FIRE-LITE® ALARMS
by Honeywell

PN 51309:K ECN 08-118

Intelligent Control Panel
S L C

Wiring Manual

Document 51309
2/14/2008 Rev: K

Fire Alarm System Limitations

While a fire alarm system may lower insurance rates, it is not a substitute for fire 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 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.

The Manufacturer recommends that smoke and/or heat detectors be located throughout a protected premise 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 Guides for Proper Use of System Smoke Detectors, which are made available at no charge to all installing dealers. These documents can be found at *http:/www.systemsensor.com/html/applicat.html*. 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, or chimneys 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.
- 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, crippling its ability to report a fire.

Audible warning devices such as bells 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:

- 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 or comprehend the meaning of the signal. It is the property owner's responsibility to conduct fire drills and other training exercise 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 fire alarm 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. It is essential to use only equipment listed for service with your control panel.

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 radio transmission systems are recommended.

The most common cause of fire alarm malfunction is inadequate maintenance. To keep the entire fire alarm 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 monthly or as required by National and/or local fire codes and should be performed by authorized professional fire alarm installers only. Adequate written records of all inspections should be kept.

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 this manual is read and understood.

CAUTION - *System Reacceptance 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. Reacceptance 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 indoor dry operation at 0-49° C/32-120° F and at a relative humidity of 93 ±2% RH (non-condensing) at 32 ±2° C/90 ±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 all peripherals be installed in an environment with a nominal room temperature of 15-27° C/60-80° F.

Verify that wire sizes are adequate for all initiating and indicating device loops. Refer to manual Specifications section for maximum allowable 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 interferences, 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, and 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.

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 by authorized personnel.

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 device pursuant to Subpart B of Part 15 of FCC Rules, which is designed to provide reasonable protection against such interference when 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 their own expense.

Canadian Requirements

This digital apparatus does not exceed the Class A limits for radiation noise emissions from digital apparatus set out in the Radio Interference Regulations of the Canadian Department of Communications.

Le present appareil numerique n'emet pas de bruits radioelectriques depassant les limites applicables aux appareils numeriques de la classe A prescrites dans le Reglement sur le brouillage radioelectrique edicte par le ministere des Communications du Canada.

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Introduction

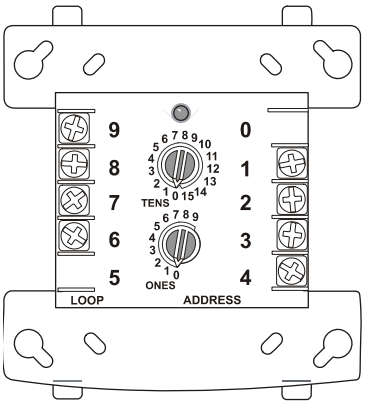
Scope

This document describes the operation, installation and wiring of various Signaling Line Circuit (SLC) devices when used with the Fire•Lite MS-9200/MS-9200E, the Fire•Lite MS-9600/MS-9600E, the Fire-Lite MS-9600LS, the Fire-Lite MS-9600LSC, the Fire-Lite MS-9600LSE, the Fire-Lite MS-9600UDLS/MS-9600UDLSE, the Fire•Lite MS-9200UD/MS-9200UDE, the Fire•Lite MS-9200UDLS/MS-9200UDLSE and the Fire-Lite MS-9050UD control panels. It also provides basic information that applies to Fire•Lite SLC loops in general, such as the branch resistance measurements.

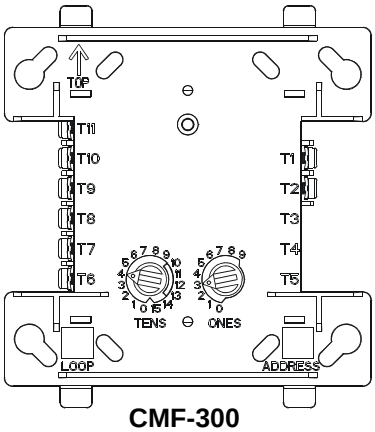
Note: Any reference in this manual to the MS-9200, MS-9200UD, MS-9200UDLS, MS-9600, MS-9600LS or MS-9600UDLS includes the MS-9200E, MS-9200UDE, MS-9200UDLSE, MS-9600E, MS-9600LSE or MS-9600UDLSE respectively.

Additional information about the specific control panel and the modules and detectors referenced in this document can be found in the respective installation manual as listed in Table 1, “Reference Documentation,” on page 9.

Currently, there are two styles of Modules available, legacy version and newer version. The obvious difference between the two styles is the orientation of the rotary dials. Refer to the diagram below for an example of each.



CMF-300
Legacy Version Module
(Vertical Rotary Dial)



CMF-300
Newer Version Module
(Horizontal Rotary Dial)

Note: Only **MMF-300**, **MMF-302**, **CRF-300** and **CMF-300** modules are available as newer type modules. Both the legacy and newer versions share the same part numbers. The newer version modules will be phased in, replacing the legacy version. This manual contains information and wiring diagrams for the newer version of the modules. Refer to "Appendix C: Terminal Conversion Charts for New & Legacy Devices" on page 58 for additional information.

Reference Documentation

The table below accommodates a list of document sources containing additional information regarding the devices used on a Signaling Line Circuit:

For information on...	Refer to...	Part Number
MS-9200/MS-9200E	Instruction Manual	51003
MS-9600/MS-9600E	Instruction Manual	51335
MS-9200UD/MS-9200UDE	Instruction Manual	51906
MS-9200UDLS/MS-9200UDLSE	Instruction Manual	52750
MS-9600LS/MS-9600LS(C/E) & MS-9600UDLS/MS9600UDLSE	Instruction Mnual	52646
MS-9050UD	Instruction Manual	52413
Compatible Devices	Device Compatibility Document	15384
BG-12LX Pull Station	Installation Instructions	51094
MMF-300 Monitor Module	Installation Instructions	F300-02-00
MMF-300-10 Monitor Module	Installation Instructions	F300-20-00
MMF-301 Mini Monitor Module	Installation Instructions	F300-05-00
MMF-302 Monitor Module	Installation Instructions	F300-03-00
MMF-302-6 Interface Module	Installation Instructions	F300-22-00
MDF-300 Dual Monitor Module	Installation Instructions	F300-09-00
CMF-300 Control Module	Installation Instructions	F300-07-00
CMF-300-6 Control Module	Installation Instructions	F300-21-00
CRF-300 Relay Module	Installation Instructions	F300-04-00
CRF-300-6 Relay Module	Installation Instructions	F300-19-00
I300 Isolator Module	Installation Instructions	F300-06-00
AD350 Multicriteria Detector	Installation Instructions	F300-17-00
AD355 Multicriteria Detector	Installation Instructions	F300-24-00
SD350 & SD350T Photo Detector	Installation Instructions	F300-14-00
SD355 & SD355T Photo Detector	Installation Instructions	F300-24-00
CP350 Ionization Detector	Installation Instructions	F300-15-00
CP355 Ionization Detector	Installation Instructions	F300-23-00
H350 Heat Detector	Installation Instructions	F300-12-00
H350R Heat Detector w/ROR	Installation Instructions	F300-13-00
H355 Heat Detector (135°)	Installation Instructions	F300-25-00
H355R Heat Detector w/ROR	Installation Instructions	F300-25-00
H355HT Heat Detector (190°)	Installation Inatructions	F300-25-00
D350P Duct Detector	Installation Instructions	F300-10-00
D350PL(A) Duct Detector - low flow	Installation Instructions	F300-27-00
D350RP Duct Detector w/Relay	Installation Instructions	F300-11-00
D350RPL(A) Duct Detector w/Relay - low flow	Installation Instructions	F300-28-00
BEAM355(S) Addressable Beam Detector	Installation Instructions	F300-29-00
B350LP Plug-in Detector Base	Installation Instructions	F400-21-00
B501BH Sounder Detector Base	Installation Instructions	D650-03-00
B224RB Relay Detector Base	Installation Instructions	D450-16-01
B224BI Isolator Detector Base	Installation Instructions	D450-15-00

Table 1 Reference Documentation

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 Style 4, Style 6, or Style 7.

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: Surge Suppression" on page 55.

Polling Protocols

The MS-9200UDLS/E, MS-9600LS(C/E) and MS-9600UDLS/E support LiteSpeed protocol or Classic Loop Interface Protocol (CLIP). The MS-9200/E, MS-9600/E, MS-9200UD/E and MS-9050UD support Classic Loop Interface Protocol (CLIP) only.

Available Protocols

LiteSpeed is a communication protocol that greatly enhances the speed of communication between analog intelligent devices. Only the MS-9200UDLS/E, MS-9600LS(C/E) and MS-9600UDLS/E are capable of operating in LiteSpeed mode.

CLIP (Classic Loop Interface Protocol) polls devices in sequential order. All Fire-Lite addressable fire alarm control panels can operate in CLIP mode. This is the default mode of operation for the FACPs.

Protocol Use

Use one of the following options with LiteSpeed/CLIP mode:

1. Program all modules and detectors on an FACP as LiteSpeed.
2. Program all modules and detectors on an FACP as CLIP.

Note: FACPs with more than one SLC loop must be programmed for only LiteSpeed or CLIP mode of operation. Communication protocols cannot be split between SLC loops.

Devices

Isolator Module

The **I300** Isolator Module permits a zone of detectors and modules 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 Style 7 circuit.

Monitor Modules

Addressable modules that 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.

MMF-300 - Monitors a Style B (Class B) or Style D (Class A) circuit of dry-contact input devises.

MMF-300-10 - Monitors ten (10) Style B (Class B) or five (5) Style D (Class A) normally open contact device circuits.

MMF-301 - Same as the MMF-300 except offered in a smaller package for mounting with Style B wired devices. This module does not have an LED.

MMF-302 - Monitors a single IDC of two-wire smoke detectors.

MMF-302-6 - An addressable module that provides an interface between the control panel and six (6) Style B (Class B) or three (3) Style D (Class A) IDCs of two-wire smoke detectors.

MDF-300 - Similar to MMF-300, but provides for two independent Style B IDCs.

Control Modules

Through the **CMF-300** addressable control module, the control panel can selectively activate a Notification Appliance Circuit (NAC).

CMF-300-6 - Similar in operation to the CMF-300, except it can activate six (6) Style Y (Class B) or three (3) Style Z (Class A) NACs.

Relay Modules

The **CRF-300** addressable relay module provides the control panel with a dry-contact output for activating a variety of auxiliary devices.

CRF-300-6 - Similar in operation to the CRF-300, except it provides six (6) Form-C relays.

Intelligent Detectors

AD350 - A multicriteria smoke sensor that combines a photoelectric sensing chamber and 135°F (57.2°C) fixed temperature heat detection. The sensor uses addressable communication to transmit smoke density and other information to the control panel. It adjusts its detection parameters and alarm threshold depending on the ambient conditions it samples in its environment.

AD355 - A multicriteria smoke sensor that combines a photoelectric sensing chamber and 135°F (57.2°C) fixed temperature heat detection. The sensor uses addressable communication to transmit smoke density and other information to the control panel. It adjusts its detection parameters and alarm threshold depending on the ambient conditions it samples in its enviornment.

CP350 - An addressable ionization smoke detector which measures the level of combustion products in its chamber using the 'ionization principle.'

CP355 - An addressable ionization smoke detector which measures the level of combustion products in its chamber using the 'ionization principle.'

D350P - An addressable photoelectric duct detector. The **D350RP** includes an alarm relay. Air velocity rating is 500 to 4,000 feet per minute.

D350PL -An addressable low flow photoelectric duct detector (**D350PLA** for Canada). The **D350RPL** includes an alarm relay (**D350RPLA** for Canada). Low Flow refers to the air velocity rating of 100 to 4,000 feet per minute (0.5 to 20.32 m/sec.)

H350[1] - An addressable detector using a thermistor sensing circuit for fast response. **H350R** incorporates a thermal rate of rise of 15°F (9.4°C)/minute.

H355[1] - An addressable 135° fixed temperature heat detector using a thermistor sensing circuit for fast response. **H355R** incorporates a thermal rate of rise of 15° F (9.4° C)/minute.

H355HT[1] - An addressable 190° fixed temperature heat detector using a thermistor sensing circuit for fast response.

SD350 - An addressable photoelectric smoke detector which provides smoke sensing utilizing optical sense technology. The **SD350T** includes a 135° F fixed thermal sensor.

SD355 - An addressable photoelectric smoke detector which provices smoke sensing utilizing optical sense technology. The **SD355T** includes a 135° F fixed thermal sensor.

BEAM355 - An addressable long range projected beam smoke detector designed to provide open area protection. The **BEAM355S** has an integral sensitivity test feature that consists of a test filter attached to a servomotor inside the detector optics.

[1]Addressable Heat Detectors are not compatible with the MS-9200(E).

Manual Pull Station

The **BG-12LX** 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.

300 Series Addressable Devices

Fire•Lite's 300 series of addressable devices are fully compatible with the MS-9200, MS-9200UD, MS-9200UDLS, MS-9600, MS-9600LS(C/E), MS-9600UDLS/E and MS-9050UD FACPs. The devices must be configured for CLIP (Classic Loop Interface Protocol) Mode operation. The address of 300 series devices cannot be set above 99. Compatible devices include:

- SD300 Photo
- SD300T Photo w/Thermal
- CP300 Ionization
- BG-10LX Pull Station
- M300 Monitor Module
- M301 Mini Monitor Module
- M302 2-wire Monitor Module
- C304 Control/Relay Module

SLC Performance

SLC performance depends on the type of circuit (Style 4, Style 6, or Style 7) and the components on the circuit.

Note: SLC operation meeting Style 7 requirements isolates each device on the SLC from faults that may occur within other areas of the SLC.

Wiring style requirements are determined by national and local codes. Consult with the Authority Having Jurisdiction before wiring the SLC. The table below (derived from NFPA 72-1999) lists the trouble conditions that result when a fault exists on an SLC.

Type of Fault	Style 4	Style 6	Style 7
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.

Table 2 SLC Performance

Surge Suppression

One primary surge protector must be used with each SLC wiring pair whenever SLC wiring runs outside the building. For detailed information refer to "Appendix B: Surge Suppression" on page 55.

Wiring Requirements

Wire Sizing

The SLC requires use of a specific wire type, depending on the mode of operation, to ensure proper circuit functioning. Wire size should be no smaller than 18 AWG (0.75 mm^2) and no larger than 12 AWG (3.25 mm^2) wire. The wire size depends on the length of the SLC circuit. It is recommended that all SLC wiring be twisted-pair to minimize the effects of electrical interference.

CLIP (Classic Loop Interface Protocol) Mode

All addressable FACPs can operated in CLIP (Classic Loop Interface Protocol) mode. It is recommended that all SLC wiring be twisted-pair and shielded when operating in CLIP mode to reduce the effects of electrical interference. Use the table below to determine the specific wiring requirements for the SLC.

Wire Requirements	Distance in Feet (meters)	Wire Size	Wire Type
Twisted-pair, shielded	10,000 feet (3,048 m)	12 AWG (3.1 mm^2)	Belden 9583, Genesis 4410, Signal 98230, WPW D999
	8,000 feet (2,438 m)	14 AWG (2.0 mm^2)	Belden 9581, Genesis 4408, Signal 98430, WPW D995
	4,875 feet (1,486 m)	16 AWG (1.3 mm^2)	Belden 9575, Genesis 4406, & 4606, Signal 98630, WPW D991
	3,225 feet (983 m)	18 AWG (0.75 mm^2)	Belden 9574, Genesis 4402 & 4602, Signal 98300, WPW D975
Untwisted, unshielded wire, inside conduit or not in conduit	**MS-9200** = 1,000 feet (305 m)	12 to 18 AWG	
	MS-9600, MS-9600LS(C) & MS-9600UDLS = 3,000 feet (914 m)		
	MS-9200UD & MS-9200UDLS = 3,000 feet (914 m)		
	MS-9050UD = 3,000 feet (914 m)		

Table 3 SLC Wiring Requirements in CLIP Mode

LiteSpeed Mode

The MS-9200UDLS, MS-9600LS(C) and MS-9600UDLS SLC can be programmed to operate in LiteSpeed mode for a quicker device response time. While shielded wire is not required, it is recommended that all SLC wiring be twisted-pair to minimize the effects of electrical interference. Use the following table to determine the specific wiring requirements for the SLC.

Wire Requirements	Distance in Feet (meters)	Wire Size	Wire Type
Twisted-pair, unshielded	10,000 feet (3,048 m)	12 AWG (3.1 mm^2)	Belden 5020UL & 6020UL, Genesis WG-4315 & WG-4515
	8,000 feet (2,438 m)	14 AWG (2.0 mm^2)	Belden 5120UL & 6120UL, Genesis WG-4313 & WG-4513
	4,875 feet (1,486 m)	16 AWG (1.3 mm^2)	Belden 5220UL & 6220UL, Genesis WG-4311 & WG-4511
	3,225 feet (983 m)	18 AWG (0.75 mm^2)	Belden 5320UL & 6320UL, Genesis WG-4306 & WG-4506

Table 4 SLC Wiring Requirements in LiteSpeed Mode

Measuring Resistance & Length

Two-Wire SLC - Style 4 (Class B)

Loop Resistance

T-tapping of the SLC wiring is permitted for 2-wire Style 4 configurations. The total DC resistance from the control panel to each branch end cannot exceed 40 ohms. 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.

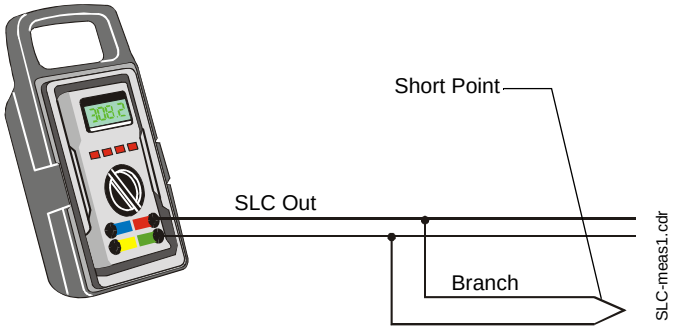


Figure 1 Measuring DC Resistance of a Two-Wire SLC

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 the wire lengths of all branches of one SLC.

In the following figure, the total length of the SLC is determined by adding the lengths of Branch A plus Branch B plus Branch C.

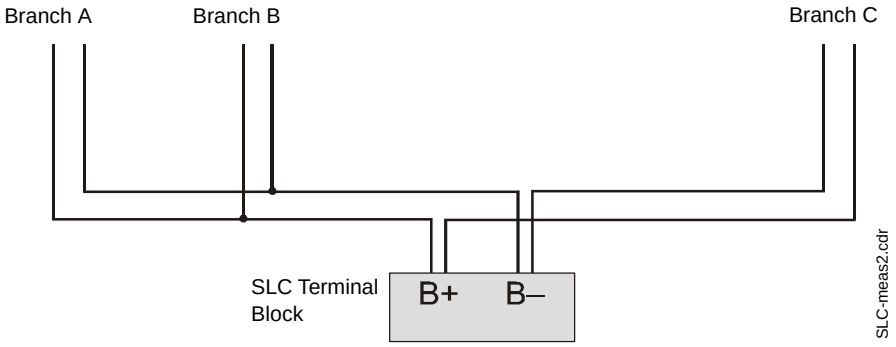


Figure 2 Measuring the Total Wire Length - Two-Wire SLC

Four-Wire SLC Style 6 & 7 (Class A)

Loop Resistance

The total DC resistance of the SLC pair cannot exceed 40 ohms. 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 two leads of SLC channel A (Return).
3. Measure the resistance across the SLC channel B (Out) leads.

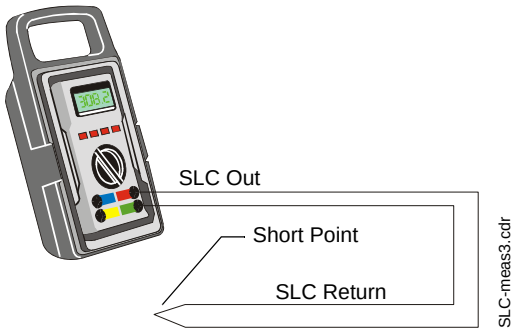


Figure 3 Measuring DC Resistance of a Four-Wire SLC

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:

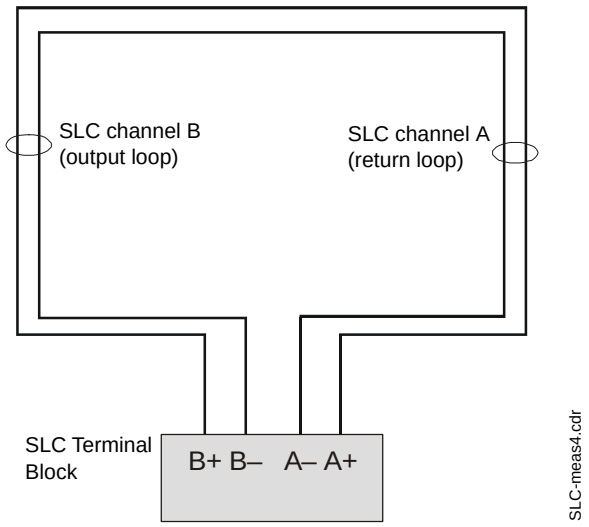


Figure 4 Measuring the Wire Length – Four-Wire SLC

Shield Wire Termination

The drawing below shows the method of proper termination of the shield.

Connect the metal conduit to the cabinet by using the proper connector. Feed the shielded wire through the conduit, into the control box. The shield drain wire must be connected to the “shield” terminal on the SLC terminal block.

Note: Use of good wiring practice consistent with local electrical codes is expected.

CAUTION: Do not let the shield drain wire or the shield foil touch the system cabinet or be connected to earth ground at any point.

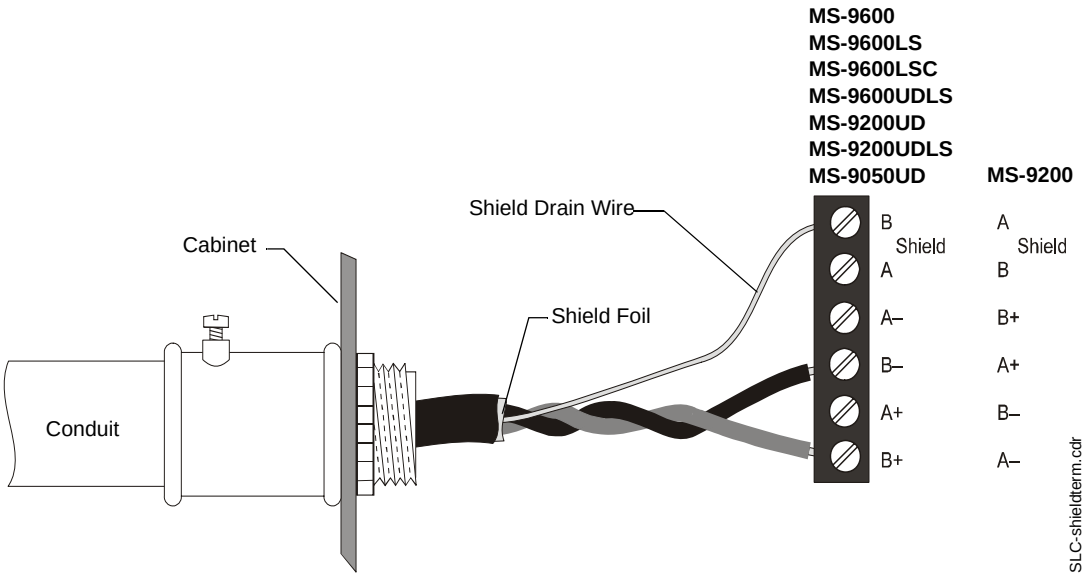


Figure 5 Shield Termination

Control Panel Terminal Blocks

The terminal blocks on the control panel circuit board that concern the SLC circuit are described below. For more information on this subject refer to the control panel's Instruction Manual.

MS-9200

TB4 provides three types of 24 VDC power; Unregulated, Nonresettable and Resettable.

TB6 provides connections for the SLC wiring.

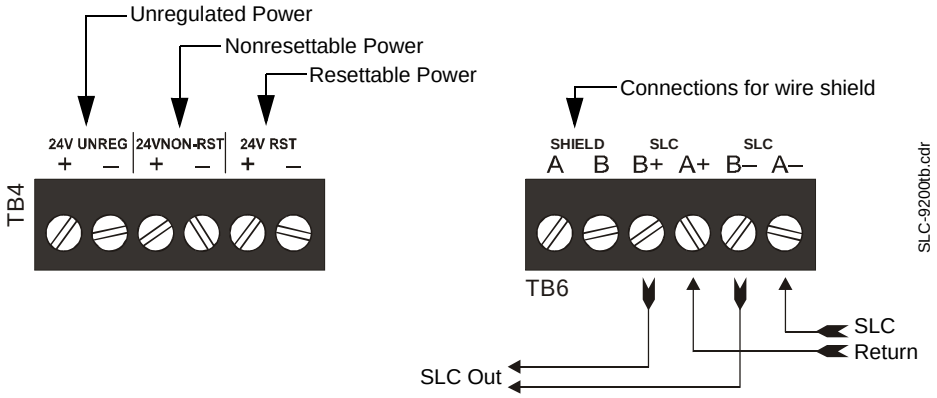


Figure 6 MS-9200 Terminal Blocks

MS-9600, MS-9600LS, MS-9600LSC & MS-9600UDLS

TB3 provides two types of 24 VDC power; Nonresettable and Resettable.

TB8 provides connections for the SLC wiring.

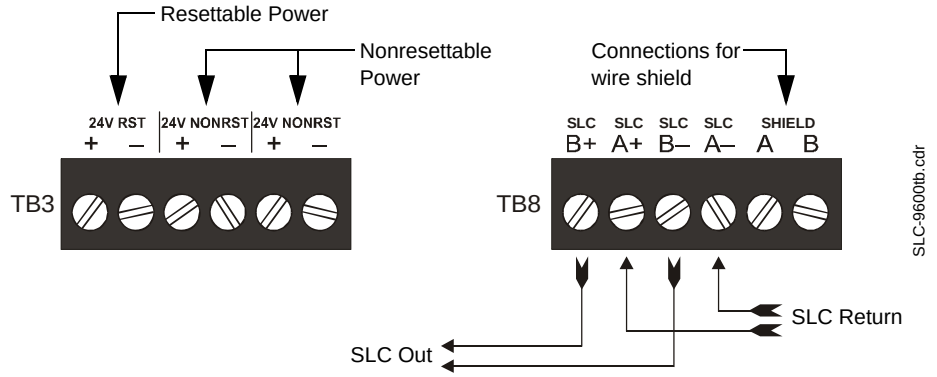


Figure 7 MS-9600 Series Terminal Blocks

MS-9200UD & MS-9200UDLS

TB1 provides two types of 24 VDC power; Nonresettable and Resettable.

TB10 provides connections for the SLC wiring.

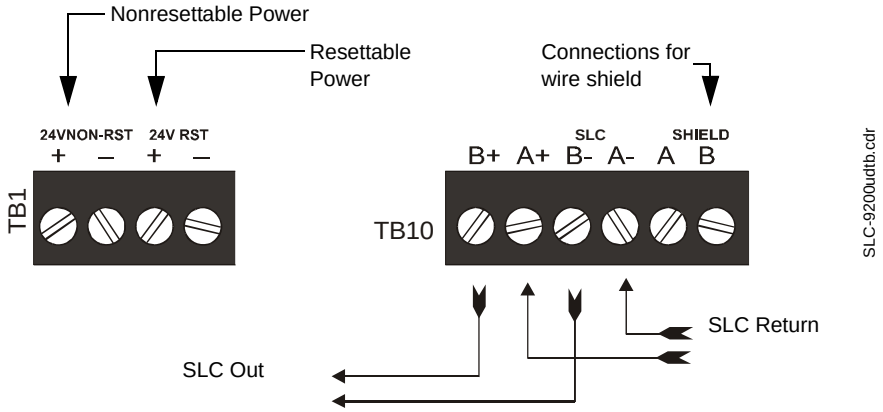


Figure 8 MS-9200UD & MS-9200UDLS Terminal Blocks

MS-9050UD

24 VDC power may be supplied by a remote power supply such as the Fire-Lite FCPS-24FS6/8.

TB2 provides connections for the SLC wiring.

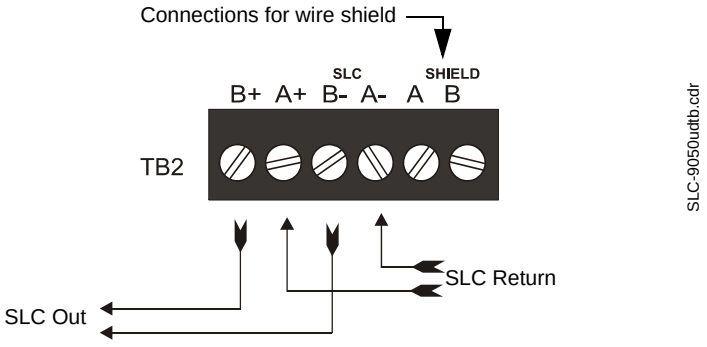


Figure 9 MS-9050UD Terminal Block

Non-Isolated Circuits

Overview

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

- NFPA Style 4
- NFPA Style 6

NFPA Style 4 SLC

NFPA Style 4 requirements can be met by using the diagram below.

- T-tapping of the SLC wiring is allowed for Style 4 configuration.

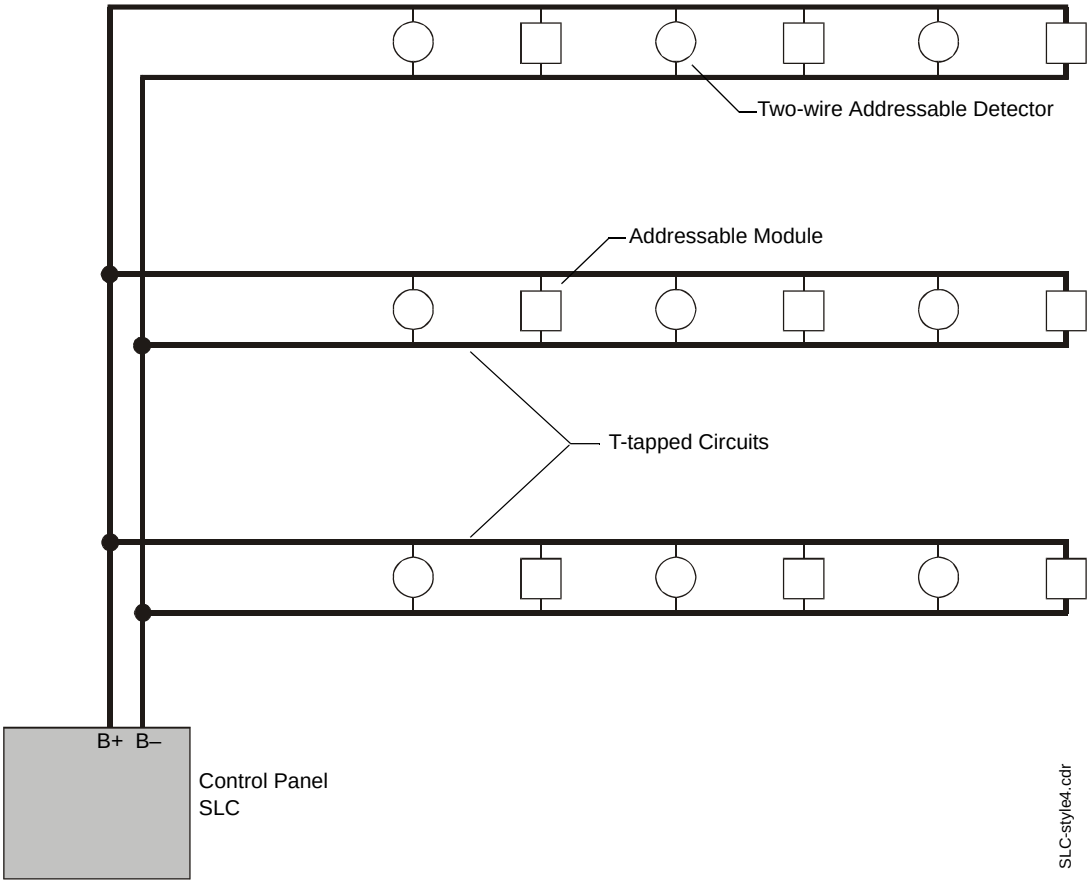


Figure 10 Basic NFPA Style 4 SLC

NFPA Style 6 SLC

NFPA Style 6 requirements can be met by using the diagram below.

- T-tapping of the SLC wiring is NOT allowed for Style 6 configuration.

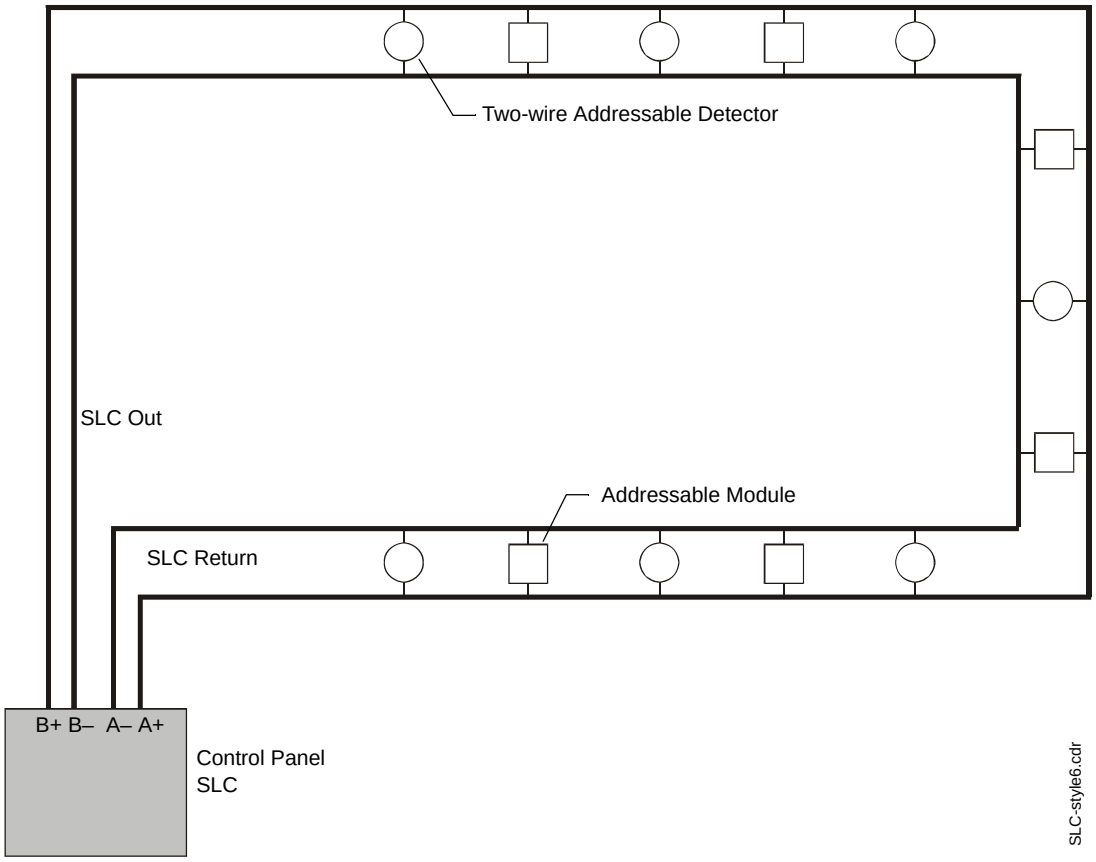


Figure 11 Basic NFPA Style 6 SLC

SLC Circuits with Isolators

Fault Isolator Module - I300

The I300 is used to protect critical elements of the SLC from faults on other SLC branches or segments

A Fault Isolator Module on both sides of a device is required to comply with NFPA Style 7 requirements.

A maximum of 25 addressable devices can be connected between isolator Modules.

When more than 100 Isolator Modules are connected to an SLC loop, the address capacity of the loop is reduced by two (2) addresses for every isolator device in excess of 100.

Isolating an SLC Branch

The 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 faulty 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.

Wiring an Isolator Module

The figure below shows typical wiring of an Isolator Module:

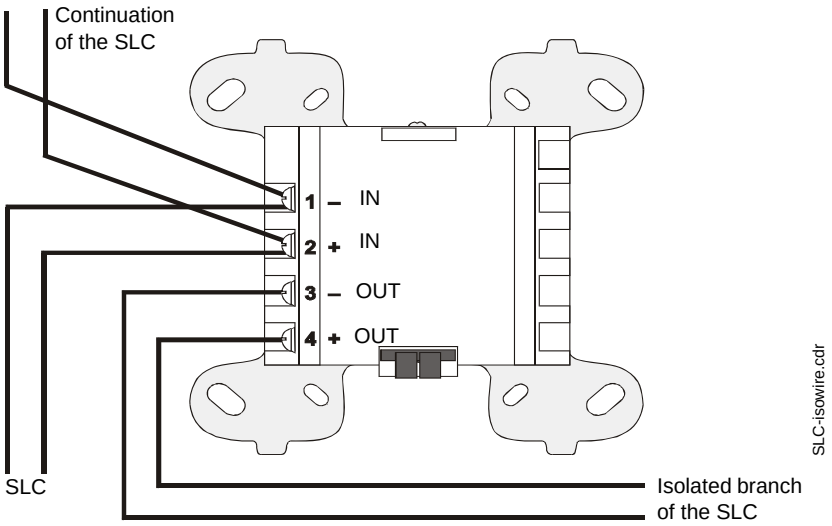


Figure 12 Wiring an I300 Module

NFPA Style 4 SLC Using an I300 Module

A variation of a Style 4 operation using isolator modules to protect each branch of the SLC. Refer to Figure 12 on page 21 for I300 wiring.

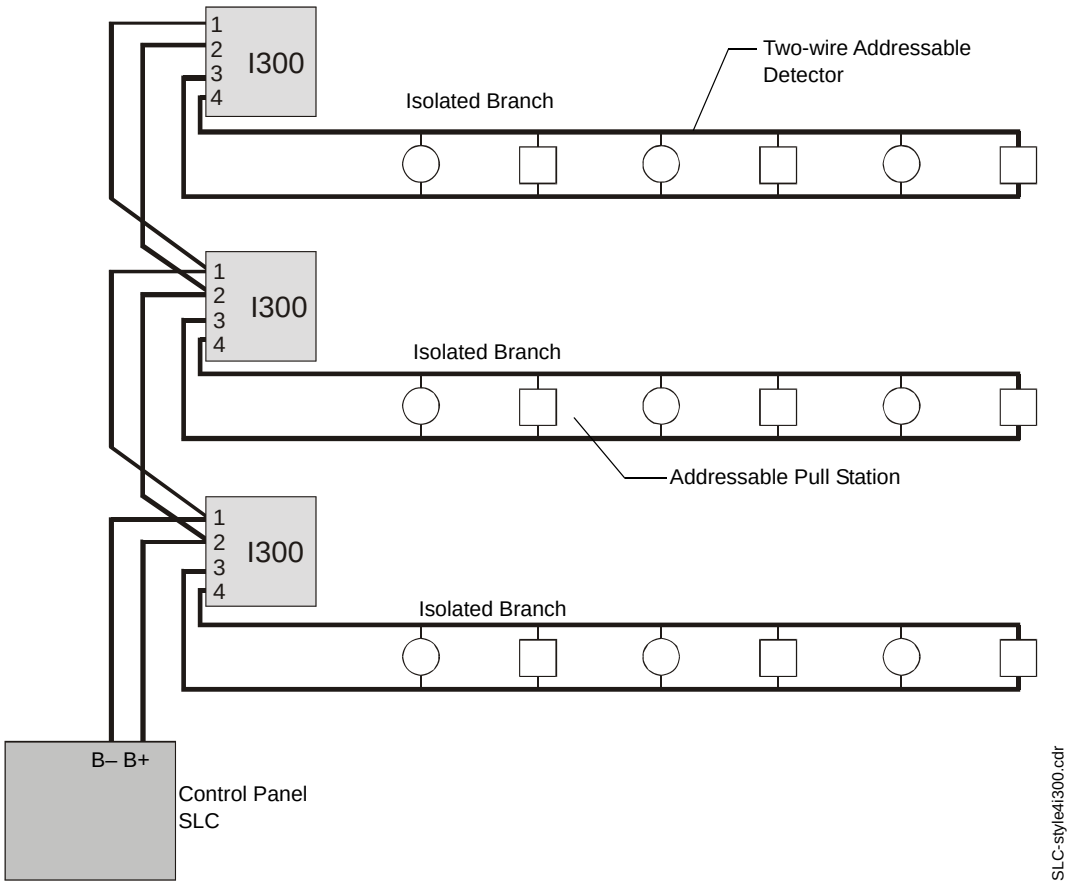


Figure 13 NFPA Style 4 SLC using I300 modules

NFPA Style 6 SLC Using an I300 Module

A variation of Style 6 operation using isolator modules to protect a section of the SLC. By flanking each group of devices with an I300 fault isolator module each group is protected from faults that may occur in the other groups. For example, a fault in Section B will not effect 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 Style 6 configuration.
- I300 modules shall be within 20 feet (6.1 meters) of device and use metal conduit.

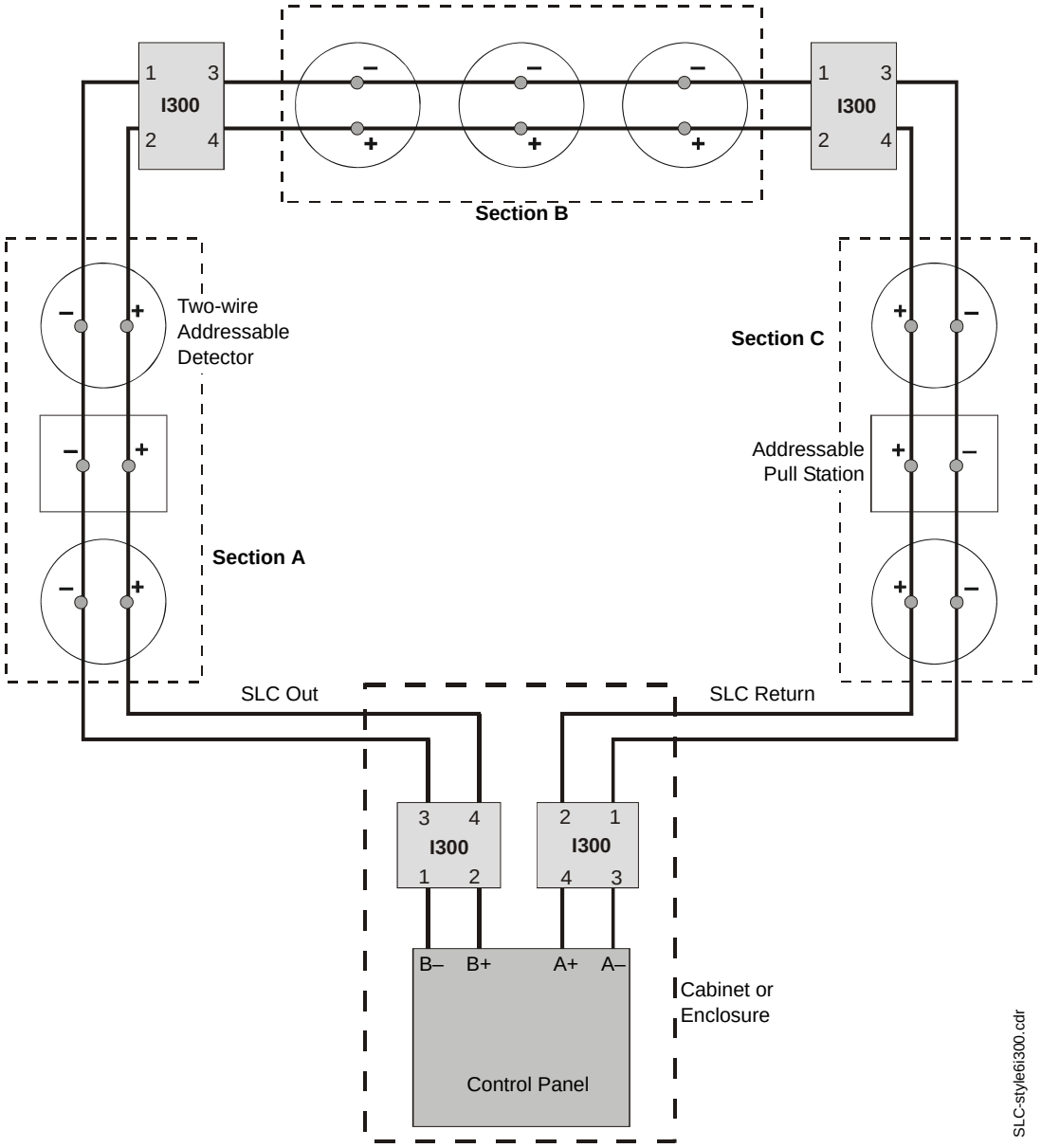


Figure 14 NFPA Style 6 SLC using I300 modules

NFPA Style 7 SLC Using an I300 Module

Style 7 operation requires using isolator modules before and after each device. Flanking each device with an isolator provides fault protection to all other devices on the loop.

- T-tapping is NOT allowed within the Style 7 wiring configuration.
- When a detector base or pull station is used, install I300 modules on both sides of the device.
- Connections between isolator modules and the device they isolate must be "close nippled" conduit, within 3 feet (91.44 cm).

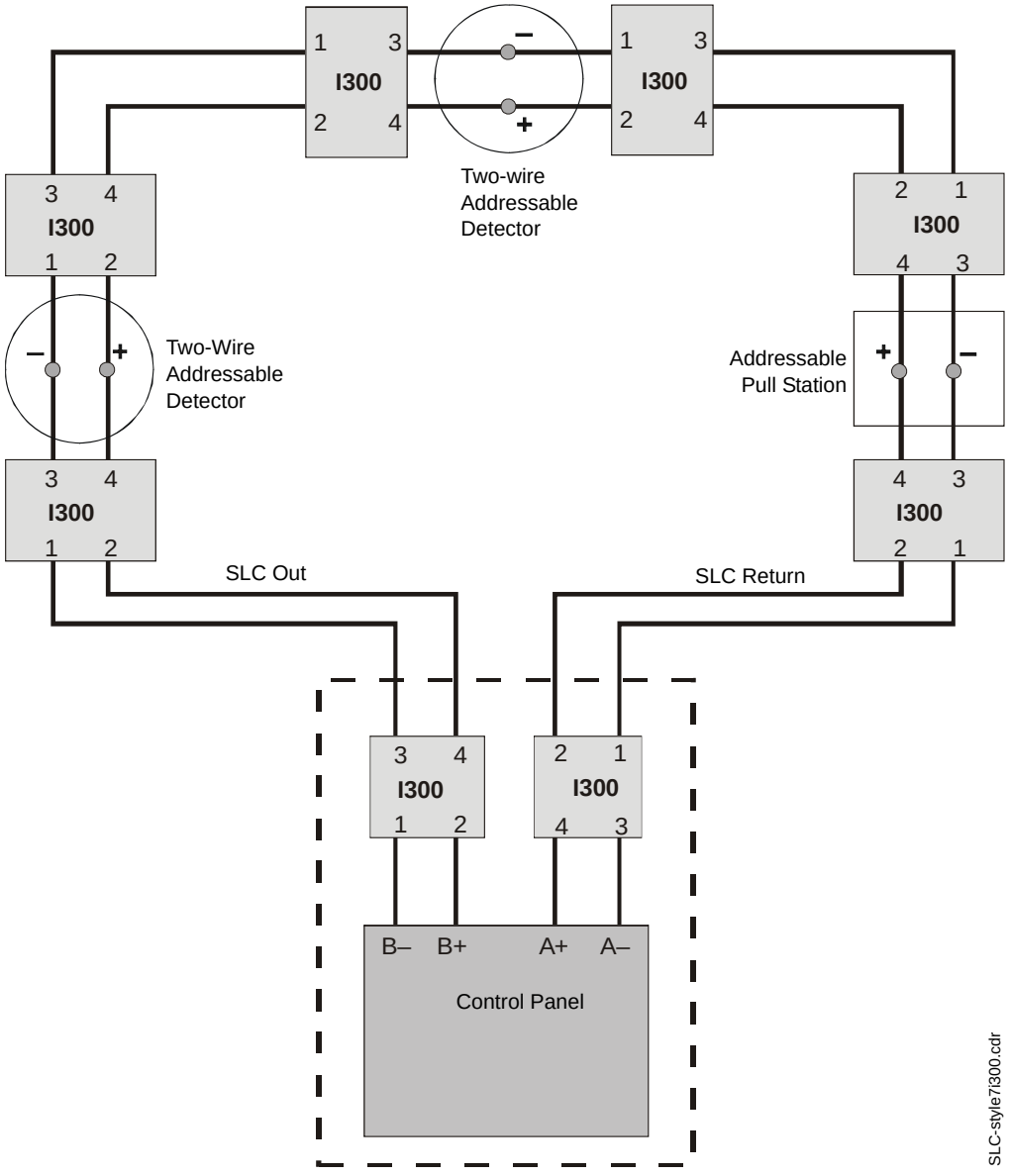


Figure 15 NFPA Style 7 SLC

Monitor Modules

Descriptions

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

Note: For more information on the individual module specifications refer to the *Installation Instructions* that are provided with these devices.

MMF-300 Monitor Module

An addressable module that monitors either a Style B (Class B) or Style D (Class A) circuit of dry-contact input devices.

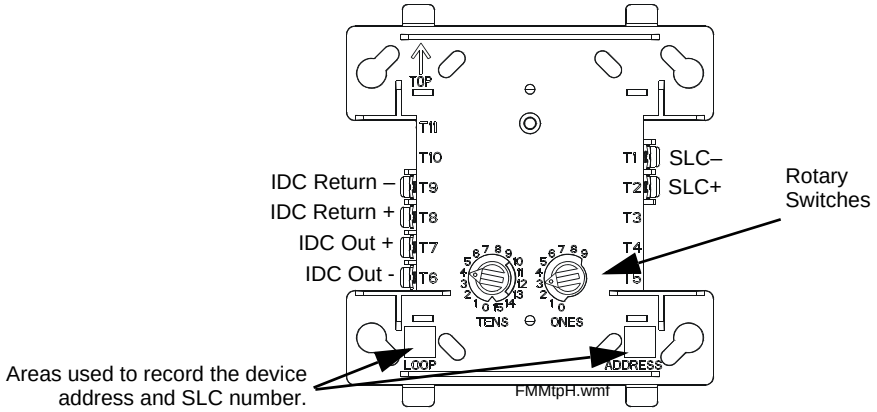


Figure 16 MMF-300 Monitor Module

MMF-302 Monitor Module

Similar to the MMF-300, except it is used to monitor a single IDC of UL listed compatible two-wire 24 volt conventional smoke detectors. Refer to the *Device Compatibility Document*.

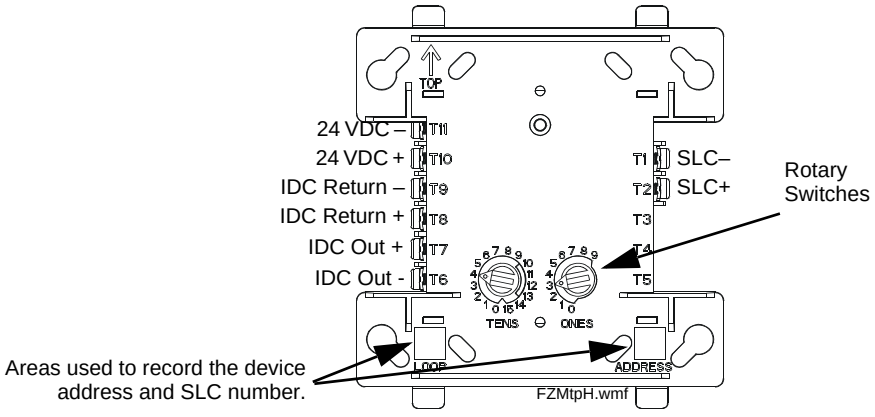


Figure 17 MMF-302 Module

MDF-300 Dual Monitor Module

Similar to the MMF-300 but provides for two independent 2-wire IDCs at two separate, consecutive addresses.

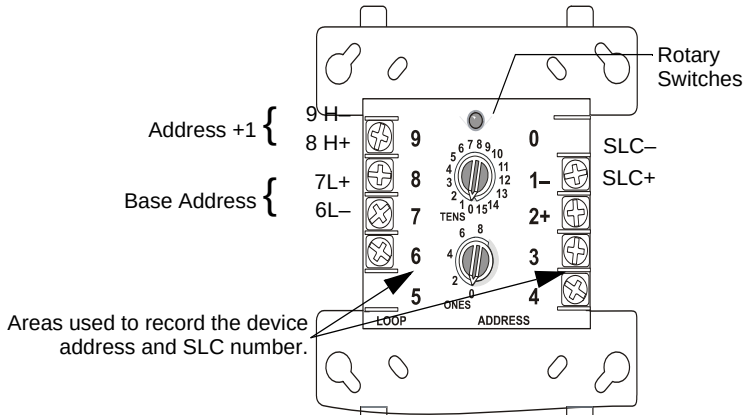


Figure 18 Dual Monitor Module

MMF-301 Monitor Module

Functionally and electrically identical to an MMF-300, but offered in a smaller package for mounting directly in the electrical box of the Style B (Class B) device being monitored.

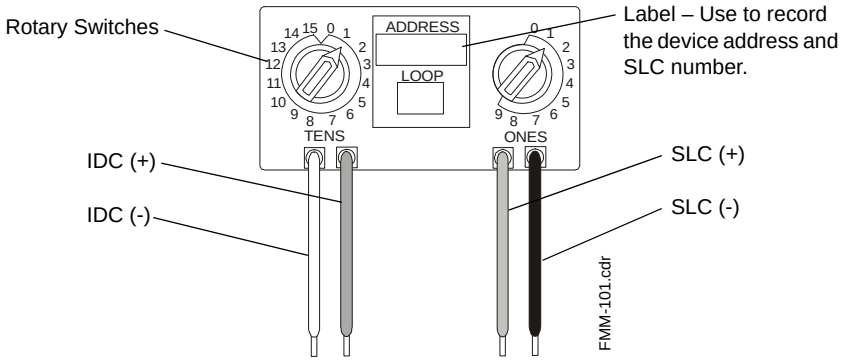


Figure 19 MMF-301 Module

MMF-300-10

A monitor module intended to interface between the FACP and up to ten (10) Style B (Class B) or five (5) Style D (Class A) IDCs containing normally open contact devices.

This type of module is contained in either a BB-2 or BB-6 cabinet. The BB-2 can accommodate up to 2 modules and the BB-6, which requires the CH-6 chassis, can accommodate up to 6 modules.

See the *Installation Instructions* provided with module for proper installation into cabinet.

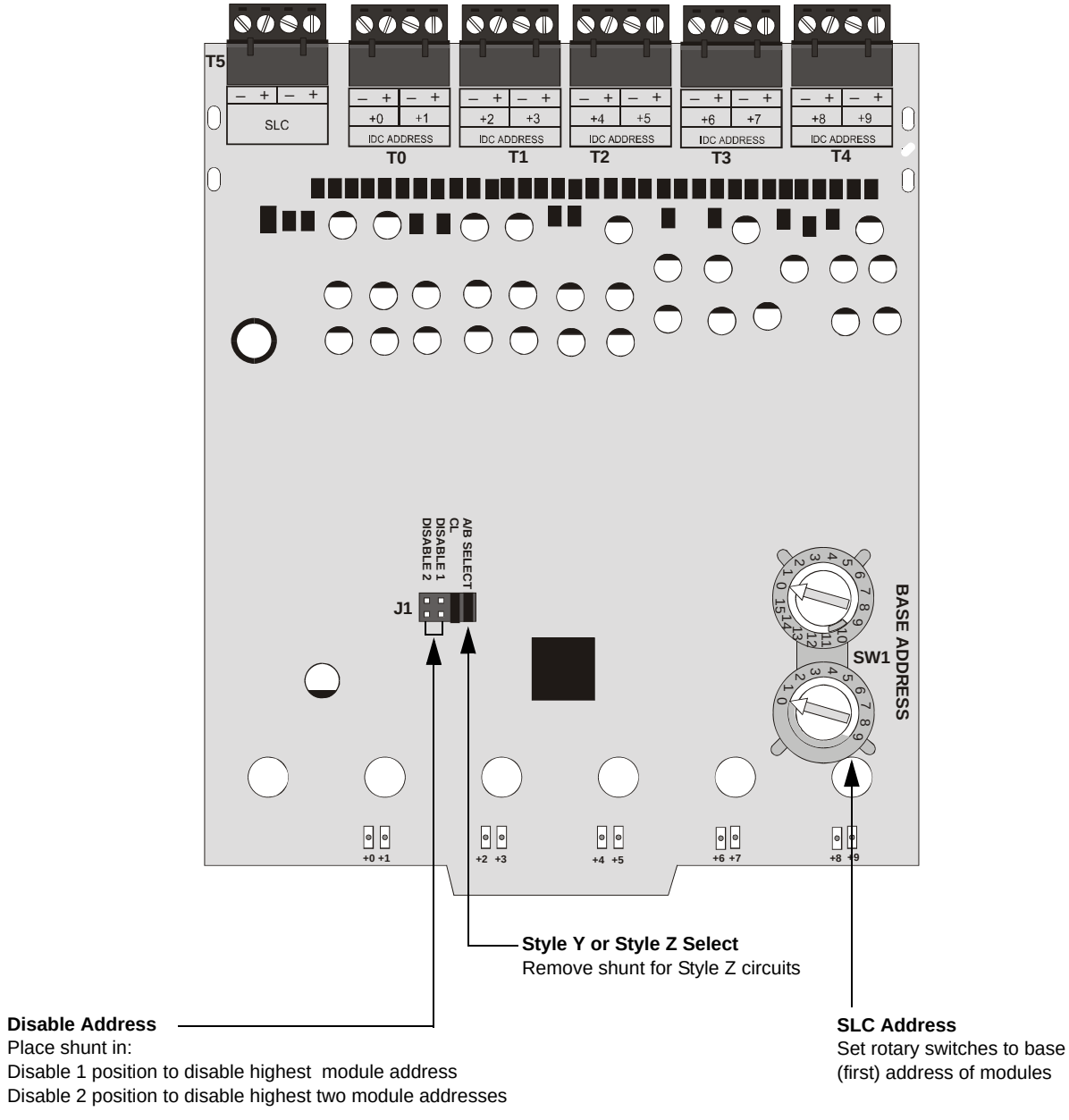


Figure 20 MMF-300-10 Module

MMF-302-6

A monitor module intended to interface between the FACP and a conventional alarm system with up to six (6) Style B (Class B) or three (3) Style D (Class A) IDCs containing normally open contact devices.

This type of module is contained in either a BB-2 or BB-6 cabinet. The BB-2 can accommodate up to 2 modules and the BB-6, which requires the CH-6 chassis, can accommodate up to 6 modules.

See the *Installation Instructions* provided with module for proper installation into cabinet.

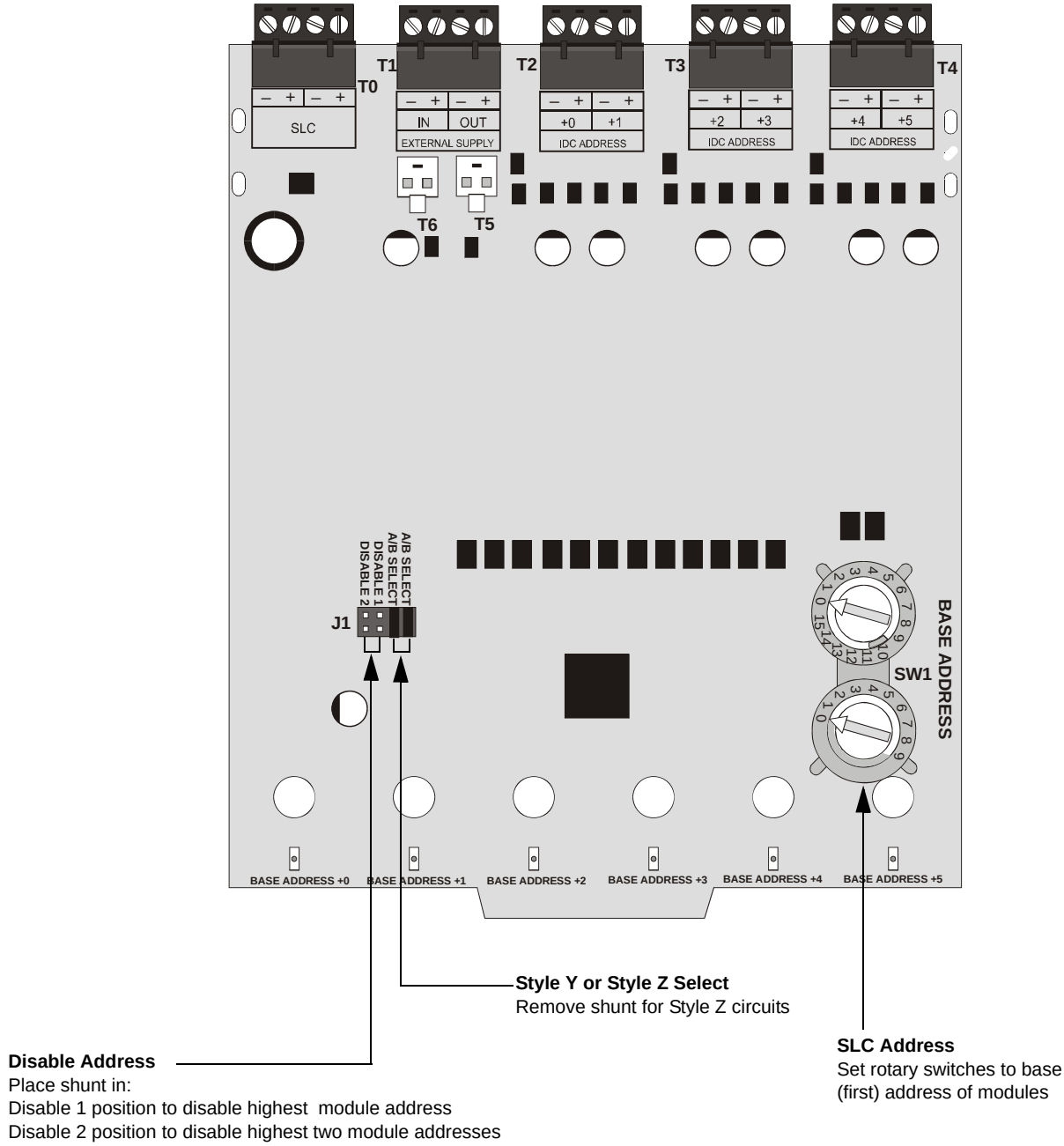


Figure 21 MMF-302-6 Module

Installation

When installing any of these modules DO NOT mix the following services that the IDC provides:

- Fire alarm service
- Automatic and manual waterflow alarm service with normally open contact devices
- Sprinkler supervision with normally open contact devices

Setting an SLC address for a Single Point Module

Each module can be set to one of 159 addresses (01-159) and is factory preset with an address of “00”.

Note: The MS-9050UD can support addresses 01 - 50. The MS-9200, MS-9200UD and MS-9200UDLS can support module addresses of 01 - 99. The MS-9600, MS-9600LS, MS-9600LSC and MS-9600UDLS can support module addresses 01 - 159.

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

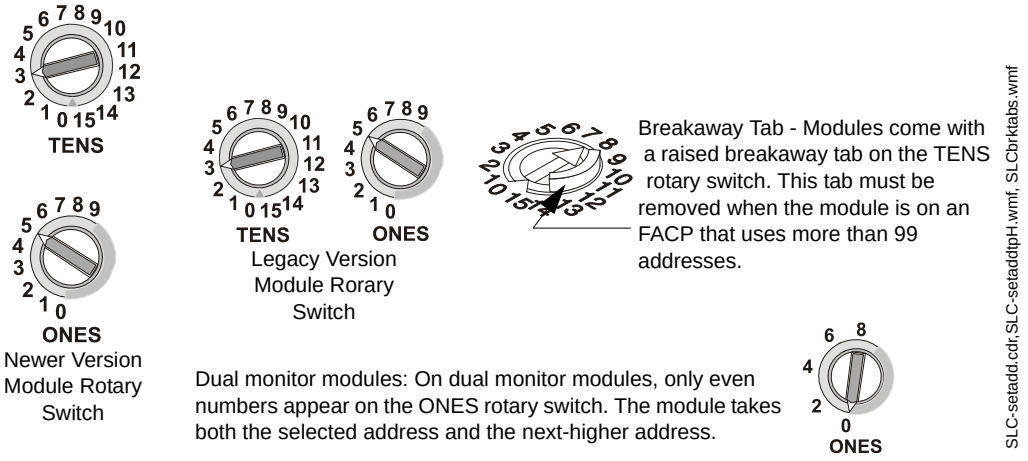


Figure 22 Setting SLC Address on a Single Point Module

Setting an SLC address for a Multi-Point Module

In Class B operation, each MMF-300-10, MMF-302-6, CMF-300-6 and CRF-300-6 module is set to a base address. The remaining module points are automatically assigned to the next higher SLC addresses. For example, if the base address of a MMF-300-10 is set to 28, the next module points will be addressed to 29, 30, 31, 32, 33, 34, 35, 36 and 37.

In Class A operation, alternate module points are paired together, resulting in a total of five module points. For example, if the base address of a MMF-300-10 is set to 28, then 30, 32, 34 and 36 will be automatically assigned to the remaining module points and 29, 31, 33, 35 and 37 are available for use by other modules.

Note: The MS-9050UD can support addresses 01 - 50. The MS-9200, MS-9200UD and MS-9200UDLS can support module addresses of 01 - 99. The MS-9600, MS-9600LS, MS-9600LSC and MS-9600UDLS can support module addresses 01 - 159 (the plastic *stop* located on the Tens switch must be removed to set addresses above 99).

To set an SLC address, use a common screwdriver to adjust the rotary switches on the module to the desired address. The module below is set at “28”.

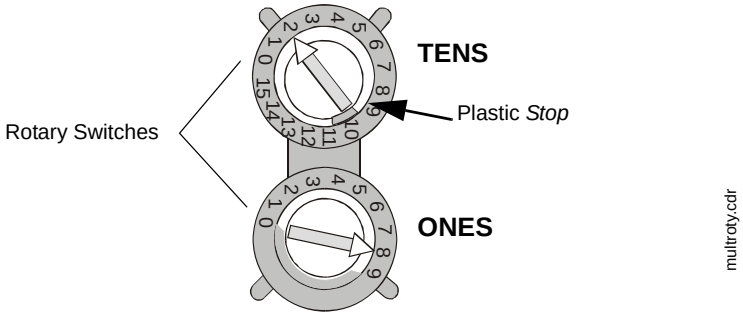


Figure 23 Setting SLC Address on a Multi-Point Module

MMF-300 Wiring Diagrams

Following are wiring diagrams that depict NFPA Style B (Class B) and D (Class A) Initiating Device Circuits (IDCs) using MMF-300 monitor modules.

The Initiating Device Circuit (IDC) is supervised and current-limited to 210 microamperes @ 24 VDC (nominal).

Wiring a NFPA Style B IDC with an MMF-300

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

Each module takes one address on the SLC. Use the rotary switches on the module to set it to the required SLC address. Refer to “Setting an SLC address for a Single Point Module” on page 29.

The figure below shows typical wiring for a supervised and power-limited NFPA Style B IDC using an MMF-300 module.

- Refer to the *Device Compatibility Document* for compatible smoke detectors.
- See "Appendix A: Power Considerations" on page 53 for information on supervising 24 VDC power.

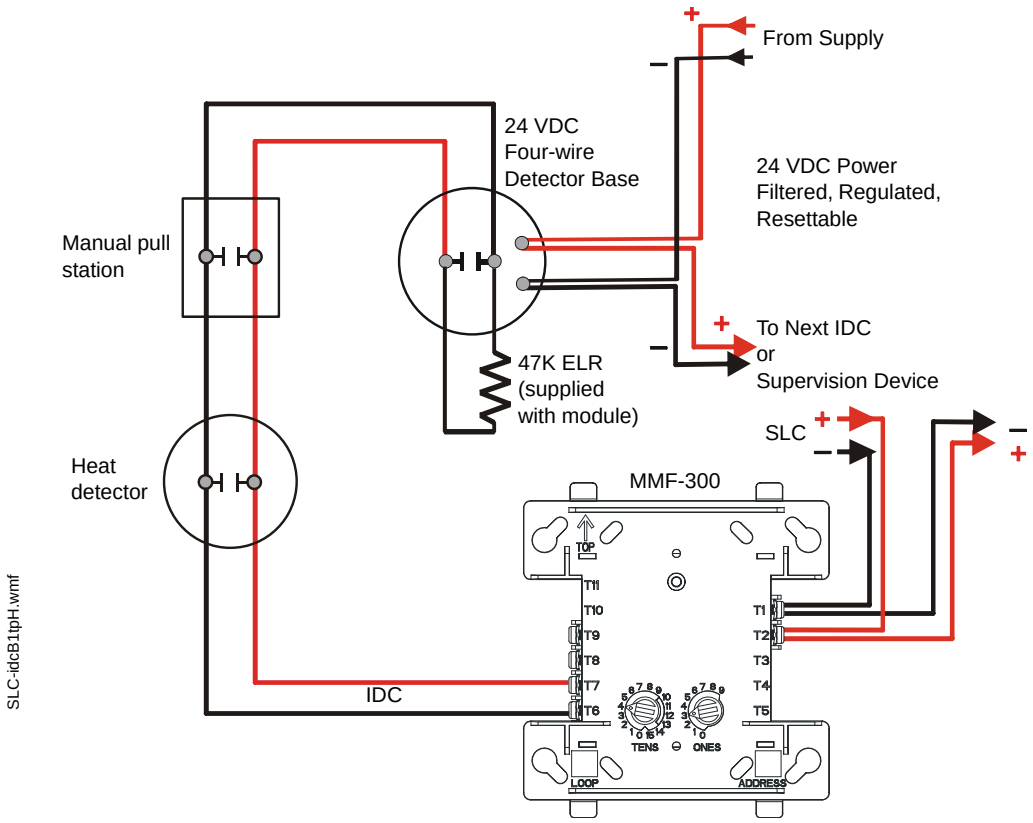


Figure 24 Typical Style B IDC Wiring with MMF-300

Wiring a NFPA Style D IDC with an MMF-300

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

Each module takes one address on the SLC. Use the rotary switches on the module to set it to the required SLC address. Refer to “Setting an SLC address for a Single Point Module” on page 29.

The figure below shows typical wiring for a supervised and power-limited NFPA Style D (Class A) IDC using an MMF-300 module.

- Refer to the *Device Compatibility Document* for compatible smoke detectors.
- See "Appendix A: Power Considerations" on page 53 for information on supervising 24 VDC power.

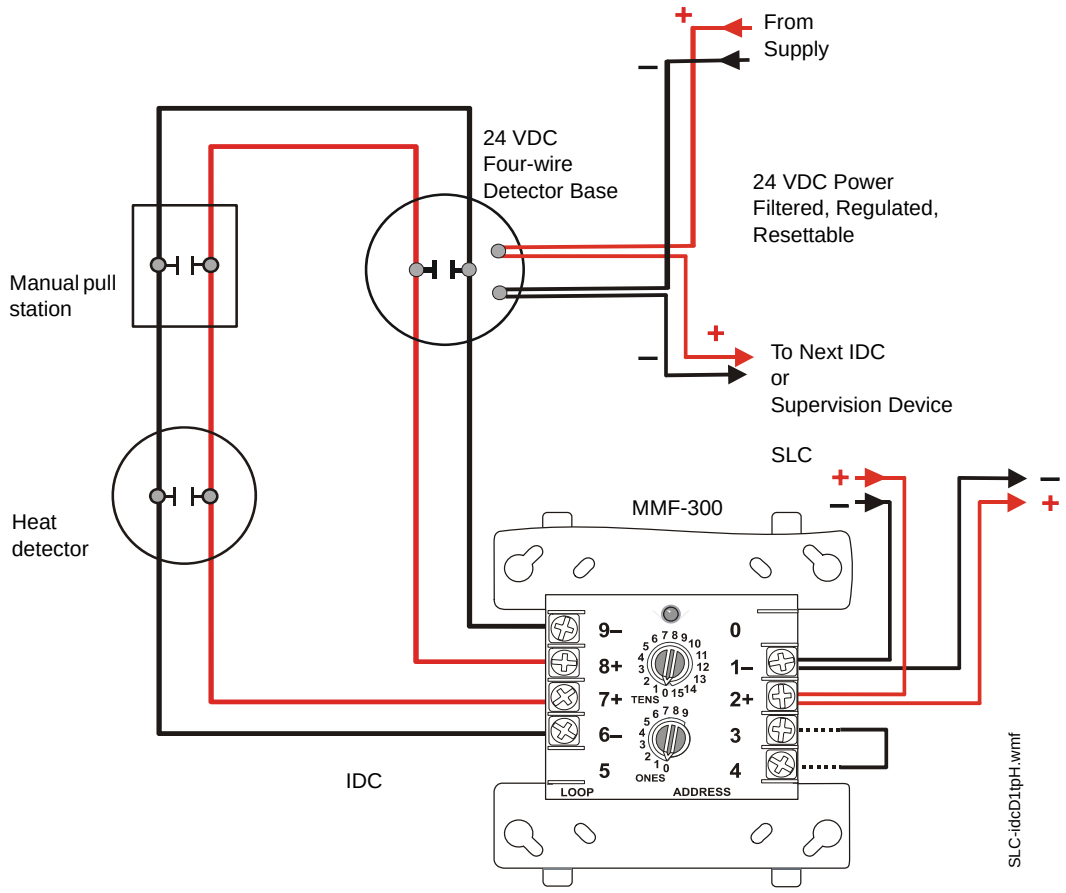


Figure 25 Typical Style D IDC Wiring with MMF-300

MMF-300-10 Wiring Diagrams

Following are wiring diagrams that depict NFPA Style B (Class B) and D (Class A) Initiating Device Circuits (IDCs) using MMF-300-10 monitor modules.

The Initiating Device Circuit (IDC) is supervised and current-limited to 1.0 milliampere @ 24 VDC (nominal).

Wiring a NFPA Style B IDC with an MMF-300-10

Connect the SLC wiring to the module terminals T5 as shown below.

Use the rotary switches on the module to set the base SLC address. Each module takes ten addresses on the SLC. The remaining module points are automatically assigned to the next nine higher addresses. Refer to “Setting an SLC address for a Multi-Point Module” on page 30.

DO NOT set the lowest address above 150 (41 for the MS-9050UD, 90 for the MS-9200, MS-9200UD and MS-9200UDLS), as the other module points will be assigned to nonexistent addresses.

The figure below shows typical wiring for a supervised and power-limited NFPA Style B IDC using an MMF-300-10 module.

- Refer to the *Device Compatibility Document* for compatible smoke detectors.
- See "Appendix A: Power Considerations" on page 53 for information on supervising 24 VDC power.

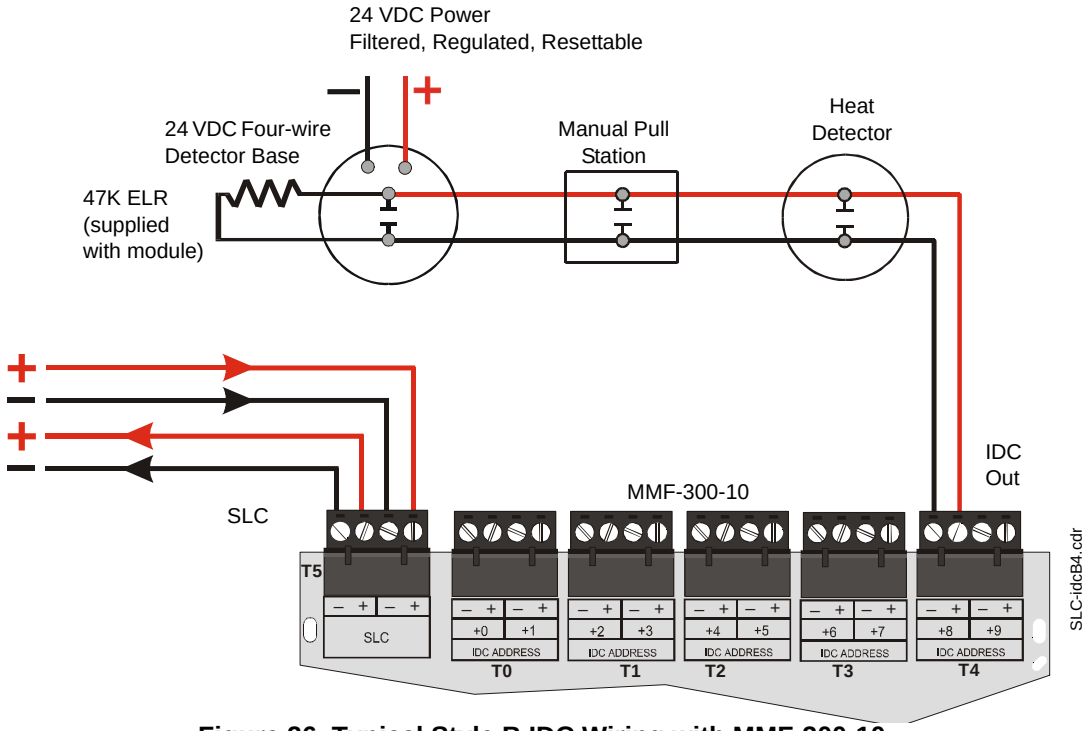


Figure 26 Typical Style B IDC Wiring with MMF-300-10

Wiring a NFPA Style D IDC with an MMF-300-10

Connect the SLC wiring to the module terminals T5 as shown below.

Use the rotary switches on the module to set the base SLC address. Each module takes five alternating addresses on the SLC. The remaining module points are automatically assigned to the next four higher addresses. (Example: 28, 30, 32, 34 and 36). Refer to “Setting an SLC address for a Multi-Point Module” on page 30.

DO NOT set the lowest address above 150 (41 for the MS-9050UD, 90 for the MS-9200, MS-9200UD and MS-9200UDLS), as the other module points will be assigned to nonexistent addresses.

The figure below shows typical wiring for a supervised and power-limited NFPA Style D (Class A) IDC using an MMF-300-10 module.

- Refer to the *Device Compatibility Document* for compatible smoke detectors.
- See "Appendix A: Power Considerations" on page 53 for information on supervising 24 VDC power.

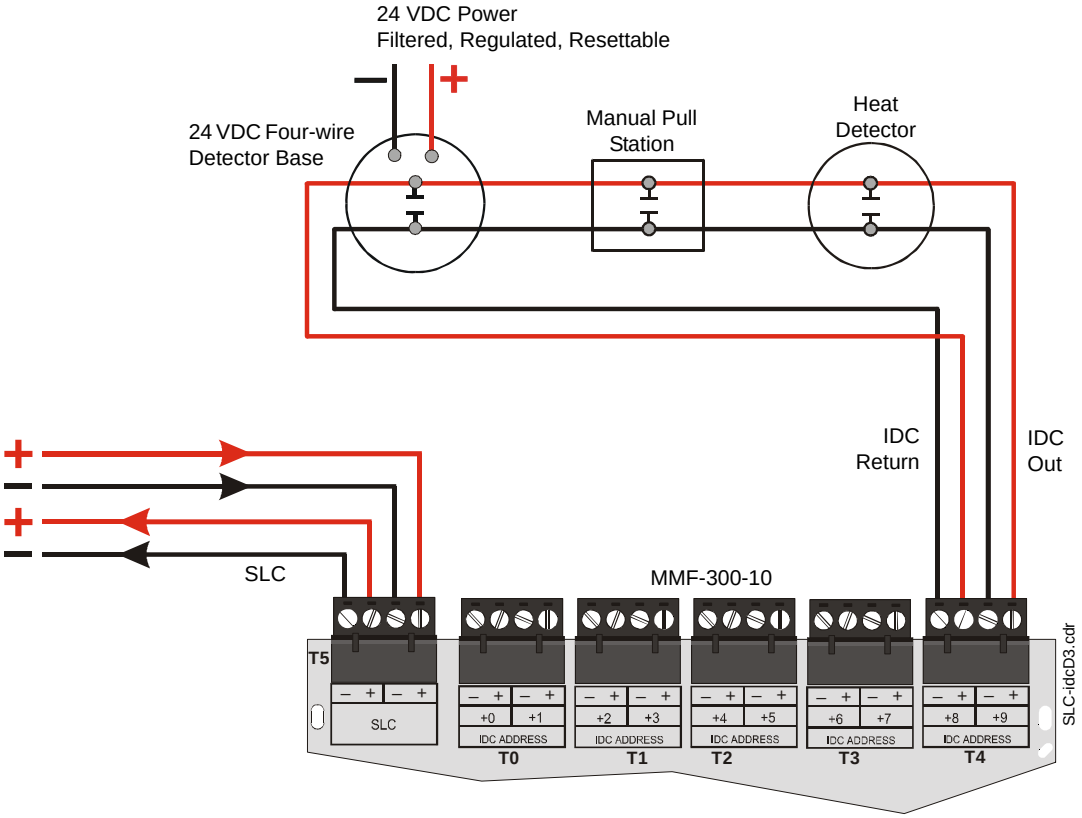


Figure 27 Typical Style D IDC Wiring with MMF-300-10

MDF-300 Wiring Diagrams

Following is a wiring diagrams that depict NFPA Style B (Class B) Initiating Device Circuits (IDCs) using MDF-300 dual monitor module.

Wiring a NFPA Style B IDC with an MDF-300

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

Use the rotary switches on the module to set it to the SLC address. Each dual module takes two addresses on the SLC. Circuit 'L' corresponds to the address set on the rotary switches, which will be an even number. Circuit 'H' will automatically respond to the next higher address, which will be an odd number. Use caution to avoid duplicate addressing of modules on the system. Refer to "Setting an SLC address for a Single Point Module" on page 29.

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

The figure below shows typical wiring for a supervised and power-limited NFPA Style B IDC using an MDF-300 module.

- Refer to the *Device Compatibility Document* for compatible smoke detectors.
- See "Appendix A: Power Considerations" on page 53 for information on supervising 24 VDC power.

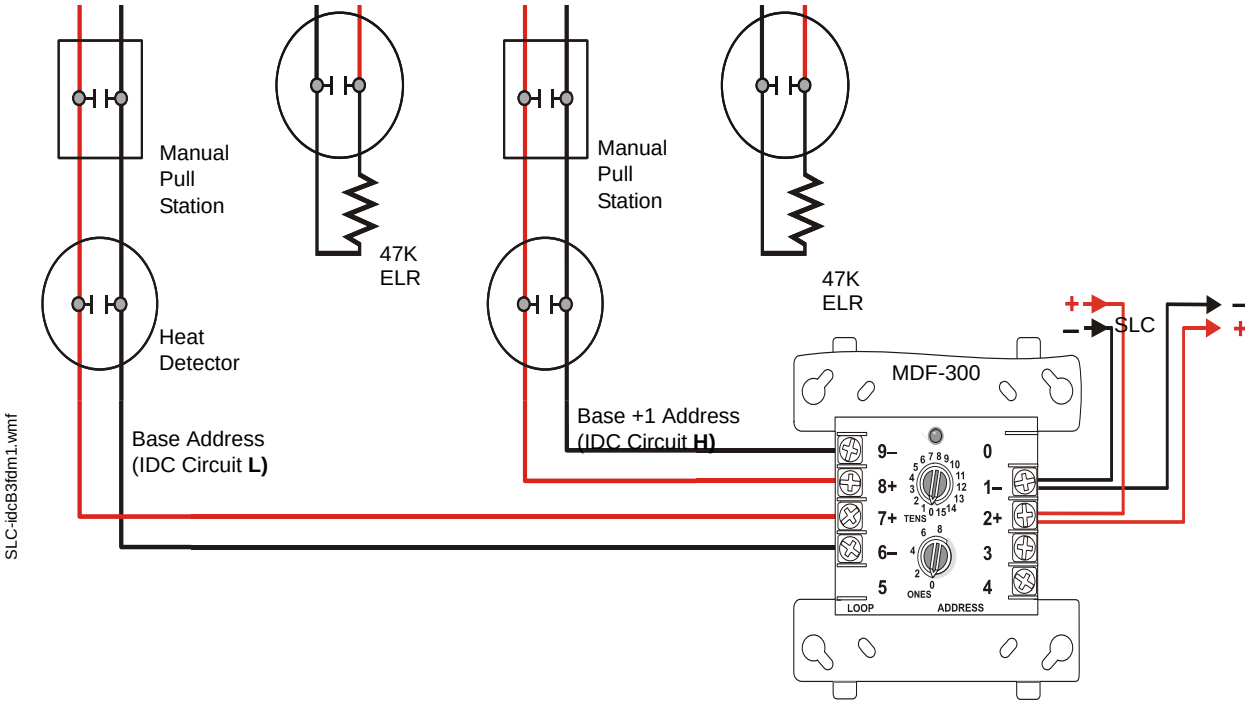


Figure 28 Typical Style B IDC Wiring with MDF-300

MMF-302 Wiring Diagrams

Following are wiring diagrams that concern NFPA Style B (Class B) and D (Class A) Initiating Device Circuits (IDCs) using MMF-302 monitor modules.

Wiring a NFPA Style B IDC with an MMF-302

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

Each module takes one address on the SLC. Use the rotary switches on the module to set it to the required SLC address. Refer to “Setting an SLC address for a Single Point Module” on page 29.

The IDC is supervised and power limited to 230 microamperes @ 24 VDC.

The figure below shows typical wiring for a supervised and power-limited NFPA Style B IDC using an MMF-302 module.

- Refer to the *Device Compatibility Document* for compatible smoke detectors.
- 24 VDC power must be provided from a UL listed power supply for fire protection use. This power is inherently supervised by the module.
- See "Appendix A: Power Considerations" on page 53 for information on 24 VDC power.

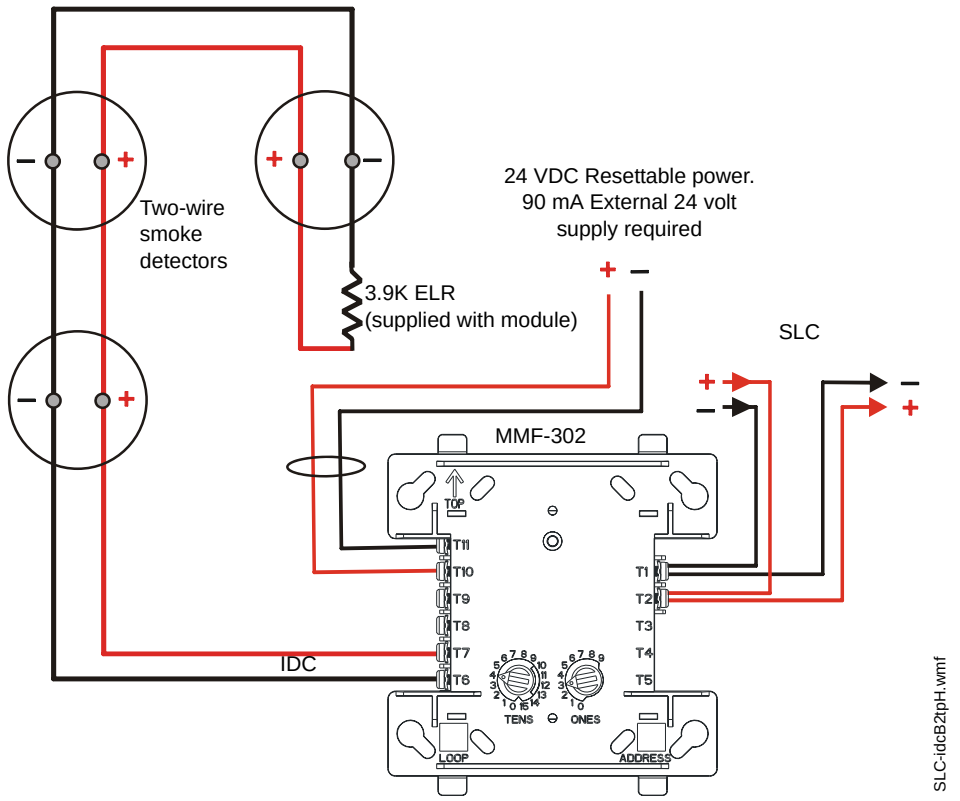


Figure 29 Typical Style B IDC Wiring with MMF-302

Wiring a NFPA Style D IDC with an MMF-302

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

Each module takes one address on the SLC. Use the rotary switches on the module to set it to the required SLC address. Refer to “Setting an SLC address for a Single Point Module” on page 29.

The figure below shows typical wiring for a supervised and power-limited NFPA Style D (Class A) IDC using an MMF-302 module.

- Refer to the *Device Compatibility Document* for compatible smoke detectors.
- 24 VDC power must be provided from a UL listed power supply for fire protection use. This power is inherently supervised by the module.
- See "Appendix A: Power Considerations" on page 53 for information on 24 VDC power.

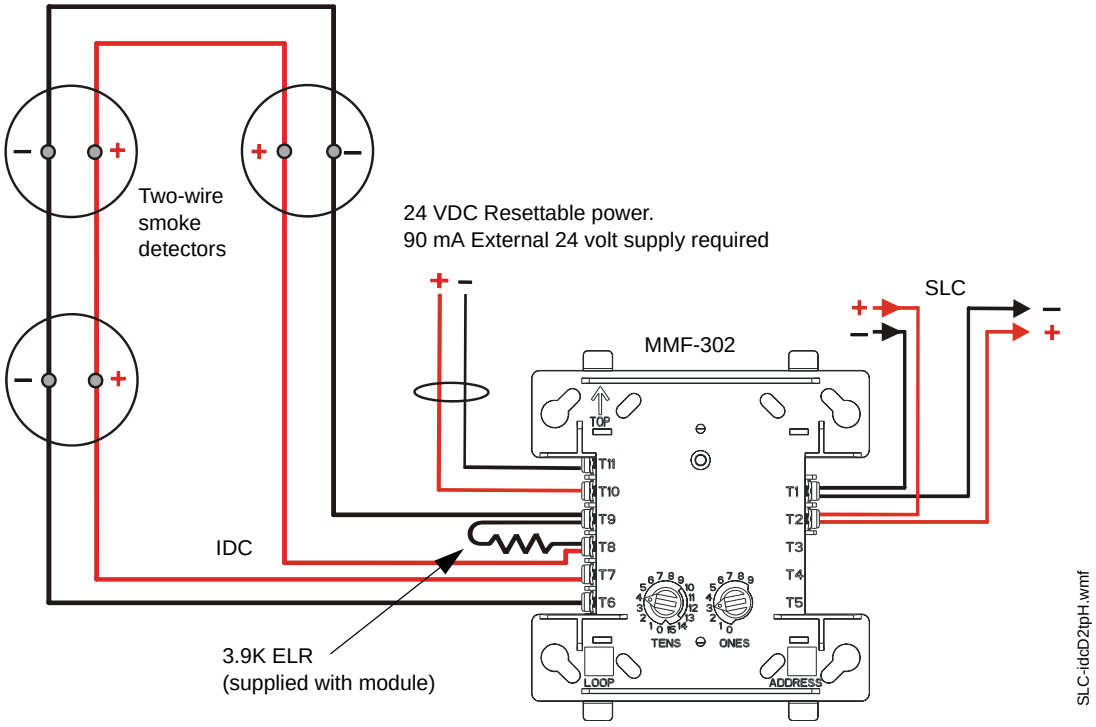


Figure 30 Typical Style D IDC Wiring with MMF-302

MMF-302-6 Wiring Diagrams

Following are wiring diagrams that concern NFPA Style B (Class B) and D (Class A) Initiating Device Circuits (IDCs) using MMF-302-6 monitor modules.

Wiring a NFPA Style B IDC with an MMF-302-6

Connect the SLC wiring to the module terminals T0 as shown below.

Use the rotary switches on the module to set the base SLC address. Each module takes six addresses on the SLC. The remaining module points are automatically assigned to the next five higher addresses. Refer to “Setting an SLC address for a Multi-Point Module” on page 30.

DO NOT set the lowest address above 154 (45 for the MS-9050UD, 94 for the MS-9200, MS-9200UD and MS-9200UDLS), as the other module points will be assigned to nonexistent addresses.

The figure below shows typical wiring for a supervised and power-limited NFPA Style B IDC using an MMF-302-6 module.

- Refer to the *Device Compatibility Document* for compatible smoke detectors.
- 24 VDC power must be provided from a UL listed power supply for fire protection use. This power is inherently supervised by the module.
- See "Appendix A: Power Considerations" on page 53 for information on 24 VDC power.

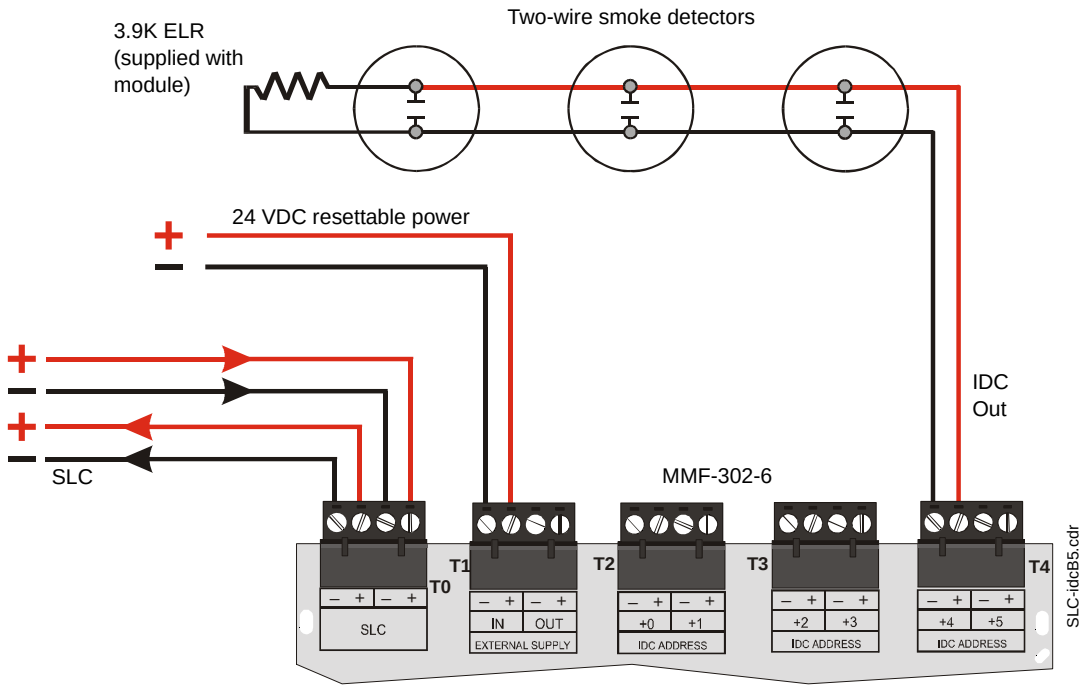


Figure 31 Typical Style B IDC Wiring with MMF-302-6

Wiring a NFPA Style D IDC with an MMF-302-6

Connect the SLC wiring to the module terminals T0 as shown below.

Use the rotary switches on the module to set it to the SLC addresses. Each module takes three alternating addresses on the SLC. The remaining module points are automatically assigned to the next two higher addresses. (Example: 28, 30 and 32). Refer to “Setting an SLC address for a Multi-Point Module” on page 30.

DO NOT set the lowest address above 154 (45 for the MS-9050UD, 94 for the MS-9200, MS-9200UD and MS-9200UDLS), as the other module points will be assigned to nonexistent addresses.

The figure below shows typical wiring for a supervised and power-limited NFPA Style D (Class A) IDC using an MMF-302-6 module.

- Refer to the *Device Compatibility Document* for compatible smoke detectors.
- 24 VDC power must be provided from a UL listed power supply for fire protection use. This power is inherently supervised by the module.
- See "Appendix A: Power Considerations" on page 53 for information on 24 VDC power.

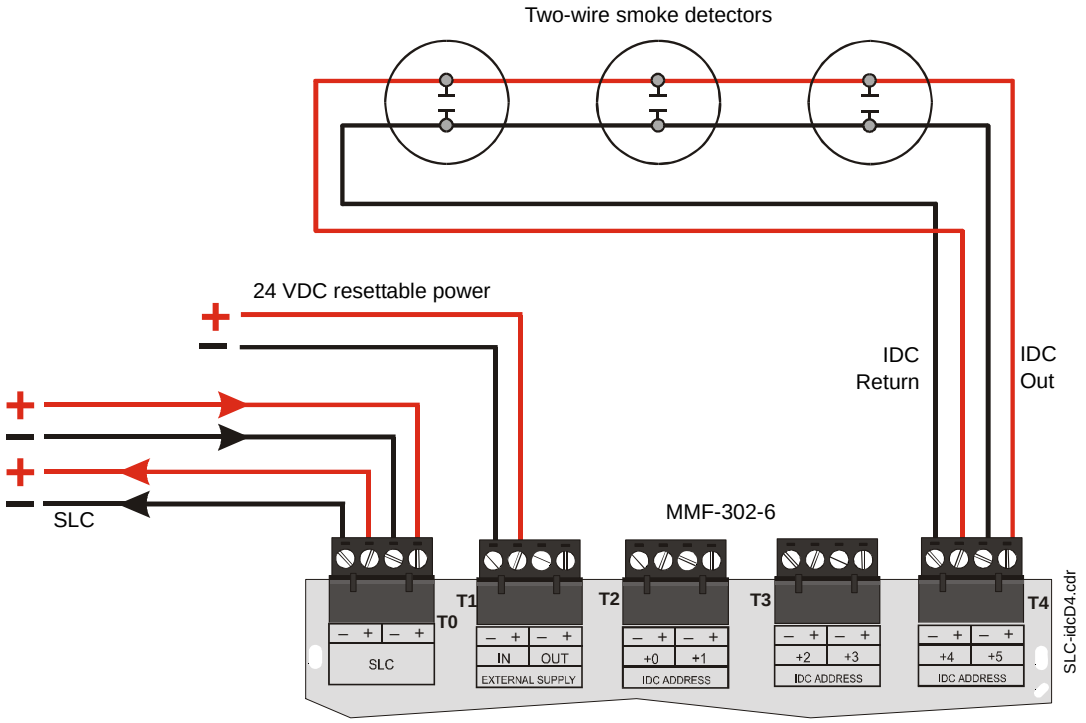


Figure 32 Typical Style D IDC Wiring with MMF-302-6

Control Modules

When using a Control Module as a Notification Appliance Circuit (NAC), the isolation described in the section titled SLC Circuits with Isolators which begins on page 21, is required or Riser Conductors must be installed in accordance with the survivability from attack by fire requirements in National Fire Alarm Code, NFPA 72.

Description

The CMF-300 and CMF-300-6 modules are addressable modules that can be used for monitoring and switching 24 VDC Notification Appliance Circuit (NAC) power for NFPA Style Y (Class B) and NFPA Style Z (Class A) circuits.

Ratings for the relay contacts on the module are:

Load Description	Application	Maximum Voltage	Current Rating
Resistive	Non-Coded	30 VDC	3.0 A
Resistive	Coded	30 VDC	2.0 A
Resistive	Non-Coded	110 VDC	0.9 A
Resistive	Non-Coded	125 VAC (CMF-300) 70.7 VAC (CMF-300-6)	0.9 A
Inductive (L/R = 5ms)	Coded	30 VDC	0.5 A
Inductive (L/R = 2ms)	Coded	30 VDC	1.0 A
Inductive (PF = 0.35)	Non-Coded	125 VAC (CMF-300) 70.7 VAC (CMF-300-6)	0.5 A

Note: For more information on module specifications, refer to the *Installation Instructions* provided with these devices.

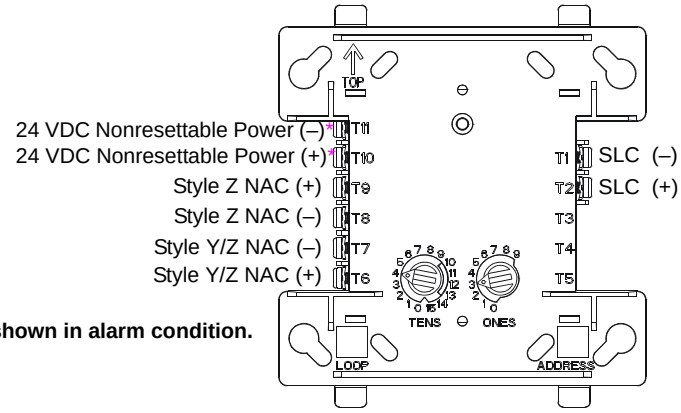
CMF-300 Installation

Setting an SLC address for an CMF-300 Module

Each module is factory preset with an address of “00”. To set an SLC address refer to "Setting an SLC address for a Single Point Module" on page 29.

Wiring a Notification Appliance Circuit (NAC) with an CMF-300

The figure below shows the connections to wire a module for powering a 24 VDC NAC:



NOTE: Module polarities are shown in alarm condition.

SLCModule-simplified.wmf

Figure 33 CMF-300 Wiring Connections

Wiring a CMF-300 Module

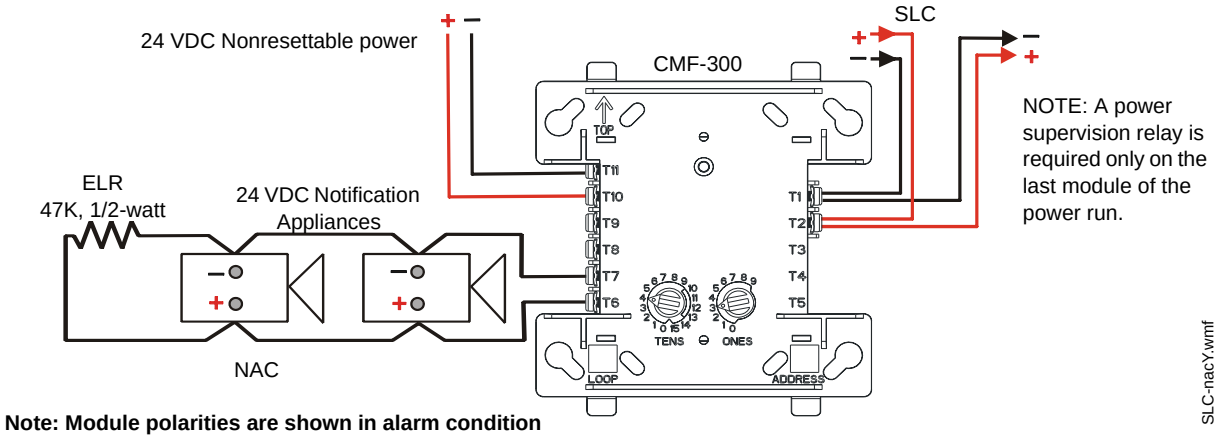
This section contains instructions and diagrams for wiring a Signaling Line Circuit with a CMF-300 as a Notification Appliance Circuit (NAC).

Wiring a Style Y NAC (Two-Wire)

A supervised and power-limited NFPA Style Y (Class B) NAC using a CMF-300 module. Polarized alarm notification appliances are shown connected to the module in a two-wire configuration.

Note: Refer to *Device Compatibility Document* for compatible notification appliances and relays.

- See "Appendix A: Power Considerations" on page 53 for information on monitoring 24 VDC power.
- Each module can control 2 amps of resistive load (on electronic devices) or 1 amp of inductive load (on mechanical bells and horns).
- 24 VDC power must be provided from a UL listed power supply for fire protection use.
- A power supervision relay is required only on the last module of the power run.
- Do not T-tap or branch a Style Y circuit.
- Terminate the circuit across the last device using an End-of-Line Resistor 47K, 1/2-watt, P/N SSD A2143-00 (ELR-47K in Canada).
- Do not loop wiring under the screw terminals of any notification appliance. To maintain supervision, break the wire run at each device



Note: Module polarities are shown in alarm condition

Figure 34 NFPA Style Y Notification Appliance Circuit

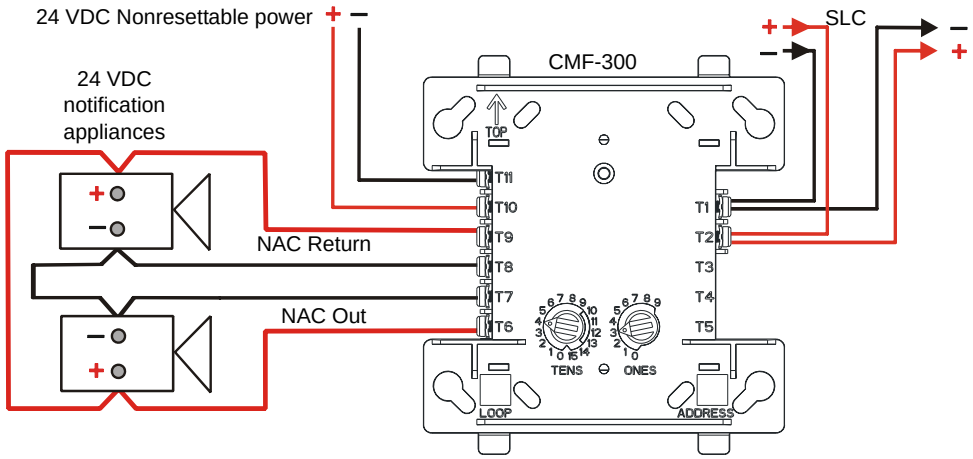
Wiring a Style Z NAC (Four-Wire)

A supervised and power-limited NFPA Style Z (Class A) NAC using a CMF-300 module. Polarized alarm notification appliances are shown connected to the module in a four-wire configuration.

Note: Refer to the *Device Compatibility Document* for compatible notification appliances and relays.

- See "Appendix A: Power Considerations" on page 53 for information on monitoring 24 VDC power.
- Each module can control 2 amps of resistive load (on electronic devices) or 1 amp of inductive load (on mechanical bells and horns).
- 24 VDC power must be provided from a UL listed power supply for fire protection use.
- A power supervision relay is required only on the last module of the power run.
- Do not T-tap or branch a Style Z circuit.
- Do not loop wiring under the screw terminals of any notification appliance. To maintain supervision, break the wire run at each device.

NOTE: A power supervision relay is required only on the last module of the power.



Note: Module polarities are shown in alarm condition.

Figure 35 NFPA Style Z Notification Appliance Circuit

CMF-300-6 Installation

Cabinet Installation

This type of module is contained in either a BB-2 or BB-6 cabinet. The BB-2 can accommodate up to 2 modules and the BB-6, which requires the CH-6 chassis, can accommodate up to 6 modules.

See the *Installation Instructions* provided with module for proper installation into cabinet.

Setting an SLC address for an CMF-300-6 Module

In "Style Y" operation each CMF-300-6 module can be set to one of 154 base addresses (01-154). The remaining module points are automatically assigned to the next five higher SLC addresses. For example, if the base address is set to 28, the next five module points will be addressed to 29, 30, 31, 32 and 33.

In "Style Z" operation alternate module points are paired together, resulting in a total of three module points. For example, if the base address is set to 28, then 30 and 32 will be automatically assigned to the remaining module points and 29, 31 and 33 are available to be used for other modules on the SLC.

DO NOT set the lowest address above 154 (45 for the MS-9050UD, 94 for MS-9200, MS-9200UD and MS-9200UDLS), as the other module points will be assigned to nonexistent addresses.

Note: The MS-9050UD can support addresses 01 - 50. The MS-9200, MS-9200UD and MS-9200UDLS can support module addresses of 01 - 99. The MS-9600, MS-9600LS, MS-9600LSC and MS-9600UDLS can support module addresses 01 - 159.

To set an SLC address, use a common screwdriver to adjust the rotary switches on the module to the desired address. See Figure 36 on page 44.

Note: For use with MS-9600, MS-9600LS, MS-9600LSC and MS-9600UDLS, remove the stop on the upper rotary switch.

Setting NACs as Style Y or Style Z

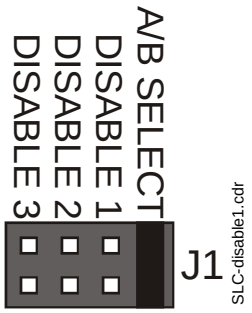
To use this module for Style Y (Class B) operation ascertain that a small shunt is installed on the "A/B SELECT" set of pins. (As shipped).

To use this module for Style Z (Class A) operation remove the small shunt from the "A/B SELECT" set of pins. See drawing below and Figure 36 on page 44.

Disabling Unused Module Addresses

A shunt is used, in conjunction with a pin block, to disable a maximum of three (3) unused module addresses. If two module addresses are disabled, the lowest four addresses will be functional, while the highest two will be disabled. For example, if the shunt is placed on 'DISABLE 2' and the base address is set to 28, the module addresses will be assigned to 28, 29, 30 and 31.

In Style Z operation, placing a small shunt on 'DISABLE 3' will disable all three addresses. Placing it on 'DISABLE 2' will disable two out of three addresses.



To disable addresses, securely place one of the supplied small shunts onto the desired set of pins. See drawing and Figure 36 on page 44.

Short Circuit Protection

Protection is disabled for each module address when there is a large shunt installed on the corresponding pins of the pin block (as shipped, all six addresses are disabled).

When enabled, the module will not switch power supply if a short circuit condition exists on a NAC.

To enable "Short Circuit Protection" for an address, remove the large shunt from the corresponding pins of the pin block. See Figure 36 on page 44. Place unused shunts on single pin to store on board for future use.

Features Not Supported

The “Synchronization” and “Power Supply Monitoring” features are not supported at this time.

Circuit Board Information

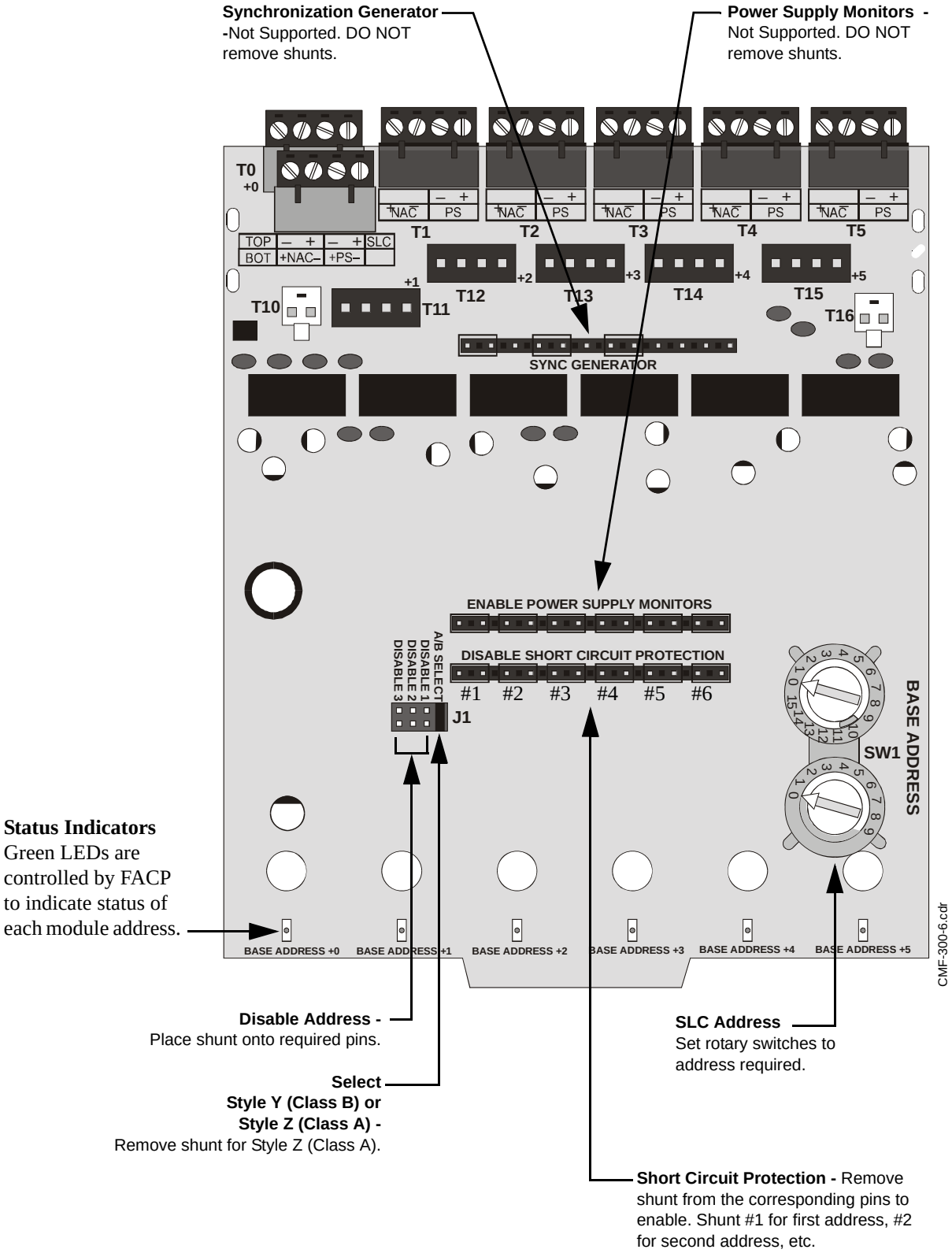


Figure 36 CMF-300-6 Control Module Settings

Wiring a CMF-300-6 Module

This section contains basic instructions and diagrams for wiring a Signaling Line Circuit with a CMF-300-6 as a Notification Appliance Circuit (NAC).

For more detailed information on wiring a CMF-300-6 Control Module refer to the Installation Instructions provided with the module. Included in these instructions are wiring diagrams concerning a single power supply being shared by multiple NACs and audio NAC configurations.

Wiring a Style Y NAC (Two-Wire)

A supervised and power-limited NFPA Style Y (Class B) NAC with a single power supply dedicated to a single NAC using a CMF-300-6 module. Polarized alarm notification appliances are shown connected to the module in a two-wire configuration.

Note: Refer to *Device Compatibility Document* for compatible notification appliances and relays.

- See "Appendix A: Power Considerations" on page 53 for information on monitoring 24 VDC power.
- Each module can control 2 amps of resistive load (on electronic devices) or 1 amp of inductive load (on mechanical bells and horns).
- 24 VDC power must be provided from a UL listed power supply for fire protection use.
- A power supervision relay is required only on the last module of the power run.
- Do not T-tap or branch a Style Y circuit.
- Terminate the circuit across the last device using an End-of-Line Resistor 47K, 1/2-watt, P/N SSD A2143-00 (ELR-47K in Canada).
- Do not loop wiring under the screw terminals of any notification appliance. To maintain supervision, break the wire run at each device.

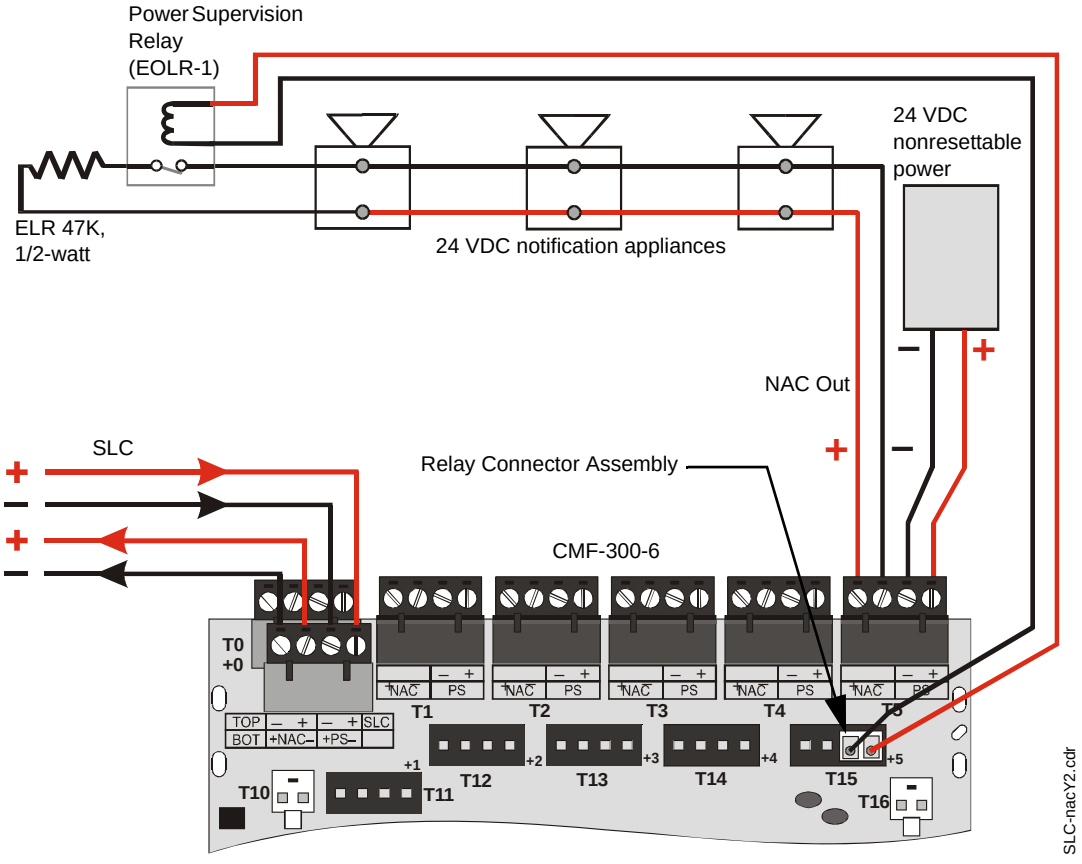


Figure 37 NFPA Style Y Notification Appliance Circuit

Wiring a Style Z NAC (Four-Wire)

A supervised and power-limited NFPA Style Z (Class A) NAC with a single power supply dedicated to a single NAC using a CMF-300-6 module. Polarized alarm notification appliances are shown connected to the module in a four-wire configuration.

Note: Refer to the *Device Compatibility Document* for compatible notification appliances and relays.

- See "Appendix A: Power Considerations" on page 53 for information on monitoring 24 VDC power.
- Each module can control 2 amps of resistive load (on electronic devices) or 1 amp of inductive load (on mechanical bells and horns).
- 24 VDC power must be provided from a UL listed power supply for fire protection use.
- A power supervision relay is required only on the last module of the power run.
- Do not T-tap or branch a Style Z circuit.
- Do not loop wiring under the screw terminals of any notification appliance. To maintain supervision, break the wire run at each device.

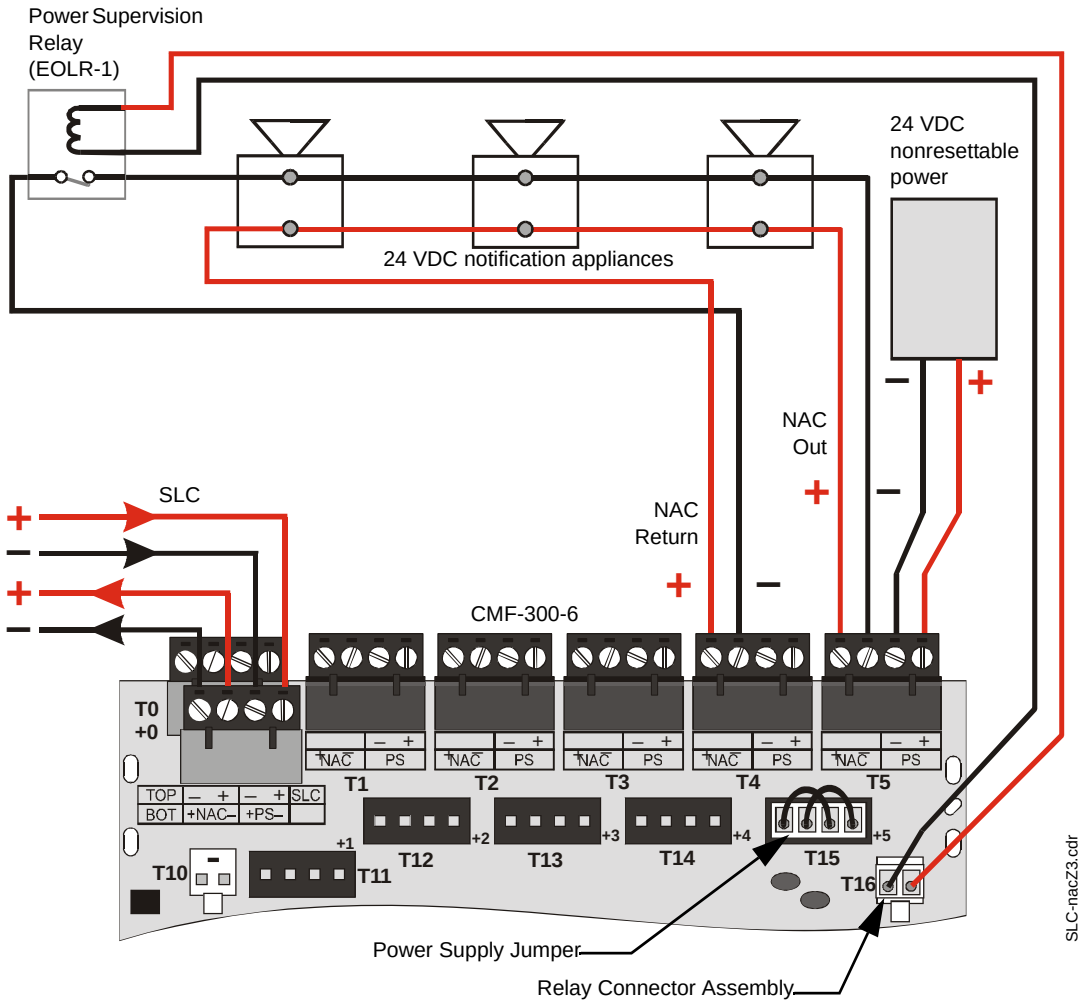


Figure 38 NFPA Style Z Notification Appliance Circuit

Relay Modules

Description

The CRF-300 and the CRF-300-6 modules are addressable modules that provides Form-C relay contacts.

Ratings for the relay contacts on the module are:

Load Description	Application	Maximum Voltage	Current Rating
Resistive	Non-Coded	30 VDC	3.0 A
Resistive	Coded	30 VDC	2.0 A
Resistive	Non-Coded	110 VDC	0.9 A
Resistive	Non-Coded	125 VAC	0.9 A
Inductive (L/R = 5ms)	Coded	30 VDC	0.5 A
Inductive (L/R = 2ms)	Coded	30 VDC	1.0 A
Inductive (PF = 0.35)	Non-Coded	70.7 VAC	0.7 A
Inductive (PF = 0.35)	Non-Coded	125 VAC	0.5 A

Note: For more information on the module specifications refer to the *Installation Instructions* provided with these devices.

CRF-300 Installation & Wiring

Setting an SLC address for a CRF-300 Module

Each module is factory preset with an address of “00.” To set an SLC address refer to "Setting an SLC address for a Single Point Module" on page 29.

Wiring a CRF-300 Module (Form-C Relay)

The figure below shows a CRF-300 module wired to the Control Panel:

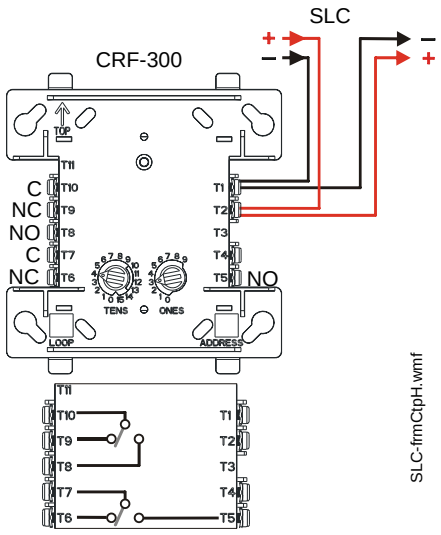


Figure 39 CRF-300 Wiring Connections

CRF-300-6 Circuit Board Information

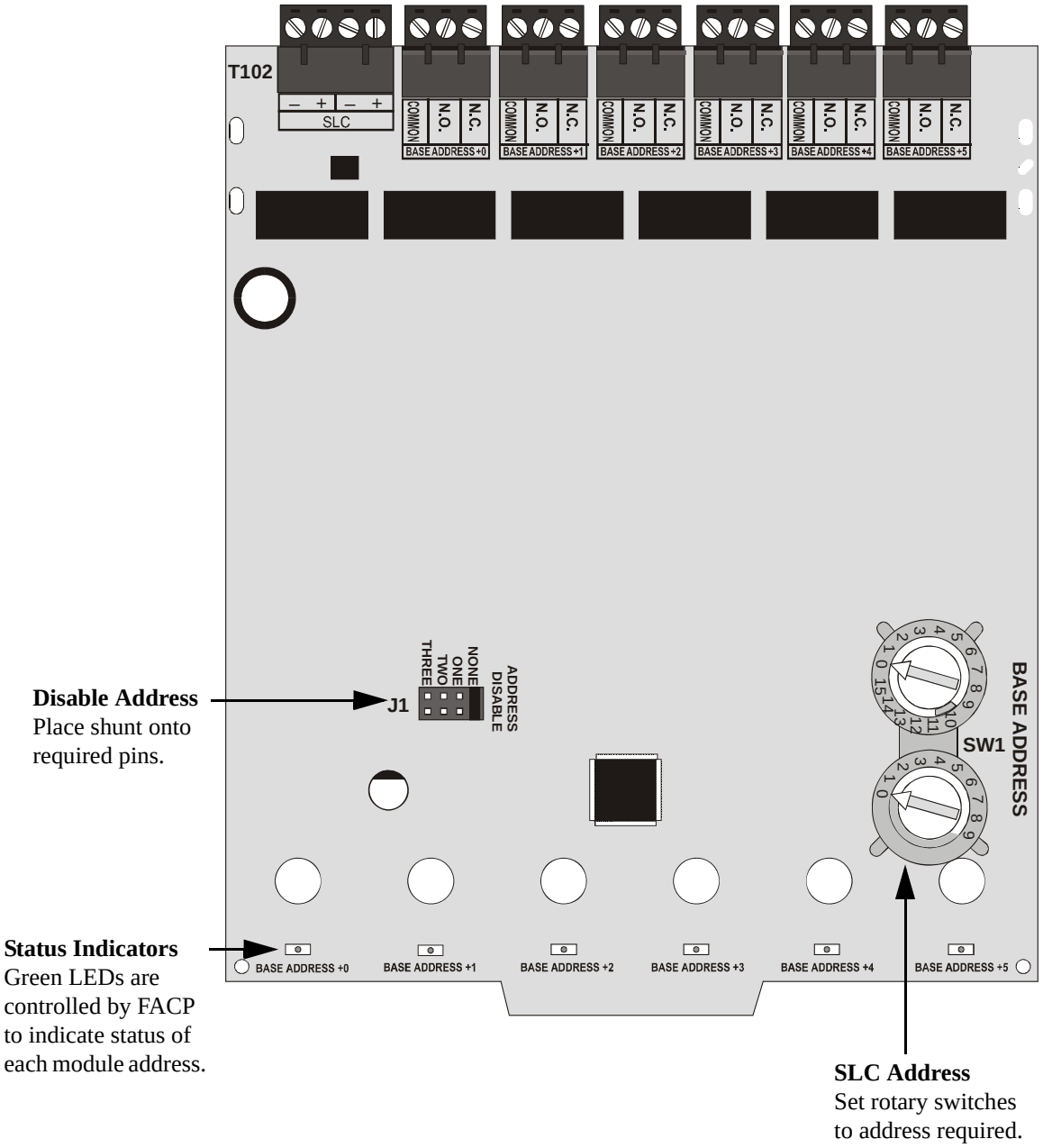


Figure 40 CRF-300-6 Control Relay Module

CRF-300-6 Installation & Wiring

Cabinet Installation

This type of module is contained in either a BB-2 or BB-6 cabinet. The BB-2 can accommodate up to 2 modules and the BB-6, which requires the CH-6 chassis, can accommodate up to 6 modules.

See the *Installation Instructions* provided with module for proper installation into cabinet.

Setting an SLC address for a CRF-300-6 Module

Each CRF-300-6 module can be set to one of 154 base addresses (01-154). The remaining module points are automatically assigned to the next five higher SLC addresses. For example, if the base address is set to 28, the next five module points will be addressed to 29, 30, 31, 32 and 33.

DO NOT set the lowest address above 154 (45 for the MS-9050UD, 94 for MS-9200, MS-9200UD and MS-9200UDLS), as the other module points will be assigned to nonexistent addresses.

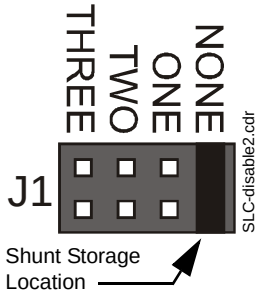
Note: The MS-9050UD can support addresses 01 - 50. The MS-9200, MS-9200UD and MS-9200UDLS can support module addresses of 01 - 99. The MS-9600, MS-9600LS, MS-9600LSC and MS-9600UDLS can support module addresses 01 - 159. To set an SLC address, use a common screwdriver to adjust the rotary switches on the module to the desired address. See Figure 36 on page 44.

Note: For use with a MS-9600, MS-9600LS, MS-9600LSC and MS-9600UDLS, remove the stop on the upper rotary switch.

Disabling Unused Module Addresses

A shunt is provided on the circuit board to disable a maximum of three (3) unused module addresses. If two module addresses are disabled, the lowest four addresses will be functional, while the highest two will be disabled. For example, if the shunt is placed on 'TWO' and the base address is set to 28, the module addresses will be assigned to 28, 29, 30 and 31.

To disable addresses, remove the shunt from it's storage location and securely place it onto the desired set of pins. See illustration.



Wiring a CRF-300-6 Module (Form-C Relay)

The figure below shows a CRF-300-6 module wired to the Control Panel.

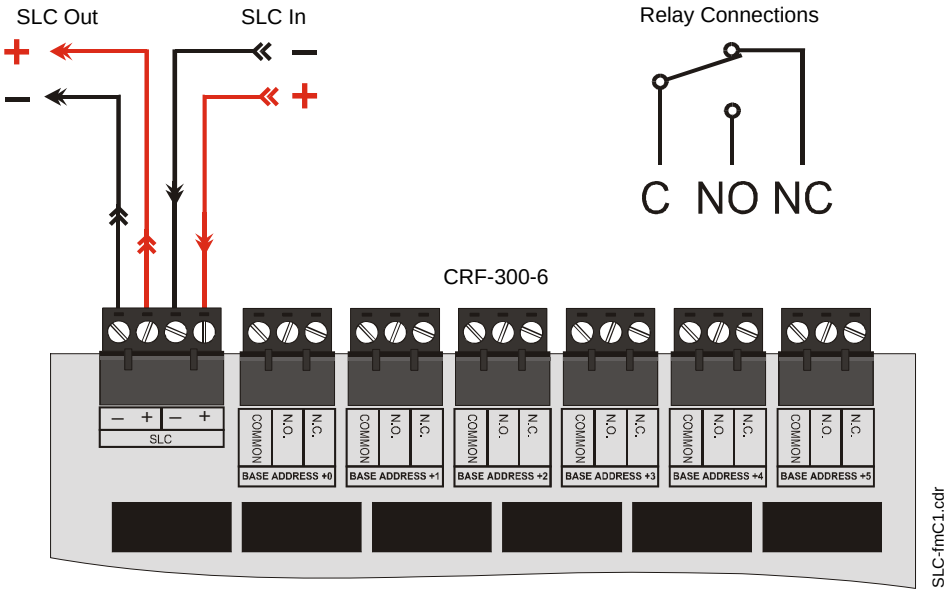


Figure 41 CRF-300-6 Wiring Connections

Intelligent Detector Bases

Description

The following bases provide connection between the SLC and these detector heads:

- AD350 and AD355 Multicriteria Photoelectric Smoke Detector
- CP350 and CP355 Ionization Smoke Detector
- H350, H350R, H355, H355R and H355HT Thermal Detector
- SD350, SD350T, SD355 and SD355T Photoelectric Smoke Detector

The **B350LP** Detector Base is a standard plug-in base provided with each detector head.

The **B501BH** Sounder Detector Base includes a horn that will sound when the sensor's visible LEDs are latched on for approximately 10 seconds.

On the MS-9200 control panel, the sounder will activate when the sensor's visible LEDs are latched on for approximately 10 seconds (Alarm Verification does not delay sounder).

If the MS-9600, MS-9600LS, MS-9600LSC, MS-9600UDLS, MS-9200UD, MS-9200UDLS or MS-9050UD control panel is set with Alarm Verification ON, the sounder will activate at the end of the verification cycle, providing an alarm is verified, approximately 10 seconds after the sensor's LEDs are latched on. If Alarm Verification is OFF, the sounder will activate when the sensor's visible LEDs are latched on for approximately 10 seconds.

The **B224RB** Relay Detector Base includes Form-C latching relay contacts for the control of an auxiliary function. The relay operates 12 seconds (nominally) after activation of the sensor head remote annunciator output.

The **B224RI** Isolator Detector Base prevents an entire communications loop from being disabled when a short circuit occurs.

Note: For more information refer to the *Installation Instructions* document provided with these devices.

Installation and Wiring

Setting the Detector Address

Each intelligent detector is factory preset with an address of "00." To set an SLC address, use a common screwdriver to adjust the rotary switches on the detector to the desired address (see "Setting an SLC address for a Single Point Module" on page 29). When finished, mark the address in the place provided on the base and the detector.

Wiring a Detector Base

Typical wiring of a detector base (B350LP shown) connected to an SLC is shown in the figure below. An optional **RA400Z** Remote LED Annunciator is shown connected to the detector.

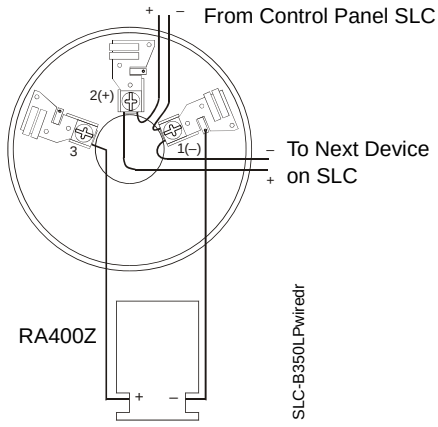


Figure 42 Detector Terminal Block Wiring

Addressable Beam Detectors

Description

The **BEAM355** and **BEAM355S** are intelligent, addressable projected beam smoke detectors, designed for protecting open areas with high and sloping ceilings and wide-open areas, where spot type smoke detectors are difficult to install and maintain. The **BEAM355S** has an integral sensitivity test feature that consists of a test filter attached to a servomotor inside the detector optics.

Note: *This section provides basic wiring and addressing information. For **critical information** on device installation, operation and alignment, refer to the Installation Instructions document provided with these devices.*

Installation and Wiring

Setting an SLC Address for a Beam Detector

Each beam detector is factory preset with an address of "00." To set an SLC address, use a common screwdriver to adjust the address rotary code switches on the detector to the desired address (refer to "Setting an SLC address for a Single Point Module" on page 29).

Wiring a Beam Detector

Typical wiring of a beam detector connected to an SLC is illustrated in the figure below.

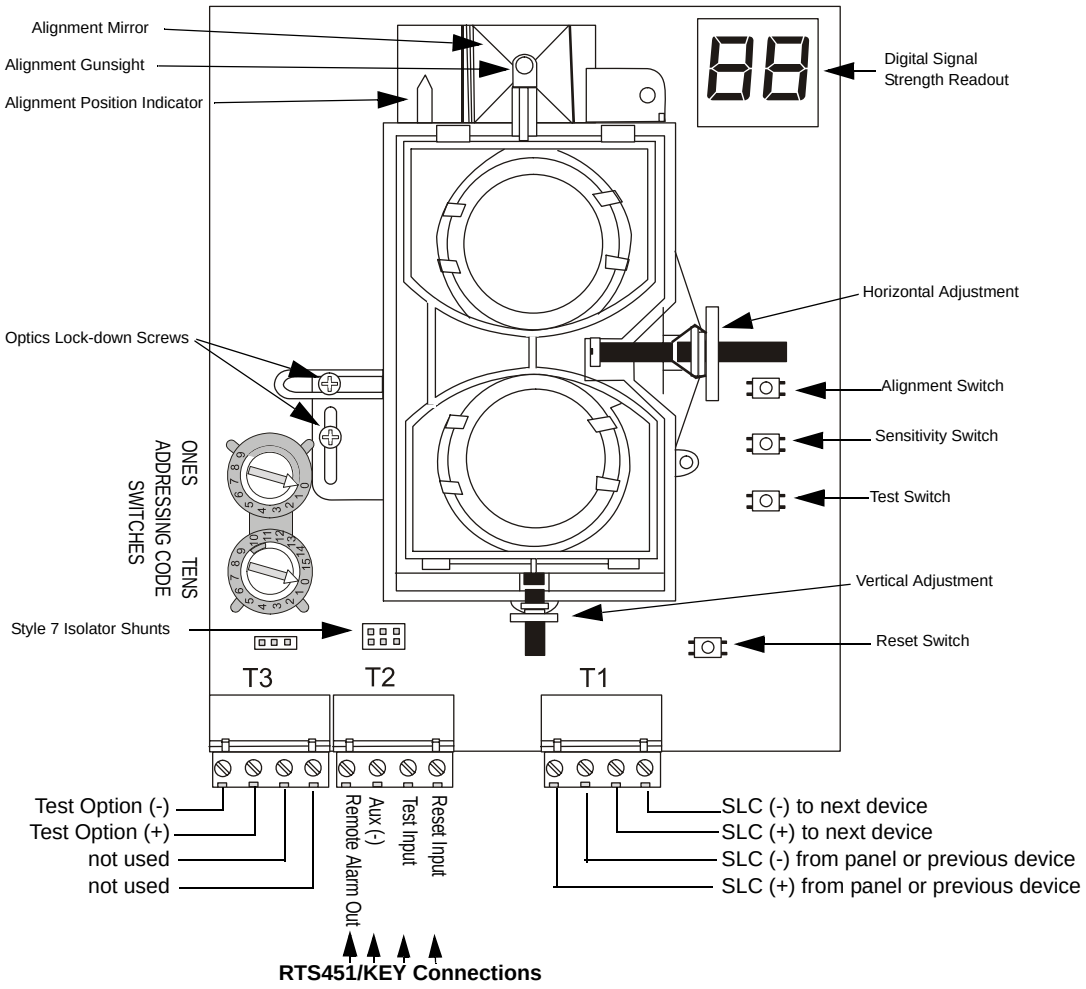


Figure 43 Beam Detector Terminal Block Wiring

Addressable Manual Pull Station

Description

The **BG-12LX** is an addressable manual pull station with a key-lock reset feature.

Note: For more information refer to the *Installation Instructions* document provided with this device.

Installation

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 Single Point Module" on page 29.

Wiring a Manual Pull Station

Typical wiring for a BG-12LX Manual Pull Station to an SLC:

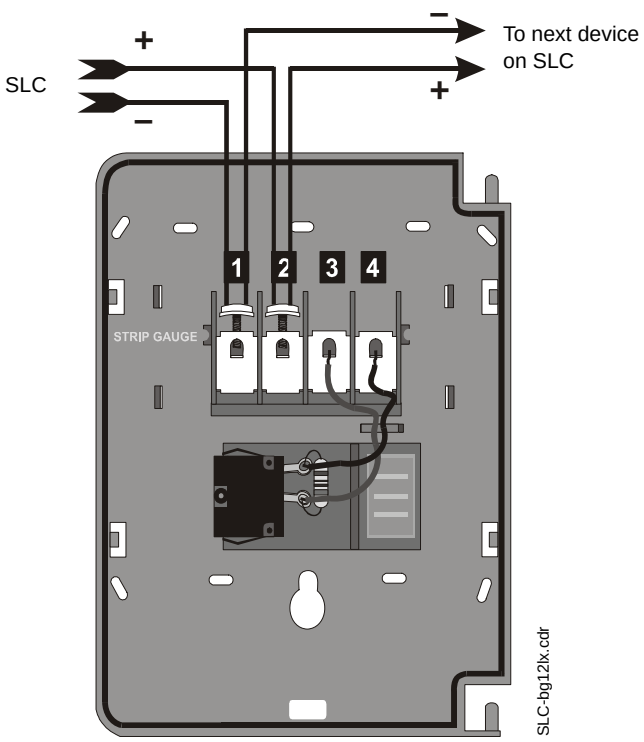


Figure 44 Wiring of an BG-12LX Pull Station to an SLC

Appendix A: Power Considerations

Supplying Power to 24 VDC Detectors

Resistance and Size

To determine the minimum resistance that can be tolerated in supplying power to 24 VDC 4-wire detectors, use the calculation below. Use this resistance to select the proper gauge wire for the power run from the manufacturers specifications for the desired wire.

$$Rmax = \frac{(18.1 - Vom)}{(N)(Is) + (Na)(Ia) + (Ir)}$$

Where:

Rmax = maximum resistance of the 24 VDC wires
Vom = 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
Is = detector current in standby
Na = number of detectors on the 24 VDC power circuit which must function at the same time in alarm
Ia = detector current in alarm
Ir = end-of-line relay current

Supervising 24 VDC Power

Power used to supply 24 VDC notification appliances (using the CMF-300) 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.

- 24 VDC power must be provided from a UL listed power supply for fire protection use.

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 as to 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 circuit, either a Style B (Class B) or a Style D (Class A) circuit.

The drawing below illustrates this concept.

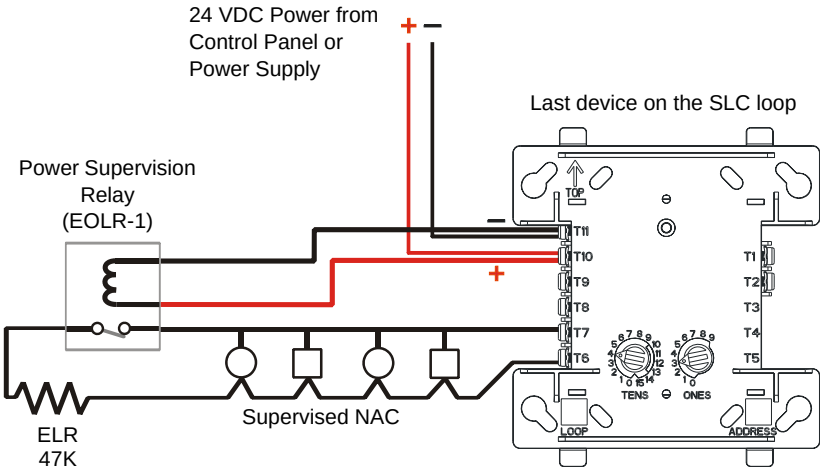


Figure 45 Supervised 24 VDC Circuit

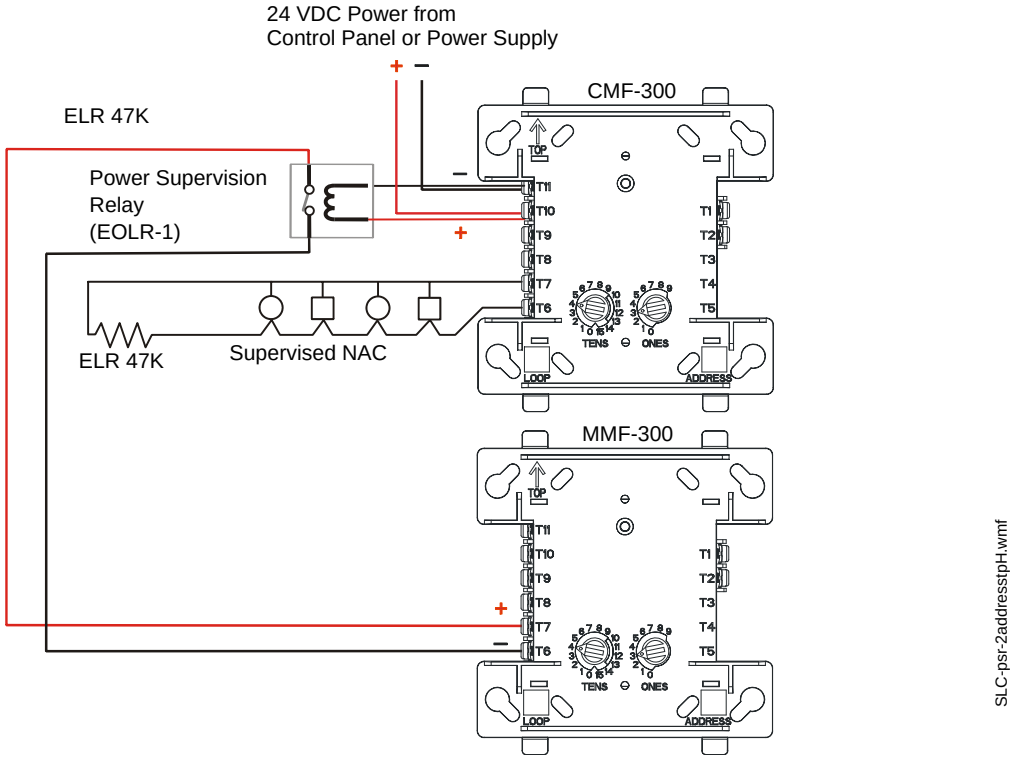


Figure 46 Alternate: 2-Address Method of Supervising a 24 VDC Circuit

Appendix B: Surge Suppression

Introduction

There are three (3) primary surge protectors that are approved for use with the MS-9200, MS-9200UD, MS-9200UDLS, MS-9600, MS-9600LS, MS-9600LSC, MS-9600UDLS and MS-9050UD.

- **DTK-2LVLP-F** Diversified Technology Group, Inc. 1720 Starkey Rd. Largo, FL 33771 (727) 812-5000
- **SLCP-030** EDCO 1805 N.E. 19th Ave. Ocala, FL 34470 (352) 732-3029
- **PLP-42N** Northern Technologies, Inc. 23123 E. Madison Ave. Liberty Lake, WA 99019 (800) 727-9119

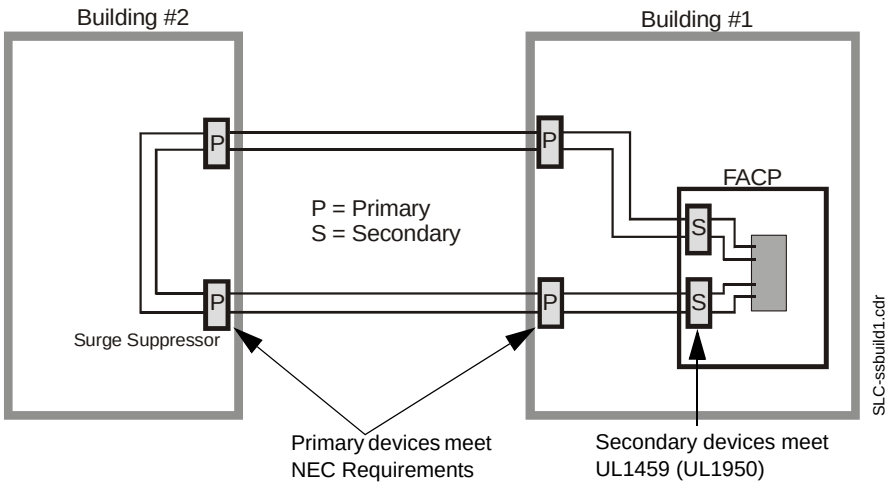
Note: For detailed information refer to the installation documentation supplied with the unit.

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.



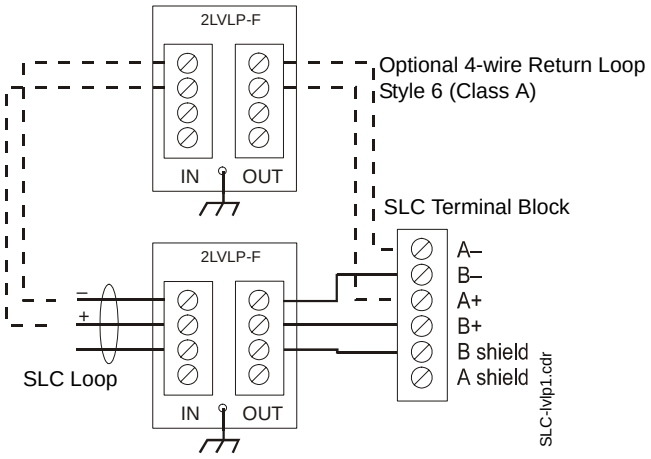
Installation

Mounting of the surge suppressor must be inside the FACP enclosure or in a separate enclosure listed for fire protective signaling use.

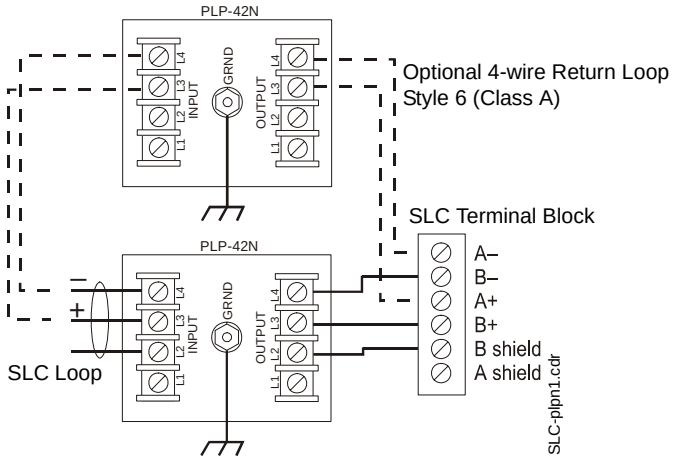
- Locate on an available stud and secure with nut.
- Unit is connected in series with the SLC Loop to protect the Control Panel.
- Provide a common ground to eliminate the possibility of a differential in ground potentials.

Wiring Diagram for MS-9200

DTK-2LVLP-F Connections

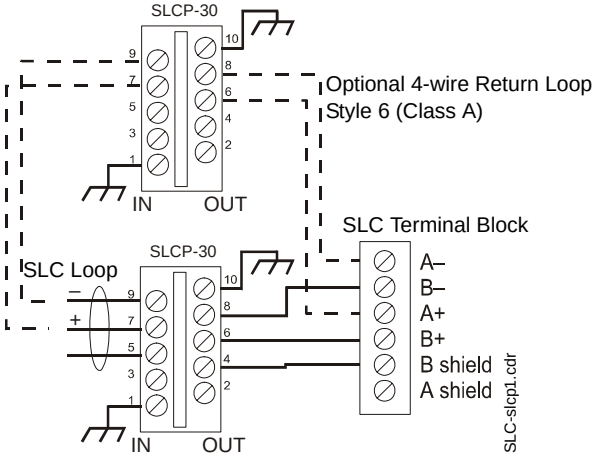


PLP-42N Connections



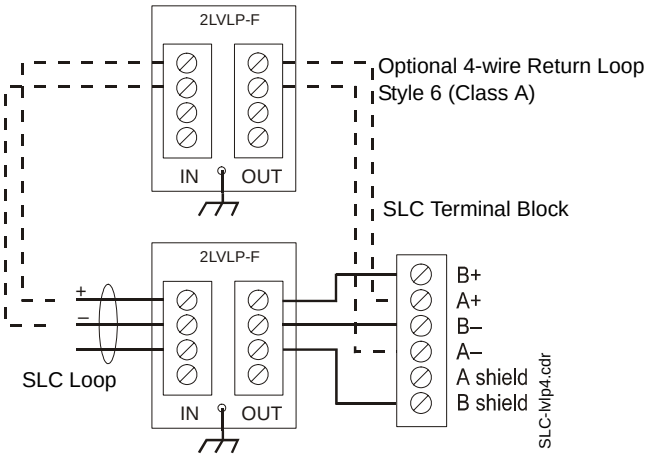
Note: Use 12AWG (3.25mm^2) to 18AWG (0.75mm^2) wire with crimp-on connectors to connect the unit's ground terminal to equipment ground. Wire length must be minimized to provide best protection.

SLCP-030 Connections

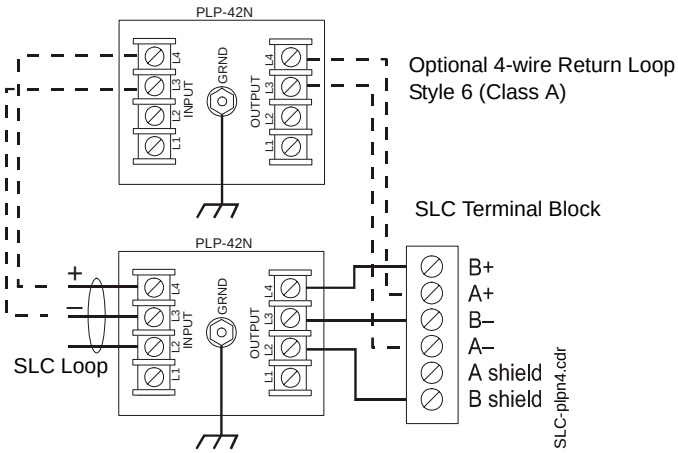


Wiring Diagram for MS-9600, MS-9600LS, MS-9600LSC, MS-9600UDLS, MS-9200UD, MS-9200UDLS and MS-9050UD

DTK-2LVLP-F Connections

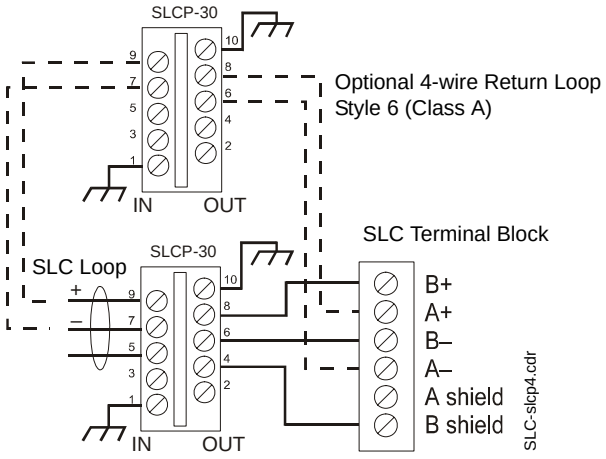


PLP-42N Connections



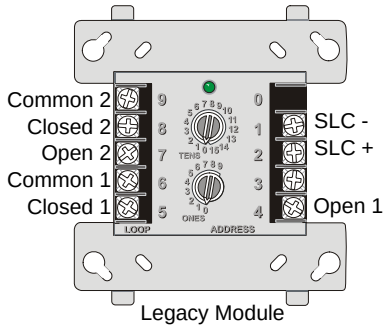
Note: Use 12AWG (3.25mm^2) to 18AWG (0.75mm^2) wire with crimp-on connectors to connect the unit's ground terminal to equipment ground. Wire length must be minimized to provide best protection.

SLCP-030 Connections

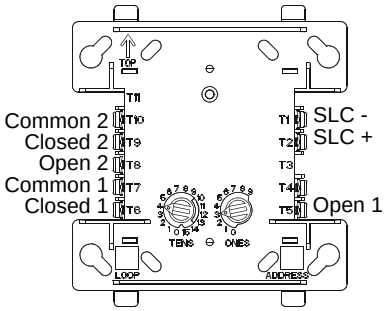


Appendix C: Terminal Conversion Charts for New & Legacy Devices

CRF-300



Legacy Module



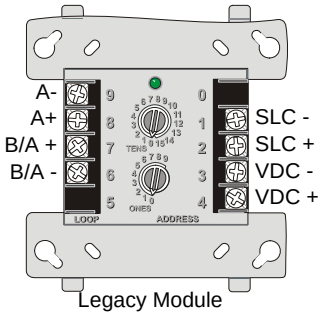
Newer Module

Legacy Module Terminal Number	Terminal Function	Newer Module 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

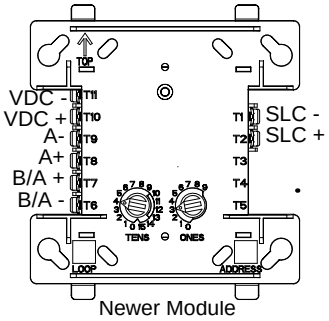
Table 5 CRF-300 Terminal Conversions

CMF-300 and MMF-302

Note: All module polarities are shown in **standby** condition, which reflects the labels on the new modules.



Legacy Module

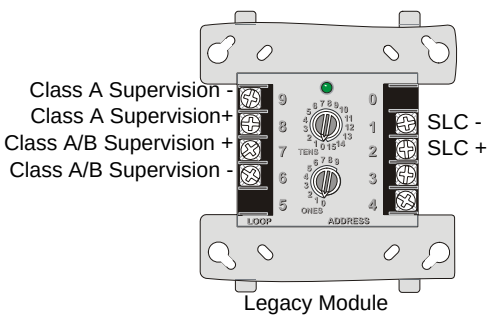


Newer Module

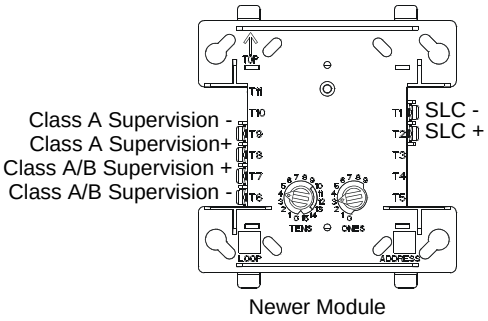
Legacy Module Terminal Number	Terminal Function	Newer Module Terminal Number
1	SLC -	1
2	SLC +	2
3	VDC -	11
4	VDC +	10
5	Unused	5
6	Solenoid B/A -	6
7	Solenoid B/A +	7
8	Solenoid A +	8
9	Solenoid A -	9
N/A	Unused	3
N/A	Unused	4

Table 6 CMF-300 and MMF-302 Terminal Conversions

MMF-300



Legacy Module



Newer Module

Legacy Module Terminal Number	Terminal Function	Newer Module 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 7 MMF-300 Terminal Conversions

O

P

R

S

T

U

V

W

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FIRE·LITE ALARMS
by Honeywell

World Headquarters
1 Firelite Place
Northford, CT 06472-1653 USA
203-484-7161
fax 203-484-7118

www.firelite.com

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