Johnson Controls

Intelligent Control Panel
SLC

Wiring Manual

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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 panel. 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.

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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. Overtightening 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.

Precau-D1-9-2005

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.

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.

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
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- 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.

Table of Contents

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 Panels (FACPs):

- IFC-200
- IFC-300/IFC-400
- IFC-1010/IFC-2020
- IFC-640/E, IFC2-640/E, IFC-320/E/C
- IFC-3030/IFC2-3030
- JNCA and JNCA-2

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

See Section 2.4, “Control Panel Terminal Blocks”, on page 20 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” below.

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

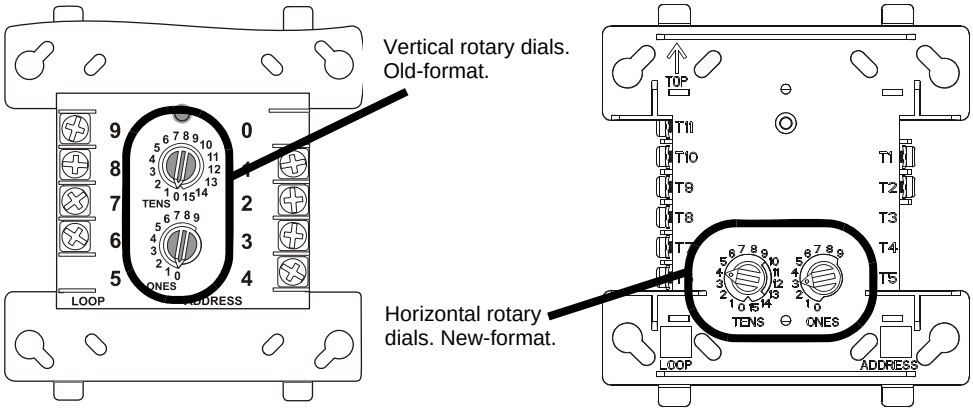


Figure 1.1 Example of Old and New Module Formats

1.2 UL 864 Compliance

1.2.1 Products Subject to AHJ Approval

This SLC Wiring Manual accompanies installation, operation, and programming manuals for various fire alarm control panels (FACPs). IFC2-3030, IFC2-640 and IFC-320/C have been certified to comply with the requirements in the Standard for Control Units and Accessories for Fire Alarm Systems, UL 864 9th Edition.

The following products have not received UL 864 9th Edition certification and may only be used in retrofit applications. Operation of the SLC with products not tested for UL 864 9th 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).

- IFC-200
- IFC-300/400
- IFC-1010/IFC-2020
- CMX-1
- M510CJ
- FFT-7/FFT-7S
- M500MJ
- M501MJ
- M502MJ
- MPS-24A/E
- MPS-24B/E
- JNCA
- IFC-3030 with JCPU-3030
- IFC-640/E
- XP Series (XPP-1, XPC-8, XPM-8 & XPR-8)
- XP5-C
- XP5-M
- ACPS-2406
- B224RB
- B501BH
- B501BHT
- FCPS-24/E

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 (DOC-JCI) provides the current document revision. A copy of this document is included in every shipment. See Appendix D, “Canadian Versions of SLC Devices” for Canadian part numbers.

Compatible Conventional Devices (Non-addressable)	**Document Number**
Device Compatibility Document Device Compatibility Technical Bulletin	51922 LIT-445180
Fire Alarm Control Panel (FACP) and Main Power Supply Installation	**Document Number**
IFC-200 Instruction Manual	Technical Manual 444
IFC-300/400 Installation, Operations and Programming Manual	Technical Manual 443
IFC-640 Installation, Operations, and Programming Manuals	51864, 51865, 51866
IFC2-640 Installation, Operations, and Programming Manuals	52835, 52836, 52837
IFC-320 Installation, Operations, and Programming Manuals IFC-320C Canadian Applications Addendum	52858, 52859, 52860 52858CDN
IFC2-3030E Installation, Operations, and Programming Manuals	52563, 52565, 52564
IFC-3030E Installation, Operations, and Programming Manuals	52024, 52026, 52025
JDVC Digital Voice Command Manual	52567
JDAA Digital Audio Amplifier Manual	52569
Johnson Controls Voice Alarm System Manual	51869
AA-series Audio Amplifier Manual	52526
IFC-1010/IFC-2020 Installation Manual	Technical Manual 448
Power Supplies, Auxiliary Power Supplies & Battery Chargers	**Document Number**
ACPS-610/E Installation Manual	53018
ACPS-2406 Installation Manual	51304
AMPS-24/E Power Supply Manual	51907
FCPS-24 Field Charger/Power Supply Manual Field Charger/Power Supply FCPS-24 Technical Bulletin	50059 LIT-445111

Table 1.1 Reference Documentation (1 of 3)

Continued on next page...

FCPS-24S6/FCPS-24S8 Field Charger/Power Supply	51977
System Components	**Document Number**
RA400Z Remote LED Annunciator Installation Document	I56-508
RFX Wireless Interface Manual	51012
XP Transponder Manual XP Transponder Technical Bulletin	15888 LIT-448180
XP10-M Installation Document	I56-1803
XP5 Series Manual	50786 LIT-445230
XP6-C Installation Document	I56-1805
XP6-MA Installation Document	I56-1806
XP6-R Installation Document	I56-1804
XPIQ Audio Transponder Manual XPIQ Quad Intelligent Audio Transponder Technical Bulletin	51013 LIT-445235
SLC Loop Devices	**Document Number**
B224BI Isolator Base Installation Document (FlashScan/CLIP)	I56-725
B224RB Relay Base Installation Document	I56-659
B501J Standard Base Installation Document	I56-1433
B501BH Sounder Base Installation Document	I56-0491
B501BHT Temporal Sounder Base Installation Document	I56-1367
B501B-FTXJ HARSH™ Base Installation Document	I56-1486
B210LPJ Flanged Base Installation Document	I56-727
2351TMJ Acclimate™ Multi-Sensor Detector Installation Document	I56-1860
2951TMJ: See document for 2951J, 2951TJ and 2951TMJ	
M300CJ Control Module Installation Document	I56-1210
M300CJ-REL Control Module Installation Document	I56-XXXX
M300DJ Dual Monitor Module Installation Document	I56-0016
M300MJ Monitor Module Installation Document	I56-1211
M300MJ-4-20 Monitor Module Installation Document	I56-XXXX
M301MJ Mini Monitor Module Installation Document	I56-1214
M300RJ Relay Module Installation Document	I56-1213
FSB-200, FSB-200S Single-ended Reflected Type Projected Beam Smoke Detector	I56-2424
2951J-COPTIR Intelligent Photoelectric Multi-Criteria Smoke Sensor	I56-XXXX
DH300PL Low-flow Duct Detector	I56-2198
DH300RPL Low-flow Duct Detector with Relay	I56-2199
DH300P Duct Detector Installation Document	I56-0018
DH300RP Duct Detector Installation Document	I56-0048
FTX-P2J HARSH™ Installation Document	I56-1863
1351J Ion Detector Installation Document	I56-1362
1951J Ion Detector Installation Document	I56-1929
7351J VIEW® Laser Detector Installation Document	I56-1898
2351J & 2351TJ Photo Installation Document	I56-1366

Table 1.1 Reference Documentation (2 of 3)

2951J, 2951TJ and 2951TMJ (Acclimate™) Photoelectric Detectors Installation Document	I56-1930
5351J Thermal Detector Installation Document	I56-1363
5351RJ Rate of Rise Sensor Installation Document	I56-1634
5951J, 5951RJ, and 5951HJ Thermal Detectors Installation Document	I56-1931
M500FPJ Firephone Control Module	I56-2550
M302MJ Zone Interface Module Installation Document	I56-1212
FTX-P1J HARSH™ (CLIP mode) Installation Document	I56-1485
M500XJ Isolator Module Installation Document	I56-1384
JBG-12LX Addressable Pull Station Installation Document	51242
Note: Refer to the Device Compatibility Document for compatible conventional devices.	

Table 1.1 Reference Documentation (3 of 3)

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 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, “SLC Surge Suppression”, on page 58.

1.5 Polling Protocols

FlashScan® 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 FlashScan® capable; see “Protocol Use” below.

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

Protocol Use: LCM-320/LEM-320 loops on IFC2-640, IFC-640/E and IFC-3030/IFC2-3030, and SLC loops on IFC-320 can run in FlashScan mode or CLIP mode. IFC-200, IFC-300/IFC-400, IFC-1010 and IFC-2020 run in CLIP mode only.

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

1. Program all modules and detectors on an SLC as FlashScan.
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 FlashScan on an SLC.

CAUTION:
Do not program modules as CLIP and detectors as FlashScan on the same SLC. This combination does not work.

1.6 Devices

1.6.1 Monitor/Zone Interface Modules

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.

- **M300MJ** Monitor Module; FlashScan or CLIP mode. (An earlier module named **M500MJ** was CLIP mode only.)
- **M300DJ** Dual Monitor Module; FlashScan or CLIP mode.
- **M301MJ** Addressable Mini-Monitor Module; FlashScan or CLIP mode. (An earlier module named **M501MJ** was CLIP mode only.)
- **M300MJ-4-20** Four-to-Twenty Milli-Amp Monitor Module; FlashScan mode only. CLIP mode operation will generate a trouble message at the panel. This module is only compatible with the IFC2-3030.
- **M302MJ** Zone Interface Module; FlashScan or CLIP mode. (An earlier module named **M502MJ** was CLIP mode only).
- **XP5-M** Supervises five Class-B addressable Initiating Device Circuits (IDC) which monitor normally open contact initiating devices. Supports FlashScan or CLIP mode. This module is capable of participating in degraded mode where supported by the FACP. (See the *XP5 Series Manual)*
- **XP6-MA** Allows an intelligent alarm system to monitor six zones of conventional two-wire detectors; FlashScan or CLIP mode.
- **XP10-M** Supervises ten Class-B addressable Initiating Device Circuits (IDC) which monitor normally open contact initiating devices; FlashScan 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).

- **M300CJ** Control Module; FlashScan or CLIP mode. (Earlier monitor modules named **CMX-1** and **M510CJ** were CLIP mode only.)
- **M300CJ-REL** Control Module; FlashScan mode only. CLIP mode operation will generate a trouble message at the panel.
- **XP5-C** Acts as a NAC or a speaker/telephone circuit (Class B only) or a Form-C relay. FlashScan capable. (See the *XP5 Series Manual.)*
- **XP6-C** Controls six NAC or speaker/telephone circuits; FlashScan or CLIP mode.
- **M500FPJ** Firefighter's Telephone Module; FlashScan-only device for use with Fire Fighters Telephone on IFC-320, IFC2-640, IFC-640, IFC-3030, and IFC2-3030. (See the *Voice Alarm System Manual*, the *DVC Manual*, or the *DAA Manual*.)

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 Style 7 circuit.

- **M500XJ** Loop Fault Isolator Module; FlashScan or CLIP mode.

1.6.4 Relay Modules

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

- **M300RJ** Relay Module; FlashScan or CLIP mode.
- **XP6-R** Controls six Form-C relays; FlashScan or CLIP mode.

1.6.5 Transponders

- **XPIQ** An integrated, multiple channel audio amplification and distribution subsystem remotely controlled by the FACP. It can direct up to four low level audio signals from risers to up to four audio amplifiers, which are then directed to up to four integrated, continuously supervised speaker circuits. The XPIQ is FlashScan capable (only).
- **XP Series** (XPP-1, XPC-8, XPM-8 & XPR-8) Provides the FACP with an efficient multiplex subsystem capability. It communicates with the FACP and functions as a data-gathering panel for alarm Initiating Device Circuits and as a remote switching center for Notification Appliance Circuits (NAC), telephone circuits or relays. Not FlashScan capable.

For information on connecting these transponders to the SLC, refer to the *XP Transponder Manual* or the *XPIQ Manual*.

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 style is required. Sounder and relay bases are similar to standard bases, but have sound or relay capabilities.

- **Standard Base** - Models **B501J** (4 inch standard small diameter base, commonly used in European installations) and **B210LPJ** (6 inch standard large diameter base, commonly used in US installations)
- **HARSH™ Base** - Model **B501B-FTXJ**
- **Isolator Base** - Model **B224BI** isolator base.
- **Sounder Base** - Models **B501BH** (standard sounder base), and **B501BHT**(base with temporal sounder)
- **Relay Base** - Model **B224RB** relay base

1.6.7 Intelligent Detectors

FSB-200S Addressable, intelligent, single-ended beam smoke detector with built-in sensitivity testing. The **FSB-200** is the same except that it does not provide sensitivity testing. Both models support FlashScan and CLIP mode.

2951TMJ (Acclimate ™) Addressable, intelligent detector that combines a photoelectric sensing chamber and fixed temperature heat detection (135°F / 57.2°C). FlashScan capable. (An earlier version named **2351TMJ** was also FlashScan capable. The model named **3251J** was discontinued as of December 1, 2001.)

2951J-COPTIR Intelligent Photoelectric Multi-Criteria Smoke Sensor. Plug-in type smoke sensor that is a photoelectric sensing chamber combined with Carbon Monoxide (CO), thermal, and infra-red (IR) sensors to help reduce false alarms. The **2951J-COPTIR** adds thermal sensors that will alarm at a fixed temperature of 135° F (57.2° C) and alarm sensitivity options with built-in alarm and pre-alarm time delay. JCI panels offer different feature sets across different models. Certain features of the **2951J-COPTIR** may not be available on some panels. The **2951J-COPTIR** supports both FlashScan and CLIP modes. Read Status limitations may apply in CLIP mode.

1951J Addressable, intelligent smoke detector that incorporates an ionization sensing chamber. Designed to provide open area protection. FlashScan- and CLIP-mode capable. (An earlier model named **1351J** was also FlashScan capable. Earlier models named **1251J** and **1551J** were CLIP mode only.)

2951J Analog, addressable intelligent smoke detector that uses a photoelectric sensing chamber. Listed for use in ducts. Designed to provide open area protection. The **2951TJ** adds thermal sensors that will alarm at a fixed temperature of 135° F (57.2°C). Both models support FlashScan or CLIP mode. (Earlier versions named **2351J** and **2351TJ** also supported FlashScan or CLIP mode, but were not listed for use in ducts. Earlier models named**2551J, 2251J** and **2251THJ** were CLIP mode only.)

5951J 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 **5951RJ** incorporates a thermal rate of rise of 15°F (8.3°C). The **5951HJ** is a high temperature sensor with 190°F (87.8°C) fixed temperature alarm. Both models support FlashScan or CLIP mode. (Earlier versions named **5351J** and **5351RJ** also supported FlashScan or CLIP mode. Earlier models named **5551J** and **5551JR** were CLIP mode only.)

DH300P Photoelectric Duct Detector. The **DH300RP** includes an alarm relay. Both models support FlashScan or CLIP mode.

DH300PL Low-flow Photoelectric Duct Detector, with extended speed range of 100–4000 FPM (0.5 m/s to 20.3 m/s). **DH300RPL** adds a relay. Both models support FlashScan or CLIP mode.

FTX-P2J (HARSH™) A special smoke detector that provides early warning smoke detection in hostile environments where traditional smoke detectors are not practical. Supports FlashScan or CLIP mode. (An earlier model named **FTX-P1J** was CLIP mode only.)

7351J VIEW® An advanced intelligent photoelectric detector that uses a laser diode, special optics, and signal processing to obtain extremely high sensitivity. Supports FlashScan and CLIP mode; compatible with IFC-300/IFC-400, IFC-320, IFC2-640, IFC-640, and IFC-3030/IFC2-3030 only. **LPX-751L** is compatible with IFC-200 and IFC-1010/IFC-2020; CLIP mode only. (An earlier version named **7251J** was CLIP mode only and compatible with IFC-300/IFC-400.)

1.6.8 Addressable Manual Pull Stations

The **JBG-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. Supports FlashScan or CLIP mode. An earlier model named BGX-101L was CLIP mode only.

1.6.9 RFX Wireless Interface

The RFX Wireless Interface allows communication between an intelligent addressable fire alarm control panel and up to 80 wireless smoke detectors. The RFX Interface, which includes a wireless receiver, monitors the status of each wireless detector and forwards this information to the control panel through the SLC. This system uses the **SDRF-751** Wireless Photo-Thermal Smoke Detector, which is battery-powered and designed to operate with the RFX Wireless Interface. FlashScan capable. Not suitable for Canadian applications. The RFX and associated devices were discontinued as of December 31, 2005.

1.6.10 ACPS-610/E Addressable Charger/Power Supply

The ACPS-610/E is an addressable power supply and battery charger with 24 VDC outputs. It operates in FlashScan or CLIP mode and has built-in strobe synchronization. Its four outputs may be independently configured to drive Notification Appliance Circuits (NACs) or to provide auxiliary power.

1.6.11 ACPS-2406 Addressable Charger/Power Supply

The **ACPS-2406** is an auxiliary power supply and battery charger. Each of its four Notification Appliance Circuits (NAC) is individually addressable, eliminating the need for control modules. In addition, each circuit can provide notification appliance synchronization. FlashScan and CLIP capable.

1.6.12 AMPS-24/E Addressable Power Supply

The AMPS-24/E is a primary power supply and battery charger. Depending on its configuration, it can occupy either one or four addresses on an SLC. FlashScan capable.

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 (Style 4, Style 6, or Style 7) depends on the configuration of the circuit and the components on the circuit (see Table 1.2). SLC operation meeting Style 7 requirements isolates each addressable device on the SLC from faults that may occur on 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 72-2002) lists the trouble conditions that result when a fault exists on an SLC. Additional information is broken out in Section 2, “Wiring Requirements”, on page 17, and Section 3, “Shielded Wire Termination”, on page 17.

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 1.2 SLC Circuit Configuration and Performance: Style 4, Style 6, Style 7

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 FlashScan® Mode. When switching from FlashScan® 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		FlashScan® Mode	
Control Panel	**Device**	**Standby**	**Activated**	**Standby**	**Activated**
IFC-1010 IFC-2020	Monitor Module Control Module Detector	Blinks RED Blinks GREEN Blinks RED	RED continuous 2 sec. GREEN, then OFF RED continuous	N/A N/A N/A	N/A N/A N/A
IFC-300/IFC-400	Monitor Module Control Module Detector	Blinks RED Blinks GREEN Blinks RED	RED continuous GREEN continous RED continuous	N/A N/A N/A	N/A N/A N/A
IFC-200	Monitor Module Control Module Detector	Blinks RED Blinks GREEN Blinks RED	RED continuous OFF RED continuous	N/A N/A N/A	N/A N/A N/A
IFC-320/E/C, IFC2-640/E, IFC-640/E, IFC-3030, IFC2-3030	Monitor Module Control Module Detector	Blinks RED Blinks GREEN Blinks RED	RED continuous GREEN continuous RED continuous	Blinks GREEN Blinks GREEN Blinks GREEN	RED continuous GREEN continuous RED continuous

NOTE: In CLIP mode, the 7251J and FTX-P1J blink GREEN in standby and stay RED when activated.

Section 2: Wiring Requirements

2.1 Recommended SLC Wiring

- Twisted-unshielded pair is recommended for IFC-320, IFC2-640, IFC-640, IFC2-3030, IFC-3030, LCM-320, LEM-320, JLIB-200A, and JLIB-400;
  Maximum resistance is 50 ohms per branch. See Table 2.1.
- Twisted-shielded pair: IFC-200, IFC-300/400, JLIB-200
  Maximum resistance 40 ohms per branch. See Table 2.2.

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.

FACP: Wire Type and Limitations*	**Recommended Max. Distance**	**Wire Gauge†**
JLIB-200A or JLIB-400 on IFC-1010/IFC-2020 (See Table 2.2 for JLIB-200.)		
RECOMMENDED: Twisted unshielded pair, 12 to 18 AWG (3.31 mm² to 0.82 mm²†). 50 ohms max per length of Style 6 and 7 loops. 50 ohms per branch max for Style 4 loops	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)	12 AWG/3.31 mm² 14 AWG/2.08 mm² 16 AWG/1.31 mm² 18 AWG/0.82 mm²
NOTE: Twisted-shielded pair or untwisted unshielded wire is not recommended for use with JLIB-200A or JLIB-400.		
IFC-640 and LEM-320 on IFC-640		
RECOMMENDED: Twisted-unshielded pair, 12 to 18 AWG (3.31 mm² to 0.82 mm²). 50 ohms maximum per length of Style 6 & 7 loops. 50 ohms per branch maximum for Style 4 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)	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.	1,000 ft. (304.8 m)	12 to 18 AWG (3.31 mm² to 0.82 mm²)
Note: Twisted-shielded pair is not recommended for use with this panel. **Note:** Maximum total capacitance of all SLC wiring (both between conductors and from any conductor to ground) should not exceed 0.5 microfarads.		
IFC-320, IFC2-640, LEM-320 on IFC2-640, LCM-320, LEM-320 on IFC-3030 or IFC2-3030		
RECOMMENDED: Twisted-unshielded pair, 12 to 18 AWG (3.31 mm² to 0.82 mm²). 50 ohms, maximum per length of Style 6 & 7 loops. 50 ohms per branch maximum for Style 4 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)	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) 3,700 ft. (1,127.76m)	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) 3,700 ft. (1,127.76m)	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: IFC-320, IFC2-640, IFC-640, IFC2-3030, IFC-3030, JLIB-200A, JLIB-400, LEM-320, and LCM-320

* XPIQ-SLI is an SLC device that provides an additional local SLC loop. This local SLC loop should use the same type of wire recommended for the FACP controlling the main SLC loop. Maximum resistance of the local SLC (from any device to FACP): 50 ohms. Maximum resistance of the local SLC (from any device to XPIQ-SLI): 20 ohms. (Maximum number of detectors and modules = 64) Maximum SLC local branch current degraded mode: 20 mA. Maximum distance of local loop: 2,000 ft. (600 m). Recommended wire: 12 AWG (3.31 mm²)

† Notifier brand cable is recommended; see the product catalog available from Paige Electric.

FACP: Wire Type and Limitations	**Recommended Max. Distance**	**Wire Gauge**
IFC-200		
Twisted-shielded pair. 40 ohms maximum per length of Style 6 and 7 loops. 40 ohms per branch maximum for Style 4 loops	10,000 ft. (3,048 m) 8,000 ft. (2,438.4 m) 4,875 ft. (1,485.9 m) 3,225 ft. (982.98 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	1,000 ft. (304.8 m)	12 to 18 AWG (3.31 mm² to 0.82 mm²)
Note: Twisted-unshielded pair wire is not recommended for use with this panel. **Note:** Maximum total capacitance of all SLC wiring (both between conductors and from any conductor to earth) should not exceed 0.5 microfarads.		
IFC-300/IFC-400		
Twisted-shielded pair, 12 to 18 AWG. 40 ohms, maximum per length of Style 6 and 7 loops. 40 ohms per branch maximum for Style 4 loops.	10,000 ft. (3,048 m) 8,000 ft. (2,438.4 m) 4,875 ft. (1,485.9 m) 3,225 ft. (982.98 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.	1,000 ft. (304.8 m)	12 to 18 AWG (3.31 mm² to 0.82 mm²)
Note: Twisted-unshielded pair wire is not recommended for use with this panel.		
JLIB-200 on IFC-1010/IFC-2020 (See Table 2.1 for JLIB-200A or JLIB-400.)		
Twisted-shielded pair. Maximum loop resistance is 40 ohms. Maximum length is 10,000 ft. per channel (NFPA Style 4) or 10,000 ft. total twisted pair length (NFPA Style 6 and 7). Maximum loop current is 200 mA (short circuit) or 100 mA (normal).	10,000 ft. (3,048 m) 8,000 ft. (2,438.4 m) 4,875 ft. (1,485.9 m) 3,225 ft. (982.98 m)	12 AWG (3.31 mm²) 14 AWG (2.08 mm²) 16 AWG (1.31 mm²) 18 AWG (0.82 mm²)
	*If the wiring connected to the JLIB-200 leaves the building it must be in conduit. It can not exceed 1000 m (1093 yards), must not cross any power lines, and must not be in the vicinity of any high voltage. These outdoor wiring restrictions do not apply to the JLIB-200A or the JLIB-400.	

Table 2.2 Wiring: IFC-200, IFC-300/400, JLIB-200

2.2 Two-Wire SLC - Style 4 (Class B)

2.2.1 Measuring Loop Resistance

T-tapping of the SLC wiring is permitted for two-wire Style 4 configurations. The total DC resistance from the control panel to each branch end cannot exceed50 ohms.

- 50 ohms for IFC-320, IFC2-640, IFC-640, LCM-320, LEM-320, JLIB-200A and JLIB-400.
- 40 ohms for IFC-200, IFC-300/400, and JLIB-200

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.

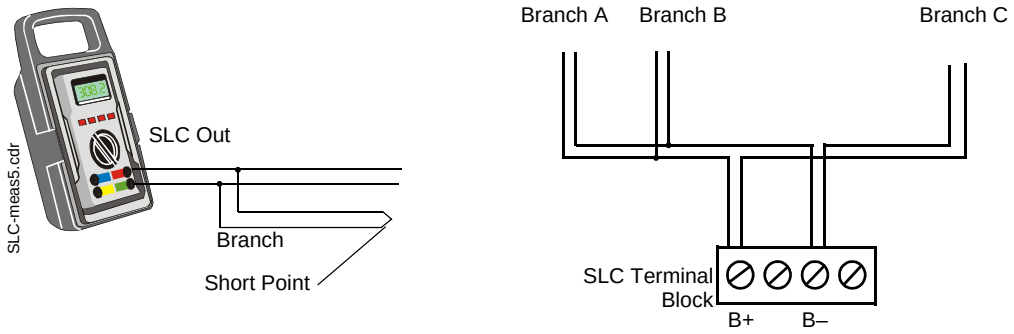


Figure 2.1 Measuring DC Resistance of a Two-Wire SLC

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.

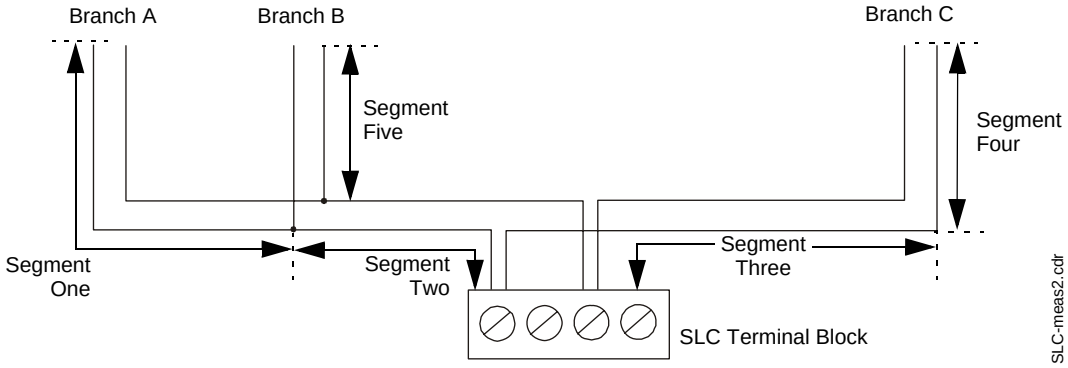


Figure 2.2 Measuring the Total Wire Length of a Two-wire SLC

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

2.3.1 Measuring Loop Resistance

The total DC resistance of the SLC pair exceed 50 ohms.

- 50 ohms for IFC-320, IFC2-640, IFC-640, LCM-320, LEM-320, JLIB-200A and JLIB-400.
- 40 ohms for IFC-200, IFC-300/400, and JLIB-200

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.
3. Short the SLC at the first device and measure the resistance at SLC return. Record resistance and remove the short.

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

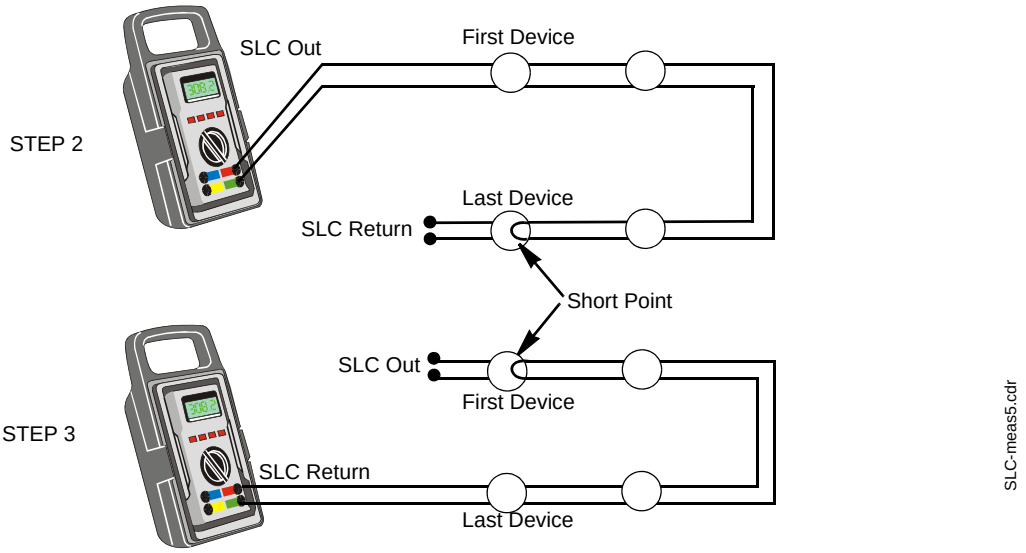


Figure 2.3 Measuring DC Resistance of a Four-Wire SLC

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:

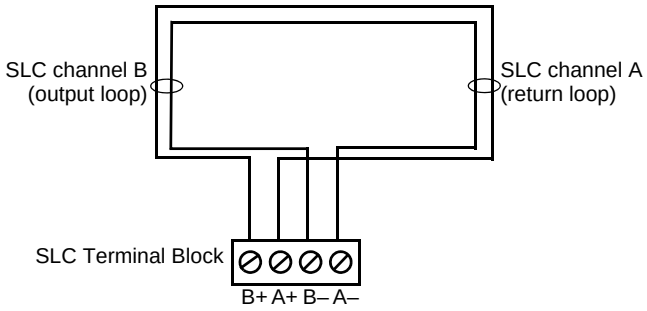


Figure 2.4 Measuring the Wire Length of a Four-Wire SLC

2.4 Control Panel Terminal Blocks

2.4.1 IFC2-3030 and IFC-3030 with LCM-320, LEM-320

The IFC-3030/IFC2-3030 supports up to five pairs of loop control and expander modules, providing from one to ten SLC loops. Loops can be either CLIP mode or FlashScan mode. SLC loops connect to TB1 on the LCM-320 or LEM-320.

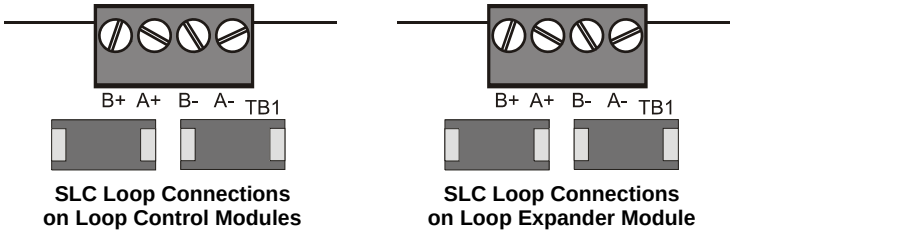


Figure 2.5 IFC2-3030, IFC-3030 SLC Loop Connections and Wiring

2.4.2 IFC2-640 with Loop Expander Modules, IFC-320

The IFC2-640 provides one SLC loop and supports a second using optional expander module LEM-320.The IFC-320 provides one SLC loop on the FACP's main circuit board. Terminal block designations are the same on the circuit board for both FACPs. Loops can be either CLIP mode or FlashScan mode. SLC loop #1 connects to TB13 on the control panel; SLC loop #2 connects to TB1 on the LEM-320.

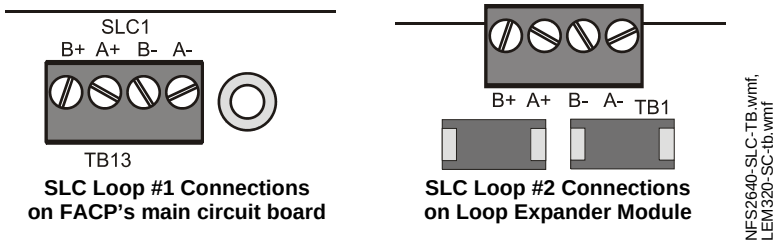


Figure 2.6 SLC Loop Connections and Wiring

2.4.3 IFC-640 with Loop Expander Modules

The IFC-640 provides one SLC loop and supports a second using optional expander module LEM-320. Loops can be either CLIP mode or FlashScan mode. SLC loop #1 connects to TB16 on the control panel; SLC loop #2 connects to TB1 on the LEM-320.

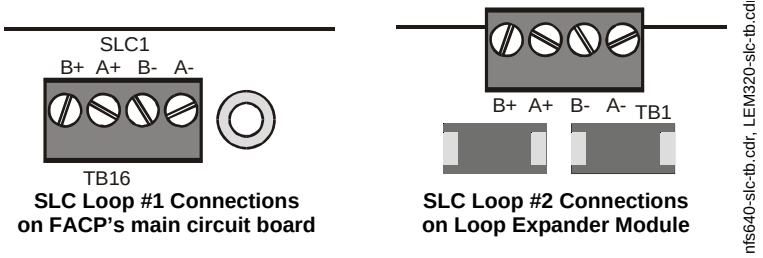


Figure 2.7 SLC Loop Connections and Wiring

2.4.4 IFC-200

IFC-200 supports one SLC loop; the loop is CLIP mode only. The SLC loop connects to TB5.

Figure 2.8 SLC Connections for IFC-200

2.4.5 IFC-300/IFC-400

IFC-300 supports one SLC loop; IFC-400 supports two SLC loops. The loops are CLIP mode only. SLC loops connect to TB6 on IFC-300; SLC loops connect to TB5 and TB6 on IFC-400.

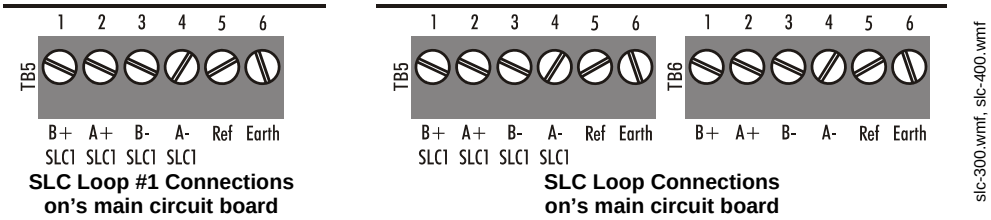
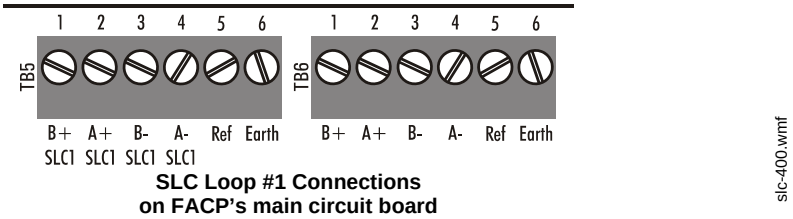
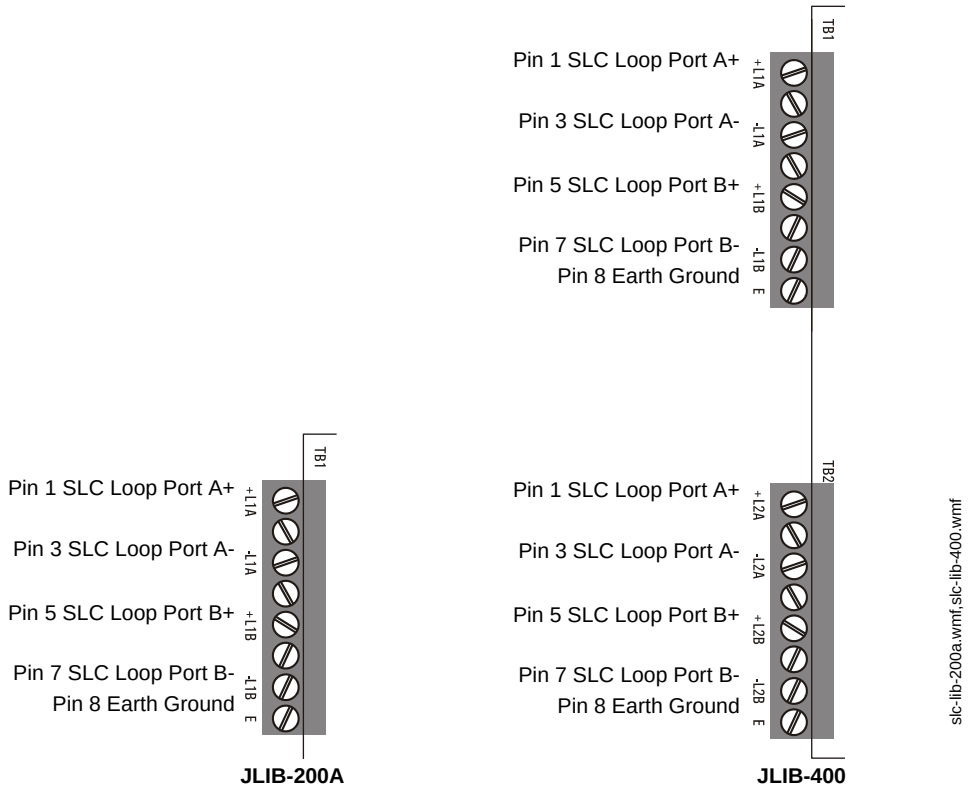


Figure 2.9 IFC-300/IFC-400.

2.4.6 IFC-1010/IFC-2020 with JLIB-200A or JLIB-400



IFC-1010/IFC-2020 supports up to ten SLC loops using JLIB-200A (one SLC loop per board) and/or JLIB-400 (one or two SLC loops per board). The loops are CLIP mode only. SLC loops connect to TB1 and TB2 on JLIB-400, and TB1 on JLIB-200A.



NOTE: JLIB-200 has been replaced by JLIB-200A.

Figure 2.10 SLC Connections for JLIB-200A & JLIB-400

Section 3: Shielded Wire Termination

3.1 Overview

This section shows the proper termination of the shield, if used.

Shielding of the SLC is recommended for use with IFC-200, IFC-300/400, JLIB-200. Proper termination of the shield depends on the type of conduit used:

- Section 3.2, “No Conduit”.
- Section 3.3, “Full Conduit” (Canadian requirement).
- Section 3.4, “Partial Conduit”.

Shielding of the SLC is not recommended for use with IFC-320/E/C, IFC2-640/E, IFC-640/E, IFC2-3030, IFC-3030, LCM-320, LEM-320, JLIB-200A or JLIB-400. If twisted-shielded wire is used in one of these installations, use a floating shield to terminate the wire as shown in Section 3.5, “Floating Shield”, on page 25.

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

3.2 No Conduit

■ For use with IFC-200, IFC-300/400, and JLIB-200 only

Scrape the paint on the cabinet to bare metal to provide a good electrical connection. Fold the foil and drain wire back over the cable jacket. Slide the cable into the connector clamp and secure. The drain wire should be connected to the connector screw. Do not allow the shield drain wire or foil to enter the system cabinet.

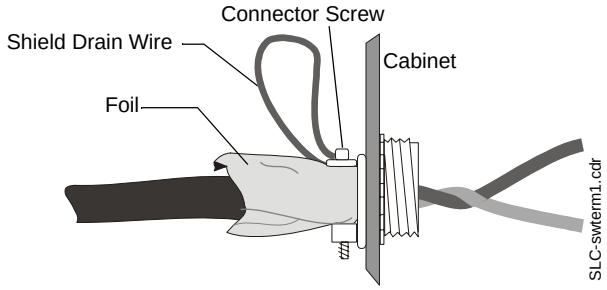
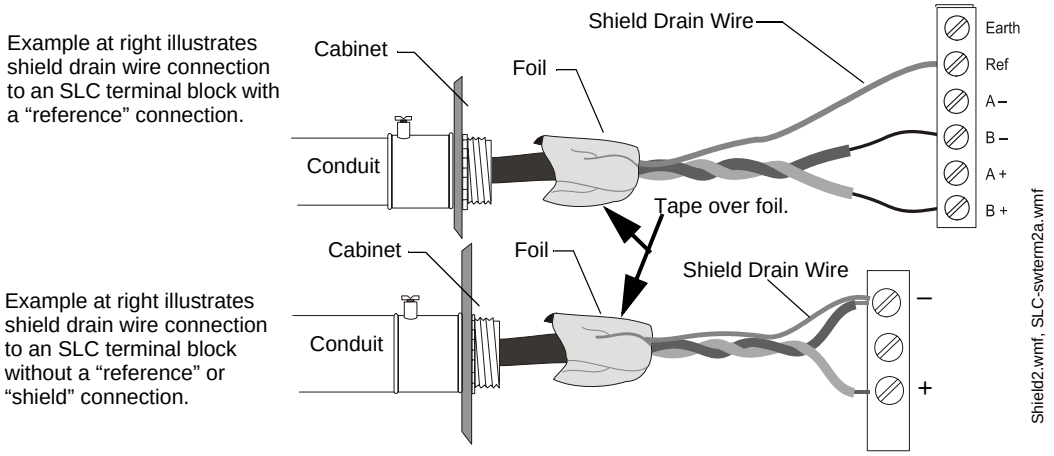


Figure 3.1 Shield Termination – No Conduit

3.3 Full Conduit

■ For use with IFC-200, IFC-300/400, and JLIB-200only

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 "reference" or "shield" terminal on the SLC terminal block, or connected to the negative side of the loop if there is no "reference" or "shield" terminal on the SLC terminal block. Do not let the shield drain wire or the shield foil touch the system cabinet or be connected to earth ground at any point.



NOTE: For Style 6 or Style 7 SLC wiring, connect one end of the shield to the reference/negative side of the respective channel

Figure 3.2 Shield Termination – Full Conduit

3.4 Partial Conduit

■ For use with IFC-200, IFC-300/400, and JLIB-200

If the length of conduit from the control panel cabinet is less than 20 ft. (6.1 m), terminate the shield as shown. If using a metal box, you must use a metal conduit.

Connect the shielded wire to the junction box by using a proper connector. Scrape the paint on the cabinet to bare metal to provide a good electrical connection. Connect the metal conduit between the junction box and the cabinet by using the proper connectors.

Feed the twisted-pair wire into the junction box, through the conduit, into the cabinet box. Within the junction box, connect the appropriate wires together using wire nuts. Connect the shield drain wire to the junction box, at the end of the conduit run, as shown below.

Do not allow the shield drain wire to enter the system cabinet or the conduit.

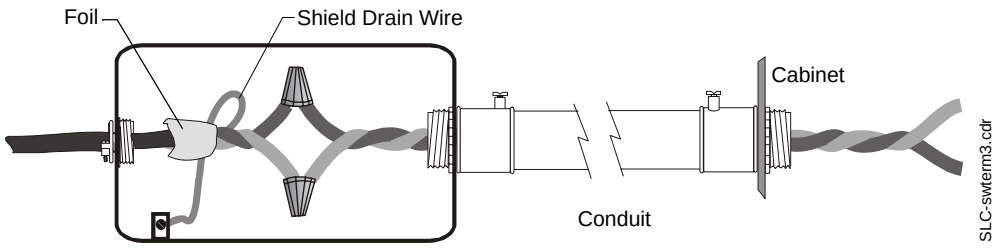


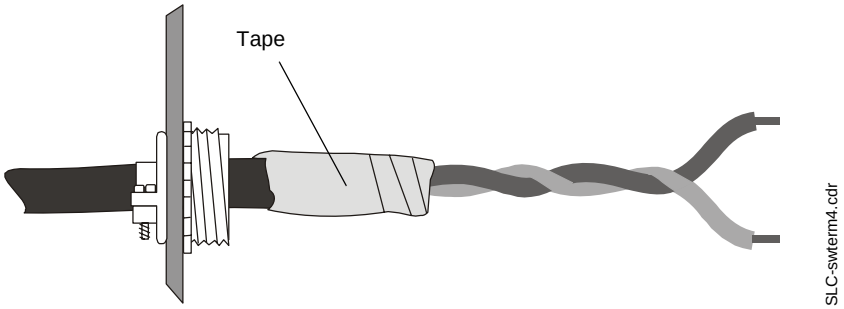
Figure 3.3 Shield Termination – Partial Conduit

3.5 Floating Shield

■ If using shielded wire with IFC-320, IFC2-640/E, IFC-640/E, IFC2-3030, IFC-3030, LCM-320, LEM-320, JLIB-200A and JLIB-400

Twisted-**unshielded** wire is recommended for IFC-320/E/C, IFC2-640/E, IFC-640/E, IFC2-3030, IFC-3030, LCM-320, LEM-320, JLIB-200A and JLIB-400. If twisted-shielded pair wire is used in these installations, use a floating shield to terminate the wire. The following precautions must be met:

- If the SLC is more than 3000 ft. (914.4 m), divide the shield into floating segments of less than 1000 ft. (304.8 m).
- To divide the shield wire into floating segments, cut shield even with jacket and tape as shown:



NOTE: Using shielded wire in applications where it is not recommended will reduce the maximum SLC length. If shielded wire must be used where not recommended, failing to float the ends will reduce the maximum SLC length even further.

Figure 3.4 Floating the Shield

Section 4: SLC Circuits without Isolators

4.1 Overview

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

- NFPA 72 Style 4
- NFPA 72 Style 6

4.2 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.

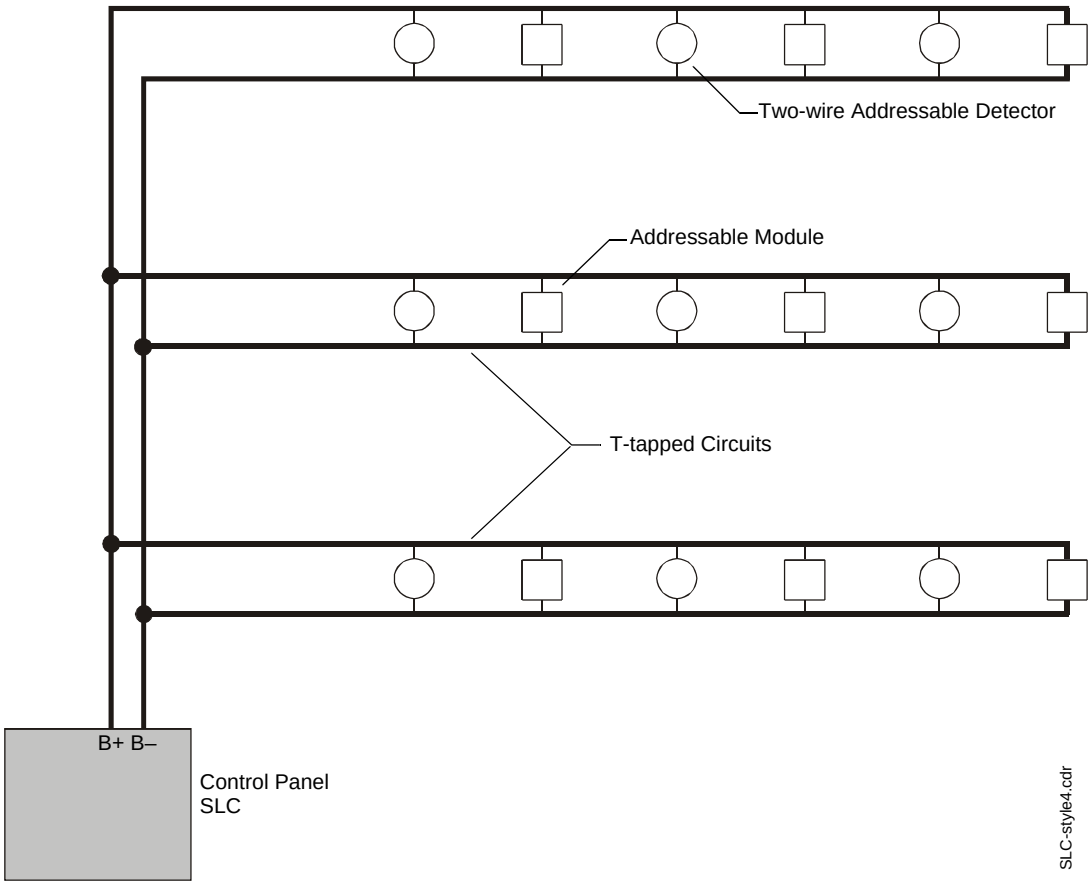
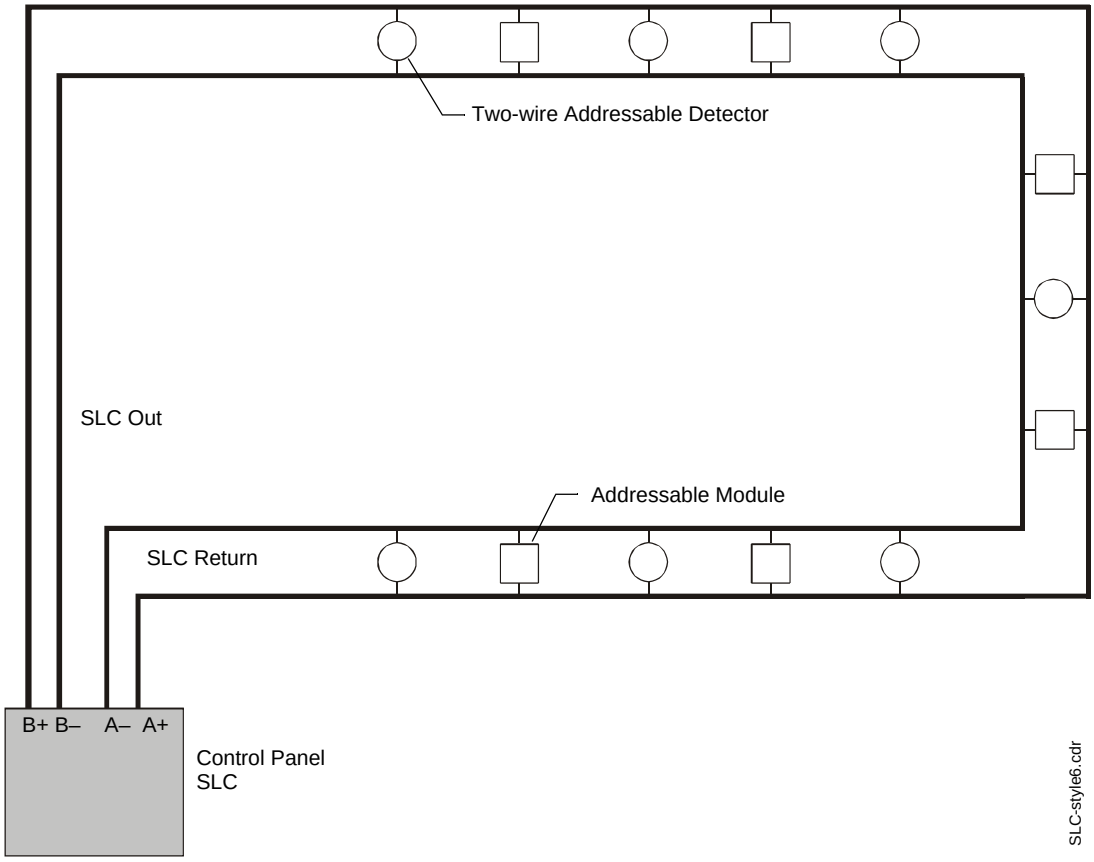


Figure 4.1 Basic NFPA Style 4 SLC

4.3 NFPA Style 6 SLC

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



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

Figure 4.2 Basic NFPA Style 6 SLC

Section 5: SLC Circuits with Isolators

5.1 Overview

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

- Fault Isolator Module **M500XJ**
- Isolator Detector Base **B224BI**

A Fault Isolator Module on both sides of a device, or the combination of an Isolator Base and Isolator Module are required to comply with NFPA Style 7 requirements.

CAUTION:
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. IFC-300 or IFC-400 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 IFC-320/E/C, IFC2-640/E, IFC-640/E, IFC2-3030, IFC-3030, or IFC-200.

5.2 Fault Isolator Module

The M500XJ module continuously monitors the circuit connected to terminals 3(–) and 4(+). Upon powerup, 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 belowFigure 5.1). 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.

5.2.1 Wiring an Isolator Module

Figure 5.1 shows a Style 4 example for wiring of an Isolator Module.

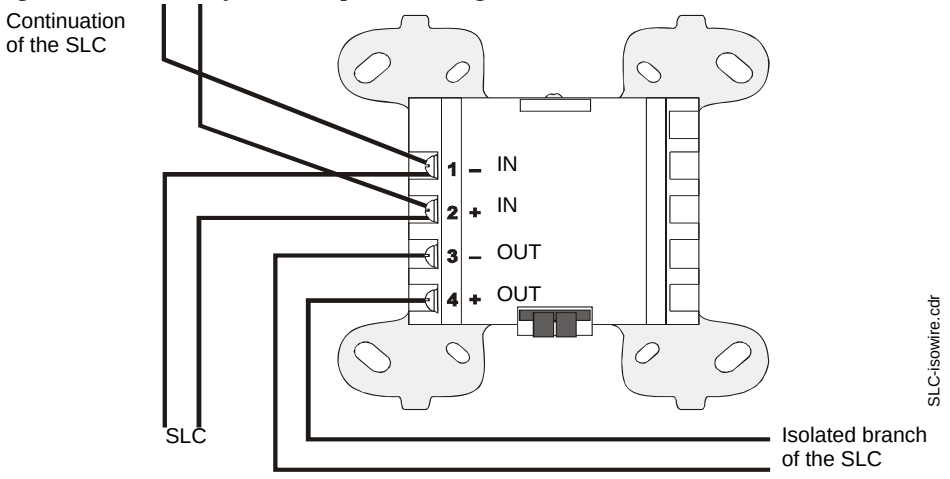


Figure 5.1 Wiring the M500XJ Module

5.3 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.

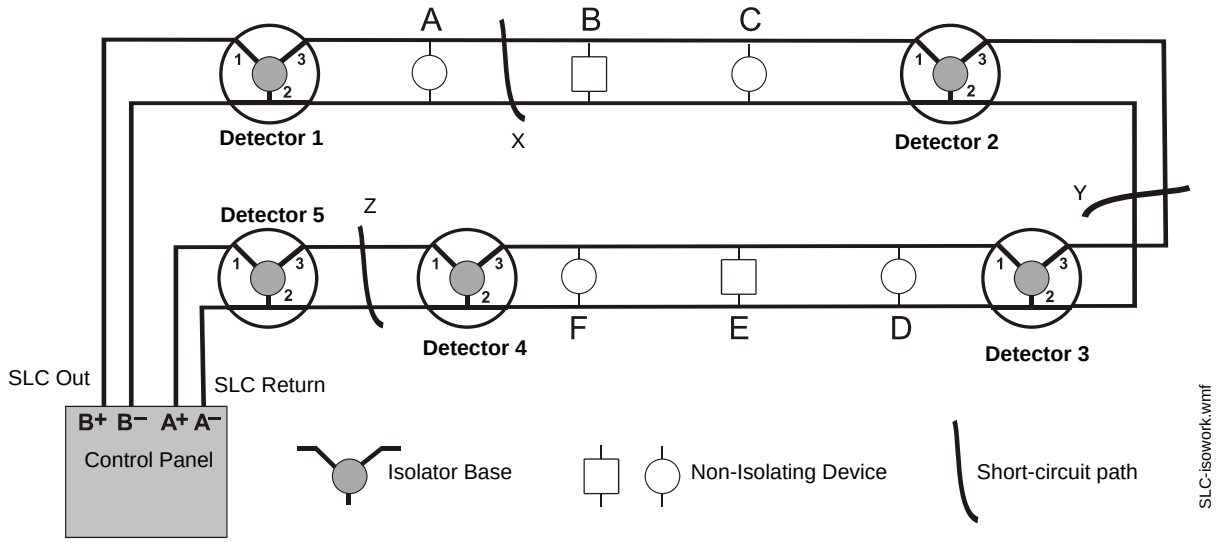
B224BI is an intelligent isolator base used with FlashScan® detectors and most CLIP mode detectors.

5.3.1 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.



NOTE: For information on wiring an isolator base, refer to Figure 9.3, “Wiring an Isolator Base” on page 50.

Figure 5.2 Isolator Base Circuit: Sample Style 6 Wiring

5.4 NFPA Style 4 SLC Using Isolator Modules

A variation of a Style 4 operation using isolator modules to protect each branch of the SLC. Refer to Figure 5.1 on page 28 for M500XJ wiring and to Section 5.1, “Overview” for limitations.

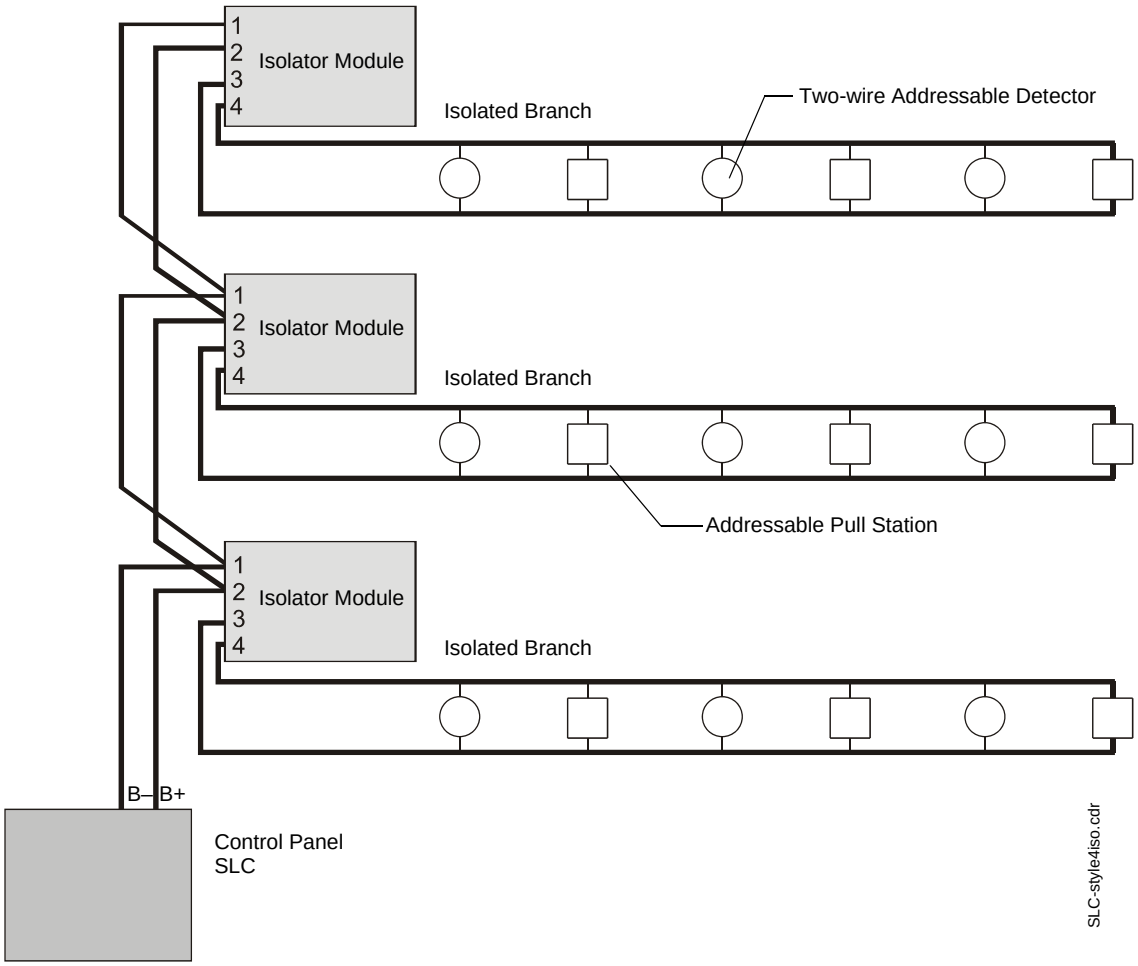


Figure 5.3 NFPA Style 4 SLC Using M500XJ Modules

5.5 NFPA Style 6 SLC Using Isolator Modules

A variation of Style 6 operation using isolator modules to protect a section of the SLC. By flanking each group of devices with M500XJ 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 Style 6 configuration.
- Isolator modules shall be within 20 ft. (6.1 m) of device and the wire must be enclosed in metal conduit.

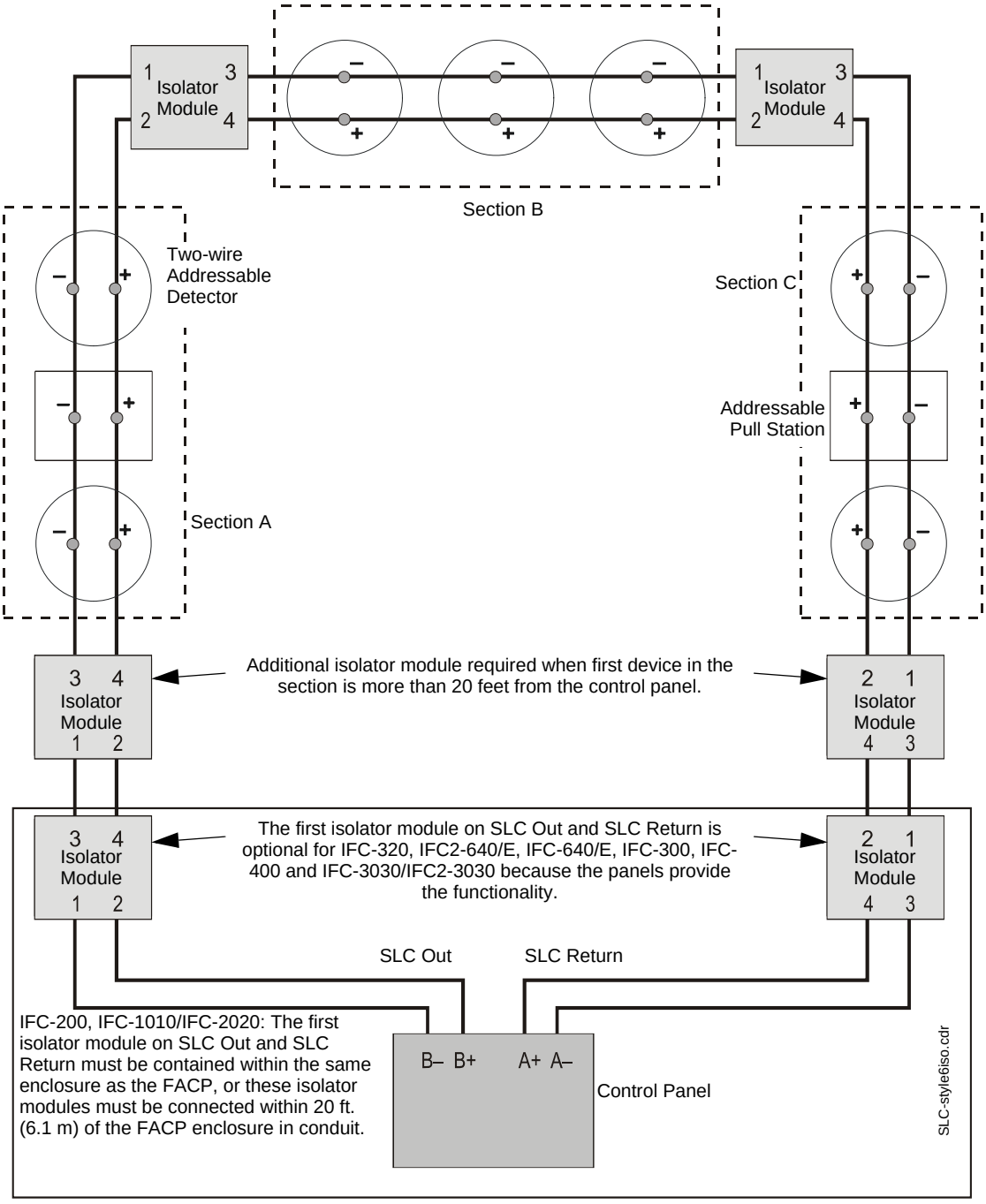
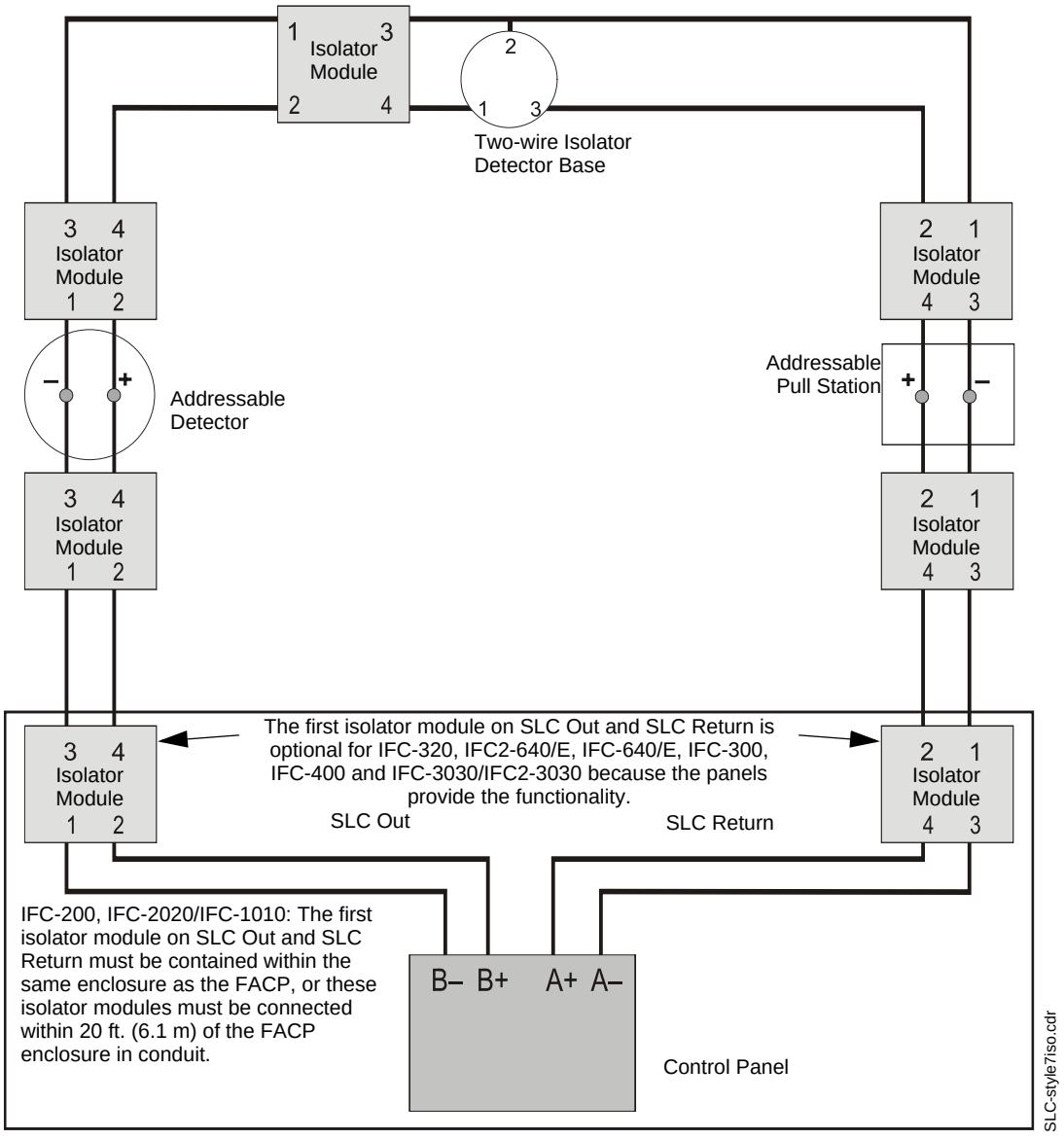


Figure 5.4 NFPA Style 6 SLC Using Isolator Modules

5.6 NFPA Style 7 SLC Using an Isolating Device

Style 7 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 Style 7 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.



NOTE: See Figure 9.3, “Wiring an Isolator Base” on page 50.

Figure 5.5 NFPA Style 7 SLC

Section 6: Monitor Modules

6.1 Description

These addressable modules monitor conventional contact-type alarm initiating devices. You can configure module circuits as 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 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.

6.1.1 Addressable Monitor Module

M300MJ is an addressable modules that monitors either a Style B (Class B) or Style D (Class A) IDC of dry-contact input devices. This module is capable of participating in degraded mode where supported by the FACP.

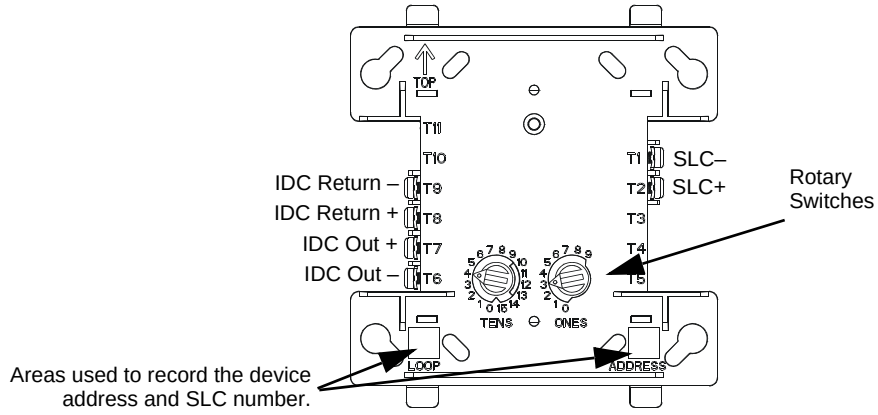


Figure 6.1 M300MJ Monitor Module

6.1.2 Zone Interface Module

M302MJ is similar to the M300MJ, except it is used to monitor compatible two-wire, 24 volt, conventional (non-addressable) smoke detectors on a Style B (Class B) or Style D (Class A) IDC.

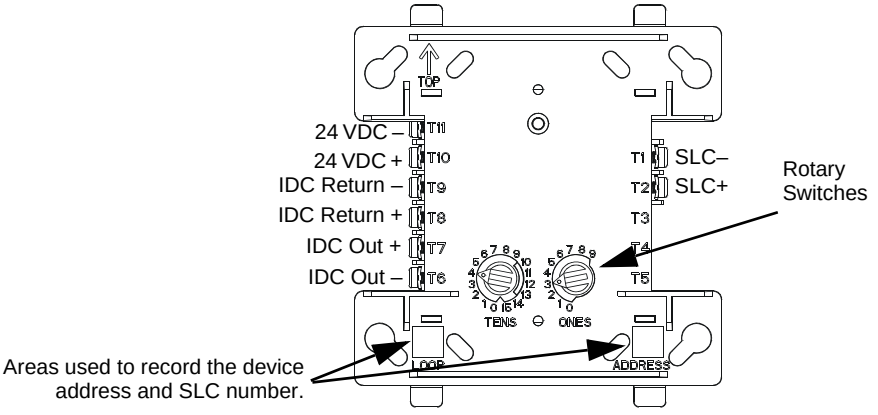
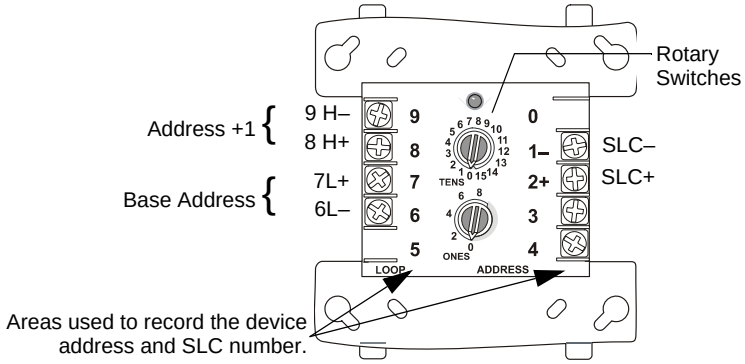


Figure 6.2 M302MJ Zone-interface Module

6.1.3 Dual Monitor Module

M300DJ is similar to the M300MJ, except intended for use in intelligent two-wire systems providing two independent Style B (Class B) IDCs at two separate, consecutive addresses.

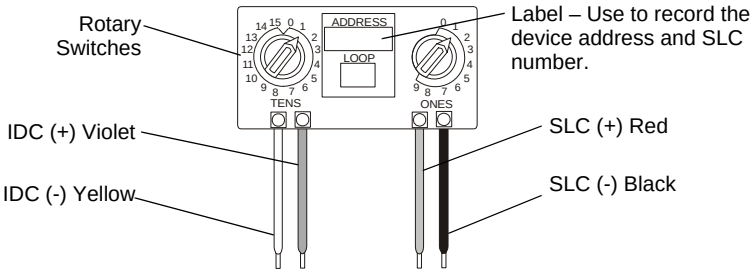


SLCDualMod-simplified.wmf

Figure 6.3 Dual Monitor Module

6.1.4 Miniature Monitor Module

M301MJ is intended to monitor a Style B (Class B) IDC; it is offered in a smaller package for mounting directly in the electrical box of the device being monitored.



FMM-101.cdr

Figure 6.4 Miniature Monitor Module

6.1.5 M300MJ-4-20 4-20mA Monitor Module

M300MJ-4-20 is intended for use in intelligent, two-wire systems, allowing Control Panels to interface and monitor two-wire or three-wire sensors with a 4-20mA signal output.

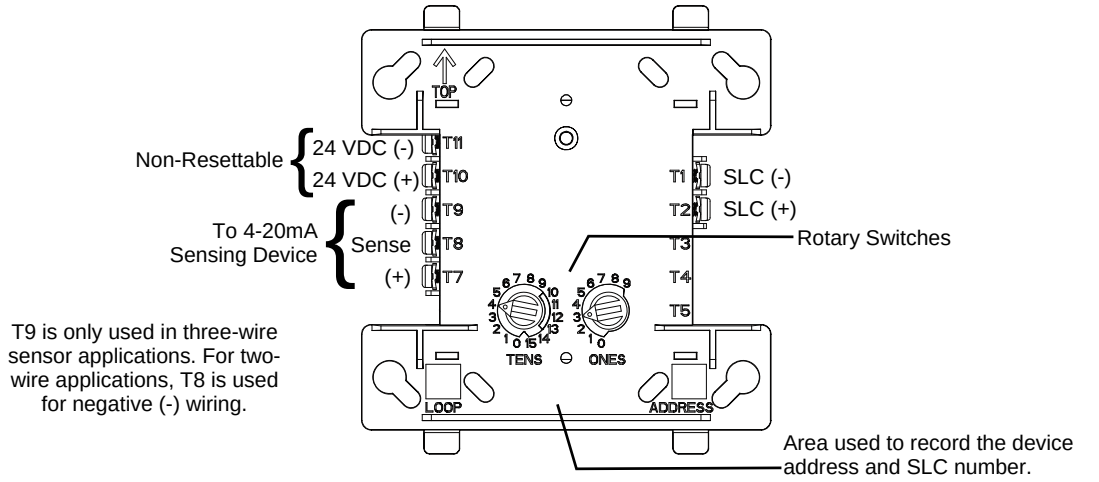


Figure 6.5 M300MJ-4-20 4-20mA Monitor Module

6.2 Setting an SLC Address for a Module

FlashScan 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 6.6 is set at address “35”. When finished, mark the address on the module face in the place provided.

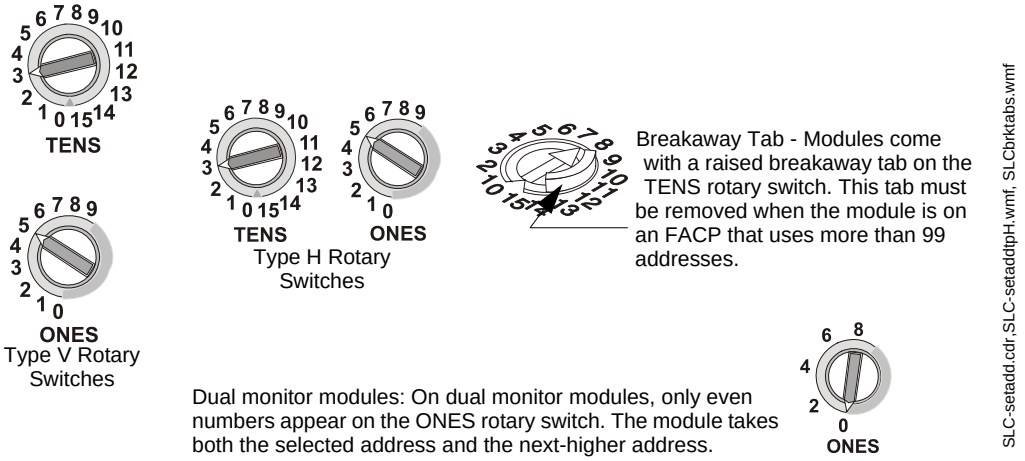


Figure 6.6 Setting SLC Address on Module

6.3 NFPA Style B IDC Using Monitor Modules

Connect the SLC wiring to the module terminals 1 (–) and 2 (+). Each M300MJ module takes one address on the SLC. Use the rotary switches on the module to set it to the required SLC address.

Figure 6.7 shows typical wiring for a supervised and power-limited NFPA Style B (Class B) Initiating Device Circuit using the M300MJ 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 “Power Considerations” on page 53 for information on supervising 24 VDC power.

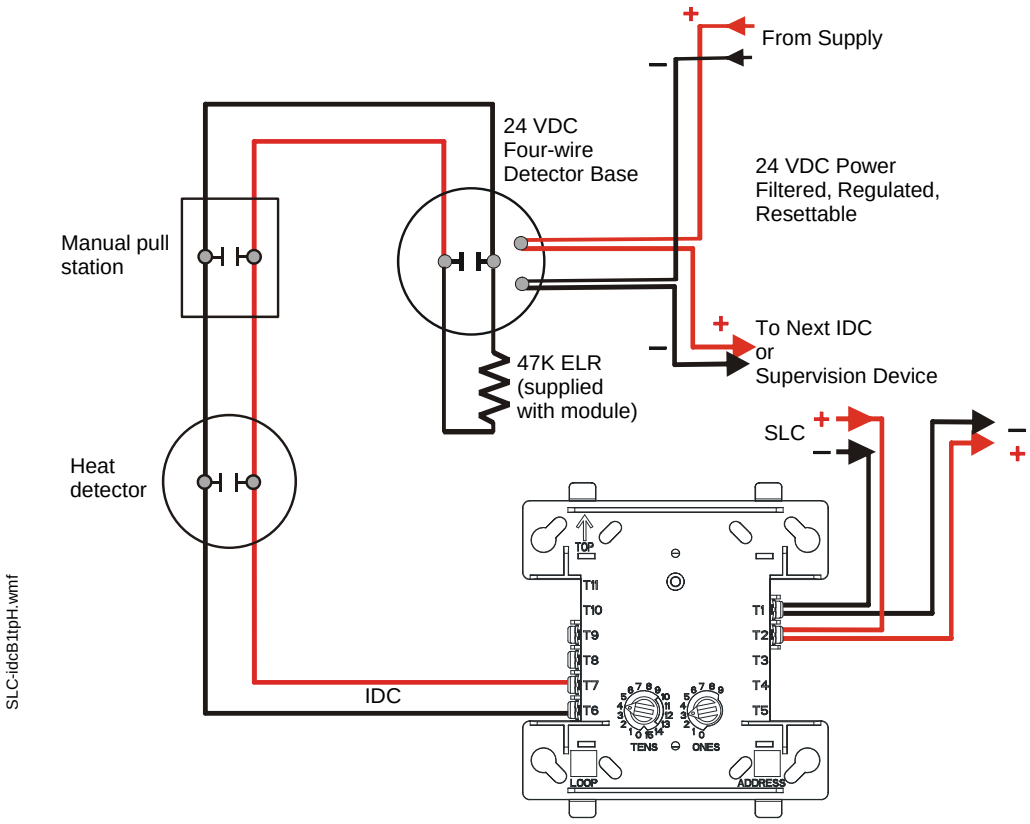


Figure 6.7 Typical Style B IDC Wiring with M300MJ

6.4 NFPA Style D IDC Using Monitor Modules

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

Each M300MJ module takes one address on the SLC. Use the rotary switches on the module to set it to the required SLC address.

Figure 6.8 shows typical wiring for a supervised and power-limited NFPA Style D (Class A) IDC using the M300MJ 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 “Power Considerations” on page 53 for information on supervising 24 VDC power.

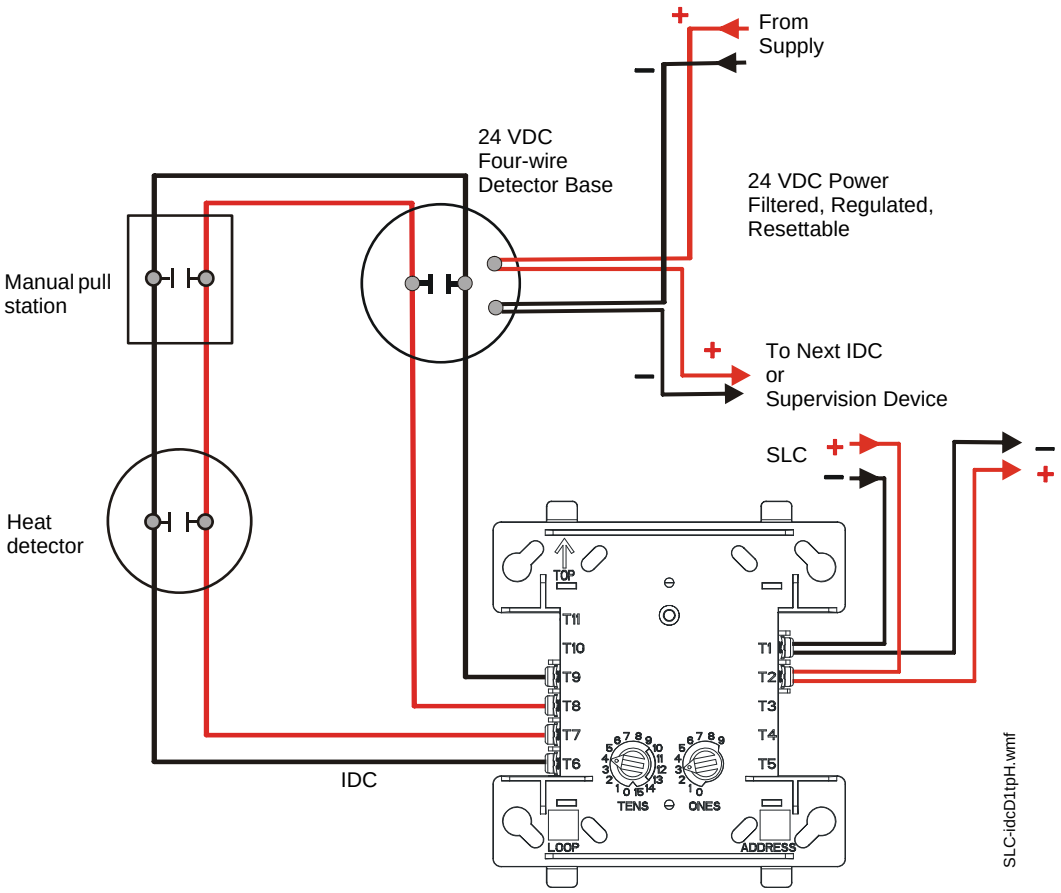


Figure 6.8 Typical Style D IDC Wiring with M300MJ

6.5 NFPA Style B IDC Using Dual Monitor Modules

Connect the SLC wiring to the M300DJ 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 6.9 shows typical wiring for a supervised and power-limited NFPA Style B (Class B) Initiating Device Circuit using the M300DJ 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
   - Security service
3. Refer to the *Device Compatibility Document* for compatible smoke detectors.

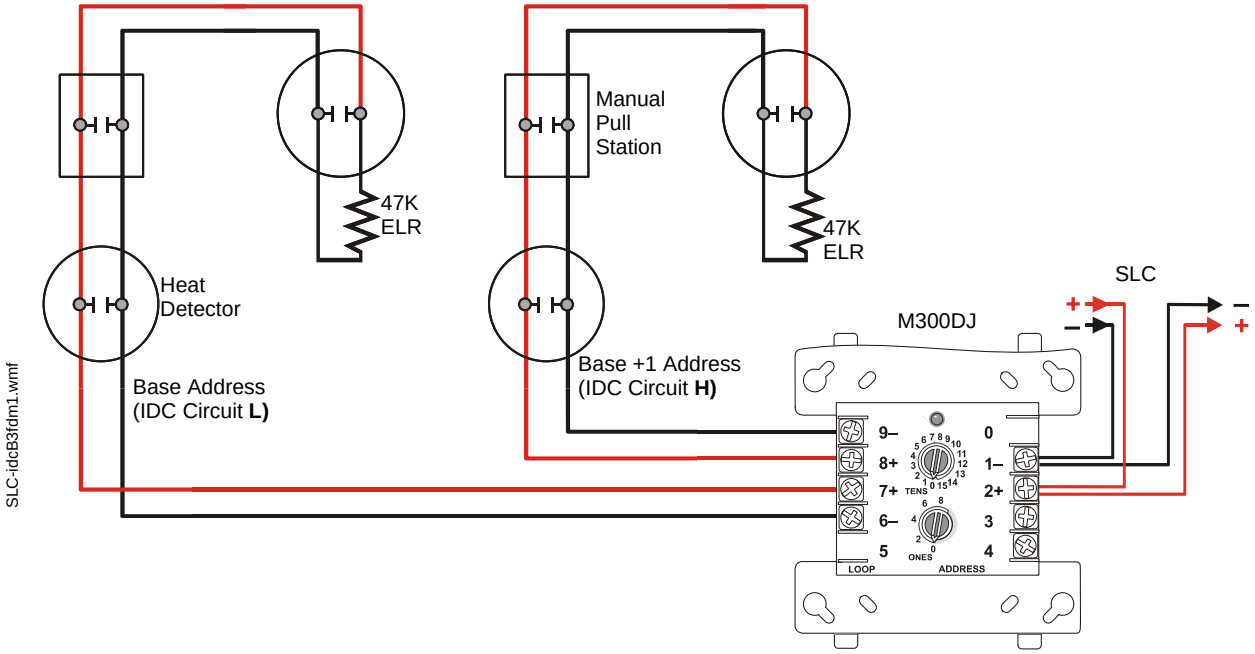


Figure 6.9 Typical Style B IDC Wiring with M300DJ

6.6 NFPA Style B IDC Using Zone Interface Modules

Connect the SLC wiring to the M302MJ 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.

Figure 6.10 shows typical wiring for a supervised and power-limited NFPA Style B (Class B) IDC using the M302MJ 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.

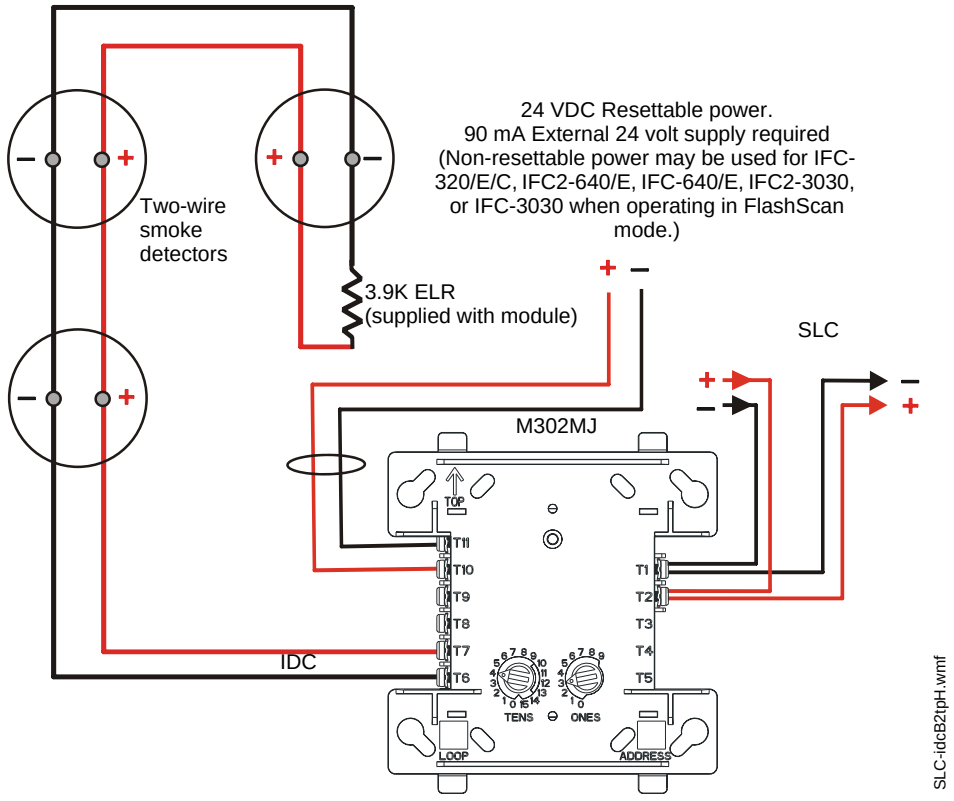


Figure 6.10 Typical Style B IDC Wiring with M302MJ

6.7 NFPA Style D IDC Using Zone Interface Modules

Connect the FlashScan SLC wiring to the M302MJ 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.

Figure 6.11 shows typical wiring for a supervised and power-limited NFPA Style D (Class A) IDC using the M302MJ zone interface modules.

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.

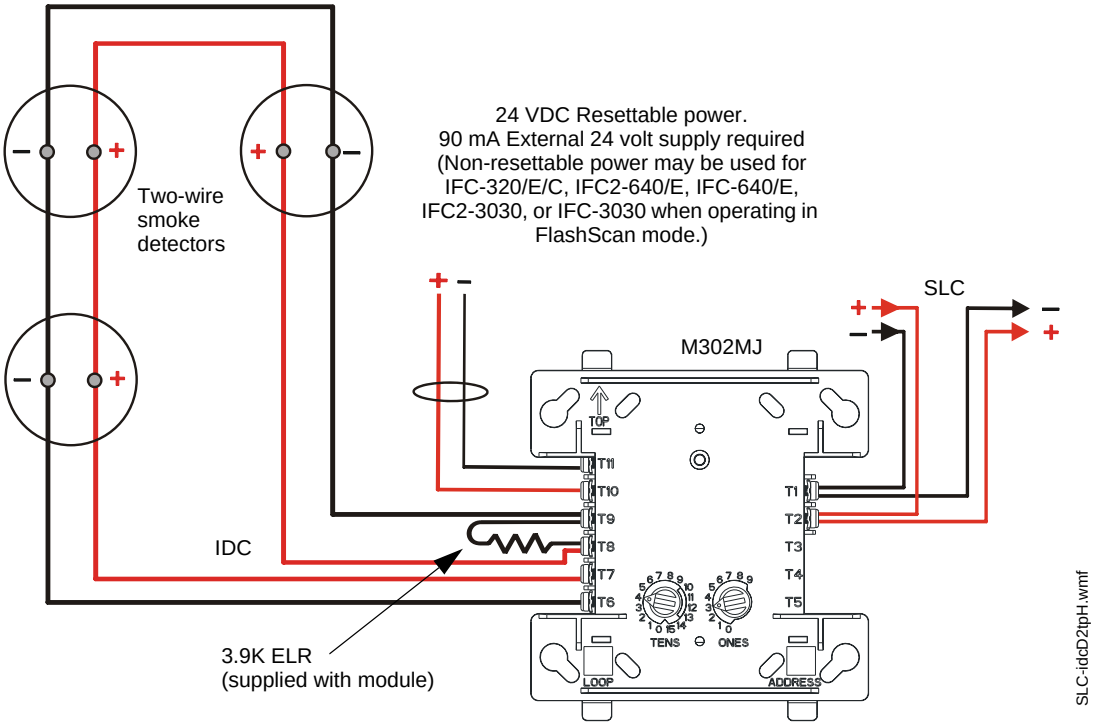


Figure 6.11 Typical Style D IDC Wiring with the M302MJ

Figure 6.12

Section 7: Control Modules

7.1 Description

The M300CJ module is an addressable module 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. It can also be used for audio/voice applications and fire-fighters telephone; these two types of applications are documented separately. For UL 9th edition audio applications, refer to the *Digital Voice Command Manual* and the *Digital Audio Amplifiers Manual*. For UL 8th edition audio applications, refer to the *Voice Alarm System Manual* or *FireVoice 25/50 Manual*. The module has a resistor on the back (refer to Figure 7.2) that must be removed when it is used on an FFT-7 or FFT-7S telephone circuit.

The M300CJ-REL is an addressable module used to switch an external power supply to a solenoid. The M300CJ-REL can be configured for NFPA Class B or Class A wiring. When using the M300CJ-REL for Class B applications, remove jumper J1 (refer to Figure 7.4) on the back.

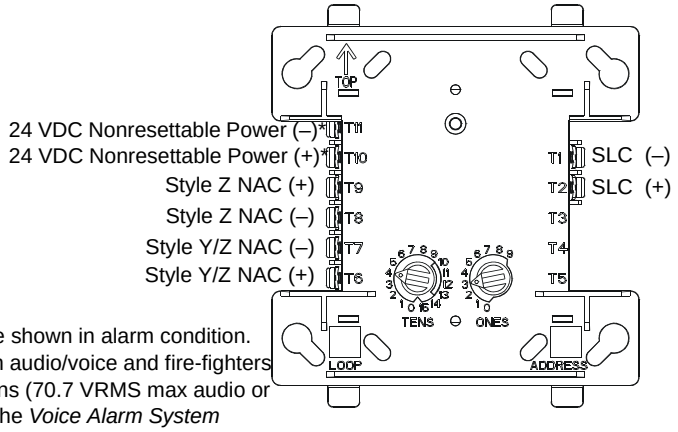
Refer to the *Device Compatibility Document* for a list of compatible UL Listed Fire Alarm Releasing Solenoids. For more information on the module specifications refer to the *Installation Instructions* provided with these devices.

■ Setting an SLC Address

Each module is factory preset with an address of "00." To set an SLC address refer to "Setting SLC Address on Module" on page 35.

7.2 Wiring a NAC with Addressable Control Modules

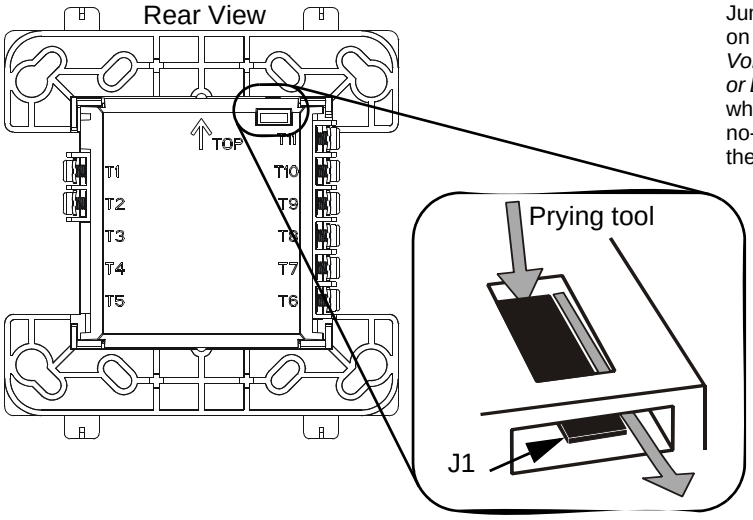
Figure 7.1 and Figure 7.2 show the connections to wire the M300CJ module for powering a 24 VDC NAC.



NOTE:
- Module polarities are shown in alarm condition.
- *Can also be used in audio/voice and fire-fighters telephone applications (70.7 VRMS max audio or telephone); refer to the *Voice Alarm System Manual, FireVoice 25/50 Manual* or *DVC Manual* as appropriate for your equipment.

SLCModule-simplified.wmf

Figure 7.1 M300CJ Wiring Connections



Jumper J1 must be removed when using the M300CJ on an FFT-7 or FFT-7S telephone circuit (see the *Voice Alarm System Manual, FireVoice 25/50 Manual or DVC Manual* as appropriate for your equipment) and when supervising 24VDC 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:

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 so that it exits from the slot in the back.

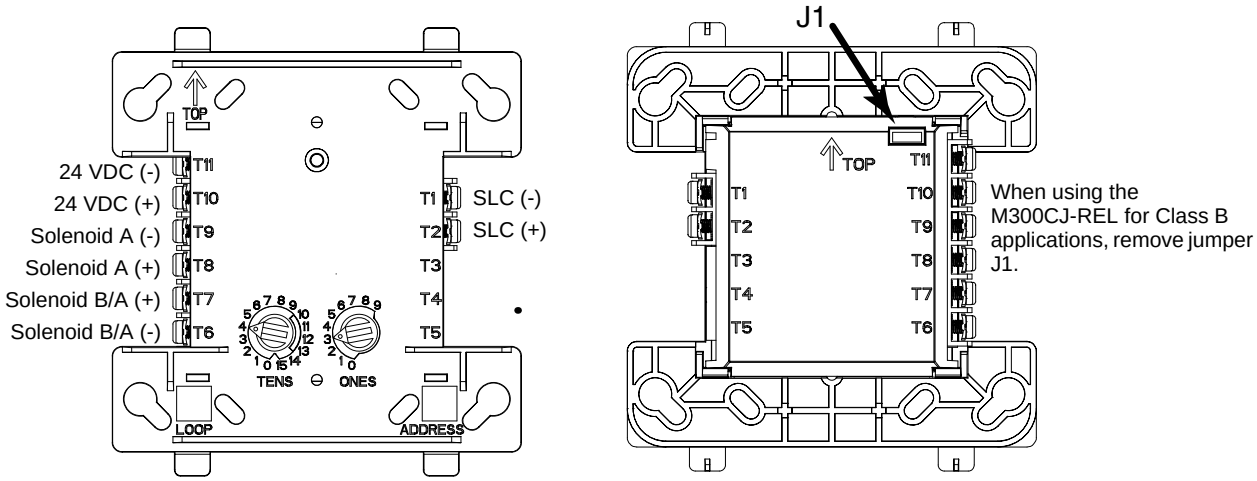
FCMBackJump.wmf, FCMBackJumpcl.wmf

NOTE: When using IFC-3030/IFC2-3030 and the Control type ID, do **not** remove jumper J1.

Figure 7.2 M300CJ Top and Rear View - Jumper Location

7.2.1 Wiring a Solenoid with the M300CJ-REL

Figure 7.3 shows the connections to wire the M300CJ-REL to a solenoid.



M300CJ-REL
Wiring Connections

M300CJ-REL
Rear View - Jumper Location

Figure 7.3 M300CJ-REL Wiring Connections and Rear View - Jumper Location

NOTE: The M300CJ-REL will not function on an SLC loop that is programmed for CLIP mode.

7.3 Wiring a Style Y NAC (Two-Wire) with Addressable Control Modules

A supervised and power-limited NFPA Style Y (Class B) Notification Appliance Circuit (NAC) using the M300CJ module. Polarized alarm notification appliances are shown connected to the module in a two-wire configuration.

1. See “Power Considerations” on page 53 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. (*IFC-3030 only*: If using one of the IFC-3030’s FlashScan type IDs that provide built-in power supervision, no relay is required.)
4. Do not Tap or branch a Style Y 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 (ELR-47K in Canada).
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.

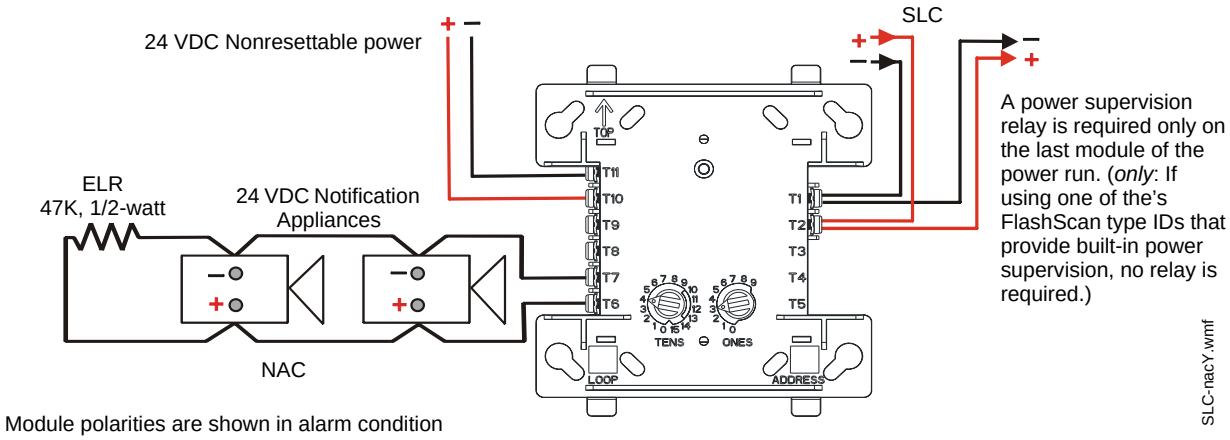


Figure 7.4 NFPA Style Y Notification Appliance Circuit

7.4 Wiring a Style Z NAC (Four-Wire) with Addressable Control Modules

A supervised and power-limited NFPA Style Z (Class A) Notification Appliance Circuit (NAC) using the M300CJ module. Polarized alarm notification appliances are shown connected to the module in a four-wire configuration.

1. See “Power Considerations” on page 53 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. (*IFC-3030 only*: If using one of the IFC-3030’s FlashScan type IDs that provide built-in power supervision, no relay is required.)
4. Do not T-Tap or branch a Style Z 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.

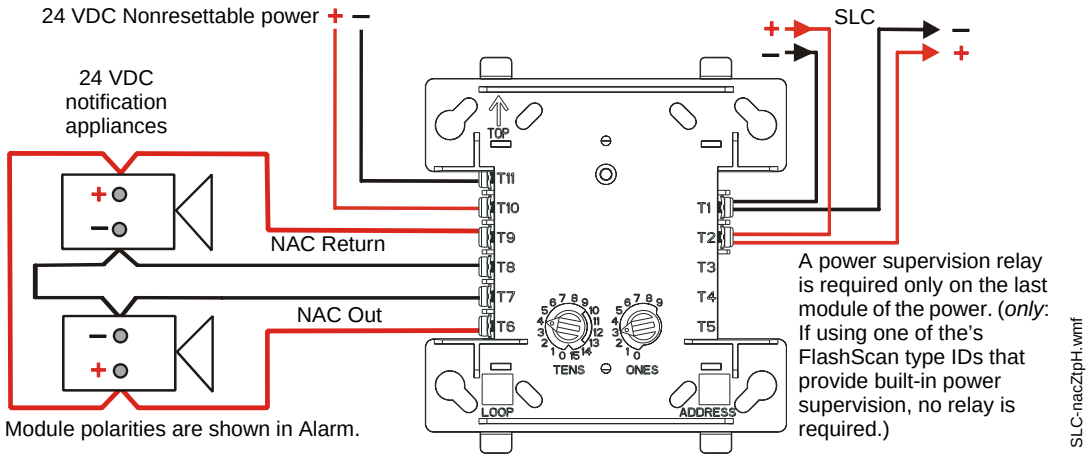


Figure 7.5 NFPA Style Z Notification Appliance Circuit

7.5 Connecting a Releasing Device to the Addressable Control Module

The M300CJ-REL module can control 1 A of current. Make sure to keep total system current within the limits of the power supply. You can power the module from the power supply of the Control Panel 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*.

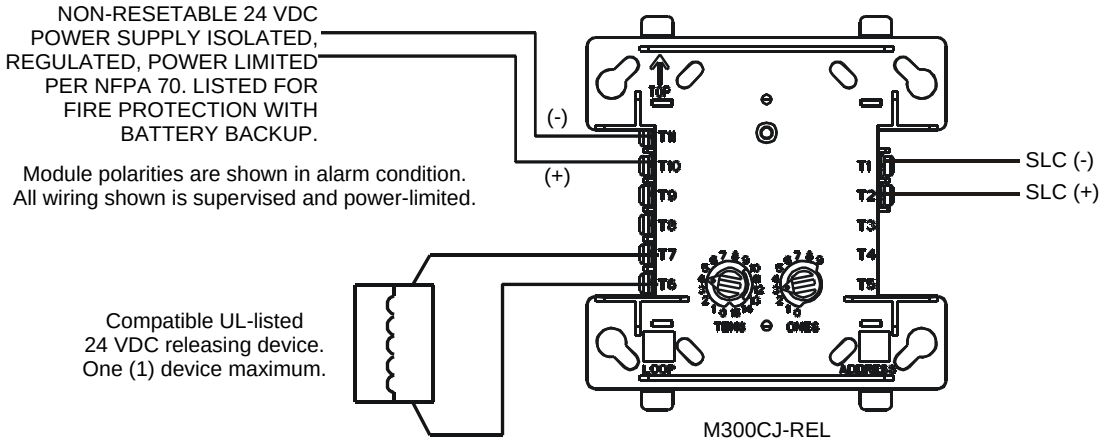


Figure 7.6 NPFA Class B Wiring of the M300CJ-REL

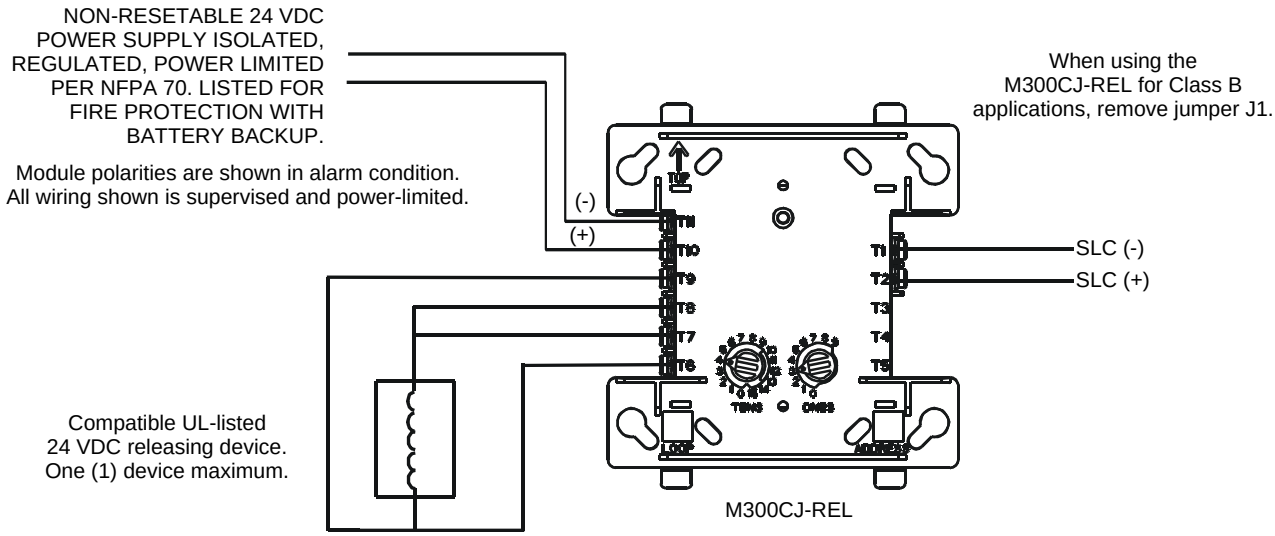


Figure 7.7 NPFA Class A Wiring of the M300CJ-REL

Critical Requirements. When connecting a releasing device to the M300CJ-REL module, note the following:

1. See "Power Considerations" on page 52 for information on monitoring 24 VDC power.
2. Do not T-tap or branch a Style Y or Style Z circuit.
3. Only one (1) 24V solenoid or two (2) 12V solenoids in series can be connected to the M300CJ-REL.

4. Do not loop wiring under the screw terminals. Break the wire run to provide supervision of connections.
5. All applications using the M300CJ-REL are power-limited:
   a. Program the releasing circuit for Type Code REL CKT ULC or RELEASE CKT.
   b. Circuits are supervised against opens and shorts.
6. Refer to your FACP's *Programming Manual* for instructions on setting the Soak Timer.

The M300CJ-REL module must be programmed with the correct releasing type code listed in your FACP's *Programming Manual*.

Section 8: Relay Module

8.1 Description

The M300RJ module is an addressable module that provides 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.

■ Setting an SLC Address

Each relay module is factory preset with an address of “00.” To set an SLC address refer to Section 6.2, “Setting an SLC Address for a Module”, on page 35.

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

The figure below shows the M300RJ module wired to the Control Panel.

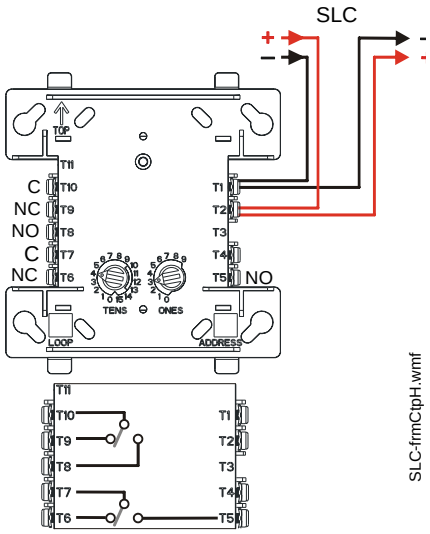


Figure 8.1 Relay Module Wiring Connections

Figure 8.2

Section 9: Intelligent Detector Bases

9.1 Description

The **B501J** and **B210LPJ** Detector Bases, the **B224RB** plug-in relay detector base, and the **B501BH** sounder base provide the connection between the SLC and a variety of intelligent detectors. Use the **B501B-FTXJ** Detector Base with all HARSH™ detectors.

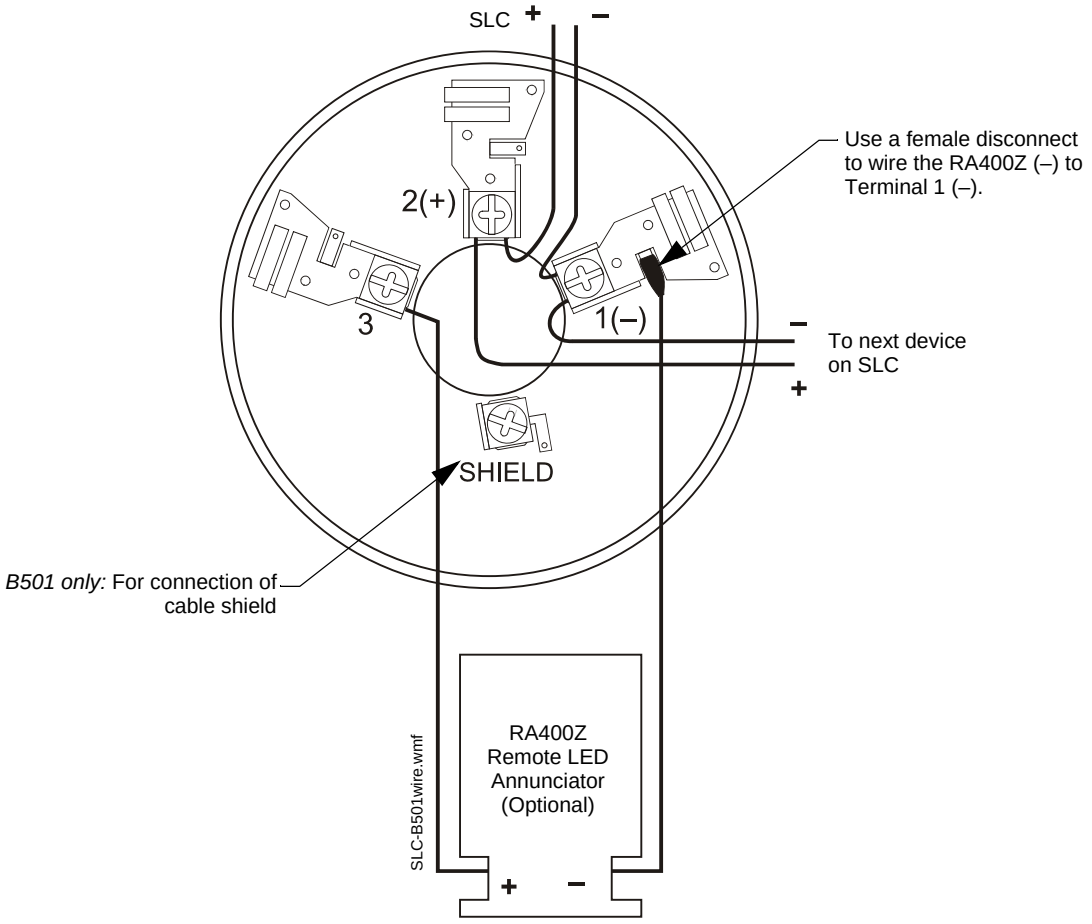
For more information refer to the *Installation Instructions* documents provided with these devices.

■ Setting the Detector Address

Each intelligent detector head is factory preset with an address of "00." To set an SLC address refer to "Setting an SLC Address for a Module" on page 35.

9.2 Wiring a Detector Base

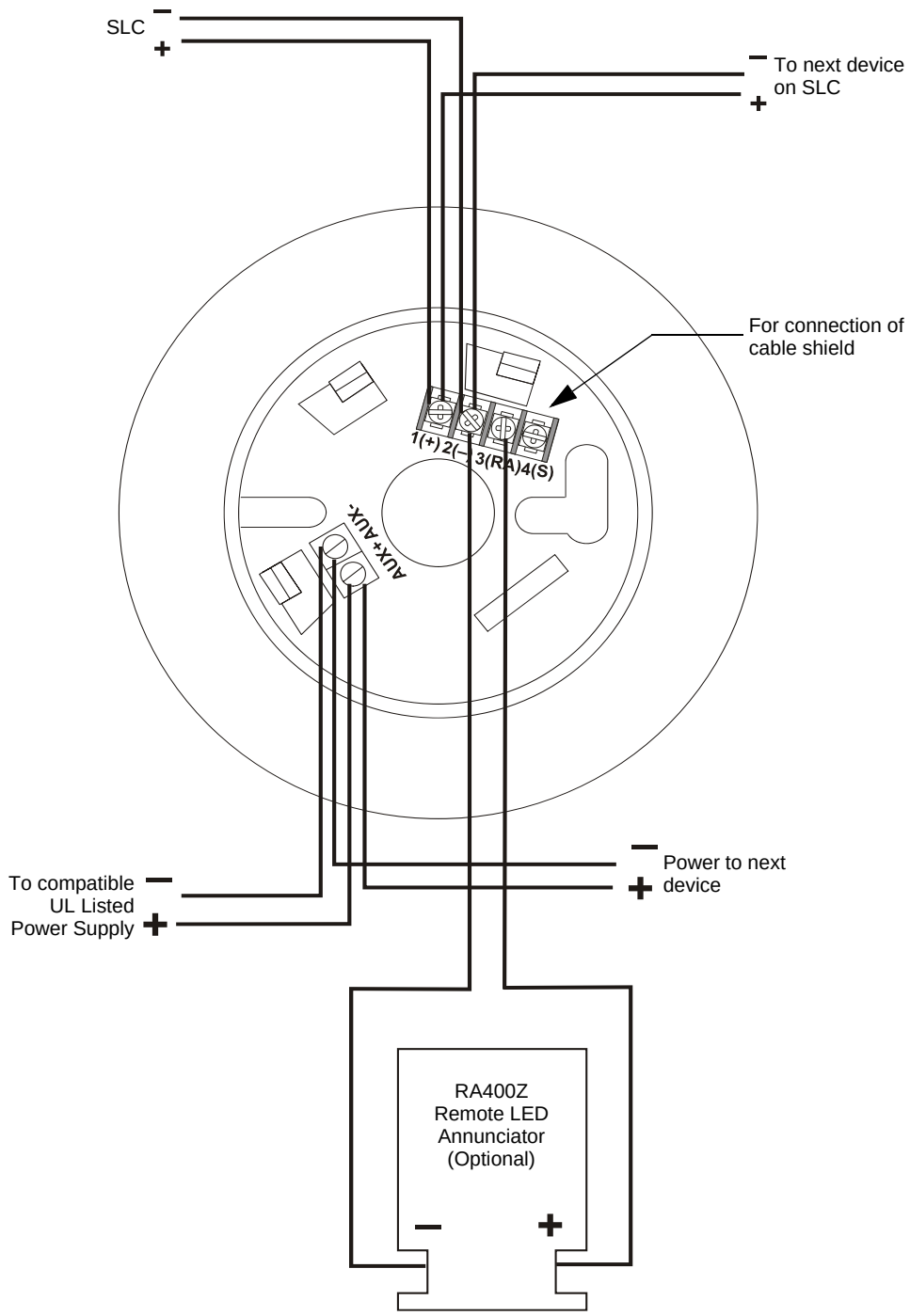
Figure 9.1 shows typical wiring of the B210LPJ or **B501J** detector base connected to an SLC. An optional RA400Z Remote LED Annunciator is shown connected to the base.



NOTE: The B210LPJ base wiring is identical to the B501J, except there is no shield terminal.

Figure 9.1 Wiring of the B501J Detector Base

Figure 9.2 shows typical wiring of the **B501B-FTXJ** detector base (for use with a HARSH™ detector) connected to an SLC. An optional **RA400Z** Remote LED Annunciator is shown connected to the base.



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

Figure 9.2 Wiring of the B501B-FTXJ Detector Base

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 Style 7 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.

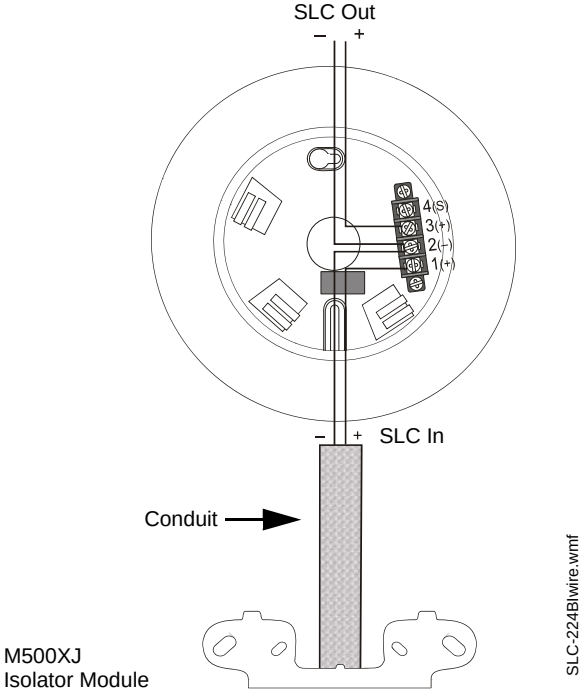


Figure 9.3 Wiring an Isolator Base

9.4 Wiring a Relay Base

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

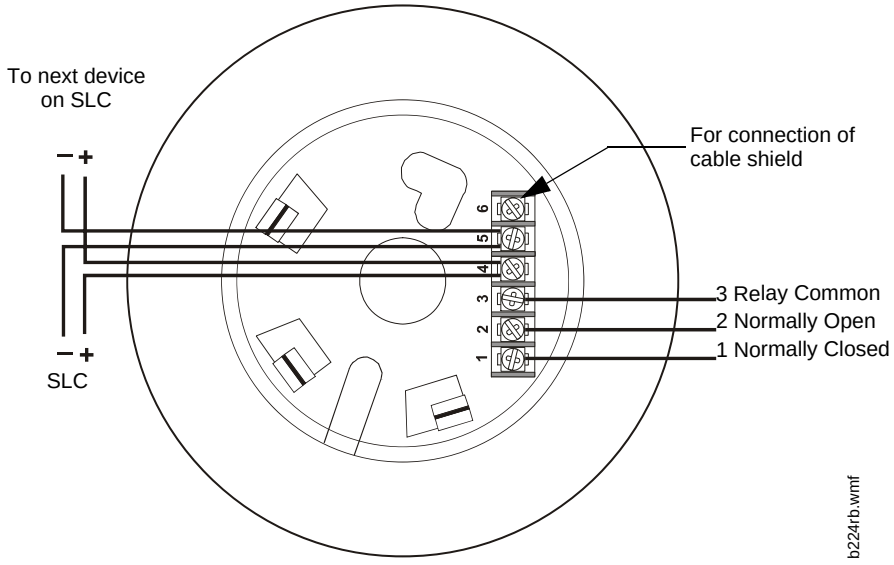
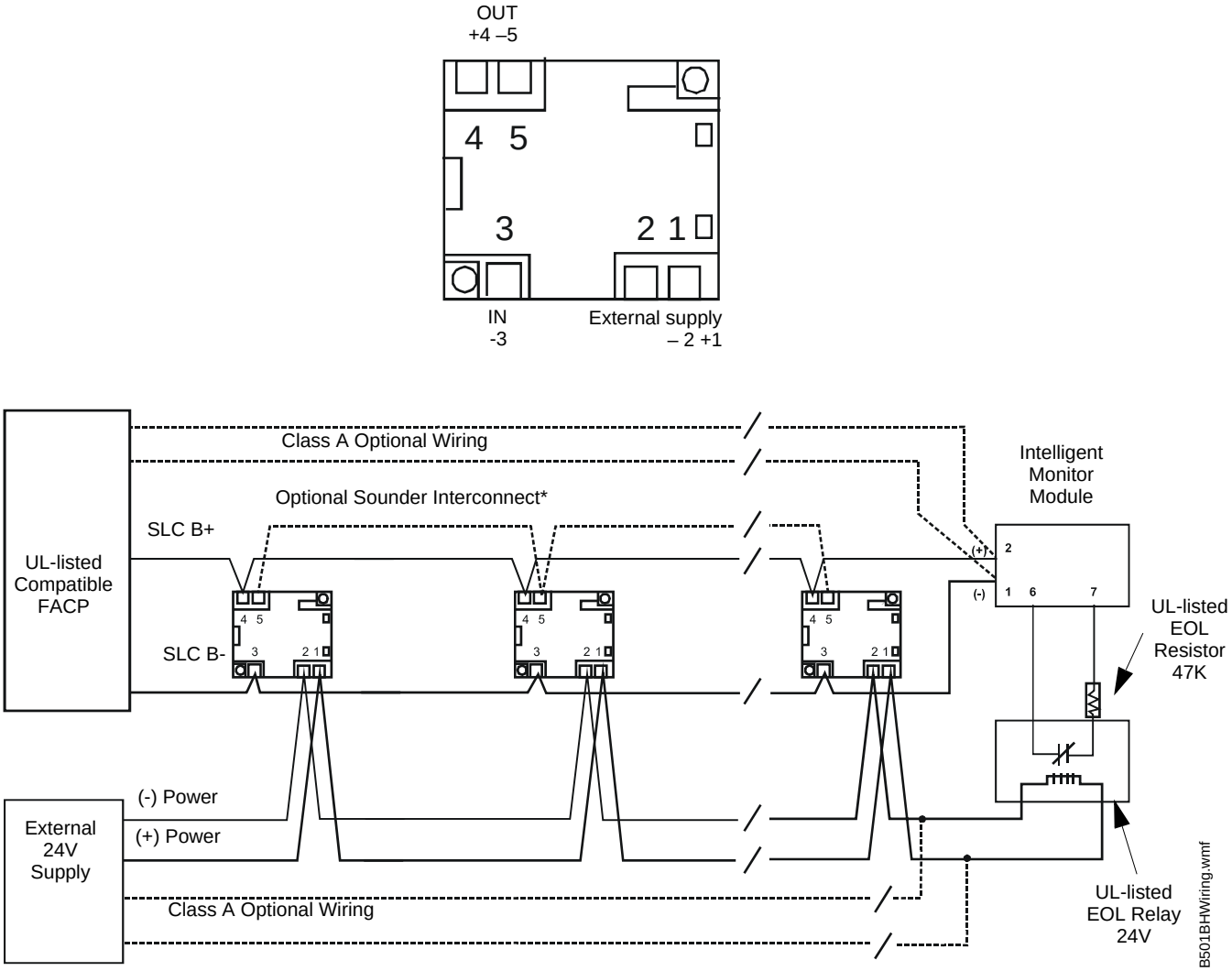


Figure 9.4 Wiring of the B224RB Plug-in Relay Detector Base

9.5 Wiring a Sounder Base

Figure 9.5 shows typical wiring of the B501BH, and B501BHT sounder bases.



*Grouping of up to 6 model B501BHT temporal tone sounder bases.

Figure 9.5 Wiring of the B501BH/B501BHT Sounder Bases

Section 10: Addressable Manual Pull Station

10.1 Description

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

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

■ 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 35.

10.2 Wiring a Manual Pull Station

Typical wiring for the JBG-12LX Manual Pull Station to an SLC.

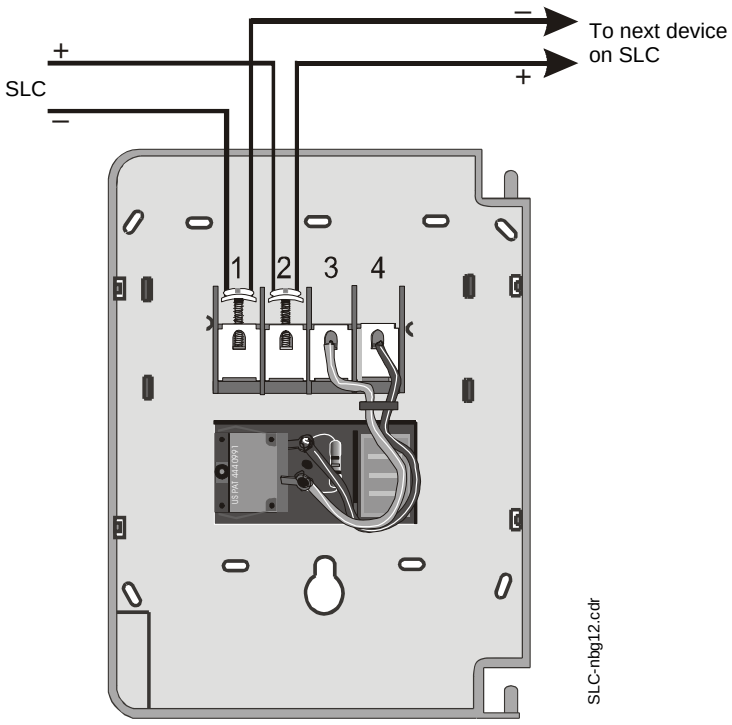


Figure 10.1 Wiring the JBG-12LX Pull Station to an SLC

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:

$\mathbf{R_{max}}$ = maximum resistance of the 24 VDC wires
$\mathbf{V_{ms}}$ = minimum supply voltage (see Table A.1 below)
$\mathbf{V_{om}}$ = minimum operating voltage of the detector or end-of-line relay, whichever is greater, in volts
$\mathbf{N}$ = total number of detectors on the 24 VDC supply circuit
$\mathbf{I_s}$ = detector current in standby
$\mathbf{N_a}$ = number of detectors on the 24 VDC power circuit which must function at the same time in alarm
$\mathbf{I_a}$ = detector current in alarm
$\mathbf{I_r}$ = end-of-line relay current
$\mathbf{N_b}$ = number of Notification Appliance Devices
$\mathbf{I_b}$ = 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 Johnson Controls power supplies are listed below:

FACP	Vms	Power Supply	Vms
IFC-200	19.4	FCPS-24/E	19.1
IFC-640/E	19.15	FCPS-24S6/FCPS-24S8	19.1
KAPS-24 on IFC2-640 or IFC-320	20.16V	MPS-24A/E	19.6
		MPS-24B/E	20.1
		MPS-400	19.23
		ACPS-2406/E	19.8
		AMPS-24/E	20.27
		ACPS-610/E	19.4

Table A.1 Minimum Supply Voltage

A.2 Supervising 24 VDC Power

There are options for supervising 24 VDC power, as discussed below.

- Using FlashScan Type Codes with Built-In Power Supervision (IFC-3030 only)
- Power Supervision Relay
- Using the M300CJ module without relay

A.2.1 Using Type Codes with Built-In Power Supervision on IFC-3030

Certain FlashScan 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 M300CJ) and two wire detectors (using the M302MJ) 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.

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 or IDC circuit, either a two or a four-wire style.

See Figure A.1 and Figure A.2. Refer to the *Device Compatibility Document* for compatible notification appliances and relays.

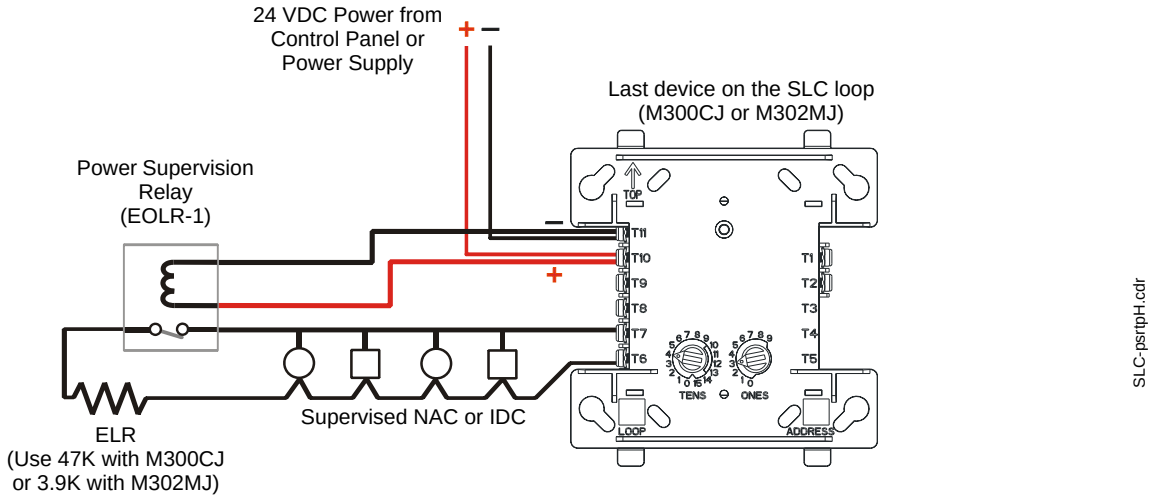


Figure A.1 Supervised 24 VDC Circuit

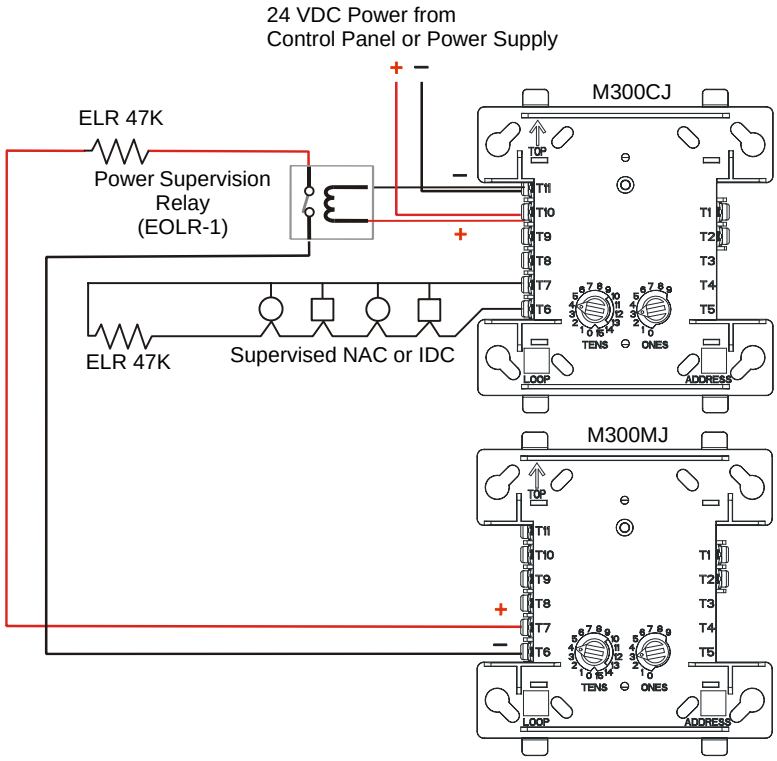


Figure A.2 Alternate: 2-Address Method of Supervising a 24 VDC Circuit

A.2.3 Using the Addressable Control Module Without Relay

An alternate method of supervising 24 VDC power fed to the Notification Appliance Circuit of the M300CJ 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 M300CJ modules. The control panel supervises this circuit, which can be either a Style Y or Style Z.

Style Y 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 M300CJ 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 M300CJ (see instructions in Figure 7.2 on page 42).

Connect the NAC power as follows:

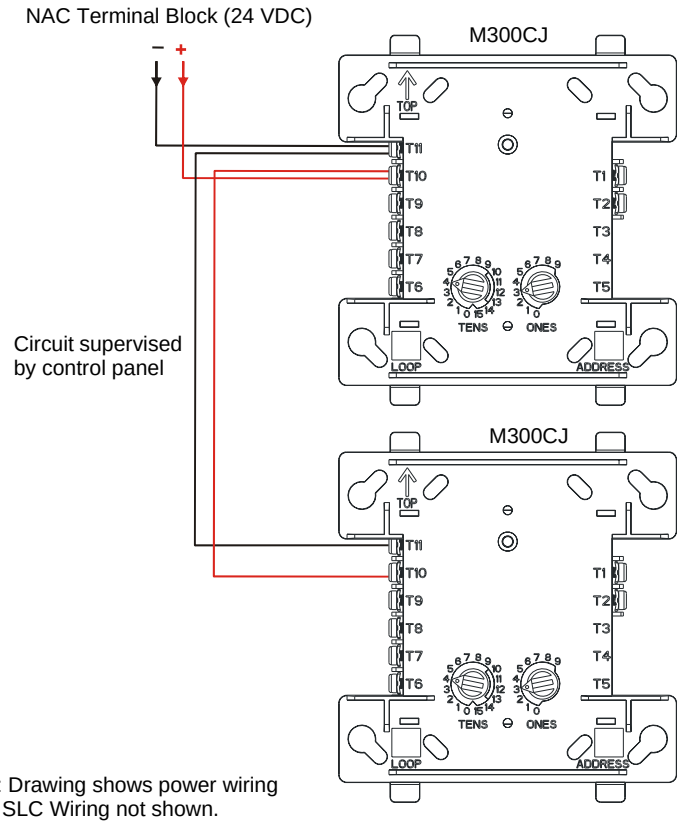


Figure A.3 NFPA Style Y NAC Power (Alternate)

Style Z NAC Power Wiring (Alternate)

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 M300CJ 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 resistor on each M300CJ (see instructions in Figure 7.2 on page 42).

Connect the NAC power as follows:

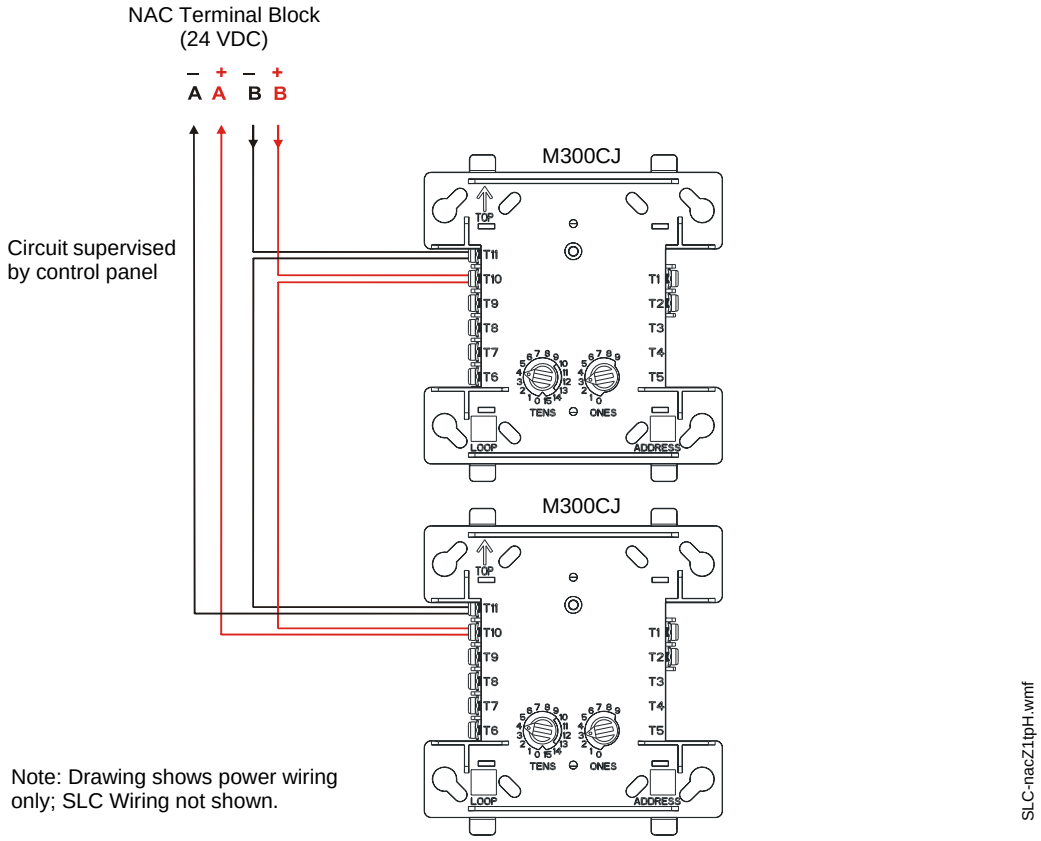


Figure A.4 NFPA Style Z NAC Power (Alternate)

Appendix B: SLC Surge Suppression

B.1 Introduction

There are one primary and three secondary UL–listed surge protectors approved for use with the FACPs listed in this appendix.

Primary Surge Protector:

- **326-2M** TII Station Protector

Secondary Surge Protectors:

- **DTK-2LVLP-F:** Diversified Technology Group, Inc. (DITEK) 1720 Starkey Rd. Largo, FL 33771 (800) 753-2345.
- **SLCP-30:** 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

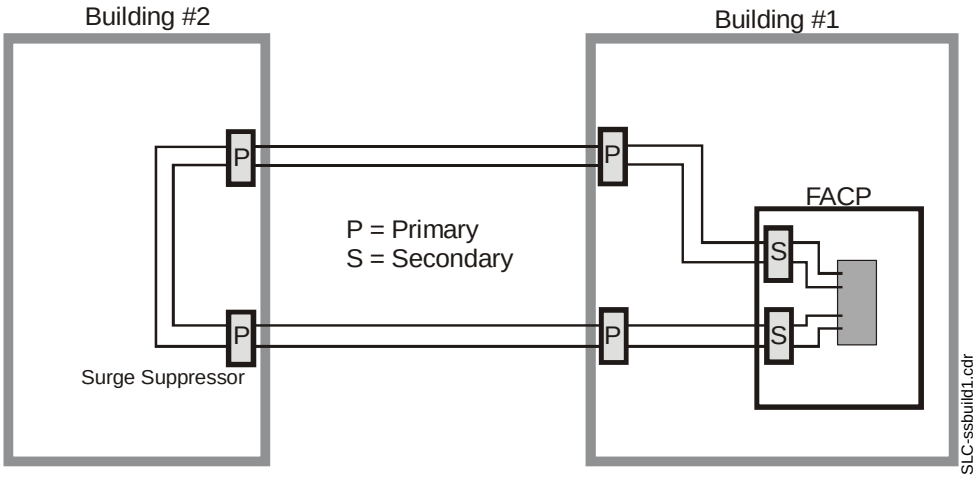
NOTE: For detailed information refer to the installation documentation supplied with the unit.

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.



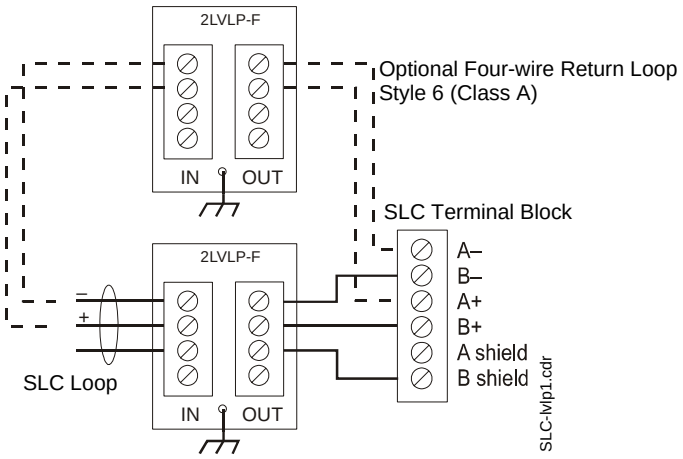
B.2 Installation

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

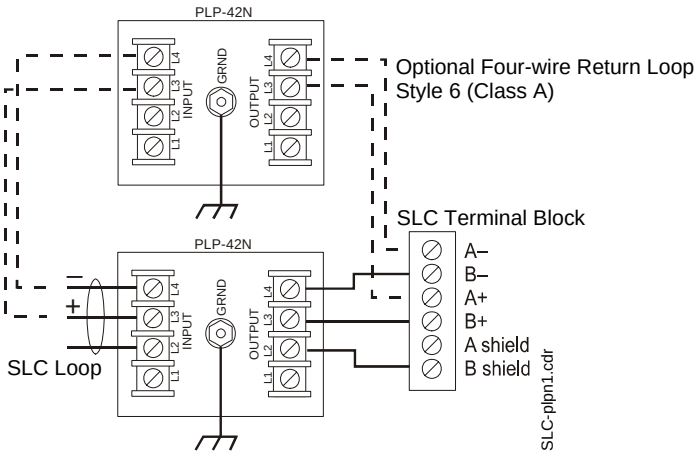
- Locate on an available stud and secure with nut.
- Unit is connected in series with the SLC Loop to protect the Control Panel.
- Provide a common ground to eliminate the possibility of a differential in ground potentials.

B.2.1 IFC-200

DTK-2LVLP-F Connections

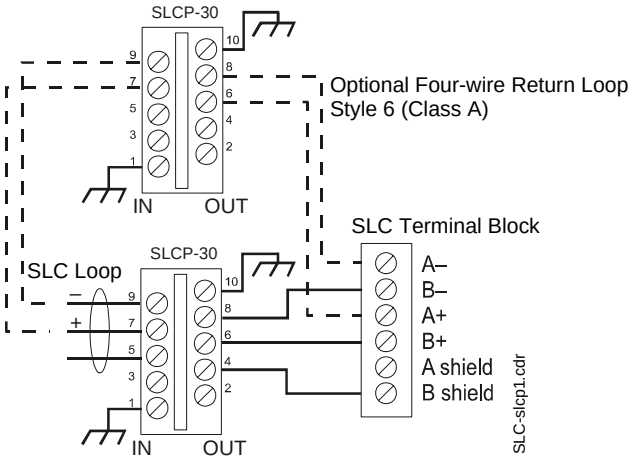


PLP-42N Connections



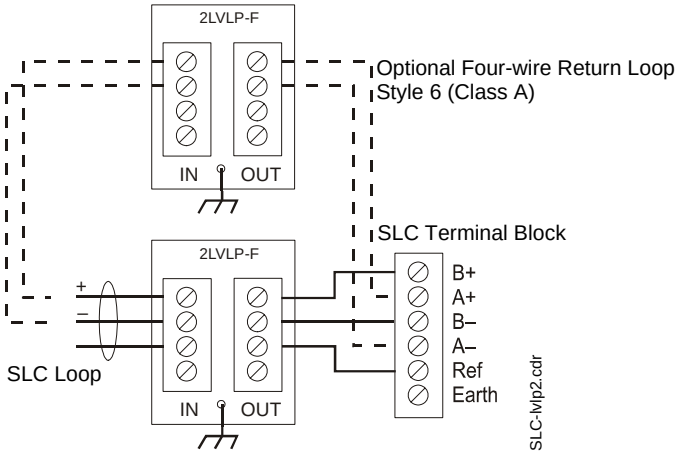
NOTE:

SLCP-30 Connections

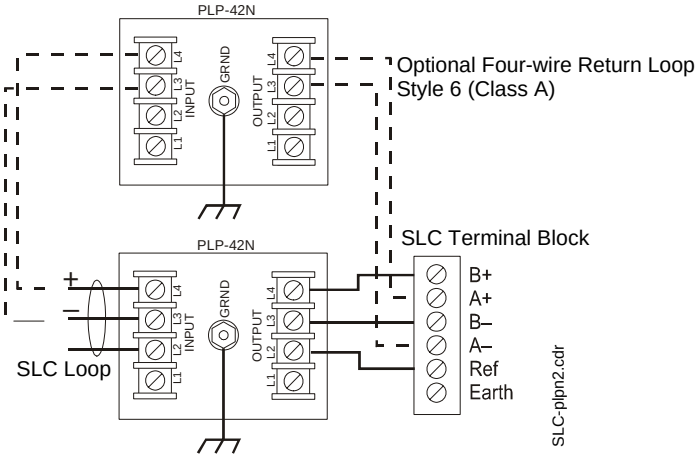


B.2.2 IFC-300, IFC-400

DTK-2LVLP-F Connections

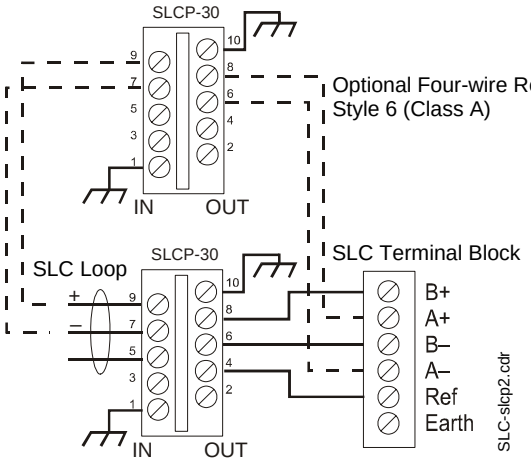


PLP-42N Connections



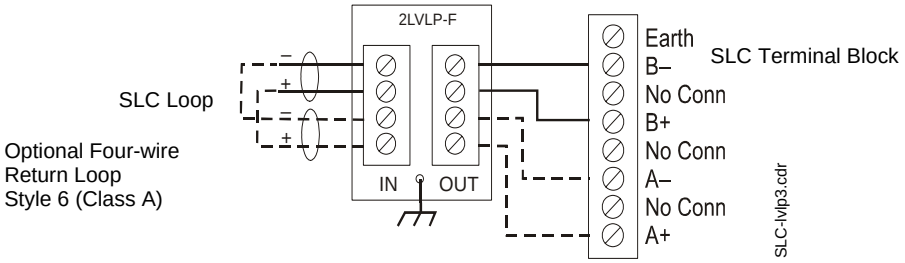
NOTE: Use 12 AWG (3.31 mm^2) to 18 AWG (0.82 mm^2) wire with crimp-on connectors to connect the unit's ground terminal to equipment ground. Wire length must be minimized to provide best protection

SLCP-30 Connections



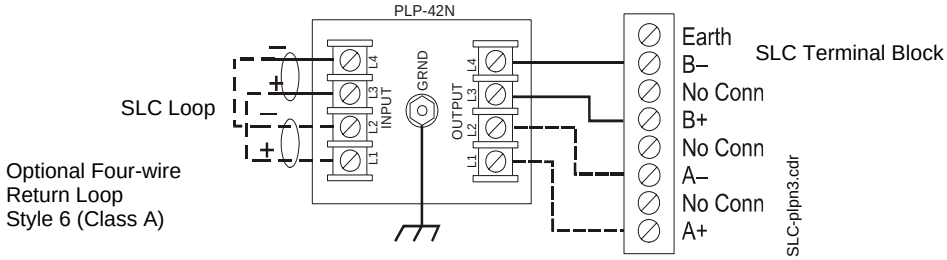
B.2.3 IFC-1010 & IFC-2020 (JLIB-200A or JLIB-400)

DTK-2LVLP-F Connections



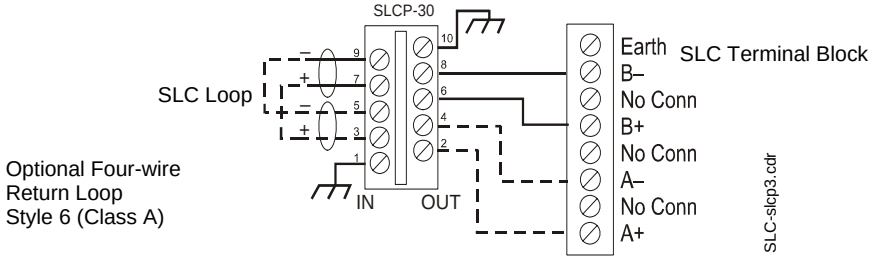
NOTE: Do not connect shield (if present) to surge protector or fire panel.

PLP-42N Connections



NOTE: Use 12 AWG (3.31 mm²) to 18 AWG (0.82 mm²) wire with crimp-on connectors to connect the unit's ground terminal to equipment ground. Wire length must be minimized to provide best protection. Do not connect shield (if present) to surge protector or fire panel.

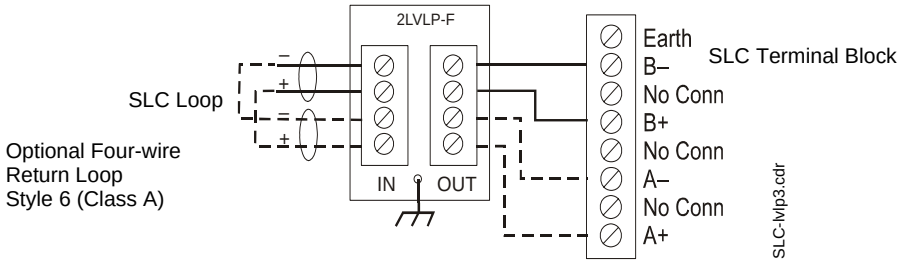
SLCP-30 Connections



NOTE: Do not connect shield (if present) to surge protector or fire panel.

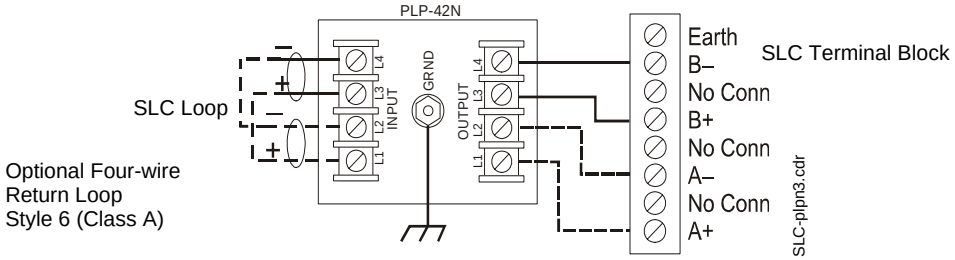
B.2.4 IFC-640/E, IFC-3030/IFC2-3030

DTK-2LVLP-F Connections



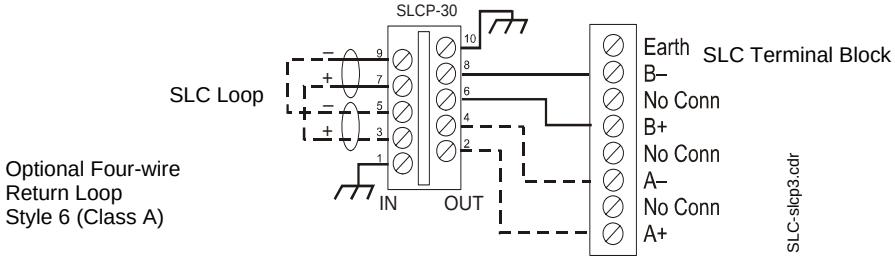
NOTE: Do not connect shield (if present) to surge protector or fire panel.

PLP-42N Connections



NOTE: Use 12 AWG (3.31 mm²) to 18 AWG (0.82 mm²) wire with crimp-on connectors to connect the unit's ground terminal to equipment ground. Wire length must be minimized to provide best protection. Do not connect shield (if present) to surge protector or fire panel.

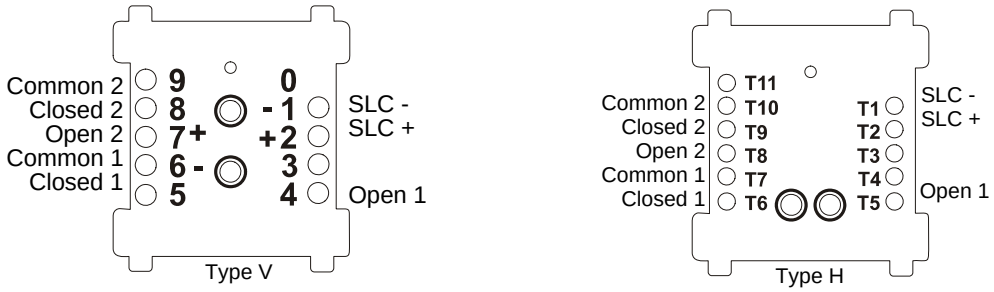
SLCP-30 Connections



NOTE: Do not connect shield (if present) to surge protector or fire panel.

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

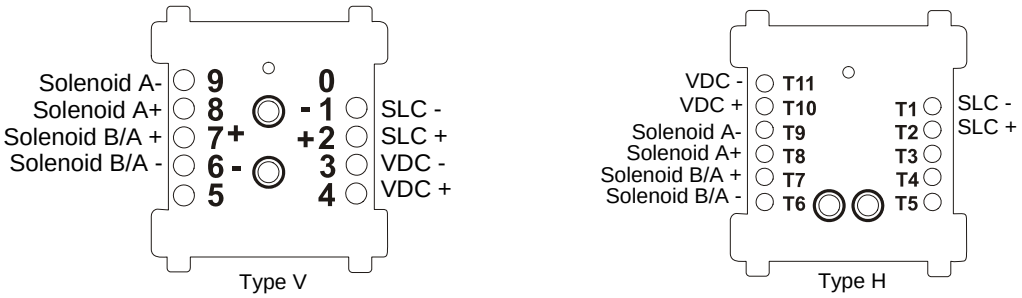
C.1 M300RJ



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 M300RJ Terminal Conversions

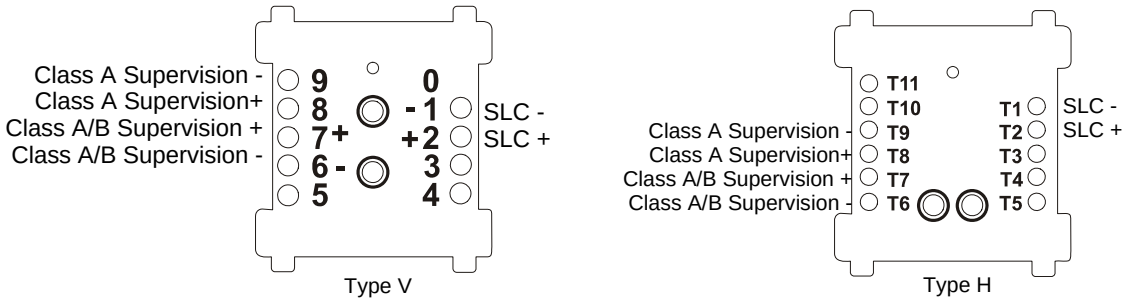
C.2 M300CJ and M302MJ



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 M300CJ and M302MJ Terminal Conversions

C.3 M300MJ



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 M300MJ Terminal Conversions

Appendix D: Canadian Versions of SLC Devices

Note: Only FlashScan/CLIP devices are listed for releasing applications.

UL-listed SLC Device	ULC-listed SLC Device	
2951TMJ (Acclimate™)	2951TMJA	Intelligent detector that combines a photoelectric sensing chamber and fixed temperature heat detection (135°F/57.2°C). FlashScan capable.
FSB-200, FSB-200S	FSB-200A, FSB-200SA	Addressable, intelligent, single-ended beam smoke detector with built-in sensitivity testing. FlashScan and CLIP mode.
1951J	1951JA	Addressable, intelligent smoke detector that incorporates an ionization sensing chamber. Designed to provide open area protection. FlashScan capable.
2951J	2951JA	Analog, addressable intelligent smoke detector that uses a photoelectric sensing chamber. Listed for use in ducts. Designed to provide open area protection. FlashScan capable.
2951TJ	2951TJA	Adds thermal sensors that will alarm at a fixed temperature of 135°F (57°C).
5951J	5951JA	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 fixed temperature alarm. FlashScan capable.
5951RJ	5951RJA	Incorporates a thermal rate of rise of 15°F (9.4°C). FlashScan capable.
5951HJ		High temperature sensor with 190°F (87.8°C) fixed temperature alarm.
DH300PL	DH300PLA	Photoelectric Duct Detector, Low-flow
DH300RPL	DH300RPLA	Photoelectric Duct Detector, Low-flow
FTX-P1J		Smoke detector that provides early warning smoke detection in hostile environments where traditional smoke detectors are not practical. Discontinued.
FTX-P2J	FTX-P2JA	Smoke detector provides early warning smoke detection in hostile environments where traditional smoke detectors are not practical.
7251J		Early detection laser detector, similar to the 7351J, but limited to CLIP mode operation only. Discontinued.
7351JLow Profile Laser Detector	7351JA	An advanced intelligent photoelectric detector that uses a laser diode, special optics, and signal processing to obtain extremely high sensitivity.
Bases		
B210LPJ	B210LPJA	Standard U.S. Low-Profile base (6", 15.24 cm)
B501J	B501JA	Standard European flangeless base (4", 10.16 cm)
B501BH, B501BHT	B501BHA, B501BHTA	Sounder base, includesB501J Sounder base with temporal sounder (UL 8th Edition)
B501BH-2, B501BHT-2	B501BH-2A, B501BHT-2A	Sounder base, includesB501J Sounder base with temporal sounder (UL 9th Edition)
B224RB	B224RBA	Low Profile Intelligent relay base
B510B-FTXJ	B510B-FTXJA	Base for a hostile environment detector.
Monitor and Zone Interface Modules		
M300MJ	M300MJA	Used for normally open contact alarm initiating devices, such as manual pull stations, four-wire smoke detectors, heat detectors, waterflow, and supervisory devices
M302MJ	M302MJA	Used to interface with two-wire smoke detectors in addition to normally open contacts

UL-listed SLC Device	ULC-listed SLC Device	
M300DJ	M300DJA (CLIP)	Two independent 2-wire Initiating Device Circuits (IDCs) at two separate, consecutive addresses. Wire supervised IDCs as NFPA Style B (Class B) or Style D (Class A) circuits. The modules come with a thermoplastic cover for mounting to a 4-inch (10.16 cm) square mounting box.
M301MJ	M301MJA	Functionally similar to the M300MJ Monitor Module, but offered in a smaller package for mounting directly in the electrical box of the device being monitored. (Class B input circuit only.)
JBG-12LX	JBG-12LXA	An addressable manual pull station with key-lock reset feature. The addressable module is housed within the pull station.
Control Modules		
M300CJ	M300CJA	Control Module, NAC: Addressable Control Module used as Notification Appliance Circuits (NACs) to power and supervise compatible, UL-listed notification appliances. Wired supervised NACs as NFPA Style Y (Class B) or Style Z (Class A). The modules come with a thermoplastic cover for mounting to a 4-inch (10.16 cm) square mounting box.
M300RJ	M300RJA	Relay Control Module is similar to the M300CJ except used as a Form-C control relay module.
Fault Isolator Module		
M500XJ	M500XJA	The Fault Isolator Module protects the system against wire-to-wire short circuits on the SLC. It should be placed between groups of sensors in a Style 6 or Style 7 SLC to isolate short- and open-circuit problems and protect the rest of the loop so it can continue to operate normally. It is not addressable, but listed here due to its use in an SLC
Multi-input/output modules		
XPIQ	XPIQ	Quad Intelligent Audio Transponder - The XPIQ is an integrated audio amplification and distribution subsystem that can direct up to four low-level audio signals through four audio amplifiers to integrated, continuously supervised speaker circuits. An on-board power supply charges and supervises battery backup.
XP6-C	XP6-CA	Controls six NAC or speaker/telephone circuits. (Not listed for use in releasing applications.)
XP6-R	XP6-RA	Controls six Form-C relays.
XP10-M	XP10-MA	Supervises ten Class-B addressable Initiating Device Circuits (IDC) which monitor normally open contact initiating devices.
XP6-MA	XP6-MAA	Monitors six zones of conventional two-wire detectors.

Numerics

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