Honeywell

SLC

INTELLIGENT CONTROL PANEL

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 National Fire Protection Association Standard 72-2002 (NFPA 72-2002), 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 72-2002 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 0-49° C/32-120° 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 15-27° C/60-80° 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
- Topic Title (for online Help)
- Page number (for printed manual)
- Brief description of content you think should be improved or corrected
- Your suggestion for how to correct/improve documentation

Send email messages to:

FireSystems.TechPubs@honeywell.com

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

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Section 1: Introduction

1.1 About This Manual

This document covers the installation and wiring of various Signaling Line Circuit (SLC) devices, when used with the following Fire Alarm Control Panels (FACPs):

- XLS120
- XLS140
- XLS140-2
- XLS3000

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

NOTE: This manual does not call out Canadian and Export versions of panels. The information presented applies to all versions of the base panel.

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".

FlashScan 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.

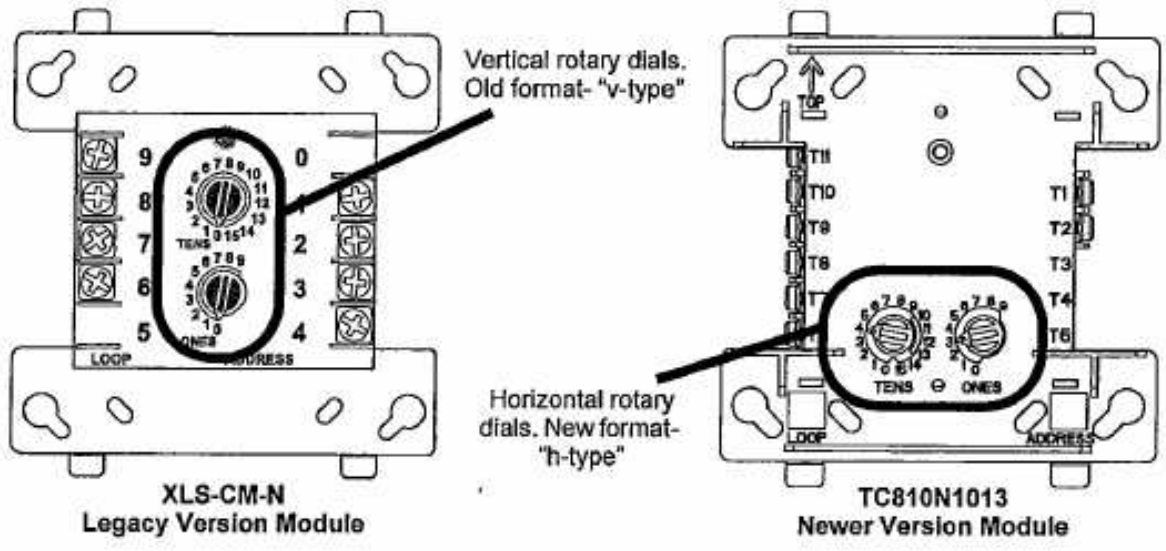


Figure 1.1 Example of Old and New Module Formats

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). The XLS120, XLS140-2, and XLS3000 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 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).

- MPS-24A/E
- MPS-24B/E
- XLS-NCA
- XLS140
- ACPS-2406
- 14507371-003
- 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-HON) provides the current document revision. A copy of this document is included in every shipment. See Appendix E, "Canadian Versions of SLC Devices" for Canadian part numbers.

Compatible Conventional Devices (Non-addressable)	**Document Number** (Form number if applicable)
Device Compatibility Document	51939 (74-3944)
Fire Alarm Control Panel (FACP) and Main Power Supply Installation	**Document Number** (Form number if applicable)
Honeywell Voice Alarm System Manual	51931 (95-7674)
XLS140 Installation, Operations, and Programming Manuals	51927 (95-7673) 51928 (85-0254) 51929 (85-0253)
XLS120 Installation, Operations, and Programming Manuals	53903,53905, 53904
XLS140-2 Installation, Operations, and Programming Manuals	52844 (95-7731) 52845 (85-0308) 52846 (85-0307)
XLS3000 Installation, Operations, and Programming Manuals	52509 (95-7702) 52510 (74-4007) 52511 (74-4010)
XLS-DVC Digital Voice Command Manual	52558(85-0261)
AA-series Audio Amplifier Manual	52526
Power Supplies, Auxiliary Power Supplies & Battery Chargers	**Document Number** (Form number if applicable)
ACPS-2406 Installation Manual	51304
AMPS-24/E Power Supply Manual	51907
FCPS-24 Field Charger/Power Supply Manual	50059

Table 1.1 Reference Documentation (1 of 4)

Continued on next page...

ACPS-610/E Installation Manual	53018
FCPS-24S6/FCPS-24S8 Field Charger/Power Supply	51977
System Components	**Document Number** (Form number if applicable)
RFX Wireless Interface Manual	51012
XP6-C Installation Document	I56-1805
XP6-MA Installation Document	I56-1806
XP6-R Installation Document	I56-1804
XP10-M Installation Document	I56-1803
RA100Z Remote LED Annunciator Installation Document	I56-0508
SLC Loop Devices	**Document Number** (Form number if applicable)
EA-CT Configuration Tool Installation and Maintenance Instructions	I56-2245
B224BI Isolator Base Installation Document (FlashScan/CLIP)	I56-0725 / I56-3736
14507371-005/14507371-005CDN Isolator Base Installation Document (FlashScan/CLIP)	I56-0754
B224RB Relay Base Installation Document	I56-2815 / I56-3737
14507371-003/14507371-003CDN Relay Base Installation Document	I56-0753
B501 Standard Base Installation Document	I56-0357 / I56-3738
B501BH Sounder Base Installation Document	I56-0491
B501BHT Temporal Sounder Base Installation Document	I56-1367
B501BH-2 UL 864 Ninth Compliant Sounder Base Installation	I56-2813
B501BHT-2 UL 864 Ninth Compliant Temporal Sounder Base Installation	I56-2819
B200S Addressable Sounder Base Installation document	I56-3392
B200SR Sounder Base Installation document	I56-3387
14507371-008 Filtrex® Base Installation Document	I56-1327
B210LP Flanged Base Installation Document	I56-0595 / I56-3739
DNR/W Innovairflex intelligent, non-relay, low-flow photoelectric duct detector housing	I56-3051
TC840M1013 Acclimate™ Multi-Sensor Detector Installation Document	I56-1984
TC840M1021: See document for TC806B1076, TC806B1084 and TC840M1021	I56-1940
TC910N1007 Control Module Installation Document (Eclipse)	I56-2789
XLS-CM-N Control Module Installation Document (FlashScan)	I56-2702
TC810N1013/TC810N1013CDN Control Module Installation Document (CLIP)	I56-1490
TC810S1000 Control Module Installation Document	I56-3367
XLS-MM-D Dual Monitor Module Installation Document (FlashScan)	I56-2700
TC809D1004/TC809D1004CDN Dual Monitor Module Installation Document (CLIP)	I56-004
TC909A1009 Monitor Module Installation Document (Eclipse)	I56-2786
XLS-MM-A Monitor Module Installation Document (FlashScan)	I56-2698
TC809A1059/TC809A1059CDN Monitor Module Installation Document (CLIP)	I56-1521
TC809D1004 Monitor Installation Document	I56-3822
TC909B1007 Mini Monitor Module Installation Document (Eclipse)	I56-2784
XLS-MM-B Mini Monitor Module Installation Document (FlashScan)	I56-2699

Table 1.1 Reference Documentation (2 of 4)

TC809B1008/TC809B1008CDN Mini Monitor Module Installation Document (CLIP)	I56-1512
TC910R1009 Relay Module Installation Document (Eclipse)	I56-2785
XLS-CM-R Relay Module Installation Document (FlashScan)	I56-2703
TC810R1024/TC810R1024CDN Relay Module Installation Document (CLIP)	I56-1489
TC822A1010 Dual Monitor/Dual Relay Module	I56-3732
TC847A1004 Single-ended Reflected Type Projected Beam Smoke Detector	I56-2427
TC840C1000 Intelligent Photoelectric Multi-Criteria Smoke Sensor	I56-3365
TC806D1049/TC806D1049CDN Low-flow Duct Detector	I56-2184
TC806D1056/TC806D1056CDN Low-flow Duct Detector with Relay	I56-2183
TC806D1011 Duct Detector Installation Document	I56-0022
TC806D1018 Duct Detector Installation Document	I56-0050
TC844A1015 Filtrex® (with FlashScan) Installation Document (FlashScan/CLIP)	I56-1982
TC807B1042 Ion Detector Installation Document	I56-1986
TC807B1059/TC807B1059CDN Ion Detector Installation Document	I56-1939
TC846A1013 Pinnacle Installation Document (FlashScan)	I56-1985
TC846A1005 Pinnacle Installation Document (CLIP)	I56-060
TC806B1050 & TC806B1068 Photo Installation Document	I56-1980
TC806B1076/TC806B1076CDN, TC806B1084 and TC840M1021 (Acclimate™) Photoelectric Detectors Installation Document	I56-1940
TC808B1025 Thermal Detector Installation Document	I56-1981
TC808B1033 Rate of Rise Sensor Installation Document	I56-1987
TC808B1041/TC808B1041CDN, TC808B1058/CDN, and TC808B1066/TC808B1066CDN Thermal Detectors Installation Document	I56-1941
XLS-CM-T Firefighter's Telephone Module Installation Document (FlashScan)	I56-2704
XLS-MM-Z 2-Wire Smoke Detector Zone Interface Module Installation Document (FlashScan)	I56-2701
TC841A1000/TC841A1000CDN 2-Wire Smoke Detector Zone Interface Module Installation Document (CLIP)	I56-1509
TC844A1007 Filtrex (CLIP mode) Installation Document	I56-1326
TC811A1006 & TC811A1014 Isolator Module Installation Document	I56-1385
S464H1006 Addressable Pull Station Installation Document (Eclipse)	I56-2791
XLS-MPS Addressable Pull Station Installation Document (FlashScan)	I56-2705
S464G1007 Addressable Pull Station Installation Document	I56-2284/51436
TC907A1001 Ion Detector Installation Document (Eclipse)	H500-05-00
TC906A1002 Photo Detector and TC906A1010 Photo/Thermal Detector (Eclipse)	I56-2790
TC908A1000 Heat Detector Installation Document (Eclipse)	I56-2788
TC906D1006 Photo Detector Head for Duct Detectors Installation Document (Eclipse)	I56-2790
50001949-001 Housing for Duct Detectors	H00-54-00
50001947-001 and 50001947-002 Detector Bases Installation Document (Eclipse)	I56-2787
EBI and EBFI Detector Bases Installation Document (Eclipse)	I56-2020
EBR Eclipse Relay Base	D550-11-00

Table 1.1 Reference Documentation (3 of 4)

EBS Eclipse Sounder Base	D550-08-00
TC840C2010 Photo/CO Detector	I56-3873
Note: Refer to the Device Compatibility Document for compatible conventional devices.	

Table 1.1 Reference Documentation (4 of 4)

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 66.

1.5 Polling Protocols

1.5.1 Available Protocols

FlashScan

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

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.

Eclipse

Eclipse protocol is also available for XLS3000 only. Eclipse supports devices addressed with the EA-CT configuration tool. Eclipse devices allow for extremely fast response time because inputs and outputs are directly mapped to each other on the SLC. Device traffic on the SLC is minimized because the Eclipse devices only broadcast off-normal events. The number of devices connected to an Eclipse loop is limited to 127 detectors and 127 modules per loop. Eclipse devices have built-in isolation.

1.5.2 Protocol Use

Control panels can use more than one type of protocol, with some restrictions as discussed below. Most importantly, on XLS3000, LCM-320 cannot be expanded by XLS-ELEM-320, and XLS-ELCM-320 cannot be expanded by LEM-320.

Overview

LCM-320/LEM-320 loops on XLS140-2, XLS3000, and XLS140 and SLC loops on XLS120 can run in FlashScan mode or CLIP mode. XLS-ELCM-320 and XLS-ELEM-320 loops on XLS3000 run in Eclipse mode.

Eclipse-mode SLC Loops

XLS3000 only: Eclipse loops use the XLS-ELCM-320 loop-control module, or a pair of XLS-ELCM-320/XLS-ELEM-320 loop-control and loop-expander modules. Eclipse loops do not support either FlashScan or CLIP devices, but can be installed next to FlashScan/CLIP-mode loops.

FlashScan- and CLIP-mode SLC Loops

FlashScan and CLIP loops use the LCM-320 loop-control module or a pair of LCM-320/LEM-320 loop-control and loop-expander modules. FlashScan/CLIP loops do not support Eclipse devices, but can be installed next to Eclipse-mode loops.

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

NOTE: In this manual, UL-listed model numbers are used; the ULC-listed versions are specified in Section E, "Canadian Versions of SLC Devices", on page 77. Eclipse devices are not listed for releasing applications.

1.6.1 Monitor/Zone Interface Module

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

- **TC909A1009** Monitor Module; Eclipse mode.
- **TC941A1005** Eclipse Zone Interface module.
- **TC809A1059** Monitor Module; FlashScan or CLIP mode. (An earlier module named XLS-MM-A was FlashScan mode only.)
- **TC809B1008** Addressable Mini-Monitor Module; FlashScan or CLIP mode. (An earlier module named XLS-MM-B was FlashScan mode only.)
- **TC809C1004** 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 XLS3000.
- **TC841A1000** Zone Interface Module; FlashScan or CLIP mode. (An earlier module named XLS-MM-Z was FlashScan mode only.)
- **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).

- **TC910N1007** Control Module; Eclipse mode.
- **TC810N1013** Control Module; FlashScan and CLIP mode. (An earlier module named XLS-CM-N was FlashScan mode only.)
- **TC810S1000** Control Module for releasing applications; FlashScan mode only. CLIP mode operation will generate a trouble message at the panel.
- **XP6-C** Controls six NAC or speaker/telephone circuits; FlashScan or CLIP mode.
- **TC810T1000** Firephone Control Module; FlashScan-only device for use with Fire Fighters Telephone on XLS120, XLS120, XLS140-2, XLS140, and XLS3000. An earlier module was named XLS-CM-T. (See the *Voice Alarm System Manual,* the *DVC Manual,* or the *DAA2/DAX Manual.*)

1.6.3 Isolator Modules

FlashScan-mode and CLIP-mode SLC loops only: 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. Eclipse loops do not require isolator modules because the devices have built-in isolation.

- **TC811A1006** Loop Fault Isolator Module; FlashScan or CLIP mode.

1.6.4 Relay Modules

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

- **TC910R1009** Relay Module; Eclipse mode.
- **TC810R1024** Relay Module with two Form-C relays; FlashScan or CLIP mode. (An earlier module named XLS-CM-R was FlashScan mode only.)
- **XP6-R** Controls six independent Form-C relays; FlashScan or CLIP mode.

1.6.5 Multiple Input/Output Modules

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

- **TC809D1004** Dual Class B Monitor Module; FlashScan mode. (An earlier module named XLS-MM-D was FlashScan mode only.)
- **TC822A1010** Dual Monitor/Dual Relay Module; functions as two Class B monitor modules and two individual relay modules. FlashScan or CLIP mode.

1.6.6 Plug-in Detector Bases

Plug-in detector bases provide a connection between the SLC and a variety of intelligent detectors which are snapped into place. Standard and isolator bases are used depending upon which NFPA SLC style is required (for FlashScan/CLIP loops only; Eclipse devices have built-in isolation). Sounder and relay bases are similar to standard bases, but have sound or relay capabilities.

- **Standard Base** - Models B501 (FlashScan/CLIP) and EBI (Eclipse) (4 inch standard small diameter base, commonly used in European installations; an earlier version of the European style base was 50001947-001) and B210LP (FlashScan/CLIP) and EBFI (Eclipse) (6 inch standard large diameter base, commonly used in US installations, replacement model for 14507371-001; an earlier version of the US style base was 50001947-002).

- **Filtrex Base** - Model 14507371-008
- **Isolator Base** - Model B224BI, 14507371-005 isolator bases for FlashScan/CLIP loops.
- **Sounder Base** - Models EBS (Eclipse sounder base), B501BH (standard sounder base), B501BH-2 (UL 864 9th edition compliant standard sounder base), B501BHT(base with temporal sounder), B501BHT-2 (UL 864 9th edition compliant temporal sounder base), B200S (intelligent sounder base) B200SR (intelligent sounder base, designed to be compatible with existing installations of the B501-Series sounder bases).
- **Relay Base** - Models EBR (Eclipse relay base), B224RB, and 14507371-003 relay bases.

For a list of polling protocol use, see Section 10, "Intelligent Detector Bases".

1.6.7 Intelligent Detectors

TC840C2010 Intelligent Photoelectric Multi-Criteria Smoke/CO (Carbon Monoxide) detector. 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. For CO, the detectors electromechanical sensing cell creates a separate indication of for life safety CO detection. The TC840C2010 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. FlashScan mode only.

TC847A1004 Addressable, intelligent, single-ended beam smoke detector with built-in sensitivity testing. Supports FlashScan and CLIP mode.

TC840M1021 (Acclimate®) Addressable, intelligent detector that combines a photoelectric sensing chamber and fixed temperature heat detection (135°F / 57.2°C). FlashScan- and CLIP-mode capable. (An earlier version named TC840M1013 was also FlashScan capable. The model named TC840A1001 was discontinued as of December 1, 2001.)

TC840C1000 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 TC840C1000 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. Honeywell panels offer different feature sets across different models. Certain features of the TC840C1000 may not be available on some panels. The TC840C1000 supports both FlashScan and CLIP modes. Read Status limitations may apply in CLIP mode.

TC807B1059 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 TC807B1042 (discontinued) was also FlashScan- and CLIP-mode capable. Earlier models named TC807B1000 and TC807A1036 were CLIP mode only.)

TC806B1076 Analog, addressable intelligent smoke detector that uses a photoelectric sensing chamber. Listed for use in ducts. Designed to provide open area protection. The **TC806B1084** adds thermal sensors that will alarm at a fixed temperature of 135° F (57.2°C). The **TC806DNR** is a low profile, intelligent photoelectric sensor that is remote test capable. It's for use with DNR(W). Both models support FlashScan or CLIP mode. (Earlier versions named TC806B1050 and TC806B1068 [both discontinued] also supported FlashScan or CLIP mode, but were not listed for use in ducts. Earlier models named TC806B1043, TC806A1037, TC806B1001, and TC806A1045 were CLIP mode only. An earlier model named TC806A1037 was listed for duct use only and is now obsolete.

TC808B1041 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 TC808B1058 incorporates a thermal rate of rise of 15°F (8.3°C). The TC808B1066 is a high temperature sensor with 190°F (87.8°C) fixed temperature alarm. Both models support FlashScan or CLIP mode. (Earlier versions named TC808B1025 and TC808B1033 [both discontinued] also supported FlashScan or CLIP mode. Earlier models named TC808B1002, TC808B1010, TC808A1027, and TC808A1118 were CLIP mode only.)

TC806D1011 Photoelectric Duct Detector. The TC806D1018 includes an alarm relay. All models support FlashScan or CLIP mode. (TC806D1011, TC806D1018, and the TC806D1011 and 14506873-001 duct detector housings have been discontinued.)

TC806D1049 Low-flow Photoelectric Duct Detector, with extended speed range of 100–4000 FPM (0.5 m/s to 20.3 m/s). TC806D1056 adds a relay. Both models support FlashScan or CLIP mode.

DNR/W Innovairflex intelligent, non-relay, low-flow photoelectric duct detector housing. Low Flow refers to the air velocity rating of 100 to 4,000 feet per minute (0.5 to 20.32 m/sec). Use with TC806DNR photoelectric smoke detector. Accommodates the installation of the TC810R1024 addressable relay module. The DNRW is the same as the DNR with a watertight housing.

TC844A1015 (Filtrex with FlashScan) 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 TC844A1007 was CLIP mode only.)

TC846A1013 Pinnacle 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 XLS120, XLS140-2, XLS140, and XLS3000. (An earlier version named TC846A1005 was CLIP mode only; it is compatible with the XLS140.)

1.6.8 Addressable Manual Pull Stations

The S464G1007 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 and CLIP mode. An earlier version named XLS-MPS was FlashScan 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

1.6.10 ACPS-610 Addressable Charger/Power Supply

The ACPS-610 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. This product has been discontinued.

1.6.12 AMPS-24 Addressable Power Supply

The AMPS-24 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 12). 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 18, and Section 3, "Shielded Wire Termination", on page 22.

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 and Eclipse Mode	
Control Panel	**Device**	**Standby**	**Activated**	**Standby**	**Activated**
XLS140, XLS3000, XLS140-2, XLS120	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

Table 1.3 LED Operations

NOTE: In CLIP mode, the TC846A1005 and TC844A1007 blink GREEN in standby and stay RED when activated.

Section 2: Wiring Requirements

2.1 Recommended SLC Wiring

- Twisted-unshielded pair is recommended for XLS120, XLS140-2, XLS140, XLS3000, LCM-320, LEM-320, XLS-ELEM-320, and XLS-ELCM-320.
  Maximum resistance is 50 ohms per branch. See Table 2.1.
  Maximum capacitance 0.5 µFarads per branch.

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

FACP: Wire Type and Limitations	Recommended Max. Distance	Wire Gauge
XLS140 and LEM-320 on XLS140		
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.		
XLS120, XLS140-2, LEM-320 on XLS140-2, LCM-320/LEM-320 or XLS-ELCM-320/XLS-ELEM-320 on XLS3000		
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: XLS140-2, XLS120, XLS140, XLS3000, LCM-320, LEM-320, XLS-ELCM-320, and XLS-ELEM-320

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 exceed 50 ohms.

Measure DC resistance as detailed and shown below:

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

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

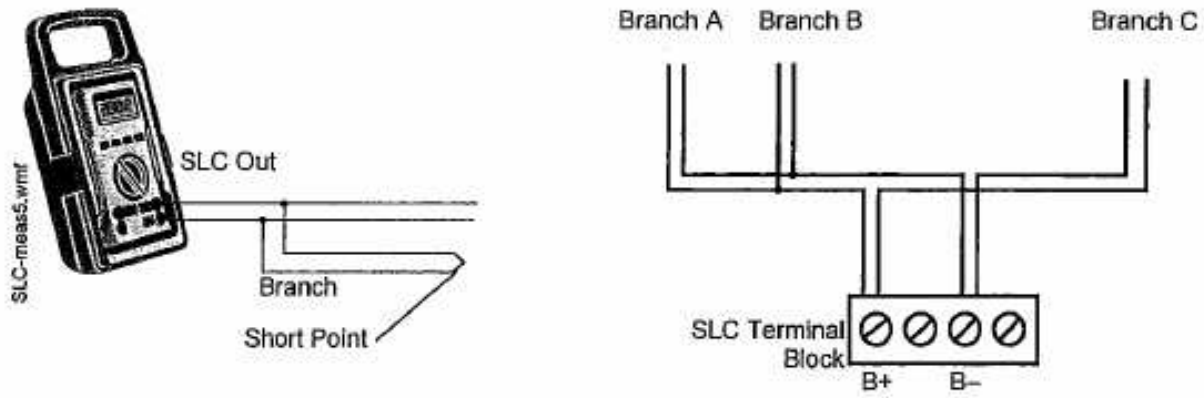


Figure 2.1 Measuring DC Resistance of a Two-Wire SLC

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.

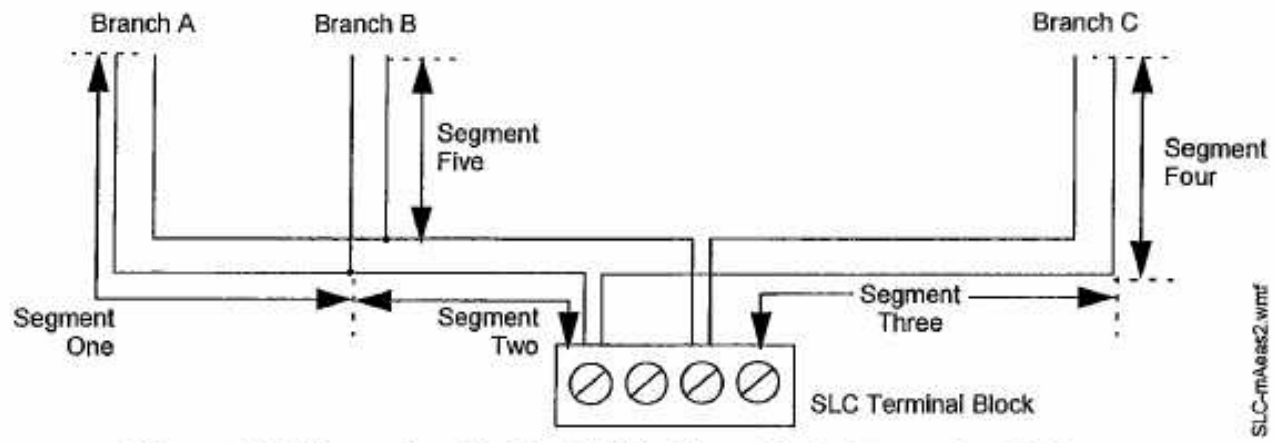


Figure 2.2 Measuring the Total Wire Length of a Two-wire SLC

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.

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. Section 2.3, "Measuring DC Resistance of a Four-Wire SLC".
3. Short the SLC at the first device and measure the resistance at SLC return. Record resistance and remove the short. Section 2.3, "Measuring DC Resistance of a Four-Wire SLC".

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

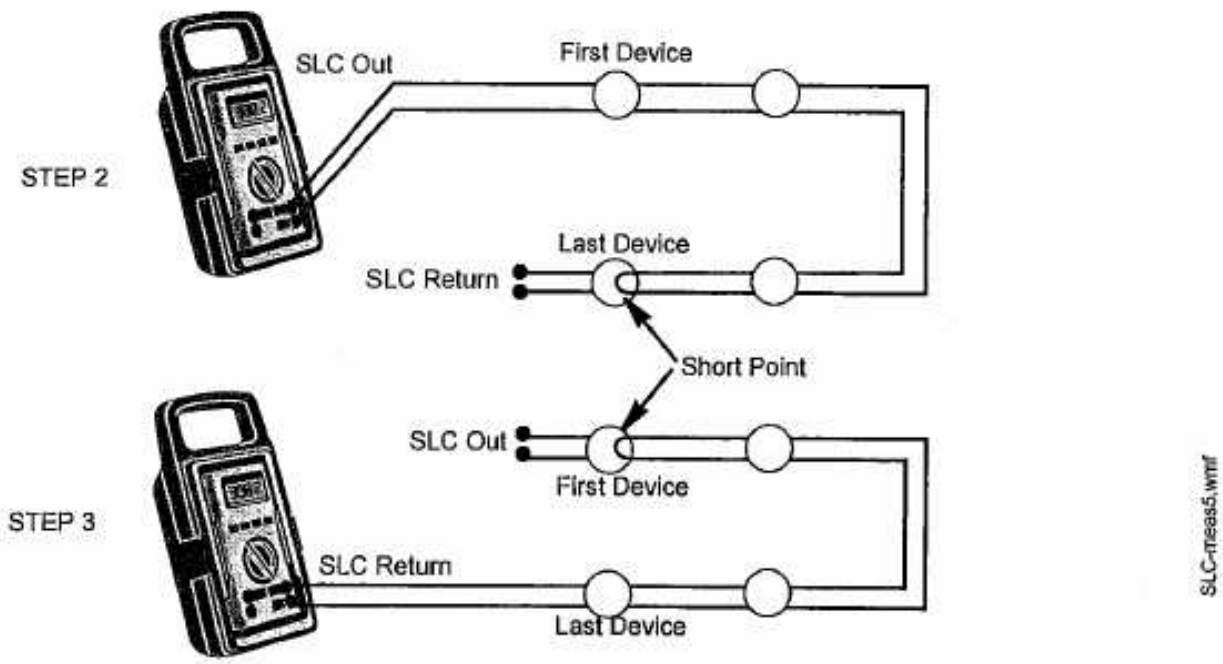


Figure 2.3 Measuring DC Resistance of a Four-Wire SLC

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:

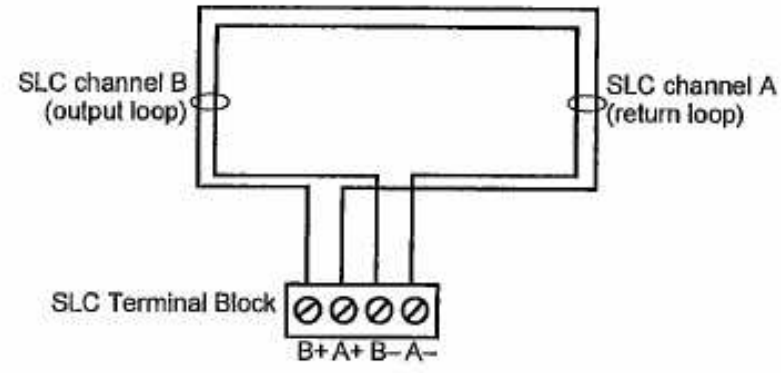


Figure 2.4 Measuring the Wire Length of a Four-Wire SLC

2.4 Control Panel Terminal Blocks

2.4.1 XLS3000 with Loop Control and Expander Modules

The XLS3000 supports up to five pairs of loop control and expander modules, providing from one to ten SLC loops. Loops on XLS-ELCM-320 and XLS-ELEM-320 are Eclipse-mode; loops on LCM-320 and LEM-320 can be either CLIP mode or FlashScan mode. See Section 1.5, "Polling

Protocols" for restrictions on mixing SLC loop mode. Eclipse-mode and FlashScan/CLIP-mode loop control and expander modules have the same wiring; SLC loops connect to TB1 on the XLS-ELCM-320, XLS-ELEM-320, LCM-320 or LEM-320.

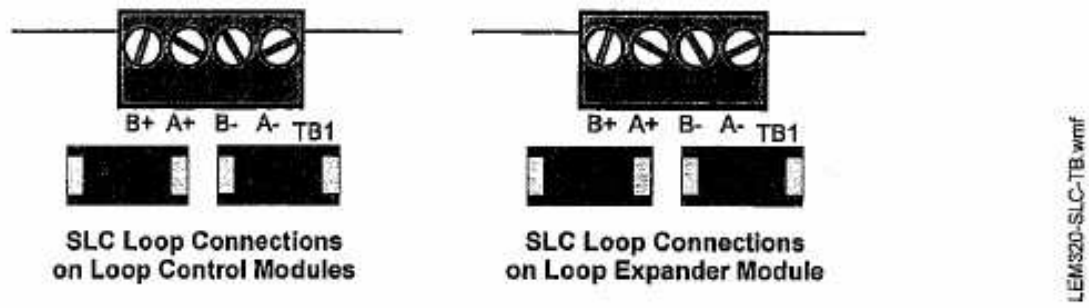


Figure 2.5 XLS3000 SLC Loop Connections and Wiring

2.4.2 XLS140-2 with Loop Expander Modules,XLS120

The XLS140-2 provide one SLC loop and supports a second using optional expander module XLS-ELEM-320. The XLS120 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. The SLC loop #1 connects to TB13 on the control panel. SLC loop #2 connects to TB1 on the XLS-ELEM-320.

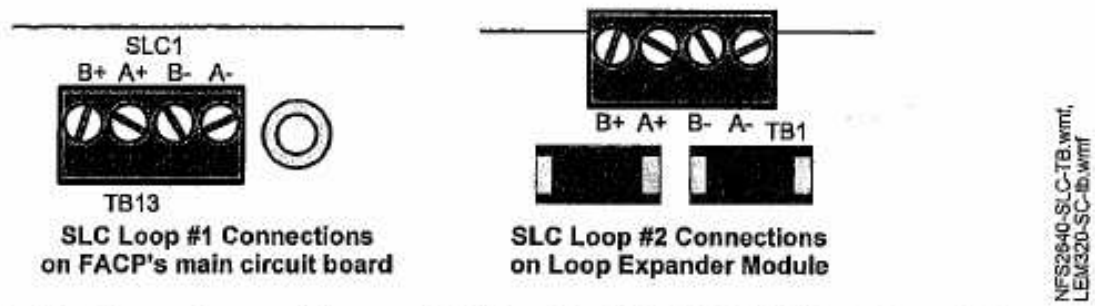


Figure 2.6 SLC Loop Connections and Wiring for XLS140-2, LEM-320, and XLS120

2.4.3 XLS140 with Loop Expander Modules

The XLS140 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.

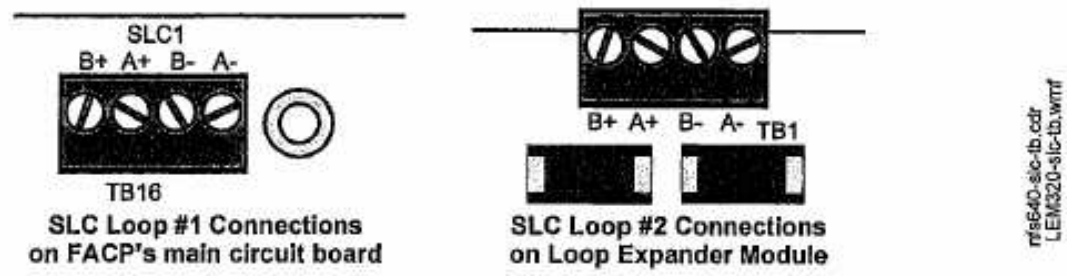


Figure 2.7 SLC Loop Connections and Wiring for XLS140 and LEM-320

Section 3: Shielded Wire Termination

3.1 Overview

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

Shielding of the SLC is not recommended. If twisted-shielded wire is used in one of these installations, use a floating shield to terminate the wire as shown below.

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

3.2 Floating Shield

Twisted-**unshielded** wire is recommended for the applications: XLS120, XLS140-2, XLS140, XLS3000, LCM-320/XLS-ELCM-320, and LEM-320/XLS-ELEM-320.

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 3,000 ft. (914.4 m), divide the shield into floating segments of less than 1,000 ft. (304.8 m). The shield should be broken at each device.
- To divide the shield wire into floating segments, cut shield even with jacket and tape as shown.

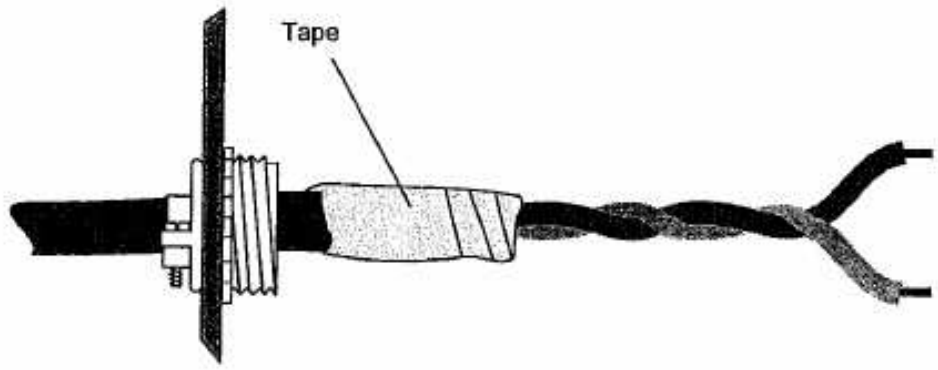


Figure 3.1 Floating the Shield

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.

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

NOTE: Isolator modules are never required for Eclipse loops.

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.

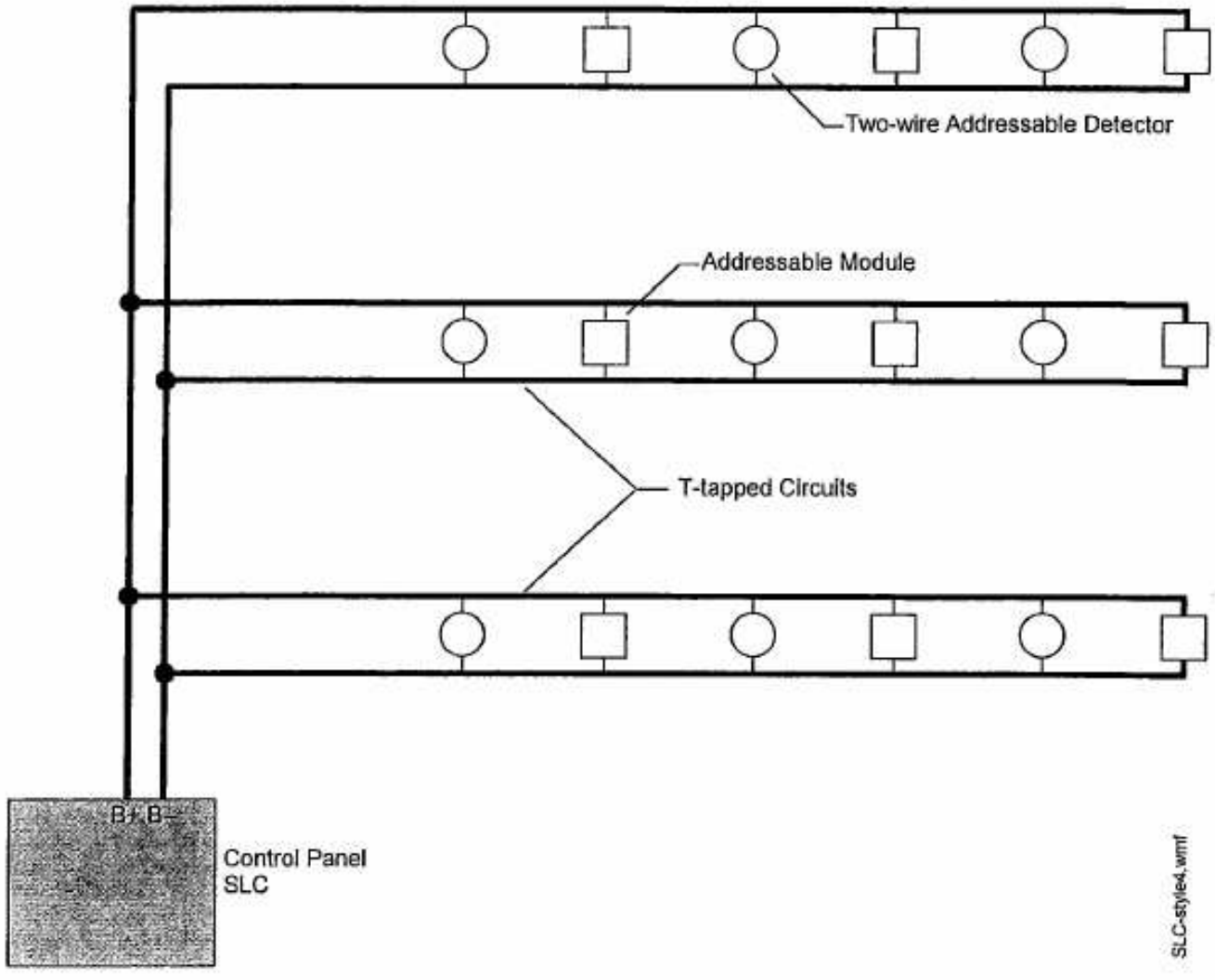


Figure 4.1 Basic NFPA Style 4 SLC

4.3 NFPA Style 6 SLC

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

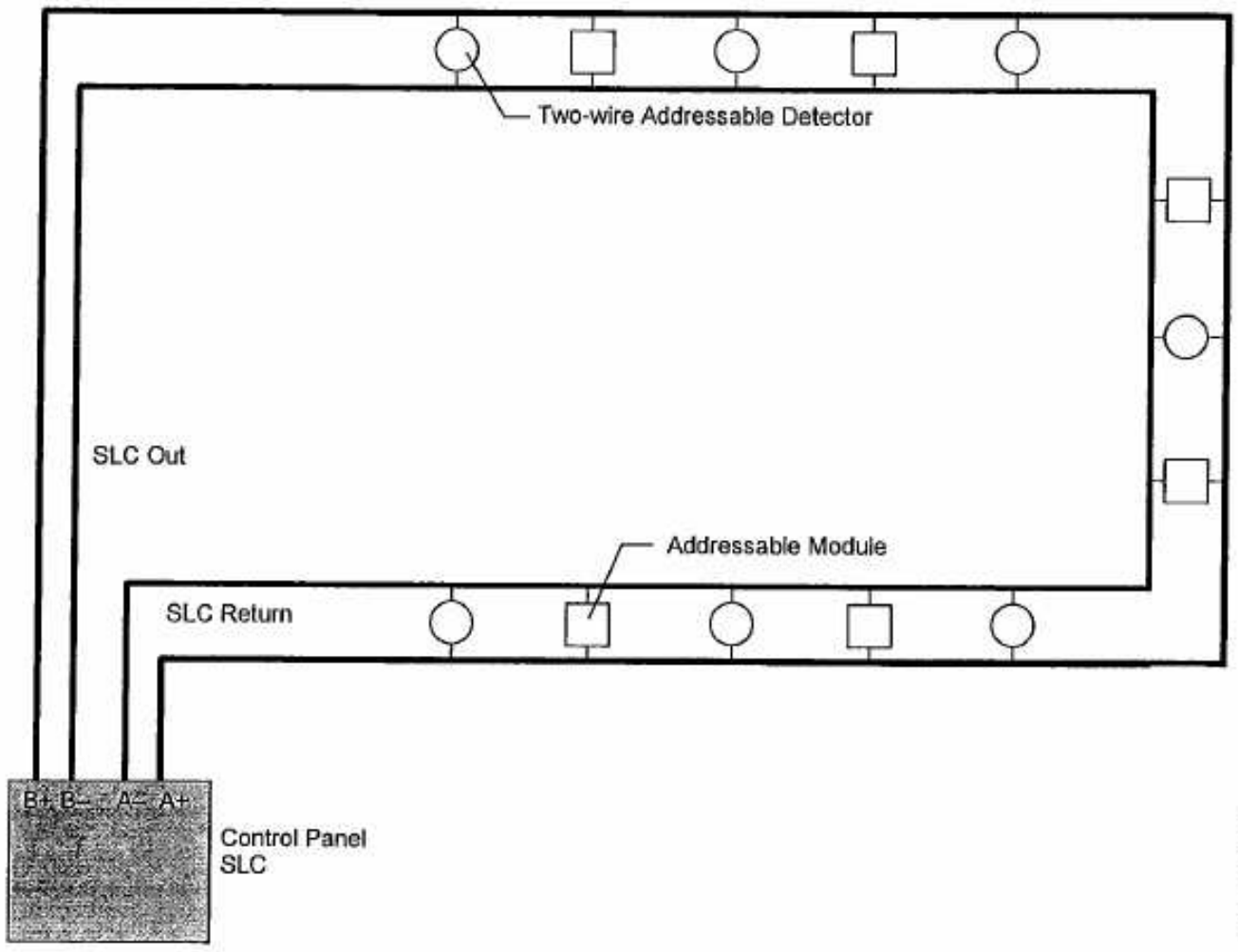


Figure 4.2 Basic NFPA Style 6 SLC

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

Section 5: SLC Circuits with Isolators

5.1 Overview

NOTE: Isolator modules are required with FlashScan-mode or CLIP-mode SLC loops only. Eclipse loops have built-in isolation.

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 TC811A1006 (ULC-listed model TC811A1014)
- Isolator Detector Base B224BI, 14507371-005 (ULC-listed model 14507371-005CDN)

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: ISOLATOR LIMITS
Flashscan-mode and CLIP-mode SLC loops: If relay or sounder bases are not used, a maximum of 25 addressable devices can be connected between Isolator Modules and/or Bases. When relay or sounder bases are used, the maximum number of addressable devices that can be connected between Isolators is reduced to seven. Isolator modules will not function properly when these limits are exceeded. The address capacity of the loop is reduced by two (2) addresses for every isolator device in excess of 200 when the Isolator Modules and/or Isolator Bases are connected to the SLC loop from the XLS120, XLS140-2, XLS140, or XLS3000.

5.2 Fault Isolator Modules

FlashScan-mode and CLIP-mode SLC loops only: The TC811A1006 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 below). During a fault condition, the control panel registers a trouble condition for each addressable device which is

isolated on the SLC segment or branch. Once the fault is removed, the module automatically reapplies power to the SLC branch or segment. Figure 5.1 shows a Style 4 example for wiring of an Isolator Module.

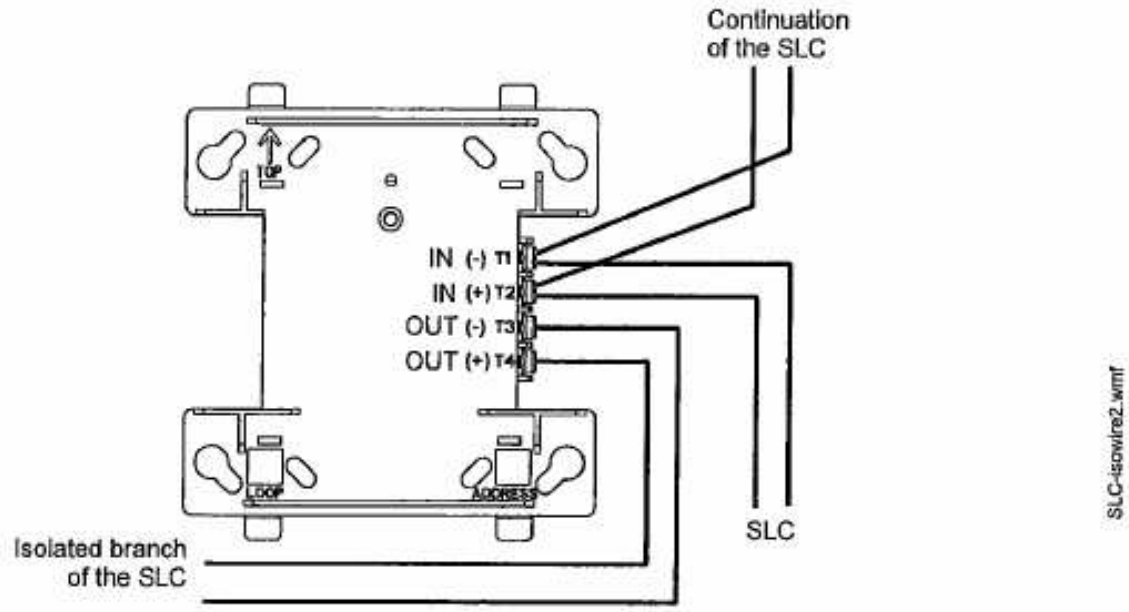


Figure 5.1 Wiring the FlashScan/CLIP Isolator Module

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 and 14507371-005 are intelligent isolator bases 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.

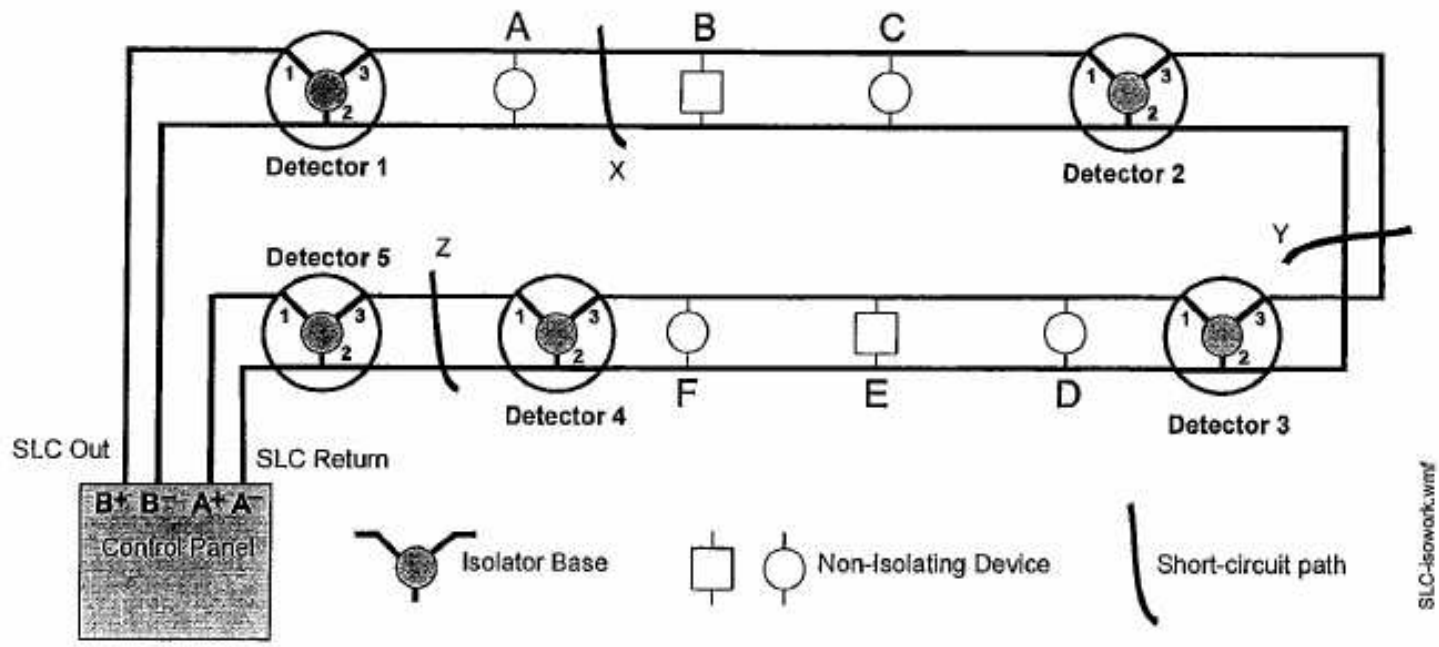


Figure 5.2 Isolator Base Circuit: Sample Style 6 Wiring

NOTE: For information on wiring an isolator base, refer to Figure 10.4, "Wiring a B224BI Isolator Base Mounting Plate for FlashScan/CLIP Loops" on page 57.

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 26 for isolator module wiring and to Section 5, "SLC Circuits with Isolators" for limitations. Isolator modules are not required for Eclipse loops.

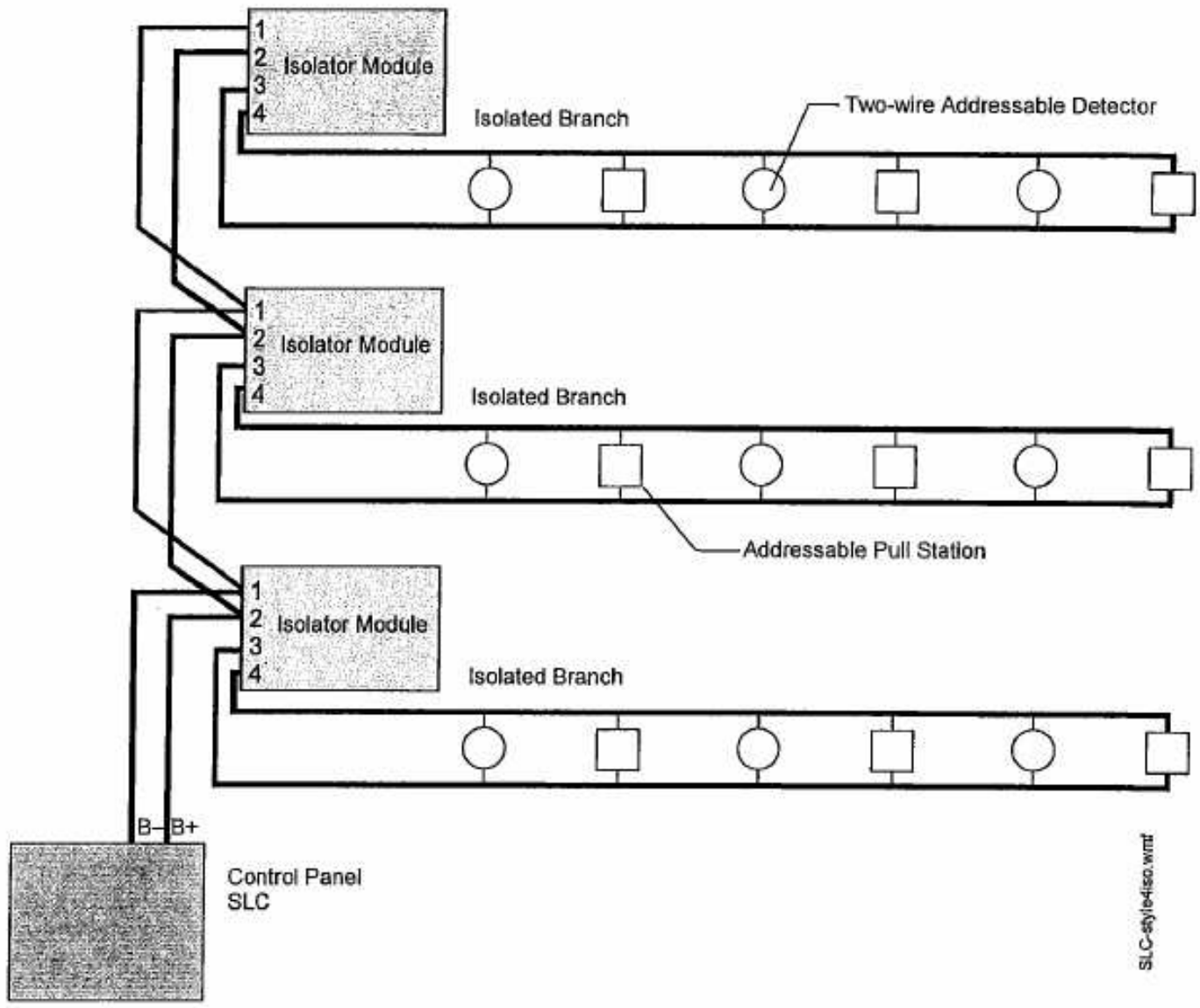


Figure 5.3 NFPA Style 4 SLC Using Isolator Modules

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 isolator module 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.

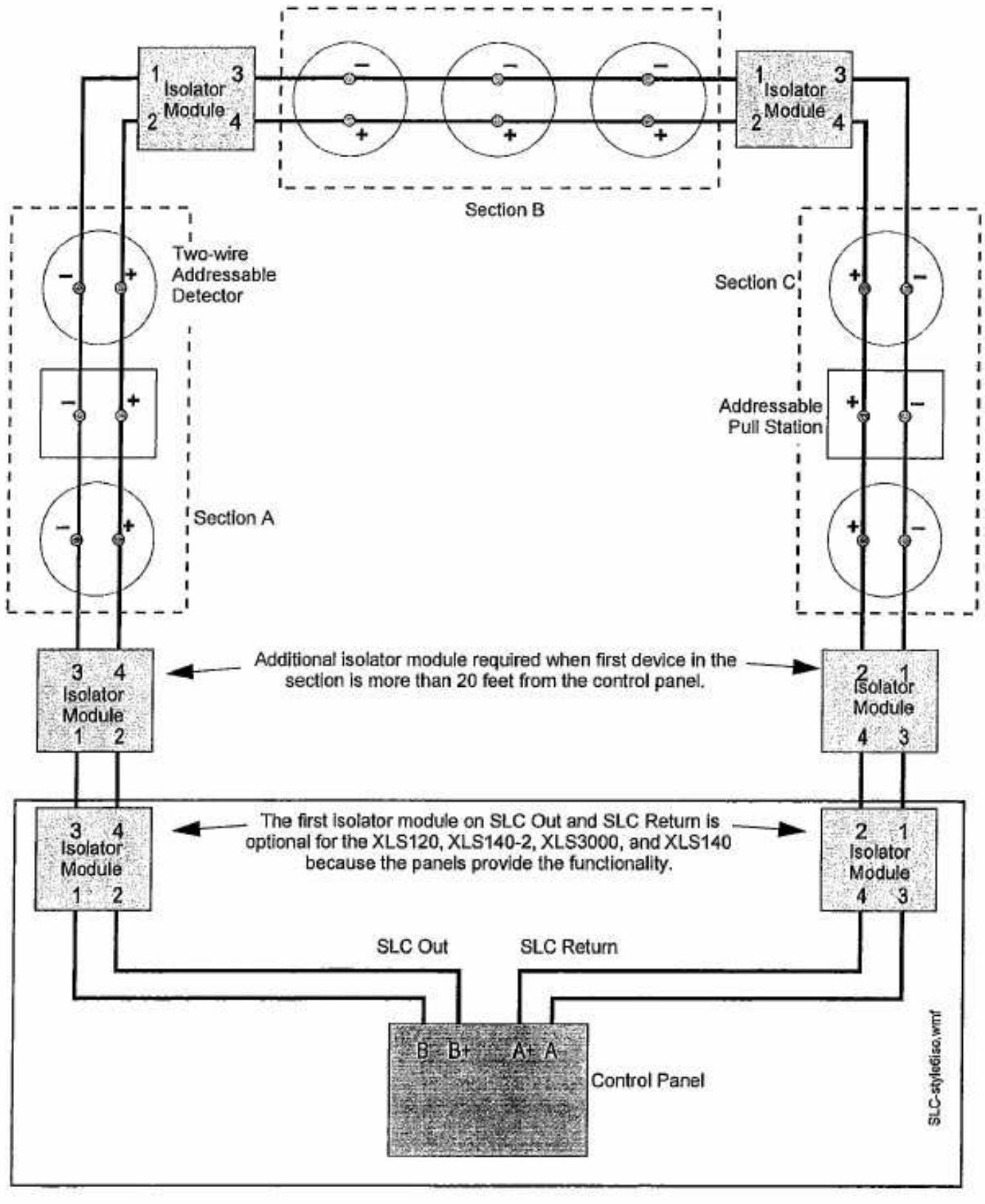


Figure 5.4 NFPA Style 6 SLC Using Isolator Modules

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 10.4.
- There must be a close-nipple connection between a device and the isolator bases or modules that protect it.

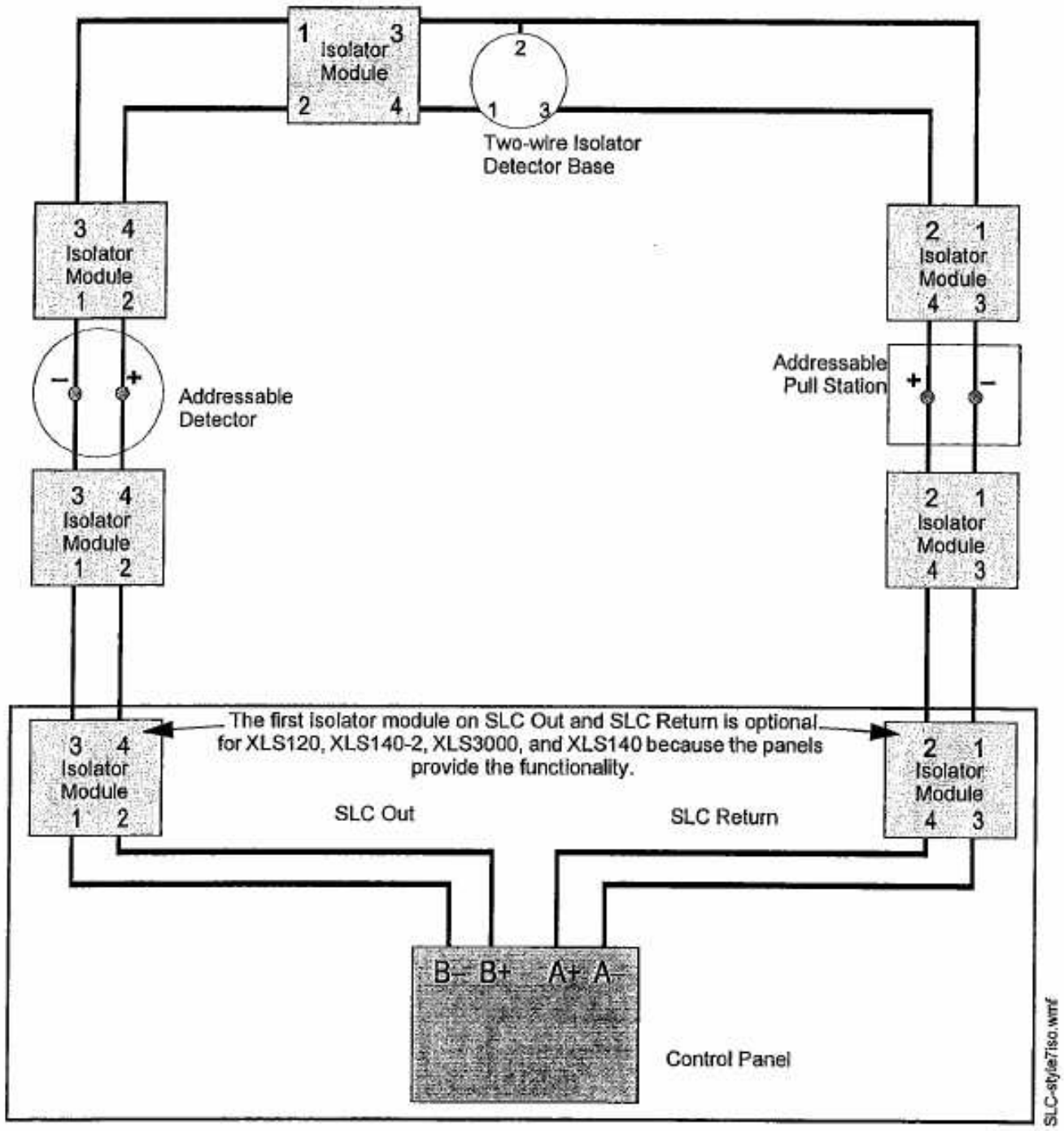


Figure 5.5 NFPA Style 7 SLC

NOTE: See Figure 10.4, "Wiring a B224BI Isolator Base Mounting Plate for FlashScan/CLIP Loops" on page 57.

Section 6: Monitor Modules

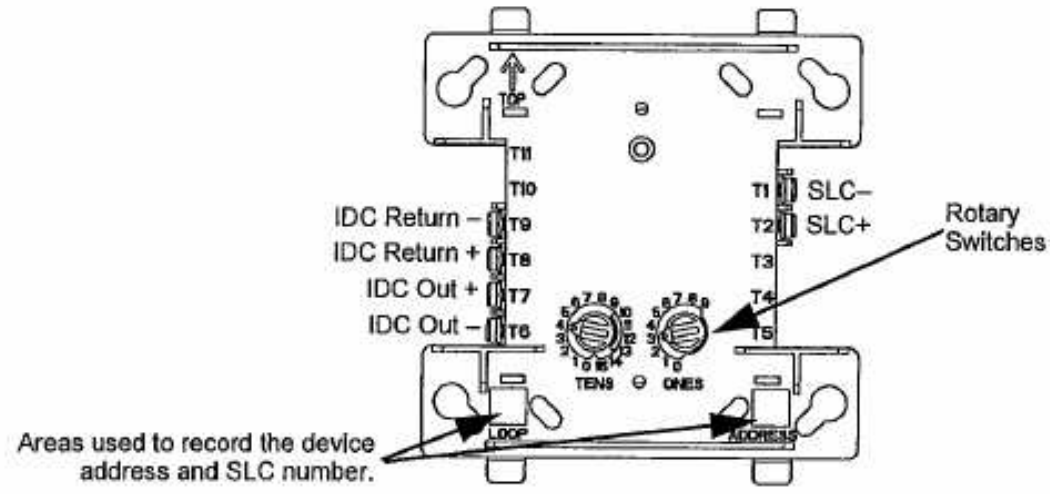
6.1 Description

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.

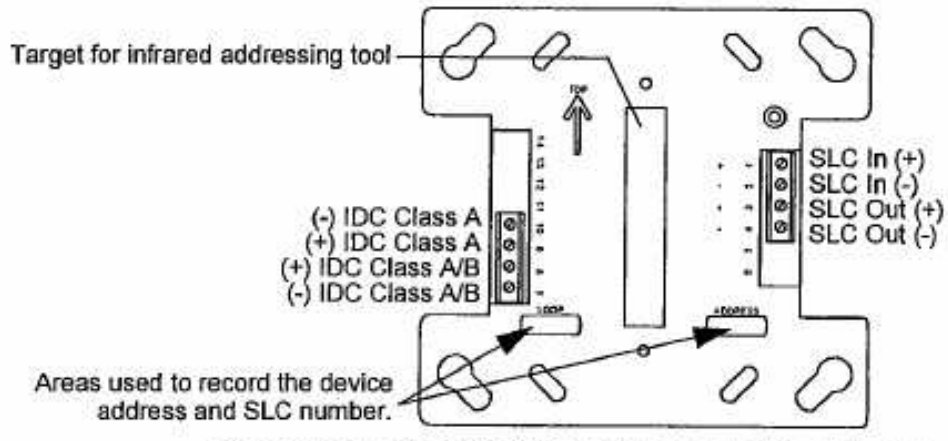
6.1.1 Addressable Monitor Module

The XLS-MM-A, TC809A1059, and TC909A1009 are addressable modules that monitor either a Style B (Class B) or Style D (Class A) IDC of dry-contact input devices. These modules are capable of participating in degraded mode where supported by the FACP. (XLS-MM-A FlashScan; TC809A1059 FlashScan/CLIP; TC909A1009 Eclipse)



FMMtpH.wmf

Figure 6.1 XLS-MM-A and TC809A1059 Monitor Module



EclipseMonMod.wmf

Figure 6.2 TC909A1009 Eclipse Monitor Module

6.1.2 Zone Interface Module

The TC841A1000, XLS-MM-Z, and TC941A1005 are similar to the TC809A1059, except they are 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. (XLS-MM-Z FlashScan; TC841A1000 FlashScan/CLIP; TC941A1005 Eclipse.)

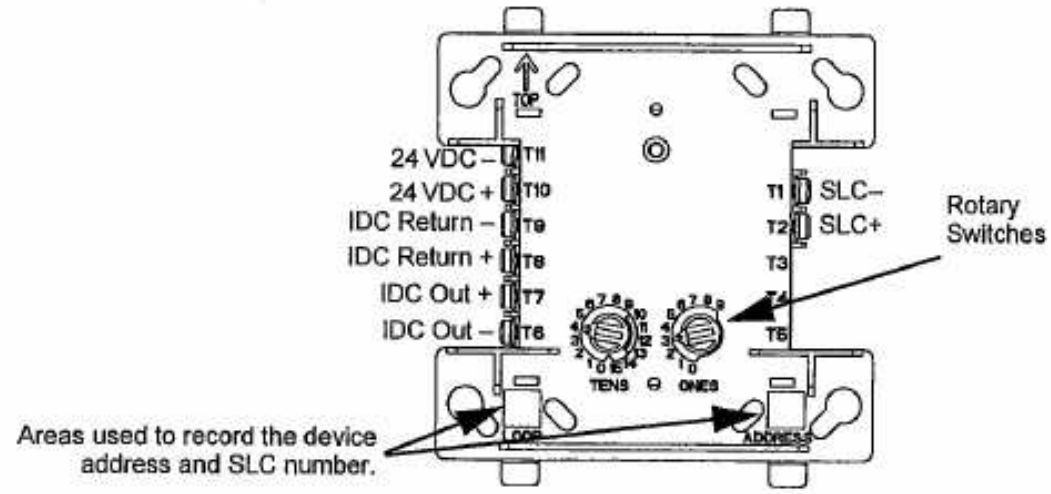


Figure 6.3 XLS-MM-Z and TC841A1000 Zone Interface Module

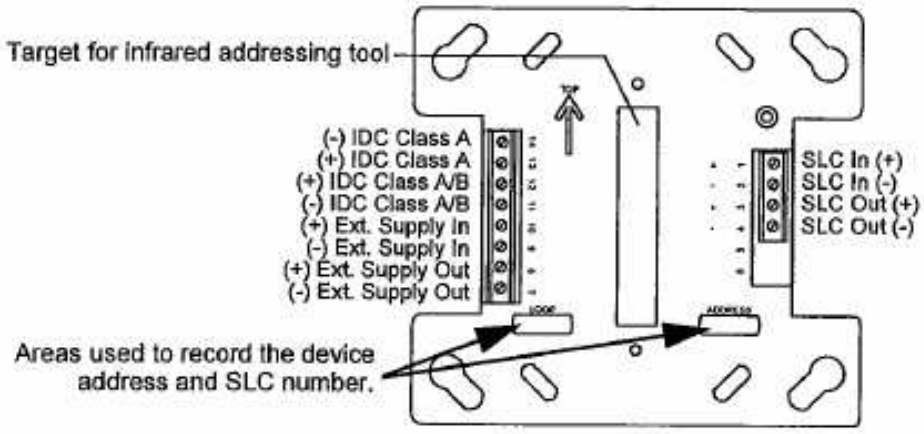


Figure 6.4 TC941A1005 Eclipse Zone Interface Module

6.1.3 Miniature Monitor Module

The XLS-MM-B, TC809B1008, and TC909B1007 are intended to monitor a Style B (Class B) IDC; they are offered in a smaller package for mounting directly in the electrical box of the device being monitored. (XLS-MM-B FlashScan; TC809B1008 FlashScan/CLIP; TC909B1007 Eclipse)

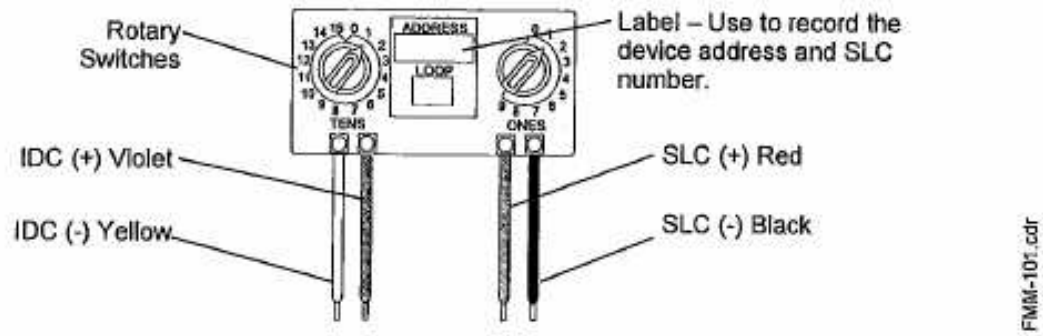


Figure 6.5 XLS-MM-B and TC809B1008 Mini Monitor Module

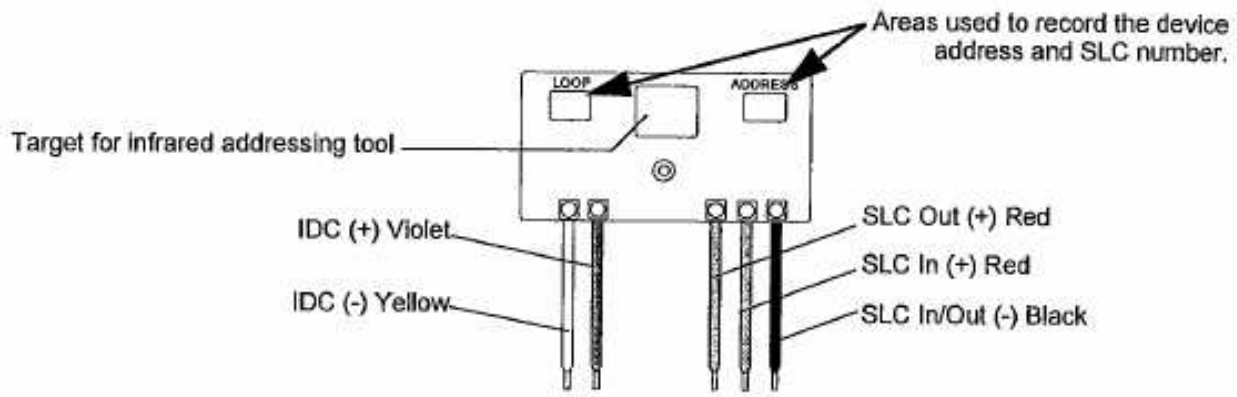


Figure 6.6 TC909B1007 Eclipse Mini Monitor Module

6.1.4 TC809C1004 4-20mA Monitor Module

The TC809C1004 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.

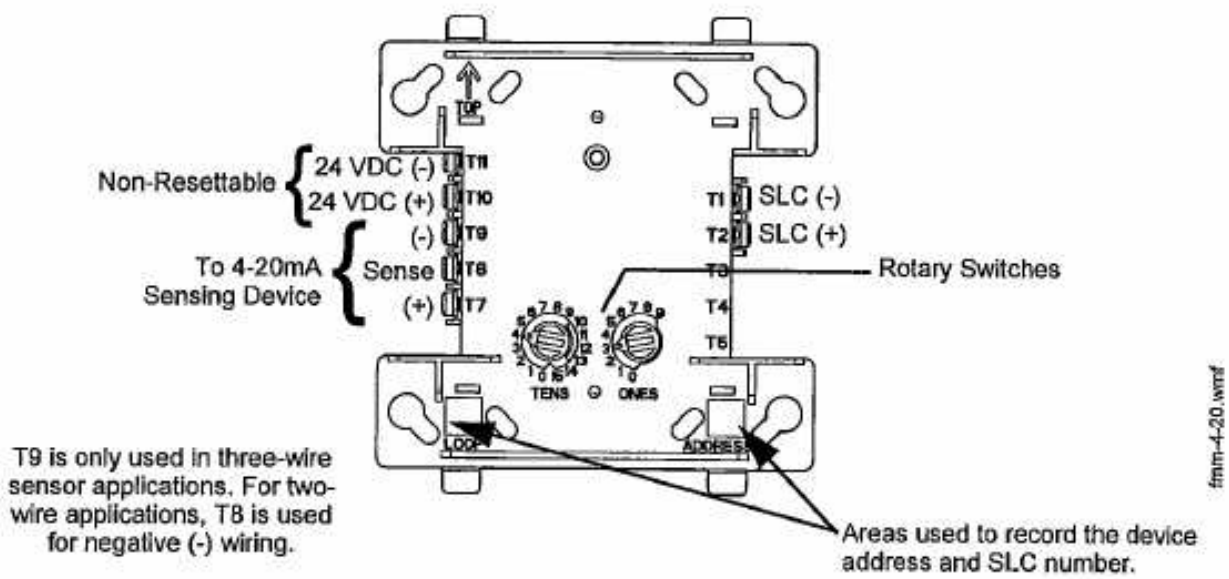


Figure 6.7 TC809C1004 4-20mA Monitor Module

6.2 Setting an SLC Address for a Module

6.2.1 Addressing FlashScan & CLIP Modules

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 6.8 is set at address "35". When finished, mark the address on the module face in the place provided.

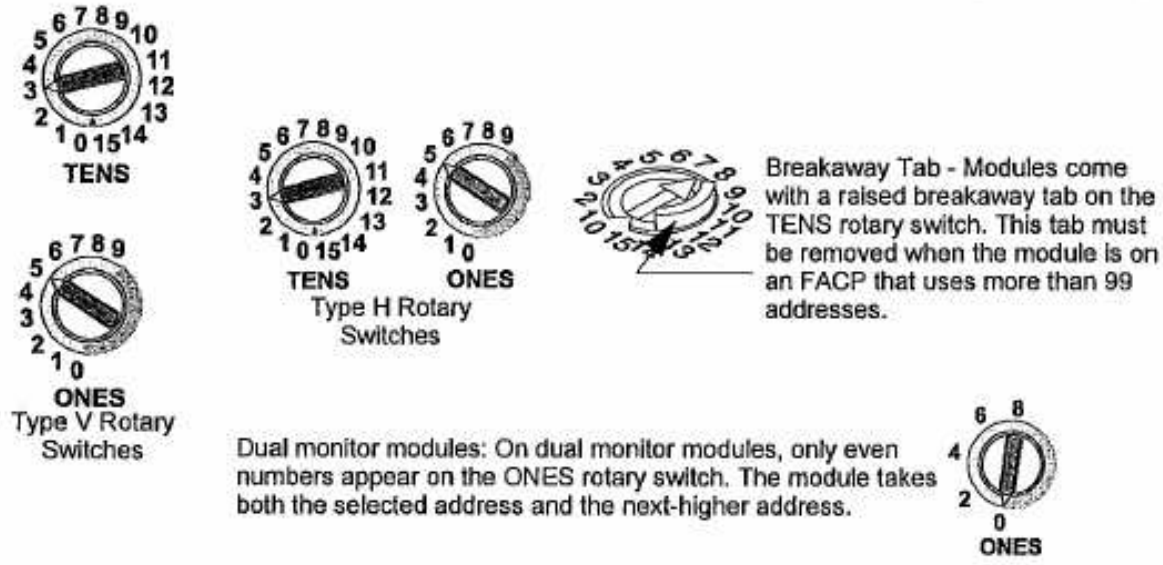


Figure 6.8 Setting the SLC Address on FlashScan & CLIP Modules

6.2.2 Addressing Eclipse Modules

Eclipse devices are addressed using the EA-CT infrared configuration tool. Basic steps to address a device are:

1. Enable IR tool use through the Alter/Status menu on XLS3000 (see *XLS3000 Programming Manual* for further details.)
2. Aim EA-CT at the device and press the SELECT key. (If more than one device is within range, scroll through the available devices by pressing SELECT again until the correct device is selected.)
3. Scroll through the main menu with the arrow keys; press ENTER at "1. Write loop/Adr".
4. Enter the specific address and loop designation.
5. Point EA-CT at the selected device and press SELECT to send the address to the device.

See the *EA-CT Installation Document* for complete details.

6.3 NFPA Style B IDC Using Monitor Modules

Connect the SLC wiring to the module terminals 1 (–) and 2 (+) or 1(+), 2(-), 3(+), and 4(-). Each XLS-MM-A, TC809A1059, and TC909A1009 module takes one address on the SLC. For Eclipse modules, set the required SLC address with EA-CT; for FlashScan and CLIP modules, use the module's rotary switches to set it to the required SLC address.

Figure 6.9 shows typical wiring for a supervised and power-limited NFPA Style B (Class B) Initiating Device Circuit using the TC809A1059 monitor module.

Figure 6.10 shows typical wiring for a supervised and power-limited NFPA Style B (Class B) Initiating Device Circuit using the TC909A1009 monitor module.

Module installation notes:

1. The Initiating Device Circuit (IDC) is supervised and current-limited to 210 microamps @ 24 VDC (nominal).
2. The IDC provides the following services (do not mix):
   - Fire alarm service
   - Automatic and manual waterflow alarm service with normally open contact devices
   - Sprinkler supervisory service with normally open contact devices
   - Security service
3. Refer to the *Device Compatibility Document* for compatible smoke detectors.
4. See Appendix A, "Power Considerations", on page 61 for information on supervising 24 VDC power.

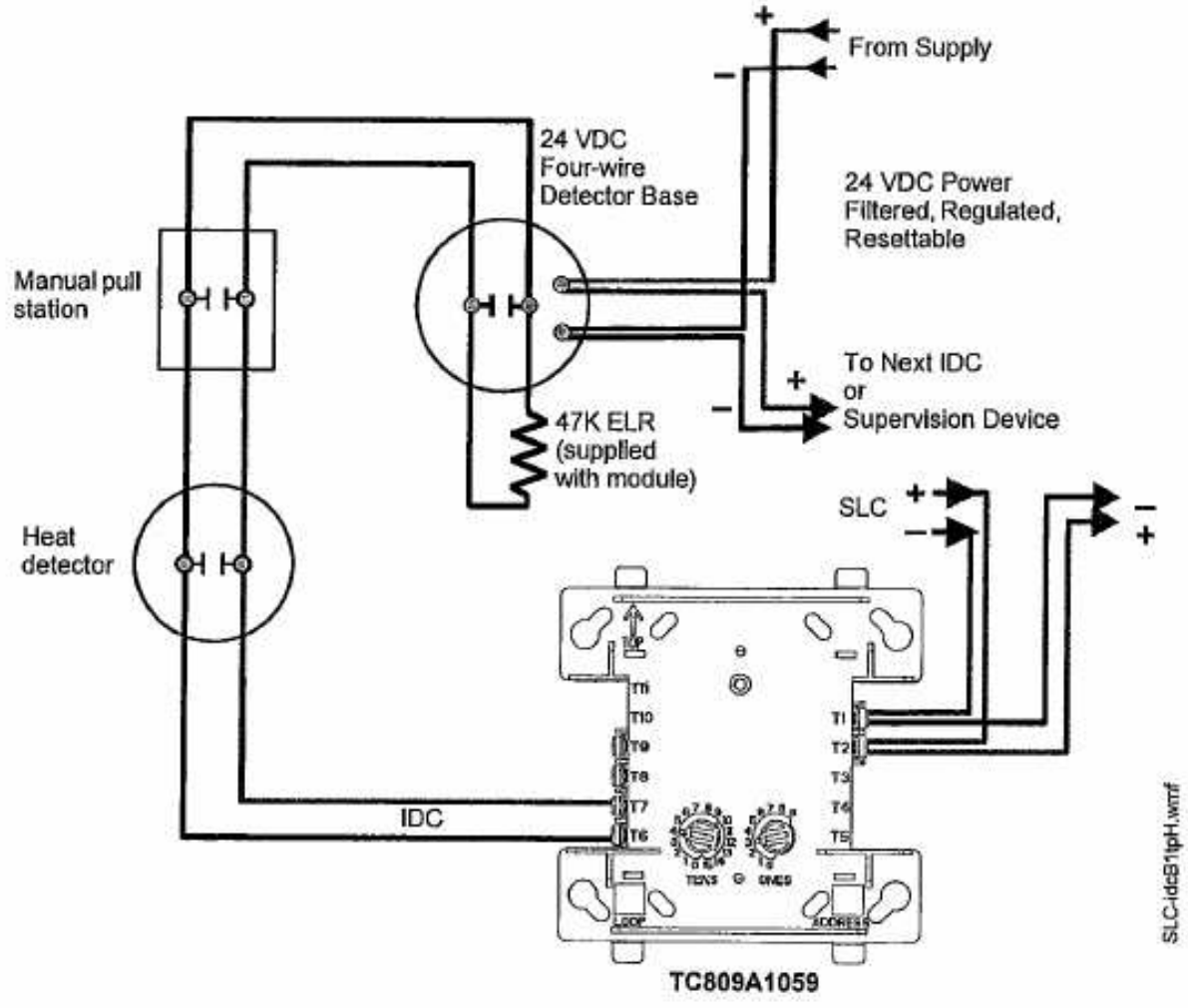


Figure 6.9 Typical Style B IDC Wiring with TC809A1059

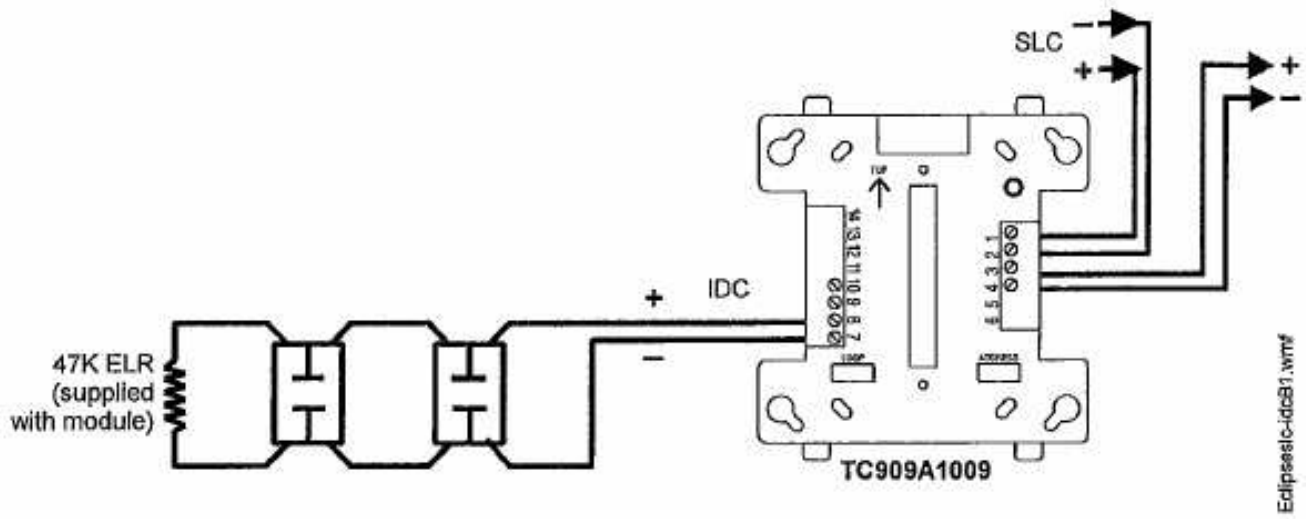


Figure 6.10 Typical Style B IDC Wiring with TC909A1009

6.4 NFPA Style D IDC Using Monitor Modules

Connect the SLC wiring to the module terminals 1 (–) and 2 (+) or 1(+), 2(-), 3(+), and 4(-).

Each XLS-MM-A, TC809A1059, and TC909A1009 module takes one address on the SLC. For Eclipse modules, set the required SLC address with EA-CT; for FlashScan and CLIP modules, use the module's rotary switches 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 TC809A1059 module.

Figure 6.12 shows typical wiring for a supervised and power-limited NFPA Style D (Class A) IDC using the TC909A1009 module.

Module installation notes:

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

4. See Appendix A, "Power Considerations", on page 61 for information on supervising 24 VDC power.

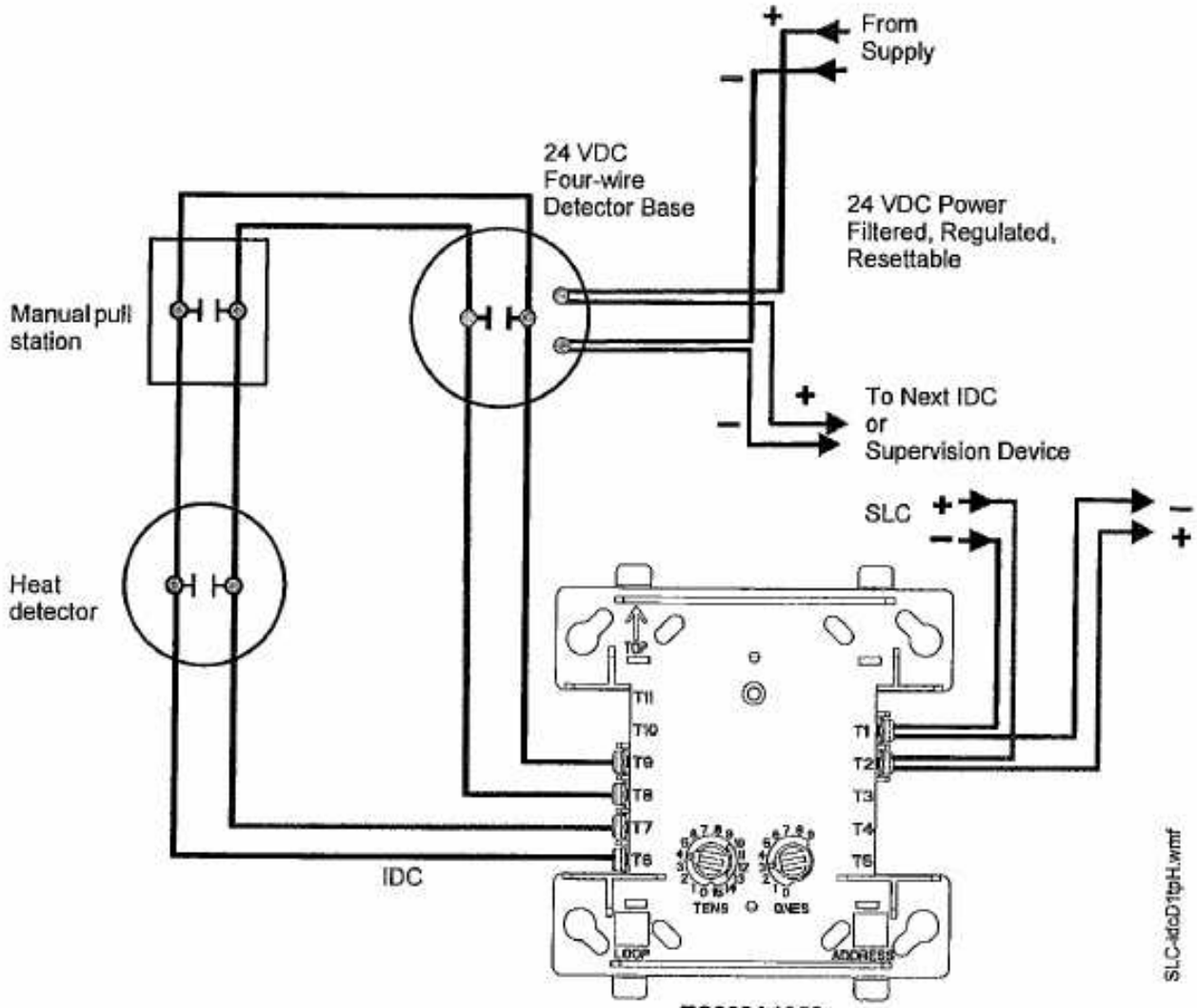


Figure 6.11 Typical Style D IDC Wiring with TC809A1059

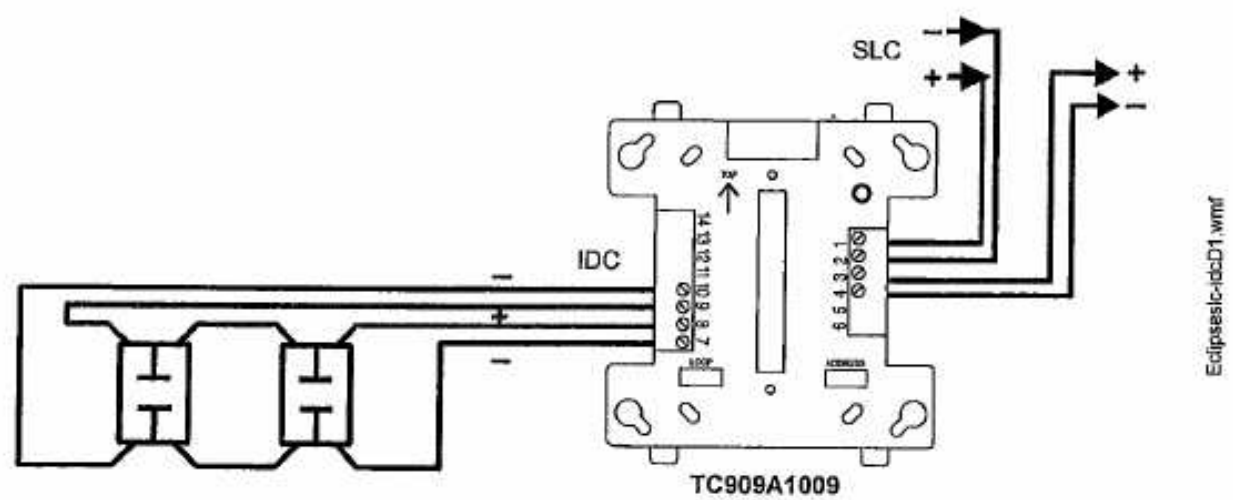


Figure 6.12 Typical Style D IDC Wiring with TC909A1009

6.5 NFPA Style B IDC Using Zone Interface Modules

Connect the SLC wiring to the module terminals 1 (–) and 2 (+) or 1(+), 2(-), 3(+), and 4(-).

Each XLS-MM-Z, TC841A1000, and TC941A1005 module takes one address on the SLC. For Eclipse modules, set the required SLC address with EA-CT; for FlashScan and CLIP modules, use the module's rotary switches to set it to the required SLC address.

Figure 6.13 shows typical wiring for a supervised and power-limited NFPA Style B (Class B) IDC using the TC841A1000 module.

Figure 6.13 shows typical wiring for a supervised and power-limited NFPA Style B (Class B) IDC using the TC941A1005 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.

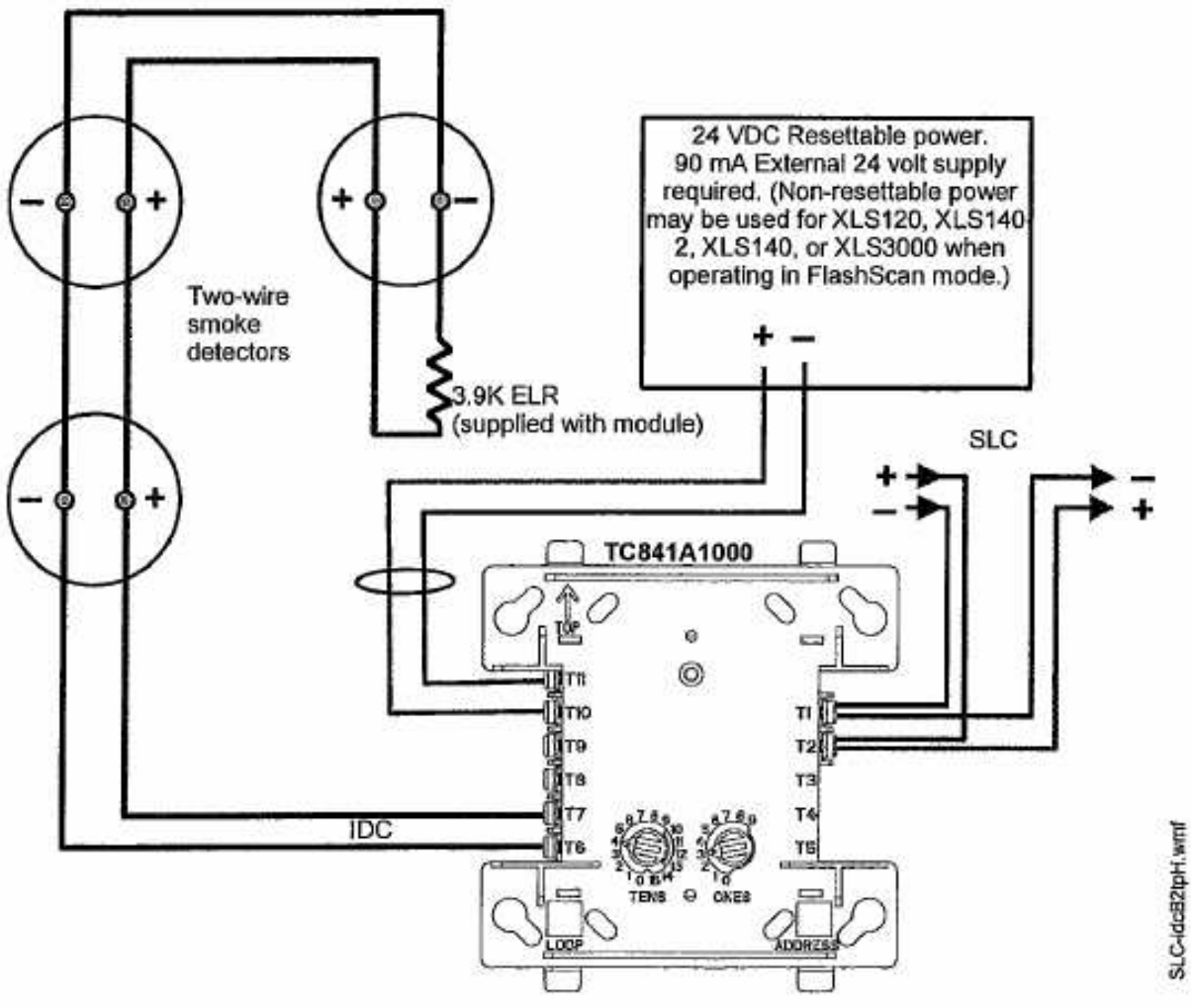


Figure 6.13 Typical Style B IDC Wiring with TC841A1000

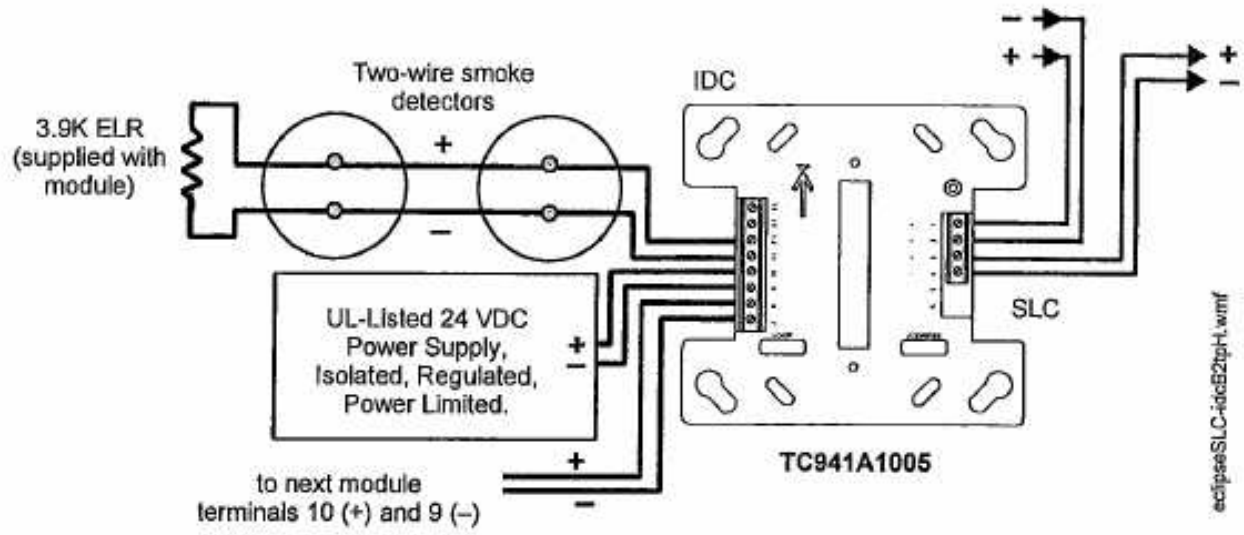


Figure 6.14 Typical Style B IDC Wiring with TC941A1005

6.6 NFPA Style D IDC Using Zone Interface Modules

Connect the SLC wiring to the module terminals 1 (–) and 2 (+) or 1(+), 2(-), 3(+), and 4(-).

Each XLS-MM-Z, TC841A1000, and TC941A1005 module takes one address on the SLC. For Eclipse modules, set the required SLC address with EA-CT; for FlashScan and CLIP modules, use the module's rotary switches to set it to the required SLC address.

Figure 6.15 shows typical wiring for a supervised and power-limited NFPA Style D (Class A) IDC using the TC841A1000 module.

Figure 6.16 shows typical wiring for a supervised and power-limited NFPA Style D (Class A) IDC using the TC941A1005 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.

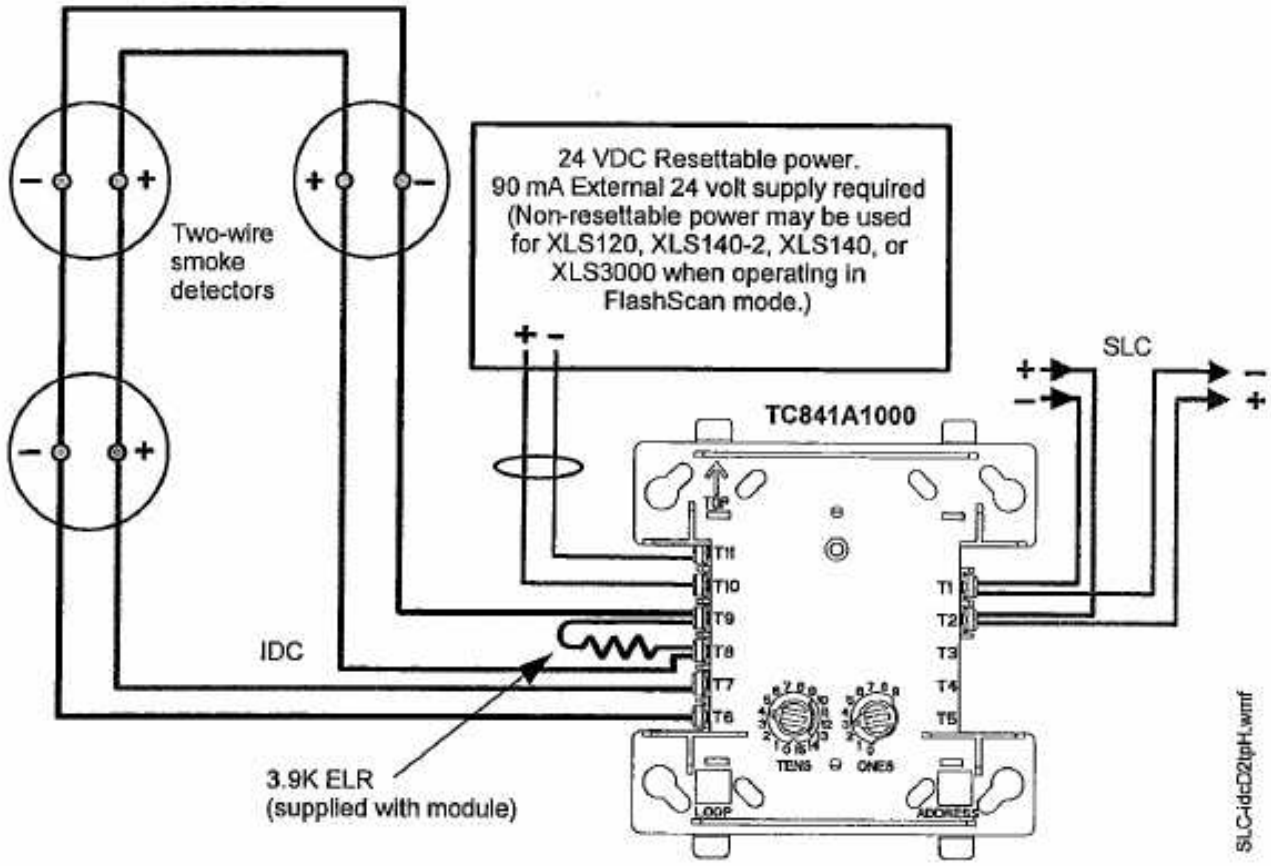


Figure 6.15 Typical Style D IDC Wiring with TC841A1000

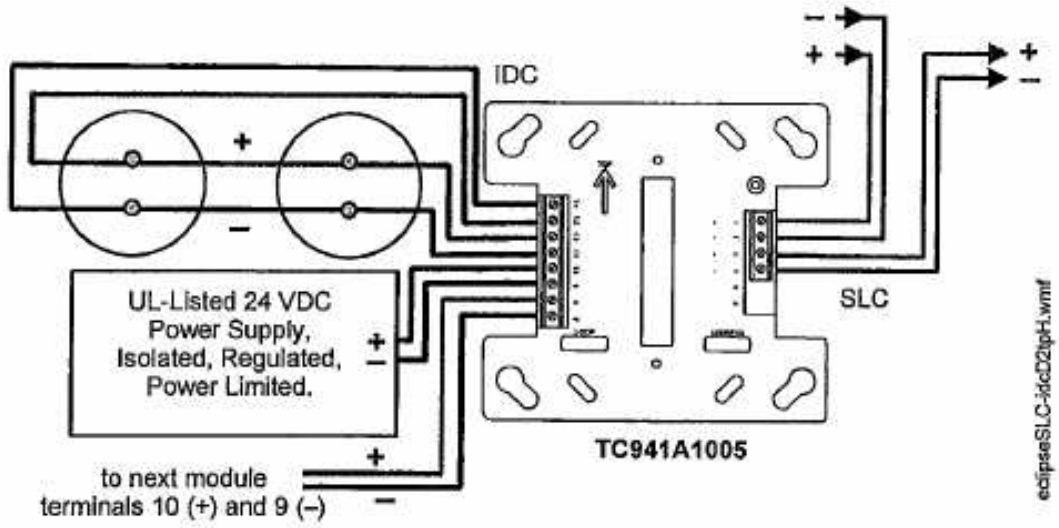


Figure 6.16 Typical Style D IDC Wiring with TC941A1005

Notes

Section 7: Control Modules

7.1 Description

The XLS-CM-N, TC810N1013, and TC910N1007 modules are addressable modules that can be used for monitoring and switching 24 VDC Notification Appliance Circuit (NAC) power for NFPA Style Y (Class B) and NFPA Style Z (Class A) circuits.

The TC810S1000 is an addressable module used to switch an external power supply to a solenoid. The TC810S1000 can be configured for NFPA Class B or Class A wiring. When using the TC810S1000 for Class B applications, remove jumper J1 on the back. Refer to Figure 7.3.

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.

7.1.1 Setting an SLC Address

Each module is factory preset with an address of "00." To set an SLC address refer to "Setting an SLC Address for a Module" on page 34 and (for Eclipse devices) to the *EA-CT Installation Document*.

7.2 Wiring a NAC with Addressable Control Modules

Connect the SLC wiring to the module terminals 1 (–) and 2 (+) or 1(+), 2(-), 3(+), and 4(-).

Each TC910N1007, XLS-CM-N, and TC810N1013 (TC910N1007 Eclipse; XLS-CM-N FlashScan; TC810N1013 Flashscan/CLIP) module takes one address on the SLC. For Eclipse modules, set the required SLC address with EA-CT; for FlashScan and CLIP modules, use the module's rotary switches to set it to the required SLC address.

Figure 7.1 shows the connections to wire the TC810N1013 module for powering a 24 VDC NAC.

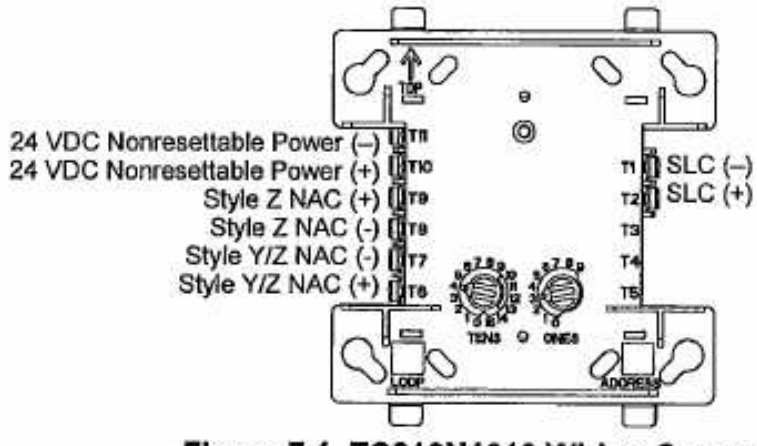


Figure 7.1 TC810N1013 Wiring Connections

Figure 7.2 shows the connections to wire the TC910N1007 module for powering a 24 VDC NAC.

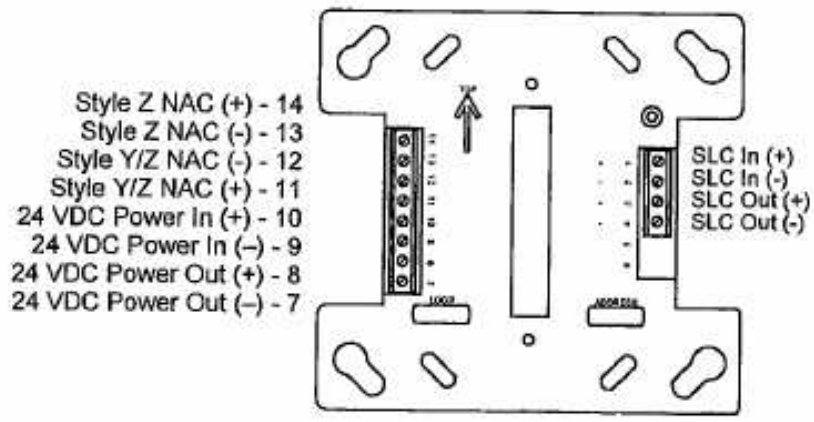
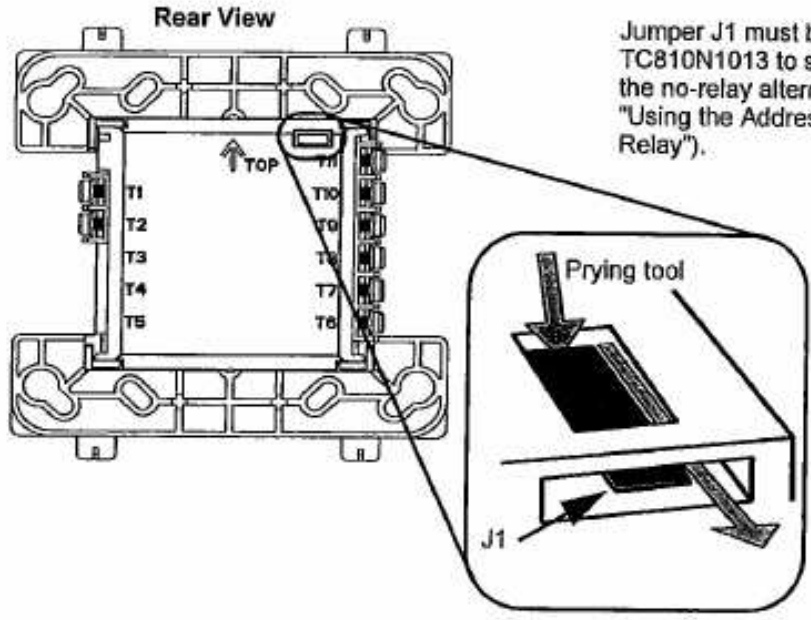


Figure 7.2 TC910N1007 Wiring Connections

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



Jumper J1 must be removed when using the TC810N1013 to supervise 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 TC810N1013:

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 TC810N1013 module so that it exits from the slot in the back.

FCMBackJump.wmf, FCMBackJumpd.wmf

Figure 7.3 TC810N1013 Jumper Location

NOTE: When using XLS3000 and the "Control" type ID, do **not** remove jumper J1.

7.2.1 Wiring a Solenoid with the TC810S1000

Figure 7.4 shows the connections to wire the TC810S1000 to a solenoid.

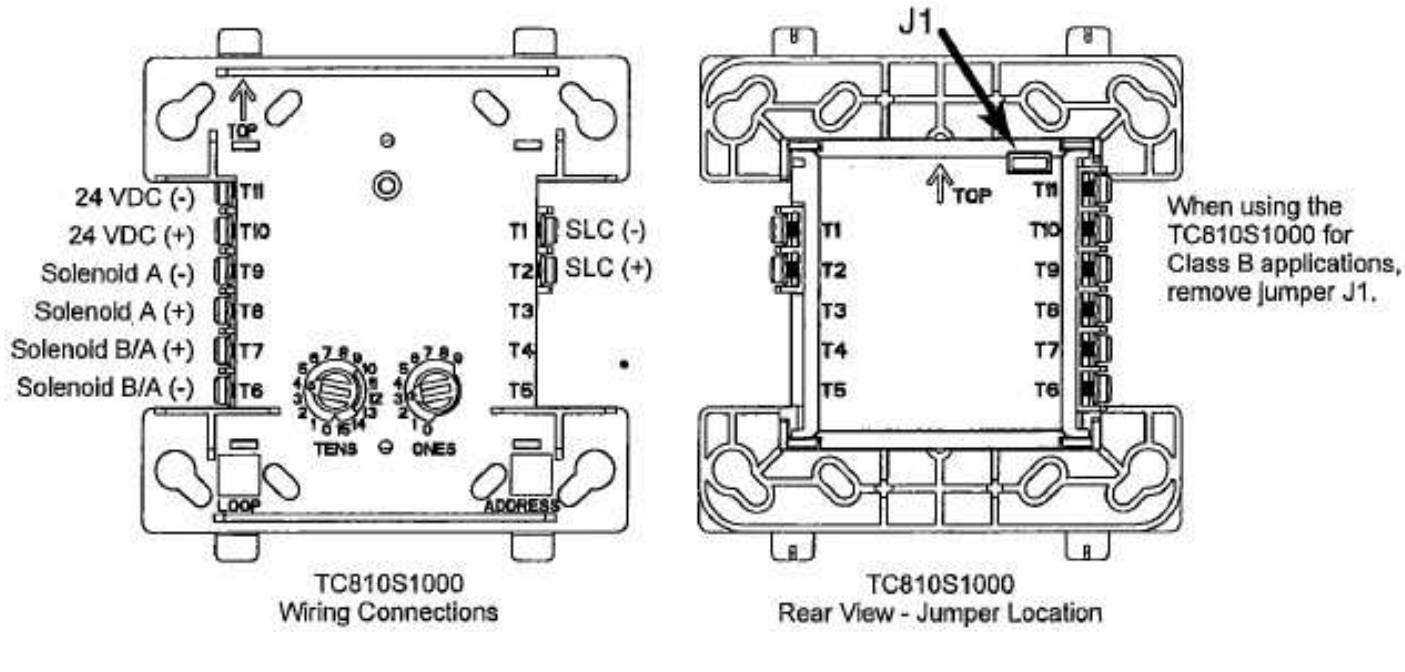


Figure 7.4 TC810S1000 Wiring Locations and Rear View - Jumper Location

NOTE: The TC810S1000 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

Figure 7.5 depicts a supervised and power-limited NFPA Style Y (Class B) Notification Appliance Circuit (NAC) using the TC810N1013 module. In the sample wiring drawing below, polarized alarm notification appliances are shown connected to the module in a two-wire configuration.

Figure 7.6 shows a supervised and power-limited NFPA Style Y (Class B) Notification Appliance Circuit (NAC) using the TC910N1007.

1. See "Power Considerations" on page 61 for information on monitoring 24 VDC power.
2. Each module can control 2 amps of resistive load (on electronic devices) or 1 amp of inductive load (on mechanical bells and horns).
3. A power supervision relay is required only on the last module of the power run unless:
   - using the no-relay alternative wire method; see Figure A.2, "Alternate: 2-Address Method of Supervising a 24 VDC Circuit".
   - using a panel with FlashScan type IDs that provide built-in power supervision. Refer to the panel installation Manual for a list of type codes.)
4. Do not T-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.

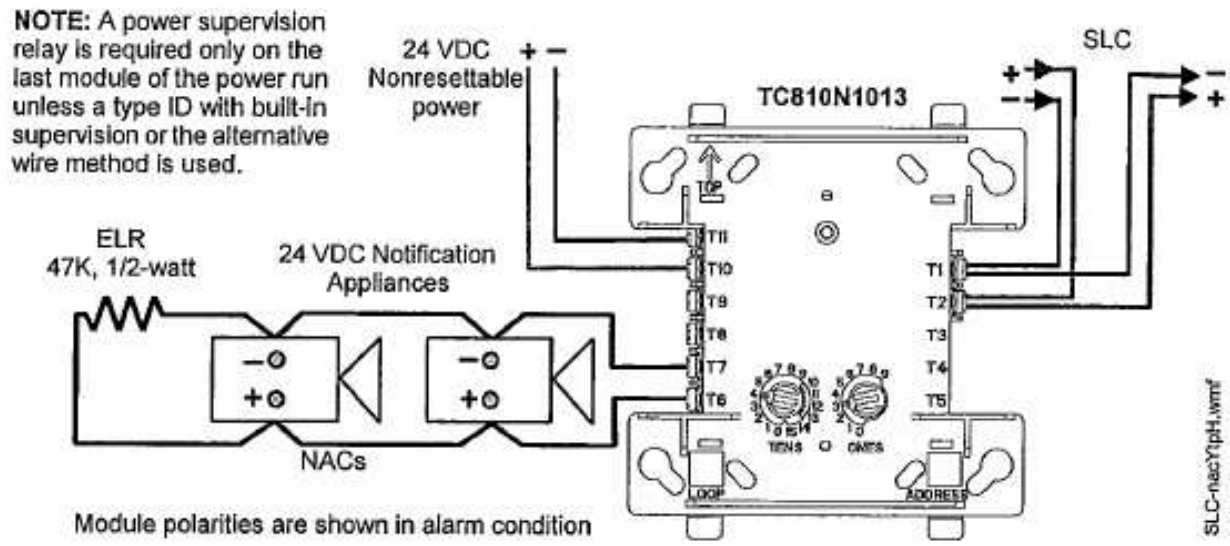


Figure 7.5 NFPA Style Y Notification Appliance Circuit with TC810N1013

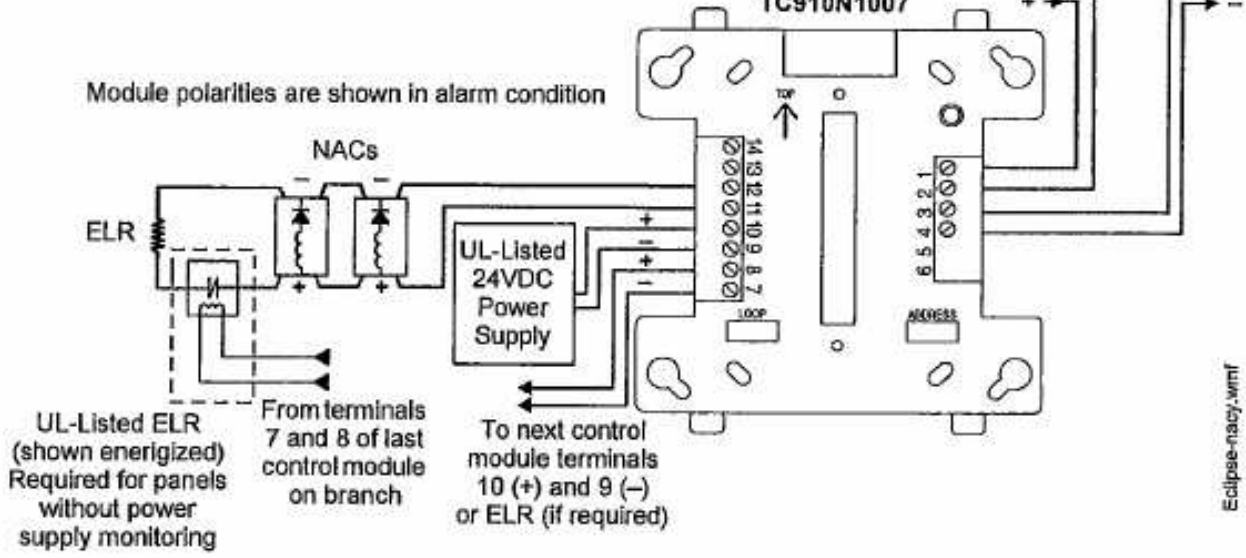


Figure 7.6 NFPA Style Y Notification Appliance Circuit with TC910N1007

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

Figure 7.7 depicts a supervised and power-limited NFPA Style Z (Class A) Notification Appliance Circuit (NAC) using the TC810N1013 module. In the sample wiring drawing below, polarized alarm notification appliances are shown connected to the module in a four-wire configuration.

Figure 7.8 shows a supervised and power-limited NFPA Style Z (Class A) Notification Appliance Circuit (NAC) using the TC910N1007.

1. See "Power Considerations" on page 61 for information on supervising 24 VDC power.
2. Each module can control 2 amps of resistive load (on electronic devices) or 1 amp of inductive load (on mechanical bells and horns).
3. A power supervision relay is required only on the last module of the power run unless:
   - using the no-relay alternative wire method; see Figure A.2, "Alternate: 2-Address Method of Supervising a 24 VDC Circuit".
   - using a panel with FlashScan type IDs that provide built-in power supervision. Refer to the panel installation Manual for a list of type codes.)
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.

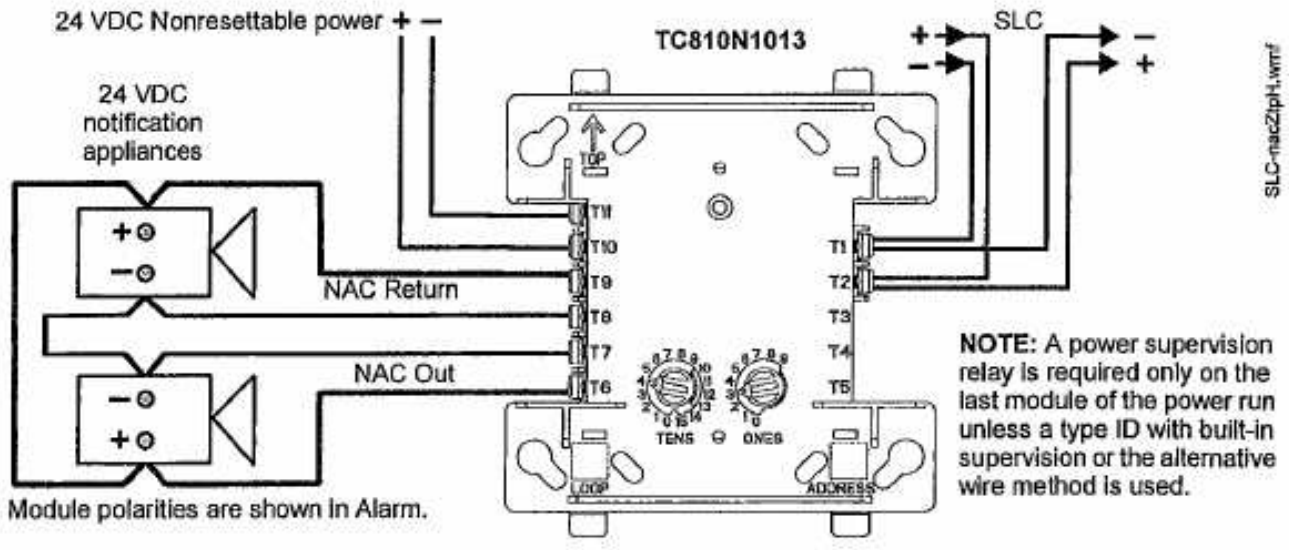


Figure 7.7 NFPA Style Z Notification Appliance Circuit with TC810N1013

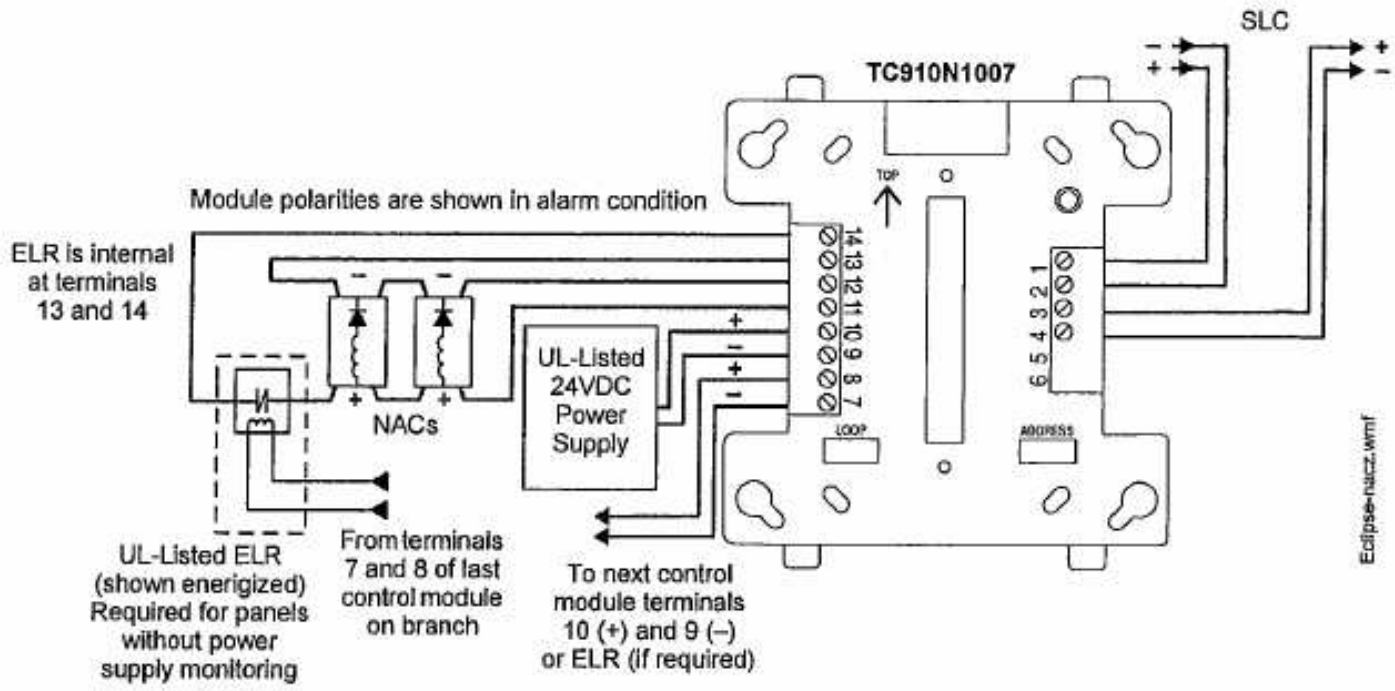


Figure 7.8 NFPA Style Z Notification Appliance Circuit using TC910N1007

7.5 Connecting a Releasing Device to the Addressable Control Module

The TC810S1000 module can control 1 A of current. Make sure to keep total system current within the limits of the power supply. Power for the module must come from the FACP's main power supply or any UL 864-listed 24 VDC regulated, power-limited power supply for Fire Protective Signaling. For more information, refer to the *Device Compatibility Document*.

NOTE: Eclipse devices are not listed for releasing applications.

Figure 7.9 shows Class B wiring of the TC810S1000.

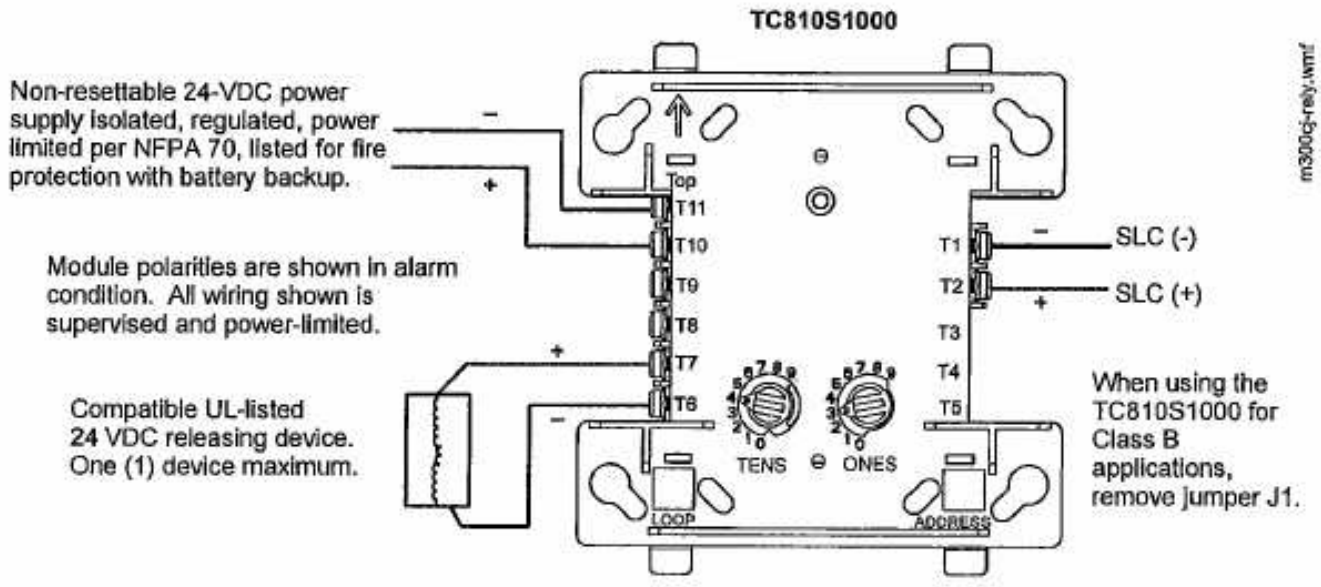


Figure 7.9 NFPA Class B Wiring of the TC810S1000

Figure 7.10 shows Class A wiring of the TC810S1000.

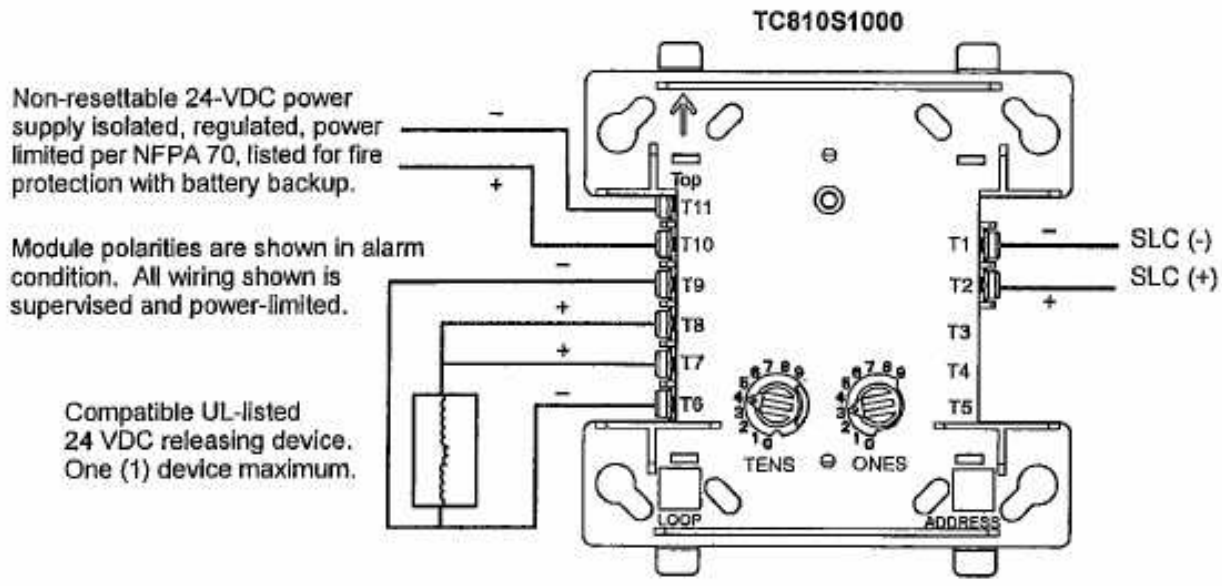


Figure 7.10 NFPA Class A Wiring of the TC810S1000

Critical Requirements.

When connecting a releasing device to the TC810S1000 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 TC810S1000.
4. Do not loop wiring under the screw terminals. Break the wire run to provide supervision of connections.
5. All applications using the TC810S1000 are power-limited:
   - Program the releasing circuit for Type Code REL CKT ULC or RELEASE CKT.
   - Circuits are supervised against opens and shorts.
6. Refer to your FACP's programming manual for instructions on setting the Soak Timer.
7. The TC810S1000 module must be programmed with the correct releasing type code listed in your FACP's programming manual.

Section 8: Relay Module

8.1 Description

The TC810R1024, XLS-CM-R, and TC910R1009 are addressable modules that provide two isolated sets of Form-C relay contacts.

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

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

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

8.1.1 Setting an SLC Address

Each relay module is factory preset with an address of "00." To set an SLC address refer to Section 6.2, "Setting an SLC Address for a Module", on page 34 and (for Eclipse devices) to the *EA-CT Installation Document.*

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

The figure below shows the TC810R1024 module wired to the Control Panel.

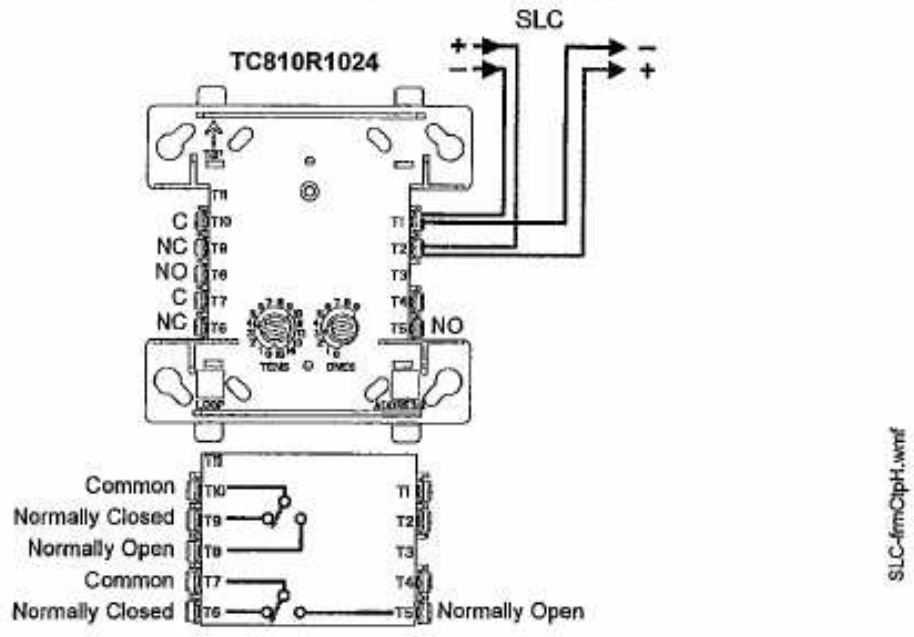


Figure 8.1 TC810R1024 Relay Module Wiring Connections

The figure below shows the TC910R1009 module wired to the Control Panel.

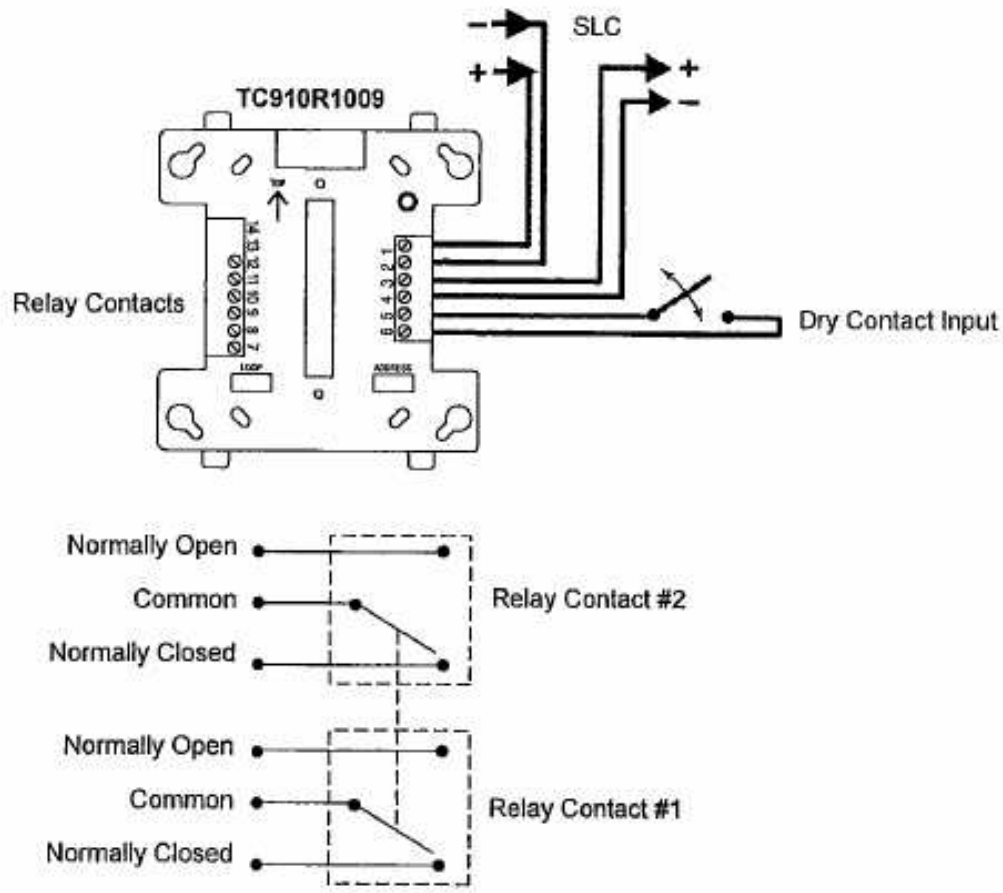


Figure 8.2 TC910R1009 Relay Module Wiring Connections

Section 9: Multiple Input/Output Modules

9.1 Description

9.1.1 XLS-MM-D and TC809D1004

The XLS-MM-D and TC809D1004 are similar to the TC809A1059, except intended for use in intelligent two-wire systems providing two independent Style B (Class B) IDCs at two separate, consecutive addresses. (XLS-MM-D FlashScan; TC809D1004 CLIP) Addresses can start using either an even or odd number.

9.1.2 TC822A1010

The TC822A1010 is an addressable module that functions as two individual relay control modules (two isolated sets of Form-C relay contacts) and two Class B monitor modules.

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

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

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

9.2 Setting the SLC Address

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

9.2.1 XLS-MM-D and TC809D1004

Each XLS-MM-D and TC809D1004 module can use up to two (2) addresses. The base address selected via the rotary address switches will be assigned to the first monitored input. The next consecutive address will be assigned to the second monitored input.

9.2.2 TC822A1010

Each TC822A1010 module can use up to four (4) addresses. The base address selected via the rotary address switches will be assigned to relay output #1 from 00 to 156. The module will automatically assign the next three addresses as appropriate to monitored input #1, relay output #2, and monitored input #2.

9.3 Wiring the Dual Monitor Module

The figure below shows the XLS-MM-D and TC809D1004 wired to the control panel.

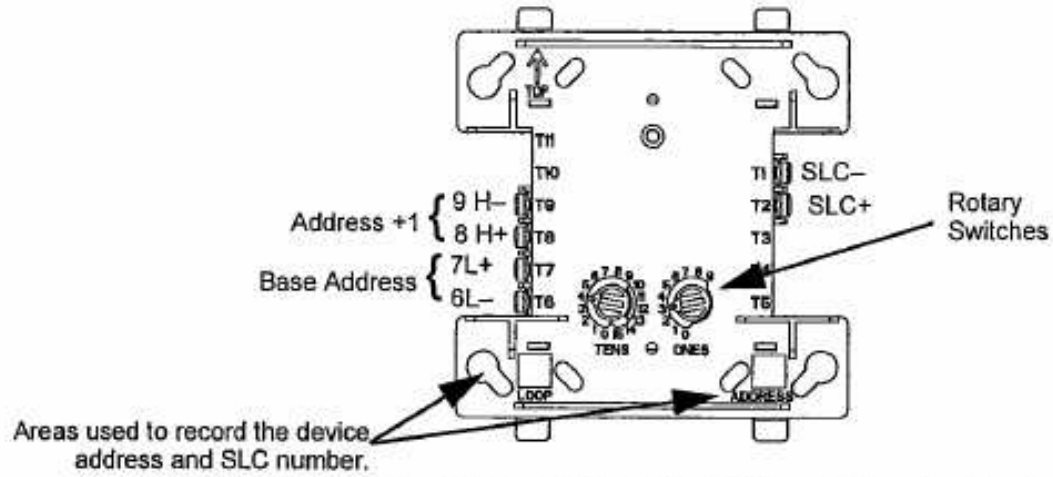


Figure 9.1 XLS-MM-D and TC809D1004 Dual Monitor Module

9.4 Wiring the Addressable Dual Monitor/Dual Relay Module

The figure below shows the TC822A1010 module wired to the control panel.

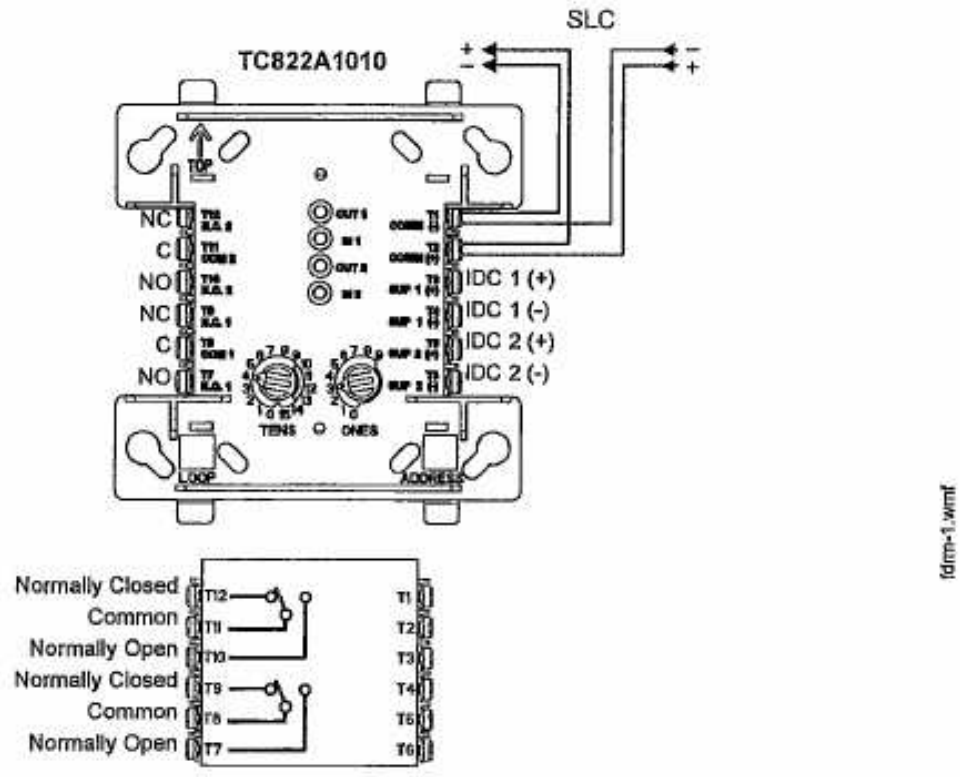


Figure 9.2 TC822A1010 Multiple Input/Output Module Wiring Connections

9.5 NFPA Style B IDC Wiring Using Dual Monitor Modules

Connect the FlashScan or CLIP SLC wiring to the XLS-MM-D and TC809D1004 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 9.3 shows typical wiring for a supervised and power-limited NFPA Style B (Class B) Initiating Device Circuit using the TC809D1004 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

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

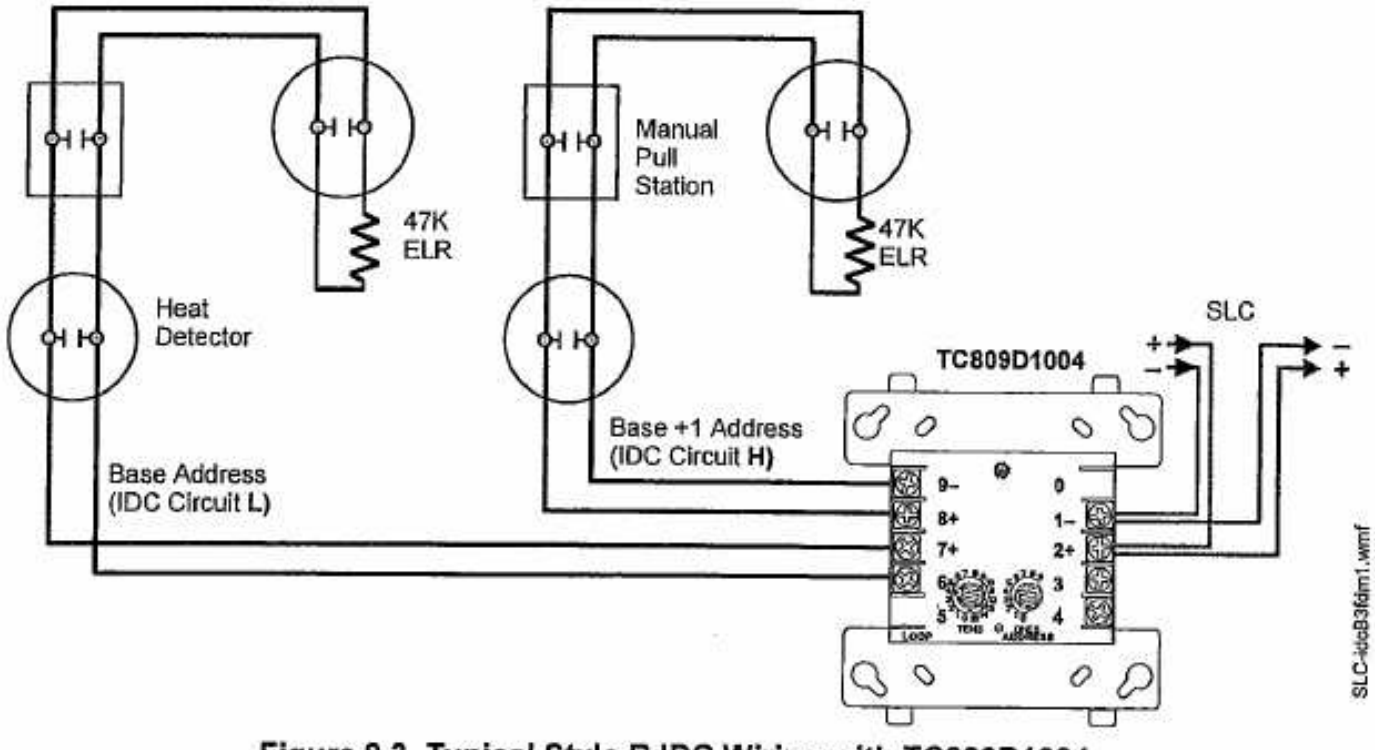


Figure 9.3 Typical Style B IDC Wiring with TC809D1004

Section 10: Intelligent Detector Bases

10.1 Description

Detector bases provide a connection between the SLC and a variety of intelligent detectors:

- EBI (Eclipse; no flange; 4 inch/10.16 cm "European standard"; Figure 10.1)
- EBFI (Eclipse; with flange; 6 inch/15.24 cm "USA standard"; Figure 10.1)
- B501 (FlashScan/CLIP; no flange; 4 inch/10.16 cm "European standard"; Figure 10.2)
- B210LP (FlashScan/CLIP; with flange; 6 inch/15.24 cm "USA standard"; Figure 10.2)
- 14507371-008 (FlashScan/CLIP Filtrex base; Figure 10.3)
- B224BI, 14507371-005 Isolator base (See Figure 10.4)
- EBR (Eclipse relay base; Figure 10.5)
- B224RB (FlashScan/CLIP, plug-in relay detector base; Figure 10.6)
- 14507371-003 (FlashScan/CLIP, plug-in relay detector base; Figure 10.6)
- EBS (Eclipse sounder base; Figure 10.7)
- B200S Addressable sounder base (See Figure 9.9)
- B200SR Sounder base (See Figure 9.10)

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

10.2 Wiring a Detector Base

Figure 10.1 shows typical wiring of Eclipse detector bases **EBI** and **EBFI**. Wiring connections for the two bases are identical.

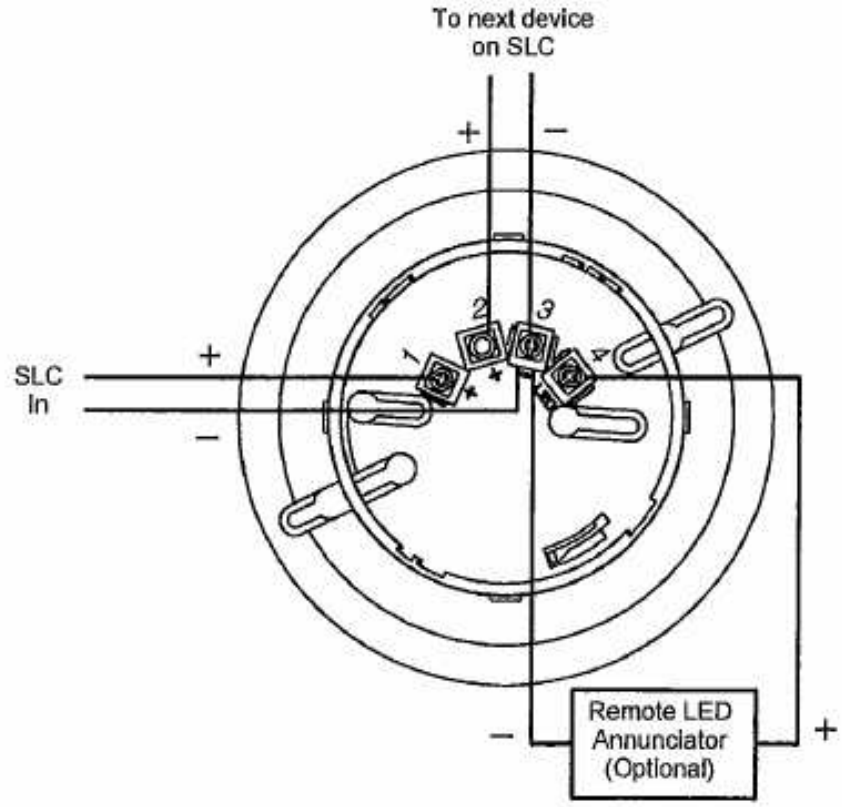


Figure 10.1 Wiring Eclipse-Mode Standard Detector Bases

Figure 10.2 shows typical wiring of a standard detector base (B501 is shown) connected to an SLC. An optional RA100Z Remote LED Annunciator is shown connected to the base.

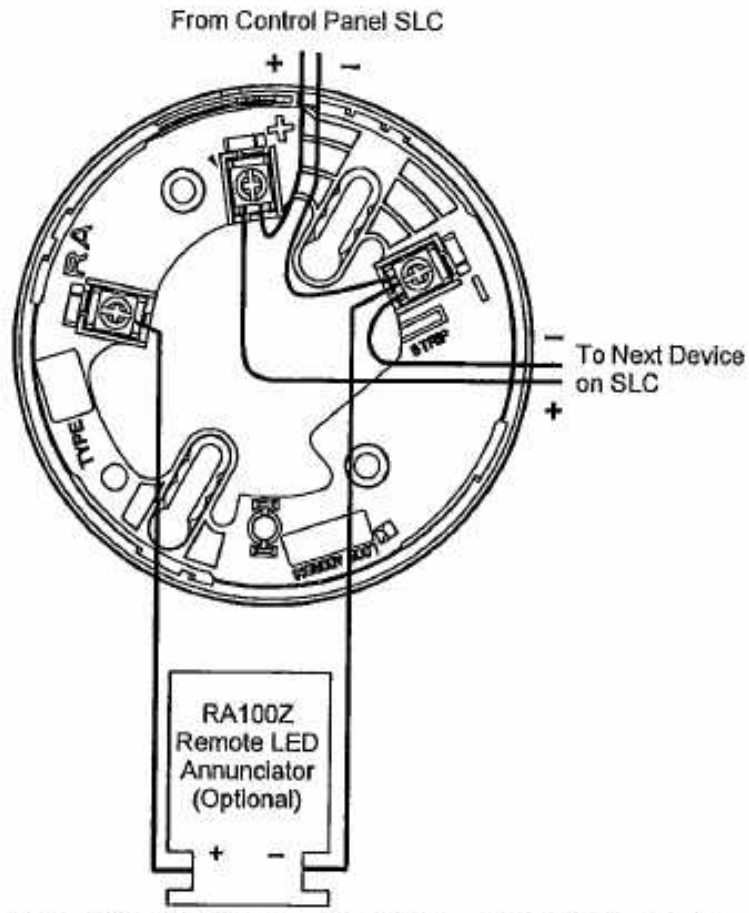


Figure 10.2 Wiring a B210LP or B501 Detector Base

NOTE: The B210LP base wiring is identical to the B501. B501 is the flangeless model.

Figure 10.3 shows typical wiring of the 14507371-008 detector base (for use with a HARSH™ Filtrex detector) connected to an SLC. An optional RA100Z Remote LED Annunciator is shown connected to the base.

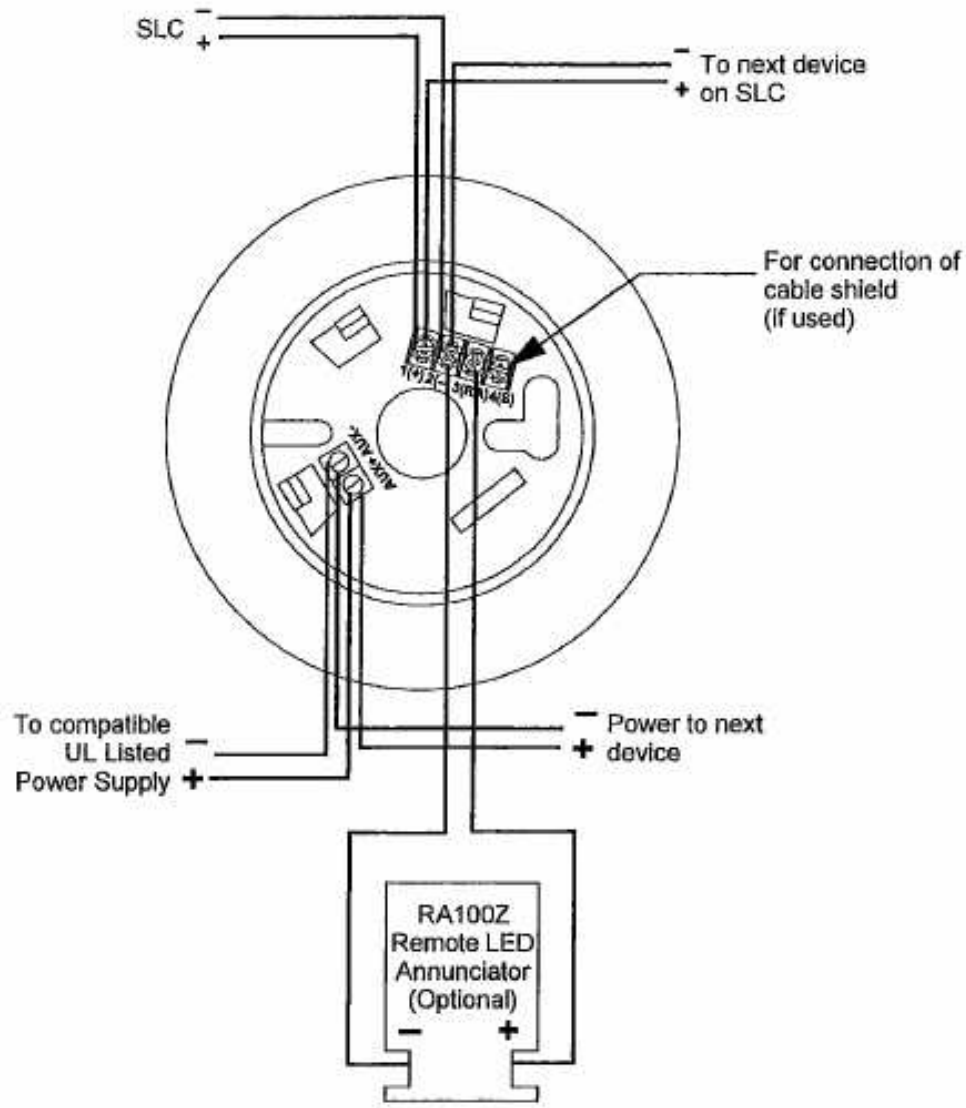


Figure 10.3 Wiring of the 14507371-008 Detector Base

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

10.3 Wiring an Isolator Base

FlashScan/CLIP only: 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. Eclipse devices have built-in isolation.

Note: The "grid" pattern on the redesigned B224BI mounting plate has been removed for illustration purposes only.

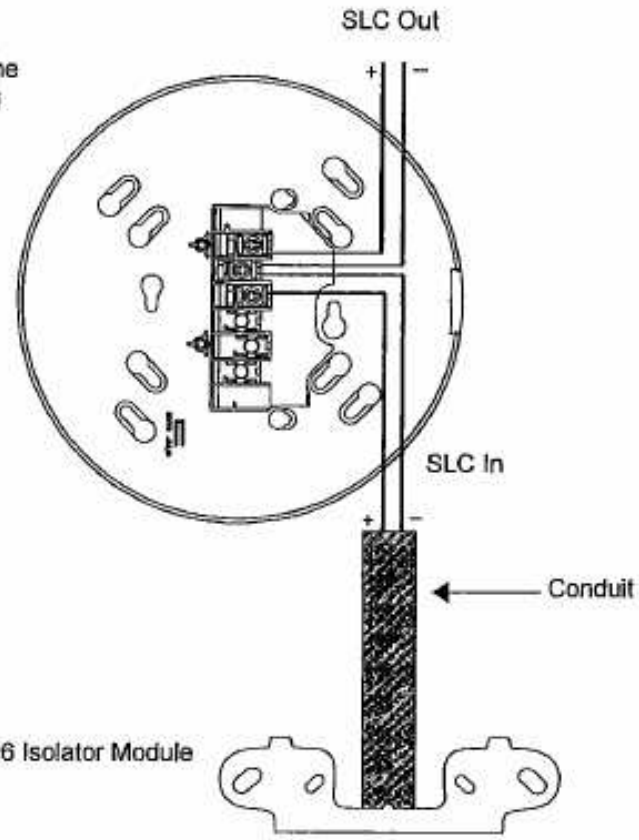


Figure 10.4 Wiring a B224BI Isolator Base Mounting Plate for FlashScan/CLIP Loops

10.4 Wiring a Relay Base

Figure 10.5 shows typical wiring of the EBR plug-in relay detector base connected to an SLC.

Note: The "grid" pattern on the redesigned EBR mounting plate has been removed for illustration purposes only.

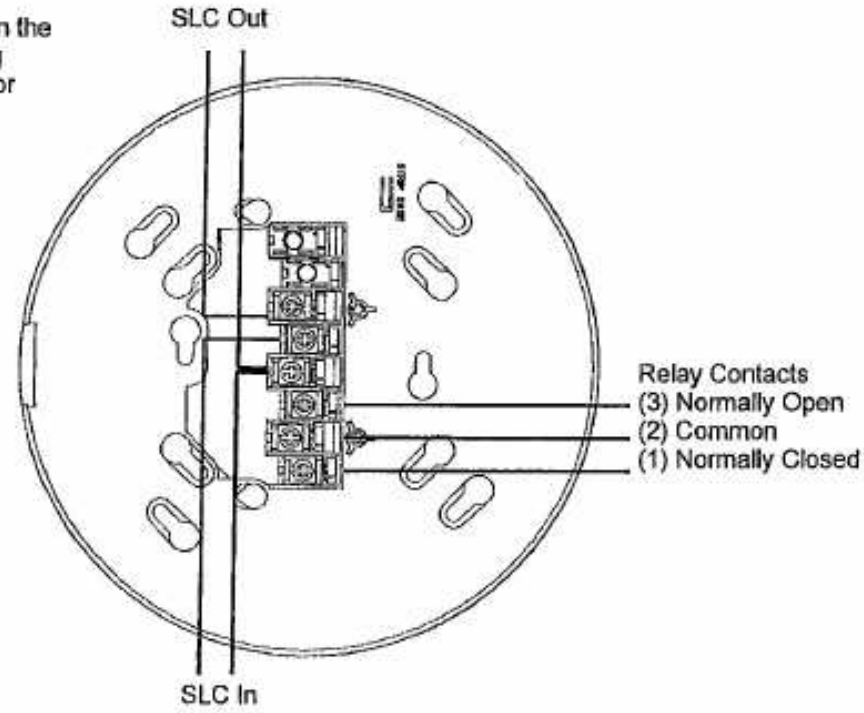


Figure 10.5 Wiring of the EBR Relay Base

Figure 10.6 shows typical wiring of the B224RB or 14507371-003 plug-in relay detector base connected to an SLC.

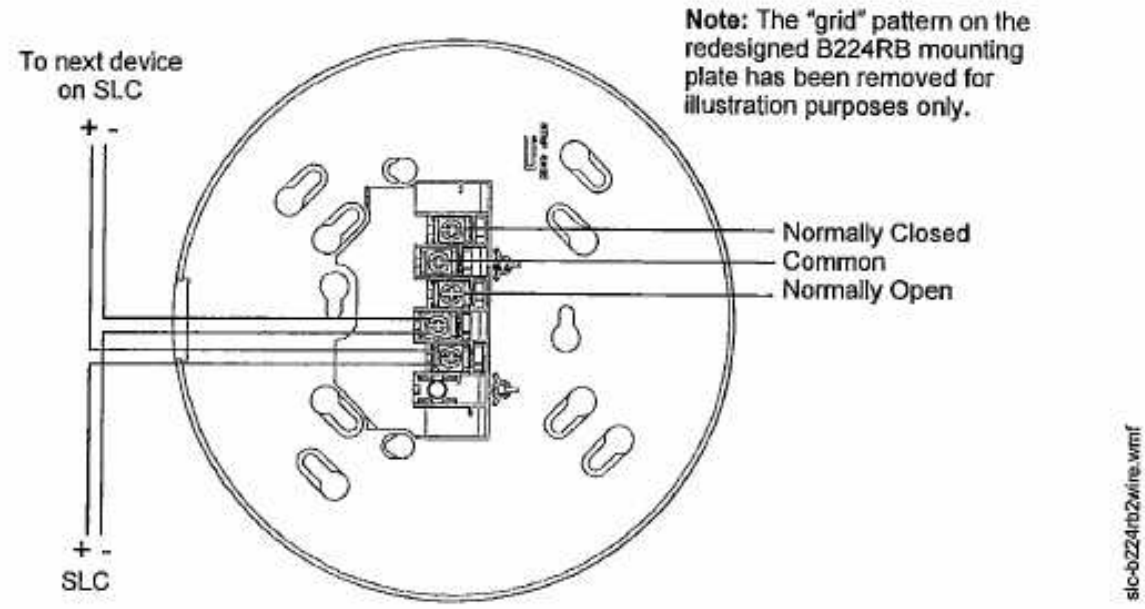


Figure 10.6 Wiring of a B224RB or 14507371-003 Relay Base Mounting Plate

10.5 Wiring a Sounder Base

Figure 10.7 shows typical wiring of the EBS Eclipse-mode sounder base.

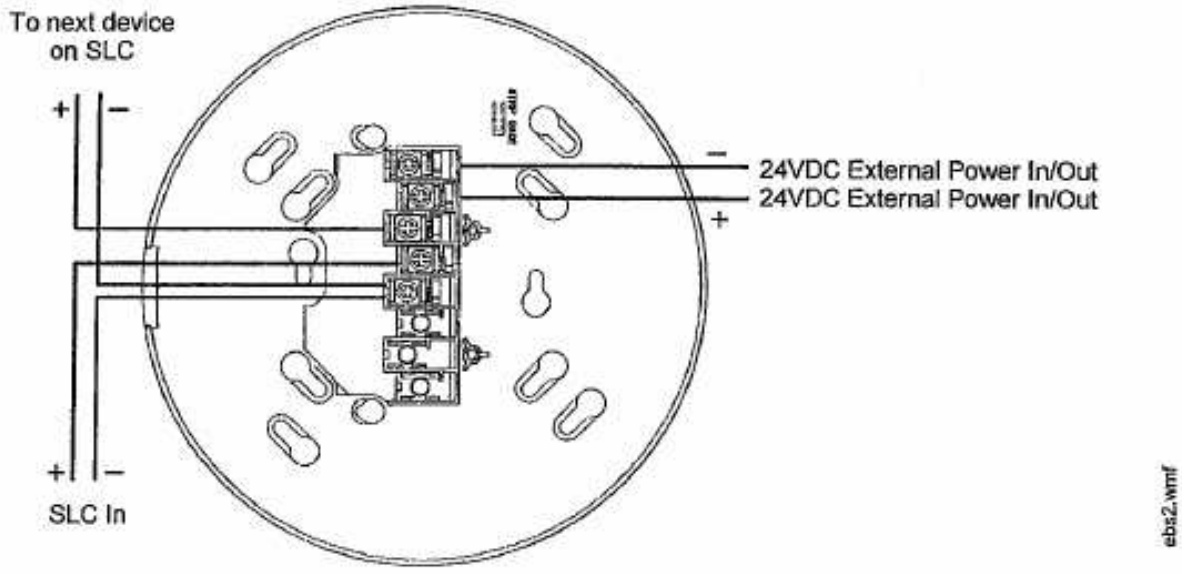


Figure 10.7 Wiring of the EBS Sounder Base

Figure 10.8 shows typical wiring of the B200S Sounder Base.

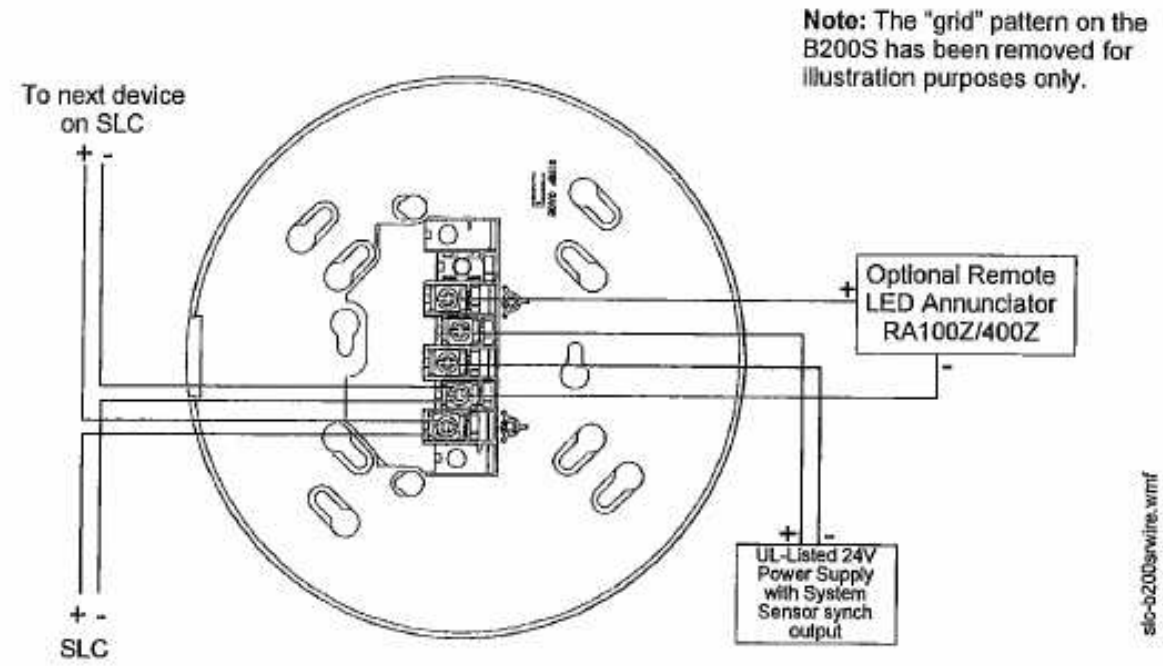


Figure 10.8 Wiring of the B200S Sounder Base

Figure 10.9 shows typical wiring of the B200SR Sounder Base.

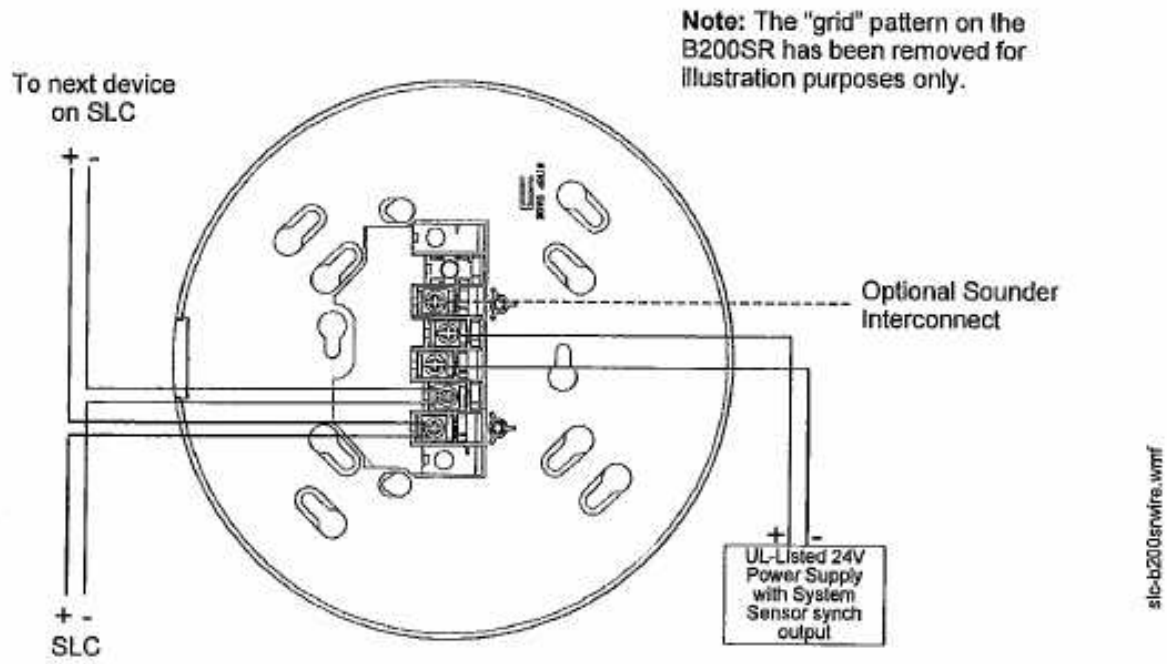


Figure 10.9 Wiring of the B200SR Sounder Base

NOTE: For more detailed wiring on sounder bases, refer to the device's installation instructions.

Section 11: Addressable Manual Pull Station

11.1 Description

The S464H1006, XLS-MPS and S464G1007 are addressable manual pull stations with a key-lock reset feature. (S464H1006 Eclipse; XLS-MPS FlashScan; S464G1007 FlashScan/CLIP.)

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

11.1.1 Setting an SLC address

Each unit is factory preset with an address of "00." To set an SLC address refer to "Setting an SLC Address for a Module" on page 34 and (for Eclipse devices) to the *EA-CT Installation Document.*

11.2 Wiring a Manual Pull Station

Typical wiring for the XLS-MPS and S464G1007 Manual Pull Stations to an SLC is shown below.

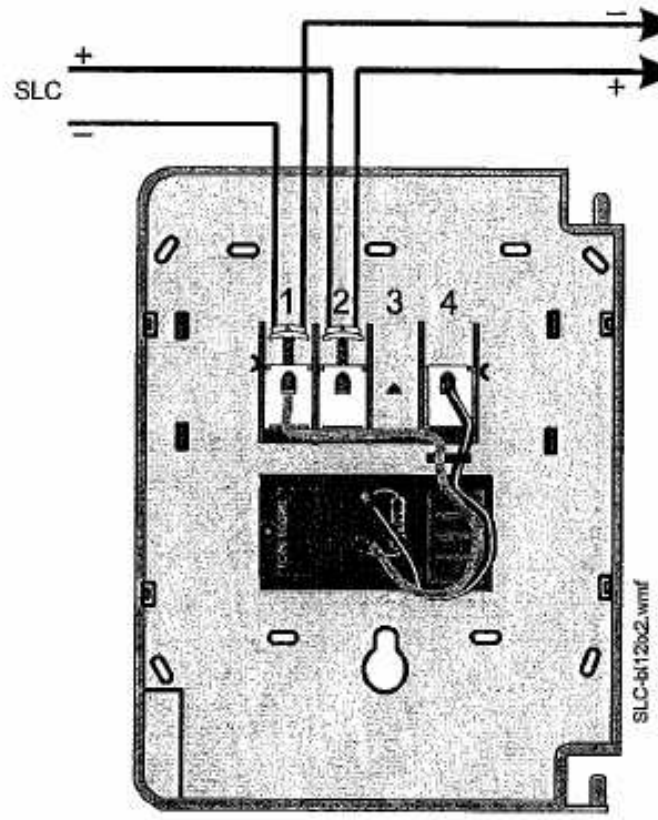


Figure 11.1 Wiring the XLS-MPS and S464G1007 Pull Stations to an SLC

Typical wiring for the S464H1006 Manual Pull Station to an SLC is shown below.

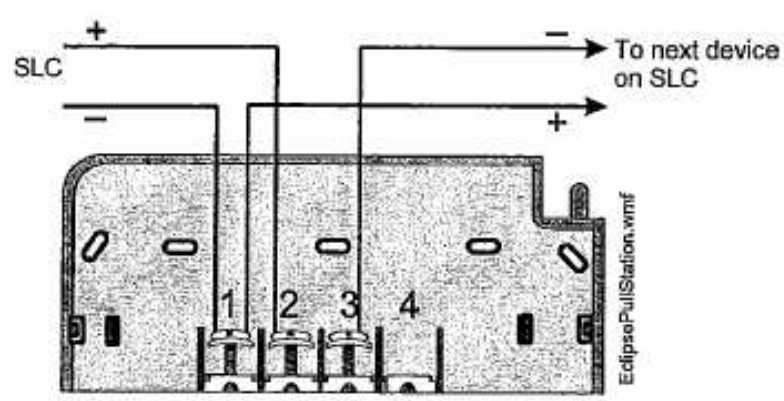


Figure 11.2 Wiring the S464H1006 Pull Station to an SLC

Appendix A: Power Considerations

A.1 Supplying Power to 24 VDC Detectors and NACs

Resistance and Size

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

For Four-Wire Detectors:

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

For NACs:

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

Where:

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

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

The minimum supply voltages produced by compatible UL-listed Honeywell and Notifier power supplies are listed below:

FACP	Vms	Power Supply	Vms
XLS140	19.15	FCPS-24	19.1
CPS-24 on XLS140-2 or XLS120	19.48V	HPF24S6/HPF24S8	19.1
		MPS-24A	19.6
		MPS-24B	20.1
		ACPS-2406	19.8
		AMPS-24	20.14
		ACPS-610	19.57

Table A.1 Minimum Supply Voltage

A.2 Supervising 24 VDC Power

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

- Using Eclipse or FlashScan Type Codes with Built-In Power Supervision
- Power Supervision Relay
- Using the TC910N1007, XLS-CM-N, or TC810N1013 module without relay

A.2.1 Using Type Codes with Built-In Power Supervision on the XLS3000, XLS140-2, and XLS120

Certain Eclipse and 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 TC910N1007, XLS-CM-N, or TC810N1013) and two wire detectors (using the TC941A1005, XLS-MM-Z or TC841A1000) 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 it does not disrupt the operating capability of all the devices on that circuit. The relay can be installed in line with any leg (+ or –) of the supervised NAC or IDC circuit, either a two or a four-wire style.

Figure A.1 shows the supervision of a 24VDC circuit using the TC810N1013 or TC841A1000. Refer to the *Device Compatibility Document* for compatible notification appliances and relays.

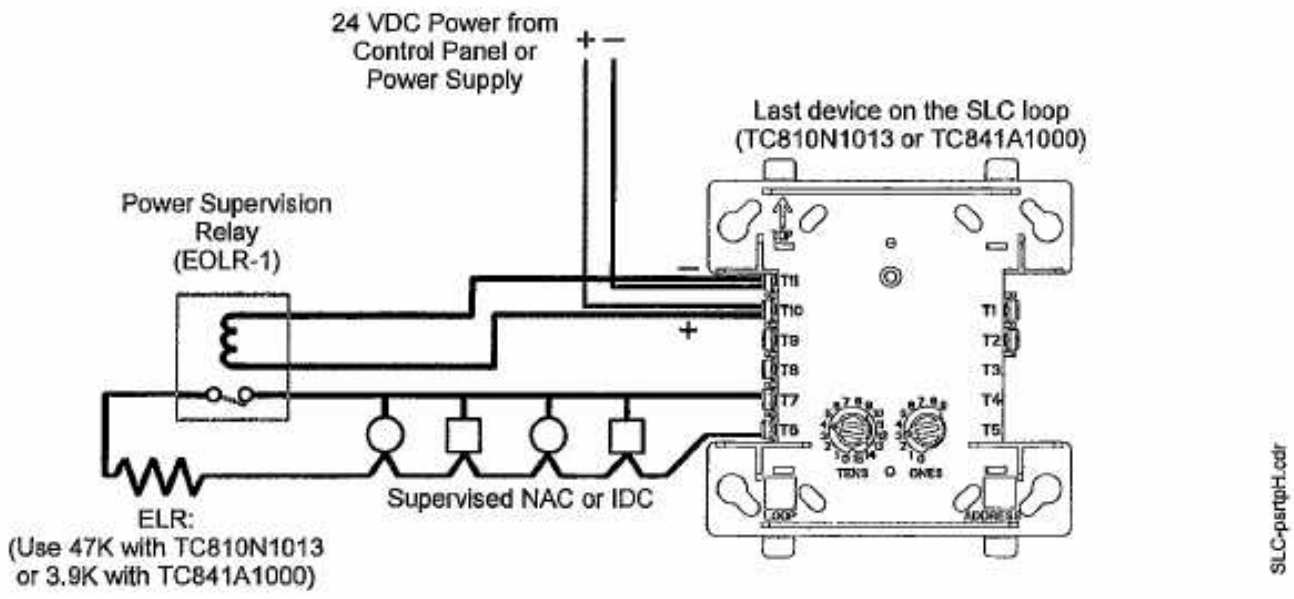


Figure A.1 Supervised 24 VDC Circuit

Figure A.2 shows an alternate method of supervising a 24VDC circuit.

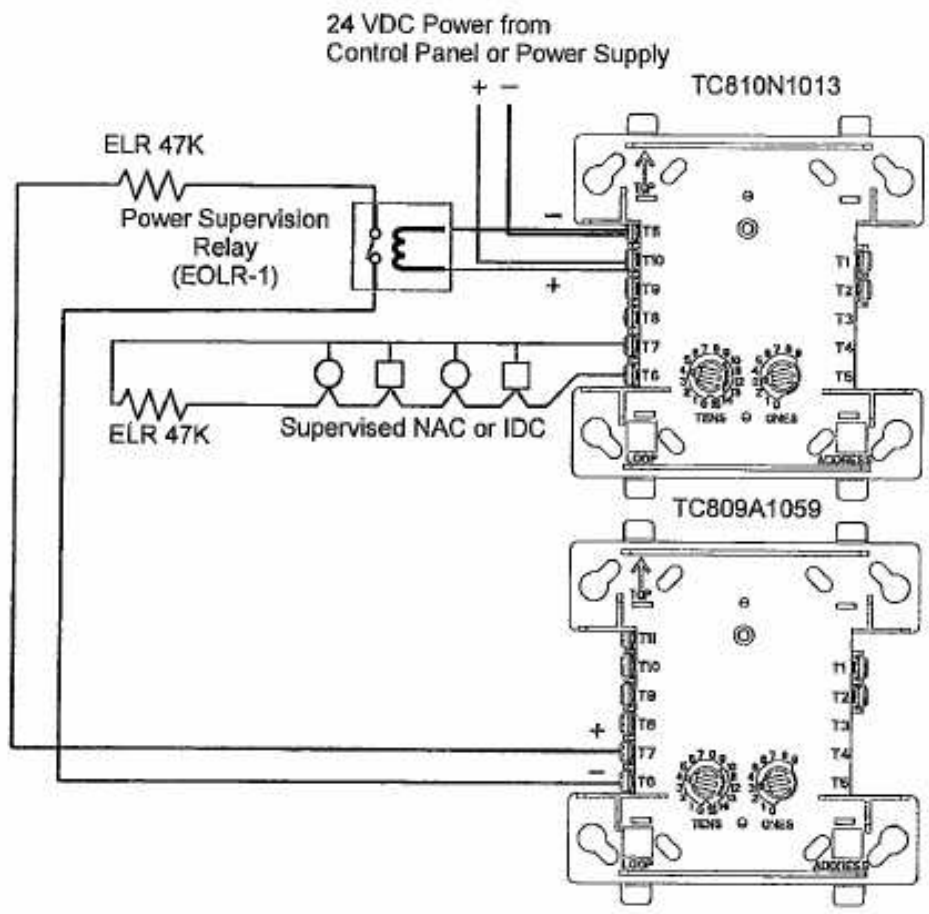


Figure A.2 Alternate: 2-Address Method of Supervising a 24 VDC Circuit

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 TC910N1007, XLS-CM-N or TC810N1013 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 TC910N1007, XLS-CM-N or TC810N1013 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 TC910N1007, XLS-CM-N or TC810N1013 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 TC910N1007, XLS-CM-N or TC810N1013 (see instructions in Figure 7.3 on page 43).

Connect the NAC power as follows:

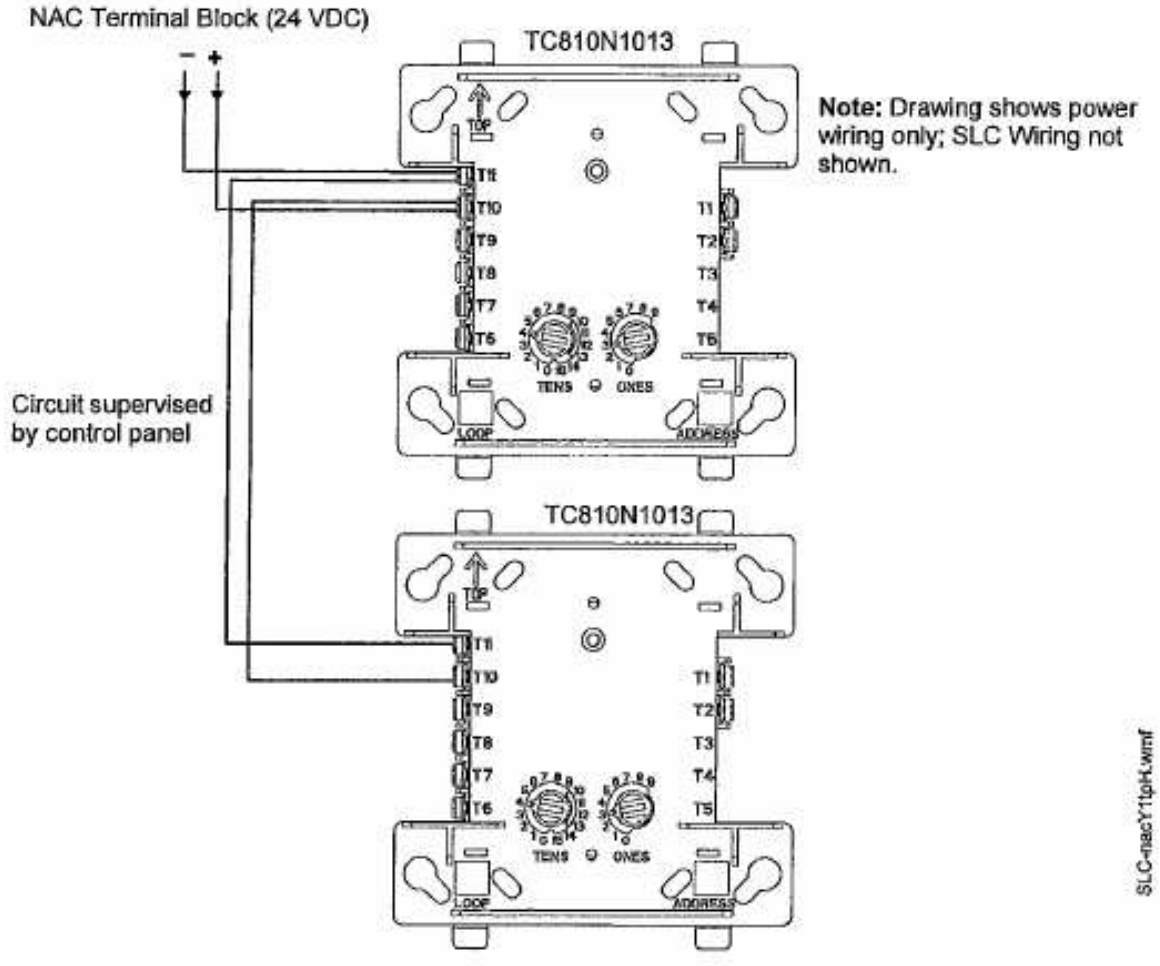


Figure A.3 NFPA Style Y NAC Power (Alternate)

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 TC910N1007, XLS-CM-N or TC810N1013 output will be coded as well.

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

- The circuit is supervised and power-limited.
- In this circuit, an external ELR is **not** required at end of the NAC circuit.
- Refer to the respective control panel installation manual for NAC terminal block connection information.
- Remove internal jumper (or resistor on the XLS-CM-N) on each TC810N1013 (see instructions in Figure 7.3 on page 43). Note that there is no jumper on the Eclipse TC910N1007.

Connect the NAC power as follows:

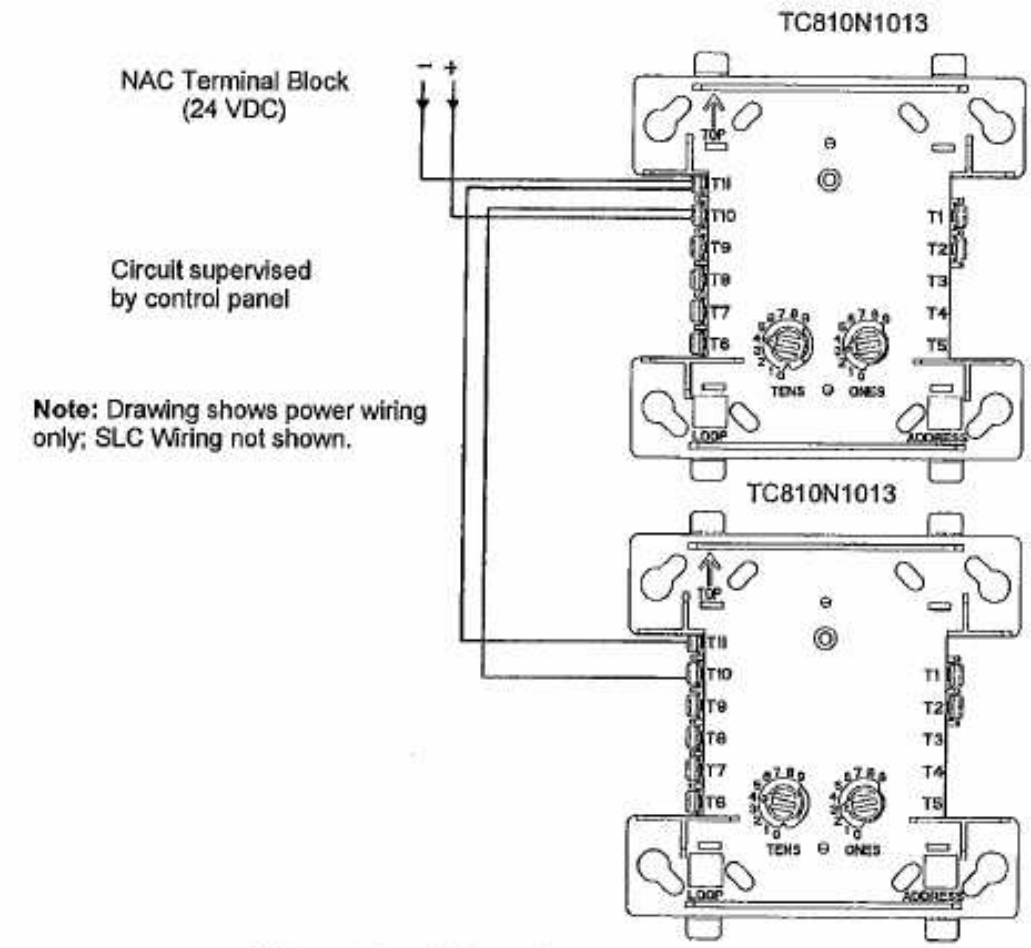


Figure A.4 NFPA Style Z NAC Power (Alternate)

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

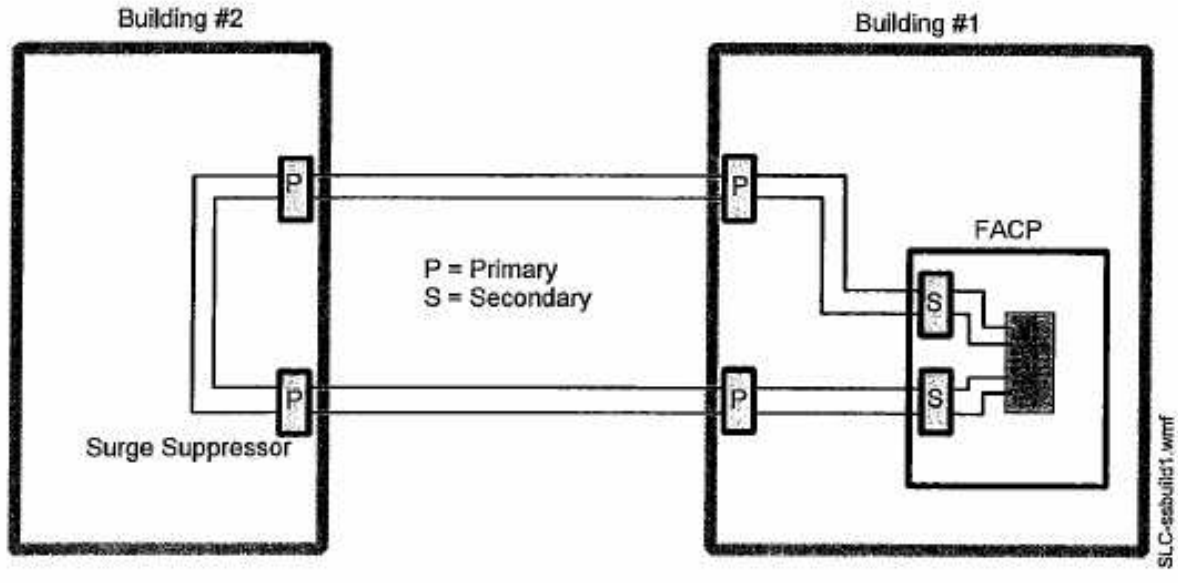
NOTE: For detailed information refer to the installation documentation supplied with the unit.

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.



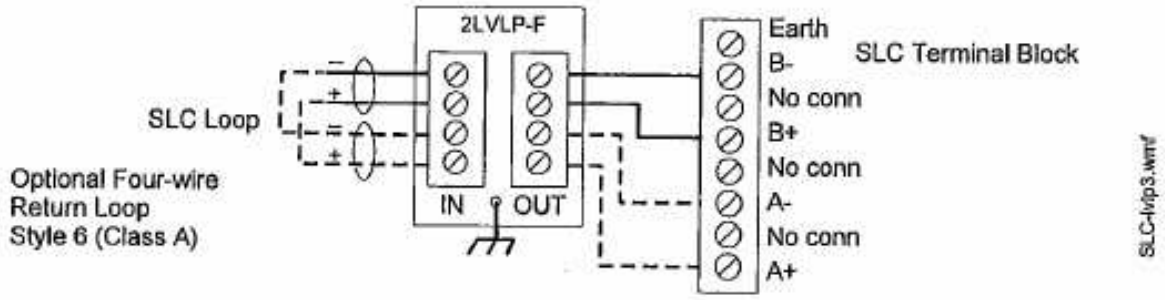
B.2 Installation

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.

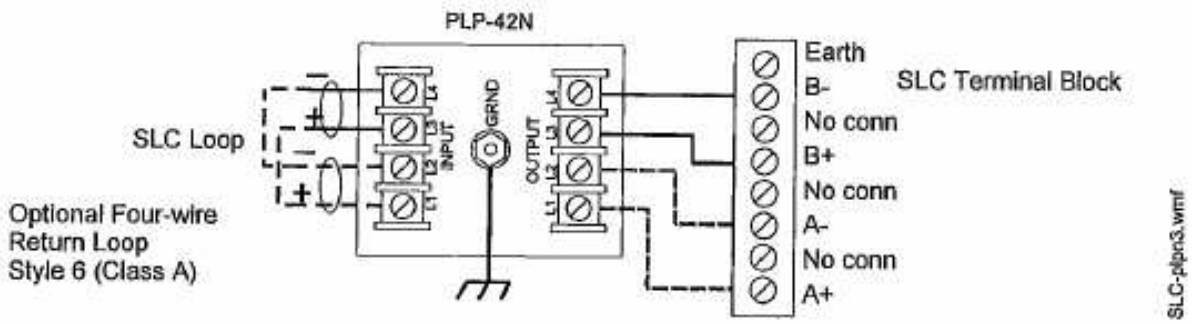
B.2.1 XLS3000, XLS140-2, XLS120/E, and XLS140

DTK-2LVLP-F Connections



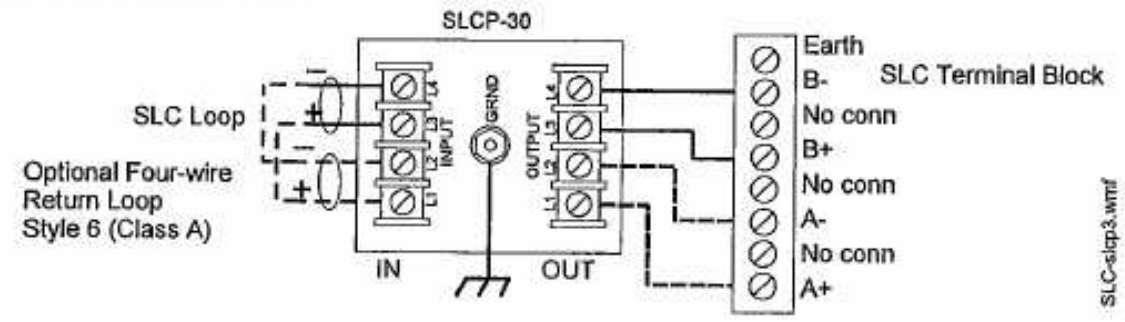
NOTE: Do not connect shield (if present) to surge protector or fire panel.

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.

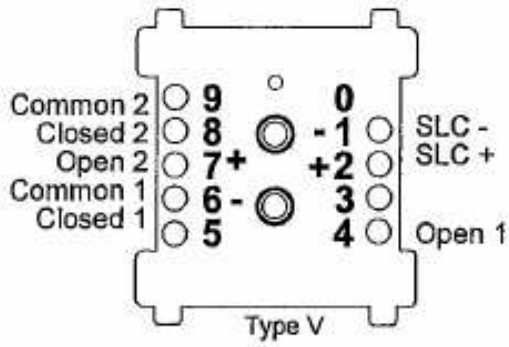
SLCP-30 Connections

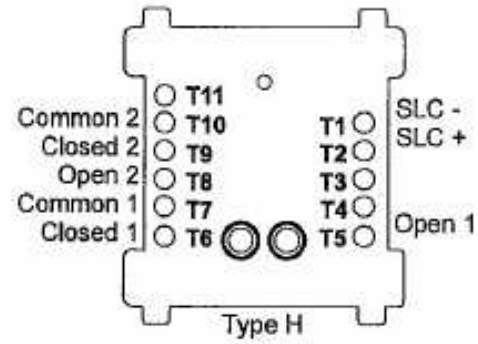


NOTE: Do not connect shield (if present) to surge protector or fire panel.

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

C.1 XLS-CM-R (v-type) to TC810R1024 (h-type)

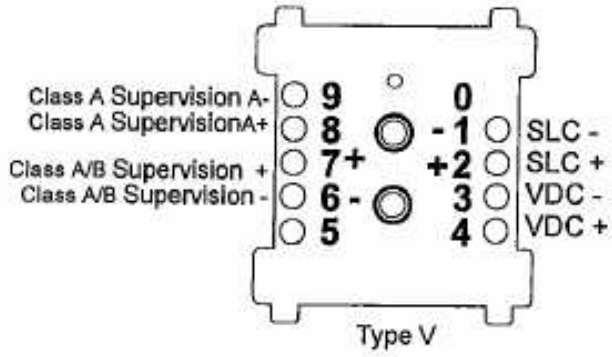


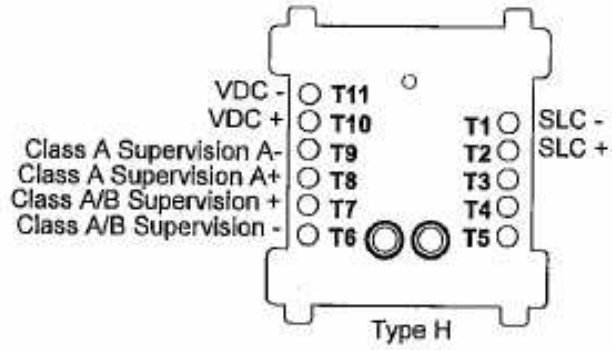


V-type Terminal Number	Terminal Function	H-type Terminal Number
1	SLC -	1
2	SLC +	2
3	Unused	3
4	Normally Open (1)	5
5	Normally Closed (1)	6
6	Relay Common (1)	7
7	Normally Open (2)	8
8	Normally Closed (2)	9
9	Relay Common (2)	10
N/A	Unused	4
N/A	Unused	11

Table C.1 XLS-CM-R to TC810R1024 Terminal Conversions

C.2 XLS-CM-N (v-type) to TC810N1013 (h-type) and XLS-MM-Z (v-type) to TC841A1000 (h-type)

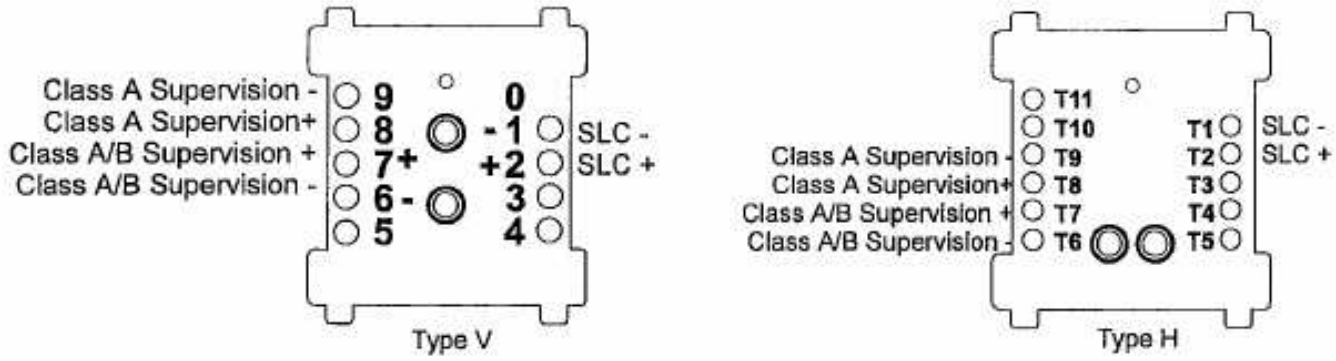




V-type Terminal Number	Terminal Function	H-type Terminal Number
1	SLC -	1
2	SLC +	2
3	VDC -	11
4	VDC +	10
5	Unused	5
6	Solenoid B/A -	6
7	Solenoid B/A +	7
8	Solenoid A +	8
9	Solenoid A -	9
N/A	Unused	3
N/A	Unused	4

Table C.2 XLS-CM-N to TC810N1013 and XLS-MM-Z to TC841A1000 Terminal Conversions

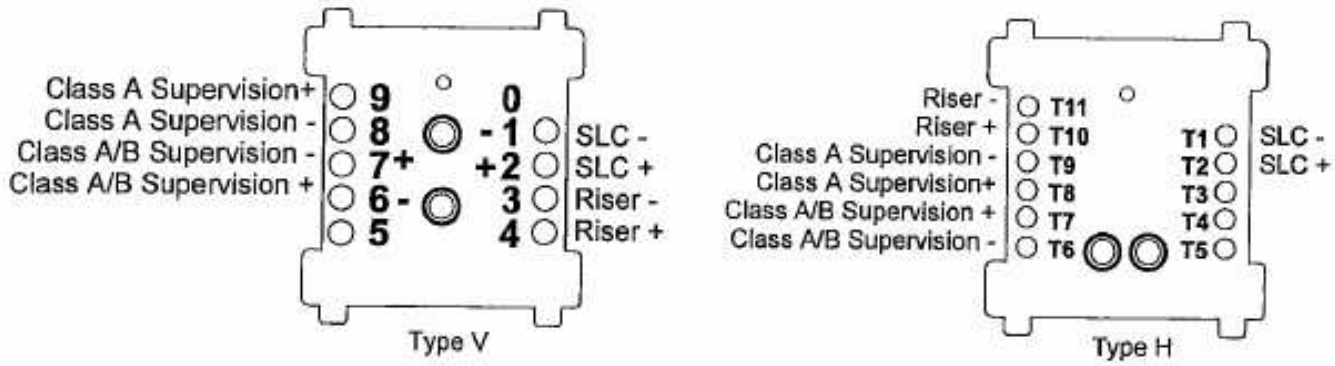
C.3 XLS-MM-A (v-type) to TC809A1059 (h-type)



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 XLS-MM-A to TC809A1059 Terminal Conversions

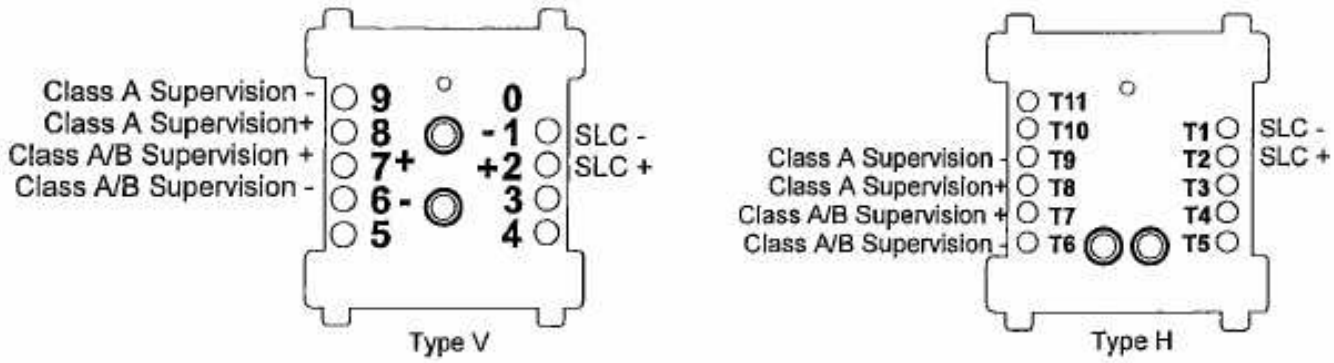
C.4 XLS-CM-T (v-type) to TC810T1000 (h-type)



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

Table C.4 XLS-CM-T to TC809A1000 Terminal Conversions

C.5 XLS-MM-D (v-type) to TC809D1004 (h-type)



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.5 XLS-MM-D to TC809D1004 Terminal Conversions

Appendix D: Intelligent Detector Base Layouts for Legacy Devices

D.1 Wiring a Detector Base

Figure D.1 shows typical wiring of the 14507371-001 or 14506414-002 detector base connected to an SLC. An optional RA100Z Remote LED Annunciator is shown connected to the base. Detector base 14507371-001 connections are identical except there is no shield terminal.

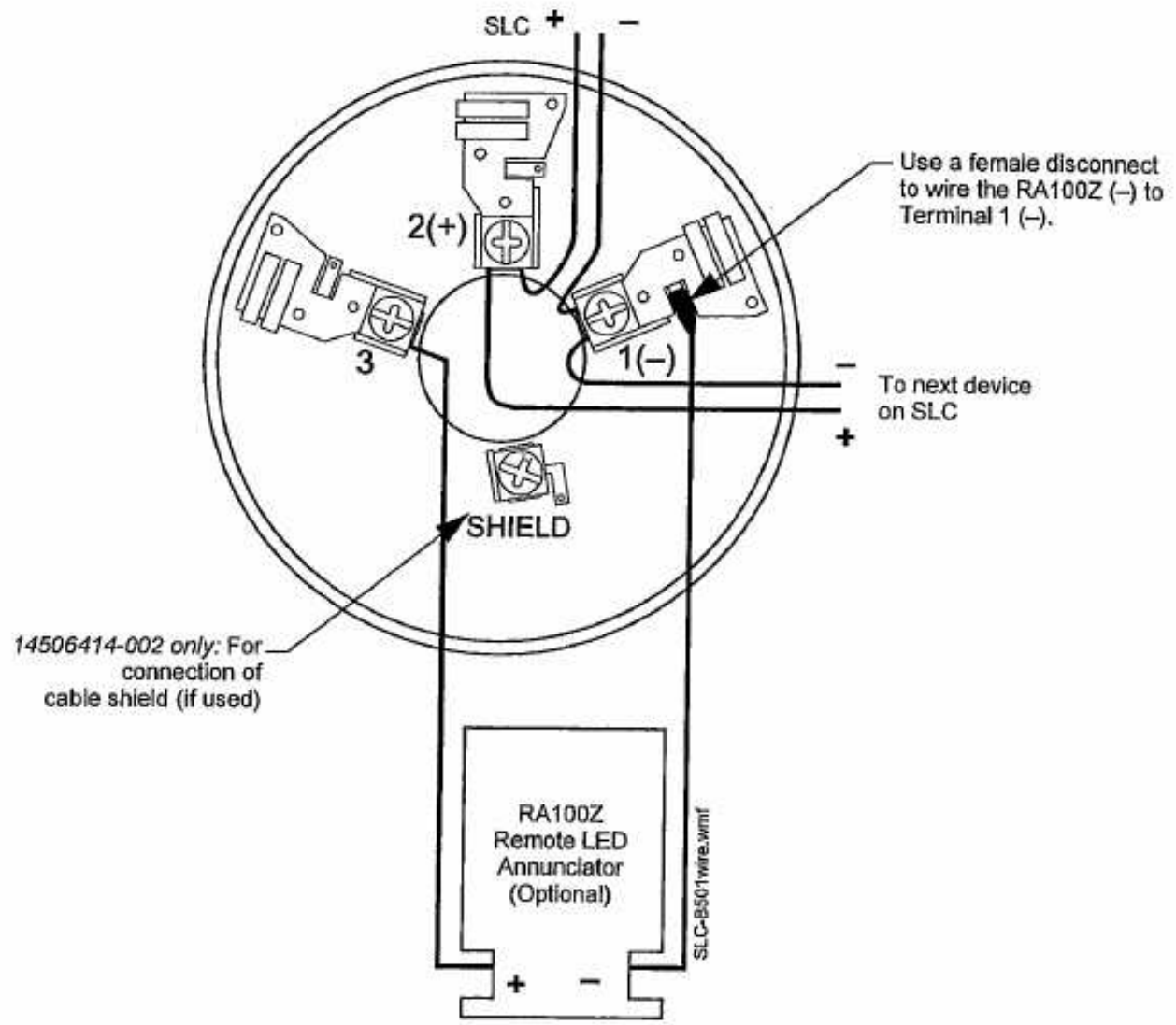


Figure D.1 Wiring of the 14507371-001 or 14506414-002 Detector Base

NOTE: The 14507371-001 base wiring is identical to the 14506414-002, except there is no shield terminal.

D.2 Wiring an Isolator Base

Figure D.2 shows typical wiring of a B224BI Isolator Base.

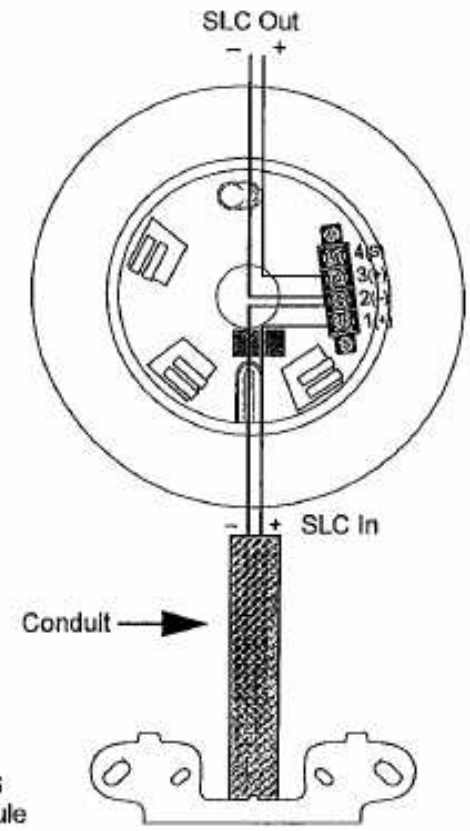


Figure D.2 Wiring an Isolator Base for FlashScan/CLIP Loops

D.3 Wiring a Relay Base

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

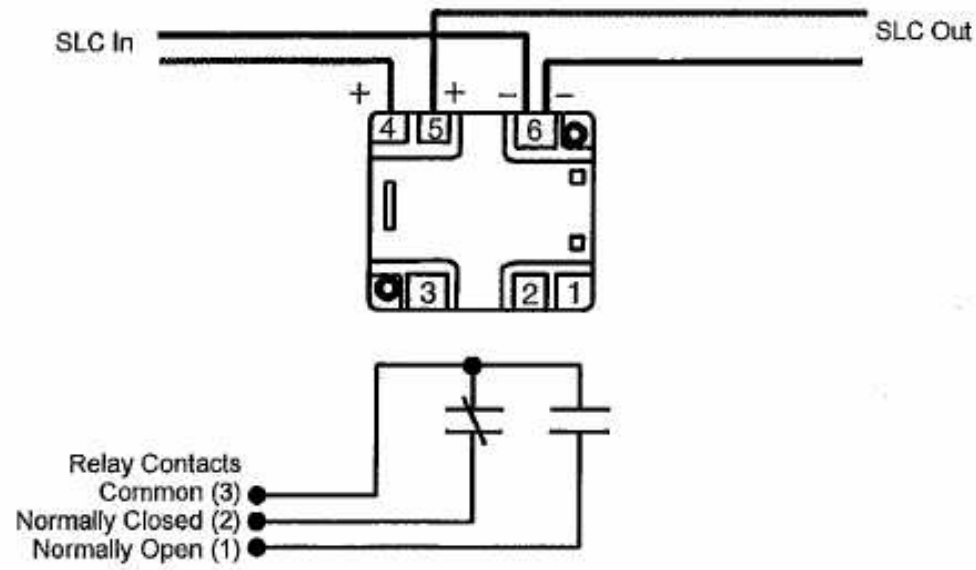


Figure D.3 Wiring of the EBR Relay Base

Figure D.4 shows typical wiring of the B224RB or 14507371-003 plug-in relay detector base connected to an SLC.

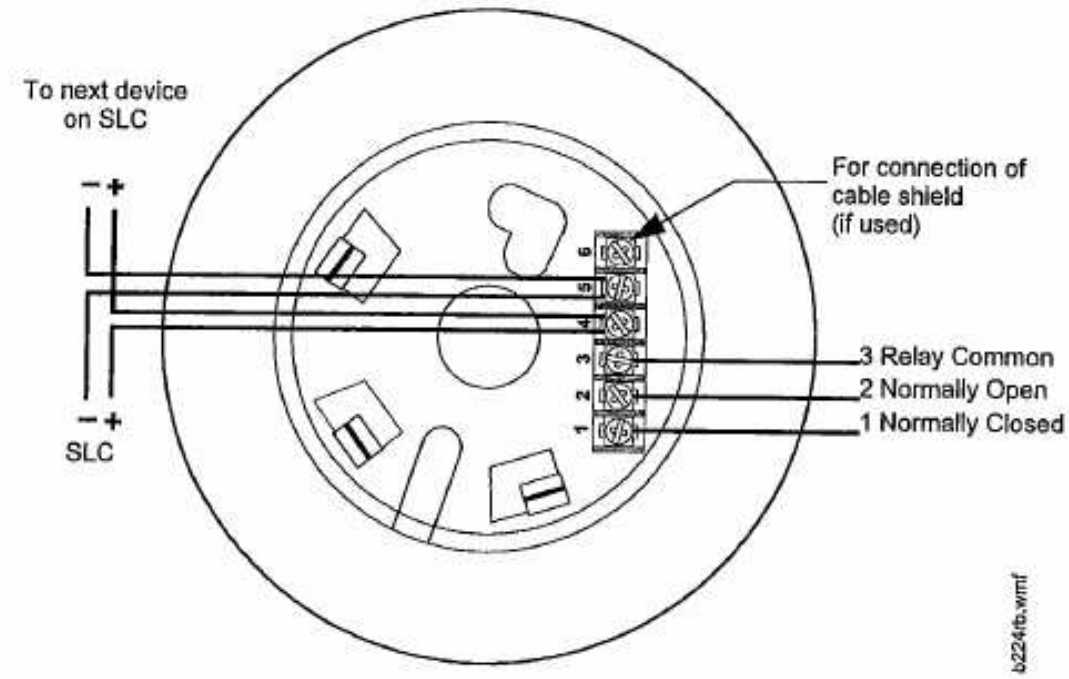


Figure D.4 Wiring of the B224RB or 14507371-003 Plug-in Relay Detector Base

D.4 Wiring a Sounder Base

Figure D.5 shows typical wiring of the EBS Eclipse-mode sounder base.

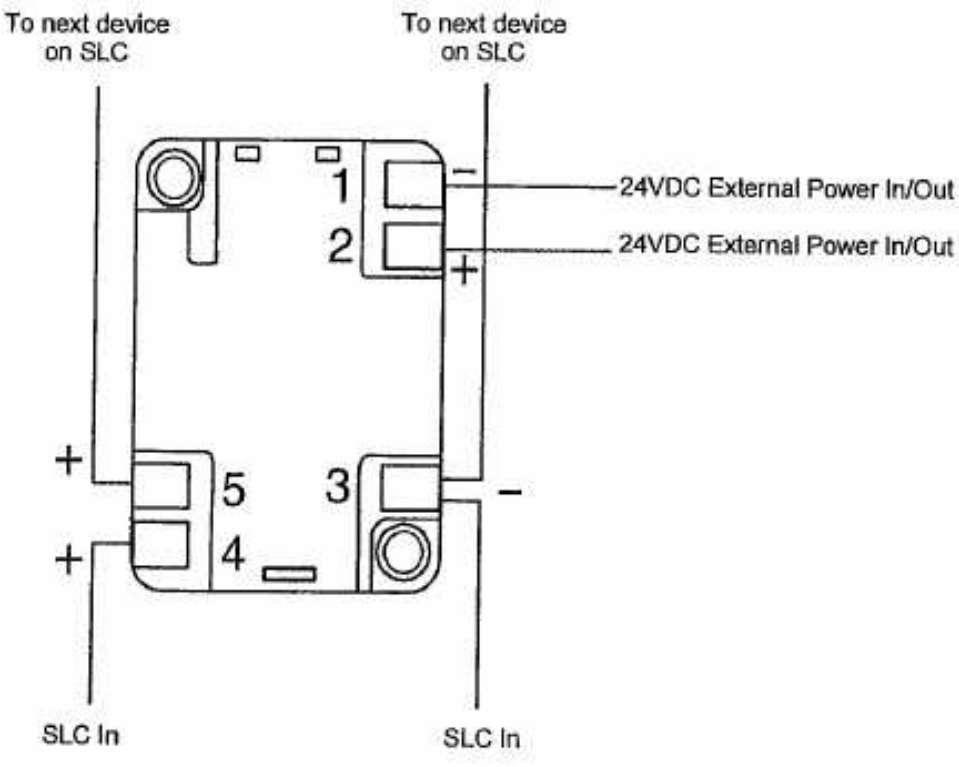


Figure D.5 Wiring of the EBS Sounder Base

Figure D.6 shows typical wiring of the B501BH(-2) and B501BHT(-2) Sounder Bases.

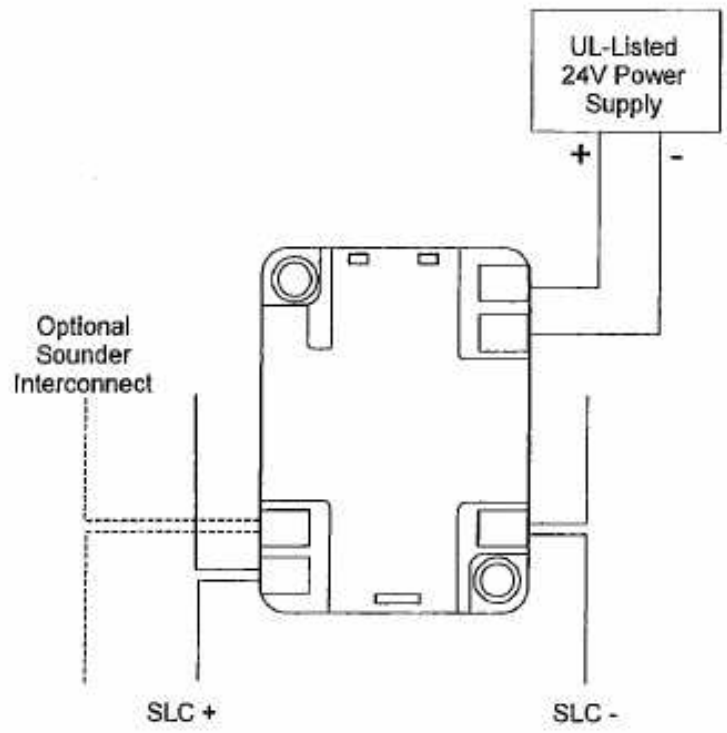


Figure D.6 Wiring the B501BH(-2) and B501BHT(-2) Sounder Bases

Appendix E: Canadian Versions of SLC Devices

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

UL-listed SLC Device	ULC-listed SLC Device	Description
Detectors		
TC840M1021 (Acclimate™)	TC840M1021CDN	Intelligent detector that combines a photoelectric sensing chamber and fixed temperature heat detection (135°F/57.2°C). FlashScan capable.
TC847A1004	TC847A1004A	Addressable, intelligent, single-ended beam smoke detector with built-in sensitivity testing. FlashScan and CLIP mode.
TC807B1059	TC807B1059CDN	Addressable, intelligent smoke detector that incorporates an ionization sensing chamber. Designed to provide open area protection. FlashScan capable.
TC806B1076	TC806B1076CDN	Analog, addressable intelligent smoke detector that uses a photoelectric sensing chamber. Listed for use in ducts. Designed to provide open area protection. FlashScan capable.
TC806B1084	N/A	Adds thermal sensors that will alarm at a fixed temperature of 135°F (57°C).
TC806DNR	TC806DNRCDN	Analog, addressable intelligent photoelectric sensor that is remote test capable. For use with DNR(W).
TC808B1041	TC808B1041CDN	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.
TC808B1058	TC808B1058CDN	Incorporates a thermal rate of rise of 15°F (9.4°C). FlashScan capable.
TC808B1066	TC808B1066CDN	High temperature sensor with 190°F (87.8°C) fixed temperature alarm.
TC806D1049	TC806D1049CDN	Photoelectric Duct Detector, Low-flow.
TC806D1056	TC806D1056CDN	Photoelectric Duct Detector, Low-flow.
TC844A1015 (FlashScan and CLIP)	N/A	Filtrex smoke detector provides early warning smoke detection in hostile environments where traditional smoke detectors are not practical.
TC846A1013 Pinnacle (FlashScan only)	TC846A1013CDN	An advanced intelligent photoelectric detector that uses a laser diode, special optics, and signal processing to obtain extremely high sensitivity.
TC840C1000	TC840C1000CDN	Intelligent multi-criteria detector that combines photoelectric sensing, heat detection, carbon monoxide and flame.
TC840C2010	TC840C2010CDN	Addressable, intelligent detector that combines a photoelectric sensing chamber combined with Carbon Monoxide (CO) sensors. FlashScan and CLIP mode only.
Bases		
B210LP	B210LPA	Standard U.S. Low-Profile base (6", 15.24 cm).
B501	B501A	Standard European flangeless base (4", 10.16 cm).
14507371-001	14507371-001CDN	Standard U.S. Low-Profile base (6", 15.24 cm). Discontinued.
B501BH, B501BHT	B501BHA, B501BHTA	Sounder base, includes 14506414-002/CDN Sounder base with temporal sounder (UL 8th Edition) Discontinued.
B501BH-2, B501BHT-2	N/A	Sounder base, includes 14506414-002/CDN Sounder base with temporal sounder (UL 9th Edition) Discontinued.
B224RB, 14507371-003	B224RBA, 14507371-003CDN	Low Profile Intelligent relay base.
B224BI, 14507371-005	B224BIA, 14507371-005CDN	Low Profile Intelligent isolator base.
14507371-008	N/A	Filtrex base.

UL-listed SLC Device	ULC-listed SLC Device	Description
B200S	N/A	Addressable sounder base.
B200SR	B200SRA	Sounder base.
Monitor and Zone Interface Modules		
XLS-MM-A (FlashScan), TC809A1059 (CLIP), TC909A1009 (Eclipse)	XLS-MM-ACDN (FlashScan), TC809A1067CDN (CLIP), TC909A1009CDN (Eclipse)	Used for normally open contact alarm initiating devices, such as manual pull stations, four-wire smoke detectors, heat detectors, waterflow, and supervisory devices.
XLS-MM-Z (FlashScan), TC841A1000 (CLIP), TC941A1005 (Eclipse)	XLS-MM-ZCDN (FlashScan), TC841A1000CDN (CLIP), , TC941A1005CDN (Eclipse)	Used to interface with two-wire smoke detectors in addition to normally open contacts.
XLS-MM-D (FlashScan), TC809D1004 (CLIP)	XLS-MM-DCDN (FlashScan), TC809D1004CDN (CLIP)	Provide 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.
XLS-MM-B (FlashScan), TC809B1008 (CLIP), TC909B1007 (Eclipse)	XLS-MM-BCDN (FlashScan), TC809B1016CDN (CLIP), TC909B1007CDN (Eclipse)	Functionally similar to the XLS-MM-A/TC809A1059/TC909A1009 Monitor Modules, but offered in a smaller package for mounting directly in the electrical box of the device being monitored. (Class B input circuit only.)
Pull Stations		
S464G1007 (CLIP), S464H1006 (Eclipse)	S464G1007 (CLIP), S464H1006 (Eclipse)	An addressable manual pull station with key-lock reset feature. The addressable module is housed within the pull station.
N/A	XLS-MPS Series	Addressable manual pull stations with hex key reset feature. The addressable module is housed within the pull station.
Control Modules		
XLS-CM-N (FlashScan), TC810N1013 (CLIP), TC910N1007 (Eclipse)	XLS-CM-NCDN (FlashScan), TC810N1013CDN (CLIP), TC910N1007CDN (Eclipse)	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.
TC810S1000	TC810S1000CDN	Control Module for releasing applications. FlashScan only.
XLS-CM-R (FlashScan), TC810R1024 (CLIP), TC910R1009 (Eclipse)	XLS-CM-RCDN (FlashScan), TC810R1024CDN (CLIP), TC910R1009CDN (Eclipse)	Relay Control Module is similar to the XLS-CM-N/TC810N1013/TC910R1009 except used as a Form-C control relay module.
XLS-CM-T, TC810T1000	XLS-CM-TCDN, TC810T1000CDN	Firefighter's Telephone Module; FlashScan-only device for use with Fire Fighters Telephone.
Fault Isolator Module		
TC811A1006	TC811A1014	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		
TC822A1010	TC822A1010CDN	Dual Class B monitor / Form-C relay module.
XP6-C (FlashScan)	XP6-CA (FlashScan)	Controls six NAC or speaker/telephone circuits. (Not listed for use in releasing applications.)
XP6-R (FlashScan)	XP6-RA (FlashScan)	Controls six Form-C relays.
XP10-M (FlashScan)	XP10-MA (FlashScan)	Supervises ten Class-B addressable Initiating Device Circuits (IDC) which monitor normally open contact initiating devices.
XP6-MA (FlashScan)	XP6-MAA (FlashScan)	Monitors six zones of conventional two-wire detectors.

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