Simplex®

4010 Fire Alarm

Applications Manual

574-908
Rev. A

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Walk Test™ is protected by US Patent No. 4,725,818.
MAPNET addressable communications is protected by US Patent No.4,796,025.
IDNet™ is patent pending.
TrueAlarm® Analog Detection is protected by US Patent No. 5,155,468.
TrueAlarm® Detector Base is protected by US Patent No. 5,173, 683.

Cautions and Warnings

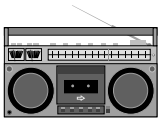
SYSTEM REACCEPTANCE TEST AFTER SOFTWARE CHANGES - To ensure proper system operation, this product must be tested in accordance with NFPA72-1996, Chapter 7 after any programming operation or change in site-specific software. Reacceptance testing is required after any change, addition or deletion of system 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.

READ AND SAVE THESE INSTRUCTIONS. 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. Fire Alarm Control Panel (FACP) 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 carter and notify Simplex.

ELECTRICAL HAZARD - Disconnect electrical power when making any internal adjustments or repairs. Servicing should be performed by qualified Simplex Representatives.



RADIO FREQUENCY ENERGY - 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 a Class A computing device pursuant to Subpart J of Part 15 of FCC Rules, which are designed to provide reasonable protection against such interference when operated in a commercial environment. Operation of this equipment in a residential area may cause interference in which case the user at his own expense will be required to take whatever measures may be required to correct the interference.

Codes and Standards

The 4010 is listed for the following.

UL 864 Listings for Type of System:

- UL 864 Power-Limited Fire Alarm Control Unit.
- Local (formerly NFPA 72A).
  Requires the sounding of an alarm via listed notification appliance(s).
- Auxiliary (formerly NFPA 72B).
  Requires 4010-9809 City Circuit Module.
- Remote Station - protected premise (formerly NFPA 72C).
  Requires 4010-9809 City Circuit Module or the 4010-9810 or -9816 DACT.
- Proprietary - protected premise (formerly NFPA 72D).
  Requires 4010-9817 (with 4010-9818 or 4010-9819) or 4010-9821 Network Interface Modules.
- Central Station - protected premise (formerly NFPA 71).
  Requires 4010-9810 or -9816 DACT.
- Suppression Releasing Service
  Requires 4010-9814 Suppression Kit.

UL 864 Listings for Type of Service:

- Automatic, Manual, Waterflow, and Sprinkler Supervisory.

UL 864 Listings for Type of Signaling:

- Coded, Non-Coded, March-Time and DACT.
  DACT requires the 4010-9810 or -9816.

Factory Mutual Approved

- Same as UL above.

Local Approvals

- CSFM
- MEA

Continued on next page

Codes and Standards (*continued*)

The installer should be familiar with the relevant codes listed below as well as any other applicable local codes and standards, when installing a fire alarm system.

- NFPA 72 National Fire Alarm Code
- NFPA 11 Standard for Low-Expansion Foam and Combined Agent Systems
- NFPA 11A Standard for Medium- and High-Expansion Foam Systems
- NFPA 12 Standard on Carbon Dioxide Extinguishing Systems
- NFPA 12A Standard on Halon 1301 Fire Extinguishing Systems
- NFPA 13 Standard for the Installation of Sprinkler Systems
- NFPA 14 Standard for the Installation of Standpipe and Hose Systems
- NFPA 15 Standard for Water Spray Fixed Systems for Fire Protection
- NFPA 16 Standard for the Installation of Deluge Foam-Water Sprinkler and Foam-Water Spray Systems
- NFPA 16A Standard for the Installation of Closed-Head Foam-Water Sprinkler Systems
- NFPA 17 Standard for Dry Chemical Extinguishing Systems
- NFPA 17A Standard for Wet Chemical Extinguishing Systems
- NFPA 25 Standard for Inspection, Testing, and Maintenance of Water-Based Fire Protection Systems
- NFPA 70 National Electrical Code
- NFPA 80 Standard for Fire Doors and Fire Windows
- NFPA 90A Standard for the Installation of Air Conditioning and Ventilation Systems
- NFPA 90B Standard for the Installation of Warm Air Heating and Air Conditioning Systems
- NFPA 92A Recommended Practice for Smoke-Control Systems
- NFPA 92B Guide for Smoke Management Systems in Malls, Atria, and Large Areas
- NFPA 101 Life Safety Code
- NFPA 170 Standard for Fire Safety Symbols
- NFPA 231C Standard for Rack Storage of Materials
- NFPA 1221 Standard on the Installation, Maintenance, and Use of Public Fire Service Communication Systems

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Appendix A. System Options and Point Types

Chapter 1
Overview

Overview

This document addresses the following:

- It provides programming examples for common 4010 system applications.
- It describes the specifications, limitations, and capacities of the 4010's Custom Control system. Although the 4010 will meet a wide range of project requirements, 4020 or 4100 systems are best used in more complex situations where the listed capacities of the 4010 are approached.
- It provides reference information concerning the 4010's system options and point types. In many cases, the built-in application programming provided by these system components can be used in place of Custom Control.

Related Documentation

Additional information related to 4010 Version 2.x can be found in the following documents:

574-052..... *4010 Installation, Operation, and Front Panel Programming Instructions*
574-779..... *4010 SFIO Programmed IC Installation Instructions*
574-499..... *4010 SFIO Board Installation Instructions*
574-181..... *4009 IDNet NAC Extender Installation Instructions*
574-182..... *4009 Fiber Optic Link Option Installation Instructions*
574-325..... *4009-9807 NAC Option Card Installation Instructions*
574-326..... *4009-9808 NAC Class A Adapter Option Card Installation Instructions*

In this Chapter

Refer to the following page for specific information on a topic.

Before You Begin

Introduction

The 4010 is best used in small to medium size buildings up to 6 stories. Some of the best uses for the 4010 are:

- K - 12 educational facilities
- Nursing homes and small hospitals
- Board and care facilities
- Inns, motels and small hotels
- Assisted living
- Apartments and condominiums
- Office buildings
- Strip malls

Even in these situations, however, job-specific details (a large number of fan dampers, for example) combined with complex, job-specific application needs may push the 4010 beyond its practical limits. Before beginning, therefore, it is important to know the 4010's Custom Control capacities, understand the installation details of the facility, and understand the role of the 4010's point types and system options.

Custom Control Capacities

The 4010 programming capacities are as follows:

- Up to 75 User Pseudo Points (P76 – P150)
- Up to 25 User List Points (L26 – L50)
- Up to 60 Custom Control Equations (Phase 2 systems)
- Up to 40 Custom Control Equations (Phase 1 systems)

Understand the Details of the Intended Application

Judging whether the 4010 can meet the application requirements of a job requires a detailed understanding of the facilities' devices (both fire and utility), as well as an understanding of exactly how the customer and the AHJ expect the system to function.

In general, the following guidelines can help you determine whether the 4010 can handle the application-specific needs of a facility.

- Situations requiring extensive fan/damper control (i.e., multiple smoke chambers and a very large number of dampers) are not good candidates for the 4010.

Understand the Built-in Functionality Provided by System Options and Point Types

The 4010 System Options, Point Types, and Modes provide default fire alarm system operation for common fire alarm system applications without the need for writing more complex Custom Control programming equations. Whenever possible System Options, Point Types, and Modes should be used in lieu of Custom Control to provide the required operation. Custom Control programming is available to provide additional flexibility and to meet job-specific requirements.

Refer to Appendix A for a summary of system options and point types.

QuickAlert Class A / Class B Guidelines

Overview

The term QuickAlert with SmartSync operation refers to a family of Simplex A/V and VO notification appliances that allow both horns and the synchronized strobes to work independently on a two-wire notification appliance circuit. The strobes operate in an "On until Reset" mode and the horns operate in an "On until Silence" mode. All references to QuickAlert in this document are in regards to QuickAlert with SmartSync operation.

When programming QuickAlert with SmartSync operation, you must be aware of the following requirements and differences between Class A and Class B applications.

Class A QuickAlert

Class A QuickAlert with SmartSync operation depends on the following:

- All strobes must be Simplex synchronized VO, not free run. All A/Vs, must be QuickAlert SmartSync compatible. Other manufacturer's appliances are not compatible on a SmartSync, two-wire circuit.

- A 4905-9938 SmartSync Control Module (SCM) is required for all Class A QuickAlert Applications. The SCM must be mounted within 20 feet of the control panel and all wiring must be in metal conduit. Refer to 4010 Field Wiring Drawings (841-058) and the 4905-9938 QuickAlert Sync Control Module Installation Instructions (574-719) for specific installation instructions. (Note: 4010-9806 Class A Adapter module is not required for Class A QuickAlert.)

- Each SCM requires a Notification Appliance Circuit designated as the loading circuit. This circuit handles all power consumption of the VO and A/V appliances connected to the NAC output of the SCM.

- For Multi-sync operation, one Notification Appliance Circuit must also be designated as the Horn Control Notification Appliance Circuit. This allows for the interconnection of multiple SCM's configured in a Master/Slave configuration to synchronize the QuickAlert devices.

- In the 4010 panel, for QuickAlert with Multi-sync applications, there would only be three circuits available for the "loading" Notification Appliance Circuits and one available for the "Horn Control" Notification Appliance Circuit. (4009 IDNet can be added if additional signals are required.)

- For a General Alarm operation, the "loading" NAC must use a point type of RSIGNAL (Off on Reset) while the "Horn Control" NAC must use a point type of SSIGNAL (Off on Silence).

- QuickAlert Horn operation (Slow March Time, Steady or Temporal) is set by a dip switch on the SCM.

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Class B QuickAlert

Class B QuickAlert with SmartSync operation depends on the following factors:

- All strobes must be Simplex synchronized VO, not free run. All A/V's, must be QuickAlert SmartSync compatible. Other manufacturer's appliances are not compatible on a QuickAlert SmartSync two-wire circuit.
- The QuickAlert with SmartSync notification appliance circuits connect directly to the 4010 notification appliance circuits terminals. The 4905-9938 SmartSync Control Module is not required.
- For General Alarm operation, the point type SQALERT must be utilized, which will provide the QuickAlert Horns to be controlled "Off on Silence" and the Visuals to be controlled "Off on Reset." For any selective signal operation, the point type QALERT (no default operation) must be utilized and all operations must programmed in Custom Control.
- QuickAlert Horn operation (Slow March Time, Steady or Temporal) is selected in the System Options, Signal Operation, under QuickAlert Horn.

Chapter 2
Selective Signaling Applications

Overview

Selective signaling replaces the system's general alarm NAC operation – which activates all NACs in response to any alarm condition – with selective NAC control. This type of control allows you to program the system so that only specific NACs respond to specific initiating devices.

In this Chapter

Refer to the following page for specific information on a topic.

Selective Signaling by Floor

Overview

Selective Signaling by Floor limits the activation of NACs to the floor on which an activated initiating device(s) is located. When activated, audible NAC appliances sound a temporal code until Alarm Silence, and visible NAC appliances flash until System Reset.

In Figure 2-1, for example, an activated initiating device on Floor 2 triggers only the NACs located on Floor 2.

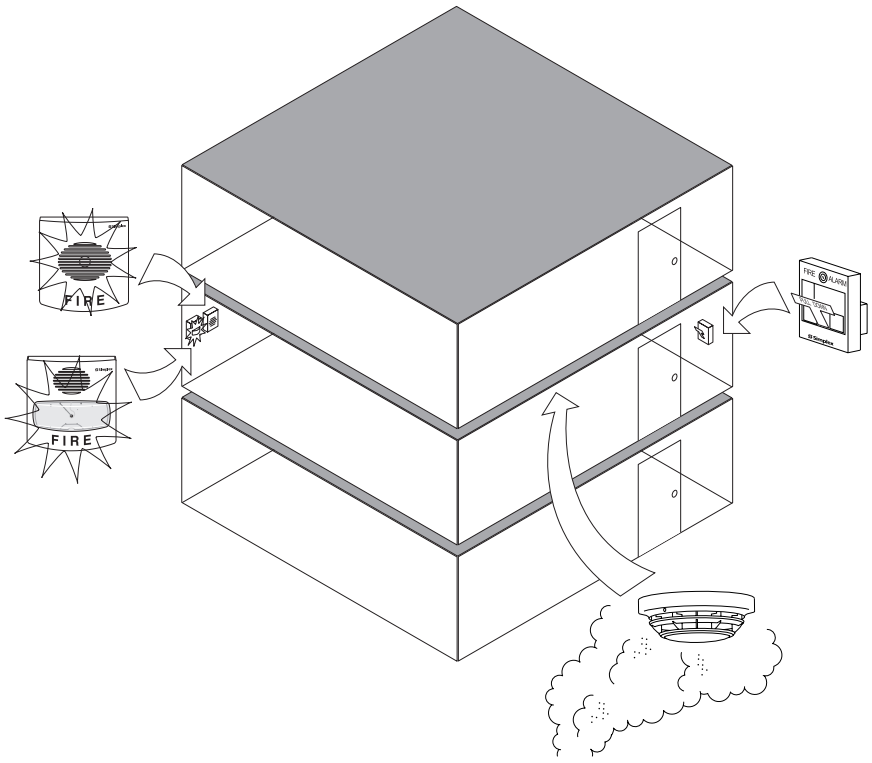

Figure 2-1. Selective Signaling by Floor

Step 1. Define NAC's Device Type, Point Type, and Custom Label

The NACs used with the Selective Signaling by Floor application can be either the NACs located on the panel's SFIO board or NACs located on a 4009 IDNet NAC Extender.

Use the PC Programmer to program the NACs with the device types and point types listed in Table 2-1. When defining custom labels make sure to use descriptive labels, such as "Floor1-Visual-Circuit."

If necessary, refer to Chapter 7, Programming Points, of the *4010 PC Programmer Installation and Programming Instructions* (574-187) for information on using the PC Programmer to edit a point's device type, point type, and custom label.

For QuickAlert applications, refer to "QuickAlert Class A / Class B Guidelines" in Chapter 1.

Continued on next page

Step 1. Define NAC's Device Type, Point Type, and Custom Label *(continued)*

Table 2-1. NAC Device Types and Point Types

	Option	Explanation
NAC Device Type	SIGA	Use for standard (non-QuickAlert) Class A NAC. This type of NAC contains multiple signal paths, allowing circuit operation to continue if a single open circuit occurs. This device type requires installation of a Class A NAC adapter card. **Important Note:** Do not use this device type for Class A QuickAlert applications.
	SIGB	Use for the following: - Standard (non-QuickAlert) Class B NAC. - QuickAlert Class B NAC. - QuickAlert Class A NAC.
NAC Point Type	QALERT	Use only for Class B QuickAlert NACs. This point type allows you to control Class B QuickAlert appliances with Custom Control (selective signaling).
	SIGNAL	Use for either of the following: - Standard, non-QuickAlert (Class A or B) NAC appliances requiring Custom Control (selective signaling). - Class A QuickAlert devices requiring Custom Control (selective signaling).

Step 2. Assign Device Types, Point Types, and Custom Labels to Initiating Devices

Each initiating device must be programmed with a device type and point type. Refer to "Programming Points," located in Chapter 7 of the *4010 PC Programmer Installation and Programming Instructions*, for information on programming an initiating device's device type and point type. Refer to "Point Types" in Appendix A of this manual for detailed descriptions of the initiating device point types.

Step 3. Add Appropriate NACs to List L6 (Off On Silence)

Skip this step if you are using Class B QuickAlert NACs. Use the PC Programmer's List Tab to add the following to List L6 (Control Points, Off on Silence). Members of this list automatically turn off when an Alarm Silence is performed.

- Standard (non-QuickAlert) Audible NACs.
- NAC used for horn control input to SCM (Class A QuickAlert applications only).

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Step 4: Add Appropriate NACs to List L7 (Off on Reset)

Use the PC Programmer's List Tab to add the following to List L7 (Control Points Off on Reset). Members of this list automatically turn off when a System Reset is performed.

- Standard (non-QuickAlert) Visible NACs.
- Class B QuickAlert NACs.
- The Class A QuickAlert NACs wired to the "NAC IN" input of the SCM. **Note:** Assign the Class A QuickAlert Horn Control NAC to List L6, as described in "Step 3. Add Appropriate NACs to List L6 (Off on Silence)" above.

Step 5. Add Floor's Initiating Devices to a User-Defined List

Adding each floor's initiating devices to a separate user-defined list limits the number of Custom Control equations that must be written to perform Selective Signaling by Floor. To add these devices to a list, use the PC Programmer's List Tab, adding each floor's initiating devices to one of the available user-defined lists (L26 through L50).

Step 6. Add Custom Control Equations

This section describes programming the Selective Signaling by Floor application using either standard NAC appliances or Class A/Class B QuickAlert NAC applicances. Refer to the applicable section below for specific information.

Standard NAC Example. The following example, shown in Figure 2-2, illustrates how to implement Selective Signaling by Floor using standard NAC appliances.

- **Equation 1**. The input side of this equation monitors the FIRE DETECT state of list L26, which is a user-defined list containing all initiating devices for Floor 1.

  The first output statement programs the floor's **audible** NACs to emit a temporal signal when any point within list L26 enters an ALARM condition. Because the audible NACs were added to the Control Points – Off on Silence list, they stop sounding when an Alarm Silence occurs.

  The second output statement programs the floor's **visible** NACs to activate when any point within list L26 enters an ALARM condition. Because the visible NACs were added to the Control Points – Off on Reset list (L7), they stop flashing when a System Reset occurs.

- **Equation 2**. The input side of this equation monitors the FIRE DETECT state of list L27, which is a user-defined list containing all initiating devices for Floor 2.

  The first output statement programs the floor's **audible** NACs to emit a temporal signal when any point within list L27 enters an ALARM condition. Because the audible NACs were added to the Control Points – Off on Silence list, they stop sounding when an Alarm Silence occurs.

  The second output statement programs the floor's **visible** NACs to activate when any point within list L27 enters an ALARM condition. Because the visible NACs were added to the Control Points – Off on Reset list (L7), they stop flashing when a System Reset occurs.

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Step 6. Add Custom Control Equations *(continued)*

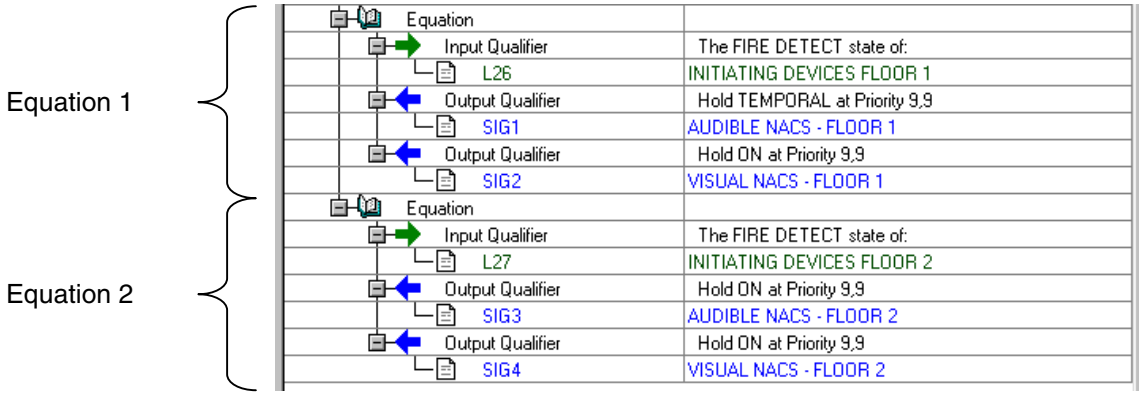

Figure 2-2. Selective Signaling by Floor, Standard NACs

QuickAlert Class A / Class B NAC Example. The following example, shown in Figure 2-3, illustrates how to implement Selective Signaling by Floor using Class A or Class B QuickAlert NAC appliances.

- **Equation 1**. The input side of this equation monitors the FIRE DETECT state of list L26, which is a user-defined list containing all initiating devices for Floor 1. The output side of Equation 1 programs the floor's QuickAlert NACs to operate when any point within list L26 enters an ALARM condition.

  Important Note: Use HOLD ON for Class A QuickAlert applications; use HOLD TEMPORAL for Class B QuickAlert applications.

- **Equation 2**. The input side of this equation monitors the FIRE DETECT state of list L27, which is a user-defined list containing all initiating devices for Floor 2. The output side of Equation 2 programs the floor's QuickAlert NACs to operate when any point within list L27 enters an ALARM condition.

  Important Note: Use HOLD ON for Class A QuickAlert devices; use HOLD TEMPORAL for Class B QuickAlert devices.

- **Equation 3**. The input side of Equation 3 monitors the ON state of P26, which is the Alarm Silence Activated system pseudo point. The first output statement in this equation turns the QuickAlert horns OFF (using the Horn OFF opcode) when P26 is ON (i.e., following an Alarm Silence). The second output statement in this equation resets P26 to its OFF state.

  Important Notes:

  - The HORN OFF opcode is used for Class B QuickAlert applications. This equation is not required for Class A QuickAlert applications.
  - Resetting P26 is very important; do not leave this out.

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Step 6. Add Custom Control Equations *(continued)*

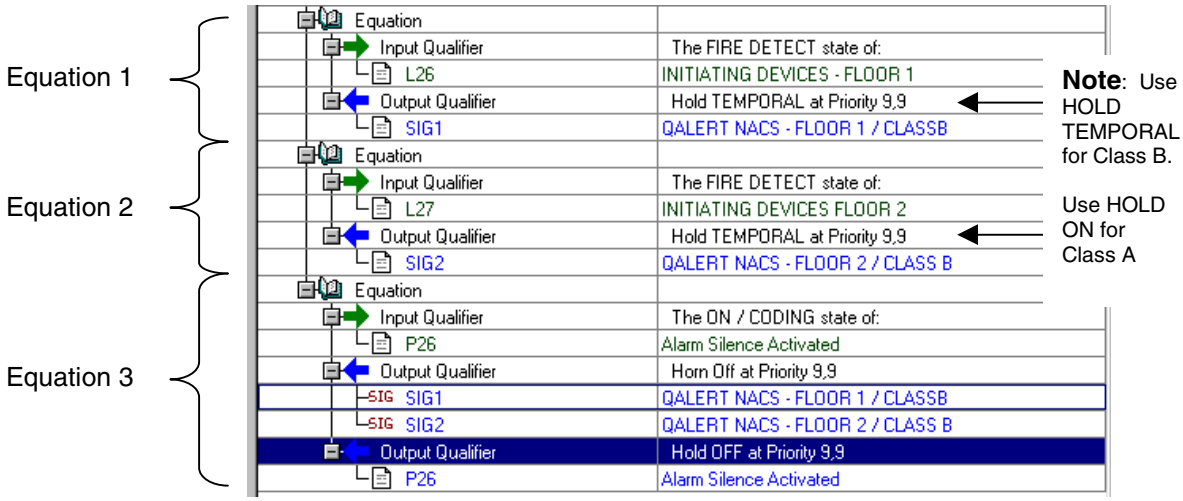

Figure 2-3. Selective Signaling by Floor, QuickAlert NACs

Selective Signaling by Area

Overview

Selective Signaling by Area limits the activation of NACs to the area in which the activated initiating device (smoke detector, pull station, etc.) is located. In the following figure, for example, the initiating devices in Area 1 trigger only the NACs located in Area 1, the initiating devices in Area 2 activate only the NACs located in Area 2, etc.

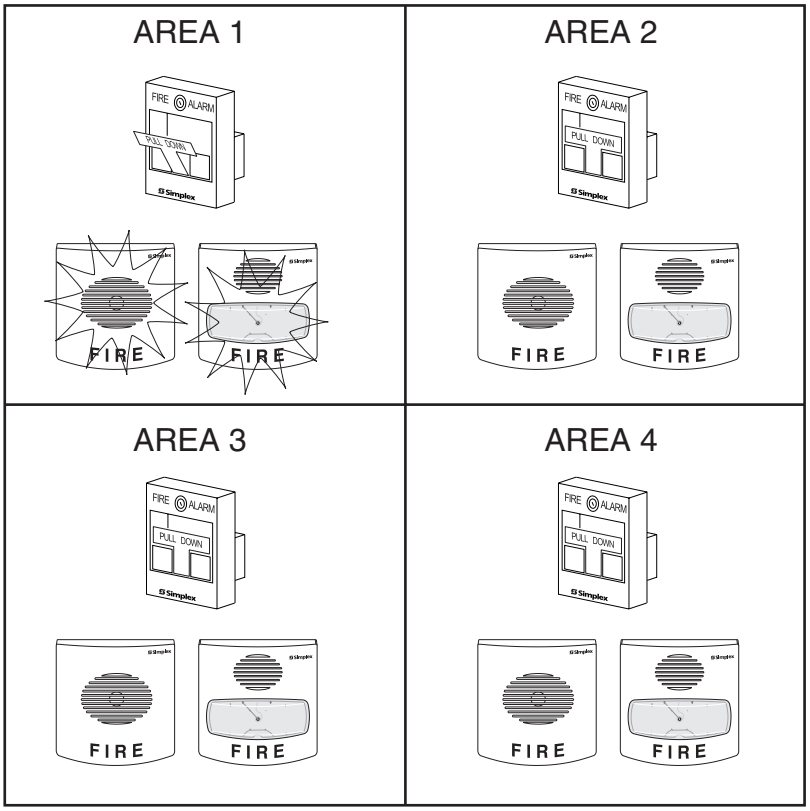

Figure 2-4. Selective Signaling by Area

Step 1. Define NAC's Device Types / Point Types / Custom Labels

The NACs used with the Selective Signaling by Area application can be either the NACs located on the panel's SFIO board or the NACs located on a 4009 IDNet NAC extender.

Use the PC Programmer to program the NACs with the following device types and point types. When defining custom labels, make sure to use descriptive labels, such as "AREA1-VISUAL-CIRCUIT."

For QuickAlert applications, refer to "QuickAlert Class A / Class B Guidelines" in Chapter 1.

Continued on next page

Step 1. Define NAC's Device Types / Point Types / Custom Labels *(continued)*

Table 2-2. NAC Device Types and Point Types

	Option	Explanation
NAC Device Type	SIGA	Use for standard (non-QuickAlert) Class A NAC. This type of NAC contains multiple signal paths, allowing circuit operation to continue if a single open circuit occurs. This device type requires installation of a Class A NAC adapter card. **Important Note:** Do not use this device type for Class A QuickAlert applications.
	SIGB	Use for the following: - Standard (non-QuickAlert) Class B NAC. - QuickAlert Class B NAC. - QuickAlert Class A NAC.
NAC Point Type	QALERT	Use only for Class B QuickAlert NACs. This point type allows you to control Class B QuickAlert appliances with Custom Control (selective signaling).
	SIGNAL	Use for either of the following: - Standard, non-QuickAlert (Class A or B) NAC appliances requiring Custom Control (selective signaling). - Class A QuickAlert devices requiring Custom Control (selective signaling).

Step 2. Assign Device Types, Point Types, and Custom Labels to Initiating Devices

Each initiating device must be programmed with a device type and point type. Refer to "Programming Points," located in Chapter 7 of the *4010 PC Programmer Installation and Programming Instructions*, for information on programming an initiating device's device type and point type. Refer to "Point Types" in Appendix A of this manual for detailed descriptions of the initiating device point types.

Step 3. Add Appropriate NACs to List L6 (Off On Silence)

Use the PC Programmer's List Tab to add the following to List L6 (Control Points, Off on Silence). Members of this list automatically turn off when an Alarm Silence is performed. **Note:** Skip this step if you are using Class B QuickAlert NACs.

- Standard (non-QuickAlert) Audible NACs.
- NAC used for horn control input to SCM. (Class A QuickAlert applications only).

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Step 4: Add Appropriate NACs to List L7 (Off On Reset)

Use the PC Programmer's List Tab to add the following to List L7 (Control Points Off on Reset). Members of this list automatically turn off when a System Reset is performed.

- Standard (non-QuickAlert) Visible NACs.
- Class B QuickAlert NACs.
- The Class A QuickAlert NACs wired to the "NAC IN" input of the SCM. **Note:** Assign the Class A QuickAlert Horn Control NAC to List L6, as described in "Step 3. Add Appropriate NACs to List L6 (Off on Silence)" above.

Step 5. Add Area's Initiating Devices to a User-Defined List

Adding the area's initiating devices to a list limits the number of Custom Control equations that must be written to perform Selective Signaling by Area. To add these devices to a list, use the PC Programmer's List Tab, adding each of the area's initiating device to one of the available user-defined lists (L26 through L50). Naming a list (AREA1-INITIATING DEVICES, for example) is done via the Card Tab and cannot be done through the List Tab.

Step 6. Add Custom Control Equations

This section describes programming the Selective Signaling by Area application using either standard NAC appliances or Class A/Class B QuickAlert NAC applicances. Refer to the applicable section below for specific information.

Standard NAC Example. The following example, shown in Figure 2-5, illustrates how to implement Selective Signaling by Area using standard NAC appliances. The example uses two areas.

- **Equation 1.** The input side of this equation monitors the FIRE DETECT state of list L26, which is a user-defined list containing all initiating devices for Area 1.

  The first output statement in Equation 1 programs Area 1's audible NACs to sound a temporal signal when any point within list L26 enters an ALARM condition. Because the audible NACs were added to the Control Points – Off on Silence list, they stop sounding when an Alarm Silence occurs.

  The second output statement in Equation 1 programs the visible NACs to flash when any point within L26 enters an ALARM condition. Because the visible NACs were added to the Control Points – Off on Reset list (Step 4 above), they stop flashing when a System Reset is performed.

- **Equation 2.** The input side of this equation monitors the FIRE DETECT state of list L27, which is a user-defined list containing all initiating devices for Area 2.

  The first output statement in Equation 2 programs Area 2's audible NACs to sound a temporal signal when any point within list L27 enters an ALARM condition. Because the audible NACs were added to the Control Points – Off on Silence (Step 3 above), they stop sounding when an Alarm Silence occurs.

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Step 6. Add Custom Control Equations *(continued)*

The second output statement in Equation 2 programs the visible NACs to flash when any point within L27 enters an ALARM condition. Because the visible NACs were added to the Control Points – Off on Reset list (Step 4 above), they stop flashing when a System Reset occurs.

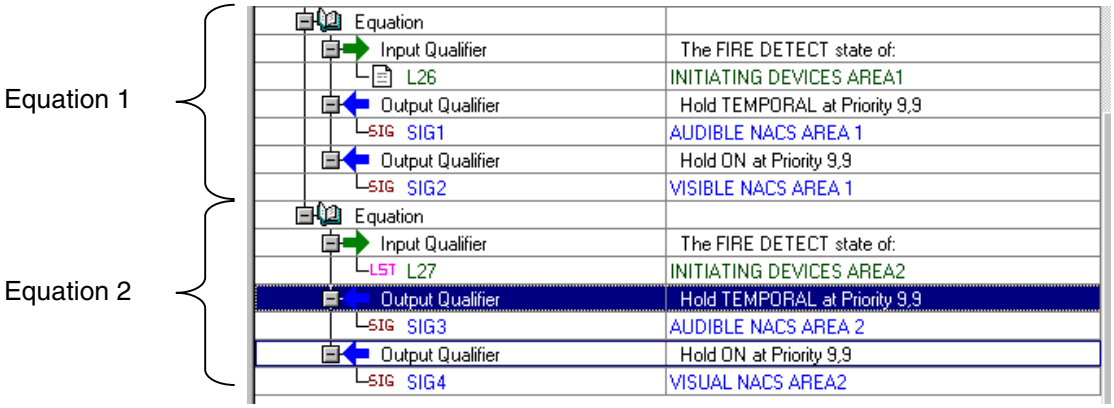

Figure 2-5. Selective Signaling by Area, Standard NACs

QuickAlert Class A/Class B NAC Example. The following example, shown in Figure 2-6, illustrates how to implement Selective Signaling by Area for a building that uses QuickAlert notification appliances. Only a single area is shown in the example. To program selective NAC control for additional areas, copy these equations, substituting another area's initiating devices and NAC appliances.

- **Equation 1.** The input side of this equation monitors the FIRE DETECT state of list L26, which is a user-defined list containing all initiating devices for Area 1.

  The output side of Equation 1 programs the Area's QuickAlert NACs to operate when any point within list L26 enters an ALARM condition.

  Important Note: Use HOLD ON for Class A QuickAlert applications; use HOLD TEMPORAL for Class B QuickAlert applications.

- **Equation 2.** The input side of Equation 2 monitors the ON state of P26, which is the Alarm Silence Activated system pseudo point.

  The first output statement in this equation turns the QuickAlert horns OFF (using the Horn OFF opcode) when P26 is ON (i.e., following an Alarm Silence).

  The second output statement in this equation resets the P26 pseudo point to its OFF state.

  Note: Resetting P26 is very important; do not leave this out.

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Step 6. Add Custom Control Equations *(continued)*

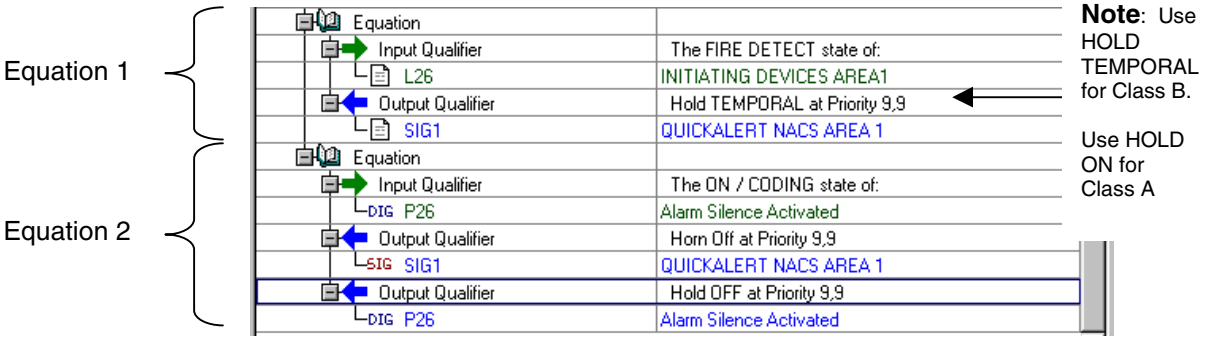
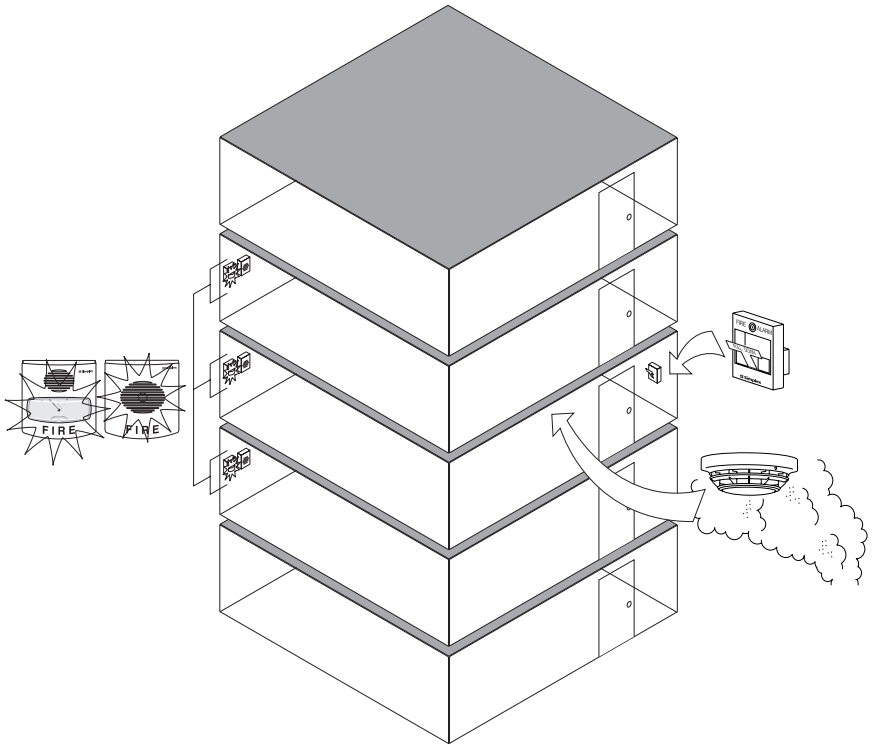


Figure 2-6. Selective Signaling by Area, QuickAlert NACs

Selective Signaling by Fire Floor, Floor Above, and Floor Below

Overview

This application limits the activation of NACs to the floor on which the activated initiating device is located, referred to as the fire floor, and the floors immediately above and below the fire floor.



In the figure above, an activated smoke detector or pull station on Floor 3 activates the NACs on Floors 2, 3, and 4.

Step 1. Define NAC's Device Types / Point Types / Custom Label

The NACs used with this application can be either the NACs located on the panel's SFIO board or the NACs located on a 4009 IDNet NAC extender.

Use the PC Programmer to program the NACs with the following device types and point types. When defining custom labels, make sure to use descriptive labels, such as "FLOOR-1 AUDIBLE NACS."

For QuickAlert applications, refer to "QuickAlert Class A / Class B Guidelines" in Chapter 1.

Continued on next page

Step 1. Define NAC's Device Types / Point Types / Custom Label *(continued)*

Table 2-3. NAC Device Types and Point Types

	Option	Explanation
NAC Device Type	SIGA	Use for standard (non-QuickAlert) Class A NAC. This type of NAC contains multiple signal paths, allowing circuit operation to continue if a single open circuit occurs. This device type requires installation of a Class A NAC adapter card. **Important Note:** Do not use this device type for Class A QuickAlert applications.
	SIGB	Use for the following: - Standard (non-QuickAlert) Class B NAC. - QuickAlert Class B NAC. - QuickAlert Class A NAC.
NAC Point Type	QALERT	Use only for Class B QuickAlert NACs. This point type allows you to control Class B QuickAlert appliances with Custom Control (selective signaling).
	SIGNAL	Use for either of the following: - Standard, non-QuickAlert (Class A or B) NAC appliances requiring Custom Control (selective signaling). - Class A QuickAlert devices requiring Custom Control (selective signaling).

Step 2. Define Device Types, Point Types, and Custom Labels for Initiating Devices

Each initiating device must be programmed with a device type and point type. Refer to "Programming Points," located in Chapter 7 of the *4010 PC Programmer Installation and Programming Instructions*, for information on programming an initiating device's device type and point type. Refer to "Point Types" in Appendix A of this manual for detailed descriptions of the initiating device point types.

Step 3. Add Appropriate NACs to List L6 (Off On Silence)

Use the PC Programmer's List Tab to add the following to List L6 (Control Points, Off on Silence). Members of this list automatically turn off when an Alarm Silence is performed. **Note:** Skip this step if you are using Class B QuickAlert NACs.

- Standard (non-QuickAlert) Audible NACs.
- NAC used for horn control input to SCM. (Class A QuickAlert applications only).

Continued on next page

Step 4: Add Appropriate NACs to List L7 (Off On Reset)

Use the PC Programmer's List Tab to add the following to List L7 (Control Points Off on Reset). Members of this list automatically turn off when a System Reset is performed.

- Standard (non-QuickAlert) Visible NACs.
- Class B QuickAlert NACs.
- The Class A QuickAlert NACs wired to the "NAC IN" input of the SCM.
  Note: Assign the Class A QuickAlert Horn Control NAC to List L6, as described in "Step 3. Add Appropriate NACs to List L6 (Off on Silence)" above.

Step 5. Add Each Floor's Initiating Devices to a User-Defined List

Adding each floor's initiating devices to a separate list limits the number of Custom Control equations required to implement this application. To add a floor's initiating devices to a list, use the PC Programmer's List Tab, adding each floor's initiating device to a separate user-defined list (L26 through L50).

Step 6. Add NACs to User-Defined Lists

For a multi-story facility containing a large number of NAC circuits, add each floor's NACs to a separate user-defined list. Doing this limits the number of Custom Control equations required to implement this application. To add a floor's NACs to a list, use the PC Programmer's List Tab, adding each floor's NACs to a separate user-defined list (L26 through L50).

Step 7. Add Custom Control Equations

This section describes programming the Selective Signaling by Fire Floor application using either standard NAC appliances or Class A/Class B QuickAlert NAC applicances. Refer to the applicable section below for specific information.

Standard NAC Example. The following example, shown in Figure 2-7, illustrates how to implement this application for a four-story building that uses standard NAC appliances.

Each of the four equations functions in the same manner. The input side monitors a list of initiating devices for the floor. If any point within the list goes into ALARM, the output side activates the NACs for the appropriate set of floors.

Continued on next page

Step 7. Add Custom Control Equations *(continued)*

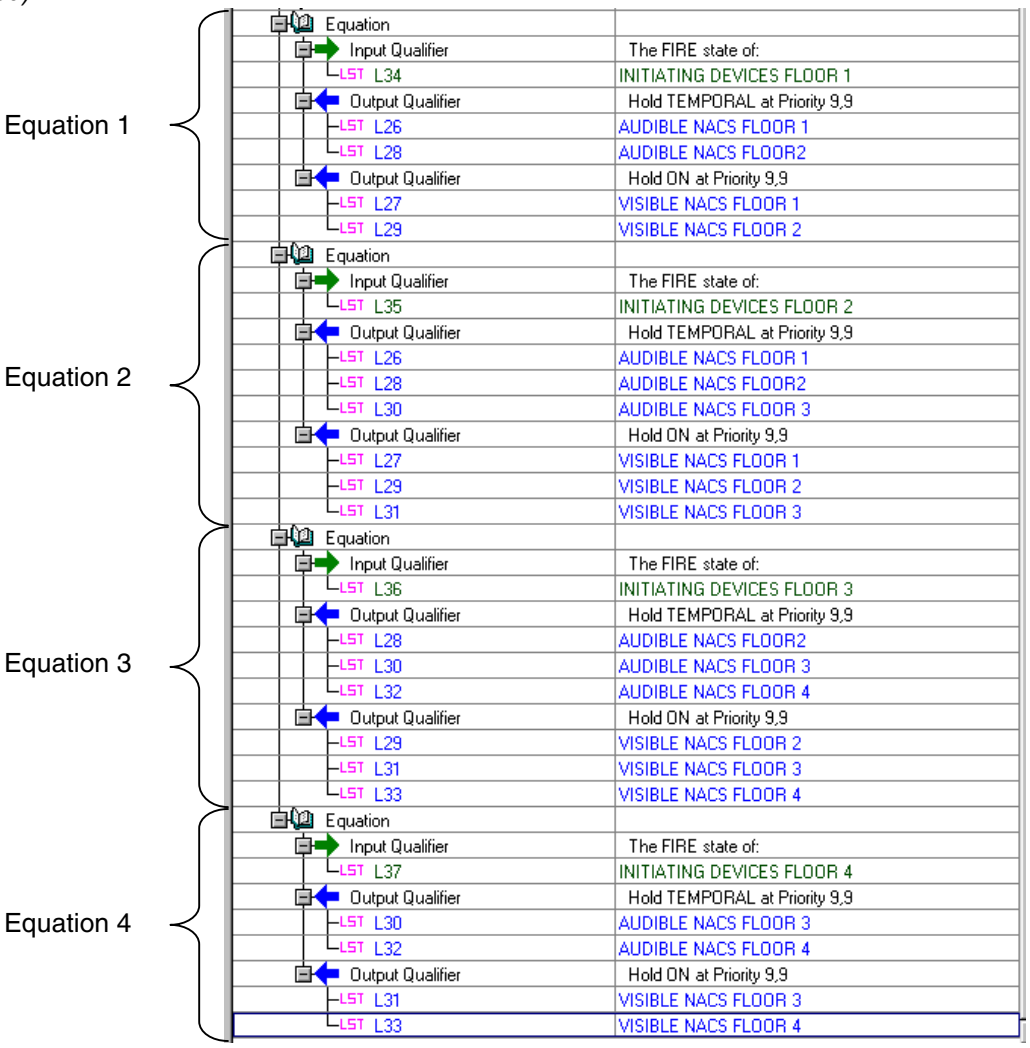


Figure 2-7. Fire Floor, Floor Above, and Below with Standard NACs

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Step 7. Add Custom Control Equations *(continued)*

QuickAlert Class A / Class B NAC Example. The following example, shown in Figure 2-8, illustrates how to implement this application for a four-story building that uses QuickAlert NAC appliances.

The first four equations monitor the state of each floor's initiating devices. The output side of each equation activates the appropriate list of NACs as required. **Important Note:** Use HOLD ON for Class A QuickAlert devices; use HOLD TEMPORAL for Class B QuickAlert devices.

The last equation monitors the state of P26, the Alarm Silence Activated pseudo point. If this point is ON (i.e., following an Alarm Silence), the output executes, issuing the HORN OFF command to silence all audible QuickAlert NAC appliances. HORN OFF opcode is only required for Class B QuickAlert NAC applications. This equation is not required for Class A QuickAlert NAC applications. **Important Note:** You cannot associate a list containing NACs with the Horn OFF command, you must associate specific NACs with the command.

The last output statement at the bottom of the sample screen resets the P26 pseudo point to its OFF state. **Note:** Resetting P26 is very important.

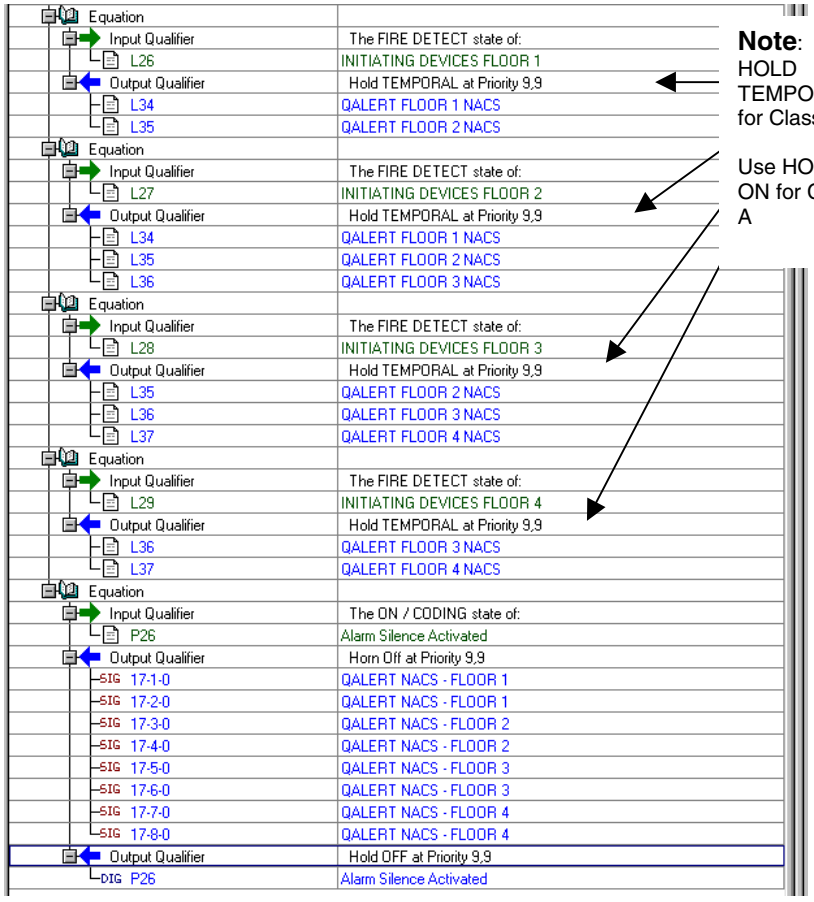

Figure 2-8. Fire Floor, Floor Above, and Below with QuickAlert NACs

Selective Bypass of NAC/Relay Circuits

Overview

The Selective Bypass of NAC/Relay Circuits application allows a 24 Point I/O switch to override the automatic operation of NACs and door holder relays (i.e., horns/strobes do not automatically turn ON and doors do not close when an alarm condition occurs). This application also causes a Trouble to appear at the panel to indicate that the bypass switch is active.

Step 1. Define Switch Attributes

Use the PC Programmer application to program the following switch attributes.

- **Device Type.** Select the GRAPHIN device type, which indicates that the device being programmed is a 24 Point I/O switch.
- **Point Type.** Any of the following switch point types can be used.
  - **OSWITCH.** Specifies a two-position switch, supervised for open circuits. Requires an EOL resistor.
  - **SSWITCH.** Specifies a two-position switch, supervised for open and short circuits. Requires EOL and current limited (up leg) resistors.
  - **TSWITCH.** Three position (SPDT) switch, supervised for open circuits. Requires EOL and current limited resistors.
  - **USWITCH.** Two-position switch, unsupervised. Assumes that no EOL or current limited resistor is used.
- **Mode.** Select the ONOFF mode. This mode allows one position of the switch to represent the ON state and another position to represent the OFF state. Refer to Table 2-4 for information on which switch position is equivalent to ON or OFF.
- **Reference Address.** Select a user-defined digital pseudo point. A Custom Control equation will monitor this point to determine if the signals should be bypassed or not.

Table 2-4. Relationship between Point Status and ON/OFF State

Mode	Point Type	Point Status and Result	
ONOFF – Programs the switch to turn the referenced point ON or OFF. This mode is typically used with a 2-position maintained or a 3-position switch, and is not intended to be used with a 2-position momentary switch.	USWITCH	Limited*	Turns point ON
		Normal*	Turns point OFF
	OSWITCH	Limited*	Turns point ON
		Normal*	Turns point OFF
	SSWITCH	Limited*	Turns point ON
		Normal*	Turns point OFF
	TSWITCH	Normal*	Mode OFF
		Limited*	Turns Point ON
		Short	Indicates Short

* When the I/O point's status is viewed from the LCD panel (using Control/View Points menu selection), this is the state that appears when the switch is in the ON or OFF position.

Continued on next page

Step 2. Define Digital Pseudo Point Attributes

Define the attributes of the digital pseudo point used as the Reference Address in Step 1 above as follows:

- **Point Type.** Define the point type of the digital pseudo point as TROUBLE. This programs the system to display a system trouble if the switch is active (ON).
- **Custom Label.** Use a descriptive name such as "3RD-FLOOR-DOORS & SIGNALS BYPASS TROUBLE."

Step 3. Add the Floor's Initiating Devices to a List

Add the initiating devices for the floor or area that you want to bypass to a list. Doing this limits the number of Custom Control equations required. To add a floor's initiating devices to a list, use the PC Programmer's List Tab.

Step 4. Change the Point Type of NACs and Door Relays

Use the PC Programmer to program the NACs and Door Holder relays with the following point types. (Do not program the door holders with a door holder point type such as DHOLDER. Door holder point types are used to specify the automatic operation of the relay, not its custom operation.) When defining custom labels, make sure to use descriptive labels, such as "FLR-1 AUDIBLE-NAC."

Type of Device	Point Type Required
Class B QuickAlert NACS	QALERT
Standard NACs or Class A QuickAlert NACs	SIGNAL
Door Holder Relays	RELAY

Step 5. Add the NACs and Door Relays to a List

Add the NACs and Door Relays that you want to bypass to a list. Doing this allows the Custom Control equation to refer to the floor's entire set of NACs and Relays as a single point. This limits the number of equations required to implement the bypass function.

Step 6. Add Appropriate NACs to List L6 (Off On Silence)

Use the PC Programmer's List Tab to add the following to List L6 (Control Points, Off on Silence). Members of this list automatically turn off when an Alarm Silence is performed. **Note:** Skip this step if you are using Class B QuickAlert NACs.

- Standard (non-QuickAlert) Audible NACs.
- NAC used for horn control input to SCM. (Class A QuickAlert only.)

Continued on next page

Step 7. Add Appropriate NACs to List L7 (Off On Reset)

Use the PC Programmer's List Tab to add the following to List L7 (Control Points Off on Reset). Members of this list automatically turn off when a System Reset is performed.

- Door Holder Relays.
- Standard (non-QuickAlert) Visible NACs.
- Class B QuickAlert NACs.
- Class A QuickAlert NACs wired to the "NAC IN" input of the SCM.
  Note: Assign the Class A QuickAlert Horn Control NAC to list L6.

Step 8. Add Custom Control Equations

This section illustrates how to implement Selective Bypass of NAC/Relay Circuits for a facility that uses either standard NACs or Class A and Class B QuickAlert NACs. Refer to the appropriate section below.

Standard NACs. The first two input statements, separated by the AND operator, check whether there is an activated initiating device **and** whether the bypass switch (monitored by pseudo P76) is active. The NACs activate when the following conditions are **both** true, and do not activate if either is false.

- List L26 contains an activated initiating device (i.e., a smoke detector in alarm).
- P76 is NOT in its ON/CODING state (i.e., the NACs activate if the switch is not active).

User	This is user cc
Equation	
Input Qualifier	Any 1 of type FIRE DETECT in point list:
L26	INITIATING DEVICES 3RD FLOOR
Input Qualifier	And Not The ON / CODING state of:
P76	3RD FLOOR DOORS AND NACS BYPASS SWITCH
Output Qualifier	Hold TEMPORAL at Priority 9,9
L28	3RD FLOOR AUDIBLE NACS
Output Qualifier	Hold ON at Priority 9,9
L27	3RD FLOOR VISIBLE NACS
Output Qualifier	Hold ON at Priority 9,9
LST L30	3RD FLOOR DOOR RELAYS

Figure 2-9. Selective Bypass of NACs, Standard NAC Example

QuickAlert NACs. Figure 2-10 shows how to implement the selective bypass application with Class A or Class B QuickAlert NACs. As with the Standard NACs example, the first two input statements check whether there is an activated initiating device **and** whether the bypass switch (monitored by pseudo P76) is active.

The NACs activate when the following conditions are **both** true, and do not activate if either is false. Use HOLD TEMPORAL for Class B QuickAlert NACs; use HOLD ON for Class A QuickAlert NACs.

- List L26 contains an activated initiating device (i.e., a smoke detector in alarm).
- P76 is NOT in its ON/CODING state (i.e., the NACs activate if the switch is not active).

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Step 8. Add Custom Control Equations *(continued)*

The second equation checks the ON/CODING state of P26, which is ON when Alarm Silence is active. If P26 is ON (i.e., an Alarm Silence has occurred), the HORN OFF command executes, turning off the QuickAlert Horns. Be aware that you cannot associate a list with the HORN OFF command; you must specify the specific NAC points (for example, SIG1, etc.).

The last output qualifier resets the state of P26. **Note: Resetting P26 is very important. Do not leave this step out.**

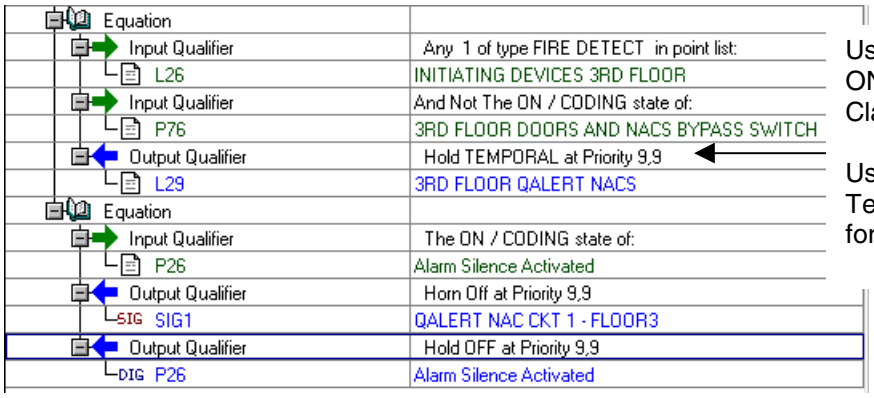

Figure 2-10. Selective Bypass of NACs, QuickAlert NAC Example

Selective Activation of Single Station Devices

Introduction

Single station smoke detectors -- typically used in hotel rooms, dormitories, and hospital rooms -- contain their own sounder. When activated, only the sounder on the activated device signals the presence of an alarm condition. This application describes programming the 4010 so that when a manual pull station activates, all single station devices in the area also activate.

Step 1. Define Device Types, Point Types, and Mode for Single Station Devices

Use the PC Programmer's Point tab to program each Single Station Device with the following attributes:

- **Device Type.** A single station device can use any one of the following device types:
  - **SPHOTO** designates that a photoelectric sensor is attached to a separate sounder base.
  - **XSPHOTO** indicates that a photoelectric sensor is mounted to a separate sounder base and that the system is using a more sensitive smoke-detection algorithm. (.2% sensitivity to smoke not .5%.).
  - **QSPHOTO** is a quick connect photoelectric sensor/sounder base combination in which the sensor cannot be removed from the base.
  - **SHEAT** is a heat detector attached to a separate sounder base.
  - **SION** indicates that an ionization detector is mounted to a separate sounder base.
  - **SOHEAT** is a rate of rise heat detector mounted to a separate sounder base.
- **Point Type.** Any of the standard point types may be used, including DUCT, GVMON, SDUCT, SMOKE, UTIL, VSMOKE. Refer to Appendix A of this manual for the function of these point types.
- **Mode.** The default mode setting for a TrueAlarm device equipped with sounder is SSTATION (Single Station), which is required to support single station operation.

  To check whether this mode is enabled, you need to select the PC Programmer's Card Tab and view the IDNet card. The Mode field is on the far right of the device's point information. (**Note:** Mode does not appear in the Point Tab.)

Step 2. Add Area's Pull Stations to a User-Defined List

Adding each area's pull stations to a separate list limits the number of Custom Control equations required to implement this application. To add an area's pull stations to a list, use the PC Programmer's List Tab.

Step 3. Add Custom Control Equations

Programming selective activation of single station devices requires two equations, as shown in Figure 2-11.

Continued on next page

Step 3. Add Custom Control Equations *(continued)*

Equation 1. This equation uses a single input qualifier to monitor List L26, which contains all of Floor 1's pull stations. If any pull station within this list activates, this equation's output qualifiers execute. The first output qualifier programs the tone used by the single station sounders when they activate. The second output qualifier turns on the sounders in the area of the activated pull station.

Note: You cannot put single station devices in a list; each device must be separately listed in the Custom Control program, as shown in Figure 2-11.

Equation 2. The input qualifier used in this equation monitors the state of P26, which is ON if an Alarm Silence has been performed. The output qualifiers only execute when P26 is ON (i.e., following Alarm Silence). The first output qualifier, Device Code OFF, turns off the sounders on the single station devices. The second output qualifier resets the state of P26.

Note: Resetting P26 is very important. Do not leave this step out.

Equation 1

Equation 2

Equation	
Input Qualifier	The FIRE DETECT state of:
LST L26	PULL STATIONS FLOOR 1
Output Qualifier	Channel Code FAST MARCH TIME
Output Qualifier	Device Code ON at Priority 9,9
TRU M1-11	SINGLESTATION-ROOM 1-1
TRU M1-12	SINGLESTATION-ROOM 1-2
TRU M1-13	SINGLESTATION-ROOM 1-3
Equation	
Input Qualifier	The ON / CODING state of:
DIG P26	Alarm Silence Activated
Output Qualifier	Device Code OFF at Priority 9,9
TRU M1-11	SINGLESTATION-ROOM 1-1
TRU M1-12	SINGLESTATION-ROOM 1-2
TRU M1-13	SINGLESTATION-ROOM 1-3
Output Qualifier	Hold OFF at Priority 9,9
DIG P26	Alarm Silence Activated

Figure 2-11. Selective Activation of Single Station Devices

Chapter 3
Suppression Release

Overview

This chapter describes the 4010 programming required for common suppression-release applications.

Basic applications, which do not involve pre-signaling or an abort switch with delay, can be programmed without Custom Control using a mix of the 4010's built-in system options, point types, and lists. More complex applications, involving pre-signaling or an abort switch with delay, require Custom Control programming.

Before continuing, make sure that you have the following information:

- Fire Alarm STRM Ref. number SEB-FAS0899-01. This STRM contains **critical** information concerning UL, FM, and IRI suppression requirements.
- Field Wiring Diagram 842-058.
- Field Wiring Diagram 842-073.
- Detailed knowledge concerning AHJ requirements .

In this Chapter

Refer to the following page for specific information on a topic.

Default Suppression Release Applications

Suppression Release Triggered by Single Pull Station or Automatic Initiating Device

The application described in this section is used in situations that require the release of the suppression agent immediately (or slightly delayed by a timer) after alarm activation. A typical use is for a fueling station equipped with a manual release station and flame detectors. An important point to note with this application is that it does not use either an abort switch or a NAC pre-signal that indicates imminent release of the agent.

As shown in Figure 3-1, activation of a single initiating device – typically a manual release station or an automatic initiating device such as a flame detector – triggers a Suppression Release Delay Timer. This optional delay timer, which is a system option having a range of zero to 30 seconds for a manual release station or zero to 60 seconds for an automatic initiating device, delays the activation of the NAC signals and prevents suppression dump. When the timer expires, both of these actions – NAC signal activation and suppression dump – occur. (**Important Note**: If the delay timer is not selected, both NAC signal activation and the release of the agent immediately follow alarm activation.)

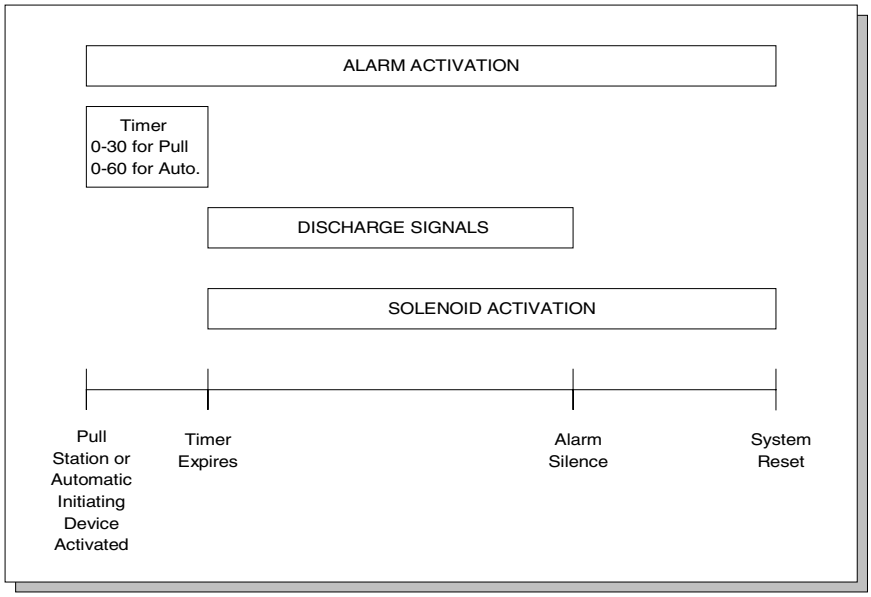

Figure 3-1. Timeline for Single Device Suppression Release

Suppression Release Triggered by Dual Automatic Initiating Devices

Some situations require additional verification of an alarm condition (i.e., two automatic initiating devices must activate) before the release of the suppression agent can occur.

As shown in Figure 3-2, activation of the second automatic initiating device triggers an optional timer, which has a range of 0-60 seconds for an automatic initiating device. When this timer expires, the discharge signals sound and the solenoid activates, releasing the suppression agent. As with the previous application, it is important point to note that this application does not include either an abort switch or pre-signal.

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Suppression Release Triggered by Dual Automatic Initiating Devices *(continued)*

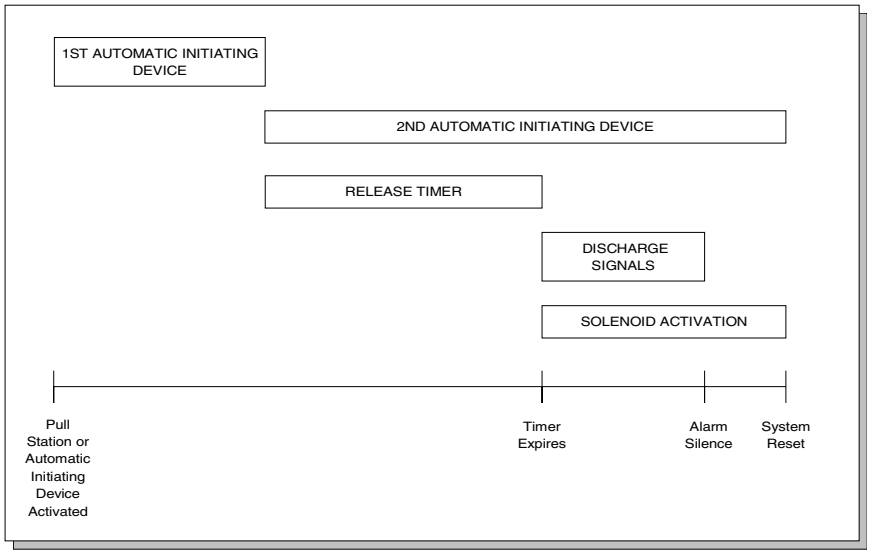


Figure 3-2. Timeline for Suppression Release Using Dual Automatic Initiating Devices

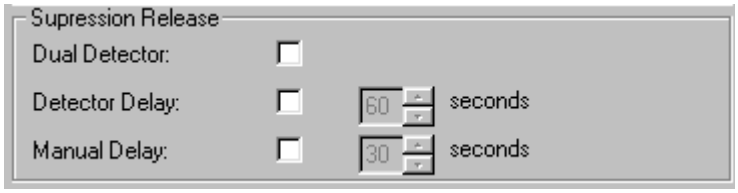
Programming Default Applications

Programming the suppression component of either default application is done with the system's built-in suppression release options, suppression point types, and suppression lists.

1. Set the Suppression Release System Options, as shown below. These options are available by first selecting the PC Programmer Card Tab and then selecting the System Options Radio button.

Select only if two detectors must activate prior to agent discharge

Check and enter number of seconds to delay, if necessary



2. Use the PC Programmer's Point Tab to assign suppression points with the point types listed below. Refer to Appendix A for specific details on these point types.

   - **SUPDUMP.** Use for manual suppression release points.
   - **SUPREL.** Use for suppression (agent discharge) release output points.
   - **SUPDET.** Use for automatic initiating devices

Continued on next page

Programming Default Applications *(continued)*

3. Use the PC Programmer's List Tab to add the initiating devices and output points to the appropriate lists, as follows:

List	Add These Points
L9	Automatic Suppression Release Points. Add all automatic initiating devices whose activation should result in the release of the suppression agent.
L10	Suppression Manual Release Points. Add all manual suppression release points whose activation should result in the release of the suppression agent.
L12	Suppression Release Output Points. Add the NACs that control the suppression release solenoids.

Dual Detector, Pre-Signal, and Abort Switch with No Delay

Introduction

The application described in this section provides the following suppression operation.

- Activation of the suppression release system occurs when either two automatic initiating devices (detectors) or a single manual release point (pull station) are activated. Release of the suppression agent can be delayed for up to 60 seconds after the second automatic initiating device activates and for up to 30 seconds after a pull station activates. These delays are configurable via system options.

- At any time prior to the actual release of the agent, an operator can prevent the release of the suppression agent by pressing an abort switch. Release of the suppression agent is prevented for the duration of time this switch is held. Release of the suppression agent occurs immediately after release of the abort switch, assuming the timers discussed in the previous bullet have expired. Operators should be made aware that if the alarm is false, clearing the alarm condition and resetting the system prior to releasing the switch prevents agent discharge.

- NAC appliances operate in a slightly different manner depending on whether the activated device is an automatic initiating device or a pull station.

    - Automatic Initiating Devices. When the first automatic initiating device activates, the NACs in the suppression release area sound a pre-signal (Slow March Time). When a second automatic initiating device activates, this tone converts to a Fast March Time tone. At the time of agent discharge, the tones convert to Steady, indicating that the agent has been released.

    - Manual Release Point (pull station). When a manual release point activates, the NACs in the suppression area sound a Fast March Tone. At the time of agent discharge, the tone converts to a Steady tone, indicating that the agent has been released.

Figure 3-3 shows a timeline for this application. First stage signals activate following the first stage alarm condition (which is always an automatic initiating device). Second stage signals activate following the activation of either a second automatic initiating device or following activation of a manual release station. The second alarm condition (or the manual pull station) also triggers the optional release timer, if used. This timer ranges from 0-30 seconds for a manual release station and 0-60 seconds for an automatic initiating device. Suppression is delayed until the release timer expires or the abort switch is released, at which time the signals convert to a discharge tone and the solenoid activates.

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Introduction *(continued)*

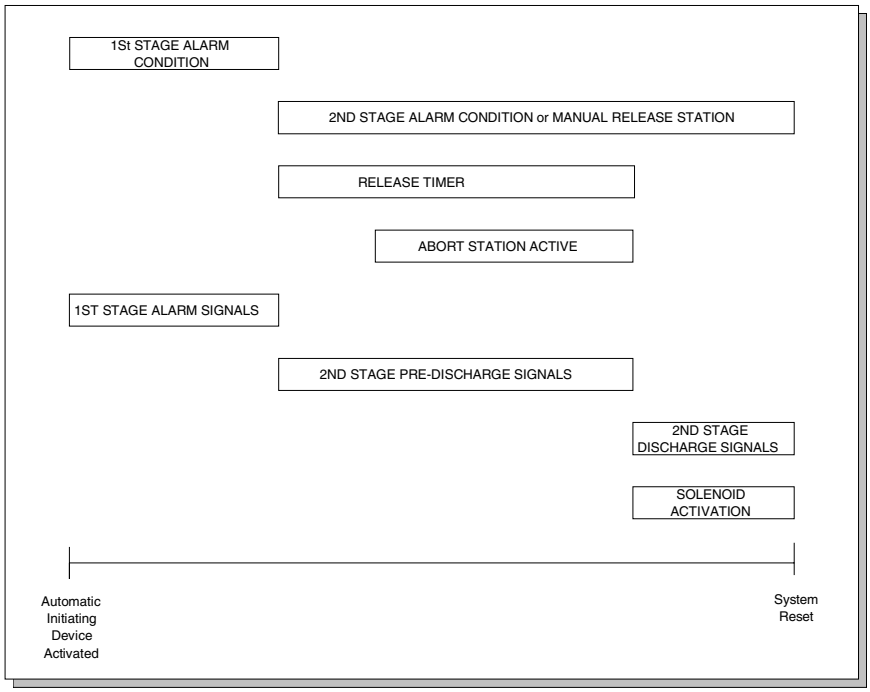


Figure 3-3. Pre-Signal with Abort Switch Timeline

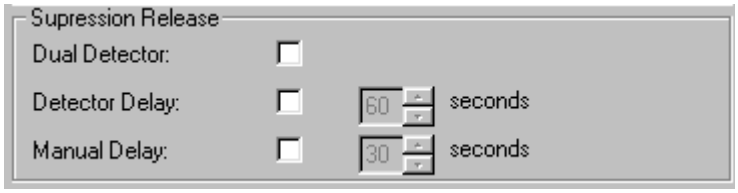
Programming System Options, Point Types, and Lists

Programming the suppression component of either default application is done with a combination of Custom Control and the system's built-in suppression release options, suppression point types, and suppression lists.

1. Set the Suppression Release System Options, as shown below. These options are available by first selecting the PC Programmer Card Tab and then selecting the System Options Radio button.

Select only if two detectors must activate prior to agent discharge

Check and enter number of seconds to delay, if necessary



2. Use the PC Programmer's Point Tab to assign suppression points with the point types listed below. Refer to Appendix A for specific details on these point types.

   - **SUPABRT.** Use for suppression release abort points.
   - **SUPDUMP.** Use for manual suppression release points.
   - **SUPREL.** Use for suppression (agent discharge) release output points.
   - **SUPDET.** Use for automatic initiating devices

Continued on next page

Programming System Options, Point Types, and Lists *(continued)*

3. Use the PC Programmer's list tab to add the initiating devices and output points to the appropriate lists, as follows:

List	Add These Points
L9	Automatic Suppression Release Points. Add all automatic initiating devices whose activation should result in the release of the suppression agent.
L10	Suppression Manual Release Points. Add all manual suppression release points whose activation should result in the release of the suppression agent.
L11	Suppression Release Abort Points. Add all abort switch points to this list.
L12	Suppression Release Output Points. Add the NACs that control the suppression release solenoids.

Programming Custom Control

The following example, shown in Figure 3-4, illustrates how to implement this application.

- **Equation 1.** The input side of this equation monitors the FIRE state of list L9, which is a system list containing all suppression-related automatic initiating devices. The output side of Equation 1 programs the NAC appliances to sound in SLOW MARCH TIME when any point within list L9 enters an ALARM condition.

- **Equation 2.** The input side of Equation 2 monitors L9 (suppression-related automatic initiating devices) and L10 (suppression-related manual release points). If there is an activated device in either list, the output side of the equation executes, activating the NAC appliances in FAST MARCH TIME.

- **Equation 3.** The input side of Equation 3 monitors the suppression release output points contained in system list L12. If any of the points in this list are ON/CODING, the NACs are held ON, indicating that the suppression agent has been released.

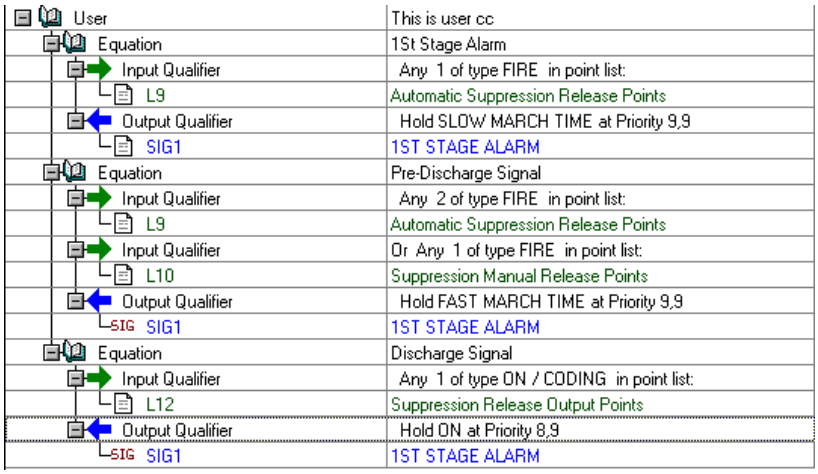


Figure 3-4. Custom Control for Pre-Signal

Dual Detector, Pre-Signal, and Abort Switch with Delay

Introduction

The application described in this section operates in the following way. Figure 3-5 shows a timeline for this application.

- Activation of the suppression release system occurs when either two automatic initiating devices (detectors) or a single manual release point (pull station) are activated. Release of the suppression agent is delayed for 30 seconds after the second automatic initiating device activates and for five seconds after a pull station activates.
- At any time prior to the actual release of the suppression agent, an operator can prevent the release by pressing an abort switch. Agent release is prevented for the duration of time this switch is held. If the condition that triggered the alarm is cleared (i.e., the detectors or pull station are reset) **and** a System Reset is performed, release of the suppression agent does not occur. If however, the abort switch is released and the condition that triggered the alarm is still present, a 10-second Abort Switch timer starts. After the timer expires, release of the agent occurs.
- NAC appliances operate in a slightly different manner depending on whether the activated device is an automatic or a pull station.
  - Automatic Initiating Devices. When the first automatic initiating device activates, the NACs in the suppression release area sound a pre-signal (Slow March Time). When a second automatic initiating device activates, this tone converts to Fast March Time. At the time of agent discharge, the tones convert to Steady, indicating that the agent has been released.
  - Manual Release Point (pull station). When a manual release point activates, the NACs in the suppression area sound a Fast March Tone. At the time of agent discharge, the tone converts to a Steady tone, indicating that the agent has been released.

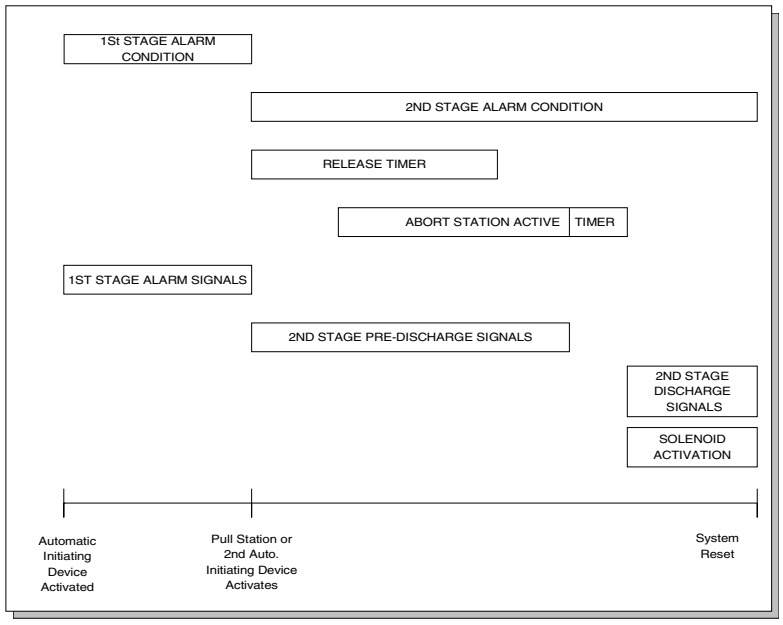


Figure 3-5. Dual Detector, Pre-Signal, and Abort Switch with Delay

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Define Lists, Digital Pseudos, and Analog Pseudos

The dual detector, pre-signal, and abort switch with delay application requires the following components to be defined prior to programming the Custom Control equations.

1. Use the PC Programmer's Point Tab to assign suppression points with the point types listed below. Refer to Appendix A for specific details on these point types.

   - **SUPABRT.** Use for suppression release abort points. Use 2080-9030 system abort switch. Wire this switch according to FWD 842-073.
   - **SUPDUMP.** Use for manual suppression release points.
   - **SIGNAL.** Use for suppression (agent discharge) release output points. **Note**: Do not use the SUPREL point type for this application.
   - **SUPDET.** Use for automatic initiating devices

2. Use the PC Programmer's list tab to add four lists similar to the ones shown below. Do not use the system's suppression release lists – L9, L10, L11, or L12.

List	Add These Points
L26	Add all automatic initiating devices (detectors) whose activation should result in the release of the suppression agent.
L27	Add all manual suppression release points (pull stations) whose activation should result in the release of the suppression agent.
L28	Add all abort switch points to this list.
L29	Add the NACs that control the suppression release solenoids.

3. Define five Digital Pseudo Points, similar to the following:

   - P80. Two detectors in alarm
   - P81. Manual release station activated
   - P82. Abort switch activated
   - P83. Abort switch released
   - P84. Delay timer running

4. Analog Pseudo Points. Define three analog pseudo points, similar to the following. These will be used as the running timers in the example.

   - A26. 10 Second Abort Delay
   - A27. Detector Delay
   - A28. Pull Station Delay

Continued on next page

Program Custom Control Equations

The eight Custom Control equations required to program this application are shown in Figure 3-7. These equations have the following functions.

Equation 1. This equation contains two input qualifiers and a single output qualifier. The first input qualifier in this equation monitors the state of list L26. If two detectors within this list are in the FIRE state, the remainder of the equation executes. The second input qualifier, which executes only if the first input qualifier is true (i.e., two detectors are activated), starts a running timer of 30 seconds. The output qualifier at the bottom of the first equation, which also executes only if the first input qualifier is true, turns P80 on.

Equation 2. The first input qualifier monitors the state of List L28, which contains all manual release stations (pull stations) in the suppression release area. The second input qualifier and the output qualifier at the bottom of Equation 2 execute only if the first input qualifier is true. The second input qualifier starts a running timer of five seconds. The output qualifier at the bottom of the equation turns P81on.

Equation 3. The first input qualifier checks to see whether an abort switch is active. It does this by checking to see whether any point within list L27, which contains all abort switch points, is in a supervisory state. (Note that these points must have a point type of SUPABRT for this to occur.) The second input qualifier, which is linked to the first by an AND logical operator, determines whether two detectors are in an activated state. Because the first two input qualifiers are separated by the AND operator, they both must be true (i.e., an abort switch must be active while two detectors are in an activated state) for the equation's two output qualifiers to execute. If the inputs are both true, the first output qualifier holds pseudo point P82 ON and the second output qualifier tracks ON P83. (Understanding the function of this last output qualifier is very important. Because it uses TRACK ON, P83 turns on when both input qualifiers are true, and turns off when either one of the input qualifiers is false.)

Equation 4. The first input qualifier checks pseudo point P82, which is ON only if Equation 3's input qualifiers are both true (i.e., abort switch is active and two detectors in the suppression area are active at the same time). The second input qualifier, which is linked to the first input by the logical AND operator, checks P83. This input is true only if P83 is NOT in its ON/CODING state (i.e., switch is not being held in). The third input qualifier starts a running timer of 10 seconds. The output qualifer turns P84 on, which indicates that the timer is running.

Equation 5. The four input qualifiers in this expression are linked via logical operators. The output qualifier (which holds on the suppression release circuits) in this equation executes if the following occurs:

- Two detectors are active (i.e., P80 is ON) AND the abort switch is not active (P82 cannot be in the ON/CODING state).
- OR a pull station is active (P81 is ON).
- OR P84 is on (i.e., the abort switch delay timer has expired).

Continued on next page

Program Custom Control Equations *(continued)*

Equation 6. If one detector in List L26 goes into alarm, SIG1 turns on steady. This functions as a pre-signal for system operators.

Equation 7. This equation turns off SIG1 and sounds a slow march tone on SIG2 if either two detectors activate in list L26 or if a pull station activates.

Equation 8. This equation turns SIG2 on steady if any one of the releasing circuits (NACs) is ON (i.e., it is discharging).

User	This is user cc
Equation	2 Detectors in Alarm
Input Qualifier	Any 2 of type FIRE in point list:
L26	DETECTOR LIST
Input Qualifier	Delay For 30 secs, running timer is A27
Output Qualifier	Hold ON at Priority 9,9
P80	
Equation	Pull Station Active
Input Qualifier	Any 1 of type FIRE in point list:
L28	PULL STATIONS
Input Qualifier	Delay For 5 secs, running timer is A28
Output Qualifier	Hold ON at Priority 9,9
P81	
Equation	Abort Active
Input Qualifier	Any 1 of type SUPERVISORY in point list:
L27	ABORT STATIONS
Input Qualifier	And Any 2 of type FIRE in point list:
L26	DETECTOR LIST
Output Qualifier	Hold ON at Priority 9,9
P82	
Output Qualifier	Track ON at Priority 9,9
P83	
Equation	Abort Releaed Start 10 Sec.
Input Qualifier	The ON / CODING state of:
P82	
Input Qualifier	And Not The ON / CODING state of:
P83	
Input Qualifier	Delay For 10 secs, running timer is A26
Output Qualifier	Hold ON at Priority 9,9
P84	

Figure 3-6. Custom Control (Part One)

Continued on next page

Program Custom Control Equations *(continued)*

Equation	Release Equation
Input Qualifier	The ON / CODING state of:
P80	
Input Qualifier	And Not The ON / CODING state of:
P82	
Input Qualifier	Or The ON / CODING state of:
P81	
Input Qualifier	Or The ON / CODING state of:
P84	
Output Qualifier	Hold ON at Priority 9,9
L29	RELEASING CIRCUITS
Equation	1ST Stage Alarm
Input Qualifier	Any 1 of type FIRE in point list:
L26	DETECTOR LIST
Output Qualifier	Hold ON at Priority 9,9
SIG1	NAC Circuit: SIG 1
Equation	2ND Stage Pre-Discharge
Input Qualifier	Any 2 of type FIRE in point list:
L26	DETECTOR LIST
Input Qualifier	Or Any 1 of type FIRE in point list:
L28	PULL STATIONS
Output Qualifier	Hold SLOW MARCH TIME at Priority 9,9
SIG2	NAC Circuit: SIG 2
Output Qualifier	Hold OFF at Priority 8,9
SIG1	NAC Circuit: SIG 1
Equation	Discharge Signal
Input Qualifier	Any 1 of type ON / CODING in point list:
L29	RELEASING CIRCUITS
Output Qualifier	Hold ON at Priority 8,9
SIG2	NAC Circuit: SIG 2

Figure 3-7. Custom Control (Part Two)

Chapter 4
Additional Applications

Overview

This chapter describes additional useful applications.

In this Chapter

Refer to the following page for specific information on a topic.

Pre-Signal Operation

Overview

This application monitors initiating devices and does the following:

- **Automatic Initiating Device Activation.** Sounds a pre-alert, slow march time tone when an automatic initiating device (for example, a smoke or heat sensor) activates. This tone lasts for five minutes. After five minutes, if no Alarm Silence has occurred, the tone converts to a temporal "general evacuation" tone. The purpose of this is to alert system operators that an automatic initiating device has triggered and allow them up to five minutes to investigate the cause of the alarm.

- **Pull Station Activation.** Sounds a temporal "general evacuation" tone, for a duration of five minutes, when a pull station activates.

Note: Always consult the local AHJ to determine whether this type of operation is allowed or not allowed.

Step 1. Define NAC's Device Type, Point Type, and Custom Label

The NACs used with the Pre-Signal application can be either the NACs located on the panel's SFIO board or the NACs located on a 4009 IDNet NAC extender. **Note:** Class A QuickAlert cannot be used with pre-signal applications.

Use the PC Programmer to program the NACs with the device types and point types listed in Table 4-1. When defining custom labels, make sure to use descriptive labels, such as "FLOOR1-VISUAL-CIRCUIT."

If necessary, refer to Chapter 7, Programming Points, of the *4010 PC Programmer Installation and Programming Instructions* (574-187) for information on editing a point's device type, point type, and custom label.

Table 4-1. NAC Device Types and Point Types

	Option	Explanation
NAC Device Type	SIGA	Use for Class A NAC. This type of NAC contains multiple signal paths, allowing circuit operation to continue if a single open circuit occurs. This option requires installation of a Class A NAC adapter card.
	SIGB	Use for Class B NAC, which is a NAC containing only a single circuit path.
NAC Point Type	QALERT	Use **only** for Class B QuickAlert NAC appliances requiring Custom Control (selective signaling).
	SIGNAL	Use for either of the following: - **Non**-QuickAlert (standard) NAC appliances requiring Custom Control (selective signaling).

Continued on next page

Step 2. Define Device Types, Point Types, and Custom Labels for Initiating Devices

Each initiating device must be programmed with a device type and point type. Refer to "Programming Points," located in Chapter 7 of the *4010 PC Programmer Installation and Programming Instructions* for information on programming an initiating device's device type and point type. Refer to "Monitor Point Types" in Appendix A of the PC Programmer manual for detailed descriptions of the initiating device point types.

Step 3. Add Initiating Devices and NACs to User-Defined Lists

Create user-defined lists, as follows:

- Automatic initiating devices.
- Pull stations.
- NACs (if you are using standard NACs you may need two lists, one for audible NACs and one for visible NACs).

To add devices to a list, use the PC Programmer's List Tab, adding each of the devices to one of the available user-defined lists (L26 through L50).

Step 4. Add Appropriate NACs to List L6 (Off On Silence)

Use the PC Programmer's List Tab to add the following to List L6 (Control Points, Off on Silence). Members of this list automatically turn off when an Alarm Silence is performed. **Note:** Skip this step if you are using Class B QuickAlert NACs.

- Standard (non-QuickAlert) Audible NACs

Step 5. Add Appropriate NACs to List L7 (Off On Reset)

Use the PC Programmer's List Tab to add the following to List L7 (Control Points Off on Reset). Members of this list automatically turn off when a System Reset is performed.

- Standard (non-QuickAlert) Visible NACs
- Class B QuickAlert NACs

Continued on next page

Step 6. Add Custom Control Equations

Standard NAC Example. Figure 4-1 shows an example of pre-signal Custom Control equations for a facility that uses standard NAC devices. Information on QuickAlert devices is contained in the example at the end of this section.

- **Equation 1.** The input side of this equation monitors the Physical Abnormal state of each device within list L26, which is a user-defined list containing the automatic initiating devices (smokes/heats, for example) for Floor 1. The output side of Equation 1 programs SIG1 to sound (slow march tone) when any point within list L26 enters a physical abnormal condition (i.e., when any smoke sensor activates).

- **Equation 2.** The input side of this equation monitors the Physical Abnormal state of each device within list L26, which is a user-defined list containing the automatic initiating devices (smokes/heats, for example) for Floor 1. If any point within L26 activates and P1 (pseudo point for unacknowledged alarms) is ON (i.e., no operator acknowledgment has occurred), a timer starts. This timer runs for five minutes (300 seconds). When it expires, the NACs convert to a temporal pattern. Note that you must assign an analog pseudo point (A26 in this example) to the timer.

- **Equation 3.** This equation's input side monitors the Physical Short state of each device within L27, which is a list containing the floor's pull stations. If a device within this list is active (i.e., pulled), the output side of this equation programs the NACs to activate in a temporal pattern.

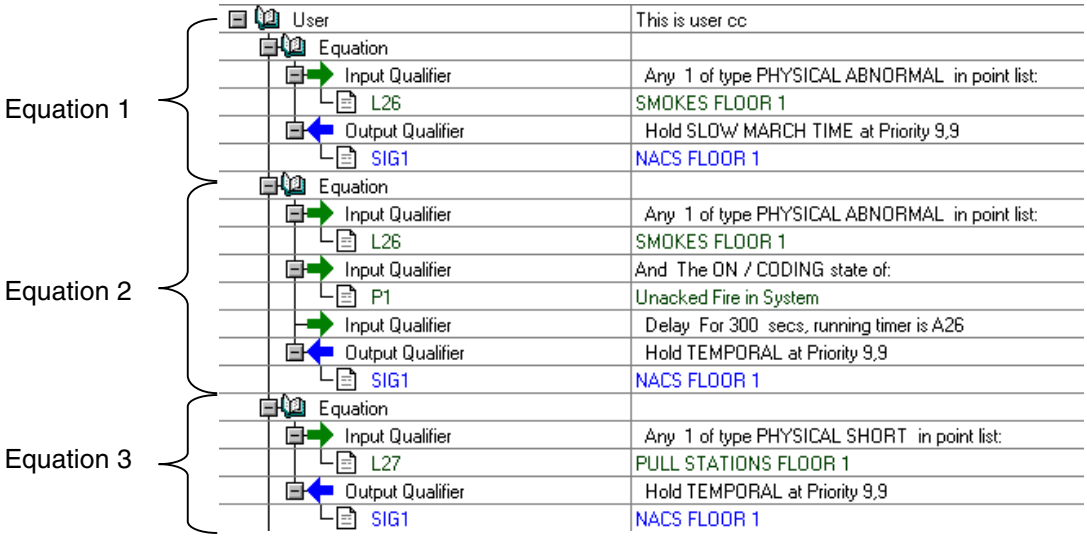

Figure 4-1. Pre-Signal Custom Control, Standard NACs

Continued on next page

Step 6. Add Custom Control Equations *(continued)*

QuickAlert NACs. A pre-signal application that uses QuickAlert NACs is programmed in virtually the same manner as the standard NAC example shown above. The two differences for QuickAlert are that it requires one additional equation to turn the horns off and you cannot use Class A QuickAlert with a pre-signal application. (The horn pattern generated by the Sync module is set via a switch, and it cannot be controlled by Custom Control.) Figure 4-2 shows an example of a pre-signal application that uses QuickAlert NACs.

Equation	
Input Qualifier	Any 1 of type PHYSICAL ABNORMAL in point list:
L26	SMOKES FLOOR 1
Output Qualifier	Hold SLOW MARCH TIME at Priority 9,9
SIG SIG3	QALERT FLOOR1
Equation	
Input Qualifier	Any 1 of type PHYSICAL ABNORMAL in point list:
LST L26	SMOKES FLOOR 1
Input Qualifier	And The ON / CODING state of:
DIG P1	Unacked Fire in System
Input Qualifier	Delay For 300 secs, running timer is A26
Output Qualifier	Hold TEMPORAL at Priority 9,9
SIG SIG3	QALERT FLOOR1
Equation	
Input Qualifier	Any 1 of type PHYSICAL SHORT in point list:
LST L27	PULL STATIONS FLOOR 1
Output Qualifier	Hold TEMPORAL at Priority 9,9
SIG SIG3	QALERT FLOOR1
Equation	
Input Qualifier	The ON / CODING state of:
DIG P26	Alarm Silence Activated
Output Qualifier	Horn Off at Priority 9,9
SIG SIG3	QALERT FLOOR1
Output Qualifier	Hold OFF at Priority 9,9
DIG P26	Alarm Silence Activated

Figure 4-2. Pre-Signal Custom Control, QuickAlert NACs

Programming a Utility Monitoring Point

Overview

Utility monitoring points differ from standard fire alarm points in that they do not report a trouble when they activate and they do not latch (i.e., they reset themselves). A utility monitoring point tracks the state of a monitor device (for example, a heat sensor), turning a relay or supervisory pseudo point on when the sensor's value equals or exceeds an analog value that you specify.

This section uses an example in which a customer wants a water heater to come on and a supervisory alert to occur when the temperature of a water tank is between 38 and 50 degrees.

Step 1. Change the Heat Detector's Point Type and Custom Label

Use the PC Programmer to change the heat detector's point type to Utility. This is a generic point type with no default operation, allowing the point to be controlled by Custom Control. Assign a descriptive custom label, such as "Water Temp Monitor – Tank 2" to the point.

Step 2. Change the AUX Relay Point's Point Type and Custom Label

The output point is typically a relay (AUX1, for example). Use the PC Programmer to change its point type to Relay. This is a generic point type that allows the point to be controlled via Custom Control. Change its custom label to a descriptive text, such as "Water Heater Control Relay Tank 2."

Step 3. Define a Supervisory Digital Pseudo Point

Use the PC Programmer to define a user digital pseudo point. Assign it a point type of Supervisory, which means it will generate a Supervisory alert to the panel when activated. Change its custom label to the message that you want to appear on the panel when the monitor's threshold point is reached. For example, "Water Tank Temp Warning."

Step 4. Program Custom Control Equations

The Custom Control example, shown in Figure 4-3, outlines the equation needed to program the example water tank/heater application. This equation contains two input qualifiers and two output qualifiers.

1st Input Qualifier. The first input qualifier in the example equation checks the value of the heat sensor to determine if it is greater than or equal to 38 degrees. To do this, you need to program this input statement's properties, as follows:

1. Choose the COMPARE opcode and select COUNTS (constant) for the qualifier.

2. Enter the threshold value in the Counts box at the bottom right of the panel. The example shows 38, which represents a temperature value in this example.

3. Choose the greater than or equal to (>=) operator.

Continued on next page

Step 4. Program Custom Control Equations *(continued)*

2nd Input Qualifier. The 2nd input qualifier, which is connected to the 1st input qualifier by an AND (i.e, **both** qualifiers must be true), checks to see if the heat sensor is at a temperature of less than or equal to 50 degrees. Its programming is very similar to the 1st input statement.

1. Select the COMPARE opcode and the COUNTS (constant) qualifier.

2. Specify 50 in the Counts box and select the AND radio button in the top left corner.

3. Choose the less than or equal to (<=) operator for the 50 count.

1st Output Qualifier. This output tracks the input. That means that a supervisory message ("Water Tank Temp Warning") is sent to the panel when the temperature range is between 38 and 50. This supervisory cannot be cleared until the temperature is outside of the 38 to 50 degree range.

2nd Output Qualifier. This output tracks the input as well. Its function, however, is to turn on a relay connected to a water heater while the temperature range is between 38 and 50. As soon as the temperature is out of this range, the relay goes off.

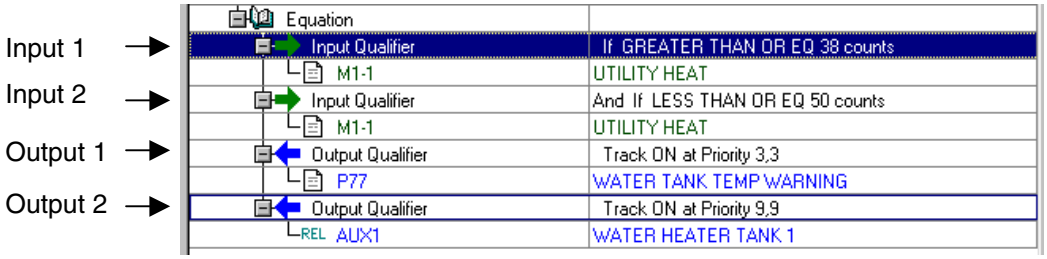

Figure 4-3. Example Custom Control Non Latching / Non Alarm

Day / Night Programming

Overview

The Day / Night programming application allows Custom Control to perform one set of instructions during daytime hours and another set of instructions at night.

Step 1. Program the Monitor Device's Point Type, Device Type, and Custom Label

The monitor device must be capable of accepting a variable operating level (for example, a smoke sensor whose sensitivity can be changed). The following devices support this functionality:

- TrueAlarm Photo
- TrueAlarm Heat
- TrueAlarm Ion
- TrueAlarm XPHOTO

Use the PC Programmer to program the initial sensitivity of the sensor.

Step 2. Program Custom Control Equations

Day / Night programming is done by comparing a constant that represents the time at which an action should occur against the value of A11, the current hour of day analog pseudo point.

Example: Suppose M1-1 is a TrueAlarm Photo sensor and a customer wants normal 2.5% sensitivity during working hours (7am – 6pm) and higher sensitivity (1.0%) at night. (A11 is current hour analog pseudo point).

To do this, you would need two equations similar to the following:

Equation 1:

```
IN:
     A11  GREATER THAN  7          (7 is 7am)
OUT:
     SET THRESHOLD M1-1 LEVEL 5 (2.5% obscuration)
END:
```

Equation 2:

```
IN:
     A11  GREATER THAN 18          (18 is 6pm)
OUT:
     SET THRESHOLD M1-1 LEVEL  2 (1.0% obscuration)
```

Program the first equation, as follows:

1. Add an input to a new equation and change its properties as shown in the figure below.

2. Select COMPARE as the opcode and COUNTS (constant) as the qualifier.

3. In the Compare panel at the bottom of the screen, do the following:

    a. Choose A11 as the Analog Pseudo.

    b. Choose the equal sign as the operator.

    c. In the Counts box, enter the hour at which the change takes place.

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Step 2. Program Custom Control Equations *(continued)*

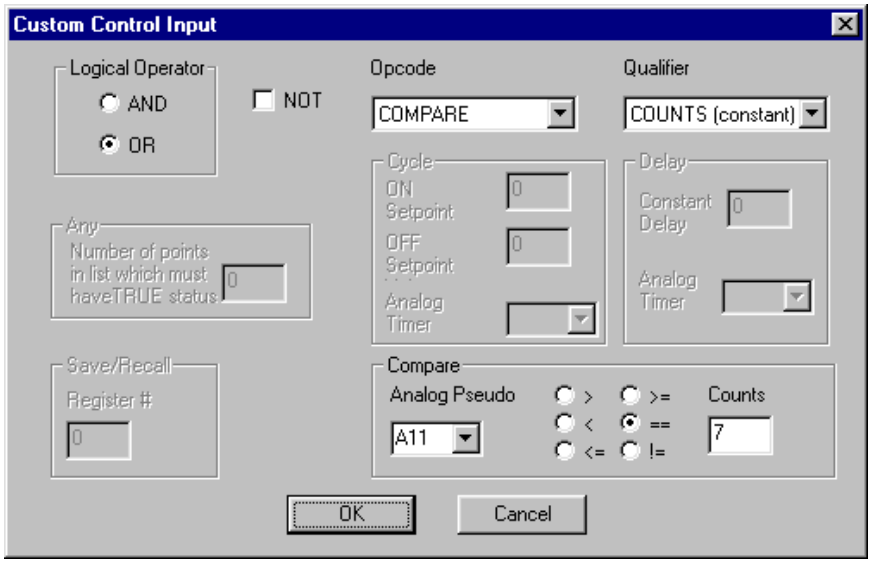


Figure 4-4. Input Properties for Compare Operation

4. Add an output to the equation. Set its Opcode and Qualifier to the following:

   - The Opcode must be one of the following: Set Threshold Photo, Set Threshold Ion, Set Threshold Heat, Set Threshold XPHOTO.
   - The Qualifier is the threshold that you want to set. For example, Smoke Level 2.5.

As shown in the figure below, the second equation is programmed almost exactly as the first equation. Its Input Qualifier monitors A11 (current hour) to determine when it is equal to 18 (6:00 p.m.). At 6:00 p.m., the smoke level is changed to 1.0.

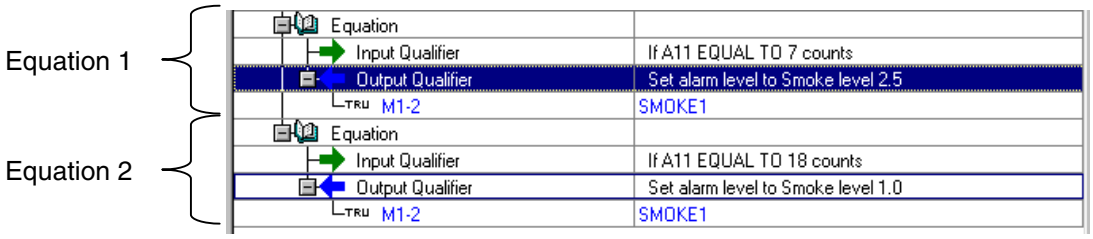


Figure 4-5. Equations for Example Day/Night Programming

AHJ City Reset

Overview

Newer versions of the 4010 FACP (Version 2.01 or later) provide the ability to reset the City Circuit in the following situations.

- If the device(s) in alarm is physically removed. (Remove the faulty sensor from its base, for example.)
- No other devices are in an alarm state.
- A System Reset is performed.

Always consult the local AHJ before implementing this functionality. Some jurisdictions may not allow this operation.

Program Custom Control Equations

To program AHJ City reset, enter the following equation.

1. Add a new equation. Program its input statement to monitor the ON/CODING state of the A4 analog pseudo point, which is the system startup pseudo.

2. Program the output statement to Hold ON digital pseudo point P16 (AHJ Reset).

Equation 1

Elevator Recall

Overview

The Elevator Recall application programs the system to automatically recall the building elevators following alarm activation. Guidelines to be aware of include:

- General information on and requirements for Elevator Recall and Fire Safety Control Functions can be found in NFPA 72, 1996, Chapter 3 for Protected Premises Fire Alarm Systems, and ANSI/ASME A17.1 Safety Code for Elevators and Escalators.
- Installation wiring running between the 4010 FACP and the auxiliary relays used for fire safety control functions (in this case, elevator recall) must be monitored for integrity (supervised) and the auxiliary relay must be located within 3 feet of the controlled circuit or device. Reference NFPA 72, 1996, Section 3-9.2.
- It is recommended that relay IAMs be used as the primary and alternate elevator recall relays. Other supervised wiring methods, such as a 24 Point I/O output connected to a supervised relay, may be used in lieu of a relay IAM.

The remainder of this section describes the Custom Control programming required to implement this application.

Step 1. Add Primary Floor Initiating Devices to a User-Defined List

Use the PC Programmer's List Tab to add all of the building's initiating devices, *with the exception of those located on the alternate floor*, to a user-defined list. Use the Card Tab to give the list a descriptive name such as "BANK2 PRIMARY ELEVATOR RECALL."

Step 2. Add Alternate Floor Initiating Devices to a User-Defined List

Use the PC Programmer's List Tab to add the initiating devices located on the alternate floor to a user-defined list. Use the Card Tab to give the list a descriptive name such as "BANK2 ALTERNATE ELEVATOR RECALL."

Step 3. Add Custom Labels to AUX Relays

The 4010 uses AUX relays, connected to the appropriate contacts on the control panel of the elevator, to indicate that a fire condition exists and the elevator should be returned to either the primary or alternate floor. Use the Point Tab to assign a descriptive label, such as "BANK2 PRIMARY ELEVATOR" or "BANK2 ALTERNATE ELEVATOR," to the appropriate AUX Relay.

Step 4. Add Custom Control Equations

The following example, shown in Figure 4-6, illustrates how to implement Elevator Recall with Custom Control.

- **Equation 1.** The first two input statements, separated by the AND NOT operator, check whether there is an activated initiating device (List L26) **and** make sure the relay that returns the elevator to the alternate floor is **not** activated (i.e., possible fire on primary floor). If both of these are true, the relay for the primary floor activates.

Continued on next page

Step 4. Add Custom Control Equations *(continued)*

- **Equation 2.** The input side of this equation monitors List L27, which contains the initiating devices located on the alternate floor. If one of these devices contained activates, the output side of this equation executes, energizing the relay and returning the elevator to the alternate floor.

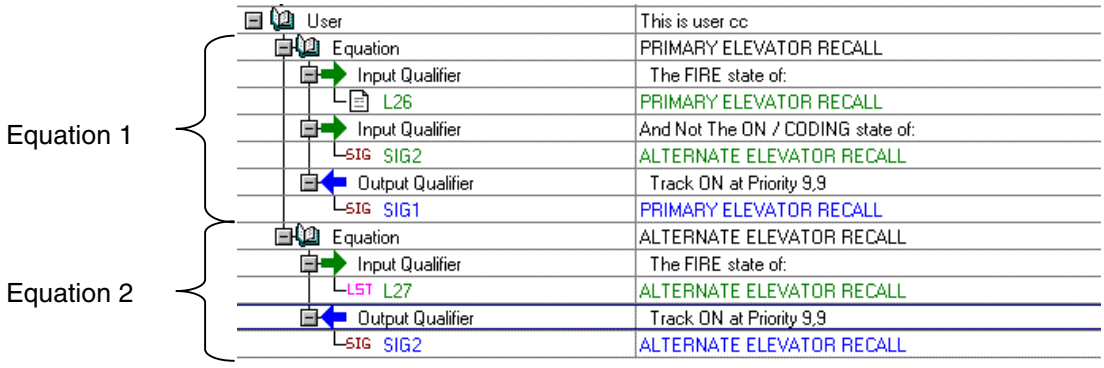


Figure 4-6. Custom Control Equations for Elevator Recall

Selective City Circuit Activation

Overview

By default, the City Circuit activates on all alarm conditions. In some cases, however, the customer may want to prevent activation of the city circuit for certain types of alarms (waterflow alarms, for example).

This application describes programming the system to activate the City Circuit only for a specific set of alarms.

Note: The trouble circuit on the City Circuit card cannot be selectively controlled.

Step 1. Create a User-Defined List of City Circuit Alarm Points

Use the PC Programmer's List Tab to create a user-defined list containing all of the City Circuit alarm points. Exclude points that you want to prevent from activating the City Circuit. Use the Card Tab to assign a descriptive name, such as "CITY CIRCUIT ALARM ACTIVATION POINTS," to this list.

Step 2. Create Custom Control Equations

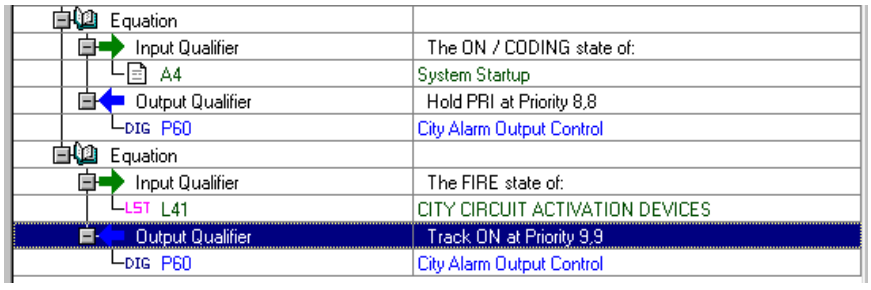
The following example, shown in the figure below, illustrates how to implement selective City Circuit activation.

- **Equation 1.** The input side of this equation monitors system startup pseudo point, A4, to determine if the system has been restarted. Each time the system restarts, the output qualifier executes, holding the priority of the City Circuit Output Control pseudo point at Priority 8,8.

- **Equation 2.** The input qualifier monitors the fire state of all devices in List L41. If any device within this list activates, the output qualifier executes, turning ON the City Circuit's alarm connection.

Equation 1

Equation 2



General Alarm Shutdown for Fans and Dampers

Overview

This application describes using Custom Control to shutdown all fans and close all dampers during a general alarm condition. A System Reset returns all fans and dampers to normal operation.

Refer to Simplex Technical Support for advice on implementing more complex fan/damper applications. Situations requiring extensive monitoring and control of the building's fans and dampers may be beyond the 60 equation capacity of the 4010.

Example: Fan / Damper Shutdown for a Four Story Building

The following figure illustrates a typical four-story building. Assume that the building includes a supply and exhaust fan, and the relays controlling the dampers are wired to 24 PT I/O outputs.

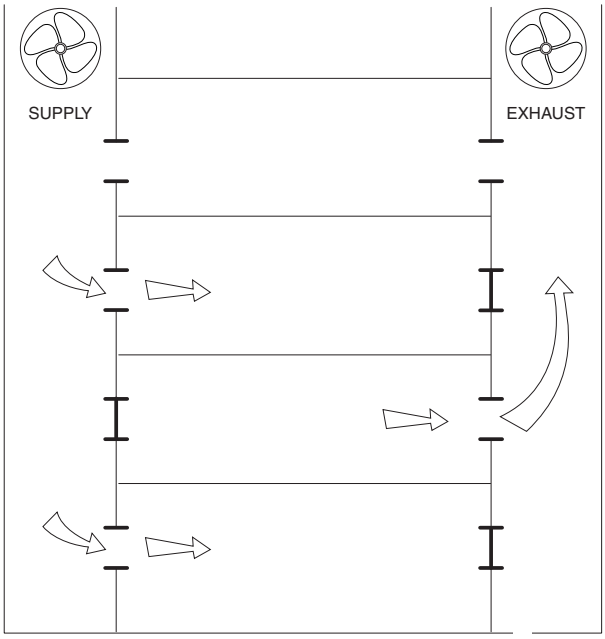


Figure 4-7. Fan / Damper Example

Step 1. Program Point Type and Custom Labels for Fan Relays

Use the PC Programmer's Point Tab to program each fan relay with the RELAY point type. When defining custom labels, make sure to use descriptive labels, such as "EXHAUST FAN RELAY."

Step 2. Program Point Types and Custom Labels for Damper Monitor Switches and Relays

Each damper typically contains two switches for monitoring the position of the damper and a relay for controlling the damper motor. Use the PC Programmer's Point Tab to program the Point Type and Custom Label for these components, as follows:

- **Fan Relays.** Program each relay with the RELAY point type. When defining custom labels for damper relays, make sure to use descriptive labels, such as "EXH DAMPER1 RELAY."

Continued on next page

Step 2. Program Point Types and Custom Labels for Damper Monitor Switches and Relays *(continued)*

- **Damper Monitor Switches.** The switches used to monitor the damper position are typically connected to either an IAM or MZAM. Each damper uses two switches, one switch monitors the OPEN position of the damper and the other monitors the CLOSED position.

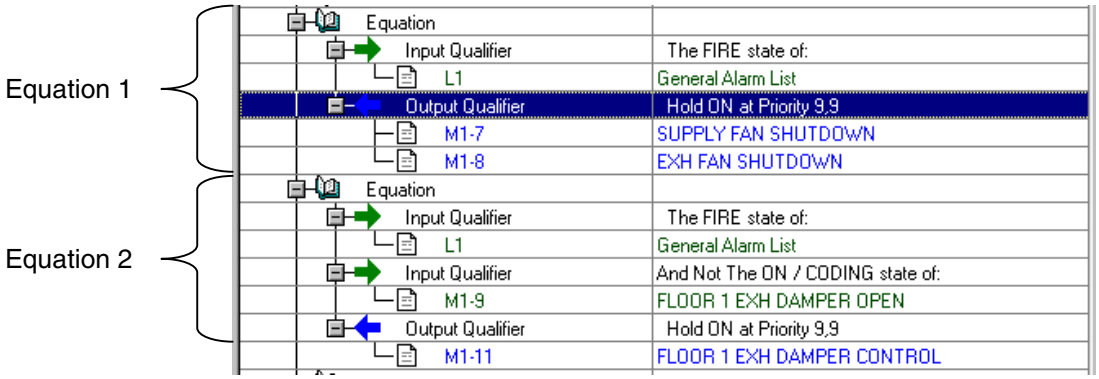
  Program the appropriate device type (IAM, MAZAM, or MBZAM) and then assign a point type of DAMPER to each device. When defining custom labels for damper monitor switches, make sure to use descriptive labels, such as "EXH DAMPER1 OPEN."

Step 3. Custom Control Equations

Use the CC Tab in the PC Programmer to program the Custom Control equations as shown below. Note that these equations only show a single damper being controlled. Copy this equation, changing the damper points as required to account for all of the building's dampers.

- **Equation 1.** This equation monitors the General Alarm List (L1). If any point within this list activates, the Hold ON Output Qualifier executes, turning off the relays for the supply and exhaust fans.

- **Equation 2.** If any point within List L1 (General Alarm List) activates AND the open damper monitor switch is not ON (i.e., the damper is already closed), the output executes, turning on the damper motor relay and closing the damper.



Appendix A
System Options and Point Types

Introduction

This appendix lists and explains the following:

- System Options.
- Software Point Types. 4010 point types are grouped into two general categories:
  - Monitor point types are used with monitoring devices, such as smoke detectors, pull stations, heat detectors, fire pump monitors, etc.
  - Control point types are used with signal (notification appliance) and relay devices.

In this Chapter

This appendix discusses the following topics:

System Options

System Options

Many common applications have been incorporated into the 4010 panel as system options. Table 1-1 lists these options.

Refer to Chapter 5 of the *4010 PC Programmer Installation and Programming Manual* (574-187) for information on programming these options.

Table A-1. System Options

System Option	Description
Time Format	The Time Format option allows you to display system time in 12- or 24-hour format. That is, time is displayed in either a 12-hour format that uses an AM (morning) or PM (afternoon) designation, or in 24-hour (military style) format. The Time format directly affects how time is displayed on the 4010 LCD display and within the Historical Logs.
Depleted Battery	This option selects the mode of operation for the 4010 FACP if an alarm occurs during an AC power loss while a Depleted Battery trouble exists. The specific operation of this option differs slightly, depending on whether you have a domestic or Canadian system. **Domestic Operation.** The default setting for the option is OFF and the depleted battery threshold voltage is 19.4 VDC ± 5%. Operation of this option for a domestic system is as follows: • If the system is in alarm and a depleted battery condition occurs, any NACs that are active remain active. • If the system is not in alarm and a depleted battery condition occurs, the NACs are prevented from activating. **Canadian Operation**. The default setting for the option is OFF and the depleted battery threshold voltage is 19.4 VDC ± 5%. Operation of this option for a Canadian system is as follows: • When a depleted battery condition occurs, power is turned off to the 4010. AC power must be restored to re-activate the 4010.
Alarm Silence Inhibit	This option prevents an Alarm Silence/System Reset on a 4010 FACP for a set duration. The range for the Silence/Reset Inhibit timer is 0-60 minutes. Zero (no inhibit) is the default setting.
Alarm Cutout Timer	The Alarm Signal Cut-Out timer allows you to set a duration for how long signals sound after an alarm. In other words, when an alarm condition exists, the signals sound until silenced. With this option set at two minutes, building signals sound on alarm for two minutes and then stop sounding. However, the alarm condition remains active in the panel. The default setting for this option is No Cutout (meaning an Alarm Silence is required to shut off signals).
Door Drop on Alarm	The Door Drop on Alarm timer allows the 4010 to hold doors open for a set duration during an alarm condition. After that duration has expired, the 4010 shuts off the door holder relays and the doors close. The range for the timer is 0-60 seconds with a default setting of zero seconds. To have door holders drop the doors immediately, leave the timer set to zero seconds. Note: to make a relay a door holder relay, you must assign it the DHOLDER point type.

Continued on next page

System Options *(continued)*

Table 1-1. System Options, *continued*

System Option	Description
Door Drop on AC Fail	The Door Holder - AC Fail Door Drop Timer allows the 4010 to hold doors open for a set duration during an AC power loss condition. After that duration has expired, the 4010 conserves battery power by shutting off the door holder devices and closing the doors. The range for the timer is 0-60 minutes, with a default setting of 5 minutes. To have door holders drop the doors immediately upon AC power loss, set the timer to zero minutes.
Air Handling Units (AHU) Stagger Start	This option allows you to set the 4010 to stagger start any Air Handling Units (point types AHUR, AHUO, and AHUF) in the 4010 FACP. This option protects against power spikes that may cause the circuit breakers to trip when AHUs start simultaneously. The range for stagger starting the AHUs is 0-60 seconds. The default setting for this option is 30 seconds. A setting of zero allows all AHUs to start immediately. The 4010 FACP displays an AHU Stagger Start message when the sequence starts and an AHU Stagger Start Complete message when the sequence ends.
Suppression Release	The Suppression Release option contains three selections: • Dual Detector. When enabled, this option requires two points in L9 (Automatic Suppression Release Points List) to activate before the outputs specified in L12 (Suppression Release Output Points List) activate. • Detector Delay. When enabled, this option allows you to specify a delay between the time that a detector activates and the time that a point within the L9 list triggers. The range is from 0 to 60 seconds (60 is the default). • Manual Delay. When enabled, this option allows you to specify a delay, ranging from 0 to 30 seconds, between the time that a manual release point is activated and the time that the suppression release points in L10 (Suppression Manual Release Points) trigger.
Active Status Reminder	The Active Status Reminder option allows you to set an interval and duration during which the 4010 remind operators that a FIRE, SUPV, or TBL condition still exists in the panel. Active Status Reminder consists of two parts: • Reminder Interval. The range can be from 1 to 12 hours, and the default is 8 hours. • Acknowledge Option. This option sets the duration of the acknowledge signal. The range can be from 0 to 60 seconds, and the default is 5 seconds.
Signal Operation	Audible and Visible ON until Silence Notification Appliance Circuits (NACs) can be set to the choices shown below. The default setting for the Audible NACs is Temporal; the default setting for the Visible NACs is Synchronous; and the default setting for QuickAlert Horns is TEMPORAL. • Audible NAC Operation – choices are temporal, steady, march time, slow march time. • Visible NAC Operation – choices are steady, march time, slow march time, temporal, synchronous • QuickAlert Horn Operation – choices are steady, temporal, slow march time.

Point Types

Introduction

Some application-specific needs can also be met without Custom Control simply by using the correct point types. A point's type determines the following:

- The message displayed on the 4010's LCD when changes occur to the state of the point's circuit.
- The way in which the system operates (for example, initiate an Alarm, Trouble, or Supervisory action) when changes occur to the state of the point's circuit.

AHUF

AHU off relay – dual relay control. This point type is used with applications that use two auxiliary relays for AHU control – one relay for ON and one relay for OFF. Use this point type for the OFF relay. Points assigned with this type operate on general alarm (that is, when any point within L1 "General Alarm List" goes into alarm). Point turns OFF on Reset.

Stagger Start functionality for air handler units is provided by the "Stagger Start" system option.

See AHUO for the ON relay point type. If you have a single relay that performs both ON and OFF functions, see AHUR.

Circuit Status	LCD Display	System Status
ON	AHU OFF Relay	ON
OFF	AHU OFF Relay	OFF
	AHU OFF Relay	CODING
Disabled TBL	AHU OFF Relay	TROUBLE
OFF AUTO TBL	AHU OFF Relay	TROUBLE

AHUO

AHU on relay – dual relay control. This point type is used with applications that use two auxiliary relays for AHU control – one relay for ON and one relay for OFF. Use this point type for the ON relay. Points assigned with this type operate on general alarm (that is, when any point within L1 "General Alarm List" goes into alarm). Point turns OFF on Reset.

Stagger Start functionality for air handler units is provided by the "Stagger Start" system option.

See AHUF for the OFF relay point type. If you have a single relay that performs both ON and OFF functions, see AHUR.

Circuit Status	LCD Display	System Status
ON	AHU ON Relay	ON
OFF	AHU ON Relay	OFF
	AHU ON Relay	CODING
Disabled TBL	AHU ON Relay	TROUBLE
OFF AUTO TBL	AHU ON Relay	TROUBLE

Continued on next page

AHUR

AHU on/off relay – single relay control. This point type is used with applications in which a single relay performs AHU ON and OFF control. Points assigned with this type operate on general alarm (that is, when any point within L1 "General Alarm List" goes into alarm). Point turns OFF on Reset.

Circuit Status	LCD Display	System Status
ON	AHU Relay	ON
OFF	AHU Relay	OFF
	AHU Relay	CODING
Disabled TBL	AHU Relay	TROUBLE
OFF AUTO TBL	AHU Relay	TROUBLE

ALTERN

Elevator capture – alternate. Used for a relay connected to the elevator controls to provide alternate floor elevator recall. This relay turns ON when any of the points in L5, Alternate Elevator Recall Zones, goes into alarm. Points with this type turn OFF when the system is reset.

Circuit Status	LCD Display	System Status
ON	ALT Elevator Recall	ON
OFF	ALT Elevator Recall	OFF
	ALT Elevator Recall	CODING
Disabled TBL	ALT Elevator Recall	TROUBLE
OFF AUTO TBL	ALT Elevator Recall	TROUBLE

BSIGNAL

Trouble/supervisory "bell" signal. Used when an audible signal should activate on any supervisory or trouble condition and remain ON until the condition has been acknowledged or cleared.

Circuit Status	LCD Display	System Status
ON	Trouble Signal	ON
OFF	Trouble Signal	OFF
	Trouble Signal	CODING
Disable TBL	Trouble Signal	TROUBLE
OFF AUTO TBL	Trouble Signal	TROUBLE

Continued on next page

DHOLDER

Door holder control (normally off). Used when the auxiliary relay is connected to door holders. The relay energizes on alarm (any point in L1 General Alarm List goes into alarm), loss of AC Power, or when programmed.

Circuit Status	LCD Display	System Status
ON	Door Holder	ON
OFF	Door Holder	OFF
	Door Holder	CODING
Disable TBL	Door Holder	TROUBLE
OFF AUTO TBL	Door Holder	TROUBLE

PRIMARY

Elevator capture – primary. Used for any relay connected to the elevator controls to provide primary floor elevator recall. A relay assigned this point type turns ON when any point in L4, Primary Elevator Recall, goes into alarm. Relay turns Off on reset.

Circuit Status	LCD Display	System Status
ON	Pri Elevator Capture	ON
OFF	Pri Elevator Capture	OFF
	Pri Elevator Capture	CODING
Disable TBL	Pri Elevator Capture	TROUBLE
OFF AUTO TBL	Pri Elevator Capture	TROUBLE

QALERT

QuickAlert signal. QALERT device type has no automatic operation. All operations for this type of device type must be programmed with Custom Control.

SQALERT

SQALERT device type automatically turns on the designated circuit on alarm detect (general alarm), issues the horn silence command upon Alarm Silence, and turns off the circuit at the completion of System Reset. Any point programmed with the SQALERT point type is not available for use in Custom Control programming.

RELAY

Generic relay – no default operation. Used for selective relay applications (Custom Control) not defined by a specific point type. Point must be programmed to turn ON and OFF.

Circuit Status	LCD Display	System Status
ON	Auxiliary Relay	ON
OFF	Auxiliary Relay	OFF
	Auxiliary Relay	CODING
Disable TBL	Auxiliary Relay	TROUBLE
OFF AUTO TBL	Auxiliary Relay	TROUBLE

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RSIGNAL

Alarm signal – On until Reset. Used for any signaling device (such as an audible or visible notification appliance) that is required to be on until a System Reset is performed. Points assigned with this type operate on general alarm (that is, when any point within the L1 General Alarm List goes into alarm).

Circuit Status	LCD Display	System Status
ON	Signal Circuit	ON
OFF	Signal Circuit	OFF
	Signal Circuit	CODING
Disable TBL	Signal Circuit	TROUBLE
OFF AUTO TBLE	Signal Circuit	TROUBLE

RVISUAL

Used only with visual notification appliances that must be ON until a System Reset is performed. Points assigned with this type operate on general alarm (that is, when any point within the L1 General Alarm List goes into alarm).

Circuit Status	LCD Display	System Status
ON	Visual	ON
OFF	Visual	OFF
	Visual	CODING
Disable TBL	Visual	TROUBLE
Off Auto TBL	Visual	TROUBLE

RWATER

Waterflow signal – On until Reset. A point with this type turns ON when any point within L2, the Waterflow Alarm Monitor List, goes into alarm. Points with this type turn OFF on System Reset.

Circuit Status	LCD Display	System Status
ON	Signal Circuit	ON
OFF	Signal Circuit	OFF
	Signal Circuit	CODING
Disable TBL	Signal Circuit	TROUBLE
Off Auto TBL	Visual	TROUBLE

Continued on next page

SIGNAL

Generic Alarm Signal – no default operation. Used for selective control (Custom Control) of audible or visible notification appliances. Points assigned with this point type operate on general alarm.

Circuit Status	LCD Display	System Status
ON	Signal Circuit	ON
OFF	Signal Circuit	OFF
	Signal Circuit	CODING
Disable TBL	Signal Circuit	TROUBLE
OFF AUTO TBLE	Signal Circuit	TROUBLE

SSIGNAL

Alarm signal – On until Silence. Used for any signaling device (such as an audible or visible notification appliance) that is required to be on until reset. Points assigned with this type operate on general alarm (that is, when any point within L1 General Alarm List goes into alarm). Points with this type turn OFF when an Alarm Silence is performed.

Circuit Status	LCD Display	System Status
Normal	Signal Circuit	ON
Normal	Signal Circuit	OFF
	Signal Circuit	CODING
Disable TBL	Signal Circuit	TROUBLE
OFF AUTO TBLE	Signal Circuit	TROUBLE

SUPREL

Suppression release (agent discharge) output.

Circuit Status	LCD Display	System Status
Normal	Signal Circuit	ON
Normal	Signal Circuit	OFF
	Signal Circuit	CODING
Disable TBL	Signal Circuit	TROUBLE

SUPV

Sprinkler supervisory signal. Turns ON when any point in L3 Sprinkler Supervisory Monitor Points activates. Turns OFF on ACK or when the supervisory clears. Example: Have a relay and its point type is SUPV, used to set off a bell when a tamper is triggered or a gate valve is opened.

Circuit Status	LCD Display	System Status	LED
Normal	Signal Circuit	ON	
Normal	Signal Circuit	OFF	
	Signal Circuit	CODING	
Disable TBL	Signal Circuit	TROUBLE	

Continued on next page

SVISUAL

Visual – on until silence. Points assigned with this point type are ON when any point within L1, General Alarm List, goes into alarm. Visual Notification Appliances assigned this point type remain ON until an Alarm Silence is performed.

Circuit Status	LCD Display	System Status
Normal	Visual	ON
Normal	Visual	OFF
	Visual	CODING
Disable TBL	Visual	TROUBLE
OFF AUTO TBL	Visual	TROUBLE

SWATER

Waterflow signal – on until silence. Points with this point type turn ON when any point in L2, Waterflow Alarm Monitor List, goes into alarm. Points remain activated until the Alarm Silence.

Circuit Status	LCD Display	System Status
ON	Signal Circuit	ON
OFF	Signal Circuit	OFF
	Signal Circuit	CODING
Disable TBL	Signal Circuit	TROUBLE
Disable TBL	Signal Circuit	TROUBLE

TSIGNAL

Trouble/Supervisory Signal On until Clear. Points with this point type turn ON when any trouble or supervisory condition occurs. Points turn OFF when the trouble or supervisory condition is cleared.

Circuit Status	LCD Display	System Status
ON	Signal Circuit	ON
ON	Signal Circuit	OFF
	Signal Circuit	CODING
Disable TBL	Signal Circuit	TROUBLE
Disable TBL	Signal Circuit	TROUBLE

Continued on next page

BRELAY

Trouble / Supervisory "Bell Relay." A relay with this point type turns ON when any Trouble or Supervisory condition occurs. Relays with this point type turn OFF when the condition is acknowledged or cleared.

Circuit Status	LCD Display	System Status
ON		ON
ON		OFF
		CODING
Disable TBL		TROUBLE
Disable TBL		TROUBLE

RRELAY

Alarm Relay ON until Reset. A relay with this point type turns ON when any point in L1, General Alarm List, goes into alarm. These relays turn OFF on System Reset.

Circuit Status	LCD Display	System Status
ON		ON
ON		OFF
		CODING
Disable TBL		TROUBLE
Disable TBL		TROUBLE

FIRE

This is a generic fire alarm point type. A typical application for this point type is a fire alarm zone containing more than one type of device. For example, when a combination of smoke detectors, pull stations, waterflow monitors, and heat detectors is connected to an IAM or ZAM, this point type allows alarms to report as originating from a zone.

Circuit Status	LCD Text	Status
Normal		Normal
Limited	Fire Monitor Zone	Fire Alarm
Open	Fire Monitor Zone	Open Trouble
Short	Fire Monitor Zone	Fire Alarm

When an Alarm or Trouble condition occurs, press Enter to view specific information for the Fire Monitor Zone

WATER

Used to define the operation of a waterflow monitor for all possible circuit states.

Circuit Status	LCD Text	Status
Normal		Normal
Limited	Waterflow Monitor	Fire Alarm
Open	Waterflow Monitor	Open Trouble
Short	Waterflow Monitor	Fire Alarm

Continued on next page

DUCT

Used to define the operation of a duct detector for all possible circuit states.

Circuit Status	LCD Text	Status
Normal		Normal
Limited	Duct Detector	Fire Alarm
Open	Duct Detector	Open Trouble
Short	Duct Detector	Fire Alarm

HEAT

Defines the operation of a heat detector for all possible circuit states.

Circuit Status	LCD Text	Status
Normal		Normal
Limited	Heat Detector	Fire Alarm
Open	Heat Detector	Open Trouble
Short	Heat Detector	Fire Alarm

FLAME

Use for flame detectors.

Circuit Status	LCD Text	Status
Normal		Normal
Limited	Flame Detector	Fire Alarm
Open	Flame Detector	Open Trouble
Short	Flame Detector	Fire Alarm

PULL

Use with manual pull stations.

Circuit Status	LCD Text	Status
Normal		Normal
Limited	Manual Pull Station	Fire Alarm
Open	Manual Pull Station	Open Trouble
Short	Manual Pull Station	Fire Alarm

SMOKE

Use for 2- and 4-wire smoke detectors.

Circuit Status	LCD Text	Status
Normal		Normal
Limited	Smoke Detector	Fire Alarm
Open	Smoke Detector	Open Trouble
Short	Smoke Detector	Fire Alarm

Continued on next page

EMERG

Use for an emergency monitor zone in which two types of alarm devices – for example, emergency alarm devices such as Nurse Call and fire alarm devices -- are connected to an IAM or ZAM. Emergency devices require the use of a current limiting resistor. These devices generate an Emergency Alarm condition at the panel.

Circuit Status	LCD Text	Status
Normal		Normal
Limited	Monitor Zone	Emergency Alarm
Open	Monitor Zone	Open Trouble
Short	Monitor Zone	Fire Alarm

SFIRE

Used when smoke detectors and shorting type devices are connected to an IAM or ZAM.

Circuit Status	LCD Text	Status
Normal		Normal
Limited	Fire Monitor Zone	Smoke Alarm
Open	Fire Monitor Zone	Open Trouble
Short	Fire Monitor Zone	Fire Alarm

VFIRE

Used to activate the alarm verification software for all smoke detectors connected to an IAM or ZAM. Shorting type devices cause an immediate alarm.

Circuit Status	LCD Text	Status
Normal		Normal
Limited	Fire Monitor Zone	Verified Alarm
Open	Fire Monitor Zone	Open Trouble
Short	Fire Monitor Zone	Fire Alarm

SPULL

Used when smoke detectors and pull stations are connected to an IAM or ZAM.

Circuit Status	LCD Text	Status
Normal		Normal
Limited	Fire Monitor Zone	Smoke Alarm
Open	Fire Monitor Zone	Open Trouble
Short	Fire Monitor Zone	Manual Alarm

VSPULL

Used when smoke detectors that must be verified and pull stations are connected to an IAM or ZAM.

Circuit Status	LCD Text	Status
Normal		Normal
Limited	Fire Monitor Zone	Verified Alarm
Open	Fire Monitor Zone	Open Trouble
Short	Fire Monitor Zone	Manual Alarm

Continued on next page

GENMON

Used when emergency generator monitoring is required. The shorted condition of the circuit indicates an abnormal status and is indicated by the Supervisory Service LED. The current limited condition of the circuit indicates that the generator is running, and can be tracked with an LED (must be programmed). A current limiting resistor must be installed for this to happen.

Circuit Status	LCD Text	Status
Normal		Normal
Limited	Generator Monitor	Running
Open	Generator Monitor	Open Trouble
Short	Generator Monitor	Abnormal

SGENMON

Same operation as the GENMON point type, but the generator running condition automatically displays and requires operator acknowledgment.

Circuit Status	LCD Text	Status
Normal		Normal
Limited	Generator Monitor	Running
Open	Generator Monitor	Open Trouble
Short	Generator Monitor	Abnormal

FPUMP

Used to monitor fire pump conditions. The shorted condition indicates that the fire pump is abnormal A current limited condition indicates that the fire pump is running.

Circuit Status	LCD Text	Status
Normal		Normal
Limited	Fire Pump Monitor	Running
Open	Fire Pump Monitor	Open Trouble
Short	Fire Pump Monitor	Abnormal

SFPUMP

Same as the FPUMP point type, except that the fire pump running condition requires operator acknowledgement.

Circuit Status	LCD Text	Status
Normal		Normal
Limited	Fire Pump Monitor	Running
Open	Fire Pump Monitor	Open Trouble
Short	Fire Pump Monitor	Abnormal

S2STAGE

Used for 2-stage alarms. The current limited operation of any device indicate a Stage 1 Alarm. A short on the point's circuit, such as a key switch operation, causes a Stage 2 Alarm.

Circuit Status	LCD Text	Status
Normal		Normal
Limited	2 Stage Monitor	Stage 1 Alarm
Open	2 Stage Monitor	Open Trouble
Short	2 Stage Monitor	Stage 2 Alarm

Continued on next page

SO

Used to indicate abnormal sprinkler conditions, such as the opening of a PIV or OS&Y tamper switch. This point type must be used with normally open contacts only.

Circuit Status	LCD Text	Status
Normal	Normal	
Limited	Sprinkler Monitor	Abnormal
Open	Sprinkler Monitor	Open Trouble
Short	Sprinkler Monitor	Abnormal

WSO

Combination Waterflow/Sprinkler Monitor (NO). Where permitted by the AHJ, this circuit operates both waterflow monitors and PIV/OS&Y tampers on the same circuit. All tamper switches (N.O. contacts) must be connected with a current limiting resistor. Refer to the 4010 field wiring diagrams. A short condition indicates waterflow alarms.

Circuit Status	LCD Text	Status
Normal		Normal
Limited	Sprinkler Monitor	Abnormal
Open	Sprinkler Monitor	Open Trouble
Short	Sprinkler Monitor	Waterflow Alarm

SUPDET

Suppression (Agent Discharge) Monitor.

Circuit Status	LCD Text	Status
Normal		Normal
Limited	Suppression Detector	Fire Alarm
Open	Suppression Detector	Open Trouble
Short	Suppression Detector	Fire Alarm

SUPABRT

Suppression Abort (supervised)

Circuit Status	LCD Text	Status
Normal		Normal
Limited	Suppression Abort	Activated
Open	Suppression Abort	Open Trouble
Short	Suppression Abort	Short Trouble

SUPDUMP

Manual suppression agent discharge

Circuit Status	LCD Text	Status
Normal		Normal
Limited	Suppression Manual Dump	Activated
Open	Suppression Manual Dump	Open Trouble
Short	Suppression Manual Dump	Short Trouble

Continued on next page

SUPPRES

Suppression agent pressure switch monitor.

Circuit Status	LCD Text	Status
Normal		Normal
Limited	Suppression Pressure	Discharge
Open	Suppression Pressure	Open Trouble
Short	Suppression Pressure	Short Trouble

SUPV

Used to monitor any supervisory type device where operator acknowledgment is required.

Circuit Status	LCD Text	Status
Normal		Normal
Limited	Supervisory Monitor	Abnormal
Open	Supervisory Monitor	Open Trouble
Short	Supervisory Monitor	Abnormal

UTIL

Used to monitor and supervise any condition; operator acknowledgment is not required. No alarm is generated by this point type.

Circuit Status	LCD Text	Status
Normal		Normal
Limited	Utility Monitor	Abnormal
Open	Utility Monitor	Open Trouble
Short	Utility Monitor	Abnormal

TROUBLE

Used for trouble monitoring only. No alarm is generated by this point type.

Circuit Status	LCD Text	Status
Normal		Normal
Limited	Trouble Monitor	Abnormal
Open	Trouble Monitor	Open Trouble
Short	Trouble Monitor	Abnormal

VSMOKE

Used with smoke detectors whose alarm status must be verified.

Circuit Status	LCD Text	Status
Normal		Normal
Limited	Smoke Detector	Verified Alarm
Open	Smoke Detector	Open Trouble
Short	Smoke Detector	Fire Alarm

Continued on next page

GVMON

Used when the abnormal condition of the circuit must be verified.

Circuit Status	LCD Text	Status
Normal		Normal
Limited	Fire Monitor	Verified Alarm
Open	Fire Monitor	Open Trouble
Short	Fire Monitor	Fire Alarm

LATSUPV

Supervisory Monitor – latch until reset. Used for generic supervisory alarm.

Circuit Status	LCD Text	Status
Normal		Normal
Limited	Supervisory Alarm	Abnormal
Open	Supervisory Alarm	Open Trouble
Short	Supervisory Alarm	Abnormal

STYLEC

Style-C Fire Alarm Monitor. Used when only current limited devices are connected to the zone. A short circuit is reported as a Trouble.

Circuit Status	LCD Text	Status
Normal		Normal
Limited	Fire Monitor Zone	Fire Alarm
Open	Fire Monitor Zone	Open Trouble
Short	Fire Monitor Zone	Short Trouble

SDUCT

Supervisory Duct Detector.

Circuit Status	LCD Text	Status
Normal		Normal
Limited	Flame Detector	Abnormal
Open	Flame Detector	Open Trouble
Short	Flame Detector	Abnormal

ABORT

Abort zone.

Circuit Status	LCD Text	Status
Normal		Normal
Limited	Fire Alarm Abort	Abnormal
Open	Fire Alarm Abort	Open Trouble
Short	Fire Alarm Abort	Abnormal

DAMPER

Damper Monitor

Circuit Status	LCD Text	Status
Normal		Normal
Limited	Damper Monitor	Abnormal
Open	Damper Monitor	Open Trouble
Short	Damper Monitor	Abnormal

Continued on next page

4009A

4009A Point Type.

Circuit Status	LCD Text	Status
Normal		Normal
Limited	4009A	Abnormal
Open	4009A	Open Trouble
Short	4009A	Abnormal

USWITCH

2-position switch, unsupervised. Used for a 2-position switch without an EOL or current limited resistor.

Circuit Status	LCD Text	Status
Normal		OFF
Limited	2-Position Switch	Invalid State TBL
Open	2-Position Switch	ON
Disable TBL	2-Position Switch	Disable TBL

OSWITCH

2-position switch, supervised for opens. Requires an EOL resistor.

Circuit Status	LCD Text	Status
Normal		OFF
Limited	2-Position Switch	Invalid State TBL
Open	2-Position Switch	Open CKT TBL
Short	2-Position Switch	ON
Disable TBL	2-Position Switch	Disable TBL

SSWITCH

2-position switch, supervised for opens and shorts. Requires EOL and current limited resistors.

Circuit Status	LCD Text	Status
Normal		OFF
Limited	2-Position Switch	ON
Open	2-Position Switch	Open CKT TBL
Short	2-Position Switch	SHORT CKT TBL
Disable TBL	2-Position Switch	Disable TBL

TSWITCH

3-position (SPDT) switch, supervised for opens. Requires EOL and series current limiting resistors (up leg).

Circuit Status	LCD Text	Status
Normal		CENTER
Limited	3-Position Switch	UP
Open	3-Position Switch	Open CKT TBL
Short	3-Position Switch	DOWN
Disable TBL	3-Position Switch	Disable TBL

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