FA-265

Fire Alarm Control Panel

Installation and Operation Manual

LT-2016 MIR Rev. 3
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1 Introduction

1.1 The FA-265 Fire Alarm Control Unit

1.1.1 General features

- Five initiating device circuits, class B / style B
- Two notification appliance circuits, class B / style Y (Power Limited) [can be wired as one NAC, class A / style Z]
- One common alarm-actuated relay, form ‘C’
- One common trouble-actuated relay, form ‘C’
- AUX+ power output, 500 mA max. (Power Limited)
- Unswitched common and switched common auxiliary power returns
- Integral battery charger
- Cabinet with dead-front construction
- Transformer, mounted in the cabinet

1.1.2 Applications

The FA-265 five zone, fire alarm control panel is listed for use in the following applications.

- Protected Premises Fire Alarm System

And for the following types of service:

A – automatic, M – Manual, SS – Sprinkler Supervisory, WF – Waterflow

1.2 Codes, Standards and Installation Requirements

1.2.1 Relevant codes and standards

The FA-265 fire alarm control panel is designed to meet the requirements of NFPA 72, 2002 edition, UL 864 Rev 9, Control Units for Fire Protective Systems, and in Canada, CAN/ULC-S527-99, Standard for Control Units for Fire Alarm Systems.

Information provided with this unit is intended as a guide. Installation of this equipment, optional system components, alarm initiating devices and notification appliances must follow the manufacturer’s guidelines as contained in their respective installation documents, all applicable codes and the instructions of the Local Authority Having Jurisdiction.

1.2.2 General Installation requirements

Manufacturer’s documents

When installing the FA-265 control panel, refer to this manual. When installing optional system components refer to the installation documents included with those components. When

installing compatible alarm initiating devices or notification appliances, refer to the installation documents included with those products.

Field wiring

Field wiring recommendations in this document are intended as guidelines. All field wiring must be installed in accordance with NFPA 70 National Electrical Code and in Canada with the standard for installation ULC/S 524, the most current Canadian Electrical Code, with all relevant local codes and standards, and the Authority Having Jurisdiction.

Compatible devices

Use UL or ULC Listed smoke detectors and notification appliances that are compatible with the FA-265 Fire alarm control panel from the lists included in this manual.

1.3 Technical Support and General Information

For technical support call 1--888-660-4655, or email techsupport@mircom.com.

For general product information visit the Mircom web site: **www.mircom.com**.

1.4 System Verification

The complete fire alarm system must be verified for proper installation and operation when:

- the initial installation is ready for inspection by the Local Authority Having Jurisdiction;
- any system component is added, changed or deleted;
- any programming changes are made;
- system wiring has been altered or repaired;
- system failure due to external influences such as lightning, water damage or extended power outages has occurred.

1.5 Standby Power

The FA-265 provides standby battery support for lead-acid rechargeable batteries. The required capacity of the standby batteries must be calculated using the charts and tables within this manual for the period as required by national or local codes and standards. Even though the calculation table within this manual includes a safety margin, lead-acid batteries commonly used for standby can have variable capacity as a result of age and ambient conditions. Periodic inspection for damage and the batteries' ability to support the attached equipment is highly recommended.

1.6 Battery Maintenance

The two 12V sealed lead-acid batteries should be replaced after each period of 3 to 5 years of normal service. If the Battery Trouble indicator activates, obtain required service.

2 Preparing to Install the FA-265 Fire Panel

2.1 Unpacking the FA-265

The basic FA-265 package includes the following components:

- Cabinet with hinged door
- Display and control plate c/w display and control printed circuit board.
- Zone label insert
- Battery compartment dead front plate
- Main control PCB
- Transformer
- Installation manual
- Hardware pack
- 2 × NAC EOL resistors (4.7 K, 5%, ½ W)
- 5 × Zone EOL resistors (4.7 K, 5%, ½ W)
- 1 × Battery jumper wire
- 1 × EGND terminal ring
- 1 × EGND KEP nut
- Door keys (taped to outside of cabinet)

All components described above are factory assembled into the enclosure.

2.2 Optional Accessories

Model Number	Name	Description
RM-263	Relay module	Provides 3 relays that are jumper programmable to activate on common ‘alarm’, ‘supervisory’ or ‘trouble’. Mounts inside the enclosure and plugs into the main board.
UDACT-286	Dual line dialer	Communicates all alarms, supervisory and trouble conditions to a Central Station using Contact ID, SIA or 10/20 BPS communication formats. Programmable using the MR-2844 handheld programmer. Mounts inside the enclosure and connects to the main panel using a supplied 4-wire cable with connector.
MR-2844	Programmer	Handheld programmer for the UDACT-286 DACT.
RTI-265	Remote trouble indicator.	Single gang plate complete with common trouble buzzer, trouble visual indicator, ‘AC on’ visual indicator and a trouble silence / lamp test switch. Mounts remotely to a single gang electrical box and is connected to the main panel via the 4-wire ‘secur-bus’.
RAM-265	Remote trouble indicator and alarm indicator	Two gang plate complete with common trouble buzzer, trouble visual indicator, ‘AC on’ visual indicator and a trouble silence / lamp test switch and5 red zone alarm visual indicators and 5 yellow zone supervisory indicators. Mounts to a standard 2 gang electrical box and is connected to the panel via the 4-wire ‘secur-bus’.

2.3 FA-265 Overview

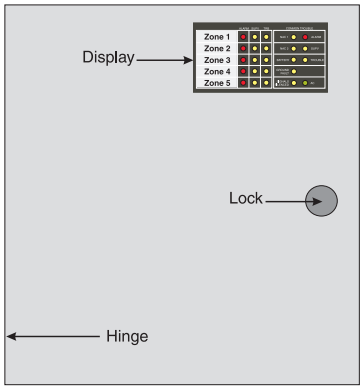


Figure 1 FA-265 cabinet with door closed

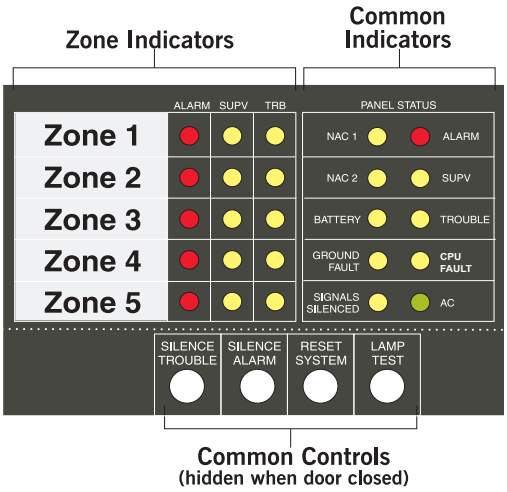


Figure 2 FA-265 display and controls

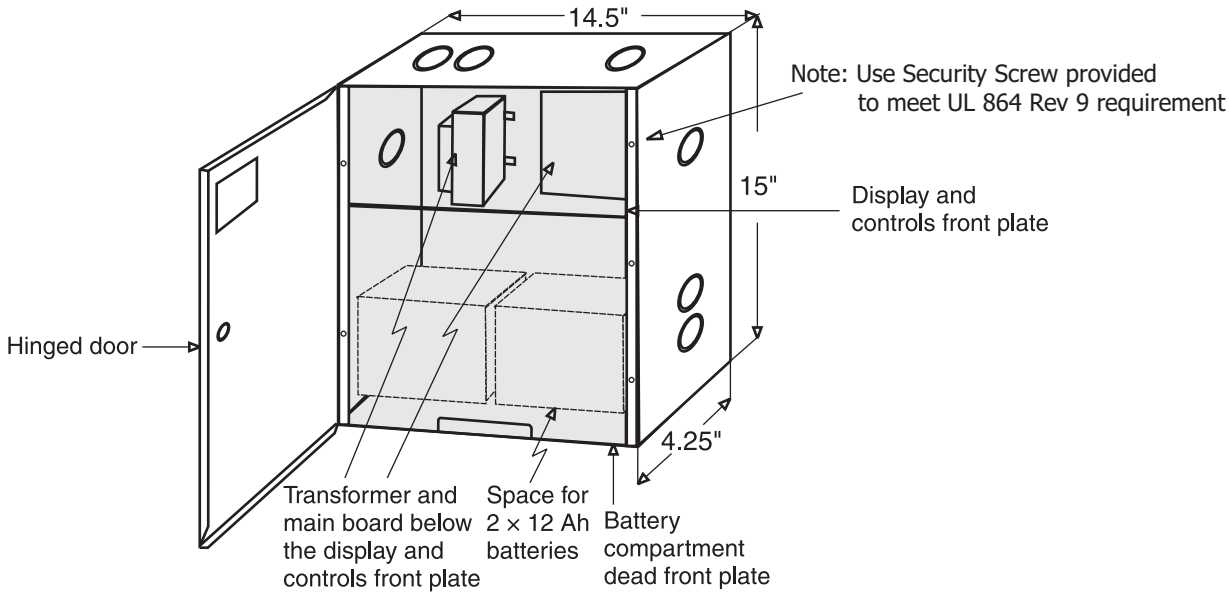


Figure 3 FA-265 Cabinet Overview

2.3.1 Zone Label Insert

A zone label insert is installed in the zone window area. Reach behind the display/control panel and remove the blank insert. Zone designations can be written directly on the insert or can be created using Word for Windows, printed on Avery label #5167 and applied to the insert.

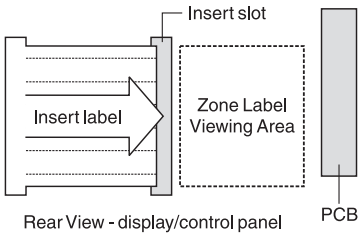


Figure 4 Zone Label Insert

2.4 Planning Your Installation

Note: This system should be installed and serviced by qualified fire alarm installation professionals.

As a minimum, the following points should be considered to ensure that the installation will be successful and proceed without delay.

- Consult with your local AHJ to ensure that the overall system will meet all requirements. Have your plans reviewed and approved as required.
- Review the electrical specifications, mounting and wiring instructions in this manual and in the manuals of all connected modules and devices.
- Using the chart in this manual, calculate the standby battery size that will meet the standby time required. Include all components that will draw current from the standby battery when the panel is in the ‘standby’ mode.
- Determine the location of the control panel, all initiating and indicating devices and remote modules and mark them on your system layout plan. An indicating device must be located in close proximity to the control panel.
- Using the charts in this manual, determine the wire gauge and wire run distances for the connected components. (initiating devices, indicating devices and ‘secur-bus’ connected components.)
- Review the programming section of this manual and determine the operating characteristics required of the initiating zones, indicating zones and common panel features.

2.5 Electrical Specifications

Circuit / Model(s)	Rating
Primary AC	120 volts, 60 Hz. 1.5 Amps maximum/ 240 volts, 50 Hz. 1.0 Amps maximum
AUX+	500 mA maximum Restoral of Aux Power shorts requires removal of all Aux Power loading
SCOM	500 mA maximum (current sink)
COM	500 mA maximum (current sink)
Relays (common alarm & trouble)	Form 'C' contact, 2 Amp, 30 VDC resistive, power limited source
NAC Outputs	24 volts, full-wave rectified DC, 1.5 Amps max Power limited 3.0 Amps total for both NAC circuits EOLR 4.7K ohm, ½ W, 5%
Initiating Zone Inputs	24 VDC, 60 mA max.(in alarm) Supervisory current: 6.0 mA – max Loop resistance: 100 ohms max. EOLR: 4.7 K ohm, ½ W, 5%
Battery Charging Current	270mA maximum
Low Battery Trouble	Low Battery Trouble: 22.0 VDC Low Battery Trouble Restore: 23.0 VDC Critical Shutdown: 19±0.5 VDC

Table 1 Electrical Specifications

2.6 Module Current Ratings

Module	Standby Current (mA) DC	Alarm Current (mA) DC	Max. Alarm Current (mA) DC
FA-265 Control panel	130	475*	715
RTI-265 Remote trouble indicator	15	15	15
RAM-265 R.T.I. and remote 5 zone annunciator	15	20*	40
UDACT-286 DACT	45	60	60
RM-263 Relay module**	0	24	24

Table 2 Module Current Ratings

Notes: *Current noted assumes ONE initiating zone is in alarm. The “Max. Alarm Current” assumes all zones are in alarm.

**Values shown are for all relays set for activation on ‘Alarm’. Each relay set for activation on ‘trouble’ is normally energized and on ‘AC fail’ will draw 0 mA.

2.7 Standby Battery calculation chart

1. All components that draw current from the panel while it is in the ‘standby’ mode (AC OFF) must be considered for the standby battery calculation. All components that draw current while in the ‘Alarm’ mode must be considered for the alarm battery calculation.
2. The control panel will always draw the currents as shown in the chart.
3. Typically the alarm current is calculated assuming only one initiating zone is in alarm. If it is required that more than one zone be considered, add 60 mA per zone in the Alarm column. Consult the smoke detector manufacture’s installation sheet to determine the standby current of these devices. Write that number in the ‘current per device’ column then multiply that number by the number of devices on the zone. Repeat for each zone.
4. Consult the Notification Appliance installation sheet to determine the current draw for each device connected to the NAC. For each NAC, calculate the total current in alarm and put that number (mA) in the ‘Alarm’ column.

Note: Each NAC can supply 1.5 Amps max.

5. For each added module in the system, multiply the number of modules times the module ‘standby’ and ‘alarm’ currents and write those totals in the ‘standby’ and ‘alarm’ columns.
6. Add up all the current drawn from the AUX+ output in the standby and alarm mode and put those totals in the ‘standby’ and ‘alarm’ columns.
7. Add up all the currents in the ‘standby’ column and the ‘Alarm’ column.
8. Convert the ‘standby’ and ‘alarm’ currents from mA to Amps. (divide mA by 1000)

9. Write in the ‘standby’ time required. (24 or 60 Hr.)
10. Multiply the ‘standby’ Amps times the ‘standby’ time to get the ‘standby’ Amp-Hr. required.
11. Write in the ‘alarm’ time required in hours. (5 min. =.08 Hr.; 30 min. =0.5 Hr.)
12. Multiply the ‘alarm’ Amps times the ‘alarm’ time to get the ‘alarm’ Amp-Hr required.
13. Add the ‘standby’ Amp-Hr. to the ‘alarm’ Amp-Hr. for the total Amp-Hr. required.
14. Multiply the total Amp-Hr. times 1.20 for the **minimum Amp-Hr. battery required** to support the system for the selected ‘standby time and the selected ‘alarm’ time.

2.7.1 Calculation for Standby Battery Requirement

Step	Device		Current per device (mA)		Number of device		Total Standby Current (mA)	Total Alarm Current (mA)
1	FA-265	Standby:	130	x	1	=	130	
		Alarm:	415	x	1	=		415
2	Zone 1	Standby:		x		=		
		Alarm:	69	x	1	=		69
	Zone 2	Standby:		x		=		
		Alarm:	69	x	1	=		
	Zone 3	Standby:		x		=		
		Alarm:	69	x	1	=		
	Zone 4	Standby:		x		=		
		Alarm:	69	x	1	=		
	Zone 5	Standby:		x		=		
		Alarm:	69	x	1	=		
3	NAC 1	Alarm:		x		=		
	NAC 2	Alarm:		x		=		
4	RTI-265	Standby:	15	x				
		Alarm:	15	x				
	RAM-265	Standby:	15	x				
		Alarm:	25	x				
	UDACT-286	Standby:	45	x				
		Alarm:	60	x				
	RM-263	Standby:	0	x		=		
		Alarm:	24	x				
5	AUX+	Standby:		x		=		
		Alarm:		x		=		
6	Total ‘standby’ and ‘alarm’ current:						mA	mA
7	Divide ‘standby’ mA and ‘alarm’ mA by 1000:						Amp	Amp

Step	Device		Current per device (mA)		Number of device		Total Standby Current (mA)	Total Alarm Current (mA)
8	Select ‘standby’ time required (24 or 60 Hr.):						Hr.	
9	Standby Amp-Hr. - multiply 8 × 7 = (Amps × Hr.):							Amp-Hr.
10	Select ‘alarm’ time required (0.08 or 0.5):							Hr.
11	Alarm Amp-Hr. - multiply 7 × 10 = (Amps × Hr.):							Amp-Hr.
12	Total Amp-Hr = standby Amp-Hr (9) + alarm Amp-Hr. (11):							Amp-Hr.
13	Multiply the total Amp-Hr. by the safety margin:						1.20	
14	Total battery Amp-Hr required to support the system:							**Amp-Hr.**

Table 3 Battery Calculation Chart

Select a battery with an Amp-Hr. rating that is equal to or larger than the calculated minimum Amp-Hr. battery required.

Note: The maximum battery allowed is 26 Ah. Install batteries outside the panel box. Total “Standby” current is not to exceed 0.5 Amperes.

3 Installing the FA-265 Fire Panel

3.1 Environmental Specifications

Consider the following conditions when selecting a mounting location for the FA-265 panel:

- Operating temperature: 32°F to 122°F / 0°C to 50°C
- Humidity: 95% RH non-condensing
- Close to a source of unswitched AC power

3.2 Panel Assembly and Modules Locations

The panel comes completely assembled from the factory. Remove the lower dead front for access to the battery compartment. Remove display control panel for access to AC connections.

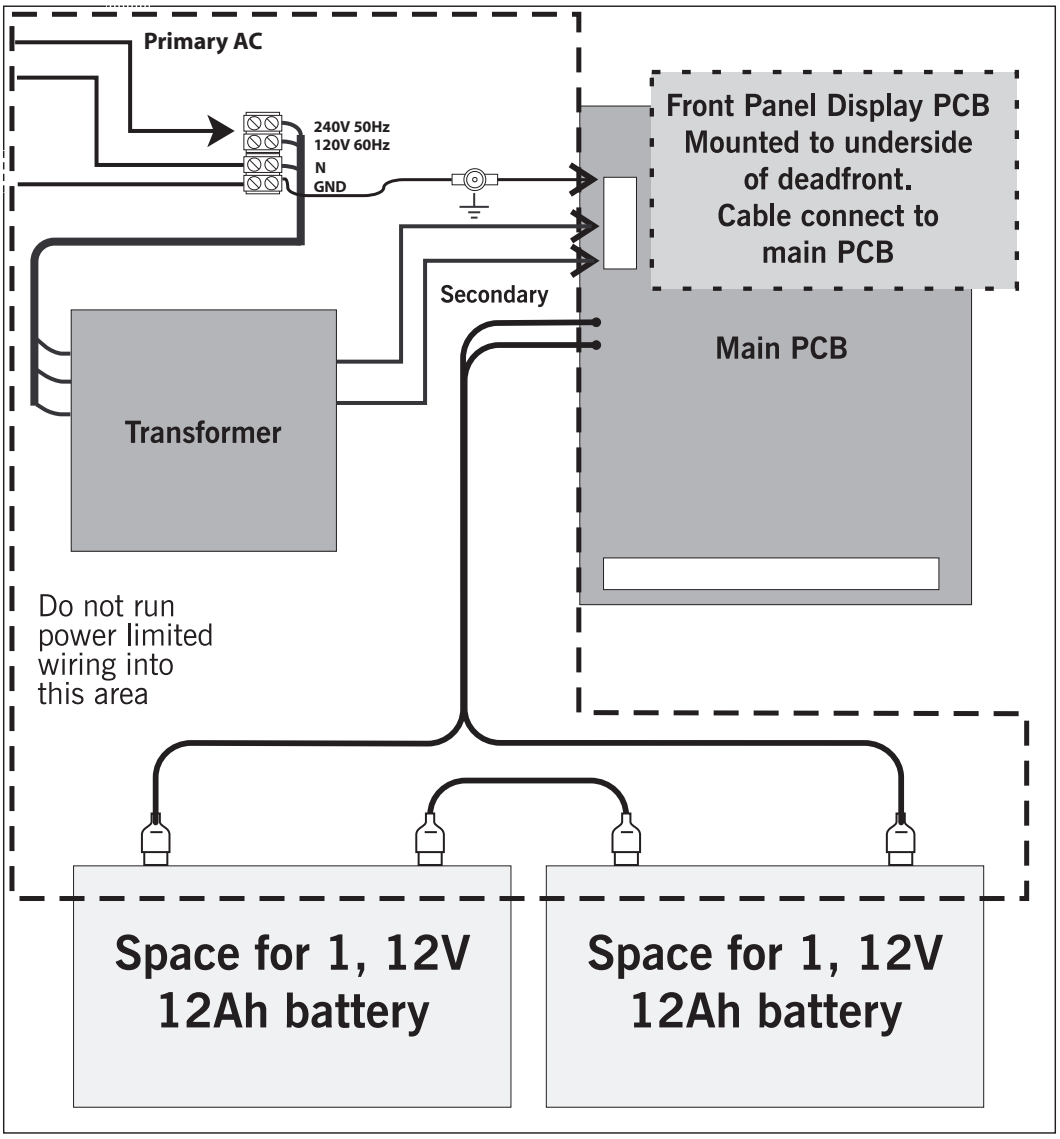


Figure 5 Panel Assembly and Modules Locations

3.3 Mounting the FA-265

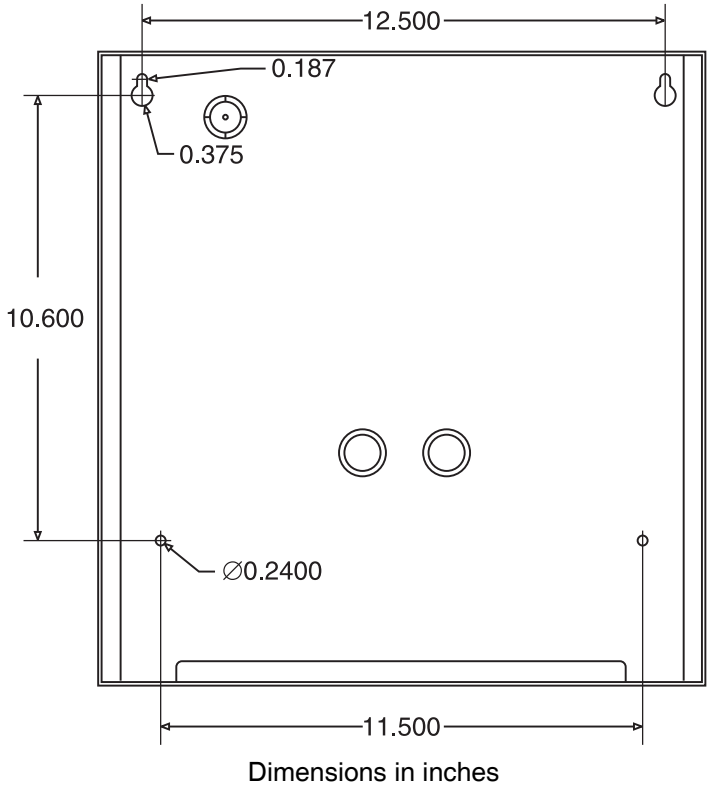


Figure 6 Mounting Dimensions

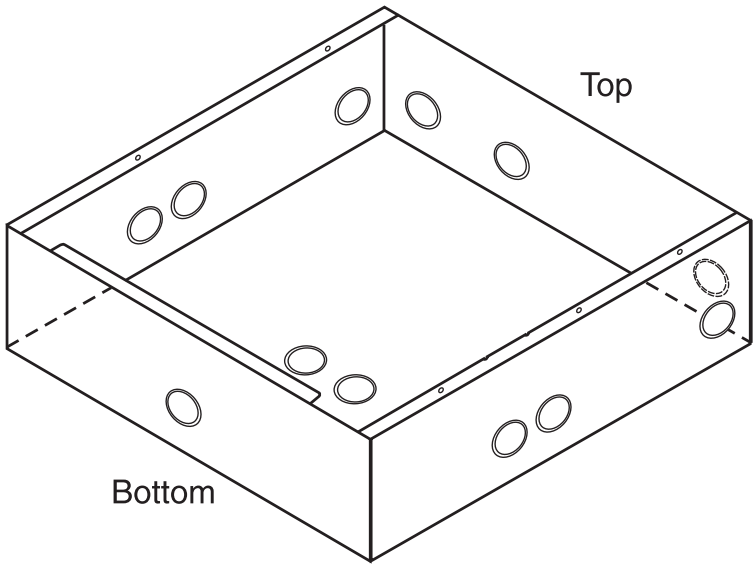


Figure 7 Knockout Locations

4 Wiring the FA-265

4.1 Wiring Specifications

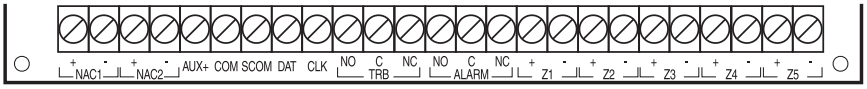


Figure 8 FA-265 Terminals Descriptions

Terminal Label	Description
NAC 1 (+, –)	**Notification Appliance Circuit # 1** 24 VDC, Full-Wave Rectified voltage, 1.5 Amps max. Programmable as Steady or Temporal output on alarm. Supervised for opens, shorts and ground fault. Power limited.
NAC 2 (+, –)	**Notification Appliance Circuit # 2** 24 VDC, Full-Wave Rectified voltage, 1.5 Amps max. Programmable as Steady or Temporal output on alarm. Supervised for opens, shorts and ground fault. Power limited
AUX+	**Auxiliary power output** 24 VDC, filtered and regulated, 500 mA max., 400 mV P-P ripple, power limited. Aux power shorts must be restored by removing all Aux Power loading.
COM	**Auxiliary common power return,** unswitched 24 VDC, 500 mA max.
SCOM	**Auxiliary common power return, switched** (open circuit on system reset or on 4-wire smoke detector reset) 24 VDC, 500 mA max. (Please refer to Appendix A for compatible 4-wire smoke detectors.)
DAT	**Data line for remote module communications**
CLK	**Clock line for remote module communications**
TRB NO	**Common Trouble relay, Normally Open contact**
TRB C	**Common Trouble relay, Common contact**

Terminal Label	Description
TRB NC	**Common Trouble relay, Normally Closed contact** The Common Trouble relay is normally energized and is de-energized on trouble. Contacts are shown in the de-energized state. Contacts are rated 30 VDC, 2 Amps.
ALM NO	**Common Alarm relay, Normally Open contact**
ALM C	**Common Alarm relay, Common contact**
ALM NC	**Common Alarm relay, Normally Closed contact** The Common Alarm relay is normally de-energized. Contact is shown in the de-energized state. Contacts are rated 30 VDC, 2 Amps max.
Z1+	**Zone 1 positive input**
Z1-	**Zone 1 negative input** Zone output is 24 VDC nominal to power 2-wire smoke detectors. Maximum current draw is 60 mA in alarm and is limited by the zone circuitry. Zones may be configured to monitor both 2-wire smoke detectors and initiating devices that employ dry contacts. (manual stations & heat detectors)
Z2+…..Z5+	Same as zone 1 positive
Z2-…..Z5-	Same as zone 1 negative

Table 4 FA-265 Terminal Descriptions

Note: For each supervised installation wire, a separate terminal must be used.

4.1.1 2-Wire and 4-Wire Devices Typical Wiring

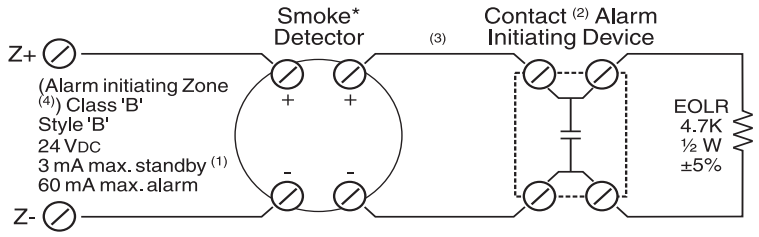


Figure 9 Connecting 2-Wire Alarm Initiating Devices

Note: * See Chapter 10 FCC Compliance Statement on page 64 in this manual for a list of compatible 2-wire smoke detectors.

- Maximum 30 smoke detectors per zone (100 µA each standby).
- Manual station, heat detector.
- Maximum total loop wire resistance = 100 ohms.
- Program zone as:
  Type 1 - Smoke and contact devices instant alarm (default)
  Type 2 - Smoke auto-verify and contact as instant.

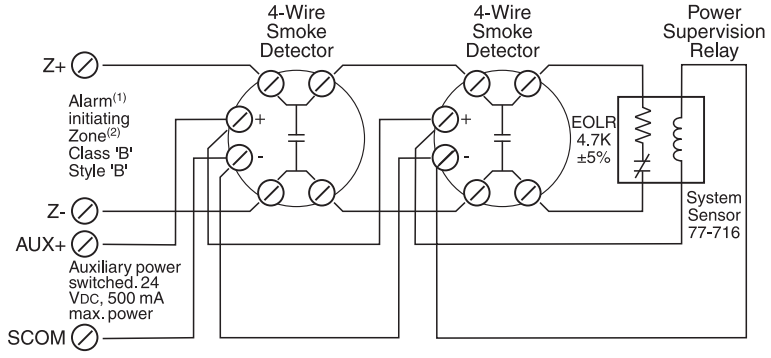


Figure 10 Connecting 4-Wire Smoke Detectors

- Program as zone type 01, instant alarm.
- Maximum total loop wire resistance is 100 ohms.

4.1.2 Zone Wiring Chart

Wire (Gauge)	Distance (feet)	Distance (meters)	
18	7,690	2,345	Maximum loop resistance is 100 ohms. Maximum current in alarm is 60 mA.
16	12,195	3,717	
14	19,230	5,861	

Table 5 Zone Wiring Chart

4.2 Connecting NAC Devices (Class ‘A’ and Class ‘B’)

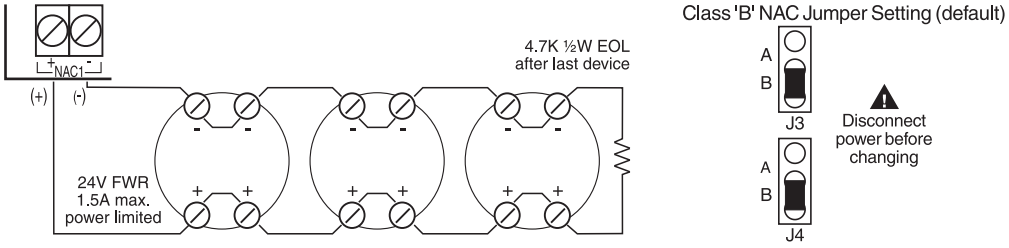


Figure 11 Connecting NAC Devices (Class ‘B’)

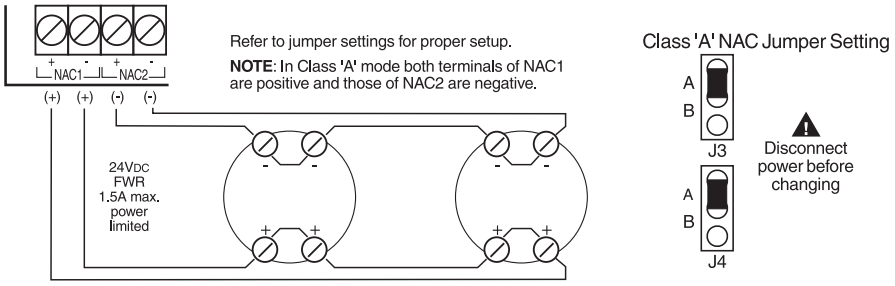


Figure 12 Connecting NAC Devices (Class ‘A’)

4.2.1 NAC Wiring Chart

Maximum Total Loop (ohms)	Maximum Current (A)	18-Awg Wire		16-Awg Wire		14-Awg Wire		12-Awg Wire	
		ft	m	ft	m	ft	m	ft	m
8.00	0.25	615	188	978	297	1,538	469	2,500	762
5.00	0.50	308	94	488	149	769	235	1,250	381
2.70	0.75	205	63	325	99	513	156	833	254
2.00	1.00	154	47	244	74	385	117	625	191
1.60	1.25	123	38	195	59	308	94	500	152
1.30	1.50	103	31	163	50	256	78	417	127
Note: This chart is based on a minimum source voltage of 22 volts and a maximum line loss of 2 volts thus leaving a minimum of 20 volts at the last notification appliance.									

Table 6 NAC Wiring Chart

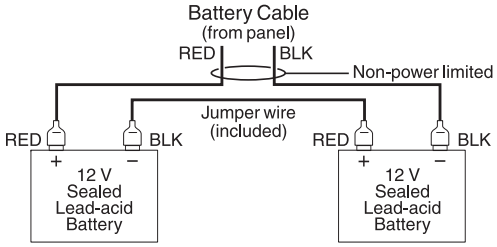
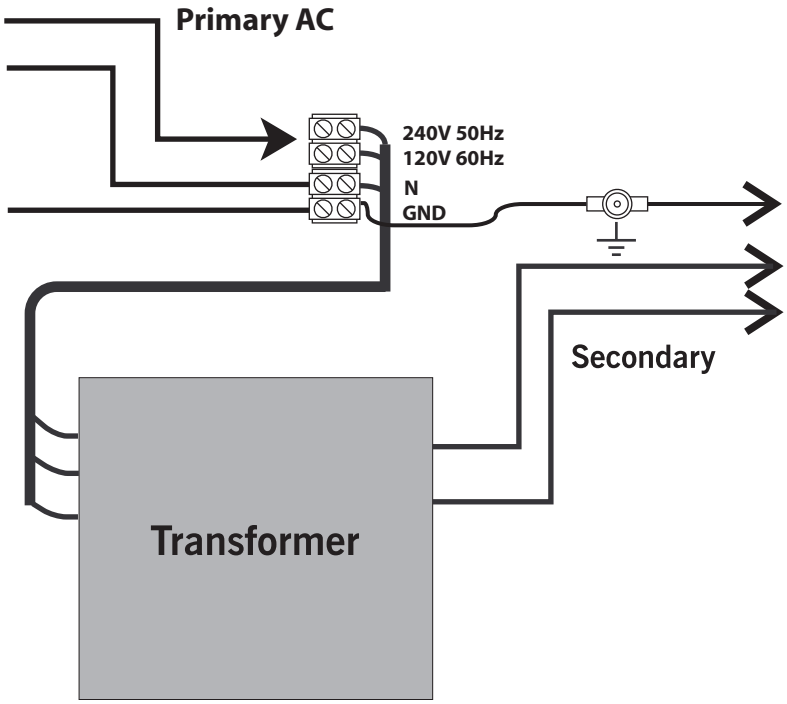


Figure 13 Connecting Batteries



Note: The wire gauges must be no less then the size required by the Canadian Electrical Code C22.1, Part 1, Section 32.

Figure 14 Connecting AC Power

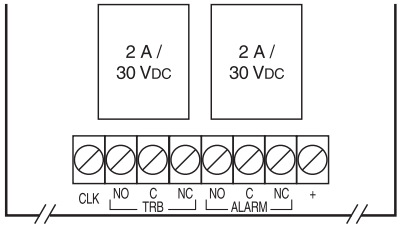


Figure 15 Connecting the Alarm and Trouble Relays

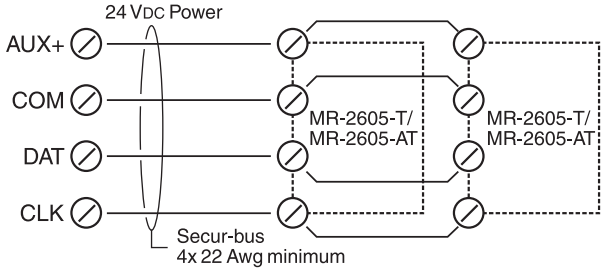


Figure 16 Connecting Optional Devices

See installation sheets for the remote devices for detailed wiring and address setup.

- Maximum of 4 RTI-265 per panel.
- Maximum of 4 RAM-265 per panel.

4.2.2 Secur-bus Wiring Chart

Current (mA)*	22-awg Wire		18-awg Wire		16-awg Wire		14-awg Wire	
	ft	ft	ft	m	ft	m	ft	m
15	2,524	769	6,410	1,954	10,160	3,098	16,000	4,878
30	1,262	384	3,200	976	5,080	1,549	8,000	2,439
45	842	256	2,135	651	3,385	1,032	5,340	1,628
60	631	192	1,600	488	2,540	774	4,000	1,220
75	505	154	1,280	390	2,030	619	3,200	976
90	421	128	1,065	325	1,690	515	2,670	814
105	361	110	915	279	1,450	442	2,285	697
120	315	96	800	244	1,270	387	2,000	610
135	281	86	710	216	1,125	343	1,780	543
150	252	77	640	195	1,015	309	1,600	488
165	229	70	580	177	920	280	1,455	444
180	210	64	530	162	845	258	1,335	407
195	194	59	490	149	780	238	1,230	375
210	180	55	455	139	725	221	1,145	349
225	168	51	425	130	675	206	1,065	325
*See module current ratings chart for current drawn by each module attached to the secur-bus.								

Table 7 Secur-bus Wiring Chart

To calculate the wire run distance for any gauge wire and any maximum current value, use the following formula:

$$\text{Rmax} = \frac{1.25}{\text{Imax Amps}} \text{ ohms}$$

$$\text{Distance} = \frac{\text{Rmax} \times 1{,}000}{2(\text{wire resistance in ohms per 1,000 feet})} \text{ feet}$$

Secur-bus Capacitance

Maximum wire capacitance for proper operation of the Secur-bus is 90 nF (nanofarad). Typical wire capacitance for 22 awg quad cable is 20 nF per 1,000 feet. Thus, for 22 awg quad cable, the maximum wire run distance is ((90/20)× 1,000) = **4,500 feet**. Other types of wire have different capacitance values. Consult the wire manufacturer's data sheets for typical capacitance values.

Note: Shielded wire has a much higher capacitance value and distances are severely reduced.

The following devices may be connected to the Secur-bus. All devices are supervised. See the section 6.3.7 Entering the Reset Programming Mode on page 48 for information on adding and deleting devices on the Secur-bus.

Devices	Description
RTI-265	External to control panel. Up to 4 of each device may be connected.
RAM-265	
UDACT-286	Mounted inside control panel. See diagram in Figure 5 Panel Assembly and Modules Locations on page 23.

Table 8 Secur-bus Devices

Notes: Do not run the Secur-bus adjacent to sources of high transient noise such as AC wiring, telephone cable bundles or computer wiring.

If the Secure-bus must go through a high transient area, use shielded cable.

If shielded cable is used, the distances in the chart above are cut in half.

5 Panel Operation

5.1 Operating Sequences

This section describes how the panel functions under various conditions. The choices you make in panel programming will also affect how the panel operates. Please see Chapter 6 FA-265 System Programming on page 39 for information on how to program the panel, and descriptions of each of the programming options.

5.2 General Zone Fire Alarms

Zone alarms have priority over all other annunciation. When an alarm occurs, the following happens:

- The corresponding zone alarm LED begins flashing, the common alarm LED turns on steady, and the alarm relay turns on.
- If a trouble was present on that zone then the zone trouble LED turns off. If the trouble buzzer is audible then it also turns off.
- The NACs sound in a steady or temporal pattern, depending on the option selected (see 6.3.2 NAC Sounding Rate Programming on page 44).
- If enabled, the silence inhibit timer begins counting down (see 6.3.4 Signal Silence Inhibit Timer and Walk Test Programming on page 46). If the silence inhibit timer is enabled, the panel cannot be silenced for 60 seconds following the first fire alarm. Subsequent fire alarms do not restart or extend this timer. While the signal silence inhibit timer is counting down, if the Silence Alarm button is pressed the panel will sound a 1 second 'error tone' on the common trouble buzzer.
- The NACs remain on until silenced with the Silence Alarm button, or if the automatic alarm silence is enabled, until the thirty minute bell timer runs out (see 6.3.3 NAC Automatic Signal Silence and NAC2 Strobe Mode Programming on page 45). If the automatic silence timer is enabled, the panel will automatically silence the NACs 30 minutes after the **last** fire alarm. Each zone alarm will restart the timer, giving a full 30 minutes after the last alarm before the NACs are silenced.
- Once the NACs are silenced the signals silenced LED turns on and any flashing zone alarm LEDs turn on steady. The common trouble LED and trouble relay also turn on and, if the NACs have been silenced *automatically*, the buzzer will sound at a rate of ½ second ON/OFF.

Note: A manual signal silence will not initiate the trouble buzzer. Only the common trouble LED and signals silenced LED are turned on.

- Any additional zone alarms that occur while the panel is in alarm will reset the auto alarm silence timer and turn on the NACs, but the panel will not restart the 60 second silence inhibit timer.
- The zone alarm LEDs, common alarm LED and alarm relay will remain on steady until a system reset is performed.

5.3 Waterflow Alarms

If the Waterflow Silence option is turned off (see 6.3.5 Waterflow Alarms Programming on page 47), when a waterflow zone (type 03) initiates an alarm the NACs cannot be silenced until all waterflow zones are returned to normal. If all waterflow zones return to normal after the 30 minute automatic signal silence timer has expired, then the panel will silence the NACs.

If the Waterflow Silence option is turned on, then an alarm on a waterflow zone is treated like any other fire alarm.

5.4 Supervisory Zone Alarms

When an alarm occurs on a supervisory zone (type 04), the corresponding zone supervisory LED begins flashing. The common supervisory LED and supervisory relay (supervisory relay is optional) turn on steady, and the buzzer turns on steady. If there was a trouble on that zone, the zone trouble LED turns off. The buzzer remains on until the trouble silence button is pressed. Once the buzzer is silenced any flashing zone supervisory LEDs turn on steady. The zone supervisory LEDs, common supervisory LED and supervisory relay remain on steady until a system reset is performed.

5.4.1 Subsequent Fire Supervisory

After silencing a fire supervisory, a subsequent fire supervisory from another zone will resound the trouble/supervisory buzzer and the new zone supervisory LED flashes until the Silence Trouble button is pressed.

5.4.2 Supervisory / Trouble Priority

If a supervisory zone has a trouble and it goes into alarm, the zone trouble LED is extinguished until that zone is restored and the panel has been reset. The common trouble LED will remain on steady until all supervisory alarms have been restored and the panel reset. All other ‘common’ trouble indicators will operate normally.

5.4.3 Supervisory / Fire Alarm Priority

The supervisory zone LED, the common supervisory LED and the buzzer (in the steady supervisory mode) function normally whether there is a fire alarm present or not.

5.5 Trouble Operation

When a trouble occurs, if there is a corresponding trouble LED it turns on steady. The common trouble LED and the trouble relay also turn on. If no alarm is present on the system, the buzzer will sound at a rate of ½ second ON/OFF. The buzzer and trouble LEDs will remain on until the trouble is restored. If the Silence Trouble button is pressed, the buzzer turns off. Subsequent troubles will resound the trouble buzzer.

Note: If there is no trouble present in the system then pressing the Silence Trouble button will result in a 1 second error tone.

5.5.1 System Troubles

For a list of system faults that will initiate a trouble see the following table.

System faults	Common Trouble LED	Buzzer	Trouble Relay	Other Indicators
Alarm zone open circuit – loss of EOLR	turns on	sounds ½ second on/off	deactivates	Zone trouble LED turns on steady
NAC open circuit or short circuit	turns on	sounds ½ second on/off	deactivates	NAC1 or NAC2 trouble LED turns on
Battery low voltage or disconnected	turns on	sounds ½ second on/off	deactivates	Battery LED turns on
Signals silenced - automatically	turns on	sounds ½ second on/off	deactivates	Signals Silenced LED turns on
Ground on extended conductor	turns on	sounds ½ second on/off	deactivates	Ground LED turns on
AC fails completely, or is low for more than 10 seconds (brownout)	turns on	sounds ½ second on/off	deactivates	AC LED turns off
Installer Programming Mode Active	flashes	sounds ½ second on/off	deactivates	AC LED turns off
Loss of Remote Trouble Unit	turns on	sounds ½ second on/off	deactivates	
Loss of Remote Alarm/Trouble Unit	turns on	sounds ½ second on/off	deactivates	
TLM on one or both telephone lines (Dialer)	turns on	sounds ½ second on/off	deactivates	
Failure to communicate (Dialer)	turns on	sounds ½ second on/off	deactivates	
Unsuccessful system reset	turns on	sounds ½ second on/off	deactivates	
Loss of Dialer module	turns on	sounds ½ second on/off	deactivates	

Table 9 System Faults and Troubles

5.6 System Reset Operation

To reset the system, press the ‘Reset System’ button. The panel will remove all power from the zones and the switched auxiliary relay for 10 seconds. During this 10 second period, the buzzer will beep twice every 2 seconds.

The panel can only be reset if all waterflow zones are restored (only applies if the Silence Waterflow option is turned off - see 6.3.5 Waterflow Alarms Programming on page 47).

If the panel is not in a condition to be reset, when the ‘Reset System’ button is pressed the panel will sound a 1 second error tone on the buzzer.

After the 10 second reset period, the panel will turn off the zone LED for any zones that have been restored. If one or more zones is still in alarm after the reset period, the panel will activate the NACs as programmed. If there are no alarms but one or more Supervisory zones is still ‘off-normal’ after the reset period, the panel will sound the trouble buzzer in the Supervisory mode. If there are no alarms or supervisory conditions but a trouble is present in the panel after the reset period, the panel will sound the trouble buzzer. After the reset period, LEDs for any alarms, supervisory off-normal or trouble conditions will be on.

5.7 Lamp Test

The lamp test will check all of the panel and annunciator LEDs. To do a lamp test, press and hold the Lamp Test button. All the LEDs will flash.

A lamp test will only work if the NACs are not active and the supervisory buzzer is not active. If a lamp test is unsuccessful the buzzer will sound a 1 second error tone. If any trouble or zone has a state change during lamp test, the lamp test will be cancelled and the panel will return to normal operation.

5.8 Walk Test (Installer function only)

To do a walk test, all zone alarms, troubles and relays must be in their normal state. You can program the walk test to be either audible or silent (see 6.3.4 Signal Silence Inhibit Timer and Walk Test Programming on page 46).

1. To walk test the panel press the Walk Test button. The common trouble LED flashes and the buzzer sounds one short beep. The panel will be in walk test mode for one hour, or until you press the Walk Test button again.
2. As you test each part of the system, the panel will give the following indications:

Type of activation	LEDs	NACs*	Trouble Buzzer
Fire Alarm or Fire Supervisory	Zone alarm/Supv LED turns on	1 squawk	
Fire Alarm or Fire Supervisory Restoral	Zone alarm/Supv LED turns off	1 squawk	
Zone or System Trouble	Zone or system trouble LED turns on	2 squawks	Sounds
Zone or System Trouble Restoral	Zone or system trouble LED turns off	2 squawks	Stops sounding
Ground Fault	Ground trouble LED turns on	3 squawks	Sounds
Ground Fault Restoral	Ground trouble LED turns off	3 squawks	Stops sounding

Note: *Only if Walk Test Audible option is turned on.

Zone LEDs operate normally except that alarms do not latch - the alarm LEDs will turn off when the zone is restored and the auto-reset has been successful.

Alarm and trouble relays are NOT activated. If used, any remote connection is not activated.

3. To return the system to normal operation, press the Walk Test button. If you do not press the Walk Test button, the system will return to normal operation after one hour. If any zones are in alarm at the end of the walk test, the zones will indicate silenced signals.

Note: The Lamp Test button does not work while the panel is in Walk Test mode.Walk Test function not available without AC power.

5.9 NAC operation

See also 6.3.2 NAC Sounding Rate Programming on page 44, and 6.3.4 Signal Silence Inhibit Timer and Walk Test Programming on page 46 for more information.

5.9.1 Class ‘B’ operation selections:

- **Steady (default)** – On alarm the NAC will turn on steady. It will turn off on either a manual or automatic signal silence.
- **Temporal 3** – On alarm the NAC will turn on with the temporal 3 pattern and turn off on either a manual or automatic signal silence.
- **NAC2 Strobe –** On alarm NAC2 will turn on steady. It will not turn off on a manual or automatic signal silence. NAC2 set in this mode will only turn off on system reset if all zone fire alarms are restored. Only NAC2 can be set in this mode.

5.9.2 Class ‘A’ operation selections

If the panel NACs are set for class ‘A’ operation then there is only one NAC. In this configuration the NAC output can only be set for *steady* or *temporal* using the NAC1 programming options For class ‘A’, the NAC2 Strobe option is not available.

5.10 Relay Function

5.10.1 Alarm Relay

The panel activates the alarm relay upon any (non-supervisory) zone alarm. The panel deactivates the alarm relay upon a successful system reset.

5.10.2 Trouble Relay

The panel deactivates the trouble relay upon any system trouble. The panel activates the trouble relay upon the restoral of all system troubles.

5.10.3 Supervisory Relay (available with the RM-263 Relay Expander only)

The panel activates the supervisory relay upon any supervisory zone alarm. The panel deactivates the supervisory relay upon a successful system reset.

6 FA-265 System Programming

Programming the FA-265 System is done using the Silence Trouble, Alarm Silence controls and the indicator LEDs. Programmed operating mode data is stored in non-volatile memory that retains the information if the power to the panel is removed.

The following are the FA-265 System Programmable Functions

- Zone Programming
- NAC Sounding Rate
- NAC Auto-Silence and NAC2 Strobe Mode
- 60 Second Signal Silence Inhibit and Audible Walk Test
- Waterflow Programming
- Reference AC Line Frequency (50 or 60 Hz)

There are two additional operational modes that can be performed, the Reset Programming Mode and Viewing the Event Buffer. For more information on

The Reset Programming Mode can perform the following.

- Adding and Removing a Module
- Defaulting the System

During Installer Programming Mode, each Programmable Function is displayed on the panel using the LED Indicators.

6.1 Entering Installer Programming Mode

All zone alarms must be reset prior to entering the Installer Programming Mode. While the panel is in Installer Programming Mode, the annunciators will show a trouble condition.

How to enter Installer Programming Mode

1. Remove the lower front cover and locate the 'Walk Test Switch' behind the control panel PCB, as shown in Figure 17 Locating the Walk Test Switch.
2. Press and hold the Walk Test Switch for two seconds. The common trouble buzzer and common trouble LED turn on and pulse ½ second on/off.
3. Press any button. The trouble buzzer is silent, and the zone 1 alarm LED turns on steady. The common trouble LED continues to flash.
4. The panel is now ready to program.

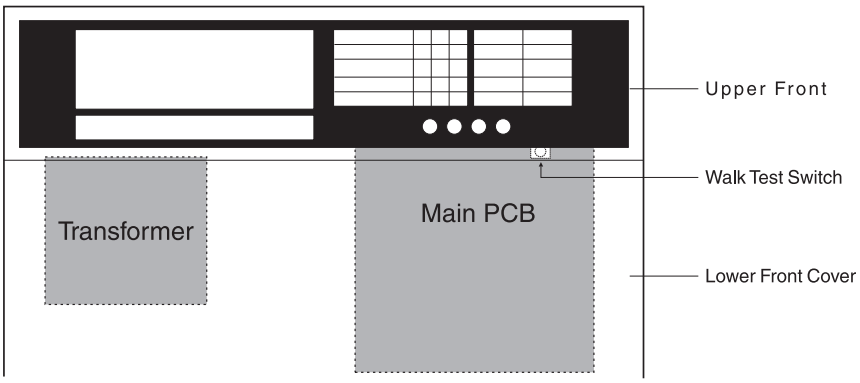


Figure 17 Locating the Walk Test Switch

6.1.1 Using the LED Indicators to Program the System

The Panel Status LED Indicators display the current Programmable function.

The Zone Indicator LEDs display the options for the current Programmable function.

For a further explanation of the LED Indicators see Figure 18 Using the LED Indicators to Program the System.

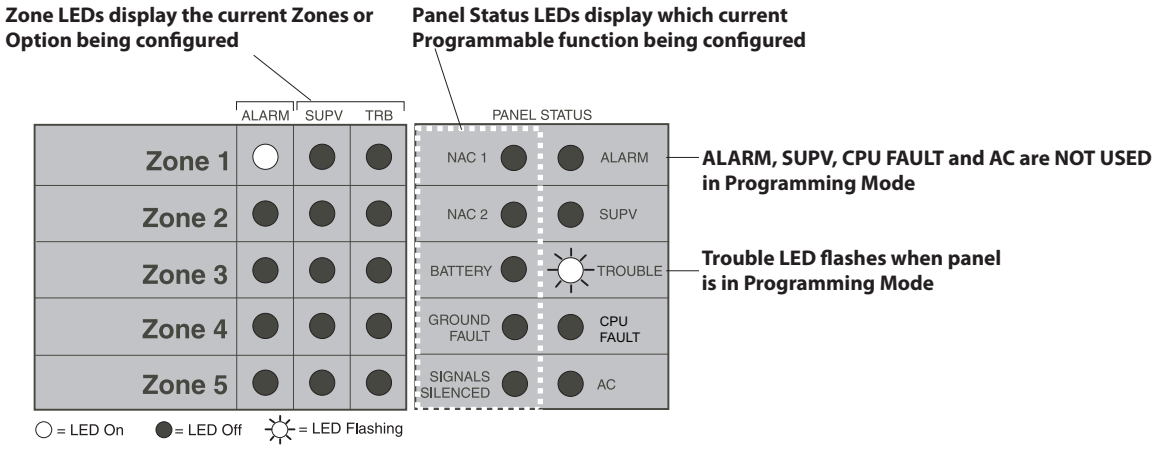


Figure 18 Using the LED Indicators to Program the System

6.1.2 Using the Silence Trouble and Silence Alarm Controls to Program the System

Pressing the Signal Silence button cycles you to the next setting for the current programmable function.

Pressing the Silence Trouble button cycles to the next programmable function.

6.1.3 Using the Reset System and Lamp Test Controls

Pressing the Reset System control enters the Reset Programming Mode. For more information see 6.3.7 Entering the Reset Programming Mode on page 48.

Pressing the Lamp Test control enters the View Event Buffer mode. For more information see 6.4 Viewing the Event Buffer on page 51.

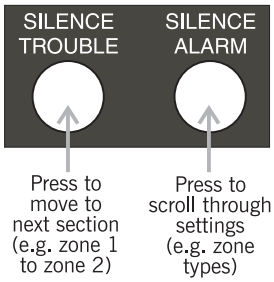


Figure 19 Using the Controls to Program the System

6.2 Programming and Exiting the System

How to Program the System

1. Enter Installer Programming Mode. For details on how to do so see 6.1 Entering Installer Programming Mode on page 40.
2. Press the Signal Silence button to select the correct option for the Programmable Function.
3. Press the Silence Trouble button to cycle to the next function.
4. Repeat steps 2-3 until all Programmable Functions are completed. You are now ready to exit the Installer Programming Mode.

How to Exit the System

1. To exit Installer Programming Mode press the Silence Trouble button.
2. Upon exiting the Installer Programming Mode, the panel performs a system reset for 10 seconds, during which the buzzer sounds double beeps. When the beeping stops the panel returns to normal operating mode and all programming choices are stored in memory.

Notes: To exit the Installer Programming Mode at any other point in the panel programming, press and hold the Walk Test switch for two seconds.

If 5 minutes elapse without any button presses, the panel will automatically exit the Installer Programming Mode. During the final 60 seconds before the exit, the panel will sound a warning tone on the buzzer. Press any button to cancel the auto-exit and resume programming.

6.3 Programming Function Descriptions

6.3.1 Zone Programming

Zone Programming is the first Programmable function. Each of the 5 zones can be configured as one of the following:

- Instant Alarm
- Waterflow Zone
- Supervisory Zone
- Not Used

Use all 5 Zone Alarm, Supervisory and Trouble LED's to program this function.

Press the Silence Alarm control to cycle through the programmable settings for each zone.

Press the Silence Trouble control to cycle through the Zones. To proceed to the next programming function cycle through all 5 zones.

The Trouble LED flashes when the panel is in any Programming Mode.

No other Panel Status LED's will be lit.

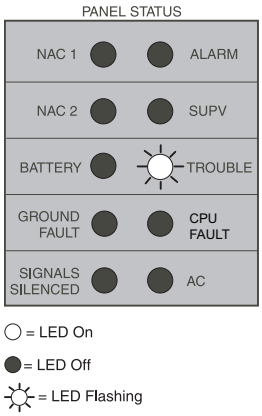
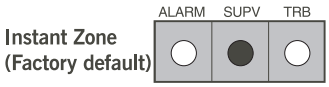
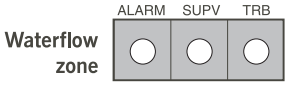
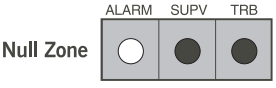
Panel Status LED	Alarm, Supervisory and Trouble LED's	Programmable Setting Description
		Instant Alarm Instant alarm for 2-wire smoke detectors, 4-wire smoke detector and contact devices. Acivating a 2-wire smoke detector, 4 –wire smoke detector or contact device instantly causes the panel to enter alarm. Any zone entering alarm causes any in progress auto-verify sequence on another zone to be cancelled and both zones will indicate an alarm condition.
		Waterflow Zone This zone type is intended for waterflow alarm initiating contact devices only. Do not mix other alarm initiating devices on this zone. For Waterflow delay, use actuating devices with a built-in delay of 30 seconds or more. The overall maximum waterflow alarm initiation delay allowed is 90 seconds. (NFPA A-5-6.2 – 1996 edition) Activating the contact on a Waterflow alarm initiating device instantly causes the control panel to enter alarm.
		Supervisory Zone Initiating a contact on a Supervisory device causes the control panel to immediately indicate the Supervisory "off-normal" condition The zone supervisory LED flashes yellow, the common 'supervisory' LED illuminates steady and the common trouble buzzer sounds steady. Pressing the 'trouble silence' switch will silence the buzzer, the zone supervisory LED ceases flashing and turns on steady. Fire supervisory zones are latching and can only be restored after restoring the initiating device and resetting the system.
		Not Used The zone is not used. The zone is not supervised, alarms and troubles are ignored. The end-of-line resistor is not required.

Table 10 LED Indicators for Zone Programming

6.3.2 NAC Sounding Rate Programming

NAC1 and NAC2 can be configured to sound at either steady or temporal rate. The default rate is steady.

Use the Zone 1 and Zone 2 Alarm, Supervisory and Trouble LED's to program this function.

Press the Silence Alarm control to cycle through the programmable settings for each function.

Press the Silence Trouble control to cycle through the Zones. To proceed to the next programming function cycle through the 2 zones.

The Trouble LED flashes when the panel is in programming mode.

The NAC1 Panel Status LED will illuminate steady.

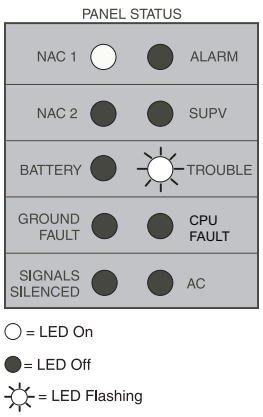
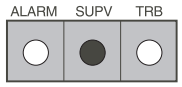
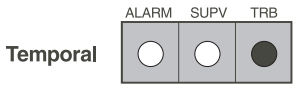
Panel Status LED	Alarm, Supervisory and Trouble LED's	Programmable Setting Description
		Steady (default) The NAC will sound continuously.
		Temporal The NAC will sound the Temporal/ANSI Fire Pattern: 0.5 seconds ON, 0.5 seconds OFF, 0.5 seconds ON, 0.5 seconds OFF, 0.5 seconds ON, 1.5 seconds OFF, repeat.

Table 11 LED Indicators for NAC Sounding Rate Programming

6.3.3 NAC Automatic Signal Silence and NAC2 Strobe Mode Programming

Use the Zone 1 Alarm, Supervisory and Trouble LED's to enable or disable the Automatic Signal Silence function.

Use the Zone 2 Alarm, Supervisory and Trouble LED's to enable NAC2 Strobe Mode function.

Press the Silence Alarm control to cycle through the programmable settings for each function.

Press the Silence Trouble control to cycle through the Zones. To proceed to the next programming function cycle through the 2 zones.

The Trouble LED flashes when the panel is in programming mode.

The NAC2 Panel Status LED will illuminate steady.

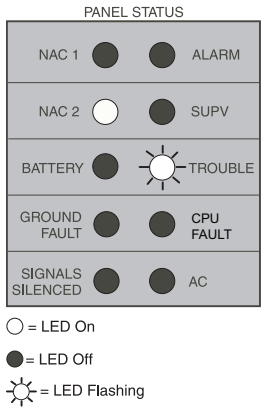
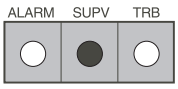
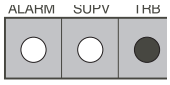
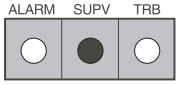
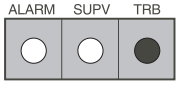
Panel Status LED	Alarm, Supervisory and Trouble LED's	Programmable Setting Description
	**Zone 1 Auto-Silence DISABLED** 	Automatic Signal Silence disabled The panel will not silence the NACs automatically.
Zone 1 Signal Silence Inhibit Timer ENABLED 		**Automatic Signal Silence enabled** Silences all alarms and restores the panel to normal 30 minutes after the last alarm. Subsequent alarms after silencing causes the NAC's to resound and restarts the 30 minute Automatic Signal Silence timer.
Zone 2 NAC2 Strobe Mode DISABLED 		NAC2 Strobe Mode disabled An automatic signal silence (see above) or pressing the SIlence Alarm button restores NAC2 to normal.
Zone 2 NAC2 Strobe Mode ENABLED 		NAC2 Strobe Mode enabled NAC2 is not silenced by the Silence Alarm button or by the Automatic Signal Silence function. NAC2 can only be turned off when all zone fire alarms are restored and the system is reset. Only NAC2 can be set to this mode.

Table 12 LED Indicators for NAC Auto SIlence and NAC2 Strobe Mode Programming

6.3.4 Signal Silence Inhibit Timer and Walk Test Programming

Use the Zone 1 Alarm, Supervisory and Trouble LED's to enable or disable the Signal Silence Inhibit timer function.

Use the Zone 2 Alarm, Supervisory and Trouble LED's to enable or silence the Audible Walk Test function.

Press the Silence Alarm control to cycle through the programmable settings for each function.

Press the Silence Trouble control to cycle through the Zones. To proceed to the next programming function cycle through the 2 zones.

The Trouble LED flashes when the panel is in programming mode.

The Battery Panel Status LED will illuminate steady.

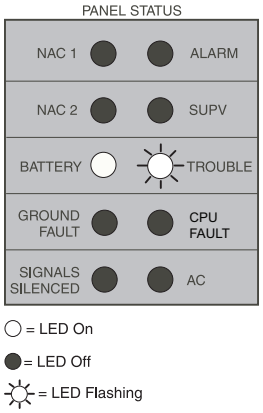
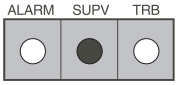
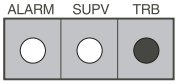
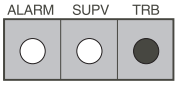
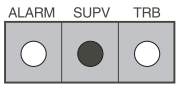
Panel Status LED	Alarm, Supervisory and Trouble LED's	Programmable Setting Description
	**Zone 1 Signal Silence Inhibit Timer DISABLED** 	Signal Silence Inhibit Timer Disabled (default) Pressing the Silence Alarm button turns off the NACs at any time. Setting NAC2 as a strobe disables removes the ability to silence NAC2 by pressing the Silence Alarm Button. See 6.3.3 NAC Automatic Signal Silence and NAC2 Strobe Mode Programming on page 45.
Zone 1 Signal Silence Inhibit Timer ENABLED 		Signal Silence Inhibit Timer Enabled The panel begins a 60 second countdown when the first alarm activates. During this 60 seconds, users **will not** be able to turn off the NACs by pressing the Silence Alarm button. The timer starts on the first alarm only and does not restart on subsequent alarms.
Zone 2 Audible Walk Test AUDIBLE 		Audible Walk Test - Audible Setting the One Man Walk Test to audible, causes the following: The bells pulse ONCE on a fire or Supervisory alarm/restoral The bells pulse TWICE on a zone or system trouble/restoral, excluding a ground fault. The bells pulse THREE times on any ground fault.
Zone 2 Audible Walk Test SILENT 		Audible Walk Test - Silent The bells will not sound during the walk test.

Table 13 LED Indicators for Signal Silence Inhibit Timer and Audible Walk Test Programming

6.3.5 Waterflow Alarms Programming

Use the Zone 1 Alarm, Supervisory and Trouble LED's to enable or disable the Waterflow Delay Timer function.

Use the Zone 2 Alarm, Supervisory and Trouble LED's to enable or silence the Silence Waterflow Alarms function.

Press the Silence Alarm control to cycle through the programmable settings for each function.

Press the Silence Trouble control to cycle through the Zones. To proceed to the next programming function cycle through the 2 zones.

The Trouble LED flashes when the panel is in programming mode.

The Ground Fault Status LED will illuminate steady.

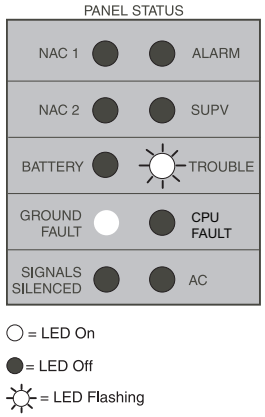
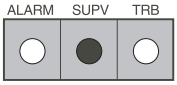
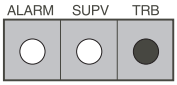
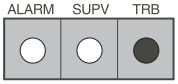
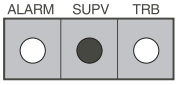
Panel Status LED	Alarm, Supervisory and Trouble LED's	Programmable Setting Description
	**Zone 1 Waterflow Delay Timer DISABLED** 	Waterflow Delay Timer Disabled (default) Alarms on Waterflow zones causes an immediate alarm in the panel.
Zone 1 Waterflow Delay Timer ENABLED 		Waterflow Delay Timer Enabled The panel starts a 60 second timer when the first Waterflow zone enters alarm. The panel will not restart the timer on subsequent Waterflow zone alarms. When the timer expires, if any waterflow zone is still in alarm, the panel will immediately go into alarm. If any other type of fire zone enters alarm during the waterflow delay countdown, the panel immediately enters alarm.
Zone 2 Silence Waterflow Alarm ENABLED 		Silence Waterflow Alarms Enabled (default) Waterflow zones can be silenced without being physically restored.
Zone 2 Silence Waterflow Alarm DISABLED 		Silence Waterflow Alarms Disabled Waterflow zones cannot be silenced until they are physically restored. This applies to both automatic signal silence, and the Silence Alarm button. If there is a trouble on a Waterflow zone following the alarm and alarm restore, the zone can be silenced.

Table 14 LED Indicators for Waterflow Alarms Programming

6.3.6 Reference AC Line Frequency (50 or 60 Hz)

Use the Zone 2 Alarm, Supervisory and Trouble LED's to select the Reference AC Line Frequency.

Press the Silence Alarm control to cycle through the programmable settings,

Press the Silence Trouble control to cycle through the Zones. To proceed to the next programming function cycle through the 2 zones.

The Trouble LED flashes when the panel is in programming mode.

The Ground Fault Status LED will illuminate steady.

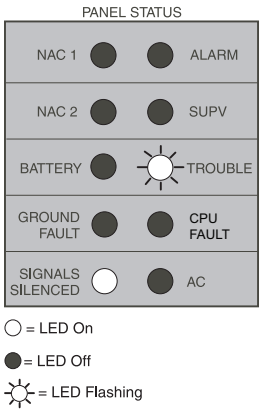
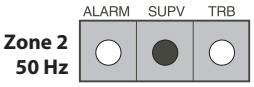
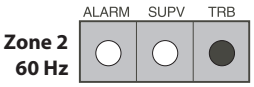
Panel Status LED	Alarm, Supervisory and Trouble LED's	Programmable Setting Description
		50 Hz
		60 Hz (default)

Table 15 LED Indicators for Reference AC Line Frequency (50 or 60 Hz*)*

6.3.7 Entering the Reset Programming Mode

The Reset Programming mode allows for the following

- Removing a Module
- Adding a Module
- Default the System

Enter the Reset Programming Mode as described in the following steps

How to enter the Reset Programming Mode

1. Enter the Installer Programming Mode as described in 6.1 Entering Installer Programming Mode on page 40.
2. To enter the Reset Programming mode, press and hold the System Reset button for 2 seconds. The Zone1 Alarm LD and Trouble LED will be ON and all the System Trouble LEDs will flash Once in the Installer Programming Mode, the Reset Programming Mode can be accessed at any time.

6.3.8 Removing a Module from the System

How to Remove a Modules from the System

1. Physically remove the module from the system and enter the reset section programming as described above.
2. Enter the Reset Programming Mode as described above.
3. Press the ‘Silence Alarm’ button until the Z1 SUPV LED is ON.
4. Press the ‘Silence Trouble’ button to exit the Reset Programming Mode.The common trouble buzzer and common trouble LED turn on and pulse ½ second on/off.
5. Press any button to re-enter the Installer Programming Mode. The trouble buzzer is silent and the zone 1 alarm LED turns on steady. The common trouble LED continues to flash. You can now cycle through the Installer Programming Mode.
6. To exit immediately, press and hold the Walk Test button for 2 seconds.
7. Upon exit the system will reset the ‘supervision’ field for all the modules currently connected to the ‘secur-bus.

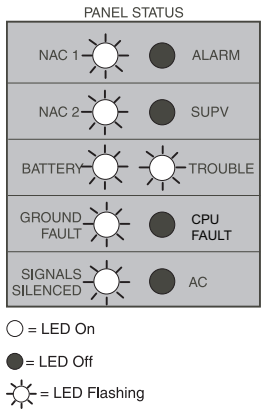
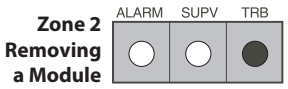
Panel Status LED	Alarm, Supervisory and Trouble LED’s	Programmable Setting Description
		Removing a Module from the System

Table 16 Removing an Module from the System

6.3.9 Adding a Module to the System

Physically connecting the module to the system will allow the module to auto-enroll within one minute. No additional programming is required.

6.3.10 Defaulting the System

How to Default the System

1. Enter the Reset Programming Mode as described above.
2. Press the ‘Silence Trouble’ button to go to Zone 2
3. Press the ‘Silence Alarm’ button once to illuminate the Zone 2 Supervisory LED.
4. Press the ‘Silence Trouble’ button to exit the Reset Programming Mode. The common trouble buzzer and common trouble LED turn on and pulse ½ second on/off.
5. Press any button to re-enter the Installer Programming Mode. The trouble buzzer is silent and the zone 1 alarm LED turns on steady. The common trouble LED continues to flash. You can now cycle through the Installer Programming Mode.
6. To exit immediately, press and hold the Walk Test button for 2 seconds.
7. Upon exit, the system will reset all of the panel programmable parameters to their factory default state. Please note that the ‘supervision’ field will be reset as well.

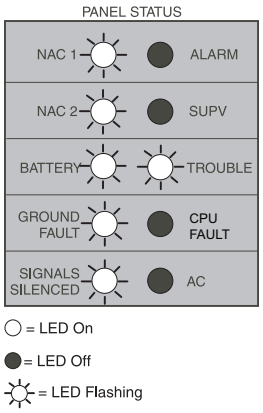
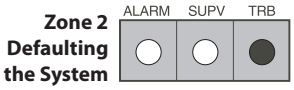
Panel Status LED	Alarm, Supervisory and Trouble LED’s	Programmable Setting Description
		Defaulting the System

Table 17 LED Indicators for Defaulting the System

6.4 Viewing the Event Buffer

The Event Buffer stores up to 20 events. For a complete description of the Events see Table 18 Event Buffer Table on page 52

How to View the Event Buffer

1. Enter the Installer Programming Mode by pressing and holding the **Walk Test** switch for 2 seconds.
2. Press any switch. To silence the trouble buzzer and enter the **Installer Programming** mode.
3. Press and hold the **Lamp Test** switch for 2 seconds.
4. The Common Supervisory LED flashes to indicate the **View Buffer** mode.
5. Events are shown from the most recent to the oldest.
6. See the event table below which indicates the LED patterns used to indicate various events.
7. To advance to the next event press the **Silence Trouble** switch.
8. Once all 20 events have been viewed, the next **Silence Trouble** keypress will exit the view buffer mode and return to the Installer Programming Mode programming. To exit the Installer Programming Mode, press and hold for 2 seconds the **Walk Test** switch.
9. Pressing the **Silence Signal** switch at any time will cause the system to exit the View Buffer mode. The buzzer will sound. Press any button to go to the Installer Programming Mode.

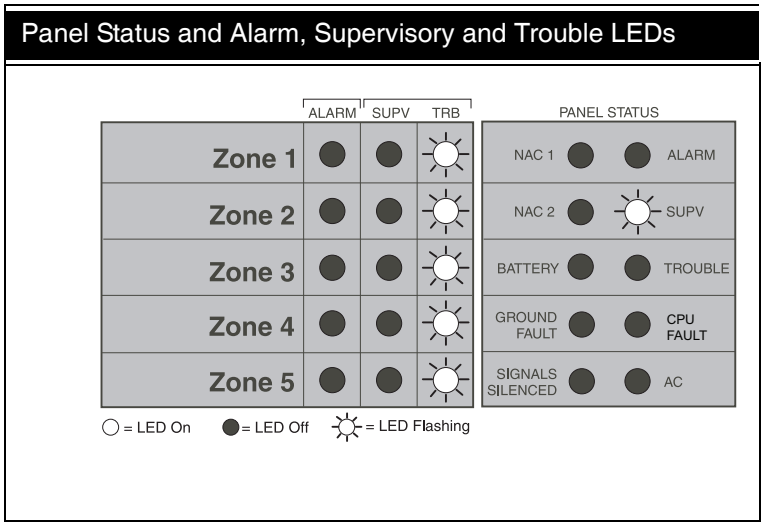


Figure 20 LED Indicators for Viewing the Event Buffer

Display	Event
Steady Common Alarm LED	Null Event
Flashing Zone X Alarm LED	Verified Zone X Alarm
Steady Zone X Alarm LED	Verified Zone X Alarm Restore
Flashing Zone X Alarm LED and Flashing Zone X Supervisory LED	Unverified Zone X Alarm
Flashing Zone X Supervisory LED	Zone X Supervisory
Steady Zone X Supervisory LED	Zone X Supervisory Restore
Flashing Zone X Trouble LED	Zone X Trouble
Steady Zone X Trouble LED	Zone X Trouble Restore
Flashing Common Trouble LED	Expansion Module Fault
Steady Common Trouble LED	Expansion Module Fault Restore
Flashing NAC1 Trouble LED	NAC 1 Trouble
Steady NAC1 Trouble LED	NAC 1 Trouble Restore
Flashing NAC2 Trouble LED	NAC 2 Trouble
Steady NAC2 Trouble LED	NAC 2 Trouble Restore
Flashing Battery Trouble LED	Battery Trouble
Steady Battery Trouble LED	Battery Trouble Restore
Flashing Ground Fault LED	Ground Fault Trouble
Steady Ground Fault LED	Ground Fault Restore
Flashing Signal Silenced Trouble LED	Manual Signal Silence
Steady Signal Silenced Trouble LED	(Successful) Reset
Flashing AC On LED	AC Failure
Steady AC On LED	AC Fail Restore
Steady AC On LED and Steady BAT TRB LED	Cold Start
Flashing AC On LED and Flashing BAT TRB LED	Warm Start
Flashing (ALL) Zone Trouble LED's	Walk Test Start / Installer Mode Entry
Steady (ALL) Zone Trouble LED's	Walk Test End / Installer Mode Exit

Table 18 Event Buffer Table

7 Startup of the FA-265

7.1 Prior to power up

- Verify that all field wiring is free of shorts, opens and grounds and that end-of-line devices are connected and are the proper value.
- Verify that all modules and internal cables are properly seated in their location.
- Verify that all metal components are bonded to the incoming ground. Should measure zero ohms between any metal part and the incoming ground wire.
- Verify that the polarity between the panel and connected devices is correct.

7.2 Power up sequence

- Connect AC power first before Battery.
- The panel goes into the Reset mode immediately. This lasts for 10 seconds and the trouble buzzer will beep during the reset period.
- After the reset period ends, the buzzer goes silent, the green AC indicator should be ON and all other LEDs should be OFF.
- If any LED other than the AC LED is ON then there is a fault in the system. Troubleshoot and repair the fault before proceeding.
- If the battery is not fully charged, the battery fault LED will come on after about 2 minutes. Verify that the battery is connected properly and if it is, it may take up to 24 hours to recharge the batteries. Once the battery is charged, the battery fault LED will go OFF.

7.3 Default Operation

- On first power up, all programmable features will be in the default mode.
- Do a ‘Lamp Test’ to verify that all the indicators function.
- It is suggested that an initial verification of operation be done before the panel is programmed. Verify that each zone will go into alarm and that each NAC operates the Notification Appliances and that the zone alarm indicator(s) function. Each zone is defaulted as an instant ‘fire alarm’ and each NAC is defaulted for ‘steady’ output on alarm. An Alarm, Silence, Reset cycle will also verify that the push-button function properly.
- Verify that each zone indicates a trouble on a zone open and that a ground fault on the extended conductors is properly indicated.

7.4 Programming the Panel

- Program the panel for the operational features desired. (section 6)
- Record your configuration choices for future reference. (section 8)
- Verify panel operations and feature selections by initiating alarms and troubles as described above.

7.5 Final Verification

- Verify system operation and fault detection as required by the local Authority Having Jurisdiction.
- Enable the ‘one-man’ walk test feature to test all the field devices and wiring.

8 Programming Worksheets

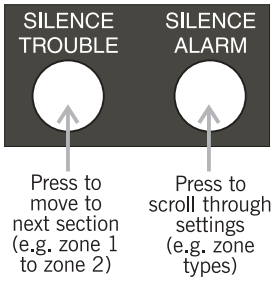
8.1 Entering the Installer Programming Mode

Please see Chapter 6 FA-265 System Programming on page 39 for complete instructions.

Note: All zone alarms must be reset prior to entering the Installer Programming Mode. While the panel is in the Installer Programming Mode, the annunciators will show a trouble condition.

To enter the Installer Programming Mode:

1. Press and hold the **Walk Test** button for two seconds (located behind the display PCB).
2. Press any button to turn off the trouble buzzer.
3. Press **Silence Alarm** to scroll through the settings for each programming section (e.g. to change the zone type, or to turn an option on or off).
4. Press **Silence Trouble** to move to the next programming section (e.g. to move from zone 1 to zone 2).

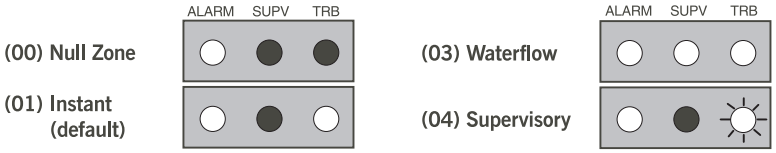


5. The panel will indicate the current programming section using the Common Trouble LEDs, as shown below:

Please see 6.3 Programming Function Descriptions on page 42 for detailed descriptions of each programming section.

8.2 Zone Programming

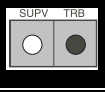
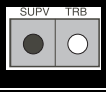
Program each of the zones as one of the following types. (See 6.3.1 Zone Programming on page 42.) Record your programming choices in the table below.



ZONE ALARM LED On	Zone No.	Type (00 - 05)	Label
1	1		
2	2		
3	3		
4	4		
5	5		

8.3 NAC Temporal/Steady Programming (Section 1)

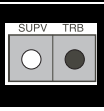
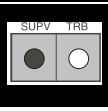
Please see 6.3.2 NAC Sounding Rate Programming on page 44.

ZONE ALARM LED On	Programming Section	Settings	
			
1	NAC1 Temporal / Steady	Temporal ❑	*Steady ❑
2	NAC2 Temporal / Steady	Temporal ❑	*Steady ❑

* = Factory default

8.4 NAC Auto-silence, Strobe Programming (Section 2)

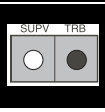
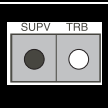
Please see 6.3.3 NAC Automatic Signal Silence and NAC2 Strobe Mode Programming on page 45.

ZONE ALARM LED On	Programming Section	Settings	
			
1	NAC Auto-silence	Enabled ❑	*Disabled ❑
2	NAC2 Strobe or Bell	Strobe ❑	*Bell ❑

* = Factory default

8.5 Silence Inhibit and Walk Test Programming (Section 3)

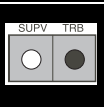
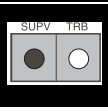
Please see 6.3.4 Signal Silence Inhibit Timer and Walk Test Programming on page 46.

ZONE ALARM LED On	Programming Section	Settings	
			
1	Signal Silence Inhibit Timer	Enabled ❑	*Disabled ❑
2	One Man Walk Test	*Audible ❑	Silent ❑

* = Factory default

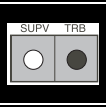
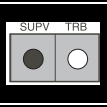
8.6 Waterflow Programming (Section 4)

Please see 6.3.5 Waterflow Alarms Programming on page 47.

ZONE ALARM LED On	Programming Section	Settings	
			
1	Waterflow Delay Timer	Enabled ❑	*Disabled ❑
2	Silencing of Waterflow Alarms	*Enabled ❑	Disabled ❑

* = Factory default

8.7 50/60Hz Option (Section 5)

ZONE ALARM LED On	Programming Section	Settings	
			
2	AC power 50Hz or 60Hz	*60Hz ❑	50Hz ❑

* = Factory default

9 Appendix: ULI Compatible Smoke Detectors

Panel CID	Max. # Detectors	Manufacturer	Model	Model CID	Base	Base CID	Description
01	25	System Sensor	1400/ 1400A	A	N/A	N/A	Ionization type smoke, 2-wire 12/24VDC
01	25	System Sensor	1451	A	B401 B401B	N/A	Plug-in – Ionization type smoke detector
01	25	System Sensor	2400	A	N/A	N/A	Photoelectric, 2-wire, 12/24VDC
01	25	System Sensor	2400TH	A	N/A	N/A	Photoelectric with Thermal, 2-wire, 12/ 24VDC
01	25	System Sensor	2400AT	A	N/A	N/A	Photoelectric with Thermal and Horn, 2-wire, 24VDC
01	25	System Sensor	2400AIT	A	N/A	N/A	Photoelectric with isolated Thermal and Horn, 2-wire, 24VDC
01	25	System Sensor	2451	A	B401 B401B DH400	N/A	Plug-in – Photoelectric type smoke detector
01	25	System Sensor	2451TH	A	B401 B401B	N/A	Plug-in – Photoelectric type smoke detector with Thermal
01	25	System Sensor	1100	A	N/A	N/A	Ionization, 2-wire, 12/ 24VDC, terminal strip
01	25	System Sensor	2100	A	N/A	N/A	Photoelectric, 2-wire, 12/24VDC, terminal strip
01	25	System Sensor	2100T	A	N/A	N/A	Photoelectric, 2-wire, 12/24VDC, thermistor, terminal strip
01	25	System Sensor	2112/24T	A	N/A	N/A	Photoelectric, 12/ 24VDC, terminal strip

Panel CID	Max. # Detectors	Manufacturer	Model	Model CID	Base	Base CID	Description
01	25	System Sensor	4451HT 4451HTA	A	B401 B401B DH400	N/A	Plug-in – High Temp Heat 88°C (190°F)
01	25	System Sensor	5451	A	B401 B401B DH400	N/A	Plug-in – Fixed Temp/ Rate of Rise Detector
01	25	System Sensor	1151 1151A	A	B401 B401B DH400	N/A	Plug-in – Low Profile Ion
01	25	System Sensor	2151 2151A	A	B401 B401B DH400	N/A	Plug-in – Low Profile Photo
01	25	System Sensor	2100S	A	N/A	N/A	2-wire direct wire Photoelectric
01	25	System Sensor	2100TS	A	N/A	N/A	2-wire direct wire Photoelectric Thermal
01	30	System Sensor	2100AT	A	N/A	N/A	2-wire direct wire Photoelectric Audible Thermal
01	30	System Sensor	2100TR	A	N/A	N/A	2-wire direct wire Photoelectric Thermal Auxiliary Relay

Table 19 ULI Compatible Smoke Detectors

9.1 ULI Compatible Smoke Detector Bases

Max. # Detectors	Manufacturer	Model	Base CID	Description
25	System Sensor	B401	N/A	2-wire standard base, 4”, 12/24VDC
25	System Sensor	B401B	N/A	2-wire standard base, 6”, 12/24VDC
25	System Sensor	B406B	N/A	2-wire base, 24VDC, form contact
25	System Sensor	B401BH	N/A	24VDC sounder base for use with B401
25	System Sensor	B110LP	N/A	2-wire, flangeless, 12/24VDC
25	System Sensor	B116LP	N/A	2-wire base, 24VDC, form contact
25	System Sensor	DH400	N/A	Duct Detector Mount
25	System Sensor	RMK400	N/A	Recessed mount kit for Series 400

Table 20 ULI Compatible Smoke Detector Bases

9.2 ULI Compatible 4-Wire Smoke Detectors

Manufacturer	Models					
System Sensor	1124B	2124B	2124TB	2124S	2124TS	2124R
	2124TR	2124AT	2124ATR	2124AITR	1424	2424
	2424TH	2424AT	1151*	2151*	-	-
	2424AIT	6424	1451**	2451**	22451TH**	-
	*Detector with B112LP Base **Detector with B402B Base					
Detection Systems	DS284	DS284TH	DS284THS	DS284THR	DS284THSR	DS284THCS
	DS284THC	DS284THE	DS284ES	DS284IS	-	-
Gentex	8240	8240T	8240P	8243P	8240PH	8243PH
	8240PT	8243PT	-	-	-	-
Hochiki	SIJ-24	SLR-24	SLR-24H	SLR-835B	-	-
DSC	MN240	MN240T	MN240R	MN240RT	MN240S	MN240ST
	MN240SR	MN240SRT	-	-	-	-
ESL	741U	741UT	-	-	-	-

Table 21 ULI Compatible 4-Wire Smoke Detectors

9.3 ULI Compatible Horns/Strobes

System Sensor	Type	Cd	Voltage (FWR)
P2415(W)(A)	H/S	15	20-30
P241575(W)(A)	H/S	15/75	20-30
P2475(W)(A)	H/S	75	20-30
P24110(W)(A)	H/S	110	20-30
S2415(W)(A)	S	15	20-30
S241575(W)(A)	S	15/75	20-30
S2475(W)(A)	S	75	20-30
S24110(W)(A)	S	110	20-30
H24(W)(A)	H	-	20-30
MDL(W)(A)	Synch	Module	20-30
No suffix = Red, suffix W = White, suffix A = Canadian version			

Table 22 ULI Compatible System Sensor Horns/Strobes

Gentex	Type	Cd	Voltage (FWR)
GEH24	H	-	20-31
GES24-15	S	15	20-31
GES24-15/75	S	15/75	20-31
GES24-30	S	30	20-31
GES24-60	S	60	20-31
GES24-75	S	75	20-31
GES24-110	S	110	20-31
GEC24-15	H/S	15	20-31
GEC24-15/75	H/S	15/75	20-31
GEC24-30	H/S	30	20-31
GEC24-60	H/S	60	20-31
GEC24-75	H/S	75	20-31
GEC24-110	H/S	110	20-31
Available in Red and White.			

Table 23 ULI Compatible Gentex Horns/Strobes

Wheelock	Type	Cd	Voltage (FWR)
NS-2415W-FR(W)	H/S	15	20-31
NS-241575W-FR(W)	H/S	15/75	20-31
NS-2430W-FR(W)	H/S	30	20-31
NS-2475W-FR(W)	H/S	75	20-31
NS-24110W-FR(W)	H/S	110	20-31
NS4-2415W-FR(W)	H/S	15	20-31
NS4-241575W-FR(W)	H/S	15/75	20-31
NS4-2430W-FR(W)	H/S	30	20-31
NS4-2475W-FR(W)	H/S	75	20-31
NS4-24110W-FR(W)	H/S	110	20-31
NS = 2-wire, NS4 = 4-wire			
AS-2415W-FR(W)	S	15	20-31
AS-241575W-FR(W)	S	15/75	20-31
AS-2430W-FR(W)	S	30	20-31
AS-2475W-FR(W)	S	75	20-31
AS-24110W-FR(W)	S	110	20-31
AS4-2415C-FR(W)	S	15	20-31
AS4-2430C-FR(W)	S	30	20-31
AS4-2475C-FR(W)	S	75	20-31
AS4-24110C-FR(W)	S	110	20-31
AH-24-R	H	-	20-31
AH-24-WP-R	H	-	20-31
MT-24-R	H		20-31
MT4-24-R	H		20-31
MT-24-SL-VFR	H/S	15	20-31
MT-24-SLM-VFR	H/S	15/75	20-31
MT-24-MS-VFR	H/S	30	20-31
MT-24-IS-VFR	H/S	75	20-31
MT-24-WM-VFR	H/S	117	20-31

Table 24 ULI Compatible Wheelock Horns/Strobes

10 FCC Compliance Statement

CAUTION: Changes or modifications not expressly approved by the manufacturer could void your authority to use this equipment.

This equipment has been tested and found to comply with the limits for a Class B digital device, pursuant to Part 15 of the FCC Rules. These limits are designed to provide reasonable protection against harmful interference in a residential installation. This equipment generates, uses and can radiate radio frequency energy and, if not installed and used in accordance with the instructions, may cause harmful interference to radio communications. However, there is no guarantee that interference will not occur in a particular installation. If this equipment does cause harmful interference to radio or television reception, which can be determined by turning the equipment off and on, the user is encouraged to try to correct the interference by one or more of the following measures:

- Re-orient the receiving antenna.
- Increase the separation between the equipment and receiver.
- Connect the equipment into an outlet on a circuit different from that to which the receiver is connected.
- Consult the dealer or an experienced radio/television technician for help.

The user may find the following booklet prepared by the FCC useful: “How to Identify and Resolve Radio/Television Interference Problems”. This booklet is available from the U.S. Government Printing Office, Washington D.C. 20402, Stock # 004-000-00345-4.

11 Warranty & Warning Information

11.1 Warning Please Read Carefully

Note to End User

This equipment is subject to terms and conditions of sale as follows:

11.1.1 Note to Installers

This warning contains vital information. As the only individual in contact with system users, it is your responsibility to bring each item in this warning to the attention of the users of this system. Failure to properly inform system end-users of the circumstances in which the system might fail may result in over-reliance upon the system. As a result, it is imperative that you properly inform each customer for whom you install the system of the possible forms of failure.

11.1.2 System Failures

This system has been carefully designed to be as effective as possible. There are circumstances, such as fire or other types of emergencies where it may not provide protection. Alarm systems of any type may be compromised deliberately or may fail to operate as expected for a variety of reasons. Some reasons for system failure include:

Inadequate Installation

A Fire Alarm system must be installed in accordance with all the applicable codes and standards in order to provide adequate protection. An inspection and approval of the initial installation, or, after any changes to the system, must be conducted by the Local Authority Having Jurisdiction. Such inspections ensure installation has been carried out properly.

Power Failure

Control units, smoke detectors and many other connected devices require an adequate power supply for proper operation. If the system or any device connected to the system operates from batteries, it is possible for the batteries to fail. Even if the batteries have not failed, they must be fully charged, in good condition and installed correctly. If a device operates only by AC power, any interruption, however brief, will render that device inoperative while it does not have power. Power interruptions of any length are often accompanied by voltage fluctuations which may damage electronic equipment such as a fire alarm system. After a power interruption has occurred, immediately conduct a complete system test to ensure that the system operates as intended.

Failure of Replaceable Batteries

Systems with wireless transmitters have been designed to provide several years of battery life under normal conditions. The expected battery life is a function of the device environment, usage and type. Ambient conditions such as high humidity, high or low temperatures, or large temperature fluctuations may reduce the expected battery life. While each transmitting device has a low battery monitor which identifies when the batteries need to be replaced, this monitor

may fail to operate as expected. Regular testing and maintenance will keep the system in good operating condition.

Compromise of Radio Frequency (Wireless) Devices

Signals may not reach the receiver under all circumstances which could include metal objects placed on or near the radio path or deliberate jamming or other inadvertent radio signal interference.

System Users

A user may not be able to operate a panic or emergency switch possibly due to permanent or temporary physical disability, inability to reach the device in time, or unfamiliarity with the correct operation. It is important that all system users be trained in the correct operation of the alarm system and that they know how to respond when the system indicates an alarm.

Automatic Alarm Initiating Devices

Smoke detectors, heat detectors and other alarm initiating devices that are a part of this system may not properly detect a fire condition or signal the control panel to alert occupants of a fire condition for a number of reasons, such as: the smoke detectors or heat detector may have been improperly installed or positioned; smoke or heat may not be able to reach the alarm initiating device, such as when the fire is in a chimney, walls or roofs, or on the other side of closed doors; and, smoke and heat detectors may not detect smoke or heat from fires on another level of the residence or building.

Software

Most Mircom products contain software. With respect to those products, Mircom does not warranty that the operation of the software will be uninterrupted or error-free or that the software will meet any other standard of performance, or that the functions or performance of the software will meet the user's requirements. Mircom shall not be liable for any delays, breakdowns, interruptions, loss, destruction, alteration or other problems in the use of a product arising our of, or caused by, the software.

Every fire is different in the amount and rate at which smoke and heat are generated. Smoke detectors cannot sense all types of fires equally well. Smoke detectors may not provide timely warning of fires caused by carelessness or safety hazards such as smoking in bed, violent explosions, escaping gas, improper storage of flammable materials, overloaded electrical circuits, children playing with matches or arson.

Even if the smoke detector or heat detector operates as intended, there may be circumstances when there is insufficient warning to allow all occupants to escape in time to avoid injury or death.

Alarm Notification Appliances

Alarm Notification Appliances such as sirens, bells, horns, or strobes may not warn people or waken someone sleeping if there is an intervening wall or door. If notification appliances are located on a different level of the residence or premise, then it is less likely that the occupants will be alerted or awakened. Audible notification appliances may be interfered with by other noise sources such as stereos, radios, televisions, air conditioners or other appliances, or passing traffic. Audible notification appliances, however loud, may not be heard by a hearing-impaired person.

Telephone Lines

If telephone lines are used to transmit alarms, they may be out of service or busy for certain periods of time. Also the telephone lines may be compromised by such things as criminal tampering, local construction, storms or earthquakes.

Insufficient Time

There may be circumstances when the system will operate as intended, yet the occupants will not be protected from the emergency due to their inability to respond to the warnings in a timely manner. If the system is monitored, the response may not occur in time enough to protect the occupants or their belongings.

Component Failure

Although every effort has been made to make this system as reliable as possible, the system may fail to function as intended due to the failure of a component.

Inadequate Testing

Most problems that would prevent an alarm system from operating as intended can be discovered by regular testing and maintenance. The complete system should be tested as required by national standards and the Local Authority Having Jurisdiction and immediately after a fire, storm, earthquake, accident, or any kind of construction activity inside or outside the premises. The testing should include all sensing devices, keypads, consoles, alarm indicating devices and any other operational devices that are part of the system.

Security and Insurance

Regardless of its capabilities, an alarm system is not a substitute for property or life insurance. An alarm system also is not a substitute for property owners, renters, or other occupants to act prudently to prevent or minimize the harmful effects of an emergency situation.

IMPORTANT NOTE

End-users of the system must take care to ensure that the system, batteries, telephone lines, etc. are tested and examined on a regular basis to ensure the minimization of system failure.

11.2 Limited Warranty

Mircom Technologies Ltd. warrants the original purchaser that for a period of three years from the date of shipment, the product shall be free of defects in materials and workmanship under normal use. During the warranty period, Mircom Technologies Ltd. shall, at its option, repair or replace any defective product upon return of the product to its factory, at no charge for labor and materials. Any replacement and/or repaired parts are warranted for the remainder of the original warranty or ninety (90) days, whichever is longer. The original owner must promptly notify Mircom Technologies Ltd. in writing that there is defect in material or workmanship, such written notice to be received in all events prior to expiration of the warranty period.

11.2.1 International Warranty

The warranty for international customers is the same as for any customer within Canada and the United States, with the exception that Mircom Technologies Ltd. shall not be responsible for any customs fees, taxes, or VAT that may be due.

11.2.2 Conditions to Void Warranty

This warranty applies only to defects in parts and workmanship relating to normal use. It does not cover:

- damage incurred in shipping or handling
- damage caused by disaster such as fire, flood, wind, earthquake or lightning
- damage due to causes beyond the control of Mircom Technologies Ltd. such as excessive voltage, mechanical shock or water damage
- damage caused by unauthorized attachment, alterations, modifications or foreign objects
- damage caused by peripherals (unless such peripherals were supplied by Mircom Technologies Ltd.)
- defects caused by failure to provide a suitable installation environment for the products
- damage caused by use of the products for purposes other than those for which it was designed
- damage from improper maintenance
- damage arising out of any other abuse, mishandling or improper application of the products.

11.3 Warranty Procedure

To obtain service under this warranty, please return the item(s) in question to the point of purchase. All authorized distributors and dealers have a warranty program. Anyone returning goods to Mircom Technologies Ltd. must first obtain an authorization number. Mircom Technologies Ltd. will not accept any shipment whatsoever for which prior authorization has not been obtained. NOTE: Unless specific pre-authorization in writing is obtained from Summit management, no credits will be issued for custom fabricated products or parts or for complete fire alarm system. Summit will at its sole option, repair or replace parts under warranty. Advance replacements for such items must be purchased.Mircom Technologies Ltd.

Note: ’s liability for failure to repair the product under this warranty after a reasonable number of attempts will be limited to a replacement of the product, as the exclusive remedy for breach of warranty.

11.4 Disclaimer of Warranties

This warranty contains the entire warranty and shall be in lieu of any and all other warranties, whether expressed or implied (including all implied warranties of merchantability or fitness for a particular purpose) And of all other obligations or liabilities on the part of Mircom Technologies Ltd. neither assumes nor authorizes any other person purporting to act on its behalf to modify or to change this warranty, nor to assume for it any other warranty or liability concerning this product. This disclaimer of warranties and limited warranty are governed by the laws of the province of Ontario, Canada.

11.5 Out of Warranty Repairs

Mircom Technologies Ltd. will at its option repair or replace out-of-warranty products which are returned to its factory according to the following conditions. Anyone returning goods to Mircom Technologies Ltd. must first obtain an authorization number. Mircom Technologies Ltd. will not accept any shipment whatsoever for which prior authorization has not been obtained.

Products which Mircom Technologies Ltd. determines to be repairable will be repaired and returned. A set fee which Mircom Technologies Ltd. has predetermined and which may be revised from time to time, will be charged for each unit repaired.

Products which Mircom Technologies Ltd. determines not to be repairable will be replaced by the nearest equivalent product available at that time. The current market price of the replacement product will be charged for each replacement unit.

The FA-265 fire alarm control panel is designed to meet the requirements of NFPA 72, 2002 edition, UL 864 Rev 9, Control Units for Fire Protective Systems, and in Canada, CAN/ULC-S527-99, Standard for Control Units for Fire Alarm Systems.

Information provided with this unit is intended as a guide. Installation of this equipment, optional system components, alarm initiating devices and notification appliances must follow the manufacturer's guidelines as contained in their respective installation documents, all applicable codes and the instructions of the Local Authority Having Jurisdiction.

The foregoing information is accurate as of the date of publishing and is subject to change or revision without prior notice at the sole discretion of the Company.

WARNING: Mircom Technologies Ltd. recommends that the entire system be completely tested on a regular basis. However, despite frequent testing, and due to, but not limited to, criminal tampering or electrical disruption, it is possible for this product to fail to perform as expected.

NOTE: Under no circumstances shall Mircom Technologies Ltd. be liable for any special, incidental, or consequential damages based upon breach of warranty, breach of contract, negligence, strict liability, or any other legal theory. Such damages include, but are not limited to, loss of profits, loss of the product or any associated equipment, cost of capital, cost of substitute or replacement equipment, facilities or services, down time, purchaser's time, the claims of third parties, including customers, and injury to property.

MIRCOM **MAKES NO WARRANTY OF MERCHANTABILITY OR FITNESS FOR A PARTICULAR PURPOSE WITH RESPECT TO ITS GOODS DELIVERED, NOR IS THERE ANY OTHER WARRANTY,**

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