QS4 Fire Alarm Control Panel
Technical Reference Manual

P/N 3100186 • Rev 2.0 • 12JUL01

Compliance Statement

The QS4, hereinafter referred to as the FACP or control panel, when properly installed, operates as a Local Protected Premises Fire Alarm System in accordance with the following standards:

- NFPA Standard 72, 1999 Edition
- Underwriters Laboratories Standard 864, 7th Edition
- Underwriters Laboratories of Canada Standard ULC S527

In addition, Auxiliary Fire Alarm System operation requires a Reverse Polarity Module (RPM). Central Station Fire Alarm System operation requires a Dialer card (DLD).

Installation in accordance with this manual, applicable codes, and the instructions of the authority having jurisdiction is mandatory.

Limitation of Liability

Edwards Systems Technology (EST) 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 EST products beyond the cost of repair or replacement of any defective products. EST reserves the right to make product improvements and changes to product specifications at any time.

While every precaution was taken during the preparation of this document to ensure its accuracy, EST assumes no responsibility for errors or omissions.

Fire Alarm System Limitations

Automatic fire alarm systems can not guarantee against property damage, loss of property, or loss of life. An automatic fire alarm system's ability to provide early warning of a developing fire may be limited for a variety of reasons, but mainly due to improper installation or maintenance.

The best way to minimize system failures is to perform regularly scheduled preventive maintenance in accordance with national and local fire codes. All system components and wiring should be tested and maintained by trained fire alarm system professionals.

FCC Compliance Statement

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 within 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.

Content

Content

About this manual

Organization

This manual provides information on how to properly install, wire, and maintain the FACP and related components, and is organized as follows:

Chapter 1 provides a detailed description of the fire alarm control panel and its operation.

Chapter 2 provides instructions for installing the fire alarm control panel.

Chapter 3 provides instructions for operating the control panel.

Chapter 4 provides instructions for programming the fire alarm system from the front panel.

Chapter 5 provides simplified wiring schematics for standard applications.

Chapter 6 provides instructions for maintaining the system.

Appendix A provides worksheets for calculating maximum wire lengths for notification and Signature circuits, and for sizing standby batteries.

Appendix B provides a set of bar codes that you can use to enter text for location messages.

Appendix C provides information on how to program the SIGA–REL using the QS–CU (QuickStart Configuration Utility).

Safety information

Important safety admonishments are used throughout this manual to warn of possible hazards to persons or equipment.

WARNING: Warnings are used to indicate the presence of a hazard which will or may cause personal injury or death, or loss of service if safety instructions are not followed or if the hazard is not avoided.

Caution: Cautions are used to indicate the presence of a hazard which will or may cause damage to the equipment if safety instructions are not followed or if the hazard is not avoided.

Related documentation

National Fire Protection Association 1 Batterymarch Park P.O. Box 9101 Quincy, MA 02269-9101	NFPA 70 National Electric Code
	NFPA 72 National Fire Alarm Code
	NFPA 11 Low-Expansion Foam Systems
	NFPA 11A Medium- and High-Expansion Foam Systems
	NFPA 12 Carbon Dioxide Extinguishing Systems
	NFPA 13 Sprinkler Systems
	NFPA 15 Water Spray Fixed Systems for Fire Protection
	NFPA 16 Deluge Foam-Water Sprinkler and Foam-Water Spray Systems
	NFPA 17Dry Chemical Extinguishing Systems
Underwriters Laboratories, Inc. 333 Pfingsten Road Northbrook, IL 60062-2096	UL 38 Manually Actuated Signaling Boxes
	UL 217 Smoke Detectors, Single & Multiple Station
	UL 228 Door Closers/Holders for Fire Protective Signaling Systems
	UL 268 Smoke Detectors for Fire Protective Signaling Systems
	UL 268A Smoke Detectors for Duct Applications
	UL 346 Waterflow Indicators for Fire Protective Signaling Systems
	UL 464 Audible Signaling Appliances
	UL 521 Heat Detectors for Fire Protective Signaling Systems
	UL 864 Standard for Control Units for Fire Protective Signaling Systems
	UL 1481 Power Supplies for Fire Protective Signaling Systems
	UL 1638 Visual Signaling Appliances
	UL 1971 Visual Signaling Appliances
Underwriters Laboratories of Canada 7 Crouse Road Scarborough, ON Canada M1R 3A9	Canadian Electrical Code Part 1
	ULC S527 Standard for Control Units for Fire Alarm Systems
	ULC S524 Standard for the Installation of Fire Alarm Systems
	ULC S536 Standard for the Inspection and Testing of Fire Alarm Systems
	ULC S537 Standard for the Verification of Fire Alarm Systems
	ULC ORD–C693–1994 Central Station Fire Protective Signaling System and Services

Content

Edwards Systems Technology
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2–CTM City Tie Module Installation Sheet (P/N 270496)

CDR–3 Bell Coder Installation Sheet (P/N 3100023)

DLD Dual Inline Dialer Installation Sheet (P/N 3100187)

PS6 Power Supply Card Installation Sheet (P/N 3100201)

QSA–1(X), QSA–2(X) Remote Annunciator Cabinet Installation Sheet (P/N 3100295)

QS–CPU(X) CPU/Display Unit Installation Sheet (P/N 3100276)

SL30, SL30–1 LED/Switch Card Installation Sheet (P/N 3100193)

SLIC Signature Intelligent Controller Card Installation Sheet (P/N 3100192)

RS485 (NT–A) Card and QS–232 UART Module Installation Sheet (P/N 3100191)

ZA8–2 Class A Zone Card Installation Sheet (P/N 3100189)

ZB16–4 Class B Zone Card Installation Sheet (P/N 3100188)

ZR8 Relay Card Installation Sheet (P/N 3100190)

SIGA–APS Auxiliary Power Supply Installation Sheet (P/N 387342)

Signature Series Intelligent Smoke and Heat Detectors Applications Bulletin (P/N 270145)

Signature Series Component Installation Manual (P/N 270497)

EST Strobe Applications Guide (P/N 85000-0049)

QuickStart Online Help Utility (P/N 7350047)

QuickStart ULI and ULC Compatibility Lists (P/N 3100335)

Network Hardware Technical Reference (P/N 250100)

Document history

Date	Revision	Description of changes
24JUN01	1.0	Original release.
12JUL01	2.0	Corrections and additions on pp 2.12, 2.24, 3.9, 4.4, 4.8, 4.10, 4.19, A.3.

Chapter 1

Product description

Summary

This chapter provides a detailed description of the fire alarm control panel and its operation.

Content

System overview

System hardware capabilities

Hardware capabilities vary depending on cabinet size and option card configuration, but generally:

- Up to four Class A or Class B Signature signaling line circuits that support up to 250 single-address Signature devices each

- Up to 40 Class A or 48 Class B initiating device circuits (IDC). Combination systems can not exceed 40 IDC circuits total

- Up to 16 Class A or 20 Class B notification appliance

- Up to two 30-zone displays

- Up to 96 dry-contact relay

- 4.5 amps of 24 Vdc power for external notification appliances

- Battery charger capable of charging batteries rated up to 40 Ah. Maximum battery size for ULC applications is 30 Ah

- Up to eight, fully-supervised, mirrored or customized remote annunciators

Minimum system requirements

A Local Protected Premises Fire Alarm System requires only the FACP (CPU, PS6, and enclosure) with at least one SLIC, ZB16–4, or ZA8–2 card programmed with at least one audible output circuit and one alarm input circuit.

In addition to the hardware requirements of a Local system:

- Add a 2–CTM City Tie Module for an Auxiliary Fire Alarm System

- Add a DLD Dual Line Dialer Card or RPM Reverse Polarity Module for a Remote Supervising Station Fire Alarm System

- Add a DLD Dual Line Dialer Card or RPM Reverse Polarity Module for a Central Station Fire Alarm System

- Add a SIGA–REL for Releasing Device Service

Normal operating mode description

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

Off-normal operating mode description

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

- Changes the contact positions on the appropriate common relays

- Activates all common alarm outputs (alarm events only)

- Turns on the panel buzzer

- Executes the appropriate programmed output response for the input that signaled the event

- Sends a record of the event to the appropriate display queue and out the serial port

If there is no operator in attendance, the panel displays the content of the highest priority display queue containing a record.

If there is an operator in attendance, the panel displays the content of the current display queue regardless of any new events introduced into the system.

Failsafe operating mode description

The panel operates in failsafe mode when the CPU loses the ability to communicate with the PS6 and JP1 on the PS6 is in the ON position. When this happens, the power supply:

- Closes the common trouble relay contacts

- Instructs the dialer to send the default trouble message

- Monitors the system for any alarm events

If an alarm event occurs, the power supply:

- Changes the contact positions on the common alarm relay

- Turns on all conventional common alarm outputs. Signature common alarm outputs are not affected.

- Instructs the dialer to send the default alarm message

Component descriptions
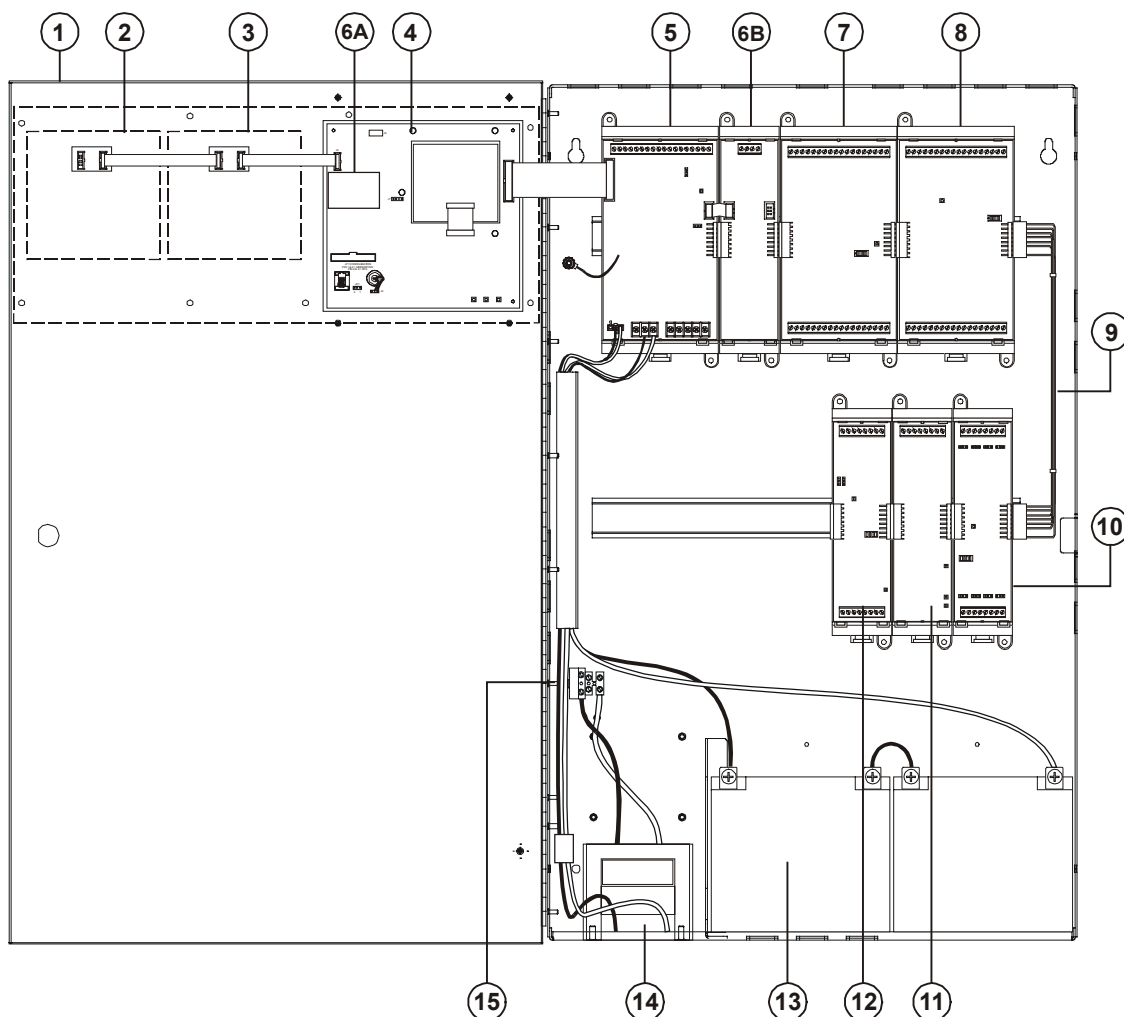
1. Cabinet enclosure: Houses the panel electronics and standby batteries.

2. SL30–1 LED/Switch Card: Provides thirty circuits for point or zone annunciation. Each circuit has two LEDs for annunciating alarm, supervisory, and trouble signals, and a button numbered from 31 to 60.

3. SL30 LED/Switch Card: Same as SL30–1 except the buttons are numbered 1–30.

4. CPU/Display: Provides operator access to system messages, status information, and programming menus, and executes system responses based on the panel programming.

5. PS6 Power Supply Card: Provides primary dc power to the panel electronics and external circuits. The PS6 also provides common alarm, supervisory and trouble relays for remote station supervision.

6. RS485 (NT–A) Class A Card: The NT–A comprises the RS485 card and QS–232 UART module. Together these provide an additional RS–232 channel to allow Class A communication between the control panel and other remote annunciator panels. Control panels require installation of both cards while remote annunciator panels only require installation of a QS–232 card and only then if you want to connect a printer or service computer.

7. ZA8–2 Class A Conventional Zone Card: Provides six dedicated Class A initiating device circuits (IDCs) for connecting two-wire smoke detectors and dry-contact initiating devices. The ZA8–2 also provides two circuits that you can configure as IDCs or as 24 Vdc notification appliance circuits (NACs).

8. ZB16–4 Class B Conventional Zone Card: Provides twelve dedicated Class B initiating device circuits (IDCs) for connecting two-wire smoke detectors and dry-contact initiating devices. The ZB16–4 also provides four circuits that you can configure as IDCs or as Class B 24 Vdc notification appliance circuits (NACs).

9. QS–Cable12 Expansion Cable: Extends the CPU data and power bus to circuit cards installed on the lower DIN rail in the 12-option cabinet.

10. ZR8 Relay Card: Provides eight dry-contact relays. You can configure each relay for normally-open or normally-closed operation.

11. DLD Dual Line Dialer Card: Provides two telephone line connections for sending system messages to a compatible Digital Alarm Communicator Receiver.

12. SLIC Signature Loop Intelligent Controller Card: Provides one Class A or Class B signaling line circuit (loop) for connecting Signature series detectors and modules. The SLIC also provides two Class A or Class B notification appliance circuits (NACs) for connecting polarized 24 Vdc notification appliances (horns, strobes).

13. Standby batteries: Provides dc power to the panel electronics in the absence of ac power.

14. Transformer: Changes the mains ac supply voltage for the power supply card.

15. AC wiring block and fuse holder: Provides connections for mains ac (primary power) and 5A fuse.

Circuit descriptions

PS6 Power Supply Card

1. Relay 1 (Common Alarm)
Style: Form C
Contact rating: 1 A @ 20.4 – 26.4 Vdc (0.6 PF)
Wire size: 18 to 12 AWG (0.75 to 2.5 mm²)
Nonsupervised and power-limited only when
connected to a power-limited source

2. Relay 2 (Common Supervisory)
Style: Normally-open
Contact rating: 1 A @ 20.4 – 26.4 Vdc (0.6 PF)
Wire size: 18 to 12 AWG (0.75 to 2.5 mm²)
Nonsupervised and power-limited only when
connected to a power-limited source

3. Relay 3 (Common Trouble)
Style: Normally-open, held closed
Contact rating: 1 A @ 20.4 – 26.4 Vdc (0.6 PF)
Wire size: 18 to 12 AWG (0.75 to 2.5 mm²)
Nonsupervised and power-limited only when
connected to a power-limited source

4. Relay 4 (Programmable)
Style: Normally-open
Contact rating: 1 A @ 20.4 – 26.4 Vdc (0.6 PF)
Wire size: 18 to 12 AWG (0.75 to 2.5 mm²)
Nonsupervised and power-limited only when
connected to a power-limited source

5. Smoke/Accessory Power
Output: Continuous or interruptible via jumper
selection
Voltage: 24 Vdc, regulated
Current: 250 mA
Wire size: 18 to 12 AWG (0.75 to 2.5 mm²)
Supervised and power-limited

6. RS485
Wire size: 18 to 12 AWG (0.75 to 2.5 mm²)
Wire type: Twisted pair, six twists per foot
minimum
Circuit capacitance: 0.4 μF
Circuit resistance: 100 Ω
Supervised and power-limited

7. RS232
Wire size: 18 to 12 AWG (0.75 to 2.5 mm²)
Nonsupervised and power-limited
Wire length: 20 ft maximimum
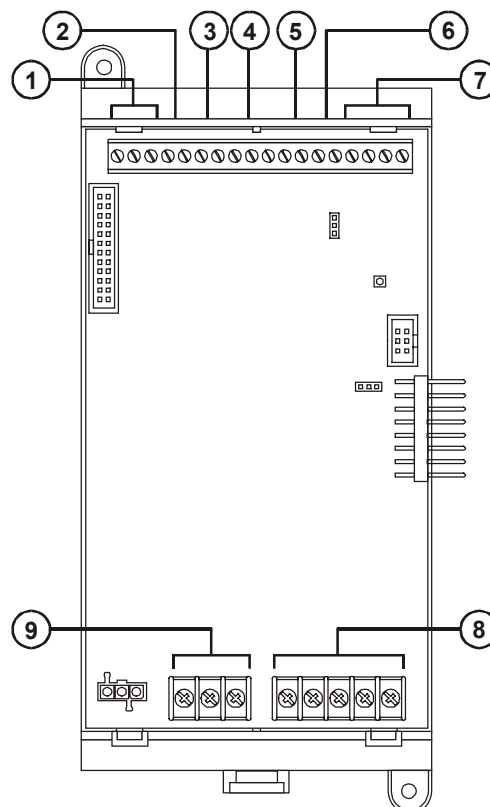
8. AUX Power #1, #2, and #3
Voltage: 17.5 – 26.4 Vdc FWR (full wave
rectified)
Current: 1.5 A each
Wire size: 18 to 12 AWG (0.75 to 2.5 mm²)
Power-limited and supervised for short circuit
conditions only

9. Battery Circuit
Charge current: 2 A
Charge capacity: 40 Ah (UL), 30 Ah (ULC)
Supervised and nonpower-limited

SLIC Signature Loop Intelligent Controller Card circuits

1. NAC #1
Configuration: Class B or Class A
Output voltage: 24 Vdc, nominal
Output current: 2.0 A @ 24 Vdc
Wire size: 18 to 12 AWG (0.75 to 2.5 mm^2)
End of line resistor: 10 kΩ, 1/2W
Supervised and power-limited

2. NAC #2
Configuration: Class B or Class A
Output voltage: 24 Vdc, nominal
Output current: 1.0 A @ 24 Vdc
Wire size: 18 to 12 AWG (0.75 to 2.5 mm^2)
End of line resistor: 10 kΩ, 1/2W
Supervised and power-limited

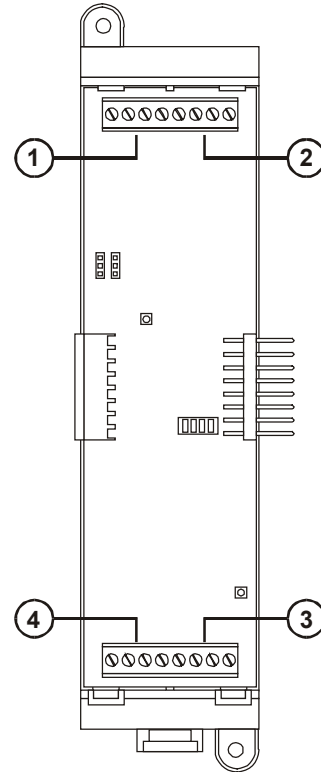### 3. Signature Loop
Configuration: Class B (Style 4) or Class A (Style 6)
Capacity: 125 Signature detectors, 125 Signature single-address modules
Wire size: 18 to 12 AWG (0.75 to 2.5 mm^2)
Circuit resistance: 65 Ω
Circuit capacitance: 0.3 μF
Supervised and power-limited

4. NAC Riser In/Out
Voltage: 24 Vdc, nominal
Wire size: 18 to 12 AWG (0.75 to 2.5 mm^2)

ZR8 Relay Card circuits

1. Dry-contact relays R1 – R4
Outputs: Normally-open or normally-closed contacts via jumper selection
Contact rating: 24 Vdc @ 1.0 A
Wire size: 18 to 12 AWG (0.75 to 2.5 mm^2)
Nonsupervised, and power-limited only when connected to a power-limited source
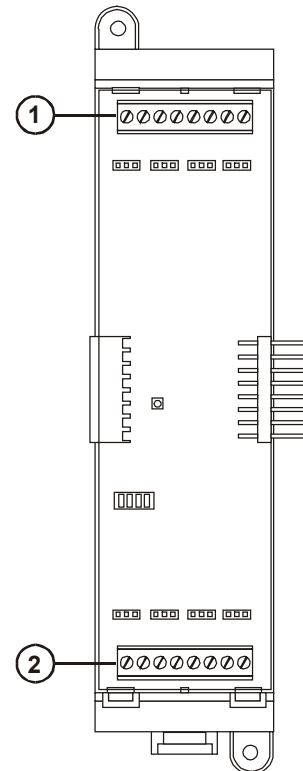
2. Dry-contact relays R5 – R8
Outputs: Normally-open or normally-closed contacts via jumper selection
Contact rating: 24 Vdc @ 1.0 A
Wire size: 18 to 12 AWG (0.75 to 2.5 mm^2)
Nonsupervised, and power-limited only when connected to a power-limited source

ZB16–4 Class B Conventional Zone Card circuits

1. IDC Circuits Z1 – Z12
    Wiring configuration: Class B
    Detector voltage: 20.33 – 24.76 Vdc, max ripple 2000 mV
    Short circuit current: 75.9 mA, max.
    Resistance: 50 Ω, max.
    Capacitance: 100 μF, max
    Wire size: 18 to 12 AWG (0.75 to 2.5 mm^2)
    End of line resistor: 4.7 kΩ, 1/2W
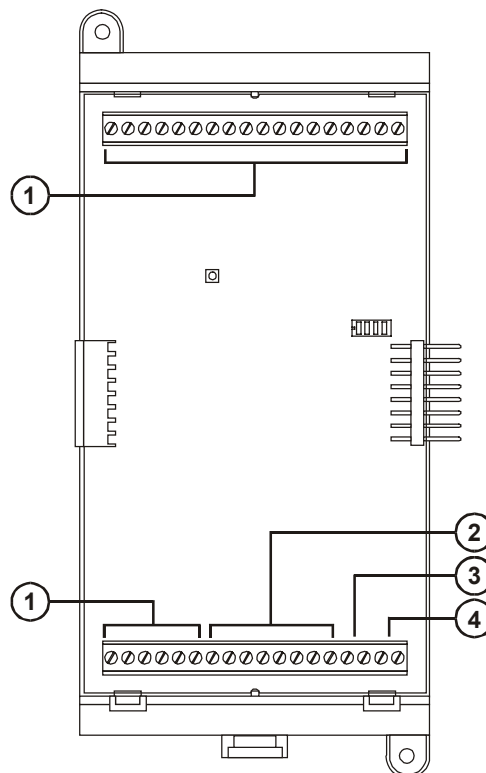   Supervised and power-limited

2. NAC Circuits Z13 – Z16
    Wiring configuration: Class B
    Output voltage: 24 Vdc, nominal
    Output current: 2.0 A @ 24 Vdc
    Wire size: 18 to 12 AWG (0.75 to 2.5 mm^2)
    End of line resistor: 10 kΩ, 1/2W
    Supervised and power-limited
    IDC specifications apply when programmed as IDC circuit

3. R1
    Voltage: 24 Vdc, nominal
    Wire size: 18 to 12 AWG (0.75 to 2.5 mm^2)

4. R2
    Voltage: 24 Vdc, nominal
    Wire size: 18 to 12 AWG (0.75 to 2.5 mm^2)

ZA8–2 Class A Conventional Zone Card circuits

1. IDC Circuits Zone 1 – Zone 3, Zone 5 – Zone 7
    Wiring configuration: Class A
    Detector voltage: 19.90 – 22.46 Vdc, max ripple 2000 mV
    Short circuit current: 75.9 mA, max.
    Resistance: 50 Ω, max.
    Capacitance: 100 μF, max
    Wire size: 18 to 12 AWG (0.75 to 2.5 mm^2)
    End of line resistor: 4.7 kΩ, 1/2W
    Supervised and power-limited

2. NAC Circuits Zone 4, Zone 8
    Wiring configuration: Class A
    Output voltage: 24 Vdc, nominal
    Output current: 2.0 A, 24 Vdc
    Wire size: 18 to 12 AWG (0.75 to 2.5 mm^2)
    End of line resistor: 10 kΩ, 1/2W
    Supervised and power-limited
    IDC specifications apply when programmed as IDC circuit

3. NAC PWR IN (Zone 4)
    Voltage: 24 Vdc, nominal
    Wire size: 18 to 12 AWG (0.75 to 2.5 mm^2)

4. NAC PWR IN (Zone 8)
    Voltage: 24 Vdc, nominal
    Wire size: 18 to 12 AWG (0.75 to 2.5 mm^2)
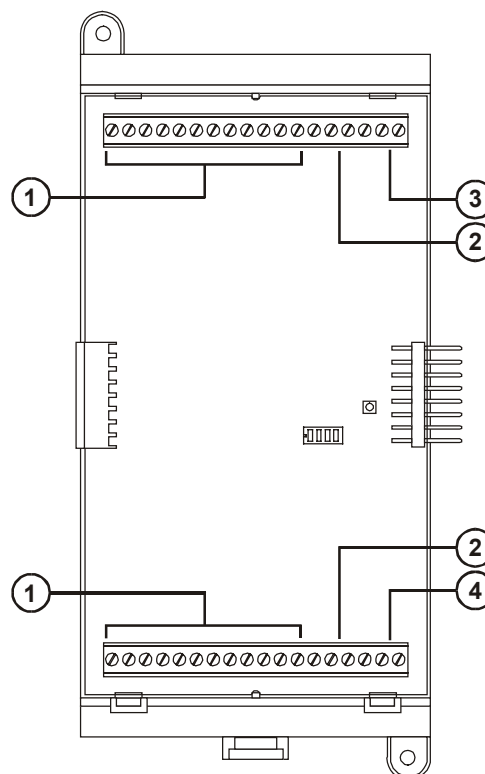
DLD Dual Line Dialer Card circuits

1. Line #1
   Supervised and nonpower-limited

2. Line #2
   Supervised and nonpower-limited
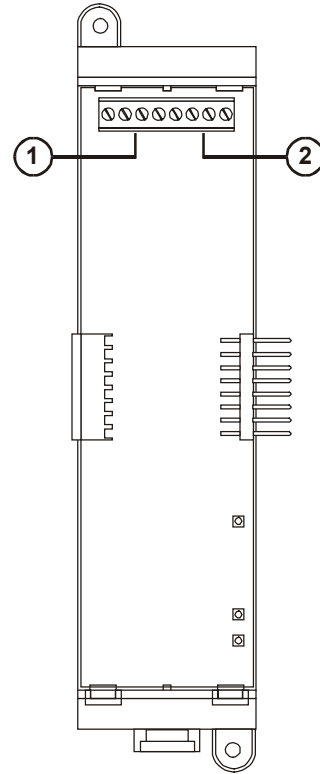
RS485 (NT–A) Class A Card circuits

1. Secondary RS485 channel
   Wire size: 18 to 12 AWG (0.75 to 2.5 mm^2)
   Supervised and power-limited

2. Primary RS485 channel
   Wire size: 18 to 12 AWG (0.75 to 2.5 mm^2)
   Supervised and power-limited

Note: JP1 installed for ground fault detection on RS485 circuits.
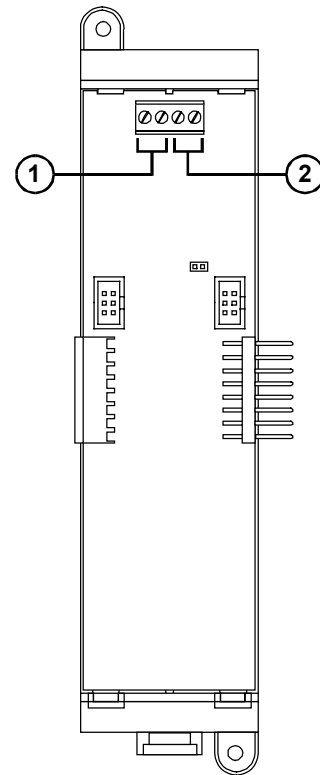
Controls and indicators
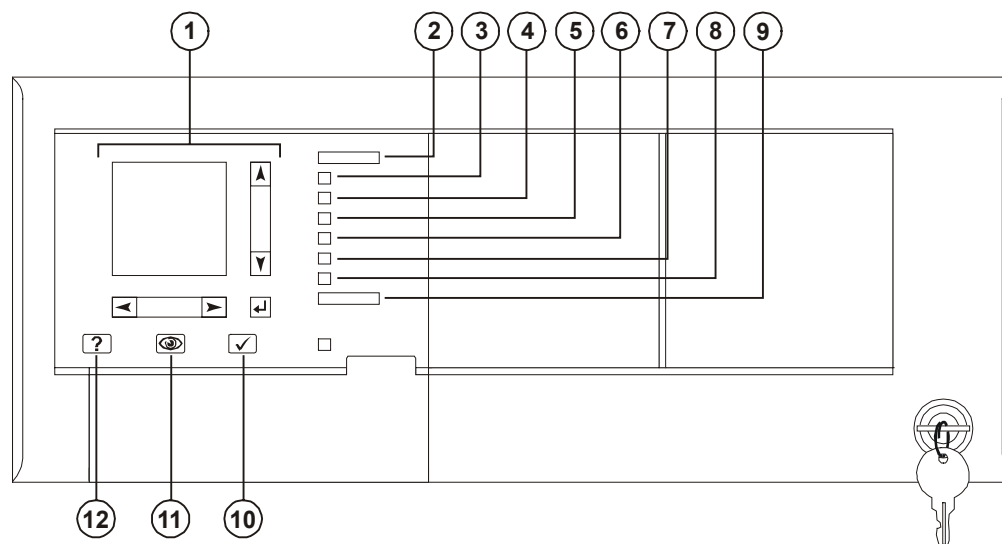
1. Text display and controls: Displays system messages, status information, programming menus.

| ▲ | Moves the cursor up one line at a time or to the previous record in the display queue |

| ▼ | Moves the cursor down one line at a time or to the next record in the display queue |

| ► | Moves the cursor right one character at a time or to the next display queue |

| ◄ | Moves the cursor left one character at a time or to the previous display queue |

| ↵ | Enters operator input and selects menu items |

2. Alarm LED: Indicates the panel posted an alarm event record into the corresponding display queue.

3. Supervisory LED: Indicates the panel posted a supervisory event record into the corresponding display queue.

4. Disable/Test LED: Indicates part of the system is disabled or is currently under test. Disabled components also signal a system trouble.

5. Monitor LED: Indicates the panel posted a monitor event record into the corresponding display queue.

6. Trouble LED: Indicates the panel posted a trouble event record into the corresponding display queue.

7. Ground Fault LED: Indicates a ground fault in the system wiring. Ground faults also signal a system trouble.

8. CPU Fail LED: Indicates an unexpected reboot or failure with the microprocessor. CPU failures also signal a system trouble.

9. Power LED: Indicates the panel has ac power.

10. Panel Silence/Acknowledge button/LED: Turns off the panel buzzer and acknowledges all events. The Panel Silenced LED indicates that all off normal events have been acknowledged and the internal buzzer is off.

11. Status button: Displays the Status menu from which you can identify active or disabled points in the system.

12. Help button: Provides additional information for the event record selected on the display.

Controls and indicators behind the flip-down cover
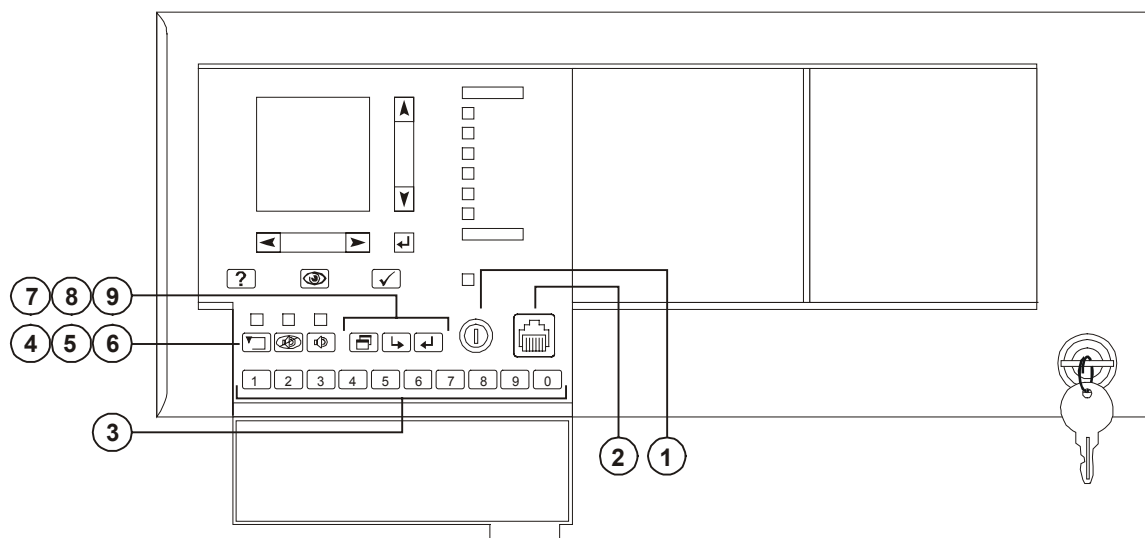
1. Enable Controls key switch: Gives priority access to control functions reserved for operators with Level 2 access.

2. Barcode scanner jack: Input point for optional barcode scanner.

3. Numeric keypad: Numbered buttons for entering data and selecting menu options.

4. Reset button: Restores devices or zones in alarm or trouble to their standby condition. The LED indicates when the panel is resetting.

5. Alarm Silence button: Turns active notification appliances off according to the panel programming. Pressing Alarm Silence a second time turns them back on. The LED indicates when the panel is in alarm and operating with notification appliances turned off.

6. Drill button: Turns notification appliances on according to the panel programming but does not place the panel in alarm. The LED indicates when the panel is in Drill mode.

7. Menu button: Displays the operator menus.

8. Delete button: Returns to the previous menu or back spaces the cursor.

9. Enter button: Press the Enter button to accept information from the operator or continue to the next item.

Controls and indicators on the zone annunciator card
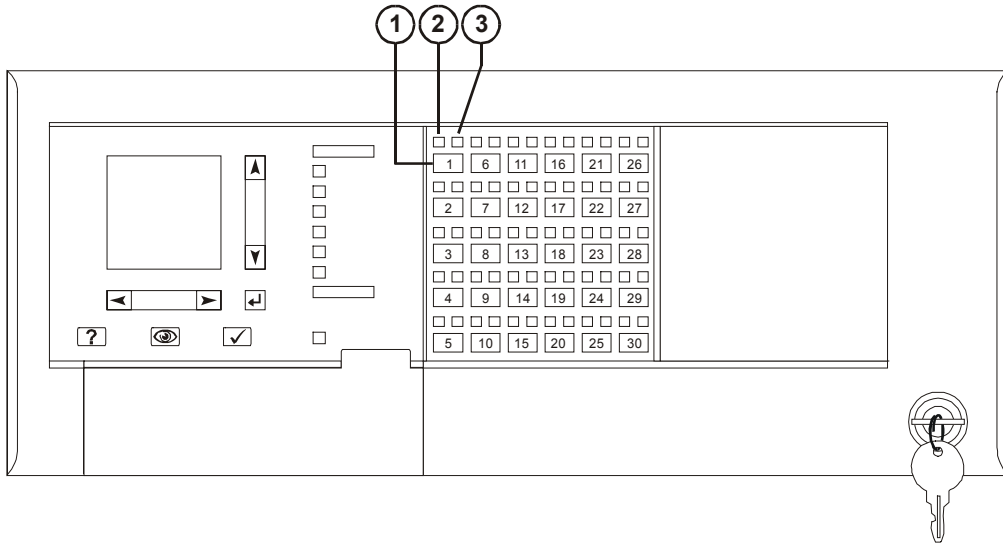
1. Zone display button: Displays an event record for each device in the corresponding zone that signaled an alarm.

2. Zone active LED: Indicates a device in the corresponding zone signaled an alarm condition.

3. Zone trouble LED: Indicates a device or wiring fault in the corresponding Zone.

Note: ULC requires that every fire panel have the capability to visually display system status by means of specific indicators for each zone. All status changes must clearly indicate that the information is an Alarm (ALM), Supervisory (SUP), Trouble (TBL), or Monitor (MON).

Interpretation of screen displays

```
HH:MM:SS    MM/DD




     System
     Normal

Project Name


Alarm History:
nnnn
```

This is what the panel display looks like when there are no event records posted in a display queue.

HH:MM:SS is the current time in hours, minutes, and seconds

MM/DD is the current month and date

nnnn is the number times the panel went into alarm since being placed into service

```
HH:MM:SS
Axxx Dxxx

▶nnn event name
Custom message 1
Custom message 2

 nnn event name
Custom message 1
Custom message 2


ALM SUP TRBL MON
aaa sss  ttt mmm
```

This is what the panel display looks like when there are event records posted in a display queue.

HH:MM:SS is the current time in hours, minutes, and seconds

Axxx is the current number of active points

Dxxx is the current number of disabled points

These items comprise the event record:

nnn is the posting sequence number (001 = first, 002 = second, and so on)

event name is the event produced when the device changed states. Refer to Table 1-1.

P:pp C:cc D:ddd is the address of the device that signaled the event (P = panel number, C = card number, D = device number)

The event record may also include a custom message that typically indicates the location of the device, depending on the panel programming.

These items indicate the content of the display queues:

aaa is the number of alarm event records (highest priority)

sss is the number of supervisory event records

ttt is the number of trouble event records

mmm is the number of monitor event records (lowest priority)

Table 1-1: Event descriptions

Event name	Event type	Description
ALARM ACTIVE	Alarm	Smoke detector active
ALARM VERIFY	Monitor	Alarm active. Performing auto reset.
AND GROUP	Alarm	And group active
BAD PRSONATY	Trouble	SIGA personality mismatch
BAD TYPE	Trouble	SIGA type mismatch
COMM FAULT	Trouble	Communication failure
DEV COMPATIB	Trouble	SIGA compatibility fault
DIRTY HEAD	Trouble	Dirty smoke detector. No compensation remaining
DISAB SOUND	Trouble	Sounder is disabled (EN–54 only)
DISABLED	Trouble	Device is disabled
GROUND FAULT	Trouble	Ground fault
HEAT ALARM	Alarm	Heat detector active
INTERNAL TBL	Trouble	Internal system trouble
LCL MONITOR	Monitor	Common monitor
LCL TROUBLE	Trouble	Generic trouble.
MAINT ALERT	Monitor	Dirty smoke detector. Some compensation remaining
MATRIX GROUP	Alarm	Matrix group active
MONITOR	Monitor	Active non-latching input circuit.
OBJECT RUN	Monitor	Service group is enabled and governing all defined objects
PREALARM	Monitor	Possible fire condition exists.
PULL STATION	Alarm	Manual fire alarm box active
SERVICE GROUP	Trouble	Service group active
SUPERVISORY	Supervisory	A device used to monitor a component of the fire suppression system is active
SWITCH	Monitor	Operator presses switch on LED/Switch card
TAMPER	Supervisory	Sprinkler tamper active
TEST	Trouble	A member of a Service group under test is activated
TIME CONTROL	Monitor	Time control active
TROUBLE	Trouble	Common trouble
TROUBLE OPEN	Trouble	Open detected on a supervised output device's field wiring
TROUBLE SHORT	Trouble	Short detected on a supervised output device's field wiring
UNEXPECT DEV	Trouble	Signature device not defined in database
WATERFLOW	Alarm	Water flowing through the sprinkler system
ZONE ALARM	Alarm	Alarm zone active
ZONE MONITOR	Monitor	Monitor zone active
ZONE SUPER	Supervisory	Supervisory zone active

QS4 Technical Reference Manual

Chapter 3

Operating instructions

Summary

This chapter provides instructions for operating the control panel.

Content

Instructions for the Level 1 operator (public mode access)

Tasks that do not require you to log in

What is it you want to do	This is how you do it
Silence the panel trouble buzzer	Press Panel Silence.
Get a list of all the active points on a panel	1. Press Status. 2. Choose All Active to get a list of all the active points. Choose Alarm to get a list of only the active alarm points. Choose Supervisory to get a list of only the active supervisory points. Choose Monitor to get a list of only the active monitor points. 3. Press DEL to backspace the cursor then enter the panel number. 4. Choose Display to view the list on the CPU/Display unit. — or — Choose Printer to print the list.
Identify points that are in trouble	1. Press Status. 2. Choose Trouble 3. Press DEL to backspace the cursor then enter the panel number. 4. Choose Display to view the list on the CPU/Display unit. — or — Choose Printer to print the list.
Identify active points in a Service Group that is being tested	1. Press Status. 2. Choose Test. 3. Press DEL to backspace the cursor then enter the panel number. 4. Choose Display to view the list on the CPU/Display unit. — or — Choose Printer to print the list.

Tasks that do not require you to log in

What is it you want to do	This is how you do it
Identify points that are disabled	1. Press Status. 2. Choose Disabled Pts. 3. Press DEL to backspace the cursor then enter the panel number. 4. Choose Display to view the list on the CPU/Display unit. — or — Choose Printer to print the list.
Identify output devices that are turned on	1. Press Status. 2. Choose Outputs 3. Press DEL to backspace the cursor then enter the panel number. 4. Choose Display to view the list on the CPU/Display unit. — or — Choose Printer to print the list.
Verify power supply voltage levels	1. Press Status. 2. Choose Internal 3. Press Enter. 4. Choose Display to view the list on the CPU/Display unit. — or — Choose Printer to print the list.
Get a list of smoke detectors that require servicing (DIRTY attribute greater than 80%)	1. Press Menu. 2. Choose Reports > Maintenance > Dirty>80%. 3 Enter the panel number. 4. Choose Display to view the list on the CPU/Display unit. — or — Choose Printer to print the list.

Tasks that do not require you to log in

What is it you want to do	This is how you do it
Get a list of smoke detectors that may require servicing (DIRTY attribute greater than 20%)	1. Press Menu. 2. Choose Reports > Maintenance > Dirty>20%. 3 Enter the panel number. 4. Choose Display to view the list on the CPU/Display unit. — or — Choose Printer to print the list.
Get the attributes for a single smoke detector	1. Press Menu. 2. Choose Reports > Maintenance > Single Device. 3. Enter the panel number. 4. Choose Display to view the list on the CPU/Display unit. — or — Choose Printer to print the list.
Get the attributes for every smoke detector on a single SLIC	1. Press Menu. 2. Choose Reports > Maintenance > Card Devices. 3 Enter the panel number. 4. Choose Display to view the list on the CPU/Display unit. — or — Choose Printer to print the list.
Perform a lamp test	1. Press Menu. 2. Choose Test > Lamp Test.

Instructions for the Level 2 operator (emergency mode access)

Tasks that require you to log on as a Level 2 operator

What is it you want to do	This is how you do it
Log onto the panel as a Level 2 operator	Turn the Enable Controls key 1/4 of a turn clockwise. — or — 1. Press Menu. 2. Choose Login then enter the password required for Level 2 access.
Reset the panel	Press System Reset.
Turn off alarm signaling circuits when the panel is in alarm (Alarm Silence)	Press Alarm Silence.
Turn on alarm signaling circuits when the panel is not in alarm (Drill)	Press Drill then Enter.
Get a list of all events processed on a panel	1. Press Menu. 2. Choose Reports > History. 3. Enter the panel number. 4. Choose Display to view the list on the CPU/Display unit. — or — Choose Printer to print the list.
Change the password required for Level 1 access	1. Press Menu. 2. Choose Program > Edit Password > Level 1. 3. Enter the new password.
Switch automatic detectors to their alternate sensitivity settings	1. Press Menu. 2. Choose Activate > Alt Sens.
Switch automatic detectors to their primary sensitivity settings	1. Press Menu. 2. Choose Restore > Prm Sens.

Tasks that require you to log on as a Level 2 operator

What is it you want to do	This is how you do it
Distribute event records according to their alternate message routing	1. Press Menu. 2. Choose Activate > Alt Msg Route.
Distribute event records according to their primary message routing	1. Press Menu. 2. Choose Restore > Prm Msg Route.
Disable a Zone	1. Press Menu. 2. Choose Disable > Zone. 3. Select a Zone from the pick list then press Enter.
Enable a Zone	1. Press Menu. 2. Choose Enable > Zone. 3. Select a Zone from the pick list then press Enter.
Disable a device	1. Press Menu. 2. Choose Disable > Device. 3. Enter the device address, where: PP is the panel number (01) CC is the card number DDD is the circuit or device number
Enable a device	1. Press Menu. 2. Choose Enable > Device. 3. Enter the device address, where: PP is the panel number (01) CC is the card number DDD is the circuit or device number

Instructions for the Level 3 operator (maintenance mode access)

Tasks that require you to log on as a Level 3 operator

What is it you want to do	This is how you do it
Log onto the panel as a Level 3 operator	1. Press Menu. 2. Choose Login then enter the password required for Level 3 access.
Change the password required for Level 2 access	1. From the Main Menu, select Program. 2. Select Edit Password. 3. Select Level 2 then enter the new password.
Get a list of all the hardware and software components installed on a panel and their revision levels	1. Press Menu. 2. Choose Reports > Revision. 3. Enter the panel number. 4. Choose Display to view the list on the CPU/Display unit. — or — Choose Printer to print the list.
Set the system time and date	1. Press Menu. 2. Choose Program > Time/Date. 3. Choose Enter Time, then press DEL until the display shows HHMMSS. Enter the time in 24–hour format where HH is the hour, MM is the minutes, and SS is the seconds. **Example:** To set the time for 1:00 p.m., enter 130000. 4. Select Enter Date. Enter the date where MM is the number of the month, DD is the date, and YYYY is the year. **Example:** To set the date for January 1, 2001, enter 01012001.

Tasks that require you to log on as a Level 3 operator

What is it you want to do	This is how you do it
Turn on an output circuit **Note:** A typical system may assign manual override functions a high priority level, alert responses a low priority, and alarm responses a medium priority.	1. Press Menu. 2. Choose Activate > Output. 3. Enter the output circuit's address, where PP is the panel number, CC is the card number, and DDD is the circuit number. 4. Choose Steady to change the circuit's output to always on Choose 20 BPM to change the circuit's output to a 20 beat per minute signal rate (On = 2–1/2 s; Off = 2–1/2 s). Choose 120 BPM to change the circuit's output to a 120 beat per minute signal rate (On = 1/4 s; Off = 1/4 s). Choose Temporal to change the circuit's output to a 3–3–3 pattern. 5. Choose High Priority.
Turn off an output circuit	1. Press Menu. 2. Choose Restore > Output. 3. Enter the output circuit's address, where PP is the panel number, CC is the card number, and DDD is the circuit number. 4. Choose Off.
Turn an LED on	1. Press Menu. 2. Choose Activate > LED. 3. Choose one of the following: Steady to turn the LED on Fast Blink to have the LED flash at a fast rate Slow Blink to have the LED flash at a slow rate 4. Enter the LED's address where GG is the group number, SS is the switch number, and L is the LED number.
Turn an LED off	1. Press Menu. 2. Choose Restore > LED. 3. Choose Off 4. Enter the LED's address where GG is the group number, SS is the switch number, and L is the LED number.

Tasks that require you to log on as a Level 3 operator

What is it you want to do	This is how you do it
Disable or enable an And Group, Matrix Group, or Time Control	1. Press Menu. 2. Choose Disable or Enable. 3. Choose And if an And group, Matrix if a Matrix group, or Time Control if a time control. 4. Pick a group from the appropriate list and press Enter.
Disable or enable a switch on a zone display	1. Press Menu. 2. Choose Disable > Switch. — or — Enable > Switch. 3. Enter the switch address, where GG is the group number, and SS is the switch number.
Disable or enable the mapping function on an SLIC	1. Press Menu. 2. Choose Disable > Loop Mapping. — or — Enable > Loop Mapping. 3. Enter the card address for the SLIC.
Start a Service Group test	1. Press Menu. 2. Choose Test > Start Test. 3. Select a Service group from the pick list and press Enter.
Cancel a Service Group test **Note:** The panel automatically resets after you cancel a test.	1. Press Menu. 2. Choose Test > Cancel Test. 2. Select a Service group from the pick list and press Enter.

Instructions for the Level 4 operator (service mode access)

What is it you want to do	This is how you do it
Log onto the panel as a Level 4 operator	1. Press Menu. 2. Choose Login then enter the password required for Level 4 access.
Change the password required for Level 3 access	1. Press Menu. 2. Choose Program > Edit Password > Edit Password 3. Choose Level 3 then enter the new password.
Change the password required for Level 4 access	1. Press Menu. 2. Choose Program > Edit Password > Edit Password 3. Choose Level 4 then enter the new password.
Restart a panel	1. Press Menu. 2. Choose Program > Restart > Panel 3. Enter the panel's address.
Reset the alarm history counter	1. From the Main Menu, select Program. 2. Select Reset. 3. Enter the panel's address.

QuickReference list

What is it you want to do	Required access level			
	L1	L2	L3	L4
Change smoke detector sensitivity settings to their alternate values		✓	✓	✓
Change smoke detector sensitivity settings to their primary values		✓	✓	✓
Change the current state of an LED (manual override)			✓	✓
Change the current state of an output circuit (manual override)			✓	✓
Change the password required for Level 1 access		✓	✓	✓
Change the password required for Level 2 access			✓	✓
Change the password required for Level 3 access				✓
Change the password required for Level 4 access				✓
Disable or enable a device		✓	✓	✓
Disable or enable a switch on a zone display			✓	✓
Disable or enable a zone		✓	✓	✓
Disable or enable all the devices on a single card				✓
Disable or enable an And Group, Matrix Group, or Time Control			✓	✓
Disable or enable the mapping function on an SLIC			✓	✓
Get a list of all the active points on a panel	✓	✓	✓	✓
Get a list of all the hardware and software components installed on a panel and their revision levels			✓	✓
Get a list of smoke detectors that may require servicing (DIRTY attribute greater than 20%)	✓	✓	✓	✓
Get a list of smoke detectors that require servicing (DIRTY attribute greater than 80%)	✓	✓	✓	✓
Get the attributes for a single smoke detector	✓	✓	✓	✓
Get the attributes for all the smoke detectors on a single SLIC	✓	✓	✓	✓
Identify output devices that are turned on	✓	✓	✓	✓
Identify active points in a Service Group that is being tested	✓	✓	✓	✓
Identify points that are disabled	✓	✓	✓	✓
Identify points that are in their active state	✓	✓	✓	✓
Identify points that are in trouble	✓	✓	✓	✓
Log onto the panel as a Level 2 operator		✓	✓	✓
Log onto the panel as a Level 3 operator			✓	✓
Log onto the panel as a Level 4 operator				✓
Perform a lamp test	✓	✓	✓	✓

What is it you want to do	Required access level			
	L1	L2	L3	L4
Reset the alarm history counter				✓
Reset the panel		✓	✓	✓
Restart the panel				✓
Restore an LED to its previous state			✓	✓
Restore an output circuit to its previous state			✓	✓
Route off-normal signals to the alternate set of panels used to post messages		✓	✓	✓
Route off-normal signals to the primary set of panels used to post messages		✓	✓	✓
Set the system time and date			✓	✓
Silence the panel trouble buzzer	✓	✓	✓	✓
Start a Service Group test			✓	✓
Cancel a Service Group test			✓	✓
Turn off alarm signaling circuits when the panel is in alarm (Alarm Silence)		✓	✓	✓
Turn on alarm signaling circuits when the panel is not in alarm (Drill)		✓	✓	✓
Verify power supply voltage levels	✓	✓	✓	✓

Chapter 6

Maintenance instructions

Summary

This chapter provides instructions for maintaining the system.

Content

Pseudo point definitions

Table 6-1: Main Panel pseudo points

LCD Indication	Event Type	Definition
Panel xx Card Communications	Trouble	CPU has failed to communicate with the option card at address xx.
Panel 01 Reset Extension	Monitor/Trouble	Signature loop is still resetting.
Panel 01 Service Active Trouble	Trouble	Service group was restored with a device still in the active condition.
Pnl 0x Database Incompatible	Trouble	Changes made to the system programming on the control panel were not updated in this unit.
Panel 01 Reboot Fault		Control panel CPU restarted unexpectedly.
Panel 0x, CH1 Communications	Trouble	Annunciator is not communicating on RS485 channel 1.
Panel 01 Task Failure	Trouble	Internal processing fault.
Card xx Setup Mismatch	Trouble	CPU encountered problem configuring the option card at address xx.
Dailer Setup Mismatch	Trouble	A problem has occurred with the CPU configuring the dialer card.
Power Supply Setup Mismatch	Trouble	A problem has occurred with the CPU configuring the POWER supply card.
Panel 01 LED/Switch display	Trouble	LED/Switch card is not connected.
Panel 0x, CH2 Communications	Trouble	Annunciator is not communicating on RS485 channel 2.
Pnl 01 Database Supervision	Trouble	Internal CPU memory failure
Panel 01 Code Supervision	Trouble	Internal CPU memory failure
Panel 01, Call For Service	Trouble	Internal CPU processing error
Panel 01, ROM Supervision	Trouble	Internal CPU memory failure
Panel 01 RS232 Port Fault	Trouble	
Panel 01 Unexpected Card	Trouble	CPU detected an option card not defined in the database.
Panel 01 Switch Latched	Trouble	Button either on the main display or on an LED/Switch card has been pressed too long.
Panel 01 Loop Database Fault	Trouble	Internal CPU memory failure with Signature data.

Table 6-2: Remote Annunciator pseudo points

LCD Indication	Event Type	Definition
Ann 0x Service Active Trouble	Trouble	Indicates that a device was left in an active condition after service group has restored.
Ann 0x Database Incompatible	Trouble	Indicates that the data
Annunciator 0x Reboot Fault	Trouble	Indicates CPU has restarted due to internal processing failure.

LCD Indication	Event Type	Definition
Ann 0x, CH1 Communications	Trouble	Indicates failure to communicate with the main panel on RS485 channel 1.
Annunciator 0x Task Failure	Trouble	Internal software failure
Ann 0x, LED/ Switch Display	Trouble	Indicates that a SL30-x has been disconnected or is connected but not defined.
Ann 0x, CH2 Communications	Trouble	Indicates failure to communicate with the main panel on RS485 channel 2.
Ann 0x Database Supervision	Trouble	Internal memory failure
Ann 0x Code Supervision	Trouble	Internal memory failure
Ann 0x, Call For Service	Trouble	Internal software failure
Ann 0x ROM Supervision	Trouble	Internal memory failure
Ann 0x RS232 Port Fault	Trouble	
Ann 0x Program Mode	Trouble	Panel has entered program mode.
Ann 0x Switch Latched	Trouble	Indicates that a button either on the main display or on an SL30-x has been pressed to long.
Annunciator 0x Power Fault	Trouble	Indicates a loss of power on either of the 24vdc inputs to the RAI card.

Table 6-3: Power Supply pseudo points

LCD Indication	Event Type	Definition
Battery Charger Fault	Trouble	This fault will occur when the battery charger charging voltage falls below 20.4vdc.
Battery Wiring or Battery Fault	Trouble	Caused by an open in the battery wiring or if the batteries are below 20.4vdc.
Aux Power 1/2 Shorted	Trouble	This point occurs when Aux 1 or Aux 2 power is shorted on the PS6
Aux Power 3 Shorted	Trouble	This point occurs when Aux 3
Smoke Power Shorted	Trouble	This point occurs when smoke power is shorted
Primary AC Power Failure	Trouble	Caused by loss of AC or very low AC.
Excessive Battery Current	Trouble	Will go active when PS6 detects over current condition
Check System Wiring	Trouble	Indicates a ground fault exists on field wiring.
Power Supply Card RAM Fault	Trouble	Internal memory fault
Power Supply Card ROM Fault	Trouble	Internal memory fault
Power Supply EEPROM Fault	Trouble	Internal memory fault

Table 6-4: SLIC card pseudo points

LCD Indication	Event Type	Definition
Card 0x, Loop Wiring Problem	Trouble	Indicates a break on a Class A signature loop
Card 0x Map Fault	Trouble	Signature map is different than the one written in memory

LCD Indication	Event Type	Definition
Card 0x, Mapping In Progress	Monitor	Indicates Signature devices are in the process of being mapped.
Card 0x Unconfig. Device	Trouble	Indicates that a new signature device has been detected on a loop.
Card 0x, Line Initialization	Monitor	Occurs after power up or a restart. Indicates signature devices are being initialized.
Card 0x, Loop Ground Fault	Trouble	Indicates a ground fault on a signature module.
Card 0x, LIM Driver Fault	Trouble	Internal hardware failure.
Card 0x, RAM Supervision	Trouble	Internal memory fault
Card 0x, ROM Supervision	Trouble	Internal memory fault
Card 0x, EEPROM Supervision	Trouble	Internal memory fault

Table 6-5: Dialer pseudo points

LCD Indication	Event Type	Definition
Primary Phone Line:check Telco	Trouble	Telephone line has low or no voltage
Secondary Phone Line:check Telco	Trouble	Telephone line has low or no voltage
Pri. Receiver Failed to answer	Trouble	Dialer attempted to dial event to CMS but did not get an answer.
Sec. Receiver Failed to answer	Trouble	Dialer attempted to dial event to CMS but did not get an answer.
Dialer Account 1 Fault	Trouble	Indicates dialer did not get proper handshake for event sent to the CMS for Account 1.
Dialer Account 2 Fault	Trouble	Indicates dialer did not get proper handshake for event sent to the CMS for Account 2.
Dialer Account 3 Fault	Trouble	Indicates dialer did not get proper handshake for event sent to the CMS for Account 3.
Dialer Account 4 Fault	Trouble	Indicates dialer did not get proper handshake for event sent to the CMS for Account 4.
Dialer Account 5 Fault	Trouble	Indicates dialer did not get proper handshake for event sent to the CMS for Account 5.
Dialer Account 6 Fault	Trouble	Indicates dialer did not get proper handshake for event sent to the CMS for Account 6.
Dialer Account 7 Fault	Trouble	Indicates dialer did not get proper handshake for event sent to the CMS for Account 7.
Dialer Account 8 Fault	Trouble	Indicates dialer did not get proper handshake for event sent to the CMS for Account 8.
Dialer ROM Fault	Trouble	Internal memory fault
Dialer Queue Overflow	Trouble	Indicates that too many dialer messages are trying to be sent.
Dialer Card, RAM Supervision	Trouble	Internal memory fault

Table 6-6: General CPU pseudo points

LCD Indication	Event Type	Definition
Startup Response	Monitor	Monitor point that goes active on system startup or after restart.
First Alarm	Alarm	Occurs anytime that the system goes into alarm for the first time.
First Supervisory	Supervisory	Occurs anytime that the system goes into supervisory for the first time.
First Trouble	Trouble	Occurs anytime that the system goes into a trouble for the first time.
First Monitor	Monitor	Occurs anytime that the system goes into a monitor condition for the first time.
Evacuation		
Drill	Monitor	This point will go active anytime drill is pressed.
Alarm Silence	Monitor	This point will go active anytime alarm silence is pressed.
Two Stage Expiration		
Reset	Monitor	This point goes active anytime reset is pressed.
Reset Phase 1	Monitor	Active during the power down phase of reset.
Reset Phase 2	Monitor	Active during the retard phase of reset.
Reset Phase 3	Monitor	Active during the restoration phase of reset.
First Disable	Trouble	Activated the first time an item is disabled from the front menu.
First Test	Trouble	Activated the first time a service group is started from the front menus.
Two Stage Timer Started		
User Trouble	Trouble	Triggered by custom programming.

Maintenance tasks

What is it you want to do	This is how you do it
Change the fuse	1. Switch the circuit breaker that supplies ac power to the control panel to the OFF position. 2. Expose the ac terminal block and pull out the fuse holder. 3. Replace the blown fuse with a new one of the same type and size. 4. Plug the fuse holder back into the ac terminal block. 5. Switch the circuit breaker that supplies ac power to the control panel to the ON position.

Replacing a SIGA device when mapping is disabled)	**WARNING:** Replacing a device when mapping is disabled leaves the area unprotected. The control panel does not automatically reassign responses to replaced devices when mapping is disabled.
	
	To replace devices on a loop that operates with mapping disabled, you must first enable mapping then accept the map. After you replace your devices, you can disable mapping on the loop.
	
	Note: Replacement devices must be the same model as the devices being replaced.
	
	1. Press Menu.
	
	2. Log onto the panel as a Level 4 operator.
	
	3. Choose Enable > Loop Mapping.
	
	4. Enter the card number of the SLIC that connects to the device you want to replace.
	
	   Wait until mapping finishes before continuing.
	
	5. Choose Cards > Edit.
	
	6. Enter the card number of the SLIC that connects to the device you want to replace.
	
	7. Choose Accept Map.
	
	   If actual and expected data for detectors and modules are the same, press Enter.
	
	8. Choose Exit > Exit > Save and Sync.
	
	9. Replace the device.