The Great Lakes Construction Co.

TRANSMITTAL

No. 174

10737 Medallion Drive
Cincinnati, Ohio 45241

PROJECT:	ODOT 150085 HAM 71-1.34	**DATE:**	October 26, 2017
TO:	ODOT District 8 505 South SR 741 Lebanon, OH 45036	**REF:**	Fire Alarm & Linear Heat O&M Line Item: #378.00 & #402.00
ATTN:	Marvin Lennon		

WE ARE SENDING		SUBMITTED FOR:		ACTION TAKEN:	
	Shop Drawings		Approval		Approved as Submitted
	Letter	X	Your Use		Approved as Needed
	Prints		As Requested		Returned after Loan
	Change Order		Review and Comment		Resubmit
	Plans			X	Submit
	Samples	**SENT VIA:**			Returned
	Specifications	X	Attached		Returned for Correction
X	Other: User Manual		Separate Cover:		Due Date:

SUBMITTAL	COPIES	DATE	DESCRIPTION
TR85.15-174	1 pdf	10/26/2017	Fire Alarm & Linear Heat O&M Per Sheet 496/555, Section 1.06A & 511/555, Section 3.5

REMARKS

As-built requirement per Sheet 496/555, Section 1.06A.3 will be submitted with complete as-built set
CC: Joe Smithson, ODOT D8
    Darryl Meadows, CFD

Signed:

Jacob D. Elmore.

Operation & Maintenance Manual

Date:

SG Project Number:

Project Name

Project Address:

Installation by:

Architect:

Engineer:

Table of Contents

Description of System

Thank you for choosing SimplexGrinnell as the provider of your new

As of _____ ¨ẑwork on the project was certified by the   local AHJ, and your equipment
is operating according to our published specifications. Accordingly,   SimplexGrinnell is providing a
one (1) year warranty on our material, which is now in effect and will expire on

Unless specifically negotiated   or contracted otherwise, warranty service is   available during regular working
hours, i.e. 8:00 a.m. – 5:00 p.m. Monday through Friday, excluding holiday s. The warranty coverage does not
include preventative maintenance or equipment provided by others.

We want you to get the optimum performance from the equipment you have purchased from SimplexGrinnell,
but, if a warranty problem reported cannot be substantiat ed by SimplexGrinnell, an invoice will be sent for our
services.

SimplexGrinnell maintains its commitment to you   by providing warranty and maintenance services. Our
planned service agreements are tailored to you and your new system/equipment. Additionally, SimplexGrinnell
offers unparalleled Central Station monitoring services , designed to ensure peace of mind regarding the safety
of your facility and personnel.

Should you need warranty service or wish to discu   ss your maintenance needs, please call our service
department at (513) 342-9001. The following people are available to assist you:

Mr. Dan Kepple   Service Supervisor

SimplexGrinnell appreciates your business and wants to maintain a long-term business
partnership with you, our customer. Please feel free to call if you have any questions about the
project. We look forward to servicing you in the future.

Sincerely,

SimplexGrinnell, LLC

9685 Cincinnati- Dayton Road
West Chester, OH 45069

THE SIMPLEXGRINNELL WARRANTY/HARDWARE

1. **SimplexGrinnell Warranty statement:**

SimplexGrinnell warrants to the purchaser of new SimplexGrinnell product(s) that during the effective period of the warranty such product(s) shall be free of defects in workmanship and material.

.
2. **Warranty Period:**

The warranty period will terminate immediately following the earliest occurrence of either of the following:

> **Building Systems**
>
> 1. 18 months have elapsed following shipment if any system or subsystem from SimplexGrinnell to the customer site, or
>
> 2. 12 months have elapsed following the final connection operation and beneficial use of all or any part of the system.

3. **SimplexGrinnell Obligation Under the Terms of the Warranty:**

SimplexGrinnell sole responsibility shall be to repair, adjust, or replace at its option any SimplexGrinnell product which fails during this period provided purchaser has promptly reported such failure to SimplexGrinnell in writing. Replacement parts provided under warranty of products may contain used parts which are equivalent to new parts when used. Replacement parts will be warranted only for the balance of the equipment warranty. SimplexGrinnell agrees to continue to honor all of the unexpired warranties specified above on defective equipment after transfer of the equipment to purchaser's customer, provided purchaser's customer assumes the purchaser's obligations specified below.

EXCEPT FOR THE EXPRESS WARRANTIES STATED HEREIN, SIMPLEXGRINNELL DISCLAIMS ALL WARRANTIES ON PRODUCTS FURNISHED HEREUNDER, INCLUDING WITHOUT LIMITATION, ALL IMPLIED WARRANTIES OF MERCHANTABILITY AND FITNESS FOR A PARTICULAR PURPOSE, AND THE STATED WARRANTIES ARE IN LIEU OF ALL OBLIGATIONS OR LIABILITIES ON THE PART OF SIMPLEXGRINNELL ARISING OUT OF OR IN CONNECTION WITH THE PERFORMANCE OF THE PRODUCTS. THE SELLER SHALL NOT BE LIABLE FOR ANY DIRECT, INCIDENTAL OF CONSEQUENTIAL LOSS OR DAMAGE TO THE PURCHASER OR USER OF THIS EQUIPMENT ARISING OUT OF THE FAILURE OF THE EQUIPMENT TO OPERATE IN EXCESS OF THE PURCHASE PRICE OF SAID EQUIPMENT.
SimplexGrinnell makes no warranty and no warranty shall be deemed to exist, that purchaser holds the goods free of the claim of any third person by way of the patent infringement or the like.

4. **Purchaser's Obligations Under the Terms of Warranty:**
This warranty is contingent upon the proper installation and use of the product(s). Such warranty shall not apply if the product failure is the result of accident, unusual physical, electrical, or electro-mechanical stress, neglect, misuse, user programming errors, failure of electrical power, air conditioning, or humidity control, construction dust, damaging foreign substances, transportation or causes other than manufacturing defect. Purchaser agrees to provide full and free access to authorized SimplexGrinnell employees.

5. **Warranty Service Hours:**
Services provided under this warranty will be performed during 8:00AM to 5:00PM, Monday through Friday, excluding locally observed SimplexGrinnell holidays. Off hours response is available as an extra cost service option.

6. **Warranty Exclusions:**

1.   Labor, travel, and mileage for:

  i) Service outside of SimplexGrinnell normal business hours.

  ii) Program and/or label changes.

  iii) Failures due to external causes (lightning surges, construction dust, etc.) other than manufacturing defect.

2.   Electrical work external to the equipment supplied by SimplexGrinnell or maintenance of accessories, alterations, attachments or other devices not furnished by SimplexGrinnell.

3. Batteries.

4.   Coverage of equipment classed as a water flow monitoring/control devices installed in or on water piping.
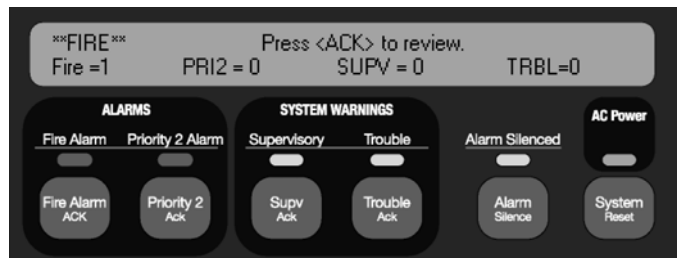
4100U AND 4100ES OPERATING INSTRUCTIONS
FOLLOWING AN ALARM, SUPERVISORY, OR TROUBLE CONDITION

Systems Using Global Acknowledge

| ALARM	SUPERVISORY/TROUBLE
RED LED FLASHES AND TONE ALERT PULSES	**YELLOW LED FLASHES AND TONE ALERT ON STEADY**

ALARM

1. Unlock and open the panel door. The appearance of the alphanumeric display depends on whether the Display 1st Alarm Option is enabled.

- **If Display 1st Alarm Option is enabled.** The display alternates between two screens similar to Screen 1 and Screen 2 (which is a detailed description of the 1st alarm) below.

Screen 1
```
**FIRE**              Press (ACK) to review.
FIRE = 1    PRI2=0     SUPV=0       TRBL=0
```
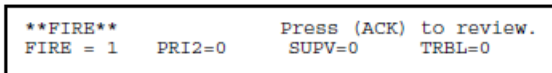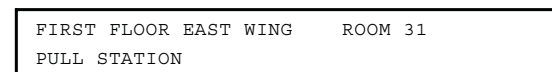
Screen 2
```
FIRST FLOOR EAST WING    ROOM 31
PULL STATION
```

- **If Display 1st Alarm Option is not enabled**. Only a screen similar to Screen 1 appears, indicating the total number of alarm conditions present on the system.

2. Press the <ALARM ACK> key under the flashing red LED. Read the alphanumeric display. The tone-alert turns off and the ALARM led changes from flashing to ON steady.

Silencing the Signals

1. Press the ALARM SILENCE key and read the display. The alphanumeric display reads "ALARM SILENCE IN PROGRESS" and the ALARM SILENCED LED turns on steady.

Note: The Disable switch on the front panel is not to be used during an alarm condition to silence the notification appliances.

Resetting the System

1. When the alarm condition has been cleared, restore or replace all affected devices (smoke detectors, motion sensors, etc.) in accordance with the instructions provided with each device.

2. Reset the system as follows:

- FIRE ALARM Condition. Press the SYSTEM RESET key.
- PRIORITY 2 ALARM Condition. Reset these conditions using either the System Reset key or a dedicated CONTROL key, located on left side of panel.

After a delay, the red ALARM LED flashes and the tone-alert sounds with a pulsing tone.
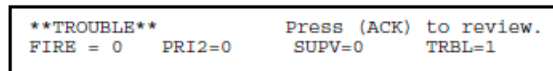
3. Press the <ALARM ACK> key under the flashing red LED. Continue to press the ALARM ACK> key until all alarm conditions have been acknowledged.

After a delay, the display reads "SYSTEM IS NORMAL".

SUPERVISORY/TROUBLE
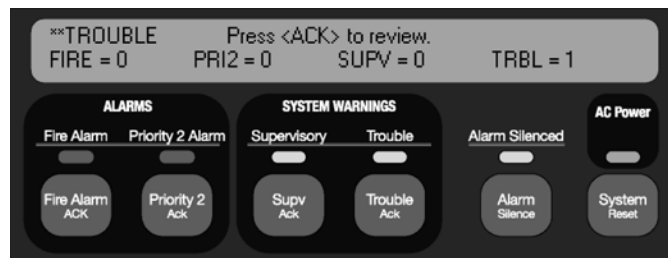
1. Unlock and open the panel door. The alphanumeric display shows the number of abnormal conditions. (This example describes managing a Trouble condition. A Supervisory condition is handled similarly.

```
**TROUBLE**           Press (ACK) to review.
FIRE = 0    PRI2=0      SUPV=0       TRBL=1
```

2. Press the <TBL ACK> key under the flashing yellow LED. Read and follow instructions on the alphanumeric display. The display shows the area and type of problem, as shown in the example below. The tone alert momentarily silences and then resounds.

```
FIRST FLOOR EAST WING    ROOM 31
FIRE MONITOR ZONE        OPEN CKT TROUBLE
```
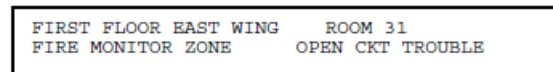
3. Press the <TBL ACK> key under the flashing yellow LED again to review the abnormal status. The alphanumeric display shows the area and type of problem, the tone-alert silences, and the SYSTEM TROUBLE LED turns ON steady. Read the alphanumeric display and then investigate the problem to determine its cause.

4. If a Trouble condition exists, restore or replace the defective equipment (switch, wire, device, etc.) in accordance with the equipment's instructions.

The Trouble condition automatically clears when the abnormal condition has been corrected.

After a short delay, the system returns to normal and displays the following.

```
        SYSTEM IS NORMAL
   9:27:40    TUE 29 NOV 00
```
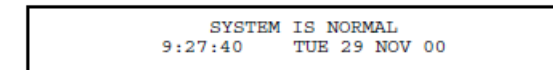
Note: If your system switch configuration does not match this sheet, consult Simplex for specific operations. Simplex is listed in the Yellow Pages.

In case of trouble, notify:

Name:_____

Address: _____

Phone #: _____

574-852

Rev. B

UD WOHLLENBEN

Qty.	Product ID	Description	Data Sheet
1	4100-9111	4100ES PRECONFIG DOMESTIC 120V	S4100-0031
2	4100-0011	FACTORY USE ONLY-AUDIO SHIPKIT	
1	4100-0634	POWER DISTRIBUTION MODULE 120V	S4100-0037
1	4100-1242	MESSAGE EXPANSION, 32 MINUTES	S4100-0034
1	4100-1252	AUDIO IF MODULE, SGL CHANNEL	S4100-0034
5	4100-1279	2 BLANK DISPLAY MODULE	S4100-0032
1	4100-1288	64/64 LED/SWITCH CONTROLLER	S4100-0032
1	4100-1294	LED/SWITCH SLIDE-IN LABEL KIT	S4100-0032
1	4100-1329	DIG. 100W AMP,6NAC,120VAC,70V	4100-0034
1	4100-2302	8 SLOT EXP BAY FILLER PANEL	S4100-0031
1	4100-2303	LEGACY CARD STABILIZER BRKT	
1	4100-6052	EVENT/POINT REPORTING DACT	S2080-0009
1	4100-9621	BASIC AUDIO W/MIKE-DIGITAL	S4100-0034
1	41002153	INDICATOR ONLY 3 BAY GLASS	
1	41007905	FACTORY BUILT-MAIN CONFIGURED	
1	4100-9924	4100ES RETROKT 3 BAY RED SLD D	4100-0044
1	565-233	4100 REMOTE INTERFACE II	
		New Panel Backbox/Door	
1	2975-9443	3 BAY BB/GDOOR/DRESS PNL RED	S4100-0037
2	2081-9276	BATTERY 33AH	S2081-0006
		Smoke above New Panel	
4	4098-9714	PHOTO SENSOR	S4098-0019
4	4098-9792	SENSOR BASE	S4098-0019
		Pull Station	
1	4099-9006	STATION-LED, DA PUSH ADDR	S4099-0005
		S/V's	
18	4906-9153	SPKR/STROBE MC WHITE	S4906-0003

4100ES
Fire Alarm System

Operator's
Manual

579-197
Rev. H

Simplex

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Cautions and Warnings

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

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

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

STATIC HAZARD - Static electricity can damage components. Handle as follows:
- Ground yourself before opening or installing components.
- Prior to installation, keep components wrapped in anti-static material at all times.

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

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

SYSTEM REACCEPTANCE TEST AFTER SOFTWARE CHANGES - To ensure proper system operation, this product must be tested in accordance with NFPA72 after any programming operation or change in site-specific software. Reacceptance testing is required after any change, addition or deletion of system components, or after any modification, repair or adjustment to system hardware or wiring.

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

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Chapter 9 Audio Operations 9-1

x

How to Use this Publication

Before you start using the *4100ES Fire Alarm Operator's Manual*, it's important to understand the typographic conventions used in this publication.

General Conventions

The following conventions are used in this publication to identify special names or text.

Convention	Meaning
Bold type	Indicates words or characters that you type. Unless it is specifically noted, you can type the text in lowercase or uppercase characters. For example, **cd access** means that you type the lowercase letters "cd" followed by a space and the lowercase word "access."
Italic type	Indicates information that the user must supply, such as filenames. For example, cd *directory_name* means that you type the letters "cd" followed by a space and a directory name. Indicates important terms or titles of publications.
"Text in quotes"	Indicates the title of a chapter or section of the manual, such as "How to Use This Publication."
• Bulleted lists	Provides you with information. They are also used to indicate alternatives in numbered procedural steps.
1. Numbered lists	Indicates procedures that you must carry out sequentially.

Keyboard Conventions

The following conventions are used to describe keys and key combinations.

Convention	Meaning
SHIFT	Key names appear in bold type and in capital letters and are referred to by their names only, without the word "key." For example, "press SHIFT" means press the key labeled "Shift."
CTRL+ALT+DEL	A plus sign (+) between two key names means that you hold down the first key while pressing the second key. For example, "press SHIFT+F1" means hold down the SHIFT key while pressing the F1 key. If the key sequence includes three or more key names, hold down all of the keys except for the last one, and then press and release the last key. For example, "press CTRL+ALT+DELETE" means hold down the CTRL and ALT keys, and then press the DELETE key.
ALT,F,P	A comma between key names means that you press and release the first key, and then press and release the second key, and so on. For example, "press ALT, F, P" means press ALT and release it, press F and release it, then press P and release it.
Arrow keys	Arrow keys refers to the UP ARROW ($\uparrow$), DOWN ARROW ($\downarrow$), LEFT ARROW ($\leftarrow$), and RIGHT ARROW ($\rightarrow$) keys.

Using the Mouse

The following table lists four common terms related to mouse operation that you should know. Use the left mouse button for all actions unless instructed otherwise.

Note: When using the mouse button to point, click, or drag, keep the mouse steady; otherwise, you may select the wrong item.

Term	Function
Point	Move the mouse until the tip of the mouse pointer rests on the screen object or area that you wish to select.
Click	Point to the item you want to select, then press and immediately release the mouse button.
Double-click	Point to the item you want to select, then press and immediately release the mouse button twice in rapid succession.
Drag	Point to the item you want to move, then press and hold down the mouse button while you move the mouse to the desired location. Once you have moved the mouse pointer to the position you want, release the mouse button.

Chapter 1
Basic Concepts and Operations

Introduction

This chapter provides an overview of the operator interface panel and describes the normal appearance of the operator interface panel.

In this Chapter

Refer to the page number listed in this table for information on a specific topic.

Topic	See Page #
Basic System Description	1-2
Normal Appearance of Operator Interface Panel	1-4

Basic System Description

Overview

The Simplex 4100ES Fire Alarm Control Panel (FACP) has three general functions.

- It monitors fire alarm *initiating points* (smoke detectors, heat detectors, and pull stations).

- It activates fire alarm *notification appliances* (horns, strobes, audio evacuation messages) when an initiating point activates.

- It monitors and controls auxiliary building equipment (fan dampers, relays, security devices).

Note: The term point is used extensively throughout this manual. It is a generic term used to refer to an individual component of the system, such as a single smoke detector, a single pull station, etc.)

The operator interface, shown in Figure 1-1, allows a system operator to control and monitor the facility-specific components connected to the FACP.

Facility-Specific Control Keys

Labels shown are examples.

Entry Keypad
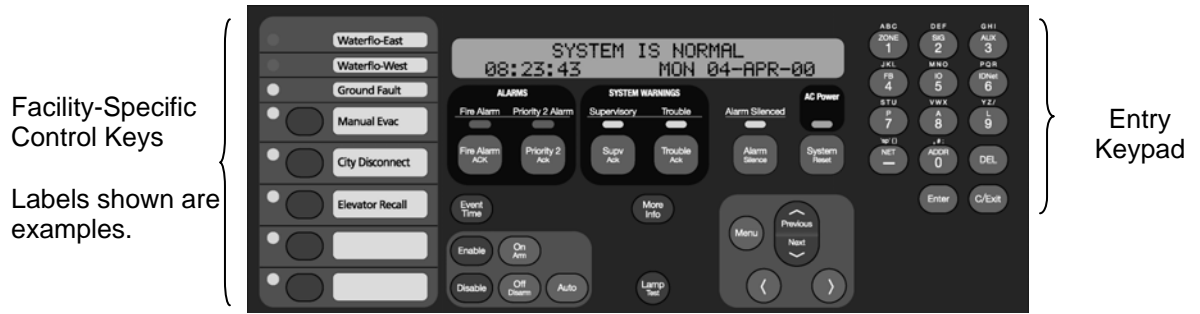
Figure 1–1. Operator Interface

Table 1–1. Components of the Operator Interface

LED/Key	Description	Refer To
Fire Alarm LED and Fire Alarm ACK Key	The Fire Alarm LED flashes to indicate the presence of an unacknowledged alarm condition. Other components of the system, such as the horns and strobes, also activate to indicate the presence of an alarm. The FIRE ALARM ACK key allows you to indicate that you have observed the presence of an alarm.	Chapter 2
Alarm Silenced LED/Alarm Silence Key	Pressing the ALARM SILENCE key provides a means of silencing the building's audible notification appliances (horns). The LED indicates when this key has been used.	Chapter 2

Basic System Description, *Continued*

Table 1-1. Components of the Operator Interface (*continue*d)

LED/Key	Description	Refer To
System Warning Keys and LEDs	The System Warning LEDs – Supervisory and Trouble – indicate when abnormal, non-fire conditions occur to the fire alarm's wiring or devices. The System Warning keys – SUPV ACK and TROUBLE ACK – allow an operator to acknowledge the presence of the abnormal condition.	Chapter 3 for Troubles. Chapter 4 for Supervisory Conditions
System Reset Key	Pressing this key directs the panel to reset all attached devices and clear all acknowledged alarms, troubles, and supervisory conditions.	Chapter 2
AC Power LED	Indicates the presence of AC power at the panel.	N/A
Event Time Key	Used to display the time at which an acknowledged alarm, trouble, or supervisory condition occurred.	Chapter 6
Entry Keypad	Used to call up points for monitoring and control.	Chapter 5
Facility-Specific Control Keys	These are programmable keys. Typical functions include manual evacuation, ground fault monitor, etc.	N/A
Enable/Disable Keys	Pressing these keys allows you to enable or disable devices attached to the panel.	Chapter 6
On/Off/Auto Keys	Pressing these keys allows you to force a device (such as a relay) ON or OFF. The Auto key returns control of the device to the panel.	Chapter 6
Arm/Disarm Keys	Used with security points. These keys allow you to turn security devices on (arm) or off (disarm).	Chapter 6
Alphanumeric Display	Displays text describing abnormal conditions for devices attached to the panel (i.e., smoke detector in main lobby is in alarm). Also displays system prompts and messages.	
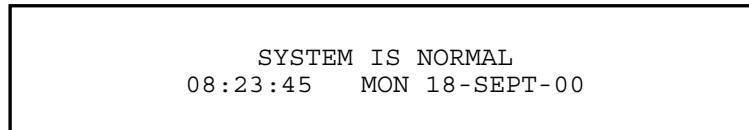
Important Note: The degree to which you are allowed to control the system depends on the passcode assigned to you. See "Logging in and Out of the System" for details on this.

Normal Appearance of Operator Interface Panel

Description

The operator interface panel shows the following under normal conditions.

- Green power LED is ON – indicating the panel is receiving AC Power.
- All other LEDs off.
- Alphanumeric display reports that the system is normal, as shown below.

```
          SYSTEM IS NORMAL
    08:23:45    MON 18-SEPT-00
```

Note: If the appearance of the operator interface panel is not as shown above, refer to the information in Chapters 2, 3, and 4 for instructions on managing the alarm, supervisory, or trouble condition.

Chapter 2
Alarm Conditions

Introduction

An alarm condition occurs when an initiating device (such as a manual pull station, smoke detector, etc.) activates. The FACP indicates the presence of the alarm condition through messages it displays on the alphanumeric display, by flashing the ALARM indicator, and by activating the building's notification appliances (horns and strobes).

Note: An alarm condition is a serious event, indicating the possibility of fire danger. In addition to using the operator interface panel to investigate and manage alarm conditions as described in this chapter, you should also be aware of any facility-specific procedures that you may be required to follow.

In this Chapter

Refer to the page number listed in this table for information on a specific topic.

Topic	See Page #
Acknowledging an Alarm	2-2
Silencing an Alarm	2-5
Resetting the System	2-6
Disabling a Point that Remains in Alarm	2-8

Acknowledging an Alarm

How the FACP Indicates that an Alarm has Occurred

When an alarm condition is detected by the FACP, the panel does the following to indicate the presence of the alarm.

- Red LED, labeled Fire Alarm flashes
- Tone-alert (piezo buzzer) pulses
- LEDs on remote annunciators may illuminate
- The alphanumeric display on the interface panel indicates an alarm condition. The exact manner in which the alphanumeric display reports information for the alarm condition depends on whether the system's Display First Alarm Option is enabled.

    − **If Display 1st Alarm Option is Enabled.** The display alternates between two screens similar to Screen 1 and Screen 2 shown below. Screen 1 is a tally screen indicating the total number of fire alarms, priority 2 alarms, supervisory conditions, and trouble conditions present on the panel. Screen 2 is a detailed description of the first alarm received by the panel.

Screen 1
```
**FIRE**              Press (ACK) to review.
FIRE = 1    PRI2=0    SUPV=0      TRBL=0
```

Screen 2
```
FIRST FLOOR EAST WING    ROOM 31
PULL STATION
```

    − **If Display 1st Alarm Option is not enabled**. Only a screen similar to Screen 1 appears, indicating the total number of alarm conditions present on the system.

Overview – Acknowledging Alarms

The first step in managing an alarm condition is to *acknowledge* the alarm. Acknowledging an alarm does two important things:

- It records the time and date at which you observed the presence of an alarm, trouble, or supervisory condition on the operator interface panel and stores that information in the system's historical log.
- When you press the Acknowledge key, the system displays specific data on the location of the alarm.

It is important to understand that the FACP can be configured with either *Global* or *Individual* Acknowledge. These options function as follows:

- **Global Acknowledge.** When global acknowledge is enabled, one press of the ALARM ACK key acknowledges *every* abnormal point currently reporting an alarm status. This is helpful when a series of devices enter an alarm state (for example, all of the smoke detectors in an area of the building) and you want to acknowledge all of them at the same time.
- **Individual Acknowledge.** If individual acknowledge is enabled, the ALARM ACK key must be pressed to individually acknowledge each alarm. Individual acknowledge must be selected if the panel is providing proprietary receiving service in accordance with NFPA72.

The ALARM ACK key, which is used to acknowledge alarms (either globally or individually), is located just beneath the SYSTEM ALARM LED

Acknowledging an Alarm, *Continued*

Globally Acknowledging Alarms

Use the following procedure if the Global Acknowledge option is enabled on your system.

1. Unlock and open the enclosure door. Read the alphanumeric display on the interface panel. It reports the number of alarm conditions as shown below.

```
**FIRE**              Press <ACK> to review.
Fire =1     PRI2 = 0     SUPV = 0     TRBL=0
```

2. Press the ALARM ACK key. Read and follow the instructions on the alphanumeric display. After you press the ALARM ACK key, the system responds as follows:

    *   The tone-alert silences and the alphanumeric display reports pertinent information about the alarm, such as the following:

```
FIRST FLOOR EAST WING            ROOM 31
PULL STATION                     FIRE ALARM
```

    *   The SYSTEM ALARM LED changes from flashing to steady ON, and all alarm conditions are acknowledged.

    *   Pressing the ALARM ACK key again displays information on the next alarm. Continue to do this to review all alarms in the system.

Individually Acknowledging Alarms

Use the following procedure if the Individual Acknowledge option is enabled on your system.

1. Unlock and open the enclosure door. Read the alphanumeric display on the interface panel. It reports the number of alarm conditions as shown below.

```
**FIRE**              Press <ACK> to review.
Fire =1     PRI2 = 0     SUPV = 0     TRBL=0
```

2. Press the ALARM ACK key. A report similar to the one shown below appears. Read and follow the instructions on the alphanumeric display.

```
     FIRST FLOOR EAST WING      ROOM 31
     Press ACK key to acknowledge ALARM
        PULL STATION            ALARM
```

Acknowledging an Alarm, *Continued*

Individually Acknowledging Alarms

3. Press the ALARM ACK key again. Read the report data. Repeat this procedure to review all reports. Reports are displayed in chronological order.

    - Tone-alert silences when the last unacknowledged alarm is acknowledged.
    - System Alarm LED is ON, but is no longer flashing.

Silencing an Alarm

Overview

When an alarm condition exists, various signals (horns and strobes), auxiliary relays, the city connection (which is the link to the local fire department or central station monitoring service), and the tone-alert may activate. The ALARM SILENCE key turns OFF all devices that are programmed to turn off when it is pressed. Typically, this will be the audible notification appliances (horns).

Note: Depending on the programming of the system, some devices may not turn off when the ALARM SILENCE key is pressed.

At a minimum, the following occurs when the key is pressed.

- Turns OFF signal circuits (which usually connect to the Notification Appliances)
- Turns ON the ALARM SILENCED LED
- Displays a message indicating the ALARM SILENCE function is activated

You should be aware that the following functions affect the operation of the ALARM SILENCE function.

- If a **Coded Input Device** (typically a pull station) activates, the <ALARM SILENCE> key may be ignored until this function has completed coding. Notification appliances (horns) cannot be silenced when a coded station is in alarm, but silence upon coding completion.

- If the **Alarm Silence Inhibit Option** -- which is a timer that inhibits the operation of the ALARM SILENCE function – is enabled, pressing the <ALARM SILENCE> key is ignored until the timer expires. The message "ALARM SILENCE INHIBITED" displays for a short time to indicate the action was not taken. The message "ALARM SILENCE NO LONGER INHIBITED" displays when the timer expires.

- If **Waterflow Sprinkler Devices** are activated, Notification Appliances may or may not be silenced (depending on local code requirements). Usually, a dedicated bell will continue to sound to indicate water flow.

- Some visual notification appliances may continue to flash until the system is reset.

Using the Alarm Silence Key

Press the <ALARM SILENCE> key and read the display. The alphanumeric display shows signal status and the ALARM SILENCE LED turns ON steady.

```
ALARM SILENCE IN PROGRESS
```

Resetting the System

Overview   The function of the SYSTEM RESET key depends on whether active alarms are present at the time the key is pressed.

- **Active Alarms Present.** Pressing the SYSTEM RESET key when alarms are present attempts to return the system to its normal state. This includes resetting initiating devices (pull stations and smoke detectors, for example), relays (including city relay and door holder relays), notification appliances (horns and strobes), and all LEDs and indicators that have been programmed to be reset with the SYSTEM RESET key. See "Resetting a System with Active Alarms" below for more information.

- **No Active Alarms Present.** Pressing the SYSTEM RESET key when no alarms are present causes the system to perform a hardware reset. See "Performing a Hardware Reset" below for more information.

Resetting a System with Active Alarms   Activated devices (i.e, devices in alarm) can be reset, using the SYSTEM RESET key. Doing this allows the system to return to a normal state following alarm activation. Follow these steps to perform a System Reset when alarms are present.

1. Press the SYSTEM RESET key. The following message appears.

```
SYSTEM RESET IN PROGRESS
```

2. One of the following occurs, depending on whether the activated devices reset or not.

- If all zones or devices in alarm reset, the SYSTEM ALARM LED flashes. Press the <ALARM ACK> key, and the following message appears.

```
          SYSTEM IS NORMAL
   8:37:13     MON 18-SEP-00
```

- If a zone or device remains in alarm and fails to reset, the "SYSTEM RESET IN PROGRESS" message is followed by the message shown below.

```
ALARM PRESENT, SYSTEM RESET ABORTED
```

When this message appears, the system remains in an alarm state. The display indicates the total number of alarms present in the system along with a prompt to use the <ALARM ACK> key to **review** the points. (These points do not require acknowledgment.) The SYSTEM ALARM LED remains ON to indicate that a fire alarm device is still in the alarm condition. Read the display to determine the type and location of the device. Follow local procedures to investigate the area of the building in alarm. Look for devices that are in an alarm state -- pull stations with the handle down, smoke detectors with their LED lit.

Resetting the System, *Continued*

Performing a Hardware Reset

A hardware reset reinitializes the state of certain hardware components and is typically used to reset a Class A Trouble (for example, on a MAPNET, IDNet, or RUI channel) after the problem causing the trouble is resolved. If you attempt to perform a hardware reset without first fixing the problem causing the trouble, the hardware reset fails and the trouble reappears.

To perform a hardware reset, press the SYSTEM RESET key when no alarms are present.

Disabling a Point that Remains in Alarm

Overview

If a device remains in alarm and no alarm condition (i.e., smoke or an activated pull station) exists, the FACP provides a way to inhibit alarm reporting for the malfunctioning point. Disabling a point causes a trouble condition for the point or zone that you disable.

The <DISABLE> key, which is used to disable points, may be passcode protected. If it is, you need to first log in to the system using the passcode that enables the key. Refer to "Logging In and Out of the System" in Chapter 6 for information on doing this.

Important Notes

Be aware of the following issues related to disabling points.

- Disabling a point causes the point to NOT report alarm conditions or other status changes. A point should not be disabled unless it is clearly understood that fire detection or security for the area of the building covered by that point will be lost. Appropriate steps must be taken to provide alternate means of protecting the area of the building covered by the disabled point.

- If the Service Reset option is enabled, an operator can clear an alarm condition (i.e., successfully perform a system reset) even though the device that caused the alarm remains in a trouble state. The typical application for this would be the case where a malfunctioning initiating device such as a smoke detector (consisting of a base and removable sensor) causes an alarm and activates the city circuit. With this option enabled, the sensor can be removed and the system (including the city circuit) can be reset. Without this option enabled, removing the sensor would cause a trouble, which would prevent the city circuit from being reset.

  Note: Service Reset is not a UL-Approved option and enabling this option on the panel invalidates the panel's UL certification.

Procedure

To disable a point in alarm, follow these steps.

1. Press the <ALARM ACK> key to display the point's information on the alphanumeric display. For example:

   ```
   SECOND FLOOR EAST WING          ROOM 16
   PULL STATION                    ALARM
   ```

2. Press the <DISABLE> key. The alphanumeric display shows the following message.

   ```
   PRESS <ENTER> TO DISABLE
   MONITOR ZONE:   ZNXX
   ```

   Note: XX represents the point to be disabled.

Disabling a Point that Remains in Alarm, *Continued*

Procedure

3. Press the <ENTER> key. The alphanumeric display shows the action taken.

```
ALARM PRESENT, SYSTEM RESET ABORTED
```

Note: The system indicates a trouble condition each time a point is disabled. It is important to repair the disabled point as soon as possible. Once repaired, the disabled point should be enabled as soon as possible.

Chapter 3
Trouble Conditions

Introduction

A Trouble message is used to indicate the presence of a circuit break or ground within a system point, or somewhere between the FACP and one of its points.

This chapter describes using the Operator Interface Panel keys to investigate the details of the trouble condition.

In this Chapter

Refer to the page number listed in this table for information on a specific topic.

Topic	See Page #
Overview	3-2
Acknowledging Troubles	3-4
If the Trouble Doesn't Clear	3-6

Overview

How the FACP Indicates the Presence of a Trouble

When a trouble condition is detected by the FACP, the panel does the following to indicate the presence of the trouble condition.

- Yellow LED, labeled "SYSTEM TROUBLE" flashes
- Tone-alert (piezo buzzer) sounds steady
- LEDs on remote annunciators may illuminate
- The alphanumeric display on the interface panel indicates trouble condition, as shown below
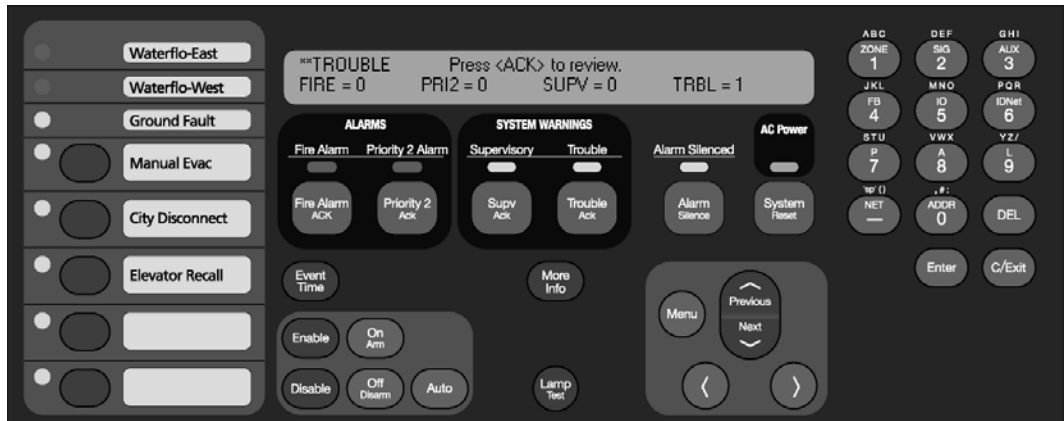
Figure 3–1. Interface Panel Showing Trouble Condition

What Acknowledge Does

The first step in managing a trouble condition is to *acknowledge* the trouble. Acknowledging a trouble does two important things:

- It records the time and date at which you observed the presence of the trouble and stores that information in the system's historical log.
- When you press the acknowledge key, the system displays specific data on the location of the trouble.

It is important to understand that the FACP can be configured with either *Global* or *Individual* Acknowledge. These options function as follows:

Global Versus Individual Acknowledge

- **Global Acknowledge.** When global acknowledge is enabled, one press of the <TBL ACK> key acknowledges *every* point currently reporting a trouble.

- **Individual Acknowledge.** If individual acknowledge is enabled, the <TBL ACK> key must be pressed to individually acknowledge each trouble. Individual acknowledge must be selected if the panel is providing proprietary receiving service in accordance with NFPA72.

The <TBL ACK> key, which is used to acknowledge troubles (either globally or individually), is located just beneath the SYSTEM TROUBLE LED. Refer to Figure 3-1. If the <TBL ACK> key is passcode protected (by default, it is not), you cannot use this key to acknowledge troubles unless you have the required passcode.

Trouble Indications for TrueAlarm Sensors

TrueAlarm devices are considered *sensors* instead of detectors because these devices do not determine alarm conditions. Instead, the TrueAlarm smoke sensor is a measuring device that sends data regarding smoke density to the FACP. The TrueAlarm heat sensor operates in a similar fashion, but it sends temperature data to the control panel instead of smoke density data. Also, CO heat/smoke sensors operate just like the TrueAlarm heat/smoke sensors. The FACP uses this data to determine whether a trouble has occurred.

The TrueAlarm and CO sensors have three automatic trouble indications.

- **Dirty.** A "Smoke Detector Dirty" condition is reported any time the average value on an individual sensor reaches a set threshold value.

- **Excessively Dirty.** A "Smoke Detector Excessively Dirty" trouble condition is reported any time the average value of an individual sensor reaches a slightly higher threshold level.

- **Expired Trouble.** An "Expired Trouble" condition is reported anytime a CO sensor has reached the end of its useful lifetime.

In addition to the three automatic trouble conditions, the FACP software includes three pre-programmed digital pseudo points: P132, P463 and P464. The pseudo point P132 (Sensor Almost Dirty Log Enable) can be turned ON through the FACP PC Programmer application to allow a TrueAlarm sensor that is close to being dirty to report as if it were one. This is useful when maintenance is being scheduled for dirty sensors, as it provides a means of seeing which sensors are approaching a dirty state. The pseudo points P463 and P464 are used to log all the CO sensors that will expire in 6 and 12 months respectively.

Once a minute the FACP performs a test of each TrueAlarm sensor. The test raises the value of each sensor to a value that simulates an alarm condition. If the sensor reports back a value that is not within the alarm range, a "Self-Test Abnormal" trouble is displayed for the sensor.

What to Do when TrueAlarm Troubles Occur

System Operators should do the following when these troubles occur.

- **Almost Dirty Trouble.** In this case, a Simplex Technical Representative has programmed the system to allow almost dirty sensors to report as dirty. Contact your facilities management personnel to report the trouble and schedule maintenance (cleaning) for the sensors.

- **Dirty.** This trouble means the sensor is holding its sensitivity, that maintenance should be scheduled for the sensor. Contact your facilities management personnel to report the trouble and schedule maintenance (cleaning) for the sensors.

- **Excessively Dirty.** This trouble means the sensor is no longer compensating for dirt and dust. False alarms are possible in this condition and sensors should be cleaned as soon as possible. Contact your facilities management personnel to report the trouble and immediately schedule maintenance (cleaning) for the sensors.

- **Self-Test Abnormal.** All TrueAlarm sensors are automatically tested once a minute. If a sensor fails to report properly to the FACP, a Self-Test Abnormal trouble occurs. This indicates that the sensor is not working properly and needs to be replaced. Contact your facilities' management personnel to report the trouble.

- **Expired.** This trouble means that the CORC (CO Replacement Cartridge) needs to be replaced.

- **Almost Expired.** This trouble means that the CORC is almost at the end of its lifetime and would need to be replaced within 6 or 12 months, depending on the system configuration.

Acknowledging Troubles

Globally Acknowledging Troubles

If global acknowledge is enabled on the FACP, the system automatically clears after the source of the trouble clears. Approximately 30 seconds after the source of the trouble clears, the alphanumeric display should indicate a normal system.

To globally acknowledge trouble points, follow these steps.

1. Unlock and open the enclosure door. The alphanumeric display shows the trouble condition. For example:

```
**TROUBLE              Press <ACK> to review.
FIRE = 0    PRI2 = 0    SUPV = 0    TRBL = 1
```

2. Press the <TBL ACK> key under the flashing yellow LED. The alphanumeric display shows the area and type of trouble. The tone-alert silences and the yellow LED glows steady.

```
**TROUBLE              Press <ACK> to review.
FIRE = 0    PRI2 = 0    SUPV = 0    TRBL = 1
```

3. Read the alphanumeric display and investigate the area to determine the cause of the trouble.

    a. Restore or replace the defective device (switch, wire, notification appliance, etc.) in accordance with the device's instructions.
    b. The trouble condition automatically clears when the problem has been corrected.
    c. After a delay, the alphanumeric display reads:

```
             SYSTEM IS NORMAL
    8:36:28          FRI 15-SEP-00
```

Individually Acknowledging Troubles

When individual acknowledge is used, the tone-alert re-sounds when the condition clears. Individual acknowledge must be selected if the panel is providing proprietary receiving service in accordance with NFPA72. Follow these steps to use individual acknowledge.

1. Unlock and open the enclosure door. The alphanumeric display shows the trouble condition. For example:

```
**TROUBLE              Press <ACK> to review.
FIRE = 0    PRI2 = 0    SUPV = 0    TRBL = 1
```

Acknowledging Troubles, *Continued*

Individually Acknowledging Troubles

2. Press the <TBL ACK> key. Repeat this step and read the reports. You need to do this for each trouble event. The following occurs

   - The tone-alert silences and the LED glows steady
   - The alphanumeric display shows the area and type of problem, as shown below.

```
┌──────────────────────────────────────────────────┐
│         FIRST FLOOR EAST WING       ROOM31        │
│            Press ACK key to acknowledge           │
│      FIRE MONITOR ZONE OPEN CIRCUIT TROUBLE       │
└──────────────────────────────────────────────────┘
```

3. Read the alphanumeric display. Investigate the trouble to determine its cause. Restore or replace defective device (switch, wire, notification appliance, etc.) in accordance with the manufacturer's instructions.

   When the trouble clears, the Trouble LED flashes and the tone-alert sounds steady.

4. Press the <TBL ACK> key. The display shows the system status. Press the <TBL ACK> key again. After a delay, the display shows that the system status is normal.

If the Trouble Doesn't Clear

Overview

Normally, trouble points do not require acknowledgment of the cleared condition. If the system does not clear, read the display. Check for devices still in trouble (pull stations with their handles down, smoke detectors with their LEDs ON). If the source of the trouble cannot be located, call Simplex to repair the system.

System Reset Key

Some troubles latch until they are reset manually, or are reset by pressing the SYSTEM RESET key. Try pressing the SYSTEM RESET key if the trouble is any one of the following:

- Style D initiating device circuit trouble
- City Circuit trouble
- 24 Point I/O trouble

If pressing the SYSTEM RESET key does not clear the trouble, or if the trouble toggles (clears and then reappears), you may choose to either disconnect the device or to disable the point, using the procedure outlined in the next section.

Disabling a Point with a Trouble Condition

Keep the following in mind when disabling points.

- Disabling a point causes the point to NOT report alarm conditions or other status changes. A point should not be disabled unless it is clearly understood that fire detection or security for the area of the building covered by that point would be lost. Appropriate steps must be taken to provide alternate means of protecting the area of the building covered by the disabled point.

- Repair or replace the failed device or circuit as soon as possible. Once repaired, the disabled point should be enabled as soon as possible.

1. Press the TBL ACK key to display the point's information on the alphanumeric display. For example:

```
SECOND FLOOR EAST WING               ROOM 16
PULL STATION               OPEN CIRCUIT TROUBLE
```

2. Press the DISABLE key. The alphanumeric display shows the following message.

```
PRESS <ENTER> TO DISABLE
MONITOR ZONE:   ZNXX
```

Note: XX represents the point to be disabled.

If the Trouble Doesn't Clear, *Continued*

Disabling a Point with a Trouble Condition

3. Press the <ENTER> key. The alphanumeric display shows the action taken.

```
ACTION TAKEN
```

Note: The system indicates a trouble condition each time a point is disabled. It is important to repair the disabled point as soon as possible. Once repaired, the disabled point should be enabled as soon as possible.

Chapter 4
Supervisory Conditions

Introduction

A Supervisory trouble indicates a problem with the condition of the building's automatic sprinkler system or some other system used for the protection of life and property.

This chapter describes using the Operator Interface Panel keys to investigate the details of the supervisory condition.

In this Chapter

Refer to the page number listed in this table for information on a specific topic.

Topic	See Page #
Overview	4-2
Acknowledging Supervisory Conditions	4-3

Overview

How the FACP Indicates the Presence of a Supervisory Condition

When a supervisory condition is detected by the FACP, the panel does the following to indicate the presence of the condition.

- Yellow LED, labeled "SUPERVISORY" flashes
- Tone-alert (piezo buzzer) sounds steady
- The alphanumeric display on the interface panel indicates supervisory condition, as shown below
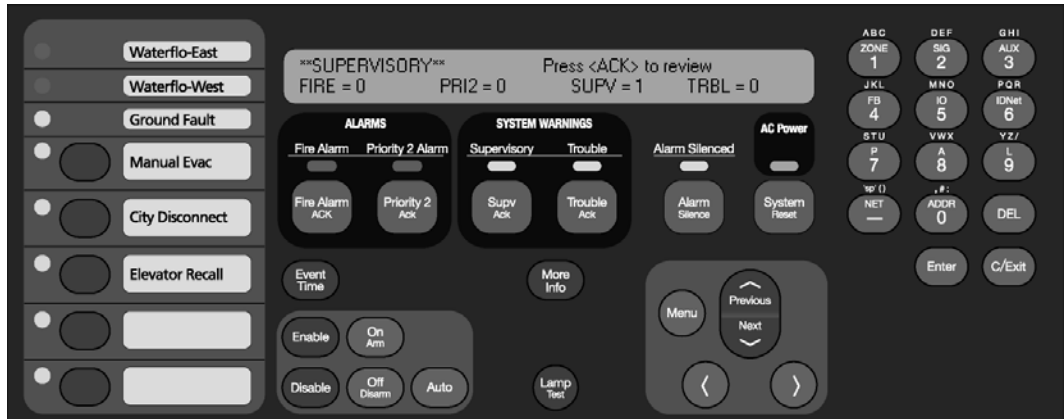
Figure 4–1. Interface Panel Showing Supervisory Condition

What Acknowledge Does

The first step in managing a supervisory condition is to *acknowledge* the condition. Acknowledging a supervisory does two important things:

- It records the time and date at which you observed the presence of the condition and stores that information in the system's historical log.
- When you press the acknowledge key, the system displays specific data on the location of the supervisory condition.

It is important to understand that the FACP can be configured with either *Global* or *Individual* Acknowledge. These options function as follows:

- **Global Acknowledge.** When global acknowledge is enabled, one press of the SUPV ACK key acknowledges *every* point currently reporting a supervisory condition.

- **Individual Acknowledge.** If individual acknowledge is enabled, the SUPV ACK key must be pressed to individually acknowledge each supervisory condition. Individual acknowledge must be selected if the panel is providing proprietary receiving service in accordance with NFPA72.

The SUPV ACK key, which is used to acknowledge supervisory conditions (either globally or individually), is located just beneath the "SUPERVISORY" LED. Refer to Figure 4-1. If the SUPV ACK key is passcode protected (by default, it is not), you cannot use this key to acknowledge supervisory conditions unless you have the required passcode.

Acknowledging Supervisory Conditions

Globally Acknowledging Supervisory Conditions

Pressing the SUPV ACK key once globally acknowledges all supervisory conditions that exist within the fire alarm system. In addition, the "SUPERVISORY" LED changes from flashing to steady ON and the tone-alert silences.

If global acknowledge is enabled on your system, use the following procedure to acknowledge the supervisory conditions.

1. Unlock and open the enclosure door. The alphanumeric display shows the supervisory condition, similar to the following example.

```
**SUPERVISORY**       Press <ACK> to review
FIRE = 0    PRI2 = 0    SUPV = 1    TRBL = 0
```

2. Press the SUPV ACK key under the flashing yellow LED. The alphanumeric display shows the area and type of condition. The tone-alert silences and the yellow LED glows steady.

```
REVERE BASEMENT NORTH WING        ROOM 31
SPRINKLER MONITOR                 ABNORMAL
```

Read the alphanumeric display. Investigate the problem to determine its cause. Restore or replace the defective device (switch, wire, notification appliance) in accordance with the manufacturer's instructions, or call Simplex to repair the system. When the problem causing the supervisory is corrected, the supervisory automatically clears and, after a delay, the alphanumeric display indicates that the system status is normal.

Individually Acknowledging Supervisory Conditions

If individual acknowledge is enabled on your system, you need to separately acknowledge each supervisory condition. Use the following procedure to do this.

1. Unlock and open the enclosure door. The alphanumeric display shows the supervisory condition, similar to the following example.

```
**SUPERVISORY**       Press <ACK> to review
FIRE = 0     PRI2 = 0    SUPV = 1     TRBL = 0
```

Acknowledging Supervisory Conditions, *Continued*

Individually Acknowledging Supervisory Conditions

2. Press the SUPV ACK key. Repeat this step and read the reports. The alphanumeric display shows the area and type of condition. The tone-alert silences and the yellow LED glows steady.

   a. The tone-alert silences and the LED glows steady.
   b. The display shows the area and type of problem, as shown below.

```
FIRST FLOOR EAST WING          ROOM 31
Press <ACK> key to acknowledge
```

OR

```
FIRST FLOOR EAST WING          ROOM 31
FIRE PUMP MONITOR              RUNNING
```

3. Read the alphanumeric display. Investigate the problem to determine its cause. Restore or replace the defective device (switch, wire, notification appliance) in accordance with the manufacturer's instructions, or call Simplex to repair the system.

   When the problem causing the condition is corrected, the SUPERVISORY LED flashes and the tone-alert sounds steady.

4. Press the SUPV ACK key. The display shows the system status.

5. Press the SUPV ACK key again. After a short delay, the display indicates that the system is normal.

Chapter 5
Selecting Points for Status and Control

Introduction

Many of the advanced operations that can be accomplished from the operator interface first require you to select the point on which you want to perform the operation. Points can be selected in one of three ways.

- **Alarm, Trouble, Supervisory List.** Points that are reporting an alarm, trouble, or supervisory condition can be selected from the active alarm, trouble, or supervisory list.

- **Using the Menu.** The menu system includes an option that allows you to scroll through each category (monitor, signal, etc.) of point, and then after selecting a category, you can scroll through the points for the category.

- **Using the Entry Keys.** The Entry keys, located on the far right of the operator interface, contain abbreviated labels for each category of point. (For example, the key in the upper left corner of the Entry keys is labeled "ZONE" and the key to its right is labeled "SIG." Pressing one of these keys causes the system to prompt you to select a specific point within the selected category.

In this Chapter

Refer to the page number listed in this table for information on a specific topic.

Topic	See Page #
Selecting Points from Alarm, Trouble, Supervisory List	5-2
Selecting Points from the Menu	5-3
Selecting Points with the Entry Keypad	5-4

Selecting Points from Alarm, Trouble, Supervisory List

Procedure

When a point experiences an abnormal condition, such as an alarm, trouble, or supervisory, it is added to the appropriate list (alarm list, supervisory list, or trouble list). Points within these lists can be selected as follows:

1. Press the appropriate acknowledge key to enter the list. (For example, press the FIRE ALARM ACK key to enter the list of current fire alarms; press the TROUBLE ACK key to enter the list of current troubles).

2. Use the NEXT and PREV keys to scroll through the entries in this list. Stop scrolling when the point you are interested in is displayed.

Selecting Points from the Menu

Procedure

1. Press the MENU key to enter the panel's menu system.

2. Press the NEXT key until the alphanumeric display reads as follows:

```
Press <NEXT> or <PREVIOUS> to scroll
Select a List of Points?
```

3. Press ENTER. The display reads as follows:

```
Press ENTER to select a list of points
All Monitor Zones?
```

4. Press the NEXT key to scroll through the categories of points until the appropriate category is shown. Press the ENTER key. The first point in the selected category appears. In the example below, the point shown is the first one in the monitor zone category.

```
MONITOR CARD 1 ZONE NUMBER 1
FIRE MONITOR ZONE                      NORMAL
```

5. Press the NEXT key to scroll through the list of points in the category. When the point that you want to select is displayed, press ENTER.

Selecting Points with the Entry Keypad

Overview

The Entry Keypad, shown below, allows you to quickly select a category of points. For example, pressing the ZONE key on the upper left side of the keypad selects the monitor zone category. After selecting a category, messages on the display prompt you for the specific point in the category.

You can use the keypad to select either a local point or a network point. A local point is one that is physically connected to the panel you are currently at, and a network point is one that is located on a different panel but has been programmed so that it can be selected and controlled from another panel.

Figure 5–1. Entry Keypad

Selecting Points

Refer to the following table for information on using the keypad to select local points on this panel.

Table 5–1. Keypad Use

Key	Data to Enter
ZONE – allows you to select a Monitor Zone point.	*ZN*, followed by ENTER, where *ZN* represents a zone card and is a number from 1 to *n*. (*n* represents the number of the last zone card in your system.) After selecting a zone, use NEXT and PREV to scroll through the points.
SIG – allows you to select a Signal point.	*SIG*, followed by ENTER, where *SIG* represents a signal card and is number from 3 to *n*. (*n* represents the number of the last signal card in your system.) After selecting a signal card, use NEXT and PREV to scroll through the signal points.
AUX – allows you to select an Auxiliary Relay	*AUX*, followed by ENTER, where *AUX* represents an auxiliary relay and is a number from 3 to *n*. (*n* represents the number of the last auxiliary relay in your system.)

Selecting Points

Table 5-1. Keypad Use *(continued)*

Press this Key on Keypad	Data to Enter
FB – allows you to select a feedback point.	*FB*, followed by ENTER, where *FB* represents a feedback point and is a number from 3 to *n*. (*n* represents the number of the last feedback point in your system.)
IO – allows you to select a point on a 24 Point I/O card	*IO*, followed by ENTER, where *IO* represents a point and is a number from 1 to *n*. (*n* represents the number of the last I/O point in your system.
IDNet – allows you to select an IDNet, MAPNET, or VESDA point.	*C-D*, followed by ENTER, where C represents the IDNet, MAPNET, or VESDA channel and *D* represents the device number. You must insert the dash between channel and device. Use the NET key to insert the dash. **Notes:** • IDNet. Specify the channel with a number from 1 through 10. Use the number 0 to represent channel 10. Device numbers on each IDNet channel run from 1 to 250. • MAPNET. Specify the channel then the device. Device numbers on each MAPNET channel run from 1 to 127. • VESDA. Specify the channel then the device. Device numbers on each VESDA channel run from 1 to 127.
P / A / L – allows you to select a digital (P), analog (A), or List (L) pseudo point.	Enter the number corresponding to the digital pseudo, analog pseudo, or list point. For example, pressing the P key and entering a 1 selects the Alarm Silence Key pseudo point.
NET – allows you to select a network point.	Enter a network NODE number*,* followed by ENTER. The system then prompts for the type of point you want to select. Press the keypad key corresponding to the type of point (Zone, Signal, etc.) Use the descriptions above for information on selecting the specific point.
ADDR = sw address of the point in the system	Specify the address using the format *C-P-S*, where *C* is the card, *P* is the point, and *S* is the subpoint. You must insert the dash between the components of the address. Use the NET key to enter the dash.

Chapter 6
Advanced Functions

Introduction

This chapter describes advanced functions that you can perform from the operator interface panel.

In this Chapter

Refer to the page number listed in this table for information on a specific topic.

Logging In and Out of the System

Introduction

The FACP system uses four access levels, referred to by the numbers one through four, to control what system operators can do with the system. The system typically operates at access level one, which allows an operator to accomplish basic tasks (for example, acknowledge alarm, trouble, and supervisory conditions) without logging in to the system.

Other functions – for example, the use of the user-defined function keys – are passcode protected to prevent access by unauthorized personnel.

Log In Procedure

Follow these steps to log in to the system at access level two, three, or four. The keypad used to enter the passcode is located behind the interface panel access door.

1. Obtain the passcode for the access level at which you want to operate.

2. Press the <MENU> key on the Display/Action keypad, located on the right side of the interface panel. The alphanumeric display shows the following message.

```
Press <NEXT> or <PREVIOUS> to scroll
Change Access Level?
```

3. Press the <ENTER> key on the Display/Action keypad. The following message displays.

```
1 = Login   2 = Logout
CURRENT ACCESS LEVEL = 1
```

4. Press the 1 key on the Display/Action keypad. The display shows the following message.

```
Enter a Passcode followed by <ENTER>
```

5. Enter the passcode for the access level. The passcode can be up to 10 numbers in length. Press the <ENTER> key on the Display/Action keypad when you have finished entering the code. An X is displayed for each digit of your passcode, as shown below.

```
Enter a Passcode followed by <ENTER>
XXX
```

Logging In and Out of the System, *Continued*

Log In Procedure   If the passcode entered in Step 5 is correct, the following message is shown.

```
Enter a Passcode followed by <ENTER>
ACCESS GRANTED
```

After a brief pause, the system displays the granted access level, such as the level 2 message shown below.

```
1 = Login   2 = Logout
CURRENT ACCESS LEVEL = 2
```

Press the <CLR> key twice. The display shows the system status, as shown below.

```
1 = Login   2 = Logout
CURRENT ACCESS LEVEL = 2
```

Log Out Procedure   Failure to log out allows unauthorized personnel access to the various passcode protected functions. If no keypad activity is detected for ten minutes, the system returns to Level 1 access.

Perform the following procedure to log out and return the operator access level to Level 1.

1. Press the <MENU> key. The following message is displayed.

```
Press <NEXT> or <PREVIOUS> to scroll
Change Access Level?
```

2. Press the <ENTER> key. The following message is displayed.

```
1 = Login   2 = Logout
CURRENT ACCESS LEVEL = 2
```

Logging In and Out of the System, *Continued*

Log Out Procedure

3.   Press the <F2> key. After a brief pause, the display shows a message similar to the one below.

```
1 = Login   2 = Logout
CURRENT ACCESS REDUCED TO LEVEL 1
```

4.   Press the <CLR> key to exit. The display shows the system status.

Setting System Time and Date

Procedure

Follow these steps to set the time and date used by the FACP. Ensuring that the current time and date are correct on the system is important. In particular, the accuracy of historical logs and reports depends on the system time

1. Press the MENU key. Press the NEXT or PREVIOUS key until the display shows the option for setting time and date.

```
Press <Next> or <Previous> to Scroll
Set Time and Date?
```

2. Press the ENTER key. The system responds as follows:

```
Press <INFO> to Change Time and Date
12:44:12 am            WED 01-JAN-00
```

3. Press the MORE INFO key. The display shows the time and date and places an underline character under the hour, meaning it is the part of the time and date that can be changed.

```
12:44:12 am            WED 01-JAN-00
```

4. Set the time and date as follows:

- **Time.** Use the < and > keys to move the underline character between hours and minutes. Use the NEXT and PREVIOUS keys to increment or decrement the value. For example, to change the minutes, first use the < and > keys to move the highlight under the minutes field. Then use the NEXT and PREVIOUS keys to change the value of the minutes field.

- **Date**. Use the < and > keys to move the underline character between the components of the date field. Use the NEXT and PREVIOUS keys to increment or decrement the value of the field until it is correct.

5. When the date and time are correct, press the ENTER key.

Viewing the Time at which an Event Occurred

Overview

The system records the time at which each alarm, trouble, and supervisory event occurs. You can view this information in one of two ways:

- By displaying or printing the historical alarm or trouble log. Refer to "Displaying Historical Logs" later in this chapter for information on doing this.

- By scrolling through the list of active alarm, trouble, or supervisory conditions, selecting a specific event, and using the EVENT TIME key. Refer to the procedure below for information on doing this.

Procedure

1. Select the alarm, trouble, or supervisory event whose event time you want to display. To do this, follow these steps.

   a. Press the FIRE ALARM ACK, PRIORITY 2 ACK, TROUBLE ACK, or SUPERVISORY ACK key to enter the appropriate list of events. (For example, press the FIRE ALARM ACK key to enter the list of active fire alarms.)

   b. Use the NEXT and PREVIOUS keys to scroll through the list until the alarm in which you are interested is displayed.

   c. Press the EVENT TIME key. The time at which the alarm, priority 2 alarm, trouble, or supervisory occurred appears in the display.

Enabling and Disabling Points

Overview

Enabling and disabling points is sometimes necessary when performing maintenance on the system. When using this function, it is critical that you understand whether Custom Control (either the system's default Custom Control or any user Custom Control) makes reference to the point or not. Actions driven by custom control are suspended for the duration of time the point is disabled, but execute immediately after the point is enabled.

Example. Suppose you disable a signal point and during the time the point is disabled, a Custom Control equation executes that turns the point ON. This action is suspended for the duration of time the point is disabled. However, when the point is subsequently enabled, the point's state updates and the Custom Control equation turning the point ON executes, turning the signal ON.

Procedure

Follow these steps to enable or disable a point.

1. Select the point. Refer to Chapter 5 for information on selecting points.

2. Press the DISABLE or ENABLE key.

3. Press the ENTER key to carry out the action.

The system generates a "Disable Trouble" to remind you that the point is disabled. When you enable the point again, the trouble clears.

Forcing Points On and Off

Overview

Forcing control points ON and OFF allows a precise degree of manual system control. For example, you can force a relay or signal point ON to test or execute its function. Unlike ENABLE/DISABLE (see description in previous section), a point that you force OFF does not refresh its state when the point is turned back ON.

Example. Suppose you turn a signal point OFF and during the time the point is disabled, a Custom Control equation executes that turns the point ON. When the point is subsequently returned to automatic operation, the point's state does not update and the Custom Control equation turning the point ON does not execute.

Forcing Points ON and OFF

Follow these steps to force a point ON or OFF.

1. Select the point. Refer to Chapter 5 for information on selecting points.

2. Press the ON or OFF key.

3. Press the ENTER key to carry out the action.

The system generates a "Manual Override Trouble" for the point to remind you that the point has been forced ON or OFF.

Returning a Point to Automatic Operation

Automatic operation is the normal operation of the point. For example, if the point is a signal point, a setting of AUTOMATIC indicates that the signal is under the control of the job executing on the panel.

To return the state of a point that is currently ON or OFF to AUTOMATIC, follow these steps.

1. Select the point. Refer to Chapter 5 for information on selecting points.

2. Press the AUTOMATIC key.

3. Press the ENTER key to carry out the action.

The system clears the "Manual Override Trouble."

Displaying and Clearing Historical Logs

Overview

Historical logs provide a record of both the events that have occurred on the system and the actions taken by an operator to manage those events. The system contains the following logs.

- Historical Alarm Log. Provides detailed information on each alarm, including time and date stamp, that has occurred since the last time the logs were cleared.

- Historical Trouble Log. Provides detailed information on each trouble, including time and date stamp, that has occurred since the last time the logs were cleared.

Displaying/Clearing Historical Logs

1. Press the MENU key. Use the NEXT and PREVIOUS keys to scroll through the choices until the "DISPLAY HISTORICAL ALARM LOG" or "DISPLAY HISTORICAL TROUBLE LOG" choice is displayed.

2. Press ENTER to enter the log file.

3. Use the NEXT and PREVIOUS keys to scroll through the entries in the selected log.

Printing Reports

Overview

The system can generate any of the following reports.

Table 6–1. Reports

Report	Description
Alarm History Log Report	Report includes all information contained in the alarm history log – device number, custom label, time and date device entered alarm.
Trouble History Log Report	Report includes all information contained in the trouble history log – device number, custom label, type of trouble, time and date device experienced trouble.
TrueAlarm Status Report	Reports the following information for each point. • Device Number • Custom Label • Current Sensitivity of the Point • Point Status: Normal, Trouble, Alarm • Almost Dirty Status: Points which are almost dirty have an asterisk in this field to denote this.
TrueAlarm Service Report	Reports the following information for each point. • Device Number • Custom Label • Alarm Level (sensitivity level of the device) • Average Value – • Current Value -- • Percent of Alarm: Shows the current value for the sensor. Value is shown as a percentage of 100 percent (alarm). For example, if the value shown is 9%, it means that the sensor is currently at 9% of the value required to trigger an alarm. • Peak Value. Shows the highest value that the sensor has reached. Value is shown as a percentage of 100 percent (alarm). For example, if the value shown is 9%, it means that the peak value experienced by the sensor was 9% of the value required to trigger an alarm. • Current State: Possible values include Normal, Trouble, Dirty, Excessively Dirty, and Almost Dirty.
TrueAlert Device Report	Report the following information for each TrueAlert device. • Point ID • Custom Label • Device Type • Candela

Printing Reports, *Continued*

Table 6-1. Reports *(continued)*

Report	Description
TrueAlert Status Report	This report can be created after the TrueNAC Voltage Drop Test (see Chapter 7) is run. It reports the following information for each Multi Candela TrueAlert Device. • Point ID • Custom Label • Pass/Fail Report the following information for each SLC • Nominal Current (A) - The current draw on the TrueAlert circuit when the test was run. • Worst Case Current (A) - The current draw on the SLC under worst case operating conditions. • Worst Case voltage Above/Below threshold (V)
TrueAlarm CO Report	This report provides the following information regarding the CO devices: • Device Number (on the network) • Custom Label (custom description of device) • Current Device Value (PPM) • End-of-Life Date • Device Status (Normal, Trouble)
Install Mode List Report	This report provides the following information regarding the Install Mode list: • Point ID • Custom Label • Device Status
Alarm Verification Tally Report	This report provides the following information for each device supporting alarm verification: • Device Number • Custom Label • Device Type • Point Type • Tally Count

Procedure

1. Press the MENU key. Use the NEXT and PREVIOUS keys to scroll through the choices until the "PRINT REPORTS?" choice is displayed.

2. Use the NEXT and PREVIOUS keys to scroll through the categories of report (Alarm History, Trouble History, etc.).

3. When the category of report you want to print is displayed, press ENTER. The system prompts you to confirm that you want to generate the report. Press ENTER again.

The report prints on the panel's report printer.

Chapter 7
Install Mode

Introduction

The **Install Mode** is a 4100ES feature that allows the user to minimize the amount of Troubles that occur when the system is being installed or when it is undergoing extensive service.

Install Mode allows the technician to select device points and cards that might raise Troubles due to installation issues and place them in "Install Mode". Install Mode will only raise one Trouble "INSTALL MODE ACTIVE", regardless of the number of items in it.

Install mode is available on Panels programmed with a revision 1.01 of the ES Programmer or later.

In this Chapter

This chapter covers the following topic.

Accessing Install Mode

Accessing Install Mode

Install mode is accessed directly from the user interface.
To access Install Mode:
1. Power-up the panel
2. Log into the FACP at a level3 or higher.

Once logged in, you can move and remove points, cards, lists and groups to and from Install Mode.

Adding and Removing Items To and From Install Mode

Adding and Removing Points and Cards

Moving a point or a card to Install Mode:

⁂ **IMPORTANT:** A Card in the Install Mode List no longer reports Card Faults. For example, a Power Supply in Install Mode does not report AC Failures, Depleted/Missing Batteries, or Ground Faults.

1. Press on the button that represents the point type you want to add to Install Mode. For example, press on the **6** button to access IDNet points.
2. Enter the Name or Address of the item you want to add.
3. Press **Enter**
4. Once the Item appears on the display, press the **More Info** button.
5. Use the arrows to find and select "Add this Point/Card to Install Mode?".
6. Press **Enter** to confirm the selection and move the item to Install mode.

Removing a point or a card to Install Mode:

1. Press on the button that represents the point type you want to move to Install Mode.
2. Enter the Name or Address of the item you want to move.
3. Press **Enter**
4. Once the Item appears on the display, press the **More Info** button.
5. Use the arrows to find and select "Remove Point/Card from Install Mode?".
6. Press **Enter** to confirm the selection and remove the point/card from Install Mode.

Depending upon the state of the point being removed (normal or alarm, respectively), one of the following screens is displayed:

```
Please stand by…
M1-6    Will Enable in 60 seconds
```

Or

```
**WARNING** Press <Disable> to abort
M1-6 will Alarm in 60 seconds
```

⁂ **IMPORTANT:** An Alarm could be reported after removing a List or a Card from the Install Mode List (without warning).

Adding and Removing Lists

Adding and Removing Lists from Install Mode:

Note: For information on making lists refer to the *ES Panel Programmer's Manual (574-849)*.

1. Press on the **9** button to access the lists.
2. Enter the Number of the list you want to move.
3. Press **Enter**
4. Once the Item appears on the display:

   •Press **1** to move the List to Install Mode

   •Press **2** to remove the List from Install Mode.

Once the action has been confirmed the following screen will appear.

```
Please stand by…
M1-6    Will Enable in 60 seconds
```

IMPORTANT: **An Alarm could be reported after removing a**
List or a Card from the Install Mode List (without warning).

Adding and removing groups to Install Mode

Adding a group of points that raise the same Trouble to Install mode:

1. Press on the **Menu** button.
2. Use the Arrows to Scroll to the Diagnostic Function option.
3. Press **Enter.**
4. From that menu, use the arrows to scroll down to the "View/Change Install Mode List" option.
5. Press **Enter.**
6. From "View Change Install Mode List" use the arrows to scroll down and select the group of Troubles you want moved to Install Mode. For Example:

```
Move NO ANSWER devices to Install mode?
```

7. Select the group and press **Enter** to add them to Install Mode.

Removing a group of points from Install Mode:

1. Press on the **Menu** button.
2. Use the Arrows to Scroll to the Diagnostic Function option.
3. Press **Enter.**
4. From that menu, use the arrows to scroll down to the "View/Change Install Mode List" option.
5. Press **Enter.**
6. From "View Change Install Mode List" use the arrows to scroll down and select either:

   •"Remove ALL NORMAL pts from Install Mode"

   •"Remove ALL POINTS from Install Mode". Choosing this option makes the following screen appear:

```
Please stand by…
M1-6    Will Enable in 60 seconds
```

IMPORTANT: **Active Alarms can initiate without warning after the 60 second**
countdown

Viewing Install Mode

Viewing Install Mode

To view Install Mode:

1. Press the **Menu** button.
2. Use the Arrows to Scroll to the Diagnostic Function option.
3. Press **Enter.**
4. From that menu, use the arrows to scroll down to the "View/Change Install Mode List" option.
5. Press **Enter.**
6. From "View Change Install Mode List" use the arrows to scroll down and select "View the Install Mode List"
7. Press **Enter** to Display the List of items in Install Mode

Chapter 8
System Test Procedures

Introduction

This section describes performing the system tests that can be performed from the front panel of the FACP.

In this Chapter

Refer to the page number listed in this table for information on a specific topic.

Lamp Test / Tone Alert Test

Overview

The LAMP TEST key on the operator interface panel is used to determine local lamp failures within the system. Lamps on the operator interface panel illuminate along with the five function and acknowledge LEDs.

The tone-alert (buzzer) can also be tested with the LAMP TEST.

Performing a Lamp Test

Do the following procedures to test for lamp failures.

1. Press the "LAMP TEST" push-button. All LEDs should illuminate (lamps should stay illuminated as long as the key is depressed).

2.   If you find defective lamps/LEDs, contact your local Simplex branch office.

Testing the Tone-Alert

Holding the Lamp Test key for more than 3 seconds tests the tone-alert.

Walk Test™ Overview

Overview	WalkTest allows the function of the system's initiating devices and signals to be tested by a single person. Conducting a WalkTest requires you to perform the following steps.

- **Step 1. Create WalkTest Groups.** The FACP supports up to eight Walk Test™ groups. This allows the building to be divided into small portions for the Walk Test™, and allows the rest of the building to be protected by the fire alarm panel. Each group has a list of monitor points (initiating devices) and a list of the signal circuits that activate when one of the group's control points activates.

    Refer to Chapter 9 of the *ES Panel Programmer's Manual* (574-849) for information on adding monitor points (initiating devices) and signals/relays to a WalkTest group.

- **Step 2. Enable WalkTest Options from Front Panel.** These options include the following. Refer to the "Setting WalkTest Options" later in this section for information on setting these options.

    – Which WalkTest Group is enabled.

    – Whether the group's signals turn on when a monitor point in the same group activates. Turn this option on (along with the WalkTest logging option) to perform a silent WalkTest on the system.

    – Whether logging of WalkTest information is enabled or not. (Enable this option to perform a silent WalkTest.)

Step 3. Manually Activate Initiating Devices in Each Group and Interpret Signals.
   Individually activate each initiating device in the group, using a magnet or canned smoke. Make sure to proceed in a logical manner (i.e., start with the lowest IDNet or MAPNET address and work toward the highest). Each time you activate an initiating device, the system's signals pulse a code that allows you to verify exactly which initiating device triggered the signals. For hardwired monitor zones, the signal code corresponds to the number of the zone. (For example, if the zone number is eight, the signals pulse eight times to indicate zone eight.) For IDNet and MAPNET devices, the first set of pulses from the signals correspond to the channel. The signals then pauses momentarily and the second set of pulses correspond to the number of the device on the channel. For example, if you activate an IDNet smoke detector with an address of M1-25, the signals would sound once to indicate channel one, pause for a short duration, and then sound 2 times pause, and then sound 5 times to indicate device 25.

   In some cases, immediately after verifying the function of an initiating device, you may also want to verify its ability to generate a trouble condition. To do this, cause a trouble on the device (i.e., remove the sensor from a TrueAlarm device), and then listen to the signals. The signals sound steady for 4 seconds to indicate trouble conditions, and then reset.

Important Notes	Signals and initiating devices (with the exception of pull stations) automatically acknowledge and automatically reset, allowing for one-man testing without the need for someone at the main control panel to acknowledge and reset the system each time an initiating device and its associated signals activate.

A silent Walk Test™ may be performed (no signals will sound) and logging of events may be selected. Refer to "Setting WalkTest Options" below for additional information.

Walk Test™ Overview, *Continued*

Important Notes   If an alarm condition is detected from a zone that is not in the present active Walk Test™ group, the system will operate as a fire alarm panel and the active Walk Test™ groups are aborted.

Setting WalkTest Options

Enabling WalkTest for a Group

1. Press the MENU key and then use the NEXT and PREV keys until "ENABLE WALKTEST?" is displayed. Press ENTER.

2. Use the NEXT and PREVIOUS keys to scroll through the WalkTest groups until the group that you want to test is displayed. Press ENTER. A screen similar to the following appears.

```
1 = on->OFF   2 = no->LOG   3 = ?->ZONE   4 = no->SIG
```

Setting Options

Each of the options shown in the example above is associated with a number from one to four. Pressing the associated number on the keypad toggles the setting of the option. The arrow points to choice currently enabled for the option.

Example. The first option shown above (`1 = on --> OFF`) allows you to turn WalkTest on and off for the group you selected in Step 2 above. In the example, the arrow points to OFF, indicating that WalkTest is not currently on for the selected group. To turn it on, you would press the number 1 on the keypad. When you do this, the arrow turns around to indicate that ON is selected and the option reads `1 = ON <-- off`.

The options are as follows

Table 8–1. WalkTest Options

Option	Description
`1 = on --> OFF`	Turns WalkTest on and off for the selected group. Press 1 on the keypad to toggle the setting of the option.
`2 = no --> LOG`	Allows you to enable or disable logging. If the arrow points to LOG, logging is enabled. If the arrow points to NO, logging is disabled. Press 2 on the keypad to toggle the setting of this option.
`3 = ? --> ZONE`	When ZONE is selected, the signals play a code that indicates the activated initiating device's address. (For hardwired zones, the signals sound the number of the zone. For IDNet and MAPNET, the code has two parts, separated by a pause. The first part indicates the channel and the second part indicates the device number. When ? is selected, the signals play 2 ¼ second pulses. Press 3 on the keypad to toggle the setting of this option.
`4 = no --> SIG`	Allows you to configure a silent WalkTest (i.e., no signals are used). Make sure to enable the logging of Walk Test™ events, which allows each zone with an abnormal condition to be time tagged and added to the log. See previous option above. When SIG is selected, signals sound during the WalkTest. When NO is selected, no signals are used during the WalkTest.

TrueNAC Voltage Drop Test

Overview

The TrueNAC Voltage Drop Test is used in conjunction with the TrueNAC Circuit Design tool. A job is first designed using the TrueNAC Circuit Design tool. The tool provides a report with job layout and device voltages. After the job is installed, the TrueNAC Voltage Drop Test is run to verify proper installation of the 4906 devices.

The TrueNAC Voltage Drop Test determines the line voltage for notification appliances that are connected to a TrueAlert Power Supply's (TPS) Signaling Line Circuit (SLC) channels, under worst case panel operating conditions. It differs from simply checking with a meter, in that the voltage output of the panel under nominal operating conditions is typically higher than the voltage output under worst case conditions (e.g. on end-of-life batteries). Prior to the start of the test, the horn volume is selected to be either "ON" (horns set to high volume) or "OFF" (silent testing of the system).

The TrueNAC Voltage Drop Test is compatible only with the 4906 series TrueAlert devices connected to a TrueAlert Power Supply (TPS). The test can be run on a single TrueAlert SLC, or on all the TPS's in the system.

- If older "fixed" candela devices are present, the tool will indicate incompatible devices and will not run. This will also be indicated in the report
- TPS PCA's Revision E and older may be updated with the latest slave code to run the TrueNAC Voltage Drop Test. The results will be less accurate than with Revision F or later TPS's. The reports will also indicate the use of an older TPS and caution that results are less accurate.
- If older TPS slave code (1.04 and earlier) is installed on a newer TPS PCA (Revision F or later), a "HW CONFIG/SW REV MISMATCH TROUBLE" trouble will be indicated on the FACP.

The TrueNAC Voltage Drop Test performs the following diagnostic verification:
- Devices are polled and report terminal voltage, candela rating, and device type to the FACP.
- The line impedance of the SLC channel is determined through the TrueNAC algorithm.
- Notification Appliances that fall below the device threshold are reported as failed devices to the FACP, and the panel indicates TrueNAC Voltage Drop Test failed trouble.

Devices that have failed the TrueNAC Voltage Drop Test require the following actions:
- Fix the device with the lowest voltage as indicated in the TrueNAC status report.
- Repeat the TrueNAC Voltage Drop Test.

The FACP keeps track of the devices that failed the TrueNAC Voltage Drop test. A trouble alarm is indicated on the panel for devices that failed the test. This trouble is cleared after hardware reset. The TrueNAC Voltage Drop Test must be repeated to verify that all troubles are fixed.

Accessing the TrueNAC Voltage Drop Test

To gain access to the TrueNAC Voltage Drop diagnostic test, you must login with an access level higher than level one (Refer to Chapter 6 for access level discussion).

1. Press the <MENU> key on the Display/Action keypad, located on the right side of the interface panel. The alphanumeric display shows the following message.

```
Press <NEXT> or <PREVIOUS> to scroll
Change Access Level?
```

_____

**Accessing the
TrueNAC Voltage
Drop Test**

2. Press the <NEXT> key on the Display/Action keypad. Use the <NEXT> and <PREVIOUS>
    keys to scroll to the **Diagnostic Functions**. The following message displays.

```
Press <NEXT> or <PREVIOUS> to scroll
Diagnostic Functions?
```

3. Press the <ENTER> key on the Display/Action keypad. Scroll to the TrueNAC Voltage Drop
    Test using the <NEXT> and <PREVIOUS> keys on the Display/Action keypad. The
    following message displays.

```
Press <NEXT> or <PREVIOUS> to scroll
TrueAlert TrueNAC Test?
```

4. Press the <ENTER> key on the Display/Action keypad. The following message displays.

```
ALL TPS SLCs
<ENTER>=Enable TrueNAC Test
```

_____

**Testing all TrueAlert
Power Supply's
SLCs**

Use the following procedure to test all the TrueAlert Power Supply's SLC lines at once. Before
you start this test, make sure you have already completed the procedure *Accessing the TrueNac
Voltage Drop Test*.

1. Press the <ENTER> key on the Display/Action keypad. The following message displays.

```
ALL TPS SLCs
<ENTER>=HORN ON
```

2. To turn the horn on or off before performing the TrueNAC Voltage Drop Test, use the
    <NEXT> and <PREVIOUS> keys to set the horn state.

    Note: The horn can be turned off to prevent any disturbance during the TrueNAC
    Voltage Drop Test. Horns that are turned on are set to high volume. If Horns are on,
    the panel will perform two passes one with horns on and one with horns off. This is
    done to enhance measurement accuracy with A/V's.

_____

Testing all TrueAlert Power Supply's SLCs

3. Press the <ENTER> key on the Display/Action keypad. If the test is successful, the following message displays.

```
ALL TPS SLCs
TrueAlert TEST COMPLETED
```

Testing each TrueAlert Power Supply's SLC

Use the following procedure to test separately each of the TrueAlert Power Supply's SLC lines. Before you start this test, make sure you have already completed the procedure *Accessing the TrueNAC Voltage Drop Test*.

1. Press the <NEXT> key on the Display/Action keypad. The following message displays.

```
CARD X, TRUEALERT POWER SUPPLY
<ENTER>=Select Channel
```

2. Press the <ENTER> key on the Display/Action keypad. The following message displays.

```
TPS CARD: X Channel: X
<ENTER>=Enable TrueNAC Test
```

3. Use the <NEXT> and <PREVIOUS> keys on the Display/Action keypad to change the SLC channel.

4. Press the <ENTER> key on the Display/Action keypad. The following message displays.

```
TPS CARD: X Channel: X
<ENTER>=HORN ON
```

5. To turn the horn on or off before performing the TrueNAC Voltage Drop Test, use the <NEXT> and <PREVIOUS> keys to set the horn state.

   Note: The horn can be turned off to prevent any disturbance during the TrueNAC Voltage Drop Test. Horns that are turned on are set to high volume. If Horns are on, the panel will perform two passes one with horns on and one with horns off. This is done to enhance measurement accuracy with A/V's.

TrueNAC Voltage Drop Test, *Continued*

Testing each TrueAlert Power Supply's SLC

6. Press the <ENTER> key on the Display/Action keypad. If the test is successful, the following message displays.

```
TPS CARD: X Channel: X
TrueNAC TEST COMPLETED
```

The TrueNAC Report

A TrueNAC status report can be generated by the panel with the completion of the TrueNAC Voltage Drop Test.

Sample reports are shown below.

TrueNAC Report Samples

Example of a successful single-channel test:

```
-------------------------------------------------------------------
Service Port                                                Page 1
Report 6: TrueAlert Device Status Report 10:23:45am WED 07-FEB-07
-------------------------------------------------------------------


TPS   3
SLC   1

POINT ID  CUSTOM LABEL                               TEST RESULT
--------- ------------------------------------------ --------------
T3-1-1    Cafeteria East                             PASSED
T3-1-2    Cafeteria West                             PASSED
T3-1-3    Main Lobby                                 PASSED
T3-1-4    Library East                               PASSED
T3-1-5    Library West                               PASSED

NOMINAL CURRENT (A):                           1.34
WORST_CASE CURRENT (A):                        1.97
WORST_CASE VOLTAGE ABOVE/BELOW THRESHOLD (V):  0.9


SLC HAS NOT PASSED UNLESS ALL DEVICES ARE MARKED AS PASSED
-------------------------------------------------------------------
```

TrueNAC Voltage Drop Test, *Continued*

TrueNAC Report Samples

Example of a failed single-channel test:

```
----------------------------------------------------------------------
Service Port                                                  Page 1
Report 6: TrueAlert Device Status Report 10:23:45am WED 07-FEB-07
----------------------------------------------------------------------
TPS   3
SLC   1

POINT ID  CUSTOM LABEL                    TEST RESULT
--------- ------------------------------- --------------
T3-1-1    Cafeteria East                  PASSED
T3-1-2    Cafeteria West                  PASSED
T3-1-3    Main Lobby                      PASSED
T3-1-4    Library East                    PASSED
T3-1-5    Library West                    FAILED          -0.4
T3-1-6    Electrical West                 FAILED          -0.6

NOMINAL CURRENT (A):                          1.34
WORST_CASE CURRENT (A):                       1.97
WORST_CASE VOLTAGE ABOVE/BELOW THRESHOLD (V): -0.6

SLC HAS NOT PASSED UNLESS ALL DEVICES ARE MARKED AS PASSED
----------------------------------------------------------------------
```

Example of a successful test with an old HW version for TPS 3:

```
----------------------------------------------------------------------
Service Port                                                  Page 1
Report 6: TrueAlert Device Status Report 10:23:45am WED 07-FEB-07
----------------------------------------------------------------------
TPS   3
SLC   1

POINT ID  CUSTOM LABEL                    TEST RESULT
--------- ------------------------------- ---------------------
T3-1-1    Cafeteria East                  PASSED
T3-1-2    Cafeteria West                  PASSED
T3-1-3    Main Lobby                      PASSED
T3-1-4    Library East                    PASSED
T3-1-5    Library West                    PASSED

NOMINAL CURRENT (A):                          1.34
WORST_CASE CURRENT (A):                       1.97
WORST_CASE VOLTAGE ABOVE/BELOW THRESHOLD (V):  0.8

WARNING: OLD VERSION OF TPS HARDWARE USED, RESULTS MAY HAVE
         GREATER VARIATIONS THAN EXPECTED

SLC HAS NOT PASSED UNLESS ALL DEVICES ARE MARKED AS PASSED
----------------------------------------------------------------------
```

TrueNAC Voltage Drop Test, *Continued*

TrueNAC Report Samples

Example of an aborted (incompatible device problem) test

```
---------------------------------------------------------------------
Service Port                                                   Page 1
Report 6: TrueAlert Device Status Report 10:23:45am WED 07-FEB-07
---------------------------------------------------------------------

TPS   3
SLC   1

POINT ID  CUSTOM LABEL                         TEST RESULT
--------- ------------------------------------ --------------------
T3-1-1    Auditorium North                     PASSED
T3-1-2    Auditorium South                     PASSED
T3-1-3    Auditorium Lobby                     DEVICE NOT COMPATIBLE

NOMINAL CURRENT (A):                           0.80
WORST_CASE CURRENT (A):                        1.17
WORST_CASE VOLTAGE ABOVE/BELOW THRESHOLD (V):  1.2


SLC HAS NOT PASSED UNLESS ALL DEVICES ARE MARKED AS PASSED
---------------------------------------------------------------------
```

Disable IDNET CO Algorithms

Overview

The Disable IDNET CO Algorithms is one of the options available under the Diagnostics menu, at the front panel of the FACP. When choosing this option, the technician ensures that the CO sensors will get a testing threshold downloaded and the CO over time is disabled. With the Disable IDNET CO Algorithms option on, the technician can then proceed to test the devices with the WalkTest option Enabled or Disabled. When the Disable IDNET CO Algorithms is entered, a trouble will be generated. The trouble screen that will appear will look as follows:

```
IDNET CO ALGORITHMS DISABLED (TROUBLE)
TROUBLE POINT                  ABNORMAL
```

Since all three possible sensors (photo, heat and CO) could be tested simultaneously, the LED on the base will be used to give the technician an indication of the test result. The LED states and their meanings are as follows:

- LED OFF - No sensors have passed the test
- LED ON - At least one sensor has passed the test (If testing only one sensor this is the LED state you'd expect if the test passed).
- LED FLASHING - All sensors for this device have passed the test (Note: This could be 2 or 3 sensors depending on what type of CO combination device is configured. This state will not be seen if only a single sensor is being tested)

Because the sensors can either be tested one at a time or by combining multiple technologies into a single test, one can follow two similar approaches to complete the tests. Figures 8-1 and 8-2 show the two flowcharts denoting those approaches.
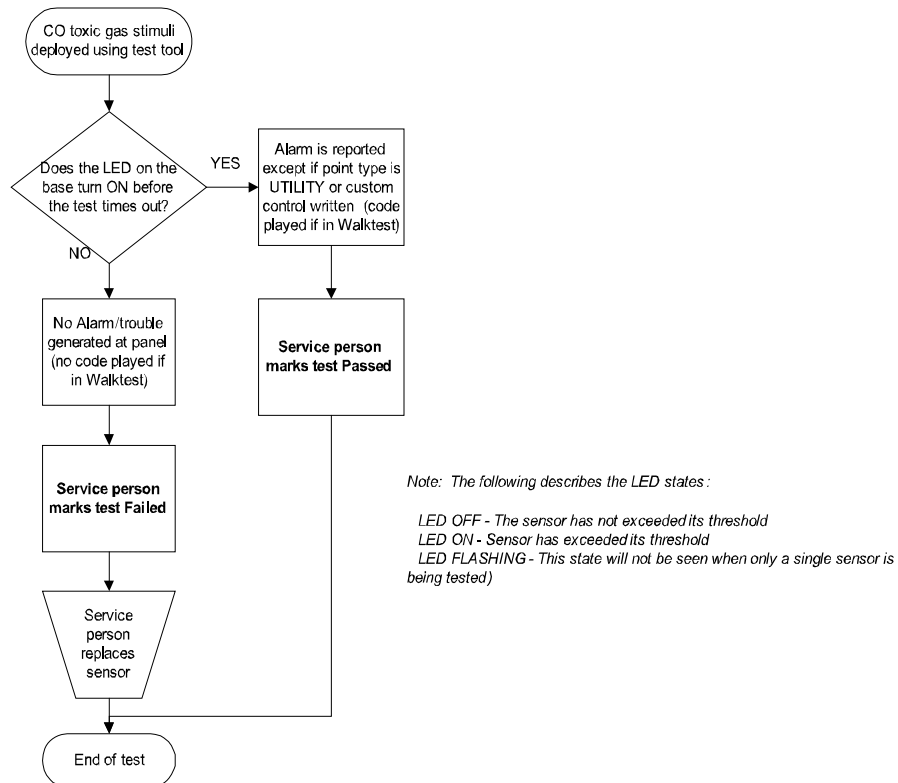
Figure 8-1. Testing a Single CO Sensor

Disable IDNET CO Algorithms, *Continued*

CO toxic gas, heat and smoke stimuli deployed using test tool

Does the LED on the base remain OFF through entire test?

The LED turns ON but doesn't flash

Does the LED change to slow flashing?
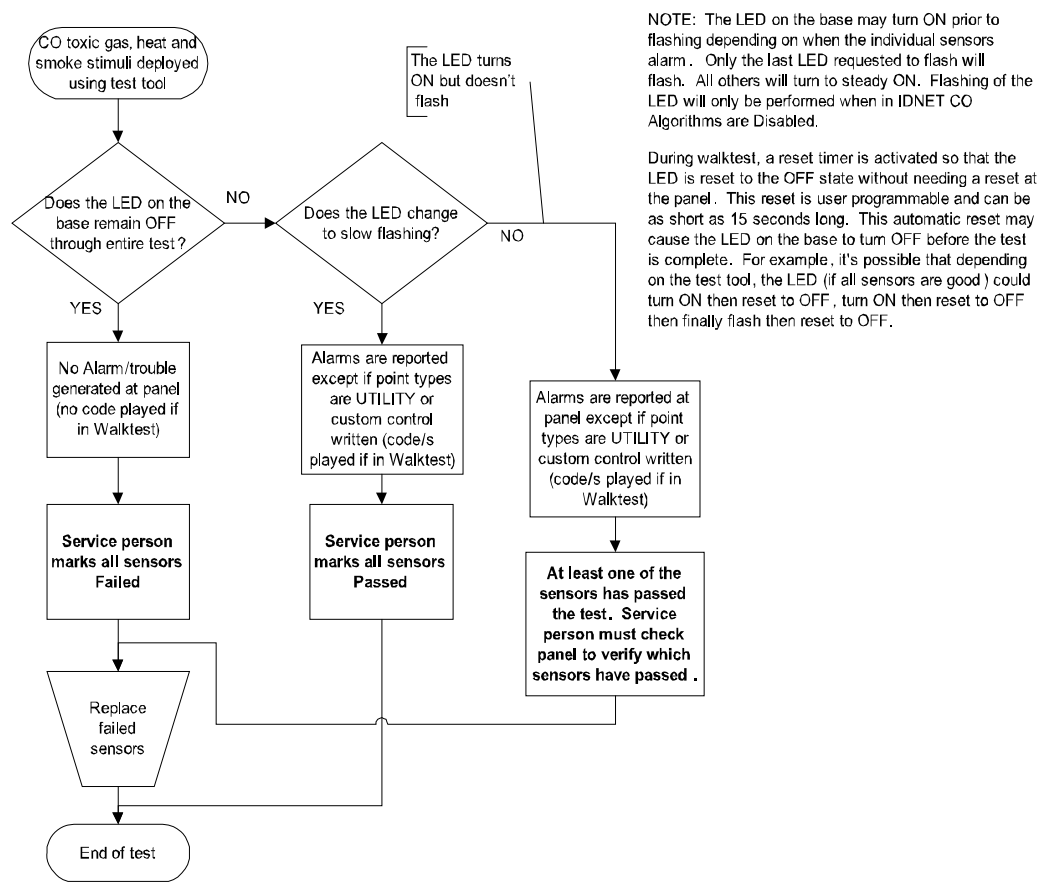
NOTE: The LED on the base may turn ON prior to flashing depending on when the individual sensors alarm. Only the last LED requested to flash will flash. All others will turn to steady ON. Flashing of the LED will only be performed when in IDNET CO Algorithms are Disabled.

During walktest, a reset timer is activated so that the LED is reset to the OFF state without needing a reset at the panel. This reset is user programmable and can be as short as 15 seconds long. This automatic reset may cause the LED on the base to turn OFF before the test is complete. For example, it's possible that depending on the test tool, the LED (if all sensors are good) could turn ON then reset to OFF, turn ON then reset to OFF then finally flash then reset to OFF.

No Alarm/trouble generated at panel (no code played if in Walktest)

Alarms are reported except if point types are UTILITY or custom control written (code/s played if in Walktest)

Alarms are reported at panel except if point types are UTILITY or custom control written (code/s played if in Walktest)

Service person marks all sensors Failed

Service person marks all sensors Passed

At least one of the sensors has passed the test. Service person must check panel to verify which sensors have passed.

Replace failed sensors

End of test

Note: The following describes the LED states:

LED OFF - No sensors have exceeded their thresholds
LED ON - At least one sensor exceeded its threshold
LED FLASHING - All sensors for this device have exceeded their thresholds (Note: This could be 2 or 3 sensors depending on what type of CO combination device is configured)

Flashing will only be performed when in IDNET CO Algorithms are Disabled

Figure 8-2. Simultaneous Testing of Multiple Sensor Technologies

Disable IDNET CO Algorithms without WalkTest Enabled

With the WalkTest option disabled, the devices will bring in actual alarms at the panel unless specific custom control is written to prevent this.

Disable IDNET CO Algorithms with WalkTest Enabled

With the WalkTest option enabled, the devices won't go into alarm at the panel. Instead the device that went over threshold will be coded out and a print message will be generated to show that it passed a functional test.

TrueAlert ES Appliance Self-Test

Self-Test Overview

When a Self-Test is run on a TrueAlert Zone, the TrueAlert ES appliances in that zone test their notification components (strobe or horn) and report their results to the panel.

The TrueAlert ES appliance Self-Test feature is available for 4100ES FACPs revision 2.02 or higher. This feature is compatible with all TrueAlert ES notification appliances.

Note: Legacy TrueAlert notifications appliances found in the tested zones will be diagnosed as "unsupported", they will not trigger a system trouble.

Self-Test Menus and Options Overview

To launch the Self-Test, the user must navigate to the Diagnostic Menu and access the TrueAlert Test menu. Figure 8-3 depicts the menu options and directories found under the TrueAlert ES Self-Test option.
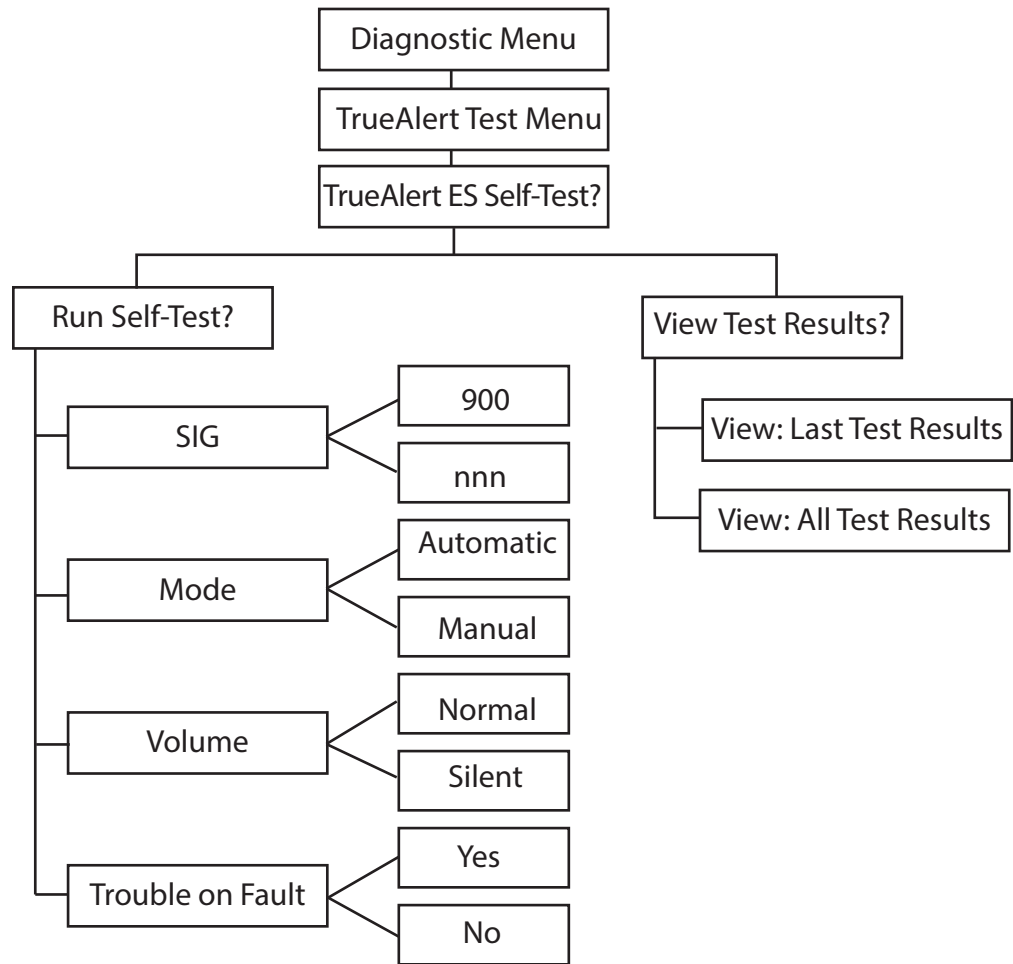
Figure 8-3. Self-Test Menu Overview

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Running a Self-Test   When a Self-Test is initiated, the tested appliances activate their notification components. This results in the strobes flashing and, unless the "Volume option" is set to "Silence", the horns sounding for up to 3 seconds. This should be taken into account while planning when to perform the Self-Test.

To run the Self-Test:

1. Select Run Self-Test from the TrueAlert ES Self-Test menu.

2. From the Run Self-Test screen, the user will have the chance to edit the test settings. Consult table 8-2 for the list of options and settings.

Table 8–2. Self-Test Options and Settings

Setting	Options
SIG: This option enables you to select the group of devices that you want to test.	**900*:** Runs the Self-Test on all TrueAlert ES notification appliances in SIG900 (i.e. all General Evac TrueAlert appliances).
	nnn: Runs the Self-Test on all TrueAlert ES notification appliances in SIGnnn, where "nnn" corresponds to a user selected TrueAlert Zone. Note: Zones 2 and 5 are not available for testing.
Mode: Select the mode in which the test will be performed.	**Automatic*:** Performs an automated Self-Test on all devices in the selected SIG.
	Manual: Places devices in selected SIG into a test mode where they will wait for magnet switch activation before performing a Self-Test. **Note:** The manual Self-Test triggers a trouble at the panel indicating that the Panel is in manual Self-Test mode. This trouble will stay active during Self-Test and disappear once the user completes the test.
Volume: The test can be run with either the horns on or off.	**Normal*:** Audible devices sound as they are configured for normal operation.
	Silent: Audible appliances do not sound during the Self-Test, only visual components are tested in this mode. Audible components in silent mode will be diagnosed as "NOT TESTED".
Trouble on Fault: This determines if the Test-failures trigger cause a trouble or not.	**Yes:** Self-Test failures cause a device trouble.
	No*: Self-Test failures do not cause a trouble.
*Option selected by default.	

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Continued on next page

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Running a Self-Test
3. Once the options and settings have been configured, return to the initial Run Self-Test screen and press on <Enter> to start the test.

4.   a) If your Self-Test is set to **Automatic:** The appliances will test themselves automatically. When all the appliances have been tested the Self-Test will stop on its own.

    b) If your Self-Test is set to **Manual:** The person performing the test must manually poll the appliances with a magnet to test them. When polled, the appliances will activate their components. Please allow each appliance up to 15 seconds to activate. To complete the test, the user must return to the panel and stop the test by pressing <Enter>.

5. Once the Self-Test is complete, a screen will appear with a summary of the test results. From this screen, press <Enter> to see the detailed test results.

Note: A utility pseudo "P502 TRUEALERT SELF-TEST FAILED" will turn on if any appliance returns a Failed result. It can be turned off by performing a hardware reset.

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Viewing Test Results
1. Select View Test Results from the TrueAlert ES Self-Test menu.

2. From the View Test Results screen, the user can select the results they wish to view. See table 8-3 for the list of options.

Table 8–3. View Results Options

Option	Description
View Last Test Results*	Select this option to display the test results from the last test performed by the panel. The "failed" appliances are listed first, followed by appliances that "passed" the Self-Test, and conclude with the "unsupported" appliances.
View All Test Results	Select this option to display the latest results for all the appliances that have ever been Self-Tested by the panel. The "failed" appliances are listed first, followed by appliances that "passed" the Self-Test, and conclude with the "unsupported" appliances.
*Option selected by default.	

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TrueAlert ES Appliance Self-Test , *Continued*

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Analyzing Self-Test Results

Once the Self-Test is complete, the panel will display the test results and group the devices into different categories.

Consult Table 8-4 for the explanation of the various diagnostics:

Table 8–4. View Results Options

Category	Diagnostic	Definition	User Action
Passed	Normal	The test results indicate that the appliance component is functioning properly.	N/A
Failed	No Output	The audible or visual sensor did not detect any sound or light from the appliance.	To clear the trouble* the appliance must be repaired and re-tested. A panel hardware reset will reset the pseudo but will not automatically clear the trouble.
	No Result / Not Tested	-The appliance did not return a result before the test ended. -The test was deactivated for a tested component. For example, if the "Volume" option is set to "Silent", all horn components will display this result.	This trouble* can be cleared by performing a panel hardware reset.
Unsupported	Unsupported	The appliance tested is a legacy notification appliance and is not compatible with the TrueAlert ES Self-Test.	N/A
*Troubles will only be triggered if the "Trouble on Fault" option is set to "Yes".			

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TrueAlert ES Appliance Self-Test , *Continued*

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Self-Test Reports   Self -Test reports can be downloaded and printed in the same manner as other panel reports. The
                          test results can also be uploaded from the IP File Transfer utility tool using the radio buttons
                          dedicated to the Self-Test.

                          The following entries are examples of various result reports.

Table 8–5. Result Reports

Appliance Type	Status	Result Report Example				
		Point ID	**Custom Label**	**Date**	**Visual**	**Audible**
A/V	Normal	T8-2-45	AV Second Floor	05- Apr-13	NORMAL	NORMAL
	The "Volume" option is set to "Silent"	T8-3-13	AV Third Floor	05- Apr-13	NORMAL	NOT TST
	The strobe is not responding	T8-3-11	AV Third Floor	05- Apr-13	NO OUT	NORMAL
V/O	Normal	T4-1-7	VO First Floor	05- Apr-13	NORMAL	N/A
	Strobe is not responding	T4-1-10	VO First Floor	05- Apr-13	NO OUT	N/A
A/O	Normal	T1-2-4	AO Second Floor	05- Apr-13	N/A	NORMAL
	The "Volume" option is set to "Silent"	T1-3-4	AO Third Floor	05- Apr-13	N/A	NOT TST
	The horn is not responding	T1-3-8	AO Third Floor	05- Apr-13	N/A	NO OUT
Legacy A/V Appliance	Normal	T8-2-60	Legacy AV Second Floor	N/A	UNSUPP	UNSUPP

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Chapter 9
Audio Operations

Introduction

The FACP audio system provides the following functionality.

- **Automatic, Pre-recorded Messages**, which automatically play in response to system events. For example, when a fire alarm is detected on the system, a message known as the Primary Evacuation message automatically plays.

- **Manually Selected, Pre-Recorded Messages.** Some systems are capable of playing a prerecorded message when a specific button is pressed. For example, you may press a button to play an attention tone and phrase before using the microphone to make a live audio announcement.

- **Live Audio.** Microphones connected to the audio system allow operators to issue live announcement messages.

In this Chapter

Refer to the page number listed in this table for information on a specific topic.

Topic	See Page #
Single Channel Audio Operation	9-2
Single Channel Audio Plus Paging	9-5
Two Channel Audio Operation	9-7
Three to Eight Channel Audio System Operation	9-11

Single Channel Audio Operation

Overview

This section describes the single channel and single channel plus paging audio systems. The term *Single Channel Audio* refers to the audio capability of the system.

- A Single Channel Audio system has the ability to play pre-recorded messages **or** live audio messages, but it cannot do both at one time. For example, suppose the building's audio system is divided into eight groups, each of which represents a floor of the building. A single channel audio system can play a pre-recorded message or live audio one floor at a time.
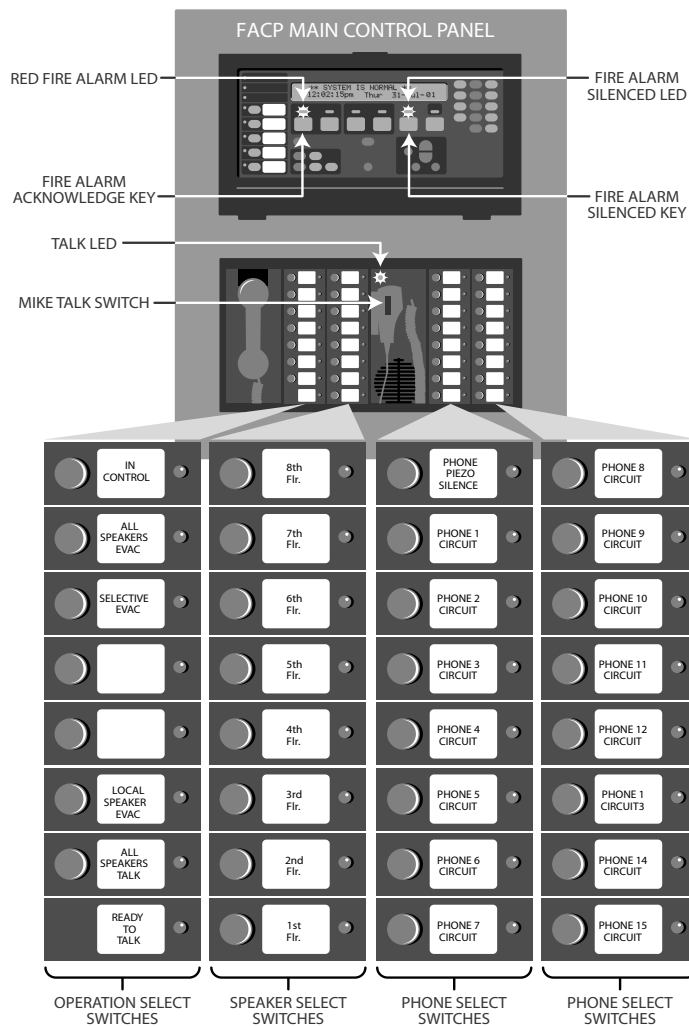
Figure 9–1. Single Channel Audio

Single Channel Audio Operation, *Continued*

Evacuate Entire Building

1. Press the **All Speakers Evac** button to play the Primary Evacuation message on every speaker circuit connected to the audio system.

   To indicate that the All Speakers Evac function has been activated, the LED associated with this button illuminates, as do the LEDs for each of the speaker groups (floors).

Evacuate Specific Floors when No Alarms are Present

Specific floors in the building can be manually evacuated at any time, even when no fire alarm condition is present. To do this, follow these steps.

1. Press the speaker circuit buttons corresponding to the speaker group (floors) you want to evacuate. The LEDs corresponding to the selected speaker groups illuminate.

2. Press the Selective Evac button. The LED associated with the Selective Evac button illuminates and the Primary Evacuation message plays on the selected speaker circuit.

   Example   To evacuate floors 1 and 2, you would first press the buttons labeled Floor 1 and Floor 2. Their LEDs light to let you know that these are the selected floors. Next, press the Selective Evac button. The Selective Evac LED lights and the message plays on the selected floors.

Evacuate Additional Floors During an Alarm

When a fire alarm occurs, the evacuation message automatically plays on specific floors but other areas of the building may not automatically play the message. Additional floors can be evacuated, as follows:

1. Press the speaker circuit button(s) for the additional floors. When you do this, the LEDs for the selected floors illuminate and the message plays on the speaker circuits for those floors.

   Note: The evacuation message begins at whatever point it is currently at. For example, if the entire message is, "Please evacuate this Floor. Proceed to your designated assembly area," and you press the speaker circuit when the message is half through, only the second half of the message will play on the additional speaker circuit.

Single Channel Audio Operation, *Continued*

Page Entire Building

1. Press the **All Speakers Talk** button. The LED associated with this button illuminates, along with the LEDs for each of the speaker circuits.

2. Key the microphone (depress the talk switch) and wait for the Ready to Talk LED to illuminate. When this LED is ON, talk into the microphone. The page is routed to all speaker circuits connected to the system.

Page Only Floors Being Evacuated

1. Key the microphone (depress the talk switch).

2. Wait for the **Ready to Talk** LED to illuminate. (It will not illuminate until the evacuation message has finished playing.)

3. Speak into the microphone to page the floors being evacuated.

Page Additional Floors

While an evacuation is in progress, you can page additional floors. To do this, follow these steps.

1. Press the buttons associated with the additional floors prior to keying the microphone. The LEDs associated with these floors turn ON.

2. Key the microphone and wait for the Ready to Talk LED to illuminate. Once this LED illuminates, speak into the microphone. The message is played on the additional floors.

Listen to What is Being Played Using the Local Speaker

1. Press the button labeled "Local Speaker" to hear what is being played at that time. The LED associated with this button illuminates when the button is pressed to indicate the function is active.

   Note: If the user picks up the local phone or keys the microphone while the local speaker is active, the speaker shuts off to prevent feedback. Following local phone or microphone use, the local speaker must be manually turned back on if operation is required.

Silencing the Audio System

Press the Alarm Silence button on the front panel to silence the audio system. When you do this, the speakers remain on, but play nothing.

Resetting the Audio System

Press the System Reset button to reset the audio system. When you do this, the following occurs.

- All speakers and associated LEDs turn OFF.
- The local speaker turns off.
- Any paging that is in progress is canceled.

Single Channel Audio Plus Paging

Overview

A Single Channel Audio System Plus Paging can play one prerecorded message and one live message *at the same time*. In other words, a prerecorded message can be playing on Floor 1 while an announcement is being made on Floor 2. The hardware (microphone, switches, LEDs, etc.) is the same as single channel audio. Refer to Figure 9-1 for an example of the hardware configuration.

Evacuate Entire Building

1. Press the **All Speakers Evac** button to play the evacuation message on every speaker circuit connected to the audio system.

   To indicate that the All Speakers Evac function has been activated, the LED associated with this button illuminates, as do the LEDs for each of the speaker circuits (floors).

Evacuate Specific Floors when No Alarms are Present

Specific floors in the building can be manually evacuated at any time, even when no fire alarm condition is present. To do this, follow these steps.

1. Press the speaker circuit buttons corresponding to the speaker group (floors) you want to evacuate. The LEDs corresponding to the selected speaker groups illuminate.

2. Press the **Selective Evac** button. The LED associated with the Selective Evac button illuminates and the Primary Evacuation message plays on the selected speaker circuit.

   Example To evacuate floors 1 and 2, you would first press the buttons labeled Floor 1 and Floor 2. Their LEDs light to let you know that these are the selected floors. Next, press the Selective Evac button. The Selective Evac LED lights and the message plays on the selected floors.

Evacuate Additional Floors During an Alarm

When a fire alarm occurs, the evacuation message automatically plays on specific floors but other floors (or areas) of the building may not automatically play the message. Additional floors can be evacuated, as follows:

1. Press the speaker circuit button(s) for the additional floors. When you do this, the LEDs for the selected floors illuminate and the message automatically plays on the speaker circuits for those floors.

   Note: The evacuation message begins at whatever point it is currently at. For example, the entire message may be, "Please evacuate this Floor. Proceed to your designated assembly area." If you press the speaker circuit when the message is half through, only the second half of the message will play on the additional speaker circuit.

Single Channel Audio Plus Paging, *Continued*

Page Entire Building

1. Press the **All Speakers Talk** button. The LED associated with this button illuminates, along with the LEDs for each of the speaker circuits.

2. Key the microphone (depress the talk switch) and wait for the Ready to Talk LED to illuminate. When this LED is ON, talk into the microphone. The page is routed to all speaker circuits connected to the system.

Page Specific Floors

1. Press the buttons corresponding to the floors requiring the page. The LEDs associated with the selected buttons illuminate.

2. Key the microphone (depress the talk switch).

3. Wait for the **Ready to Talk** LED to illuminate and speak into the microphone to page the floors selected in Step 1.

Page Additional Floors

While a page is in progress, you can add floors to the existing page. To do this, follow these steps.

1. Press the buttons associated with the additional floors. The LEDs associated with these floors turn ON and the page is heard on their speaker circuits

Listen to What is Being Played Using the Local Speaker

1. Press the button labeled "Local Speaker" to hear what is being played on the EVAC channel at that time. The LED associated with this button illuminates when the button is pressed to indicate the function is active.

   Note: If the user picks up the local phone or keys the microphone while the local speaker is active, the speaker shuts off to prevent feedback. The local speaker turns back on when the page is complete.

Silencing the Audio System

Press the Alarm Silence button on the front panel to silence the audio system. When you do this, the speakers remain on, but play nothing.

Resetting the Audio System

Press the System Reset button to reset the audio system. When you do this, the following occurs.

- All speakers and associated LEDs turn OFF.
- The local speaker turns off.
- Any paging that is in progress is canceled.

Two Channel Audio Operation

Overview   A Dual Channel Audio System can play one prerecorded message and one live message *at the same time*. In other words, a prerecorded message can be playing on Floor 1 while an announcement is being made on Floor 2.
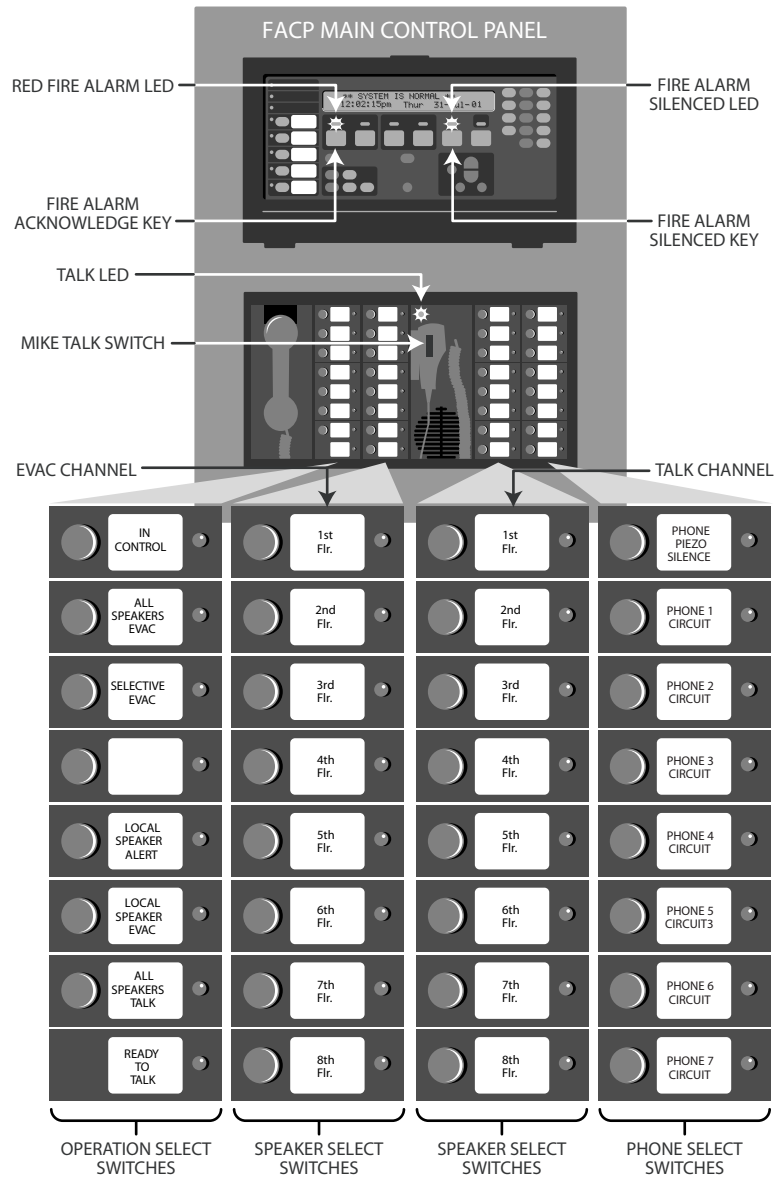
Figure 9–2. Two Channel Hardware

Two Channel Audio Operation, *Continued*

Evacuate Entire Building

1. Press the **All Speakers Evac** button to play the evacuation message on every speaker circuit connected to the audio system.

   To indicate that the All Speakers Evac function has been activated, the LED associated with this button illuminates, as do the LEDs for each of the speaker circuits (floors).

Evacuate Specific Floors when No Alarms are Present

Specific floors in the building can be manually evacuated at any time, even when no fire alarm condition is present. To do this, follow these steps.

1. Press the speaker circuit buttons corresponding to the speaker groups (floors) you want to evacuate. The LEDs corresponding to the selected speaker groups illuminate.

2. Press the **Selective Evac** button. The LED associated with the Selective Evac button illuminates and the Primary Evacuation message plays on the selected speaker circuit.

Example To evacuate floors 1 and 2, you would first press the buttons labeled Floor 1 and Floor 2. Their LEDs light to let you know that these are the selected floors. Next, press the Selective Evac button. The Selective Evac LED lights and the message plays on the selected floors.

Evacuate Additional Floors During an Alarm

When a fire alarm occurs, the evacuation message automatically plays on specific floors but other floors (or areas) of the building may not automatically play the message. Additional floors can be evacuated, as follows:

1. Press the speaker circuit button(s) for the additional floors. When you do this, the LEDs for the selected floors illuminate and the message automatically plays on the speaker circuits for those floors.

   Note: The evacuation message begins at whatever point it is currently at. For example, the entire message may be, "Please evacuate this Floor. Proceed to your designated assembly area." If you press the speaker circuit when the message is half through, only the second half of the message will play on the additional speaker circuit.

Alert Specific Floors

Follow these steps to play the Alert message on specific floors (areas) of the building.

1. Press the speaker circuit buttons corresponding to the speaker groups (floors) on which you want to play the Alert message. The LEDs corresponding to the selected speaker groups illuminate.

2. Press the **Selective Alert** button. The LED associated with the Selective Alert button illuminates and the Alert message plays on the selected speaker circuit.

Evacuate Floors On Which Alert Message is Playing

Follow these steps to convert the Alert message playing on a group of speakers to an Evacuation message.

1. On the EVAC display card, press the buttons corresponding to the floors currently playing the Alert message (the LEDs on the Alert display card for these floors are lit).

2. Press the Selective Evac button.

When you do this, the following occurs.

- The Alert message stops playing
- The Evacuation message starts playing
- The LEDs on the Alert Display Card turn off
- The LEDs on the EVAC display card that correspond to the buttons pressed in Step 1 turn on

Note: If other floors were playing the Evacuation message, the evacuation message would start at the point it is at on the other floors.

Page Entire Building

1. Press the **All Speakers Talk** button. The LED associated with this button illuminates, along with the LEDs for each of the speaker circuits.

2. Key the microphone (depress the talk switch) and wait for the Ready to Talk LED to illuminate. When this LED is ON, talk into the microphone. The page is routed to all speaker circuits connected to the system.

Page Specific Floors

1. Press the buttons corresponding to the floors requiring the page. The LEDs associated with the selected buttons illuminate.

2. Key the microphone (depress the talk switch).

3. Wait for the **Ready to Talk** LED to illuminate and speak into the microphone to page the floors selected in Step 1.

Page Additional Floors

While a page is in progress, you can add floors to the existing page. To do this, follow these steps.

1. Press the buttons associated with the additional floors. The LEDs associated with these floors turn ON and the page is heard on their speaker circuits

Listen to What is Being Played on the EVAC Channel Using the Local Speaker

1. Press the button labeled "Local Speaker" to hear what is being played on the EVAC channel at that time. The LED associated with this button illuminates when the button is pressed to indicate the function is active.

Note: If the user picks up the local phone or keys the microphone while the local speaker is active, the speaker shuts off to prevent feedback. The local speaker turns back on when the page is complete.

Two Channel Audio Operation, *Continued*

Listen to What is Being Played on the Alert Channel Using the Local Speaker

1. Press the button labeled "Local Speaker Alert" to hear what is being played on the Alert channel at that time. The LED associated with this button illuminates when the button is pressed to indicate the function is active.

   Note: If the user picks up the local phone or keys the microphone while the local speaker is active, the speaker shuts off to prevent feedback. The local speaker turns back on when the page is complete.

Silencing the Audio System

Press the Alarm Silence button on the front panel to silence the audio system. When you do this, the speakers remain on, but play nothing.

Resetting the Audio System

Press the System Reset button to reset the audio system. When you do this, the following occurs.

- All speakers and associated LEDs turn OFF.
- The local speaker turns off.
- Any paging that is in progress is canceled.

Three to Eight Channel Audio System Operation

Overview

Triple Channel Audio
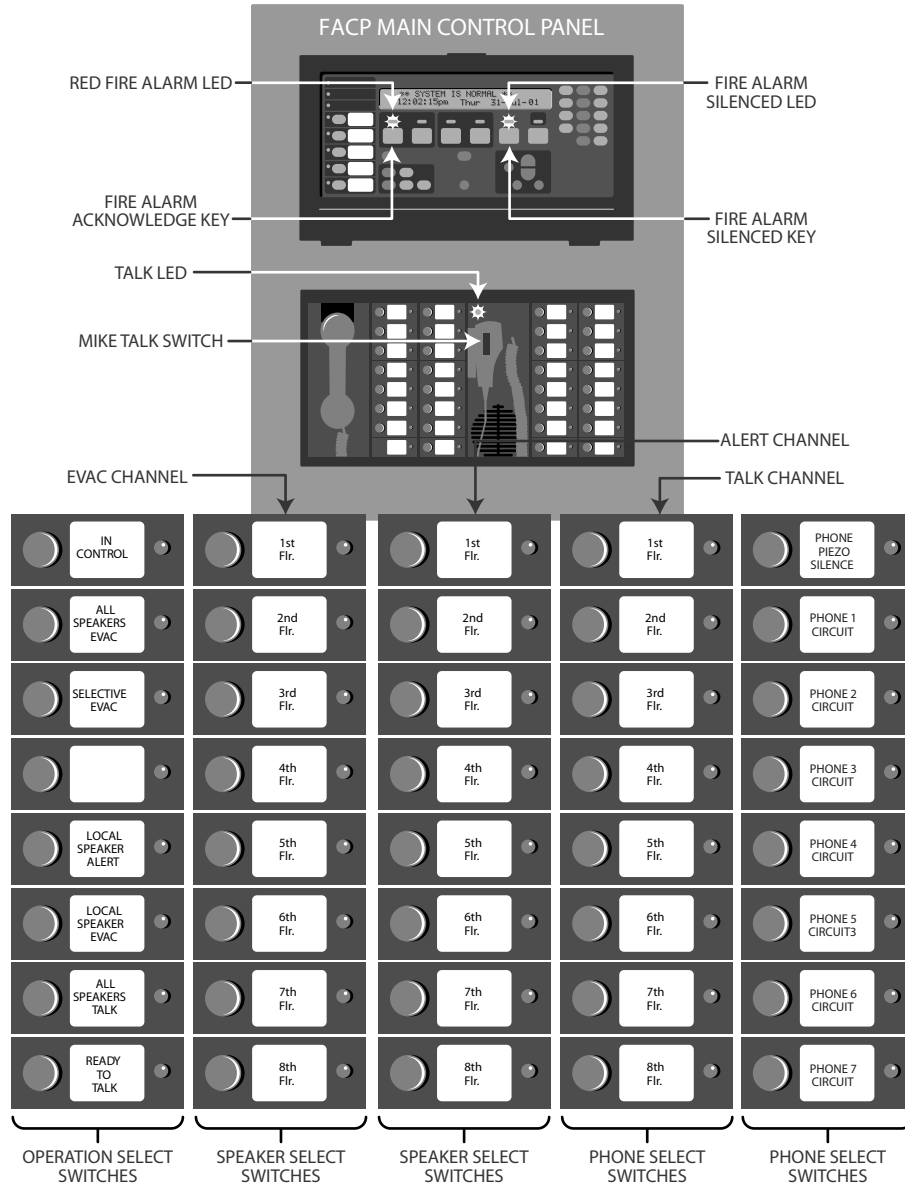
Figure 9–3. Three to Eight Channel Hardware

Evacuate Entire Building

1. Press the **All Speakers Evac** button to play the evacuation message on every speaker circuit connected to the audio system.

   To indicate that the All Speakers Evac function has been activated, the LED associated with this button illuminates, as do the LEDs for each of the speaker circuits (floors).

Evacuate Specific Floors when No Alarms are Present

Specific floors in the building can be manually evacuated at any time, even when no fire alarm condition is present. To do this, follow these steps.

1. Press the speaker circuit buttons corresponding to the speaker groups (floors) you want to evacuate. The LEDs corresponding to the selected speaker groups illuminate.

2. Press the **Selective Evac** button. The LED associated with the Selective Evac button illuminates and the Primary Evacuation message plays on the selected speaker circuit.

Example To evacuate floors 1 and 2, you would first press the buttons labeled Floor 1 and Floor 2. Their LEDs light to let you know that these are the selected floors. Next, press the Selective Evac button. The Selective Evac LED lights and the message plays on the selected floors.

Evacuate Additional Floors During an Alarm

When a fire alarm occurs, the evacuation message automatically plays on specific floors but other floors (or areas) of the building may not automatically play the message. Additional floors can be evacuated, as follows:

1. Press the speaker circuit button(s) for the additional floors. When you do this, the LEDs for the selected floors illuminate and the message automatically plays on the speaker circuits for those floors.

   Note: The evacuation message begins at whatever point it is currently at. For example, the entire message may be, "Please evacuate this Floor. Proceed to your designated assembly area." If you press the speaker circuit when the message is half through, only the second half of the message will play on the additional speaker circuit.

Alert Specific Floors

Follow these steps to play the Alert message on specific floors (areas) of the building.

1. Press the speaker circuit buttons corresponding to the speaker groups (floors) on which you want to play the Alert message. The LEDs corresponding to the selected speaker groups illuminate.

2. Press the **Selective Alert** button. The LED associated with the Selective Alert button illuminates and the Alert message plays on the selected speaker circuit.

Evacuate Floors On Which Alert Message is Playing

Follow these steps to convert the Alert message playing on a group of speakers to an Evacuation message.

1. On the EVAC display card, press the buttons corresponding to the floors currently playing the Alert message (the LEDs on the Alert display card for these floors are lit).

2. Press the Selective Evac button.

When you do this, the following occurs.

- The Alert message stops playing.
- The Evacuation message starts playing.
- The LEDs on the Alert Display Card turn off.
- The LEDs on the EVAC display card that correspond to the buttons pressed in Step 1 turn on.

Note: If other floors were playing the Evacuation message, the evacuation message would start at the point it is at on the other floors.

Page Entire Building

1. Press the **All Speakers Talk** button. The LED associated with this button illuminates, along with the LEDs for each of the speaker circuits.

2. Key the microphone (depress the talk switch) and wait for the Ready to Talk LED to illuminate. When this LED is ON, talk into the microphone. The page is routed to all speaker circuits connected to the system.

Page Specific Floors

1. Press the buttons corresponding to the floors requiring the page. The LEDs associated with the selected buttons illuminate.

2. Key the microphone (depress the talk switch).

3. Wait for the **Ready to Talk** LED to illuminate and speak into the microphone to page the floors selected in Step 1.

Page Additional Floors

While a page is in progress, you can add floors to the existing page. To do this, follow these steps.

1. Press the buttons associated with the additional floors. The LEDs associated with these floors turn ON and the page is heard on their speaker circuits

Play Announcements on Specific Floors

Multi channel audio systems have the capability to play specific announcements on specific floors. To do this, follow these steps.

1. Press the button corresponding to the floors.

2. Press the Start All Selected button.

When you do this, the LEDs on the display card light and the announcement plays over the speakers.

Listen to What is Being Played on the EVAC Channel Using the Local Speaker

1. Press the button labeled "Local Speaker" to hear what is being played on the EVAC channel at that time. The LED associated with this button illuminates when the button is pressed to indicate the function is active.

   Note: If the user picks up the local phone or keys the microphone while the local speaker is active, the speaker shuts off to prevent feedback. The local speaker turns back on when the page is complete.

Listen to What is Being Played on the Alert Channel Using the Local Speaker

1. Press the button labeled "Local Speaker Alert" to hear what is being played on the Alert channel at that time. The LED associated with this button illuminates when the button is pressed to indicate the function is active.

   Note: If the user picks up the local phone or keys the microphone while the local speaker is active, the speaker shuts off to prevent feedback. The local speaker turns back on when the page is complete.

Silencing the Audio System

Press the Alarm Silence button on the front panel to silence the audio system. When you do this, the speakers remain on, but play nothing.

Resetting the Audio System

Press the System Reset button to reset the audio system. When you do this, the following occurs.

- All speakers and associated LEDs turn OFF.
- The local speaker turns off.
- Any paging that is in progress is canceled.

Simplex

Back Box

Master Controller

Dress Panel

Glass Door

Batteries

Expansion Bay

In this publication

This publication discusses the following:

4100ES Service Parts List

Back Boxes, Doors, Expansion Bays & Accessories

Replacement Service Part	For Reference Only		Description
	Sales Feature PID	Installation Instruction	
Back Boxes			
2975-9407	2975-9407		1 Bay Back Box – Red
2975-9408	2975-9408		2-Bay Back Box – Red
2975-9409	2975-9409		3-Bay Back Box – Red
2975-9438	2975-9438	579-117	1 Bay Back Box – Platinum
2975-9439	2975-9439		2 Bay Back Box – Platinum
2975-9440	2975-9440		3 Bay Back Box – Platinum
Back Box Accessories			
2975-9811	2975-9811		Semi-Flush Trim Band – Beige (fits 1, 2, and 3-bay boxes)
2975-9812	2975-9812	579-117	Semi-Flush Trim Band – Red (fits 1, 2, and 3-bay boxes)
2975-9813	2975-9813		Semi-Flush Trim Band – Platinum (fits 1, 2, and 3-bay boxes)
Doors and Dress Panels			
4100-2104	4100-2104		1 Bay Plastic Door (Glass) & Dress Panel - Platinum
4100-2105	4100-2105		2 Bay Plastic Door (Glass) & Dress Panel - Platinum
4100-2106	4100-2106	579-117	3 Bay Plastic Door (Glass) & Dress Panel - Platinum
4100-2124	4100-2124		1 Bay Plastic Door (Glass) & Dress Panel - Red
4100-2125	4100-2125		2 Bay Plastic Door (Glass) & Dress Panel - Red
4100-2126	4100-2126		3 Bay Plastic Door (Glass) & Dress Panel - Red
Product Specific Doors and Dress Panels			
4100-2107	4100-2107		2 Bay Plastic Door (Glass) & Incident Commander Dress Panel - Platinum
4100-2108	4100-2108	579-117	3 Bay Plastic Door (Glass) & Incident Commander Dress Panel- Platinum
4100-2127	4100-2127		2 Bay Plastic Door (Glass) & Incident Commander Dress Panel - Red
4100-2128	4100-2128		3 Bay Plastic Door (Glass) & Incident Commander Dress Panel - Red
Door Accessories			
266-085	NA	NA	"B" Cam Lock for Plastic door
650-450			Box Hinge - Platinum
Rack-Mount Kits			
4100-2140	4100-2140	579-229	Master Controller Rack Bay Mounting Kit
4100-2144	4100-2144		Rack-Mount PDM Mounting Kit
4100-2145	4100-2145	NA	Option Bay Mounting Kit
Expansion Bays			
4100-2300	4100-2300	574-848	Expansion Bay – 4100ES Back Box
4100-2301	4100-2301	579-229	Expansion Bay – 4100ES Legacy Back Box

4100ES Service Parts List

CPU & Operator I/F Modules

Replacement Service Part	For Reference Only				Description
	PC Board Assembly	Installation Instruction	Inter-connection Harness	Sales Feature PID	
CPU					
650-759	566-938 650-759	574-848	NA	NA (New ES Panels only)	RUI+, CPU Motherboard
742-516	566-227	574-912	NA	NA	CPU Motherboard
8566-719	566-719	579-943	746-180	4100-7158	NXP Master Controller
746-177	746-177	NA	NA	NA	2GB Compact Flash Memory
Operator Interfaces					
742-590	566-284	574-925	734-033 734-026	NA	2X40 Master Operator Interface Assembly
742-740	566-284	574-925			2X40 Master Operator Interface Assembly, Canadian - French
566-284	566-284	574-925			2X40 Master Operator Interface PCB
4100-7153	566-536 566-538	579-229	734-008	4100-7153	InfoAlarm display Assy. for 4100ES mount, English
4100-7155	566-536 566-538	579-229	734-008	4100-7155	InfoAlarm display Assy. for 4100ES mount, Int'l
743-185	566-536 566-538	574-925	734-008	NA	InfoAlarm display Assy. for 4100ES mount, French
4100-7154	566-536 566-538	579-229	734-008	4100-7154	InfoAlarm display Assy. for 4100 Legacy mount, English
4100-7156	566-536 566-538	579-229	734-008	4100-7156	InfoAlarm display Assy. for 4100 Legacy mount, Int'l
743-325	566-536 566-538	579-687	734-008	NA	Display Assy. (small) for Remote InfoAlarm w/cabinet, English
743-327	566-536 566-538	579-687	734-008	NA	Display Assy. (small) for Remote InfoAlarm w/cabinet, Int'l
743-326	566-536 566-538	579-687	734-008	NA	Display Assy. (small) for Remote InfoAlarm w/cabinet, French
566-848	566-848	579-943	746-180	NA	4100ES Front Panel Ethernet
Memory - InfoAlarm					
4100-0640	566-579	579-686	NA	4100-0640	InfoAlarm Memory Expansion Module – 6 Meg.
Note: An "8" prefix on Replacement Service Part numbers indicates a repaired assembly / PC Board.					

Communication Modules

Replacement Service Part	For Reference Only				Description
	PC Board Assembly	Installation Instruction	Inter-connection Harness	Sales Feature PID	
General					
566-440 8566-440	566-440	579-513	734-053	4100-3115	XA Loop Interface Card
8566-276	566-276	579-194	NA	4100-6030	Service Port Modem
4100-6031	565-999	574-839		4100-6031	City Module with Disconnect
4100-6032	566-078	574-839	733-952	4100-6032	City Module without Disconnect
4100-6033	566-058	574-839		4100-6033	Alarm Relay Card
4100-6034	NA	579-195	734-053	4100-6034	Tamper Switch with IDNet IAM
8565-415	565-415	579-221		4100-6038	Dual RS232 Interface Card - Legacy
4100-6046	566-798	579-910	NA	4100-6046	Dual RS232 Interface Module – 4x5 Flat Card
565-270	565-270	574-037		4100-6045	Decoder Module
8565-744	565-744	574-050		4100-6048	VESDA Interface Kit
566-787	566-787 or 566-158	574-836	733-929	4100-6052 4100-6080	Event and Point Reporting DACT
4004-9810 or 8566-799	566-799	579-158	841-992	4004-9810	Contact Closure DACT
8566-338	566-338	574-046	NA	4100-6055	Dial-In Service Modem
8566-355	566-355	579-349	NA	4100-6060	Fire Panel Internet Interface (SafeLINC) *Version 1 and 2*
4100-6079	566-915/ 566-916	579-1004	NA	4100-6079	Fire Panel Internet Interface (SafeLINC) *Version 3*
566-587	566-587	579-902	734-165	4100-6068	TFX Network Interface Assembly
976451	976451	579-902	733-909	4100-6068	TFXnet Network Interface PCA
4100-6065	566-696	579-805	NA	4100-6065	BMUX Comms Module
4100-6066	566-705	579-811	734-180	4100-6066	TFX Addressable Loop Interface
566-132	566-132	574-913	733-572	4100-9816	Master Clock Interface Kit
Fiber Modem					
566-571 8566-571	566-571	579-581	NA	4100-6063	Fiber Optic Modem
***	566-573				Fiber Optic - Left Port
566-571 8566-571	566-571	579-581	NA	4100-6064	Fiber Optic Modem
***	566-574				Fiber Optic - Right Port
566-571 8566-571	566-571	579-831	NA	4100-6072	Fiber Optic Modem
566-716 8566-716	566-716				Fiber Optic - Left Port – single mode
566-571 8566-571	566-571	579-831	NA	4100-6073	Fiber Optic Modem
566-717 8566-717	566-717				Fiber Optic - Right Port – single mode

Communication Modules (Continued)

Replacement Service Part	For Reference Only				Description
	PC Board Assembly	Installation Instruction	Inter-connection Harness	Sales Feature PID	
566-571 8566-571	566-571	579-831	NA	4100-6074	Fiber Optic Modem
566-714 8566-714	566-714				Fiber Optic - Left Port - multimode
566-571 8566-571	566-571	579-831	NA	4100-6075	Fiber Optic Modem
566-715 8566-715	566-715				Fiber Optic - Right Port - multimode
4100-9842 4190-9018	566-670	579-581	734-191	4100-9842 4190-9018	Fiber Modem Audio Expansion Card
Network					
4100-6078	566-793	579-182	NA	4100-6078	Network Interface Card – Modular (Media Modules NOT included) (Replacement for 565-516)
4100-6101	566-794	579-184	733-808	4100-6101	Physical Bridge – Style - 4 (Media Modules NOT included) (Replacement for 565-649)
4100-6102	565-713	579-184	733-808	4100-6102	Physical Bridge – Style – 7 (Media Modules NOT included)
	566-794 565-713				
742-859 8566-338	566-338	579-184	NA	NA	Physical Bridge Card Modem Media
565-413	565-413	579-182 579-184	NA	4100-6056	Network Media Card – Wired
4100-6057	746-109	579-182 579-184	NA	4100-6057	Network Media Card – Fiber Optic (Replacement for 565-261 and 566-376)
4100-9863	566-793	579-818	734-211	4100-9863	TCP/IP Style 4 Physical Bridge Kit – includes Ethernet adapter and mounting hardware (media modules must be ordered separately) (Replacement for 4100-9849)
4100-9864	566-793	579-818	734-211	4100-9864	TCP/IP Style 4 Physical Bridge Kit – includes 2 Ethernet adapters and mounting hardware (media modules must be ordered separately) (Replacement for 4100-9850)
565-713	565-713	579-184	733-808	NA	Network Media Mounting Adapter – Physical Bridge
4100-6069	NA	579-842	NA	4100-6069	BACPac Ethernet Module
4100-6047	566-821	579-949	NA	4100-6047	Building Network Interface Card (BNIC)

Notes:
An "8" prefix on Replacement Service Part numbers indicates a repaired assembly / PC Board.
***Select one of 566-714 through 566-717 according to left/right requirements and to match the fiber type on your site.

4100ES Service Parts List

IDNet and MAPNET II Modules

Replacement Service Part	For Reference Only				Description
	PC Board Assembly	Installation Instruction	Inter-connection Harness	Sales Feature PID	
4100-3101	566-044	574-800	NA	4100-3101	IDNet Module – 250 Devices
4100-3108	566-922	579-1014	NA	4100-3108	IIDNet+ Module (4x5)
566-736 8562-976	566-736 562-976	579-222	734-071	4100-3102	MAPNET II Interface Module
562-974	562-974	579-222	734-071	4100-3102	MAPNET II Power Supply
8565-158	565-158	579-514	733-677	4100-3103	MAPNET II /IDNet Quad Isolator Module (requires Firmware 1.03 or higher for IDNet)
4100-3104	566-329		NA	4100-3104	IDNet Module – 127 Devices
4100-3105	566-330	574-800		4100-3105	IDNet Module – 64 Devices
4100-3106	566-421			4100-3106	IDNet Module – QuickConnect2 (11.03)
4100-3107	566-675	579-786	NA	4100-3107	IDNet+ Module – 246 Devices, Quad Isolator
Note: An "8" prefix on Replacement Service Part numbers indicates a repaired assembly / PC Board.					

Suppression Release Peripherals & Options

Replacement Service Part	For Reference Only				Description
	PC Board Assembly	Installation Instruction	Inter-connection Harness	Sales Feature PID	
2975-9227	NA			2975-9227	Red Enclosure (for use with 4090-9005)
4010-9830	NA	NA	NA	4010-9830	Releasing Panel Applique - English
4010-9830CAF	NA			4010-9830CAF	Releasing Panel Applique - Canadian
4090-9005	566-104	579-385	NA	4090-9005	IDNet Suppression Release Peripheral
4090-9006				4090-9006	IDNet Suppression Release Peripheral with Enclosure
4090-9812	NA		NA	4090-9812	LED Option (for use with 4090-9005)
Note: An "8" prefix on Replacement Service Part numbers indicates a repaired assembly / PC Board.					

Relay Modules

Replacement Service Part	For Reference Only				Description
	PC Board Assembly	Installation Instruction	Inter-connection Harness	Sales Feature PID	
562-760	562-760			4100-3201*	4-Point (2-Amp) Auxiliary Relay Module (Legacy)
562-951	562-951			4100-3202	4-Point (10-Amp) Auxiliary Relay Module (Legacy)
565-045	565-045	NA	NA	4100-3203*	8-Point (3-Amp) Auxiliary Relay Module (Legacy)
4100-3204	566-401			4100-3204	4-Point (2-Amp) Auxiliary Relay Module 4x5 (11.03)
4100-3206	566-403			4100-3206	8-Point (2-Amp) Auxiliary Relay Module 4x5 (11.03)
* Discontinued Sales PID. Order via the Available Replacement Service Part numbers.					

4100ES Service Parts List

Zone Modules

Replacement Service Part	For Reference Only				Description
	PC Board Assembly	Installation Instruction	Inter-connection Harness	Sales Feature PID	
565-226	565-226	579-205	NA	4100-5005	8-Point Zone Module - Class B
565-231	565-231			4100-5015	8-Point Zone Module - Class A

Analog Audio Modules

Replacement Service Part	For Reference Only				Description
	PC Board Assembly	Installation Instruction	Inter-connection Harness	Sales Feature PID	
Analog Modules					
566-1011	566-1011	579-159	NA	4100-1210	Audio Controller Board - Analog
4100-1340	566-701	579-815	NA	4100-1340	TFX Audio Interface
Analog Amplifiers					
8743-436 566-676	566-676	579-173	NA	4100-1312	Analog Flex 50 Watt Amplifier w/3 Class B NACs - 25V RMS w/ Constant Supervision (11.08)
8743-437 566-676	566-676	579-173	NA	4100-1313	Analog Flex 50 Watt Amplifier w/3 Class B NACs - 70V RMS w/ Constant Supervision (11.08)
743-457 8566-677	566-677	NA	NA	NA	Analog 100 Watt Amplifier, w/ 6 Class B NACs, and Constant Supervision (11.08) (Amp PC Board Only)
8566-678	566-678	NA	NA	NA	Analog 100 Watt Amplifier, w/ 6 Class B NACs, and Constant Supervision (11.08) Canada (Amp PC Board Only)
8743-438 8566-677	566-677	579-174	NA	4100-1314 4100- 1320BU*	Analog 100 Watt Amplifier w/Pwr Supply and 6 Class B NACs - 120VAC, 25V RMS w/ Constant Supervision (11.08)
8743-439 8566-677	566-677	579-174	NA	4100-1315 4100-1321BU*	Analog 100 Watt Amplifier w/Pwr Supply and 6 Class B NACs - 120VAC, 70V RMS w/ Constant Supervision (11.08)
8566-678	566-678	579-174	NA	4100-1316 4100-1322BU*	Analog 100 Watt Amplifier w/Pwr Supply and 6 Class B NACs - 120VAC, 25V RMS Canada w/ Constant Supervision (11.08)
8566-678	566-678	579-174	NA	4100-1317 4100-1323BU*	Analog 100 Watt Amplifier w/Pwr Supply and 6 Class B NACs - 120VAC, 70V RMS Canada w/ Constant Supervision (11.08)
8566-677	566-677	579-174	NA	4100-1318 4100-1324BU*	Analog 100 Watt Amplifier w/Pwr Supply and 6 Class B NACs – 220/230/240VAC, 25V RMS w/ Constant Supervision (11.08)
8566-677	566-677	579-174	NA	4100-1319 4100-1325BU*	Analog 100 Watt Amplifier w/Pwr Supply and 6 Class B NACs – 220/230/240VAC, 70V RMS w/ Constant Supervision (11.08)
8743-444 566-676	566-676	579-173	NA	4100-1361	Analog Flex 35 Watt Amplifier w/3 Class B NACs - 25V RMS w/ Constant Supervision
8743-445 566-676	566-676	579-173	NA	4100-1362	Analog Flex 35 Watt Amplifier w/3 Class B NACs - 70V RMS w/ Constant Supervision

* Discontinued Sales PID. Order via the Available Replacement Service Part numbers.

An "8" prefix on Replacement Service Part numbers indicates a repaired assembly / PC Board

4100ES Service Parts List

Digital Audio Modules

Replacement Service Part	For Reference Only				Description
	PC Board Assembly	Installation Instruction	Inter-connection Harness	Sales Feature PID	
Digital Modules					
566-1028	566-1028	579-159	NA	4100-1311	Audio Controller Board w/ CRC – Digital (11.08)
Digital Amplifiers					
8743-447 566-223 566-523 566-559	566-223 566-523 566-559	579-173	NA	4100-1326	Digital Flex 50 Watt Amplifier w/3 Class B NACs - 25V RMS w/ Constant Supervision (11.08)
8743-448 566-223 566-523 566-559	566-223 566-523 566-559	579-173	NA	4100-1327	Digital Flex 50 Watt Amplifier w/3 Class B NACs - 70V RMS w/ Constant Supervision (11.08)
8743-449 8566-521 566-223	566-521 566-223	579-174	NA	4100-1328 4100 -1334BU*	Digital 100 Watt Amplifier w/Pwr Supply and 6 Class B NACs - 120VAC, 25V RMS w/Constant Supervision (11.08)
8566-521 566-223	566-521 566-223	579-174	NA	4100-1329 4100-1335BU*	Digital 100 Watt Amplifier w/Pwr Supply and 6 Class B NACs – 120VAC, 70V RMS w/Constant Supervision (11.08)
8566-524 566-223	566-524 566-223	579-174	NA	4100-1330 4100-1336BU*	Digital 100 Watt Amplifier w/Pwr Supply and 6 Class B NACs – 120VAC, 25V RMS Canada w/ Constant Supervision (11.08)
8566-524 566-223	566-524 566-223	579-174	NA	4100-1331 4100-1337BU*	Digital 100 Watt Amplifier w/Pwr Supply and 6 Class B NACs – 120VAC, 70V RMS Canada w/Constant Supervision (11.08)
8566-521 566-223	566-521 566-223	579-174	NA	4100-1332 4100-1338BU*	Digital 100 Watt Amplifier w/Pwr Supply and 6 Class B NACs – 220/230/240VAC, 25V RMS w/Constant Supervision (11.08)
8566-521 566-223	566-521 566-223	579-174	NA	4100-1333 4100-1339BU	Digital 100 Watt Amplifier w/Pwr Supply and 6 Class B NACs – 220/230/240VAC, 70V RMS w/ Constant Supervision (11.08)
8743-455 566-223 566-523 566-559	566-223 566-523 566-559	579-173	NA	4100-1363	Digital Flex 35 Watt Amplifier w/3 Class B NACs – 25V RMS w/Constant Supervision (11.08)
8743-456 566-223 566-523 566-559	566-223 566-523 566-559	579-173	NA	4100-1364	Digital Flex 35 Watt Amplifier w/3 Class B NACs – 70V RMS w/Constant Supervision (11.08)

* Discontinued Sales PID. Order via the Available Replacement Service Part numbers.

An "8" prefix on Replacement Service Part numbers indicates a repaired assembly / PC Board

Audio Optional Modules

| Replacement Service Part | For Reference Only | | | | Description |
	PC Board Assembly	Installation Instruction	Inter-connection Harness	Sales Feature PID	
4100-0623	566-249	574-844	NA	4100-0623	Network Audio Riser Controller
4100-1240	566-037	579-160	734-048	4100-1240	Auxiliary Audio Input Board
4100-1241	566-357	579-172	NA	4100-1241	Message Expansion Board (8 Min. [4MB])
4100-1242	566-362			4100-1242	Message Expansion Board (32 Min. [16MB])
4100-1243	NA	579-168	734-042	4100-1243	Microphone Module
4100-1244	NA	579-168	NA	4100-1244	Remote Microphone Module
566-221	566-221	579-175	NA	4100-1245	Flex 50 Expansion NAC Board w/3 Class B NACs
566-220	566-220			4100-1246	Flex 50 Class A Adapter
566-221	566-221			4100-1248	100 Watt Expansion NAC Board w/6 Class B NACs (includes 2, 566-221 modules)
566-220	566-220			4100-1249	100 Watt Class A Adapter
566-316	566-316	579-168	NA	4100-1252	1-Channel Audio Operator Interface Module
566-316	566-316			4100-1253	1.5-Channel Audio Operator Interface Mod.
566-317	566-317			4100-1254	2-Channel Audio Operator Interface Module
566-318	566-318			4100-1255	3 – 8-Channel Audio Operator Interface Module
4100-1258	NA	NA	734-102 & 734-103	4100-1258	NPU/ Audio Interconnection Module
4100-1259	566-491	579-515	NA	4100-1259	Constant Supervision NAC 25V w/3 Class A/B NACs for 4100-13xx Amplifiers (11.08)
8566-492	566-492	579-515	NA	4100-1260	Constant Supervision NAC 70V w/3 Class A/B NACs for 4100-13xx Amplifiers and 4100-5116 XSIG (11.08)
4100-1266	566-598	579-175	NA	4100-1266	Expansion Signal Card Class B Expander (XNAC) (11.08)
566-220	566-220	579-175	NA	4100-1267	Expansion Signal Card Class A Adapter (11.08)
8566-492	566-492	579-515	NA	4100-1268	Constant Supervision NAC – 25V RMS for use with 4100-5116 Expansion Signal Card (11.08)
4100-1274	566-761	579-879	NA	4100-1274	Microphone Mux Module
4100-5116	566-489	579-516	NA	4100-5116	Expansion Signal Card w/3 Class B NACs (11.08)
4190-9011	618-019	574-795	734-114, 734-115, & 734-116	4190-9011	Master Fiber Optic Audio Modem
4190-9012	618-020	574-795	733-579	4190-9012	Slave Fiber Optic Audio Modem
4190-9014	NA	574-795	NA	4190-9014	Voice Fiber Modem Mounting Kit (for use with 4190-9011, -9012)
275-002	NA	NA	NA	NA	Microphone Only (Noise Canceling)
635-946	NA	NA	NA	NA	Microphone Only

4100ES Service Parts List

Audio Optional Modules (Continued)

| Replacement Service Part | For Reference Only | | | | Description |
	PC Board Assembly	Installation Instruction	Inter-connection Harness	Sales Feature PID	
566-998	566-998	579-779	NA	NA	Digital Audio Decoder
565-457	565-457	NA	NA	NA	NPU Audio Interface Board
566-559	566-559	NA	NA	NA	Flex Amplifier Mezzanine Card
742-302	565-919	574-878	NA	NA	Audio Isolation Transformer
743-736	NA	579-837	NA	NA	BMUX Replacement Class A Audio Mounting bracket
566-765 8566-765	566-765	579-837	NA	NA	4100ES to BMUX Class A audio riser monitor board
NA	NA	NA	NA	NA	Keyswitch 2 Pos SPDT for DFSM Assy
An "8" prefix on Replacement Service Part numbers indicates a repaired assembly / PC Board.					

Firefighter Phone Modules & Accessories

| Replacement Service Part | For Reference Only | | | | Description |
	PC Board Assembly	Installation Instruction	Inter-connection Harness	Sales Feature PID	
4100-1270	566-127 566-286	579-226	734-055	4100-1270	Master Telephone with Phone Card and 3 NACs (combines 4100-1271 & 4100-1272)
4100-1271	566-286	579-226		4100-1271	Remote Master Phone - includes enclosure, telephone handset, Master Phone Interface Bd, no phone card
4100-1272	566-127	579-226		4100-1272	Expansion Phone Card
4100-1297	566-760	579-862		4100-1297	TFX Phone Controller
4100-1273	566-131	579-226	NA	4100-1273	Telephone Class A NAC Adapter Module
566-286	566-286	NA		NA	Master Phone Interface Board
NA	NA	NA		NA	Master/Remote Phone Enclosure Only
NA	NA	NA		NA	Actuator - FACP Phone
625-220	NA	NA		NA	Telephone Handset (for Master/Remote Phone)
Accessories					
2084-9001	NA			2084-9001	Remote Phone Jack station
2084-9014	NA	NA	NA	2084-9014	Standard Red Pluggable Phone w/Jack
2084-9023	565-106			2084-9023	Remote Phone Jack Station w/Call-In LED
2084-9024	NA			2084-9024	Push-to-Talk Red Pluggable Phone w/Jack
An "8" prefix on Replacement Service Part numbers indicates a repaired assembly / PC Board.					

4100ES Service Parts List

Transponder Interface Modules

Replacement Service Part	For Reference Only				Description
	PC Board Assembly	Installation Instruction	Inter-connection Harness	Sales Feature PID	
4100-0620	566-093	574-844	NA	4100-0620	Basic Transponder Interface Module
4100-0621	566-242	574-844	733-997	4100-0621	Analog Audio Riser Module
566-1000	566-1000	574-844	733-997	4100-0622	Digital Audio Riser Module w/ CRC
4100-1341	566-1001	574-844	733-997	4100-1341	MCC Digital Audio Riser Module w/CRC
4100-0625	566-094	574-844	NA	4100-0625	Local Mode Transponder Interface Module
4100-0632	NA	579-248	NA	4100-0632	Terminal Block Utility Module
4100-0633	NA	579-195	734-054	4100-0633	Tamper Switch - Transponder Cabinet
4601-9108	NA	579-343	NA	4601-9108	Local Mode Controller - Flush Mount Red
4601-9109	NA	579-343	NA	4601-9109	Local Mode Controller - Surface Mount Red (includes matching box)
4601-9110	NA	579-343	NA	4601-9110	Local Mode Controller - Flush Mount Beige
4601-9111	NA	579-343	NA	4601-9111	Local Mode Controller - Surface Mount Beige (includes matching box)
8566-407	566-243	574-844	733-997	N/A	Digital Audio Riser Module (Service Replacement Only)
743-560	566-141	579-785	734-008	N/A	Basic Remote Transponder Interface Card – plate mount
An "8" prefix on Replacement Service Part numbers indicates a repaired assembly / PC Board.					

Annunciator Modules & Accessories

Replacement Service Part	For Reference Only				Description
	PC Board Assembly	Installation Instruction	Inter-connection Harness	Sales Feature PID	
4100-1275	566-786	574-843	166-226/227	4100-1275	HOA IBC Module (English Text) with 24 Switches, 24 LEDs Green/Red/White
4100-1276	566-432	574-843	166-226/227	4100-1276	8 Red Pluggable LED Module (11.03)
4100-1277	566-433	574-843	166-226/227	4100-1277	16 Red/Yel Pluggable LED Module (11.03)
4100-1278	566-430	574-843	166-226/227	4100-1278	16-Switch, 16 Red/Yellow LED Module
4100-1279	N/A	574-843	NA	4100-1279	2-inch (51mm) Blank Display Module
4100-1280	566-239	574-843	166-226/227	4100-1280	8-Switch, 8 Red LED Module
4100-1281	566-123	574-843	166-226/227	4100-1281	8-Switch, 8 Yellow LED Module
4100-1282	566-091	574-843	166-226/227	4100-1282	8-Switch, 16 Red/Yellow LED Module
4100-1283	566-122	574-843	166-226/227	4100-1283	8-Switch, 16 Yellow LED Module
4100-1284	566-092	574-843	166-226/227	4100-1284	8-Switch, 16 Red/Green LED Module
4100-1285	566-238	574-843	166-226/227	4100-1285	16-Switch, 16 Red LED Module
4100-1286	566-235	574-843	166-226/227	4100-1286	HOA Module (English Text) with 24 Switches, 24 Green/Red/Green LEDs
4100-1287	566-236	574-843	166-226/227	4100-1287	24-Switch, 24 Red LED Module
566-060	566-060	574-843	NA	4100-1288	64/64 LED/Switch Cont. Mod. w/mtng plate
566-060	566-060	574-843	NA	4100-1289	Exp. 64/64 LED/Switch Controller Module

4100ES Service Parts List

Annunciator Modules & Accessories (Continued)

Replacement Service Part	For Reference Only				Description
	PC Board Assembly	Installation Instruction	Inter-connection Harness	Sales Feature PID	
8562-789 562-858	562-789 562-858	579-183	NA	4100-1290	24-Point Graphic I/O Module
565-217 562-856	565-217 562-856	579-213	NA	4100-1291	Remote Unit Interface
4100-1292	NA	579-265	NA	4100-1292	Remote Command Center (includes 4603-9101 LCD Annunciator & Front Panel Assy)
4100-1293	637-413	579-249	NA	4100-1293	Panel-Mounted Printer
4100-1295	566-235	574-843	166-226/227	4100-1295	HOA Module (No Text) with 24 Switches, 24 Green/Red/Green LEDs
4100-1296	566-351	574-843	166-226/227	4100-1296	8-Switch 16 Green/Yellow LED Module
4100-1299	566-786	574-843	166-226/227	4100-1299	HOA IBC Module (No Text) with 24 Switches, 24 LEDs Green/Red/White
4100-1300	NA	574-843	166-226/227	4100-1300	16 Pluggable LED / 16 Switch Module – RED/YEL
4100-1301	566-796	574-843	166-226/227	4100-1301	HOA Module (No Text) w/ 24 Sw & 24 GRN/YEL/GRN LEDs
4100-1302	566-796	574-843	166-226/227	4100-1302	HOA Module (No Text) w/ 24 Sw & 24 GRN/YEL/GRN LEDs
4100-9843	NA	NA	NA	4100-9843	LED Kit - 8 Yellow LEDs (11.03)
4100-9844	NA	NA	NA	4100-9844	LED Kit - 8 Green LEDs (11.03)
4100-9845	NA	NA	NA	4100-9845	LED Kit - 8 Red LEDs (11.03)
562-876 8562-876	562-876	NA	NA	4602-9101	Remote Command Unit (RCU)
562-817	562-817	NA	NA	4602-9102	Status Command Center (SCU)
4603-9101	NA	NA	NA	4603-9101	Rem. LCD Annun. w/Alarm Silenced LED
274-240	NA	NA	NA	NA	Red LED
274-241	NA	NA	NA	NA	Yellow LED
274-242	NA	NA	NA	NA	Green LED
274-328	NA	NA	NA	NA	White LED
NA	NA	NA	NA	NA	LED – Suppression Release Peripheral
454-101	NA	NA	NA	NA	Key (for RCU and LCD Annunciator)
454-130	NA	NA	NA	NA	Keyswitch (for RCU and LCD Annunciator)
565-035	565-035	574-024	N/A	4602-7101	SCU/RCU Graphic Drive Module
565-078	565-078	NA	NA	NA	CPU Board (for 4603-9101 LCD Annun.)
565-087 8565-087	565-087	574-028	N/A	4100-7401	Graphical 24-Point I/O Controller Module
565-089 8565-089	565-089	574-028	N/A	4100-7402	LED/Switch Controller
565-110	565-110	574-028	N/A	4100-7403	Graphical 32-Point LED Driver Module
565-112	565-112	574-028	N/A	4100-7404	Graphical 32-Point Switch Input Module
565-329	565-329	NA	NA	NA	Display Board (for 4603-9101 LCD Annun.)
636-409	636-409	NA	NA	NA	Overlay (for 4603-9101 LCD Annunciator)
An "8" prefix on Replacement Service Part numbers indicates a repaired assembly / PC Board.					

Power Supplies, Chargers & Expansion Modules

| Replacement Service Part | For Reference Only | | | | Description |
	PC Board Assembly	Installation Instruction	Inter-connection Harness	Sales Feature PID	
EPS Power Supplies					
8650-694 and 4100-5325	566-873	579-1015	NA	4100-5325	EPS Power Supply 120v
8650-697 and 4100-5327	566-873	579-1015	NA	4100-5327	EPS Power Supply 220v
8650-770 and 4100-5311	566-873	579-1015	NA	4100-5311	EPS+ Power Supply 120v
8650-771 and 4100-5313	566-873	579-1015	NA	4100-5313	EPS+ Power Supply 220v
4100-6103	566-942	579-1037	734-259	4100-6103	Dual Class A Module (DCAI) for EPS IDNAC
Power Supplies					
4100-0156	565-166	574-123	733-940 & 733-941	4100-0156	8V DC Converter
566-246	566-246	574-923	NA	4100-0634	Power Distribution Module (120 volts)
566-248	566-248	574-923	NA	4100-0635	Power Distribution Module (220/230/240 volts)
8742-383 566-075 8566-075	566-075	574-772	NA	4100-5101	Expansion Pwr Supply (XPS) w/3 Built-in Class A/B NACs - 120VAC 60Hz
566-075 8566-075	566-075	574-772	NA	4100-5102	Expansion Pwr Supply (XPS) w/3 Built-in Class A/B NACs – 220/230/240VAC 50/60Hz
566-076	566-076	574-772	NA	4100-5103	Expansion Pwr Supply (XPS) w/3 Built-in Class A/B NACs – 120VAC 60Hz – Canada
742-342 8566-071	566-071	574-911	733-996	NA	System Pwr Supply (SPS) PCA (Domestic & International) (SPS PC board only)
742-343	566-072	574-911	733-996	NA	System Pwr Supply (SPS) PCA (Canada) (SPS PC board only)
8742-631 8566-071	566-071	579-246	NA	4100-5111	Expansion System Pwr Supply (SPS) w/3 Class A/B NACs, IDNet Channel & Charger - 120VAC 60Hz (mounts to PDI)
4100-5112 8742-632	566-072	579-246	NA	4100-5112	Expansion System Pwr Supply (SPS) w/3 Class A/B NACs, IDNet Channel & Charger – 120VAC 60Hz (mounts to PDI) – Canada
8566-071	566-071	579-246	NA	4100-5113	Expansion System Pwr Supply (SPS) w/3 Class A/B NACs, IDNet Channel & Charger – 220/230/240 VAC 50/60Hz (mounts to PDI)
8742-659 566-323 8566-323	566-323	579-336	NA	4100-5120	TrueAlert Pwr Supply (TPS) w/3 Class B Channels – 120VAC 60Hz
566-324	566-324	579-336	NA	4100-5121	TrueAlert Pwr Supply (TPS) w/3 Class B Channels – 120VAC 60Hz – Canada
566-323 8566-323	566-323	579-336	NA	4100-5122	TrueAlert Pwr Supply (TPS) w/3 Class B Channels – 220/230/240VAC 50/60Hz
8742-628 566-277 8566-277	566-277	579-246	NA	4100-5125	Remote Pwr Supply (RPS) w/3 Class A/B NACs & Charger 120VAC 60Hz

4100ES Service Parts List

Power Supplies, Chargers & Expansion Modules (Continued)

| Replacement Service Part | For Reference Only | | | | Description |
	PC Board Assembly	Installation Instruction	Inter-connection Harness	Sales Feature PID	
566-278 8742-629	566-278	579-246	NA	4100-5126	Remote Pwr Supply (RPS) w/3 Class A/B NACs & Charger 120VAC 60Hz – Canada
566-277 8566-277	566-277	579-246	NA	4100-5127	Remote Pwr Supply (RPS) w/3 Class A/B NACs & Charger 220/230/240VAC 50/60Hz
565-215	565-215	579-218	NA	4100-5152	12V 2A Power Option
566-722	566-722	579-902	734-205	4100-6068	5V Converter Card (TFXnet Interface)
4100-5130	566-710	579-812	NA	4100-5130	TFX Voltage Regulator
8740-802	NA	NA	NA	4100-6005*	Universal Power Supply (for Legacy Upgrade)
External Chargers					
566-320 8566-320	566-320	579-268	734-082 & 734-023	4081-9306	120V External Battery Cabinet with Charger for 110 Ah Batteries – Red
566-320 8566-320	566-320	579-268	734-082 & 734-023	4081-9308	220/230/240V External Battery Cabinet with Charger for 110 Ah Batteries – Red
Optional Modules					
4100-0650	N/A	575-978		4100-0650	Battery Shelf for use with 50 AH Batteries
4100-1266	566-598	579-175	NA	4100-1266	Expansion Signal Card - 3 NACs Class B Expander (XNAC)
566-220	566-220	579-175	NA	4100-1267	Expansion Signal Card, Class A Adapter
4100-5115	566-025	574-772	NA	4100-5115	Expansion NAC Module (XPS) – 3 NACs
4100-5116	566-489	579-516	NA	4100-5116	Expansion Signal Card (XSIG Card)
4100-5124	566-326	579-336	NA	4100-5124	TrueAlert Class "A" Adapter Module
450-323	450-323	579-332	NA	4100-5128	Battery Distribution Termination Module
742-351	566-084	574-910	NA	NA	Power Distribution Interface (PDI)

* Discontinued Sales PID. Order via the Available Replacement Service Part numbers.
An "8" prefix on Replacement Service Part numbers indicates a repaired assembly / PC Board.

4009 IDNAC Repeater

Replacement Service Part	PC Board Assembly	Installation Instruction	Inter-connection Harness	Sales Feature PID	Description
650-768 8650-768	566-949 650-768	579-1019	734-255	4009-9601	4009 IDNAC Repeater (for EPS IDNACs)
4009-9814	566-986	579-1080	NA	4009-9814	Class A Adapter Card

4100ES Service Parts List

Transformers

Replacement Service Part	Description
478-352	120VAC Transformer – (SPS, XPS, RPS, TPS, 100 Watt Amp)
478-353	220VAC Transformer – (SPS, XPS, RPS, TPS, 100 Watt Amp)
478-369	25V Transformer for 100 Watt Amplifier (4100-1214, -1216, -1218, -1220, -1222, -1224, -1228, -1230, -1232, -1234, -1236, & -1238)
478-370	70V Transformer for 100 Watt Amplifier (replaces 478-363)

Batteries

Replacement Service Part	Sales Feature PID	Description
2081-9272	2081-9272	Battery (6.2 Ah)
2081-9274	2081-9274	Battery (10 Ah)
2081-9275	2081-9275	Battery (18.8 Ah)
2081-9276	2081-9276	Battery (33 Ah)
2081-9279	2081-9279	Battery (110 Ah)
2081-9287	2081-9287	Battery (25 Ah)
2081-9288	2081-9288	Battery (12.7 Ah)
2081-9296	2081-9296	Battery (50 Ah)
112-125	NA	Battery (190 mAh) 3.0v Lithium (CPU RAM Battery)
2081-9272	2081-9272	Battery (6.2 Ah)
2081-9274	2081-9274	Battery (10 Ah)
2081-9275	2081-9275	Battery (18.8 Ah)

Resistors & EOL Resistor Harnesses

Replacement Service Part	For Reference Only		Description
	Harness	Sales Feature PID	
Active Circuit End-of-Line Resistors			
4081-9001	733-892	4081-9001	EOL Harness 2.2K ½W 5%
4081-9002	733-893	4081-9002	EOL Harness 3.3K 1W 5%
4081-9003	733-896	4081-9003	EOL Harness 4.7K ½W 5%
4081-9004	733-886	4081-9004	EOL Harness 6.8K ½W 5%
4081-9005	733-984	4081-9005	EOL Harness 1.8K ½W 5%
4081-9006	733-890	4081-9006	EOL Harness 560 OHM 1W 5%
4081-9007	733-891	4081-9007	EOL Harness 1.2K 1W 5%
4081-9008	733-894	4081-9008	EOL Harness 10K ½W 5%
4081-9009	733-912	4081-9009	EOL Harness 20 OHM 1W 5%
4081-9010	733-973	4081-9010	EOL Harness 1K 1W 5%
4081-9011	733-974	4081-9011	EOL Harness 100 OHM ½W 5%
4081-9012	733-985	4081-9012	EOL Harness 22K ½W 5%
4081-9013	734-086	4081-9013	EOL Harness 4.9K ½W 1%
4081-9018	734-168	4081-9018	EOL Harness 10K 1W 5% (for 70V RMS CSNACs)

4100ES Service Parts List

Resistors & EOL Resistor Harnesses (Continued)

Replacement Service Part	For Reference Only		Description
	Harness	Sales Feature PID	
Unused Circuit End-of-Line Resistors			
378-017	NA	NA	3.3K OHM 1W 5%
378-030			10K OHM ½W 5%
378-038			2.2K OHM ½W 5%
378-045			4.7K OHM ½W 5%
378-058			6.8K OHM ½W 5%
378-073			22K OHM ½W 5%
378-090			8.2K OHM ½W 5%
Miscellaneous Resistors			
378-022	NA	NA	100K OHM
378-069			12K OHM
378-093			1K OHM
382-110			20 OHM (for Graphic I/O)

Harness Assemblies

Replacement Service Part	Description
166-226	Harness, Ribbon – LED/Switch Display Card 2" (51 mm)
166-227	Harness, Ribbon – LED/Switch Display Card 6" (152 mm)
166-271	Harness, Ribbon – LED/Switch Display Card 14.5"
166-568	Amplifier NAC Expansion 20 Position Header Connector
733-525	Harness, Legacy Pwr/Comm Bay to Bay
733-532	Harness, 11 ft. (3.35 m) 2-wire 10 Ga. (Red/Black) Battery Block Interconnection
733-542	Harness, Legacy Pwr/Comm Box to Box 74" (1880 mm)
733-579	Harness, Interconnect for 4190-9012 Slave Fiber Optic Audio Modem
733-621	Harness, Legacy 4100 battery block to battery
733-677	Harness, MAPNET Isolator Module
733-734	Harness, Panel Printer Signal Power
733-808	Harness, Ribbon – Harness for Modem Modules
733-929	Harness, Legacy 4100 for SDACT Pwr/Comm
733-940	Harness, 8-Volt Power/Comm – for 4100-0156 8-Volt Converter
733-952	Harness, Ribbon – City/Relay Module to SPS
733-953	Harness, DFSM to Audio Controller
733-996	Harness, SPS to 4100ES CPU Motherboard
733-997	Harness, Ribbon – Audio Riser to Transponder Interface Card
733-998	Harness, XPS PCA to PDI
734-005	Harness, Flex Amplifier PCA to PDI
734-008	Harness, PDI Power/Comm Bay to Bay, 24" (610 mm)
734-012	Harness, SPS/RPS/XPS/TPS to PDM AC/Battery 120V
734-013	Harness, SPS/RPS/XPS/TPS to PDM AC/Battery 220V

4100ES Service Parts List

Harness Assemblies (Continued)	
Replacement Service Part	**Description**
734-015	Harness, PDM to battery 24" (610 mm) (used with back plane mounted PDM)
734-023	Harness, 4081 Battery w/o Fuse
734-026	Harness, Ribbon – 4100ES CPU to Front Display Service port
734-033	Harness, Ribbon – 4100ES CPU to 2X40 Operator Interface
734-036	Harness, 64/64 Controller to Expansion 64/64 Controller Pwr/Comm (4 inch)
734-040	Harness, 100W Amp – PDI Backplane to Amp PCA
734-042	Harness, Master Microphone/Local Spkr to Audio Controller
734-048	Harness, Ribbon – Audio Input Option Board to Audio Controller
734-049	Harness, SPS/RPS/XPS/TPS AC pwr – for 4100 legacy box installation
734-050	Harness, SPS/RPS/XPS/TPS Battery – for 4100 legacy box installation
734-051	Harness, SPS/RPS/TPS PCA to PDI
734-052	Harness, Audio Bay to Bay 25" (635 mm)
734-053	Harness, Tamper Switch to IAM
734-055	Harness, Master Phone P2 to Expansion Phone Card P3
734-056	Harness, Panel Mounted Printer RS232
734-057	Harness, Panel Mounted Printer Power
734-071	Harness, MAPNET Power Jumper P3 to P4
734-072	Harness, PDM to battery 40" (1016 mm) (used with side wall mounted PDM and Rack Mount Kit 4100-2144)
734-073	Harness, Redundant CPU Power/Comm
734-074	Harness, Redundant CPU Backup
734-075	Harness, Power/Comm Box to Box (4100-0636) 96" (2438 mm)
734-076	Harness, Audio Box to Box (4100-0637) 96" (2438 mm)
734-078	Harness, 4100ES TIC to Legacy Pwr/Comm
734-081	Harness, Pwr/Comm 4020 Upgrade Kit
734-082	Harness, 4081 Battery with Fuse
734-083	Harness, 4081 Communication to 4100ES PDI
734-084	Harness, Legacy to PDI Pwr/Comm Bay to Bay 41" (1041 mm) overall length, 2 power/comm connector
734-085	Harness, Ribbon – 4100 Legacy Upgrade CPU to 2X40 Operator Interface
734-087	Harness, Legacy to PDI Pwr/Comm Box to Box 96" (2438 mm)
734-088	Harness, PDI Pwr/Comm Remote Command Center 35" (889 mm)
734-091	Harness, PDM Varistor
734-095	Harness, Additional 24V for Legacy Modules (4100-0638) 68" (1727 mm) overall length, 4 power/comm connector
734-102	Harness, NPU/4100ES Microphone/Local Speaker
734-114	Harness, Channel 1 only – for 4190-9011 Master Fiber Optic Audio Modem
734-115	Harness, Channel 2 only – for 4190-9011 Master Fiber Optic Audio Modem
734-165	Harness, TFX Interface to TLT-530 Network Module
734-180	Harness, Synch TFX Addressable Loop Interface
734-183	Digital Audio Riser Termination Plug
734-211	Harness, TCP/IP Physical Bridge
734-300	Harness, SPS Power and Comm with Signal Power Extension
734-302	Harness, Card/Signal Power and Comms

4100ES Service Parts List

Harness Assemblies (Continued)

Replacement Service Part	Description
746-180	3' Ethernet Cable (CPU to Front Panel Service Port)
746-186	5' Ethernet Cable (BNIC ports C and D)
4100-0642	Harness, MX Loop EPS Power
734-280	Harness, RUI+ Motherboard to EPS
734-257	Harness, PDM to EPS, 120V
734-258	Harness, PDM to EPS, 220/230/240V

Motherboards, Miscellaneous Modules, Accessories & Hardware

Replacement Service Part	Sales Feature PID	Description
Motherboards		
562-727	NA	Motherboard, 32 points (w/o Suppression)
562-799	NA	Motherboard, Style B (w/Suppression)
562-856	NA	Motherboard, Style B (w/o Suppression)
562-858	NA	Motherboard, 32 points (w/Suppression)
562-952	NA	Motherboard, 10 Amp Aux Relay Legacy
565-233	NA	Remote Interface Card (RICII) Legacy
565-274	NA	Universal Master Motherboard (UT, 4100+) – for use in 4100ES Upgrade systems
565-275	NA	Motherboard, Network Card
Miscellaneous Modules		
2080-9031	2080-9031	PROGRAMMER CABLE FOR 2080-9028
374-123	NA	Power Rectifier – (SPS, XPS, RPS, TPS, 100 Watt Amp)
Accessories		
2080-9047	2080-9047	DACT Communication Cable (14 ft. [4.27 m]), Harness 733-913
155-010	4100-5129	Ferrite Bead Kit – contains 3 Ferrite Beads (CE Compliance)
4190-9803	4190-9803	Replacement Paper for 4100-1293 Panel-Mounted Printer
4100-9837	4100-9837	Canadian 'Power On" Indicator Kit
155-010	NA	Ferrite Bead (Quantity = 1)
Hardware		
4100-9867	NA	MX Loop Module SPS Mounting Kit
184-038	NA	Battery Block Diode (used with the 450-323 Battery Distribution Block)
202-055	NA	Nylon Standoff (for 4100-6031, -6032, -6033)
202-060	NA	Nylon Standoff (for 4100-6030)
202-084	NA	Spacer 6x1/2 (for 4100-6031, -6032, -6033)
202-090	NA	PDI Standoff (for 4100 Legacy Motherboards, Fiber Optic Modems)
202-091	NA	Nylon Standoff (for 4100 Legacy Motherboards, mounts to card socket screws)
252-019	NA	"B" Key
266-072	NA	Retaining Clip for Cam Lock
268-009	NA	Lock Washer (for mounting 4100ES and 4100 Legacy modules)
294-030	NA	Rubber Bumper – Door
NA	NA	Hex Nut # 6
NA	NA	Speed Nut # 6 (for Blank Filler Plate)

4100ES Service Parts List

Motherboards, Miscellaneous Modules, Accessories & Hardware (Continued)

Replacement Service Part	Sales Feature PID	Description
NA	NA	Screw # 6 Torx 5/16" (8 mm) (Mounting screw for 4100 Legacy modules)
NA	NA	Screw # 6 Torx 7/8" (22 mm) (Mounting screw for 4100-6031, -6032, -6033)
NA	NA	Flathead Screw for Back Box Hinge
450-457	NA	Plug Connector (5 positions) for 565-413 Media Board
524-247	NA	PDI Stand Off (for 4100ES Modules)
524-253*	NA	Ground Post (for 4100-6030)
524-257*	NA	Mounting Post for 4100-1311 Digital Audio Controller
524-275*	NA	Mounting Post for Legacy Relay Cards
524-289	NA	Mounting Post for NAC Adapters
635-694	NA	Restriction Wire
* Discontinued Replacement Service Part.		

Fuses

Replacement Service Part	Description
208-002	1 Amp 120 Volt, Legacy Monitor Card
208-004	5 Amp, Legacy Power Supply F1 and F2
208-050	15 Amp, 4100ES Battery Harness
208-023	2 Amp, Legacy Signal Card and Power Supply
208-048	2 Amp, MAPNET II Devices
208-053	15 Amp, Legacy 10 Amp Relay Card, Enhanced (110 Ah) Battery Charger, and AC
208-094	20 Amp, Legacy Battery Fuse
208121	8 Amp, Legacy Expansion (50 Ah) Battery Charger
208-132	3 Amp, Legacy CPU Motherboard,
208-134	0.4 Amp, Legacy Internal Serial Communication Bus
208-136	5 Amp, Legacy Expansion Power Supply (w/leads [UL])
208-140	5 Amp 220 Volt, Legacy 8 pt Relay Card
208-142	12 Amp, Legacy Power Supply (8 Amp) for 100 Watt Amplifier
208-154	80 Amp, Legacy 110 Ah Charger Cabinet
208-156	30 Amp, Legacy 733-621 Battery Harness
208-163	3 Amp 250 Volt Fast .177 X .57
208-185	5 Amp 125VAC, Fast Acting GLS, 4100ES 8Pt/3 Amp Relay Card
208-186	3 Amp, 4100ES 4Pt/2 Amp Relay Card
208-189	2.5 Amp 250 Volt, Fast .177 X .57"
208-190	2.5 Amp, Subminiature Fuse
208-196	20 Amp Fuse
* Discontinued Replacement Service Part.	

4100ES Service Parts List

Labels		
Replacement Service Part	**Sales Feature PID**	**Description**
4100-1294	4100-1249	LED / Switch Slide in Label Kit
619-293	4100-9835	4100ES Circuit Termination Labels (2 sheets) (742-852)
4100-6029	4100-6029	Aftermarket Energy Management Application Guide UUKL
526-873	NA	Slide-In Label for 4100-1280, -1281, -1282, -1283, -1284
619-208		Slide-In Label for 4100-1252 (1-Channel Audio Operator Interface Module)
4100-9856	4100-9856	Canadian - French Applique Kit for 4100ES
4100-9857	4100-9857	4100ES Applique Retrofit Kit (for Legacy)
4100-9858	4100-9858	4100ES Appliqué Kit – Remote Unit Interface W/FUI
4100-9859	4100-9859	4100ES Appliqué Kit – Remote Unit Interface W/FUI, Can – French
* Discontinued Replacement Service Part.		

| Service Equipment		
Replacement Service Part	**Sales Feature PID**	**Description**
4100-9851	4100-9851	Wireless WalkTest Kit
734-212	NA	Wireless WalkTest Cable (replacement Motorola 2-way radio interface cable assembly
TrueStart	TrueStart	TrueStart Installation & Service Instrument (refer to manual for detailed service parts list)
733-571	NA	25 Pin (DB25) to Flying Lead Cable
617-836	NA	6 Foot DB9 to DB25 Adaptor
4190-9816	4190-9816	Service Gateway Software Kit (Includes Software and Customer Dongle)
741-776	NA	Customer USB Dongle for Service Gateway Software
741-727	NA	TR USB Dongle
734-296	AT Harness	Harness used for analyzing Service Port traffic or with PC board 566-859 for analyzing network traffic
566-859	4120 Network Analyzer	Card that plugs into Modular Network card, used with harness 734-296 for analyzing network traffic

Software

Replacement Service Part	Description
*741-805	ES Programmer Software CD
*741-806	Service Gateway Software CD
	Network Programming Software
	Transponder Interface Card (TIC) Software (TIC.bin)
	System Power Supply (SPS) Software w/SPS IDNet Software (SPS.bin)
	Expansion Power Supply (XPS) Software (XPS.bin)
	Remote Power Supply (RPS) Software (RPS.bin)
	IDNET Software for individual 4X5 IDNet cards only (IDNET.bin)
	TrueAlert Power Supply (TPS) Software (TPS.bin)
	External Battery Charger (XBC.bin)
	Analog Audio Controller Software (AUDANA.bin)
	Digital Audio Controller Software (AUDDIG.bin)
	Audio Amplifier (AMP.bin)
	Phone Software (PHONE.bin)
	Local Mode Transponder Interface Card (LMC.bin)
**	XA Loop Interface Card Software (XALIC.bin)
	Expansion Signal Card (XSIG.bin)
	MAPNET/IDNet Quad Isolator Software (MAPISO.mot)
	ES Master Controller Software (ES.bin)
	ES CPU Bootloader Software (CPUBoot.bin)
	Flexible User Interface Software (FUI.bin)
	Flexible User Interface Bootloader Software (FUIBoot.bin)
	Building Network Interface Card Software (BNIC.bin)
	Ethernet Bootloader Software (EBoot.bin)
	eSlave Operating System Software (EOS.bin)
	Audio Amplifier 2 Software (AMP2.bin)
	Digital Audio Controller 2 Software (AUDDIG2.bin)
	BMUX Card Software (BMUX.bin)
	IDNet+ Card Software (IDNETPLUS.bin)
	TFX Loop Interface Card Software (TFXLoop.bin)
***741-754	Slave Bootloader (BOOT)
***742-146	IDNet PIC Software (PIC)
***741-164	TrueAlert Power Supply PCC (for TPS and 4009T) (PCC)
***740-748	MAPNET Quad Isolator Software -Programmed IC (uses 246-320 EPROM)
***246-320	Blank EPROM 27C64 8K X 8
***741-366	PROM – Fiber Optic Modem FPGA Configuration
*Available on CD and download from Technical Services INTRAnet Web Site, Downloads section **Download Only from Technical Services INTRAnet Web Site, Downloads section ***Available via Order only	

SimplexGrinnell™ Services
One Company. One Call. Total Protection.

Your **INTRUSION SYSTEM** is vital to protecting employees and property against unwelcome visitors. An inspection, testing and maintenance program from SimplexGrinnell will ensure optimum system performance. Our services, which include testing glass-break sensors, cleaning the optics of motion sensors and realigning magnetic door sensors, help keep your facilities safe.
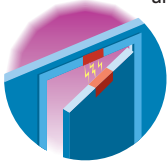
AUTOMATIC SPRINKLERS can minimize property damage and save lives. SimplexGrinnell's comprehensive Sprinkler System Testing and Inspection program is based on NFPA Codes 25 and 13, keeping you in compliance with insurance and fire codes. SimplexGrinnell specialists will test and inspect your sprinkler system to detect problems and fully document the results – before potential failures affect your safety.

**SPECIAL-HAZARD FIRE SUPPRESSION SYSTEMS** protect the key assets and resources that make your business successful. From computer rooms to fuel-pump islands, rare documents to manufacturing equipment, SimplexGrinnell experts test all elements of special-hazard fire suppression systems and recommend maintenance and improvements.

Today's high-temperature appliances make **KITCHEN-FIRE SUPPRESSION SYSTEMS** essential. Our semi-annual, 21-point assessment will keep you up-to-date on ever-changing requirements, keep your personnel safe and prevent loss and damage. A specially trained SimplexGrinnell professional inspects all elements of these important safety devices.
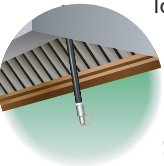
We'll help make sure your **EMERGENCY LIGHTS** work when you need them. At SimplexGrinnell, our emergency lighting service goes far beyond the simple "button test." We'll thoroughly test and inspect your entire system to ensure proper operation. All SimplexGrinnell tests and inspections are in accordance with NFPA 101 (Life Safety Code).
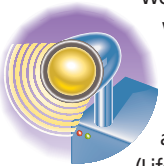
SimplexGrinnell can optimize the operations and quality of your sound and **COMMUNICATIONS** infrastructure. Whether it's a building intercom or SimplexGrinnell-installed PBX telephony system, our trained technicians will provide superior sound enhancement, multimedia distribution and other custom services to keep your communications clear.

ACCESS CONTROL is vital to security and productivity. If the access control system is down, no one gets in the building and work time is wasted. Hundreds of organizations use SimplexGrinnell services to ensure uninterrupted access to their facilities – and only by authorized personnel.

Our **MONITORING SERVICE** gives you the ultimate peace of mind: around-the-clock electronic surveillance of your facilities. We're the only national UL-listed service with a total focus on commercial facilities. First, we'll integrate your safety systems with our Central Monitoring Station, the industry's most advanced. Then, we'll monitor your building 24/7. In an emergency, SimplexGrinnell will notify authorities, guide emergency personnel to the scene and keep you informed. We'll even initiate your emergency action plan.
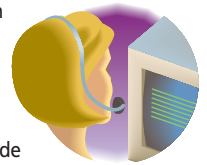
Keep everyone in your facility healthy and safe with our certified test for **BACKFLOW FLOW PREVENTION SYSTEMS**. Careful, regular inspection assures that backflow prevention devices operate correctly to protect potable water. SimplexGrinnell experts flag any deterioration in valves, piping, hangers, drains, test ports and related equipment.
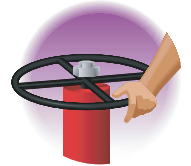
Your **FIRE ALARM SYSTEM** may look fully operational but still malfunction in an emergency. SimplexGrinnell Fire Alarm Testing and Inspection exposes and resolves potential problems before your building and your people are put at risk. Control panels, pull stations, smoke detectors, horns – our specialists will keep them all in perfect shape.
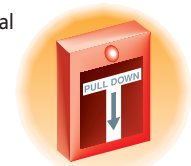
CCTV SYSTEMS must be inspected regularly to ensure the highest levels of uptime and availability. SimplexGrinnell provides a complete range of service and maintenance options for installed video surveillance equipment and security technologies, right down to cleaning the VCR heads. By optimizing the performance of your security equipment, you'll help protect your people and property against intruders, fraud and vandalism.

Imagine grabbing a **FIRE EXTINGUISHER**, pointing it at a fire – and nothing happens. That's the danger if an extinguisher goes too long without maintenance. Fortunately, SimplexGrinnell's trained specialists can regularly inspect and maintain your extinguishers. So when you need them, they'll be ready.

When fire strikes, be sure you have the water pressure to strike back. SimplexGrinnell experts use special technology to inspect **AUTOMATIC FIRE PUMPS**, reporting deficiencies and recommending corrective action. Regular inspections, required by local, state and federal codes, can save lives and property in an emergency.
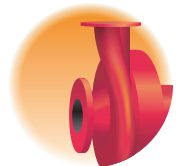
If there's a fire, **SMOKE DETECTORS** are your first line of defense. So keeping your detectors in perfect condition is vital to any safety strategy. SimplexGrinnell's world-class Smoke Detector Maintenance Program offers multiple service levels, including testing, cleaning, sensitivity testing, replacement and stock supply. This comprehensive approach helps keep your detectors fully operational and minimizes false alarms.

1-800-746-7539
www.simplexgrinnell.com

MC18-1-745

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SimplexGrinnell

FIRE ALARM SYSTEM TESTING AND INSPECTION

Your fire alarm system may look like it's fully operational. But the truth is, you can't tell if a system is working properly just by looking at it.

And that means you may not know how (or even if) it will function until an emergency occurs. Which is too late.

With the SimplexGrinnell™ Fire Alarm System Testing and Inspection program, you can be sure your system will provide the protection your building requires and your occupants expect. Our service covers all fire alarm control equipment and alarm devices, including pull stations, smoke detectors, heat detectors and horns.

Beyond testing and inspection, SimplexGrinnell will provide predictive maintenance to expose problems before they result in system failures. In the process, SimplexGrinnell will also help reduce costly false alarms and help you comply with fire codes

Looks can be deceiving. To be sure your system is working, you need an expert.

SimplexGrinnell has extensive experience in designing and testing fire alarm systems. In fact, we're recognized as a leader in our industry – with the expertise to professionally test, inspect and service all SimplexGrinnell systems as well as those from other suppliers.

As one of our customers, you can expect:

- comprehensive, functional testing using specialized tools and instrumentation to detect malfunctions you can't find by visual inspection alone.

- testing of all alarm devices for functionality or damage.

- adjustment and calibration of system control equipment.

- system performance evaluation.

- service performed by factory-trained technicians using specialized instrumentation.

- thorough documentation confirming test completion and results.

SimplexGrinnell predictive maintenance includes:

- equipment analysis to detect potential failures.

- repair estimates for corrective action.

- component replacement on a per-item basis or as part of an annual service agreement.

Let SimplexGrinnell be your single source for system services that help protect people and property. We'll keep you a step ahead of any emergency.

PROTECTING PEOPLE, PROPERTY AND PEACE OF MIND

tyco

Fire & Security

SimplexGrinnell

www.simplexgrinnell.com

FIRE SYSTEMS MAINTENANCE INTERVALS

	Quarterly	Semi-Annually	Annually
VISUAL INSPECTION			
Control Panels			X
Batteries		X	
Fiber Optic Connections			X
Emergency Voice/Alarm Equipt		X	
Remote Annunciators		X	
Air Sampling		X	
Duct Detectors		X	
HVAC Control Dampers		X	
Suppression Release Systems		X	
Heat detectors		X	
Smoke Detectors		X	
Waterflow & Tampers	X		
Post Indicator Valves	X		
Alarm Notification Appliances		X	
Dialers & Interface Equipt		X	
TESTING			
Control Panels			X
Batteries		X	
Fiber Optic Connections			X
Emergency Voice/Alarm Equipt		X	
Remote Annunciators			X
Air Sampling			X
Duct Detectors			X
HVAC Control Dampers			X
Suppression Release Systems			X
Heat detectors			X
Smoke Detectors			X
Waterflow & Tampers		X	
Post Indicator Valves	X		
Alarm Notification Appliances			X
Dialers & Interface Equipt			X

*********INSERT PANEL POINTS LIST HERE********

*********INSERT PANEL NFPA72 COMPLETION FORM HERE********

PROTECTOWIRE® FireSystems

Protectowire FiberSystem 8000 PTS Series Controllers
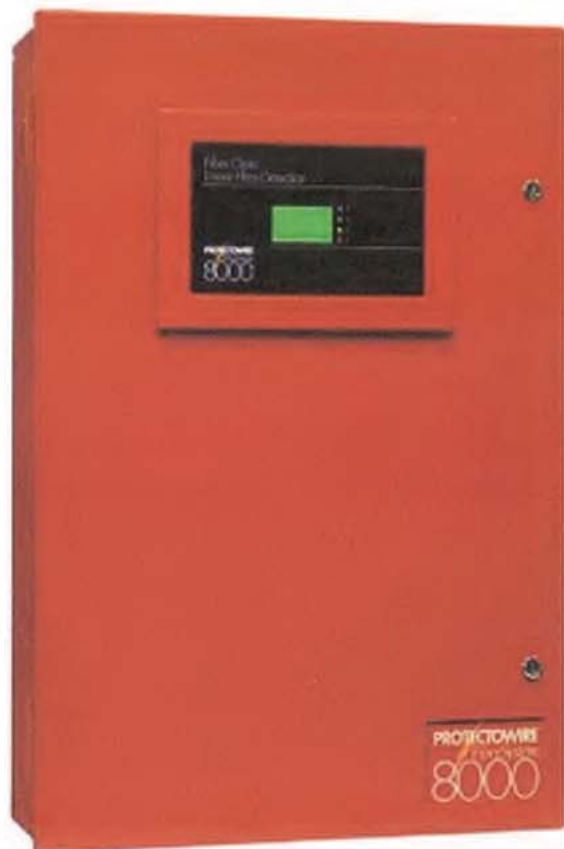
Features

- Unique zoning capabilities. A single length of sensor can contain up to 256 zones.

- Multiple alarm initiating criteria by zone.

- Available with 1, 2 or 4 channels.

- Capable of continuous temperature monitoring in ranges up to 10km (32,800 ft.).

- Graphic display of temperature profile, fire size, and spread using computer interface.

- LAN Interface (TCP/IP) enables remote access from multiple locations.
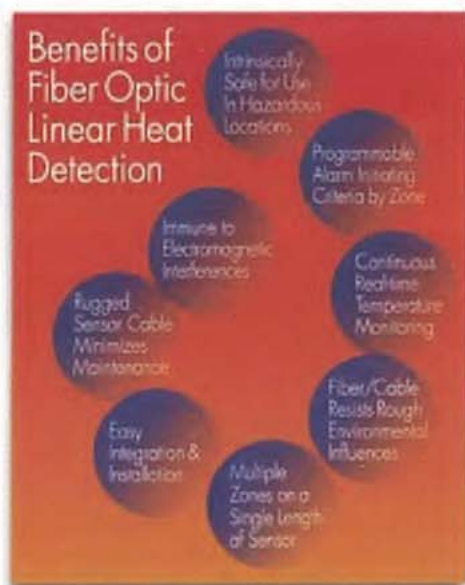
Description

The Protectowire FiberSystem 8000 has been designed for use as a linear heat detection system using state-of-the-art fiber optic sensing technology. The system consists of Type PFS Fiber Optic Sensor Cable and the PTS Controllers with related software. The PTS Series Controllers can be configured for various alarm criteria and can be connected to an approved fire alarm control panel using relay inputs and outputs. The system is specifically designed for high risk commercial and industrial hazards that demand high reliability and customized system features.

Protectowire's distributed temperature measurement is based on the proven Raman-Optical Time-Domain-Reflectometry (OTDR) technique. An optical laser pulse propagating through the sensor fiber gets scattered light back to the transmitting end, where it is analyzed using a patented code sequence measurement concept.

The backscattered light is spread across a range of wavelengths. Some of these wavelengths are affected by temperature changes while others are immune. The intensity of the Raman signals is a measure of the temperature along the fiber. By very accurately measuring the difference in the signal intensity of the backscattered light an accurate temperature measurement can be made.

In a Multi-Channel Single End configuration, the Controller performs single ended measurements on two or four separate fibers thus providing distinct detection "channels." In the Multi-Channel Closed Loop operating mode, the sensor cable is installed in a loop, and the Controller performs measurements from both ends of the fiber. If a break should occur in the fiber, the entire sensor cable length continues to be monitored from both directions thus ensuring detection over the entire length of the sensor cable up to the point of the break.

Zones: A single length of sensor cable can be partitioned into different "zones" for various requirements (e.g. equipment shutdown, ventilation, and extinguishment release). Zones can be defined as desired and even overlapped, increasing system control capabilities. All FiberSystem 8000 PTS Controllers provide up to 256 alarm zones per channel. Individual alarm parameters and outputs can be assigned to each zone. The PTS Controllers also provide the ability to localize fire location with great accuracy. This ability is particularly useful for connecting the Controller to a control panel with extinguishing release capabilities.

Benefits of Fiber Optic Linear Heat Detection

Intrinsically Safe for Use In Hazardous Locations

Programmable Alarm Initiating Criteria by Zone

Immune to Electromagnetic Interferences

Continuous Realtime Temperature Monitoring

Rugged Sensor Cable Minimizes Maintenance

Fiber/Cable Resists Rough Environmental Influences

Easy Integration & Installation

Multiple Zones on a Single Length of Sensor

Alarm Initiation: Temperature measurement on the sensor cable by the PTS Controller takes place at periodic intervals known as the measurement cycle time. An alarm is triggered at the end of the measurement cycle if any one of the following alarm criteria is exceeded in a zone:

- Maximum temperature per zone.
- Temperature difference between a measurement location and the zone average (zone differential).
- Temperature development per zone in terms of time (time differential / rate-of-rise).

Unlike conventional systems, these freely programmable alarm settings are user selectable and can be adapted individually by zone depending upon the specific requirements of the application. Different alarm sensitivities on the same sensor cable run allow precise and selective initiation of counter measures.

Fire Size: The PTS Controllers have the unique ability to provide information on the size of the fire by displaying relevant information in the visualization software. Fire size parameters can be individually set for five different sizes during parameterization. Default values are: Size 1 = < 5m (16 ft.); Size 2 = 5 to 10m

(16 - 33 ft.); Size 3 = 10 to 50m (33 - 164 ft.); Size 4 = 50 to 100m (164 - 328 ft.); Size 5 = 100 to 500m (328 - 1640 ft.).

Direction of Fire Spread: Most fires have a dominant direction of spread caused by such factors as air current, construction, or combustibles. By knowing this propagation direction, the counter action of the emergency services can be directed to the less hazardous side of the fire. The visualization software provides three different options for determining the direction of fire spread.

- No direction - localized.
- Toward the PTS Controller (beginning of the sensor cable run).
- In the direction away from the PTS Controller (toward the end of the sensor cable run).

In the case of a sensor cable closed loop set-up, the "Point of Return" needs to be set to ensure that the propagation direction is displayed correctly.

Alarm Resetting: Resetting an alarm condition on the PTS Controller is done by using one of the four input contacts, the internally mounted reset button, or via the PTS Configuration software.

Communication

Configuration Software is provided with each FiberSystem 8000 Controller. This software can be easily adapted to specific customer requirements, and offers numerous options for displaying and processing the recorded alarm and temperature data. The software makes it possible to create multiple zones along a single length of sensor cable, select multiple alarm initiating criteria, provide unique alarm visualization graphics, and to configure zone related alarm generated outputs for event handling.

Interface Solutions

The FiberSystem 8000 can easily be integrated into SCADA Systems, direct process control or external connections to fire alarm control panels. The following special order accessory products can be used to extend the standard PTS interfaces:

Interface Box for Modbus: This device provides access via the Modbus protocol over RS232, RS422, or RS485, as well as over TCP/IP. The Modbus protocol offers, complete temperature trace data, each alarm parameter per zone, and several status conditions like fiber break.

Through a virtual host concept, the data is available for each sensor (channel) as a Modbus unit. This means that only one unit is required even for multiple channel operation. Ten thousand register holdings and three thousand register coil definitions can be flexibly assigned for each Modbus unit.

Relay Control: When the application requires the use of more than the forty four (44) embedded relay outputs of the PTS Controller, a Relay Controller Set should be used. In combination with the Relay Extension Set it is capable of controlling up to 256 relay outputs per channel. Each relay output can be flexibly assigned to any defined alarm condition.

The Relay Controller Set includes:

- Power Supply (More than 128 relays requires a second power supply)
- Pre-programmed Relay Controller
- One (1) digital output module, one (1) end module
- Eight (8) relays

The local position of an alarm temperature is determined by measuring the arrival time of the returning light pulse similar to a radar echo showing the distance of a car or plane. This enables the FiberSystem PTS Controller to provide an exact location of a fire or hot spot anywhere along the sensor's length. Temperatures are recorded as a continuous profile. The system is also capable of providing graphical representation of the fire size and direction of fire spread based upon the length of sensor in alarm.

System Design Features

Each PTS Controller is provided with four (4) programmable optically decoupled inputs, and forty four (44) programmable voltage free outputs (one trouble relay output and forty three alarm relay outputs) for reporting to a main fire alarm panel. The trouble relay is normally closed and the alarm relays are normally open. Reverse logic can also be programmed. The resulting ability to switch between these two states provides several options for the user. For example, the output can be used to operate external audible signals or warning lamps.

The system can be integrated easily into your management platform (e.g. SCADA systems) by either directly communicating over Ethernet (TCP/IP) using SCPI (Standard Commands for Programmable Interface), or Modbus RS232, RS422, RS485 and TCP/IP. Also optionally available is a relay extension module that can trigger up to 256 relays per channel. The relay extension module is used to extend the forty four (44) standard embedded relay outputs provided in the PTS Controller.

System Architecture

Controller: The PTS Controller is housed in a NEMA 1(IP20) type enclosure. The Controller contains the system operating software, transmitter, receiver, and digital processor.

- Transmitter: This unit contains the laser and its control. Its function is to generate the laser light by means of a semiconductor laser diode, and to control its overall operation.

- Receiver: This unit contains the entire optical design including coupler and optical receiver. Its function is to couple the laser light generated in the transmitter module to the sensor cable fiber. Additionally, the back-scattered light returned from the sensor fiber is distributed to the individual measurement channels, converted optically/electrically and amplified.

- Digital Processor: The digital processor controls the overall operation of the Controller and the temperature measurement process. Based upon the data it receives, the unit calculates the temperature profile along the sensor cable, controls alarm processing based upon stored zone definitions, manages the integrated four (4) inputs and multiple outputs, and communicates over the serial interface or via Ethernet.

The Controller is provided with active system status indicators, color display, one (1) power disconnect switch, and one (1) reset switch mounted inside the enclosure. The LED visual indicators are grouped into four functional categories and signal the following information:

- TX/RX - Indicates communication activity between the PTS and controlling computer.

- FAULT - Indicates the PTS has an error or "trouble" condition.

- RDY - Switches on after booting as readiness indicator.

- ALARM - On when the temperature value measured on the corresponding measuring channel exceeds the predefined alarm limits.

Fiber Optic Sensor Cable:
Protectowire PFS Series Fiber Optic Sensor Cable has unique advantages over other types of detectors, especially when difficult installation factors or severe environmental conditions are present. When used with a Protectowire FiberSystem 8000 PTS Controller, temperature measurement on the Sensor Cable takes place at periodic intervals to provide a continuous temperature profile.

The sensor cable consists of a non-metallic or stainless steel tube with an outside diameter of 1.2 - 1.8 mm (.05 - .07 inches). In the
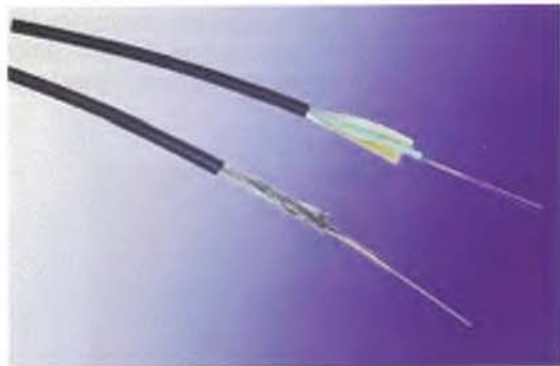
tube are two independent color-coded quartz fibers. Depending upon the model selected, the tube is clad with a layer of stainless steel wire or Aramid yarns. The sensor's core is then sheathed in a flame retardant jacketing material to a diameter of 4 mm (.16 inches).

System Configuration:
- Power supply and a power source in compliance with UL requirements (10 to 30 VDC).

- The fiber optic sensor cable with PTS Controller shall be connected to a listed or approved fire alarm control panel through up to forty four (44) potential free contact outputs. Alarm and trouble conditions are conveyed by this means (43 alarm, 1 common trouble).

- Alarm confirmation of the fire alarm control panel occurs by means of up to four (4) opto-decoupled Controller inputs. Alternatively, this can also take place by means of a computer (if connected).

- The Controller can be connected to a PC by USB or LAN. This allows system parameterization to be carried out and measurement information to be read and displayed.

Functions

Operating Modes: Standard PTS Controllers are configured to operate as a Single Channel Single End device. In this configuration, if a fiber break caused by fire or mechanical damage should occur, the monitored area after the fiber break would be lost, and would no longer be capable of initiating an alarm.

When a Multi-Channel Controller is utilized, it incorporates additional optical connectors. These connectors allow the device to operate in a Multi-Channel Single End mode, or a Multi-Channel Closed Loop mode.

The **Relay Extension Set** adds another Digital Output Module and eight (8) relays. As an example, to offer forty-eight relays, one Relay Controller Set and five Relay Extension Sets would be needed.

FiberSystem 8000 PTS Specifications

Power Input:
D C Power Supply, 10 to 30 V D C

Power consumption: 17 W typical @ 20°C (68°F). Maximum power is < 40 W (under all operating conditions). U L listed systems require the use of an auxiliary 24 V D C power source capable of providing a minimum of 24 hours of standby emergency power with 10 minutes of alarm.

Environmental Conditions:
Operating Temperature Range: -10°C to 60°C (14°F to 140°F)

Storage Temperature Range: -40°C to +80°C (-40°F to 176°F)

Operating Humidity Range: 0% to 95% non-condensing

Housing:
PTS Controller is mounted in a N E M A 1 (IP20) type enclosure with a textured red finish.

Size: 20in. W x 30in. H x 7in. D (51cm x 76cm x 18cm)

Interfaces:
Optical Connector: E2000; 8 degree angled
Number of Channels: 1, 2 or 4 depending on model
Computer Interface: USB, L A N
Relay Board: 4 inputs / 44 outputs (voltage free contacts)

Ordering Information

1. FiberSystem 8000 PTS Series Controllers - Select the model number of the basic system control unit from the chart below. All Controllers are mounted in a N E M A 1 (IP20) enclosure and contain 4 input and 44 output relay contacts, ethernet/USB interface and configuration software.

Range	One (1) Channel	Two (2) Channels	Four (4) Channels
1 kilometer (3,280 ft.)	PTS-8101	PTS-8201	PTS-8401
2 kilometer (6,560 ft.)	PTS-8102	PTS-8202	PTS-8402
4 kilometer (13,120 ft.)	PTS-8104	PTS-8204	PTS-8404
6 kilometer (19,680 ft.)	PTS-8106	PTS-8206	PTS-8406
B kilometer (26,240 ft.)	PTS-8108	PTS-8208	N/A
10 kilometer (32,800 ft.)	PTS-8110	N/A	N/A

2. PTS Controller Options - Add option code letter to basic PTS model number when ordering.

Option Code	Description
A	Integrated Modbus T CP/IP Interface

Accessories

Protectowire Model No.	Description
R C C-3	Relay Connection Cable Set - 1 input cable D-Sub 9, 2 output cables D-Sub 25, 90 inches (230cm) long.
RCS-1	Relay Controller Set (includes power supply, relay controller, output/end modules, and eight (8) relays. **This accessory requires the MIB-8000 Interface Box for proper operation.**
RES-2	Relay Extension Set (includes digital output module and eight (8) relays).
RPS-1A	Relay Power Supply (maximum 128 relays).
P W C-2000	E-2000 APC 8° Angled Connector with 16 ft. (5m) Pigtail.
P W C-2000A	E-2000 Adapter; Connects two E-2000 Connectors.
M I B-8000	Interface Box for Modbus.
JB-2S	Joint Box w/Integral Strain Relief & Splice Tray (N E M A 1/IP20).

SPECIAL HAZARD FIRE DETECTION SYSTEMS

PROTECTOWIRE® FireSystems

Protectowire FiberSystem 8000
PFS Series Fiber Optic Sensor Cable

Features

- Two models available.
- Immune to electromagnetic interferences.
- Withstands severe environmental conditions.
- Little or no maintenance required.
- Halogen free, flame retardant jacket.
- Programmable alarm temperature.

Description

Protectowire PFS Series Fiber Optic Sensor Cable measures temperatures by means of optical fibers functioning as linear sensors. Temperatures are monitored along the sensor cable as a continuous profile. This ensures highly accurate temperature discrimination over great distances or large surface areas. The sensor cable consists of a non-metallic or stainless steel tube with an outside diameter of 1.2 - 1.8 mm (.05 - .07 inches). In the tube are two independent color-coded quartz fibers. Depending upon the model selected, the tube is clad with a layer of stainless steel wire or Aramid yarns. The sensor's core is then sheathed in a flame retardant and halogen free jacketing material to a diameter of 4 mm (.16 inches).

Applications

- Tunnels
- Cable trays
- Conveyors
- Power distribution apparatus: switchgear, transformers, motor control centers, power cables
- Cooling towers
- Mines
- Pipelines
- Bridges, piers, marine vessels
- Aircraft hangars

Today, fiber optic temperature sensors are used in a variety of special applications. Their unique characteristics make them adaptable for such varied uses as monitoring the curing of concrete, detecting road icing and leaks in pipelines, and monitoring power cables for overloads.

In the area of fire detection, fiber optic technology is ideally suited to industrial high-risk hazards as well as many types of commercial applications. Protectowire PFS Series Fiber Optic Sensor Cable has unique advantages over other types of detectors, especially when difficult installation factors or severe environmental conditions are present. When used with a Protectowire FiberSystem 8000 PTS Controller, temperature measurement on the Sensor Cable takes place at periodic intervals to provide a continuous temperature profile.

Features & Benefits

• Identifies and displays the alarm location anywhere along its length when used with the unique visualization software and PTS Controller.
• Unique zoning capabilities. A single length of sensor can be divided into 256 zones for various requirements (e.g. video, ventilation, and extinguishment zones).
• Multiple alarm initiating criteria by zone. Alarm initiating may be based upon a maximum temperature per zone, temperature development per zone in terms of time (rate-of-rise), or temperature difference between a measurement location and the zone average (zone differential).
• Reinforced stainless steel inner core and rugged flame retardant outer jacket provide resistance to mechanical damage.
• Simple to install. Can be field spliced with appropriate fusion splicing tools.

Specifications

The PFS Series product range consists of two distinct types of Sensor Cable. Each type has a unique construction that has been designed to accommodate the widest range of installation requirements and environments. All product specifications are subject to change without notice.

PFS-554-FR - Type FR Sensor Cable consists of a stainless steel core tube that contains two independent color-coded quartz fibers each with an outside diameter of .25 mm (.01 inches). The tube cavity is gel-free and is longitudinally and laterally watertight. The outside of the core tube is wrapped with a layer of fine stainless steel wires that add to the mechanical and tensile strength of the cable. The sensor cable is then sheathed with a halogen free, flame retardant FRNC thermoplastic jacket suitable for a wide range of applications and environments.

PFS-654-MF - Type MF Sensor Cable is a metal free Sensor and has been specifically designed for use in applications where a high amount of electromagnetic disturbances are expected like tunnels, high voltage cable trays and transformers. To minimize the risk of induced voltages, the construction of the metal free Sensor Cable substitutes a polyamide core tube reinforced with Aramid yarn in place of the stainless steel tube and wire used in the FR type Sensor. The outer jacket consists of the same halogen free, flame retardant FRNC thermoplastic used throughout the product line. This series is best described as multi-purpose, and is well suited to a wide range of both commercial and industrial applications.

Installation Accessories

A comprehensive range of mounting and installation accessories are available for the installation of Protectowire Type FR and MF Fiber Optic Sensor Cables. These include several types of clips, straps, drive rings, beam clamps, cable standoffs, connectors and zone boxes. Their proper use assures a neat and reliable installation. Only installation hardware supplied or approved by The Protectowire Company should be used.

Cable Type	PFS-554-FR	PFS-654-MF
Number of fibers	2	2
Cable Diameter	4 mm (.16 inches)	3.8 mm (.15 inches)
Min. bend radius	60 mm (2.4 inches)	60 mm (2.4 inches)
Max. Ambient Temperature Range	-40° to 85° C (-40° to 185° F)	-40° to 85° C (-40° to 185° F)
Cable Weight	44 kg/km (30 lbs./1,000 ft.)	18 kg/km (12 lbs./1,000 ft.)
Max. UL Listed Spacing	15.2 m (50 ft.)	15.2 m (50 ft.)
UL Listed Alarm Operating Temperature Range	Both Models Programmable from 57° C (135°F) to 113° C (235° F).	

Only Protectowire PFS Fiber Optic Sensor Cables comply with the manufacturer's requirements for calibration and compatibility with FiberSystem 8000 PTS Controllers. The use of any other fiber optic cable or sensor on this system is considered a misapplication of the product and will void all warranties either expressed or implied.

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ALTV2416300ULCBM

Overview

ALTV2416300ULCBM provides 24VAC or 28VAC distributed via Sixteen (16) Class 2 Rated PTC protected power-limited outputs for powering CCTV Cameras, heaters and other video accessories.

Specifications

Input:
- 115VAC, 50/60Hz, 2.7 amp.

Output:
- Sixteen (16) Class 2 Rated PTC protected power-limited outputs.
- 24VAC @ 12.5 amp (300VA) supply current *(0.781 amp per device, 2.5 amp max.)* or 28VAC @ 10 amp (280VA) supply current *(0.625 amp per device, 2.5 amp max.).*
- Outputs are rated @ 2.5 amp.
- Surge suppression.

Electrical:
- Operating temperature: 0° C to 49° C ambient.
- BTU/Hr.:
  - 24VAC: 153.55 BTU/Hr.
  - 28VAC: 143.31 BTU/Hr.

Electrical (cont'd):
- System AC input VA requirement: 310.5VA.

Features:
- Secondary fuse rated @ 10 amp/250V.
- AC power LED.
- Power ON/OFF switch.

Mechanical:
- Enclosure Dimensions (H x W x D approx.): 8.5" x 7.5" x 3.75" (215.9mm x 190.5mm x 97.9mm)
- Product weight (approx.): 8.2 lbs (3.7 kg)
- Shipping weight (approx.): 9.2 lbs (4.2 kg)

Agency Approvals
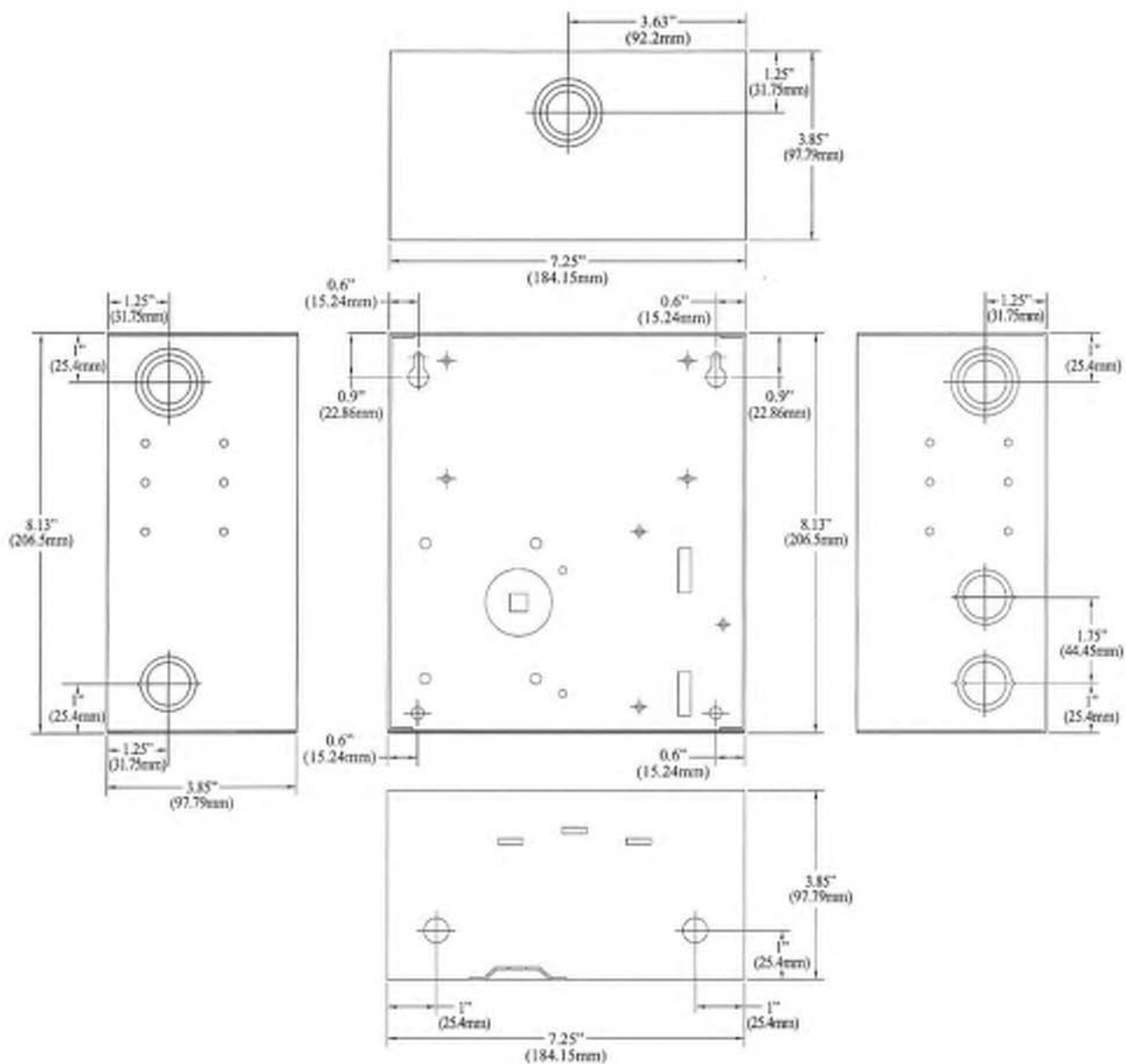
UL Listed for Commercial CCTV Equipment (UL 2044).

CUL Listed - CSA Standard C22.2 No.1-98, Audio, Video and Similar Equipment.

CE European Conformity

Enclosure Dimensions *(H x W x D approximate):*

8.5" x 7.5" x 3.75" (215.9mm x 190.5mm x 97.9mm)

SimplexGrinnell

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A Tyco International Company

End of Manual