GE
Security
Fire & Life Safety

FireShield Plus Fire Alarm Control Panel
Technical Reference Manual

DOCUMENT HISTORY

Date	Revision	Reason for change
09AUG07	1.0	Initial release
28NOV07	2.0	Added RPM module. Corrected descriptions for FSRA10C(F) controls and indicators. Corrected FSUIM wiring diagram.

Content

Important information

Limitation of liability

This product has been designed to meet the requirements of NFPA 72 *National Fire Alarm Code,* UL 864 *Standard for Control Units and Accessories for Fire Alarm Systems*, and ULC S527 *Standard for Control Units for Fire Alarm Systems.* Installation in accordance with this manual, applicable codes, and the instructions of the authority having jurisdiction is mandatory. GE Security shall not under any circumstances be liable for any incidental or consequential damages arising from loss of property or other damages or losses owing to the failure of GE Security products beyond the cost of repair or replacement of any defective products. GE Security reserves the right to make product improvements and change product specifications at any time.

While every precaution has been taken during the preparation of this manual to ensure the accuracy of its contents, GE Security assumes no responsibility for errors or omissions.

FCC warning

This equipment can generate and radiate radio frequency energy. If this equipment is not installed in accordance with this manual, it may cause interference to radio communications. This equipment has been tested and found to comply with the limits for Class A computing devices pursuant to Subpart B of Part 15 of the FCC Rules. These rules are designed to provide reasonable protection against such interference when this equipment is operated in a commercial environment. Operation of this equipment is likely to 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.

F-DACT(F) FCC information

Cautions

To ensure proper operation, this dialer must be installed according to the enclosed installation instructions. To verify that the dialer is operating properly and can successfully report an alarm, it must be tested immediately after installation, and periodically thereafter, according to the enclosed test instructions.

In order for the dialer to be able to seize the phone line to report an alarm or other event when other customer equipment (telephone, answering system, computer modem, etc.) connected to the same line is in use, the dialer *must* be connected to a properly installed RJ-31X jack. The RJ-31X jack must be connected in series with, and ahead of, all other equipment attached to the same phone line.

Series installation of an RJ-31X jack is depicted in the wiring diagram. If you have any questions concerning these instructions, you should consult your telephone company or a qualified installer.

Testing

When programming emergency numbers or making test calls to emergency numbers, remain on the line and briefly explain to the dispatcher the reason for the call. Perform programming and testing activities in the off-peak hours, such as early morning or late evenings.

Compliance requirements

For equipment approved before July 23, 2001: This dialer complies with Part 68 of the FCC rules. A label attached to the dialer contains, among other information, the FCC registration number and ringer equivalence number (REN) for this equipment. If requested, this information must be provided to the telephone company.

For equipment approved after July 23, 2001: This dialer complies with Part 68 of the FCC rules and the requirements adopted by the Administrative Council for Terminal Attachments (ACTA). A label attached to the dialer contains, among other information, a product identifier in the format US:AAAEQ##TXXXX. If requested, this information must be provided to the telephone company.

The plug and jack used to connect the dialer to the premises wiring and telephone network must comply with the applicable FCC Part 68 rules and requirements adopted by ACTA. The dialer must be connected to a compliant RJ-31X or RJ-38X jack using a compliant cord. If a modular telephone cord is supplied with the dialer, it is designed to meet these requirements. See installation instructions for details.

A ringer equivalence number (REN) is used to determine how many devices you can connect to a telephone line. If the total REN value for all devices connected on a telephone line exceeds that allowed by the telephone company, the devices may not ring on an incoming call. In most (but not all) areas the total REN value should not exceed 5.0. To be certain of the total REN value allowed on a telephone line, contact the local telephone company.

For products approved after July 23, 2001, the REN is part of the product identifier in the format US:AAAEQ##TXXXX. The digits ## represent the REN without a decimal point. Example: 03 is an REN of 0.3. For earlier products the REN is listed separately.

If the dialer is harming the telephone network, the telephone company will notify you in advance that temporary discontinuance of service may be required. If advance notice isn't practical, the telephone company will notify you as soon as possible. You will also be advised of your right to file a complaint with the FCC, if you believe it is necessary.

The telephone company may make changes to its facilities, equipment, operations, or procedures that could affect the operation of the dialer. If this happens, the telephone company will provide advance notice in order for you to make necessary modifications to maintain uninterrupted service.

If you are experiencing problems with the dialer, contact GE Technical Support at 1-800-655-4497 for repair or warranty information. If the dialer is harming the telephone network, the telephone company may request that you disconnect the dialer until the problem is resolved.

The dialer contains no user serviceable parts. In case of defects, return the dialer for repair.

You may *not* connect the dialer to a public coin phone or a party line service provided by the telephone company.

Industry Canada information

The Industry Canada label identifies certified equipment. This certification means that the equipment meets certain telecommunications network protective, operational, and safety requirements. Industry Canada does not guarantee the equipment will operate to the user's satisfaction.

Before installing this equipment, users should ensure that it is permissible to be connected to the facilities of the local telecommunications company. The equipment must also be installed using an acceptable method of connection. The customer should be aware that compliance with the above conditions may not prevent degradation of service in some situations.

Repairs to certified equipment should be made by an authorized Canadian maintenance facility designated by the supplier. Any repairs or alterations made by the user to this equipment, or equipment malfunctions, may give the telecommunications company cause to request the user disconnect the equipment.

Users should ensure for their own protection that the electrical ground connections of the power utility, telephone lines, and internal metallic water pipe system, if present, are connected together. This precaution may be particularly important in rural areas.

Caution: Users should not attempt to make such connections themselves, but should contact the appropriate electric inspection authority, or electrician, as appropriate

The Load Number (LN) assigned to each terminal device denotes the percentage of the total load to be connected to a telephone loop which is used by the device, to prevent overloading. The termination on a loop may consist of any combination of devices subject only to the requirements that the sum of the Load Numbers of all the devices does not exceed 100.

Chapter 1
System overview and operation

Summary

This chapter provides an overview of the panel and major system components. It describes the controls and indicators located on the panel and components. In addition, detailed instructions are given for operating the panel.

Content

System overview

FireShield Plus conventional fire alarm control panels are available in the models listed below.

Table 1: Control panel models

Model	Description
FSP302(G/R)	Three-zone panel (3 IDCs, 2 NACs), 120 V, gray or red cabinet
FSP302(G/R)D	Three-zone panel (3 IDCs, 2 NACs), 120 V, gray or red cabinet, and F-series dialer/modem
FSP302G-2	Three-zone panel (3 IDCs, 2 NACs), 230 V, gray cabinet
FSP302F	Three-zone panel (3 IDCs, 2 NACs), 120 V, gray cabinet, and French overlay
FSP502(G/R)	Five-zone panel (5 IDCs, 2 NACs), 120 V, gray or red cabinet
FSP502(G/R)D	Five-zone panel (5 IDCs, 2 NACs), 120 V, gray or red cabinet, and F-series dialer/modem
FSP502G-2	Five-zone panel (5 IDCs, 2 NACs), 230 V, gray cabinet
FSP502F	Five-zone panel (5 IDCs, 2 NACs), 120 V, gray cabinet, and French overlay
FSP1004(G/R)	Ten-zone panel (10 IDCs, 4 NACs), 120 V, gray or red cabinet
FSP1004(G/R)D	Ten-zone panel (10 IDCs, 4 NACs), 120 V, gray or red cabinet, and F-series dialer/modem
FSP1004G-2	Ten-zone panel (10 IDCs, 4 NACs), 230 V, gray cabinet
FSP1004F	Ten-zone panel (10 IDCs, 4 NACs), 120 V, gray cabinet, and French overlay

Note: Each panel is configured for Class B operation. Five- and ten-zone models can easily be converted to Class A by using two Class B circuits to make one Class A circuit.

Control panel accessories are listed in the table below.

Table 2: Control panel accessories

Model	Description
FSRSI	Remote system indicator module with five LEDs for indicating system status (power, alarm, supervisory, trouble, and ground fault), and a lamp test button
FSRZI-A	Remote zone indicator module with five red LEDs for indicating active alarm zones

Table 2: Control panel accessories

Model	Description
FSRZI-SA	Remote zone indicator module with five bicolor (red/yellow) LEDs for indicating active alarm, supervisory, and monitor zones
FSRRM24	Remote relay module with five Form C relays. Jumper configurable for dry contact or 24 V output.
FSUIM	Universal interface module with five common supervised inputs and nine common dry contact relay outputs
FSRA10(F)	Remote annunciator for ten-zone panels. Ten bicolor (red/yellow) LEDs for indicating active zones and ten yellow LEDs for indicating zone troubles.
FSRA10C(F)	Remote annunciator with common controls for ten-zone panels. Ten bicolor (red/yellow) LEDs for indicating active zones and ten yellow LEDs for indicating zone troubles.
F-XTR120	NAC power expander transformer for ten-zone, 120 V control panels
F-XTR230	NAC power expander transformer for ten-zone, 230 V control panels
F-DACT(F)	Dialer/modem for central station reporting and remote programming
CTM	City tie module for connection to a local energy master box
RPM	Reverse polarity transmitter for signaling alarm, supervisory, and trouble events off-premises
BC-3	External battery cabinet for 17 Ah and 24 Ah batteries
MFC-A	Cabinet enclosure for control panel accessories
EOL3.6-1.1	One 3.6 kΩ and one 1.1 kΩ end-of-line resistor
EOL47PK7	Pack of seven 4.7 kΩ end-of-line resistors
F-TRIM35(G/R)	Trim ring for gray (G) or red (R) three- and five-zone panels
F-TRIM10(G/R)	Trim ring for gray (G) or red (R) ten-zone panels
FSAT1	Remote annunciator trim plate, white, 1-gang
FSAT2	Remote annunciator trim plate, white, 2-gang
FSAT3	Remote annunciator trim plate, white, 3-gang
FSAT4	Remote annunciator trim plate, white, 4-gang

Minimum system requirements

The following table lists the minimum system requirements for each type of fire alarm system for which the control panel is listed. See Appendix C for wiring details.

Table 3: Minimum system requirements for listings

Listing	Equipment needed
Protected Premises (Local) Fire Alarm System	A control panel with at least one alarm initiating device circuit programmed to activate at least one notification appliance circuit, and appropriately sized standby batteries
Auxiliary Fire Alarm System, Local Energy Type	A control panel with at least one alarm initiating device circuit programmed to activate a dedicated nonsilenceable notification appliance circuit connected to a local energy master box, appropriately sized standby batteries, and a CTM module
Remote Supervising Station Fire Alarm System	A control panel with at least one alarm initiating device circuit, appropriately sized standby batteries, and an F-DACT(F) dialer/modem or an RPM module
Central Station Fire Alarm System	A control panel with at least one alarm initiating device circuit, appropriately sized standby batteries, and an F-DACT(F) dialer/modem

Operation overview

The panel operates in *normal mode* in the absence of any alarm, supervisory, trouble, or monitor events. In normal mode, the control panel monitors the system.

The panel operates in *off-normal mode* any time an event is introduced into the system. When this happens, the panel:

• Changes contact positions on appropriate common relays

• Activates alarm outputs (for alarm events only)

• Turns on the appropriate LEDs and the panel buzzer

• Executes the appropriate programmed output response for the input that activated the event

• Communicates event information to appropriate optional components

If a dialer is installed, the panel:

• Sends a record of the event to the F-DACT(F) LCD and to the history log

• Transmits event activation and restoration codes to a monitoring station as programmed

Panel controls and indicators

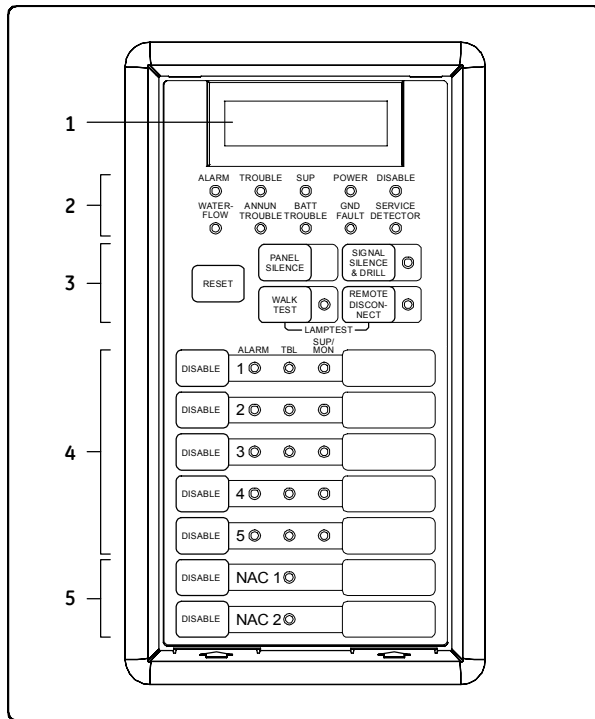**Figure 1: Location of the panel controls, LEDs, and LCD display**

Table 4: Descriptions of the panel controls and indicators

Item	Name	Description
1	LCD text display	Provides supplemental information relevant to the current functional condition of the control panel. Available only when a dialer is installed.
2	System status LEDs	**Alarm:** On indicates an active alarm zone.
		Trouble: On indicates a system trouble. For example, an open, shorted, or disabled circuit, a ground fault, a battery trouble, an annunciator trouble, or a walk test.
		Supervisory (SUP): On indicates an active supervisory zone.
		Power: On indicates the control panel has AC power.
		Disable: Double-flashes indicate a disabled IDC, NAC, remote relay module, or dialer when the control panel is normal. On indicates a disabled IDC, NAC, remote relay module, or dialer when the control panel is in alarm.
		Waterflow: On indicates an active waterflow switch.
		Annunciator Trouble: On indicates a communication failure between the control panel and a device on the remote module communication bus.
		Battery (BATT) Trouble: On indicates low or no battery voltage. Flashing indicates a charger trouble.

Table 4: Descriptions of the panel controls and indicators

Item	Name	Description
		Ground (GND) Fault: On indicates a ground fault.
		Service Detector: On indicates and IDC has detected a "Clean Me" signal. Available only when an IDC's service check option is enabled.
3	Common controls	**Reset:** Restores the panel to the normal state provided there are no active devices or switches on an initiating device circuit. The LED indicates that the Reset function is active.
		Depending on the panel's programming, Reset may be inhibited for one minute after alarm signals are activated.
		In program mode, pressing Reset enters the current value for the selected option.
		Panel Silence: Turns the control panel's buzzer and the buzzer on FSRSI modules off until another event turns them on.
		In program mode, pressing Panel Silence selects the next value.
		Signal Silence & Drill: Turns all active audible notification appliances off until you press it again or until another event turns them back on. The LED indicates that the Signal Silence function is active.
		Depending on the panel's programming, Signal Silence may not turn visible notification appliances off and may be inhibited for one minute after alarm signals are activated. Signal Silence does not turn off coded alarm signals, city tie signals, or alarm signals activated by a waterflow switch.
		If the panel is normal, pressing Signal Silence & Drill for 2 seconds toggles the Drill function. Drill activates all notification appliance circuits. Drill does not turn on coded alarm signals or activate the common alarm relay.
		In program mode, pressing Signal Silence & Drill selects the next option.
		Walk Test: Places the panel in walk test mode. Press once for an audible walk test. Press twice for a silent walk test. Press a third time to cancel the walk test.
		The LED indicates which walk test is active. Flashing indicates an audible walk test. On indicates a silent walk test. [2]
		In program mode, pressing Walk Test selects the previous value.
		Remote Disconnect: Disables and enables the common alarm relay and city tie NAC types. When a dialer is installed, pressing Remote Disconnect disables and enables the dialer and city tie NAC types, but not the common alarm relay.
		The LED indicates that the dialer, the common alarm relay, and city tie NAC types have been disabled. [2]
		In program mode, pressing Remote Disconnect selects the previous option.
4	IDC controls and LEDs	**Disable:** Disables the IDC. In walk test and program mode, pressing Disable selects the IDC.
		Alarm: On indicates an active alarm zone.

Table 4: Descriptions of the panel controls and indicators

Item	Name	Description
		Trouble (TBL): On indicates an open circuit and double-flashes indicate the IDC is disabled.
		In walk test mode, rapid flashes indicate the IDC is resetting.
		In program mode, on indicates the IDC is selected.
		Supervisory/Monitor (SUP/MON): On indicates an active supervisory zone. Flashing indicates an active monitor zone.
5	NAC controls and LEDs	**Disable:** Disables the NAC. In walk test and program mode, pressing Disable selects the NAC.
		Trouble (TBL): On indicates an open or short circuit. Double-flashes indicate the NAC is disabled.
		In program mode, on indicates the NAC is selected.

Notes

1. Pressing the Signal Silence & Drill button does not turn off notification appliances activated by a waterflow zone type while a waterflow switch is active.

2. Pressing the Walk Test and Remote Disconnect buttons at the same time activates a lamp test.

3. Disabled IDCs and NACs remain disabled after a panel reset.

4. On Class A IDCs and NACs, either Trouble LED can indicate a trouble condition for the pair.

Remote module controls and indicators

Figure 2: Location of the controls and indicators on the remote modules
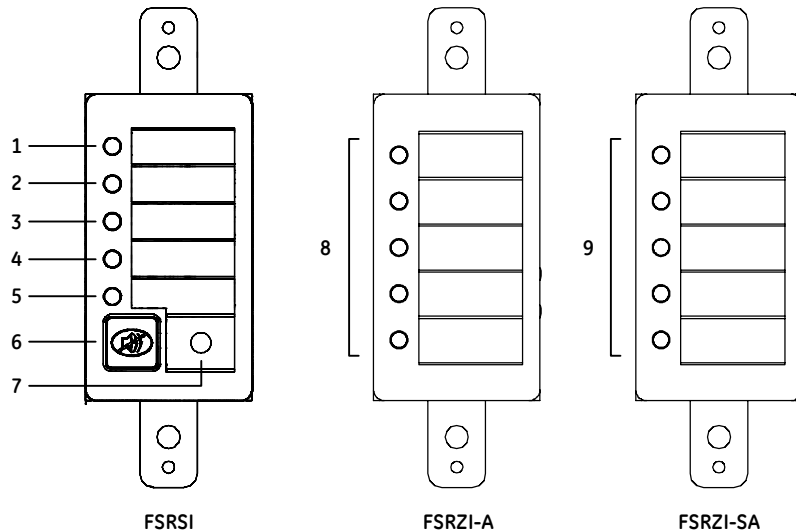

FSRSI　　　　　FSRZI-A　　　　　FSRZI-SA

Table 5: Descriptions of the remote module controls and indicators

Item	Name	Description
1	Power LED	On indicates the control panel has AC power
2	Alarm LED	On indicates an active alarm zone
3	Supervisory (SUP) LED	On indicates an active supervisory zone
4	Trouble (TBL) LED	On indicates a system trouble
5	Ground Fault (Gnd Flt) LED	On indicates a ground fault
6	Silence/Lamp Test button	Silences the FSRSI's buzzer. Pressing this button for more than 2 seconds activates a lamp test. The lamp test briefly turns on all FSRI LEDs and all zone indicator module LEDs in the same peripheral group.
7	Lamp Test LED	On indicates a lamp test is in progress
8	Zone active LEDs	On indicates an active alarm zone. Active supervisory and monitor zone types, and zone troubles are not indicated.
9	Zone active LEDs	Red indicates an active alarm zone. Yellow indicates an active supervisory zone. Flashing yellow indicates an active monitor zone. Zone troubles are not indicated.

Notes

1. You can install remote modules separately or combined in the same electrical box. For example, a system with a ten-zone control panel typically has one FSRSI and two FSRZI-SAs installed in a 3-gang electrical box.

2. The FSRSI includes a buzzer that sounds a temporal (3-3-3) pattern when there is an active alarm zone, a slow pulse pattern when there is an active supervisory zone, and an intermittent pattern when there is a system trouble.

FSRA10(F) and FSRA10C(F) controls and indicators

Figure 3: Location of the controls and indicators on the remote annunciators
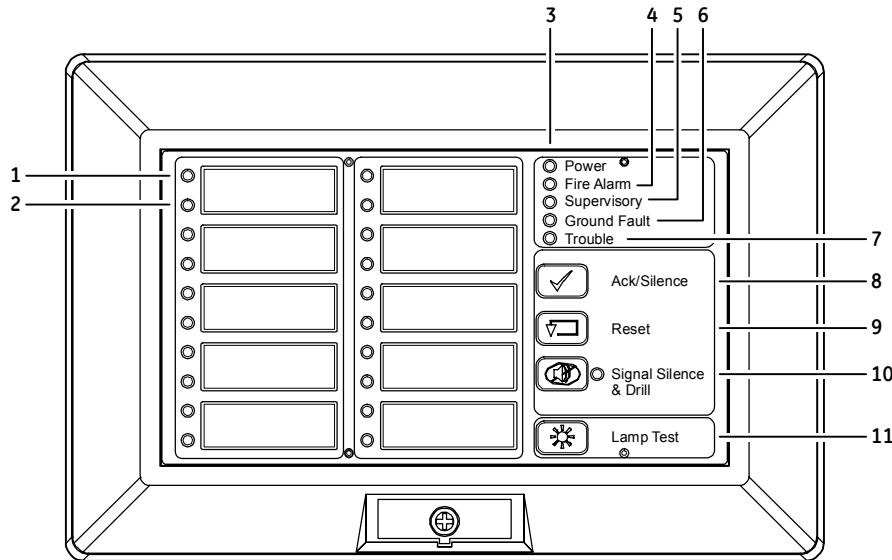

Table 6: Descriptions of the remote annunciator controls and indicators

Item	Name	Description
1	Zone active LEDs	Red indicates an active alarm zone. Yellow indicates an active supervisory zone. Flashing yellow indicates an active monitor zone.
2	Zone trouble LEDs	On indicates a zone trouble.
3	Power LED	On indicates the control panel has AC power.
4	Fire Alarm LED	On indicates an active alarm zone.
5	Supervisory LED	On indicates an active supervisory zone.
6	Ground Fault LED	On indicates a ground fault.
7	Trouble LED	On indicates a system trouble.
8	Ack/Silence button	Silences the buzzer.
9	Reset button	Resets the control panel. Not available on the FSRA10(F).
10	Signal Silence & Drill button	Silences notification appliances when the system is in alarm. Activates notification appliances when the system is normal. Not available on the FSRA10(F).
11	Lamp Test button	Briefly turns on all LEDs so you can verify their operation.

Note: The FSRA10(F) and FSRA10C(F) are only used with ten-zone control panels. The left set of LEDs indicate the status of zones 1 to 5. The right set of LEDs indicate the status of zones 6 to 10.

Component descriptions
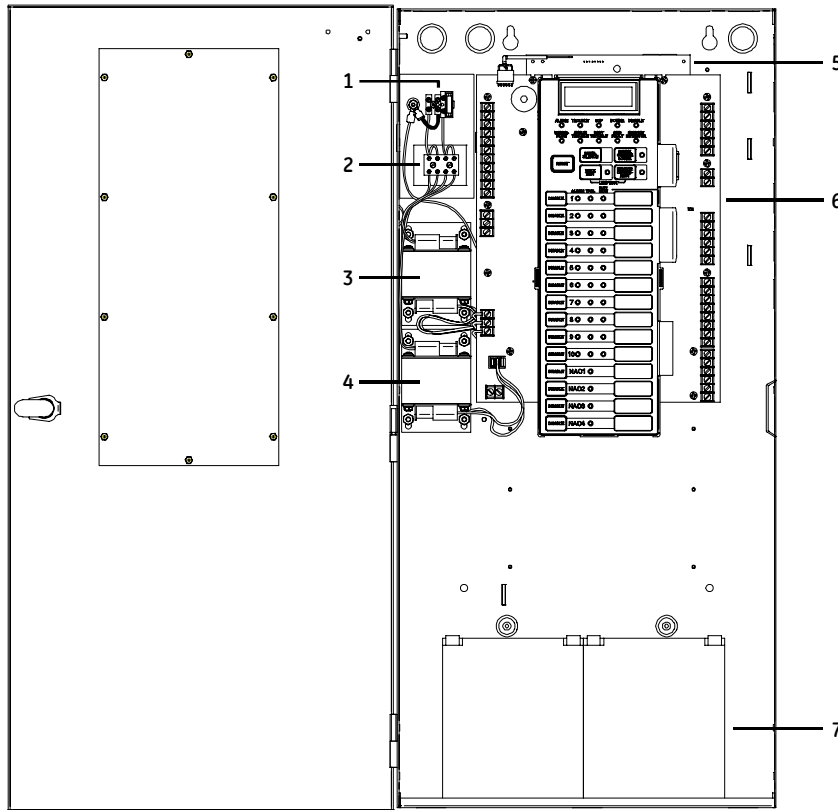
Figure 4: Location of the panel components

Table 7: Descriptions of the panel components

Item	Name	Description
1	Main AC wiring block and fuse holder	Provides connections for 120 or 230 VAC (primary power) from dedicated service. Includes a primary power fuse (5 A).
2	Dual transformer AC wiring block	Provides connections between primary side of both main and expander transformer and 120 or 230 VAC (fused primary power). Available on ten-zone panels only.
3	Primary transformer	Converts 120 or 230 VAC supply voltage to 24 VAC.
4	Power expander transformer (optional)	Provides additional primary power to increase the available NAC current. Available on ten-zone panels only.
5	Dialer/modem (optional)	Provides LCD text display for status messages and programming menus, and stores an event history log. When configured as a dialer, it also provides two telephone line connections for transmitting event activation and restoration codes to a compatible digital alarm communicator receiver (DACR).
6	Main circuit board	Provides connections for all circuits and the operator interface.

Table 7: Descriptions of the panel components

Item	Name	Description
7	Standby batteries	Provide secondary (standby) power in the absence of primary power. We recommend using the following: ▪ For 3- and 5-zone control units: GE Security models 12V4A or 12V6A5, or equivalent ▪ For 10-zone control units: GE Security models 12V4A, 12V6A5, or 12V10A, or equivalent Larger batteries must be installed in a BC-3 battery cabinet.

FireShield Plus Technical Reference Manual

Operating the panel

Resetting the panel

Pressing Reset restores the control panel to the normal state provided there are no active devices on a circuit. When you reset the panel:

- All LEDs on the panel turn on for five seconds

- The trouble and power LEDs remain on for an additional 15 seconds

- When reset is complete, the buzzer sounds (then turns off) and the trouble LED turns off

While the control panel is resetting:

- All panel indicators are temporarily cleared

- All notification appliances are turned off

- All latched IDCs are cleared

- Alarm, trouble, and supervisory relays are returned to the inactive state

- Resettable auxiliary power momentarily turns off

At the conclusion of the reset, if an IDC is in an off-normal state, the panel treats the event as a new event and activates the programmed responses. Pressing Disable for the active IDC within 30 seconds after the panel has reset turns off the NACs and disables the IDC.

If one or more IDCs are disabled prior to initiation of the reset, those IDCs remain disabled.

If signal silence inhibit or reset inhibit is enabled, system reset is inhibited during the silence or reset inhibit period.

To reset the panel:

1. Press the Reset button.

> **WARNING:** Notification appliances should not be silenced until the building is fully evacuated and the cause of the alarm has been determined.

Silencing the panel and FSRSI buzzers

Both the panel and the optional FSRSI module have buzzer silence buttons. Pressing the Panel Silence button silences the buzzer on the panel and on remote FSRSIs.

Pressing the FSRSI Silence button silences the buzzer on the FSRSI only.

To silence the panel buzzer:

1. Press the Panel Silence button on the panel.

2. Determine the type of condition that caused the buzzer to sound: alarm, trouble, supervisory, or monitor.

3. Determine the cause of the condition.

To silence the FSRSI buzzer:

1. Press the Silence button on the FSRSI.

2. Determine the type of condition that caused the buzzer to sound: alarm, trouble, supervisory, or monitor.

3. Determine the cause of the condition.

Silencing notification appliances

Pressing the Signal Silence & Drill button turns off all audible notification appliances. Visible notification appliances or NAC circuits may or may not turn off, depending on panel programming.

When you silence the signals, the Signal Silenced LED turns on, indicating that the notification appliances are off. The panel does not indicate a trouble condition. If Genesis, horn/strobe, or horn-only devices are used on NACs programmed for Genesis operation, Signal Silence & Drill silences only the horns.

WARNING: Notification appliances should not be silenced until the building is fully evacuated and the cause of the alarm has been determined.

To silence notification appliances:

1. Press the Signal Silence & Drill button.

When the auto signal silence timer is programmed

When an event activates the notification appliances, the auto signal silence timer is activated. The notification appliances are activated for the time period defined during programming. When the timer expires, any NACs that are programmed as silenceable are deactivated, and the Signal Silenced LED turns on.

If another event takes place that activates the previously silenced notification appliances, the Signal Silenced LED turns off. At any time, you can deactivate silenceable NACs by pressing Signal Silence & Drill.

Note: NACs activated by IDCs programmed as waterflow cannot be silenced until the activated devices are restored to normal. After the devices restore, the Signal Silence & Drill button or the auto signal silence timer can silence the NACs.

Resounding an alarm condition

Pressing the Signal Silence & Drill button again turns the audible devices back on if they were silenced.

Note: NACs resound automatically if a new alarm (from another IDC) is received.

To resound notification appliances:

1. Press the Signal Silence & Drill button.

Disabling an IDC

Pressing an IDC Disable button prevents the panel from responding to any status change from that IDC. When you disable an IDC:

- The common Disable LED double-flashes

- The IDC Trouble LED double-flashes

- The common Trouble LED turns on and the panel goes into the trouble state

- The common trouble relay changes state

Resetting the panel has no effect on a disabled IDC, but removing all power from the panel clears the disable and enables the IDC.

Note: During an alarm condition, all *flashing* LEDs go steady.

To disable an IDC:

1. Press the Disable button for the IDC you want to disable.

Disabling an NAC

When you disable an NAC:

- The common Disable LED double-flashes

- The NAC Trouble LED double-flashes

- The common Trouble LED turns on and the panel goes into a trouble state

- The common trouble relay changes state

Resetting the panel has no effect on a disabled NAC, but removing all power from the panel clears the disable and enables the NAC.

To disable an NAC:

1. Press the Disable button for the NAC that you want to disable.

Enabling a disabled IDC or NAC

When you enable a disabled IDC or NAC:

- The common Disable LED turns off

- The IDC or NAC trouble LED turns off

- The common Trouble LED turns off and the panel returns to normal

- The IDC or NAC LEDs are updated to show current status

  Example: If the IDC or NAC is in trouble, the Trouble LED turns on.

After enabling an IDC, alarms from that IDC are inhibited for 30 seconds. During this time, the IDC can be disabled to avoid an unwanted alarm.

To enable a disabled IDC or NAC:

1. Press the Disable button for the IDC or NAC you want to enable.

Using the drill command

You can use the drill command to activate all of the notification appliance circuits. Pressing Drill activates all audibles and visibles according to the panel programming, but does not activate the panel's common alarm relay. The F-DACT(F) can be programmed to transmit a drill condition, but it will never report the drill as an alarm. Drill will not operate with an active alarm or supervisory event at the panel.

To perform a fire drill:

1. Press and hold the Signal Silence & Drill button for one second.

2. To stop the drill, press and hold the Signal Silence & Drill button for one second.

Chapter 2
Installation

Summary

This chapter provides instructions for installing the fire alarm system. It is intended for trained installers who are familiar with all applicable codes and regulations.

Content

Installation checklist

☐ Prepare the site. Make sure the installation location is free from construction dust and debris and extreme temperature ranges and humidity.

☐ Unpack the equipment.

☐ Install the cabinet. See "Installing the cabinet" on page 19 for cabinet dimensions.

☐ Remove the clear protective plastic from the front panel display.

☐ Install the F-DACT(F), if required. For more information, see "Installing the F-DACT(F)" on page 21.

☐ Connect the field wiring. For details, see Appendix C "Wiring diagrams" on page 97 or the panel door label.

Meter for opens, grounds, and shorts before connecting wires.

For more information on remote modules, see "Installing remote modules" on page 20.

☐ Connect AC power and ground. For wiring diagrams, see Appendix C or the panel label.

☐ Connect the batteries. For wiring diagrams, see Appendix C or the panel door label.

☐ Program the panel. See Chapter 3 "Panel programming" on page 25.

☐ Program the dialer, if installed. See Chapter 4 "Dialer programming" on page 43.

☐ Test the system for proper operation.

WARNING: Make sure that the AC power circuit breaker is off before connecting wires to the terminal block.

Note: The panel will not turn on if AC power is not applied.

Installing the cabinet

Cabinets can be surface mounted or semiflush mounted. Framing and mounting dimensions are provided below.

To surface mount the cabinet:

1. Position the cabinet on the finished wall surface.

2. Fasten the cabinet to the wall surface where indicated.

To semiflush mount the cabinet:

1. Frame the interior wall as required to support the full weight of the cabinet and standby batteries.

2. Install the (optional) semiflush trim ring on the cabinet.

3. Fasten the cabinet to the framing studs where indicated.

Figure 5: Panel dimensions and mounting holes
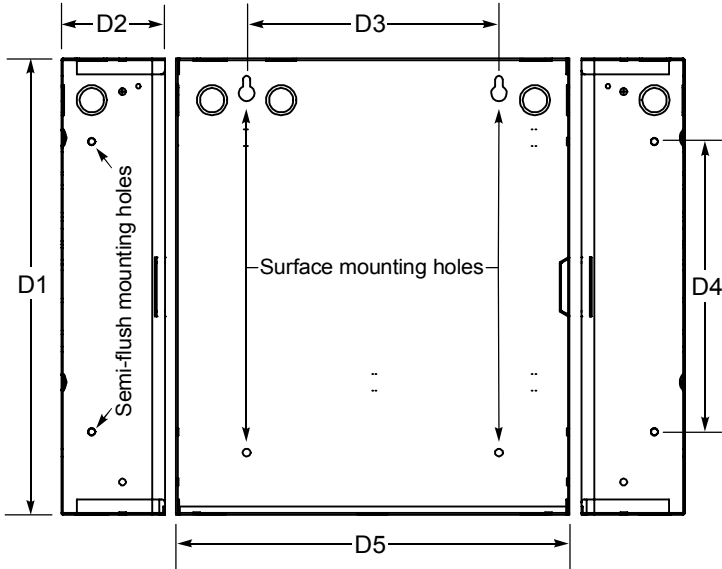
Table 8: Panel dimensions

Model	D1 [1]	D2	D3	D4	D5 [1]
Three- and five-zone	19.5 in (49.5 cm)	3.75 in (9.5 cm)	9.13 in (23.2 cm)	10.5 in (26.67 cm)	14.23 in (36.14 cm)
Ten-zone	30.0 in (76.2 cm)	3.75 in (9.5 cm)	7.75 in (19.7 cm)	21.27 in (54.0 cm)	16.25 in (41.27 cm)

[1] Add 1-1/2 in (3.81 cm) to D1 and D5 dimensions if a trim ring kit is installed.

Installing remote modules

Figure 6 shows the maximum number of devices that you can install on the remote module communication bus. Refer to the installation sheet provided with the remote module for mounting and wiring instructions. Wiring diagrams are also provided in Appendix C.

Figure 6: Remote module bus block diagram
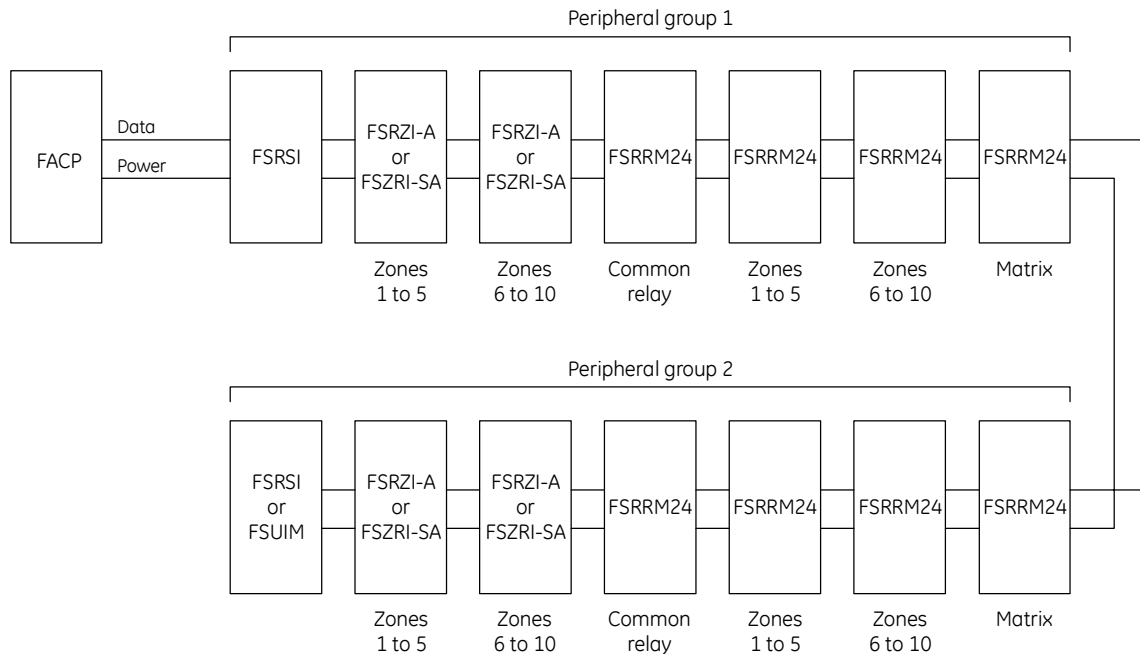
Important points

- You can only install one FSRRM24 configured for common relay operation (jumper installed on JP5) per peripheral group.

- You can only install zone indicator modules for zones 6 to 10 on ten-zone control panels.

- For ten-zone control panels, you can install an F-series remote annunciator in place of the FSRSI and the two zone indicator modules (FSRZI-A or FSRZI-SA).

- If the remote modules require more power than the control panel can provide, use a power-limited and regulated 24 VDC auxiliary/booster power supply that is UL/ULC Listed for fire protective signaling systems to power all or some of the remote modules.

Installing the F-DACT(F)

The F-DACT(F), also called the dialer, is a digital alarm communicator transmitter (DACT). The dialer transmits event activation and restoration codes to a compatible digital alarm communicator receiver (DACR) over standard loop-start telephone lines. The dialer is capable of split reporting to two different accounts and telephone numbers.

In addition to the dialer functions, the F-DACT(F) provides:

- An alphanumeric LCD to display system messages and programming prompts

- An event history log of panel and DACT events, viewable through compatible software

- A modem for uploading and downloading panel configuration, history, and current status to a PC running compatible software

The F-DACT(F) can be programmed to operate as a single- or dual-line DACT/Modem/LCD display, a Modem/LCD display, or an LCD display only.

Note: The F-DACT(F) modem is only rated for 2400 baud communication. Some PC modems may not be compatible with this baud rate.

NFPA 72 compliance requirements

For the dialer to be NFPA 72 CS compliant, the following conditions are required:

- The factory installed warning label must be removed from the F-DACT(F)'s LINE 2 phone jack.

- A second phone line, independent of that used for line one must be connected to the F-DACT(F)'s LINE 2 phone jack.

- The F-DACT(F) must be programmed to transmit a test signal at least once every 24 hours.

In addition, NFPA 72 requires that you perform a reacceptance test after you make any changes to the panel programming (also called the site-specific software). See NFPA 72 National Fire Alarm Code for testing requirements.

For additional download security, the F-DACT(F) can be programmed to perform a callback function.

Receiver compatibility

The F-DACT(F) is listed for use with the receivers shown below.

Table 9: Receiver models and formats

Manufacturer	Model	Format
Ademco	685	EST 4/2, Contact ID
FBII	CP220	EST 4/2, Contact ID
Osborne-Hoffman	OH 2000	EST 4/2, Contact ID
Radionics	D6500	EST 4/2
	D6600	EST 4/2. Contact ID
Silent Knight	9000	EST 4/2
Sur-Gard	MLR1, MLR2, MCDI TLR, TLR+	EST 4/2, Contact ID

Note: EST 4/2 is SIA DCS-02 P3 with the ability to transmit hexadecimal event codes.

Connecting an auxiliary/booster power supply

The control panel can provide up to 0.5 A of AUX power to operate ancillary equipment. For example, remote modules and graphic annunciator cards. If more than 0.5 A is required, you must use a power-limited and regulated 24 VDC auxiliary/booster power supply that is UL/ULC Listed for fire protective signaling systems to power all or some of the ancillary equipment.

Connect an auxiliary/booster supply to the control panel as shown in Figure 7.

Figure 7: Typical auxiliary/booster power supply wiring
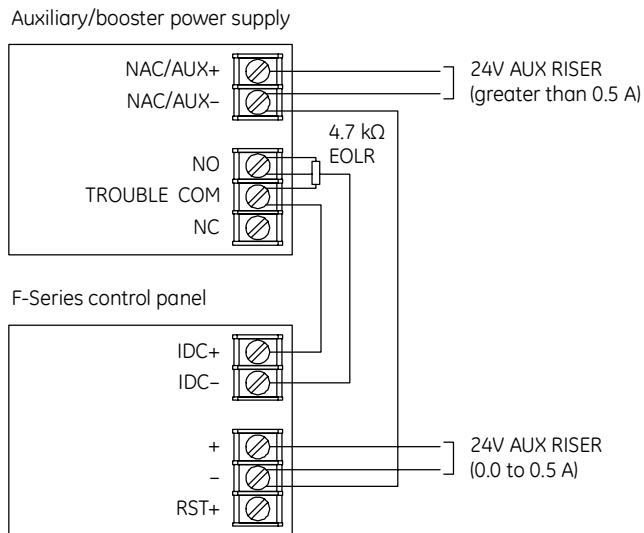
In addition, remember to do the following:

• Configure the auxiliary/booster power supply's trouble relay to close only on AC power failures. Refer to the power supply's installation instructions for more infomation.

• Use an initiating device circuit to monitor the auxiliary/booster power supply's trouble relay. Set the IDC's zone type for AC Fail.

• Wire the AUX power common on the auxiliary/booster supply to the AUX power common on the F-Series control panel.

Chapter 3
Panel programming

Summary

This chapter provides instructions for programming the control panel using the panel's keypad. It includes instructions for configuring the panel operation, initiating device circuits, and notification appliance circuits.

For dialer configuration instructions, see Chapter 4 "Dialer programming" on page 43.

Instructions for programming the control panel using the Fire Systems Configuration Utility (FSCU) are provided in the FSCU's online Help.

Content

UL 864 programming requirements

NOTICE TO USERS, INSTALLERS, AUTHORITIES HAVING JURISDICTION, AND OTHER INVOLVED PARTIES

This product incorporates field-programmable software. In order for the product to comply with the requirements in the Standard for Control Units and Accessories for Fire Alarm Systems, UL 864, certain programming features or options must be limited to specific values or not used at all as indicated below.

Programmable feature or option	Permitted in UL 864? (Y/N)	Possible settings	Settings permitted in UL 864
AC fail delay	Y	0 to 15 hours	1, 2, or 3 hours
Electronic waterflow retard	Y	0 to 150 seconds	0 to 90 seconds
Nonlatching alarm circuits	Y	No Yes	No Yes [1]
NAC wiring class	Y	A B Parallel	Yes Yes No
Telephone line supervision duration	Y	0 to 200 seconds	1 to 200 seconds
Telephone line ground fault supervision	Y	No Yes	Yes
Test signal frequency	Y	0 to 45 days	1 (daily)
Dialer mode	Y	Dual line Single line Modem/LCD LCD only	Dual line Single line [2] Modem/LCD [3] LCD only [3]
Send event restore codes	Y	Send Restores No Restores	Send Restores

Notes

[1]   Allowed only when the IDC is connected to a latching alarm device

[2]   Allowed only when the supervising station supervises the telephone line and annunciates fault conditions within 200 seconds

[3]   Prohibited when the control panel is connected to a supervising station

Before you begin

Programming methods

There are two ways you can program the control panel. You can use the control panel's keypad (also called front panel programming). You can also use a computer and the Fire Systems Configuration Utility (FSCU).

To program the control panel using the FSCU, you must install an F-DACT(F) in the control panel. Configure the F-DACT(F) for dialer or modem operation.

Front panel programming does not require that you have an F-DACT(F) installed.

Entering and exiting local program mode

The panel must be in local program mode before you can change any of the panel's current settings.

To enter local program mode:

1. Install the jumper on J3 (PRG).

   The panel status LEDs start flashing to indicate local program mode is activated.

2. If passcode protection is enabled, enter the passcode.

To exit local program mode:

1. Remove the jumper from J3 (PRG).

   The panel automatically resets after the jumper on J3 is removed.

Programming mode times out about 90 seconds after the last programming button is pressed. The panel status LEDs start flashing to indicate that the panel has timed out.

Pressing the Signal Silence & Drill button returns you to local programming mode at the point you left. If passcode protection is enabled, you must enter the correct passcode to continue.

Selecting panel options

Use the Signal Silence & Drill button and the Remote Disconnect button to select panel options. Pressing Signal Silence & Drill selects the next option. Pressing Remote Disconnect selects the previous option.

If you have a dialer, the selected option is displayed on the first line of the LCD. If not, the option is indicated on the top row of status

| SIGNAL SILENCE & DRILL | = | NEXT OPTION |
| REMOTE DISCON-NECT | = | PREVIOUS OPTION |
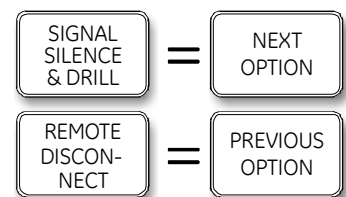
LEDs.

In the programming instructions that follow, when you see "select the <option_name> option," press Signal Silence & Drill or Remote Disconnect until the option is displayed on the LCD or indicated on the status LEDs.

Entering values for panel options

Use the Panel Silence, Walk Test, and Reset buttons to enter values for the selected panel option. Pressing the Panel Silence button selects the next value. Pressing the Walk Test button selects the previous value. Pressing the Reset button enters the selected value.

PANEL SILENCE	=	NEXT VALUE
WALK TEST	=	PREVIOUS VALUE
RESET	=	ENTER

If you have a dialer, the selected value is displayed on the second line of the LCD. If not, the value is indicated on the bottom row of status LEDs.

In the programming instructions that follow, when you see "enter <value>," press the Panel Silence or Walk Test buttons until the value is displayed on the LCD or indicated on the status LEDs then press Reset.

When entering a set of numbers:

1. Press the Panel Silence or Walk Test buttons to increase or decrease the number.

2. Press the Reset button to enter the number and position the cursor at the next number.

If the number doesn't need to be changed, press Reset to go to the next number.
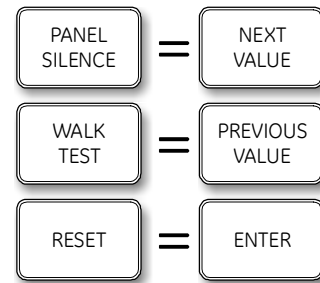
When you finish

After you have finished programming, make sure the panel is not in a trouble fault state. No trouble LEDs should be turned on. Test all circuits and panel functions to make sure that the panel is programmed correctly.

Getting started

Restoring panel default settings

Control panels are shipped from the factory with default settings for a typical system. Use the Load Defaults option to restore the panel default settings.

To restore panel default settings:

1. Select the Load Defaults option.

2. Enter Yes.

Caution: Restoring panel default settings disables passcode protection. If you want passcode protection you must enable it again.

Note: Restoring *panel* default settings doesn't change the passcode and doesn't restore *dialer* default settings.

Enabling passcode protection

Passcode protection prevents unauthorized access to the panel's programming. The default passcode is 1111.

This option is only available when a dialer is installed.

To enable passcode protection:

1. Select the Enable Passcode option.

2. Enter Yes.

Changing the passcode

After enabling the passcode, you should change it at your earliest convenience. Write down the new passcode and store it in a safe place.

This option is only available when a dialer is installed and the passcode is enabled.

To change the passcode:

1. Select the Edit Passcode option.

2. Enter the new passcode.

   A passcode consists of four characters. Valid characters are the numbers 0 to 9 and the letters A to F.

Detecting remote modules

Use the Find Peripherals option to detect which remote modules are connected to the control panel when you first configure the control panel and anytime you add or remove remote modules from the system.

Note: Do not remove the jumper on J3 (PRG) until the control panel has completed the detection process. If you do, you must remove all power from the panel before you can enter local programming mode again.

To detect remote modules:

1. Select the Find Peripherals option.

2. Enter Yes.

   The bottom status LEDs will flash until the control panel has completed the detection process. This may take up to 40 seconds. When finished, the control panel displays how many remote modules were detected, as shown in Table 10.

Table 10: Find Peripherals results

Step	Option											
		ALARM	TROUBLE	SUP	POWER	DISABLE		WATERFLOW	ANN TROUBLE	BATT TROUBLE	GND FAULT	SERVICE DETECTOR
	LCD first line						LCD second line					
9	Find Peripherals	○	●	○	○	●	was XX now 00	○	○	○	○	○
							was XX now 01	○	○	○	○	●
							was XX now 02	○	○	○	●	○
							was XX now 03	○	○	○	●	●
							was XX now 04	○	○	●	○	○
							was XX now 05	○	○	●	○	●
							was XX now 06	○	○	●	●	○
							was XX now 07	○	○	●	●	●
							was XX now 08	○	●	○	○	○
							was XX now 09	○	●	○	○	●
							was XX now 10	○	●	○	●	○
							was XX now 11	○	●	○	●	●
							was XX now 12	○	●	●	○	○
							was XX now 13	○	●	●	○	●
							was XX now 14	○	●	●	●	○

Configuring the panel

To configure the panel, assign values to the panel program options as indicated in Table 11. Record your settings on the panel programming worksheet in Appendix B.

Follow this general sequence of steps:

1. Restore the panel default settings.

2. If passcode protection is required, enable the passcode. You should also change the passcode from its default value.

3. Starting with Panel Operating Mode, enter a value for each option. You can skip an option if its default value is acceptable.

4. Detect which remote modules are connected to the control panel.

The panel program options are described below.

Panel Op Mode: Determines the basic operation of the control panel. The values that you can select are:

- **FACP:** Panel operates as a fire alarm control panel. By default, all initiating device circuits are latching alarm circuits. A manual reset is required to return the panel to normal.

- **FACOM:** Panel operates as a dialer for fire alarm control panels that do not have a dialer. By default, all initiating device circuits are nonlatching alarm circuits. The control panel resets automatically after the central station receiver acknowledges that it received all events from the control panel.

- **Sprinkler Supv:** Panel operates as an unattended sprinkler supervisory panel. For alarm and waterflow events, the panel operates as a fire alarm control panel. For all other events, the control panel resets automatically after the central station receiver acknowledges that it has received all events from the control panel.

Rst/Sil Inhibit: Determines how long you must wait after an alarm event before you can silence notification appliances or reset the control panel. You can select None (to silence notification appliances or reset the control panel immediately) or 1 minute.

AC Fail Delay: Determines how long the panel must be without AC power or a remote AC fail zone type must be active before the dialer transmits an AC fail event. You can select between 0 and 15 hours.

WF Retard/Delay: Determines how long a waterflow switch must be closed before a waterflow-retard or a waterflow-retard/supervisory zone type is activated. You can select between 0 and 150 seconds.

Disable Lockout: Determines which control panel buttons are inoperable (locked out). The values that you can select are:

- **None:** No buttons are locked out.

Note: The panel operating mode option is only available when an F-DACT(F) is installed. By default, the panel operates as a fire alarm control panel.

Note: To meet UL 864 9th edition requirements, set AC Fail Delay for 1, 2, or 3 hours.

Note: To meet NFPA 72 2002 edition requirements, set WF Retard/Delay between 0 and 90 seconds.

- **All:** Remote Disconnect button, IDC Disable buttons, and NAC Disable buttons.

- **IDC/NAC:** Only IDC Disable buttons and NAC Disable buttons.

- **Rem Disconnect:** Only the Remote Disconnect button.

RRM Multi Mode: Determines how relays on an FSRRM24 configured for programmable operation (jumper installed on JP2) are programmed. The values that you can select are:

- **Common Alarm:** Relays are automatically programmed to energize on any alarm event.

- **Matrix:** You must program an initiating device circuit to activate the relays.

Table 11: Panel program options

Step	Option						Values					
	LCD first line	ALARM	TROUBLE	SUP	POWER	DISABLE	LCD second line	WATERFLOW	ANN TROUBLE	BATT TROUBLE	GND FAULT	SERVICE DETECTOR
1	Load Defaults	○	○	○	○	●	No (default)	○	○	○	○	●
							Yes	○	○	○	●	○
2	Edit Passcode [3]	○	○	○	●	○	1111 (default) to FFFF	○	○	○	○	○
3	Enable Passcode [2]	○	○	○	●	●	No (default)	○	○	○	○	●
							Yes	○	○	○	●	○
4	Panel Op Mode [2]	○	○	●	○	○	FACP (default)	○	○	○	○	●
							FACOM	○	○	○	●	○
							Sprinkler Supv	○	○	○	●	●
5	Rst/Sil Inhibit	○	○	●	○	●	None (default)	○	○	○	○	●
							1 minute	○	○	○	●	○
6	AC Fail Delay	○	○	●	●	○	0 hours	○	○	○	○	○
							1 hour	○	○	○	○	●
							2 hours	○	○	○	●	○
							3 hours (default)	○	○	○	●	●
							4 hours	○	○	●	○	○
							5 hours	○	○	●	○	●
							6 hours	○	○	●	●	○

Table 11: Panel program options

Step	Option						Values					
	LCD first line	ALARM	TROUBLE	SUP	POWER	DISABLE	LCD second line	WATERFLOW	ANN TROUBLE	BATT TROUBLE	GND FAULT	SERVICE DETECTOR
							7 hours	○	○	●	●	●
							8 hours	○	●	○	○	○
							9 hours	○	●	○	○	●
							10 hours	○	●	○	●	○
							11 hours	○	●	○	●	●
							12 hours	○	●	●	○	○
							13 hours	○	●	●	○	●
							14 hours	○	●	●	●	○
							15 hours	○	●	●	●	●
7	WF Retard/Delay	○	○	●	●	●	0 seconds	○	○	○	○	○
							5 seconds (default)	○	○	○	○	●
							10 seconds	○	○	○	●	○
							15 seconds	○	○	○	●	●
							20 seconds	○	○	●	○	○
							25 seconds	○	○	●	○	●
							30 seconds	○	○	●	●	○
							35 seconds	○	○	●	●	●
							40 seconds	○	●	○	○	○
							45 seconds	○	●	○	○	●
							50 seconds	○	●	○	●	○
							55 seconds	○	●	○	●	●
							60 seconds	○	●	●	○	○
							65 seconds	○	●	●	○	●
							70 seconds	○	●	●	●	○
							75 seconds	○	●	●	●	●
							80 seconds	●	○	○	○	○
							85 seconds	●	○	○	○	●

Table 11: Panel program options

Step	Option	LCD first line	ALARM	TROUBLE	SUP	POWER	DISABLE	LCD second line	WATERFLOW	ANN TROUBLE	BATT TROUBLE	GND FAULT	SERVICE DETECTOR
								90 seconds	●	○	○	●	○
								95 seconds	●	○	○	●	●
								100 seconds	●	○	●	○	○
								105 seconds	●	○	●	○	●
								110 seconds	●	○	●	●	○
								115 seconds	●	○	●	●	●
								120 seconds	●	●	○	○	○
								125 seconds	●	●	○	○	●
								130 seconds	●	●	○	●	○
								135 seconds	●	●	○	●	●
								140 seconds	●	●	●	○	○
								145 seconds	●	●	●	○	●
								150 seconds	●	●	●	●	○
8	Disable Lockout		○	●	○	○	○	None (default)	○	○	○	○	●
								All	○	○	○	●	○
								IDC/NAC	○	○	○	●	●
								Remote Disconnect	○	○	●	○	○
9	Find Peripherals [4]		○	●	○	○	●	XX now on buss	○	○	○	○	●
								Find devices	○	○	○	●	○
10	RRM Multi Mode [5]		○	●	○	●	○	Common Alarm (default)	○	○	○	○	●
								Matrix	○	○	○	●	○

Notes

1. ○ = OFF, ● = ON

[2] Available only when an F-DACT(F) is installed

[3] Available only when an F-DACT(F) is installed and the panel's Enable Passcode option is set for Yes

[4] For result display options, see Table 10 on page 30

[5] Available only when an FSRRM24 configured for programmable operation (jumper installed on JP2) is detected on the peripheral bus

Configuring initiating device circuits

To configure the initiating device circuits (IDCs), assign values to the IDC program options as indicated in Table 12. Record your settings on the IDC programming worksheet in Appendix B.

Follow this general sequence of steps:

1. Select the IDC zone type option. IDC 1 is automatically selected for you.

2. Enter the IDC zone type value for each IDC. To select a different IDC, press the IDC's disable button. The panel indicates which IDC you are programming by turning on the IDC's trouble LED.

    If the IDC is an alarm zone type or a waterflow zone type, press the Disable button for each NAC that you want the IDC to turn on. The panel indicates which NAC you selected by turning on the NAC's trouble LED.

3. Select the next option and enter a value for each IDC before proceeding to the next option.

The IDC programming options are described below.

IDC Zone Type: Determines the type of event that the IDC activates and other operating characteristics. The values that you can select are:

- **Alarm-unverified:** Activates alarm events. Select this zone type when the IDC is connected to two-wire smoke detectors, dry contact devices, or both.

- **Alarm-verified:** Activates alarm events immediately for dry contact devices and at the end of the alarm verification cycle for two-wire smoke detectors. Select this zone type when the IDC is connected to two-wire smoke detectors, dry contact devices, or both.

- **WaterFlow-retard:** Activates alarm events when a waterflow switch remains closed for as long as the panel's waterflow retard/delay setting. Select this zone type when the IDC is only connected to waterflow switches.

- **WaterFlow:** Activates alarm events when a waterflow switch closes, regardless of the panel's waterflow retard/delay setting. Select this zone type when the IDC is only connected to waterflow switches.

- **WF-retard/Supv:** Activates alarm events when a waterflow switch remains closed for as long as the panel's waterflow retard/delay setting and supervisory events when a supervisory device is activated. Select this zone type when the IDC is connected to waterflow switches and supervisory devices.

- **WF/Supervisory:** Activates alarm events when a waterflow switch closes, regardless of the panel's waterflow retard/delay setting, and supervisory events when a supervisory device is

activated. Select this zone type when the IDC is connected to waterflow switches and supervisory devices.

- **Supervisory:** Activates supervisory events. Select this zone type when the IDC is connected to supervisory devices.

- **Monitor:** Activates monitor events. Select this zone type when the IDC is connected to dry contact devices that monitor the operation of ancillary system functions.

    Note: The monitor zone type is not approved for use in Canada under ULC 527.

- **Remote SigSil/Drill:** Activates the Signal Silence or Drill command. Select this zone type when the IDC is connected to momentary switches that are used to silence or activate notification appliances from a remote location.

- **Remote AC Fail:** Activates trouble events when the trouble relay on an auxiliary/booster power supply remains closed for as long as the panel's AC fail delay setting. Select this zone type when the IDC is connected to auxiliary/booster power supply trouble relays that only close when AC power fails.

- **Cross Zoned:** Activates alarm events only when two zones are activated. Select this zone type when the IDC is connected to two-wire smoke detectors, dry contact devices, or both and multiple detector operation is required. For more information, see Figure 30 on page 115.

IDC Class: Determines if the IDC is wired Class A or Class B.

IDC Non-Latching: Determines if alarm, waterflow, or supervisory zone types are latching or nonlatching circuits. Monitor and other zone types are always nonlatching.

Note: To meet UL 864 9th edition requirements, nonlatching alarm circuits are only allowed when connected to a latching alarm device.

IDC Service Chk: Determines if the panel indicates when an ESL model detector needs servicing.

IDC RRM Relay: Determines which relays on a remote relay module the IDC turns on. Available only when the panel's RRM multi mode option is set to Matrix.

IDC Code Digit 1: Determines the first set of pulses in a coded alarm signal. The IDC Code Digit options are only available when a notification appliance circuit's NAC type option is set for Coder.

IDC Code Digit 2: Determines the second set of pulses in a coded alarm signal.

IDC Code Digit 3: Determines the third set of pulses in a coded alarm signal.

IDC Code Digit 4: Determines the fourth set of pulses in a coded alarm signal.

IDC Label: Determines the text displayed on the LCD when the IDC is activated. The IDC label option is only available when an F-DACT(F) is installed.

Table 12: IDC program options

Step	Option											
	LCD first line	**ALARM**	**TROUBLE**	**SUP**	**POWER**	**DISABLE**	**LCD second line**	**WATERFLOW**	**ANN TROUBLE**	**BATT TROUBLE**	**GND FAULT**	**SERVICE DETECTOR**
11	IDC Zone Types	○	●	○	●	●	Alarm-unverified (default)	○	○	○	○	●
							Alarm-verified	○	○	○	●	○
							WaterFlow-retard	○	○	○	●	●
							WaterFlow	○	○	●	○	○
							WF-retard/Supv	○	○	●	○	●
							WF/Supervisory	○	○	●	●	○
							Supervisory	○	○	●	●	●
							Monitor	○	●	○	○	○
							Remote SigSil/Drill	○	●	○	○	●
							Remote AC fail	○	●	○	●	○
							Cross Zoned	○	●	○	●	●
12	IDC Class	○	●	●	○	○	Class B (default)	○	○	○	○	●
							Class A	○	○	○	●	○
13	IDC Non-Latching	○	●	●	○	●	No (default)	○	○	○	○	●
							Yes	○	○	○	●	○
14	IDC Service Chk	○	●	●	●	○	No (default)	○	○	○	○	●
							Yes	○	○	○	●	○
15	IDC RRM Relay [2]	○	●	●	●	●	000 (default)	○	○	○	○	○
							001	○	○	○	○	●
							002	○	○	○	●	○
							003	○	○	○	●	●
							004	○	○	●	○	○
							005	○	○	●	○	●
16	IDC Code Digit 1 [3]	●	○	○	○	○	000 (default)	○	○	○	○	○
							001	○	○	○	○	●
							002	○	○	○	●	○
							003	○	○	○	●	●

Table 12: IDC program options

Step	Option						Values					
	LCD first line	ALARM	TROUBLE	SUP	POWER	DISABLE	LCD second line	WATERFLOW	ANN TROUBLE	BATT TROUBLE	GND FAULT	SERVICE DETECTOR
							004	O	O	●	O	O
							005	O	O	●	O	●
							006	O	O	●	●	O
							007	O	O	●	●	●
							008	O	●	O	O	O
							009	O	●	O	O	●
							010	O	●	O	●	O
							011	O	●	O	●	●
							012	O	●	●	O	O
							013	O	●	●	O	●
							014	O	●	●	●	O
							015	O	●	●	●	●
17	IDC Code Digit 2 [3]	●	O	O	O	●	same as IDC Code Digit 1	X	X	X	X	X
18	IDC Code Digit 3 [3]	●	O	O	●	O	same as IDC Code Digit 1	X	X	X	X	X
19	IDC Code Digit 4 [3]	●	O	O	●	●	same as IDC Code Digit 1	X	X	X	X	X
20	IDC Label [4]	●	O	●	O	O	IDC/Zone XX	O	O	O	O	O

Notes

1.   O = OFF, ● = ON, X = Either

[2]   Available only when the panel's RRM Multi Mode option is set for Matrix

[3]   Available only when a notification appliance circuit's NAC Type option is set for Coder

[4]   Available only when an F-DACT(F) is installed

Configuring notification appliance circuits

To configure the notification appliance circuits (NACs), assign values to the NAC program options as indicated in Table 13. Record your settings on the initiating device circuit programming worksheet in Appendix B.

Follow this general sequence of steps:

1. Select the NAC type option. NAC 1 is automatically selected.

2. Enter the NAC type value for each NAC. To select a different NAC, press the NAC's disable button. The panel indicates which NAC you are programming by turning on the NAC's trouble LED.

3. Select the next option and enter a value for each NAC before proceeding to the next option.

NAC program options are described below.

NAC type: Determines the type of signal that the NAC outputs and other operating characteristics. The values that you can select are:

- **Continuous:** Outputs an unsynchronized 24-volt continuous (steady) signal. Select this NAC type when the NAC is connected to compatible audible and visible notification appliances, other than Genesis.

- **Temporal (3-3-3):** Outputs an unsynchronized 24-volt temporal signal. Select this NAC type when the NAC is connected to compatible audible notification appliances, other than Genesis, that are designed or configured to output a steady tone.

- **GENESIS:** Outputs a synchronized 24-volt continuous (steady) signal, and a horn-only signal silence command. Select this NAC type when the NAC is connected to Genesis audible and visible notification appliances and Signal Silence is for horns only.

- **GENESIS (AV Sil):** Outputs a synchronized 24-volt continuous (steady) signal. Select this NAC type when the NAC is connected to Genesis audible and visible notification appliances and Signal Silence is for both horns and strobes.

- **Coder:** Outputs an unsynchronized 24-volt coded signal that is four rounds of an IDC's zone code. Select this NAC type when the NAC is connected to compatible audible notification appliances designed or configured to output a steady tone.

- **City Tie:** Outputs an unsynchronized 24-volt continuous (steady) signal that can't be silenced or disabled. Select this NAC type when the NAC is connected to a city tie module.

NAC Class: Determines if the NAC is wired Class A, Class B.

Automatic Sig Silence: Determines how long NACs stay on after an alarm event before they are automatically silenced. Select between 0 minutes (NACs stay on indefinitely) and 30 minutes.

NAC Silenceable: Determines if the NAC can be silenced.

Table 13: NAC program options

Step	Option							Values				
	LCD first line	ALARM	TROUBLE	SUP	POWER	DISABLE	LCD second line	WATERFLOW	ANN TROUBLE	BATT TROUBLE	GND FAULT	SERVICE DETECTOR
21	NAC Types [2]	●	○	●	○	●	Continuous	○	○	○	○	●
							Temporal (3-3-3)	○	○	○	●	○
							GENESIS (default)	○	○	○	●	●
							GENESIS (AV Sil)	○	○	●	○	○
							Coder	○	○	●	○	●
							City Tie	○	○	●	●	○
22	NAC Class [3]	●	○	●	●	○	Class B (default)	○	○	○	○	●
							Class A	○	○	○	●	○
23	Auto Sig Silence [4]	●	○	●	●	●	0 minutes (default)	○	○	○	○	○
							1 minute	○	○	○	○	●
							2 minutes	○	○	○	●	○
							3 minutes	○	○	○	●	●
							4 minutes	○	○	●	○	○
							5 minutes	○	○	●	○	●
							6 minutes	○	○	●	●	○
							7 minutes	○	○	●	●	●
							8 minutes	○	●	○	○	○
							9 minutes	○	●	○	○	●
							10 minutes	○	●	○	●	○
							11 minutes	○	●	○	●	●
							12 minutes	○	●	●	○	○
							13 minutes	○	●	●	○	●
							14 minutes	○	●	●	●	○
							15 minutes	○	●	●	●	●
							16 minutes	●	○	○	○	○
							17 minutes	●	○	○	○	●
							18 minutes	●	○	○	●	○

Table 13: NAC program options

Step	Option						Values					
	LCD first line	ALARM	TROUBLE	SUP	POWER	DISABLE	LCD second line	WATERFLOW	ANN TROUBLE	BATT TROUBLE	GND FAULT	SERVICE DETECTOR
							19 minutes	●	○	○	●	●
							20 minutes	●	○	●	○	○
							21 minute	●	○	●	○	●
							22 minutes	●	○	●	●	○
							23 minutes	●	○	●	●	●
							24 minutes	●	●	○	○	○
							25 minutes	●	●	○	○	●
							26 minutes	●	●	○	●	○
							27 minutes	●	●	○	●	●
							28 minutes	●	●	●	○	○
							29 minutes	●	●	●	○	●
							30 minutes	●	●	●	●	○
24	NAC Silenceable [5]	●	●	○	○	○	No	○	○	○	○	●
							Yes (default)	○	○	○	●	○

Notes

1. ○ = OFF, ● = ON

[2] City tie NAC types can't be silenced or disabled. To inhibit operation of city tie NAC types you must press the control panel's Remote Disconnect button.

[3] Class A notification appliance circuits are programmed in odd-even pairs. If you program either circuit as Class A, NAC type and NAC silenceable values are automatically entered for both circuits.

[4] Does not turn off NACs activated by waterflow, waterflow-retard, waterflow/supervisory, and waterflow-retard/supervisory zone types

[5] Does not affect notification appliance circuits whose NAC Type option is set for City Tie or those activated by a waterflow switch

Programming coded alarm signals

A coded alarm signal consists of at least three rounds of a series of pulses that identify the active fire alarm zone. Each round consists of up to three digits (the fourth digit is optional). Each digit consists of up to 15 pulses.

Figure 8: Coded alarm signal format
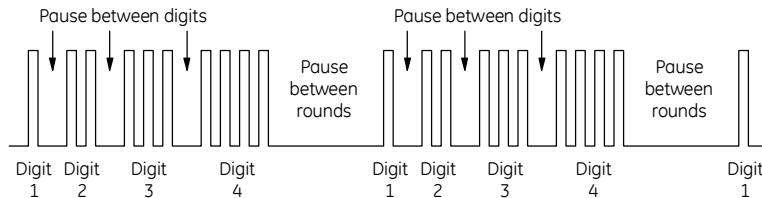
To program a coded alarm signal, follow this general sequence of steps:

1. For each NAC, set the NAC type option for Coder.

2. Select the IDC Zone Type option, then program each IDC to activate all NACs.

3. Select the IDC Code Digit 1 option, then for each IDC enter a number for the first set of pulses in the coded alarm signal. Enter a number between 1 and 15. Do not enter a 0.

4. Select the IDC Code Digit 2 option, then for each IDC enter a number for the second set of pulses in the coded alarm signal. You can enter any number between 0 and 15.

5. Select the IDC Code Digit 3 option, then for each IDC enter a number for the third set of pulses in the coded alarm signal. You can enter any number between 0 and 15.

6. Select the IDC Code Digit 4 option, then for each IDC enter a number for the fourth set of pulses in the coded alarm signal. You can enter any number between 0 and 15.

Note: Entering a value of 0 terminates the round. For example, if IDC Code Digit 3 is set for 0, each round will consist of only digits 1 and 2.

Chapter 4
Dialer programming

Summary

This chapter provides instructions for programming the dialer using the panel's keypad. It includes instructions for setting the system clock, setting daylight saving time, and configuring the dialer.

Instructions for programming the dialer using the Fire Systems Configuration Utility (FSCU) are provided in the FSCU's online Help.

Content

Before you begin

Programming the F-DACT(F) sets up the dialer for communication with the central monitoring station. It also sets a number of other options such as date, time, phone numbers, etc. Many of the options have default settings, which are detailed below.

Programmable features

Here are some of the dialer's programmable features:

- **Passcode protection:** Prevents unauthorized access to the panel's programming.

- **Daylight saving time:** Determines how much the system clock is adjusted for daylight saving time and when it is adjusted.

- **Dialer operating mode:** Determines if the F-DACT(F) operates as a dual- or single-line dialer, a modem, or only an LCD text display.

- **Blind call dialing:** Determines if the F-DACT(F) can dial out without waiting for a dial tone.

- **Callback security:** Prevents someone at another location from dialing into your control panel to access information.

You can only program this feature using the Fire Systems Configuration Utility:

- **Swinger shutdown:** Limits the number of consecutive identical events transmitted for the same point.

Entering and exiting dialer program mode

Dialer program mode provides a separate set of options just for the dialer. It is only available when a dialer is installed.

To enter dialer program mode:

1. Install the jumper on J3 (PRG).

   The panel status LEDs start flashing to indicate local program mode is activated.

2. If passcode protection is enabled, enter the passcode.

3. Select the Program DACT option. The quickest way is to press Signal Silence & Drill then Remote Disconnect.

4. Enter Yes.

To exit dialer program mode:

1. Remove the jumper from J3 (PRG).

The panel automatically resets after the jumper on J3 is removed.

Selecting dialer options

Use the Signal Silence & Drill and Remote Disconnect buttons to select dialer options. Pressing Signal Silence & Drill selects the next option. Pressing Remote Disconnect selects the previous option.

In the programming instructions that follow, when you see "select this option," press Signal Silence & Drill or Remote Disconnect until the option is displayed on the LCD.

| SIGNAL SILENCE & DRILL | = | NEXT OPTION |
| REMOTE DISCON-NECT | = | PREVIOUS OPTION |
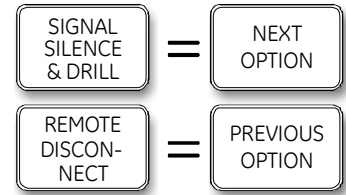
Entering values for dialer options

Use the Panel Silence, Walk Test, and Reset buttons to enter values for the selected dialer option. Pressing Panel Silence selects the next value. Pressing Walk Test selects the previous value. Pressing Reset enters the value.

In the programming instructions that follow, whenever you see "enter this value," use the Panel Silence or Walk Test buttons to select the value then press Reset.

When entering a set of numbers, pressing the Panel Silence and Walk Test buttons increases or decreases the number. Pressing Reset enters the number and positions the cursor at the next number. If the number doesn't need to be changed, press Reset to go to the next number.

PANEL SILENCE	=	NEXT VALUE
WALK TEST	=	PREVIOUS VALUE
RESET	=	ENTER
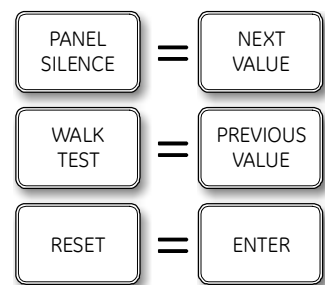
Entering telephone numbers for dialer accounts

Table 14 lists the characters you can enter for telephone numbers.

Table 14: Telephone number characters

Character	Description
0 to 9	Numbers 0 to 9
A	DTMF A
B	DTMF B
C	Not used
D	Not used
E	Not used
F	Terminator (indicates last digit)
*	DTMF *
#	DTMF #

Table 14: Telephone number characters

Character	Description
,	DTMF , (inserts a pause between digits)

Getting started

Setting the system clock

The control panel uses a system clock to time-stamp events. Time is presented in 24-hour format. Dates are presented in month-day-year format.

To set the system clock:

1. Select the Date option.

2. Enter the month, day, and year.

3. Under Time, enter the time in hours and minutes

4. Under Current Day, enter the day of the week.

Setting daylight saving time options

The daylight saving time options determine how much the system clock is adjusted for daylight saving time and when it is adjusted.

The default DST settings adjust the system clock forward one hour on the second Sunday in March at 2:00 a.m. and back one hour on the first Sunday in November at 2:00 a.m.

To change daylight saving time settings:

1. Select the Daylight Saving option.

2. Enter Set.

3. For DST Adjustment, enter how many minutes you want the system clock adjusted when DST begins and ends. The default value is 60 minutes.

   Enter 00 minutes to prevent daylight saving time from automatically adjusting the system clock.

4. For DST Start Month, enter the month that DST begins. The default value is 03 (March).

5. For DST Start Week, enter the week that DST begins. The default value is 2nd.

6. For DST Start Day, enter the day that DST begins. The default value is Sunday.

7. For DST Start Hour, enter the hour that DST begins. The default value is 02 (2:00 a.m.).

   The start hour is in 24-hour format. 00 = 12:00 a.m. (midnight), 01 = 1:00 a.m., 12 = 12:00 p.m. (noon), 23 = 11:00 p.m.

8. For DST End Month, enter the month that DST ends. The default value is 11 (November).

9. For DST End Week, enter the week that DST ends. The default value is First.

10. For DST End Day, enter the day that DST ends. The default value is Sunday.

11. For DST End Hour, enter the hour that DST ends. The default value is 02 (2:00 a.m.).

Selecting a dialer mode

The dialer mode option determines how the F-DACT(F) operates. The values that you can select are:

- **Dual-Line DACT:** Dialer is used to transmit event codes to a central station on LINE 1 and LINE 2, and to perform modem functions/LCD functions.

- **Single-Line DACT:** Dialer is used to transmit event codes to a central station on LINE 1 only, and to perform modem functions/LCD functions.

- **Modem/LCD only:** Dialer is used to communicate with a computer running the FSCU, and to display text. Dialer functions are disabled.

- **LCD only:** Dialer is only used to display text. Dialer and modem functions are disabled.

If Single-Line DACT is selected, dual-line programming is skipped. If Modem/LCD only is selected, all account and receiver related programming is skipped. If LCD only is selected, all account, receiver, and telephone related programming is skipped.

To select a dialer mode:

1. Select the Dialer Mode option.

2. Enter a mode.

Setting account options

Table 15 and Table 16 list the set of options for account 1 and account 2 and their default values.

Review Table 15 and Table 16 and change values as required. If you don't need to change any values, go to "Setting dialer options" on page 51.

Table 15: Account 1 options

Option	Description	Values
RCVR1 Phone 1	Account 1's first telephone number	0 to 9, A, B, asterisk (*), pound sign (#), and comma (,) up to 20 characters Default: Blank
RCVR1 Phone 2	Account 1's second telephone number	0 to 9, A, B, asterisk (*), pound sign (#), and comma (,) up to 20 characters Default: Blank
RCVR1 Acct Code	Account 1's identification number	0 to 9, and A to F Default: FFFF
Alarm Format 1	Determines the format of event codes sent to account 1	Contact ID or EST 4×2 Default: Contact ID
Restore Type 1	Determines if event restoration codes are sent to account 1	Send Restores or No Restores Default: Send Restores
Retry Count 1	Determines how many times the dialer will attempt to call account 1 before indicating a delivery trouble	5 to 10 Default: 5
Retry Time 1	Determines how many seconds the dialer waits between retry attempts	5 to 10 Default: 5
Note: To meet UL 864 9th edition requirements, set Restore Type 1 to Send Restores.		

Table 16: Account 2 options

Option	Description	Values
RCVR2 Phone 1	Account 2's first telephone number	0 to 9, A, B, asterisk (*), pound sign (#), and comma (,) up to 20 characters Default: Blank
RCVR2 Phone 2	Account 2's second telephone number	0 to 9, A, B, asterisk (*), pound sign (#), and comma (,) up to 20 characters Default: Blank
RCVR2 Acct Code	Account 2's identification number	0 to 9, and A to F Default: FFFF

Table 16: Account 2 options

Option	Description	Values
Alarm Format 2	Determines the format of event codes sent to account 2	Contact ID or EST 4x2 Default: Contact ID
Restore Type 2	Determines if event restoration codes are sent to account 2	Send Restores or No Restores Default: Send Restores
Retry Count 2	Determines how many times the dialer will attempt to call account 1 before indicating a delivery trouble	5 to 10 Default: 5
Retry Time 2	Determines how many seconds the dialer waits between retry attempts	5 to 10 Default: 5

Note: To meet UL 864 9th edition requirements, set Restore Type 2 to Send Restores.

Setting dialer options

Table 17 lists the set of options for the dialer and their default values.

Review Table 17 and change values as required. If you don't need to make any changes, go to "Setting system event transmit options" on page 53.

Table 17: Dialer options

Option	Description	Values
Line 1 Dialing	Determines whether LINE 1 is connected to a touch tone phone system or a rotary dial phone system	Tone or Pulse Default: Pulse
Line 1 Supv Dur [1]	Determines how long the dialer waits before reporting a line cut or ground fault (if selected) on LINE 1	0 to 200 seconds. 0 turns line supervision off. Default: 200 seconds.
Line 2 Dialing	Determines whether LINE 2 is connected to a touch tone phone system or a rotary dial phone system	Tone or Pulse Default: Pulse
Line 2 Supv Dur [1]	Determines how long the dialer waits before reporting a line cut or ground fault (if selected) on LINE 2	0 to 200 seconds. 0 turns line supervision off. Default: 200 seconds.
Blind Call Dial	Determines whether the dialer can dial out without waiting for a dial tone	Yes or No Default: No
Line GF Check [2]	Determines whether LINE 1 and LINE 2 are supervised for ground faults	Yes or No Default: Yes
Tx Test Time	Determines when the dialer transmits a test signal	00:00 (midnight) to 23:59 (11:59 p.m.) Default: 2:17 a.m.
Tx Tst Frequency [3]	Determines how often the dialer transmits a test signal	00 to 45 days Default: 01 (daily)
Rings to Answer	Determines how many rings it takes before the dialer answers	01 to 15 Default: 05
Ring Type	Determines the ring pattern that the dialer recognizes	Any or Normal (2 seconds on, 4 seconds off) Default: Any
Callback Enable	Determines whether the callback security feature is enabled	Yes or No Default: No
Callback #	The telephone number that the dialer dials out when the callback security feature is enabled	0 to 9, A, B, asterisk (*), pound sign (#), and comma (,) up to 20 characters Default: Blank

Table 17: Dialer options

Option	Description	Values

Notes

[1] To meet UL 864 9th edition requirements, set Line 1 Supv Dur and Line 2 Supv Dur to a value between 1 and 200.

[2] To meet UL 864 9th edition requirements, set Line GF Check to Yes.

[3] To meet UL 864 9th edition requirements, set Tx Tst Frequency to 01.

Setting system event transmit options

Table 18 lists the set of system event transmit options and their default values.

Review Table 18 and change values as required. If you don't need to make any changes, go to "Setting IDC event transmit options" on page 55.

Table 18: System event transmit options

Option	Description	Values
CS Test Rcvr	Determines where the dialer transmits a test signal when the control panel is in the normal state	CS 1, CS 2, CS 1 & 2, or None Default: CS 1
CS AB Tst Rcvr	Determines where the dialer transmits a test signal when the control panel is in an abnormal state	CS 1, CS 2, CS 1 & 2, or None Default: CS 1
Walk Tst Rcvr	Determines where the dialer transmits an event code when the control panel is placed in walk test mode	CS 1, CS 2, CS 1 & 2, or None Default: CS 1
Drill Rcvr	Determines where the dialer transmits an event code when notification appliance circuits are manually activated	CS 1, CS 2, CS 1 & 2, or None Default: None
Reset Rcvr	Determines where the dialer transmits an event code when the control panel is reset	CS 1, CS 2, CS 1 & 2, or None Default: CS 1
Prog Mode Rcvr	Determines where the dialer transmits an event code when the control panel is placed in program mode	CS 1, CS 2, CS 1 & 2, or None Default: CS 1
Dialer Dis Rcvr	Determines where the dialer transmits an event code when the dialer is disabled	CS 1, CS 2, CS 1 & 2, or None Default: CS 1
Panel Sil Rcvr	Determines where the dialer transmits an event code when the control panel is silenced	CS 1, CS 2, CS 1 & 2, or None Default: None
Signal Sil Rcvr	Determines where the dialer transmits an event code when notification appliance circuits are automatically or manually silenced	CS 1, CS 2, CS 1 & 2, or None Default: None
Gnd Flt Rcvr	Determines where the dialer transmits an event code when the control panel detects an earth ground connection	CS 1, CS 2, CS 1 & 2, or None Default: CS 1
Low Batt Rcvr	Determines where the dialer transmits an event code when the battery voltage is between 19.4 and 21.4 VDC	CS 1, CS 2, CS 1 & 2, or None Default: CS 1
Mis Batt Rcvr	Determines where the dialer transmits an event code when the battery voltage is below 19.4 VDC or the batteries are not connected	CS 1, CS 2, CS 1 & 2, or None Default: CS 1
Int Comm Tr Rcvr	Determines where the dialer transmits an event code when the control panel and the dialer are not communicating	CS 1, CS 2, CS 1 & 2, or None Default: CS 1

Table 18: System event transmit options

Option	Description	Values
AC Fail Rcvr	Determines where the dialer transmits an event code when the control panel or a remote auxiliary/booster supply has been without AC power for longer than the control panel's AC fail delay setting (typically 3 hours)	CS 1, CS 2, CS 1 & 2, or None Default: CS 1
Charger Tr Rcvr	Determines where the dialer transmits an event code when the battery charger circuit can't adequately charge the batteries	CS 1, CS 2, CS 1 & 2, or None Default: CS 1
Xfrmr 2 Tr Rcvr	Determines where the dialer transmits an event code when the expander transformer in a ten-zone panel is bad or missing	CS 1, CS 2, CS 1 & 2, or None Default: CS 1
Aux Pwr Tr Rcvr	Determines where the dialer transmits an event code when the smoke/accessory power wiring is shorted	CS 1, CS 2, CS 1 & 2, or None Default: CS 1
Periph Trb Rcvr	Determines where the dialer transmits an event code when the control panel and one or more remote modules are not communicating	CS 1, CS 2, CS 1 & 2, or None Default: CS 1
Line 1 Trb Rcvr	Determines where the dialer transmits an event code when the dialer detects a line cut or ground fault on LINE 1	CS 1, CS 2, CS 1 & 2, or None Default: CS 1
Line 2 Trb Rcvr	Determines where the dialer transmits an event code when the dialer detects a line cut or ground fault on LINE 2	CS 1, CS 2, CS 1 & 2, or None Default: CS 1
Delivery Tr Rcvr	Determines where the dialer transmits an event code when the dialer transmits a signal to an account and the account doesn't answer	CS 1, CS 2, CS 1 & 2, or None Default: CS 1

Setting IDC event transmit options

Table 19 lists the set of IDC event transmit options and their default values.

Review Table 19 and make changes as required. If you don't need to make any changes, go to "Setting NAC event transmit options" on page 56.

Table 19: IDC event transmit options

Option	Description	Values
Alarm Zone	Determines where the dialer transmits an event code when the IDC is activated and the IDC is an alarm-verified or alarm-unverified zone type	CS 1, CS 2, CS 1 & 2, or None Default: CS 1 for all IDCs
Water Zone	Determines where the dialer transmits an event code when the IDC is activated by a waterflow switch and the IDC is a waterflow, waterflow-retard, waterflow/ supervisory, or waterflow-retard/supervisory zone type	CS 1, CS 2, CS 1 & 2, or None Default: CS 1 for all IDCs
Troub Zone	Determines where the dialer transmits an event code when the IDC wiring is open or the IDC is disabled	CS 1, CS 2, CS 1 & 2, or None Default: CS 1 for all IDCs
Super Zone	Determines where the dialer transmits an event code when the IDC is activated by a supervisory device and the IDC is a supervisory, waterflow/ supervisory, or waterflow-retard/supervisory zone type	CS 1, CS 2, CS 1 & 2, or None Default: CS 1 for all IDCs
Monitor Zone	Determines where the dialer transmits an event code when the IDC is activated and the IDC is the monitor zone type	CS 1, CS 2, CS 1 & 2, or None Default: CS 1 for all IDCs

Setting NAC event transmit options

Table 20 lists the set of NAC event transmit options and their default values.

Review Table 20 and make changes as required. If you don't need to make any changes, go to "Setting system 4/2 event activation code options" on page 57.

Table 20: NAC event transmit options

Option	Description	Values
Trouble NAC	Determines where the dialer transmits an event code when the NAC wiring is open or shorted or when the NAC is disabled	CS 1, CS 2, CS 1 & 2, or None Default: CS 1 for all NACs

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Setting system 4/2 event activation code options

Table 21 lists the set of system 4/2 event activation code options and their default values.

Review Table 21 and make changes as required. If you don't need to make any changes, go to "Setting IDC 4/2 event activation code options" on page 59.

Table 21: System 4/2 event activation code options

Option	Description	Values
Int Comm TR CODE	Determines the 4/2 code that the dialer transmits when the control panel and the dialer are not communicating	0 to 9, and A to F Default: AA
CS AB Test CODE	Determines the 4/2 code that the dialer transmits as the test signal when the control panel is in an abnormal state	0 to 9, and A to F Default: 6F
Periph Trb CODE	Determines the 4/2 code that the dialer transmits when the control panel and one or more remote modules are not communicating	0 to 9, and A to F Default: 6D
Low Batt CODE	Determines the 4/2 code that the dialer transmits when the battery voltage is between 19.4 and 21.4 VDC	0 to 9, and A to F Default: 6C
Mis Batt CODE	Determines the 4/2 code that the dialer transmits when the battery voltage is below 19.4 VDC or the batteries are not connected	0 to 9, and A to F Default: 6C
AC Fail CODE	Determines the 4/2 code that the dialer transmits when the control panel or a remote auxiliary/booster supply has been without AC power for longer than the control panel's AC fail delay setting	0 to 9, and A to F Default: 69
Charger CODE	Determines the 4/2 code that the dialer transmits when the battery charger circuit can't adequately charge the batteries	0 to 9, and A to F Default: 6B
Gnd Flt CODE	Determines the 4/2 code that the dialer transmits when the control panel detects an earth ground connection	0 to 9, and A to F Default: 66
XFMR Tr CODE	Determines the 4/2 code that the dialer transmits when the expander transformer in a ten-zone panel is bad or missing	0 to 9, and A to F Default: 6A
Aux Trb CODE	Determines the 4/2 code that the dialer transmits when the smoke/accessory power wiring is shorted	0 to 9, and A to F Default: 65
Wlk Tst CODE	Determines the 4/2 code that the dialer transmits when the control panel is placed in walk test mode	0 to 9, and A to F Default: AF

Table 21: System 4/2 event activation code options

Option	Description	Values
Drill CODE	Determines the 4/2 code that the dialer transmits when notification appliance circuits are manually activated	0 to 9, and A to F Default: AD
Signal Sil CODE	Determines the 4/2 code that the dialer transmits when notification appliance circuits are automatically or manually silenced	0 to 9, and A to F Default: AC
Panel Sil CODE	Determines the 4/2 code that the dialer transmits when the control panel is silenced	0 to 9, and A to F Default: CA
Line 1 Trb CODE	Determines the 4/2 code that the dialer transmits when the dialer detects a line cut or ground fault on LINE 1	0 to 9, and A to F Default: 68
Line 2 Trb CODE	Determines the 4/2 code that the dialer transmits when the dialer detects a line cut or ground fault on LINE 2	0 to 9, and A to F Default: 6E
Program CODE	Determines the 4/2 code that the dialer transmits when the control panel is placed in program mode	0 to 9, and A to F Default: C1
Delivery Trb CDE	Determines the 4/2 code that the dialer transmits when the dialer transmits a signal to an account and the account doesn't answer	0 to 9, and A to F Default: 67
Disable CODE	Determines the 4/2 code that the dialer transmits when the dialer is disabled	0 to 9, and A to F Default: AE
CS Test CODE	Determines the 4/2 code that the dialer transmits as the test signal when the control panel is in the normal state	0 to 9, and A to F Default: DF
Reset CODE	Determines the 4/2 code that the dialer transmits when the control panel is reset	0 to 9, and A to F Default: AB

Setting IDC 4/2 event activation code options

Table 22 lists the set of IDC 4/2 event activation code options and their default values.

Review Table 22 and make changes as required. If you don't need to make any changes, go to "Setting NAC 4/2 event activation code options" on page 60.

Table 22: IDC 4/2 event activation code options

Option	Description	Values
IDC Alm CDE	Determines the 4/2 code that the dialer transmits when the IDC is activated and the IDC is an alarm-verified or alarm-unverified zone type	0 to 9, and A to F Default: 1<n> where n is the 1 to 9 (IDC 1 to 9), and A (IDC 10)
IDC WF CDE	Determines the 4/2 code that the dialer transmits when the IDC is activated by a waterflow switch and the IDC is a waterflow, waterflow-retard, waterflow/ supervisory, or waterflow-retard/supervisory zone type	0 to 9, and A to F Default: 2<n> where n is the 1 to 9 (IDC 1 to 9), and A (IDC 10)
IDC Trb CDE	Determines the 4/2 code that the dialer transmits when the IDC wiring is open	0 to 9, and A to F Default: 7<n> where n is the 1 to 9 (IDC 1 to 9), and A (IDC 10)
IDC Sup CDE	Determines the 4/2 code that the dialer transmits when the IDC is activated by a supervisory device and the IDC is a supervisory, waterflow/ supervisory, or waterflow-retard/supervisory zone type	0 to 9, and A to F Default: 3<n> where n is the 1 to 9 (IDC 1 to 9), and A (IDC 10)
IDC Mon CDE	Determines the 4/2 code that the dialer transmits when the IDC is activated and the IDC is monitor zone type	0 to 9, and A to F Default: 3<n> where n is the 1 to 9 (IDC 1 to 9), and A (IDC 10)

Setting NAC 4/2 event activation code options

Table 23 lists the set of NAC 4/2 event activation code options and their default values.

Review Table 23 and make changes as required.

Table 23: NAC 4/2 event activation codes

Option	Description	Values
NAC Trb CDE	Determines the 4/2 code that the dialer transmits when the NAC wiring is open or shorted	0 to 9, and A to F Default: 6<n> where n is the 1 to 4 (NAC 1 to 4)

Restoring dialer default settings

Dialers are shipped from the factory with default settings for a typical system. You can restore the default settings at any time.

To restore dialer default settings:

1. Press Reset and select Yes.

2. Press Panel Silence to save and advance to the next program option.

   The trouble buzzer sounds a long beep as confirmation.

Chapter 5
Maintenance

Summary

This chapter provides instructions for maintaining the control panel, performing walk tests, and clearing trouble messages. It is intended for those trained and authorized to maintain the fire alarm system.

Content

Preventive maintenance

Before commencing testing, notify all areas where the alarm sounds and off-premises locations that receive alarm and trouble transmissions that testing is in progress.

Records of all testing and maintenance must be kept as required by the authority having jurisdiction.

Required tools:

- Slotted screwdriver, insulated
- Digital multimeter
- 1.1 kΩ, 1 W resistor
- 12 in (30.5 cm) jumper lead with alligator clips
- Panel door key
- Sound-level meter

A complete check of installed field wiring and devices should be made at regular intervals in accordance with NFPA 72, Canadian Electrical Code Part I, ULC S524, and ULC S536 requirements. This includes testing all alarm and supervisory initiating devices and circuits and any off-premises connections.

Panel operation should be verified in the alarm, supervisory, and trouble modes.

To ensure that the panel can operate correctly when primary power is lost, the batteries should be inspected and tested periodically. Batteries should be replaced (at a minimum) every four years.

Preventive maintenance schedule

Refer to NFPA 72, Canadian Electrical Code Part I, ULC S524, or ULC S536 for more information on required inspection and testing methods and frequency of fire alarm systems and devices. For detector sensitivity and functionality testing, refer to the detector manufacturer's installation instructions.

Canadian tests for grounds, opens, and shorts

ULC requires that you test ground fault, open circuit, and short circuit indications.

For ground fault tests, short one leg of the circuit to chassis ground and verify that the system Ground Fault LED and Trouble LEDs turn on.

For NAC and IDC open circuit tests, remove the end-of-line resistor from the last device on the circuit and verify that the system Trouble LED and the circuit's trouble (TBL) LED turn on.

For NAC short circuit testing, place a short across the NAC output terminals and verify that the system Trouble LED and the circuit's trouble (TBL) LED turn on.

For AUX power short circuit testing, place a short across the AUX power output's plus (+) and minus (–) terminals and verify that the system Trouble LED turns on.

For communications testing, place a short across C+ and C– and verify that the system Trouble LED and Annun Trouble LED turn on.

Caution: Do not place the short across the 24VAC IN terminals.

Performing a walk test

A walk test lets you test initiating device circuits (IDCs) without having to create an actual alarm condition. IDCs should be placed in walk test one at a time. This allows the rest of the system to remain in service. Walk test will not operate with an active alarm or supervisory event at the panel.

You can conduct a walk test in silent or audible mode. In silent mode, the audible devices (NACs) do not sound. In audible mode, the NACs sound for a number of times equal to the zone number. Example: three times for IDC 3.

In a walk test, the panel responds to the first signal it receives and ignores all others on that IDC until it clears that signal or the panel is reset. The input must be restored to the normal state before the next input is tested. When the input is restored, the panel automatically resets the circuit being tested. The automatic reset takes eight seconds. After the circuit is reset, the next device can be tested.

WARNING: If you cancel a walk test with a device in the active state, the control panel will activate the programmed responses for that device. Do not cancel a walk test when the Trouble LED for the IDC under test is flashing rapidly.

The panel terminates the walk test if:

- A zone other than the zone being tested is activated

- There are 30 minutes of inactivity on the zone being tested

- The panel is reset

- The Walk Test button is pressed a third time

When you press Walk Test:

- The Walk Test LED turns on or flashes depending if you selected a silent or audible walk test, respectively

- The panel enters the trouble state

- There is no fire protection for the IDC in walk test

  If an unselected IDC goes into alarm or trouble, all outputs operate as programmed.

The IDC you are testing behaves as follows:

- The appropriate panel, FSRSI, and FSRZI-A LEDs and buzzers are turned on.

- In the audible test mode, the notification appliances sound for a number of times equal to the zone number.

- After activation, the panel resets the IDC. During the reset period (approximately eight seconds), the IDC trouble LED flashes rapidly. If the device being tested is not restored, the IDC does not reset and the LED continues to flash. If the device is restored (no alarm is present), the panel is ready to test another device or detector.

- Resettable auxiliary power is deactivated while the zone is reset.

- Input zones programmed as waterflow with retard require 10 to 15 seconds of activation to initiate the test signals.

- For trouble events, the appropriate LEDs and the buzzers are turned on. In the audible (NAC) test mode a one-second pulse sounds on the audible devices. After sounding, the zone resets in preparation for continued testing.

- For ground fault events, the appropriate LEDs and the buzzers are turned on. In the audible (NAC) test mode a one-second pulse sounds on the audible devices. After sounding, the zone resets in preparation for continued testing.

To perform a walk test:

1. Press the Walk Test button once to perform an audible walk test.

   — or —

   Press the Walk Test button twice to perform a silent walk test.

2. Press the Disable button for the IDC you want to test.

3. Conduct your walk test for the IDC.

4. When you are finished testing an IDC, press the Disable button to turn off the walk test for that IDC.

5. Select another IDC to walk test (steps 2 through 4) or exit from the walk test by pressing the Walk Test button.

Performing lamp tests

Panel lamp test

A panel lamp test turns on all the LEDs on the panel and on FSRSI, FSRZI-A, and FSRZI-SA modules so you can verify their proper operation.

To test panel LEDs:

1. Press and hold the Remote Disconnect and Walk Test buttons simultaneously.

2. Verify that all LEDs on the panel turn on.

    If a dialer is installed, the LCD displays:

    ```
    DB#  xx  P:x.yy.zz
             D:x.yy.zz
    ```

    Where:

    DB# is the database revision number

    P:x.yy.zz is the main panel version

    D:x.yy.zz is the F-DACT(F) version

FSRSI, FSRZI-A, and FSRZI-SA lamp test

FSRSI, FSRZI-A, and FSRZI-SA modules can be installed individually or in groups to create a complete remote annunciator. You can perform a local lamp test on the FSRSI, FSRZI-A, and FSRZI-SA. An FSRSI is required to initiate this function.

To test FSRSI and FSRZI-A LEDs:

1. Press and hold the FSRSI Silence button for five seconds.

2. Verify that all LEDs on the FSRSI and FSRZI-A modules turn on.

Trouble messages

Table 24: Possible causes of trouble messages

Message	Possible cause
Peripheral trouble	The panel lost communications with the peripherals.
Battery Bad	The battery is bad and needs to be replaced.
Battery Missing	The battery is no longer connected.
AC Failure	The panel lost AC power.
Charger Trouble	The panel detected a battery charger trouble condition. The charger may not be able to charge the batteries.
Ground Fault	The panel detected a ground fault.
Transformer 2 TR	The panel detected a trouble condition in the Power Expander Transformer.
AUX Power Troub	The panel detected a trouble condition in the AUX power circuit.
Internal Comm TR	There panel lost communications with an F-DACT(F).
RRM(s) disabled	One or more FSRRM24s are disabled.
Dialing...	The F-DACT(F) is dialing a DACR.
DACT Configuration TRBL	The F-DACT(F) is not programmed or has unverified changes.
DACT Delivery TR	The F-DACT(F) failed to deliver a message to the receiver or CMS.
DACT Line 1 Trbl	A ground fault or line fault has been detected on Line 1 of the F-DACT(F).
DACT Line 2 Trbl	A ground fault or line fault has been detected on Line 2 of the F-DACT(F).

Note: If the Disabled and Annunc Trouble LEDs are on, and all IDC and NAC Disabled LEDs are off, then the FSRRM24 is disabled.

Replacing the control panel fuse

The control panel is protected with a 5 A fuse. The fuse is part of the AC terminal block located inside the control panel.

To replace the fuse:

1. Disconnect the standby batteries, then switch off the circuit breaker that supplies mains AC power to the control panel.

2. Open the cabinet door, then remove the terminal block cover from its slot to expose the AC terminal block.

3. Unplug the fuse holder and replace the existing fuse with a new fuse of the same type and size.

4. Plug the fuse holder into the AC terminal block and insert the terminal block cover into its slot.

5. Switch on the circuit breaker that supplies mains AC power to the control panel then connect the standby batteries.

WARNING: High voltage capable of causing personal injury or death may be present. Make sure all sources of power are removed from the panel before replacing the fuse.

Replacement parts

Figure 9: Exploded view, showing the replacement parts available
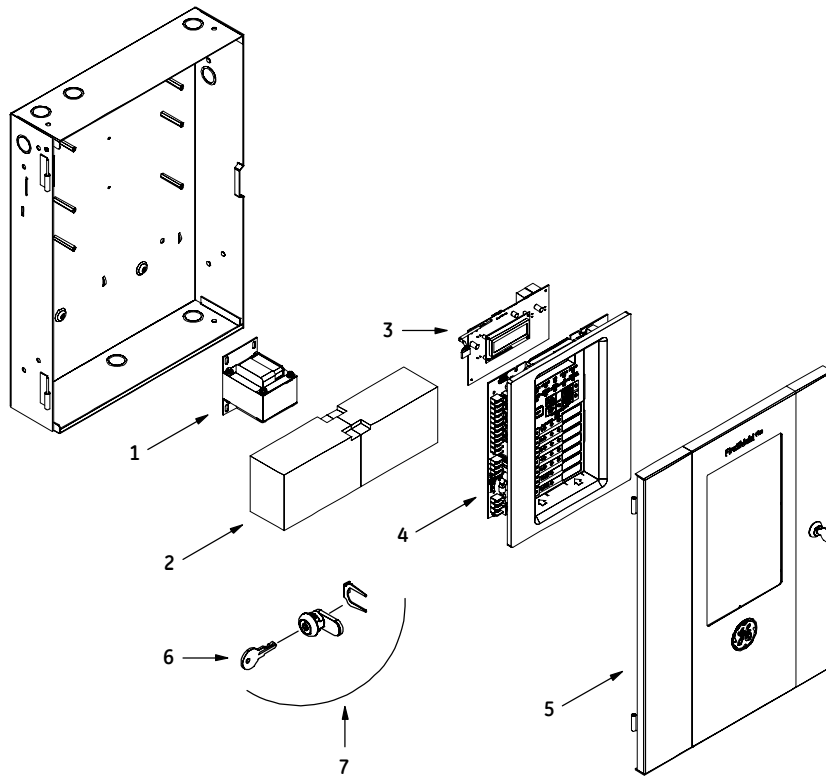
Table 25: Replacement parts

Item	Part number	Description
1	F-TRANS-120	Primary transformer, 120 V
	F-TRANS-230	Primary transformer, 230 V
2	12V4A	Standby battery, 12 V, 4 Ah
	12V6A5	Standby battery, 12 V, 6.5 Ah
	12V10A	Standby battery, 12 V, 10 Ah (may require BC-3 to install)
	12V17A	Standby battery, 12 V, 17 Ah (requires BC-3 to install)
	12V24A	Standby battery, 12 V, 24 Ah (requires BC-3 to install)
3	F-DACT(F)	Dialer/modem/LCD text display, English (French)
4	F-3ELEC(-F)	Main circuit board for three-zone control panels, English (French)
	F-5ELEC(-F)	Main circuit board for five-zone control panels, English (French)
	F-10ELEC(-F)	Main circuit board for ten-zone control panels, English (French)
5	FS-35D(G/R)	Door for three- and five-zone control panels, gray or red
	FS-10D(G/R)	Door for ten-zone control panels, gray or red

Table 25: Replacement parts

Item	Part number	Description
6	P-037449	CAT 45 key
7	PP46166-0144	Lock assembly and CAT 45 key

Appendix A
System calculations

Summary

This appendix provides worksheets for sizing standby batteries and for calculating the maximum wire lengths of notification appliance circuits (NACs).

Content

Battery calculation worksheet

Use this worksheet to determine the minimum size required for the panel's standby batteries. Obtain operating current requirements for initiating devices and notification appliances from their respective installation sheets.

Battery calculation worksheet

	Standby Current (mA)		Alarm Current (mA)	
Base panel [1]				
F-DACT(F) (optional)		(65 mA)		(107 mA)
AUX current (see Form A)				
IDC detector current [3]				
NAC 1 load	0			
NAC 2 load	0			
NAC 3 load	0			
NAC 4 load	0			
Total current [6]				

Required standby and alarm time (in hours)   × ☐ Standby time [4]   × ☐ Alarm time [5]

☐ mAh + ☐ mAh = ☐ mAh

÷ 1000

Battery amp hour total = ☐ Ah

× 1.2

Minimum battery size [2] ☐ **Ah**

Notes

[1] The base panel standby and alarm currents consist of the main controller board with no load other than the end-of-line resistors. In addition, the base panel alarm current includes the IDC alarm current. Use these values for base panel standby and alarm currents:

Control panel	Standby	Alarm
Three-zone	96 mA	180 mA
Five-zone	104 mA	224 mA
Ten-zone	128 mA	242 mA

[2] The maximum battery size that the panel can charge is 24 Ah (model 12V24A or equivalent).

Battery space inside the control panel is limited. See Appendix D "Panel specifications" on page 117 for more information.

[3] The IDC detector alarm current is included in the base panel alarm current. For IDC detector standby current, enter the calculated total IDC standby current from Form B or use these values:

Control panel	Total IDC standby current
Three-zone	9 mA
Five-zone	15 mA
Ten-zone	30 mA

[4] Standby time value: 24 or 60 hours.

[5] Alarm time values:

5 min = 0.083 hr
10 min = 0.167 hr
15 min = 0.250 hr
30 min = 0.500 hr

[6] Total standby current may not exceed 635 mA.

Form A

Module	Quantity	Standby current (mA)	Qty X Standby current (mA)	Alarm current (mA)	Qty X Alarm current (mA)
FSRSI		17		56	
FSRZI-A or FSRZI-SA		8		76	
FSRRM24 (common)		26		70	
FSRRM24 (zone)		10		70	
FSUIM		53		114	
FSRA10(F)/FSRA10C(F)		17		98	
Other AUX					
Total AUX [2]					

Notes

1. The maximum number of remote modules that you can install varies with the control panel model.

[2] If Total AUX exceeds 500 mA, use an auxiliary/booster supply to share some of the load. See "Connecting an auxiliary/booster power supply" on page 23.

Form B

IDC	Quantity of detectors [1]	Detector current (mA) [2]	Standby current per circuit (Quantity x Detector current)
IDC 1			
IDC 2			
IDC 3			
IDC 4			
IDC 5			
IDC 6			
IDC 7			
IDC 8			
IDC 9			
IDC 10			
Total IDC standby current =			

Notes

[1] See compatibility list P/N 3101019 for a list of approved detector models and quantities.

[2] Maximum current per IDC may not exceed 3.0 mA.

Notification appliance voltage drop calculation

NAC 1 voltage drop calculations

Circuit length		Total current [1]		Wire resistance per 1000 ft [2]			Voltage drop
_____ ft	×	_____ A	×	_____ Ω	÷ 1000 =		_____ V

Panel voltage [3]		Voltage drop		End of line voltage [4]	Voltage drop		Panel voltage [4]		% of voltage drop
_____ V	−	_____ V	=	_____ V	_____ V	÷	_____ V	=	_____

NAC 2 voltage drop calculations

Circuit length		Total current [1]		Wire resistance per 1000 ft [2]			Voltage drop
_____ ft	×	_____ A	×	_____ Ω	÷ 1000 =		_____ V

Panel voltage [3]		Voltage drop		End of line voltage [4]	Voltage drop		Panel voltage [4]		% of voltage drop
_____ V	−	_____ V	=	_____ V	_____ V	÷	_____ V	=	_____

NAC 3 voltage drop calculations

Circuit length		Total current [1]		Wire resistance per 1000 ft [2]			Voltage drop
_____ ft	×	_____ A	×	_____ Ω	÷ 1000 =		_____ V

Panel voltage [3]		Voltage drop		End of line voltage [4]	Voltage drop		Panel voltage [4]		% of voltage drop
_____ V	−	_____ V	=	_____ V	_____ V	÷	_____ V	=	_____

NAC 4 voltage drop calculations

Circuit length		Total current [1]		Wire resistance per 1000 ft [2]			Voltage drop
_____ ft	×	_____ A	×	_____ Ω	÷ 1000 =		_____ V

Panel voltage [3]		Voltage drop		End of line voltage [4]	Voltage drop		Panel voltage [4]		% of voltage drop
_____ V	−	_____ V	=	_____ V	_____ V	÷	_____ V	=	_____

Notes

[1]   Use the operating current ratings found on the installation or
       catalog sheet of each device.

[2]   Use 3.5 Ω for 12 AWG and 2.5 sq mm wire, 5.2 Ω for 14 AWG
       and 1.5 sq mm wire, 8.0 Ω for 16 AWG and 1.0 sq mm wire, and
       13.0 Ω for 18 AWG and 0.75 sq mm wire.

[3]   Use 19.5 V for three-zone panels, 19.5 V for five-zone panels,
       and 19.4 V for ten-zone panels.

[4]   This voltage cannot drop below 16 VDC.

Notification appliance circuit calculations

Introduction

This topic shows you how to determine the maximum cable length of a notification appliance circuit (NAC) for a given number of appliances.

Two methods are presented: worksheet and equation. The worksheet method is simpler, but your installation must meet the criteria listed on the worksheet. If your installation does not meet these criteria, you need to use the equation method.

The methods given here determine cable lengths that work under all operating conditions. The calculations ensure that the required operating voltage and current will be supplied to all notification appliances. To do this, we assume these two worst-case conditions:

- The voltage at the NAC terminals is the minimum provided by the power supply.

- The notification appliances are clustered at the end of the NAC cable.

Other, more detailed methods that distribute the appliance load along the NAC cable may indicate longer cable runs.

What you'll need

Appliance and cable values

Whether you use the worksheet method or the equation method, you'll need to know:

- The minimum operating voltage required for the appliances

- The maximum operating current drawn by each appliance

- The resistance per unit length of the wire used (Ω/ft)

This information can be found on the appliance installation sheets and on the cable specification sheet.

Power supply values

For either method, you'll need some fixed or calculated operating values for your specific power supply. The fixed values are:

- Source voltage = 20.4 V

- Load factor = 0.25 A/V for three-zone panels, 0.40A/V for five-zone panels, and 0.20 A/V for ten-zone panels

- Power type = FWR

The *source voltage* is the theoretical operating minimum for the power supply, and is calculated as 85% of 24 volts.

The *load factor* is a measure of how the power supply voltage reacts when a load is applied. The load factor measures the voltage drop per ampere of current drawn by the load.

The *power type* reflects the type of power supplied to the NAC terminals at minimum voltage. The current draw of notification appliances can vary substantially with the type of power supplied: full-wave rectified (VFWR) or direct current (VDC). It is important to know the power type at minimum terminal voltage.

You'll need to calculate the following values relating to your power supply and to the NAC circuit current. These are:

- Minimum voltage

- Voltage drop

The *minimum voltage* is the lowest voltage measured at the NAC terminals when the power supply is under the maximum load for that circuit (i.e. for the appliances that constitute the NAC).

The *voltage drop* is the difference between the minimum voltage and 16 V. This value is for use with the worksheet only.

Worksheet method

Use this worksheet to determine the maximum cable length of a notification appliance circuit for a given number of appliances.

Use this worksheet only if all the appliances are regulated. That is, they must have a minimum operating voltage of 16 V. For other appliances, use the "Equation method."

Worksheet 1: NAC cable length

		NAC1	NAC2	NAC3	NAC4	
Total operating current [1]						A
Load factor	×					V/A
Load voltage drop	=					V
Source voltage		20.4	20.4	20.4	20.4	V
Load voltage drop	−					V
Minimum voltage	=					V
Regulated appliance voltage	−	16.0	16.0	16.0	16.0	V
Voltage drop [2]	=					V
Total operating current	÷					A
Maximum resistance	=					Ω
Wire resistance (Ω/ft) [3]	÷					
Maximum wire length	=					ft
	÷	2	2	2	2	
Maximum cable length	=					ft

[1] Total of the maximum operating currents for all appliances as specified for FWR power. See the appliance installation sheets for operating currents.

[2] This voltage drop is valid for regulated notification appliances only. For unregulated appliances, see "Equation method," later in this topic.

[3] Use the manufacturer's published wire resistance expressed in ohms per foot. For typical values, see Table 26, later in this topic.

Equation method

Appliance operating voltage and current

Regulated notification appliances have an operating range from 16 V to 33 V. Use 16 V as the minimum appliance voltage when using regulated notification appliances.

When using unregulated notification appliances, refer to the installation sheets to determine the minimum appliance voltage required.

What if there are different types of appliances in the NAC, and each type has a different minimum operating voltage? In this case, use the highest minimum voltage required by any appliance.

The total current requirement for the appliances will be the sum of the individual maximum currents drawn by each appliance when using FWR power. Use the maximum current for the appliance over the 16 V to 33 V range.

If all appliances draw the same maximum current, the total current is the maximum current multiplied by the number of appliances. If different appliance types have different maximum currents, the total current is the sum of the maximum current for each appliance type multiplied by the number appliances of that type.

Wire resistance

Typical wire resistances are shown in the following table.

Table 26: Typical wire resistances

Wire gauge (AWG)	Resistance 1 strand uncoated copper		Resistance 7 strand uncoated copper	
	Ω per foot	Ω per meter	Ω per foot	Ω per meter
12	0.00193	0.00633	0.00198	0.00649
14	0.00307	0.01007	0.00314	0.01030
16	0.00489	0.01604	0.00499	0.01637
18	0.00777	0.02549	0.00795	0.02608

When performing these calculations, always refer to the actual cable supplier documentation and use the actual Ω/ft (or Ω/m) for the cable being used.

Calculating cable length

To calculate the maximum NAC cable length:

1. Calculate the total current (Itot) as the sum of the maximum operating currents for all the appliances.

Itot = ΣIa

Where:
Ia = appliance maximum current

See the appliance installation sheets for Ia. Remember to use the maximum operating current specified for FWR power.

2. Calculate the minimum voltage (Vm).

Vm = Vr – (Itot × K)

Where:
Vs = source voltage
Itot = total current (from above)
K = load factor

For the power supply, Vs is 20.4 V and K is 0.25 A/V for three-zone panels, 0.40A/V for five-zone panels, and 0.20 A/V for ten-zone panels

3. Calculate the allowable voltage drop (Vd) between the power supply and the appliances.

Vd = Vm – Va

Where:
Vm = minimum voltage (from above)
Va = appliance minimum voltage

For regulated notification appliances, Va is 16 V. For unregulated notification appliances, Va is the lowest operating voltage specified on the appliance installation sheet.

4. Calculate the maximum resistance (Rmax) the wire can have.

Rmax = Vd / Itot

Where:
Vd = voltage drop
Itot = total current

5. Calculate the maximum length of the cable (Lc), based on the maximum resistance allowed, the resistance of the wire, and the number of wires in the cable (two).

Lc = (Rmax / Rw) / 2

Where:
Rmax = maximum resistance
Rw = wire resistance factor

Example: You're using regulated notification appliances with a ten-zone control panel. Assume that the maximum operating current for each appliance is 100 mA for FWR power, and that 20 appliances will be placed on the NAC. The cable is 12 AWG wire, and the manufacturer specifies a wire resistance factor of 0.002 Ω/ft.

Itot = ΣIa
    = 20 × 0.1 A
    = 2 A

Vm = Vr − (Itot × K)
  = 20.4 V − (2 A × 0.20 V/A)
  = 20.4 V − 0.4 V
  = 20.0 V

Vd = Vm − Va
  = 20.0 V − 16.0 V
  = 4.0 V

Rmax = Vd / Itot
  = 4.0 V / 2.0 A
  = 2.0 Ω

Lc = (Rmax / Rw) / 2
  = (2.0 Ω / 0.002 Ω/ft) / 2
  = 1000 ft / 2
  = 500 ft

So the maximum wire run for this NAC would be 500 ft (rounding down for safety).

Appendix B
Programming templates

Summary

This appendix provides worksheets to help you program the control panel using the panel's keypad.

Content

Panel programming worksheet

Project:	**Address:**			
Programmer:	**Date:**	**Tested by:**		**Date:**

Edit passcode _____ (default: 1111)

Enable passcode
☐ No (default)
☐ Yes

Operating mode:
☐ FACP (default)
☐ FACOM
☐ Sprinkler supervisory

Signal silence/reset inhibit:
☐ None (default)
☐ 1 minute

AC fail delay: _____ (0 to 15 hours, default: 1 hour)

Waterflow-retard/delay: _____ (0 to 150 seconds in 5-second increments, default: 5 seconds)

Automatic signal silence: _____ (0 to 30 minutes, default: 0 minutes)

Disable lockout:
☐ None (default)
☐ All
☐ IDC/NAC
☐ Remote disconnect

RRM multi mode:
☐ Common alarm (default)
☐ Matrix

IDC programming worksheet

Project:		Address:							
Programmer:		Date:		Tested by:			Date:		

Zone type	IDC 1	IDC 2	IDC 3	IDC 4	IDC 5	IDC 6	IDC 7	IDC 8	IDC 9	IDC 10
Alarm-unverified (default)	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐
Alarm-verified	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐
Waterflow	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐
Waterflow-retard	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐
Waterflow/supervisory	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐
Waterflow-retard/supervisory	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐
Supervisory	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐
Monitor	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐
Remote signal silence/drill	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐
Remote AC fail	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐
Cross zone	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐

NAC assignments	IDC 1	IDC 2	IDC 3	IDC 4	IDC 5	IDC 6	IDC 7	IDC 8	IDC 9	IDC 10
NAC 1 (default)	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐
NAC 2 (default)	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐
NAC 3 (default)	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐
NAC 4 (default)	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐

Class	IDC 1	IDC 2	IDC 3	IDC 4	IDC 5	IDC 6	IDC 7	IDC 8	IDC 9	IDC 10
Class B (default)	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐
Class A	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐

Non-latching	IDC 1	IDC 2	IDC 3	IDC 4	IDC 5	IDC 6	IDC 7	IDC 8	IDC 9	IDC 10
No	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐
Yes	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐

Service check	IDC 1	IDC 2	IDC 3	IDC 4	IDC 5	IDC 6	IDC 7	IDC 8	IDC 9	IDC 10
No (default)	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐
Yes	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐

RRM relay assignment	IDC 1	IDC 2	IDC 3	IDC 4	IDC 5	IDC 6	IDC 7	IDC 8	IDC 9	IDC 10
Relay 1	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐
Relay 2	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐
Relay 3	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐
Relay 4	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐
Relay 5	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐

Zone code	IDC 1	IDC 2	IDC 3	IDC 4	IDC 5	IDC 6	IDC 7	IDC 8	IDC 9	IDC 10
Digit 1										
Digit 2										
Digit 3										
Digit 4										

NAC programming worksheet

Project:		Address:		
Programmer:	Date:		Tested by:	Date:

NAC types	NAC 1	NAC 2	NAC 3	NAC 4
Continuous	☐	☐	☐	☐
Temporal (3-3-3)	☐	☐	☐	☐
Genesis (default)	☐	☐	☐	☐
Genesis (AV Sil)	☐	☐	☐	☐
Coder	☐	☐	☐	☐
City tie	☐	☐	☐	☐

Class	NAC 1	NAC 2	NAC 3	NAC 4
Class B (default)	☐	☐	☐	☐
Class A	☐	☐	☐	☐

Silenceable	NAC 1	NAC 2	NAC 3	NAC 4
No	☐	☐	☐	☐
Yes (default)	☐	☐	☐	☐

Dialer programming worksheet

Project:		Address:		
Programmer:	**Date:**	**Tested by:**		**Date:**

Daylight saving time

DST adjustment: _____ (0 to 255 minutes, default: 60)

DST start month: _____ (01 to 12, default: 04)

DST start week:
☐ 1st (default)   ☐ 4th
☐ 2nd   ☐ Last
☐ 3rd

DST start day:
☐ Sunday (default) ☐ Thursday
☐ Monday   ☐ Friday
☐ Tuesday   ☐ Saturday
☐ Wednesday

DST start hour: _____ (00 to 23, default: 02)

DST end month: _____ (01 to 12, default: 10)

DST end week:
☐ 1st (default)   ☐ 4th
☐ 2nd   ☐ Last
☐ 3rd

DST end day:
☐ Sunday (default) ☐ Thursday
☐ Monday   ☐ Friday
☐ Tuesday   ☐ Saturday
☐ Wednesday

DST end hour: _____ (00 to 23, default: 02)

Dialer configuration

Operating mode:
☐ Dual line (default)
☐ Modem/LCD only
☐ LCD only
☐ Single line

Line 1 dialing:
☐ Pulse (default)
☐ Tone

Line 1 supervision duration: _____ (00 to 200 seconds, default: 200)

Line 2 dialing:
☐ Pulse (default)
☐ Tone

Line 2 supervision duration: _____ (00 to 200 seconds, default: 200)

Blind call dialing:
☐ No (default)
☐ Yes

Line ground fault check:
☐ No
☐ Yes (default)

Test transmission time: _____ : _____ (00:00 to 23:59, default: 02:17)

Test transmission frequency: _____ (01 to 45 days, default: 01)

Rings to answer: _____ (01 to 15 days, default: 05)

Ring type: ☐ Any (default)
☐ Normal

Callback enable: ☐ No (default)
☐ Yes

Callback telephone number: _____ (up to 20 characters, ex: 9,1234567)

Account 1

First telephone number: _____ (up to 20 characters, ex: 9,1234567)

Second telephone number: _____ (up to 20 characters, ex: 9,1234567)

Account code: _____ (4 characters, default: FFFF)

Alarm format: ☐ Contact ID (default)
☐ 4/2

Send restores: ☐ No
☐ Yes (default)

Retry count: _____ (05 to 10 times, default: 05)

Retry time: _____ (05 to 10 seconds, default: 05)

Account 2

First telephone number: _____ (up to 20 characters, ex: 9,1234567)

Second telephone number: _____ (up to 20 characters, ex: 9,1234567)

Account code: _____ (4 characters, default: FFFF)

Alarm format: ☐ Contact ID (default)
☐ 4/2

Send restores: ☐ No
☐ Yes (default)

Retry count: _____ (05 to 10 times, default: 05)

Retry time: _____ (05 to 10 seconds, default: 05)

System events

Event	Account				Contact ID event code	4/2 event act. code	4/2 event rest. code
Test-normal	☐ None	☐ 1	☐ 2	☐ 1 & 2	**(1/3)60200000**	_____ **DF**	**6F**
Test-abnormal	☐ None	☐ 1	❏ 2	☐ 1 & 2	**(1/3)60800000**	_____ **6F**	**DF**
Walk test	☐ None	☐ 1	❏ 2	☐ 1 & 2	**(1/3)60700000**	_____ **AF**	**BF**
Drill	☐ **None**	☐ 1	☐ 2	☐ 1 & 2	**(1/3)60100000**	_____ **AD**	**BD**
Reset	☐ None	☐ 1	☐ 2	☐ 1 & 2	**(1/3)30500000**	_____ **AB**	**BB**
Program mode	☐ None	☐ 1	☐ 2	☐ 1 & 2	**(1/3)62700000**	_____ **C1**	**C2**
Dialer disabled	☐ None	☐ 1	☐ 2	☐ 1 & 2	**(1/3)55100000**	_____ **AE**	**BE**
Panel silence	☐ **None**	☐ 1	☐ 2	☐ 1 & 2	**(1/3)31500000**	_____ **CA**	**CA**
Signal silence	☐ **None**	☐ 1	☐ 2	☐ 1 & 2	**(1/3)32800000**	_____ **AC**	**BC**
Ground fault	☐ None	☐ 1	☐ 2	☐ 1 & 2	**(1/3)31000000**	_____ **66**	**D6**
Low battery	☐ None	☐ 1	☐ 2	☐ 1 & 2	**(1/3)30200000**	_____ **6C**	**DC**
Missing battery	☐ None	☐ 1	☐ 2	☐ 1 & 2	**(1/3)31100000**	_____ **6C**	**DC**
Internal comm. trouble	☐ None	☐ 1	☐ 2	☐ 1 & 2	**(1/3)30800000**	_____ **AA**	**BA**
AC fail	☐ None	☐ 1	☐ 2	☐ 1 & 2	**(1/3)30100000**	_____ **69**	**D9**
Battery charger trouble	☐ None	☐ 1	☐ 2	☐ 1 & 2	**(1/3)30900000**	_____ **6B**	**DB**
Transformer 2 trouble	☐ None	☐ 1	☐ 2	☐ 1 & 2	**(1/3)30100000**	_____ **6A**	**DA**
AUX power trouble	☐ None	☐ 1	☐ 2	☐ 1 & 2	**(1/3)31200000**	_____ **65**	**D5**
Peripheral trouble	☐ None	☐ 1	☐ 2	☐ 1 & 2	**(1/3)33000000**	_____ **6D**	**DD**
Phone line 1 trouble	☐ None	☐ 1	☐ 2	☐ 1 & 2	**(1/3)35100000**	_____ **68**	**D8**
Phone line 2 trouble	☐ None	☐ 1	☐ 2	☐ 1 & 2	**(1/3)35200000**	_____ **6E**	**DE**
Delivery trouble	☐ None	☐ 1	☐ 2	☐ 1 & 2	**(1/3)35400000**	_____ **67**	**D7**

Notes
1. Default values are shown in bold
2. You must use the FSCU to change Contact ID event code and 4/2 event restoration code values
3. The Contact ID event code is preceded with a 1 for event activations and a 3 for event restorations

IDC 1 events

Event	Account				Contact ID event code	4/2 event act. code	4/2 event rest. code
Alarm zone active	☐ None	☐ **1**	☐ 2	☐ 1 & 2	**(1/3)11000001**	_____ **11**	**E1**
Waterflow zone active	☐ None	☐ **1**	☐ 2	☐ 1 & 2	**(1/3)13000001**	_____ **21**	**EA**
Trouble	☐ None	☐ **1**	☐ 2	☐ 1 & 2	**(1/3)37300001**	_____ **71**	**F1**
Supervisory zone active	☐ None	☐ **1**	☐ 2	☐ 1 & 2	**(1/3)20000001**	_____ **31**	**E1**
Monitor zone active	☐ None	☐ **1**	☐ 2	☐ 1 & 2	**(1/3)40000001**	_____ **5A**	**EA**

Notes
1. Default values are shown in bold
2. You must use the FSCU to change Contact ID event code and 4/2 event restoration code values
3. The Contact ID event code is preceded with a 1 for event activations and a 3 for event restorations

IDC 2 events

Event	Account				Contact ID event code	4/2 event act. code	4/2 event rest. code
Alarm zone active	☐ None	☐ **1**	☐ 2	☐ 1 & 2	**(1/3)11000002**	_____ **12**	**E2**
Waterflow zone active	☐ None	☐ **1**	☐ 2	☐ 1 & 2	**(1/3)13000002**	_____ **22**	**E2**
Trouble	☐ None	☐ **1**	☐ 2	☐ 1 & 2	**(1/3)37300002**	_____ **72**	**F2**
Supervisory zone active	☐ None	☐ **1**	☐ 2	☐ 1 & 2	**(1/3)20000002**	_____ **32**	**E2**
Monitor zone active	☐ None	☐ **1**	☐ 2	☐ 1 & 2	**(1/3)40000002**	_____ **52**	**E2**

Notes
1. Default values are shown in bold
2. You must use the FSCU to change Contact ID event code and 4/2 event restoration code values
3. The Contact ID event code is preceded with a 1 for event activations and a 3 for event restorations

IDC 3 events

Event	Account				Contact ID event code	4/2 event act. code	4/2 event rest. code
Alarm zone active	☐ None	☐ **1**	☐ 2	☐ 1 & 2	**(1/3)11000003**	_____ **13**	**E3**
Waterflow zone active	☐ None	☐ **1**	☐ 2	☐ 1 & 2	**(1/3)13000003**	_____ **23**	**E3**
Trouble	☐ None	☐ **1**	☐ 2	☐ 1 & 2	**(1/3)37300003**	_____ **73**	**F3**
Supervisory zone active	☐ None	☐ **1**	☐ 2	☐ 1 & 2	**(1/3)20000003**	_____ **33**	**E3**
Monitor zone active	☐ None	☐ **1**	☐ 2	☐ 1 & 2	**(1/3)40000003**	_____ **53**	**E3**

Notes
1. Default values are shown in bold
2. You must use the FSCU to change Contact ID event code and 4/2 event restoration code values
3. The Contact ID event code is preceded with a 1 for event activations and a 3 for event restorations

IDC 4 events

Event	Account				Contact ID event code	4/2 event act. code	4/2 event rest. code
Alarm zone active	☐ None	☐ **1**	☐ 2	☐ 1 & 2	**(1/3)11000004**	_____ **14**	**E4**
Waterflow zone active	☐ None	☐ **1**	☐ 2	☐ 1 & 2	**(1/3)13000004**	_____ **24**	**E4**
Trouble	☐ None	☐ **1**	☐ 2	☐ 1 & 2	**(1/3)37300004**	_____ **74**	**F4**
Supervisory zone active	☐ None	☐ **1**	☐ 2	☐ 1 & 2	**(1/3)20000004**	_____ **34**	**E4**
Monitor zone active	☐ None	☐ **1**	☐ 2	☐ 1 & 2	**(1/3)40000004**	_____ **54**	**E4**

Notes
1. Default values are shown in bold
2. You must use the FSCU to change Contact ID event code and 4/2 event restoration code values
3. The Contact ID event code is preceded with a 1 for event activations and a 3 for event restorations

IDC 5 events

Event	Account				Contact ID event code	4/2 event act. code	4/2 event rest. code
Alarm zone active	☐ None	☐ **1**	☐ 2	☐ 1 & 2	**(1/3)11000005**	_____ **15**	**E5**
Waterflow zone active	☐ None	☐ **1**	☐ 2	☐ 1 & 2	**(1/3)13000005**	_____ **25**	**E5**
Trouble	☐ None	☐ **1**	☐ 2	☐ 1 & 2	**(1/3)37300005**	_____ **75**	**F5**
Supervisory zone active	☐ None	☐ **1**	☐ 2	☐ 1 & 2	**(1/3)20000005**	_____ **35**	**E5**
Monitor zone active	☐ None	☐ **1**	☐ 2	☐ 1 & 2	**(1/3)40000005**	_____ **55**	**E5**

Notes
1. Default values are shown in bold
2. You must use the FSCU to change Contact ID event code and 4/2 event restoration code values
3. The Contact ID event code is preceded with a 1 for event activations and a 3 for event restorations

IDC 6 events

Event	Account				Contact ID event code	4/2 event act. code	4/2 event rest. code
Alarm zone active	☐ None	☐ **1**	☐ 2	☐ 1 & 2	**(1/3)11000006**	_____ **16**	**E6**
Waterflow zone active	☐ None	☐ **1**	☐ 2	☐ 1 & 2	**(1/3)13000006**	_____ **26**	**E6**
Trouble	☐ None	☐ **1**	☐ 2	☐ 1 & 2	**(1/3)37300006**	_____ **76**	**F6**
Supervisory zone active	☐ None	☐ **1**	☐ 2	☐ 1 & 2	**(1/3)20000006**	_____ **36**	**E6**
Monitor zone active	☐ None	☐ **1**	☐ 2	☐ 1 & 2	**(1/3)40000006**	_____ **56**	**E6**

Notes
1. Default values are shown in bold
2. You must use the FSCU to change Contact ID event code and 4/2 event restoration code values
3. The Contact ID event code is preceded with a 1 for event activations and a 3 for event restorations

IDC 7 events

Event	Account				Contact ID event code	4/2 event act. code	4/2 event rest. code
Alarm zone active	☐ None	☐ **1**	☐ 2	☐ 1 & 2	**(1/3)11000007**	_____ **1A**	**EA**
Waterflow zone active	☐ None	☐ **1**	☐ 2	☐ 1 & 2	**(1/3)13000007**	_____ **2A**	**EA**
Trouble	☐ None	☐ **1**	☐ 2	☐ 1 & 2	**(1/3)37300007**	_____ **7A**	**FA**
Supervisory zone active	☐ None	☐ **1**	☐ 2	☐ 1 & 2	**(1/3)20000007**	_____ **3A**	**EA**
Monitor zone active	☐ None	☐ **1**	☐ 2	☐ 1 & 2	**(1/3)40000007**	_____ **5A**	**EA**

Notes
1. Default values are shown in bold
2. You must use the FSCU to change Contact ID event code and 4/2 event restoration code values
3. The Contact ID event code is preceded with a 1 for event activations and a 3 for event restorations

IDC 8 events

Event	Account				Contact ID event code	4/2 event act. code	4/2 event rest. code
Alarm zone active	☐ None	☐ **1**	☐ 2	☐ 1 & 2	**(1/3)11000008**	_____ **18**	**E8**
Waterflow zone active	☐ None	☐ **1**	☐ 2	☐ 1 & 2	**(1/3)13000008**	_____ **28**	**E8**
Trouble	☐ None	☐ **1**	☐ 2	☐ 1 & 2	**(1/3)37300008**	_____ **78**	**F8**
Supervisory zone active	☐ None	☐ **1**	☐ 2	☐ 1 & 2	**(1/3)20000008**	_____ **38**	**E8**
Monitor zone active	☐ None	☐ **1**	☐ 2	☐ 1 & 2	**(1/3)40000008**	_____ **58**	**E8**

Notes
1. Default values are shown in bold
2. You must use the FSCU to change Contact ID event code and 4/2 event restoration code values
3. The Contact ID event code is preceded with a 1 for event activations and a 3 for event restorations

IDC 9 events

Event	Account				Contact ID event code	4/2 event act. code	4/2 event rest. code
Alarm zone active	☐ None	☐ **1**	☐ 2	☐ 1 & 2	**(1/3)11000009**	_____ **19**	**E9**
Waterflow zone active	☐ None	☐ **1**	☐ 2	☐ 1 & 2	**(1/3)13000009**	_____ **29**	**E9**
Trouble	☐ None	☐ **1**	☐ 2	☐ 1 & 2	**(1/3)37300009**	_____ **79**	**F9**
Supervisory zone active	☐ None	☐ **1**	☐ 2	☐ 1 & 2	**(1/3)20000009**	_____ **39**	**E9**
Monitor zone active	☐ None	☐ **1**	☐ 2	☐ 1 & 2	**(1/3)40000009**	_____ **59**	**E9**

Notes
1. Default values are shown in bold
2. You must use the FSCU to change Contact ID event code and 4/2 event restoration code values
3. The Contact ID event code is preceded with a 1 for event activations and a 3 for event restorations

IDC 10 events

Event	Account				Contact ID event code	4/2 event act. code	4/2 event rest. code
Alarm zone active	☐ None	☐ **1**	☐ 2	☐ 1 & 2	**(1/3)11000010**	_____ **1A**	**EA**
Waterflow zone active	☐ None	☐ **1**	☐ 2	☐ 1 & 2	**(1/3)13000010**	_____ **2A**	**EA**
Trouble	☐ None	☐ **1**	☐ 2	☐ 1 & 2	**(1/3)37300010**	_____ **7A**	**FA**
Supervisory zone active	☐ None	☐ **1**	☐ 2	☐ 1 & 2	**(1/3)20000010**	_____ **3A**	**EA**
Monitor zone active	☐ None	☐ **1**	☐ 2	☐ 1 & 2	**(1/3)40000010**	_____ **5A**	**EA**

Notes
1. Default values are shown in bold
2. You must use the FSCU to change Contact ID event code and 4/2 event restoration code values
3. The Contact ID event code is preceded with a 1 for event activations and a 3 for event restorations

NAC events

Event	Account				Contact ID event code	4/2 event act. code	4/2 event rest. code
NAC 1 trouble	☐ None	☐ **1**	☐ 2	☐ 1 & 2	**(1/3)32000001**	_____ **61**	**D1**
NAC 2 trouble	☐ None	☐ **1**	☐ 2	☐ 1 & 2	**(1/3) 32000002**	_____ **62**	**D2**
NAC 3 trouble	☐ None	☐ **1**	☐ 2	☐ 1 & 2	**(1/3) 32000003**	_____ **63**	**D3**
NAC 4 trouble	☐ None	☐ **1**	☐ 2	☐ 1 & 2	**(1/3) 32000004**	_____ **64**	**D4**

Notes
1. Default values are shown in bold
2. You must use the FSCU to change Contact ID event code and 4/2 event restoration code values
3. The Contact ID event code is preceded with a 1 for event activations and a 3 for event restorations

Appendix C
Wiring diagrams

Summary

This appendix provides typical system wiring diagrams.

Content

Warnings, cautions, and notes

The following warnings, cautions, and notes apply to the wiring diagrams included in this appendix.

Warnings

1. Before connecting mains AC, make sure the circuit supplying primary power is turned off and the conductors are deenergized. High voltages capable of causing personal injury or death may be present.

2. Before connecting standby batteries, make sure the panel is energized. Connecting batteries before applying AC power can cause personal injury.

Cautions

1. The middle terminal of the AC terminal block is connected to the chassis even when the ground wire is removed.

2. Connecting standby batteries with the battery leads reversed can cause equipment damage.

3. For initiating device circuits and notification appliance circuits, break the wire run at each field device to provide proper connection supervision. Do not loop wires under the terminals.

Notes

1. All wiring is power-limited except for mains AC and battery wiring. All wiring is supervised unless noted otherwise.

2. Maintain 1/4-inch spacing between power-limited and nonpower-limited wiring at all times. Keep power-limited wiring in the shaded area and nonpower-limited wiring in the unshaded area as shown in Figure 13.

3. The dialer, if installed, must be the first piece of equipment on the protected premises' telephone network. We recommend that you install a listed surge protector between the dialer and the public switched telephone network as shown in Figure 23.

4. Relay outputs are not supervised and do not provide current limiting. Connect relays only to power-limited sources.

5. If you connect an RPM module that is configured to transmit separate alarm, supervisory, and trouble signals to a control panel that has an F-DACT(F), you can't use the F-DACT(F) as a dialer.

6. If you use a CTM to activate a local energy type master box, wire the CTM to a dedicated notification appliance circuit as

shown in Figure 29. Configure the NAC to provide a nonsilenceable, continuous (steady) output.

7. Wiring between CTM and local energy type master box is supervised for opens and ground faults only.

8. NFPA 72 allows systems that require the operation of two automatic detectors (cross zones) to initiate an alarm response, provided:

   • The systems are not prohibited by the authority having jurisdiction.

   • At least two automatic detectors are in each protected space.

   • The alarm verification feature is not used.

   • You reduce the detector installation spacing to 0.7 times the linear spacing.

9. Panel must be connected to a 15 A branch circuit, max.

10. Installing detectors from different manufacturers on the same initiating device circuit is not allowed.

11. All FSUIM relays are common. FSRRM24 relays can be configured as common, zone, or programmable,

Figure 10: Field wire connections, three-zone control panel
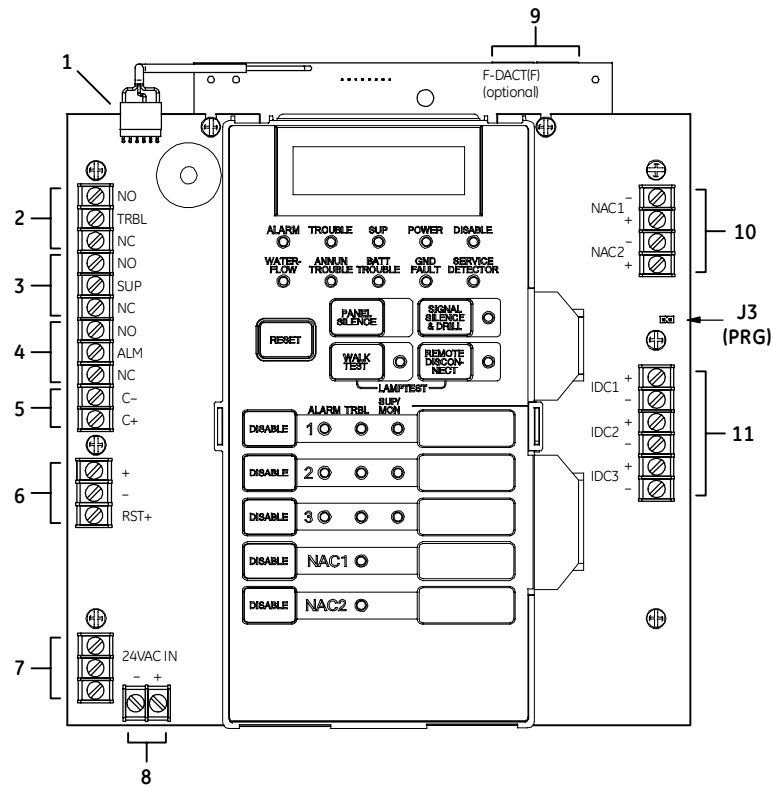
Table 27: Three-zone field wire connections

Item	Description
1	F-DACT(F) connector
2	Common trouble relay
3	Common supervisory relay
4	Common alarm relay
5	Remote module communication bus. See Figure 24 for typical wiring.
6	Smoke/accessory power
7	Mains AC power. For wiring, see Figure 14.
8	Battery power. For wiring, see Figure 14.
9	Telephone line modular jacks. See Figure 23 for typical wiring.
10	Notification appliance circuits. Terminal marking indicates polarity when the NAC is active. See Figure 22 for typical wiring.
11	Initiating device circuits. See Figure 16 for typical wiring.

Note: For specifications, see Table 30 on page 117

Figure 11: Field wire connections, five-zone control panel
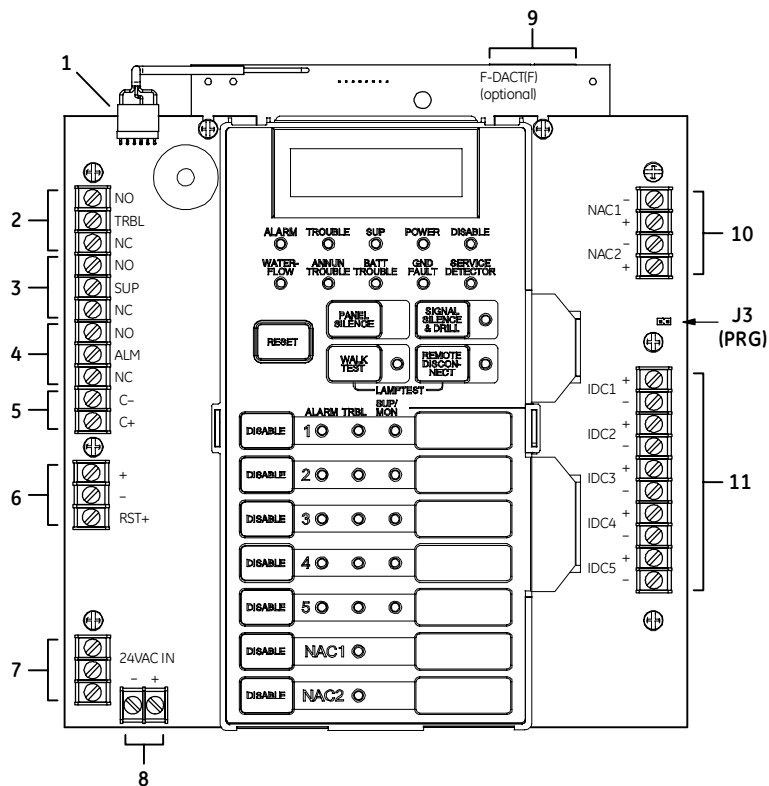
Table 28: Five-zone field wire connections

Item	Description
1	F-DACT(F) connector
2	Common trouble relay
3	Common supervisory relay
4	Common alarm relay
5	Remote module communication bus. See Figure 24 for typical wiring.
6	Smoke/accessory power
7	Mains AC power. For wiring, see Figure 15.
8	Battery power. For wiring, see Figure 15.
9	Telephone line modular jacks. See Figure 23 for typical wiring.
10	Notification appliance circuits. Terminal marking indicates polarity when the NAC is active. See Figure 22 for typical wiring.
11	Initiating device circuits. See Figure 16 for typical wiring
Note: For specifications, see Table 30 on page 117	

Figure 12: Field wire connections, ten-zone control panels
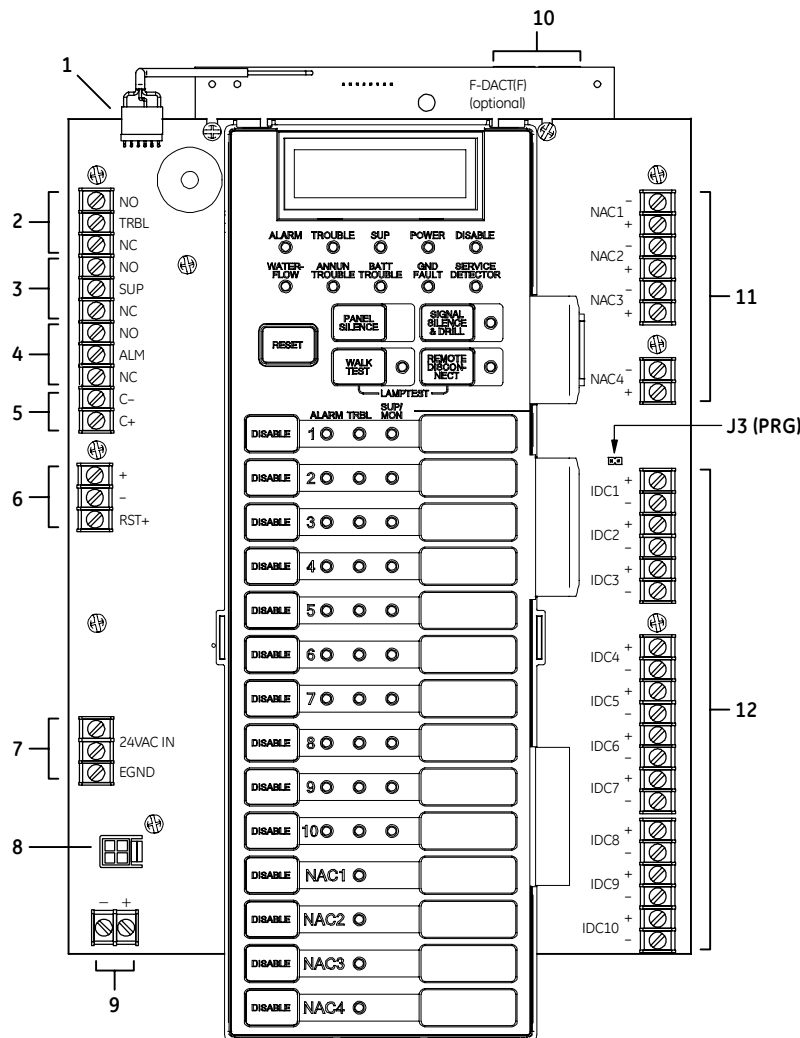
Table 29: Ten-zone field wire connections

Item	Description	Item	Description
1	F-DACT(F) connector	7	Mains AC power. For wiring, see Figure 15.
2	Common trouble relay	8	Expander transformer. For wiring, see Figure 15.
3	Common supervisory relay	9	Battery power. For wiring, see Figure 15.
4	Common alarm relay	10	Telephone line modular jacks. See Figure 23 for typical wiring.
5	Remote module communication bus. See Figure 24 for typical wiring.	11	Notification appliance circuits. Terminal marking indicates polarity when the NAC is active. See Figure 22 for typical wiring.
6	Smoke/accessory power	12	Initiating device circuits. See Figure 16 for typical wiring.
Note: For specifications, see Table 30 on page 117			

Figure 13: Wire routing diagram
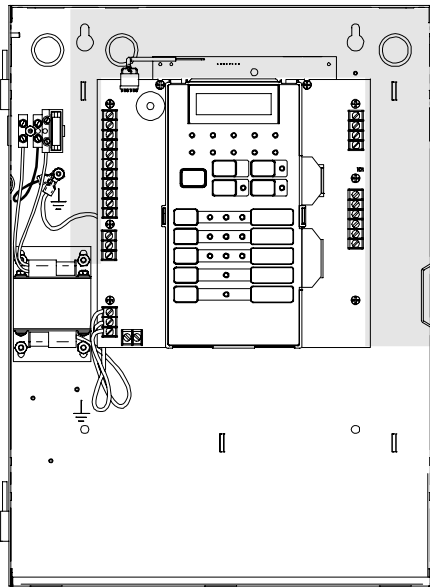
3-zone
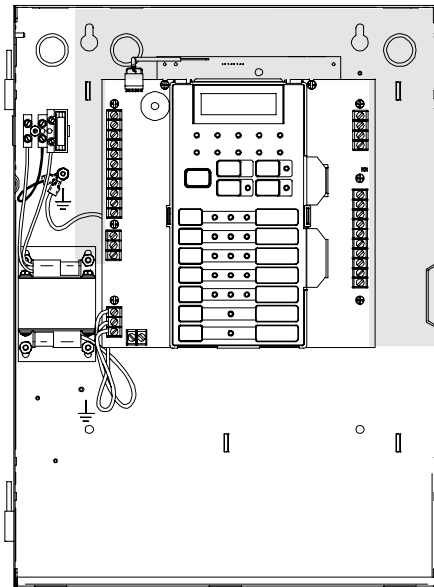
5-zone
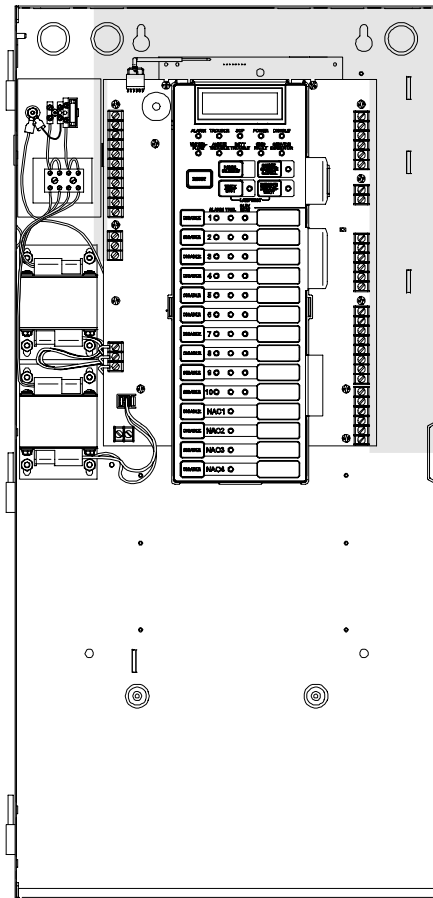
10-zone

Figure 14: Mains AC and battery wiring, three- and five-zone control panels

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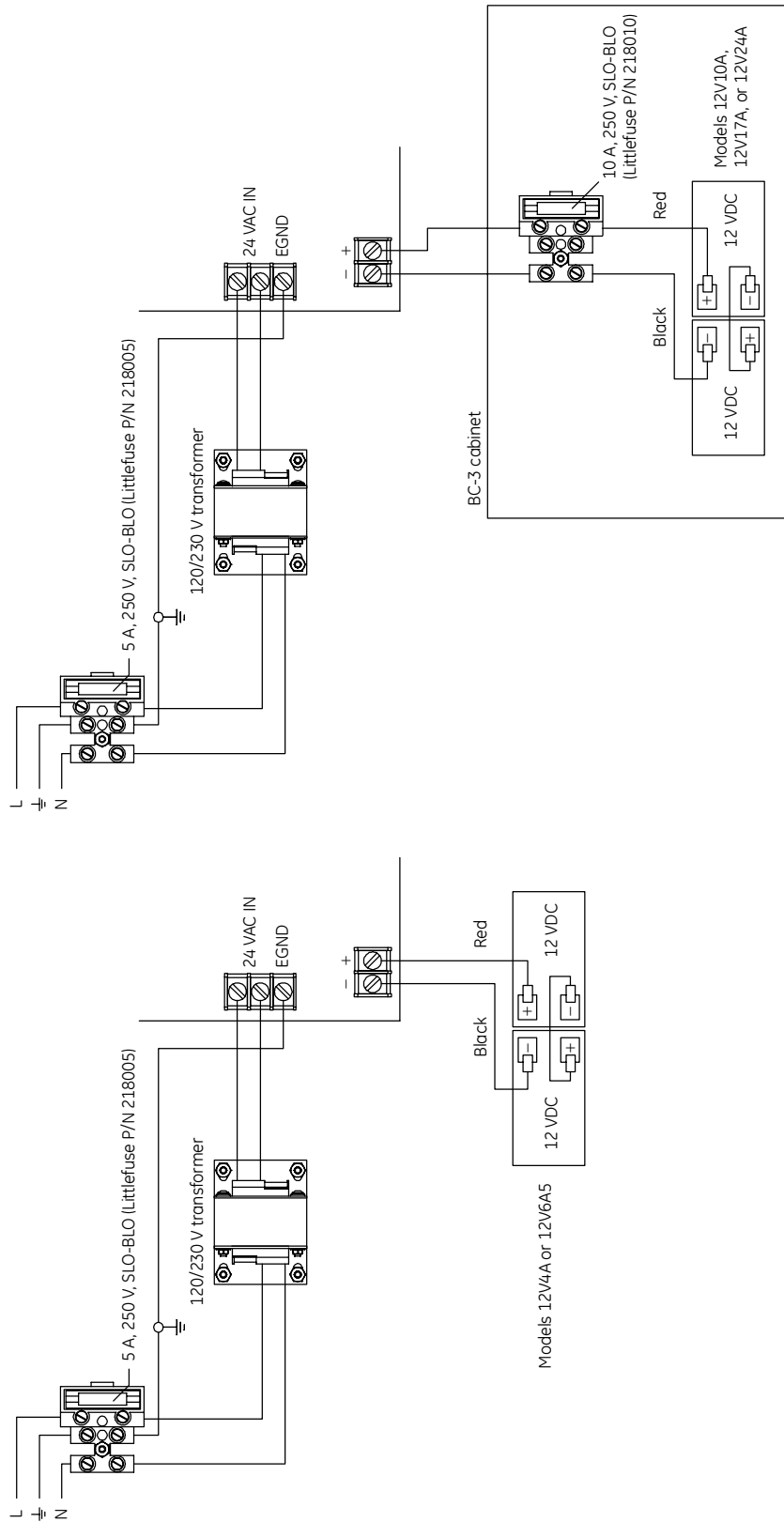
Figure 15: Mains AC and battery wiring, ten-zone control panels
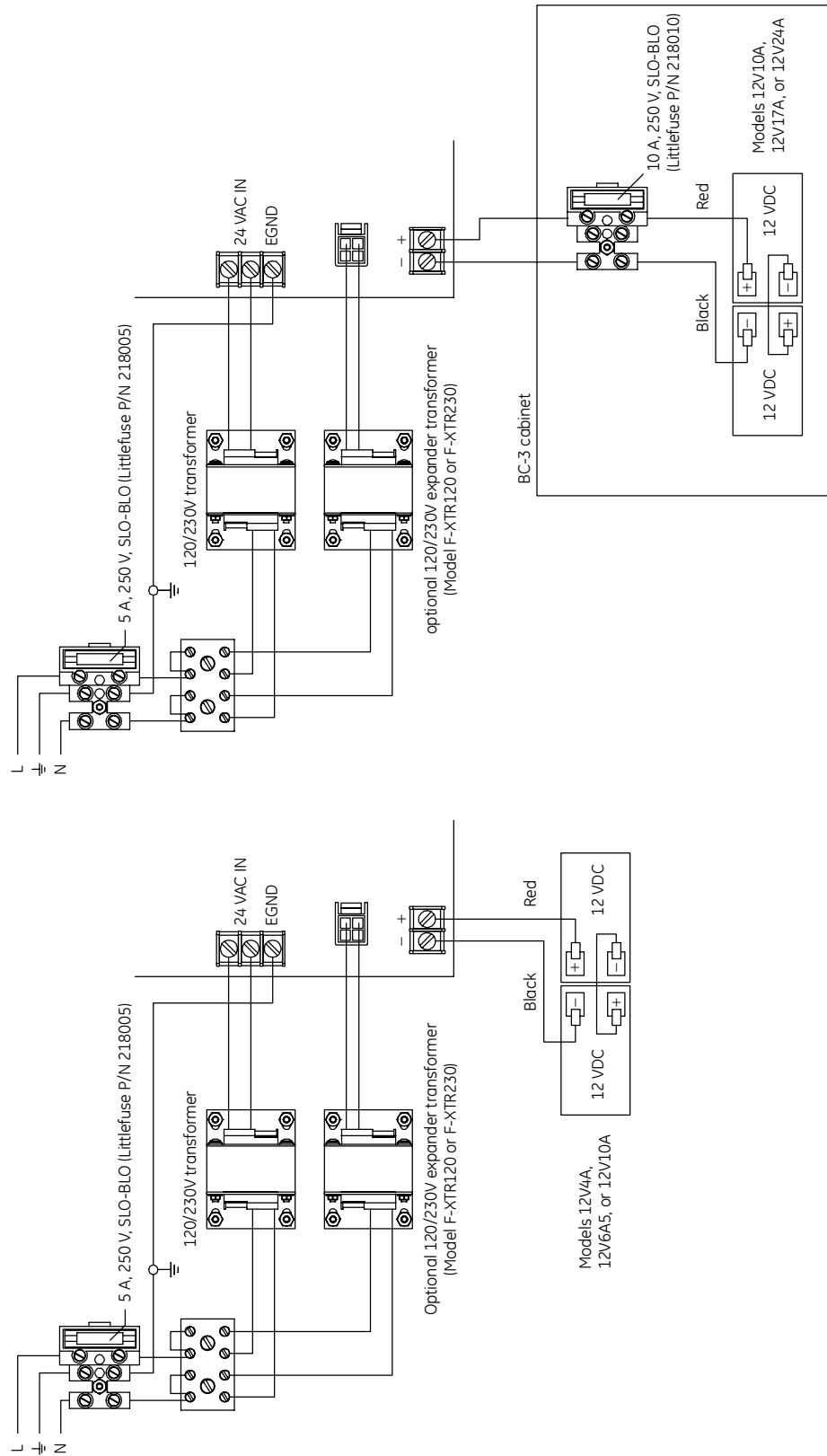
Figure 16: Typical alarm circuit
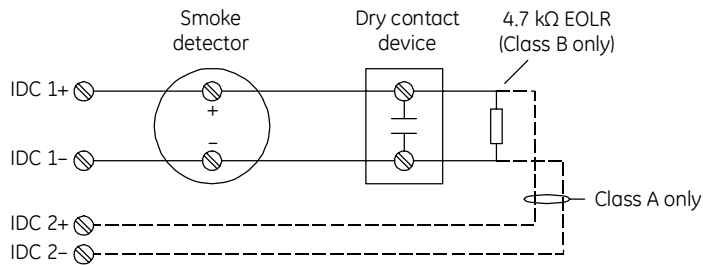
Figure 17: Typical 4-wire smoke detector circuit
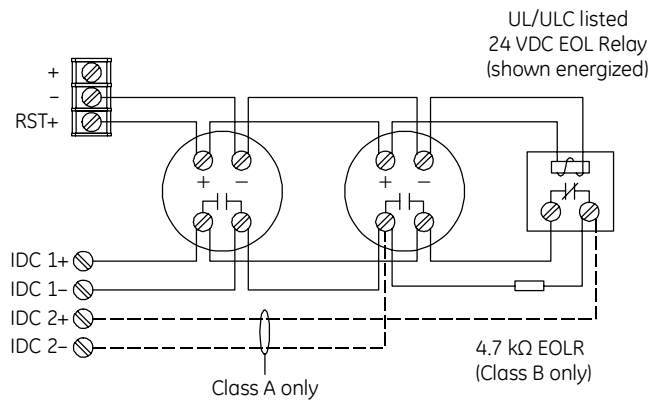
Figure 18: Typical waterflow alarm circuit
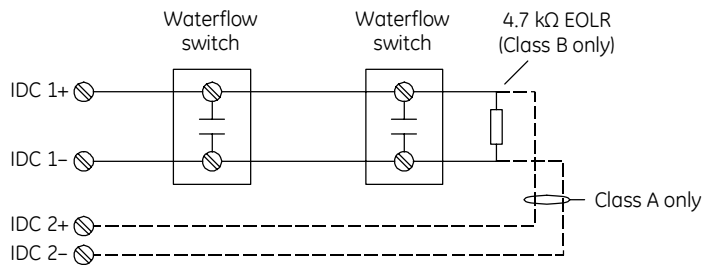
Figure 19: Typical supervisory circuit
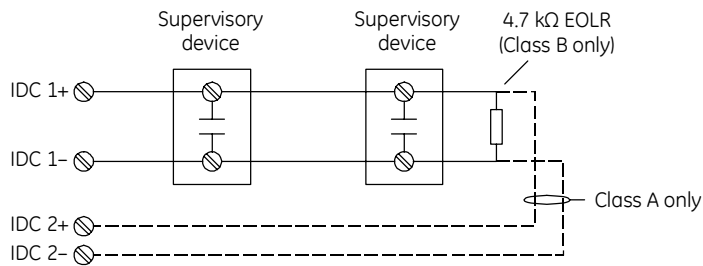
Note: Supervisory circuits are also known as tamper circuits

Figure 20: Typical waterflow/supervisory combination circuit
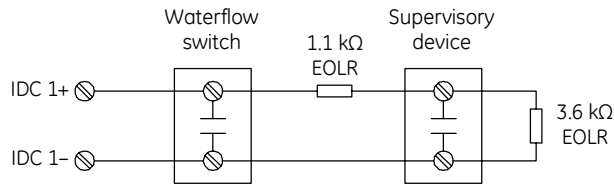
Figure 21: Typical remote signal silence/drill circuit
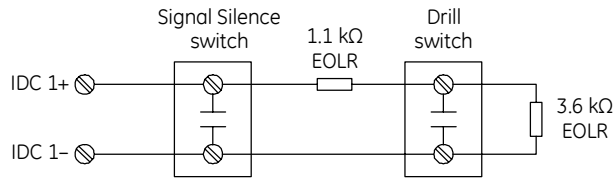
Figure 22: Typical notification appliance circuit
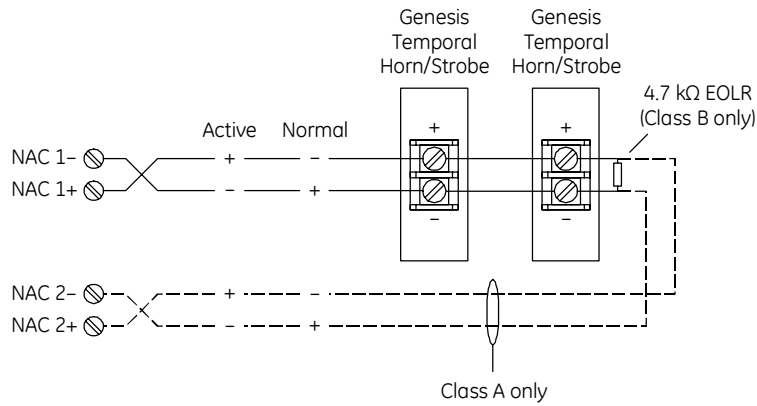
Figure 23: Typical F-DACT(F) wiring
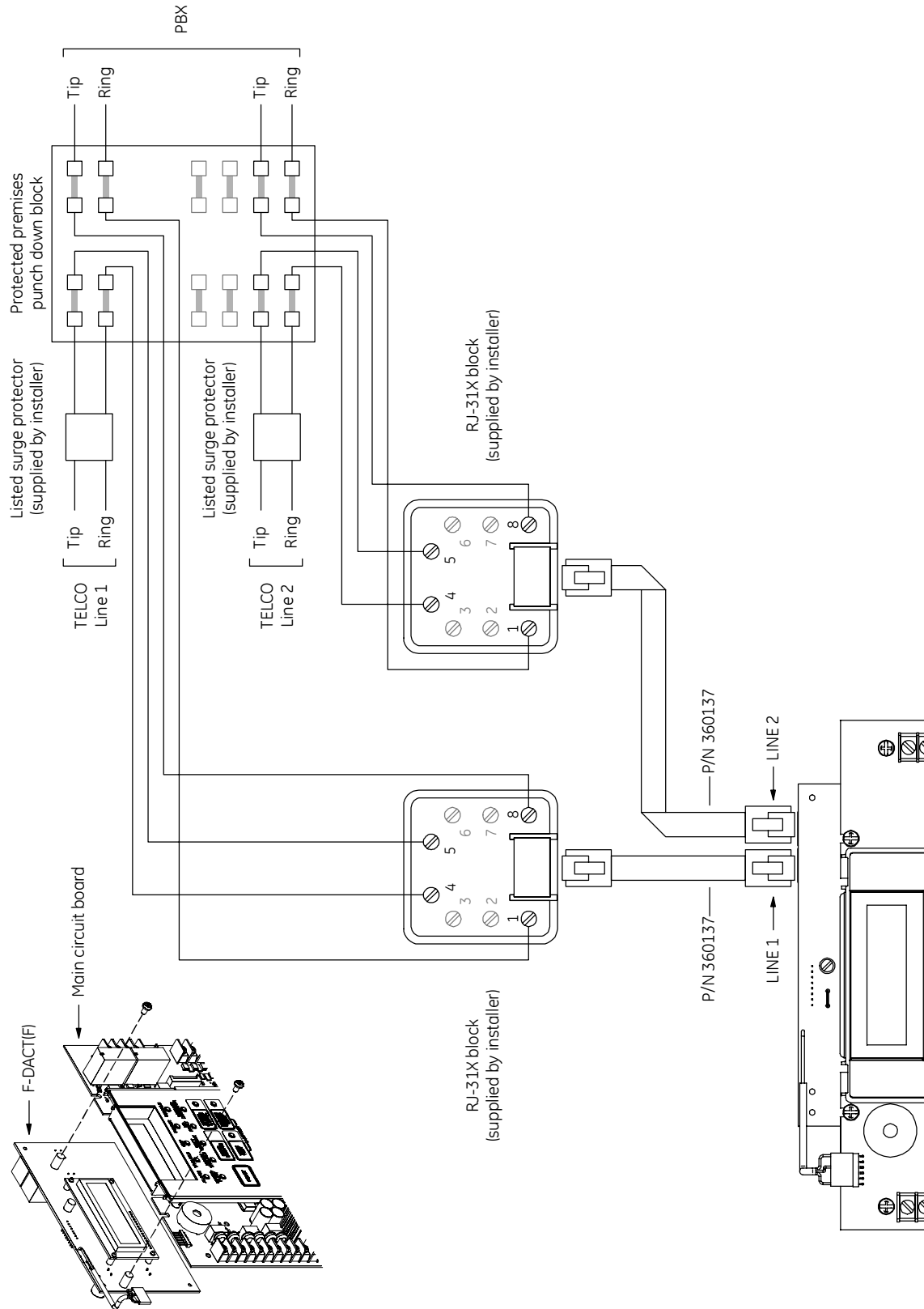
Figure 24: Typical remote indicator wiring for three- and five-zone systems
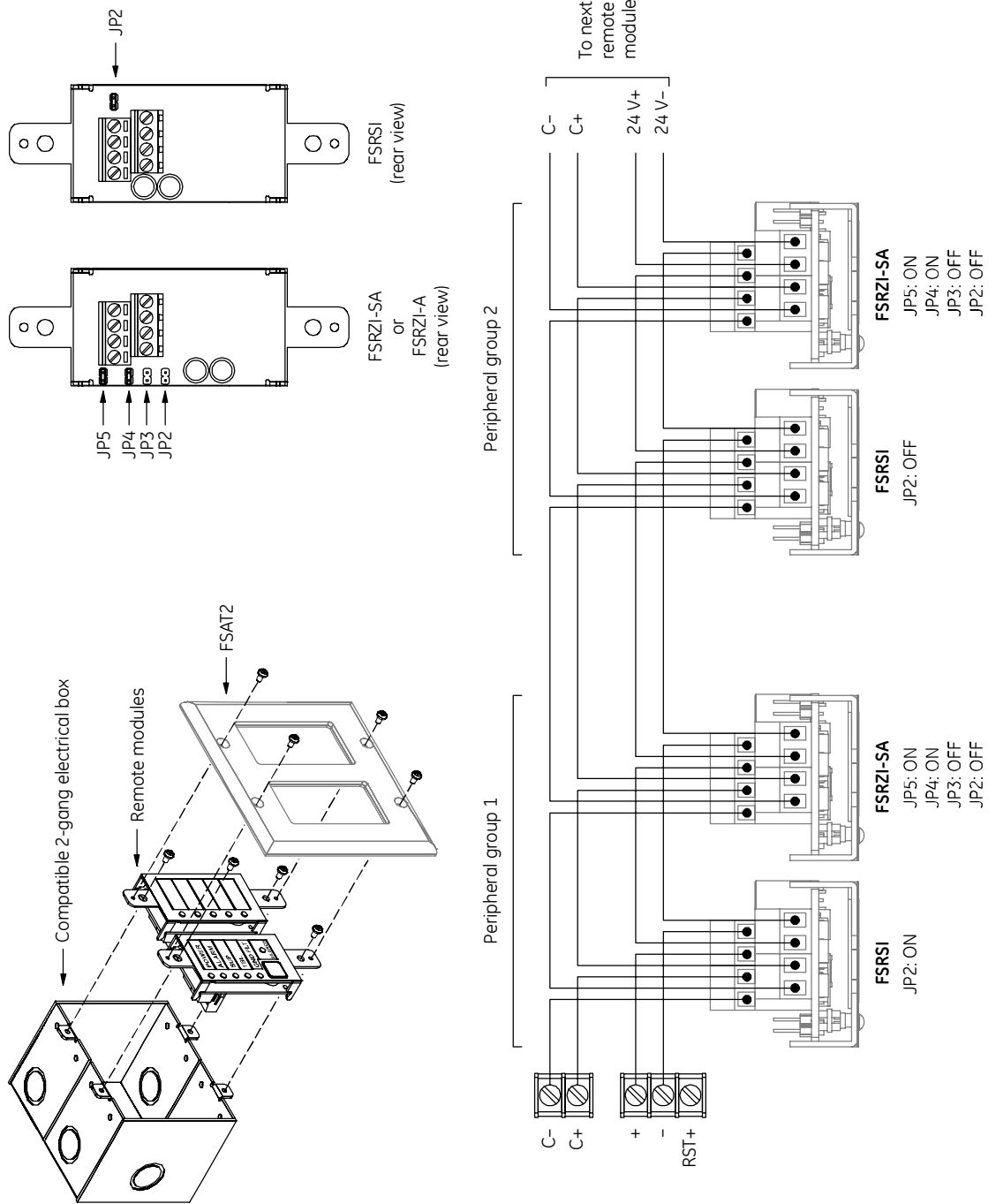
Figure 25: Typical remote indicator wiring for ten-zone systems
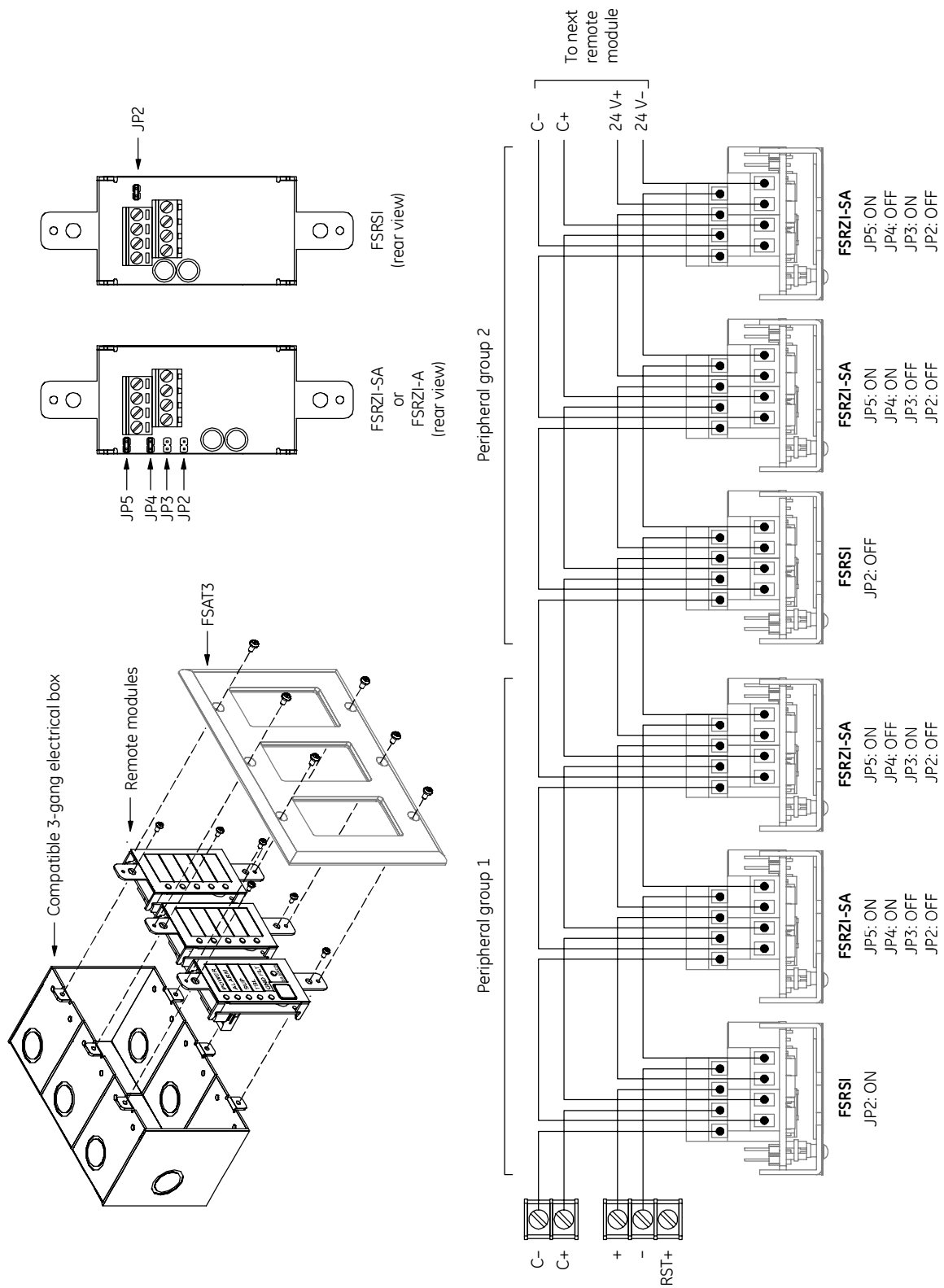
Figure 26: Typical FSRRM24 wiring
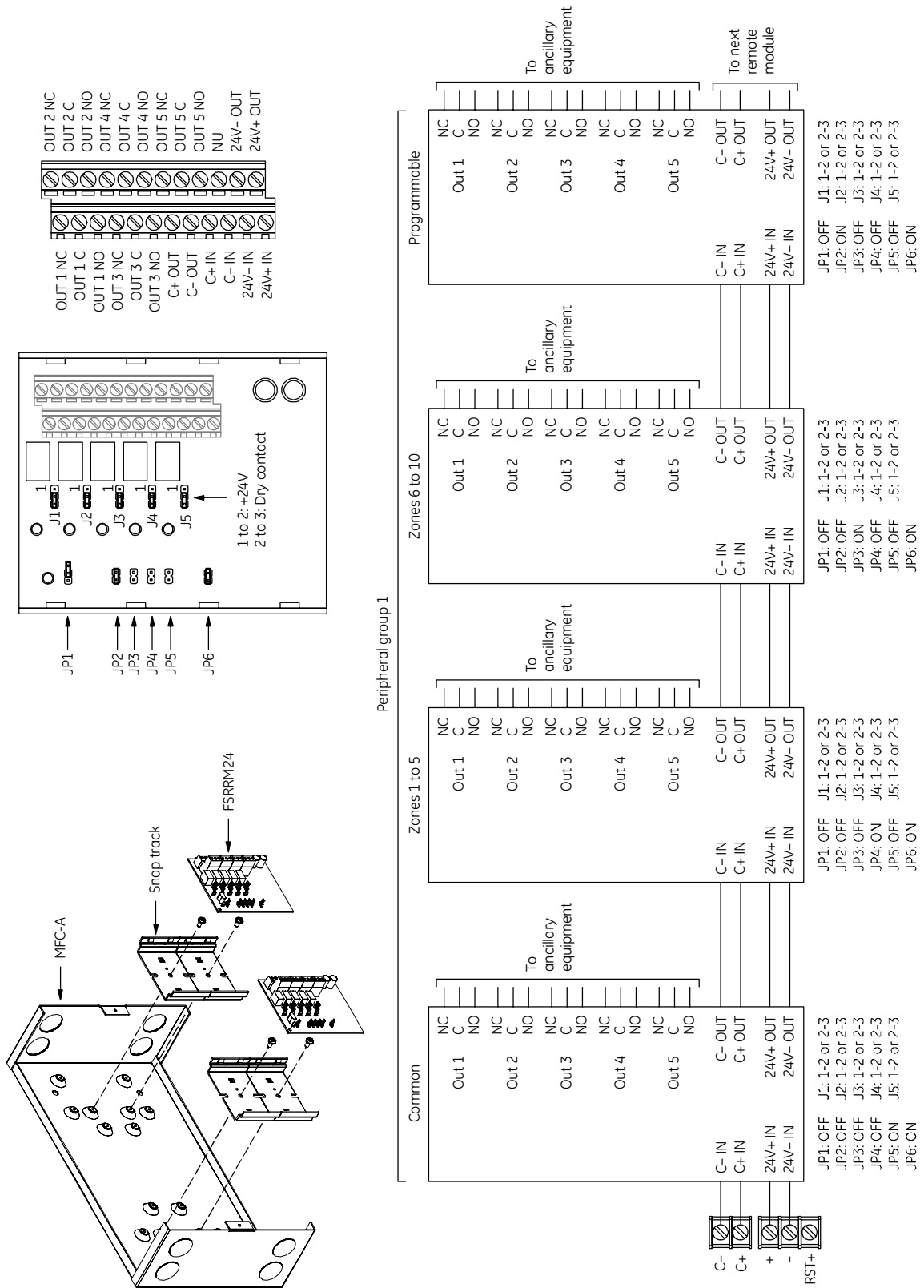
Figure 27: FSUIM wiring for a graphic annunciator panel, three- and five-zone systems
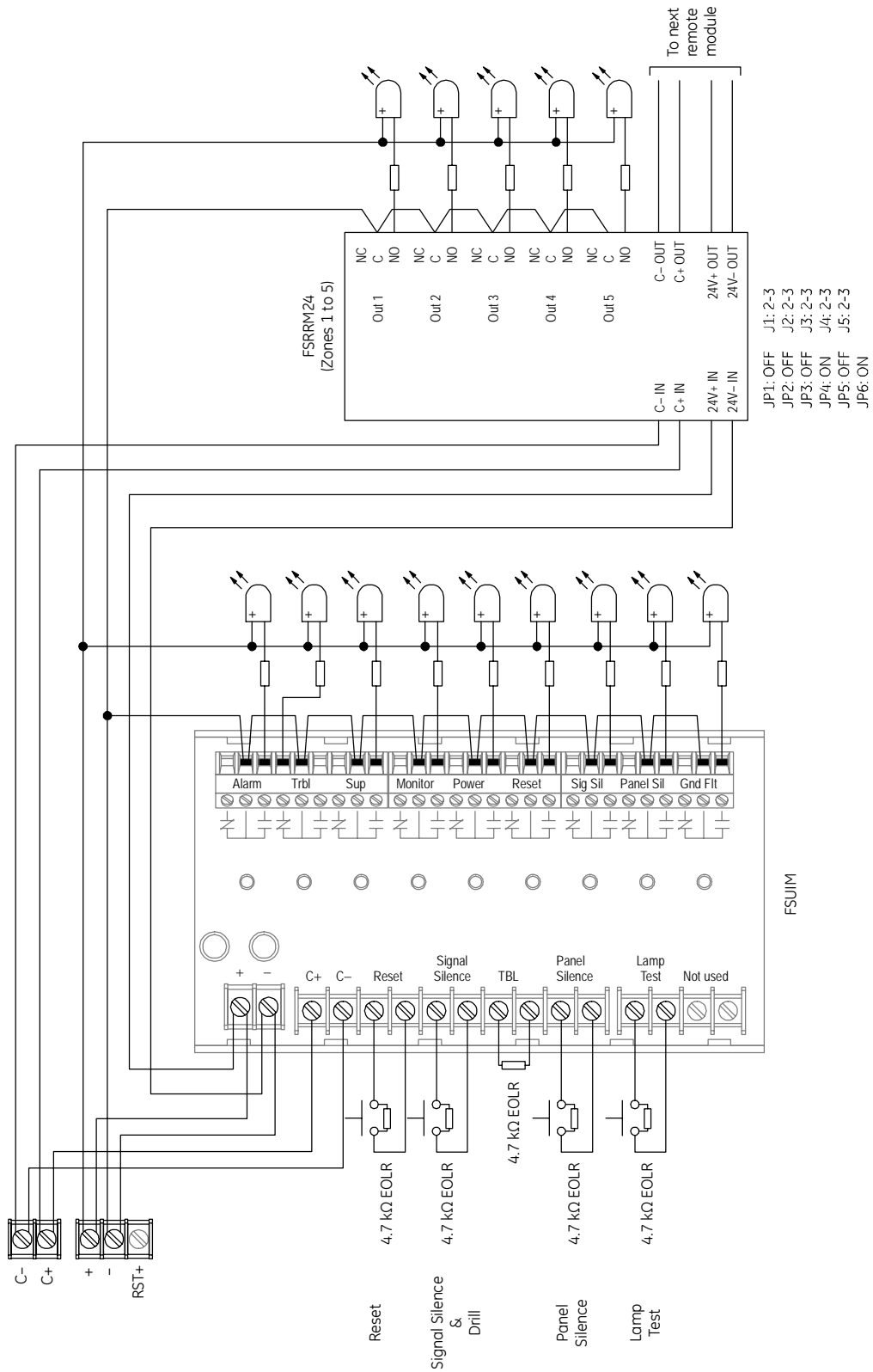
Figure 28: Typical Reverse Polarity Module (RPM) wiring
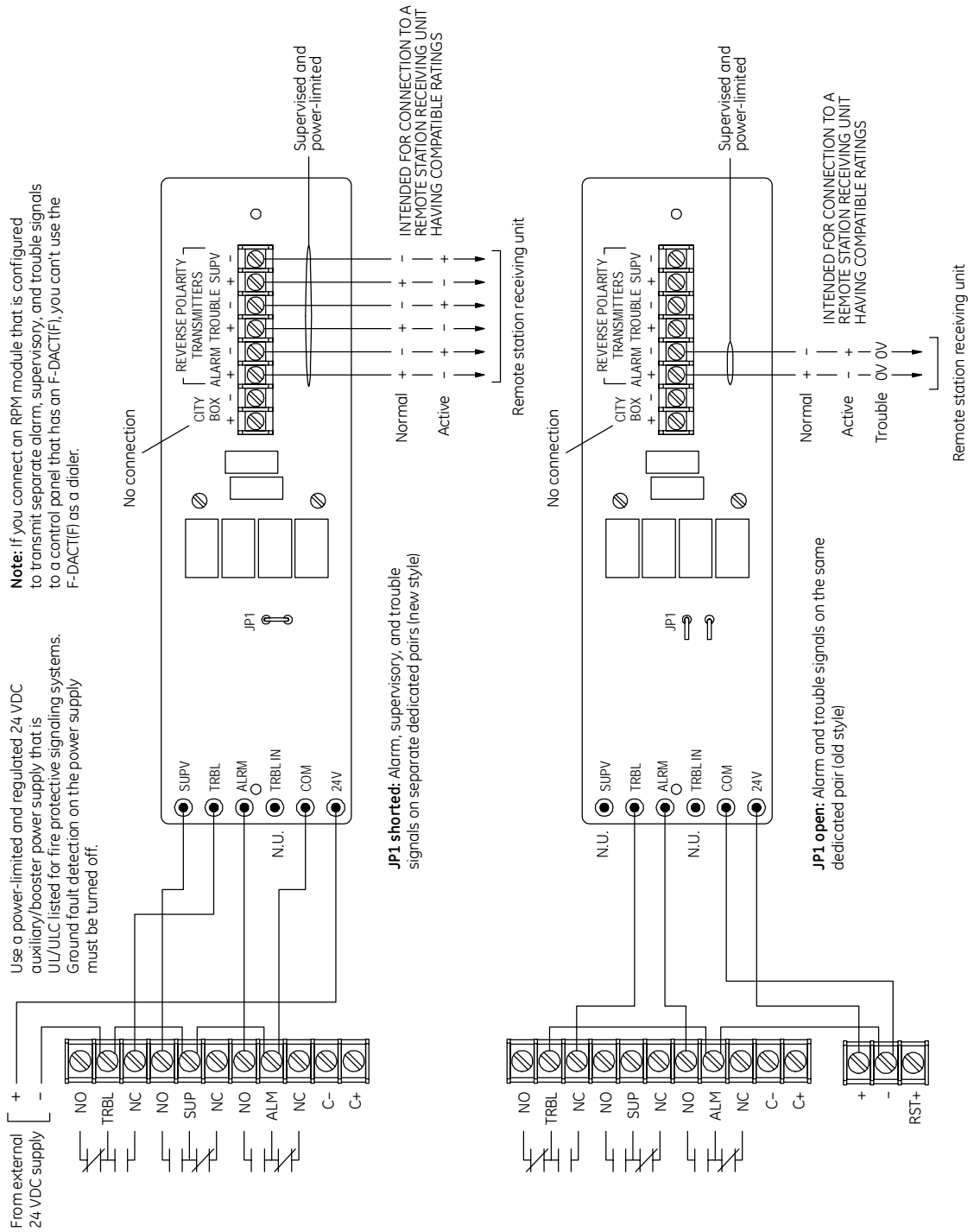
Figure 29: Typical CTM wiring
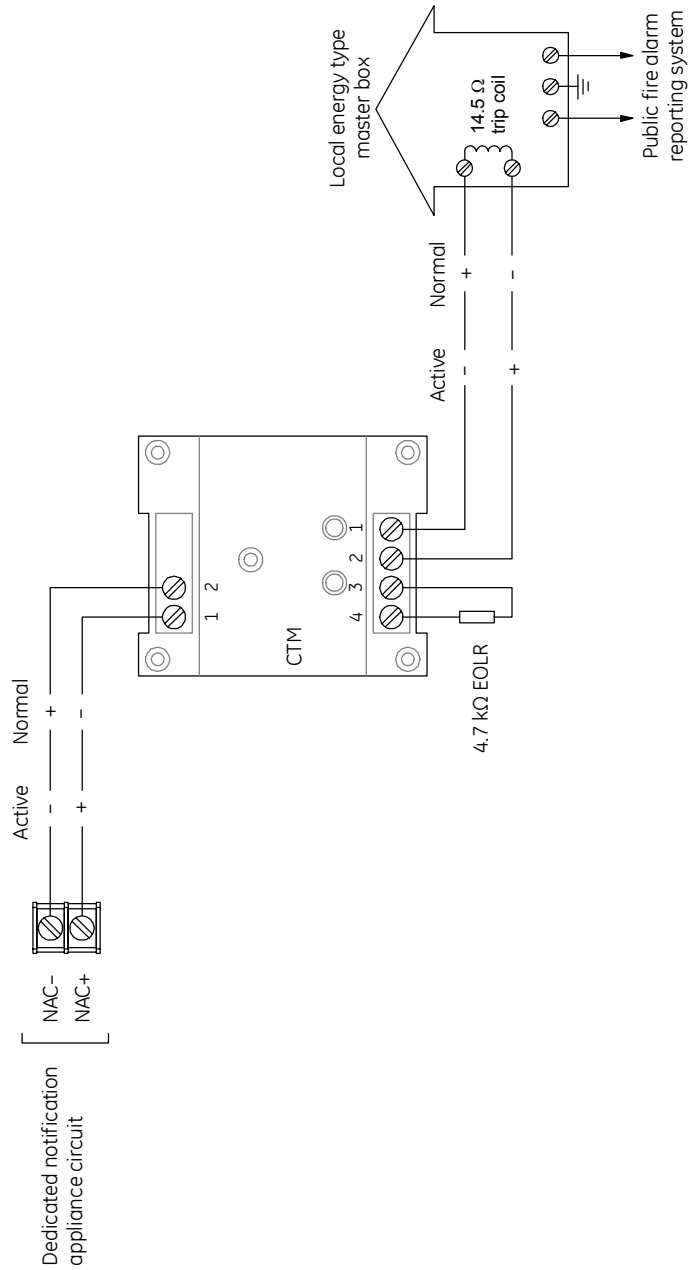
Figure 30: Typical cross zone wiring

Protected space

Class A wiring

Protected space

4.7 kΩ
EOLR

4.7 kΩ
EOLR
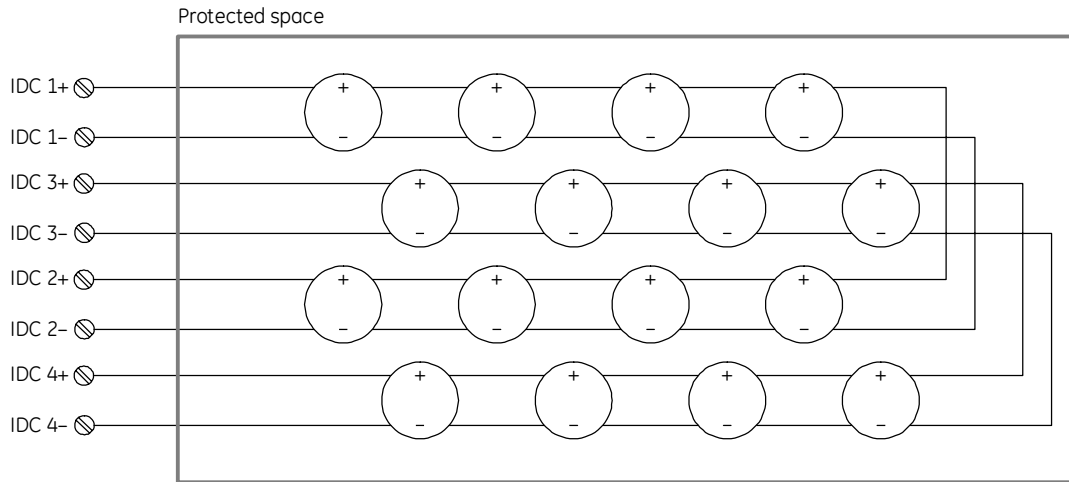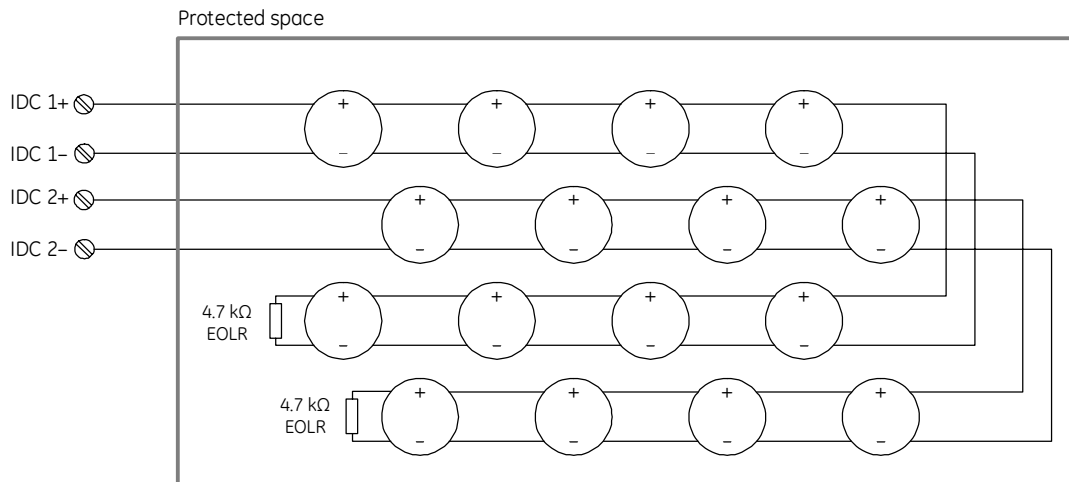
Class B wiring

Appendix D
Panel specifications

Table 30: Panel specifications

		Three-zone control panel				Five-zone control panel				Ten-zone control panel				
Initiating device circuits (IDCs)	Class B	3				5	3	1		10	8	6	4	2	0
	Class A	0				0	1	2		0	1	2	3	4	5
Notification appliance circuits (NACs)	Class B	2				2		0		4		2		0	
	Class A	0				0		1		0		1		2	
Power supply		4.25 A total				4.25 A total				4.25 A (expandable to 7.5 A total)					
NAC voltage rating		Regulated 24 VFWR													
Maximum NAC current		2.0 A each 3.5 A total				2.0 A each 3.5 A total				2.0 A each 3.5 A total, 7.0 A with optional power expander transformer					
AC input	120 V, 60 Hz	1.2 A				1.25 A				2.2 A (includes optional power expander transformer)					
	230 V, 50/60 Hz	0.6 A				0.62 A				1.1 A (includes optional power expander transformer)					
Base panel current draw (standby)		96 mA				104 mA				128 mA					
Base panel current draw (alarm)		180 mA				224 mA				242 mA					
Battery placement		Up to two 7 Ah batteries will fit in the control panel. Use a BC-3 battery cabinet to install batteries larger than 7 Ah.								Up to two 18 Ah batteries will fit in the control panel. Use a BC-3 battery cabinet to install batteries larger than 18 Ah.					
Maximum auxiliary current		0.5 amps													
Auxiliary output		24 VDC, Regulated													
IDC max. detector standby current		3.0 mA per circuit. See compatibility list P/N 3101019 for a list of approved detector models and quantities													
IDC circuit		Maximum loop resistance: 26 Ω Maximum loop capacitance: 0.03 μF													
IDC operating voltage		16.9 to 29.0 VDC													

Table 30: Panel specifications

	Three-zone control panel	Five-zone control panel	Ten-zone control panel
Compatibility ID	100		
Common alarm contact	Form C, 30 VDC at 1 A (resistive load)		
Common trouble contact	Form C, 30 VDC at 1 A (resistive load)		
Common supervisory contact	Form C, 30 VDC at 1 A (resistive load)		
Environmental	Temperature: 32 to 120 °F (0 to 49 °C) Humidity: 5 to 93% RH, noncondensing at 90 °F (32 °C)		
Terminal rating	All terminals rated for 12 to 18 AWG (0.75 to 2.5 sq mm)		
Serial communications	Asynchronous communications maximum resistance: 13 Ω Maximum capacitance: 0.03 µF		
Batteries	Sealed lead acid type only Maximum charging capacity: 24 Ah		
Ground fault impedance	0 ohms		

Appendix E
Default event codes

Summary

This appendix provides a list of the default event codes that the dialer uses to transmit event activation and restoration codes.

Content

Default Contact ID event codes

Table 31: Default Contact ID event codes

Event	Activation code	Restoration code
Alarm zone	1110000<01-10>	3110000<01-10>
Waterflow zone	1113000<01-10>	3113000<01-10>
Supervisory zone	1200000<01-10>	3200000<01-10>
Monitor zone	1140000<01-10>	3140000<01-10>
Zone trouble	1373000<01-10>	3373000<01-10>
Zone bypass	1570000<01-10>	3570000<01-10>
NAC trouble	1320000<01-04>	3320000<01-04>
NAC bypass	1520000<01-04>	3520000<01-04>
AC failure	130100000	330100000
Transformer 2 trouble	130100000	330100000
Battery bad	130200000	330200000
Reset	130500000	330500000
Internal comm fault	130800000	330800000
Charger trouble	130900000	330900000
Ground fault	131000000	331000000
Battery missing	131100000	331100000
AUX power trouble	131200000	331200000
Panel silence	131500000	331500000
Signal silence	132800000	332800000
Peripheral trouble	133000000	333000000
Phone line 1 trouble	135100000	335100000
Phone line 2 trouble	135200000	335200000
Dialer delivery trouble	135400000	335400000
RRM bypass	153000000	353000000
DACT disabled	155100000	355100000
Drill	160100000	360100000
Test-normal	160200000	360200000
Walk test	160700000	360700000
Test-abnormal	160800000	360800000
Program mode entry	162700000	362700000
Program mode exit	162800000	362800000

Default 4/2 event codes

Table 32: Default 4/2 event codes

Event	Activation code	Restoration code
Alarm zone	1<1-A>	E<1-A>
Waterflow zone	2<1-A>	E<1-A>
Supervisory zone	3<1-A>	E<1-A>
Monitor zone	5<1-A>	E<1-A>
NAC trouble	A<1-4>	B<1-4>
AUX power trouble	65	D5
Ground fault	66	D6
Dialer delivery trouble	67	D7
Phone line 1 trouble	68	D8
AC failure	69	D9
Transformer 2 trouble	6A	DA
Charger trouble	6B	DB
Battery bad	6C	DC
Battery missing	6C	DC
Peripheral trouble	6D	DD
Phone line 2 trouble	6E	DE
Test-abnormal	6F	DF
Zone trouble	7<1-A>	F<1-A>
IDC disabled (not configurable)	8<1-A>	9<1-A>
NAC disabled (not configurable)	6<1-4>	D<1-4>
RRM disabled (not configurable)	A5	B5
Internal comm trouble	AA	BA
Reset	AB	BB
Signal silence	AC	BC
Drill	AD	BD
Dialer disabled	AE	BE
Walk test	AF	BF
Program mode	C1	C2
Panel silence	CA	CA
Test-normal	DF	6F

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