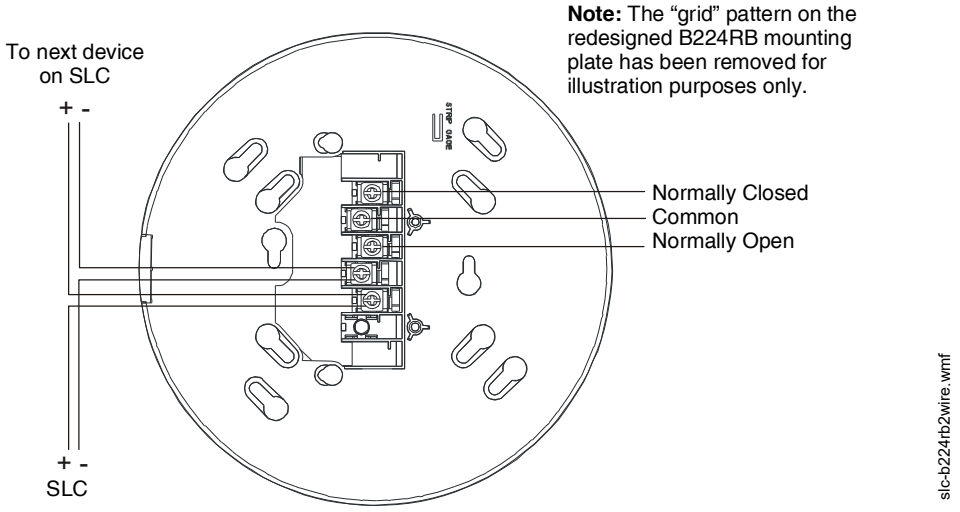


Figure 9.4 Wiring of a B224RB Relay Base Mounting Plate

NOTE: The base wiring is identical for color variations.

9.5 Wiring a Sounder Base

Figure 9.5 shows typical wiring of the B200S and B200S-LF Sounder Bases.

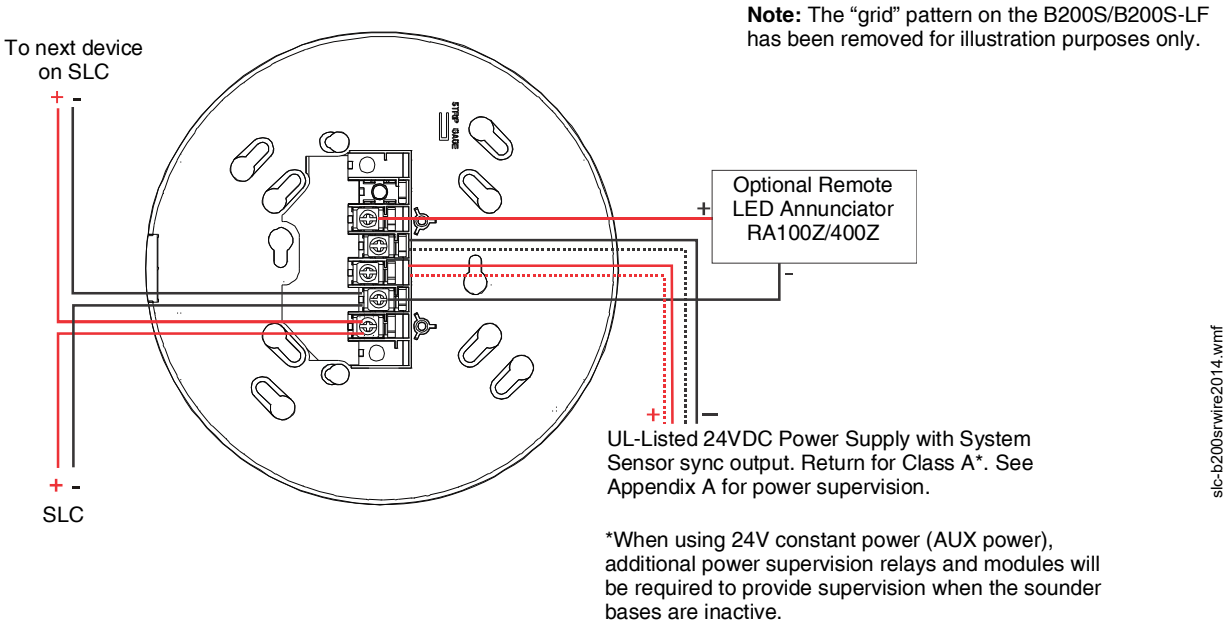


Figure 9.5 Wiring of the B200S/B200S-LF Sounder Base

Figure 9.6 shows typical wiring of the B200SR and B200SR-LF Sounder Base.

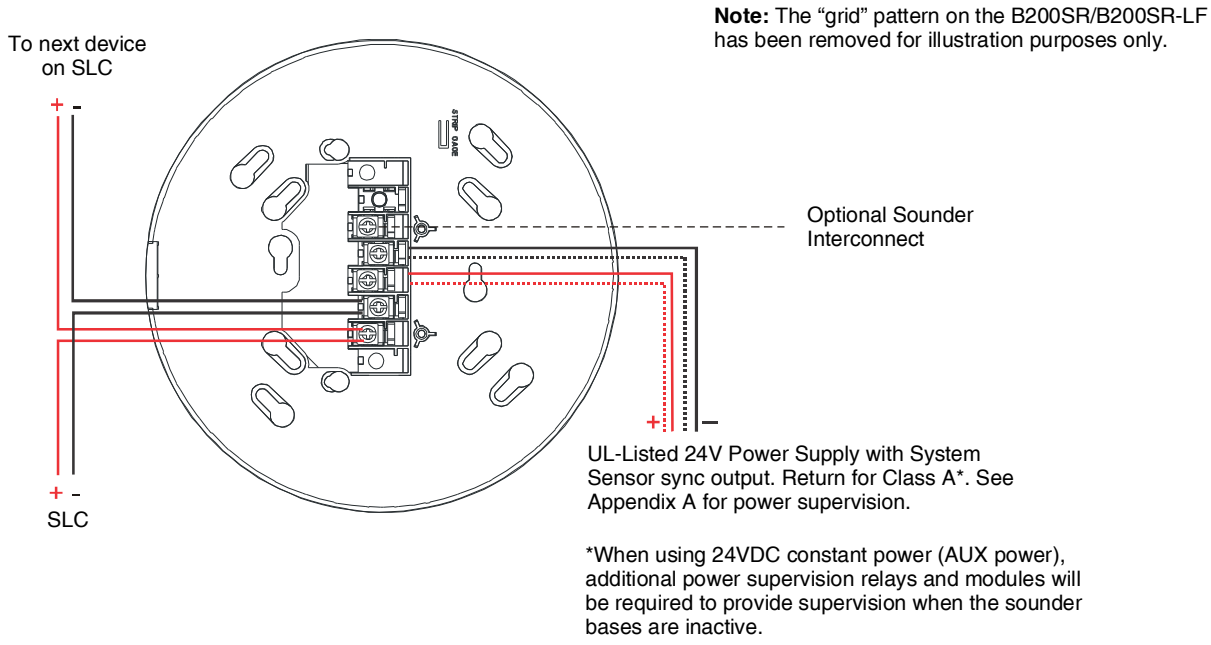


Figure 9.6 Wiring of the B200SR/B200SR Sounder Base

NOTE: The base wiring is identical for color variations. For more detailed wiring on sounder bases, refer to the device's installation instructions.

9.6 Wiring the VW-GATE

NOTE: The VW-GATE as part of the wireless network has been tested for compliance with the Federal Communications Commission (FCC) requirements of the United States Government. This product has not been evaluated for use outside the USA. Use of this system outside the USA is subject to local laws and rules to which this product may not conform. It is the sole responsibility of the user to determine if this product may be legally used outside the USA.

9.6.1 SLC Connections

The Wireless Gateway acts as a bridge between a group of wireless fire devices and a Velociti SLC loop on GFP. It is powered by the SLC loop or by an external 24 VDC UL-listed power supply. Available wireless devices include a photo detector, a photo/heat detector, a fixed-temperature heat detector, a rateof-rise heat detector, and a monitor module. For details about wireless devices, system setup, and operation, see the *SWIFT® Wireless Gateway Manual*.

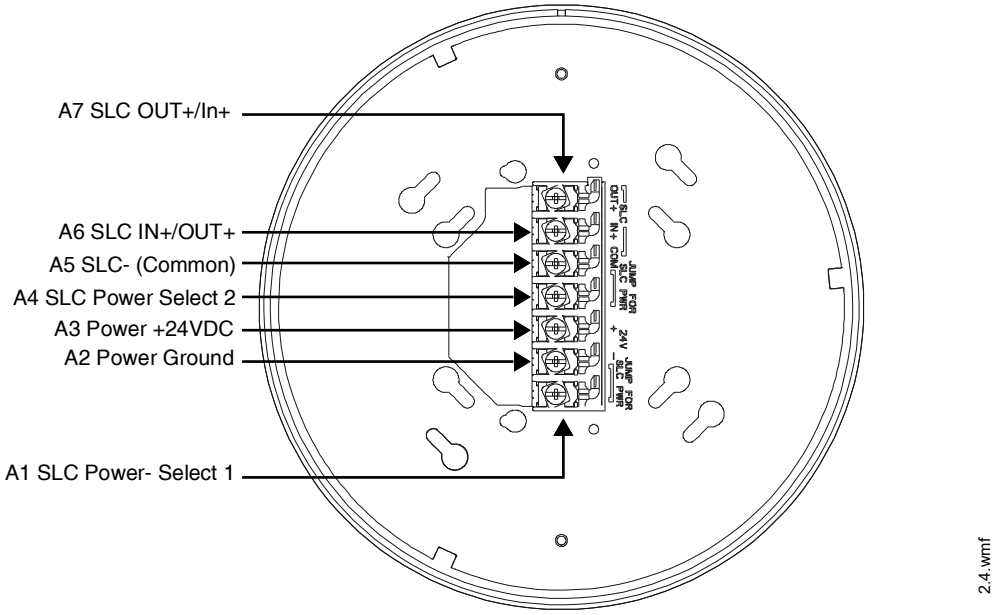


Figure 9.7 VW-GATE Mounting Plate - Terminal Layout

9.7 Power Connections: Powered by the SLC

The VW-GATE provides isolation of short circuits on the SLC in Class A installations. SLC connections are power-limited by the panel. An interruption in the SLC that causes a loss of power at the VW-GATE for more than 100ms may result in a trouble condition and loss of fire protection provided by the wireless devices for approximately 15 minutes. Use of an external +24V power source (not SLC power) is recommended for installations that require fire protection in the presence of short circuits, including Class A applications and applications that use isolator modules. Figure 9.8 on page 47 shows typical wiring of a Wireless Network Gateway connected to an SLC when power is supplied by the SLC loop.

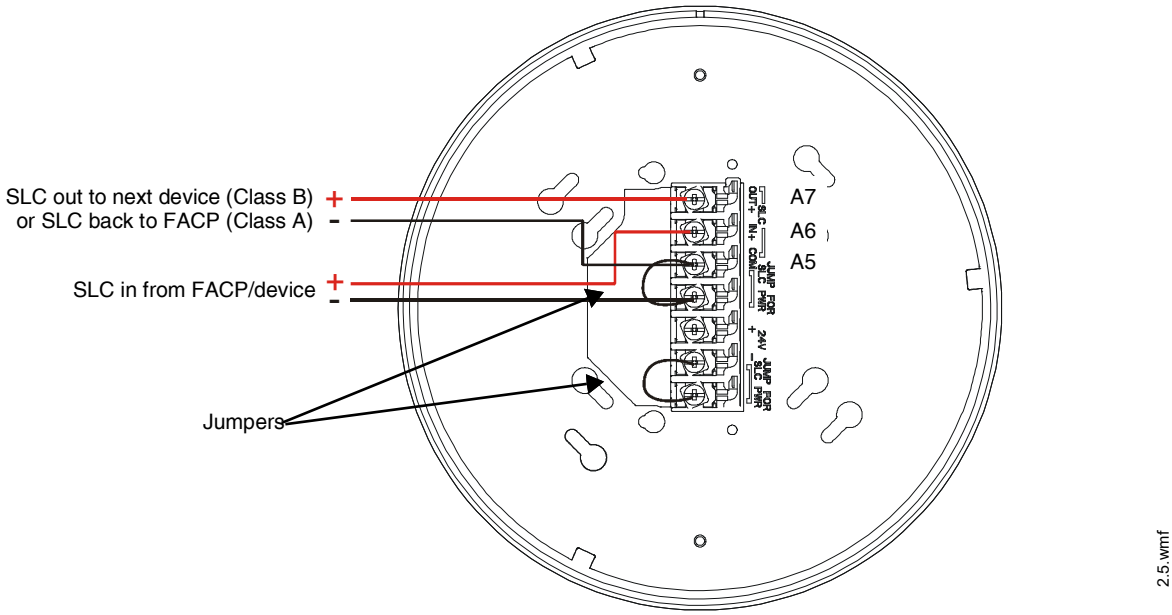


Figure 9.8 VW-GATE Wiring Diagram, Powered by the SLC Loop*

9.7.1 Power Connections: External, Regulated +24 VDC Power Source

The VW-GATE provides isolation of short circuits of the SLC in Class A installations. SLC connections are power-limited by the panel. +24VDC must be power-limited by the source. Figure 9.9 on page 47 shows typical wiring of a Wireless Network Gateway connected to an SLC when power is supplied by an external, regulated 24 VDC power supply, UL-listed for fire protective service.

For specifics of UL 10th Edition power-supervision requirements, refer to the SWIFT Gateway Manual.

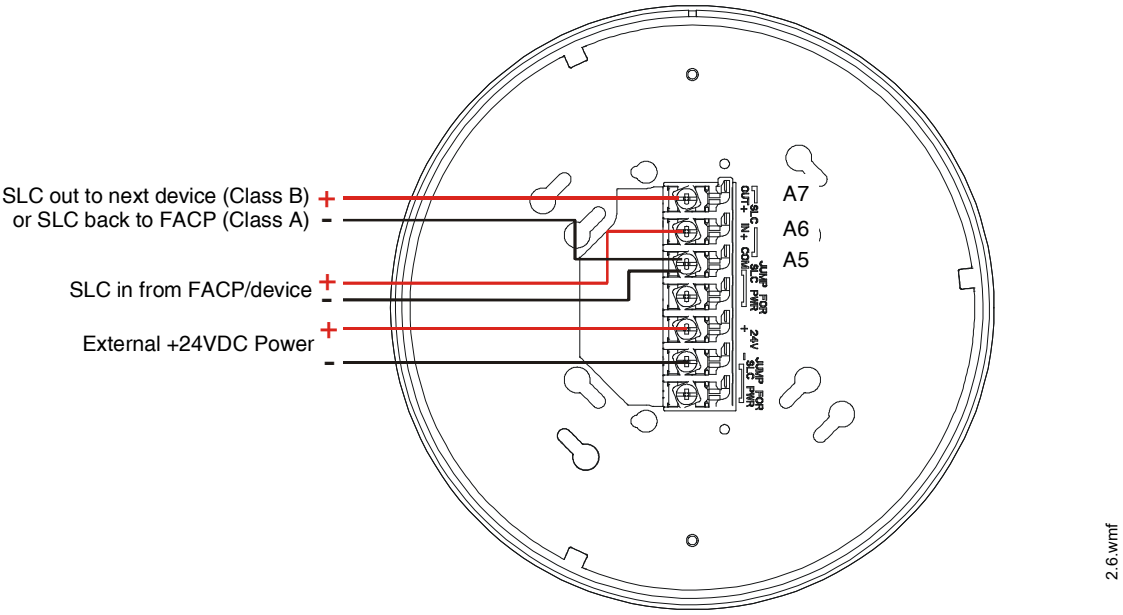


Figure 9.9 VW-GATE Wiring Diagram, Powered by External 24 VDC Power Source*

NOTE: Terminal A5 is referenced more than once in the above connections. It is recommended to use wire of the same gauge for all connections to A5 and use the same wire gauge if there are multiple connections to the same terminal.

Section 10: Addressable Manual Pull Stations

10.1 Description

The MS-7ASF addressable manual pull station with a key-lock reset feature.

For more information refer to the Installation Instructions document provided with the devices.

10.1.1 Setting an SLC address

Each unit is factory preset with an address of “00.” To set an SLC address refer to “Setting an SLC Address for a Module” on page 27.

10.2 Wiring a Manual Pull Station

Typical wiring for the Manual Pull Station to an SLC is shown below.

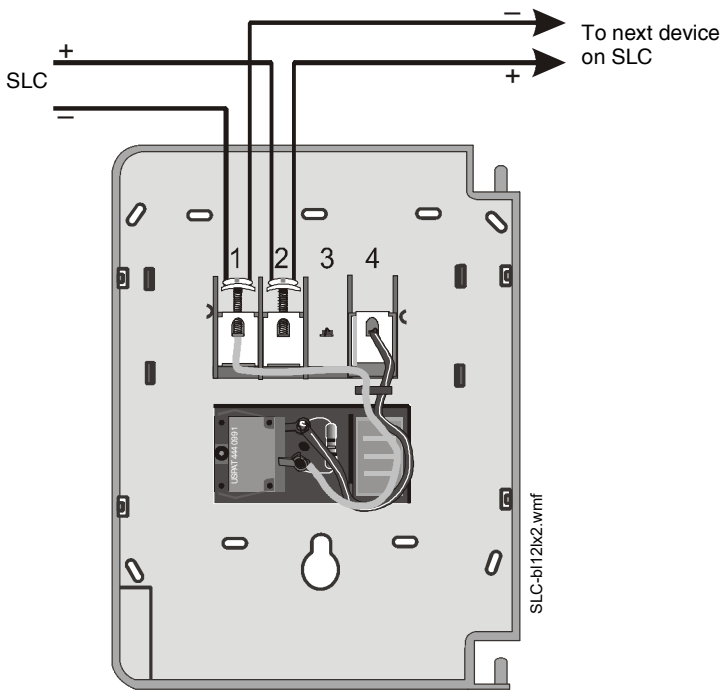


Figure 10.1 Wiring the Pull Station to an SLC

Appendix A: Power Considerations

A.1 Supplying Power to 24 VDC Detectors and NACs

Resistance and Size

To determine the maximum allowable resistance that can be tolerated in supplying power to 24 VDC four-wire devices and NACs, use the calculations below. These simplified equations assume that the devices are at the end of a long wire run. With the computed resistance and using the manufacturers specifications for the desired wire, select the proper gauge wire for the power run.

For Four-Wire Detectors:

$$R_{max} = \frac{(V_{ms} - V_{om})}{(N)(I_s) + (N_a)(I_a) + (I_r)}$$

For NACs:

$$R_{max} = \frac{(V_{ms} - V_{om})}{(N_b)(I_b)}$$

Where:

R_{max} = maximum resistance of the 24 VDC wires
V_{ms} = minimum supply voltage (see below)
V_{om} = minimum operating voltage of the detector or end-of-line relay, whichever is greater, in volts
N = total number of detectors on the 24 VDC supply circuit
I_s = detector current in standby
N_a = number of detectors on the 24 VDC power circuit which must function at the same time in alarm
I_a = detector current in alarm
I_r = end-of-line relay current
N_b = number of Notification Appliance Devices
I_b = Notification Appliance current when activated

NOTE: This simplified equation assumes that the devices are at the end of a long wire run.

The minimum supply voltages produced by the PMBNL power supply is 20.03 Vms.

A.2 Supervising 24 VDC Power

There are options for supervising 24 VDC power, as discussed below, according to Class A or Class B of NFPA 72-2013.

- Using Velociti Type Codes with Built-In Power Supervision (Appendix A.2.1)
- Power Supervision Relay (Appendix A.2.2) (two-wire, Class B only)
- Using the module without relay (Appendix A.2.3)

A.2.1 Using Type Codes with Built-In Power Supervision

Certain Velociti type codes have external power supervision built into the software. For details, refer to “Devices Requiring External Power Supervision” in the appropriate installation manual.

A.2.2 Power Supervision Relay

Power used to supply 24 VDC detectors, notification appliances (using the AOM-2SF) and two wire detectors (using the AMM-4SF) can be supervised with a power supervision relay. This relay, energized by the 24 VDC power itself, is installed at the end of each respective power run and wired in line with the supervised circuit of any intelligent module. This satisfies Class B supervision requirements under UL 864 10th edition.

When power is removed from the relay, the normally closed contacts open the supervised circuit, generating a trouble condition. Therefore, the relay needs to be installed at the end of the supervised circuit, so it does not disrupt the operating capability of all the devices on that circuit. The relay can be installed in line with any leg (+ or –) of the supervised NAC or IDC circuit, either a two- or a four-wire style.

Figure A.1 shows Class B supervision of a 24VDC circuit using the AOM-2SF or AMM-4SF. Refer to the *Device Compatibility Document* for compatible notification appliances and relays.

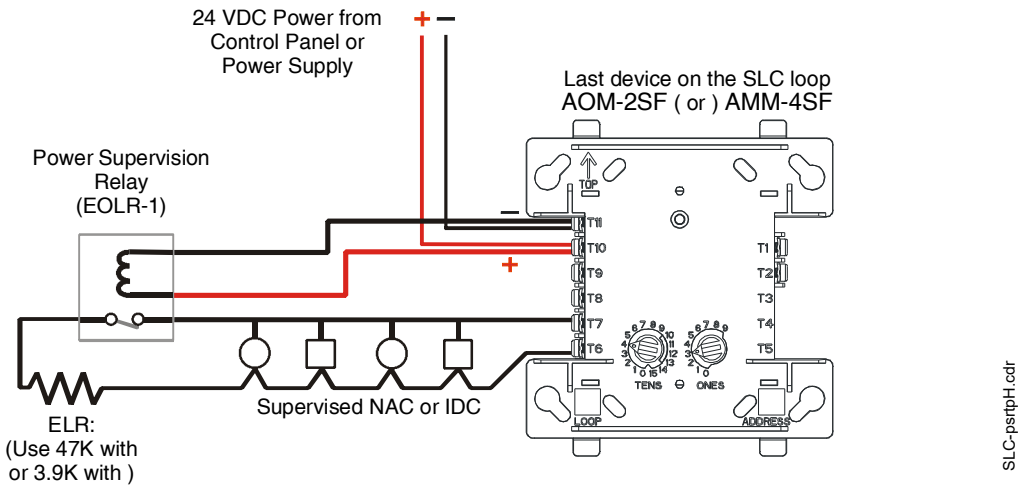


Figure A.1 Supervised 24 VDC Circuit - Class B

Figure A.2 shows an alternate Class B method of supervising a 24VDC circuit using a control module that is fully powered from the SLC loop.

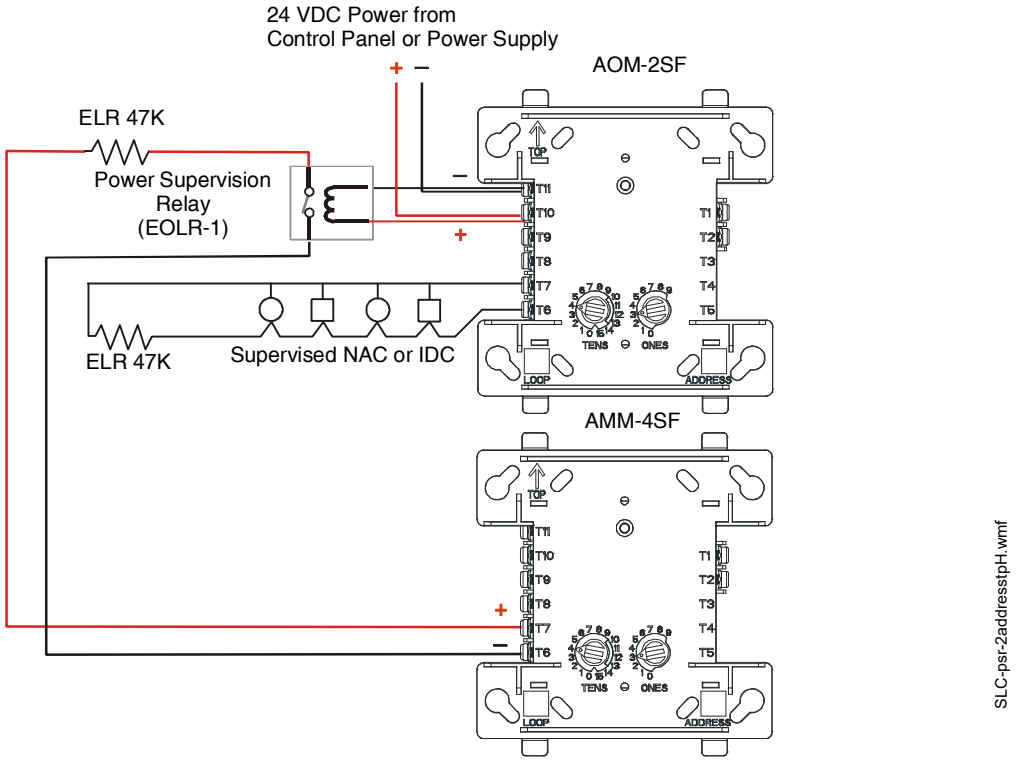


Figure A.2 Alternate: 2-Address Method of Supervising a 24 VDC Circuit - Class B

A.2.3 Using the Addressable Control Module Without Relay

Another option for supervising 24 VDC power fed to the Notification Appliance Circuit of the AOM-2SF module eliminates the need for a power supervision relay. This method uses a Notification Appliance Circuit from the control panel or power supply to supply power to the AOM-2SF modules. The control panel supervises this circuit, which can be either a Class B or Class A *(see separate wiring diagrams)*.

Class B NAC Power Wiring

Program the NAC from the control panel for general alarm. (Refer to the programming manual or programming section of the FACP documentation for instructions.) Note that if the NAC is a coded output, the AOM-2SF output will be coded as well.

Refer to the *Device Compatibility Document* for compatible notification appliances.

- The circuit is supervised and power-limited.
- In this circuit, an external ELR **is** required at end of the NAC circuit.
- Refer to the respective control panel installation manual for NAC terminal block connection information and ELR value.
- Remove internal resistor on each (see instructions in Figure 6.2 on page 33).

Connect the NAC power as follows:

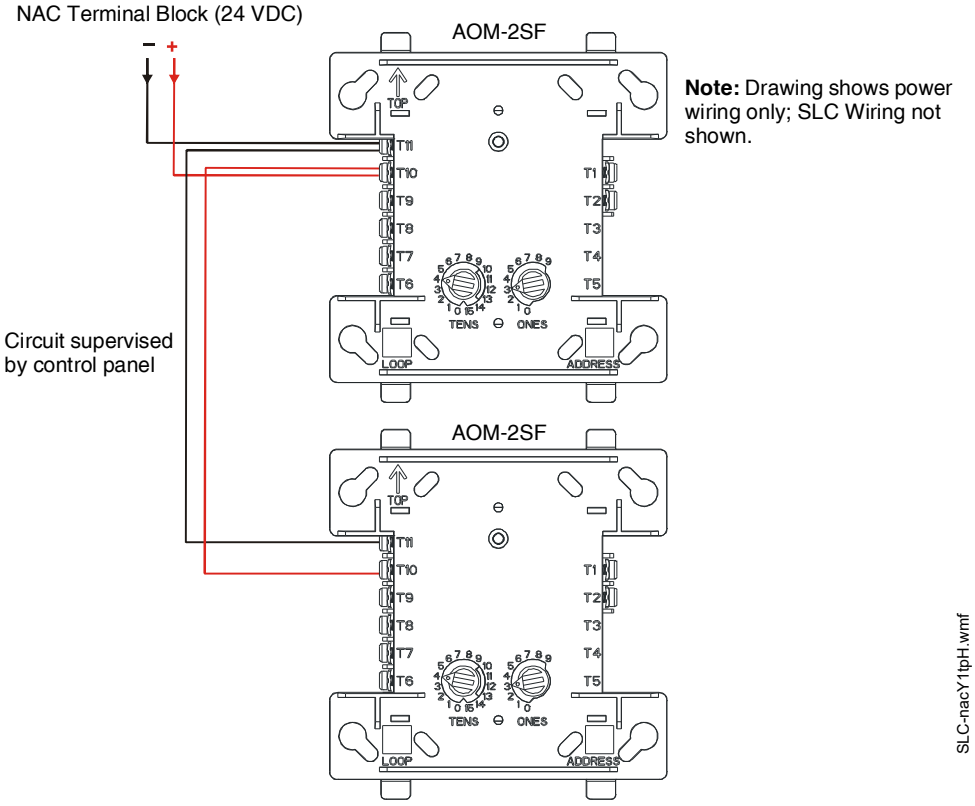


Figure A.3 NFPA Class B NAC Power (Alternate)

Class A NAC Power Wiring

Program the NAC from the control panel for general alarm. (Refer to the programming manual or programming section of the FACP documentation for instructions.) Note that if the NAC is a coded output, the AOM-2SF output will be coded as well.

Refer to the *Device Compatibility Document* for compatible notification appliances.

- The circuit is supervised and power-limited.
- In this circuit, an external ELR is **not** required at end of the NAC circuit.
- Refer to the respective control panel installation manual for NAC terminal block connection information.
- Remove internal jumper on each (see instructions in Figure 6.2 on page 33).

Connect the NAC power as follows:

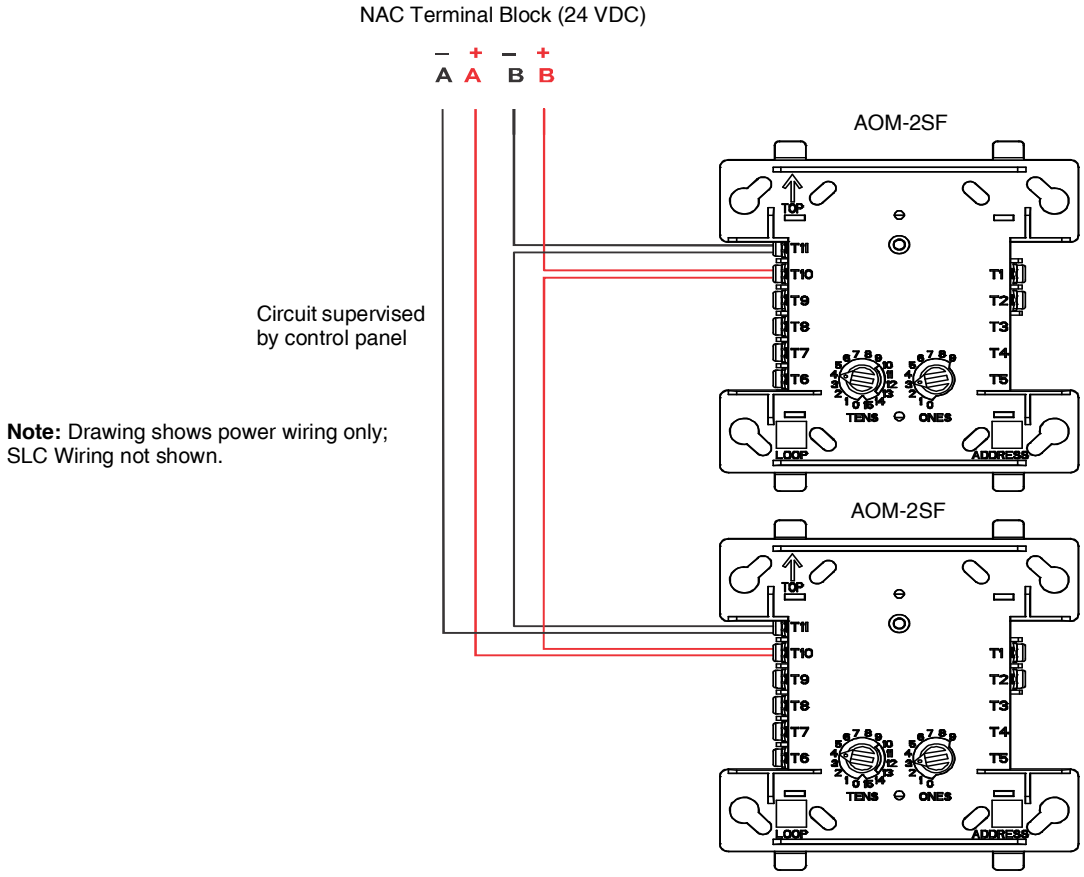


Figure A.4 NFPA Class A NAC Power

A.3 Basics of Class A Power Supervision

See Figure A.5 for Class A power supervision:

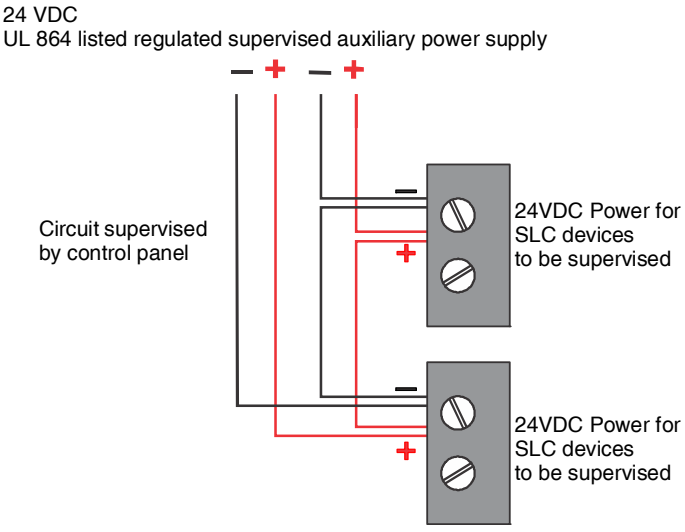


Figure A.5 Class A Wiring to Supervise 24 VDC Power to SLC Devices

Appendix B: SLC Surge Suppression

B.1 Introduction

Primary and secondary UL-listed surge protectors used with fire alarm control panels must have the following characteristics:

- Primary Surge Protector: Must be listed against UL 497, standard for surge protective devices with a marked rating of 330V or less
- Secondary Surge Protectors: Must be listed against UL 497B the Standard for Protectors for Data Communications and Fire Alarm Circuits with a marked rating of 50V or less

NOTE: For detailed information refer to the installation documentation supplied with the unit.

One primary surge protector must be used with each SLC wiring pair whenever SLC wiring runs outside the building.

- Install primary protection only as shown in this document.
- Refer to NEC Article 800 and local building code requirements.

Additional primary surge suppressors may be added as required by the NEC. Add these additional suppressors in series with the SLC wiring at the building entry/exit.

Wiring connected to the surge suppressor output must remain within the building while wiring connected to the surge suppressor input may be routed outside the building as shown below.

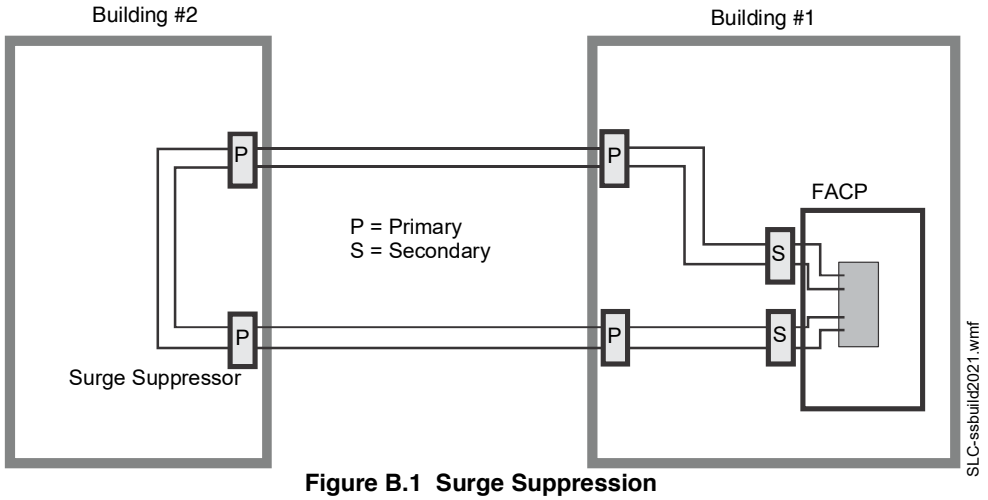


Figure B.1 Surge Suppression

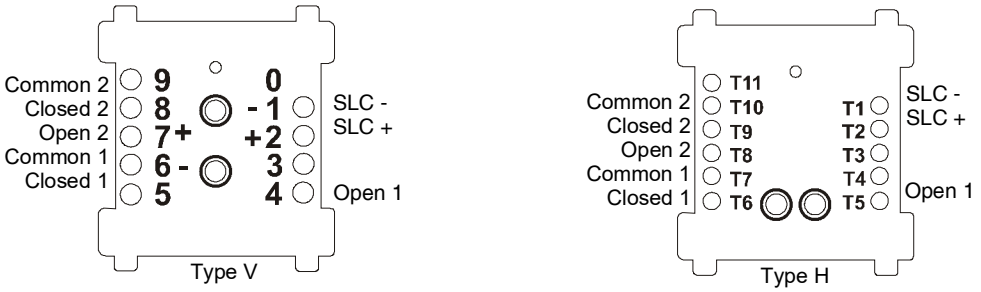
B.2 Installation

Mounting of the secondary surge suppressor must be inside a separate UL-listed enclosure.

- Locate on an available stud and secure with nut.
- Unit is connected in series with the SLC Loop to protect the Control Panel.
- Provide a common ground to eliminate the possibility of a differential in ground potentials.

Appendix C: Terminal Conversion Charts for V-type and H-type Devices

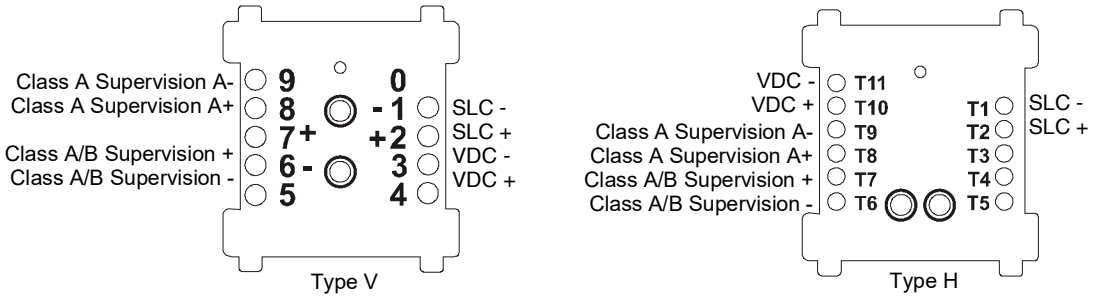
C.1 AOM-2RF



V-type Terminal Number	Terminal Function	H-type Terminal Number
1	SLC -	1
2	SLC +	2
3	Unused	3
4	Normally Open (1)	5
5	Normally Closed (1)	6
6	Relay Common (1)	7
7	Normally Open (2)	8
8	Normally Closed (2)	9
9	Relay Common (2)	10
N/A	Unused	4
N/A	Unused	11

Table C.1 Terminal Conversions

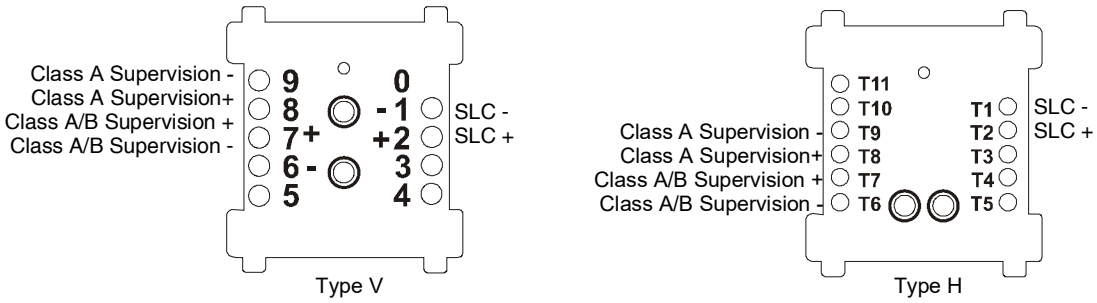
C.2 AOM-2SF and AMM-4SF



V-type Terminal Number	Terminal Function	H-type Terminal Number
1	SLC -	1
2	SLC +	2
3	VDC -	11
4	VDC +	10
5	Unused	5
6	Solenoid B/A -	6
7	Solenoid B/A +	7
8	Solenoid A +	8
9	Solenoid A -	9
N/A	Unused	3
N/A	Unused	4

Table C.2 Terminal Conversions

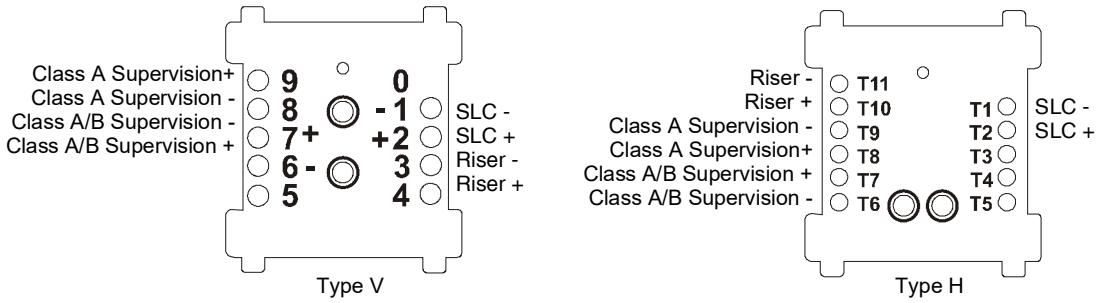
C.3 AMM-4F



V-type Terminal Number	Terminal Function	H-type Terminal Number
1	SLC -	1
2	SLC +	2
3	Unused	3
4	Unused	4
5	Unused	5
6	Class A/B Supervision -	6
7	Class A/B Supervision +	7
8	Class A Supervision +	8
9	Class A Supervision -	9
N/A	Unused	10
N/A	Unused	11

Table C.3 Terminal Conversions

C.4 AMM-2IF



V-type Terminal Number	Terminal Function	H-type Terminal Number
1	SLC -	1
2	SLC +	2
3	Unused	3
4	Unused	4
5	Unused	5
7	Class A/B Supervision -	6
6	Class A/B Supervision +	7
9	Class A Supervision +	8
8	Class A Supervision -	9
N/A	Unused	10
N/A	Unused	11

Table C.4 Terminal Conversions

NOTE: Type V" AMM-2IF modules are not compatible with the GFP panel.

Appendix D: Intelligent Detector Base Layouts for Legacy Devices

For Class A power-supervision requirements, refer to Appendix A.2, “Supervising 24 VDC Power”, on page 49.

D.1 Wiring a Detector Base

Figure D.1 shows typical wiring of the B710LP or B501 detector base connected to an SLC. An optional RA100Z Remote LED Annunciator is shown connected to the base.

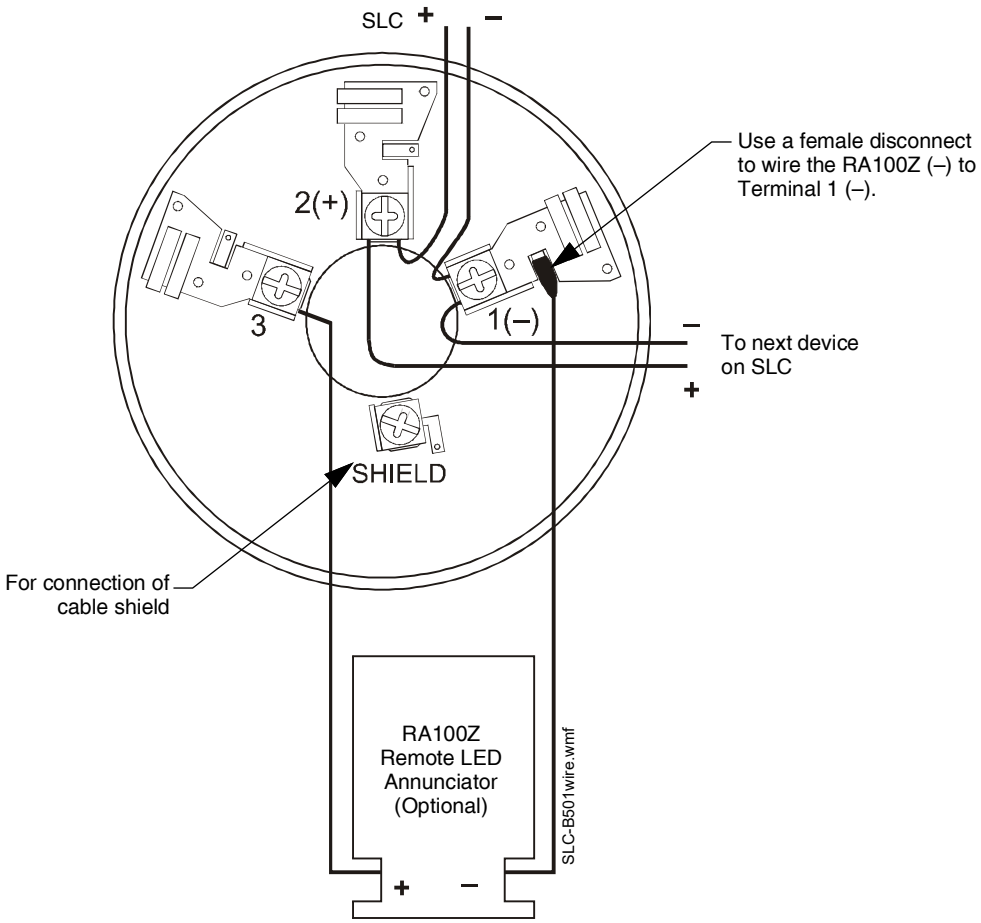


Figure D.1 Wiring of the B710LP or B501 Detector Base

NOTE: The B710LP base wiring is identical to the B501, except there is no shield terminal.

D.2 Wiring an Isolator Base

Figure D.2 shows typical wiring of a B224BI/B224BI-WH/B224BI-IV Isolator Base.

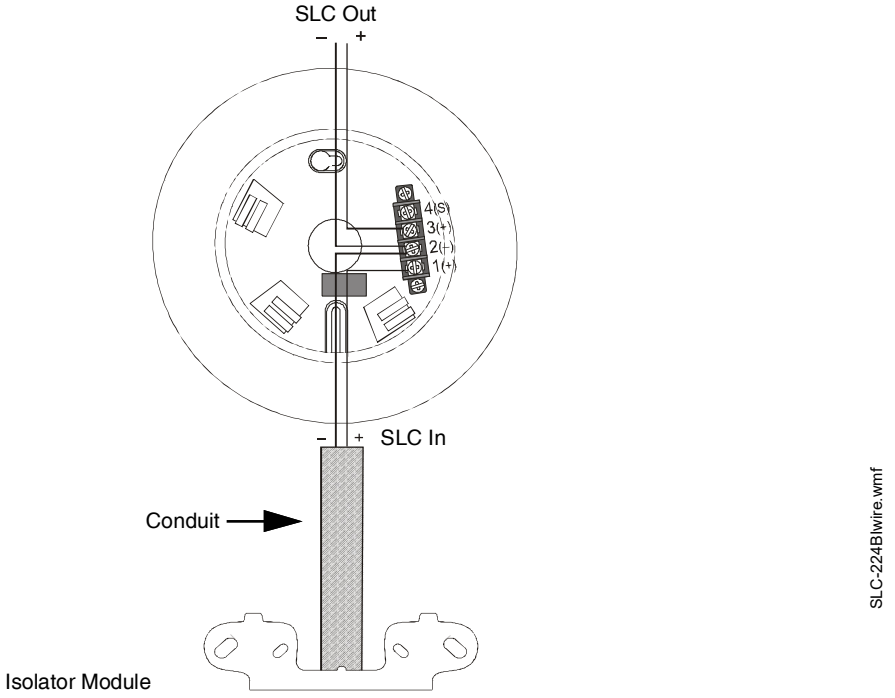


Figure D.2 Wiring an Isolator Base

D.3 Wiring a Relay Base

Figure D.3 shows typical wiring of the B224RB plug-in relay detector base connected to an SLC.

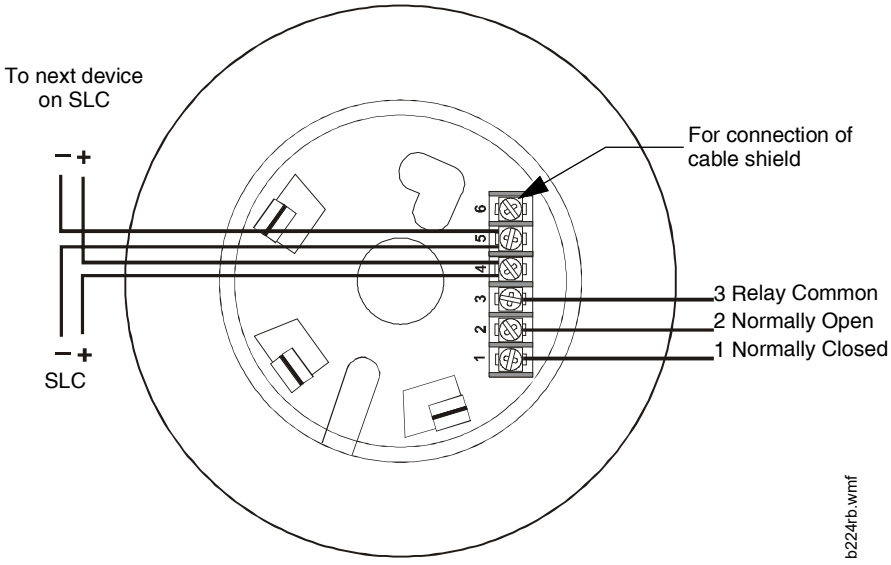


Figure D.3 Wiring of the B224RB Plug-in Relay Detector Base

D.4 Wiring a Sounder Base

Figure D.4 shows typical wiring of the B501BH(-2) and B501BHT(-2) Sounder Bases.

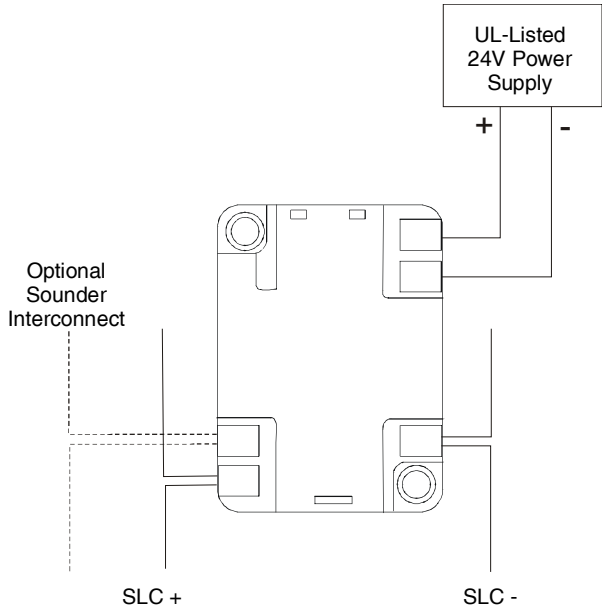


Figure D.4 Wiring the B501BH(-2) and B501BHT(-2) Sounder Bases

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Changes & Comments for LS10414-000GF-E:A

Revise to:	UL change?	ECN:	Brief description:
A	Yes	00073523	New Manual for Gamewell GFP

Page and Heading	Edit
10 -> Table 1.3 "Reference Documentation" 13 -> 1.6.7 "Intelligent Detectors"	Remove ASD-LS3-IV 2/11/2026
replace number for all	LS10414-000GF-E
9 -> 1.2.1 "Products Subject to AHJ Approval"	GFP
9 -> NOTE: "GFP does not support Legacy Type V models of .AMM-2IF"	AMM-2IF replaced FM-1
9 -> Table 1.1 "Non UL 268 7th Edition certified"	Added products not UL268 7th
9 -> Table 1.2 "Wiring Designations - History of Changes"	Removed Data Communications link (DCL) Removed ULC
10 -> 1.3.1 "**Fire Alarm Control Panel (FACP) and Main Power Supply Installation**"	DCD Document Number edit
10 -> 1.3.1 "**Fire Alarm Control Panel (FACP) and Main Power Supply Installation**"	MMO-6F installation document from R
	added row after ASD-PTL3-SELFT SWIFT manual
	added rows after DNR/W
12 -> 1.6.2 "Control Modules"	MMO-6SF Controls six NAC or speaker circuits; Velociti or CLIP mode.
12 -> 1.6.3 "Isolator Modules"	**ISO-6** Six Fault
12 -> 1.6.4 "Relay Modules"	**AOM-2RF**
13 -> 1.6.6 "Plug-in Detector Bases"	Removed Note for GFP SLC only Note: UL/ULC listed as of January 2018 to replace B501A; compatible for use in Canadian retrofit installations.
13 -> 1.6.7 "Intelligent Detectors"	In ASD-LS3: Velociti and clip spelling/placement
	after NOTE, removed MCS Acclimate2
	added /ASD-PL3R-IV to ASD-PL3R
	added /ATD-L3-IV to ATD-L3
	added ATD-L3R/ATD-L3R-IV after The
14 -> 1.8 "SLC Performance"	NFPA
Section 2	
15 -> 2.1 "Recommended SLC Wiring"	added bullet in first row/first column
15 -> Table 2.1 "Wiring Recommendations:"	SLM-318/GFP loops with self-test detectors: • 35 ohms, maximum per length of Class A and X loops. • 35 ohms per branch maximum for Class B loop.

15 -> NOTE: "35 ohms for SLM-318 (CLP-2PCB) with self-test detectors installed."	notes 2.2.1 and 2.3.1 removed: 50 ohms for SLM-318/GFP
16 -> 2.3.1 "Measuring Loop Resistance"	The total DC resistance of the SLC pair must not exceed: • 50 ohms for SLM-318/GFP
17 -> 2.4.1 "GFP with SLM-318 Signaling Loop Module"	replaced PMB-AUXPMBNL
20 -> Figure 4.1 "Wiring the ISO-X Module"	**ISO-X**
22 -> Figure 4.4 "NFPA Class B SLC Using ISO-X Modules"	added content
22 -> Figure 4.4 "NFPA Class B SLC Using ISO-X Modules"	panel provides and the “GFP”
Section 5	
27 -> 5.1.3 "Miniature Monitor Module"	is and it is added
27 -> 5.3 "NFPA Class B IDC Using Monitor Modules"	AMM-4F added througout. Changed from 2 to 4
29 -> 5.5 "NFPA Class B IDC Using Zone Interface Modules"	Hide Security service for GW
30 -> Figure 5.7 "Typical Class B IDC Wiring with AMM-4SF"	Added label
31 -> Figure 5.8 "Typical Class A IDC Wiring with AMM-4SF"	Added label
Section 6	
33 -> 6.1 "Description"	TC810S1000
33 -> 6.2 "Wiring a NAC with Addressable Control Modules"	AOM-2SF
33 -> Figure 6.2 "AOM-2SF Jumper Location"	AOM-2SF
34 -> 6.2.1 "Wiring a Solenoid with the TC810S1000"	TC810S1000 throughout section
35 -> Figure 6.4 "NFPA Class B Notification Appliance Circuit with AOM-2SF"	AOM-2SF
35 -> Figure 6.5 "NFPA Class A Notification Appliance Circuit with AOM-2SF"	AOM-2SF
35 -> 6.5 "Connecting a Releasing Device to the Addressable Control Module"	TC810S1000 throughout section Hid REL CKT ULC or Removed class 2 Figure 6.7
Section 8	
39 -> 8.2.1 "AMM-2IF"	Add AMM-21F
39 -> 8.2.2 "AMM-2RIF"	Add AMM-2R1F
40 -> Figure 8.2 "AMM-2RIF Multiple Input/Output Module Wiring Connections"	Add AMM-2R1F
41 -> Figure 8.3 "Typical Class B IDC Wiring with AMM-2IF"	AMM-21F
Section 9	

42 -> Section 9: "Intelligent Detector Bases and Wireless Gateway"	added and Wireless Gateway
42 -> 9.1.1 "Wireless Gateway"	added 9.1.1
45 -> 9.6 "Wiring the VW-GATE"	VW-GATE add note and 9.6.1 review 2. remove note.
46 -> 9.7 "Power Connections: Powered by the SLC"	new section
01282026 edits	
8 -> Figure 1.1 "Example of Old and New Module Formats"	certified Non UL
10 -> Table 1.3 "Reference Documentation"	ASD-LS3,ASD-LS3-IV - doc needs dash Removed duplicate ASD-PTL3, ASD-PTL3-IV Intelligent Photo/Temperature Detector I56-6538
27 -> 5.3 "NFPA Class B IDC Using Monitor Modules"	See
28 -> Figure 5.5 "Typical Class B IDC Wiring with AMM-4F"	AMM-4F
29 -> Figure 5.6 "Typical Class A IDC Wiring with AMM-4F"	AMM-4F
30 -> Figure 5.7 "Typical Class B IDC Wiring with AMM-4SF"	AMM-4SF above image
31 -> Figure 5.8 "Typical Class A IDC Wiring with AMM-4SF"	
34 -> Figure 6.3 "Wiring Locations and Rear View - Jumper Location"	Write "TC810S1000" under pic
23 -> Figure 4.5 "NFPA Class B SLC Using the ISO-6 Six Fault Isolator Module"	Figure 4.5 Insert Image