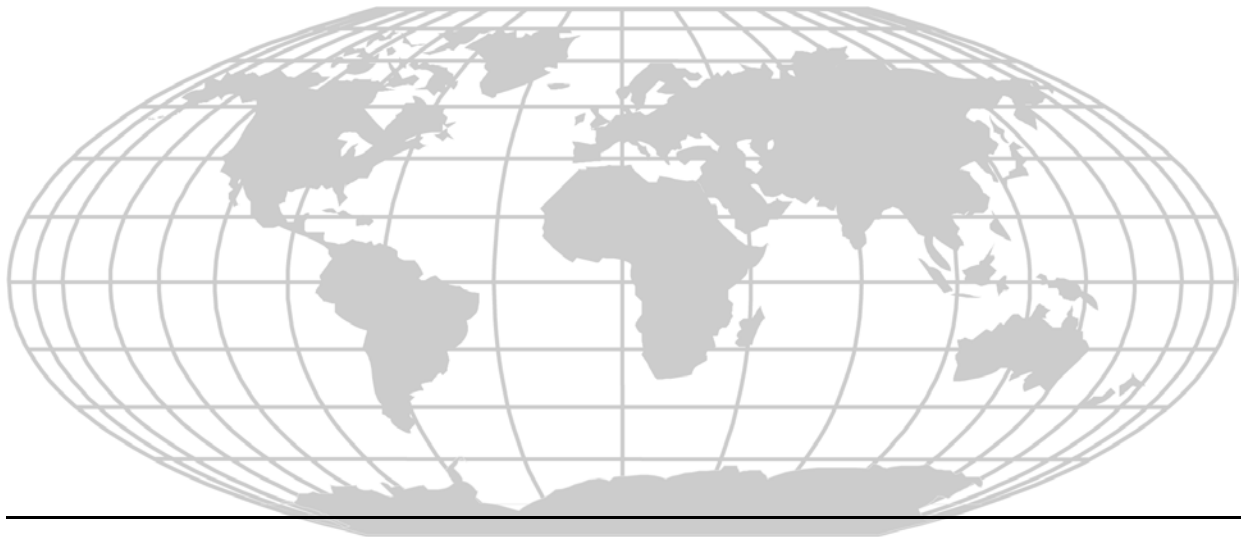




Fire Alarm Control Panel MS-9600/MS-9600E

IMPORTANT! The SLC Manual Document #51309 must be referenced in addition to this manual when installing or servicing the Fire Alarm Control Panel.

Fire Alarm System Limitations

An automatic fire alarm system—typically made up of smoke detectors, heat detectors, manual pull stations, audible warning devices, and a fire alarm control with remote notification capability—can provide early warning of a developing fire. Such a system, however, does not assure protection against property damage or loss of life resulting from a fire.

The Manufacturer recommends that smoke and/or heat detectors be located throughout a protected premise following the recommendations of the current edition of the National Fire Protection Association Standard 72 (NFPA 72), manufacturer's recommendations, State and local codes, and the recommendations contained in the Guide for Proper Use of System Smoke Detectors, which is made available at no charge to all installing dealers. A study by the Federal Emergency Management Agency (an agency of the United States government) indicated that smoke detectors may not go off in as many as 35% of all fires. While fire alarm systems are designed to provide early warning against fire, they do not guarantee warning or protection against fire. A fire alarm system may not provide timely or adequate warning, or simply may not function, for a variety of reasons:

Smoke detectors may not sense fire where smoke cannot reach the detectors such as in chimneys, in or behind walls, on roofs, or on the other side of closed doors. Smoke detectors also may not sense a fire on another level or floor of a building. A second-floor detector, for example, may not sense a first-floor or basement fire.

Particles of combustion or "smoke" from a developing fire may not reach the sensing chambers of smoke detectors because:

- Barriers such as closed or partially closed doors, walls, or chimneys may inhibit particle or smoke flow.
- Smoke particles may become "cold," stratify, and not reach the ceiling or upper walls where detectors are located.
- Smoke particles may be blown away from detectors by air outlets.
- Smoke particles may be drawn into air returns before reaching the detector.

The amount of "smoke" present may be insufficient to alarm smoke detectors. Smoke detectors are designed to alarm at various levels of smoke density. If such density levels are not created by a developing fire at the location of detectors, the detectors will not go into alarm.

Smoke detectors, even when working properly, have sensing limitations. Detectors that have photoelectronic sensing chambers tend to detect smoldering fires better than flaming fires, which have little visible smoke. Detectors that have ionizing-type sensing chambers tend to detect fast-flaming fires better than smoldering fires. Because fires develop in different ways and are often unpredictable in their growth, neither type of detector is necessarily best and a given type of detector may not provide adequate warning of a fire.

Smoke detectors cannot be expected to provide adequate warning of fires caused by arson, children playing with matches (especially in bedrooms), smoking in bed, and violent explosions (caused by escaping gas, improper storage of flammable materials, etc.).

While a fire alarm system may lower insurance rates, it is not a substitute for fire insurance!

Heat detectors do not sense particles of combustion and alarm only when heat on their sensors increases at a predetermined rate or reaches a predetermined level. Rate-of-rise heat detectors may be subject to reduced sensitivity over time. For this reason, the rate-of-rise feature of each detector should be tested at least once per year by a qualified fire protection specialist.

Heat detectors are designed to protect property, not life.

IMPORTANT! Smoke detectors must be installed in the same room as the control panel and in rooms used by the system for the connection of alarm transmission wiring, communications, signaling, and/or power. If detectors are not so located, a developing fire may damage the alarm system, crippling its ability to report a fire.

Audible warning devices such as bells may not alert people if these devices are located on the other side of closed or partly open doors or are located on another floor of a building. Any warning device may fail to alert people with a disability or those who have recently consumed drugs, alcohol or medication. Please note that:

- Strobes can, under certain circumstances, cause seizures in people with conditions such as epilepsy.
- Studies have shown that certain people, even when they hear a fire alarm signal, do not respond or comprehend the meaning of the signal. It is the property owner's responsibility to conduct fire drills and other training exercise to make people aware of fire alarm signals and instruct them on the proper reaction to alarm signals.
- In rare instances, the sounding of a warning device can cause temporary or permanent hearing loss.

A fire alarm system will not operate without any electrical power. If AC power fails, the system will operate from standby batteries only for a specified time and only if the batteries have been properly maintained and replaced regularly.

Equipment used in the system may not be technically compatible with the control. It is essential to use only equipment listed for service with your control panel.

Telephone lines needed to transmit alarm signals from a premise to a central monitoring station may be out of service or temporarily disabled. For added protection against telephone line failure, backup radio transmission systems are recommended.

The most common cause of fire alarm malfunction is inadequate maintenance. To keep the entire fire alarm system in excellent working order, ongoing maintenance is required per the manufacturer's recommendations, and UL and NFPA standards. At a minimum, the requirements of Chapter 7 of NFPA 72 shall be followed. Environments with large amounts of dust, dirt or high air velocity require more frequent maintenance. A maintenance agreement should be arranged through the local manufacturer's representative. Maintenance should be scheduled monthly or as required by National and/or local fire codes and should be performed by authorized professional fire alarm installers only. Adequate written records of all inspections should be kept.

Installation Precautions

WARNING - Several different sources of power can be connected to the fire alarm control panel. Disconnect all sources of power before servicing. Control unit and associated equipment may be damaged by removing and/or inserting cards, modules, or interconnecting cables while the unit is energized. Do not attempt to install, service, or operate this unit until this manual is read and understood.

CAUTION - *System Reacceptance Test after Software Changes.* To ensure proper system operation, this product must be tested in accordance with NFPA 72 Chapter 7 after any programming operation or change in site-specific software. Reacceptance testing is required after any change, addition or deletion of system components, or after any modification, repair or adjustment to system hardware or wiring.

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

This system meets NFPA requirements for operation at 0-49° C/32-120° F and at a relative humidity of 85% RH (non-condensing) at 30° C/86° F. However, the useful life of the system's standby batteries and the electronic components may be adversely affected by extreme temperature ranges and humidity. Therefore, it is recommended that this system and all peripherals be installed in an environment with a nominal room temperature of 15-27° C/60-80° F.

Verify that wire sizes are adequate for all initiating and indicating device loops. Most devices cannot tolerate more than a 10% I.R. drop from the specified device voltage.

Adherence to the following will aid in problem-free installation with long-term reliability:

Like all solid state electronic devices, this system may operate erratically or can be damaged when subjected to lightning-induced transients. Although no system is completely immune from lightning transients and interferences, proper grounding will reduce susceptibility. *Overhead or outside aerial wiring is not recommended, due to an increased susceptibility to nearby lightning strikes.* Consult with the Technical Services Department if any problems are anticipated or encountered.

Disconnect AC power and batteries prior to removing or inserting circuit boards. Failure to do so can damage circuits.

Remove all electronic assemblies prior to any drilling, filing, reaming, or punching of the enclosure. When possible, make all cable entries from the sides or rear. Before making modifications, verify that they will not interfere with battery, transformer, and printed circuit board location.

Do not tighten screw terminals more than 9 in-lbs. Over-tightening may damage threads, resulting in reduced terminal contact pressure and difficulty with screw terminal removal.

Though designed to last many years, system components can fail at any time. This system contains static-sensitive components. Always ground yourself with a proper wrist strap before handling any circuits so that static charges are removed from the body. Use static-suppressive packaging to protect electronic assemblies removed from the unit.

Follow the instructions in the installation, operating, and programming manuals. These instructions must be followed to avoid damage to the control panel and associated equipment. FACP operation and reliability depend upon proper installation by authorized personnel.

FCC Warning

WARNING: This equipment generates, uses, and can radiate radio frequency energy and if not installed and used in accordance with the instruction manual, may cause interference to radio communications. It has been tested and found to comply with the limits for class A computing device pursuant to Subpart B of Part 15 of FCC Rules, which is designed to provide reasonable protection against such interference when operated in a commercial environment. Operation of this equipment in a residential area is likely to cause interference, in which case the user will be required to correct the interference at his own expense.

Canadian Requirements

This digital apparatus does not exceed the Class A limits for radiation noise emissions from digital apparatus set out in the Radio Interference Regulations of the Canadian Department of Communications.

Le présent appareil numérique n'émet pas de bruits radioélectriques dépassant les limites applicables aux appareils numériques de la classe A prescrites dans le Règlement sur le brouillage radioélectrique édicté par le ministère des Communications du Canada.

Notes

Table of Contents

SECTION 1: Product Description	12
1.1: Inventory	12
1.2: Features and Options	12
1.3: Specifications	14
1.3.1: Current Availability	15
1.4: Controls and Indicators	16
1.5: Circuits	17
1.6: Components	17
1.6.1: Intelligent Addressable Detectors: Newer Series	18
1.6.2: Intelligent Addressable Modules: Newer Series	19
1.6.3: 300 Series Intelligent Addressable Devices	20
1.6.4: Addressable Device Accessories	20
1.7: Optional Modules	20
1.8: Accessories	21
1.8.1: PK-CD Programming Utility	21
1.8.2: Dress Panel	21
1.8.3: Battery Box	21
1.8.4: Battery Charger	22
1.8.4.1 CHG-75 Battery Charger	22
1.8.4.2 CHG-120F Battery Charger	22
1.8.5: Annunciators	22
1.9: Getting Started	23
SECTION 2: Installation	24
2.1: Mounting	24
2.2: Power	27
2.2.1: AC Power and Earth Ground Connection	27
2.2.2: Battery Power	27
2.2.3: DC Power Output Connection	27
2.3: Relays	28
2.4: Notification Appliance Circuits	28
2.4.1: Configuring NACs	29
2.4.2: Style Y (Class B) NAC Wiring	29
2.4.3: Style Z (Class A) NAC Wiring	30
2.5: UL Power-limited Wiring Requirements	31
2.6: Optional Modules and Devices	32
2.6.1: DACT-UD Installation	33
2.6.2: 4XTMF Transmitter Module Installation	36
2.6.3: Auxiliary Trouble Input (J16 & J17)	37
2.6.4: SLC-2 Expander Module	38
2.6.5: Printer/PC	39
2.6.6: Digital Communicator and Annunciators	40
2.6.6.1 UDACT-F Digital Alarm Communicator/Transmitter	40
2.6.6.2 ACM-8RF Relay Control Module	40
2.6.6.3 BRKT-9600 Universal Bracket Installation	40
2.6.6.4 ACM and AFM Series Annunciators	42
SECTION 3: Programming	43
3.1: Programming Data Entry	43
3.2: User Programming	44
3.3: Initial Power-up	45
3.4: Programming Screens Description	45
3.5: Programming and Passwords	45
3.6: Master Programming Level	47

Table of Contents

3.6.1: Autoprogram	48
3.6.2: Point Program.....	49
3.6.2.1 Detector Programming	49
3.6.2.1.1 Add Detector	49
3.6.2.1.2 Delete Detector	50
3.6.2.1.3 Edit Detector	50
3.6.2.2 Module Programming	59
3.6.2.2.1 Add Module	59
3.6.2.2.2 Delete Module	60
3.6.2.2.3 Edit Module Screen for Monitor Module	61
3.6.2.2.4 Edit Module Screen for Control Modules	69
3.6.3: Zone Setup.....	76
3.6.3.1 Enable	76
3.6.3.2 Disable	77
3.6.3.3 Zone 97, 98 and 99	77
3.6.3.4 Zones Installed	78
3.6.3.5 Zones Enabled	78
3.6.3.6 Zones Disabled	78
3.6.3.7 Zone Type	79
3.6.4: Loop Setup	80
3.6.4.1 Style	80
3.6.4.2 Loop Protocol	80
3.6.5: System Setup.....	81
3.6.5.1 Trouble Reminder	82
3.6.5.2 Banner	82
3.6.5.3 Time-Date	83
3.6.5.3.1 Time	83
3.6.5.3.2 Date	84
3.6.5.3.3 Clock Format	84
3.6.5.3.4 Daylight Savings Time	84
3.6.5.4 Timers	85
3.6.5.4.1 PAS (Positive Alarm Sequence) Delay	85
3.6.5.4.2 Pre-signal Delay	86
3.6.5.4.3 Waterflow Delay	86
3.6.5.4.4 AC Loss Delay	87
3.6.5.5 NAC (Notification Appliance Circuit)	87
3.6.5.5.1 Enabled	88
3.6.5.5.2 Type	89
3.6.5.5.3 Silenceable	89
3.6.5.5.4 Auto Silence	90
3.6.5.5.5 Coding	90
3.6.5.5.6 Zone	92
3.6.5.5.7 Silence Inhibited	92
3.6.5.5.8 Synced Type	92
3.6.5.6 Relays	93
3.6.5.7 Canadian Option	94
3.6.5.8 Waterflow Silenceable	94
3.6.6: Verify Loops.....	94
3.6.7: History	95
3.6.7.1 View Events	95
3.6.7.2 Erase History	95
3.6.8: Walktest.....	96
3.6.9: Option Modules.....	97
3.6.9.1 Annunciators/UDACT	97
3.6.9.2 On Board DACT	98
3.6.9.3 Printer/PC	98

3.6.10: Password Change	99
3.6.11: Clear Program	100
3.6.12: Program Check	101
3.7: Maintenance Programming Level	103
3.7.1: Disable Point	104
3.7.2: History	105
3.7.3: Program Check	106
3.7.4: Walktest	107
3.7.5: System	107
3.7.6: Zone Setup	109
SECTION 4: Operating Instructions	111
4.1: Panel Control Buttons	111
4.1.1: Acknowledge/Step	111
4.1.2: Alarm Silence	111
4.1.3: Drill/Hold 2 Sec	111
4.1.4: Reset	111
4.2: LED Indicators	112
4.3: Normal Operation	113
4.4: Trouble Operation	113
4.5: Alarm Operation	115
4.6: Supervisory Operation	116
4.7: Process Monitor Operation	117
4.8: Hazard Condition Operation	117
4.9: Medical Alert Condition Operation	117
4.10: Programmed Zone Operation	117
4.11: Disable/Enable Operation	118
4.12: Waterflow Circuits Operation	118
4.13: Detector Functions	118
4.14: Time Functions: Real-Time Clock	118
4.15: NAC Operation	118
4.16: Synchronized NAC Operation	119
4.17: Coded Operation	119
4.18: Presignal	119
4.19: Positive Alarm Sequence	120
4.20: Special System Timers	121
4.20.1: Silence Inhibit Timer	121
4.20.2: Autosilence Timer	121
4.20.3: Trouble Reminder	121
4.20.4: Waterflow Retard Timer	121
4.20.5: Alarm Verification	122
4.21: Walktest	122
4.22: Read Status	123
4.22.1: System Point	124
4.22.2: Zones	125
4.22.3: Power	126
4.22.4: Trouble Reminder	127
4.22.5: Timers	127
4.22.6: NAC	128
4.22.7: Relays	128
4.22.8: Program Check	129
4.22.9: History	129
4.22.10: Annunciators	130
4.22.11: Phone Line	130
4.22.12: Central Station	131

Table of Contents

4.22.13: Service Terminal.....	132
4.22.14: Printer/PC	132
4.22.15: Print	133
4.22.16: Time-Date.....	135
SECTION 5: Power Supply Calculations	136
5.1: Overview	136
5.2: Calculating the AC Branch Circuit.....	136
5.3: Calculating the System Current Draw	137
5.3.1: Overview	137
5.3.2: How to Use Table 5.3 on page 138 to Calculate System Current Draw	137
5.4: Calculating the Battery Size	139
5.4.1: NFPA Battery Requirements	139
5.4.2: Selecting and Locating Batteries.....	139
APPENDIX A: Software Zones	140
A.1: Correlations	140
APPENDIX B: Default Programming	148
APPENDIX C: NFPA Standard-Specific Requirements	149
APPENDIX D: Wire Requirements	156

It is imperative that the installer understand the requirements of the Authority Having Jurisdiction (AHJ) and be familiar with the standards set forth by the following regulatory agencies:

- Underwriters Laboratories Standards
- NFPA 72 National Fire Alarm Code
- CAN/ULC - S527-99 Standard for Control Units for Fire Alarm Systems

Before proceeding, the installer should be familiar with the following documents.



NFPA Standards

NFPA 72 National Fire Alarm Code
NFPA 70 National Electrical Code



Underwriters Laboratories Documents:

UL 38 Manually Actuated Signaling Boxes
UL 217 Smoke Detectors, Single and Multiple Station
UL 228 Door Closers-Holders for Fire Protective Signaling Systems
UL 268 Smoke Detectors for Fire Protective Signaling Systems
UL 268A Smoke Detectors for Duct Applications
UL 346 Waterflow Indicators for Fire Protective Signaling Systems
UL 464 Audible Signaling Appliances
UL 521 Heat Detectors for Fire Protective Signaling Systems
UL 864 Standard for Control Units for Fire Protective Signaling Systems
UL 1481 Power Supplies for Fire Protective Signaling Systems
UL 1610 Central Station Burglar Alarm Units
UL 1638 Visual Signaling Appliances
UL 1971 Signaling Devices for Hearing Impaired



CAN/ULC - S524-01 Standard for Installation of Fire Alarm Systems
Note: MS-9600E is not ULC listed for Canadian applications

Other:

EIA-232E Serial Interface Standard
EIA-485 Serial Interface Standard
NEC Article 250 Grounding
NEC Article 300 Wiring Methods
NEC Article 760 Fire Protective Signaling Systems
Applicable Local and State Building Codes
Requirements of the Local Authority Having Jurisdiction (LAHJ)

Fire-Lite Documents:

Fire-Lite Device Compatibility	Document #15384
SLC Wiring Manual	Document #51309
AFM-16ATF & AFM-32AF	Document #15970
AFM-16AF Annunciator	Document #15210
ACS Series Annunciators	Document #51480
UDACT-F Communicator/Transmitter	Document #50049
411UD Communicator/Transmitter	Document #50759
411UDAC Communicator/Transmitter	Document #51073
CHG-120F Battery Charger	Document #50888
CHG-75 Battery Charger	Document #51315
LDM Series Lamp Driver Modules	Document #50055
LCD-80F Remote Fire Annunciator	Document #51338
ACM-8RF Relay Control Module	Document #50362
DACT-UD Manual	Document #51899

Notification Appliance Circuits

Basic System Connections

DC Power Outputs (24 VDC)

Supervise with a power supervision relay A77-716B

Nonresettable Power #2 - 24 VDC filtered, power-limited (3.00 amps maximum). Supervision required. Suitable for powering annunciators.

Nonresettable Power #1 - 24 VDC filtered, power-limited (3.00 amps maximum). Supervision required. Suitable for powering annunciators.

Resettable Power - 24 VDC filtered, power-limited (3.00 amps maximum) to smoke detectors (IDC). Supervision required.

NAC #1 & #2

Style Z (Class A)
3.0 amps max. per circuit.
JP8 configured for Class A
using NACKKEY card.
(See Style Y illustrated
near right edge of board)

2 Programmable Relays & 1 Fixed Trouble Relay

Contact Ratings:
2.0 amps @ 30 VDC (resistive)
0.5 amps @ 30 VAC (resistive)
Contacts shown below in normal
condition (AC power with no alarm,
trouble or supervisory activity).

A Fail Safe Trouble
relay switches to the
NO position during
trouble conditions and
under loss of all power.

Alarm* Trouble Supervisory*
NO NC C NO NC C NO NC C

ACS (EIA-485) White
to LCD-80F
or UDACT-F
(supervised)

Red
Green
Black

DB9F

TERM
(EIA-485)
to LCD-80F

White
Green
Black

DB9F

Red
Green
Black

TERM
(EIA-485)
to LCD-80F

White
Green
Black

DB9F

Red
Green
Black

TERM
(EIA-485)
to LCD-80F

White
Green
Black

DB9F

Red
Green
Black

TERM
(EIA-485)
to LCD-80F

White
Green
Black

DB9F

Red
Green
Black

TERM
(EIA-485)
to LCD-80F

White
Green
Black

DB9F

Red
Green
Black

TERM
(EIA-485)
to LCD-80F

White
Green
Black

DB9F

Red
Green
Black

TERM
(EIA-485)
to LCD-80F

White
Green
Black

DB9F

Red
Green
Black

TERM
(EIA-485)
to LCD-80F

White
Green
Black

DB9F

Red
Green
Black

TERM
(EIA-485)
to LCD-80F

White
Green
Black

DB9F

Red
Green
Black

TERM
(EIA-485)
to LCD-80F

White
Green
Black

DB9F

Red
Green
Black

TERM
(EIA-485)
to LCD-80F

White
Green
Black

DB9F

Red
Green
Black

TERM
(EIA-485)
to LCD-80F

White
Green
Black

DB9F

Red
Green
Black

TERM
(EIA-485)
to LCD-80F

White
Green
Black

DB9F

Red
Green
Black

TERM
(EIA-485)
to LCD-80F

White
Green
Black

DB9F

Red
Green
Black

TERM
(EIA-485)
to LCD-80F

White
Green
Black

DB9F

Red
Green
Black

TERM
(EIA-485)
to LCD-80F

White
Green
Black

DB9F

Red
Green
Black

TERM
(EIA-485)
to LCD-80F

White
Green
Black

DB9F

Red
Green
Black

TERM
(EIA-485)
to LCD-80F

White
Green
Black

DB9F

Red
Green
Black

TERM
(EIA-485)
to LCD-80F

White
Green
Black

DB9F

Red
Green
Black

TERM
(EIA-485)
to LCD-80F

White
Green
Black

DB9F

Red
Green
Black

TERM
(EIA-485)
to LCD-80F

White
Green
Black

DB9F

Red
Green
Black

TERM
(EIA-485)
to LCD-80F

White
Green
Black

DB9F

Red
Green
Black

TERM
(EIA-485)
to LCD-80F

White
Green
Black

DB9F

Red
Green
Black

TERM
(EIA-485)
to LCD-80F

White
Green
Black

DB9F

Red
Green
Black

TERM
(EIA-485)
to LCD-80F

White
Green
Black

DB9F

Red
Green
Black

TERM
(EIA-485)
to LCD-80F

White
Green
Black

DB9F

Red
Green
Black

TERM
(EIA-485)
to LCD-80F

White
Green
Black

DB9F

Red
Green
Black

TERM
(EIA-485)
to LCD-80F

White
Green
Black

DB9F

Red
Green
Black

TERM
(EIA-485)
to LCD-80F

White
Green
Black

DB9F

Red
Green
Black

TERM
(EIA-485)
to LCD-80F

White
Green
Black

DB9F

Red
Green
Black

TERM
(EIA-485)
to LCD-80F

White
Green
Black

DB9F

Red
Green
Black

TERM
(EIA-485)
to LCD-80F

White
Green
Black

DB9F

Red
Green
Black

TERM
(EIA-485)
to LCD-80F

White
Green
Black

DB9F

Red
Green
Black

TERM
(EIA-485)
to LCD-80F

White
Green
Black

DB9F

Red
Green
Black

TERM
(EIA-485)
to LCD-80F

White
Green
Black

DB9F

Red
Green
Black

TERM
(EIA-485)
to LCD-80F

White
Green
Black

DB9F

Red
Green
Black

TERM
(EIA-485)
to LCD-80F

White
Green
Black

DB9F

Red
Green
Black

TERM
(EIA-485)
to LCD-80F

White
Green
Black

DB9F

Red
Green
Black

TERM
(EIA-485)
to LCD-80F

White
Green
Black

DB9F

Red
Green
Black

TERM
(EIA-485)
to LCD-80F

White
Green
Black

DB9F

Red
Green
Black

TERM
(EIA-485)
to LCD-80F

White
Green
Black

DB9F

Red
Green
Black

TERM
(EIA-485)
to LCD-80F

White
Green
Black

DB9F

Red
Green
Black

TERM
(EIA-485)
to LCD-80F

White
Green
Black

DB9F

Red
Green
Black

TERM
(EIA-485)
to LCD-80F

White
Green
Black

DB9F

Red
Green
Black

TERM
(EIA-485)
to LCD-80F

White
Green
Black

DB9F

Red
Green
Black

TERM
(EIA-485)
to LCD-80F

White
Green
Black

DB9F

Red
Green
Black

TERM
(EIA-485)
to LCD-80F

White
Green
Black

DB9F

Red
Green
Black

TERM
(EIA-485)
to LCD-80F

White
Green
Black

DB9F

Red
Green
Black

TERM
(EIA-485)
to LCD-80F

White
Green
Black

DB9F

Red
Green
Black

TERM
(EIA-485)
to LCD-80F

White
Green
Black

DB9F

Red
Green
Black

TERM
(EIA-485)
to LCD-80F

White
Green
Black

DB9F

Red
Green
Black

TERM
(EIA-485)
to LCD-80F

White
Green
Black

DB9F

Red
Green
Black

TERM
(EIA-485)
to LCD-80F

White
Green
Black

DB9F

Red
Green
Black

TERM
(EIA-485)
to LCD-80F

White
Green
Black

DB9F

Red
Green
Black

TERM
(EIA-485)
to LCD-80F

White
Green
Black

DB9F

Red
Green
Black

TERM
(EIA-485)
to LCD-80F

White
Green
Black

DB9F

Red
Green
Black

TERM
(EIA-485)
to LCD-80F

White
Green
Black

DB9F

Red
Green
Black

TERM
(EIA-485)
to LCD-80F

White
Green
Black

DB9F

Red
Green
Black

TERM
(EIA-485)
to LCD-80F

White
Green
Black

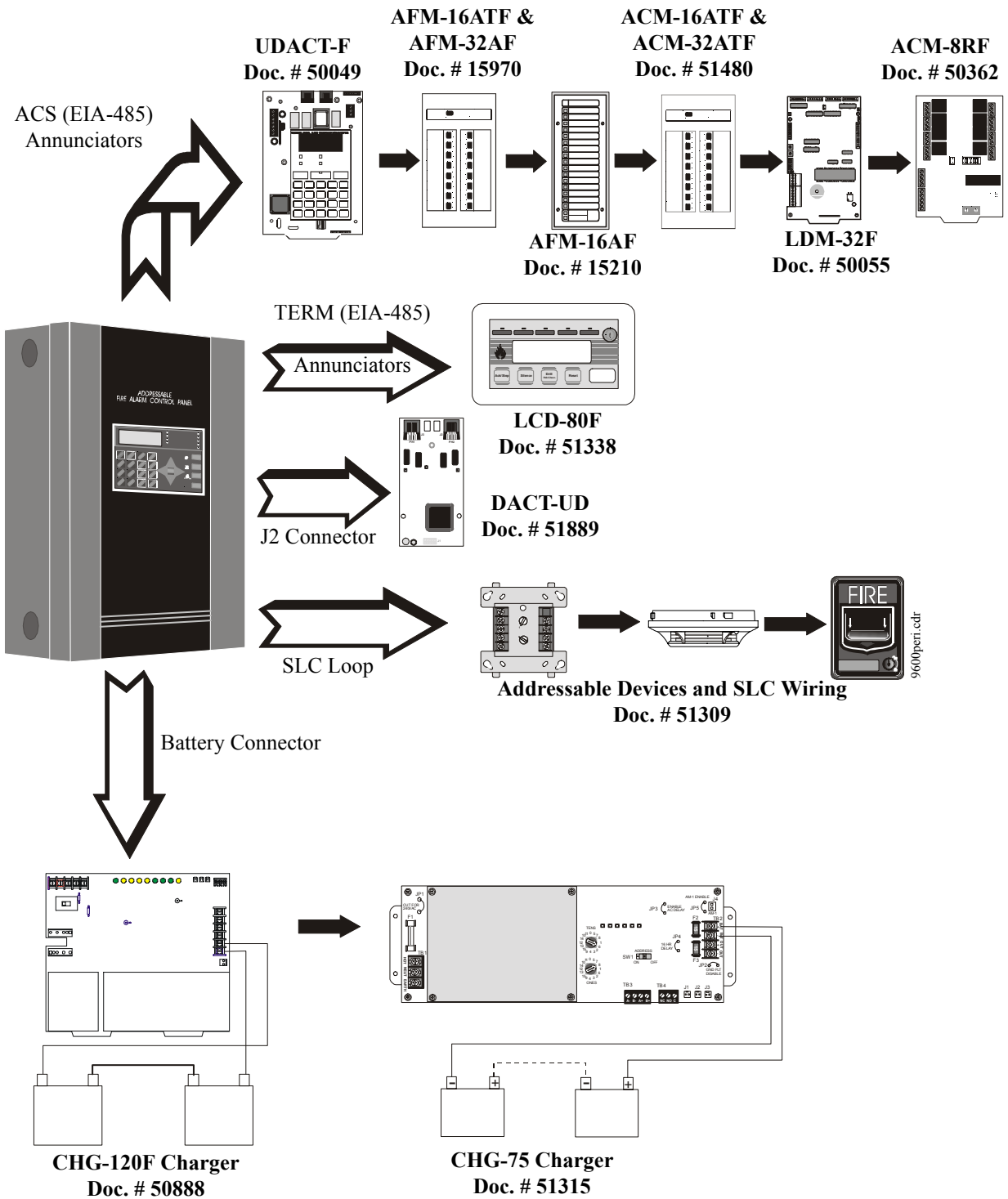
DB9F

Red
Green
Black

TERM
(EIA-485)
to LCD-80F

White
Green
Black

Peripheral Devices and Their Documents:



SECTION 1

Product Description

The Fire•Lite MS-9600 is a compact, cost effective, intelligent addressable FACP (Fire Alarm Control Panel) with an extensive list of powerful features. The combination of Fire•Lite's newer series devices and legacy 300 Series devices, along with the MS-9600 FACP, offer the latest in fire protection technology. The power supply and all electronics are contained on a single circuit board housed in a metal cabinet, providing a complete fire control system for most applications. Optional modules, which plug into the main circuit board, are available for special functions. Available accessories include LED, graphic and LCD annunciators, reverse polarity/city box transmitter, digital alarm communicator/transmitter, SLC expansion module, local and remote upload/download software and remote power expansion. The MS-9600E offers the same features as the MS-9600 but allows connection to 220/240 VAC input.

Note: Unless otherwise specified, the term MS-9600 is used in this manual to refer to both the MS-9600 and the MS-9600E FACPs.

1.1 Inventory

When the MS-9600 shipment is received, check to make certain that all parts have been included in the shipment. The MS-9600 shipment should consist of one of each of the following:

- ✓ main circuit board with display
- ✓ backbox with door
- ✓ plastic bag containing screws, cables, key, etc.
- ✓ manual

1.2 Features and Options

- Single standard addressable SLC loop which meets NFPA Style 4, 6 and 7 requirements
- Optional module for adding a second SLC loop which meets NFPA Style 4, 6 and 7 requirements
- 318 addressable device capacity for each SLC loop (159 detectors and 159 control/monitor modules)
- 99 software zones
- Up to four onboard NACs (Notification Appliance Circuits): four Style Y (Class B) or two Style Z (Class A)
- Additional NAC capability using control modules
- 7.0 amps total power for NACs and 24 VDC auxiliary power outputs in alarm
- Two programmable relay outputs and one fixed trouble relay
- EIA-232 Printer/PC interface (variable baud rate)
- 80-character LCD display (backlit)
- Real-time clock/calendar with daylight savings time control
- History file with 1,000 event capacity
- Advanced fire technology features:
 - ✓ Automatic drift compensation
 - ✓ Maintenance alert
 - ✓ Detector sensitivity test capability (NFPA 72 compliant)
 - ✓ Automatic device type-code verification
 - ✓ Point trouble identification
- Waterflow selection per module point
- Alarm verification selection per detector point
- Walktest, silent or audible

- PAS (Positive Alarm Sequence) and Pre-signal per point (NFPA 72 compliant)
- Annunciators:
 - ✓ ACM Series-LED Zone Annunciators
 - ✓ LDM Graphic Annunciator Series
 - ✓ LCD-80F Liquid Crystal Display point annunciator
 - ✓ ACM-8RF Relay Module
- Silence inhibit timer option per NAC
- Autosilence timer option per NAC
- Continuous, March Time, Temporal or California code for main circuit board NACs with two-stage capability
- Selectable strobe synchronization per NAC
- Remote Acknowledge, Alarm Silence, Reset and Drill via addressable modules, AFM annunciators or LCD-80F Remote annunciator
- Auto-program (learn mode) reduces installation time. Reports two devices set to the same address
- Password and key-protected nonvolatile memory
- User programmable password
- Fully programmable from local keypad or keyboard or local PC
- SLC operates up to 10,000 ft. (3,000 m) with twisted, shielded wire or 3,000 ft (900 m) with untwisted, unshielded wire
- Compatible with Fire•Lite newer series devices (CLIP Mode)
 - ✓ CP350 and CP355: addressable Ionization Smoke Detector
 - ✓ SD350(T) and SD355(T): addressable Photo Smoke Detector (T= with Thermal Sensor)
 - ✓ H350(R) and H350(R): Fast Response Heat Detector (R=Rate-of-Rise option)
 - ✓ D350P(R): addressable Photo Duct Detector (R=alarm relay option)
 - ✓ B501BH & B501BHT Sounder Base
 - ✓ B224RB Relay Base
 - ✓ B224BI Isolator Base
 - ✓ MMF-300: Monitor Module
 - ✓ MMF-300-10: Monitor Module (10 Input Class B or 5 Input Class A)
 - ✓ MDF-300: Dual Monitor Module (uses two consecutive SLC addresses)
 - ✓ MMF-301: Miniature Monitor Module
 - ✓ MMF-302: 2-wire Detector Module
 - ✓ MMF-302-6: 2-wire Detector Module (6 Input Class B or 3 Input Class A)
 - ✓ CMF-300: Control Module
 - ✓ CMF-300-6: Control Module (6 Output Class B or 3 Output Class A)
 - ✓ CRF-300: Relay Module
 - ✓ CRF-300-6: Relay Module (6 Form-C relays)
 - ✓ BG-12LX: Manual Pull Station
 - ✓ I300: Isolator Module
- Compatible with legacy Fire•Lite 300 Series devices (CLIP Mode only):
 - ✓ CP300: addressable Ionization Smoke Detector
 - ✓ SD300(T): addressable Photoelectric Smoke Detector (T= Thermal Sensor)
 - ✓ C304: Control Module
 - ✓ M300: Monitor Module
 - ✓ M301: Miniature Monitor Module
 - ✓ M302: 2-wire Detector Module
 - ✓ BG-10LX: Manual Pull Station
- Optional 4XTMF module (conventional reverse polarity/city box transmitter)
- Optional DACT-UD Digital Alarm Communicator Transmitter, reports up to 99 zones or 636 points (all devices) to a UL listed Central Station

1.3 Specifications

AC Power - TB1

MS-9600: 120 VAC, 50/60 Hz, 3.2 amps

MS-9600E: 240 VAC, 50 Hz, 1.6 amps

Wire size: minimum 14 AWG (2.00 mm²) with 600 V insulation

Battery (Lead Acid Only) - TB2

Maximum Charging Circuit: Normal Flat Charge - 27.6 VDC @ 1.00 amp

Maximum Battery Charger Capacity: 25 Amp Hour (MS-9600 cabinet holds maximum of two 18 Amp Hour batteries. For greater than 25 Amp Hour up to 75 Amp Hour batteries, use the CHG-75 Battery Charger and BB26 or BB-55F Battery Box. For greater than 75 Amp Hour up to 120 Amp Hour batteries, use the CHG-120F Battery Charger and BB-55F Battery Box).

Note: Jumper JP3, on the FACP main circuit board, must be removed to disable the FACP battery charger when using the CHG-75 or CHG-120F.

Communication Loop - (Standard) TB8 and (Optional SLC Expander Module) J3

24 VDC nominal, 27.6 VDC maximum

Maximum length is 10,000 ft. (3,000 m) total twisted, shielded pair length or 3,000 ft. (900 m) untwisted, unshielded pair length

Maximum loop current is 400 mA (short circuit) or 100 mA (normal)

Maximum loop resistance is 40 ohms

Supervised and power-limited

Refer to SLC Loop manual for wiring information

Notification Appliance Circuits - TB4

Power-limited circuitry

Maximum voltage drop in wiring: 2.0 VDC

Nominal operating voltage: 24 VDC

Current-limit: fuseless, electronic, power-limited circuitry

Maximum signaling current per circuit: 3.00 amps (see Figure 1.1 on page 15)

End-of-Line Resistor: 4.7 k Ω , ½ watt (P/N 71252 UL listed) for NACs

Refer to Fire•Lite Device Compatibility Document for listed compatible devices

Two Programmable and One Fixed Output Relay - TB5

Contact rating: 2.0 amps @ 30 VDC (resistive), 0.5 amps @ 30 VAC (resistive)

Form-C relays

Refer to Figure 2.5 on page 28 for information on power-limited wiring for relay circuits

Four-Wire Resettable Smoke Detector Power (24 VDC nominal) - TB3, Terminals 1 (+) & 2 (-)

Maximum ripple voltage: 10 mV_{RMS}

Up to 3.0 amps is available for powering 4-wire smoke detectors (see Figure 1.1)

Power-limited circuit

Refer to Fire•Lite Device Compatibility Document for listed compatible devices

Nonresettable Power #1 (24 VDC Nominal) - TB3, Terminals 3 (+) & 4 (-)

Maximum ripple voltage: 10mV_{RMS}

Total DC current available from each output is up to 3.00 amps (see Figure 1.1)

Power-limited circuit

Nonresettable Power #2 (24 VDC Nominal) - TB3, Terminals 5 (+) & 6 (-)

Maximum ripple voltage: 10mV_{RMS}

Total DC current available from each output is up to 3.00 amps (see Figure 1.1)

Power-limited circuit

EIA-485 (ACS) - TB6

ACS annunciator connector, Terminal 1 (+) and Terminal 2 (-)

EIA-485 (TERM) - TB7

Terminal Mode annunciator connector, Terminal 5 (In +), 6 (In -), 7 (Out +), 8 (Out -)

EIA-232 (ACS) - TB7

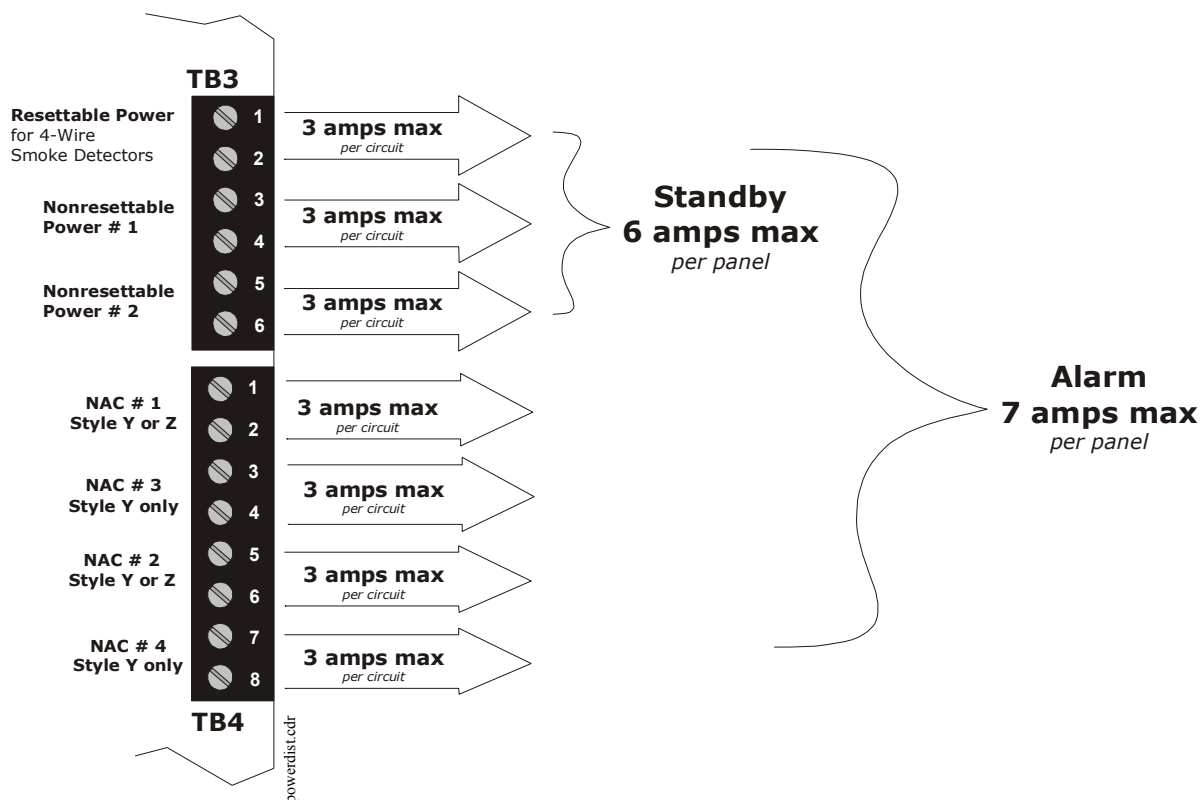
PC/Printer Connector, Terminal 1 (Transmit), 2 (Receive), 3 (DTR), 4 (Ground)

Auxiliary Trouble Inputs - J16 & J17

Two-pin connectors which can be used to monitor trouble conditions on auxiliary equipment. They can be connected to the trouble bus of a peripheral such as the CHG-120F or to the normally-open dry contacts of a trouble relay.

**CAUTION!** Do not connect power to these connectors since circuit damage may result.**1.3.1 Current Availability**

The following figure illustrates the maximum current that is possible for each panel circuit and the total current available from the FACP power supply.



Refer to the battery calculations section for additional information.

Figure 1.1 Current Availability

1.4 Controls and Indicators

LCD Display

The FACP uses an 80-character (4 lines X 20 characters) high viewing angle LCD display. The display includes a long life LED backlight that remains illuminated. If AC power is lost and the system is not in alarm, the LED backlight will turn off to conserve batteries.



FIRE-LITE ALARMS INC
SYSTEM ALL NORMAL
10:00A 020102

LED Indicators

LED indicators are provided to annunciate the following conditions:

- AC Power (green)
- Fire Alarm (red)
- Supervisory (yellow)
- Trouble (yellow)
- Maintenance/presignal (yellow)
- Alarm Silenced signals (yellow)
- Disabled (yellow)
- Battery fault (yellow)
- Ground fault (yellow)

Key Panel

Mounted on the main circuit board, the key panel includes a window for the LCD display and LED indicators as listed above. The key panel, which is visible with the cabinet door closed, has 25 keys, including a 16 key alpha-numeric pad similar to a telephone keypad.

Function keys:

- Acknowledge/Step
- Alarm Silence
- Drill
- Reset (lamp test)

Service/program keys:

- Keys labeled 1 to 9
- * key
- # key
- 0 (recall) key
- 1st Event key
- Clear key
- Escape key
- Mode key
- Four cursor keys (up, down, left and right)
- Enter key

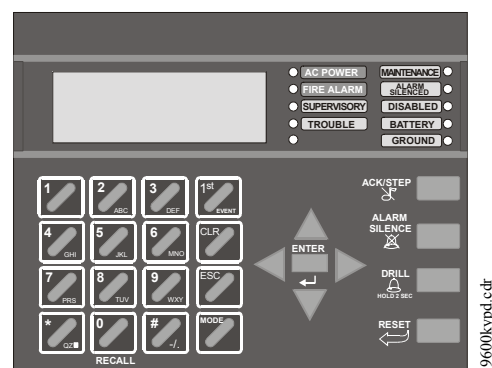


Figure 1.2 Membrane/Display Panel

Local Piezo Sounder

A piezo sounder provides separate and distinct pulse rates for alarm, trouble and supervisory conditions.

1.5 Circuits



SLC Communication Loop

One SLC loop is provided standard on the FACP main circuit board. A second SLC loop is available by plugging the optional SLC module into connector J3 on the main circuit board. SLC loops, configurable for NFPA Style 4, 6 or 7, provide communication to addressable detectors, monitor (initiating device) and control (output device) modules. Refer to the SLC Wiring manual for information on wiring devices.

Output Circuits

The following output circuits are available on the FACP:

- 24 VDC Resettable (smoke detector power) output - 3.00 amps maximum
- 24 VDC Nonresettable power output #1 - 3.00 amps maximum
- 24 VDC Nonresettable power output #2 - 3.00 amps maximum
- 24 VDC Battery Charger (up to 25 AH batteries)

NAC (Notification Appliance Circuits)

Up to four NACs are provided with various programmable features:

- four Style Y (Class B) NACs

OR

- two Style Z (Class A) NACs

Relays

One fixed and two fully programmable Form-C dry contact relays are provided. The fixed fail-safe relay monitors system trouble and the two programmable relays are factory default programmed for system alarm and system supervisory. Contacts are rated 2.0 amps @ 30 VDC (resistive) and 0.5 amps @ 30 VAC (resistive). The programmable relays can be programmed for the following operations:

- fire alarm
- trouble
- supervisory
- supervisory auto-resettable
- DACT communication failure
- process monitor
- process monitor auto-resettable
- hazard alert
- medical alert
- AC loss

Auxiliary Trouble Inputs

Auxiliary Trouble Inputs can be connected to trouble bus outputs from auxiliary equipment, such as power supplies or normally-open dry contacts of a trouble relay to allow monitoring by the MS-9600.

1.6 Components

Main Circuit Board

The main circuit board contains the system's CPU, power supply, other primary components and wiring interface connectors. Optional modules plug in and are mounted to the main circuit board. The circuit board is delivered in the MS-9600 kit and must be mounted to the backbox. Refer to the circuit board illustration on Page 10.



Cabinet

The MS-9600 cabinet is red with a navy blue front overlay. The backbox provides space for two batteries (up to 18 Amp Hour). Ample knockouts are provided for system wiring. Also included is a standard dress panel, which mounts to the inside of the cabinet (required by ULC for Canadian applications). The dress panel must be installed to meet FM requirements.



Batteries

The MS-9600 cabinet provides space for two batteries (up to 18 Amp Hour). Batteries larger than 18 Amp Hour up to 25 Amp Hour require use of the Fire•Lite BB-26 or similar UL listed battery cabinet. The CHG-75 can be used for charging 25 to 75 AH batteries and the BB-26 can be used for housing the batteries. The CHG-120F can be used for charging 25 to 120 AH batteries and the BB-55F can be used for housing the batteries. Batteries must be ordered separately.

1.6.1 Intelligent Addressable Detectors: Newer Series

Intelligent, addressable detectors provide information to the control panel on an SLC Signaling Line Circuit (refer to the SLC Wiring Manual for detailed information on device installation, wiring and operation). This allows the control panel to continually process the information to determine the status (alarm, trouble, maintenance or normal) of each detector. Each detector responds to an SLC address that is set in the detector head using built-in rotary decimal switches with the ability to select up to 159 addresses. Note that a blinking LED on an intelligent detector indicates communication between the detector and the control panel. Refer to the Fire•Lite Device Compatibility Document for a list of approved detectors.

Smoke Detectors (Photoelectric)

The SD350 and SD355 are intelligent, addressable low profile photoelectric smoke detectors which provide smoke sensing technology. The SD350T and SD355T include a 135° fixed thermal sensor. The AD350 and AD355 are multicriteria photoelectric smoke detectors with heat sensing capabilities and automatic drift compensation.

Smoke Detector (Ionization)

The CP350 and CP355 are intelligent, addressable low profile ionization smoke detectors which measure the level of combustion products in their chambers using the 'ionization principle.'

Smoke Detector (Duct)

The D350P is an intelligent, addressable photoelectric duct smoke detector. The D350RP includes an alarm relay.

Heat Detectors

The H350 and H355 are intelligent heat detectors with thermistor sensing circuits for fast response, designed to provide open area protection with 50 foot (15 m) spacing capability. The H350R and H355R incorporate a thermal Rate-of-Rise circuit of 15°F (9.4°C). The H355HT is a high temperature heat detector rated for 190°F.

Detector Bases

The **B501BH** is a standard sounder base and the **B501BHT** is a temporal tone sounder base for intelligent, addressable smoke detectors.

The **B224RB** is a relay base with one Form-C relay for intelligent, addressable smoke detectors. It may be used to control auxiliary functions.

The **B224BI** is an isolator base for intelligent, addressable smoke detectors. It functions similar to the I300 isolator module which allows loops to operate under fault conditions and automatically restore when the fault is removed.

1.6.2 Intelligent Addressable Modules: Newer Series

The newer series of Control Modules and Monitor Modules provide an interface between the control panel and conventional notification and initiating devices. Each module can be set to respond to an address with built-in rotary switches with the ability to select up to 159 addresses (a tab on the address switch must be broken off to use addresses 100-159). A blinking LED on a monitor module indicates communication between the module and the control panel. These devices are also compatible with older systems. *Refer to the Fire•Lite Device Compatibility Document for a list of approved notification and initiating devices.*



Reference
Manual

Monitor Modules

The MMF-300, MMF-300-10, MDF-300, MMF-302 and MMF-302-6 are addressable monitor modules for monitoring conventional initiating devices. The MMF-300 is used for normally open contact alarm initiating devices, such as manual pull stations, four-wire smoke detectors, heat detectors, waterflow, security contacts and supervisory devices. The MMF-300-10 functions the same as the MMF-300 except it provides 10 Class B or 5 Class A inputs. The MDF-300 is a dual monitor module (Class B only) which occupies two consecutive SLC addresses, with each module functionally the same as the MMF-300. The MMF-302 is used primarily for two-wire smoke detectors in addition to normally open contact devices. The MMF-302-6 functions the same as the MMF-302 except it provides 6 Class B or 3 Class A inputs. The supervised IDCs (Initiating Device Circuits) can be wired to the modules as NFPA Style B (Class B) or Style D (Class A) circuits. The modules are supplied with a thermoplastic cover for mounting to a 4-inch mounting box.

Monitor Module (miniature)

The MMF-301 is an addressable module that is functionally similar to an MMF-300 but offered in a smaller package for mounting directly in the electrical box of the device being monitored.

Control Module

The CMF-300 and CMF-300-6 are an addressable Control Modules used to connect NACs (Notification Appliance Circuits) to power and supervise compatible, UL-listed notification appliances. The CMF-300 provides one Class B or Class A output while the CMF-300-6 provides 6 Class B or 3 Class A outputs. The NACs can be wired to the module as supervised NFPA Style Y (Class B) or Style Z (Class A) circuits. The modules are supplied with a thermoplastic cover for mounting to a 4-inch square mounting box.

Relay Module

The CRF-300 and CRF-300-6 are a Control Relay Modules which are functionally similar to the CMF-300 but used as Form-C relay modules. The CRF-300 provides one Form-C relay while the CRF-300-6 provides six Form-C relays.

Isolator Module

The I300 loop isolator module is an automatic switch which opens the circuit voltage to the SLC loop branch(es) whenever a wire-to-wire short circuit is detected on that loop. The remainder of the communications loop leading up to the I300 will continue to operate, unaffected by the short. The isolator module is bidirectional, meaning that it can detect a fault condition between the input SLC terminals or output SLC terminals. The I300 is required to meet NFPA Style 7 requirements.

Detector Annunciator

The RA400Z is a remote single LED annunciator that can be wired directly to an addressable detector for annunciation of that detector's alarm status.

Manual Pull Station

The BG-12LX is an addressable manual pull station featuring a key-lock reset. The pull station responds to an address set by the installer using the built-in rotary decimal switches on the pull station. The manual pull station includes a Fire•Lite key.

1.6.3 300 Series Intelligent Addressable Devices

Fire•Lite's 300 Series Intelligent Addressable Devices are fully compatible with the MS-9600 FACP. The devices must be configured for CLIP Mode operation if the control panel is installed in an existing system with 300 Series devices. The address of 300 Series devices cannot be set above 99. Compatible devices include:

- SD300 Photoelectric Detector
- SD300T Photoelectric Detector with Thermal Sensor
- CP300 Ionization Detector
- M300 Monitor Module
- M301 Miniature Monitor Module
- M302 2-wire Monitor Module
- C304 Control/Relay Module
- BG-10LX Manual Pull Station

1.6.4 Addressable Device Accessories

End-of-Line Resistor Assembly Fire•Lite P/N R-47K

The 47 k Ω End-of-Line Resistor assembly (P/N: R-47K) is used to supervise the MMF-300, MDF-300, MMF-301 and CMF-300 module circuits. The 3.9 k Ω End-of-Line Resistor assembly is used to supervise the MMF-302 module circuit. The resistors are included with each module.

Power Supervision Relay

The UL listed End-of-Line power supervision relay is used to supervise the power to 4-wire smoke detectors and notification appliances.

N-ELR Mounting Plate

The N-ELR is a single End-of-Line resistor plate which is required for use in Canada. An ELR, which is supplied with each module and fire alarm control panel, is mounted to the ELR plate. Resistors mounted to the N-ELR plate can be used for the supervision of a monitor and control module circuit.

1.7 Optional Modules

The MS-9600 main circuit board includes option module connectors for the following modules:

4XTMF Transmitter Module

The 4XTMF provides a supervised output for local energy municipal box transmitter, alarm and trouble reverse polarity. It includes a disable switch and disable trouble LED. A jumper on the module is used to select an option which allows the reverse polarity circuit to open with a system trouble condition if no alarm condition exists. The module plugs into connectors J10 and J11 which are located near the top center of the main circuit board. When the 4XTMF module is installed, Jumper JP6, on the main circuit board, must be cut to allow supervision of the module.

SLC-2 Expander Module

The SLC-2 Expander Module allows expansion of the MS-9600 from one SLC circuit to two SLC circuits. The module plugs into connector J3 which is located in the lower right corner of the main circuit board. The wiring for the second SLC connects to terminals located on the expander module.

DACT-UD Digital Alarm Communicator/Transmitter

The DACT-UD is used to transmit system status to UL-listed Central Station receivers via the public switched telephone network. All circuitry and connectors are contained on a compact module which plugs into connector J2, which is located near the bottom center of the main circuit board.

1.8 Accessories

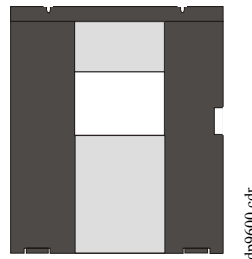
1.8.1 PK-CD Programming Utility

The PK-CD Programming Utility can be used to program an MS-9600 directly from most IBM compatible computers, including laptops and portables, equipped with a serial port. MS-9600 program files can also be created and stored on the PC and then downloaded to the control panel. The PK-CD Kit includes the MS-9600 Windows-based Programming Utility software on CD-ROM with on-line help file. A serial cable (P/N: PRT/PK-CABLE), which must be purchased separately, is required for connection of the PC to the RS-232 (PC/Printer) terminals at TB7 of the MS-9600 main circuit board. Refer to the illustration on page 10 and the section titled "Printer/PC" on page 39, for the location and connections to this terminal.

1.8.2 Dress Panel

A dress panel is provided standard with the MS-9600 (required for Canadian installations). The dress panel restricts access to the system wiring while allowing access to the key panel.

Note that the MS-9600 FACP, installed with the dress panel, has received Factory Mutual (FM) approval. FM approval is contingent on the proper installation of the dress panel.



1.8.3 Battery Box

BB-17F

The BB-17F battery box may be used to house up to two 18 AH batteries in the event that room is not available in the main cabinet due to the use of a UDACT-F, 411UD, etc. The battery box mounts directly below the FACP cabinet. The battery box is red and is provided with knockouts.

BB-26

The BB-26 battery box may be used to house up to two 26 AH batteries and the CHG-75 Battery Charger. The battery box is red and is provided with knockouts.

BB-55F

The BB-55F battery box may be used to house two 25 AH batteries, two 60 AH batteries or one 100 AH battery. When the CHG-120F is mounted in the BB-55F, two 25 AH or one 60 AH battery may also be housed in the battery box.

1.8.4 Battery Charger

1.8.4.1 CHG-75 Battery Charger

The CHG-75 is capable of charging up to 75 AH lead-acid batteries with the MS-9600 FACP. The FACP battery charger must be disabled when using the CHG-75. The charger and up to 26 AH batteries can be housed in the Fire•Lite BB-26 battery box. Larger batteries and the charger can be housed in the Fire•Lite BB-55F battery box which can be mounted up to 20 feet away from the control panel. Refer to the CHG-75 Manual for additional information.

1.8.4.2 CHG-120F Battery Charger

The CHG-120F is capable of charging up to 120 AH lead-acid batteries with the MS-9600 FACP. The FACP battery charger must be disabled when using the CHG-120F. The batteries and charger can be housed in the Fire•Lite BB-55F battery box which can be mounted up to 20 feet away from the control panel. Note that when using the BB-55F for housing the charger and batteries greater than 25AH, multiple BB-55Fs are required. Refer to the CHG-120F Manual for additional information.



1.8.5 Annunciators

ACM Series LED Zone Type Annunciators

The ACM Series Annunciators remotely display alarm and trouble status as well as system status. In addition, they can provide remote Acknowledge, Silence, Reset and Drill functions. For more detailed information, refer to the appropriate annunciator manual. Following is a list of annunciators which can be used with the MS-9600.



- **ACM-16ATF*** Annunciator Control Module annunciates 16 zones with 16 red alarm LEDs and 16 yellow trouble LEDs. In addition, it has a System Trouble LED, an On Line/Power LED and a local piezo sounder. It also has switches for FACP Acknowledge, Silence, Reset and Drill. It has rotary address switches and will accept up to three AEM-16ATF Expanders. In Canada, this module must be used to annunciate the fire alarm input points/zones only.
- **AEM-16ATF** Annunciator Expander Module annunciates 16 zones with 16 red alarm LEDs and 16 yellow trouble LEDs
- **AFM-16ATF*** Annunciator Fixed Module annunciates 16 zones with 16 red alarm LEDs and 16 yellow trouble LEDs. In addition, it has a System Trouble LED, an On Line/Power LED and a local piezo sounder. It also has switches for FACP Acknowledge, Silence, Reset and Drill. It is fixed at address '1.' In Canada, this module must be used to annunciate the fire alarm input points/zones only.
- **ACM-32AF*** Annunciator Control Module annunciates 32 alarm zones with 32 red LEDs. In addition, it has a System Trouble LED, an On Line/Power LED and a local piezo sounder. It also has a switch for local piezo silence. It has rotary address switches and will accept one AEM-32AF Expander. In Canada, this module must be used to annunciate the fire alarm input points/zones only.
- **AEM-32AF** Annunciator Expander Module annunciates 32 alarm zones with 32 red LEDs
- **AFM-16AF*** Annunciator Fixed Module annunciates 16 alarm zones with 16 red alarm LEDs. In addition, it has a System Trouble LED, an On Line/Power LED and a local piezo sounder. It also has a switch for local piezo silence. It is fixed at address '1.' In Canada, this module must be used to annunciate the fire alarm input points/zones only.
- **AFM-32AF*** Annunciator Fixed Module annunciates 32 alarm zones with 32 red LEDs. In Canada, this module must be used to annunciate the fire alarm input points/zones only.

** In Canada, the color red must be used to indicate active alarm inputs. Yellow indicates supervisory, burglary or trouble signals. Green indicates the presence of power, or an activated output.*

LCD-80F Remote Fire Annunciator

The LCD-80F annunciator is a compact 80-character backlit LCD remote fire annunciator that is capable of displaying English language text. It mimics the display on the control panel and will annunciate device type, point alarm, trouble or supervisory condition, zone assignment plus any custom alpha labels programmed into the FACP. The annunciator also provides system status LEDs to display AC Power, Alarm, Trouble, Supervisory and Alarm Silenced conditions. Additionally, the LCD-80F is capable of remotely performing critical system functions such as Acknowledge, Silence, Reset and Drill.

Communications between the control panel and the annunciator is accomplished over a serial interface employing the EIA-485 communication standard. Up to 32 LCD-80F annunciators may be connected to the EIA-485 circuit. The annunciators may be powered from the host FACP or a remote UL listed filtered power supply such as the Fire•Lite FCPS Series. For more detailed information, refer to the LCD-80F manual.



LDM Series Lamp Driver Modules (Graphic Annunciator)

The LDM Series Lamp Driver Modules, which consist of the LDM-32F master and LDM-E32F expander modules, are used to provide an interface to a custom graphic LED annunciator. The master module provides power and control for a maximum of three expander modules. The LDM-32F and LDM-E32F have output connectors which are used to drive lamps or LEDs and input connectors which are used for remote switch functions. Refer to the LDM Series Lamp Driver Modules manual for a complete description.



1.9 Getting Started

The following is a brief summary of the minimal steps involved in bringing an MS-9600 on-line:

- Install Backbox and Main Circuit Board (refer to "Mounting" on page 24)
- Address and Install Intelligent Devices (refer to the SLC Wiring Manual)
- Enter Autoprogramming (refer to "Autoprogram" on page 48)
- Resolve Programming Conflicts
- Go to Point Program to Enter Specific Data (refer to "Point Program" on page 49). Use the right and left arrow keys to navigate between devices.

SECTION 2

Installation

The cabinet may be either semi-flush or surface mounted. The cabinet mounts using two key slots and two 0.250" (6.35 mm) diameter holes located in the backbox. The key slots are located at the top of the backbox and the two securing holes at the bottom.

Carefully unpack the system and check for shipping damage. Mount the cabinet in a clean, dry, vibration-free area where extreme temperatures are not encountered. The area should be readily accessible with sufficient room to easily install and maintain the panel. Locate the top of the cabinet approximately 5 feet (1.5 m) above the floor with the hinge mounting on the left. Determine the number of conductors required for the devices to be installed. Sufficient knockouts are provided for wiring convenience. Select the appropriate knockout(s) and pull the conductors into the box. All wiring should be in accordance with the National and/or Local codes for fire alarm systems.

2.1 Mounting



The circuit board contains static-sensitive components. Always ground yourself with a proper wrist strap before handling any boards so that static charges are removed from the body. Use static suppressive packaging to protect electronic assemblies.



- ✓ Mark and predrill holes in the wall for the top two keyhole mounting bolts using the dimensions illustrated in Figure 2.2 on page 25
- ✓ Install two upper fasteners in the wall with the screw heads protruding
- ✓ Using upper 'keyholes,' place backbox over the two screws, level and secure
- ✓ Mark and drill the lower two holes
- ✓ Install remaining fasteners and tighten
- ✓ Screw supplied standoffs onto mounting studs in locations indicated below
- ✓ Attach solid earth ground wire to grounding stud as indicated in Figure 2.1
- ✓ When the location is dry and free of construction dust, install the main circuit board by aligning the 10 mounting holes in the circuit board with the 10 mounting standoffs in the backbox as illustrated below
- ✓ Secure the circuit board to the standoffs with the supplied screws and male/female standoff as indicated in following figure

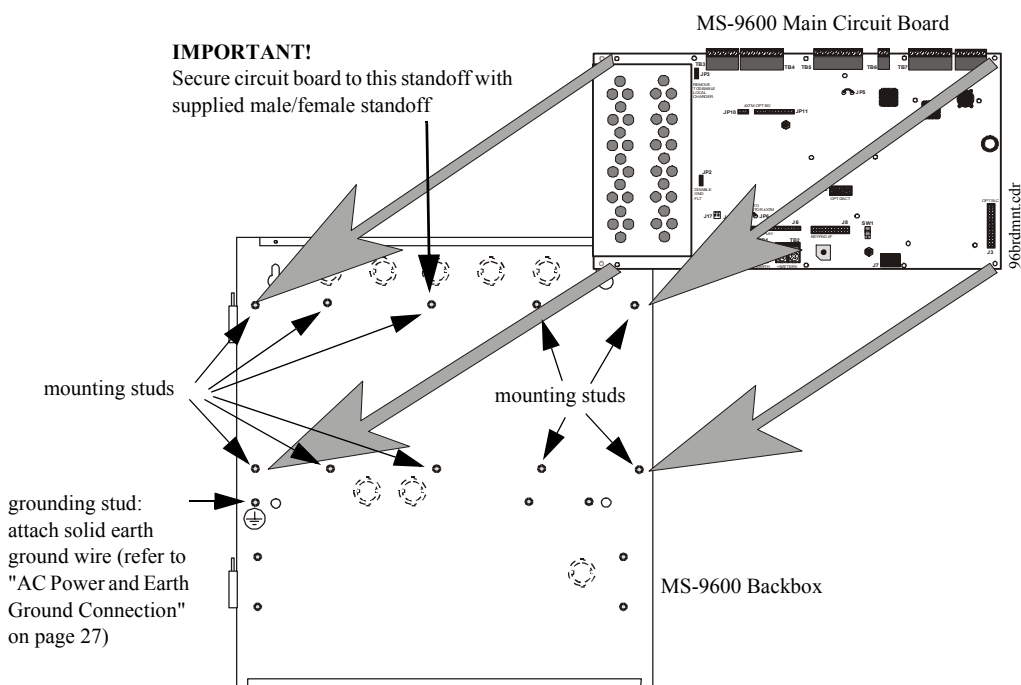


Figure 2.1 MS-9600 Main Circuit Board Installation

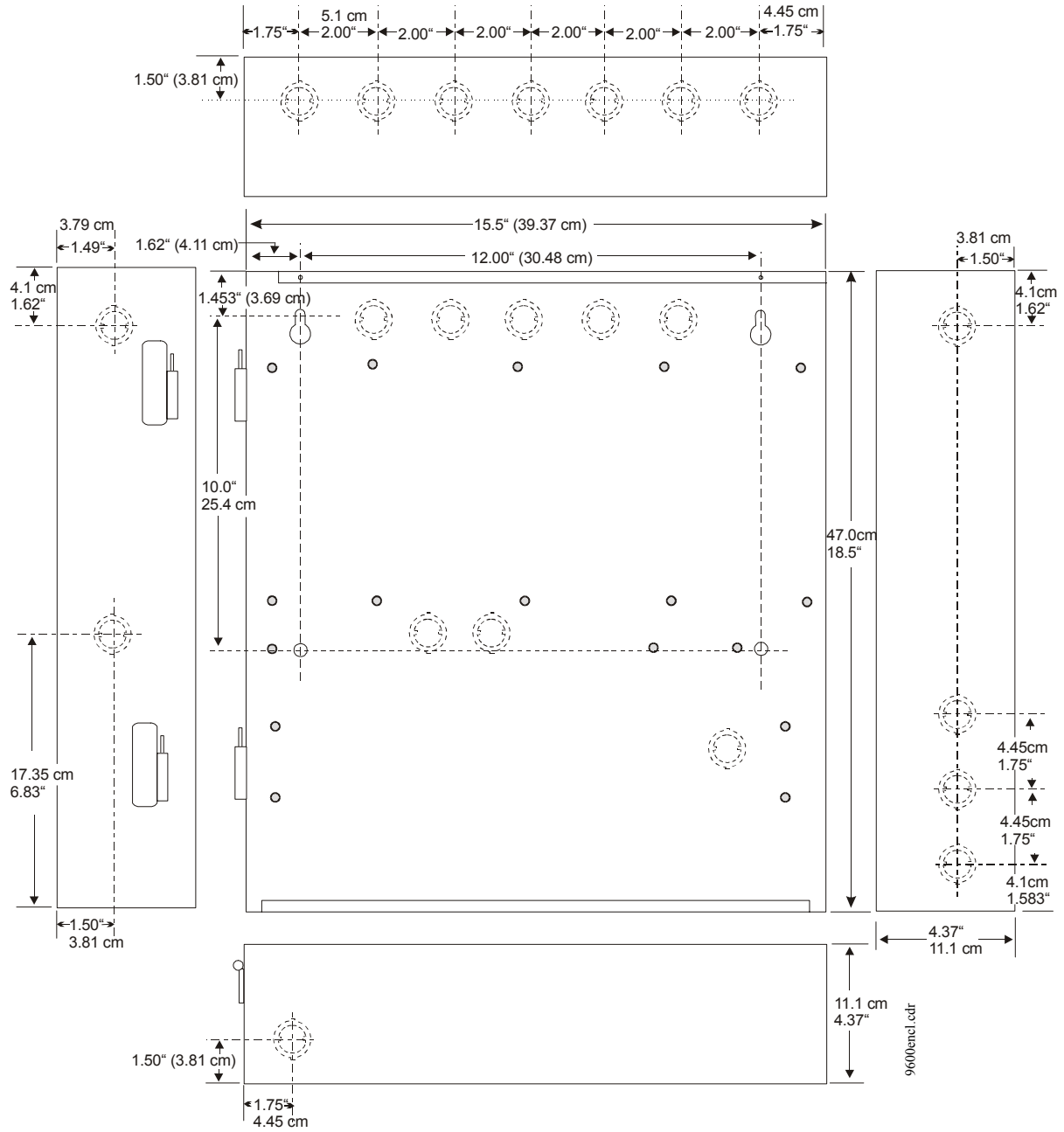


Figure 2.2 MS-9600 Cabinet Mounting

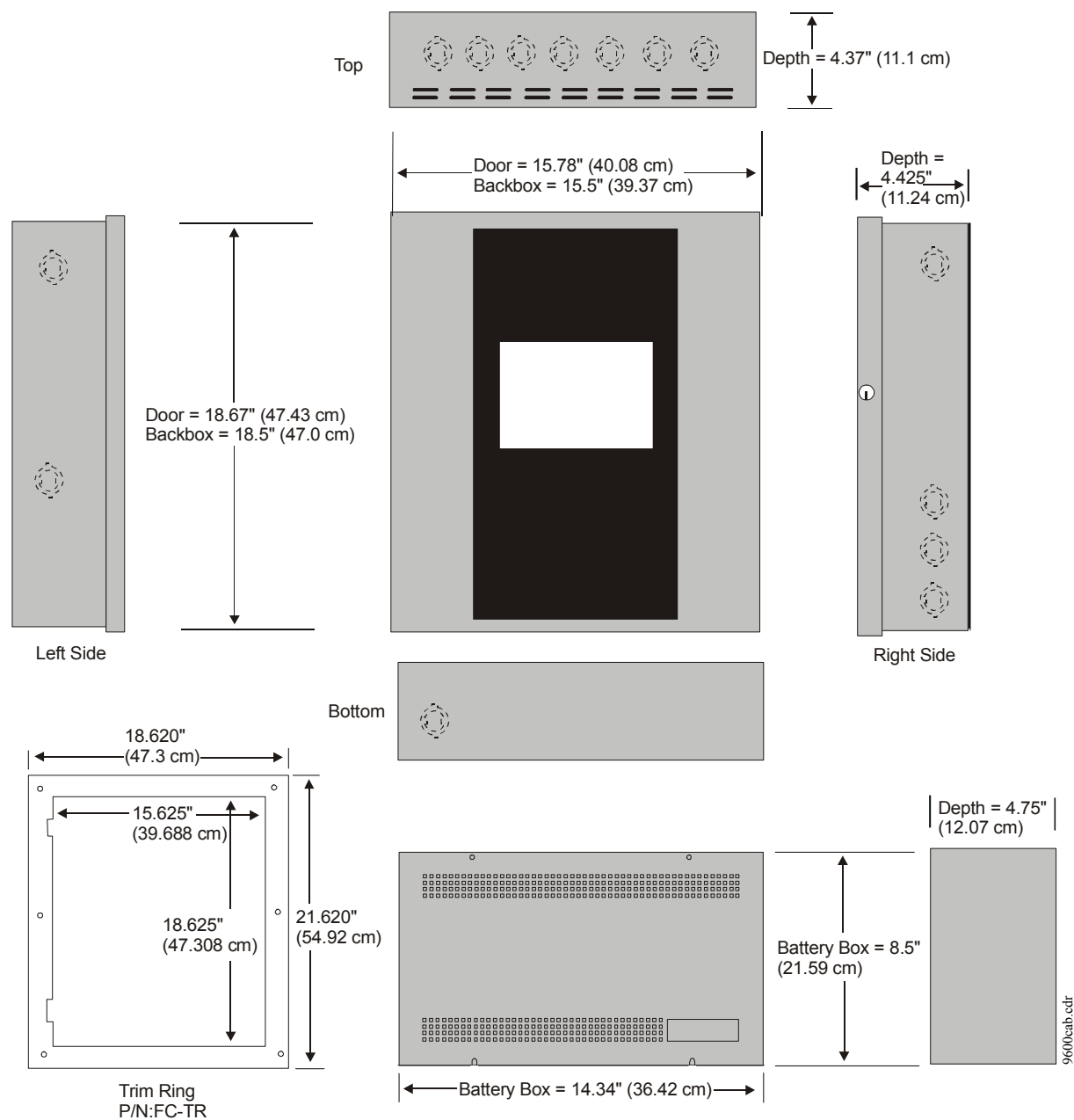


Figure 2.3 MS-9600 Cabinet Dimensions

2.2 Power



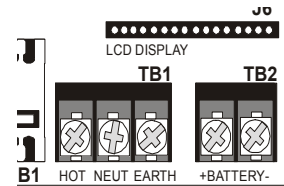
WARNING: Several different sources of power can be connected to this panel. Disconnect all sources of power before servicing. The panel and associated equipment may be damaged by removing and/or inserting cards, modules or interconnecting cables while this unit is energized.

2.2.1 AC Power and Earth Ground Connection

Primary power required for the FACP is 120 VAC, 50/60 Hz, 3.2 amps for the MS-9600 or 220/240 VAC, 50/60 Hz, 1.6 amps for the MS-9600E. Overcurrent protection for this circuit must comply with Article 760 of the National Electrical Code (NEC) and/or local codes. Use 14 AWG (2.00 mm²) or larger wire with 600 volt insulation rating.

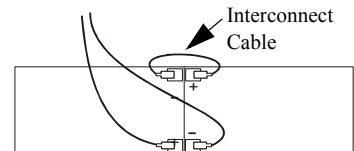
Make certain that the AC mains circuit breaker is off before wiring any connections between the mains and the control panel. Connect wiring from the AC mains to TB1 on the FACP, being careful to observe proper connections.

Connect a wire from the grounding stud in the cabinet to a known solid earth ground (refer to Figure 2.1 on page 24). This connection is vital for maintaining the control panel's immunity to unwanted transients generated by lightning and electrostatic discharge. Apply AC power to the panel only after the system is completely installed and visually checked. *Note that AC power must be applied to the panel before installing the battery interconnect cable (refer to the following section).*



2.2.2 Battery Power

Before connecting the batteries to the FACP, make certain that the interconnect cable between the batteries is not connected. Do not connect the interconnect cable until the system is completely installed. Observe polarity when connecting the batteries. Connect the battery cable to TB2 on the main circuit board. Refer "Power Supply Calculations" on page 136, for calculation of the correct battery rating.



See Page



WARNING: Battery contains sulfuric acid which can cause severe burns to the skin and eyes and can destroy fabrics. If contact is made with sulfuric acid, immediately flush the skin or eyes with water for 15 minutes and seek immediate medical attention.

2.2.3 DC Power Output Connection

All DC power outputs are power-limited.

Power-limited Resettable Power

3.0 amperes max., 24 VDC nominal filtered, resettable power can be drawn from TB3 Terminals 1(+) and 2(-)

Power-limited Nonresettable Power #1

3.0 amperes max., 24 VDC nominal filtered, nonresettable power can be drawn from TB3 Terminals 3(+) and 4(-)

Power-limited Nonresettable Power #2

3.0 amperes max., 24 VDC nominal filtered, nonresettable power can be drawn from TB3 Terminals 5(+) and 6(-)

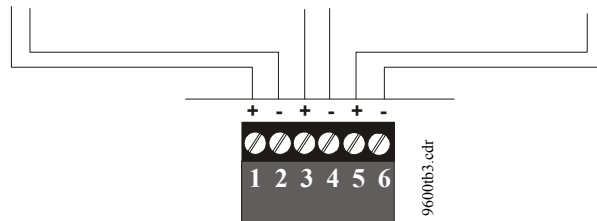


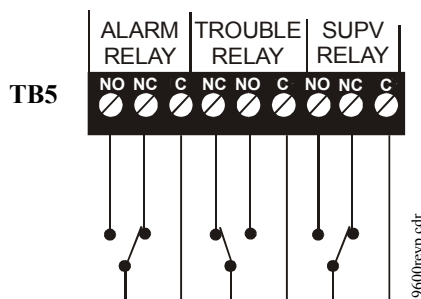
Figure 2.4 Power Outputs - 24 VDC

2.3 Relays

The FACP provides two programmable Form-C relays and one fixed fail-safe Form-C trouble relay, all with contacts rated for 2.0 amps @ 30 VDC (resistive) or 0.5 amps @ 30 VAC (resistive). The Alarm and Supervisory silk-screen labels reflect the factory default programming for the two programmable relays.

Note that relay connections may be power-limited or nonpower-limited, provided that 0.25" spacing is maintained between conductors of power-limited and nonpower-limited circuits. Refer to UL Power-limited wiring requirements.

Note that the relays labeled as Alarm Relay (Relay 1) and Supervisory Relay (Relay 3) reflect the factory default programming for these relays which are programmable. The relay labeled Trouble Relay (Relay 2) is fixed and cannot be changed. It is a fail-safe relay which will transfer on any trouble or total power failure.



Relay contacts shown with power applied to panel and no active troubles, alarms or supervisories

Figure 2.5 Relay Terminals

2.4 Notification Appliance Circuits



See Page



Reference Manual

The control panel provides four Style Y/Class B or two Style Z/Class A NACs (Notification Appliance Circuits). Each circuit is capable of 3.0 amps of current. Total system current in alarm cannot exceed 7.0 amps (refer to "Calculating the System Current Draw" on page 137). Use UL listed 24 VDC notification appliances only. Circuits are supervised and power-limited. Refer to the Fire•Lite Device Compatibility Document for a listing of compatible notification appliances. The NACs, which are located on the main circuit board, may be expanded via the Fire•Lite FCPS Series field charger/power supplies.

The following sections describe the configuration and wiring of Style Y and Style Z Notification Appliance Circuits on the MS-9600 main circuit board. The NACs are configured for Style Y (Class B) from the factory. Refer to "Configuring NACs" on page 29 for information on changing the NAC configuration to Style Z (Class A) and preparing the NACKEY configuration card located in JP8, when installing a 4XTMF Transmitter Module.

2.4.1 Configuring NACs

The Notification Appliance Circuits on the main circuit board are configured for Style Y or Style Z by properly orienting the NACKEY card in JP8 which is located at the top of the main circuit board near the NAC Terminal TB4. The default configuration is for Style Y (Class B). Refer to Figure 2.6 for information on installing the NACKEY card.

- Style Z (Class A) - install NACKEY into JP8 with Class A pointing down toward circuit board as illustrated to the right.
- Style Y (Class B) - install NACKEY into JP8 with Class B pointing down toward circuit board.

NACKEY must be inserted with text side facing in toward center of main circuit board and key into key-slot as illustrated to the right. It is keyed to prevent incorrect insertion.

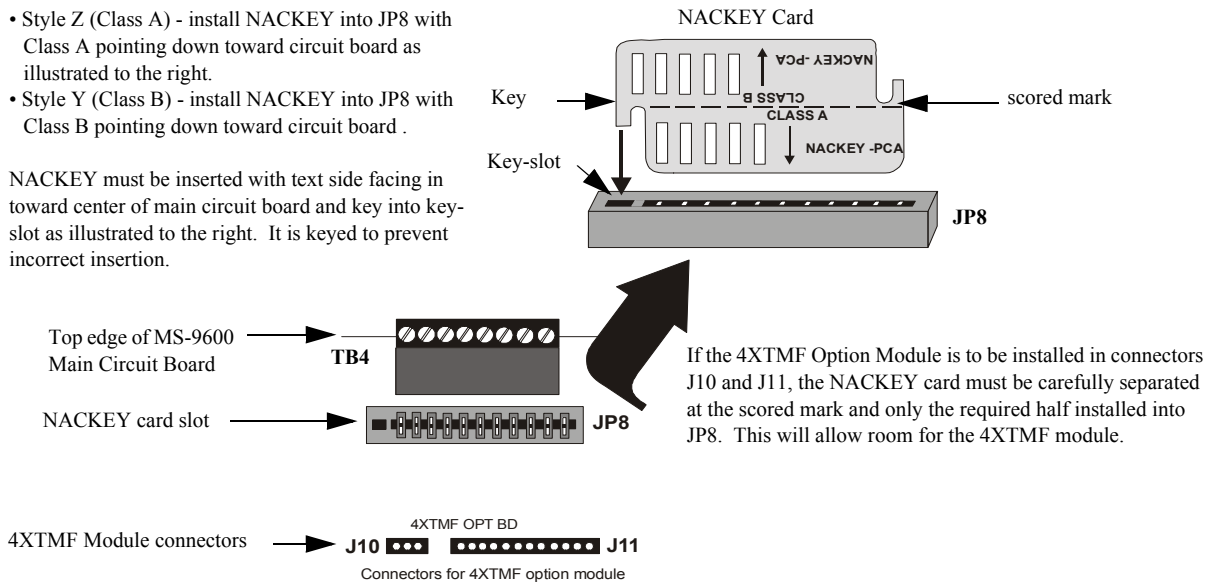


Figure 2.6 NAC Configuration Using NACKEY

2.4.2 Style Y (Class B) NAC Wiring

4 Style Y (Class B) Notification Appliance Circuits, supervised and power-limited - 4.7 kohm, ½ watt P/N:71252 UL listed

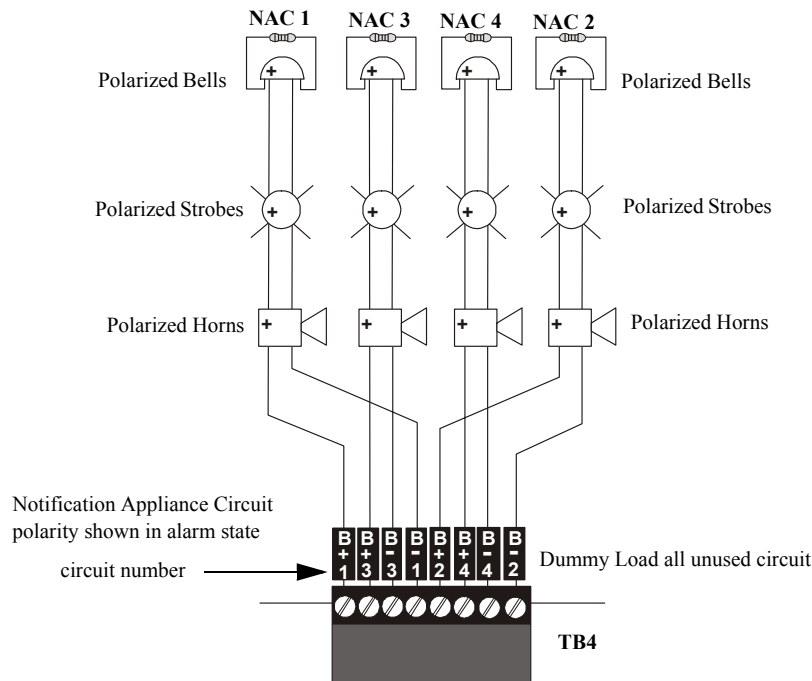


Figure 2.7 NAC Style Y (Class B) Wiring

2.4.3 Style Z (Class A) NAC Wiring

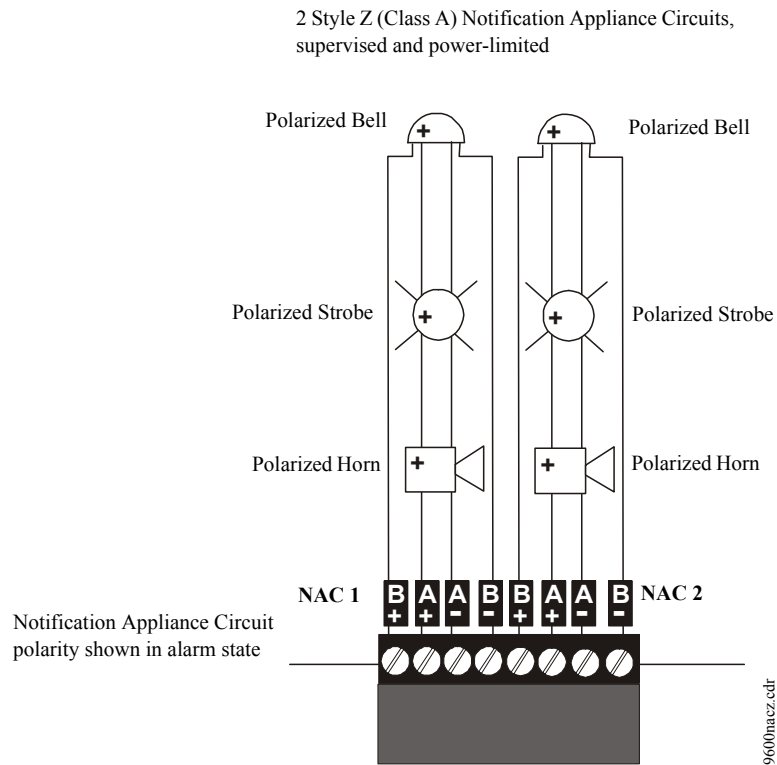


Figure 2.8 NAC Style Z (Class A) Wiring

2.5 UL Power-limited Wiring Requirements

Power-limited and nonpower-limited circuit wiring must remain separated in the cabinet. All power-limited circuit wiring must remain at least 0.25" (6.35 mm) away from any nonpower-limited circuit wiring and nonpower-limited circuit wiring must enter and exit the cabinet through different knockouts and/or conduits. A typical wiring diagram for the MS-9600 is shown below.

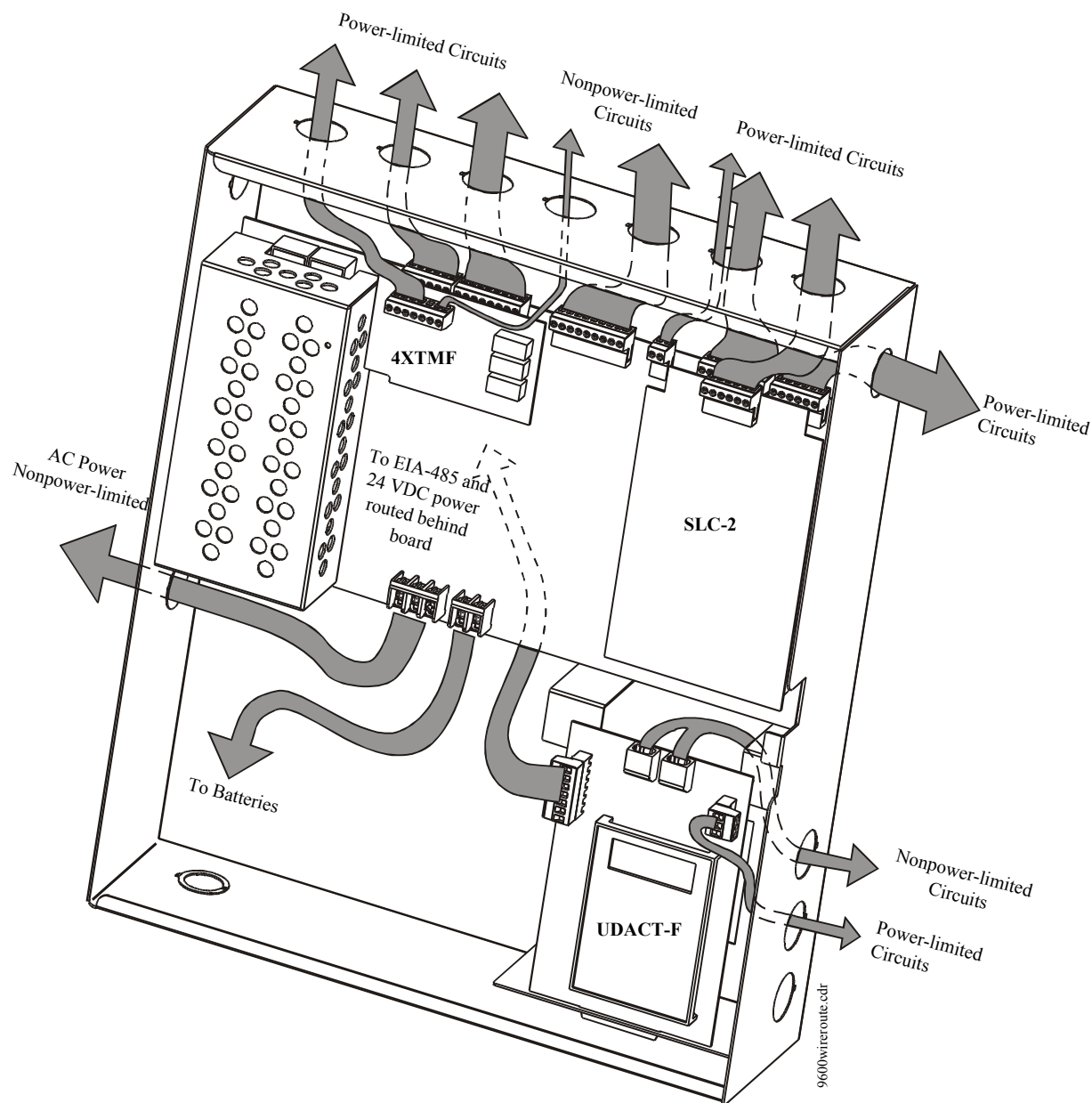
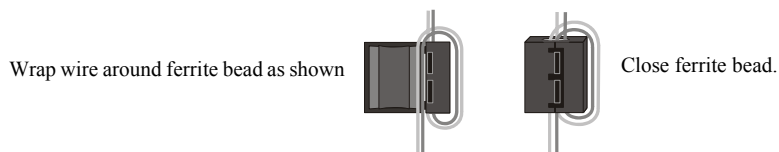


Figure 2.9 Typical UL Power-limited Wiring Requirements

Ferrite Bead Installation at Terminal Inside Cabinet

Per FCC requirements, ferrite beads are required on the wiring for the DC Nonresettable Power Outputs, NACs, TERM EIA-485 and SLC Circuit.



2.6 Optional Modules and Devices



WARNING! Disconnect all sources of power (AC and DC) before installing or removing any modules or wiring.

MS-9600 Keypad/Display Removal

Removal of the keypad/display is normally not necessary. If, however, it becomes necessary to replace the keypad/display, access the auxiliary trouble bus connectors at J16 and J17 or install the DACT-UD option module on J2, the Keypad/Display can be removed by inserting a Phillips screwdriver into each of the three holes located in the flexible covering of the Keypad/Display and loosening the three mounting screws. Note that it is not necessary to disconnect the cables between the Keypad/Display and the main circuit board unless the unit itself is being replaced. Carefully lift the Keypad/Display and rest the unit at the bottom of the main circuit board.

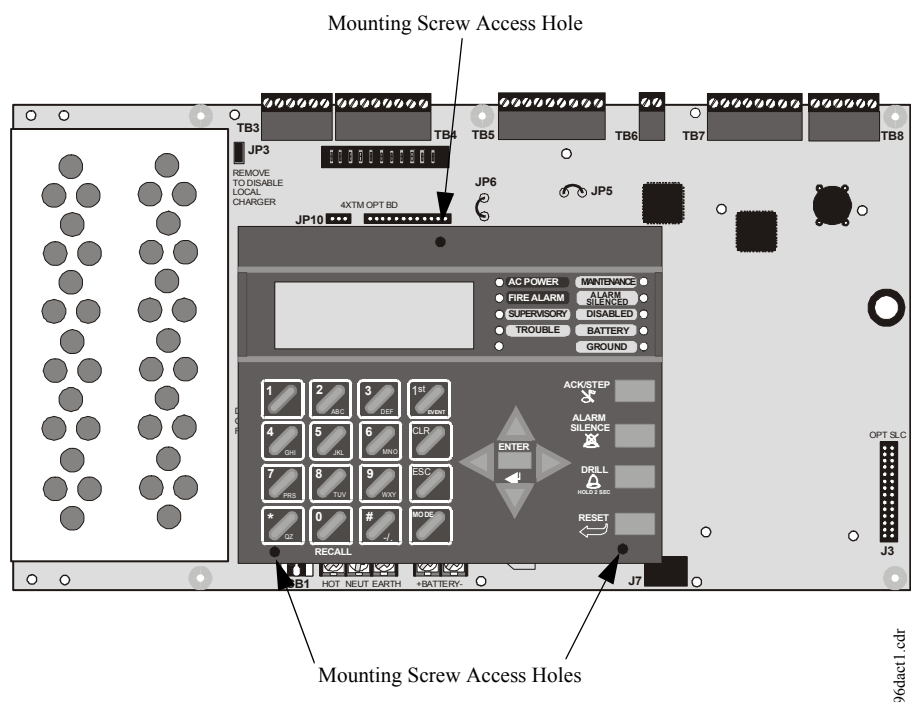


Figure 2.10 Keypad/Display Removal

2.6.1 DACT-UD Installation



WARNING! Disconnect all sources of power (AC and DC) before installing or removing any modules or wiring.

The optional DACT-UD Digital Alarm Communicator/Transmitter transmits system status to UL listed Central Station receivers via the public switched telephone network. It is capable of reporting up to 99 software zones or up to 636 addressable points. Two modular phone jacks, labeled PH1 for Primary phone line and PH2 for Secondary phone line, allow easy connection of two independent telephone lines to the DACT. Telephone line 'Primary' and 'Secondary' active red LEDs are provided as well as a green 'Kissoff' LED. The following functions have been incorporated into the DACT:

- Line Seizure - takes control of phone lines disconnecting any premises phones
- Off/On Hook - performs on and off-hook status to the phone lines
- Listen for dial tone - 440 hertz tone typical in most networks
- Dialing Central Station(s) number - default is Touch-Tone®, programmable to rotary
- For tone burst or touchtone type formats: determine proper 'Acknowledge' and 'Kissoff' tone(s) - the frequency and time duration of the tone(s) varies with the transmission format. The control panel will adjust accordingly
- Communicate in the following formats:
 - ✓ 12 Tone Burst Types: 20 pps
(3+1, 4+1, 4+2, 3+1 Exp., 4+1 Exp., 4+2 Exp.)
 - ✓ 3 Touchtone Types:
 - 4+1 Ademco Express
 - 4+2 Ademco Express
 - Ademco Contact ID

The DACT-UD module plugs into connector J2 on the MS-9600 main circuit board.

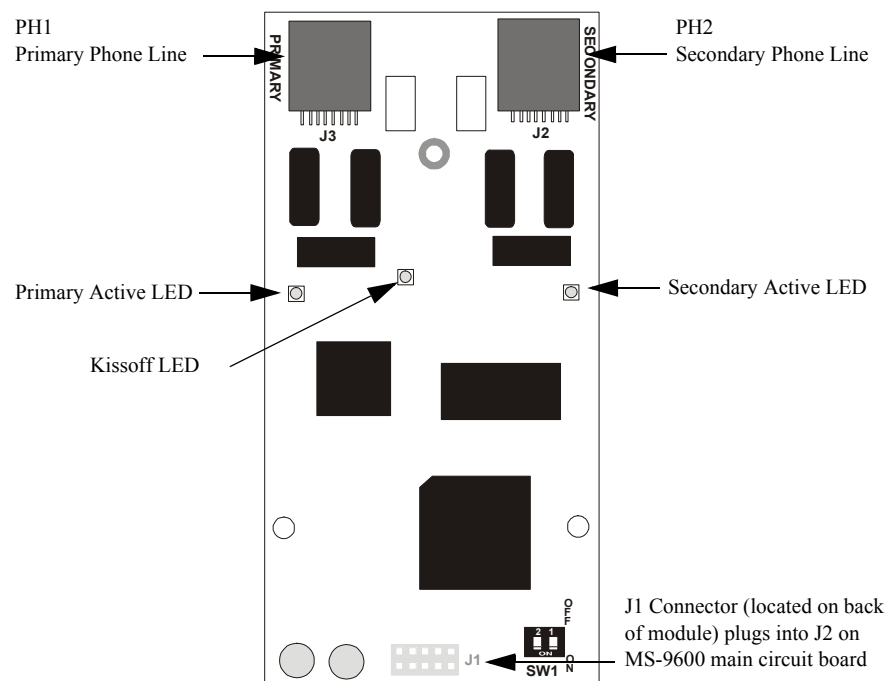


Figure 2.11 DACT-UD Module

The following steps must be followed when installing the DACT module:

1. Remove all power (AC and DC) from FACP before proceeding with installation
2. Remove the Keypad/Display from the main circuit board as described in the beginning of this section
3. Carefully plug connector J1 on back of the DACT-UD module into connector J2 on the MS-9600 main circuit board, being careful not to bend any pins
4. Align the mounting holes in the DACT module with the premounted standoffs on the FACP main circuit board

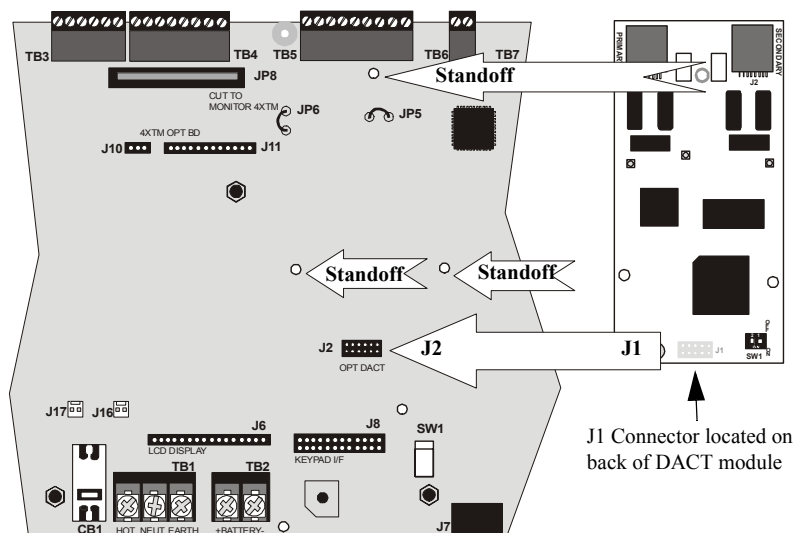


Figure 2.12 DACT J1 Connector to FACP J2 Connector

5. Secure the module to the standoffs on the main circuit board with the three screws supplied with the DACT-UD. It is important that the supplied screws be used to secure the module to the metal standoff in order to help protect against electrical transients.

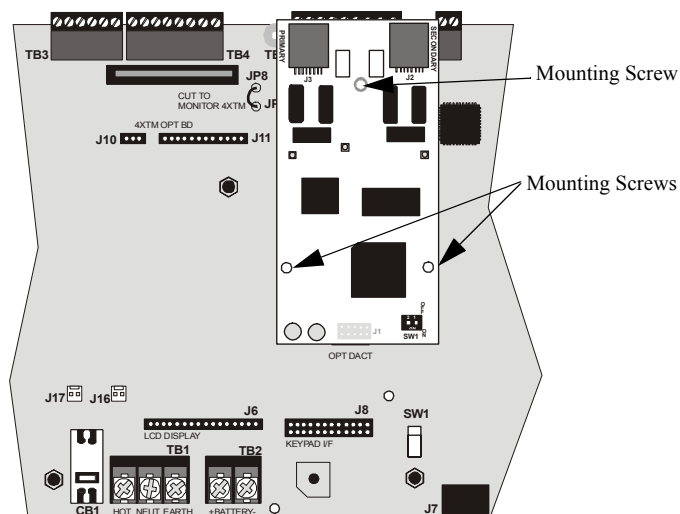


Figure 2.13 DACT Installation on Standoffs

6. Reinstall Keypad/Display on the main circuit board by positioning the unit over the appropriate standoffs and securing with screws which were loosened in step 2
7. Make certain to program the control panel for DACT operation

8. Refer to the Telephone Requirement and Warnings section of the DACT-UD Installation and Programming Manual Document #51889, before proceeding with this step. Connect the premises primary and secondary phone lines to the DACT as illustrated in Figure 2.14 and test the system for correct operation

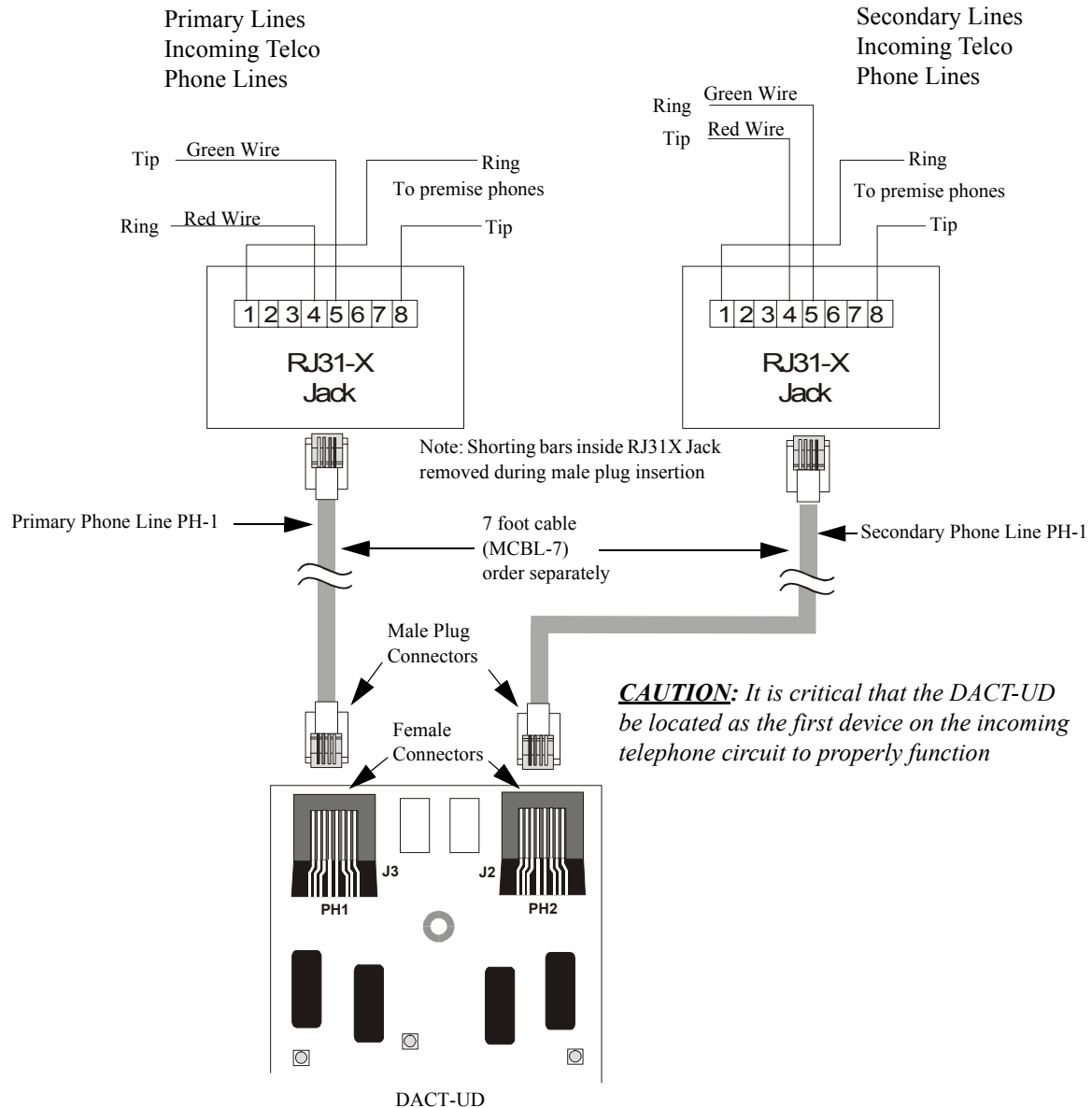


Figure 2.14 Wiring Phone Jacks

2.6.2 4XTMF Transmitter Module Installation

The 4XTMF provides a supervised output for a local energy municipal box transmitter in addition to alarm and trouble reverse polarity. A jumper option allows the reverse polarity circuit to open with a system trouble condition if no alarm condition exists. A disable switch allows disabling of the transmitter output during testing to prevent accidental calling of the monitoring service.

Local Energy Municipal Box Service (NFPA 72 Auxiliary Fire Alarm Systems):

Supervisory Current: 5.0 mA

Trip Current: 350 mA (subtracted from notification appliance power)

Coil Voltage: 3.65 VDC

Maximum Coil Resistance: 14.6 ohms

Maximum allowable wire resistance between panel and trip coil: 3 ohms

Municipal Box wiring can leave the building

Remote Station Service (NFPA 72 Remote Station Fire Alarm Systems) - Intended for connection to a polarity reversal circuit or a Remote Station receiving unit having compatible ratings:

Maximum load for each circuit: 10 mA

Reverse polarity output voltage: 24 VDC

Remote Alarm and Remote Trouble wiring can leave the building

Before installing the module, place the disconnect switch to the right (disconnect) position to prevent accidental activation of the municipal box. Note that a Disconnect LED will illuminate after the module is installed in the MS-9600. In addition, the System Trouble LED will turn on to indicate the Disconnect condition.

Note: 4XTMF Module is not suitable for transmitting reverse polarity supervisory signal.

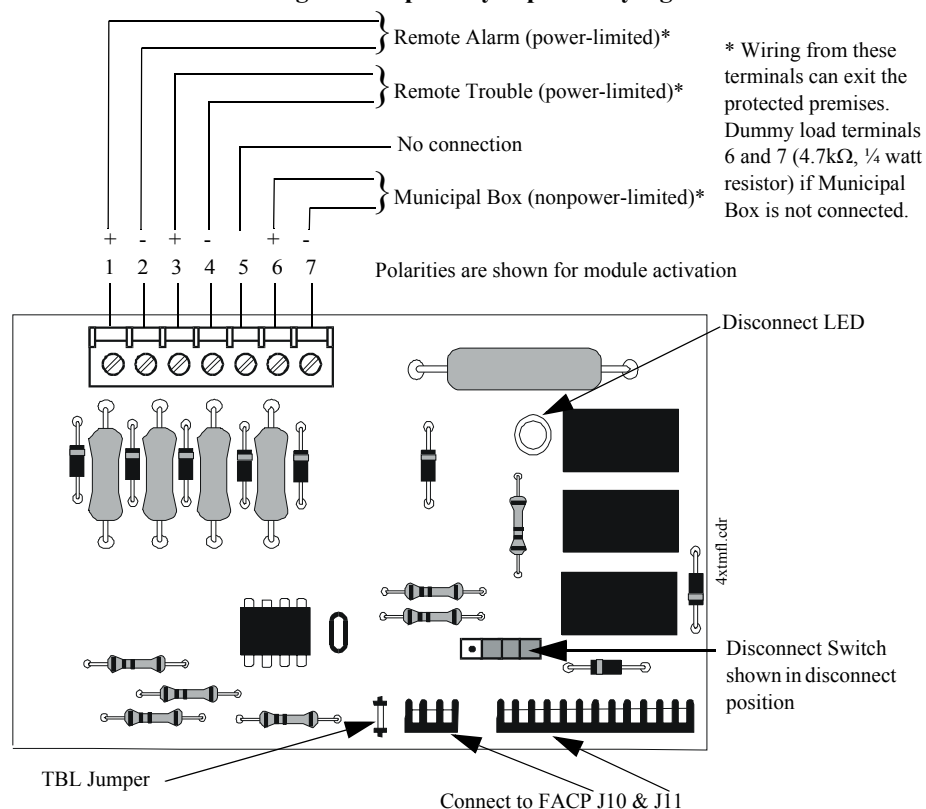


Figure 2.15 4XTMF Transmitter Module

The following steps must be followed when installing the 4XTMF module:



1. Remove all power (AC and DC) from the FACP before installing 4XTMF
2. Cut jumper JP6 on the main circuit board to allow the control panel to supervise the 4XTMF module
3. Carefully plug the connectors on the 4XTMF module into connectors J10 and J11 on the MS-9600 main circuit board, being careful not to bend any pins
4. Secure 4XTMF module to standoffs with supplied screws.
5. Reapply power to the FACP
6. For proper 4XTMF operation, the output relays must be programmed for the factory default settings as shown on the PC board silkscreen: Alarm Relay, Trouble Relay and Supervisory Relay
7. When the installation has been complete, enable the 4XTMF module by sliding the disconnect switch to the left
8. Test system for proper operation

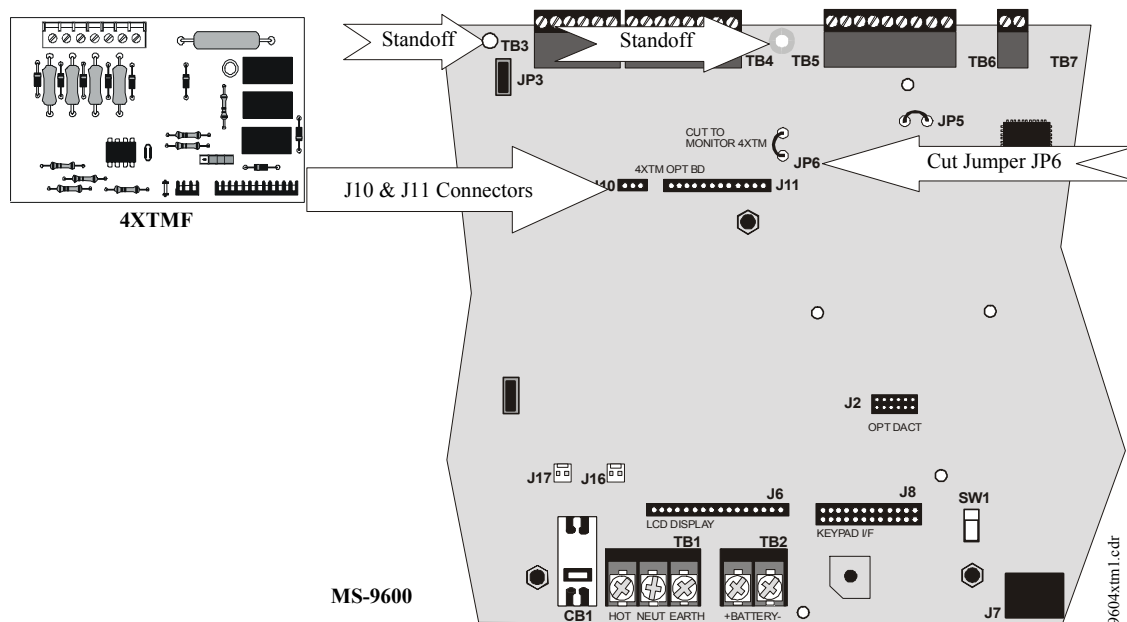


Figure 2.16 4XTMF Connectors to MS-9600 Connectors

NOTE: Jumper JP5 on the MS-9600 main circuit board can be used to configure the FACP supervisory relay for operation with the 4XTMF module. The supervisory relay must be programmed as shown on the main circuit board silkscreen (TB5, Terminals 7, 8 & 9). Cutting JP5 will allow the 4XTMF to generate a trouble if the supervisory contact opens. Leaving JP5 in will prevent generation of a trouble if the supervisory contact opens.

2.6.3 Auxiliary Trouble Input (J16 & J17)

Auxiliary Trouble Inputs 1 (J17) and 2 (J16), which are located on the MS-9600 main circuit board, can be used to monitor for trouble conditions on auxiliary equipment such as power supplies. J16 and/or J17 can be connected to any open collector trouble output on the auxiliary equipment. The MS-9600 control panel will indicate a trouble condition if a trouble is sensed at the Auxiliary Trouble Inputs.

If the 4XTMF Module is installed and jumper JP6 on the MS-9600 has been cut to supervise it, Auxiliary Trouble Input 1 (J17) will monitor the 4XTMF for trouble conditions.

2.6.4 SLC-2 Expander Module

The optional SLC-2 Expander Module provides a second SLC loop for the MS-9600 control panel. This allows connection of an additional 318 addressable devices, bringing the total to 636 addressable devices which can be connected to the FACP. Refer to the SLC Manual for information on connecting devices to the SLC.



The following steps must be followed when installing the SLC-2 Expander Module:



1. Remove all power (AC and DC) from the FACP before installing the SLC-2 module

2. Carefully plug connector J3 on the SLC-2 module into connector J3 on the MS-9600 main circuit board, being careful not to bend any pins

3. Secure the SLC-2 Expander Module to the four standoffs on the FACP main circuit board with the supplied screws

4. Connect the SLC wiring and devices to TB8 on the SLC Expander Module. Refer to the SLC Manual for wiring information

5. Reapply power to the control panel



6. Program the addressable devices connected to the SLC-2 Expander Module as detailed in "Master Programming Level" on page 47

7. Test the system for proper operation

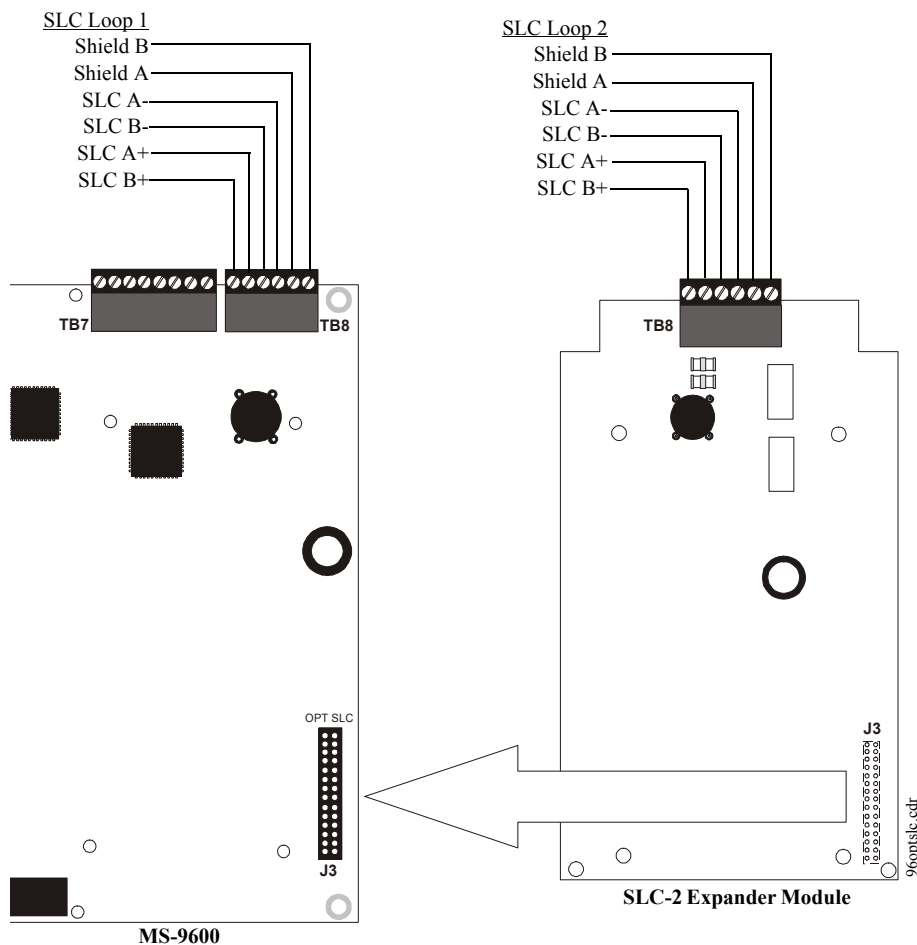


Figure 2.17 SLC-2 Expander Module Installation

2.6.5 Printer/PC

A serial printer or a PC (personal computer) may be connected to TB7 Terminals 1 - 4 on the FACP. The printer can be used to provide a hard-copy printout of real-time events, history file and walktest data. An IBM compatible PC can be connected to provide local FACP programming capabilities using the PK-CD programming utility. Installation of either device requires panel programming to allow the FACP to communicate with the device.



CAUTION! Do not connect a printer or PC to the MS-9600 FACP if a ground fault exists on the control panel. Circuit damage may result. Remove all power (AC and DC) before installing or removing any wiring.

Installation

Remote printers and PCs require separate primary power. Also required is the PRT/PK-CABLE which is an interface cable prewired to a DB9F connector. Wire the PRT/PK-CABLE to TB7 Terminals 1 - 4 as illustrated in the following figure. Connect the DB9F connector to the printer or PC serial EIA-232 port. If a nine-pin serial connector is not available on the printer or PC, use a DB25 adapter. Make certain that the DB25 adapter does not swap the Transmit and Receive lines. Apply power to the FACP and printer or PC. Note that a ground fault may occur on the FACP, dependent on the printer or PC being used, due to this connection. For this reason, it is important that there be no preexisting ground fault on the panel.

Note that the printer may or may not be supervised as determined by user programming. Refer to "Printer/PC" on page 98.

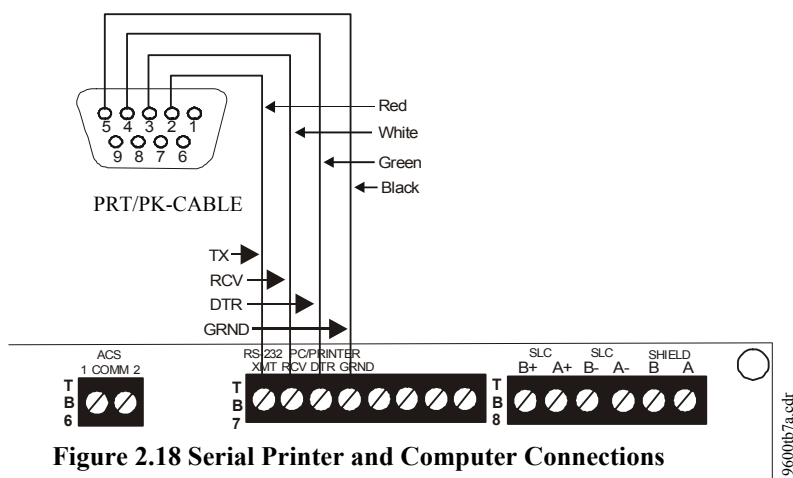


Figure 2.18 Serial Printer and Computer Connections

Printer Configuration

Refer to the documentation supplied with the printer for pertinent information about printer setup. Set the printer's options as listed in the following table:

COMMUNICATION SETUP	
BUFFER:	LARGE
DATA BITS:	7
PARITY:	EVEN
STOP BIT:	1 STOP
BAUD RATE:	2400/4800/9600
AUTOMATIC LINE FEED	NO
AUTOMATIC CARRIAGE RETURN	NO

PC Configuration

The Windows-based PK-CD Programming Utility Kit contains CD-ROM with on-line help file.

2.6.6 Digital Communicator and Annunciators

2.6.6.1 UDACT-F Digital Alarm Communicator/Transmitter



Reference
Manual

The UDACT-F transmits system status to UL listed Central Station receivers via the public switched telephone network. It is capable of reporting up to 99 software zones or up to 636 addressable points. The UDACT-F can be mounted remotely in a UBS-1F or ABS-8RF enclosure or in the panel cabinet using the P/N: BRKT-9600 Universal Bracket. For additional information, refer to the UDACT-F Manual.

Programming



See Page

The MS-9600 must be programmed to operate with the UDACT-F. Refer to "Annunciators/UDACT" on page 97 for control panel programming information.

2.6.6.2 ACM-8RF Relay Control Module



Reference
Manual

The ACM-8RF module provides eight Form-C relays with contacts rated for 5 amps. When installed with an MS-9600 FACP, the ACM-8RF modules provide relay activation for each of the 99 possible FACP zones plus special functions. Options exist to allow for alarm only or alarm and trouble activation per zone. Output activation for general alarm, general trouble, general supervisory, NAC fault, AC fail, walktest start and battery trouble are also available. The ACM-8RF can be mounted remotely in an ABS-8RF annunciator surface-mount backbox or in the panel cabinet using the P/N: BRKT-9600 Universal Bracket. Refer to the ACM-8RF manual for information on setting module switches for addressing and relay functions.

2.6.6.3 BRKT-9600 Universal Bracket Installation

The optional BRKT-9600 Universal Bracket can be used to mount specific modules inside the MS-9600 cabinet. The BRKT-9600 mounts to two studs located in the lower right corner of the control panel cabinet as illustrated below. It is secured to the PEM studs on the back wall of the cabinet with two supplied hex nuts.

IMPORTANT! When the BRKT-9600 is installed, the MS-9600 cabinet can hold a maximum of two 12 Amp Hour batteries with the orientation illustrated below.

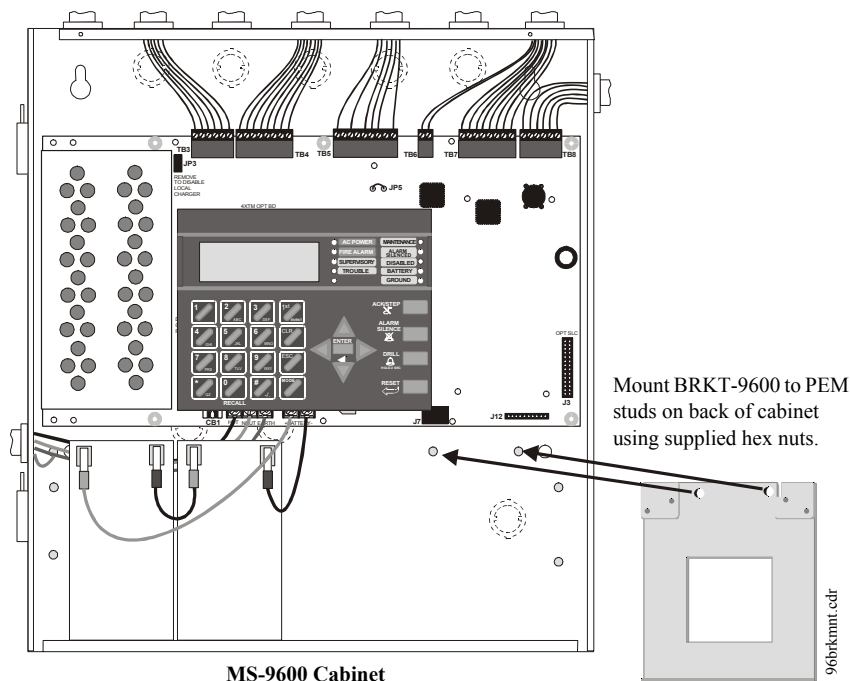


Figure 2.19 BRKT-9600 Bracket Installation

Module Installation on BRKT-9600

The following modules can be installed inside the MS-9600 cabinet using the BRKT-9600 Universal Bracket:

- ✓ UDACT-F Digital Alarm Communicator/Transmitter - installs at standoff location (A)
- ✓ ACM-8RF Annunciator Control Module (Relay) - installs at standoff location (A)

Refer to the appropriate module manual for detailed information on module operation and wiring.

1. Install the two supplied standoffs in location (A) as indicated in Step 1 of the following illustration
2. Position the module bottom in the slot located in the bottom of the BRKT-9600 as indicated in Step 2 of the following illustration
3. Secure the module to the standoffs installed in the top of the BRKT-9600 with two mounting screws as indicated in Step 3 of the following illustration
4. Refer to the appropriate module manual for detailed information on wiring the module for power, communication, etc.
5. Install a maximum of two 12 Amp Hour batteries with the orientation illustrated in Figure 2.19. Larger batteries require a separate UL listed battery box

Note: Do not bring wiring or conduit into the bottom of the cabinet for this application.

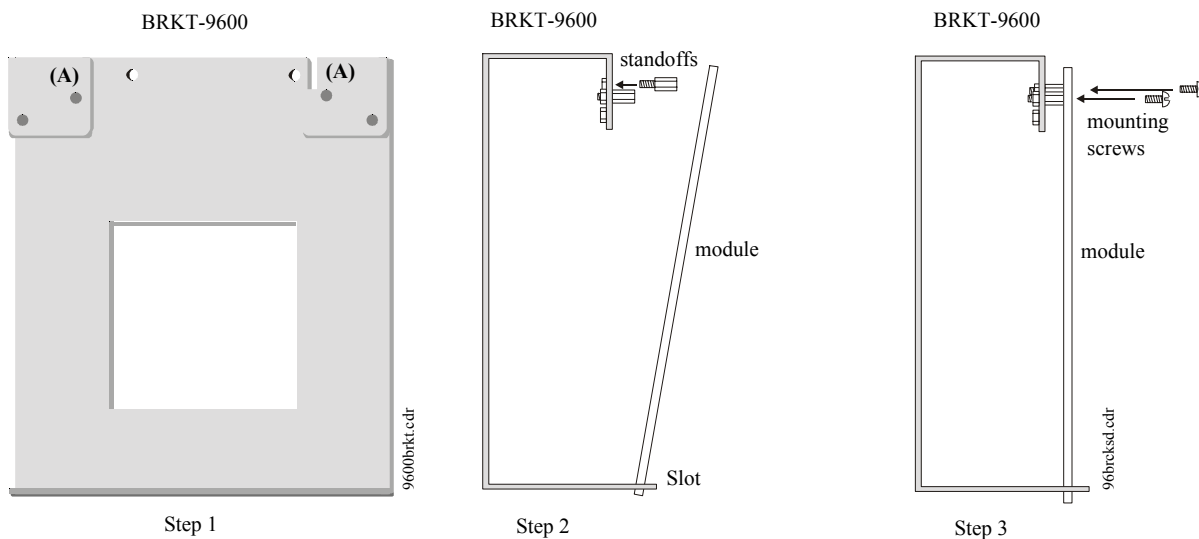


Figure 2.20 BRKT-9600 Module Installation Steps

2.6.6.4 ACM and AFM Series Annunciators

ACM and AFM Series Annunciators provide visual indications of FACP status in remote locations. Refer to the appropriate annunciator manual for information on installation, wiring and operation.

Annunciator addressing is specific to the MS-9600 control panel. The following table describes the annunciator addresses and the corresponding addressable devices that will be annunciated at each annunciator address.

ACM Annunciator Address	Annunciator Displays the Following Points
1	8 General System Status Points & Zones 1 - 56
2	Zones 57 - 99 & 4 NACs
3	Loop 1, Module Addresses 1 - 64
4	Loop 2, Module Addresses 1 - 64
5	Loop 1, Module Addresses 65 - 128
6	Loop 2, Module Addresses 65 - 128
7	Loop 1, Module Addresses 129 - 159 & Loop 2 Module Addresses 129 - 159
8	Loop 1, Detector Addresses 1 - 64
9	Loop 2, Detector Addresses 1 - 64
10	Loop 1, Detector Addresses 65 - 128
11	Loop 2, Detector Addresses 65 - 128
12	Loop 1 Detector Addresses 129 - 159 & Loop 2 Detector Addresses 129 - 159
13	not used
14	not used
15	not used
16	not used
17	not used
18	not used
19	not used
20	8 General System Status Points & Zones 1 - 56
21	Zones 57 - 99 & 4 NACs
22	Loop 1, Module Addresses 1 - 64
23	Loop 2, Module Addresses 1 - 64
24	Loop 1, Module Addresses 65 - 128
25	Loop 2, Module Addresses 65 - 128
26	Loop 1, Module Addresses 129 - 159 & Loop 2 Module Addresses 129 - 159
27	Loop 1, Detector Addresses 1 - 64
28	Loop 2, Detector Addresses 1 - 64
29	Loop 1, Detector Addresses 65 - 128
30	Loop 2, Detector Addresses 65 - 128
31	Loop 1 Detector Addresses 129 - 159 & Loop 2 Detector Addresses 129 - 159
32	not used

Important: If a UDACT-F is installed in the MS-9600 and selected in programming, the control panel will automatically assign annunciator addresses 20 - 31 to the UDACT-F and disable the selection of these addresses in programming for ACM annunciators. Do not set any ACM annunciators to these addresses.

The MS-9600 must be programmed for the annunciators installed on the system. Refer to "Annunciators/UDACT" on page 97 for information on UDACT-F and annunciator programming. Make certain to program the annunciator addresses that have been physically installed on the system.

Note: The 8 General System Status Points include the following:

- General Alarm
- General Trouble
- General Supervisory
- Alarm Silenced
- System Off Normal
- AC Loss
- Battery Fault
- NAC Fault

SECTION 3 Programming

3.1 Programming Data Entry

Programming can be accomplished using the MS-9600 keypad or by connecting an optional standard computer keyboard. The keyboard can be connected to the PS-2 connector J7 on the control panel main circuit board.

The information presented in this section refers to programming the MS-9600 via the onboard keypad. If an optional computer keyboard is connected to the MS-9600 main circuit board, the following table describes the keyboard keys which correspond to the onboard keypad keys.

Keypad Keys	Computer Keyboard Keys
1st Event	Home
CLR	Delete
ESC	Esc
RECALL	Insert
*	*
#	#
A - Z	A - Z
0 - 9	0 - 9
■ (on QZ key)	Space bar
—	—
/	/
•	•
←	←
→	→
↑	↑
↓	↓
ENTER	Enter
ACK/STEP	F1
SILENCE	F2
DRILL	F3
RESET	F4

3.2 User Programming



The MS-9600 is completely field programmable and requires no special software skills. *While programming the MS-9600, the fire protection capabilities of the control panel are enabled.*

Site-specific programming may be accomplished in three ways:

- **Autoprogramming Feature** - This is a convenient method for quickly bringing the FACP addressable SLC devices on-line without the necessity of programming each device individually. Refer to "Autoprogram" on page 48 for a detailed description of Autoprogramming
- Manual programming or editing, using the FACP keypad or a PC keyboard
- Off-line Programming and Editing Feature - allows creation and editing of site-specific custom programs using a Windows-based computer. For programs requiring a large amount of data entry, this method may be preferred. A PK-CD programming kit can be ordered for this purpose

The *System All Normal* screen will be displayed in a programmed system with no active alarms, troubles or supervisories, as illustrated below:

```
FIRE-LITE ALARMS INC
SYSTEM ALL NORMAL
10:00A 010801
```

Programming and Read Status mode can be entered while the panel is in any mode of operation. If the panel is in alarm, the alarm condition must be acknowledged before entering any other mode. To access any of the programming or read status features, the *Enter* or *Mode* key must be pressed, which will cause the LCD to display the following:

```
1=READ STATUS
2=PROGRAMMING
3=MANUAL DIAL MODE
```



See Page

Pressing 1, while this screen is being displayed, will cause the control panel to enter the Read Status feature which allows the user to view the programmed features and status of the control panel. The Read Status feature is not password protected. Refer to "Read Status" on page 123 for a detailed description of this feature.

Pressing 2 will select user Programming which may only be accomplished by an authorized person. After pressing 2, a screen will prompt for a password. After entering the correct password, the user may select from a list of programming options.

Pressing 3 will select the Manual Dial Mode feature which is used when the optional DACT-UD board is installed. Refer to the DACT-UD manual for a detailed description of this feature.

Exit Programming or Read Status

The programmer can exit Read Status or Programming mode by repeatedly pressing the keypad *ESC* (Escape) key until the display reads System All Normal. *Note that the data which is entered during Programming mode is not saved until the programmer exits this mode by repeatedly pressing the 'ESC' key. If the Reset key is pressed or power is lost before exiting Programming mode, all data which was just entered will be lost.*

User Programming Levels

There are two user programming levels:

- User Master Program Level 1 is used for programming panel specific data relating to device types, zoning, messages, control panel functions, etc.
- User Maintenance Program Level 2 is used by a qualified operator to access features such as Disable/Enable, View and Clear History, Walktest and System Time Change.

3.3 Initial Power-up

The following sections describe the initial programming procedures for a new system. The same procedures are used to modify programming in an existing system.

After completing the wiring of addressable devices to the SLC, apply power to the control panel. If the addressable devices have not yet been programmed into the FACP, their LEDs will not flash and the following trouble message will be displayed.



TROUBL IN SYSTEM
NO DEVICES INSTALLED
09:03A 010801

3.4 Programming Screens Description

Three main options are available when the *Enter* key is pressed: Read Status, Programming and Manual Dial Mode. Each option has multiple functions or features which may be chosen. To view all of the choices, it is necessary that the programmer scroll through a number of additional *subscreens*. These selections are displayed on multiple screens to make them more readable for the programmer. Refer to "Master Programming Level" on page 47, for additional information on the various screens.



The title of the main option screen will always be displayed at the top of the subscreens for the programmer's convenience. If additional subscreens exist, an Up or Down arrow will be displayed in the upper right corner of the screen being viewed. The programmer can then press the keypad Up or Down arrow key to view the new subscreen. To select one of the choices in a screen, the programmer presses the keypad numerical key corresponding to the desired choice.

Note that subscreens may also have multiple options which require viewing more than one screen. The same process, as detailed in the previous paragraphs, is followed to view all option choices.

3.5 Programming and Passwords

There are two factory set programming passwords which will access the Programming screens as indicated in the following examples. From either of the screens, access to specific system and device features or programming may be obtained. All user programming entries are stored in nonvolatile memory. The factory set passwords can be changed by the user as described in "Password Change" on page 99. If an invalid password is entered, the blinking cursor will return to the first password character position. To exit Programming, Read Status or Manual Dial mode at any time, press the *ESC* (Escape) key repeatedly. Note that Programming mode must be exited using the *ESC* key in order to store the program data entered during this mode. If the *Reset* key is pressed or power is lost before exiting Programming mode, the data just entered will not be saved.



To access user Programming mode, press the *Enter* or *Mode* key. The LCD will display the following:



```
1=READ STATUS
2=PROGRAMMING
3=MANUAL DIAL MODE
```

To enter the user Programming mode, press 2. The display will read as follows:



```
PROGRAMMING
ENTER PASSWORD
****
```

Entering the Master level password (default 00000) will cause the following screen to appear:



```
PROGRAMMING
1=AUTOPROGRAM
2=POINT PROGRAM
3=ZONE SETUP
```

If the Maintenance level password (default 11111) is entered, the following screen will appear:



```
PROGRAMMING
1=POINT PROGRAM
2=HISTORY
3=PROGRAM CHECK
```

Note that in the two preceding screens, an arrow appears to inform the programmer that additional options can be viewed by pressing the keypad *down* arrow key.

3.6 Master Programming Level

When the Master Program Level password is entered, the control panel will enter user Programming mode. In this mode, the piezo sounder remains off, the trouble relay is activated and the system Trouble LED flashes until Programming mode is exited. The following display will appear:



Programming Screen #1

The down arrow which appears in the display indicates that additional programming choices can be viewed by pressing the down arrow key on the keypad. If a down and up arrow appear in the display, pressing the 'down' arrow key will display the subsequent Programming Screens as illustrated below while pressing the 'up' arrow key will display the previous screen.



Programming Screen #2



Programming Screen #3



Programming Screen #4

```

PROGRAMMING
1=AUTOPROGRAM
2=POINT PROGRAM
3=ZONE SETUP

```

Programming Screen #1

3.6.1 Autoprogram

Pressing *I* while viewing Programming Screen #1, will select the Autoprogram option, which prompts the control panel to poll all devices installed on one or both SLC loops. The primary purpose of autoprogramming is to allow the installer a fast and easy way to bring the system on-line as quickly as possible. The first time the system is powered-up, it should be autoprogrammed.

If the system is already programmed and Autoprogram is initiated, the system will only add default values for newly installed devices.

When Autoprogram is selected, the programmer is given the option of autoprogramming all loops, only loop 1 or only loop 2. The following will be displayed on the LCD:

```

AUTOPROGRAM
1=LOOP 1
2=LOOP 2
3=ALL LOOPS

```

Autoprogram Loop Select Screen

After selecting one of the Autoprogram options, the control panel will begin autoprogramming the system by communicating with each addressable device installed on one or both loops. While autoprogramming, the panel will display the following:

```

AUTOPROGRAM
AUTOPROGRAMMING!
PLEASE WAIT

```

Autoprogram Progress Screen

When Autoprogramming is completed, the control panel will display the type and quantity of each device installed on the SLC loop(s) similar to the following display:

```

# OF DET LOOP1 055
# OF MON LOOP1 035
# OF CON LOOP1 030

```

Autoprogram Result Screen #1

```

# OF DET LOOP2 000
# OF MON LOOP2 000
# OF CON LOOP2 000

```

Autoprogram Result Screen #2

In the preceding example, the first display indicates that Loop 1 has 55 addressable detectors, 35 monitor modules and 30 control modules installed. The second display indicates that Loop 2 has no devices installed.

3.6.2 Point Program

PROGRAMMING
1=AUTOPROGRAM
2=POINT PROGRAM
3=ZONE SETUP

Programming Screen #1

The Point Program option allows the programmer to add a new addressable device to an SLC loop, delete an existing device from a loop or change the programming for an existing device. Pressing 2, while viewing Programming Screen #1, will select the Point Program option and display the following screen:

POINT PROGRAM
SELECT LOOP
1=LOOP 1
2=LOOP 2

Point Program Screen #1

The programmer selects the desired SLC loop by pressing 1 or 2 in Point Program Screen #1, which causes the panel to display the following screen:

POINT PROGRAM
SELECT TYPE
1=DETECTOR
2=MODULE

Point Program Screen #2

3.6.2.1 Detector Programming

Pressing 1, while viewing Point Program Screen #2, will allow the programmer to add, delete or change the programming of an addressable detector. The following screen will be displayed by the control panel:

DETECTOR
1=ADD
2=DELETE
3=EDIT

Detector Screen

3.6.2.1.1 Add Detector

Pressing 1 while viewing the Detector Screen will display the following screen which allows the programmer to add a new detector address to programming:

ADD DETECTOR
ENTER DETECTOR#

Add Detector Screen

A flashing cursor will appear in the position of the first asterisk to the left. The programmer keys in the three digit detector address, such as 005.

When the last digit is keyed-in, the following screen will be displayed:

```

      ADD DETECTOR
DETECTOR#      005
IS ADDED
  
```

The programmer can continue adding detectors by pressing the *ESC* or left arrow key which will return the display to the Add Detector Screen.

3.6.2.1.2 Delete Detector

Pressing 2 in the Detector Screen will display the Delete Detector Screen which allows the programmer to delete a specific detector:

```

      DETECTOR
1=ADD
2=DELETE
3=EDIT
  
```

Detector Screen

```

      DELETE DETECTOR
ENTER DETECTOR#
***
  
```

Delete Detector Screen

A flashing cursor will appear in the position of the first asterisk to the left. The programmer keys in the three digit detector address, such as 005. When the last digit is keyed-in, the following screen will be displayed:

```

      DELETE DETECTOR
DETECTOR#      005
IS DELETED
  
```

The programmer can continue deleting detectors by pressing the *ESC* or left arrow key which will return the display to the Delete Detector Screen.

3.6.2.1.3 Edit Detector

The programmer can change a detectors existing or factory default programming by pressing 3 in the Detector Screen. The following screen will be displayed:

```

      EDIT DETECTOR
ENTER POINT ADDRESS
**
  
```

Edit Detector Screen

A flashing cursor will appear in the position of the first asterisk to the left. The programmer keys in the three digit detector address, such as 017.

When the last digit is keyed-in, if the selected address has not been added to programming, a screen showing information about a device with the *highest* address that is installed will be displayed.

If no detectors have been installed on the loop, the following will be displayed:

```

NO DETECTOR
INSTALLED

```

Edit Detector Screen #1

If the selected address has been added to programming, device summary screens will be displayed. These screens allow the programmer to view all device settings at a single glance. Pressing the left or right arrow keys will allow the programmer to rapidly view the devices at the previous or next address (if installed).

If a detector (such as a photoelectric detector) with the selected address is not physically installed on the SLC or has a communication fault but the address is programmed in the system, the following screen will be displayed:

```

TROUBL SMOKE<PHOTO>
*****
                                ZNNN
                                *  1D017

```

Edit Detector Screen #1

If the selected address has been added to programming and a detector (such as a photoelectric detector) with the selected address is physically installed on the SLC and is communicating with the control panel, the following will be displayed:

```

NORMAL SMOKE <PHOTO>
*****
                                ZNNN
                                V  1D017

```

Edit Detector Screen #1

To change the programming for the displayed detector, press the keyboard 'down' arrow key to view the Edit Detector screens.

In the preceding example:

- ✓ Normal - indicates that the detector with the selected address is physically installed on the SLC and communicating with the control panel (enabled)
- ✓ <ADJ><NOUN> - represents the adjective and noun, which have been programmed, describing the location of the displayed device
- ✓ ZNNN - represents the first of five possible software zones that the detector is assigned to (NNN = the three digit zone number from 000 - 099)
- ✓ V or * - indicates whether or not alarm verification is enabled (V = alarm verification enabled and * = alarm verification disabled)
- ✓ 1D017 - represents the Loop, Device type and Device address (1 = SLC Loop 1, D=Detector and 017 = Detector Address 017)

The following examples show the editing of a photoelectric smoke detector with address 017, located on the first SLC loop:

```

EDIT DETECTOR 1D017
1=ENABLED      YES
2=TYPE  SMOKE(PHOTO)
3=VERIFICATION  OFF
  
```

Edit Detector Screen #2

```

EDIT DETECTOR 1D017
1=WALKTEST     NO
2=PAS          NO
3=PRE-SIGNAL   NO
  
```

Edit Detector Screen #3

```

EDIT DETECTOR 1D017
1=ZONE ASSIGNMENT
  00 ** ** ** **
  
```

Edit Detector Screen #4

```

EDIT DETECTOR 1D017
1=NOUN/ADJECTIVE
2=DESCRIPTION
*****
  
```

Edit Detector Screen #5

```

EDIT DETECTOR
1=ENABLED
2=TYPE
3=VERIFICATION
  
```

Edit Detector Screen #2

Enable/Disable Detector

To Enable or Disable the detector, press the *I* key while viewing the Edit Detector Screen #2. Each press of the key will toggle the screen between *Enabled Yes* and *Enabled No*. If *Enabled No* is selected, the detector will not be polled by the control panel, preventing the detector from reporting alarms and troubles to the panel. The control panel will display the device type and address which has been disabled and will turn on the Trouble LED and Disable LED.

EDIT DETECTOR
1=ENABLED
2=TYPE
3=VERIFICATION

Edit Detector Screen #2

Type

To select the type of detector being programmed, press the 2 key while viewing the Edit Detector Screen #2. This will cause the control panel to display the following Detector Type Screens:

DETECTOR TYPE
1=SMOKE PHOTO
2=USER DEFINED-1
3=SMOKE (ION)



Detector Type Screen #1

Pressing the down arrow key will display additional detector types as indicated in the following table:

Detector Type	Action When Activated
Smoke Photo	Fire Alarm
User-Defined-1	same as previous (Smoke Photo)
Smoke Ion	Fire Alarm
User-Defined-2	same as previous (Smoke Ion)
Heat Detect	Fire Alarm
User-Defined-3	same as previous (Heat Detect)
Smoke DuctP	Fire Alarm
User-Defined-4	same as previous (Smoke DuctP)
Superv DuctP	Supervisory, latching
User-Defined-5	same as previous (Superv DuctP)
Future	not used
Future	not used

While viewing any Detector Type screen, select the type of detector being programmed by pressing the corresponding keyboard number key. The display will return to Edit Detector Screen #2 and indicate the selection next to the Type option.

Note: If a detector is selected as a SUPERV DUCTP type, it will function like a supervisory point, not a fire alarm point. The supervisory LED and supervisory relay will activate, not the fire alarm LED or alarm relay, if smoke is sensed.

Verification

Alarm verification is used to confirm that a smoke detector activation is a true alarm condition and not a false alarm. This feature is selected by pressing 3 while viewing the Edit Detector Screen #2 so that the display reads *Verification On*. Each time the 3 key is pressed, the display will toggle between *Verification On* and *Verification Off*. For a detailed description, refer to "Alarm Verification" on page 122.



Walktest

The Walktest feature allows one person to test the system devices without the necessity of manually resetting the control panel after each device activation. To enable a device for the Walktest feature, press 1 while viewing the Edit Detector Screen #3 until the display reads *Walktest Yes*. Each press of the 1 key will cause the display to toggle between *Walktest Yes* and *Walktest No*. Refer to "Walktest" on page 122.

EDIT DETECTOR
1=WALKTEST
2=PAS
3=PRE-SIGNAL

Edit Detector Screen #3

PAS

The PAS (Positive Alarm Sequence) option will program the detector to delay panel activation (including alarm relay and communicator) for a period of 15 seconds plus a programmable time of up to 3 minutes. Zone 97, however, will activate immediately and may be used to connect a signaling device to indicate PAS activation (*do not use a Notification Appliance Circuit for this purpose*).



To enable the PAS feature, press 2 while viewing the Edit Detector Screen #3 until the display reads *PAS Yes*. Each press of the 2 key will cause the display to toggle between *PAS Yes* and *PAS No*. Refer to "Positive Alarm Sequence" on page 120.

For example, if a detector with address 005 is to be configured for PAS operation:

- ✓ Select *PAS Yes* when editing the detector set to address 005
- ✓ Program the desired zone or zones to be activated by this detector, in this example Z001
- ✓ Program an output, such as a control module that is to be activated by detector 005 by assigning the same zone to it; in this example Z001
- ✓ Program an output, such as a control module, for PAS activation by assigning zone Z97 to it. This control module may be connected to a signaling device used to indicate a PAS condition (*do not use a Notification Appliance Circuit for this purpose*)
- ✓ Enable zones Z001 and Special Purpose Zone PAS 97 and set the PAS delay timer to some value

With the preceding program settings, when the detector with address 005 is activated, zone Z97 will cause its associated control module to activate immediately, sounding the connected PAS signaling device. Following the PAS delay time, zone Z001 will cause its associated control module to activate and the control panel will initiate an alarm condition.

Pre-signal

EDIT DETECTOR
1=WALKTEST
2=PAS
3=PRE-SIGNAL

Edit Detector Screen #3



The Pre-signal option programs the detector to delay panel activation for a preprogrammed time delay of up to three minutes while allowing for visual verification by a person. Note that the alarm relay and communicator will respond to the initial alarm immediately. In addition, Zone 98 will activate. This zone can be programmed to a control module which may be used to activate a sounder or indicator which the installer designates as a Presignal indication (*do not use a Notification Appliance Circuit for this purpose*). To enable the Pre-signal feature, press 3 while viewing Edit Detector Screen #3 until the display reads *Pre-signal Yes*. Each press of the 3 key will cause the display to toggle between *Pre-signal Yes* and *Pre-signal No*. Refer to "Presignal" on page 119.

For example, if a detector with address 005 is to be configured for Pre-Signal operation:

- ✓ Select *Pre-signal Yes* when editing the detector set to address 005
- ✓ Program the desired zone or zones to be activated by this detector, in this example Z001
- ✓ Program an output, such as a control module that is to be activated by detector 005 by assigning the same zone to it; in this example Z001
- ✓ Program an output, such as a control module, for Pre-signal activation by assigning zone Z98 to it. This control module may be connected to a signaling device used to indicate a Pre-signal condition (*do not use a Notification Appliance Circuit for this purpose*)
- ✓ Enable zones Z001 and Special Purpose Zone Pre-signal 98 and set the Pre-signal delay timer to some value

With the preceding program settings, when the detector with address 005 is activated, zone Z98 will cause its associated control module to activate immediately, sounding the connected signaling device to indicate the Pre-signal condition. Following the Pre-signal delay time, zone Z001 will cause its associated control module to activate and the control panel will initiate an alarm condition.

Zone Assignment

```

EDIT DETECTOR
1=ZONE ASSIGNMENT
00 ** ** ** **

```

Edit Detector Screen #4

A maximum of five zones can be programmed to each addressable detector. Pressing *1* while viewing Edit Detector Screen #4 displays the following screen:

```

ZONE ASSIGNMENT
Z00 Z** Z** Z** Z**

```

Zone Assignment Screen

Note that *Z*** represents the Zone Number(s) corresponding to this device. The factory default for an unprogrammed device is *Z00* for general alarm zone. A flashing cursor will appear on the first *0* to the left. Enter the two digit number corresponding to the zone that is to be assigned to this device. The cursor moves to the next *Z*** designation. Continue entering zone assignments or the remaining zones can be left blank or programmed as general alarm zone *Z00*. When all desired changes have been made, press the Enter key to store the zone assignments. The display will return to the Edit Detector Screen #4. Note that the left and right arrow keys can be used to navigate through the zones and the *CLEAR* key can be used to quickly clear a zone.



Noun/Adjective

```

EDIT DETECTOR
1=NOUN/ADJECTIVE
2=DESCRIPTION
*****

```

Edit Detector Screen #5

The Noun/Adjective selection allows the programmer to enter specific descriptors about the detector currently being programmed. Pressing *1* while viewing Edit Detector Screen #5 will cause the following screen to be displayed:

```

1=STANDARD ADJECTIVE
2=STANDARD NOUN
3=CUSTOM ADJECTIVE
4=CUSTOM NOUN

```

Noun/Adjective Screen

1=STANDARD ADJECTIVE
 2=STANDARD NOUN
 3=CUSTOM ADJECTIVE
 4=CUSTOM NOUN

Noun/Adjective Screen

Pressing *1* while viewing the Noun/Adjective Screen will cause the following screen(s) to be displayed. Note that the keyboard *down* arrow key must be pressed to see all the Adjective screens. Press the number corresponding to the adjective that is to be used as a descriptor for the location of the detector currently being programmed. When an adjective has been selected, it will appear at the top of the display as indicated by the asterisks.

```
*****
1=NORTH
2=SOUTH
3=EAST
```

Adjective Screen #1

```
*****
1=3RD
2=4TH
3=5TH
```

Adjective Screen #5

```
*****
1=WEST
2=FRONT
3=CENTER
```

Adjective Screen #2

```
*****
1=FLOOR1
2=FLOOR2
3=FLOOR3
```

Adjective Screen #6

```
*****
1=REAR
2=UPPER
3=LOWER
```

Adjective Screen #3

```
*****
1=FLOOR4
2=FLOOR5
3=ROOM
```

Adjective Screen #7

```
*****
1=MAIN
2=FIRST
3=2ND
```

Adjective Screen #4

1=STANDARD ADJECTIVE
 2=STANDARD NOUN
 3=CUSTOM ADJECTIVE
 4=CUSTOM NOUN

Noun/Adjective Screen

Pressing 2 while viewing the Noun/Adjective Screen will cause the following screen(s) to be displayed. Note that the keyboard *down* arrow key must be pressed to see all the Noun screens. Press the number corresponding to the noun that is to be used as a descriptor for the location of the detector currently being programmed. When a noun has been selected, it will appear at the top of the display as indicated by the asterisks.

```
*****
1=BASEMENT
2=BOILER RM
3=CLASSROOM
```

Noun Screen #1

```
*****
1=KITCHEN
2=LOBBY
3=OFFICE
```

Noun Screen #5

```
*****
1=CLOSET
2=CORRIDOR
3=ELECTRIC RM
```

Noun Screen #2

```
*****
1=PATIENT
2=RESTROOM
3=ROOM
```

Noun Screen #6

```
*****
1=ELEVATOR
2=ENTRANCE
3=FLOOR
```

Noun Screen #3

```
*****
1=STAIRWAY
2=STOREROOM
3=WING
```

Noun Screen #7

```
*****
1=GARAGE
2=HALLWAY
3=HVAC RM
```

Noun Screen #4

```
*****
1=ZONE
```

Noun Screen #8

```

1=STANDARD ADJECTIVE
2=STANDARD NOUN
3=CUSTOM ADJECTIVE
4=CUSTOM NOUN

```

Noun/Adjective Screen

```

EDIT DETECTOR
1=NOUN/ADJECTIVE
2=DESCRIPTION

```

Edit Detector Screen #5

Pressing 3 or 4 while viewing the Noun/Adjective Screen will display screens similar to the previous Adjective and Noun Screens. The new screens will list custom Adjectives and Nouns which have been programmed into the control panel using the PK-CD programming kit. These descriptors are selected as described in the previous sections.

Description

The Description selection allows the programmer to enter additional information about the detector currently being programmed. This information will be displayed as part of the device label on the display. Pressing 2 while viewing Edit Detector Screen #5 will cause the following screen to be displayed:

```

DESCRIPTION      1D002
1=NOUN/ADJECTIVE

*****

```

Adjective/Noun Screen

A flashing cursor will appear at the first asterisk to the left. The programmer can enter additional descriptive information about the device being programmed. This information will appear on the display along with the standard device label information.

A maximum of 20 characters (including spaces) can be entered. To enter alphanumeric characters from the keypad, repeatedly press the appropriate key until the desired character is displayed in the first position. For example, to enter the letter *B*, press the 2 (ABC) key three times to toggle through the characters *I*, *A* and *B*. Press the right arrow key to move the cursor one position to the right and repeat the process to enter the next character. To enter a space, press the * (QZ) key four times until a blank appears in the desired position. When all characters have been entered, press the Enter key to store the information. The display will return to the Edit Detector Screen #5, displaying the new information at the bottom of the screen.

Recall/Increment Function

In addition, the user may use the Recall/Increment function at any time when the cursor is on the first letter of the Description, Adjective or Noun field as follows:

- If the zero key is pressed, a 0 is placed in the first letter position
- If the zero key is then pressed a second time with no intervening key actions, the entire field is replaced with the field entered *for the previous device programmed*, and the cursor moves to the last character of the field (Recall function). The Recalled Adjective or Noun field may now be changed letter-by-letter
- If the zero key is pressed again with no other intervening key actions and the last character in the field is a number 0-9, the number is incremented by one. If the last character is a letter, it changes to a 0. If the last character goes from 9 to 0 and the characters to the left of the last character are also numbers, they are also incremented (overflow)
- The above increment function may be repeated with each press of the zero key

As an example, the user could quickly enter 'FLR_3_ROOM_305' as follows:

1. The cursor is on the first letter of the Adjective field. Press the zero key twice to display *FLR_3*
2. With the cursor on the first letter of the Noun field, press the zero key twice to recall the display *ROOM_304*. The cursor automatically jumps from the first to the last letter of the Noun field
3. With the cursor on the last letter of the Noun field, press the zero key again to increment the room number to *305*
4. Press the right arrow key to advance the zone field
5. Select a zone number from 00 to 99. Z00 (default zone) is the general alarm zone. Z01 through Z99 may be selected to link software zones

```
POINT PROGRAM
SELECT TYPE
1=DETECTOR
2=MODULE
```

Point Program Screen #2

3.6.2.2 Module Programming

Pressing 2, while viewing Point Program Screen #2, will allow the programmer to add, delete or change the programming of an addressable module. The following screen will be displayed by the control panel:

```
MODULES
1=ADD
2=DELETE
3=EDIT
```

Modules Screen

3.6.2.2.1 Add Module

Pressing 1 while viewing the Modules Screen will display the following screen which allows the programmer to add a new module address to programming:

```
ADD MODULE
ENTER MODULE#
***
```

Add Module Screen #1

A flashing cursor will appear in the position of the first asterisk to the left. The programmer keys in the three digit module address, such as *005*.

When the last digit is keyed-in, the following screen will be displayed:

```
ADD MODULE
1=CONTROL
2=MONITOR
```

Add Module Screen #2

Pressing 1 for Control Module or 2 for Monitor Module will cause the following screen to be displayed:

```
ADD MODULE
MODULE#      005
IS ADDED
```

Add Module Screen #3

The programmer can continue adding modules by pressing the *ESC* or left arrow key which will return the display to the Add Module Screen #1.

3.6.2.2.2 Delete Module

Pressing 2 in the Modules Screen will display the Delete Module Screen which allows the programmer to delete a specific module:

```
MODULES
1=ADD
2=DELETE
3=EDIT
```

Modules Screen

```
DELETE MODULE
ENTER MODULE#
***
```

Delete Module Screen

A flashing cursor will appear in the position of the first asterisk to the left. Using the panel keypad, key in the module address such as 005. When the last digit is keyed in, the following confirmation that the module has been deleted will be displayed:

```
DELETE MODULE
MODULE#      005
IS DELETED
```

3.6.2.2.3 Edit Module Screen for Monitor Module

The programmer can change a modules existing or factory default programming by pressing 3 in the Modules Screen. The following screen will be displayed:

```

      EDIT MODULE
    ENTER MODULE ADDRESS
    ***
  
```

Edit Module Screen

A flashing cursor will appear in the position of the first asterisk to the left. The programmer keys in the three digit module address, such as 012. When the last digit is keyed-in, if the selected address has not been added to programming, a screen showing information about the highest address that is installed will be displayed. If no modules are installed on the loop, the following screen will be displayed:

```

      NO MODULE
    INSTALLED
  
```

Edit Module Screen

If the selected address has been added to programming but a module (such as a monitor module) with the selected address is not physically installed on the SLC or has a communication fault, the following screen will be displayed:

```

      TROUBL MONITOR
      <ADJ> <NOUN>
              ZNNN
            1M012
  
```

If the selected address has been added to programming and a module (such as a monitor module) with the selected address is physically installed on the SLC and is communicating with the control panel, the following screen will be displayed:

```

      NORMAL MONITOR
      <ADJ> <NOUN>
              ZNNN
            1M012
  
```

To change the programming for the displayed module, press the keyboard down arrow key to view the following Edit Monitor screens. In the preceding example:

- ✓ Normal - indicates that the module with the selected address is physically installed on the SLC and communicating with the control panel (enabled)
- ✓ <ADJ><NOUN> - represents the adjective and noun, which have been programmed, describing the location of the displayed device
- ✓ ZNNN - represents the first of five possible software zones that the module is assigned to (NNN = the two digit zone number from 000 - 099)
- ✓ 1M012 - represents the Loop, Device type and Device address (1 = SLC Loop 1, M=Module and 012 = Module Address 012)



If the selected address corresponds to a control module, a screen displaying information about the control module with the selected address will be displayed as shown in "Edit Module Screen for Control Modules" on page 69.

If the selected address corresponds to a monitor module, a screen displaying information about the module with the selected address will be displayed as illustrated in the following:

```

NORMAL MONITOR
      <ADJ> <NOUN>
              ZNNN
              1M012
  
```

```

EDIT MONITOR  1M012
1=ENABLED           YES
2=TYPE  MONITOR
  
```

Edit Monitor Screen #2

```

EDIT MONITOR  1M012
1=PRE-SIGNAL       NO
2=PAS              NO
  
```

Edit Monitor Screen #3

```

EDIT MONITOR  1M012
1=WALKTEST        YES
2=ZONE ASSIGNMENT
      00 ** ** ** **
  
```

Edit Monitor Screen #4

```

EDIT MONITOR  1M012
1=ADJECTIVE/NOUN
2=DESCRIPTION
*****
  
```

Edit Monitor Screen #5

Enable/Disable Module

To Enable or Disable the monitor module, press the *I* key while viewing the Edit Module Screen #2. Each press of the key will toggle the screen between *Enabled Yes* and *Enabled No*. If *Enabled No* is selected, the module will not be polled by the control panel, preventing the module from reporting alarms and troubles to the panel. The control panel will indicate a system trouble condition and the Disable LED will turn on if any devices are disabled.

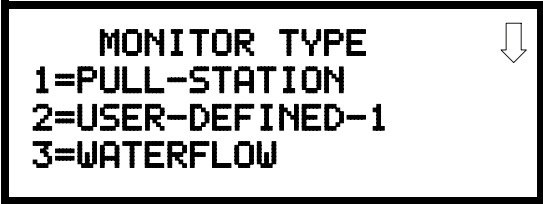


EDIT MONITOR
1=ENABLED
2=TYPE MONITOR

Edit Monitor Screen #2

Type Monitor

Using the PK-CD Upload/Download utility program, unique user-defined monitor types can be created and loaded into the FACP for later use. The FACP response to the activation of a user-defined type is the same as most previous standard types in the list, thus allowing a variety of user-defined types and responses. To select the type of monitor module being programmed, press the 2 key while viewing the Edit Monitor Screen #2. This will cause the control panel to display the following Monitor Type Screens:



MONITOR TYPE
1=PULL-STATION
2=USER-DEFINED-1
3=WATERFLOW

Monitor Type Screen #1

Pressing the down arrow key will display additional Monitor Type screens. While viewing one of the Monitor Type screens, select the type of monitor module being programmed by pressing the corresponding keypad number key. The display will return to the Edit Monitor Screen #2 which will show the new type selection.

The Table 3.1 on page 64 lists the Monitor Types and their respective functions.

Monitor module type selection will affect the function of the point as follows:

Table 3.1 Monitor Types

Monitor Type	Action When Activated
Pull-Station	Fire Alarm
User-Defined-1	same as previous (Pull-Station)
Waterflow	Fire Alarm Delayed
User-Defined-2	same as previous (Waterflow)
Monitor	Fire Alarm
User-Defined-3	same as previous (Monitor)
Future	not used
Future	not used
Smoke-Conventional	Fire Alarm
User-Defined-5	same as previous (Smoke-Conventional)
Heat-Conventional	Fire Alarm
User-Defined-6	same as previous (Heat-Detector)
Medic-Alert	Supervisory, latching
User-Defined-7	same as previous (Medic-Alert)
Hazard-Alert	Supervisory, latching
User-Defined-8	same as previous (Hazard-Alert)
Tornado-Alert	Supervisory, latching
User-Defined-9	same as previous (Tornado-Alert)
Future	not used
Future	not used
Tamper	Supervisory, nonlatching (tracking)
User-Defined 11	same as previous (Tamper)
Supervisory	Supervisory, latching
User-Defined 12	same as previous (Supervisory)
Supervisory-AR	Supervisory, nonlatching (tracking)
User-Defined 13	same as previous (Supervisory-AR)
Power-Monitor	Power Fault
User-Defined 14	same as previous (Power Monitor)
Trouble-Monitor	Trouble
User-Defined-15	same as previous (Trouble Monitor)
Process-Monitor	Piezo
User-Defined 16	same as previous (Process-Monitor)
Process-Monitor-AR	Piezo, nonlatching (tracking)
User-Defined-17	same as previous (Process-Monitor-AR)
Future	not used
Future	not used
Ack-Switch	Acts like panel Acknowledge Key
Sil-Switch	Acts like panel Silence Key
Reset-Switch	Acts like panel Reset Key
Drill-Switch	Acts like panel Drill Key
PAS-Bypass	PAS Disable
Future	not used

Note: For the PROCESS-MONITOR-AR selection, AR refers to AutoResettable


```

EDIT MONITOR
1=PRE-SIGNAL
2=PAS

```

Edit Monitor Screen #3



See Page



See Page

```

EDIT MONITOR
1=WALKTEST
2=ZONE ASSIGNMENT
00 ** ** ** **

```

Edit Monitor Screen #4

Pre-signal

To enable the Pre-signal feature, press *1* while viewing Edit Monitor Screen #3 until the display reads *Pre-signal Yes*. Each press of the *1* key will cause the display to toggle between *Pre-signal Yes* and *Pre-signal No*. Refer to "Presignal" on page 119 for additional information.

PAS

To enable the PAS feature, press *2* while viewing the Edit Detector Screen #3 until the display reads *PAS Yes*. Each press of the *2* key will cause the display to toggle between *PAS Yes* and *PAS No*. Refer to "Positive Alarm Sequence" on page 120 for additional information.

Walktest

The Walktest feature allows one person to test the system devices without the necessity of manually resetting the control panel after each device activation. To enable devices, which are connected to a monitor module, for the Walktest feature, press *1* while viewing the Edit Monitor Screen #4 until the display reads *Walktest Yes*. Each press of the *1* key will cause the display to toggle between *Walktest Yes* and *Walktest No*. Refer to "Walktest" on page 122 for additional information.

Zone Assignment

A maximum of five zones can be programmed to each addressable monitor module. Pressing *2* while viewing Edit Monitor Screen #4 displays the following screen:

```

MON ZONE ASSIGN
Z00 Z** Z** Z** Z**

```

Zone Assignment Screen

Note that *Z*** represents the Zone Number(s) corresponding to this device. The factory default for an unprogrammed device is *Z00* for general alarm zone. A flashing cursor will appear on the first *0* to the left. Enter the two digit number corresponding to the zone that is to be assigned to this device. The cursor moves to the next *Z*** designation. Continue entering zone assignments or the remaining zones can be left blank or programmed as general alarm zones *Z00*. When all desired changes have been made, press the Enter key to store the zone assignments. The display will return to the Edit Monitor Screen #4.

```

EDIT MONITOR
1=NOUN/ADJECTIVE
2=DESCRIPTION
*****

```

Edit Monitor Screen #5

Noun/Adjective

The Noun/Adjective selection allows the programmer to enter specific descriptors about the monitor module currently being programmed. Pressing *1* while viewing Edit Monitor Screen #5 will cause the following screen to be displayed:

```

1=STANDARD ADJECTIVE
2=STANDARD NOUN
3=CUSTOM ADJECTIVE
4=CUSTOM NOUN

```

Noun/Adjective Screen

1=STANDARD ADJECTIVE
 2=STANDARD NOUN
 3=CUSTOM ADJECTIVE
 4=CUSTOM NOUN

Noun/Adjective Screen

Pressing *1* while viewing the Noun/Adjective Screen will cause the following screen(s) to be displayed. Note that the keyboard *down* arrow key must be pressed to see all the Adjective screens. Press the number corresponding to the adjective that is to be used as a descriptor for the location of the monitor module currently being programmed.

```
*****
1=NORTH
2=SOUTH
3=EAST
```

Adjective Screen #1

```
*****
1=3RD
2=4TH
3=5TH
```

Adjective Screen #5

```
*****
1=WEST
2=FRONT
3=CENTER
```

Adjective Screen #2

```
*****
1=FLOOR 1
2=FLOOR 2
3=FLOOR 3
```

Adjective Screen #6

```
*****
1=REAR
2=UPPER
3=LOWER
```

Adjective Screen #3

```
*****
1=FLOOR 4
2=FLOOR 5
3=ROOM
```

Adjective Screen #7

```
*****
1=MAIN
2=FIRST
3=2ND
```

Adjective Screen #4

1=STANDARD ADJECTIVE
 2=STANDARD NOUN
 3=CUSTOM ADJECTIVE
 4=CUSTOM NOUN

Noun/Adjective Screen

Pressing 2 while viewing the Noun/Adjective Screen will cause the following screen(s) to be displayed. Note that the keyboard *down* arrow key must be pressed to see all the Noun screens. Press the number corresponding to the noun that is to be used as a descriptor for the location of the monitor module currently being programmed.

 1=BASEMENT
 2=BOILER RM
 3=CLASSROOM

Noun Screen #1

 1=KITCHEN
 2=LOBBY
 3=OFFICE

Noun Screen #5

 1=CLOSET
 2=CORRIDOR
 3=ELECTRIC RM

Noun Screen #2

 1=PATIENT
 2=RESTROOM
 3=ROOM

Noun Screen #6

 1=ELEVATOR
 2=ENTRANCE
 3=FLOOR

Noun Screen #3

 1=STAIRWAY
 2=STOREROOM
 3=WING

Noun Screen #7

 1=GARAGE
 2=HALLWAY
 3=HVAC RM

Noun Screen #4

 1=ZONE

Noun Screen #8

Pressing 3 or 4 while viewing the Noun/Adjective Screen will display screens similar to the previous Adjective and Noun Screens. The new screens will list Custom Adjectives and Nouns which have been programmed into the control panel using the PK-CD programming kit.

```

EDIT MONITOR
1=NOUN/ADJECTIVE
2=DESCRIPTION
*****
Edit Monitor Screen #5

```

Description

The Description selection allows the programmer to enter additional information about the monitor module currently being programmed. This information will be displayed as part of the device label on the LCD display. Pressing 2 while viewing Edit Monitor Screen #5 will cause the following screen to be displayed:

```

DESCRIPTION      1M012
1=NOUN/ADJECTIVE
*****

```

Noun/Adjective Screen

A flashing cursor will appear at the first asterisk to the left. The programmer can enter additional descriptive information about the device being programmed. This information will appear on the LCD display along with the standard device label information.

A maximum of 20 characters (including spaces) can be entered. To enter alphanumeric characters from the keypad, repeatedly press the appropriate key until the desired character is displayed in the first position. For example, to enter the letter *B*, press the 2 (*ABC*) key three times to toggle through the characters 2, *A* and *B*. Press the right arrow key to move the cursor one position to the right and repeat the process to enter the next character. To enter a space, press the * (*QZ*) key four times until a blank appears in the desired position. When all characters have been entered, press the Enter key to store the information. The display will return to the Edit Monitor Screen #4, displaying the new information at the bottom of the screen.

Recall/Increment Function

In addition, the user may use the Recall/Increment function at any time when the cursor is on the first letter of the Adjective or Noun field as follows:

- If the zero key is pressed, a 0 is placed in the first letter position
- If the zero key is then pressed a second time with no intervening key actions, the entire Adjective field is replaced with the field entered for the previous device programmed, and the cursor moves to the last character of the field (Recall function). The Recalled Adjective or Noun field may now be changed letter-by-letter
- If the zero key is pressed again with no other intervening key actions and the last character in the field is a number 0-9, the number is incremented by one. If the last character is a letter, it changes to a 0. If the last character goes from 9 to 0 and the characters to the left of the last character are also numbers, they are also incremented (overflow)
- The above increment function may be repeated with each press of the zero key

As an example, the user could quickly enter 'FLR_3_ROOM 305' as follows:

1. The cursor is on the first letter of the Adjective field. Press the zero key twice to display *FLR_3*
2. With the cursor on the first letter of the Noun field, press the zero key twice to recall the display *ROOM_304*. The cursor automatically jumps from the first to the last letter of the Noun field
3. With the cursor on the last letter of the Noun field, press the zero key again to increment the room number to *305*
4. Press the right arrow key to advance the zone field
5. Select a zone number from 00 to 99. Z00 (default zone) is the general alarm zone. Z01 through Z99 may be selected to link software zones

3.6.2.2.4 Edit Module Screen for Control Modules

The programmer can change a module's existing or factory default programming by pressing 3 in the Modules Screen. The following screen will be displayed:

```

MODULES
1=ADD
2=DELETE
3=EDIT

```

Modules Screen

```

      EDIT MODULE
ENTER MODULE ADDRESS
***

```

Edit Module Screen

A flashing cursor will appear in the position of the first asterisk to the left.

The programmer keys in the three digit module address, such as *002*. When the last digit is keyed-in, if the selected address corresponds to a *control* module, a screen displaying information about the control module with the selected address will be displayed as illustrated in the following:

```

NORMAL      CONTROL
      <ADJ> <NOUN>
      SW   ZNNN
      1M002

```

Edit Control Screen #1

In the preceding example:

- ✓ Normal - indicates that the module with the selected address is physically installed on the SLC and communicating with the control panel (enabled)
- ✓ <ADJ><NOUN> - represents the adjective and noun, which have been programmed, describing the location of the displayed device
- ✓ Control - indicates that the selected module is a control module
- ✓ S or * - represents Silenceable (S) or Nonsilenceable (*)
- ✓ W or * - represents Waterflow Timer Delay (W = Waterflow Timer Delay enabled, * = Waterflow Timer Delay disabled)
- ✓ ZNNN - represents the first of five possible software zones that the module is assigned to (NNN = the three digit zone number from 000 - 099)
- ✓ 1M002 - represents the Loop, Device type and Device address (1 = SLC Loop 1, M=Module and 002 = Module Address 02)

To change the programming for the displayed module, press the keyboard *down* arrow key to view the following Edit Control screens:

```

EDIT CONTROL
1=ENABLED      YES
2=TYPE CONTROL
3=SILENCEABLE  YES
  
```

Edit Control Screen #2

```

EDIT CONTROL
1=WALKTEST      YES
2=ZONE ASSIGNMENT
   00 ** ** ** **
  
```

Edit Control Screen #3

```

EDIT CONTROL
1=NOUN/ADJECTIVE
2=DESCRIPTION
*****
  
```

Edit Control Screen #4

```

EDIT CONTROL
1=ENABLED
2=TYPE
3=SILENCEABLE
  
```

Edit Control Screen #2

Enable/Disable Module

To Enable or Disable the control module, press the *I* key while viewing the Edit Control Screen #2. Each press of the key will toggle the screen between *Enabled Yes* and *Enabled No*. If *Enabled No* is selected, the module will not be polled by the control panel, preventing the module from activating its output devices. The control panel will indicate a system trouble condition and the Disable LED will turn on if any devices are disabled.

EDIT CONTROL
1=ENABLED
2=TYPE
3=SILENCEABLE

Edit Control Screen #2

Type

To select the type of control module being programmed, press the 2 key while viewing the Edit Control Screen #2. This will cause the control panel to display the following Control Type Screens:

CONTROL TYPE 
1=FUTURE USE
2=BELL-CIRCUIT
3=HORN-CIRCUIT

Control Type Screen #1

CONTROL TYPE 
1=SOUNDERS
2=RELAY-1FC
3=STROBE-CKT

Control Type Screen #2

CONTROL TYPE 
1=CONTROL
2=RESETTABLE POWER
3=FUTURE USE

Control Type Screen #3

While viewing one of the Control Type screens, select the type of control module being programmed by pressing the corresponding keypad number key. The display will return to the Edit Control Screen #2 and indicate the new type selection.

Notes:

1. A control module set to the Resettable Power type will follow the main circuit board 24 VDC resettable power unless the control module is disabled.

The following table contains control module type codes and their functions:

Control Type	Special Function
Future Use	None
Bell Circuit	None
Horn Circuit	None
Sounders	None
Relay	Ignore Open Circuit
Strobe Circuit	None
Control	None
Resettable Power	None
Future Use	None

```

EDIT CONTROL
1=ENABLED
2=TYPE
3=SILENCEABLE

```

Edit Control Screen #2

Silenceable

The Silenceable selection allows the programmer to select whether output devices connected to the control module can be silenced, either by pressing the Alarm Silence key or by enabling Autosilence. Pressing the 3 key while viewing Edit Control Screen #2 will enable the Silenceable feature causing the display to read *Silenceable Yes*. Repeated presses of the 3 key will cause the display to toggle between *Silenceable Yes* and *Silenceable No*.

Note that nonsilenceable outputs will not be activated for Fire Drill.

```

EDIT CONTROL
1=WALKTEST
2=ZONE ASSIGNMENT
00 ** ** ** **

```

Edit Control Screen #3

Walktest

The Walktest feature allows one person to test the system devices without the necessity of manually resetting the control panel after each device activation. To enable devices, which are connected to a control module, for the Walktest feature, press 1 while viewing the Edit Control Screen #3 until the display reads *Walktest Yes*. Each press of the 1 key will cause the display to toggle between *Walktest Yes* and *Walktest No*. Refer to "Walktest" on page 122 for additional information.

Zone Assignment

A maximum of five zones can be programmed to each addressable control module. Pressing 2 while viewing Edit Control Screen #3 displays the following screen:

```

ZONE ASSIGNMENT
Z00 Z** Z** Z** Z**

```

Zone Assignment Screen

Note that Z** represents the Zone Number(s) corresponding to this device. The factory default for an unprogrammed device is Z00 for general alarm zone. A flashing cursor will appear on the first 0 to the left. Enter the two digit number corresponding to the zone that is to be assigned to this device. The cursor moves to the next Z** designation. Continue entering zone assignments or the remaining zones can be left blank or programmed as general alarm zones Z00. When all desired changes have been made, press the Enter key to store the zone assignments. The display will return to the Edit Control Screen #3.

```

EDIT CONTROL
1=NOUN/ADJECTIVE
2=DESCRIPTION

```

Edit Control Screen #4

Noun/Adjective

The Noun/Adjective selection allows the programmer to enter specific descriptors about the control module currently being programmed. Pressing 1 while viewing Edit Control Screen #4 will cause the following screen to be displayed:

```

1=STANDARD ADJECTIVE
2=STANDARD NOUN
3=CUSTOM ADJECTIVE
4=CUSTOM NOUN

```

Noun/Adjective Screen

1=STANDARD ADJECTIVE
 2=STANDARD NOUN
 3=CUSTOM ADJECTIVE
 4=CUSTOM NOUN

Noun/Adjective Screen

Pressing *1* while viewing the Noun/Adjective Screen will cause the following screen(s) to be displayed. Note that the keyboard *down* arrow key must be pressed to see all the Adjective screens. Press the number corresponding to the adjective that is to be used as a descriptor for the location of the control module currently being programmed.

```
*****
1=NORTH
2=SOUTH
3=EAST
```

Adjective Screen #1

```
*****
1=3RD
2=4TH
3=5TH
```

Adjective Screen #5

```
*****
1=WEST
2=FRONT
3=CENTER
```

Adjective Screen #2

```
*****
1=FLOOR 1
2=FLOOR 2
3=FLOOR 3
```

Adjective Screen #6

```
*****
1=REAR
2=UPPER
3=LOWER
```

Adjective Screen #3

```
*****
1=FLOOR 4
2=FLOOR 5
3=ROOM
```

Adjective Screen #7

```
*****
1=MAIN
2=FIRST
3=2ND
```

Adjective Screen #4

1=STANDARD ADJECTIVE
 2=STANDARD NOUN
 3=CUSTOM ADJECTIVE
 4=CUSTOM NOUN

Noun/Adjective Screen

Pressing 2 while viewing the Noun/Adjective Screen will cause the following screen(s) to be displayed. Note that the keyboard *down* arrow key must be pressed to see all the Noun screens. Press the number corresponding to the noun that is to be used as a descriptor for the location of the control module currently being programmed.

 1=BASEMENT
 2=BOILER RM
 3=CLASSROOM

Noun Screen #1

 1=KITCHEN
 2=LOBBY
 3=OFFICE

Noun Screen #5

 1=CLOSET
 2=CORRIDOR
 3=ELECTRIC RM

Noun Screen #2

 1=PATIENT
 2=RESTROOM
 3=ROOM

Noun Screen #6

 1=ELEVATOR
 2=ENTRANCE
 3=FLOOR

Noun Screen #3

 1=STAIRWAY
 2=STOREROOM
 3=WING

Noun Screen #7

 1=GARAGE
 2=HALLWAY
 3=HVAC RM

Noun Screen #4

 1=ZONE

Noun Screen #8

Pressing 3 or 4 while viewing the Noun/Adjective Screen will display screens similar to the previous Adjective and Noun Screens. The new screens will list Custom Adjectives and Nouns which have been programmed into the control panel using the PK-CD programming kit.

```

EDIT CONTROL
1=ADJECTIVE/NOUN
2=DESCRIPTION

```

Edit Control Screen #4

Description

The Description selection allows the programmer to enter additional information about the control module currently being programmed. This information will be displayed as part of the device label on the display. Pressing 2 while viewing Edit Control Screen #4 will cause the following screen to be displayed:

```

DESCRIPTION      1M002
1=NOUN/ADJECTIVE

*****

```

Adjective/Noun Screen

A flashing cursor will appear at the first asterisk to the left. The programmer can enter additional descriptive information about the device being programmed. This information will appear on the display along with the standard device label information.

A maximum of 20 characters (including spaces) can be entered. To enter alphanumeric characters from the keypad, repeatedly press the appropriate key until the desired character is displayed in the first position. For example, to enter the letter *B*, press the 2 (*ABC*) key three times to toggle through the characters *I*, *A* and *B*. Press the right arrow key to move the cursor one position to the right and repeat the process to enter the next character. To enter a space, press the * (*QZ*) key four times until a blank appears in the desired position. When all characters have been entered, press the Enter key to store the information. The display will return to the Edit Control Screen #4, displaying the new information at the bottom of the screen.

Recall/Increment Function

In addition, the user may use the Recall/Increment function at any time when the cursor is on the first letter of the Adjective or Noun field as follows:

- If the zero key is pressed, a 0 is placed in the first letter position
- If the zero key is then pressed a second time with no intervening key actions, the entire Adjective field is replaced with the field entered for the previous device programmed, and the cursor moves to the last character of the field (Recall function). The Recalled Adjective or Noun field may now be changed letter-by-letter
- If the zero key is pressed again with no other intervening key actions and the last character in the field is a number 0-9, the number is incremented by one. If the last character is a letter, it changes to a 0. If the last character goes from 9 to 0 and the characters to the left of the last character are also numbers, they are also incremented (overflow)
- The above increment function may be repeated with each press of the zero key

As an example, the user could quickly enter 'FLR_3_ROOM 305' as follows:

1. The cursor is on the first letter of the Adjective field. Press the zero key twice to display *FLR_3*
2. With the cursor on the first letter of the Noun field, press the zero key twice to recall the display *ROOM_304*. The cursor automatically jumps from the first to the last letter of the Noun field
3. With the cursor on the last letter of the Noun field, press the zero key again to increment the room number to *305*
4. Press the right arrow key to advance the zone field
5. Select a zone number from 00 to 99. Z00 (default zone) is the general alarm zone. Z01 through Z99 may be selected to link software zones

```

PROGRAMMING
1=AUTOPROGRAM
2=POINT PROGRAM
3=ZONE SETUP

```

Programming Screen #2

3.6.3 Zone Setup

Pressing 3 while viewing Programming Screen #1 will access the Zone Setup screens as illustrated below:

```

ZONE SETUP
1=ENABLE
2=DISABLE
3=ZONE 97 98 99

```

Zone Setup Screen #1

```

ZONE SETUP
1=ZONES INSTALLED
2=ZONES ENABLED
3=ZONES DISABLED

```

Zone Setup Screen #2

```

ZONE SETUP
1=ZONE TYPES

```

Zone Setup Screen #3

```

ZONE SETUP
1=ENABLE
2=DISABLE
3=ZONE 97 98 99

```

Zone Setup Screen #1

3.6.3.1 Enable

Pressing 1 for Enable, while viewing Zone Setup Screen #1, will display the following screen:

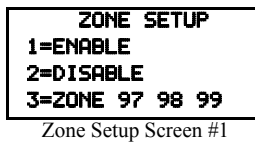
```

ZONE TO ENABLE
Z █

```

Enable Screen

This screens allows the programmer to enable zones, one at a time. A flashing cursor appears next to the Z, prompting the programmer to enter a two digit zone number (01 - 99). When the second digit is entered, the zone will be enabled and the cursor returns to the original position next to the Z. Another zone can then be enabled.



3.6.3.2 Disable

Pressing 2 for Disable, while viewing Zone Setup Screen #1, will display the following screen:

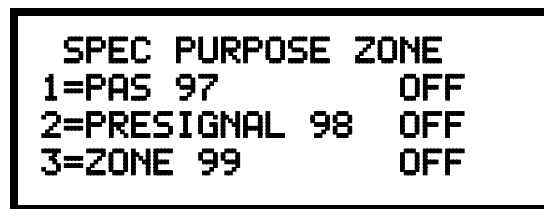


Disable Screen

This screen allows the programmer to disable zones, one at a time. A flashing cursor appears next to the Z, prompting the programmer to enter a two digit zone number (01 - 99). When the second digit is entered, the zone will be disabled and the cursor will return to the original position next to the Z. Another zone can then be disabled.

3.6.3.3 Zone 97, 98 and 99

Pressing 3 for Zone 97, 98 and 99, while viewing Zone Setup Screen #1, will display the following screen:



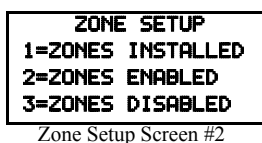
Zone 97, 98 and 99 Screen

Zones 97, 98 and 99 can be programmed for normal zone operation or for special purpose applications. In the above illustration, the three zones are shown Off, which means they can be programmed to function in the same manner as all other zones, by assigning them to input and output devices in the Programming Zone Assignment Screen.

Pressing 1 will cause the display to change to *PAS 97 On*. Each press of the 1 key will cause the display to toggle between *PAS 97 On* and *PAS 97 Off*. When Zone 97 is programmed On, a PAS (Positive Alarm Sequence) activation of any device will cause Zone 97 to activate. By assigning Zone 97 to a control module in the Programming Zone Assignment Screen, an output device connected to the control module can be used to indicate a PAS condition in the control panel. *Do not assign Zone 97 to a Notification Appliance Circuit when using this zone to indicate a PAS condition.*

Pressing 2 will cause the display to change to *Pre-signal 98 On*. Each press of the 2 key will cause the display to toggle between *Pre-signal 98 On* and *Pre-signal 98 Off*. When Zone 98 is programmed On, a Pre-signal activation of any device will cause Zone 98 to activate. By assigning Zone 98 to a control module in the Programming Zone Assignment Screen, an output device connected to the control module can be used to indicate a Pre-signal condition in the control panel. *Do not assign Zone 98 to a Notification Appliance Circuit when using this zone to indicate a Pre-signal condition.*

Zone 99, in special purpose mode, is reserved for future use and has no effect.



3.6.3.4 Zones Installed

Pressing 1 for Zones Installed, while viewing Zone Setup Screen #2, will display a screen similar to the following:

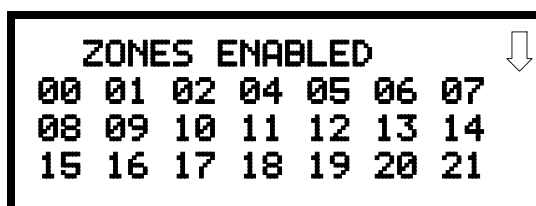


Zones Installed Screen

This display will show all of the zones that have been programmed into the control panel. Note that an up and/or down arrow may appear in the upper right corner of the display, indicating that additional screens of zone information exists. Press the up or down arrow keys to view the additional zones.

3.6.3.5 Zones Enabled

Pressing 2 for Zones Enabled, while viewing Zone Setup Screen #2, will display a screen similar to the following:



Zones Enabled Screen

This display will show all of the zones that are enabled in the control panel. Note that an up and/or down arrow may appear in the upper right corner of the display, indicating that additional screens of zone information exists. Press the up or down arrow keys to view the additional zones.

3.6.3.6 Zones Disabled

Pressing 3 for Zones Disabled, while viewing Zone Setup Screen #2, will display a screen similar to the following:



Zones Disabled Screen

This display will show all of the zones that are disabled in the control panel. Note that an up and/or down arrow may appear in the upper right corner of the display, indicating that additional screens of zone information exists. Press the up or down arrow keys to view the additional zones.

ZONE SETUP
1=ZONE TYPES

Zone Setup Screen #3

3.6.3.7 Zone Type

Zone Types must be programmed only if a DACT, programmed for zone reporting, is installed on the control panel. Pressing 1 for Zone Types, while viewing Zone Setup Screen #3, will display a screen similar to the following:

ZONE TYPE PROG
1=Z00 MONITOR
2=Z01 MONITOR
3=Z02 MONITOR

Zones Installed Screen

This display will show the system zones (default and user programmed) and their associated types. Note that an up and/or down arrow will appear in the upper right corner of the display, indicating that additional screens of zone information exists. Press the up or down arrow keys to view zones Z00 through Z99.

Zone types can be changed by pressing the keypad number key corresponding to the zone in each Zones Installed Screen. Available zone types will be displayed in the resultant screens. For example, to change the zone type for zone Z02 in the screen illustrated above, press 3. The following screens will be displayed:

ZONE TYPE PROG
1=MONITOR
2=SMOKE PHOTO
3=WATERFLOW

Zone Type Program Screen #1

ZONE TYPE PROG
1=MEDICAL
2=HAZARD
3=TAMPER

Zone Type Program Screen #3

ZONE TYPE PROG
1=HEAT
2=PULL STATION
3=DUCT

Zone Type Program Screen #2

ZONE TYPE PROG
1=SUPERVISORY
2=PROC. MON
3=SMOKE ION

Zone Type Program Screen #4

To change the zone type for Z02 to Pull Station, scroll the display until Zone Type Program Screen #2 is displayed. Press 2 to program zone Z02 as a Pull Station zone. The display will return to the Zones Installed Screen showing zone Z02 and the Pull Station program type. Repeat the procedure for each zone to be changed.

IMPORTANT! In Zone Type Program Screen #1, selecting WATERFLOW will assign a Waterflow silenceable zone type to the selected zone. Any signaling devices programmed to the same zone can be silenced by pressing the Alarm Silence key or by using the auto-silence feature.

To program a waterflow circuit as nonsilenceable, refer to "System Setup" on page 81.



3.6.4 Loop Setup

Loop Setup allows the programmer to configure the SLC Loop(s) for NFPA Style 4, 6 or 7 wiring and to select the protocol for each loop. Pressing *1* while viewing Programming Screen #2 will cause the following screen to be displayed:



Loop Selection Screen

Press *1* while viewing the Loop Selection Screen to configure Loop1 or *2* to configure Loop 2. The following screens will appear for each loop.



Loop Setup Screen

3.6.4.1 Style

To program the SLC Style for the selected loop, press *1* for Style, while viewing Loop Setup Screen. In the preceding example, the control panel is programmed for Style 4 SLC wiring as indicated by the *4* to the right of *Style* in the display. To change the wiring style, press *1* to toggle the display to read *Style 6*. Each press of the *1* key will cause the display to toggle between *Style 4* and *Style 6*. *Note that, when programming the Loop Style, the programmer can only select between Style 4 and Style 6. To program a system for Style 7 wiring, the programmer must select the Loop Setup for Style 6. Style 7 wiring is the same as Style 6 with the added requirement that each addressable device on the loop must have a pair of isolator modules, one on each side.*

3.6.4.2 Loop Protocol

Loop Protocol refers to the SLC loop mode of operation. At the present time, the only mode available is CLIP (Classic Loop Interface Protocol) which is used for the older legacy addressable devices such as the M300 Series modules and detectors. Note that the legacy devices can operate only in CLIP mode while the newer devices are compatible with all modes. Pressing *2* while viewing the Loop Setup Screen will have no effect on programming at this time.

Device Addressing

It is important to note that the MS-9600 addressable device capacity is 159 detectors and 159 control/monitor modules per SLC loop. Since older legacy addressable devices cannot be set to addresses above *099*, the newer series devices must be used when addresses *100* to *159* are to be installed. It is permissible to mix old and new devices on the same loop.

3.6.5 System Setup

System Setup allows the programmer to configure the following control panel features:

- *Trouble Reminder*: This feature, when enabled, provides an audible reminder that an alarm or trouble still exists on the FACP after the control panel has been silenced. The control panel piezo sounder will pulse once every 15 seconds during an alarm and every two minutes during a trouble condition, after the Alarm Silence or Acknowledge key is pressed. The piezo will continue to sound at these rates until the alarm or trouble condition is cleared. If the trouble condition is not cleared within 24 hours, the panel will reactivate the trouble sounder and retransmit the trouble condition to the central station if connected.
- *Banner*: This option allows the user to change the top line of the LCD display from the factory default readout of *FIRE LITE ALARMS INC* to a user defined readout when the control panel is in Normal condition.
- *Time-Date*: This feature allows the programmer to set the time, display format (24 hr or 12 hr), date and daylight savings time feature into the FACP memory
- *Timers*: This option allows the programmer to set the PAS (Positive Alarm Sequence) time delay, Pre-Signal time delay and Waterflow time delay.
- *NACs*: This feature allows the programmer to configure the control panel Notification Appliance Circuits for a variety of options, such as circuit type, silenceable/nonsilenceable, autosilence, coding, silence inhibit, zone assignment and enable/disable.
- *Relays*: This option allows programming of two onboard relays for activation by various control panel events, such as alarm, trouble, supervisory, etc.
- *Canadian Option*: This option allows the automatic programming of ionization smoke detector sensitivity thresholds to Canadian specifications.
- *Waterflow Silenceable*: This option provides the ability to silence any output circuit activated by a monitor module programmed as a waterflow type.

PROGRAMMING
1=LOOP SETUP
2=SYSTEM SETUP
3=VERIFY LOOPS

Programming Screen #2

Pressing 2 for System Setup, while viewing Programming Screen #2, will cause the following screens to be displayed:

```

      SYSTEM SETUP
1=TROUBLE REM      OFF
2=BANNER
3=TIME-DATE
  
```

System Setup Screen #1

```

      SYSTEM SETUP
1=TIMERS
2=NAC
3=RELAYS
  
```

System Setup Screen #2

```

      SYSTEM SETUP
1=CANADIAN OPT.    OFF
2=WATERFLOW SIL.  NO
  
```

System Setup Screen #3

3.6.5.1 Trouble Reminder

The Trouble Reminder features causes the control panel piezo to sound a reminder 'beep' for alarms and troubles, after the panel has been silenced. Refer to "System Setup" on page 81, for a detailed description of this feature. Pressing 1 while viewing System Setup Screen #1 will cause the display to toggle to *Trouble Rem On*, which enables this feature. Each press of the 1 key will cause the display to toggle between *Trouble Rem On* and *Trouble Rem Off*.



3.6.5.2 Banner

The top line of the display, which appears when the control panel is in normal mode, can be changed by using the Banner option. Pressing 2 while viewing System Setup Screen #1 will cause the following to be displayed:



Banner Screen



Banner Screen

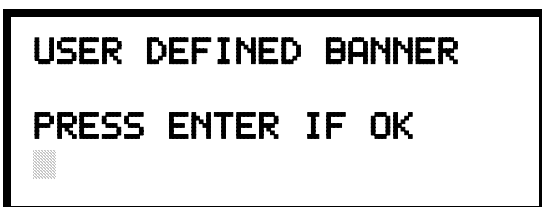
Pressing 1 while viewing the Banner Screen will select the factory default banner setting and display the following screen:



Factory Banner Screen

Pressing the Enter key will store this selection in nonvolatile memory and return the display to the Banner Screen.

Pressing 2 while viewing the Banner Screen will display the following screens :



User Defined Banner Screen #1



User Defined Banner Screen #2

These screens allow the programmer to enter a two line custom banner. A flashing cursor will appear in the bottom left corner of each display. A maximum of 20 characters (including spaces) can be entered into each screen for a total of two lines with 40 characters. After entering up to 20 characters in the first screen, press *Enter* to view the second screen. Enter up to 20 characters in the second screen in the same manner or just press *Enter* if a second banner line is not being entered. To quickly clear the current banner, press the *CLR* key.

To enter alphanumeric characters from the keypad, repeatedly press the appropriate key until the desired character is displayed in the first position. For example, to enter the letter *B*, press the 2 (*ABC*) key three times to toggle through the characters *I*, *A* and *B*. Press the right arrow key to move the cursor one position to the right and repeat the process to enter the next character. To enter a space, press the * (*QZ*) key four times to place a blank in the desired position. When all characters have been entered, press *Enter* to store the information and return to the Banner Screen.

```

SYSTEM SETUP
1=TROUBLE REM
2=BANNER
3=TIME-DATE

```

System Setup Screen #1

3.6.5.3 Time-Date

The control panel time and date can be changed by pressing 3 while viewing the System Setup Screen #1. The following screen will be displayed:

```

TIME AND DATE
1=TIME 10:00 AM
2=DATE 04-07-2000
3=CLOCK FORMAT 12HR

```

Time-Date Screen #1

```

TIME AND DATE
1=DAYLIGHT SAVINGS

```

Time-Date Screen #2

3.6.5.3.1 Time

To change the time, press 1 while viewing the Time-Date Screen. The following screen will be displayed:

```

ENTER TIME
10:00 AM
1=AM 2=PM

```

Time Screen

A flashing cursor is located toward the top left of the display. Below the cursor is the current time. To change the time, enter the two-digit hours followed by the two-digit minutes. The cursor will move one position to the right each time a digit is entered. After the last minutes digit is entered, the cursor will again move one position to the right. At this point enter 1 for AM or 2 for PM. The display will then return to the Time-Date Screen which will show the new time entry. If an error is made while entering a digit, press the *CLR* key to delete the entire entry and beginning again.

3.6.5.3.2 Date

To change the date, press 2 while viewing the Time-Date Screen. The following screen will be displayed:



```

ENTER DATE
MONTH DAY YEAR
04-07-2001
  
```

Date Screen

A flashing cursor is located toward the top left of the display. Below the cursor is the current date. To change the date, enter the two-digit month followed by the two-digit day and then the two-digit year (01 for 2001, 02 for 2002, etc.). The cursor will move one position to the right each time a digit is entered. After the last year digit is entered, the display will return to the Time-Date Screen which will show the new date entry. If an error is made while entering a digit, press the *CLR* key to delete the entire entry and beginning again.

3.6.5.3.3 Clock Format

The clock can be configured to display 12 hour (AM & PM) or 24 hour (military) time. Pressing 3 while viewing the Time-Date screen will cause the display to toggle between 12HR and 24HR. Select 12HR for 12 hour display or 24HR for 24 hour display.

Note: If the clock is changed to 24 hour (military) format, the date will change to the European standard of Day-Month-Year (for display purposes only).

```

TIME AND DATE
1=DAYLIGHT SAVINGS
  
```

Time & Date Screen #2

3.6.5.3.4 Daylight Savings Time

Pressing 1 while viewing Time-Date Screen #2 will cause the following screens to be displayed:



```

DAYLIGHT SAVINGS
1=ENABLED YES
2=START MONTH APR
3=START WEEK WEEK-1
  
```

Daylight Savings Screen #1



```

DAYLIGHT SAVINGS
1=END MONTH OCT
2=END WEEK LAST-W
  
```

Daylight Savings Screen #2

Pressing 1 while viewing Daylight Savings Screen #1 will cause the display to toggle between *Enabled Yes* and *Enabled No*. The control panel will automatically update the time for daylight savings time when *Enabled Yes* is selected.

Pressing 2 while viewing Daylight Savings Screen #1 will display another screen which allows the programmer to select the month that daylight savings time will begin. In this sub-screen, pressing 1 will select March, 2 will select April and 3 will select May.

Pressing 3 while viewing Daylight Savings Screen #1 will display two sub-screens which allow the programmer to select the week of the month that daylight savings time will begin. In the first sub-screen, pressing 1 will select the first week, 2 will select the second week and 3 will select the third week, while in the second sub-screen, pressing 1 will select the fourth week and 2 will select the last week of the selected month.

Pressing 1 while viewing Daylight Savings Screen #2 will display another screen which allows the programmer to select the month that daylight savings time will end. In this sub-screen, pressing 1 will select September, 2 will select October and 3 will select November.

Pressing 2 while viewing Daylight Savings Screen #2 will display two sub-screens which allow the programmer to select the week of the month that daylight savings time will end. In the first sub-screen, pressing 1 will select the first week, 2 will select the second week and 3 will select the third week, while in the second sub-screen, pressing 4 will select the fourth week and 5 will select the last week of the selected month.

SYSTEM SETUP
1=TIMERS
2=NAC
3=RELAYS

System Setup Screen #2

3.6.5.4 Timers

Timer delays for PAS, Pre-signal and waterflow activation can be programmed by pressing 1 while viewing System Setup Screen #2. The following screen will be displayed:

TIMERS		↓
1=PAS DELAY	000	
2=PRE SIGNAL	000	
3=WATERFLOW	000	

Timer Screen #1

TIMERS		↑
1=AC LOSS DELAY	000	

Timer Screen #2

TIMERS	
1=PAS DELAY	000
2=PRE SIGNAL	000
3=WATERFLOW	000

Timer Screen #1

3.6.5.4.1 PAS (Positive Alarm Sequence) Delay

The factory default setting for PAS is 000 for no delay. To select a PAS delay of 001 to 180 seconds for all devices programmed for PAS, press 1 while viewing Timer Screen #1. The following display will appear:

PAS DELAY
RANGE 0-180 SECONDS
█

PAS Delay Screen

A flashing cursor is positioned in the lower left corner of the display. Enter a delay time consisting of three digits, such as 005 for five seconds. Upon entering the third digit, the time delay will be stored in the control panel memory and the display will return to the Delay Screen which will indicate the new delay time.

3.6.5.4.2 Pre-signal Delay

The factory default setting for Pre-signal delay is 000 for no delay. To select a Pre-signal delay of 001 to 180 seconds for all devices programmed for Pre-signal, press 2 while viewing Timer Screen #1. The following screen will be displayed:



Pre-signal Delay Screen

A flashing cursor is positioned in the lower left corner of the display. Enter a delay time consisting of three digits, such as 009 for nine seconds. Upon entering the third digit, the time delay will be stored in the control panel memory and the display will return to the Delay Screen which will indicate the new delay time.

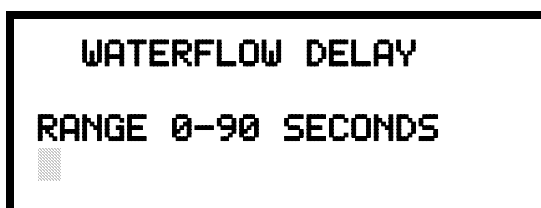
Note that the FACP can be programmed for either PAS or Pre-signal operation, not both. For this reason, if the PAS Delay timer is set with a value greater than 000 and then the Pre-Signal Delay timer is set with a value greater than 000, the PAS Delay timer will be automatically reset to 000. Only one of the two timers can have a delay time set for it.

TIMER		
1=PAS DELAY		000
2=PRE SIGNAL		000
3=WATERFLOW		000

Timer Screen #1

3.6.5.4.3 Waterflow Delay

A delay can be added prior to declaring a waterflow type of alarm. Be careful to include any built-in delays of the waterflow device. The factory default setting for Waterflow delay is 000 for no delay. To select a Waterflow delay of 01 to 90 seconds for all devices programmed for Waterflow delay, press 3 while viewing Timer Screen #1. The following screen will be displayed:



Waterflow Delay Screen

A flashing cursor is positioned in the lower left corner of the display. Enter a delay time consisting of two digits, such as 25 for twenty-five seconds. Upon entering the second digit, the time delay will be stored in the control panel memory and the display will return to the Delay Screen which will indicate the new delay time.

TIMER
1=AC LOSS DELAY

Timer Screen #2

3.6.5.4.4 AC Loss Delay

The reporting of a loss of AC power to a central station can be delayed by programming the length of the desired delay. Press *1* while viewing Timer Screen #2 to display the following:

AC LOSS DELAY
1=NO DELAY
2=ENTER DELAY

AC Loss Delay Screen #1

Pressing *1* while viewing AC Loss Delay Screen #1 will program the FACP to transmit an AC Loss report immediately to the central station.

Pressing *2* while viewing AC Loss Delay Screen #1 will display the following screen:

AC LOSS DELAY
RANGE 00-23

AC Loss Delay Screen #2

A flashing cursor will appear in the lower left corner of the display. Type the two digit AC loss reporting delay in hours (00 to 23 hour delay). When the second digit is entered, the display will return to AC Loss Delay Screen #1.

Note: For Central Station applications, AC Loss Reporting Delay must be set to a delay value ranging from 06 to 12 hours. For Remote Station applications, AC Loss Reporting Delay must be set to a delay value ranging from 15 to 23 hours.

SYSTEM SETUP
1=TIMERS
2=NAC
3=RELAYS

System Setup Screen #2

3.6.5.5 NAC (Notification Appliance Circuit)

The options for the NACs on the control panel main circuit board can be set by pressing *2* while viewing System Setup Screen #2. The following screens will be displayed:

NACS
1=NAC 1 3=NAC 3
2=NAC 2 4=NAC 4

NAC Selection Screen

The Notification Appliance Circuits can be configured independently by pressing *1* for NAC 1, *2* for NAC 2, *3* for NAC 3 or *4* for NAC 4.

Note that 3=NAC 3 and 4=NAC 4 will only be displayed if the NACKEY NAC option card is installed, in JP8 of the main circuit board, for Class B operation.

The following screens will be displayed for either selection:

NAC #		
1=ENABLED		YES
2=TYPE		BELL
3=SILENCEABLE		YES

NAC Screen #1

NAC #		
1=AUTO SILENCE		00
2=CODING		TEMPORAL

NAC Screen #2

NAC #		
1=ZONE		
	00 00 00 00 00	
2=SIL INHIBITED		NO

NAC Screen #3

NAC #		
1=SYNC TYPE		S

NAC Screen #4

3.6.5.5.1 Enabled

Pressing *1* while viewing NAC Screen #1 will cause the display to change to *Enabled No*. This will prevent the selected main circuit board NAC from activating its devices. Each press of the *1* key will cause the display to toggle between *Enabled Yes* and *Enabled No*.

NAC # 1=ENABLED 2=TYPE 3=SILENCEABLE

NAC Screen #1

3.6.5.5.2 Type

The main circuit board NAC type can be programmed by pressing 2 while viewing NAC Screen #1. The following screens will be displayed:

NAC TYPE 1=BELL 2=HORN 3=STROBE
--

Type Screen #1

NAC TYPE 1=SYNCED STROBE 2=FUTURE 3=FUTURE

Type Screen #2

NAC TYPE 1=FUTURE 2=SIREN CIRCUIT 3=BLANK
--

Type Screen #3

Select the NAC device type by pressing the number corresponding to the type in the appropriate screen as shown above. When the selection is made, the display will return to NAC Screen #1.

The following table contains NAC type codes and their functions:

NAC Type Code	Special Function
Bell	None
Horn	None
Strobe	None
Synced Strobe	Synchronized to manufacturer
Future	None
Future	None
Future	None
Siren Circuit	None
Blank	None

3.6.5.5.3 Silenceable

Pressing 3 while viewing NAC Screen #1 will cause the display to change to *Silenceable No.* This will prevent the selected main circuit board NAC from being silenced by pressing the Alarm Silence key or by the Auto Silence feature. Each press of the 3 key will cause the display to toggle between *Silenceable Yes* and *Silenceable No.*

Important: When a Notification Appliance Circuit with a mix of audible and visual devices is programmed for silenceable and the synchronization feature is selected, only the audible devices will be turned off if the Silence key is pressed. The visual devices (strobes, etc.) will continue to operate.

NAC # 1=AUTO SILENCE 2=CODING TEMPORAL

NAC Screen #2

3.6.5.5.4 Auto Silence

The Auto Silence feature, when enabled, automatically silences all main circuit board silenceable notification appliances after a programmed length of time. To enable this feature and program the time delay before Auto Silence activation, press *1* while viewing NAC Screen #2. The following screens will be displayed:

AUTO SILENCE 1=NO 2=5 MINUTES 3=10 MINUTES	↓
---	---

Auto Silence Screen #1

AUTO SILENCE 1=15 MINUTES 2=20 MINUTES 3=25 MINUTES	↕
--	---

Auto Silence Screen #2

AUTO SILENCE 1=30 MINUTES	↑
--	---

Auto Silence Screen #3

To disable the Auto Silence feature, press *1* for *No* while viewing Auto Silence Screen #1. To enable the Auto Silence feature, press the number corresponding to the time delay which will elapse before Auto Silence activates. When a time delay is selected, the information will be stored in memory and the display will return to NAC Screen #2.

3.6.5.5.5 Coding

The Coding feature allows the programmer to select the type of output that the main circuit board notification appliances will generate when activated. Pressing *2* while viewing NAC Screen #2 will cause the following displays to appear:

CODING 1=STEADY 2=MARCH TIME 3=CALIFORNIA	↓
--	---

Coding Screen #1

CODING 1=TEMPORAL 2=TWO STAGE	↑
--	---

Coding Screen #2

The programmer can select the notification appliance output by pressing the number corresponding to the desired output. The coding selections are:

- Steady - a continuous output with no coding
- March Time - 120 ppm (pulse-per-minute) output
- California - 10 seconds on and 5 seconds off
- Temporal - ½ second on, ½ second off, ½ second on, ½ second off, ½ second on, 1½ second off
- Two Stage - refer to "Two Stage Operation" on page 91 for description

Selection of one of the above options will cause the control panel to store the information in memory and return the display to NAC Screen #2, which will display the new coding choice.

3.6.5.5.1 Two Stage Operation

Two Stage operation consists of the following:

- 1st stage output - 20 ppm (pulse-per-minute) coding
- 2nd stage output - Temporal coding as described above

If Two Stage operation is programmed as the Coding option, the following sequence of events will occur during an alarm.

1. The on-board NACs which are programmed to General Alarm Zone 0 will activate with a 1st stage output upon activation of any alarm point
2. If the activated alarm point is directly mapped to a zone which is programmed to an on-board NAC, that NAC will go directly to 2nd stage coding output. All other NACs not directly mapped to the activated alarm point's zone but assigned to Zone 0 will activate with a 1st stage output
3. If, after the programmed time of 3 or 5 minutes, the Acknowledge switch has not been pressed, all NACs presently in 1st stage activation will go to 2nd stage activation
4. If an Acknowledge switch has been pressed, any NACs currently in 1st stage activation will remain in 1st stage. Pressing the Acknowledge switch does not affect NACs already in 2nd stage activation
5. If another alarm point is activated and the countdown timer is counting, the alarm point will have no effect on the NACs unless the alarm point's zones are directly mapped to one of the NACs, in which case it will follow the procedure outlined in step 2
6. If another alarm point is activated and the countdown timer has stopped counting due to the Acknowledge switch being pressed, the countdown timer will restart and the NACs will respond as outlined in step 2. NACs already in 2nd stage activation will not be affected
7. Any control modules assigned to special Zone 99 will be activated either by direct mapping of an input device programmed to Zone 99 or if the timer counts down to zero
8. Control modules that are programmed to the same zone as the activated input device will not be delayed for activation

```

NAC #
1=ZONE
  00 00 00 00 00
2=SIL INHIBITED NO

```

NAC Screen #3

3.6.5.5.6 Zone

A maximum of five zones can be programmed to each main circuit board NAC. Pressing *1* while viewing NAC Screen #3 displays the following screen:

```

ZONE ASSIGNMENT
Z00 Z** Z** Z** Z**

```

Zone Screen

Note that *Z*** represents the Zone Number(s) corresponding to the selected NAC. The factory default for an unprogrammed device is *Z00* for general alarm zone. A flashing cursor will appear on the first *0* to the left. Enter the two digit number corresponding to the zone that is to be assigned to this NAC. The cursor moves to the next *Z*** designation. Continue entering zone assignments or the remaining zones can be left blank or programmed as general alarm zone *Z00*. When all desired changes have been made, press the Enter key to store the zone assignments. The display will return to the NAC Screen #3 which will show the zone assignments just entered.

3.6.5.5.7 Silence Inhibited

The Silence Inhibit feature, when enabled, prevents the silencing of the selected main circuit board NAC for a period of one minute. Pressing *2* while viewing NAC Screen #3 will cause the display to change from the factory default of *Silence Inhibit No* to *Silence Inhibit Yes*. Each press of the *2* key will cause the display to toggle between the two options.

```

NAC #
1=SYNC TYPE

```

NAC Screen #4

3.6.5.5.8 Synced Type

If synchronized strobes were selected as the Type of device installed, the type of synchronization must be selected in this option. Pressing *1* while viewing NAC Screen #4 will cause the following screen to be displayed:

```

NAC SYNC TYPE
1=SYSTEM SENSOR
2=WHEELOCK
3=GENTEX

```

Pressing *1* while viewing this screen will select System Sensor synchronization, *2* will select Wheelock and *3* will select Gentex.

```

SYSTEM SETUP
1=TIMERS
2=NAC
3=RELAYS
System Setup Screen #2

```

3.6.5.6 Relays

Pressing 3 while viewing System Setup Screen #2 will allow the programmer to configure two of the three main circuit board Form-C relays. The following screen will be displayed:

```

RELAYS
1=RELAY 1
2=RELAY 2
3=RELAY 3

```

Relays Selection Screen

To program Relay 1 or Relay 3, press the number corresponding to the selected relay. Note that Relay 2 is fixed as a Trouble relay. Selecting Relay 2 will have no effect on its programming. The following screen will appear for each relay to be programmed:

```

RELAY #
1=TYPE
ALARM

```

Relay Type Screen

Pressing 1 for Type while viewing the Relay Screen will cause the following screens to be displayed:

```

RELAY
1=ALARM
2=SUPERVISORY
3=SUPERVISORY AR

```

Relay Screen #1

```

RELAY
1=PROCMON AR
2=AC LOSS
3=HAZARD

```

Relay Screen #3

```

RELAY
1=TROUBLE
2=COMM FAIL
3=PROCESS MON

```

Relay Screen #2

```

RELAY
1=MEDICAL

```

Relay Screen #4

While viewing the selected screen, press the number corresponding to the desired relay type to program the main circuit board relay. The choice will be stored in memory and the display will return to the Relay Type Screen which will show the programmed type choice. Press the Escape key to return to the Relays Selection Screen and repeat the preceding procedure for the remaining relays.

Note: *AR* in *SUPERVISORY AR* and *PROCMON AR* indicates AutoResettable which means that the relay will not latch when either of these conditions occur. If the corresponding condition is cleared, the relay will return to its normal state without the necessity of resetting the control panel.

```
SYSTEM SETUP
1=CANADIAN OPT. OFF
2=WATERFLOW SIL. NO
```

System Setup Screen #3

3.6.5.7 Canadian Option

Pressing 1 while viewing System Setup Screen #3 will allow the programmer to configure the system to automatically monitor addressable ionization smoke detector sensitivity using Canadian specifications. The display will change to *Canadian Opt. On*. Each press of the 1 key will cause the display to toggle between *Canadian Opt. On* and *Canadian Opt. Off*:

```
SYSTEM SETUP
1=CANADIAN OPT. OFF
2=WATERFLOW SIL. NO
```

Relays Selection Screen

3.6.5.8 Waterflow Silenceable

Pressing 2 while viewing System Setup Screen #3 will allow the programmer to configure the system for silenceable on nonsilenceable waterflow circuits. Each press of the 2 key will toggle the display between *Waterflow Sil. No* and *Waterflow Sil. Yes*. When *Waterflow Sil. No* is selected, all output devices associated with a waterflow type input device, will be nonsilenceable. When *Waterflow Sil. Yes* is selected, all output devices associated with a waterflow type input device, will be silenceable.

3.6.6 Verify Loops

```
PROGRAMMING
1=LOOP SETUP
2=SYSTEM SETUP
3=VERIFY LOOPS
```

Programming Screen #2

Pressing 3 while viewing Programming Screen #2, will select the Verify Loops option and display the following screen:

```
VERIFY LOOPS
1=LOOP 1
2=LOOP 2
3=BOTH LOOPS
```

Verify Loop Select Screen

During loop verification, the FACP polls each device on the selected SLC to determine if the device is communicating and whether or not it responds with the proper type identification. The programmer can choose to verify one or both loops by pressing the number corresponding to the choices shown above. When the selection is made, the following screen will be displayed while verification is in progress:

```
VERIFYING LOOPS
PLEASE WAIT
```

Verification Progress Screen

When Loop verification has been completed, the display will indicate that the system is OK or, if problems have been detected, any device type programming errors. Use the up and down arrow keys to view all detected errors.

3.6.7 History

```
PROGRAMMING
1=HISTORY
2=WALKTEST
3=OPTION MODULES
```

Programming Screen #3

The History option allows an authorized user to view or erase events which have occurred in the control panel. Pressing *1* while viewing Programming Screen #3 will display the History options as shown in the following display:

```
HISTORY
1=VIEW EVENTS
2=ERASE HISTORY
```

History Screen

```
HISTORY
1=VIEW EVENTS
2=ERASE HISTORY
```

History Screen

3.6.7.1 View Events

Pressing *1* while viewing the History Screen will allow the user to select the events to be viewed as illustrated in the following:

```
HISTORY
1=VIEW ALL
2=VIEW ALARMS
3=VIEW OTHER EVENTS
```

View Events Screen

While displaying the View Events screen, press *1* to view all events, *2* to view only alarms or *3* to view other events. Use the up and down arrow keys to scroll through all of the displayed events.

3.6.7.2 Erase History

The Erase History option allows a user to erase all events from the history file. This will provide a clean slate in order to use the history file to track future events.

Pressing *2* while viewing the History Screen will cause the following screen to be displayed:

```
ERASE HISTORY
PROCEED ?
1=YES          2=NO
```

Erase History Screen

Pressing *1* while viewing the Erase History Screen will erase all events from the History file. During this process, the display will read as follows:

```
ERASING HISTORY
PLEASE WAIT
```

Erase History Wait Screen

After the History file has been erased, the display will return to the History Screen.

3.6.8 Walktest

PROGRAMMING
1=HISTORY
2=WALKTEST
3=OPTION MODULES

Programming Screen #3

Walktest allows an individual to test the fire alarm system without the necessity to reset the control panel after each device activation. Pressing 2 while viewing the Programming Screen #3 will cause the following Walktest options to be displayed:

WALKTEST
1=SILENT
2=AUDIBLE
3=VIEW RESULT

Walktest Screen

To perform a silent walktest which will not sound the NACs, press 1 while viewing the Walktest Screen. To perform an audible walktest, which will sound the NACs, press 2 while viewing the Walktest Screen. When either option is chosen, the panel will enter Walktest Mode and the following screen will be displayed:

UNIT IN WALKTEST

Walktest Active Screen

The user can now perform a one-person walktest by activating devices throughout the system. As each device is activated, the screen will display the information about the activated device as shown below. Note that the colon in the time is replaced with an asterisk to distinguish the walktest screen from an actual alarm screen.

ALARM PULL STATION
<ADJ> <NOUN>
2000
10*00A 010801 1M001

After completion of the Walktest, press the *Esc* (Escape) key to exit Walktest Mode and return to the Walktest Screen. The results of the Walktest can now be viewed by pressing 3 while viewing the Walktest Screen. The following screen will be displayed:

WALKTEST RESULTS

View Result Screen

Use the up and down arrow keys to view all of the walktest results which will be displayed as illustrated in the preceding screen. Note that the Walktest log is stored in RAM. If all power (AC and DC) is removed from the FACP, the Walktest log information will be lost. This information is also overwritten when subsequent walktests are performed.

3.6.9 Option Modules

PROGRAMMING
1=HISTORY
2=WALKTEST
3=OPTION MODULES

Programming Screen #3

Options available for the MS-9600 include ACM Series, Graphic and LCD annunciators, UDACT-F Digital Alarm Communicator/Transmitter, printer connection for acquiring hardcopy printouts of panel data and PC (Personal Computer) connection for uploading and downloading panel data.

Pressing 3 while viewing Programming Screen #3 will display the following screen:

```

OPTION MODULES
1=ANNUNCIATORS/UDACT
2=ONBOARD DACT
3=PRINTER/PC  PR4800
  
```

Options Screen

Note that *PR4800* in the display indicates that a supervised printer, configured for 4800 baud, has been previously programmed into the system.

3.6.9.1 Annunciators/UDACT

Pressing 1 while viewing the Options Screen will cause the control panel to display the following screens:

```

ANNUNCIATORS
1=TERM ENABLED  YES
2=ACS ENABLED   YES
3=UDACT         YES
  
```

Annunciator Screen #1

```

ANNUNCIATORS
1=ACS INSTALLED
2=FUTURE USE
  
```

Annunciator Screen #2

A Terminal Mode annunciator¹, ACS Mode annunciator and remote UDACT can be installed in the MS-9600 system. To enable any of these devices, press the number corresponding to the selected device shown in Annunciator Screen #1 so that *Yes* appears in the display to the right of the device. Each press of the corresponding number key will cause the display to toggle between *Enabled Yes* and *Enabled No*.

Note:

1. The LCD-80F is a Terminal Mode annunciator. To enable the MS-9600 for LCD-80F operation, program *Term Enabled* to *Yes*.

If an ACS annunciator is installed, press *1* while viewing Annunciator Screen #2 to select addresses for the ACS annunciators. The following screen will be displayed:

ANNUNCIATORS		
1=ADDRESS 1	YES	
2=ADDRESS 2	NO	
3=ADDRESS 3	NO	

ACS Installed Screen

Pressing the down arrow key will allow the programmer to view additional screens displaying Addresses 1 -31. To select one or more addresses for the installed ACS annunciator(s), press the number key corresponding to the address in each screen. The display for the selected address will change from *No* to *Yes*. Each press of the number key will cause the display to toggle between *No* and *Yes*.

OPTION MODULES	
1=ANNUNCIATORS/UDACT	
2=ON BOARD DACT	
3=PRINTER/PC	NO

Option Module Screen

3.6.9.2 On Board DACT

The Onboard DACT (Digital Alarm Communicator/Transmitter) provides communication to a Central Station. Pressing 2 while viewing the Option Module Screen will allow programming of the Onboard DACT. Refer to the DACT-UD Installation and Programming Manual Document #51889 for detailed information on installing and programming this option.

3.6.9.3 Printer/PC

A Printer or a PC can be connected to the control panel. Pressing 3 while viewing the Option Module Screen will cause the following screen to appear:

PRINTER-PC		
1=PRINTER NO SU	NO	
2=PRINTER SU	YES	
3=PC	NO	

Printer-PC Screen

Pressing *1* while viewing the Printer-PC Screen will program the control panel for an unsupervised (*NO SU*) printer. The display will change to the Printer Baud Rate Screen as shown below.

Pressing *2* while viewing the Printer-PC Screen will program the control panel for a supervised (*SU*) printer. Printer supervision, when enabled, will typically detect the removal of the printer cable and will detect when the printer power has been turned off. Depending upon the brand of printer, other errors such as paper empty or printer off-line may be detected.

Enabling either printer option will cause the following screen to appear, which allows the programmer to select the baud rate for the printer communication:

PRINTER BAUD RATE	
1=2400 BAUD	
2=4800 BAUD	
3=9600 BAUD	

Printer Baud Rate Screen

Pressing the number key corresponding to the desired baud rate (2 for 4800 Baud for example) will program the control panel for the selected baud rate and return the display to the Option Module Screen which will indicate *Printer/PC PR4800* for a supervised printer installed at 4800 baud rate.

Pressing 3 while viewing the Printer-PC Screen will program the control panel for a PC connection. The display will return to the Option Module Screen which will indicate *Printer/PC PC* for personal computer installed.

3.6.10 Password Change

PROGRAMMING
1=PASSWORD CHANGE
2=CLEAR PROGRAM
3=PROGRAM CHECK

Programming Screen #4

The factory set passwords, which have been programmed into the control panel, can be changed by selecting the Password Change option. Pressing 1 while viewing Programming Screen #4 will cause the following screen to be displayed:

PASSWORD CHANGE
1=MASTER
2=MAINTENANCE

Password Change Screen

Press 1 to change the Master Programming Level password or 2 to change the Maintenance Level password. *Note that the passwords will not be displayed on LCD-80F annunciators.*

The following screen will appear when either change option is selected:

ENTER NEW FIVE DIGIT
PASSWORD

Enter Password Screen

A flashing cursor will appear in the center of the display. Enter a new five digit password (such as 10101 for the Master Level). After the fifth digit is entered, the following screen will be displayed:

NEW MASTER
PASSWORD IS 10101
PRESS ENTER IF OK

Password Change Screen

Pressing the *Enter* key will program the new password into the control panel and return the display to the Password Change Screen.

3.6.11 Clear Program

PROGRAMMING
1=PASSWORD CHANGE
2=CLEAR PROGRAM
3=PROGRAM CHECK

Programming Screen #4

Pressing 2 while viewing Programming Screen #4, will select the Clear Program option. This will cause the LCD to display the following screens:

CLEAR PROGRAM
1=WHOLE SYSTEM
2=ALL LOOPS
3=LOOP1

Clear Program Screen #1

CLEAR PROGRAM
1=LOOP2

Clear Program Screen #2



See Page

Pressing 1, for Whole System while viewing the Clear Program Screen #1, will clear all general system programming options and all programmed addressable devices from the nonvolatile memory of the FACP. *This function is useful when the control panel is first installed, prior to autoprogramming. Note that it is necessary to autoprogram after using the Clear Whole System function.*

Pressing 2, for All Loops while viewing the Clear Program Screen #1, will clear all programming related to all SLC loops and connected addressable devices.

Pressing 3, for Loop 1 while viewing the Clear Program Screen #1, will clear only the programming related to SLC Loop 1 and the connected addressable devices.

Pressing 1, for Loop 2 while viewing the Clear Program Screen #2, will clear only the programming related to SLC Loop 2 and the connected addressable devices.

Before executing any of the Clear commands listed above, the control panel will provide a warning to the user by prompting with the following display:

WARNING!
SYSTEM CHANGE
PROCEED?
1=YES **2=NO**

Pressing 1 will cause the control panel to carry out the selected clear option. Pressing 2 will prevent programming from being cleared.

3.6.12 Program Check

PROGRAMMING
1=PASSWORD CHANGE
2=CLEAR PROGRAM
3=PROGRAM CHECK

Programming Screen #4

The Program Check feature allows the programmer to view the zones which have been programmed to the Notification Appliance Circuits on the control panel but have not been programmed to Initiating Devices as well as other circuits with no input or output correlations. Pressing 3 while viewing Programming Screen #4 will cause the following screen to be displayed:

PROGRAM CHECK
1=NACS NO INPUT
2=ZONES NO INPUT
3=ZONES NO OUTPUT

PROGRAM CHECK
1=NACS NO INPUT
2=ZONES NO INPUT
3=ZONES NO OUTPUT

Program Check Screen

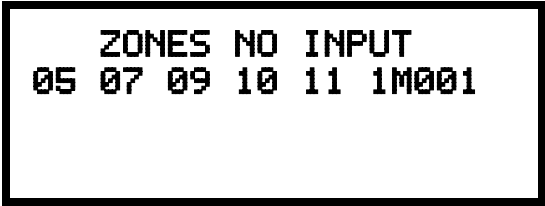
Pressing 1 while viewing the Program Check screen will display an NAC screen similar to the following.

NACS NO INPUT
NAC 1
25 31 44 55 67

The example above indicates that NAC 1 has been programmed to Zones 25, 31, 44, 55 and 67 but no input devices have been programmed to any of these zones. Use the up and down arrow keys to view all the NAC zones without input assignments for NAC 1, NAC 2, NAC 3 and NAC 4.

Note: If the NACs have been configured for Class A in the Setup option, only NAC1 and NAC2 will display test information. NAC 3 and NAC 4 will display asterisks () and will not be included in the test.*

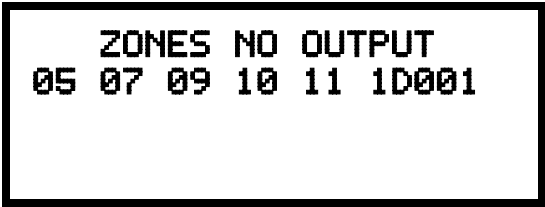
Pressing 2 while viewing the Program Check screen will display a screen similar to the following:



A screenshot of a screen titled "ZONES NO INPUT". Below the title, the text "05 07 09 10 11 1M001" is displayed. The screen is enclosed in a black rectangular border.

The Zone No Input screen allows the programmer to view the zones which have not been programmed to at least one input device (not including general alarm Zone 00). The example in the preceding screen indicates that Zones 05, 07, 09, 10 and 11 have been programmed to an addressable module (control module in this example) with an address of 001 on loop 1 but have not been programmed to any input devices. Use the up and down arrow keys to view all the zones without input assignments.

Pressing 3 while viewing Program Check screen will cause a screen similar to the following to be displayed:



A screenshot of a screen titled "ZONES NO OUTPUT". Below the title, the text "05 07 09 10 11 1D001" is displayed. The screen is enclosed in a black rectangular border.

The Zone No Output feature allows the programmer to view the zones which have not been programmed to at least one output device (not including general alarm Zone 00). The example in the preceding screen indicates that Zones 05, 07, 09, 10 and 11 have been programmed to an addressable detector with an address of 001 on loop 1 but have not been programmed to any output devices. Use the up and down arrow keys to view all the zones without output assignments.

3.7 Maintenance Programming Level

To access Maintenance Programming mode, press the *Enter* key. The LCD will display the following:



```
1=READ STATUS
2=PROGRAMMING
```

To enter the Maintenance Programming mode, press 2. The display will read as follows:



```
PROGRAMMING
ENTER PASSWORD
```

When the Maintenance level password (default *1111*) is entered, the following screen will appear:



```
PROGRAMMING
1=POINT PROGRAM
2=HISTORY
3=PROGRAM CHECK
```

Note that in the preceding screens, an arrow appears to inform the programmer that additional options can be viewed by pressing the keypad *down* arrow key, as shown in the following screen.



```
PROGRAMMING
1=WALKTEST
2=SYSTEM
3=ZONE SETUP
```

3.7.1 Disable Point

PROGRAMMING
1=POINT PROGRAM
2=HISTORY
3=PROGRAM CHECK

Maintenance Screen #1

Pressing *1* for Point Program, while viewing Maintenance Screen #1 will cause the following screens to be displayed:

POINT PROGRAM
1=LOOP 1
2=LOOP 2

Loop Select Screen

Select the Loop, containing the device to be disabled, by pressing *1* for Loop 1 or 2 for Loop 2. A screen will then be displayed, allowing the operator to select the type of addressable device to be disabled as shown in the following display:

POINT PROGRAM
1=DETECTOR
2=MODULE

Device Select Screen

Select the device type by pressing *1* for an addressable detector or 2 for an addressable module. The operator will be prompted to enter the three digit device address as shown in the following example for a detector:

EDIT DETECTOR
ENTER POINT ADDRESS

Address Select Screen

A flashing cursor will appear in the bottom left corner of the display, prompting for the three digit device address. When the third digit is enter, *001* for example, a screen will appear which will allow enabling or disabling of the selected point, as illustrated in the following example:

EDIT DETECTOR 10001
1=ENABLED YES

Enable/Disable Select Screen

Pressing *1* repeatedly will cause the display to toggle between *Enabled Yes* and *Enabled No*.

3.7.2 History

PROGRAMMING
1=POINT PROGRAM
2=HISTORY
3=PROGRAM CHECK

Maintenance Screen #1

Pressing 2 while viewing Maintenance Screen #1 will cause the following screen to be displayed:

HISTORY
1=VIEW EVENTS
2=ERASE HISTORY

History Screen

The History feature allows the operator to view control panel events which have been stored in a history file in memory and erase the contents of the history file

Pressing 1 while viewing the History screen will cause the following screen to be displayed:

HISTORY
1=VIEW ALL
2=VIEW ALARMS
3=VIEW OTHER EVENTS

Events Screen

To view all the events which have occurred in the control panel since the history file was last erased, press 1 while viewing the Events screen. To view only alarms which have occurred, press 2 while viewing the Events screen. To view events other than alarms, press 3. The most recent event will be displayed on the screen. To view all of the selected events, press the up or down arrow keys to scroll through the list of events. If no events have occurred, the display will read *NO EVENTS IN HISTORY*.

Pressing 2 while viewing the History Screen will cause the following screen to be displayed:

ERASE HISTORY
PROCEED ?
1=YES **2=NO**

Erase History Screen

Pressing 1 while viewing the Erase History Screen will cause the message *ERASING HISTORY, PLEASE WAIT* to be displayed. The display will then return to the History Screen. Pressing 2 will cause the display to return to the History Screen without erasing the History file.

3.7.3 Program Check

PROGRAMMING
1=POINT PROGRAM
2=HISTORY
3=PROGRAM CHECK

Maintenance Screen #1

Pressing 3 while viewing Maintenance Screen #1 will cause the following screen to be displayed:

PROGRAM CHECK
1=NACS NO INPUT
2=ZONES NO INPUT
3=ZONE NO OUTPUT

Program Check Screen

The Program Check feature allows the programmer to view the zones which have been programmed to the Notification Appliance Circuits on the control panel but have not been programmed to Initiating Devices as well as other circuits with no input or output correlations. Pressing 1 while viewing Program Check screen will cause a screen similar to the following to be displayed.

NACS NO INPUT
NAC 1
25 31 44 55 67

The example above indicates that NAC 1 has been programmed to Zones 25, 31, 44, 55 and 67 but no input devices have been programmed to any of these zones. Use the up and down arrow keys to view all the NAC zones without input assignments for NAC1, NAC2, NAC3 and NAC4.

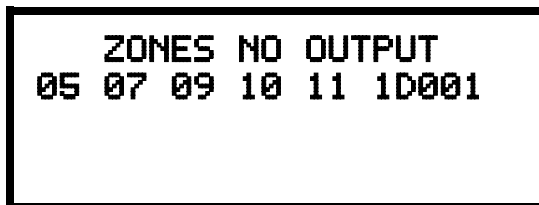
Note: If the NACs have been configured for Class A in the Setup option, only NAC1 and NAC2 will display test information. NAC 3 and NAC 4 will display asterisks () and will not be included in the test.*

Pressing 2 while viewing the Program Check screen will display a screen similar to the following:

ZONES NO INPUT
05 07 09 10 11 1M001

The Zone No Input screen allows the programmer to view the zones which have not been programmed to at least one input device (not including general alarm Zone 00). The example in the preceding screen indicates that Zones 05, 07, 09, 10 and 11 have been programmed to an addressable module (control module in this example) with an address of 001 on loop 1 but have not been programmed to any input devices. Use the up and down arrow keys to view all the zones without input assignments.

Pressing 3 while viewing Program Check screen will cause a screen similar to the following to be displayed:



ZONES NO OUTPUT
05 07 09 10 11 1D001

The Zone No Output feature allows the programmer to view the zones which have not been programmed to at least one output device (not including general alarm Zone 00). The example in the preceding screen indicates that Zones 05, 07, 09, 10 and 11 have been programmed to an addressable detector with an address of 001 on loop 1 but have not been programmed to any output devices. Use the up and down arrow keys to view all the zones without output assignments.

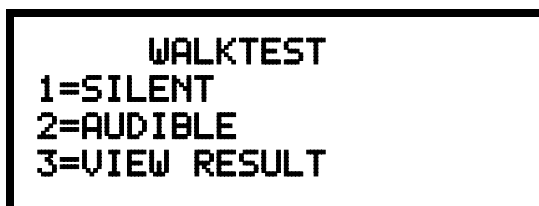
3.7.4 Walktest



PROGRAMMING
1=WALKTEST
2=SYSTEM
3=ZONE SETUP

Maintenance Screen #2

To perform a walktest, press 1 while viewing Maintenance Screen #2. The following screen will be displayed:



WALKTEST
1=SILENT
2=AUDIBLE
3=VIEW RESULT

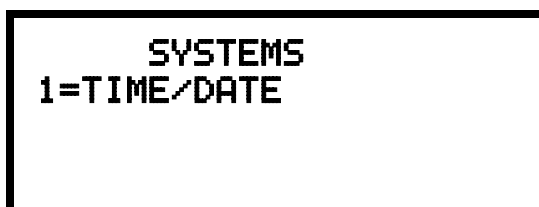
Walktest Screen

The operator can press 1 to perform a silent walktest or 2 to perform an audible walktest. The display will read *UNIT IN WALKTEST*. To end the Walktest, press the Esc (Escape) key.

Pressing 3 after the walktest has been completed, will allow the operator to view the results of the walktest.

3.7.5 System

To program the time and date into the control panel, press 2 while viewing Maintenance Screen #2. The following display will appear:



SYSTEMS
1=TIME/DATE

System Screen

Pressing *1* while viewing the System Screen will cause the following screen to be displayed:

A rectangular screen with a black border. The text is as follows:

```
TIME AND DATE
1=TIME  01:00 AM
2=DATE  01-01-2001
                12HR
```

Time and Date Screen

To change the time, press *1* to display the following screen:

A rectangular screen with a black border. The text is as follows:

```
ENTER TIME
█
01:00 AM
1=AM                2=PM
```

Time Screen

A flashing cursor will appear on the left side of the display. Enter the four digit number corresponding to the time (0000 - 1259). When the fourth digit is entered, the cursor will move one position to the right. Press *1* for AM or *2* for PM to complete entering the time. The display will return to the Time and Date Screen displaying the new time.

To change the date, press *2* while viewing the Time and Date Screen. The following screen will be displayed:

A rectangular screen with a black border. The text is as follows:

```
ENTER DATE
█
MONTH DAY YEAR
01-01-2001
```

Date Screen

A flashing cursor will appear on the left side of the display. Enter the two digit month, two digit day and four digit year. The cursor will move one position to the right after each entry. When the fourth digit of the year has been entered, the display will return to the Time and Date Screen which will show the new date.

3.7.6 Zone Setup

PROGRAMMING
1=WALKTEST
2=SYSTEM
3=ZONE SETUP

Maintenance Screen #2

Pressing 3 while viewing Maintenance Screen #2 will display the following screen:

ZONE SETUP
1=ENABLE
2=DISABLE
3=ZONE 97 98 99

Zone Setup Screen

Pressing 1 while viewing Zone Setup screen will display the following screen:

ZONE TO ENABLE
Z █

Enable Screen

A flashing cursor appears to the right of the Z. To enable a zone, enter the two digit zone number (00 - 99). After the second digit is entered, the zone will be enabled and the cursor will return to the original position. The next zone to be enabled can then be entered. Press Esc (Escape) to return to the previous screen.

Pressing 2 while viewing Zone Setup screen will display the following screen:

ZONE TO DISABLE
Z █

Disable Screen

A flashing cursor appears to the right of the Z. To disable a zone, enter the two digit zone number (00 - 99). After the second digit is entered, the zone will be disabled and the cursor will return to the original position. The next zone to be disabled can then be entered. Press Esc (Escape) to return to the previous screen.

Pressing 3 while viewing Zone Setup screen will display the following screen:

SPEC PURPOSE ZONE		
1=PAS 97		OFF
2=PRE-SIGNAL 98		OFF
3=FUTURE 99		OFF

Disable Screen

Zones 97, 98 and 99 can be programmed for normal zone operation or for special purpose applications. In the above illustration, the three zones are shown Off, which means they can be programmed to function in the same manner as all other zones, by assigning them to input and output devices in the Programming Zone Assignment Screen.

Pressing 1 will cause the display to change to *PAS 97 On*. Each press of the 1 key will cause the display to toggle between *PAS 97 On* and *PAS 97 Off*. When Zone 97 is programmed On, a PAS (Positive Alarm Sequence) activation of any device will cause Zone 97 to activate. By assigning Zone 97 to a control module in the Programming Zone Assignment Screen, an output device connected to the control module can be used to indicate a PAS condition in the control panel. *Do not assign Zone 97 to a Notification Appliance Circuit when using this zone to indicate a PAS condition.*

Pressing 2 will cause the display to change to *Pre-signal 98 On*. Each press of the 2 key will cause the display to toggle between *Pre-signal 98 On* and *Pre-signal 98 Off*. When Zone 98 is programmed On, a Pre-signal activation of any device will cause Zone 98 to activate. By assigning Zone 98 to a control module in the Programming Zone Assignment Screen, an output device connected to the control module can be used to indicate a Pre-signal condition in the control panel. *Do not assign Zone 98 to a Notification Appliance Circuit when using this zone to indicate a Pre-signal condition.*

Zone 99, in special purpose mode, is reserved for future use and has no effect.

SECTION 4 Operating Instructions

4.1 Panel Control Buttons

4.1.1 Acknowledge/Step

The first press of the *Acknowledge/Step* key silences the piezo sounder, changes flashing LEDs to steady and also changes the status field on the LCD display from capital letters to small letters. When the piezo is silenced, an *acknowledge* message is sent to the printer and the history file. Multiple active events are scrolled on the display at a three second rate. *Acknowledge* also sends a *silence piezo* command to the optional annunciators connected to the FACP.

When more than one event exists, the first press of the Acknowledge/Step key functions as described in the preceding paragraph. The second press of the key stops the scrolling and holds the event on the display for one minute. Subsequent pressing of the key *steps* through each active event.

4.1.2 Alarm Silence

The *Alarm Silence* key performs the same functions as Acknowledge/Step. In addition, if an alarm exists, it turns off all silenceable NACs (Notification Appliance Circuits) and causes the Alarm Silenced LED to turn on. It also sends an 'alarm silenced' message to the printer, history file and optional annunciators. A subsequent new alarm will resound the system NACs. *Note that the Alarm Silenced LED is turned off by pressing the Reset key, the Drill key or subsequent activation of the NACs.*

4.1.3 Drill/Hold 2 Sec

When the *Drill* key is held for a minimum of two seconds (time required to prevent accidental activations), the FACP turns on all main panel NAC outputs and all silenceable circuits such as control modules that are programmed as silenceable, and turns off the Alarm Silenced LED if it was previously on. The *EVAC IN SYSTEM* message is shown on the LCD display. The same message is sent to the printer and history file. The *Alarm Silence* key can be used to turn off all silenceable NAC outputs following activation by the *Drill* key.

4.1.4 Reset

Pressing and releasing the *Reset* key turns off all control modules and NACs, temporarily turns off resettable power to 4-wire detectors, causes a *RESET IN SYSTEM* message to be displayed on the LCD and sends the same message to the printer and history file. It also performs a lamp test by turning on all LEDs (except the Ground LED), piezo sounder and LCD display segments after the *Reset* key is released. Any alarm or trouble that exists after a reset will resound the system.

4.2 LED Indicators

The nine LED indicators, which are located on the front panel, operate as follows:

AC Power

This is a green LED which illuminates if AC power is applied to the FACP. A loss of AC power will turn off this LED

Fire Alarm

This red LED flashes when one or more alarms occur. It illuminates steady when the *Acknowledge/Step* or *Alarm Silence* key is pressed. The Fire Alarm LED turns off when the *Reset* key is pressed. The LED will remain off if all alarms have been cleared.

Supervisory

This is a yellow LED that flashes when one or more supervisory conditions occur, such as a sprinkler valve tamper condition. It illuminates steady when the *Acknowledge/Step* or *Alarm Silence* key is pressed. It turns off when the *Reset* key is pressed and remains off if all supervisory alarms have been cleared.

Trouble

This is a yellow LED that flashes when one or more trouble conditions occur. It stays on steady when the *Acknowledge/Step* or *Alarm Silence* key is pressed. The LED turns off when all trouble conditions are cleared. This LED will also illuminate if the microprocessor watchdog circuit is activated.

Maintenance

This is a yellow LED that flashes to indicate that a smoke detector requires cleaning or replacement due to an invalid chamber reading or excessive drift.

Alarm Silenced

This is a yellow LED that turns on after the *Alarm Silence* key is pressed while an alarm condition exists. It turns off when the *Drill* or *Reset* key is pressed.

Disabled

This is a yellow LED that flashes to indicate that a zone, NAC, detector or module has been temporarily disabled in programming by the user.

Battery

This is a yellow LED that flashes to indicate a low battery voltage condition.

Ground

This is a yellow LED that turns on steady to indicate a ground fault condition.

4.3 Normal Operation

With no alarms or troubles in the system, the display message is *System All Normal* along with the current time and date as shown below. To set the time and date, refer to the appropriate section in this manual.



```
FIRE-LITE ALARMS INC
SYSTEM ALL NORMAL
10:00A 010801
```

The MS-9600 performs the following functions at regular intervals while in Normal mode:

- ✓ Monitors AC input voltage and battery voltage
- ✓ Monitors and reports status of SLC loop(s), option cards and control panel
- ✓ Polls all devices on the SLC loop(s) and flashes each device LED while checking for valid replies, alarms, troubles, etc.
- ✓ Refreshes LCD display and updates time
- ✓ Scans control panel keypad for key presses
- ✓ Performs autotest for all SLC devices
- ✓ Tests memory
- ✓ Updates and reads all communications busses (EIA-485, EIA-232, etc.)

4.4 Trouble Operation

With no alarms in the system, the detection of a trouble will cause the following:

- The piezo to pulse 1 second On and 1 second Off
- The system Trouble LED to flash one second On and one second Off
- The trouble relay to activate
- *TROUBL* with device type, noun/adjective, address and trouble description will appear on the LCD display
- The same message, along with the time and date, is sent to the history buffer and optional printer.

Note that specific troubles will initiate additional actions; for example, loss of AC power will turn off the AC Power LED, a ground fault will turn on the Ground LED, etc.

Addressable Smoke Detectors, Monitor Modules and Control Modules

For addressable devices connected to the SLC loop, the following is a typical message that could appear on the LCD display for a device trouble:

```

TROUBL SMOKE (PHOTO)
      <ADJ> <NOUN>
              INVREP
10:00A 010801 1D001
  
```

The information displayed in the above example provides the following information:

- First line in display:
 - ✓ The type of event; in this example *TROUBL* indicating a device trouble
 - ✓ Device type identifier; in this example, *SMOKE (PHOTO)* indicates a Photoelectric smoke detector. Other device type identifiers which can be displayed include *SMOKE (ION)* for Ionization Detector, *HEAT* for Heat Detector, *CONTROL* for Control Module and *MONITOR* for Monitor Module, *PULL STATION* for a manual pull box, etc. Refer to "Edit Detector" on page 50, "Edit Module Screen for Monitor Module" on page 61 and "Edit Module Screen for Control Modules" on page 69 for information on additional device types.
- Second line in display:
 - ✓ <ADJ>; refers to the user programmed adjective descriptor from library list resident in the control panel or custom entry via PC.
 - ✓ <NOUN>; refers to the user programmed noun descriptor from library list resident in the control panel or custom entry via PC.
- Third line in display: *INVREP* indicates an invalid reply from the addressable device. Other possible troubles include:
 - ☐ *SHORT* - indicating a shorted circuit on an addressable device
 - ☐ *OPEN* - indicating an open circuit on an addressable device
 - ☐ *DIRTY1* - maintenance alert indicating that a detector is near but below the allowed alarm limit and is in need of maintenance before the performance is compromised
 - ☐ *DIRTY2* - maintenance alert indicating that a detector needs immediate maintenance since it has been within 80% of its alarm threshold for 24 hours
 - ☐ *INVREP* - maintenance alert indicating a hardware problem in the detector
 - ☐ *TEST F* - indicating a detector has failed the automatic test operation which functionally checks its sensing chamber and electronics
 - ☐ *INV ID* - indicating that an incorrect device code (Type ID) has been programmed for an installed device (for example, Photo has been programmed but an Ion detector has been installed)
 - ☐ *SW TBL* - indicating a module has failed the testing of its Class A switching relay
- Fourth line in display:
 - ✓ Time; the current time in this example is *10:00A* which represents 10:00 AM
 - ✓ Date; the current month, day and year in this example is *01* for January, *08* for the 8th day of the month and *01* for the year 2001
 - ✓ Device Address; *1D001* in this example *1* represents SLC Loop1, *D* represents a detector and *001* represents device address 001

Pressing the *Acknowledge/Step* or *Alarm Silence* key will cause the pulsing piezo to silence and the system Trouble LED to change from flashing to on steady. This block acknowledgment occurs regardless of the number of troubles, alarms and supervisory events active in the system. When the *Acknowledge/Step* key is pressed and at least one new alarm or trouble exists in the system, the 'acknowledge' message is sent to the printer and history file. If the trouble clears, either before or after the *Acknowledge/Step* key is pressed, the 'clear trouble' message is sent to the printer and history file.

If all troubles clear and there are no supervisory or fire conditions active in the system, the system returns to normal mode operation and the *System All Normal* message is shown on the LCD display and sent to the history and printer files. The auto-restore feature will restore cleared troubles even if the troubles were never acknowledged. Note that pressing the *Alarm Silence* key when only troubles exist in the system will have the same effect as pressing the *Acknowledge/Step* key.

If multiple trouble conditions exist in the system, they will be automatically scrolled on the LCD display at a three second rate. *If a combination of alarms, troubles and/or supervisory conditions simultaneously occur in the system, only the alarms are scrolled on the display.*

4.5 Alarm Operation

Alarm operation is similar to trouble operation with the following differences:

- The piezo sounder produces a steady output as opposed to a pulsed output
- The Fire Alarm LED flashes 1 second On and 1 second Off
- The LCD displays *Alarm* along with the device name, type, address, adjective/noun, associated zones and time/date
- Alarms latch and *are not allowed to clear automatically*
- Alarms activate software zones if so programmed
- Timers for Silence Inhibit, Autosilence and Trouble Reminder are started
- Alarms activate the general alarm relay and general alarm zone Z00
- The trouble relay is not activated
- Store event in history buffer

A typical alarm display would be as illustrated below:

```

ALARM  PULL STATION
      <ADJ> <NOUN>
                Z000
10:00A 010801 1M001
  
```

Note that the device type, which in this example is *PULL STATION*, can be any other programmable alarm type.

The information displayed in the above example provides the following information:

- First line in display:
 - ✓ The type of event; in this example *ALARM* indicating an alarm condition
 - ✓ Device type identifier; in this example, *PULL STATION* indicates a manual pull box. Other device type identifiers which can be displayed include *SMOKE (ION)* for Ionization Detector, *HEAT* for Heat Detector, *CONTROL* for Control Module and *MONITOR* for Monitor Module, *PULL STATION* for a manual pull box, etc. Refer to "Edit Detector" on page 50, "Edit Module Screen for Monitor Module" on page 61 and "Edit Module Screen for Control Modules" on page 69 for information on additional device types.

- Second line in display:
 - ✓ <ADJ>; refers to the user programmed adjective descriptor from library list resident in the control panel or custom entry via PC.
 - ✓ <NOUN>; refers to the user programmed noun descriptor from library list resident in the control panel or custom entry via PC.
- Third line in display: *Z000* indicates the zone programmed to this device which, in this example, is general alarm Zone 000. Note that a single device can be programmed to five different zones but only the first zone will be displayed.
- Fourth line in display:
 - ✓ Time; the current time in this example is *10:00A* which represents 10:00 AM
 - ✓ Date; the current month, day and year in this example is *01* for January, *08* for the 8th day of the month and *01* for the year 2001
 - ✓ Device Address; *1M001* in this example *1* represents SLC Loop1, *M* represents a module and *001* represents device address 001

4.6 Supervisory Operation

Supervisory operation is similar to alarm operation but with the following differences:

- The piezo sounder pulses ½ second On and ½ second Off
- The Supervisory LED flashes ½ second On and ½ second Off
- The LCD displays the status label *Active Supervisory* along with the device name, type, address, adjective/noun, associated zones and time/date
- The supervisory relay is activated
- The alarm relay is not activated
- Silenced alarms are not resounded
- Timers are not started
- Store event in history buffer

A typical Supervisory event would be displayed as illustrated in the following:

```

ACTIVE SUPERVISORY
      <ADJ> <NOUN>
                        Z000
10:00A 010801 1M001
  
```

Note that, like alarms, supervisory signals latch (except when programmed for supervisory autoresettable) and can be assigned to software zones. Supervisory alarms do not cause resound as do other alarm conditions. Open circuits in supervisory wiring are processed by the control panel the same way as other trouble conditions. Refer to "Alarm Operation" on page 115, for a description of the information displayed on the control panel LCD.

4.7 Process Monitor Operation

Process Monitor operation will initiate the following events:

- The piezo sounder pulses ¼ second On and ¼ second Off
- The LCD displays a process monitor message along with the device name, type, address, adjective/noun, associated zones and time/date
- Relays programmed for process monitoring will be activated
- The alarm relay is not activated
- Silenced alarms are not resounded
- Timers are not started
- Store event in history buffer

Note that, like supervisories, process monitor signals latch (except when programmed for process monitor autoresettable) and can be assigned to software zones.

4.8 Hazard Condition Operation

Hazard Condition operation will initiate the following events:

- The piezo sounder turns on steady
- The LCD displays a hazard message along with the device name, type, address, adjective/noun, associated zones and time/date
- Relays programmed for process monitoring will be activated
- The alarm relay is not activated
- Silenced alarms are not resounded
- Timers are not started
- Store event in history buffer

Hazard conditions do not latch and will therefore clear when the hazard condition is cleared. They can be assigned to software zones.

4.9 Medical Alert Condition Operation

Medical Alert Condition operation will initiate the following events:

- The piezo sounder turns on steady
- The LCD displays a medical alert message along with the device name, type, address, adjective/noun, associated zones and time/date
- Relays programmed for medical alert will be activated
- The alarm relay is not activated
- Silenced alarms are not resounded
- Timers are not started
- Store event in history buffer

Medical alert conditions do not latch and will therefore clear when the medical alert condition is cleared. They can be assigned to software zones.

4.10 Programmed Zone Operation

Each addressable detector and monitor module can be assigned to a maximum of five software alarm zones. A general alarm zone Z00 may be listed for output (control) points, but it is not necessary to list Z00 for input points, since this is the default zone for all alarm input devices. Zone Z00 is not activated by supervisory points.

When an input device alarms and is not disabled, it activates all software zones assigned to it. An output device that is not disabled is turned on when any of the software zones to which it is programmed become active.

4.11 Disable/Enable Operation

Input points which are disabled do not cause an alarm or any zone activation. Disabled output points are held in the off state. All disabled points are treated as if they were in trouble, with the exception being the status label that will be displayed is *DISABL*.

4.12 Waterflow Circuits Operation

If an alarm exists from a monitor module point that has a waterflow type code and its mapped NAC control module outputs are programmed for nonsilenceable operation, the Alarm Silence key will not function.

4.13 Detector Functions

Maintenance Alert

Each addressable detector is monitored by the control panel for its maintenance status. If a detector is near but below the allowed alarm limit, a 'maintenance alert' message will automatically be displayed, signaling that the detector is in need of servicing.

Automatic Test Operation

An automatic test of an addressable detector is performed each minute, resulting in a complete SLC loop test in approximately 5 hours (if the loop has the maximum number of devices installed). The detector's sensing chamber and electronics are functionally tested for normal, safe operation. A trouble message is displayed upon failure of this test. A System Reset will clear this trouble.

Type Code Supervision

The FACP monitors addressable hardware device codes at slow intervals. Mismatch of any type code, compared to the system program, will cause a device trouble.

System Alarm Verification

The control panel may be programmed to perform alarm verification to help eliminate the nuisance of false alarms. Alarm verification applies to smoke detectors only.

Smoke Detector Data

Smoke detector data is monitored by the FACP, eliminating the need to test the sensitivity of each detector at its location. A printout of each detector's data can be retrieved from the FACP using an optional printer or Windows® HyperTerminal. Detector sensing ability can decrease with age and should be monitored as part of a system's routine maintenance.

4.14 Time Functions: Real-Time Clock

The MS-9600 includes a crystal-based clock that provides time of day, date and day of week. Time is displayed as 12 or 24 hour time with month/day/year and is stored in RAM. Daylight savings time change-over is programmable and automatic. If both AC and battery are lost, the time must be reset.

4.15 NAC Operation

There are up to four programmable NACs (Notification Appliance Circuits) resident on the MS-9600 main circuit board. The NACs may be programmed as silenceable or nonsilenceable and may also be programmed for steady or coded operation. Coded operation provides a choice between March Time, Temporal, California coding and two-stage operation.

4.16 Synchronized NAC Operation

Synchronization is a panel feature that controls the activation of notification appliances in such a way that all devices will turn on and off at exactly the same time. This is particularly critical when activating strobes which must be synchronized to avoid random activation and a potential hazard or confusion. The FACP can be programmed to operate with a variety of manufacturer's devices.

Important: *When a Notification Appliance Circuit with a mix of audible and visual devices is programmed for silenceable and the synchronization feature is selected, only the audible devices will be turned off if the Silence key is pressed. The visual devices (strobes, etc.) will continue to operate.*

4.17 Coded Operation

The NAC circuits resident on the control panel main circuit board can be programmed for coded operation. The available pulse rates which can be programmed for coded operation are as follows:

- Continuous: Steady output with no pulsing
- March Time: Pulses at 120 ppm (pulses per minute)
- Temporal Code: Pulses at ½ second On, ½ second Off, ½ second On, ½ second Off, ½ second On, 1½ second Off
- California Code: 10 seconds On, 5 seconds Off
- Two-Stage: Pulses at 20 ppm (pulses per minute) for 5 minutes and then changes to on steady

4.18 Presignal

Presignal option programs an initiating device to delay the activation of NACs and/or control modules while allowing visual verification by a person. Once a detector or monitor module triggers an alarm, the onboard piezo sounds immediately, but the NACs are not activated for a user programmed time duration of up to three minutes. Note that the alarm relay and communicator will respond to the initial alarm immediately. In addition, Zone 98 will activate. This zone can be programmed to a control module which may be used to activate a sounder or indicator which the installer designates as a Presignal indication. *Do not assign Zone 98 to a Notification Appliance Circuit when using this zone to indicate a Pre-signal condition.*

After the programmed delay, the NACs will activate if the source of the alarm is not cleared. Note that if a second alarm occurs during the programmed time delay, the alarm will be processed immediately, causing activation of the appropriate output zones. The events which occur upon Presignal activation are as follows:

- ✓ onboard piezo sounds immediately
- ✓ control panel LCD display will indicate a presignal event and the active point
- ✓ control points programmed to Zone 98 will activate
- ✓ annunciators (if enabled) will sound the local piezo, and pulse the alarm LED and zone LED
- ✓ outputs (NACs and control modules) of associated zones will be inhibited from activating for a user programmed time delay of up to three minutes
- ✓ second alarm occurring anytime during the time delay will cause immediate activation of all associated outputs

Presignal does not affect monitor modules programmed as waterflow, supervisory, process monitoring or remote switches. *Presignal operation requires the approval of the local Authority Having Jurisdiction.*

4.19 Positive Alarm Sequence

PAS (Positive Alarm Sequence) option will program an initiating device to delay panel activation (including alarm relay and communicator) for a period of 15 seconds. Zone 97, however, will activate immediately and may be used to connect a signaling device to indicate PAS activation. *Do not assign Zone 97 to a Notification Appliance Circuit when using this zone to indicate a PAS condition.*

When a detector or monitor module triggers an alarm, the onboard piezo sounds immediately, but the NACs are prevented from activating for 15 seconds. This inhibit time is factory set and cannot be changed. Pressing the Alarm Silence or Acknowledge/Step key during the 15 second inhibit time will silence the piezo sounder and start a timer which prevents activation of NACs for an additional time duration which can be user programmed for up to three minutes. After the programmed delay, the NACs will activate if the source of the alarm is not cleared. Note that if a second alarm occurs during either time delay, the alarm will be processed immediately, causing activation of the appropriate output zones. The events which occur upon PAS activation are as follows:

- ✓ onboard piezo sounds immediately
- ✓ control panel LCD display will indicate a presignal event and the active point
- ✓ control points programmed to Zone 97 will activate
- ✓ annunciators (if enabled) will sound the local piezo, and pulse the alarm LED and zone LED
- ✓ outputs (NACs and control modules) of associated zones will be inhibited from activating for a factory set duration of 15 seconds
- ✓ pressing the Alarm Silence or Acknowledge/Step key will start a timer which inhibits output activation for additional time delay of up to three minutes which is user programmable
- ✓ second alarm occurring anytime during either time delay will cause immediate activation of all associated outputs

PAS does not affect monitor modules programmed as waterflow, supervisory, process monitoring or remote switches. *PAS operation requires the approval of the local Authority Having Jurisdiction.*

Note that the *PAS BYPASS* monitor type code, when activated, will inhibit the PAS capability until the *PAS BYPASS* monitor is deactivated. While PAS is inhibited, signaling devices will immediately place the control panel into alarm. This feature may be employed by wiring a normally open device, such as a switch, to a monitor module which has been programmed for *PAS BYPASS*.

4.20 Special System Timers

4.20.1 Silence Inhibit Timer

This option, if selected, prevents the *Alarm Silence* and *Reset* keys from functioning for 60 seconds following an alarm. A second alarm during this 60 second period will not cause the timer to restart with a new 60 seconds. *Silence Inhibit operation requires the approval of the local Authority Having Jurisdiction.*

4.20.2 Autosilence Timer

If Autosilence is selected, the notification appliances, programmed as silenceable, will automatically be silenced after a programmable duration of from 5 to 30 minutes. Pressing the *Drill* key will restart the timer. *Autosilence operation requires the approval of the local Authority Having Jurisdiction.*

4.20.3 Trouble Reminder

If selected, this feature causes a reminding ‘beep’ every 15 seconds during an alarm (after the *Alarm Silence* key is pressed) and every two minutes during a trouble condition (after the *Acknowledge/Step* or *Alarm Silence* key is pressed). The ‘beeps’ from the onboard piezo sounder will occur until the alarm or fault is cleared.

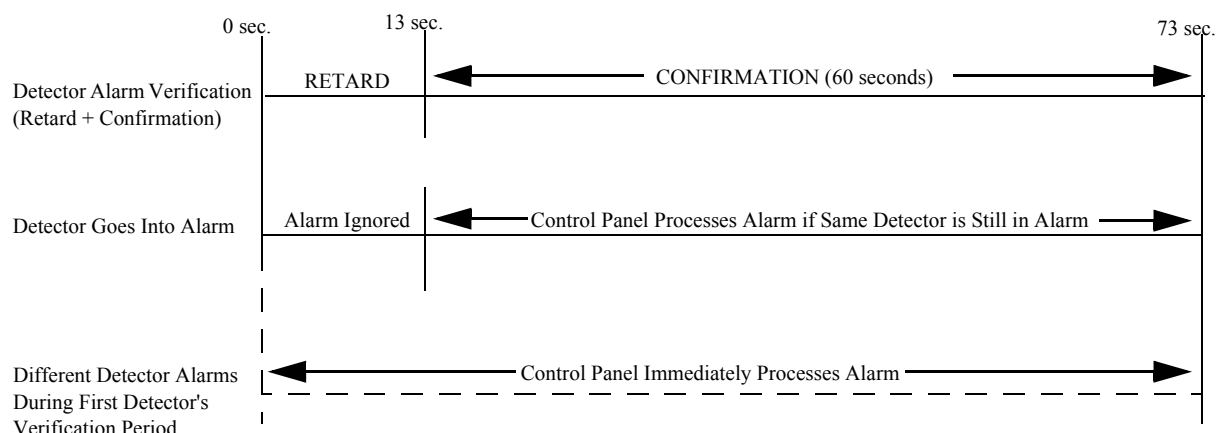
Note that if the trouble is not cleared within 24 hours, the piezo will resound, indicating that the trouble condition still exists.

4.20.4 Waterflow Retard Timer

If selected, this option will delay the activation of a waterflow type alarm for a programmable time duration from 1 to 90 seconds. This delay is in addition to any time delay inherent in the waterflow device. *This feature requires the approval of the local Authority Having Jurisdiction.*

4.20.5 Alarm Verification

If alarm verification is selected, an addressable smoke detector's alarm is ignored for a retard time of 13 seconds and the detector's alarm condition is automatically reset. There will be no alarm indication at the FACP during the Retard period. A confirmation period of 60 seconds follows, during which a subsequent alarm from the same detector will cause the panel to immediately activate the appropriate outputs and indicate the alarm condition at the FACP. If a different detector alarms any time during the first detector's verification period, the panel will immediately activate all appropriate outputs and indicate the alarm condition at the FACP. If no additional detector alarms occur within 73 seconds of the first alarm (13 second retard plus 60 second confirmation), the timer resets and the panel is ready to verify any new detector alarms which may occur.



Note: Alarm Verification is available only for addressable smoke detectors, not conventional smoke detectors.

4.21 Walktest

Walktest is a feature which allows one person to test the fire alarm system. An audible walktest will momentarily sound the Notification Appliance Circuits in the building and store the walktest information in a file at the panel. A silent walktest will not sound the NACs but will store the walktest information in a file which can be viewed at the panel. Disabled NAC devices will not activate during walktest.

Alarm/Shorted Condition

When in audible Walktest, the panel responds to each new alarm and activates its programmed control outputs for four seconds, if those outputs have been programmed for silenceable activation. It also stores each alarm in the walktest history file which can be sent to an optional printer. The stored display will be the same as if the device actually activated except the colon (:) in the time stamp is replaced with an asterisk (*).

Open Condition

Addressable devices as well as all main circuit board NACs are monitored for fault conditions during Walktest mode. When a new trouble condition occurs, the FACP will activate all NACs and control modules programmed for Walktest, then shut them off after eight seconds.

While in Walktest, the trouble relay is activated and the system Trouble LED flashes (as in all of the Program and status change operations). The alarm relay is not activated.

4.22 Read Status

Read Status functions do not require a password. The control panel will continue to provide fire protection while in Read Status mode. This mode can be entered while the control panel is in alarm or trouble. If a new alarm or trouble occurs during these functions, the Read Status is exited to prevent confusion.

Read Status Entry

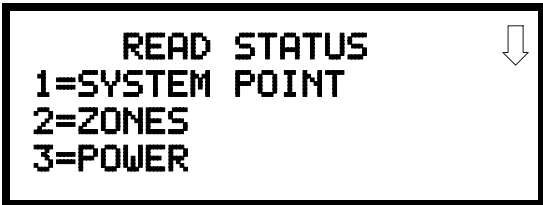
When the operator presses the control panel *Enter* key, the LCD will display the following:



```
1=READ STATUS
2=PROGRAMMING
```

Pressing *1*, while this screen is being displayed, will cause the control panel to enter the Read Status mode which allows the user to view and print the programmed features and status of the control panel.

The following screens will be displayed:



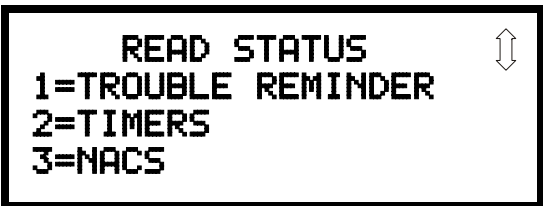
```
READ STATUS
1=SYSTEM POINT
2=ZONES
3=POWER
```

Read Status Screen #1



```
READ STATUS
1=ANNUNCIATORS
2=PHONE LINE
3=CENTRAL STATION
```

Read Status Screen #4



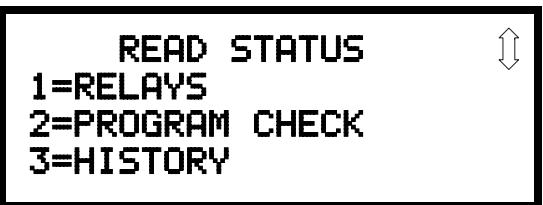
```
READ STATUS
1=TROUBLE REMINDER
2=TIMERS
3=NACS
```

Read Status Screen #2



```
READ STATUS
1=SERVICE TERMINAL
2=PRINTER/PC
3=PRINT
```

Read Status Screen #5



```
READ STATUS
1=RELAYS
2=PROGRAM CHECK
3=HISTORY
```

Read Status Screen #3



```
READ STATUS
1=TIME-DATE
```

Read Status Screen #6

4.22.1 System Point

```

READ STATUS
1=SYSTEM POINT
2=ZONES
3=POWER

```

Read Status Screen #1

Pressing *I* while viewing Read Status Screen #1 will cause the following screen to be displayed:

```

READ SYSTEM POINT
SELECT LOOP
1=LOOP 1
2=LOOP 2

```

The operator selects the loop containing the device to be read by pressing *I* for Loop 1 or 2 for Loop 2. The following screen will then be displayed:

```

READ SYSTEM POINT
SELECT TYPE
1=DETECTOR
2=MODULE

```

The operator now selects the type of device which is to be viewed by pressing *I* for Detector or 2 for Module. If *I* is pressed, the display will change to the following screen:

```

READ SYSTEM POINT
ENTER DETECTOR#
***

```

Entering the three digit detector address will cause the control panel to display the current status of the selected device. For example, if a detector with address *001* on loop *1* is entered, a display similar to the following will appear:

```

NORMAL SMOKE(PHOTO)
NORTH CLASSROOM
Z005
1D001

```

The information in the preceding display includes:

- *NORMAL* - the present status (could also be ALARM, TROUBL, DISABL, etc.)
- *SMOKE (PHOTO)* - the device type which is a photoelectric smoke detector (could also be ION for ionization smoke detector)
- *NORTH CLASSROOM* - the Adjective/Noun label for this device
- *Z005* - the first of five possible assigned software zones
- *1D001* - *I* = Loop 1, *D* = Detector, *001* = Address 001

Pressing the down arrow key, while viewing the screen shown above, will allow the operator to view additional programming information about the selected device, such as:

- Enable/Disable Status
- Device Type
- Alarm Verification On/Off
- Walktest Yes/No
- PAS (Positive Alarm Sequence) Yes/No
- Pre-Signal Yes/No
- Zone Assignments (five maximum)
- Adjective/Noun descriptor

4.22.2 Zones

READ STATUS
1=SYSTEM POINT
2=ZONES
3=POWER

Read Status Screen #1

Pressing 2 while viewing Read Status Screen #1 will cause the following screens to be displayed:

ZONES
1=ZONES INSTALLED
2=ZONES ENABLED
3=ZONES DISABLED

Zones Screen #1

ZONES
1=SPECIAL PURPOSE
2=ZONE TYPE

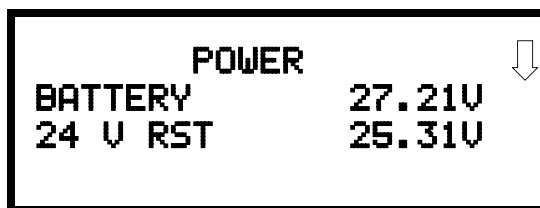
Zones Screen #2

From the preceding screens, the control panel operator can view:

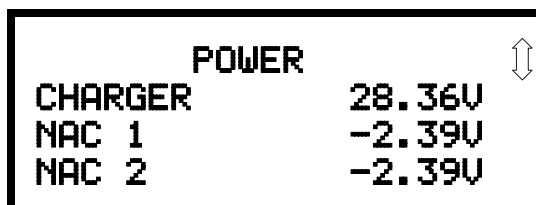
- *Zones Installed* - all software zones programmed into the system (99 maximum)
- *Zones Enabled* - all software zones that are enabled
- *Zones Disabled* - all software zones that have been disabled
- *Special Purpose* - on or off programming for Special Purpose Zones 97 reserved for PAS, 98 reserved for Pre-signal and 99 reserved for future use
- *Zone Type* - the Type assigned to each installed zone (default is Alarm)

4.22.3 Power

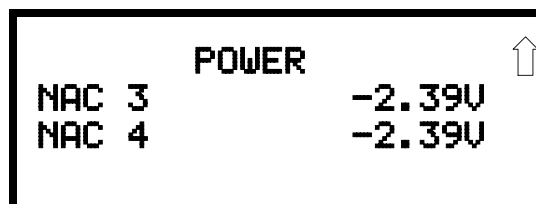
Pressing 3 while viewing Read Status Screen #1 will display the following screens:



Zones Screen #1



Zones Screen #2



Zones Screen #3

A real-time display of control panel voltages can be used to determine if system problems exist. *Note that Zones Screen #3 will only be displayed if the NACKEY NAC option card is installed, in JP8 of the main circuit board, for Class B operation.*

The following table lists the circuit being measured, possible conditions and their respective voltage ranges:

Circuit	Condition	Voltage Range
Battery	Normal Battery (nominal)	27.05 to 28.15 VDC
	Low Battery	20.0 to 20.8 VDC
	No Battery	0 to 18.36 VDC
24V Resettable	Normal	21.25 to 27.50 VDC
24V Nonresettable	Normal	21.25 to 27.50 VDC
Charger	Normal	27.05 to 28.15 VDC
NACs	Normal	-1.3 to -1.6 VDC
	Open Circuit	-2.3 to -2.5 VDC
	Short Circuit	0 to 1.0 VDC

4.22.4 Trouble Reminder

READ STATUS
1=TROUBLE REMINDER
2=TIMERS
3=NACS

Read Status Screen #2

Pressing 1 while viewing Read Status Screen #2 will display the following screen:

TROUBLE REMINDER
TROUBLE REM ON

The screen indicates whether the Trouble Reminder feature is On or Off.

4.22.5 Timers

Pressing 2 while viewing Read Status Screen #2 will cause the following Timer screens to be displayed:

TIMERS
PAS DELAY 000
PRE SIGNAL 000
WATERFLOW 000

TIMERS
AC LOSS DELAY 4

These screens indicate the delay time, in seconds, for each of four possible delay options.

4.22.6 NAC

Pressing 3 while viewing Read Status Screen #2 will display the following screen:

```

      NAC
1=NAC 1    3=NAC 3
2=NAC 2    4=NAC 4
  
```

Note that 3=NAC 3 and 4=NAC 4 will only be displayed if the NACKEY NAC option card is installed, in JP8 of the main circuit board, for Class B operation.

The operator can press 1 to view the programmed options for NAC 1, 2 to view the programmed options for NAC 2, 3 to view the programmed options for NAC 3 or 4 to view the programmed options for NAC 4. The resulting screens will display the following information:

- Enable/Disable Status
- Circuit Type (Bell, Strobe, etc.)
- Silenceable/Nonsilenceable
- Auto Silence Enable/Disable and time delay
- Coding Selection (Temporal, Steady, etc.)
- Zone Assignments
- Silence Inhibit Enabled/Disabled
- Synchronization Type (System Sensor, Wheelock or Gentex)

4.22.7 Relays

```

  READ STATUS
1=RELAYS
2=PROGRAM CHECK
3=HISTORY
  
```

Read Status Screen #3

Pressing 1 while viewing Read Status Screen #3 will display the following screen:

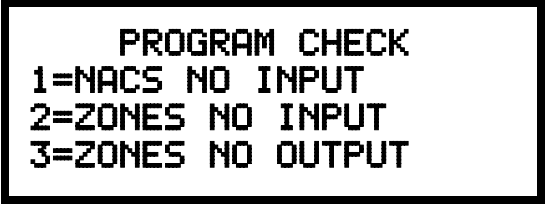
```

      RELAYS
1=RELAY 1
2=RELAY 2
3=RELAY 3
  
```

The operator can view the programmed option for each relay by pressing the corresponding number key.

4.22.8 Program Check

Pressing 2 while viewing Read Status Screen #3 will cause a screen similar to the following to be displayed:



```
PROGRAM CHECK
1=NACS NO INPUT
2=ZONES NO INPUT
3=ZONES NO OUTPUT
```

Pressing 1 while viewing the Program Check screen will display a screen which will indicate if any input zones have not been programmed to one of the Notification Appliance Circuits. Use the up and down arrow keys to view all NACs.

Pressing 2 while viewing the Program Check screen will display a screen which will indicate if any output zones have not been programmed to at least one input zone. Use the up and down arrow keys to view all zones.

Pressing 3 while viewing the Program Check screen will display a screen which will indicate if any input zones have not been programmed to at least one output zone. Use the up and down arrow keys to view all zones.

4.22.9 History

Pressing 3 while viewing Read Status Screen #3 will display the following screen:



```
HISTORY
1=VIEW ALL
2=VIEW ALARMS
3=VIEW OTHER EVENTS
```

The operator can view all events which have been stored in the history file, only alarms or other events, such as troubles or supervisories, by pressing the corresponding number key.

4.22.10 Annunciators

READ STATUS
1=ANNUNCIATORS
2=PHONE LINES
3=CENTRAL STATION

Read Status Screen #4

Pressing 1 while viewing Read Status Screen #4 will display the following screens:

ANNUNCIATORS 
TERM ENABLED **YES**
ACS ENABLED **YES**
UDACT ENABLED **NO**

Annunciator Screen #1

ANNUNCIATORS 
1=ACS ADDRESSES

Annunciator Screen #2

Annunciator Screen #1 indicates if Terminal Mode, ACS Mode and UDACT options are enabled or disabled. Pressing '1' while viewing Annunciator Screen #2 allows the operator to view the ACS Mode Annunciator addresses which have been programmed into the control panel.

4.22.11 Phone Line

Pressing 2 while viewing Read Status Screen #4 will display the following screen:

PHONE LINE
PRIMARY TOUCHTONE
SECONDARY TOUCHTONE

This screen indicates the both the Primary and Secondary phone lines have been configured for touchtone dialing operation.

4.22.12 Central Station

READ STATUS
1=ANNUNCIATORS
2=PHONE LINE
3=CENTRAL STATION

Read Status Screen #4

Pressing 3 while viewing Read Status Screen #4 will display the following screens:

CENTRAL STATION
REPORTING ENABLED
REPORT BOTH
CALL LIMIT 10

Central Station Screen #1

CENTRAL STATION
1=PRIMARY
2=SECONDARY
3=REPORT STYLE

Central Station Screen #2

Central Station Screen #1 indicates whether the Central Station Reporting is enabled or disabled, if the Reports will be sent to one or both the Primary and Secondary Central Station phone numbers and Call Limit for DACT trouble calls within a 24 hour period. Central Station Screen #2 provides information on the Primary and Secondary Central Station programming which includes:

- Test Time Interval
- Account Code
- 24 Hour Test Time
- Phone Number
- Communication Format
- Event Codes

4.22.13 Service Terminal

READ STATUS
1=SERVICE TERMINAL
2=PRINTER/PC
3=PRINT

Read Status Screen #5

Pressing 1 while viewing Read Status Screen #5 will display the following screens:

```

SERVICE TERMINAL
PANEL ID
2=TERMINAL 1
3=TERMINAL 2
  
```

Service Terminal Screen #1

```

SERVICE TERMINAL
RING COUNT
  
```

Service Terminal Screen #2

The Panel ID number is the first item displayed in Service Terminal Screen #1.

To view the Service Terminal 1 or Service Terminal 2 phone number, press 2 for Terminal 1 or 3 for Terminal 2 while viewing Service Terminal Screen #1.

The Ring Count is displayed in Service Terminal Screen #2.

4.22.14 Printer/PC

Pressing 2 while viewing Read Status Screen #5 will display the following screens:

```

PRINTER PC
PRINTER PC    PR4800
START BIT
STOP BIT
  
```

Printer/PC Screen #1

```

PRINTER PC
DATA BITS
PARITY
  
```

Printer/PC Screen #2

The display will inform the operator as to whether the control panel is configured for a printer or a PC. In the example above, PR4800 indicates that the panel is configured for a printer with a baud rate of 4,800.

4.22.15 Print

```

READ STATUS
1=SERVICE TERMINAL
2=PRINTER/PC
3=PRINT

```

Read Status Screen #5

To print program data or control panel status, press 3 while viewing Read Status Screen #5. The following screens will be displayed:

```

PRINT
1=HISTORY
2=WALKTEST LOG
3=DETECTOR DATA

```

Print Screen #1

```

PRINT
1=EXIT PRINTING

```

Print Screen #2

Pressing 1 while viewing Print Screen #1 allows the user to print the History file which will detail all of the system activities since the file was last cleared from memory.

Pressing 2 while viewing Print Screen #1 allows the user to print the Walktest log which will detail all of the system activations during walktest since the log was last cleared. Refer to "Walktest" on page 96 for additional information on the display.

Pressing 3 while viewing Print Screen #1 allows the user to print the detector data for each addressable smoke detector connected to the system. A printout, similar to the following example, will be generated if an optional printer is connected to the FACP.

DEVICE#	DEVICE TYPE	%DRIFT COMP	CHAMBER	TIME/DATE
1D001	SMOKE (PHOTO)	20	1281	12:01AM 01-08-2001
1D002	SMOKE (PHOTO)	20	1281	12:01AM 01-08-2001
1D003	SMOKE (PHOTO)	21	1259	12:01AM 01-08-2001
1D004	SMOKE (PHOTO)	20	1309	12:02AM 01-08-2001
1D005	SMOKE (PHOTO)	21	1281	12:02AM 01-08-2001
1D006	SMOKE (PHOTO)	20	1322	12:02AM 01-08-2001
1D007	SMOKE (PHOTO)	20	1280	12:02AM 01-08-2001
1D008	SMOKE (PHOTO)	20	1215	12:02AM 01-08-2001
1D009	SMOKE (PHOTO)	20	1310	12:02AM 01-08-2001

Chamber Value

The Chamber value should be within the indicated range for the following smoke detectors:

- SD350(T), SD355(T), D350P(R), SD300(T), AD350 and AD355 Addressable Photoelectric Smoke Detectors: **405 - 2100** (obscurations of 1.00%/ft. to 3.66%/ft.)
- CP350, CP355 and CP300 Addressable Ionization Smoke Detectors: **750 - 2100** (obscurations of 0.50%/ft. to 1.44%/ft.)

If the addressable smoke detector's Chamber reading is not within the acceptable range, clean the detector and check the Chamber value again. If the reading is still not within the acceptable range, immediately replace the detector.

Drift Compensation

Drift compensation uses software algorithms that identify and compensate for long-term changes in the data readings from each addressable smoke detector. These long-term changes in detector data readings are typically caused by dirt and dust accumulation inside the smoke chamber. Drift compensation performs the following functions:

- Allows a smoke detector to retain its original ability to detect actual smoke and resist false alarms, even as dirt and dust accumulate
- Reduces maintenance requirements by allowing the control panel to automatically perform the periodic sensitivity measurements required by NFPA Standard 72

The FACP software also provides filters to remove transient noise signals, usually caused by electrical interference.

Maintenance Alert

The software determines when the drift compensation for a detector reaches an unacceptable level that can compromise detector performance. When a detector reaches an unacceptable level, the control panel indicates a maintenance alert. Table 4.1 summarizes the three levels of maintenance alert:

Maintenance Level	FACP Status Displays	Indicates
Low Chamber Value	INUREP	A hardware problem in the detector
Maintenance Alert	DIRTY1	Dust accumulation that is near but below the allowed limit. <i>DIRTY 1</i> indicates the need for maintenance before the performance of the detector is compromised
Maintenance Urgent	DIRTY2	Dust accumulation above the allowed limit.

Table 4.1 Maintenance Alert Levels

Figure 4.1 illustrates a graphic representation of the maintenance levels:

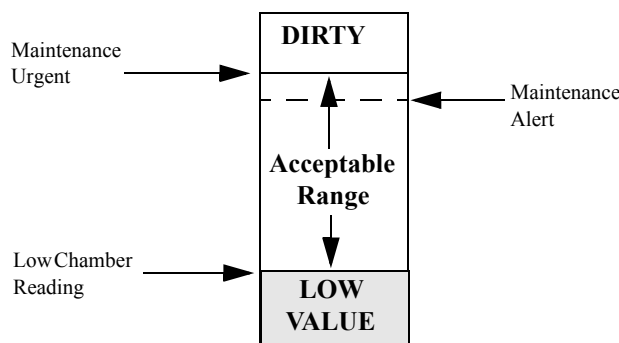


Figure 4.1 Diagram of Maintenance Levels

4.22.16 Time-Date

READ STATUS
1=TIME-DATE

Read Status Screen #6

The operator can view the daylight savings time and the month and week when daylight savings time will begin and end. Pressing 1 while viewing Read Status Screen #6 will display the following screens:

DAYLIGHT SAVINGS 
ENABLED YES
START MONTH APR
START WEEK WEEK-1

DAYLIGHT SAVINGS 
END MONTH OCT
END WEEK LAST-W

SECTION 5

Power Supply Calculations

5.1 Overview

This section contains instructions and tables for calculating power supply currents in alarm and standby conditions. This is a four-step process, consisting of the following:

1. Calculating the total amount of AC branch circuit current required to operate the system
2. Calculating the power supply load current for non-fire and fire alarm conditions and calculating the secondary (battery) load
3. Calculating the size of batteries required to support the system if an AC power loss occurs
4. Selecting the proper batteries for your system

5.2 Calculating the AC Branch Circuit

The control panel requires connection to a separate, dedicated AC branch circuit, which must be labeled **FIRE ALARM**. This branch circuit must connect to the line side of the main power feed of the protected premises. No other non-fire alarm equipment may be powered from the fire alarm branch circuit. The branch circuit wire must run

continuously, without any disconnect devices, from the power source to the control panel. Overcurrent protection for this circuit must comply with Article 760 of the National Electrical Codes as well as local codes. Use 14 AWG (2.00 mm²) wire with 600 volt insulation for this branch circuit.

Use Table 5.1 , to determine the total amount of current, in AC amperes (A), that must be supplied to the system.

Table 5.1 AC Branch Circuit Requirements

Device Type	Number of Devices	Current Draw (AC amps)	Total Current per Device
MS-9600 or MS-9600E	1	X or 1.6	=
CHG-120F	[]	X 2.0	=
	[]	X []	=
Sum Column for AC Branch Current Required			=

5.3 Calculating the System Current Draw

5.3.1 Overview

The control panel must be able to power all internal and external devices continuously during the non-fire alarm condition. To calculate the non-fire alarm load on the system power supply when primary power is applied, use Calculation Column 1 in Table 5.3 on page 138. The control panel must support a larger load current during a fire alarm condition. To calculate the fire alarm load on the power supply, use Calculation Column 2 in Table 5.3 on page 138. The secondary power source (batteries) must be able to power the system during a primary power loss. To calculate the non-fire alarm load on the secondary power source, use Calculation Column 3 in Table 5.3 on page 138.

When calculating current draw and the battery size, note the following:

- ‘Primary’ refers to the main power source for the control panel
- ‘Secondary’ refers to the control panel’s backup batteries
- All currents are given in amperes (A). Table 5.2 shows how to convert milliamperes and microamperes to full amperes.

Table 5.2 Converting to Full Amperes

To convert...	Multiply	Example
Milliamperes (mA) to amperes (A)	$\text{mA} \times 0.001$	$3 \text{ mA} \times 0.001 = 0.003\text{A}$
Microamperes (μA) to amperes (A)	$\mu\text{A} \times 0.000001$	$300 \mu\text{A} \times 0.000001 = 0.0003 \text{ A}$

5.3.2 How to Use Table 5.3 on page 138 to Calculate System Current Draw

Use Table 5.3 on page 138 to calculate current draws as follows:

1. Enter the quantity of devices in all three columns
2. Enter the current draw where required. Refer to the Fire-Lite Device Compatibility Document for compatible devices and their current draw
3. Calculate the current draws for each in all columns
4. Sum the total current for each column
5. Copy the totals from Column 2 and Column 3 to Table 5.4 on page 139

Following are the types of current that can be entered into Table 5.3 on page 138:

- ✓ **Calculation Column 1** - The primary supply current load that the control panel must support during a non-fire alarm condition, with AC power applied.
- ✓ **Calculation Column 2** - The primary supply current load that the control panel must support during a fire alarm condition, with AC power applied.
- ✓ **Calculation Column 3** - The standby current drawn from the batteries in a non-fire alarm condition during a loss of AC power.

Table 5.3 contains columns for calculating current draws. For each column, calculate the current and enter the total (in amperes) in the bottom row. When finished, copy the totals from Calculation Column 2 and Calculation Column 3 to Table 5.4 on page 139.

Table 5.3 System Current Draw Calculations

Calculation Column 1 Primary, Non-Fire Alarm Current (amps)				Calculation Column 2 Primary, Fire Alarm Current (amps)				Calculation Column 3 Secondary, Non-Fire Alarm Current (amps)			
Device Type	Qty	X[current draw]=	Total	Qty	X [current draw] =	Total	Qty	X[current draw]=	Total		
Mam Circuit Board	1	X[0.150]=	0.150	1	X[0.170]=	0.170	1	X[0.120]=	0.120		
SLC-2 Expander Module	[]	X[0.085]=		[]	X[0.085]=		[]	X[0.085]=			
ACM-8RF	[]	X[0.030]=		[]	X[0.158] ¹ =		[]	X[0.030]=			
ACM-16ATF	[]	X[0.040]		[]	X[0.056] ² =		[]	X[0.040]=			
ACM-32AF	[]	X[0.040]		[]	X[0.056] ² =		[]	X[0.040]=			
AEM-16ATF	[]	X[0.002]		[]	X[0.018] ² =		[]	X[0.002]=			
AEM-32AF	[]	X[0.002]		[]	X[0.018] ² =		[]	X[0.002]=			
AFM-16ATF	[]	X[0.040]		[]	X[0.056] ² =		[]	X[0.040]=			
AFM-32AF	[]	X[0.040]		[]	X[0.056] ² =		[]	X[0.040]=			
AFM-16AF	[]	X[0.025]		[]	X[0.065] ² =		[]	X[0.025]=			
UDACT-F	[]	X[0.040]		[]	X[0.075] ³ =		[]	X[0.040]=			
DACT-UD	[]	X[0.100]		[]	X[0.132]=		[]	X[0.100]=			
LDM-32F	[]	X[0.040]		[]	X[0.056] ⁴ =		[]	X[0.040]=			
LDM-E32F	[]	X[0.002]		[]	X[0.018]=		[]	X[0.002]=			
LCD-80F	[]	X[0.064]		[]	X[0.064]=		[]	X[0.025]=			
4XTMF	[]	X[0.005]=		[]	X[0.011] ⁵ =		[]	X[0.005]=			
4-wire Detector Heads	[]	X[] ⁶ =		[]	X[]=		[]	X[]=			
Power Supervision Relays ⁷	[]	X[0.025]=		[]	X[0.025]=		[]	X[0.025]=			
CP350 & CP355	[]	X[0.00030]=		maximum alarm draw for all devices	0.400	[]	X[0.00030]=				
SD350 & SD355	[]	X[0.00030]=				[]	X[0.00030]=				
SD350I & SD355I	[]	X[0.00030]=				[]	X[0.00030]=				
AD350 & AD355	[]	X[0.00030]=				[]	X[0.00030]=				
H350 & H355	[]	X[0.00030]=				[]	X[0.00030]=				
H350R & H355R	[]	X[0.00030]=				[]	X[0.00030]=				
H355HT	[]	X[0.00030]=				[]	X[0.00030]=				
D350P	[]	X[0.00030]=				[]	X[0.00030]=				
D350RP	[]	X[0.00030]=				[]	X[0.00030]=				
B501BH & B501BHT ⁸	[]	X[0.001]=				[]	X[0.001]=				
B224RB Relay Base	[]	X[0.00050]=				[]	X[0.00050]=				
B224BI Isolator Base	[]	X[0.00045]=				[]	X[0.00045]=				
MMF-300	[]	X[0.00040]=				[]	X[0.00040]=				
MMF-300-10	[]	X[0.00350]=				[]	X[0.00350]=				
MDF-300	[]	X[0.00075]=				[]	X[0.00075]=				
MMF-301	[]	X[0.000375]=				[]	X[0.000375]=				
MMF-302	[]	X[0.00027]=				[]	X[0.00027]=				
MMF-302-6	[]	X[0.00200]=				[]	X[0.00200]=				
BG-12LX	[]	X[0.00023]=				[]	X[0.00023]=				
CMF-300	[]	X[0.00039]=				[]	X[0.00039]=				
CMF-300-6	[]	X[0.00225]=				[]	X[0.00225]=				
CRF-300	[]	X[0.00027]=				[]	X[0.00027]=				
CRF-300-6	[]	X[0.00145]=				[]	X[0.00145]=				
I300	[]	X[0.00040]=				[]	X[0.00040]=				
NAC #1 ⁹				[]	X[]=						
NAC #2				[]	X[]=						
NAC #3				[]	X[]=						
NAC #4				[]	X[]=						
Current Draw from TB3 (nonalarm ¹⁰)	[]	[]=		[]	[]=		[]	[]=			
Sum each column ¹¹ for totals	Primary Non-Alarm =			Primary Alarm =			Secondary Alarm =				

Table Footnote

1. All eight ACM-8RF relays activated on a single module.
2. All annunciator LEDs on
3. UDACT-F actively making phone call to central station. If the normally open contact is used, current consumption increases to 100 mA.
4. LDM-32F with LEDs on
5. If using the Reverse Polarity Alarm output, add 0.005 amps; if using the Reverse Polarity Trouble output, add another 0.005 amps.
6. Refer to the Device Compatibility Document for standby current.
7. Must use compatible listed Power Supervision Relay.
8. Maximum alarm current for each sounder base is 0.015 amps which must be supplied by aux. 24VDC source.
9. Current limitation of Terminal TB4 circuits is 3.00 amps per NAC.
10. The total standby current must include both the resettable (TB3 Terminals 1 & 2) and nonresettable (TB3 Terminals 3 & 4, 5 & 6) power. Caution must be taken to ensure that current drawn from these outputs during alarm does not exceed maximum ratings specified. Current limitations of TB3 circuits is 3.0 amps per output
11. Total current draw listed above cannot exceed 7.0 amps in alarm.

5.4 Calculating the Battery Size

Use Table 5.4 to calculate the total Standby and Alarm load in ampere hours (AH). This total load determines the battery size (in AH), required to support the control panel under the loss of AC power. Complete Table 5.4 as follows:

1. Enter the totals from Table 5.3 on page 138, Calculation Columns 2 and 3 where shown
2. Enter the NFPA Standby and Alarm times (refer to 'NFPA Requirements' below)
3. Calculate the ampere hours for Standby and Alarm, then sum the Standby and Alarm ampere hours
4. Multiply the sum by the derating factor of 1.2 to calculate the proper battery size (in AH)
5. Write the ampere hour requirements on the Protected Premises label located inside the cabinet door

Table 5.4 Total Secondary Power Requirements at 24 VDC

Secondary Standby Load (total from Table 5.3 Calculation Column 3) []	Required Standby Time (24 or 60 hours) X[]	= AH
Primary Alarm Load (total from Table 5.3 Calculation Column 2) []	Required Alarm Time (for 5 min., enter 0.084, for 10 min., enter 0.168) X[]	= AH
Sum of Standby and Alarm Ampere Hours		= AH
Multiply by the Derating Factor		X 1.2
Battery Size, Total Ampere Hours Required		= AH

5.4.1 NFPA Battery Requirements

- NFPA 72 Local and Proprietary Fire Alarm Systems require 24 hours of standby power followed by 5 minutes in alarm
- NFPA 72 Central, Auxiliary and Remote Station Fire Alarm Systems require 60 hours of standby followed by 5 minutes in alarm. Batteries installed in a system powered by a generator need to provide at least 4 hours of standby power
- NFPA requires 24 hours of standby plus 15 minutes activation for audio systems. The total ampere hours required cannot exceed 25 AH with an internal charger

5.4.2 Selecting and Locating Batteries

Select batteries that meet or exceed the total ampere hours calculated in Table 5.4. The control panel can charge batteries in the 7 AH to 25 AH range. The control panel cabinet is capable of housing batteries up to 18 AH. Batteries larger than 18 AH require the BB-26, BB-55F or other UL listed external battery cabinet.

APPENDIX A Software Zones

A.1 Correlations

Setup and configuration of an addressable system is different than a conventional system. In a conventional system, assignment of input devices (smoke detectors, pull stations, heat detectors, etc.) to zones is accomplished through wiring. The wiring is direct from clearly marked panel terminals to any device assigned to a particular zone. Connection of output devices (horns, bells, strobes, etc.) in a conventional system is accomplished by direct wiring of the output devices to Notification Appliance Circuit terminals.

In an addressable system, a minimum of a single pair of wires (SLC communication loop) is used to connect all addressable input and output devices. Communications between the FACP (Fire Alarm Control Panel) and all addressable devices takes place over the wire pair which originates from the FACP. Software programming is used to configure the system as opposed to direct wiring. Zone assignments are created via software means, hence the term *software zones*.

Setup of an MS-9600 software zone is accomplished by panel programming. Each addressable device can be assigned to a maximum of five software zones. Each software zone, however, may have from 1 to 99¹ addressable input devices assigned to it and from 1 to 99¹ addressable output devices assigned to it.

Monitor and control modules comprise one group of 99¹ addresses, with each module having a unique address from 1 to 99¹. Detectors comprise a separate group of 99¹ addresses, each detector having a unique address from 1 to 99¹ in its group. Be careful not to duplicate addresses within any one group (modules and detectors). Refer to the following page for an example of zoning.

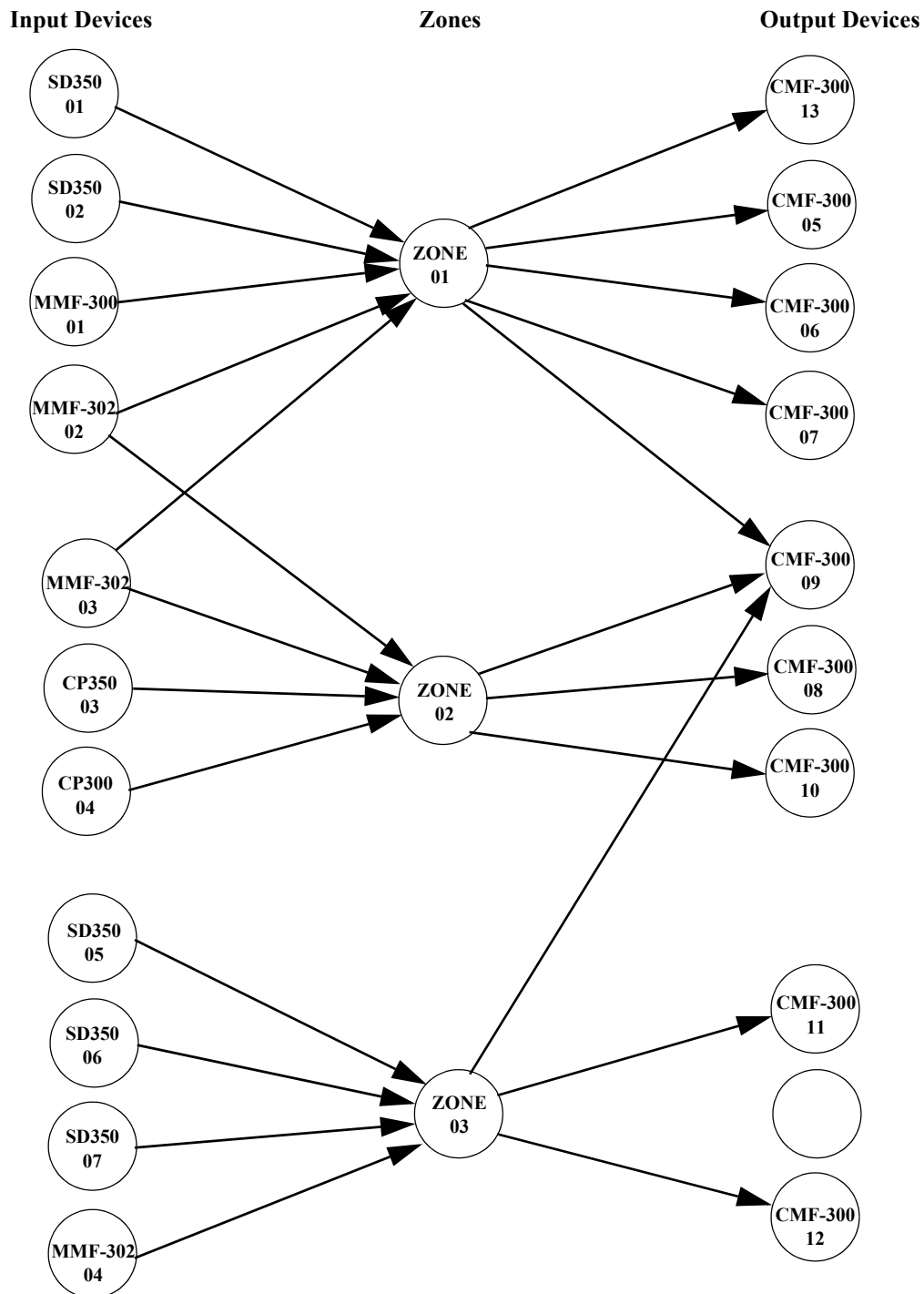
In the example on the following page:

- Zone 01 has the following addressable devices assigned to it:
 - ✓ SD350 smoke detectors with addresses 01 and 02
 - ✓ MMF-300 monitor module with address 01
 - ✓ MMF-302 monitor module with address 02 and 03
 - ✓ CMF-300 control modules with addresses 05, 06, 07, 09 and 13
- Zone 02 has the following addressable devices assigned to it:
 - ✓ MMF-302 monitor module with addresses 02 and 03
 - ✓ CP350 smoke detectors with addresses 03 and 04
 - ✓ CMF-300 control modules with addresses 08, 09 and 10
- Zone 03 has the following addressable devices assigned to it:
 - ✓ SD350 smoke detectors with addresses 05, 06 and 07
 - ✓ MMF-302 control module with address 04
 - ✓ CMF-300 control modules with addresses 09, 11 and 12

The example points out some of the key assignment features of the MS-9600. Addresses of detectors are not duplicated. Addresses of monitor and control modules are not duplicated. The control module with address 09 is assigned to three software zones (providing floor above and floor below). Be careful to properly plan the installation prior to installing any devices.

¹*CLIP or Classic Loop Interface Protocol devices (modules and detectors) can only have unique addresses of 1 to 99. Newer modules can have unique addresses of 1 to 159 which means each zone can have up to 159 input and output devices assigned to it.*

Correlation of Input and Output Zones



The zone correlations which are shown graphically above are also presented in Table A.1 on page 142 and Table A.2 on page 143.

Table A.1 Detector Programming Sheet Example

DETECTOR ZONE ASSIGNMENT							
Address	Device Type	Zone Number	ADJ/NOUN	Address	Device Type	Zone Number	ADJ/NOUN
01	SD350	1	FIRST HALL	51			
02	SD350	1	ELEV. LOBBY	52			
03	CP350	2	2ND FLOOR	53			
04	CP350	2	ROOM 210	54			
05	SD350	3	3RD FLOOR	55			
06	SD350	3	MEZZANINE	56			
07	SD350	3	MECH. ROOM	57			
08				58			
09				59			
10				60			
11				61			
12				62			
13				63			
14				64			
15				65			
16				66			
17				67			
18				68			
19				69			
20				70			
21				71			
22				72			
23				73			
24				74			
25				75			
26				76			
27				77			
28				78			
29				79			
30				80			
31				81			
32				82			
33				83			
34				84			
35				85			
36				86			
37				87			
38				88			
39				89			
40				90			
41				91			
42				92			
43				93			
44				94			
45				95			
46				96			
47				97			
48				98			
49				99			
50				100			

Table A.2 Module Programming Sheet Example

MONITOR/CONTROL MODULE ZONE ASSIGNMENT							
Address	Device Type	Zone Number	ADJ/ NOUN	Address	Device Type	Zone Number	ADJ/NOUN
01	MMF-300	1		51			
02	MMF-302	1, 2		52			
03	MMF-302	1, 2		53			
04	MMF-302	3		54			
05	CMF-300	1		55			
06	CMF-300	1		56			
07	CMF-300	1		57			
08	CMF-300	2		58			
09	CMF-300	1, 2, 3		59			
10	CMF-300	2		60			
11	CMF-300	3		61			
12	CMF-300	3		62			
13	CMF-300	1		63			
14				64			
15				65			
16				66			
17				67			
18				68			
19				69			
20				70			
21				71			
22				72			
23				73			
24				74			
25				75			
26				76			
27				77			
28				78			
29				79			
30				80			
31				81			
32				82			
33				83			
34				84			
35				85			
36				86			
37				87			
38				88			
39				89			
40				90			
41				91			
42				92			
43				93			
44				94			
45				95			
46				96			
47				97			
48				98			
49				99			
50				100			

Table A.3 Blank Detector Programming Sheet - 1 of 2

DETECTOR ZONE ASSIGNMENT							
Address	Device Type	Zone Number	ADJ/ NOUN	Address	Device Type	Zone Number	ADJ/NOUN
01				51			
02				52			
03				53			
04				54			
05				55			
06				56			
07				57			
08				58			
09				59			
10				60			
11				61			
12				62			
13				63			
14				64			
15				65			
16				66			
17				67			
18				68			
19				69			
20				70			
21				71			
22				72			
23				73			
24				74			
25				75			
26				76			
27				77			
28				78			
29				79			
30				80			
31				81			
32				82			
33				83			
34				84			
35				85			
36				86			
37				87			
38				88			
39				89			
40				90			
41				91			
42				92			
43				93			
44				94			
45				95			
46				96			
47				97			
48				98			
49				99			
50				100			

Table A.4 Blank Detector Programming Sheet - 2 of 2

DETECTOR ZONE ASSIGNMENT							
Address	Device Type	Zone Number	ADJ/NOUN	Address	Device Type	Zone Number	ADJ/NOUN
101				151			
102				152			
103				153			
104				154			
105				155			
106				156			
107				157			
108				158			
109				159			
110							
111							
112							
113							
114							
115							
116							
117							
118							
119							
120							
121							
122							
123							
124							
125							
126							
127							
128							
129							
130							
131							
132							
133							
134							
135							
136							
137							
138							
139							
140							
141							
142							
143							
144							
145							
146							
147							
148							
149							
150							

Table A.5 Blank Module Programming Sheet - 1 of 2

MONITOR/CONTROL MODULE ZONE ASSIGNMENT							
Address	Device Type	Zone Number	ADJ/NOUN	Address	Device Type	Zone Number	ADJ/NOUN
01				51			
02				52			
03				53			
04				54			
05				55			
06				56			
07				57			
08				58			
09				59			
10				60			
11				61			
12				62			
13				63			
14				64			
15				65			
16				66			
17				67			
18				68			
19				69			
20				70			
21				71			
22				72			
23				73			
24				74			
25				75			
26				76			
27				77			
28				78			
29				79			
30				80			
31				81			
32				82			
33				83			
34				84			
35				85			
36				86			
37				87			
38				88			
39				89			
40				90			
41				91			
42				92			
43				93			
44				94			
45				95			
46				96			
47				97			
48				98			
49				99			
50				100			

Table A.6 Blank Module Programming Sheet - 2 of 2

MONITOR/CONTROL MODULE ZONE ASSIGNMENT							
Address	Device Type	Zone Number	ADJ/NOUN	Address	Device Type	Zone Number	ADJ/NOUN
101				151			
102				152			
103				153			
104				154			
105				155			
106				156			
107				157			
108				158			
109				159			
110							
111							
112							
113							
114							
115							
116							
117							
118							
119							
120							
121							
122							
123							
124							
125							
126							
127							
128							
129							
130							
131							
132							
133							
134							
135							
136							
137							
138							
139							
140							
141							
142							
143							
144							
145							
146							
147							
148							
149							
150							

APPENDIX B Default Programming

The following table provides a list of the programming options and their factory default settings.

Program Option	Factory Default	Program Option	Factory Default
Detector Programming	Not Installed	Daylight Savings	Yes
Detector Type	Smoke-Photo	Month Start Daylight Savings	April
Detector Verification	Off	Week Start Daylight Savings	1st Week
Detector Walktest	Yes	Month End Daylight Savings	October
Detector PAS	No	Week End Daylight	Last Week
Detector Presignal	No	Verification	No
Detector Zone Assign.	000 only	(future)	
Detector Adj/Noun	none	PAS Timer	0
Module Programming	Not Installed	Presignal Timer	0
Module Type	Monitor	Waterflow Retard Timer	0
Module Walktest	Yes	NAC Enable	Enabled
Module PAS	No	NAC Silenceable	Yes
Module Presignal	No	NAC Type	Bell
Module Zone Assign.	000 only	NAC Sync Type	System Sensor
Module Adj/Noun	none	NAC Autosilence	0
Zone 0 Enable	Enabled	NAC Coding	Steady
Zone 1 Enable	Enabled	NAC Zones	Zone 000 only
Zone 2 Enable	Enabled	NAC Silence Inhibit	0
Zone 3 Enable	Enabled	Relay 1	Alarm
.....through.....		Relay 2	Trouble
Zone 96 Enable	Enabled	Relay 3	Supervisory
Zones 97, 98 & 99	Enabled	On Board DACT	No
(future)		Annunciator Terminal Mode	No
Loop 1 & 2 Style	Style 4	Annunciator ACS Mode	No
Loop 1 & 2 Protocol	CLIP	UDACT	No
Trouble Reminder	Off	ACS Installed	No
Banner	Fire•Lite	Printer-PC	No
Time Format	12 Hr	Printer Baud	9600
Hours Setting	12	Canadian Option	Off
Minutes Setting	00	Waterflow Silenceable	No
Second Settings	00	(future)	Off
AM-PM Setting	AM		
Month Setting	01		
Day Setting	01		
Year Setting	00		

APPENDIX C

NFPA Standard-Specific Requirements

The Fire•Lite MS-9600 has been designed for use in commercial, industrial and institutional applications and meets the requirements for service under the National Fire Protection Association (NFPA) Standards outlined in this Appendix. The minimum system components required for compliance with the appropriate NFPA standard are listed below:

MS-9600 Control Panel

Contains the main control board, cabinet (backbox and door), main power supply transformer and power supply.

Batteries

Refer to "Power Supply Calculations" on page 136, for Standby Power Requirements.

Initiating Devices

Connected to one of the control panel's Initiating Device Circuits.

Notification Appliances

Connected to the control panel's Notification Appliance Circuits via a control module.

The following additional equipment is needed for compliance with the NFPA 72 standards listed below:

NFPA 72 NATIONAL FIRE ALARM STANDARDS FOR:

NFPA 72 Central Station Service (Protected Premises Unit) or Remote Station Service

411UDAC for connection to a compatible listed Central Station DACR or Protected Premises Receiving Unit. This unit must be installed as outlined in Figure C.1, "Central Station Service Using 411UDAC," on page 150.

OR

UDACT-F may be installed as illustrated in Figure C.2, "Central Station Service Using UDACT-F," on page 151.

OR

411UD may be installed as illustrated in Figure C.3, "Fire•Lite MS-9600 Connection to 411UD," on page 152.

OR

4XTMF Transmitter Module for connection to the Fire•Lite RS82 Remote Station Receiver. See Figure C.5, "Remote Station Connection Using 4XTMF Module," on page 154, for installation instructions for this unit.

NFPA 72 Auxiliary Fire Alarm System

4XTMF Transmitter Module for connection to a compatible listed Local Energy Municipal Box. This unit must be installed as illustrated in the section titled "4XTMF Transmitter Module Installation" on page 36 and as outlined in Figure C.4, "Municipal Box Connected to 4XTMF Transmitter Module," on page 153.

NFPA 72 Proprietary Fire Alarm System

MS-9600 Alarm, Trouble and Supervisory contacts connected to Transmitter(s). See Figure C.6, "Proprietary Protective Signaling System," on page 155, for installation instructions for this unit.

NFPA Signaling Systems for Central Station Service (Protected Premises Unit)/ Remote Station

The following figure illustrates an example of Central Station/Remote Station Reporting using a 411UDAC. The relay contacts from the MS-9600 may be used to trip any dialer UL listed for Central Station/Remote Station Services. The UDACT-F may also be used. Refer to Figure C.2, “Central Station Service Using UDACT-F,” on page 151.

Notes:

1. Reference the 411UDAC Manual for additional information
2. Program the 411UDAC for slave operation
3. The MS-9600 must be programmed for AC Loss Reporting Delay. This prevents the transmission of a trouble on the loss of AC power

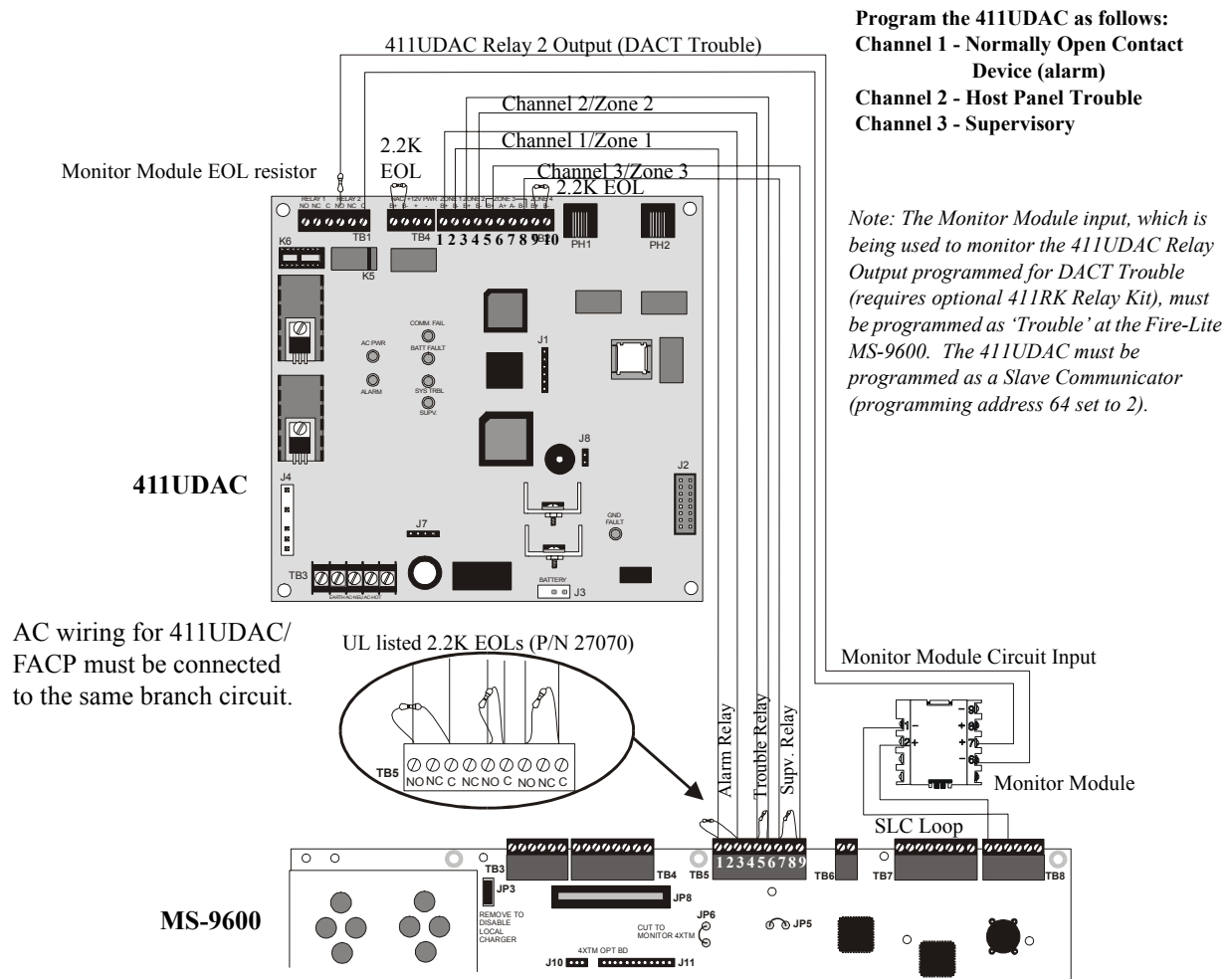


Figure C.1 Central Station Service Using 411UDAC

	411UDAC	MS-9600
Alarm	TB2-1	TB5-3
	TB2-2	TB5-1
Trouble	TB2-3	TB5-6
	TB2-4	TB5-5
Supervisory	TB2-5	TB5-9
	TB2-8	TB5-7

Table C.1 411UDAC Connections to MS-9600

The following figure illustrates an example of Central Station/Remote Station Reporting using a UDACT-F (Universal Digital Alarm Communicator/Transmitter). The UDACT-F transmits system status to UL listed Central Station receivers via the public switched telephone network. It may be mounted inside the MS-9600 cabinet using the BRKT-9600 mounting bracket or remotely in a UBS-1F or ABS-8RF enclosure.

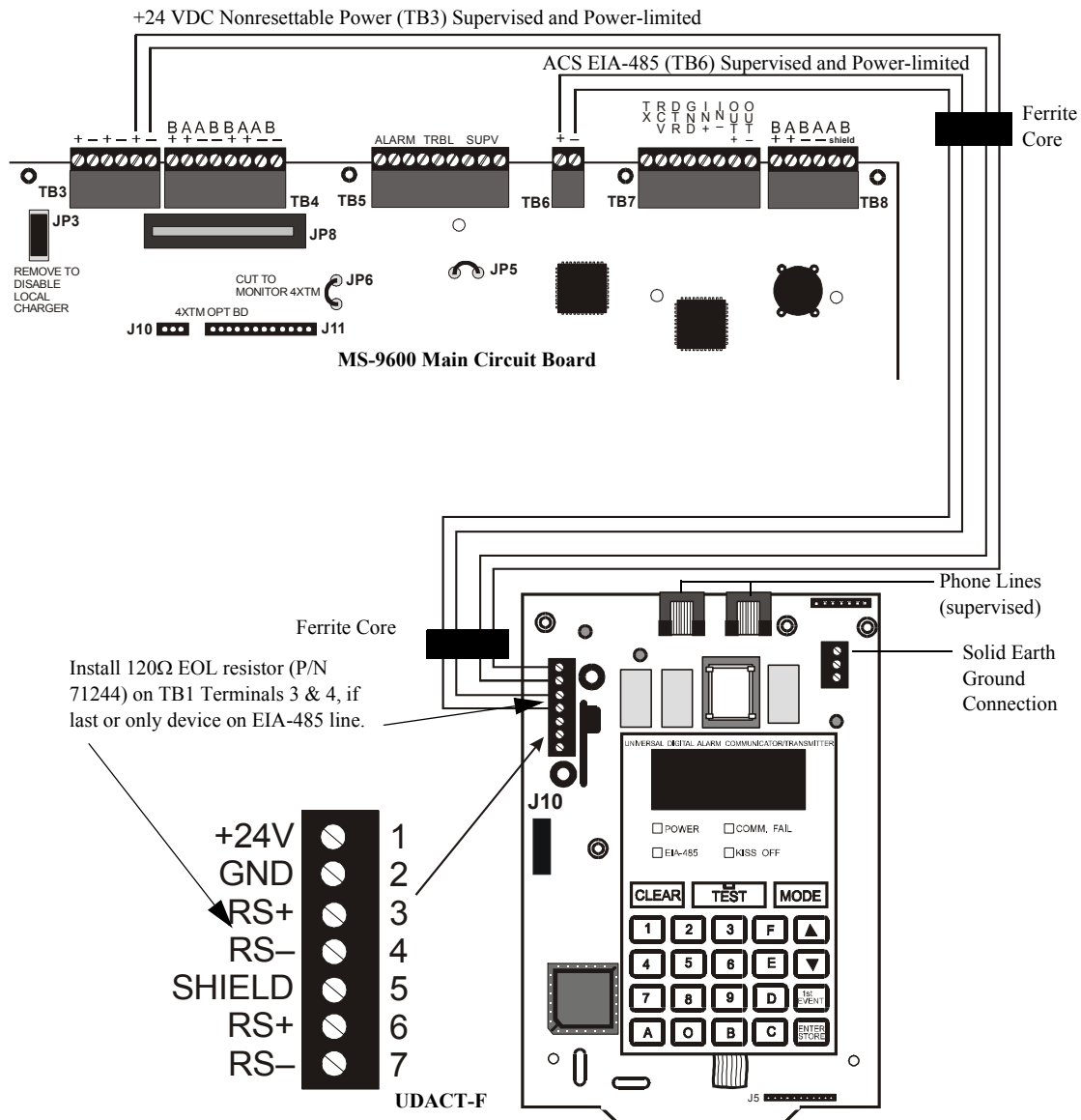


Figure C.2 Central Station Service Using UDACT-F

Notes:

1. Ferrite cores (P/N FBD-1) are recommended for all applications. Install around wires inside cabinets near terminal blocks.
2. Recommended wire is 12 AWG to 18 AWG (0.75 to 3.25 mm²) twisted, shielded pair.
3. If shielded wire is used, connect only one end of the shield.
4. Conduit is recommended for external wire runs (consult local building codes).
5. Connect ground wire from Earth Ground terminal on the UDACT-F to a solid building earth ground. Conduit alone will not provide a reliable earth ground.
6. UDACT-F may be located up to 6,000 feet (1,800 m) away from the host control panel.

The following figure illustrates an example of Central Station/Remote Station Reporting using a 411UD. The relay contacts from the MS-9600 may be used to trip any dialer UL listed for Central Station/Remote Station Reporting Services.

Note: The Monitor Module input, which is being used to monitor the 411UD Relay #2 Output (programmed for DACT Trouble), must be programmed as 'Trouble' at Fire•Lite MS-9600.

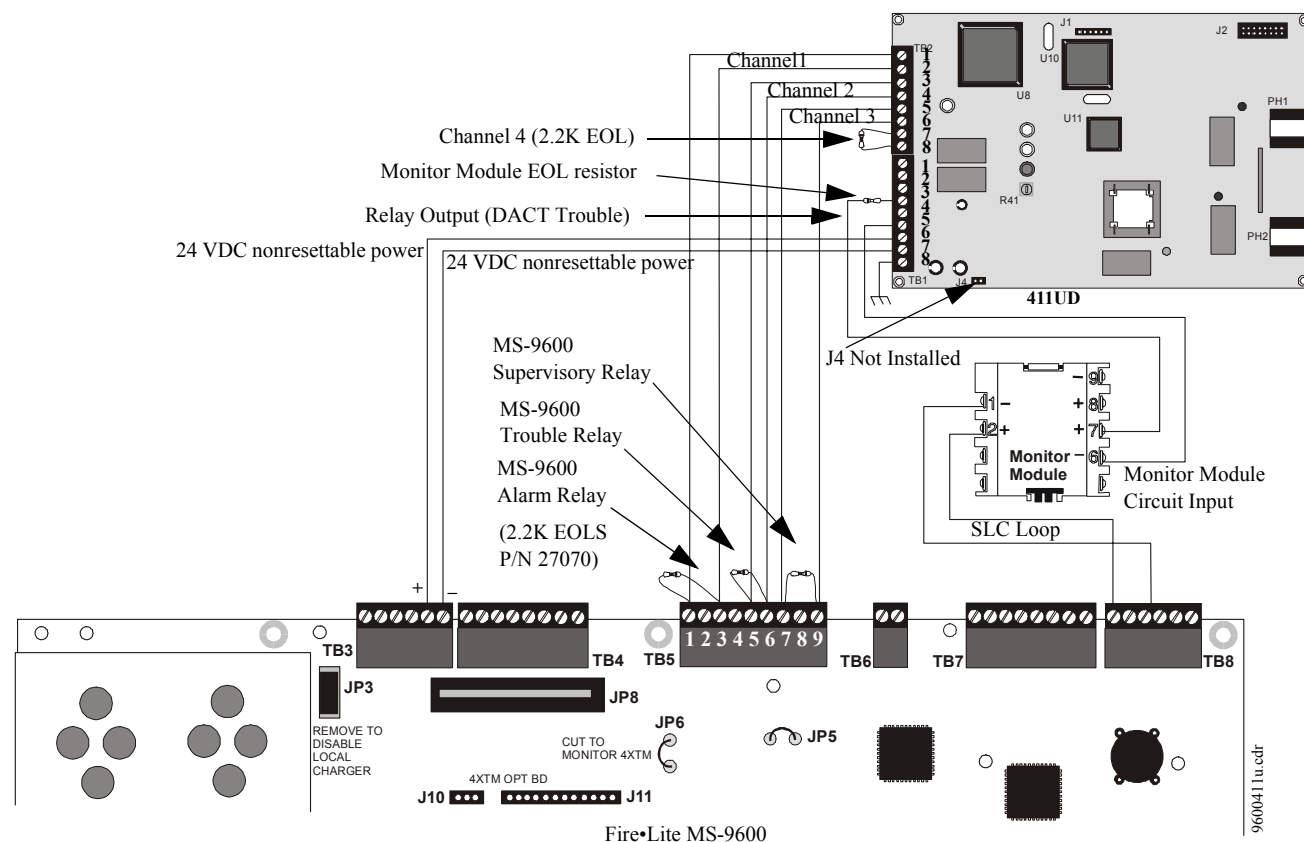


Figure C.3 Fire•Lite MS-9600 Connection to 411UD

	411UD	MS-9600
Alarm	TB2-1	TB5-1
	TB2-2	TB5-3
Trouble	TB2-3	TB5-5
	TB2-4	TB5-6
Supervisory	TB2-5	TB5-7
	TB2-6	TB5-9

Table C.2 411-UD Connections to MS-9600

NFPA 72 Auxiliary Fire Alarm System

All connections are power-limited and supervised. This application is not suitable for separate transmission of sprinkler supervisory or trouble conditions.

Notes:

1. 3 ohms maximum loop resistance allowed for wiring from control panel to Municipal Box.
2. Cut JP6 on the MS-9600 main circuit board to supervise placement of 4XTMF module and circuit.
3. Cut JP5 on the MS-9600 main circuit board to enable FACP Supervisory relay.
4. Refer to "4XTMF Transmitter Module Installation" on page 36 for detailed information.

Figure C.4 Municipal Box Connected to 4XTMF Transmitter Module

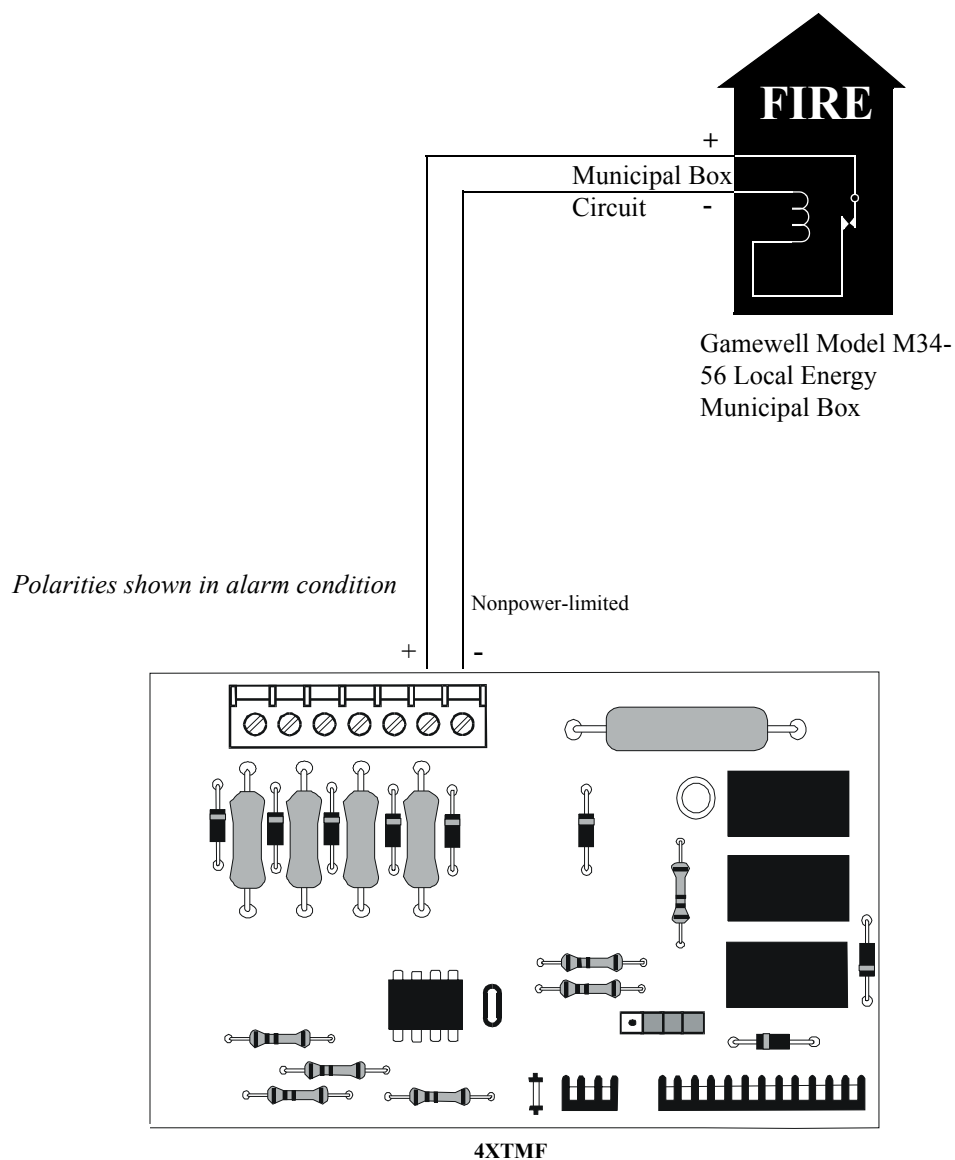


Figure C.4 Municipal Box Connected to 4XTMF Transmitter Module

NFPA 72 Remote Station Protective Signaling System

Notes:

1. Cut Jumper JP6 on the MS-9600 main circuit board to supervise placement of the 4XTMF module.
2. Refer to "4XTMF Transmitter Module Installation" on page 36 for detailed information.

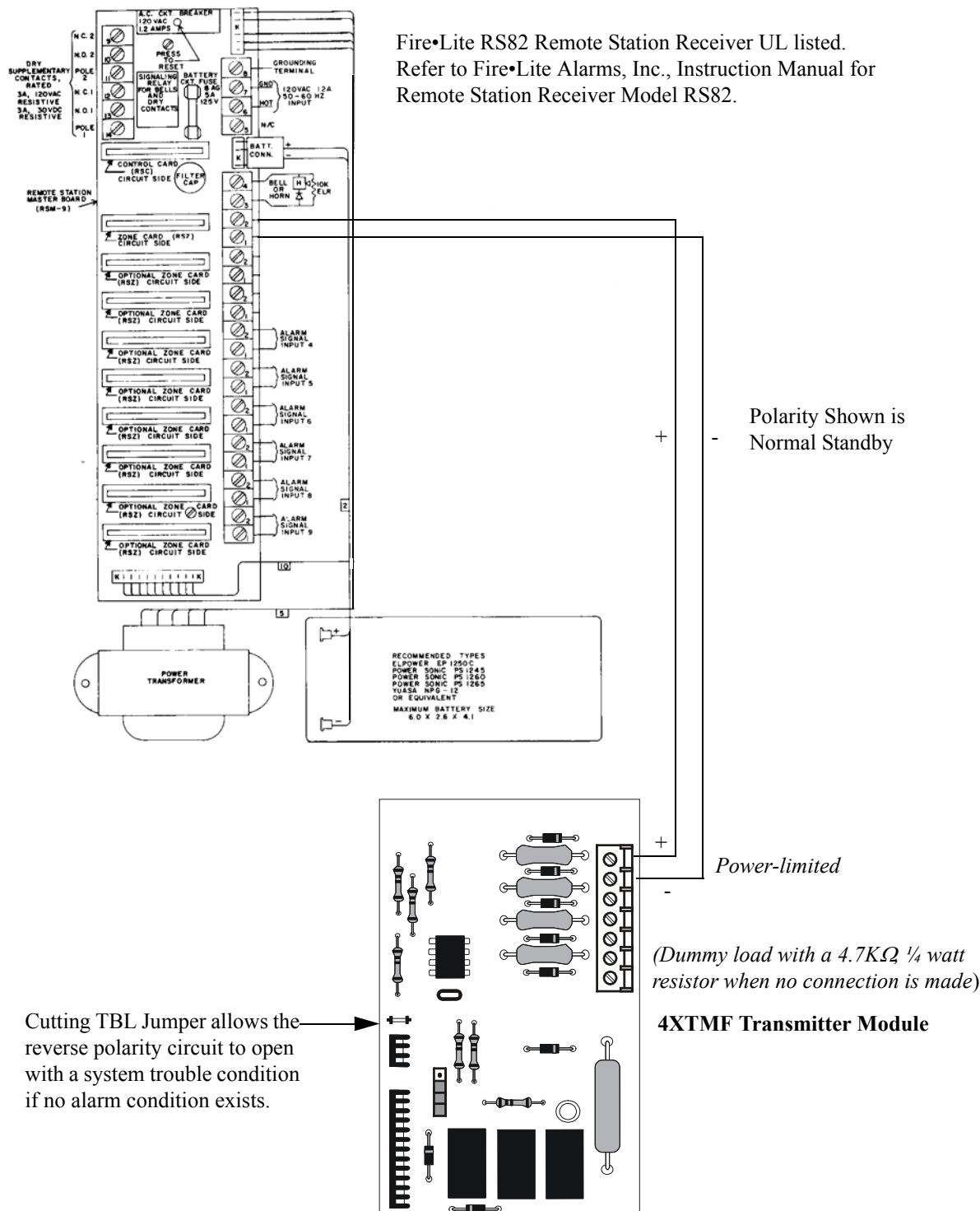


Figure C.5 Remote Station Connection Using 4XTMF Module

NFPA 72 Proprietary Protective Signaling Systems

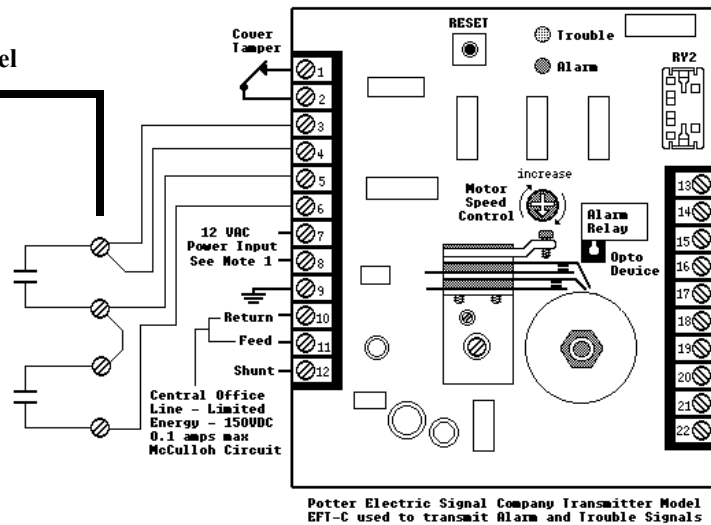
MS-9600 Addressable Fire Control Panel

MS-9600 Main Board

Form-C Alarm contact programmed to activate on General Alarm.

Form-C Trouble contact which will automatically activate on any Trouble condition.

Form-C relay contact programmed to activate on Supervisory condition.



Notes:

1. Connection between the MS-9600 and the transmitter are supervised by the transmitter.
2. This MS-9600/Transmitter arrangement can be employed for NFPA 72 Proprietary Protective Signaling System.

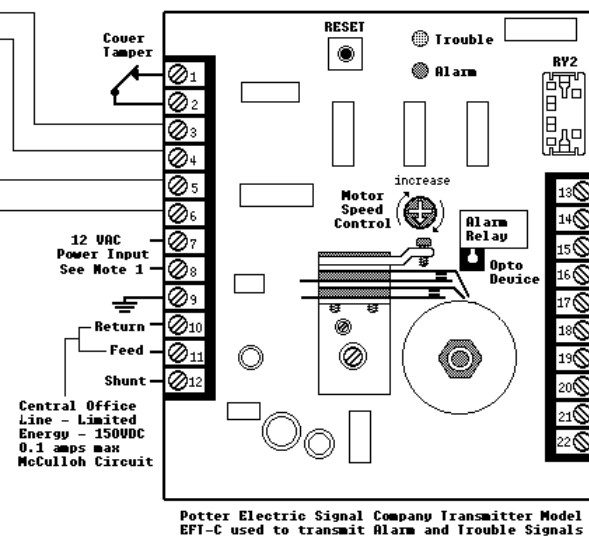


Figure C.6 Proprietary Protective Signaling System

APPENDIX D Wire Requirements

T-tapping of the SLC loop wiring is allowed for 2-wire (Style 4) configurations. The total resistance of any branch cannot exceed 40 ohms. The total wire length of all branches cannot exceed 10,000 feet (3,000 m).

Connecting external system accessories to the MS-9600 main circuits must be carefully considered to ensure proper operation. It is important to use the correct type of wire, wire gauge and wire run length for each MS-9600 circuit. Reference the chart below to specify wire requirements and limitations for each MS-9600 circuit.

Note: If the SLC loop is to be run in conduit with Notification Appliance Circuits, the risk of encountering problems can be greatly reduced by exclusively employing electronic sounders (such as MA/SS-24D) instead of more electronically noisy notification appliances such as electromechanical bells or horns.

Table D.1 MS-9600 Wire Specifications

CIRCUIT CONNECTIONS		WIRE REQUIREMENTS		
Circuit Type	Circuit Function	Wire Type and Limitations	Recommended Max. Distance Feet (meters)	Wire Gauge and Compatible Brands
SLC loop (power-limited)	Connects to Addressable Devices	Twisted, shielded pair, 40 ohms maximum per length of Style 6 and 7 loops. 40 ohms per branch maximum for Style 4 loops ¹	10,000 (3,000 m) 8,000 (2,400 m) 4,875 (1,450 m) 3,225 (980 m)	12 AWG (3.25 mm ²): Genesis 4410, Signal 98230, Belden 9583, WPW999 14 AWG (2.00 mm ²): Genesis 4408 & 4608, Signal 98430, Belden 9581, WPW995 16 AWG (1.30 mm ²): Genesis 4406 & 4606, Signal 98630, Belden 9575, WPW991 <u>Direct Burial Cable</u> Isotec NP713110VNQ-S 18 AWG (0.75 mm ²): Genesis 4402 & 4602, Signal 98300, Belden 9574, WPW975 <u>Direct Burial Cable</u> Isotec NP714110VNQ-S
		Untwisted, unshielded pair	3,000 (900 m)	12-18 AWG (3.25 - 0.75 mm ²)
ACS/TERM (EIA-485) (power-limited)	Connects to annunciator modules and UDACT-F	Twisted, shielded pair with a characteristic impedance of 120 ohms	6,000 (1,800 m)	18 AWG (0.75 mm ²)
EIA-232 (power-limited)	connects to remote printer and PC computer	Twisted, shielded pair	50 (15 m)	18 AWG (0.75 mm ²) minimum
MMF-300 and MMF-301 (power-limited)	Initiating Device Circuit	Maximum loop wire resistance is 40 ohms for the MMF-300 and 20 ohms for the MMF-301	2,500 (760 m)	12-18 AWG (3.25 - 0.75 mm ²)
MMF-302 (power-limited)	Initiating Device Circuit	No more than a 2.4 volt drop allowed at end of circuit. Maximum loop wire resistance is 25 ohms	2,500 (760 m)	12-18 AWG (3.25 - 0.75 mm ²)
CMF-300 (power-limited)	Notification Appliance Circuit	In alarm, no more than a 1.2 volt drop allowed at end of circuit	Distance limitation set by 1.2 volt maximum line drop	12-18 AWG (3.25 - 0.75 mm ²)
24 VDC filtered resettable (power-limited)	Connects to 4-wire smoke detectors	No more than 1.2 volt drop allowed from supply source to end of any branch	Distance limitation set by 1.2 volt maximum line drop	12-18 AWG (3.25 - 0.75 mm ²)
24 VDC nonresettable (power-limited)	Connects to control modules, annunciators and accessories	No more than 1.2 volt drop allowed from supply source to end of any branch	Distance limitation set by 1.2 volt maximum line drop	12-18 AWG (3.25 - 0.75 mm ²)
CHG-120F	Remote secondary power source	12 AWG (3.25 mm ²) in conduit	20 (6 m)	12-18 AWG (3.25 - 0.75 mm ²)

Table Footnote

1. When using untwisted, unshielded wire, full conduit is recommended for optimum EMI/RFI protection.

Index

Numerics

300 Series addressable devices 20
4XTMF 153, 154
4XTMF module
 coil resistance 36
 current 36
 installation 36
 installation steps 37
 see also Transmitter Module
 13, 20
 voltage 36

A

AC Branch Circuit
 calculations 136
AC Loss Delay 87
AC Power 27
 current 14
 current, maximum 27
 voltage 14
 wiring 14, 27
Acknowledge/Step 16, 111
ACM 22
ACM LED annunciator 42
ACM Series
 see also annunciator 22
ACM-16ATF Annunciator 22
ACM-32AF Annunciator 22
ACM-8RF 13
 contact rating 40
 mounting to BRKT-9600 41
 see also Relay Control Module
 40
ACS LED annunciator 13
add Detector 49
add Module 59
address range 19
addressable 12
addressable detectors
 see also detectors 13
Addressable Device Accessories 20
addressable modules 19
 see also modules 13
addressing
 annunciators 42
 see also device addressing 80
 see also module or detector addressing 19
Adjective
 control module 73
 monitor module 66
 multiple entries 58
Adjective list 56
AEM-16ATF Annunciator 22
AEM-32AF Annunciator 22
AFM annunciator 42
AFM-16AF Annunciator 22
AFM-16ATF Annunciator 22

AFM-32AF Annunciator 22
Alarm 115
Alarm Silence 16, 111
alarm verification 12, 53, 118, 122
annunciator 22
 ACM 13, 42
 ACM-8RF 13
 graphic, see also LDM Series
 13, 23
 LCD-80F 13
annunciator addressing 42
annunciator, remote
 see also LCD-80F 23
Auto Silence
 NAC 90
Automatic Test Operation 118
Autoprogramming 13, 44, 48
Autosilence 13, 121
auxiliary DC power 27
Auxiliary Trouble Input 17, 37

B

backbox 18
 see also cabinet 26
Banner 81
Banner setting 82
battery 18
 cable connection 27
 charger 17, 22
 charger capacity 14
 charger, disable 14
 charger, external 22
 Charging Circuit 14
 see also secondary power 14, 27
battery box 21
baud rate 99
BB-17F
 see also battery box 21
BB-55F
 see also battery box 18, 21
BG-10LX
 see also manual pull station 20
BG-12LX
 see also manual pull station 19
BRKT-9600
 bracket installation 40, 41
 see also Universal Bracket 40

C

C304 Control/Relay Module 20
cabinet 18
 dimensions 25, 26
 mounting 24
Calculate System Current Draw 137
Calculating the Battery Size 139
Canadian Option 81, 94
Central Station/Remote Station Reporting 151, 152

CHG-120F
 see also battery charger 22
 see also remote battery charger 14
CHG-75
 see also battery charger 22
 see also remote battery charger 14
Class A 19, 28
Class B 19, 28
 NAC wiring 29
Classic Loop Interface Protocol 80
CLIP Mode
 see also Classic Loop Interface Protocol 80
Clock Format 84
CMF-300 control module 19
Coded Operation 119
Coding
 NAC 90
coding
 two stage operation 91
control buttons 111
control module 19
 description display 75
 display 69
 edit 69
 enable/disable 70
 noun 74
 noun/adjective 72, 73
 silenceable 72
 type 71
 type codes 71
Correlations 140
CP300 Ionization Detector 20
CP350 18
CP355 18
CRF-300 relay module 19
current
 AC Power 27
 availability 15
 maximum 15
Current Draw Calculations 138
D
D350P 18
D350R 18
DACT 98
 functions 33
 option module installation 33, 34
 phone lines 35
DACT-UD
 functions 33
 installation 33
 see also Digital Alarm Communicator/Transmitter 20
data

Index

- see also detector data and sensitivity 118
- values 12
- Data Entry
 - via computer keyboard 43
 - via keypad 43
- Date setting 84
- Daylight Savings Time 84
- DC power
 - nonresettable 27
 - resettable 27
 - see also auxiliary DC power 27
- Default Programming 148
- Delete Detector 50
- Delete Module 60
- Description
 - control module 75
 - detector label 58
 - monitor module 68
- Detector 13
 - add 49
 - adding description 55
 - delete 50
 - edit 50
 - enable/disable 52
 - screen display 51
 - type 53
 - verification 53
- Detector Annunciator 19
- detector data 118, 133, 134
 - acceptable range 133
 - printout 133
- Detector Programming 49
- device addressing 80
- Digital Alarm Communicator/Transmitter
 - see also DACT-14.4K 20
 - see also UDACT-F 40
- dimensions
 - cabinet 25
- DIRTY1 134
- DIRTY2 134
- Disable 77
- Disable Point
 - Maintenance Level 104
- dress panel 18, 21
- drift compensation 12, 134
 - definition 134
- Drill 16, 111
- E**
- earth ground 27
- edit
 - control module 69
 - detector 50
 - detector screens 51
 - module, monitor 61
- EIA-232 39
- for PC/Printer connection 15
- see also Printer/PC interface 12
- EIA-485
 - for ACS annunciators 15
 - for LCD-80F 15
- Enable 76
- Enable/Disable
 - control module 70
 - detector 52
 - module, monitor 62
- End-of-Line Resistor Assembly 20
- Enter key 46
- Erase History 95
- exiting
 - programming 44, 45
 - Read Status 44, 45
- Expander Module 38
- see also SLC-2 20
- F**
- FACP
 - see also Fire Alarm Control Panel 12
- Features 12
- Fire Alarm Control Panel
 - see also FACP 12
- Form-C relay 17, 28, 40
- G**
- general alarm zone 65
- see also zone Z00 55
- ground fault 39
- H**
- H350 18
- H350R 18
- H355R 18
- Hazard Condition 117
- History 95
 - erase 95
 - Maintenance Level 105
 - view events 95
- History file 12
- I**
- I300
 - see also Isolator Module 19
- Indicators 16
- Installation 24
- intelligent 12
- Inventory 12
- INVREP 134
- Isolator Module 19
- K**
- Key Panel 16
 - function keys 16
 - service/program keys 16
- keyboard and keypad 43
- Keypad/Display
 - removal and installation 32
- L**
- lamp test 16
- LCD display 12, 16
- LCD-80F annunciator 13, 23
- LDM Series annunciator 23
- LDM-32 Graphic Annunciator 13
- LED
 - AC Power 112
 - Alarm Silenced 112
 - Battery 112
 - Disabled 112
 - Fire Alarm 112
 - Ground 112
 - Maintenance 112
 - see also Indicators 16
 - Supervisory 112
 - Trouble 112
- LED annunciator 22
- Local Energy Municipal Box Service 36
- Loop Setup 80
- M**
- M300 Monitor Module 20
- M301 Miniature Monitor Module 20
- M302 2-wire Monitor Module 20
- main circuit, mounting 24
- Maintenance Alert 12, 118
 - levels 134
- maintenance alert 134
- Maintenance Program Level 2 45, 103
- Manual programming 44
- Manual Pull Station 19
- Master Program Level 1 45, 47
- MDF-300 monitor module 19
- Medical Alert 117
- MMF-300 monitor module 19
- MMF-300-10 19
- MMF-301 mini monitor module 19
- MMF-302 monitor module 19
- Mode key 46
- Module 13
 - add 59
 - addressing 19
 - delete 60
 - edit monitor 61
 - enable/disable 62
 - see also addressable modules 19
- Module Programming 59
- Monitor module 19
 - adjective 66
 - enable/disable 62
 - noun 67
 - noun/adjective 65
 - type 63

Index

- type action 64
- Type list 63
- type selection 64
- Mounting
 - cabinet 24
 - main circuit board 24
- municipal box transmitter
 - see also 4XTMF module 36
- N**
- NAC 14, 17, 87, 118
 - Auto Silence 90
 - coded 119
 - coding 90
 - current 14
 - End-of-Line Resistor 14
 - power 12
 - see also Notification Appliance Circuit 12, 28
 - silence inhibit 92
 - silenceable 89
 - Style configuration 29
 - Style Y wiring diagram 29
 - synchronized 119
 - type codes 89
 - voltage drop 14
 - voltage, operating 14
 - wiring Style 28
- NAC enable/disable 88
- NAC options 81
- NAC type 89
- NACKEY card 29
- N-ELR Mounting Plate 20
- NFPA 72 Auxiliary Fire Alarm System 149, 153
- NFPA 72 Central Station Service (Protected Premises Unit) or Remote Station Service 149
- NFPA 72 Proprietary Fire Alarm System 149
- NFPA 72 Proprietary Protective Signaling Systems 155
- NFPA 72 Remote Station Protective Signaling System 154
- NFPA Battery Requirements 139
- NFPA Signaling Systems for Central Station Service (Protected Premises Unit)/Remote Station 150
- NFPA Standard 149
- nonpower-limited
 - relay connections 28
- Nonresettable Power 17, 27
 - current 14, 27
- nonsilenceable
 - waterflow 94
- nonsilenceable waterflow 79
- normal display 44, 113
- Notification Appliance Circuit 14, 87
 - see also NAC 12, 28
- Noun
 - monitor module 67
 - multiple entries 58
- Noun list 57
- Noun/Adjective 55, 57
 - control module 72
 - monitor module 65
- O**
- Off-line Programming 44
- Operating Instructions 111
- Operation
 - alarm 115
 - disable/enable 118
 - hazard condition 117
 - medical alert 117
 - NAC 118
 - normal 113
 - process monitor 117
 - programmed zone 117
 - supervisory 116
 - trouble 113
 - waterflow 118
- Option Modules 20, 32, 97
 - annunciators/UDACT 97
 - Printer/PC 98
- Options 12
- Output Circuits 17
- P**
- PAS 54, 77, 120
 - see also Positive Alarm Sequence 13, 53
 - selection 65
- PAS BYPASS 120
- PAS timer 85
- Password 13, 45
 - change 99
 - Maintenance Level 2 46, 103
 - Master Level 1 46
- PC (personal computer)
 - configuration 39
 - connection 39
 - ground fault 39
- phone lines
 - DACT installation 35
- Piezo
 - see also sounder 16
- PK-CD Programming Utility 21
- Point Program 49
- Positive Alarm Sequence 53, 120
 - see also PAS 13
- power
 - NAC 12
 - nonresettable 14
 - resettable 71
 - resettable smoke 14
- power supply calculations 136
- power-limited
 - relay connections 28
- Power-up
 - first time 45
- Pre-signal 13, 54, 77
 - function 119
 - selection 65
- Pre-signal Delay timer 85, 86
- primary power
 - see also AC Power 27
- printer
 - baud rate 99
 - configuration 39
 - connection 39
 - ground fault 39
 - setup 39
- Printer/PC interface 12
- Process Monitor 117
- Program
 - check 101
 - check correlations 101
 - clear 100
- Program Check
 - Maintenance Level 106
- program keys
 - see also Key Panel 16
- Programming 43, 44
 - autoprogramming 44
 - exiting 44
 - factory default 148
 - Level 1 45
 - Level 2 45
 - manual 44
 - Master Level 1 47
 - modules 59
 - off-line computer 44
 - via computer keyboard 43
 - via panel keypad 43
- Programming Levels 45
- Programming Screens 45
- Programming Sheet 142, 143, 144, 145, 147
- Programming Utility
 - see also PK-CD 21
- PRT/PK-CABLE
 - for PC/Printer connection 39
- R**
- RA400Z
 - see also detector annunciator 19
- Read Status 44, 123
 - annunciators 130, 131
 - exiting 44
 - history 129
 - NAC 128
 - power 126
 - Print 133

Index

- printer/PC 132
- program check 129
- relay 128
- system point 124
- Time-Date 135
- timers 127
- trouble reminder 127
- zones 125
- Real-Time Clock 118
- Recall/Increment Function 58, 68, 75
- Relay 14, 17, 28, 93
 - connections 28
 - contact rating 14, 17, 28
 - fixed 28
 - Form-C 14, 93
 - programmable 12, 17, 28
 - programming 93
 - selections 93
 - trouble 12, 17, 28
- Relay Control Module
 - see also ACM-8RF 40
- relay module 19
- Relay options 81
- Remote Station Service 36
- remote switch functions 13
- Reset 16, 111
- Resettable Power 17, 27, 71
 - current 27
 - see also Smoke Detector Power 14
- S**
- SD300 Photoelectric Detector 20
- SD300T Photoelectric Detector 20
- SD350 18
- SD350T 18
- SD355 18
- SD355T 18
- Secondary Power Requirements 139
- sensitivity 118, 134
 - see also smoke detector sensitivity 118
- Signal rate 13
- Signaling Line Circuit 14
- Silence Inhibit 13, 92, 121
- Silenceable
 - control module 72
 - NAC 89
- silenceable
 - waterflow 79, 81, 94
- silenceable circuits
 - synchronized signals 89
- SLC 13, 14, 17
 - current 14
 - reference manual 14
 - resistance 14
 - see also Signaling Line Circuit 12
- Style 17
- voltage 14
- wiring length 14
- SLC Loop Protocol 80
- SLC loop selection 49
- SLC Style 80
- SLC-2 38
 - installation 38
 - wiring 38
- SLC-2 Expander Module 20
- smoke detector
 - chamber reading 133
 - data 118, 133
 - sensitivity 118
- Smoke Detector Power
 - current 14
- smoke detector sensitivity 12
- Software Zones 12, 140
- sounder 16
- speaker type 71
- Specifications 14
- strobe synchronization 13
- Style 12
- Style B 19
- Style D 19
- Style Y 19, 28
 - NAC wiring 29
 - NC configuration 29
- Style Z 19, 28
 - NAC configuration 29
 - wiring 30
- subscreen 45
- Supervisory 116
- sync
 - programming 88
 - see also synchronization 92
- synchronization 119, 128
 - by manufacturer 92
 - programming 92
 - see also strobe synchronization 13
- synchronized 119
- Synchronized Signals 119
 - and silenceable circuits 89
- System
 - Maintenance Level 107
- System Point 124
- System Setup 81
- T**
- Time and Date
 - Maintenance Level 108
- Time setting 83
- Time-Date setting 81, 83
- Timers 81
- Transmitter Module 36
 - see also 4XTMF module 20
- Trouble 113
- trouble display 114
- trouble relay 12
- Trouble Reminder 81, 121, 127
- trouble responders 114
- two stage operation 91
- Type
 - control module 71
 - detector 53
 - monitor module 63
 - NAC 89
 - speaker 71
- type code
 - control module 71
 - supervision 118
 - verification 12
- U**
- UDACT-F
 - mounting to BRKT-9600 41
 - programming 40
 - see also Digital Alarm Communicator/Transmitter 40
- UL power-limited wiring requirements 31
 - see also power-limited and non-power-limited 28
- Universal Bracket
 - see also BRKT-9600 40
- V**
- Verification
 - detector 53
- Verify Loops 94
- View Events 95
- voltage
 - measurements 126
 - ranges 126
- W**
- Walktest 12, 53, 72, 96
 - audible 96
 - Maintenance Level 107
 - operation 122
 - selection 65
 - silent 96
- waterflow
 - nonsilenceable 79, 94
 - silenceable 79, 81, 94
- Waterflow Delay timer 85, 86
- Waterflow Retard Timer 121
- Wire Requirements 156
- wiring
 - AC Power 27
 - earth ground 27
 - NAC Style Y 29
 - NAC Style Z 30
 - SLC-2 38
- wiring control modules
 - see also Style Y or Style Z 19

Index

- wiring modules
 - see also Style B or Style D 19
- wiring Style 12
- Z**
- Z00 55, 65
- Z97
 - PAS zone 54
- Z98 54
- Zone 97 77
- Zone 98 77
- Zone Assignment 55, 65, 92
 - control module 72
- Zone Setup 76
 - Maintenance Level 109
- zone type 79
 - list 79
- Zone Z97 54
- Zone Z98
 - pre-signal zone 54
- Zones 125, 140
 - see also software zones 12
- Zones Disabled 78
- Zones Enabled 78
- Zones Installed 78
- zones per device 55

Notes

Limited Warranty

The manufacturer warrants its products to be free from defects in materials and workmanship for eighteen (18) months from the date of manufacture, under normal use and service. Products are date-stamped at time of manufacture. The sole and exclusive obligation of the manufacturer is to repair or replace, at its option, free of charge for parts and labor, any part which is defective in materials or workmanship under normal use and service. For products not under the manufacturer's date-stamp control, the warranty is eighteen (18) months from date of original purchase by the manufacturer's distributor unless the installation instructions or catalog sets forth a shorter period, in which case the shorter period shall apply. This warranty is void if the product is altered, repaired, or serviced by anyone other than the manufacturer or its authorized distributors, or if there is a failure to maintain the products and systems in which they operate in a proper and workable manner. In case of defect, secure a Return Material Authorization form from our customer service department. Return product, transportation prepaid, to the manufacturer.

This writing constitutes the only warranty made by this manufacturer with respect to its products. The manufacturer does not represent that its products will prevent any loss by fire or otherwise, or that its products will in all cases provide the protection for which they are installed or intended. Buyer acknowledges that the manufacturer is not an insurer and assumes no risk for loss or damages or the cost of any inconvenience, transportation, damage, misuse, abuse, accident, or similar incident.

THE MANUFACTURER GIVES NO WARRANTY, EXPRESSED OR IMPLIED, OF MERCHANTABILITY, FITNESS FOR ANY PARTICULAR PURPOSE, OR OTHERWISE WHICH EXTEND BEYOND THE DESCRIPTION ON THE FACE HEREOF. UNDER NO CIRCUMSTANCES SHALL THE MANUFACTURER BE LIABLE FOR ANY LOSS OF OR DAMAGE TO PROPERTY, DIRECT, INCIDENTAL, OR CONSEQUENTIAL, ARISING OUT OF THE USE OF, OR INABILITY TO USE THE MANUFACTURER'S PRODUCTS. FURTHERMORE, THE MANUFACTURER SHALL NOT BE LIABLE FOR ANY PERSONAL INJURY OR DEATH WHICH MAY ARISE IN THE COURSE OF, OR AS A RESULT OF, PERSONAL, COMMERCIAL, OR INDUSTRIAL USE OF ITS PRODUCTS.

This warranty replaces all previous warranties and is the only warranty made by the manufacturer. No increase or alteration, written or verbal, of the obligation of this warranty is authorized.



World Headquarters

One Fire-Lite Place, Northford, CT 06472-1653 USA

203-484-7161 • Fax 203-484-7118

www.firelite.com

ISO 9001
CERTIFIED
ENGINEERING & MANUFACTURING
QUALITY SYSTEMS