4100-3115 XALIC
Installation and Programming Guide

Introduction

This publication describes installing and programming the 4100-3115 XA Loop Interface Card (XALIC). This card allows a 4100U or a 4100ES Fire Alarm Control Panel (FACP) to function as either the XA Loop Master or as an XA Loop Slave.

This card is compatible with a 4100U FACP or a 4100ES FACP.

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Cautions and Warnings

Cautions and Warnings

READ AND SAVE THESE INSTRUCTIONS- Follow the instructions in this installation manual. These instructions must be followed to avoid damage to this product and associated equipment. Product operation and reliability depend upon proper installation.

DO NOT INSTALL ANY SIMPLEX® PRODUCT THAT APPEARS DAMAGED- Upon unpacking your Simplex product, inspect the contents of the carton for shipping damage. If damage is apparent, immediately file a claim with the carrier and notify an authorized Simplex product supplier.

ELECTRICAL HAZARD - Disconnect electrical field power when making any internal adjustments or repairs. All repairs should be performed by a representative or authorized agent of your local Simplex product supplier.

EYE SAFETY HAZARD - Under certain fiber optic application conditions, the optical output of this device may exceed eye safety limits. Do not use magnification (such as a microscope or other focusing equipment) when viewing the output of this device.

STATIC HAZARD - Static electricity can damage components. Handle as follows:

- Ground yourself before opening or installing components.
- Prior to installation, keep components wrapped in anti-static material at all times.

FCC RULES AND REGULATIONS – PART 15 - This equipment has been tested and found to comply with the limits for a Class A digital device pursuant to Part 15 of the FCC Rules. These limits are designed to provide reasonable protection against harmful interference when the equipment is operated in a commercial environment. This equipment generates, uses, and can radiate radio frequency energy and, if not installed and used in accordance with the instruction manual, may cause harmful interference to radio communications. Operation of this equipment in a residential area is likely to cause harmful interference in which case the user will be required to correct the interference at his own expense.

SYSTEM REACCEPTANCE TEST AFTER SOFTWARE CHANGES - To ensure proper system operation, this product must be tested in accordance with NFPA 72® after any programming operation or change in site-specific software. Reacceptance testing is required after any change, addition or deletion of system components, or after any modification, repair or adjustment to system hardware or wiring.

All components, circuits, system operations, or software functions, known to be affected by a change, must be 100% tested. In addition, to ensure that other operations are not inadvertently affected, at least 10% of initiating devices that are not directly affected by the change, up to a maximum of 50 devices, must also be tested and proper system operation verified.

Overview and Specifications

Overview

The XA loop is a three- or four-wire Autocall® communication channel, consisting of one master and one or more slaves. The XA Loop Interface Card (XALIC) connects the FACP to the XA loop, and allows the FACP to function as either the XA loop master or as an XA loop slave.

- **FACP XA Loop Master.** In this case, the FACP replaces an existing Autocall head end. When operating as the XA loop master, the FACP can issue ON/OFF control commands to XA devices, and monitor the alarm, trouble, and normal status of all XA devices on the loop.
- **FACP XA Loop Slave.** Devices attached to the FACP can be either of the following.
  - XALIC Status Points. Custom control is used to pass the FACP point status changes to the Autocall head end via the XA devices represented by the XALIC.
  - XALIC Control Points. This type of point works in a similar manner. Custom control on the FACP monitors the state of the XALIC points and performs specific functions (signal silence, alarm reset, etc.) when the Autocall head end turns a specific XALIC point on or off.

XALIC Components

The XALIC card, shown in Figure 1, contains the following major components.

Table 1. XALIC Components

Component	Description
Connectors and Terminal Blocks	TB3 connects the XALIC to the XA loop. 18-position terminal block consists of two separate sets of terminals, one for master operation and one for slave operation. P4 (PDI Connector), a 10-pin connector located on the reverse side of the PCB. Used for connecting to the FACP's Power Distribution Interface (PDI). TB1 (RUI Connector), a 3-position terminal block used for connecting Style 4 RUI. TB2 (AUX Power Connection), used for connecting the XALIC to an auxiliary power supply.
Jumpers and Switches	P1 and P2 (Power Source Jumpers) select the power source (System Power Supply or Auxiliary Power Supply) used by the XALIC. P3 (Earth Detect Jumper) used to connect/disconnect the Earth detect circuitry. SW1 sets XA loop options (3- or 4-wire loop), scan rate, master/slave operation. SW2 (Address Dip Switch) configures the FACP's address used by the XALIC card. Address set via dipswitch must match address programmed via the FACP programmer.
LEDs	LED 1. XA Loop Status • OFF -- Normal • Steady ON – XA Loop Channel Failure • Single Blink – XA Loop Wiring Fault LED 2 4100 Communication Status. OFF indicates the card is communication normally. ON indicates a trouble condition with the communication channel between the XALIC and the FACP. LED 3. Supervision. Flashes once every XA loop polling cycle (XA loop master only).

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XALIC Components

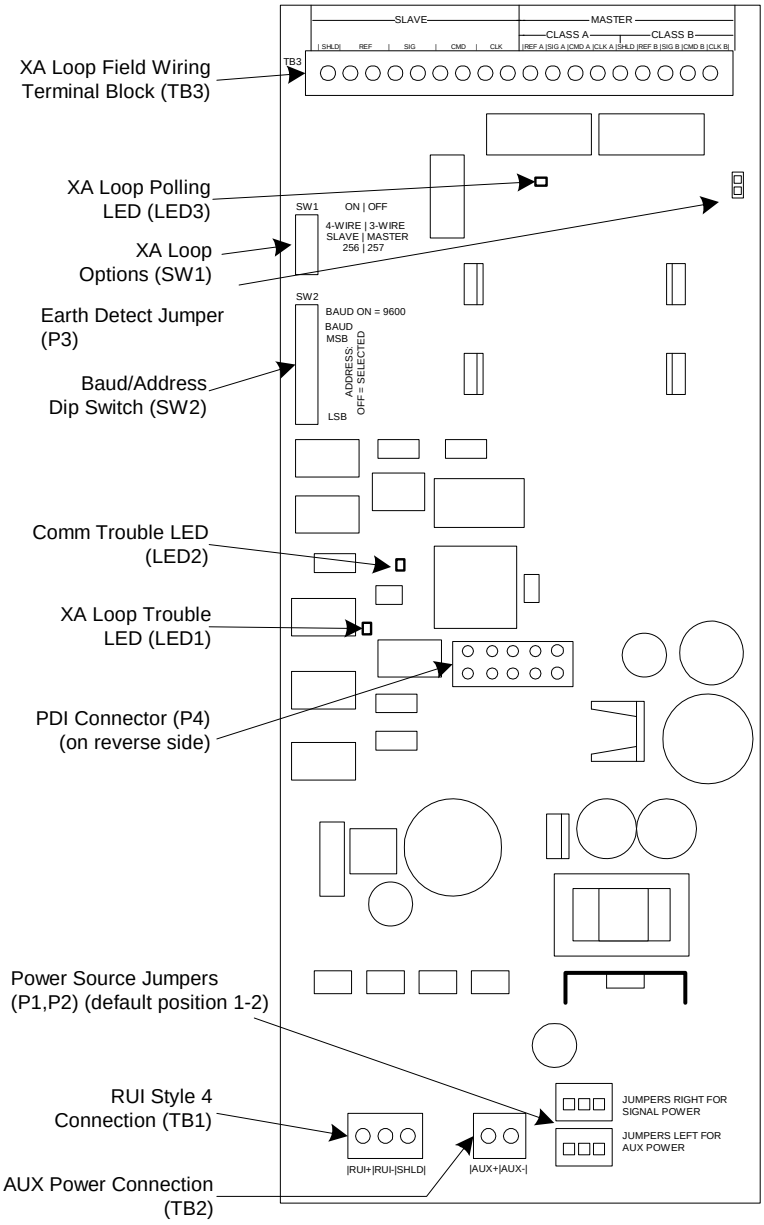

Figure 1. Location of Major XALIC Components

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Specifications

Table 2. Specifications

Category	Attribute	Specification
XA Line Interface Card	Current Draw – XA Loop Master	570 mA @ 24 VDC, maximum
	Current Draw – XA Loop Slave	70 mA @ 24 VDC
	Power	Nominal 24 VDC from FACP. When power is provided through the AUX + and AUX – terminals, the power must be provided by a power supply that is UL-listed for fire protective signaling use.
XA Loop	Max. Resistance	100 Ω per wire
	Max. Capacitance	1.5 μf wire-to-wire 1.5 μf wire-to-shield
	Normal Supervision Current	500 mA
	Maximum Alarm Current	500 mA
	Voltage/Frequency	24 VAC / 250 Hz
	Max. Number of Addresses per Loop	255
Environmental	Temperature	0° C (32° F) to 49° C (120° F), inclusive
	Humidity	Up to 93% relative humidity (non-condensing) @ 32° C (90° F)

Setting DIP Switch SW2, XALIC Card Address

The XALIC card address is set via DIP switch SW2, which is a bank of eight switches. From left to right (see Figure 2, below) these switches are designated as SW2-1 through SW2-8. The function of these switches is as follows:

- **SW2-1**. This switch sets the baud rate for the internal FACP communications line running between the card and the FACP CPU. Set this switch to ON.
- **SW2-2 through SW2-8**. These switches set the card address. Refer to Table 3 for a complete list of the switch settings for all of the possible card addresses.

  Note: You must set these switches to the value assigned to the card by the FACP Programmer.

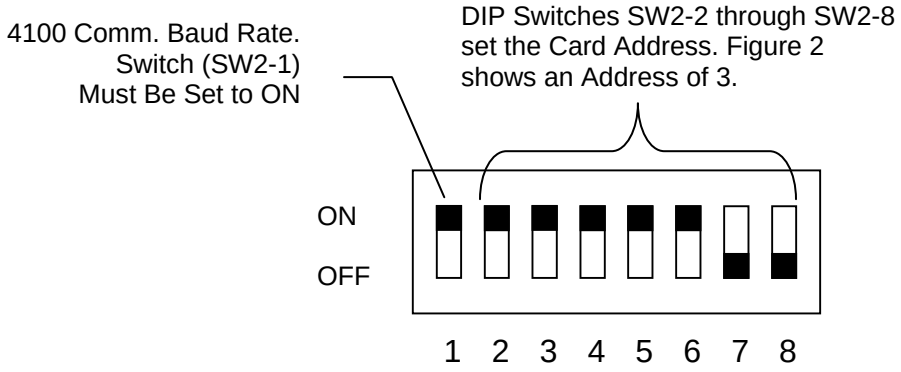

Figure 2. DIP Switch SW2

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Setting DIP Switch SW2, XALIC Card Address

Table 3. XALIC Addresses

Address	SW 1-2	SW 1-3	SW 1-4	SW 1-5	SW 1-6	SW 1-7	SW 1-8	Address	SW 1-2	SW 1-3	SW 1-4	SW 1-5	SW 1-6	SW 1-7	SW 1-8
1	ON	ON	ON	ON	ON	ON	OFF	61	ON	OFF	OFF	OFF	OFF	ON	OFF
2	ON	ON	ON	ON	ON	OFF	ON	62	ON	OFF	OFF	OFF	OFF	OFF	ON
3	ON	ON	ON	ON	ON	OFF	OFF	63	ON	OFF	OFF	OFF	OFF	OFF	OFF
4	ON	ON	ON	ON	OFF	ON	ON	64	OFF	ON	ON	ON	ON	ON	ON
5	ON	ON	ON	ON	OFF	ON	OFF	65	OFF	ON	ON	ON	ON	ON	OFF
6	ON	ON	ON	ON	OFF	OFF	ON	66	OFF	ON	ON	ON	ON	OFF	ON
7	ON	ON	ON	ON	OFF	OFF	OFF	67	OFF	ON	ON	ON	ON	OFF	OFF
8	ON	ON	ON	OFF	ON	ON	ON	68	OFF	ON	ON	ON	OFF	ON	ON
9	ON	ON	ON	OFF	ON	ON	OFF	69	OFF	ON	ON	ON	OFF	ON	OFF
10	ON	ON	ON	OFF	ON	OFF	ON	70	OFF	ON	ON	ON	OFF	OFF	ON
11	ON	ON	ON	OFF	ON	OFF	OFF	71	OFF	ON	ON	ON	OFF	OFF	OFF
12	ON	ON	ON	OFF	OFF	ON	ON	72	OFF	ON	ON	OFF	ON	ON	ON
13	ON	ON	ON	OFF	OFF	ON	OFF	73	OFF	ON	ON	OFF	ON	ON	OFF
14	ON	ON	ON	OFF	OFF	OFF	ON	74	OFF	ON	ON	OFF	ON	OFF	ON
15	ON	ON	ON	OFF	OFF	OFF	OFF	75	OFF	ON	ON	OFF	ON	OFF	OFF
16	ON	ON	OFF	ON	ON	ON	ON	76	OFF	ON	ON	OFF	OFF	ON	ON
17	ON	ON	OFF	ON	ON	ON	OFF	77	OFF	ON	ON	OFF	OFF	ON	OFF
18	ON	ON	OFF	ON	ON	OFF	ON	78	OFF	ON	ON	OFF	OFF	OFF	ON
19	ON	ON	OFF	ON	ON	OFF	OFF	79	OFF	ON	ON	OFF	OFF	OFF	OFF
20	ON	ON	OFF	ON	OFF	ON	ON	80	OFF	ON	OFF	ON	ON	ON	ON
21	ON	ON	OFF	ON	OFF	ON	OFF	81	OFF	ON	OFF	ON	ON	ON	OFF
22	ON	ON	OFF	ON	OFF	OFF	ON	82	OFF	ON	OFF	ON	ON	OFF	ON
23	ON	ON	OFF	ON	OFF	OFF	OFF	83	OFF	ON	OFF	ON	ON	OFF	OFF
24	ON	ON	OFF	OFF	ON	ON	ON	84	OFF	ON	OFF	ON	OFF	ON	ON
25	ON	ON	OFF	OFF	ON	ON	OFF	85	OFF	ON	OFF	ON	OFF	ON	OFF
26	ON	ON	OFF	OFF	ON	OFF	ON	86	OFF	ON	OFF	ON	OFF	OFF	ON
27	ON	ON	OFF	OFF	ON	OFF	OFF	87	OFF	ON	OFF	ON	OFF	OFF	OFF
28	ON	ON	OFF	OFF	OFF	ON	ON	88	OFF	ON	OFF	OFF	ON	ON	ON
29	ON	ON	OFF	OFF	OFF	ON	OFF	89	OFF	ON	OFF	OFF	ON	ON	OFF
30	ON	ON	OFF	OFF	OFF	OFF	ON	90	OFF	ON	OFF	OFF	ON	OFF	ON
31	ON	ON	OFF	OFF	OFF	OFF	OFF	91	OFF	ON	OFF	OFF	ON	OFF	OFF
32	ON	OFF	ON	ON	ON	ON	ON	92	OFF	ON	OFF	OFF	OFF	ON	ON
33	ON	OFF	ON	ON	ON	ON	OFF	93	OFF	ON	OFF	OFF	OFF	ON	OFF
34	ON	OFF	ON	ON	ON	OFF	ON	94	OFF	ON	OFF	OFF	OFF	OFF	ON
35	ON	OFF	ON	ON	ON	OFF	OFF	95	OFF	ON	OFF	OFF	OFF	OFF	OFF
36	ON	OFF	ON	ON	OFF	ON	ON	96	OFF	OFF	ON	ON	ON	ON	ON
37	ON	OFF	ON	ON	OFF	ON	OFF	97	OFF	OFF	ON	ON	ON	ON	OFF
38	ON	OFF	ON	ON	OFF	OFF	ON	98	OFF	OFF	ON	ON	ON	OFF	ON
39	ON	OFF	ON	ON	OFF	OFF	OFF	99	OFF	OFF	ON	ON	ON	OFF	OFF
40	ON	OFF	ON	OFF	ON	ON	ON	100	OFF	OFF	ON	ON	OFF	ON	ON
41	ON	OFF	ON	OFF	ON	ON	OFF	101	OFF	OFF	ON	ON	OFF	ON	OFF
42	ON	OFF	ON	OFF	ON	OFF	ON	102	OFF	OFF	ON	ON	OFF	OFF	ON
43	ON	OFF	ON	OFF	ON	OFF	OFF	103	OFF	OFF	ON	ON	OFF	OFF	OFF
44	ON	OFF	ON	OFF	OFF	ON	ON	104	OFF	OFF	ON	OFF	ON	ON	ON
45	ON	OFF	ON	OFF	OFF	ON	OFF	105	OFF	OFF	ON	OFF	ON	ON	OFF
46	ON	OFF	ON	OFF	OFF	OFF	ON	106	OFF	OFF	ON	OFF	ON	OFF	ON
47	ON	OFF	ON	OFF	OFF	OFF	OFF	107	OFF	OFF	ON	OFF	ON	OFF	OFF
48	ON	OFF	OFF	ON	ON	ON	ON	108	OFF	OFF	ON	OFF	OFF	ON	ON
49	ON	OFF	OFF	ON	ON	ON	OFF	109	OFF	OFF	ON	OFF	OFF	ON	OFF
50	ON	OFF	OFF	ON	ON	OFF	ON	110	OFF	OFF	ON	OFF	OFF	OFF	ON
51	ON	OFF	OFF	ON	ON	OFF	OFF	111	OFF	OFF	ON	OFF	OFF	OFF	OFF
52	ON	OFF	OFF	ON	OFF	ON	ON	112	OFF	OFF	OFF	ON	ON	ON	ON
53	ON	OFF	OFF	ON	OFF	ON	OFF	113	OFF	OFF	OFF	ON	ON	ON	OFF
54	ON	OFF	OFF	ON	OFF	OFF	ON	114	OFF	OFF	OFF	ON	ON	OFF	ON
55	ON	OFF	OFF	ON	OFF	OFF	OFF	115	OFF	OFF	OFF	ON	ON	OFF	OFF
56	ON	OFF	OFF	OFF	ON	ON	ON	116	OFF	OFF	OFF	ON	OFF	ON	ON
57	ON	OFF	OFF	OFF	ON	ON	OFF	117	OFF	OFF	OFF	ON	OFF	ON	OFF
58	ON	OFF	OFF	OFF	ON	OFF	ON	118	OFF	OFF	OFF	ON	OFF	OFF	ON
59	ON	OFF	OFF	OFF	ON	OFF	OFF	119	OFF	OFF	OFF	ON	OFF	OFF	OFF
60	ON	OFF	OFF	OFF	OFF	ON	ON								

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Setting XA Loop Options (SW1)

SW1 is a four-position switch used to select the following operational characteristics. See figure below for an illustration of the switch.

- **Three Wire / Four Wire (SW1-1).** This switch selects whether the XALIC is connected to a three-wire or four-wire loop. ON equals three-wire; OFF equals four-wire. (When operating in three-wire mode, the command line is absent.) Three-wire can only be selected if **no** XA output-type devices are connected to the loop.
- **Master / Slave Operation (SW1-2)**. This switch selects whether the XALIC is operating as the master or slave. ON equals master; OFF equals slave.
- **Scan Rate (SW1-3).** This switch selects the number of clock pulses in a complete scan of the XA loop. ON equals 256 pulses; OFF equals 257 pulses. Set this switch to 256 pulses for all Autocall panels except the AL1500 and AC-II which require the 257-pulse setting.

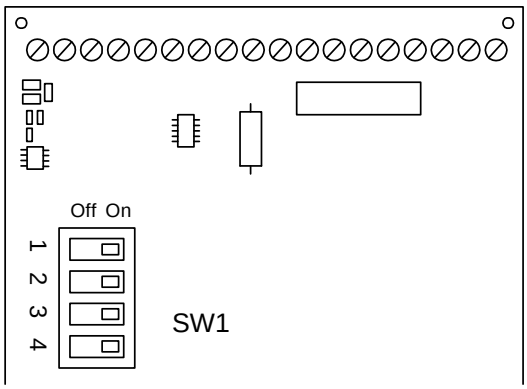

Figure 3. Location of SW1

Setting Power and Ground Jumpers

Jumpers P1 and P2 select the power and ground source for the XALIC. Set these jumpers as follows, depending on whether you are connecting AUX power or Signal Power (via PDI) to the XALIC.

- **Signal Power.** Place Jumpers P1 and P2 in the rightmost positions (covering pins 1 and 2) to select the Signal Power as the power and ground source for the XALIC. When these jumpers are installed in this manner, the XALIC receives both power and ground via the PDI.
- **AUX Power**. Place Jumpers P1 and P2 in the leftmost positions (covering pins 2 and 3) to select AUX power as the power and ground source for the XALIC. When these jumpers are installed in this manner, the XALIC receives both power and ground via the AUX power source.

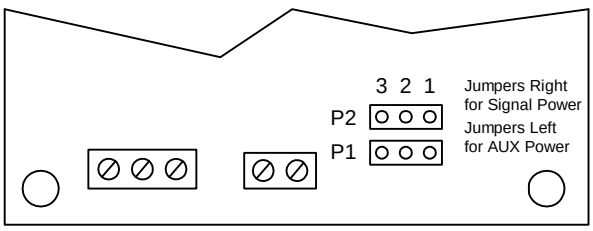

Figure 4. Location of Jumpers P1 and P2

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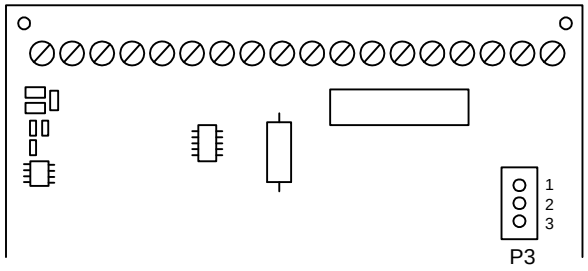
Setting Jumper P3, Earth Detect

The setting of Jumper P3 determines whether the XALIC card detects and reports Earth faults to the FACP. Earth Detect should only be enabled when the XALIC card is configured as the XA Loop Master. Disable Earth Detect if the XALIC is being configured as an XA Loop Slave.

To enable Earth Detect, place the jumper in positions 1-2. To disable Earth Detect, place the jumper in positions 2-3.



Install Jumper on pins 1 and 2 for Earth Detect (XA Loop Master Only). Install Jumper on pins 2 and 3 for XA Loop Slave Operation

Figure 5. Location of P3

Overview

This section describes installing the XALIC in the following three situations:

- Expansion Bay Contains XPS, RPS, or expansion SPS ***and*** Backbox Contains TIC or Master Controller.
- Expansion Bay **Does Not** Contain XPS, RPS, or expansion SPS but Backbox Contains TIC or Master Controller.
- Backbox does not have PDI or XPS, RPS or expansion SPS.

Expansion Bay Contains XPS, RPS or SPS and Backbox Contains TIC or Master Controller

If the expansion bay in which the XALIC is installed contains an XPS, RPS, or an expansion SPS ***and*** the backbox contains a Transponder Interface Card (TIC) or Master Controller, the XALIC can receive both power and communication via the PDI. No connections to the XALIC's RUI or AUX Power connectors are required.

Important Note: The power supply (XPS, RPS, SPS) must be located in the same expansion bay as the XALIC.

The XALIC has a form factor of 4" x 10" (101 x 254 mm), and requires a full-length slot in an expansion chassis. Locate an available slot for the card and use the PDI connector (P4) on the backside of the XALIC card to connect to one of the PDI connectors on the lower row, as shown in the figure below. Secure the card to the Expansion Chassis using the supplied hardware.

Note: Jumper P1 and Jumper P2 must be installed in the rightmost positions (pins 1-2). This is the default position. Refer back to Figure 4 for the location of these jumpers.

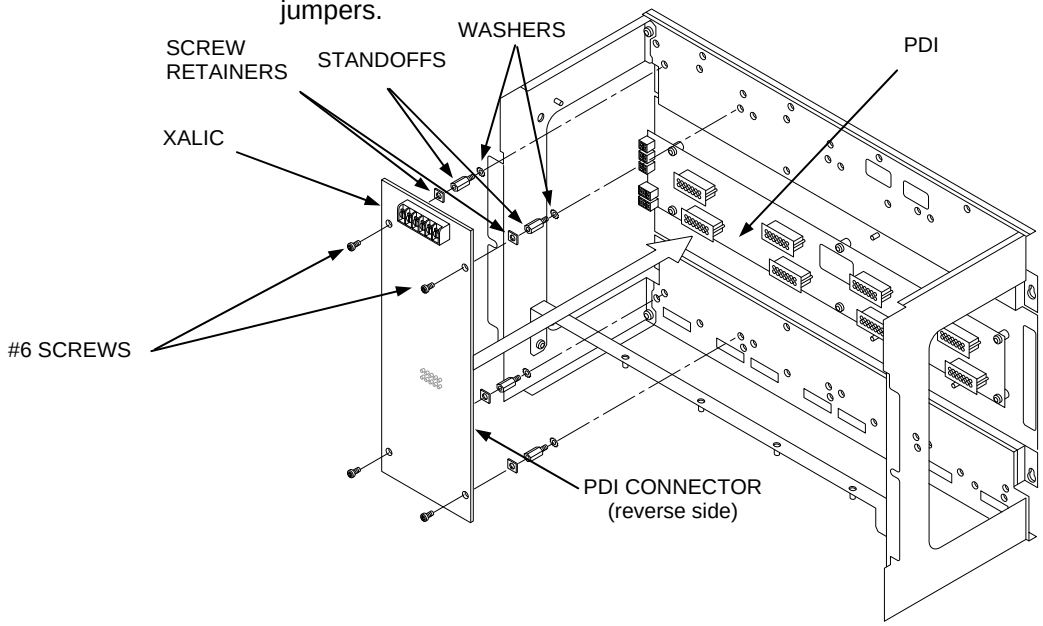


Figure 6. Mounting to the Power Distribution Interface

Expansion Bay Does Not Contain XPS, RPS, or SPS But Backbox Contains Master Controller or TIC

If the expansion bay in which the XALIC is installed **does not** contain an XPS, RPS, or expansion SPS, but the backbox contains either a TIC or Master Controller, the XALIC cannot receive power via the PDI but it can use the PDI to communicate with the TIC or Master Controller. In this situation, the XALIC must be wired to an AUX Power source that is UL-listed for fire protective signaling use.

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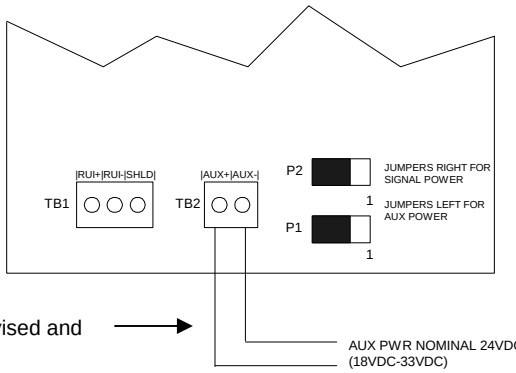
Expansion Bay Does Not Contain XPS, RPS, or SPS But Backbox Contains Master Controller or TIC

The XALIC has a form factor of 4" x 10" (101 x 254 mm), and requires a full-length slot in an expansion chassis. Locate an available slot for the card and use the PDI connector (P4) on the backside of the XALIC card to connect to one of the PDI connectors on the lower row, as shown in Figure 6 above. Secure the card to the Expansion Chassis using the supplied hardware.

Place Jumpers P1 and P2 in the leftmost position and connect the XALIC to the Aux power source as shown in the figure below.

Note: In this configuration, the XALIC receives internal Panel communications from the PDI. Do not wire RUI communications to TB1.



Note: AUX power must be provided by the Panel or power-limited power supply UL-listed for fire protective signaling use.

Figure 7. Connecting to AUX Power

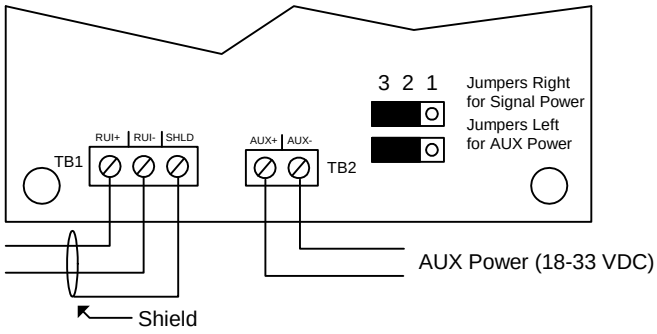
Backbox Does Not Contain XPS, RPS, or SPS, and does not Contain PDI

If the XALIC is installed in a backbox that contains neither a power supply (XPS, RPS, or expansion SPS) or a PDI, it requires power from an Aux Power source and must be connected via its RUI terminals to a TIC or Master Controller in another backbox. Aux power and RUI wiring is supervised and power-limited. Aux power must come from either the FACP, or from a regulated, power-limited supply that is UL-listed for Fire Protective Signaling Use.

The XALIC has a form factor of 4" x 10" (101 x 254 mm), and requires a full-length slot in an expansion chassis. Secure the card to the backbox using the hardware supplied with the card.

Place Jumpers P1 and P2 in the leftmost position and connect the XALIC to the Aux power source as shown in the figure below. Connect the RUI terminals on the card to the RUI terminals on a TIC or Master Controller in a separate backbox.

Note: When the XALIC is installed in this manner, the XA loop devices shall not be programmed as inputs that serve as initiating devices for preaction/deluge service, if the Panel is so configured.



Note: AUX power must be provided by the Panel or power-limited power supply UL-listed for fire protective signaling use.

Figure 8. Connecting to AUX Power and RUI

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Class A Wiring – XALIC Configured as XA Loop Master

Wire must be 12 AWG (3.309 mm^2) to 18 AWG (0.8231 mm^2), non-power limited. Wiring must test free of all grounds. Wire as follows:

1. Route wire from the CLK B, CMD B, SIG B, REF B and SHLD outputs of the XALIC card to the appropriate inputs on a XA Loop device.

2. Route wire from the first XA Loop device to the next one. Repeat for each appliance.

3. Route wire from the last XA Loop device to the CLK A, CMD A, SIG A, REF A and SHLD inputs on TB3 of the XALIC.

Note: Class A wiring is required if any of the XA loop devices are intended to serve as initiating devices that initiate a preaction/deluge function.

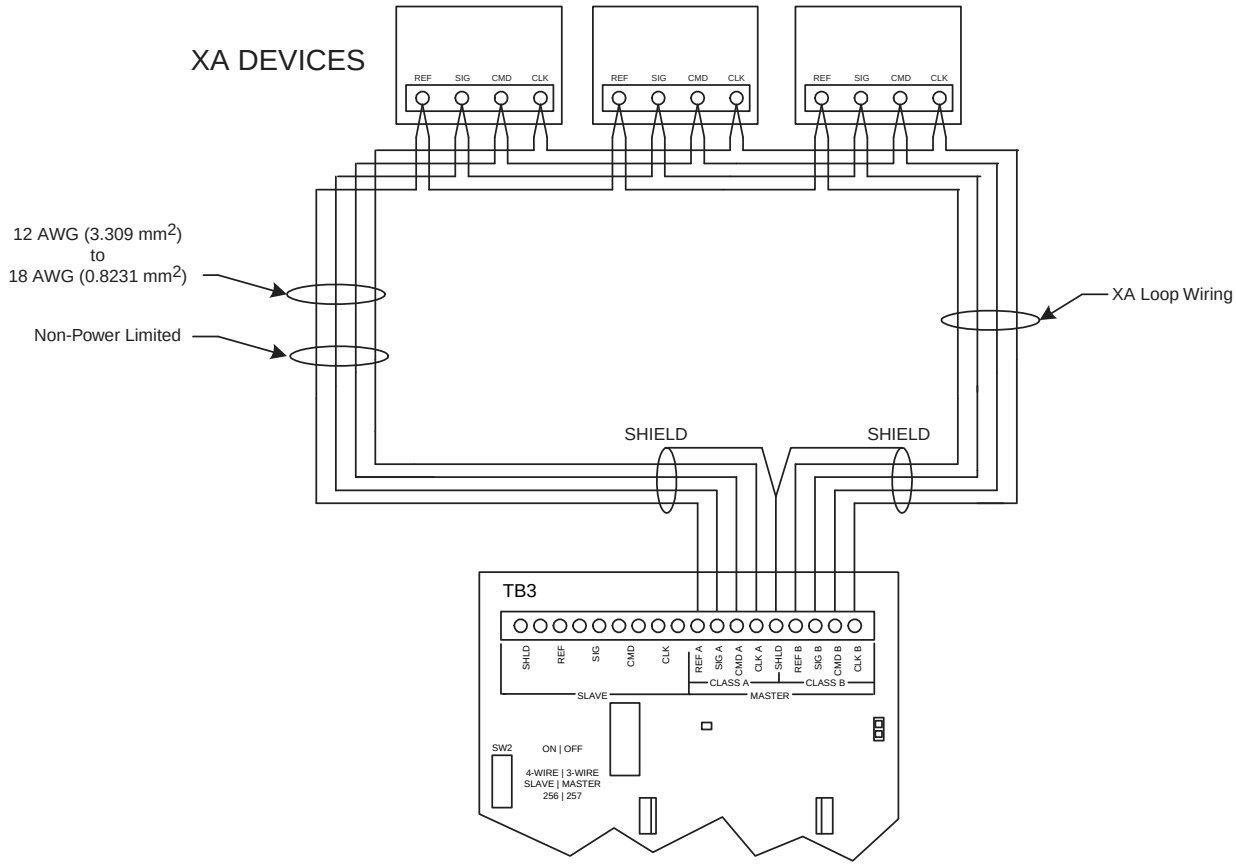

Figure 9. Class A Wiring, XALIC Configured as an XA Loop Master

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Class B Wiring – XALIC Configured as XA Loop Master

To connect the XA Loop Interface Card (XALIC) to devices using Class B wiring, do the following.

1. On TB3 jumper REF A to REF B, SIG A to SIG B, CMD A to CMD B and CLK A to CLK B. If the jumper is absent a XA Loop Wiring fault will be indicated.

2. Route wire from the CLK B, CMD B, SIG B, REF B and SHLD outputs of the XALIC card to the appropriate inputs on a XA Loop device.

3. Route wire from the first XA Loop device to the next one. Repeat for each appliance.

4. Connect an End-of-Line Supervisory device at the end of the XA Loop.

Note: This configuration shall not be used if the FACP is providing preaction/deluge service.

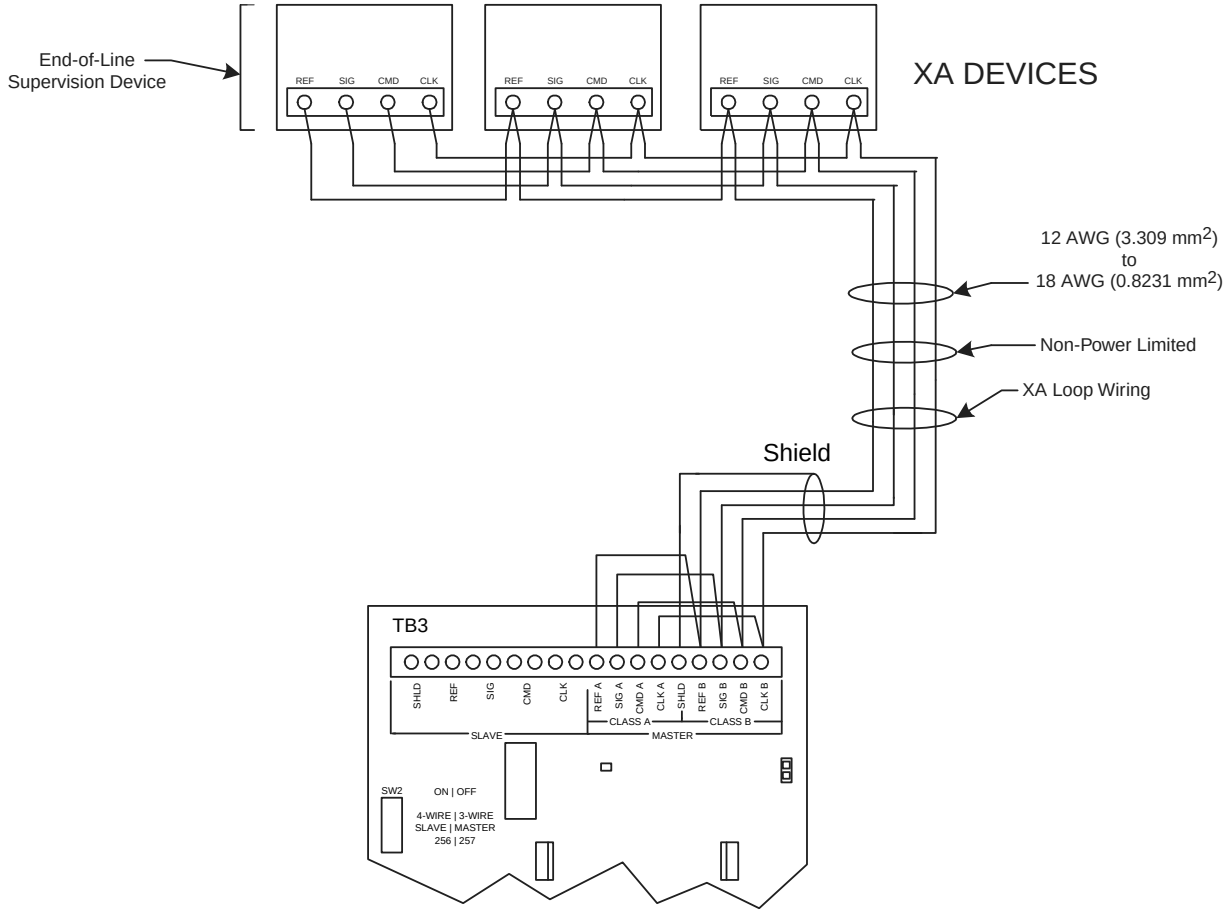

Figure 10. Class B Wiring, XALIC Configured as XA Loop Master

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Wiring -- XALIC Configured as XA Loop Slave

To connect the XA Loop Interface Card (XALIC) as a Slave on the XA Loop, do the following.

1. Route CLK, CMD, SIG, REF and SHLD from the previous XA Device / XA Master to TB3 on the XALIC card. From TB3, Route CLK, CMD, SIG, REF and SHLD to next XA device.

Note: TB3 positions 10-11, 12-13, 14-15, 16-17 are internally connected.

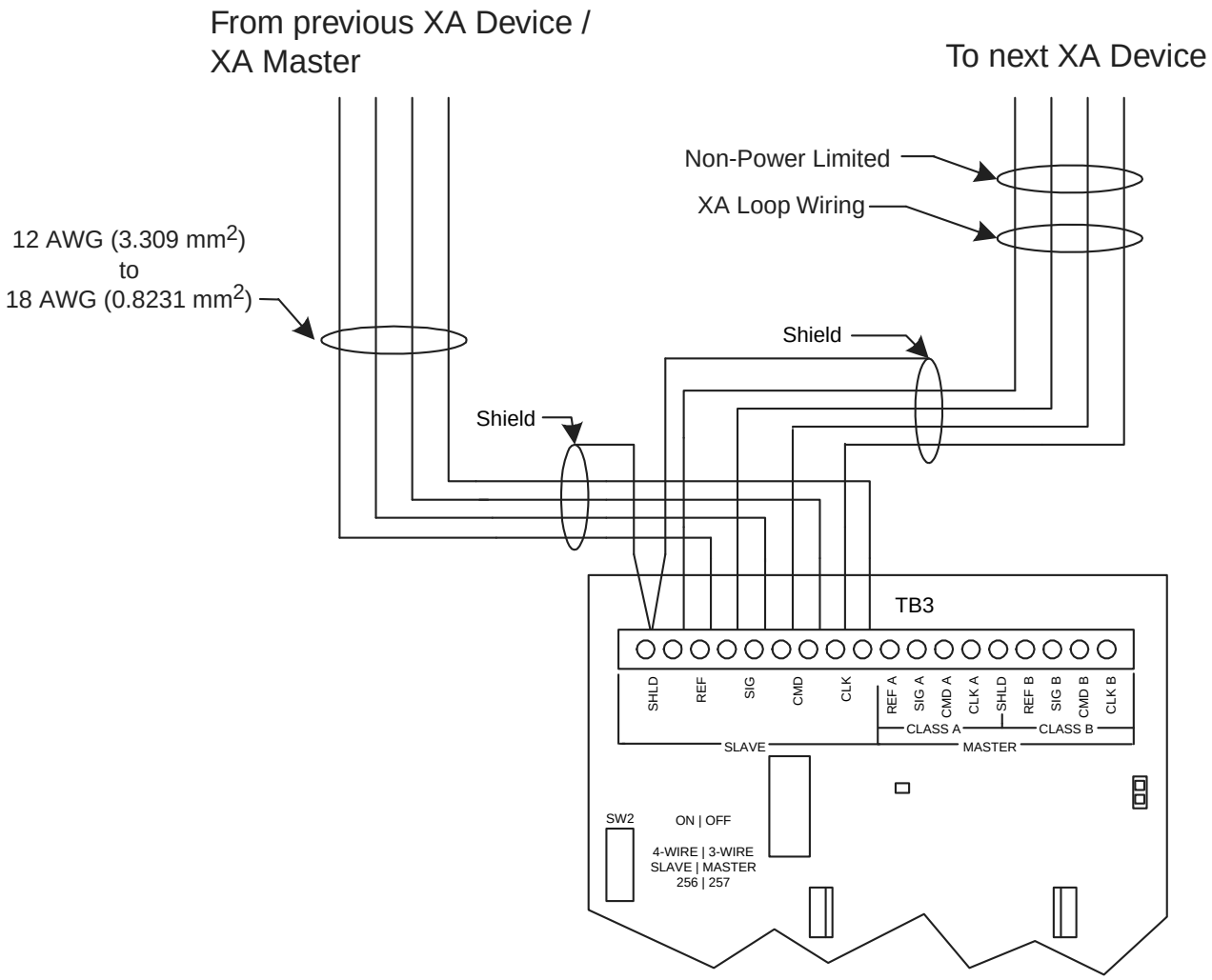


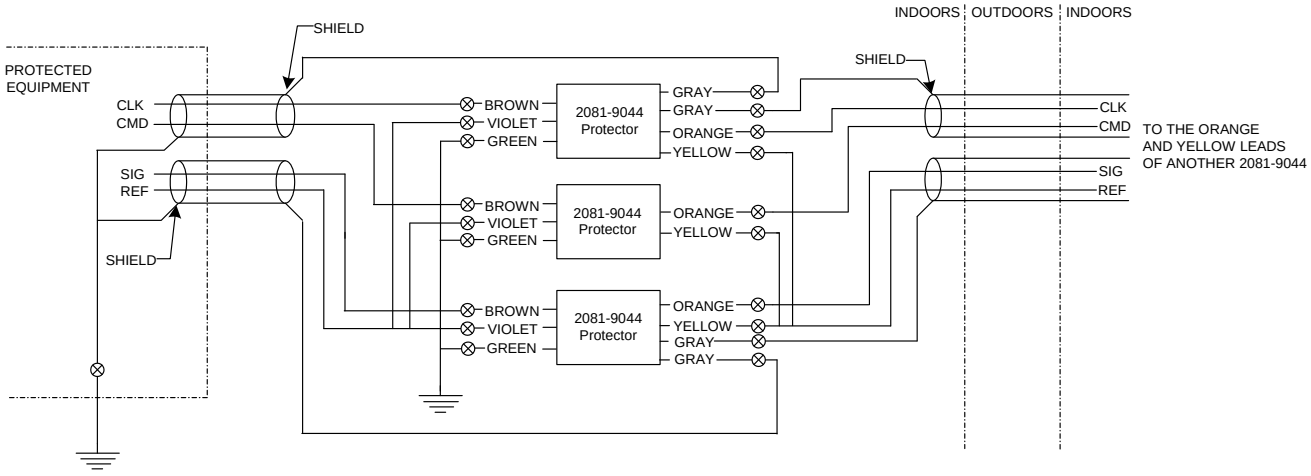
Figure 11. XALIC Configured as XA Loop Slave

Overvoltage Protection Wiring for XA Loop

All wiring that leaves a building requires overvoltage protection. Install the Module 2081-9044 whenever wire enter or exits a building. Refer to Figure 12 for Overvoltage Protection wiring. Refer to the 2081-9044 Overvoltage Protector Installation Instructions (574-832) for specific details regarding the installation of the 2081-9044 modules.

For each installed pair of 2081-9044 modules, the maximum wiring resistance is reduced by 6 ohms, and the wire-to-wire resistance & wire-to-shield capacitance are reduced by 0.012uF. With 2081-9044 modules installed, the maximum number of addresses occupied by XA loop devices (1, 2, 4, or 8 pt. input-output, output only, or input only) is limited to 200 based upon current limitations. There is no address limitation for Data Gathering Panels (DGPs). In Class B installations, this limitation only applies to devices after the 2081-9044 connection to the head-end panel. In Class A installations, limitations apply for the entire loop.

The following example describes a system in which the addresses occupied by1, 2, 4, or 8 pt. XA Loop devices is limited to 200 while a DGP occupies the remaining addresses without regard to the 200-device limit. **Example:** There are 150 addresses occupied by input only devices (1, 2, 4, or 8 pt.); 50 addresses occupied by output only devices (1, 2, 4, or 8 pt.); and 105 addresses occupied by a DGP.



Note: The above diagram shows wiring for a 4-Wire XA Loop. A 3-Wire XA Loop is wired the same except that there is one less 2081-9044 Protector because the Command line is not present

Figure 12. Overvoltage Protection Wiring for 4-Wire XA Loop

Overview and Guidelines

This section describes programming the FACP to function as the head end (master) for a loop of XA devices connected to the FACP through the XALIC card. When functioning as the head end, the FACP can monitor the status of all devices and can turn XA output devices on or off.

When programming the FACP as the head end, keep the following guidelines in mind.

- XALIC points are logical points used to control and monitor physical XA devices.
- The FACP can monitor up to 255 XA devices and control up to 255 XA devices. Since a FACP IDNet channel (each XALIC corresponds to a channel) can only support 250 devices, the following FACP **multipoint device types** must be assigned to XALIC points to achieve the 255 point limit.
  - TRIAM. Assign this device type to an address within the range 1 through 245 when the corresponding XA device is an input or input/output device. Each TRIAM point consists of two subpoints, one that can be used as an output and one that can be used as an input.
  - RIAM. Assign this device type to an address within the range 1 through 245 when the corresponding XA device is an output-only device. (XA output-only devices must be at address 245 or below.)
  - MLPTIO. Assign this device type to points 246 through 250. These devices support 6 subpoints (for each device, only four subpoints are used).
- Program only XALIC addresses that have a corresponding XA device. The XALIC card performs a configuration check to determine that a corresponding XA device is present at the programmed XALIC address. If no XA Device is present, an open circuit device trouble is generated for that device. (Note: the XALIC is unable to detect missing output-only devices.)
- You can determine which XALIC points map to which XA devices by looking at the XALIC point name. The number in the middle of the XALIC point name corresponds to the number of the XA device on the connected XA loop.

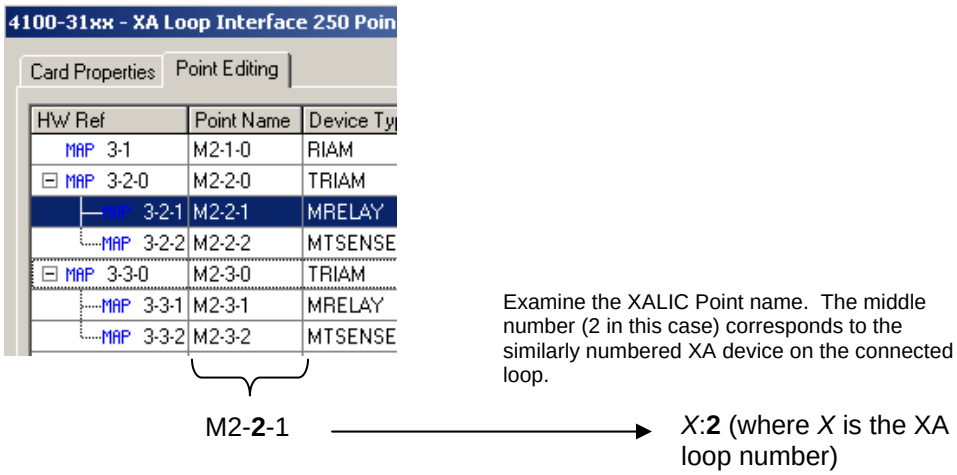


Figure 13. Interpreting XALIC Point Names

Continued on next page

Overview and Guidelines

- **XA output-only devices must be at address 245 or below**. Any XA output-only devices on the loop with an address **above** 245 must be readdressed before programming.
- You must account for all XA devices in the FACP programming. XA devices that are unprogrammed (for example, XALIC point three is not programmed, but a device exists on the XA loop with an address of three) will cause an extra device trouble.
- XA devices report three status conditions, whereas FACP IDNet devices report four status conditions. The XA device status conditions map to IDNet conditions as follows.

Table 4. Mapping of XA Device Status and IDNet Status

XA Loop Device Status	FACP IDNet Status
Normal	Normal
Alarm	Abnormal (current limited)
Trouble	Open Circuit
N/A	Short Circuit

Because XA loop devices do not report a short circuit condition, it is not possible to support the WSO or WSC FACP point types. Do not assign these point types to a FACP XALIC point.

- The Point Type you assign to the XALIC address determines the function of the point. For example, if you assign a FIRE point type, an alarm condition occurs if the state of the XA address goes abnormal. Likewise, if you assign a UTILITY point type to the address, the state of the XALIC address is either ON or OFF.

Programming FACP XALIC Points

Follow these steps to program XALIC points.

1. Add the XALIC Card to the job. See the corresponding chapter in the *ES Panel Programmer's Manual* (574-849) for information on doing this.
2. Click on the Hardware Tab. Expand the Unit/Box/Bay icons containing the XALIC card. Double click on the XALIC card icon and choose the Point Editing tab, as shown in the screen example below.
3. Examine the Point Name field and identify the name of the point you want to edit. Before the Device Type is programmed, the Point Name will have a 0 in the subpoint (last) field. (M2-5-0, for example). Remember that the number in the middle corresponds to the XA Device number on the Autocall side.
4. Click on the point name and then click on the Device Type drop down list box and select the appropriate device type, as follows:
   - Points 1-245. Select the TRIAM device type if the corresponding XA device is an input/output device. Select the RIAM device type if the XA device is an output only device.
   - Points 246-255. Select the MLPTIO device type. (Output-only devices are not allowed within this address range.)

   After you select the Device Type, the screen updates to display the subpoints.

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Programming FACP XALIC Points

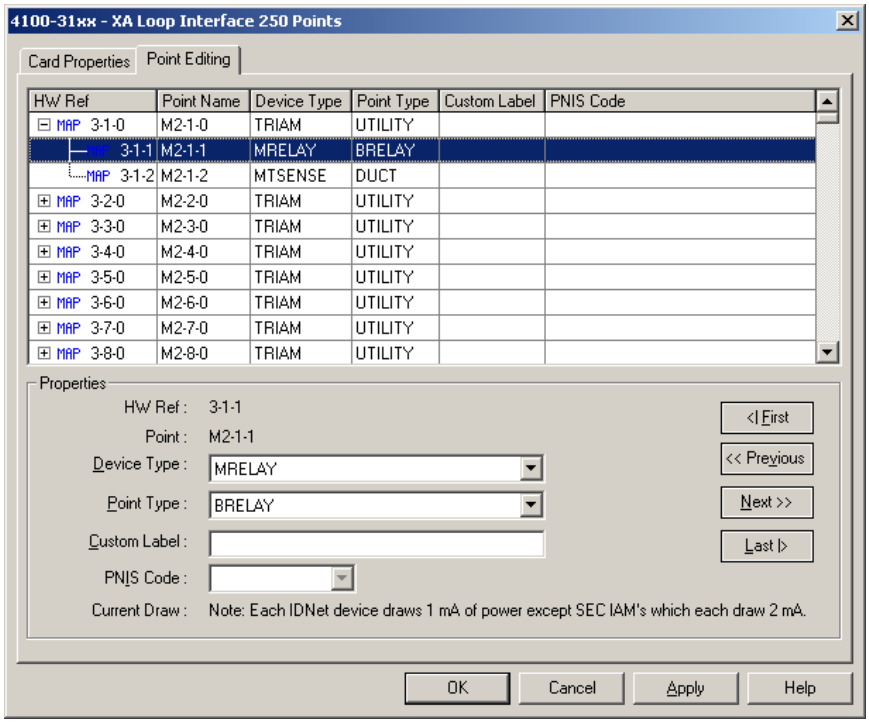


Figure 14. Programming Points

5. Click on the appropriate subpoint and define its point type, as follows. (The subpoint device type is permanently set.)

   - **Points 1-245**. If the device type is TRIAM (i.e., the XA device is an input/output device), then the first subpoint is used for the output and the second point is used for the input. Click on the Point Type drop down list and choose one of the available point types.

     If the device type is RIAM (i.e., the XA device is an output-only device), click on the subpoint and then click on the Point Type drop down list box and choose the output point type.

     Refer to 574-849 for point type definitions

   - **Points 246 – 255**. Devices in this address range must use the MLPTIO device type. MLPTIO subpoints map to XA devices as listed in Table 5 below: **Output-only devices cannot be assigned to this address range.**

     Click on the subpoint and then click on the Point Type drop down list box and choose the appropriate input or output point type.

     Refer to in 574-849 for point type definitions

Continued on next page

Programming FACP XALIC Points

Table 5. MLPTIO Device Type Address Mapping

FACP IDNet Address	Subpoint to XA Device Mapping
246	Subpoint 1 is the input and subpoint 5 is the output for XA Device 246
246	Subpoint 2 is the input and subpoint 6 is the output for XA Device 247
247	Subpoint 1 is the input and subpoint 5 is the output for XA Device 248.
247	Subpoint 2 is the input and subpoint 6 is the output for XA Device 249.
248	Subpoint 1 is the input and subpoint 5 is the output for XA Device 250.
248	Subpoint 2 is the input and subpoint 6 is the output for XA Device 251.
249	Subpoint 1 is the input and subpoint 5 is the output for XA Device 252.
249	Subpoint 2 is the input and subpoint 6 is the output for XA Device 253.
250	Subpoint 1 is the input and subpoint 5 is the output for XA Device 254.
250	Subpoint 2 is the input and subpoint 6 is the output for XA Device 255.

Programming FACP as an XA Loop Slave

Overview

The Autocall head end can control physical or logical points on the FACP, allowing the head end to perform a range of functions on the FACP such as on/off, system reset, signal silence, etc. These types of points are called **Control points**. See "Programming Control Points" in this section for more information.

The FACP's XALIC can also be configured to report status to the Autocall head end for up to 250 FACP devices. These types of points are called **Status Points**. See "Programming Status Points" in this section for more information.

Note: When the FACP functions as a slave to the Autocall panel, it is different than most master/slave situations. The FACP continues to monitor and control all devices that are not associated with an XALIC point and can operate completely independent of the Autocall panel.

Programming Control Points

A Control Point is a logical input point on the FACP XALIC card that serves as a trigger for a FACP Custom Control equation (for example, reset, silence, LED annunciation, NAC signaling, etc.). Each control point on the FACP corresponds to a physical or logical output point on the Autocall head end. When the head end turns on the output point, the corresponding FACP XALIC input turns on, and the FACP custom control equations execute.

Each FACP XALIC Control Point address consists of three parts: the MAPNET® channel number, the XA Loop Device Number, and the Subpoint. The *MAPNET channel* number is automatically assigned to the XALIC card at installation time. It can be any number between 1 and 30 and is always preceded by an M. The *XALIC Device Number* is a number between 1 and 250. It corresponds directly to the matching XA device address on the AUTOCCALL side of the loop. The *Subpoint* used with a control point is always 1.

Figure 15. Mapping XALIC Point Names to XA Loop Devices (4100U Shown)

Use the three-step process detailed below to program a control point.

Step 1. Identify and Map Addresses.

Before programming Control Points, it may be helpful to list the XALIC control points and the Autocall device numbers, along with the function of the point or device, in a spreadsheet format.

Table 6. Example: Mapping Control Points

Autocall XA Output Functions		FACP Control Point and Function	
7:1	Output Point turns on when Signal Silence occurs.	M2-1-1	When M2-1-1 goes abnormal, execute Custom Control to perform Signal Silence
7:2	Output Point	M2-2-2	Program FACP LED to turn on when M2-2-2 turns on.

Continued on next page

Programming Control Points

Step 2. Program Device Types and Point Types for FACP Control Points. Use the FACP programmer to accomplish the following steps:

a. Add the XALIC Card to the job. See the corresponding chapter in the *ES Panel Programmer's Manual* (574-849) for information on doing this.

b. Click on the Hardware Tab. Expand the Unit/Box/Bay icons containing the XALIC card. Double click on the XALIC card icon and choose the Point Editing tab, as shown in the screen example below.

c. Examine the Point Name field and identify the name of the point you want to edit. Before the Device Type is programmed, the Point Name will have a 0 in the subpoint field. (M2-5-0, for example). Remember that the number in the middle, 5 in this case, corresponds to the similarly numbered XA Device on the Autocall side.

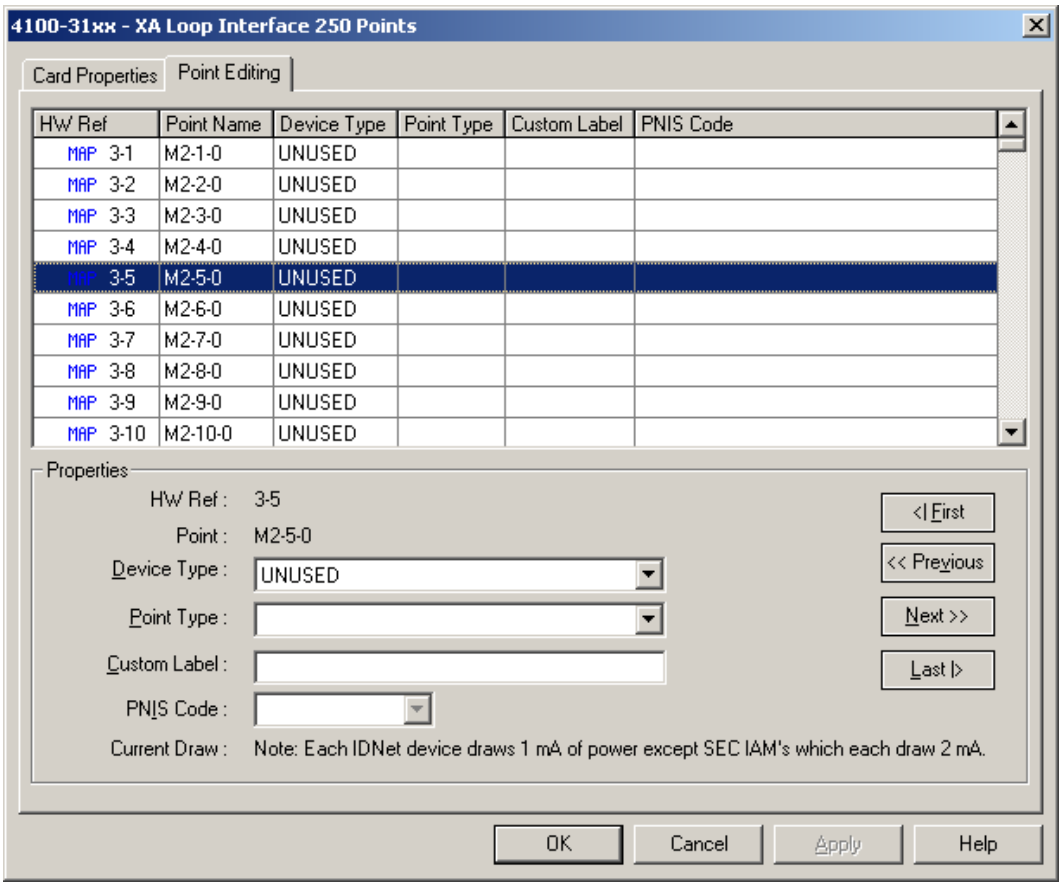


Figure 16. XA Loop Point Editing

d. Click on the Device Type drop down list box and select **MLPTIO**. After you make your selection, the screen updates to display the subpoints. See Figure 17.

Continued on next page

Programming Control Points

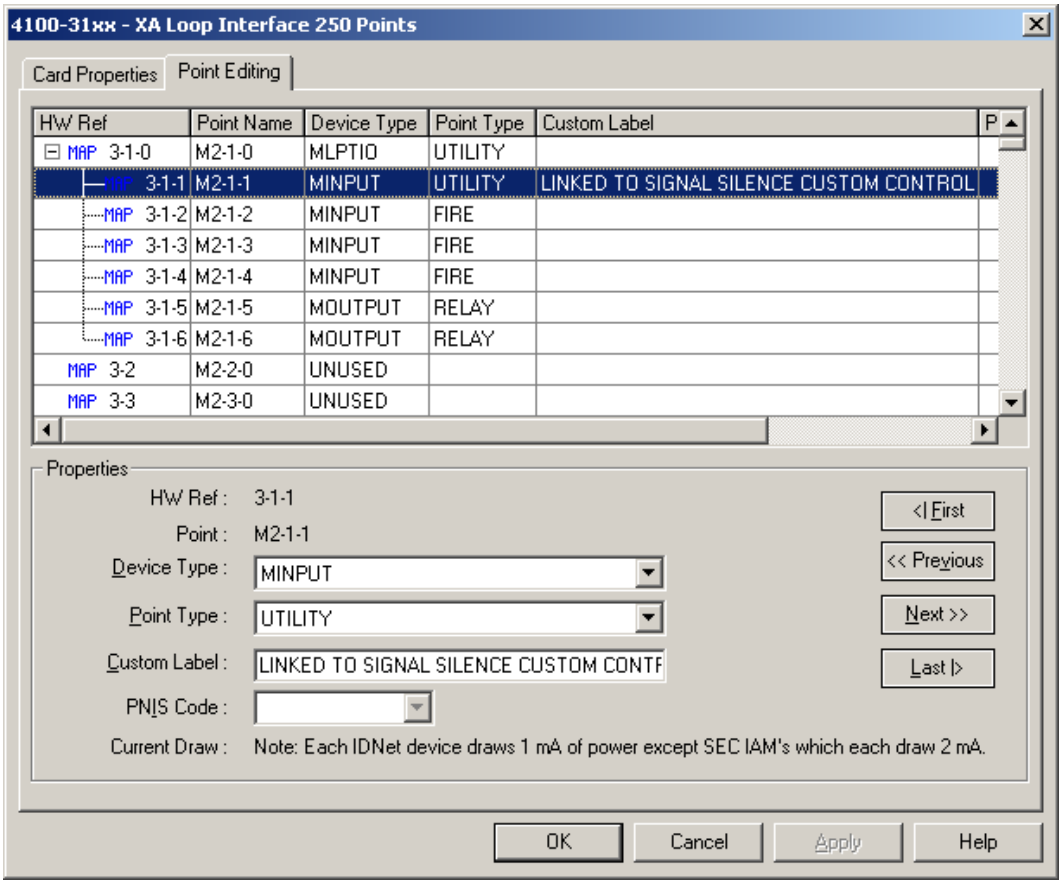


Figure 17. Programming Subpoint 1

e. Click on Subpoint 1. The device type is automatically set to MINPUT and cannot be changed. Click on the Point Type drop down list box and select the appropriate point type. (The point type determines how the control point is interpreted by the FACP. Use Utility for Signal Silence, Reset, and Miscellaneous functions. Use FIRE to annunciate a fire alarm from the Autocall panel to the FACP.)

f. Add a descriptive custom label for the point.

g. Click Apply to save the changes.

Step 3. Write Custom Control. The control point functions as an on/off switch for one or more FACP Custom Control equations. Typical equations include the following:

System Reset. In the following example, M2-1-1 is a input point on the 4100's XA card. It is linked to XA Device 1 (a switch) on the Autocall system. When XA Device 1 turns ON, the input activates, which executes the following equation. (P212 is the Detector/System Reset pseudo point on the FACP.)

```
IN:
   M2-1-1  ON
OUT:
   TRACK ON P202  PRI = 9,9
```

Continued on next page

Programming Control Points

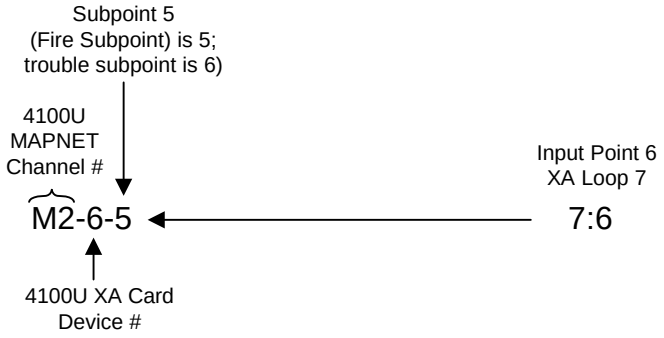
Alarm Silence. In the following example, M2-1-1 is a monitor point on the 4100's XA card. It is linked to XA Device 2 (a switch) on the Autocall system. When XA Device 2 turns ON, the input activates, which executes the following equation. (P217 is the Network Signal Silence pseudo point on the FACP.)

```
IN:
   M2-1-1  ON
OUT:
   TRACK ON P6 PRI = 9,9
```

Programming Status Points

Status points are *logical* fire and trouble points on the FACP XALIC card. The status (on or off) of these points is controlled by Custom Control equations on the FACP. The function of a status point is to signal a change in the state of a FACP point to the Autocall head end. For example, a Custom Control equation could be written to monitor the state of L256, which is the list in which all points with the FIRE point type are placed. When any device in this list enters an alarm state, the Custom Control turns ON subpoint 5 for one of the XALIC status points. (For any given XALIC status point, subpoint 5 is always the fire point and subpoint 6 is always the trouble point.) This triggers the corresponding XA device at the Autocall head end to turn on as well.

Each FACP XALIC Status Point address consists of three parts: the MAPNET channel number, the XA Loop Device Number, and the Subpoint. The *MAPNET channel* number is automatically assigned to the XALIC card at installation time. It can be any number between 1 and 30 and is always preceded by an M. The *XALIC Device Number* is a number between 1 and 250. It corresponds directly to the matching XA device address on the Autocall side of the loop. The *Subpoint* used with a status point is always either 5 (alarm status subpoint) or 6 (trouble status subpoint).



(4100U shown)

Continued on next page

Programming Status Points

Use the three-step process detailed below to program a status point.

Step 1. Identify and Map Addresses.

Before programming status points, it may be helpful to list the XALIC status points and the Autocall device numbers, along with the function of the point or device, in a spreadsheet format.

Table 7. Example: Mapping XA Input to FACP Status Point

Autocall XA Input Functions		FACP Status Point and Function	
7:1	Alarm on XA Loop Device 1	M2-1-5	When point in fire list enters alarm state, use Custom Control to turn point M2-1-5 on.
7:1	Trouble on XA Loop Device 1	M2-1-6	When any trouble in the system occurs, use Custom Control to turn M2-1-6 on.

Step 2. Programming Device Types and Point Types for FACP Status Points. Use the FACP programmer to accomplish the following steps:

a. Add the XALIC Card to the job. See the corresponding chapter in the *ES Panel Programmer's Manual* (574-849) for information on doing this.

b. Click on the Hardware Tab. Expand the Unit/Box/Bay icons containing the XALIC card. Double click on the XALIC card icon and choose the Point Editing tab, as shown in the screen example below.

c. Examine the Point Name field and identify the name of the point you want to edit. Before the Device Type is programmed, the Point Name will have a 0 in the subpoint field. (M2-5-0, for example). Remember that the number in the **middle**, 5 in this case, must correspond to the XA Device number on the Autocall side. (Refer back to Figure 1 for an illustration of the screen.)

d. Click on the Device Type drop down list box and select MLPTIO. After you make your selection, the screen updates to display the subpoints. (Refer back to Figure 2 for an illustration of the screen.)

e. Click on Subpoint 5. Leave the Device Type as MOUTPUT. Click on the Point Type drop down list box and select Relay. Add a descriptive custom label for the point. Subpoint 5 should always be used to report the alarm state of the referenced XA device.

f. Click on Subpoint 6. Leave the Device Type as MOUTPUT. Click on the Point Type drop down list box and select Relay. Add a descriptive custom label for the point. Subpoint 6 should always be used to report the trouble state of the referenced XA device.

g. Click Apply to save the changes.

Continued on next page

Programming Status Points

Step 3. Writing Custom Control. Status points are intended to turn on or off in response to Custom Control programming and to serve as indications to the Autocall head end that some fire or trouble event has occurred on the FACP. Typical equations include the following:

Smoke Detector Experiencing Alarm or Trouble Condition. In the first part of the following example, M2-1-5 is a status point on the 4100's XALIC. It is linked to XA Device 1 on the Autocall system. L256 is a list of smoke detectors. The IN portion of the Custom Control equation monitors this list. If any detector in the list enters an alarm state, the OUT side of the equation executes, turning on M2-1-5 (and its corresponding XA device on the Autocall head end). Some programming on the Autocall head end would then be required to appropriately respond to the fire condition

In the second part of the example, M2-1-6 is also a status point on the XALIC card. It is also linked to XA device 1 on the Autocall head end, but it is used to signal a trouble condition to the head end.

```
IN:
   L256 Fire
OUT:
   TRACK ON M2-1-5  PRI = 9,9
```

Trouble Indicator. In the following example, M2-1-6 is a point on the 4100's XA card. If any detector in L256 enters a trouble state, the equation executes.

```
IN:
   L256 TBL
OUT:
   TRACK ON M2-1-6  PRI = 9,9
```

FACP XA Loop Slave Application Example

Overview

In this simplified example, a FACP system is added to an existing Autocall installation. The FACP system will provide coverage for a new wing of an existing building protected by the Autocall system. The FACP system will report status to the Autocall head-end panel using the XA Loop Interface Card.

Assume the following:

- The new wing consists of 4 areas (zones) that will report alarm and trouble status to the Autocall head-end.
- Other panel troubles will be reported to the Autocall head-end.
- A fire alarm detected on the Autocall system will be reported to the Panel.
- The Panel will be reset & silenced from the Autocall head end.
- The Autocall panel can disable any of the four zones in the Panel.
- Assume the Autocall panel already has 6 XA Loops. The Panel will communicate to the Autocall head-end on a new, 7th loop.

The Panel must be programmed with the slave cards and devices necessary to support the installation. In addition, the following XA Loop mapping must also be programmed. For this example, assume there are already 4 IDNet channels in the job. This will make the XALIC channel 5 (M5-x).

Table 8. Example Areas

Area	Panel List	XA Loop Interface Address
Area 1 – Cafeteria	L512	M5-1
Area 2 – Gymnasium	L513	M5-2
Area 3 – Auditorium	L514	M5-3
Area 4 – Laboratory	L515	M5-4

It is also necessary to annunciate any other Panel trouble to the Autocall panel and we will do that by reserving XA loop address 5 (M5-5).

In order to perform the alarm silence, system reset, and disable functions, we will need to allocate six more XA addresses (one for silence, one for reset, and one for each zone that can be disabled). These will be M5-6 through M5-11. M5-12 will be used to communicate an Autocall system alarm to the FACP.

Table 9. Example XALIC Point Definitions

XALIC Address	Function
M5-1	Represents fire & trouble status for Area 1 (FACP to Autocall)
M5-2	Represents fire & trouble status for Area 2 (FACP to Autocall)
M5-3	Represents fire & trouble status for Area 3 (FACP to Autocall)
M5-4	Represents fire & trouble status for Area 4 (FACP to Autocall)
M5-5	Represents general trouble status for FACP (FACP to Autocall)
M5-6	Alarm Silence request (Autocall to FACP)
M5-7	System Reset Request (Autocall to FACP)
M5-8	Disable/Enable Area 1 Request (Autocall to FACP)
M5-9	Disable/Enable Area 2 Request (Autocall to FACP)
M5-10	Disable/Enable Area 3 Request (Autocall to FACP)
M5-11	Disable/Enable Area 4 Request (Autocall to FACP)
M5-12	Alarm in Autocall system (Autocall to FACP)

Continued on next page

Programming the FACP XALIC card

Since this is a FACP XA Loop Slave Application, the 12 XA Loop device types are programmed with the MLPTIO device type. There are two types of information transmitted on the XA Loop:

- FACP data sent to the Autocall panel
- Autocall data sent to the FACP

For FACP to Autocall data, the two output subpoints on the MLPTIO are used to convey the information. Output subpoint 5 is used to convey the alarm or activated status of the data, and output subpoint 6 is used to convey the trouble status of the data.

For Autocall to FACP data, the first input subpoint on the MLPTIO is used to convey the information. The input point reports "abnormal" (current-limited) when the Autocall information is activated. It reports "normal" when the Autocall information is deactivated.

Since the first 5 devices on our XALIC are reporting FACP information to the Autocall panel, we need to program the output subpoints to perform the desired function. We will need to write Custom Control equations to activate those outputs under the proper circumstances, so both subpoint 5 and 6 on XALIC devices 1-5 should be programmed with the RELAY point type.

The Custom Control equations used to convey the alarm and trouble status for Area 1 is shown below:

```
IN:
   L512 ALARM         ;List of Area 1 smoke detectors
OUT:
   TRACK M5-1-5 ON PRI=9,9 ;Track on XA Device 1 Alarm output
END:

IN:
   L512 TROUBLE          ;List of Area 1 smoke detectors
OUT:
   TRACK M5-1-6 ON PRI=9,9 ;Track on XA Device 1 Trouble output
END:
```

We will need similar equations for the remaining areas using the list and the XA device corresponding to that area.

To program the FACP general trouble indication to the Autocall panel, the following Custom Control equation must be written:

```
IN:
   A2  ON             ;Number of Panel troubles
OUT:
   TRACK M5-5-6 ON PRI=9,9 ;Track on XA Device 5 Trouble output
END:
```

This completes the programming required to send the FACP information to the Autocall panel. We now need to program the FACP to act upon information received from the Autocall panel.

Continued on next page

Alarm Silence

The Autocall panel will be programmed to activate command receiver address 6 whenever an alarm silence operation is performed at the Autocall head-end. This will cause the XALIC to indicate an abnormal status on M5-6-1. The following Custom Control equation will perform the FACP's alarm silence operation:

```
IN:
   M5-6-1 ABNORMAL          ; Alarm silence request from
Autocall panel
OUT:
   TRACK P6 ON PRI=2,2         ; Alarm silence pseudo point
END:
```

System Reset

The Autocall panel will be programmed to activate command receiver address 7 whenever a system reset operation is performed at the Autocall head-end. This will cause the XALIC to indicate an abnormal status on M5-7-1. The following Custom Control equation will perform the FACP's system reset operation:

```
IN:
   M5-7-1 ABNORMAL          ; System Reset request from Autocall
panel
OUT:
   TRACK P202 ON PRI=9,9       ; System Reset pseudo point
END:
```

Disabling Areas

The Autocall panel will be programmed to activate command receiver addresses 8-11 whenever a corresponding switch is activated in the panel. This will cause the XALIC to indicate an abnormal status on points M5-8-1 through M5-11-1. Four Custom Control equations (one for each area) will accomplish the disable function:

```
IN:
   M5-8-1 ABNORMAL          ; Disable area 1 request from
Autocall panel
OUT:
   DISABLE L512             ; Disable Panel Area 1
END:
```

Alarm from Autocall Panel

The Autocall panel is programmed to activate command receiver address 12 whenever an alarm is present in the system that did not come from the FACP. This causes the XALIC to indicate an abnormal status on M5-12-1. No custom control is required to annunciate the alarm in the FACP. M5-12-1 is programmed with the FIRE point type and an appropriate custom label such as "ALARM IN Autocall SYSTEM".

FACP XA Loop Master Application Example

Overview

In this simple example, an FACP is replacing an existing Autocall head end with one XA Loop. It has the following devices:

- Addresses 1-15: Smoke detectors
- Addresses 16-30: Pull stations
- Addresses 31-35: General Alarm command receivers (on-til-silence)

FACP Programming

The FACP is programmed with an SPS (containing one IDNet channel by default – M1) and an XA Loop Interface Card (XALIC – M2). Since this a master configuration, the TRIAM device type is used for the smoke detectors and pull stations, and the RIAM device type is used for the output-only command receivers.

Address	Device Type	Point Type
1-15	TRIAM	Input: SMOKE Output: RELAY
16-30	TRIAM	Input: PULL Output: RELAY
31-35	RIAM	Output: SSIGNAL