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 panel 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 Guides for Proper Use of System Smoke Detectors, which are made available at no charge to all installing dealers. These documents can be found at http://www.systemsensor.com/html/applicat.html. 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 photoelectric 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 stor-

**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 exercises 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 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 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 indoor dry operation at 0-49° C/32-120° F and at a relative humidity of 93 ±2% RH (non-condensing) at 32 ±2° C/90 ±3° 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. Refer to manual Specifications section for maximum allowable I.R. drop from the specified device voltage.

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.

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 their 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 present appareil numerique n’emet pas de bruits radioelectriques depassant les limites applicables aux appareils numeriques de la classe A prescrites dans le Reglement sur le brouillage radioelectrique edicte par le ministere des Communications du Canada.
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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**
This Fire Alarm Control Panel complies with the following NFPA Standards:


**Underwriters Laboratories Documents for Reference:**

- 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 1638 Visual Signaling Appliances
- UL 1971 Signaling Devices for Hearing Impaired
- UL 2017 General-Purpose Signaling Devices and Systems

**CAN/ULC - S524-01 Standard for Installation of Fire Alarm Systems**

**Other:**

- 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 Document #15384
- 411UD Manual Document #50759
- 411UDAC Manual Document #51073

This product has been certified to comply with the requirements in the Standard for Control Units and Accessories for Fire Alarm Systems, UL 864, 9th Edition. Operation of this product with products not tested for UL 864, 9th Edition has not been evaluated. Such operation requires the approval of the local Authority Having Jurisdiction (AHJ).
Basic System Connections
5-Zone Panel

Notes:
1. MS-5UD-3(E) = 2.5 amps max. per NAC
2. Remote Sync Output is required only for the MS-5UD-3(E); refer to “Remote Synchronization Output” on page 30
3. 18 Amp Hour max. for MS-5UD-3(E) 26 Amp Hour max. for MS-5UD-7(E)

Important! Removing Ground Fault Disable jumper JP43 voids UL/NFPA Style/Class identifications for circuits. Remove jumper JP43 only with the approval of the AHJ (Authority Having Jurisdiction).

Special Application
DC Power Outputs (24 VDC)
Non-supervised, power-limited circuits
Supervised with a power supervision relay EOLR-1

Resistible Power - 24 VDC filtered, power-limited (0.500 amps maximum) to smoke detectors (IDC). Supervision required.

Nonresistible or Resistible Power
Jumper selectable by JP31, 24 VDC filtered, power-limited (0.500 amps maximum) Supervision required. Nonresistible Power suitable for powering smoke detectors. Configure TP9, Terminals 1 & 2 as Resistible or Nonresistible Power:
- Nonresistible Power - jumper JP31 pins 1 & 2 (as shown).

For more specific UL wiring information refer to page 35.

Power Supply Connector J15

Battery (see note 3)
24 VDC, supervised, nonpower-limited

Notification Appliance Circuits (see note 1)
NAC #1, #2, #3 & #4, Style Y (Class B) (Supervised, Power Limited)
10.0 amps max. per circuit
(See Style Z illustrated near right edge of board).

Initiating Device Circuits
IDCs 1 through 5, Style B (Class B) (Supervised, Power Limited)
(See Style D illustrated near right edge of board).
4.7KΩ, ½ watt End-of-Line Resistor
PN 71252

Remove jumper JP43 to disable Ground Fault Detection circuit only with approval of AHJ.

3 Programmable Relays
Non-supervised relay contacts
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 NC position during trouble conditions and under loss of all power.

Remote Synchronization Output (see note 2)
Special Application Power
24 VDC filtered, supervised and power-limited.
0.040 amps maximum.
Requires 4.7KΩ EOLR.

Cut this jumper to enable Supervisory relay when 4XTMF module is installed
Cut this jumper to disable 4XTMF module when installed (see J4 & J5)

Primary Phone Active LED
Secondary Phone Active LED
Basic System Connections
10-Zone Panel

Notes:
1. MS-10UD-3(E) = 2.5 amps max. per NAC
2. Remote Sync Output is required only for the MS-10UD-3(E): refer to “Remote Synchronization Output” on page 30
3. 18 Amp Hour max. for MS-10UD-3(E)
4. 26 Amp Hour max. for MS-10UD-7(E)

Important! Removing Ground Fault Disable jumper JP43 voids UL/NFPA Style/Class identifications for circuits. Remove jumper JP43 only with the approval of the AHJ (Authority Having Jurisdiction).

Special Application DC Power Outputs (24 VDC)
Nonresettable, power-limited circuits
Supercede with a power supervision relay EDLR-1

Resettable Power - 24 VDC filtered, power-limited (0.500 amps maximum) to smoke detectors (IDC).
Supervision required.

Nonresettable or Resettable Power Jumper selectable by JP31, 24 VDC filtered, power-limited (0.500 amps maximum)
Supervision required. Nonresettable jumper JP31 pins 2 & 3 as Resettable or Nonresettable Power.

For more specific UL wiring information refer to page 36.

Battery (see note 3)
24 VDC, Supervised, nonpower-limited

Power Supply Connector J15

Notification Appliance Circuits (see note 1)

Special Application Power
NAC #1, #3, #4, Style Y (Class B) (Supervised, Power Limited)
(See Style Z illustrated near right edge of board).

Initiating Device Circuits
IDCs 1 through 5, Style B (Class B) (Supervised, Power Limited)
(See Style D illustrated near right edge of board).

Initiating Device Circuits
IDCs 6 through 10, Style B
(See Style D illustrated near right edge of board).

Remote Synchronization Output (see note 2)
Special Application Power
24 VDC filtered, supervised, and power-limited.
0.040 amps maximum.
Requires 4.7KΩ ELR.

Important! Removing Ground Fault Disable jumper JP43 voids UL/NFPA Style/Class identifications for circuits. Remove jumper JP43 only with the approval of the AHJ (Authority Having Jurisdiction).

3 Programmable Relays
Nonresettable relay contacts
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 NC position during trouble conditions and under loss of all power.
("Factory default relay programming")

Remove jumper JP43 to disable Ground Fault Detection circuit (only with approval of AHJ).

MS-10UD Series Main Circuit Board

**Note:** For more detailed information and diagrams, refer to the original document or manual.
SECTION 1  Product Description

The MS-5UD is a five zone FACP (Fire Alarm Control Panel) and the MS-10UD is a ten zone FACP. The information in this manual refers to both the MS-5UD and MS-10UD unless otherwise specified. The combination control and digital communicator panels provide reliable fire signaling protection for small to medium sized commercial, industrial and institutional buildings. The FACP is compatible with System Sensor’s i3 detectors which are conventional smoke detectors that can transmit a maintenance trouble signal to the FACP indicating the need for cleaning and a supervisory ‘freeze’ signal when the ambient temperature falls below the detector rating of approximately 45° F (refer to System Sensor i3 Installation and Maintenance Instructions). In addition, the control panel is compatible with conventional input devices such as two-wire smoke detectors, four-wire smoke detectors, pull stations, waterflow devices, tamper switches and other normally-open contact devices. Refer to Fire•Lite Device Compatibility Document for a complete listing of compatible devices.

Outputs include four NACs (Notification Appliance Circuits), three programmable Form-C relays (factory programmed for Alarm, Trouble and Supervisory) and 24 VDC special application resettable and nonresettable power outputs. The FACP supervises all wiring, AC voltage, battery level and telephone line integrity.

Activation of a compatible smoke detector or any normally-open fire alarm initiating device will activate audible and visual signaling devices, illuminate an indicating LED, display alarm information on the panel’s LCD, sound the piezo sounder at the FACP, activate the FACP alarm relay and operate an optional module used to notify a remote station or initiate an auxiliary control function.

The following versions of the MS-5UD and MS-10UD are available:

<table>
<thead>
<tr>
<th>FACP Version</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>MS-5UD-3</td>
<td>Five Zone Panel: 120 V AC with FLPS-3 power supply providing 3.0 amps total 24 VDC output current</td>
</tr>
<tr>
<td>MS-5UD-7</td>
<td>Five Zone Panel: 120 V AC with FLPS-7 power supply providing 7.0 amps total 24 VDC output current</td>
</tr>
<tr>
<td>MS-5UD-7C</td>
<td>Five Zone Panel: 120 V AC with FLPS-7 power supply providing 7.0 amps total 24 VDC output current. Includes built-in ANN-LED Annunciator</td>
</tr>
<tr>
<td>MS-5UD-3E</td>
<td>Five Zone Panel: 240 V AC with FLPS-3 power supply providing 3.0 amps total 24 VDC output current</td>
</tr>
<tr>
<td>MS-5UD-7E</td>
<td>Five Zone Panel: 240 V AC with FLPS-7 power supply providing 7.0 amps total 24 VDC output current</td>
</tr>
<tr>
<td>MS-10UD-3</td>
<td>Ten Zone Panel: 120 V AC with FLPS-3 power supply providing 3.0 amps total 24 VDC output current</td>
</tr>
<tr>
<td>MS-10UD-7</td>
<td>Ten Zone Panel: 120 V AC with FLPS-7 power supply providing 7.0 amps total 24 VDC output current</td>
</tr>
<tr>
<td>MS-10UD-7C</td>
<td>Ten Zone Panel: 120 V AC with FLPS-7 power supply providing 7.0 amps total 24 VDC output current. Includes built-in ANN-LED Annunciator</td>
</tr>
<tr>
<td>MS-10UD-3E</td>
<td>Ten Zone Panel: 240 V AC with FLPS-3 power supply providing 3.0 amps total 24 VDC output current</td>
</tr>
<tr>
<td>MS-10UD-7E</td>
<td>Ten Zone Panel: 240 V AC with FLPS-7 power supply providing 7.0 amps total 24 VDC output current</td>
</tr>
</tbody>
</table>

Note: Unless otherwise specified, the information in this manual applies to all versions of the panels.
1.1 Product Features

- Built-in DACT (Digital Alarm Communicator/Transmitter)
- Style B (Class B) IDC (Initiating Device Circuit)
  - MS-5UD - five programmable IDCs
  - MS-10UD - ten programmable IDCs
- Four Style Y (Class B) NAC (Notification Appliance Circuit)
  - special application power
- Three programmable Form-C relays
- Built-in Programmer
- Touchtone/ Rotary dialing
- Programmable Make/Break Ratio
- Optional Dress Panel DP-51050
- Dress Panel DP-51050LED is provided standard with Canadian models: includes an ANN-LED Annunciator module
- Optional Trim Ring TR-CE (red) for semi-flush mounting the cabinet
- ANN-BUS for connection to optional:
  - ANN-80 Remote LCD Annunciator
  - ANN-I/O LED Driver
  - ANN-S/PG Printer Module
  - GFANN-RLY Relay Module
  - GFANN-LED Annunciator Module
- 80-character LCD display (backlit)
- Real-time clock/calendar with daylight savings time control
- History log with 256 event storage
- Control Buttons
  - ACK (Acknowledge)
  - Alarm Silence
  - System Reset/Lamp Test
  - Drill
- LED Indicators
  - Fire Alarm
  - Supervisory
  - Trouble
  - AC Power
  - Alarm Silence
  - Primary and Secondary Phone Line Active LEDs
- Piezo sounder for alarm, trouble and supervisory
- 24 volt operation
- Low AC voltage sense
- Alarm Verification
- NACs Programmable for:
  - Silence Inhibit
  - Auto-Silence
  - Strobe Synchronization (System Sensor, Wheelock, Gentex, Faraday, Amseco)
  - Selective Silence (horn-strobe mute)
  - Temporal or Steady Signal
  - Silenceable or Nonsilenceable
- Automatic battery charger with charger supervision
Product Description

- Silent or audible walktest capabilities
- Optional CAC-5X Class A Converter Module for NACs and IDCs
- Optional 4XTMF Transmitter Module

1.2 Specifications

AC Power

<table>
<thead>
<tr>
<th>Model</th>
<th>AC Voltage</th>
<th>Frequency</th>
<th>Current</th>
</tr>
</thead>
<tbody>
<tr>
<td>MS-5UD-3 (FLPS-3)</td>
<td>120 V AC, 60 Hz</td>
<td>1.00 amps</td>
<td></td>
</tr>
<tr>
<td>MS-5UD-7 (FLPS-7)</td>
<td>120 V AC, 60 Hz</td>
<td>3.80 amps</td>
<td></td>
</tr>
<tr>
<td>MS-10UD-3 (FLPS-3)</td>
<td>120 V AC, 60 Hz</td>
<td>1.00 amps</td>
<td></td>
</tr>
<tr>
<td>MS-10UD-7 (FLPS-7)</td>
<td>120 V AC, 60 Hz</td>
<td>3.80 amps</td>
<td></td>
</tr>
<tr>
<td>MS-5UD-3E (FLPS-3)</td>
<td>240 V AC, 50 Hz</td>
<td>0.54 amps</td>
<td></td>
</tr>
<tr>
<td>MS-5UD-7E (FLPS-7)</td>
<td>240 V AC, 50 Hz</td>
<td>2.20 amps</td>
<td></td>
</tr>
<tr>
<td>MS-10UD-3E (FLPS-3)</td>
<td>240 V AC, 50 Hz</td>
<td>0.54 amps</td>
<td></td>
</tr>
<tr>
<td>MS-10UD-7E (FLPS-7)</td>
<td>240 V AC, 50 Hz</td>
<td>2.20 amps</td>
<td></td>
</tr>
</tbody>
</table>

Wire size: minimum #14 AWG (2.0 mm²) with 600V insulation

Supervised, nonpower-limited

Battery (sealed lead acid only) - J12

- Maximum Charging Circuit - Normal Flat Charge: 27.6 VDC @ 1.4 amp
- Supervised, nonpower-limited
- Maximum Charger Capacity: 18 Amp Hour battery for MS-5UD-3(E), MS-10UD-3(E) and 26 Amp Hour battery for MS-5UD-7(E), MS-10UD-7(E) [two 18 Amp Hour batteries can be housed in the FACP cabinet. Larger batteries require separate battery box such as BB-26 or BB-55]
- Minimum Battery Size: 7 Amp Hour

Initiating Device Circuits - TB4 (and TB6 on MS-10UD only)

- Alarm Zones 1 - 5 on TB 4 (MS-5UD and MS-10UD)
- Alarm Zones 6 - 10 on TB6 (MS-10UD only)
- Supervised and power-limited circuitry
- Normal Operating Voltage: Nominal 20 VDC
- Alarm Current: 15 mA minimum
- Short Circuit Current: 40 mA max.
- Maximum Loop Resistance: 100 ohms
- End-of-Line Resistor: 4.7KΩ, 1/2 watt (Part #71252)
- Standby Current: 2 mA
- Refer to Fire•Lite Device Compatibility Document for listed compatible devices

Notification Appliance Circuit(s) - TB5 and TB7

- Four NACs
- Operation: Style Y (Class B)
- Special Application power
- Supervised and power-limited circuitry
- Normal Operating Voltage: Nominal 24 VDC
- Maximum Signaling Current: 3.0 amps for MS-5UD-3(E), MS-10UD-3(E) (2.5 amp maximum per NAC); 7.0 amps for MS-5UD-7(E), MS-10UD-7(E) (3.0 amps maximum per NAC)
- End-of-Line Resistor: 4.7KΩ, 1/2 watt (Part #71252)
- Max. Wiring Voltage Drop: 2 VDC
- Refer to Fire•Lite Device Compatibility Document for compatible listed devices

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1. Total current for resettable power, nonresettable power and Notification Appliance Circuits must not exceed 3.0 amps for the FACP versions which are powered by the FLPS-3 power supply or 7.0 amps for the FACP versions which are powered by the FLPS-7 power supply.
Form-C Relays - Programmable - TB8
Relay 1 (factory default programmed as Alarm Relay)
Relay 2 (factory default programmed as fail-safe Trouble Relay)
Relay 3 (factory default programmed as Supervisory Relay)
Relay Contact Ratings: 2 amps @ 30 VDC (resistive), 0.5 amps @ 30 V AC (resistive)

Special Application Resettable Power - TB9
Operating Voltage: Nominal 24 VDC
Maximum Available Current: 500 mA - appropriate for powering 4-wire smoke detectors (see note 1)
Power-limited Circuitry
Refer to Fire•Lite Device Compatibility Document for compatible listed devices

Special Application Resettable or Nonresettable Power - TB9
Operating Voltage: Nominal 24 VDC
Maximum Available Current: 500 mA (see note 1)
Power-limited Circuitry
Jumper selectable by JP31 for resettable or nonresettable power:
✓ Jumper pins 1 & 2 on JP31 for nonresettable power
✓ Jumper pins 2 & 3 on JP31 for resettable power
Refer to Fire•Lite Device Compatibility Document for compatible listed devices

Remote Sync Output - TB2
Remote power supply synchronization output, only required for the MS-5UD-3(E), MS-10UD-3(E) [refer to "Remote Synchronization Output" on page 30]
24 VDC nominal special application power
Maximum current is 40 mA
End-of-Line Resistor: 4.7KΩ
Supervised and power-limited circuit

Auxiliary Trouble Input - J6
The Auxiliary Trouble Input is an open collector circuit which can be used to monitor an external device for trouble conditions. It can be connected to the trouble bus of a peripheral, such as a power supply, which is compatible with open collector circuits.
All connections must be in conduit, less than 20 ft. (610 cm) in length in the same room.

1.3 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.

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
- System 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

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

**LED Indicators**
LEDs are provided to annunciate the following conditions:
- Fire Alarm - red LED
- Supervisory - yellow LED
- AC Power - green LED
- System Trouble - yellow LED
- Alarm Silence - yellow LED
- Primary Phone Line Active (on circuit board) - red LED
- Secondary Phone Line Active (on circuit board) - red LED
- Kiss-off (on circuit board) - green LED

**Local Piezo Sounder**
A piezo sounder provides separate and distinct sounds for alarm, trouble, maintenance and supervisory conditions as follows:
- Alarm - on steady
- Trouble - pulse 1 second on and 1 second off
- Maintenance - pulse ½ second on and ½ second off
- Supervisory - pulse ½ second on and ½ second off
1.4 Digital Alarm Communicator/Transmitter

Two modular phone jacks allow easy connection to telephone lines. Modular jacks are labeled PH1 for Primary Phone Line and PH2 for Secondary Phone Line. Two telephone line active red LEDs are provided as well as a green Kissoff LED. The integral digital communicator provides the following functions:

- **Line Seizure:** takes control of the phone lines disconnecting any premises phones
- **Off/On Hook:** performs on and off-hook status to the phone lines
- **Listen for dial tone:** 440 Hz tone typical in most networks
- **Dialing the Central Station(s) number:** default is Touch-Tone®, programmable to rotary
- **For tone burst or touchtone type formats:** discern proper Ack 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:**
  - ✔ Ademco Contact ID
  - ✔ SIA-DCS-8
  - ✔ SIA-DCS-20

1.5 Components

**Main Circuit Board**
The main circuit board contains the system’s CPU, DACT and other primary components and wiring interface connectors. Optional modules plug in and are mounted to the main circuit board.

**Power Supply**
One power supply is provided standard with each FACP, mounted to a chassis.

- FLPS-3 for the MS-5UD-3(E), MS-10UD-3(E)
- FLPS-7 for the MS-5UD-7(E), MS-10UD-7(E)

**Cabinet**
The backbox measures 16.65” (42.29 cm) x 19.0” (48.26 cm) x 5.207” (13.23 cm) and provides space for two batteries (up to 18 Amp Hours). Also available are an optional dress panel (DP-51050) which mounts inside the cabinet and trim-ring (TR-CE).

**Batteries**
The cabinet provides space for two 18 Amp Hour batteries (larger batteries require use of a UL listed battery box such as the BB-26 or BB-55). Batteries must be ordered separately.

1.6 Optional Modules and Accessories

**CAC-5X Class A Converter Module**
The CAC-5X Module can be used to convert the Style B (Class B) Initiating Device Circuits to Style D (Class A) and Style Y (Class B) Notification Appliance Circuits to Style Z (Class A). The module connects to J2 on the MS-5UD and MS-10UD main circuit board and to J7 on the MS-10UD. Note that two Class A Converter modules are required for the 10 zone panel.

**4XTMF Transmitter Module**
The 4XTMF provides a supervised output for local energy municipal box transmitter and alarm and trouble reverse polarity. It includes a disable switch and disable trouble LED. A module jumper option allows the reverse polarity circuit to open with a system trouble condition if no alarm condition exists. The 4XTMF mounts to the main circuit board connectors J4 & J5.
**ANN-80 LCD Annunciator**
The ANN-80 is a remote LCD annunciator which mimics the information displayed on the FACP LCD display.

**ANN-LED Annunciator Module**
The ANN-LED Annunciator Module provides three LEDs for each zone: Alarm, Trouble and Supervisory.

**ANN-RLY Relay Module**
The ANN-RLY Module, which can be mounted inside the cabinet, provides 10 Form-C relays.

**ANN-S/PG Serial/Parallel Printer Gateway**
The ANN-S/PG module provides a connection for a serial or parallel printer.

**ANN-I/O LED Driver Module**
The ANN-I/O module provides connections to a user supplied graphic annunciator.

**DP-51050 Dress Panel**
A dress panel DP-51050 is available as an option. The dress panel restricts access to the system wiring while allowing access to the membrane switch panel.

**TR-CE Trim-ring**
A trim-ring TR-CE is available as an option. The trim-ring allows semi-flushing mounting of the cabinet.

**Battery Box**
The BB-26 or BB-55 battery box may be used to house two batteries greater than 18 Amp Hour. The battery box mounts directly below the control panel cabinet, centered to the main circuit board.
1.7 Telephone Requirements and Warnings

1.7.1 Telephone Circuitry

Ringer Equivalence Number (REN) = 0.0B
AC Impedance: 10.0 Mega Ohm
Complies with FCC Part 68
Mates with RJ31X Male Connector
Supervision Threshold: loss of phone line voltage for 2 minutes

The REN is used to determine the quantity of devices which may be connected to the telephone line. Excessive RENs on the telephone line may result in the devices not ringing in response to an incoming call. In most, but not all areas, the sum of the RENs should not exceed five (5.0). To be certain of the number of devices that may be connected to the line as determined by the total RENs, contact the telephone company to determine the maximum REN for the calling area.

1.7.2 Digital Communicator

Before connecting the control panel to the public switched telephone network, the installation of two RJ31X jacks is necessary. If trouble is experienced with this equipment, for repair or warranty information, please contact:

Manufacturer: Fire•Lite Alarms
One Fire-Lite Place
Northford, CT 06472
(203) 484-7161

Product Model Number: MS-5UD/MS-10UD
FCC Registration Number: 1W6AL00B10UD
Ringer Equivalence: 0.0B

Important! The DACT must not be used to dial a phone number that is call-forwarded.

Note: This equipment complies with Part 68 of the FCC rules and the requirements adopted by the ACTA. On the inside of the FACP door is a label that contains, among other information, a product identifier in the format US:AAA EQ##TXXXX. If requested, this number must be provided to the telephone company.

Alarm dialing equipment must be able to seize the telephone line and place a call in an emergency situation. It must be able to do this even if other equipment (telephone, answering system, computer modem, etc.) already has the telephone line in use. To do so, alarm dialing equipment must be connected to a properly installed RJ31X jack that is electrically in series with and ahead of all other equipment attached to the same telephone line. If there are any questions concerning these instructions, consult the telephone company or a qualified installer about installing the RJ31X jack and alarm dialing equipment. Refer to "Digital Communicator" on page 32 for an illustration of the proper installation of this equipment.
1.7.3 Telephone Company Rights and Warnings

The telephone company, under certain circumstances, may temporarily discontinue services and/or make changes in its facilities, services, equipment or procedures which may affect the operation of this control panel. However, the telephone company is required to give advance notice of such changes or interruptions.

If the control panel causes harm to the telephone network, the telephone company reserves the right to temporarily discontinue service. Advance notification will be provided except in cases when advance notice is not practical. In such cases, notification will be provided as soon as possible. The opportunity will be given to correct any problems and to file a complaint with the FCC if you believe it is necessary.

**DO NOT CONNECT THIS PRODUCT TO COIN TELEPHONE, GROUND START, OR PARTY LINE SERVICES.**

When the control panel activates, premise phones will be disconnected.

Two separate phone lines are required. Do not connect both telephone interfaces to the same telephone line.

The control panel must be connected to the public switched telephone network upstream (as first device) of any private telephone system at the protected premises.

A plug and jack used to connect this equipment to the premises wiring and telephone network must comply with the applicable FCC Part 68 rules and requirements adopted by ACTA. This equipment is designed to be connected to the telephone network or premises wiring using a compliant RJ31X male modular plug and compatible modular jack that is also compliant.
1.7.4 For Canadian Applications

The following is excerpted from CP-01 Issue 5:

NOTICE: The Industry Canada (IC) label identifies certified equipment. This certification means that the equipment meets certain telecommunications network protective, operational and safety requirements as prescribed in the appropriate Terminal Equipment Technical Requirements document(s). The Department does not guarantee the equipment will operate to the user’s satisfaction.

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

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

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

**CAUTION**

Users should not attempt to make such connections themselves, but should contact the appropriate electric inspections authority, or electrician.

“The Ringer Equivalence Number (REN) assigned to each terminal device provides an indication of the maximum number of terminals allowed to be connected to a telephone interface. The termination of an interface may consist of any combination of devices subject only to the requirement that the sum of the REN of all devices does not exceed 5.”

DOC Compliance - “This digital apparatus does not exceed the Class A limits for radio noise emissions from digital apparatus set out in the Radio Interference Regulations of the Canadian Department of Communications.”

**Representative:** NOTIFIER/FIRE•LITE, CANADA
24 Viceroy Road
Concord, Ontario L4K2L9
Phone: (905) 660-7210
FAX: (905) 660-7204

**IC Certificate Number:**

Ringer Equivalence Number (REN): **1.3B**
Load Number: **2**
SECTION 2  Installation

The cabinet can be surface mounted or semi-flush mounted. The door is removable during the installation period by opening and lifting it off the hinges. The cabinet mounts using two key slots at the top of the backbox and two additional securing holes located 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 Backbox 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.

To prevent damage to the circuit board and to facilitate backbox mounting, the chassis with main circuit board and transformer can be easily removed. Loosen the two 3/8” nuts securing the top flanges of the chassis, then slide the chassis up to free it from the lower tabs. Place the chassis assembly in a protective antistatic bag in a safe location until it can be reinstalled in the backbox.

- Mark and predrill hole in the wall for the center top keyhole mounting bolt using the dimensions illustrated in Figure 2.2 on page 23
- Install center top fastener in the wall with the screw head protruding
- Place backbox over the top screw, level and secure
- Mark and drill the left and right upper and lower mounting holes
  Note: outer holes (closest to sidewall) are used for 16” O.C. stud mounting
- Install remaining fasteners and tighten

See Page

MS-5UD Board on Chassis

Figure 2.1 Chassis Mounting in Backbox

 grounding stud: attach solid earth ground wire (refer to Figure 2.4 on page 25)
Hinge Slot for optional Dress Panel

Semi-Flush Mounting
Do not recess box more than 3.875” into wall to avoid covering venting holes on top of box.

Figure 2.2 Cabinet Dimensions
Figure 2.3 Backbox and Battery Box
2.2 Operating 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.

**Primary Power Source (AC) and Earth Ground Connections**

AC power connections are made inside the control panel cabinet. Refer to **AC Power** in the section titled "Specifications" on page 14, for power and current requirements for each FACP version. Run a pair of wires (with ground conductor) from the protected premises main breaker box to the AC terminal block TB1 on the main power supply. As per the National Electrical Code, use 14 AWG (2.00 mm², 1.6 mm O.D.) or heavier gauge wire with 600V insulation. No other equipment may be connected to this circuit. In addition, this circuit must be provided with overcurrent protection and may not contain any power disconnect devices. A separate Earth Ground connection must be made to ensure proper panel operation and lightning and transient protection. Connect the Earth Ground wire [minimum 14 AWG (2.00 mm²)] to the grounding stud in the backbox. Do not use conduit for the Earth Ground connection since this does not provide reliable protection.

**Secondary Power Source (Batteries)**

Observe polarity when connecting the battery. Connect the battery cable to J12 on the main circuit board using the plug-in connector and cable provided. The battery charger is current-limited and capable of charging sealed lead acid batteries. The charger shuts off when the system is in alarm.

**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.

![Operating Power Connections](5udpowr.cdr)

Figure 2.4 Operating Power Connections
2.3 Input Circuits

The MS-5UD has five IDCs (Initiating Device Circuits) and the MS-10UD has ten IDCs. Each circuit is compatible with System Sensor’s i³ smoke detectors which generate a maintenance signal when the detector becomes dirty and a separate supervisory ‘freeze’ signal when ambient temperature falls below the detector rating of approximately 45°F. The maximum loop resistance limit for each IDC is 100 ohms. The maximum number of detectors per zone is 25. The field wiring for each zone is supervised for opens, shorts and ground faults. All conditions are visually and audibly annunciated.

Each circuit is configured for Style B (Class B) operation and will accept i³ smoke detectors, any normally-open contact devices as well as conventional 2-wire or 4-wire, 24 VDC smoke detectors. Refer to the Fire•Lite Device Compatibility Document for a list of compatible devices.

Initiating Device Circuits can be converted to Style D (Class A) by installing the optional Class A Converter module. Refer to "CAC-5X Class A Converter Module" on page 33.

Class B Initiating Device Circuits (supervised and power-limited) 4.7 KΩ, ½ watt resistor P/N:71252

UL listed Power Supervision Relay
(refer to Device Compatibility Document for list of compatible relays)

UL listed compatible 4-wire smoke detector

Resettable 24 VDC
4-wire smoke
detector power
(500 mA maximum)

2-wire smoke detectors

manual pull stations

heat detectors

Dummy load all unused circuits - 4.7 KΩ, ½ watt resistor (P/N: 71245)

Figure 2.5 IDC Connections
Combination Waterflow/Supervisory Zone

A combination Waterflow/Supervisory circuit allows an FACP to distinguish between an Alarm switch (waterflow device) and a Supervisory switch (tamper) installed on the same circuit. Any circuit can be programmed as a Combo Type zone. The following figure illustrates the wiring of Zone 2 as a Style B (Class B) Waterflow/Supervisory circuit.

![Style B Combination Circuit on Zone 2](ms10udcomboIDC.cdr)

Requirements for the Combination Waterflow/Supervisory circuit are as follows:

- The Waterflow Alarm Switch must connect to the FACP Initiating Device Circuit before the In-Line Resistor as shown in Figure 2.6
- The Supervisory Switch must connect to the FACP Initiating Device Circuit after the In-Line Resistor as shown in Figure 2.6
- Program the FACP Initiating Device Circuit as a Combination circuit as described in "Input Zones" on page 57. Note that since a Waterflow Supervisory Switch is included in a Combination circuit, the workflow delay must be taken into consideration. Refer to "Waterflow Delay" on page 72.
- Waterflow Alarm Switch activation causes the panel to latch into alarm until the alarm condition is cleared and the FACP is reset
- Supervisory Switch activation causes the panel to latch the supervisory condition if the Combo type code is selected or track (the panel will clear when the supervisory condition is cleared) if the Combo Autoresettable Supervisory type code is selected
2.4 Output Circuits

2.4.1 Notification Appliance Circuits

Total current drawn from the four Style Y (Class B) Notification Appliance Circuits as well as other
DC power outputs cannot exceed 3.0 amps for the MS-5UD-3(E), MS-10UD-3(E) [2.5 amp
maximum per NAC] powered by the FLPS-3 power supply or 7.0 amps for the MS-5UD-7(E), MS-
10UD-7(E) [3.0 amps maximum per NAC] powered by the FLPS-7 power supply (refer to "Power
Supply Calculations" on page 123). Each circuit is supervised, power-limited and provides special
application power. Refer to the Fire•Lite Device Compatibility Document for a listing of
compatible notification appliances.

The NACs can be converted to Style Z (Class A) by installing the optional Class A Converter
module. Refer to "CAC-5X Class A Converter Module" on page 33.

Class B Notification Appliance Circuits (supervised and power-limited)

4.7 KΩ, ½ watt resistor P/N: 71252

Figure 2.7 NAC Connections

Large gauge wire should be
looped through bead at least once
as illustrated. Smaller gauge wire
can be looped more often.
2.4.2 Special Application DC Power Output Connections

Special Application Resettable and Nonresettable 24 VDC power is available on the MS-5UD and MS-10UD control panel.

Special Application
4-Wire Smoke Detector Power (500 mA)
24 VDC filtered, resettable power for 4-wire smoke detectors can be obtained from these terminals (power-limited)

Special Application
Resettable or Nonresettable Power (500 mA)
24 VDC filtered, resettable or nonresettable power can be obtained from these terminals (power-limited)

- Jumper JP31 pins 1 & 2 for nonresettable power (as illustrated in figure to right)
- Jumper JP31 pins 2 & 3 for resettable power

Figure 2.8 Special Application Auxiliary Power

2.4.3 Relays - Programmable

The MS-5UD and MS-10UD control panels provide a factory default programmed alarm relay, fail-safe trouble relay and supervisory relay. Each relay can be programmed to activate for other conditions (refer to "Relays" on page 68). Each Form-C relay is rated for 2 amps @ 30VDC (resistive) and 0.5 amps @ 30 VAC (resistive).

Note that relay connections must be power-limited.

Note: Relay contacts are shown with power applied to the panel and no active troubles, alarms or supervisories. The Trouble Relay is a fail-safe relay which will transfer on any trouble or total power failure.

Figure 2.9 Relay Terminals
2.4.4 Remote Synchronization Output

Synchronization is a 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 to individuals. Devices connected directly to the control panel’s NAC can be synchronized as described in "Synchronized NAC Operation" on page 66.

Notification appliances connected to remote power sources may require synchronization with the FACP’s devices. For the MS-5UD-3(E), MS-10UD-3(E), this can be accomplished by connecting the Remote Synchronization Output from TB2 of the FACP to a compatible sync input of a power supply such as the FCPS-24FS6/8. The 24 VDC, 40 mA signal from TB2 follows, that is mimics the signal on NAC 1 (Out 1). This allows the devices connected to the power supply to be synchronized with the devices connected to Out 1 on the FACP.

For the MS-5UD-7(E), MS-10UD-7(E), the Remote Sync Output is not required. Synchronization for remote power supplies is provided directly from NAC1 (Out 1). Note that NAC 1 (Out 1) must be programmed for sync operation when used for this purpose.

The Remote Synchronization Output is power-limited and supervised and requires a 4.7KΩ ELR resistor at the remote power supply end of the wiring.

![Figure 2.10 Remote Sync Output](image-url)
2.5 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. Furthermore, all power-limited and nonpower-limited circuit wiring must enter and exit the cabinet through different knockouts and/or conduits. A typical wiring diagram is illustrated below.

Figure 2.11 Typical UL Power-limited Wiring Requirements
2.6 Digital Communicator

Two independent telephone lines can be connected to the control panel. Telephone line control/command is made possible via double line seizure as well as usage of an RJ31X style interconnection. Note that it is critical that the panel’s digital communicator be located as the first device on the incoming telephone circuit to properly function.

**Important!** The DACT must not be used to dial a phone number that is call-forwarded.

The control panel's digital communicator is built into the main circuit board. Connection and wiring of two phone lines is required as shown below.

![Diagram of DACT Installation](image-url)

**Figure 2.12 DACT Installation**

The control panel's digital communicator is built into the main circuit board. Connection and wiring of two phone lines is required as shown below.

![Diagram of Wiring Phone Jacks](image-url)

**Figure 2.13 Wiring Phone Jacks**
2.7 Installation of Optional Modules

*CAUTION:* Remove all power (AC and DC) before installing or removing modules or wiring.

### 2.7.1 CAC-5X Class A Converter Module

#### 2.7.1.1 Installation

The CAC-5X Module can be used to convert five Style B (Class B) Initiating Device Circuits to Style D (Class A) and the two Style Y (Class B) Notification Appliance Circuits to Style Z (Class A). The module plugs into connector J2 which is located at the top left of the MS-5UD and MS-10UD main circuit board and J7 which is located at the top center of the MS-10UD. *Note that two CAC-5X modules are required to convert all NACs and IDCs on the MS-10UD to Class A circuits.*

To install the CAC-5X in the MS-5UD or MS-10UD, remove the two main circuit board mounting screws referenced in the following illustration and replace with the two supplied male/female standoffs in the locations indicated in the following figure. Carefully align the connector on the CAC-5X with J2 on the FACP main circuit board and press the module securely into place. Make certain the pins are properly aligned to prevent bending or breaking of any connector pins. Secure the CAC-5X to the standoffs with the screws that were just removed.

To install the second CAC-5X on J7 of the MS-10UD, remove the main circuit board mounting screw referenced in the following illustration and replace with the supplied male/female standoff. Insert the supplied plastic standoff in the location indicated in the following illustration. Carefully align the connector on the CAC-5X with J7 and press the module securely into place. Make certain the pins are properly aligned to prevent bending or breaking of any connector pins. Secure the CAC-5X to the metal standoff with the screw that was just removed.

---

**Figure 2.14 CAC-5X Module Installation**
2.7.1.2 Wiring NACs and IDCs for Class A

Wire the Style Z (Class A) Notification Appliance Circuits using TB5 of the MS-5UD/MS-10UD and TB2 of the CAC-5X module. Wire the Style D (Class A) Initiating Device Circuits using TB4 of the MS-5UD/MS-10UD and TB1 of the CAC-5X. Note that the wiring will be identical when using TB7 NAC and TB6 IDC of the MS-10UD. Make certain to observe polarity when connecting the devices to the circuits. The B+ and A+ terminals must comprise the feed and return for the positive side of a device and the B- and A- terminals must comprise the feed and return for the negative side of a device. To configure any of the zones for Class B when the CAC-5X is installed, simply wire to the B+ and B- input on the FACP terminal(s) and install the End-of-Line Resistor after the last device on the circuit. Do not wire to the corresponding A+ and A- terminals on the CAC-5X module.

![Figure 2.15 Wiring NACs and IDCs for Class A Operation](image-url)
2.7.2 4XTMF Option Module

The 4XTMF module can be plugged into connectors J4 and J5 on the main circuit board. The following steps must be followed when installing the 4XTMF module:

1. Remove all power (AC and DC) from the FACP before installing the modules
2. Cut jumper JP30 on the main circuit board to allow the control panel to supervise the placement of the 4XTMF option module
3. Install the two supplied metal standoffs in the locations indicated. These standoffs provide the required earth ground protection
4. Carefully plug the connectors on the option module into connectors J4 and J5 on the FACP main circuit board, being careful not to bend any pins
5. Secure the option module to the standoff on the main circuit board with the supplied screws
6. When the installation has been completed, connect the wiring to the modules as indicated in the following sections
7. Test system for proper operation

Note: This illustration shows the installation of the Option Module on the 5-zone panel. The module is installed in the same location on the 10-zone panel.

Figure 2.16 4XTMF Option Module Connection to MS-5UD
2.7.2.1 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 down (disconnect) position to prevent accidental activation of the municipal box. Note that a Disconnect LED will illuminate after the module is installed in the FACP. In addition, the System Trouble LED will turn on to indicate the Disconnect condition.

Note: the 4XTMF Module is not directly suitable for transmitting reverse polarity supervisory signal. For an application of reverse polarity of a supervisory signal, refer to the Appendix titled "FACP with Keltron" on page 139.
ANN-BUS Devices

2.8 ANN-BUS Devices

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

A variety of optional devices can be connected to the FACP ANN-BUS communication circuit. Compatible devices include:

- ANN-80 LCD Annunciator
- ANN-S/PG Serial/Parallel Printer Interface Module
- ANN-I/O LED Driver Module
- ANN-LED Annunciator Module
- ANN-RLY Relay Module

2.8.1 ANN-BUS Wiring

This section contains information on calculating ANN-BUS wire distances and the types of wiring configurations (Class B).

\textbf{2.8.1.1 Calculating Wiring Distance for ANN-BUS Modules}

The following instructions will guide the installer in determining the type of wire and the maximum wiring distance that can be used with FACP ANN-BUS accessory modules.

To calculate the wire gauge that must be used to connect ANN-BUS modules to the FACP, it is necessary to calculate the total worst case current draw for all modules on a single 4-conductor bus. The total worst case current draw is calculated by adding the individual worst case currents for each module. The individual worst case values are shown in the following table:

<table>
<thead>
<tr>
<th>Model Number</th>
<th>Worst Case Current Draw</th>
</tr>
</thead>
<tbody>
<tr>
<td>ANN-80 LCD Annunciator</td>
<td>0.040 amps</td>
</tr>
<tr>
<td>ANN-S/PG Serial/Parallel Printer Interface Module</td>
<td>0.040 amps</td>
</tr>
<tr>
<td>ANN-I/O LED Driver Module</td>
<td>0.200 amps</td>
</tr>
<tr>
<td>ANN-LED Annunciator Module</td>
<td>0.068 amps</td>
</tr>
<tr>
<td>ANN-RLY Relay Module</td>
<td>0.075 amps</td>
</tr>
</tbody>
</table>

\textit{Note: Total worst case current draw on a single ANN-BUS cannot exceed 0.5 amp.}
After calculating the total worst case current draw, Table 2.1 specifies the maximum distance the modules can be located from the FACP on a single wire run. The table ensures 6.0 volts of line drop maximum. In general, the wire length is limited by resistance, but for heavier wire gauges, capacitance is the limiting factor.

These cases are marked in the chart with an asterisk (*). Maximum length can never be more than 6,000 feet (1,800 m), regardless of gauge used. The formula used to generate this chart is shown in the note below.

<table>
<thead>
<tr>
<th>Total Worst Case Current Draw (amps)</th>
<th>22 Gauge</th>
<th>18 Gauge</th>
<th>16 Gauge</th>
<th>14 Gauge</th>
</tr>
</thead>
<tbody>
<tr>
<td>0.100</td>
<td>1,852 ft.</td>
<td>4,688 ft.*</td>
<td>6,000 ft.</td>
<td>6,000 ft.*</td>
</tr>
<tr>
<td>0.200</td>
<td>926 ft.</td>
<td>2,344 ft.</td>
<td>3,731 ft.</td>
<td>5,906 ft.</td>
</tr>
<tr>
<td>0.300</td>
<td>617 ft.</td>
<td>1,563 ft.</td>
<td>2,488 ft.</td>
<td>3,937 ft.</td>
</tr>
<tr>
<td>0.400</td>
<td>463 ft.</td>
<td>1,172 ft.</td>
<td>1,866 ft.</td>
<td>2,953 ft.</td>
</tr>
<tr>
<td>0.500</td>
<td>370 ft.</td>
<td>938 ft.</td>
<td>1,493 ft.</td>
<td>2,362 ft.</td>
</tr>
</tbody>
</table>

Table 2.1 Wiring Distances

Note: The following formulas were used to generate the wire distance chart:

\[
\text{Maximum Resistance (Ohms)} = \frac{6.0 \text{ Volts}}{\text{Total Worst Case Current Draw (amps)}}
\]

\[
\text{Maximum Wire Length (feet) (6,000 feet maximum)} = \frac{\text{Maximum Resistance (Ohms)}}{\text{Rpu}} \times 500
\]

where: \( \text{Rpu} = \text{Ohms per 1,000 feet for various Wire Gauges} \) (see table below)

<table>
<thead>
<tr>
<th>Wire Gauge</th>
<th>Ohms per 1,000 feet (Rpu)</th>
</tr>
</thead>
<tbody>
<tr>
<td>22</td>
<td>16.2</td>
</tr>
<tr>
<td>18</td>
<td>6.4</td>
</tr>
<tr>
<td>16</td>
<td>4.02</td>
</tr>
<tr>
<td>14</td>
<td>2.54</td>
</tr>
</tbody>
</table>

**Exception:** When using the ANN-RLY module, the installer must ensure that the maximum 24VDC power line drop does not exceed 0.3 volts. This results in the following wiring limitations:

<table>
<thead>
<tr>
<th>Wire Gauge</th>
<th>Maximum Wire Length</th>
</tr>
</thead>
<tbody>
<tr>
<td>18</td>
<td>312 feet</td>
</tr>
<tr>
<td>16</td>
<td>497 feet</td>
</tr>
<tr>
<td>14</td>
<td>787 feet</td>
</tr>
<tr>
<td>12</td>
<td>1,250 feet</td>
</tr>
</tbody>
</table>
Wiring Distance Calculation Example:
Suppose a system is configured with the following ANN-BUS modules:

- 2 ANN-80 Remote Fire Annunciators
- 1 ANN-S/PG Serial/Parallel Printer Interface Module
- 1 ANN-I/O LED Driver Module

The total worst case current is calculated as follows:

<table>
<thead>
<tr>
<th>Module Type</th>
<th>Current Draw</th>
<th>Calculation</th>
</tr>
</thead>
<tbody>
<tr>
<td>ANN-80 Current Draw</td>
<td>2 X 0.040 amps</td>
<td>= 0.080 amps</td>
</tr>
<tr>
<td>ANN-S/PG Current Draw</td>
<td>1 X 0.040 amps</td>
<td>= 0.040 amps</td>
</tr>
<tr>
<td>ANN-I/O Current Draw</td>
<td>1 X 0.200 amps</td>
<td>= 0.200 amps</td>
</tr>
</tbody>
</table>

Total Worst Case Current Draw = 0.320 amps

Using this value and referring to the Wiring Distance Table 2.1 on page 38, it can be found that the available options are:

- ✓ 463 feet maximum using 22 Gauge wire
- ✓ 1,172 feet maximum using 18 Gauge wire
- ✓ 1,866 feet maximum using 16 Gauge wire
- ✓ 2,953 feet maximum using 14 Gauge wire

2.8.1.2 Wiring Configuration
Figure 2.18 illustrates the wiring between the FACP and ANN-BUS devices.
2.8.1.3 Powering ANN-BUS Devices from Auxiliary Power Supply

Figure 2.19 illustrates the powering of ANN-BUS devices from an auxiliary power supply such as the FCPS-24FS6/8, when the maximum number of ANN-BUS devices exceeds the ANN-BUS power requirements.

2.8.2 ANN-BUS Device Addressing

Each ANN-BUS device requires a unique address (ID Number) in order to communicate with the FACP. A 5-position DIP switch on each device is used to set this address. The address set for these devices must also be programmed at the FACP for the specific device (refer to the programming section titled "ANN-BUS" on page 77).

A maximum of 8 devices can be connected to the FACP ANN-BUS communication circuit. Device addresses do not need to be sequential and can be set to any number between 01 and 08. Note that 00 is not a valid address. The following table shows the DIP switch setting for each address.

*Note: address (ID Number) DIP switches on some devices may have more than 5 switch positions. Unless otherwise specified in the documentation supplied with each device, switch positions 6 and above must be set to OFF.*

<table>
<thead>
<tr>
<th>Address</th>
<th>Switch 5</th>
<th>Switch 4</th>
<th>Switch 3</th>
<th>Switch 2</th>
<th>Switch 1</th>
</tr>
</thead>
<tbody>
<tr>
<td>not valid</td>
<td>OFF</td>
<td>OFF</td>
<td>OFF</td>
<td>OFF</td>
<td>OFF</td>
</tr>
<tr>
<td>01</td>
<td>OFF</td>
<td>OFF</td>
<td>OFF</td>
<td>OFF</td>
<td>OFF</td>
</tr>
<tr>
<td>02</td>
<td>OFF</td>
<td>OFF</td>
<td>OFF</td>
<td>ON</td>
<td>OFF</td>
</tr>
<tr>
<td>03</td>
<td>OFF</td>
<td>OFF</td>
<td>OFF</td>
<td>ON</td>
<td>ON</td>
</tr>
<tr>
<td>04</td>
<td>OFF</td>
<td>OFF</td>
<td>ON</td>
<td>OFF</td>
<td>OFF</td>
</tr>
<tr>
<td>05</td>
<td>OFF</td>
<td>OFF</td>
<td>ON</td>
<td>OFF</td>
<td>ON</td>
</tr>
<tr>
<td>06</td>
<td>OFF</td>
<td>OFF</td>
<td>ON</td>
<td>OFF</td>
<td>OFF</td>
</tr>
<tr>
<td>07</td>
<td>OFF</td>
<td>OFF</td>
<td>ON</td>
<td>ON</td>
<td>ON</td>
</tr>
<tr>
<td>08</td>
<td>OFF</td>
<td>ON</td>
<td>OFF</td>
<td>OFF</td>
<td>OFF</td>
</tr>
</tbody>
</table>
2.8.3 ANN-80 Remote Fire Annunciator

The ANN-80 Annunciator is a compact, 80 character, backlit LCD remote fire annunciator which mimics the FACP display. It also provides system status indicators for AC Power, Alarm, Trouble, Supervisory and Alarm Silenced conditions. Communication between the ANN-80 and FACP is accomplished over a two wire serial interface employing the ANN-BUS communication format. The devices are powered, via two additional wires, from either the host FACP or remote UL-listed, filtered, power supply.

2.8.4 Specifications

- Operating Voltage Range: 18 VDC to 28 VDC
- Current Consumption @ 24 VDC nominal (filtered and nonresettable):
  - Normal/Standby (no activity): 37.0 mA
  - Trouble: 39.0 mA
  - Alarm: 40.0 mA
  - AC Fail (not backlit): 15.0 mA
- For use indoors in a dry location

2.8.5 Installation

Ensure that all power (AC and DC) has been removed from the FACP before installing the annunciator.

2.8.5.1 Mounting

The ANN-80 can be surface or semi-flush mounted to a single, double or 4” square electrical box. Select and remove the appropriate knockout(s), pull the necessary wires through the knockouts and mount the annunciator in or on the wall depending on the type of installation desired.

The ANN-80 cover must be attached to the annunciator backplate before mounting the annunciator to the electrical box/wall. The cover cannot be reattached or removed after the annunciator has been mounted.

2.8.5.2 Opening/Closing Annunciator

The following procedure details the steps used to open the annunciator in order to access the terminal block and DIP switches (refer to figure below):

1. Turn the key switch to the ON (Unlocked) position by turning the key counter-clockwise
2. Push in the snap latch located on the right side of the unit while pulling the cover open
3. To close the cover, make certain the key switch is in the ON (Unlocked) position. Swing the cover closed, snapping it shut
4. Turn the key switch to the OFF (Locked) position by turning clockwise and remove the key

![Diagram of ANN-80 Annunciator](image-url)
**2.8.5.3 Wiring ANN-80 to FACP**

The following steps can be used as a guide to wire the annunciator. Make certain all power has been removed from the FACP prior to annunciator installation.

1. Route wires from hole in backplate, through wiring channel and then to ANN-80 terminal block TB1

2. Remove appropriate amount of wire insulation

3. Connect the wiring from the FACP ANN-BUS to annunciator TB1 terminals 3 (A) & 4 (B). Make certain to connect A to A and B to B

4. If appropriate, connect the wiring going to the next device on the ANN-BUS to TB1 terminals 3 & 4. Make certain to connect A to A and B to B

5. Connect the wiring from the 24 VDC power source to annunciator TB1 terminals 1 (-) & 2 (+). Make certain to observe proper polarity

6. If appropriate, connect the power wiring going to the next device to terminals 1 (-) & 2 (+). Make certain to observe proper polarity

7. After all connections are made, remove extra wire from inside of annunciator by dressing it neatly through wire channel, with any excess wire pushed back through hole into electrical box
The following table shows the ANN-80 connections to the MS-5UD/MS-10UD.

<table>
<thead>
<tr>
<th>MS-5UD/MS-10UD (TB3)</th>
<th>ANN-80 (TB1)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Terminal 4 GND (-)</td>
<td>Terminal 1 (-)</td>
</tr>
<tr>
<td>Terminal 3 PWR (+)</td>
<td>Terminal 2 (+)</td>
</tr>
<tr>
<td>Terminal 2 A (ANN-BUS)</td>
<td>Terminal 3 (A)</td>
</tr>
<tr>
<td>Terminal 1 B (ANN-BUS)</td>
<td>Terminal 4 (B)</td>
</tr>
</tbody>
</table>

**Programming**

Following installation and wiring of the ANN-80 LCD annunciator to the FACP, the annunciator must be added to the system via FACP programming. Refer to the programming section titled "ANN-BUS" on page 77 in this manual for detailed programming information. Select the LCD option for programming.
2.8.6 ANN-S/PG Serial/Parallel Printer Interface Installation

The ANN-S/PG Serial/Parallel Printer Interface module allows the ancillary connection of a serial or parallel printer to the FACP for a real-time log of system events, detector status reports and event history. Proceed with the installation as described in the following:

1. Ensure that all power (AC and DC) has been removed from the FACP.
2. Connect the ANN-S/PG to the FACP as illustrated in Figure 2.21

3. Using the DIP switches on the back of the ANN-S/PG module, assign an ID number (address) to the module
4. Select the address and configuration options for the ANN-S/PG module as described in the Programming section of this manual (refer to "ANN-BUS" on page 77)
   Note that the Auto-configure feature allows the programmer to quickly bring all installed ANN-BUS modules online (refer to "Auto-Configure" on page 78)
5. Connect a printer to the ANN-S/PG Parallel and/or Serial connectors (refer to Figure 2.21 on page 44)

2.8.6.1 Specifications

- Operating Voltage: 24 VDC
- Current (Alarm and Standby): 45 mA
- Ambient Temperature: 32°F to 120°F (0°C to 49°C)
- Max. Wiring Distance from FACP: 6,000 ft. (1,800 m)
- Mounting: Surface
- Dimensions: 6”W x 7-3/4”H x 1-7/16”D (15.2 cm W x 19.7 cm H x 3.7 cm D)
- For indoor use in a dry location only

2.8.6.2 PRN Printer Installation

When connected to the FACP via the ANN-S/PG module, the PRN prints the status changes within the control panel and time-stamps the printout with the time of day and date that the event occurred. It provides 80 columns of data on standard 9” x 11” tractor-feed paper. This section contains information on connecting a printer to the control panel and setting the printer options.
2.8.6.2.1 Connecting PRN Printer

Remote printers require a primary AC power source. If required for the fire alarm system configuration (for example, a Proprietary Fire Alarm System), a remote printer requires a secondary power source (battery backup). Since a secondary power source is not provided as a standard feature, a separate UL-listed Uninterruptible Power Supply (UPS) should be used. The building emergency power supply may be used, as long as it meets the power continuity requirements of NFPA 72. Refer to NFPA 72 for further details.

Connect the remote printer to the FACP via the ANN-S/PG module using a standard DB-25 cable. One end of the cable will plug into the DB-25 connector on the PRN printer and the other end plugs into the parallel connector on the ANN-S/PG module. Note that the 9-pin DB-9 port on the ANN-S/PG is used to connect a serial printer. The 25-pin port is used for a Centronics parallel printer cable. Connect either a serial or parallel printer, but not both at the same time.

2.8.6.2.2 Setting Printer Options

Refer to the documentation supplied with the PRN printer for instructions on using the printer menu controls. Set the printer options (under the menu area) as shown in the following table:

<table>
<thead>
<tr>
<th>Option</th>
<th>Setting</th>
<th>Option</th>
<th>Setting</th>
</tr>
</thead>
<tbody>
<tr>
<td>Font</td>
<td>HS Draft</td>
<td>CPI</td>
<td>10CPI</td>
</tr>
<tr>
<td>LPI</td>
<td>6 LPI</td>
<td>Skip</td>
<td>0.5</td>
</tr>
<tr>
<td>ESC Character</td>
<td>ESC</td>
<td>Emulate</td>
<td>Epson FX-850</td>
</tr>
<tr>
<td>Bidirectional Copy</td>
<td>ON</td>
<td>I/O</td>
<td></td>
</tr>
<tr>
<td>CG-TAB</td>
<td>Graphic</td>
<td>Buffer</td>
<td>40K</td>
</tr>
<tr>
<td>Country</td>
<td>E-US ASCII</td>
<td>Serial</td>
<td></td>
</tr>
<tr>
<td>Auto CR</td>
<td>OFF</td>
<td>Baud</td>
<td>9600 or 2400</td>
</tr>
<tr>
<td>Color Option</td>
<td>Not Installed</td>
<td>Format</td>
<td>7 Bit, Even, 1 Stop</td>
</tr>
<tr>
<td>Formien</td>
<td></td>
<td>Protocol</td>
<td>XON/XOFF</td>
</tr>
<tr>
<td>Lines</td>
<td>6LPI=60</td>
<td>Character Set</td>
<td>Standard</td>
</tr>
<tr>
<td>Standard</td>
<td>Exec 10.5</td>
<td>SI.Zero</td>
<td>On</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Auto LF</td>
<td>On</td>
</tr>
<tr>
<td>PAPER</td>
<td></td>
<td>BIN 1</td>
<td>12/72”</td>
</tr>
<tr>
<td></td>
<td></td>
<td>BIN 2</td>
<td>12/72”</td>
</tr>
<tr>
<td></td>
<td></td>
<td>SINGLE</td>
<td>12/72”</td>
</tr>
<tr>
<td></td>
<td></td>
<td>PUSH TRA</td>
<td>12/72”</td>
</tr>
<tr>
<td></td>
<td></td>
<td>PULL TRA</td>
<td>12/72”</td>
</tr>
<tr>
<td></td>
<td></td>
<td>PAP ROLL</td>
<td>12/72”</td>
</tr>
</tbody>
</table>
2.8.7 ANN-I/O LED Driver Module

The ANN-I/O is an LED driver module that can be used in a wide variety of applications, including as an interface with most customized graphic annunciators. The ANN-I/O can drive up to 40 LEDs. The following sections describe hardware installation. Refer to the section titled "ANN-BUS" on page 77 for programming information.

2.8.7.1 ANN-I/O Board Layout

Figure 2.22 illustrates the ANN-I/O board showing locations of screw terminals for connection to the FACP, pin connectors for connecting LEDs and the DIP switch for selecting the ANN-BUS ID number.

![ANN-I/O Board Layout](image)

2.8.7.2 Specifications

- Max. ANN-BUS Voltage: 28 VDC
- Max. Current:
  - Alarm: 200 mA
  - Standby: 35 mA
  - Each LED: 10 mA
- Operating Temperature: 32°F to 120°F (0°C to 49°C)
- For indoor use in a dry location only
2.8.7.3 ANN-I/O Connection to FACP

The ANN-I/O connects to the FACP via the ANN-BUS as illustrated in Figure 2.23. After the ANN-I/O is connected to the panel, it must be added to the system via FACP programming.

Figure 2.23 ANN-I/O Connection to FACP
2.8.7.4 ANN-I/O Module LED Wiring

There are four 12-pin connectors on the ANN-I/O module for connecting LEDs. Each set of 10 LEDs get their power from Pin 11 of the corresponding connector. Internal resistors are sized so that there is approximately 10 mA of current for each LED. No series resistors are required. LED outputs are mapped to output circuits. Refer to the section titled "ANN-I/O LED Zone Assignments" on page 80 of this manual.

The LEDs are wired as illustrated in Figure 2.24. Note that the illustration depicts only connectors P1 and P2. Wiring is identical for P3 (LEDs 21-30) and P4 (LEDs 31-40).

![Figure 2.24 ANN-I/O Board Layout](image-url)
2.8.8 ANN-LED Annunciator Module

The ANN-LED annunciator module provides LED annunciation of general system faults and input zones when used with a compatible FACP. The ANN-LED module provides alarm (red), trouble (yellow) and supervisory (yellow) indication for up to ten input zones.

*Canadian Applications: The ANN-LED is supplied standard with the MS-5UD-7C and MS-10UD-7C models. It is mounted to the dress panel included with these models.*

2.8.8.1 ANN-LED Board Layout

Figure 2.25 illustrates the ANN-LED board showing locations of screw terminals for connection to the FACP and the DIP switches for selecting the ANN-BUS ID number.

2.8.8.2 Specifications

- Max. ANN-BUS Voltage: 24 VDC
- Max. Current:
  - ✓ Alarm: 68 mA
  - ✓ Standby: 28 mA
- Operating Temperature: 32° F to 120° F (0° C to 49° C)
- For indoor use in a dry location only

2.8.8.3 Mounting/Installation

Install the ANN-LED Module as described in the documentation supplied with the annunciator.
2.8.8.4 ANN-LED Connection to FACP

Figure 2.26 illustrates the ANN-LED board wiring connections to the FACP.

Figure 2.26 ANN-LED Connection to FACP
2.8.9 ANN-RLY Relay Module
The ANN-RLY relay module provides 10 programmable Form-C relays when used with a compatible FACP.

2.8.9.1 ANN-RLY Board Layout
Figure 2.27 illustrates the ANN-RLY board showing locations of screw terminals for connection to the FACP and the DIP switches for selecting the ANN-BUS ID number.

2.8.9.2 Specifications
- Operating Voltage: 24 VDC
- Max. Current:
  - ✓ Alarm: 75 mA
  - ✓ Standby: 15 mA
- Relay Contact Ratings:
  - ✓ 2 amps @ 30 VDC (resistive)
  - ✓ 0.5 amps @ 30 VAC (resistive)
- Operating Temperature: 32°F to 120°F (0°C to 49°C)
- For indoor use in a dry location only

2.8.9.3 Mounting/Installation
The ANN-RLY relay module can be mounted inside the FACP main circuit board chassis.
2.8.9.4 ANN-RLY Connection to FACP

Figure 2.28 illustrates the ANN-RLY board wiring connections to the FACP.
SECTION 3  Programming

3.1 User Programming

The MS-5UD/MS-10UD FACP is completely field programmable using the panel keypad and requires no special software skills. While programming the FACP, the fire protection capabilities of the control panel are enabled.

Site-specific programming may be accomplished:

- Manual programming or editing, using the FACP keypad

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

![System All Normal Screen]

Read Status mode can be entered while the panel is in any mode of operation. If an alarm or supervisory event exists at the panel, the event must be cleared before entering Programming 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:

![Read Status Mode Menu]

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 the programmed features and status of the control panel. The Read Status feature is not password protected. Refer to "Read Status" on page 113 for a detailed description of this feature.

Pressing 2 will select user Programming Mode 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.

Exit Programming and Read Status Mode

The programmer can exit any 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 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.

3.2 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 devices to the FACP, apply power to the control panel. If wiring has not been completed and/or End-of-Line resistors are not installed at the panel, a trouble condition will be indicated at the panel and a trouble message will be displayed on the LCD. Following is an example of a possible trouble message that may be displayed.

3.3 Programming Screens Description

Two options are available when the Enter key is pressed: Read Status and Programming Mode. The Read Status and Programming options have 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 56, 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.

3.4 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 98. If an invalid password is entered, the blinking cursor will return to the first password character position. To exit Programming or Read Status 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:

![Programming Options](image)

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

![Programming Enter Password](image)

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

![Master Programming Options](image)

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

![Maintenance Programming Options](image)

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.
3.5 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]
3.5.1 Input Zones

The Input Zones option allows the user to initially program or change the programming for the five input zones (circuits) on the MS-5UD or the ten input zones (circuits) on the MS-10UD. Pressing 1, while viewing Programming Screen #1, will select the Input Zones option and display a screen similar to the following:

```
1=INPUT ZONES
2=NACS
3=RELAYS
```

Programming Screen #1

Pressing the down arrow key will display additional screens for Input Zones 4 through 5 in the MS-5UD or Input Zones 4 through 10 in the MS-10UD. To program a specific zone, press the number key corresponding to the desired zone while viewing one of the Input Zone screens. To program Input Zone 1, press the 1 key while viewing Input Zone Screen #1. The following screens will be displayed:

```
INPUT ZONES
1=ZONE 1
2=ZONE 2
3=ZONE 3
```

Input Zone Screen #1

```
Normal
```

```
PULL STATION
```

```
ZONE 1
PRESS ↓ TO EDIT
```

Edit Input Zone Screen #1

To change the programming for the displayed zone, press the keyboard ‘down’ arrow key to view the Edit Zone screens.
The following examples show the editing of Input Zone 1:

Enable/Disable Zone

To Enable or Disable the zone, press the 1 key while viewing the Edit Input Zone Screen #2. Each press of the key will toggle the screen between Enabled Yes and Enabled No. If Enabled No is selected, the zone will be disabled by the control panel, preventing the circuit from reporting alarms and troubles to the panel. The control panel LCD will display the zone which has been disabled and FACP will turn on the Trouble LED.

Type

To select the type of zone being programmed, press the 2 key while viewing the Edit Input Zone Screen #2. This will cause the control panel to display the following Zone Type Screen:
Pressing the down arrow key will display additional zone types as indicated in the following table.

<table>
<thead>
<tr>
<th>Zone Type</th>
<th>Action When Activated</th>
</tr>
</thead>
<tbody>
<tr>
<td>Pull-Station Fire Alarm</td>
<td></td>
</tr>
<tr>
<td>Waterflow Fire Alarm Delayed (uses waterflow delay)</td>
<td></td>
</tr>
<tr>
<td>Waterflow Nonsilenceable Fire Alarm (uses waterflow delay)</td>
<td></td>
</tr>
<tr>
<td>Combo Fire/Supervisory (uses waterflow delay)</td>
<td></td>
</tr>
<tr>
<td>Combo AutoResettable Supervisory Fire/Supervisory AR, nonlatching (uses waterflow delay)</td>
<td></td>
</tr>
<tr>
<td>2-Wire Detector Fire Alarm</td>
<td></td>
</tr>
<tr>
<td>Normally Open Contact Fire Alarm</td>
<td></td>
</tr>
<tr>
<td>Fire Fire Alarm</td>
<td></td>
</tr>
<tr>
<td>Tamper Supervisory</td>
<td></td>
</tr>
<tr>
<td>Supervisory Supervisory, latching</td>
<td></td>
</tr>
<tr>
<td>Supervisory AutoResettable Supervisory, nonlatching</td>
<td></td>
</tr>
<tr>
<td>Medic-Alert Supervisory, latching</td>
<td></td>
</tr>
<tr>
<td>Hazard-Alert Supervisory, latching</td>
<td></td>
</tr>
<tr>
<td>Tornado-Alert Supervisory, latching</td>
<td></td>
</tr>
<tr>
<td>Proc-Mon Piezo</td>
<td></td>
</tr>
<tr>
<td>ProcMon-AR Piezo, nonlatching</td>
<td></td>
</tr>
<tr>
<td>AC-Loss-Mon Trouble</td>
<td></td>
</tr>
<tr>
<td>Ack-Switch Acts like panel Acknowledge Key</td>
<td></td>
</tr>
<tr>
<td>S1-Switch Acts like panel Alarm Silence Key</td>
<td></td>
</tr>
<tr>
<td>Drill-Switch Acts like panel Drill Key</td>
<td></td>
</tr>
<tr>
<td>Reset-Switch Acts like panel Reset Key</td>
<td></td>
</tr>
<tr>
<td>PAS-Bypass Positive Alarm Sequence Disable</td>
<td></td>
</tr>
<tr>
<td>Drill-Switch AutoResettable Acts like panel Drill Key, nonlatching</td>
<td></td>
</tr>
</tbody>
</table>

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

**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 Zone 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 (None or One Minute)" on page 112.

Note that verification can only be enabled for a zone that is programmed as a smoke detector type. Zones programmed for any other type will not allow the Verification feature to be enabled. Do not use the verification feature if a mix of smoke detectors and normally open contact devices are connected to the same zone.
PAS/Pre-Signal Delay

Pressing 1 while viewing Edit Input Zone Screen #3 will display the following screen:

```
1 = NO DELAY
2 = PRE-SIGNAL DELAY
3 = PAS DELAY
```

PAS/Pre-Signal Delay Screen

Pre-signal

The Pre-signal option programs the zone 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. To enable the Pre-signal feature, press 2 while viewing PAS/Pre-Signal Screen. Refer to "Pre-signal" on page 110.

PAS

The PAS (Positive Alarm Sequence) option will program the zone to delay panel activation (including alarm relay and communicator) for a period of 15 seconds plus a programmable time of up to 3 minutes. To enable the PAS feature, press 3 while viewing the PAS/Pre-Signal Screen. This option is available only for circuits programmed as smoke detector circuits. Refer to "Positive Alarm Sequence" on page 110.

Noun/Adjective

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

```
1 = STANDARD ADJECTIVE
2 = STANDARD NOUN
3 = FUTURE USE
4 = FUTURE USE
```

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.

Adjective Screen #1

Adjective Screen #2

Adjective Screen #3

Adjective Screen #4

Adjective Screen #5

Adjective Screen #6

Adjective Screen #7
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.

Noun/Adjective Screen

1=STANDARD ADJECTIVE
2=STANDARD NOUN
3=FUTURE USE

Noun Screen #1

1=BASEMENT
2=BOILER RM
3=CLASSROOM

Noun Screen #2

1=CLOSET
2=CORRIDOR
3=ELECTRIC RM

Noun Screen #3

1=ELEVATOR
2=ENTRANCE
3=FLOOR

Noun Screen #4

1=GARAGE
2=HALLWAY
3=HVAC RM

Noun Screen #5

1=KITCHEN
2=LOBBY
3=OFFICE

Noun Screen #6

1=PATIENT
2=RESTROOM
3=ROOM

Noun Screen #7

1=STAIRWAY
2=STOREROOM
3=WING

Noun Screen #8

1=ZONE
Description

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

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 1, 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 Enter key to store the information

### 3.5.2 NAC (Notification Appliance Circuit)

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

<table>
<thead>
<tr>
<th>NACS</th>
</tr>
</thead>
</table>
| 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.

To program an NAC circuit, press the number corresponding to the NAC to be programmed. The following screens will be displayed for each selection:

<table>
<thead>
<tr>
<th>NAC #</th>
</tr>
</thead>
</table>
| 1=ENABLED | YES  
| 2=CODING | STEADY |

#### NAC Screen #1

<table>
<thead>
<tr>
<th>NAC #</th>
</tr>
</thead>
</table>
| 1=SILENCE | YES  
| 2=AUTO SILENCE | NO  
| 3=SIL INHIBITED | NO |

#### NAC Screen #2
3.5.2.1 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.

Note that if a circuit is disabled, a trouble will be logged on the FACP until the circuit is enabled.

3.5.2.2 NAC 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 #1 will cause the following displays to appear:

NAC Screen #1

<table>
<thead>
<tr>
<th>NAC #</th>
<th>1=ENABLED</th>
<th>2=CODING</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>STEADY</td>
<td></td>
</tr>
</tbody>
</table>

Coding Screen #1

CODING
1=STEADY
2=MARCH TIME
3=CALIFORNIA

Coding Screen #2

CODING
1=TEMPORAL
2=TWO STAGE 3 MIN
3=TWO STAGE 5 MIN

Coding Screen #3

CODING
1=SYNC SYSTEM SENSR
2=SYNC WHEELOCK
3=SYNC GENTEX

Coding Screen #4

CODING
1=SYNC FARADAY
2=SYNC AMSECO
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 3 Minutes or 5 Minutes - Refer to “Two Stage Operation” on page 66. for a description of this feature
- Synchronized output for System Sensor, Wheelock, Gentex, Faraday or Amseco - Refer to "Synchronized NAC Operation" on page 66 for additional information.

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 #1, which will display the new coding choice.

3.5.2.2.1 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 will activate with a 1st stage output upon activation of any alarm
2. 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
3. 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
4. If another alarm point is activated and the countdown timer is counting, the alarm point will have no effect on the NACs
5. 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 1. NACs already in 2nd stage activation will not be affected

3.5.2.2.2 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.
3.5.2.2.2.1 Maximum Number of Strobes for Synchronization

The maximum current draw for a Notification Appliance Circuit cannot exceed 2.5 amps for models with the FLPS-3 power supply or 3.0 amps for models with the FLPS-7 power supply (refer to the AC Power section under "Specifications" on page 14). Refer to the manufacturer’s documentation supplied with the Strobes to determine the maximum current draw for each strobe and ensure that the circuit maximum is not exceeded.

To ensure proper strobe and circuit operation, there is also a limit to the number of strobes that can be attached to each circuit. Following is a list of the strobes that have been tested with this FACP and the maximum number that can be connected to each NAC. Make sure that the NAC maximum current is not exceeded:

<table>
<thead>
<tr>
<th>Strobe Manufacturer</th>
<th>FACP with FLPS-3 Power Supply: Maximum Number of Strobes</th>
<th>FACP with FLPS-7 Power Supply: Maximum Number of Strobes</th>
</tr>
</thead>
<tbody>
<tr>
<td>System Sensor</td>
<td>35</td>
<td>46</td>
</tr>
<tr>
<td>Wheelock</td>
<td>24</td>
<td>50</td>
</tr>
<tr>
<td>Gentex</td>
<td>22</td>
<td>39</td>
</tr>
<tr>
<td>Faraday</td>
<td>22</td>
<td>33</td>
</tr>
<tr>
<td>Amseco</td>
<td>19</td>
<td>34</td>
</tr>
</tbody>
</table>

3.5.2.3 Silence

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

```
SILENCEABLE
1=SILENCEABLE
2=NON SILENCEABLE
3=SYNC MUTE
```

Pressing 1 while viewing the Silenceable Screen will program the selected NAC as a silenceable circuit. This will allow the NAC to be silenced by pressing the Alarm Silence key or by the Auto Silence feature.

Pressing 2 while viewing the Silenceable Screen will program the selected NAC as a nonsilenceable circuit. This will prevent the selected main circuit board NAC from being silenced by pressing the Alarm Silence key or by the Auto Silence feature.

Pressing 3 while viewing the Silenceable Screen will program the selected NAC as a synchronized mute circuit. Refer to "Synchronized NAC Operation" on page 66 for a description of synchronization.

**Important:** When a Notification Appliance Circuit with a mix of audible and visual devices is programmed for Sync Mute, only the audible devices will be turned off if the Silence key is pressed or if the Autosilence feature is enabled. The visual devices (strobes, etc.) will continue to operate.
3.5.2.4 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 2 while viewing NAC Screen #2. The following screens will be displayed:

![Auto Silence Screen #1](image1)

Auto Silence Screen #1

![Auto Silence Screen #2](image2)

Auto Silence Screen #2

![Auto Silence Screen #3](image3)

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. This information will be stored in memory and the display will return to NAC Screen #1.

3.5.2.5 Silence Inhibited
The Silence Inhibit feature, when enabled, prevents the silencing of the selected main circuit board NAC for a period of one minute. Resetting the FACP will also be prevented for one minute while the NAC programmed for silence inhibit is activated. Pressing 3 while viewing NAC Screen #2 will cause the display to change from the factory default of Silence Inhibit No to Silence Inhibit Yes. Each press of the 3 key will cause the display to toggle between the two options.

3.5.3 Relays
Pressing 3 while viewing Programming Screen #1 will allow the programmer to configure the three main circuit board Form-C relays. The following screen will be displayed:

![Relays Selection Screen](image4)

Relays Selection Screen
To program Relay 1, 2 or 3, press the number corresponding to the selected relay. The following screens will appear for each relay to be programmed:

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: A relay programmed with the Silenceable Alarm type will **deactivate** when the FACP Alarm Silenced LED is illuminated.*
### 3.5.4 System Setup

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

- **Timers**: This option allows the programmer to set the PAS (Positive Alarm Sequence) time delay, Pre-Signal time delay and Waterflow time delay.
- **Banner**: This option allows the user to change the top two lines of the LCD display from the factory default readout, which is blank, 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.
- **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 Troublem Reminder feature is not enabled and a 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.
- **Charger Disable**: This option allows the programmer to disable the onboard battery charger in the event an external battery charger is being used.

Pressing 1 for System Setup, while viewing Programming Screen #2, will cause the following screens to be displayed:

![System Setup Screen #1](image1)

![System Setup Screen #2](image2)
3.5.4.1 Timers
Timer delays for PAS, Pre-signal and waterflow activation can be programmed by pressing 1 while viewing System Setup Screen #1. The following screen will be displayed:

![Timer Screen #1]

3.5.4.1.1 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 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 theDelay Screen which will indicate the new delay time.

3.5.4.1.2 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 have both PAS and Pre-signal timers programmed with values but a zone can only use either the PAS or Pre-signal feature, but not both.*

### 3.5.4.1.3 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](image)

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.

### 3.5.4.1.4 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 Screen](image)

A flashing cursor will appear in the lower left corner of the display. The factory default setting is 02 hours. 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: Upon the loss of AC power at the control panel, relays programmed for AC Loss will transfer immediately, regardless of the AC Loss Delay setting. If no troubles other than AC Loss exist in the panel, the System Trouble relay will delay activation for the duration of the AC Loss Delay setting.*
3.5.4.2 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:

```
SELECT BANNER
1=FACTORY BANNER
2=USER BANNER
```

Select Banner Screen

Pressing / while viewing the Select Banner Screen will display the following screen:

```
FACTORY BANNER
PRESS ENTER IF OK
```

User Defined Banner Screen #1

This screen allows the user to select the factory default Banner which will be displayed when the system is in Normal Mode of operation. Press the Enter key to accept this as the default display. Press the Escape key to cancel and return to the Select Banner Screen.

Pressing 2 while viewing the Select Banner Screen will display the following screen:

```
USER BANNER-LINE 1
PRESS ENTER IF OK
```

User Defined Banner Screen

This screen allows the programmer to enter a custom banner. A flashing cursor will appear in the bottom left corner of the display. A maximum of 20 characters (including spaces) can be entered into the screen. After entering up to 20 characters in the screen, press Enter to store the entry. 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 1, 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 the Enter key to store the information. The display will return to the Select Banner Screen.
3.5.4.3 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-Date Screen #1](image1)

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

![Time Screen](image2)

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

![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.

3.5.4.3.3 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).

3.5.4.3.4 Daylight Savings Time
Pressing / while viewing Time-Date Screen #2 will cause the following screens to be displayed:

![Daylight Savings Screen #1]

![Daylight Savings Screen #2]

Pressing / 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 / 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.

3.5.4.4 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 70, for a detailed description of this feature. Pressing 1 while viewing System Setup Screen #2 will cause the display to toggle to Trouble Rem Yes, which enables this feature. Each press of the 1 key will cause the display to toggle between Trouble Rem Yes and Trouble Rem No.

Note that if the Trouble Reminder feature is not enabled, a trouble existing on the panel for more than 24 hours will cause the FACP to resound the trouble sounder.

3.5.4.5 Charger Disable
Pressing 3 while viewing System Setup Screen #2 will allow the programmer to enable or disable the onboard battery charger. If an external battery charger is being used, the onboard battery charger must be disabled. Each press of the 3 key will toggle between Chrgr Disable No and Chrgr Disable Yes.

3.5.5 Option Modules
Options available for the FACP include annunciators, printer connection for acquiring hardcopy printouts of panel data and onboard DACT.

Pressing 2 while viewing Programming Screen #2 will display the following screen:
3.5.5.1 ANN-BUS
Pressing 1 while viewing the Option Modules screen will cause the control panel to display the following screens.

A variety of ANN-BUS option modules can be installed in the FACP. These devices communicate with the FACP over the ANN-BUS terminals on the control panel.

### 3.5.5.1.1 ANN-BUS Enabled
The ANN-BUS must be enabled if any modules are installed on the ANN-BUS terminals. To enable the ANN-BUS, press 1 while viewing ANN-BUS screen #1 so that the display reads "ANN-BUS Enabled Yes." Each press of the 1 key will cause the display to toggle between "ANN-BUS Enabled Yes" and "ANN-BUS Enabled No."

### 3.5.5.1.2 BUS Modules
If an ANN-BUS module is installed, press 2 while viewing ANN-BUS screen #1 to select ANN-BUS addresses for the module(s). The following screen will be displayed.

Pressing the down arrow key will allow the programmer to view additional screens displaying Addresses 1 - 8. Pressing the number corresponding to the desired address will display a screen with technical information about the selected module.
In the technical information screen, pressing 1 for Type will display the following screens:

Press the number corresponding to the module type, if any, that is installed with the selected address. *This will enable the module.*

### 3.5.5.1.3 Auto-Configure
The ANN-BUS Auto-Configure features allows the programmer to quickly bring all installed ANN-BUS modules online. The software will search for all ANN-BUS modules and automatically program the device type and address into the system. Pressing 3 while viewing ANN-BUS Screen #1 will begin the Auto-Configure process and cause the following screen to be displayed:
3.5.5.1.4 ANN-S/PG Options
The Printer Option allows the user to configure the optional printer. Pressing 1 while viewing the ANN-BUS Screen #2 will display the following screens:

### Printer Options Screen #1

<table>
<thead>
<tr>
<th>Option</th>
<th>Setting</th>
</tr>
</thead>
<tbody>
<tr>
<td>Port</td>
<td>Parallel</td>
</tr>
<tr>
<td>Printer Superv.</td>
<td>No</td>
</tr>
<tr>
<td>Offline Timer</td>
<td>60</td>
</tr>
</tbody>
</table>

Pressing 1 for Port while viewing Printer Options screen #1 will allow the programmer to select between a Parallel and Serial Port for printer connection. Each press of the 1 key will cause the display to toggle between Port PAR (parallel) and Port SER (serial). It is important to note that the interface selected determines which options are available to the user.

If the Parallel Port option is selected, the user has the option to supervise the printer and select an offline timer for the supervision by pressing 2 for Printer Supervision while viewing Printer Options screen #1. Each press of the 2 key will cause the display to toggle between Printer Supv NO for no supervision and Printer Supv YES for printer supervision. Note that this option is not selectable if the Serial Port option has been selected.

If the Parallel Port option is selected, the user has the ability to select an Offline Timer by pressing 3 while viewing Print Options screen #1. The resultant screen allows the programmer to program the Offline Timer for a delay of between 0 and 255 seconds before loss of printer supervision is reported as a trouble.

If the Serial Port option is selected, the Printer Supv and Offline Timer options will not be available. The Baud Rate, Data Bits, Parity and Stop Bits options are only available when the Serial Port option has been selected.

Pressing 1 for Baud Rate while viewing Printer Options screen #2 will cause a screen to appear which allow the user to select a Baud Rate of 19200, 9600 or 2400.

Pressing 2 for Data Bits while viewing Printer Options screen #2 will cause screens to appear which allow the user to select 5, 6, 7 or 8 Data Bits.

Pressing 3 for Parity while viewing Printer Options screen #2 will cause a screen to appear which allows the user to select between No Parity, Even Parity or Odd Parity.

Pressing 1 for Stop Bits while viewing Printer Options screen #3 will cause a screen to appear which allows the user to select between 0.5, 1.0 or 2.0 Stop Bits.
3.5.5.1.5 ANN-I/O LED Zone Assignments
The information displayed by LEDs on every ANN-I/O module is not programmable and will therefore be as indicated in the following table.

<table>
<thead>
<tr>
<th>LED</th>
<th>Zone (any address)</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>AC Fault</td>
</tr>
<tr>
<td>2</td>
<td>General Alarm</td>
</tr>
<tr>
<td>3</td>
<td>General Supervisory</td>
</tr>
<tr>
<td>4</td>
<td>General Trouble</td>
</tr>
<tr>
<td>5</td>
<td>Alarm Silenced</td>
</tr>
<tr>
<td>6</td>
<td>Not Used</td>
</tr>
<tr>
<td>7</td>
<td>Not Used</td>
</tr>
<tr>
<td>8</td>
<td>Not Used</td>
</tr>
<tr>
<td>9</td>
<td>Not Used</td>
</tr>
<tr>
<td>10</td>
<td>Not Used</td>
</tr>
<tr>
<td>11</td>
<td>Zone 1 Alarm</td>
</tr>
<tr>
<td>12</td>
<td>Zone 2 Alarm</td>
</tr>
<tr>
<td>13</td>
<td>Zone 3 Alarm</td>
</tr>
<tr>
<td>14</td>
<td>Zone 4 Alarm</td>
</tr>
<tr>
<td>15</td>
<td>Zone 5 Alarm</td>
</tr>
<tr>
<td>16</td>
<td>Zone 6 Alarm</td>
</tr>
<tr>
<td>17</td>
<td>Zone 7 Alarm</td>
</tr>
<tr>
<td>18</td>
<td>Zone 8 Alarm</td>
</tr>
<tr>
<td>19</td>
<td>Zone 9 Alarm</td>
</tr>
<tr>
<td>20</td>
<td>Zone 10 Alarm</td>
</tr>
<tr>
<td>21</td>
<td>Zone 1 Trouble</td>
</tr>
<tr>
<td>22</td>
<td>Zone 2 Trouble</td>
</tr>
<tr>
<td>23</td>
<td>Zone 3 Trouble</td>
</tr>
<tr>
<td>24</td>
<td>Zone 4 Trouble</td>
</tr>
<tr>
<td>25</td>
<td>Zone 5 Trouble</td>
</tr>
<tr>
<td>26</td>
<td>Zone 6 Trouble</td>
</tr>
<tr>
<td>27</td>
<td>Zone 7 Trouble</td>
</tr>
<tr>
<td>28</td>
<td>Zone 8 Trouble</td>
</tr>
<tr>
<td>29</td>
<td>Zone 9 Trouble</td>
</tr>
<tr>
<td>30</td>
<td>Zone 10 Trouble</td>
</tr>
<tr>
<td>31</td>
<td>Zone 1 Supervisory</td>
</tr>
<tr>
<td>32</td>
<td>Zone 2 Supervisory</td>
</tr>
<tr>
<td>33</td>
<td>Zone 3 Supervisory</td>
</tr>
<tr>
<td>34</td>
<td>Zone 4 Supervisory</td>
</tr>
<tr>
<td>35</td>
<td>Zone 5 Supervisory</td>
</tr>
<tr>
<td>36</td>
<td>Zone 6 Supervisory</td>
</tr>
<tr>
<td>37</td>
<td>Zone 7 Supervisory</td>
</tr>
<tr>
<td>38</td>
<td>Zone 8 Supervisory</td>
</tr>
<tr>
<td>39</td>
<td>Zone 9 Supervisory</td>
</tr>
<tr>
<td>40</td>
<td>Zone 10 Supervisory</td>
</tr>
</tbody>
</table>
3.5.5.1.6 ANN-80 Options
Pressing 2 while ANN-BUS screen #2 will display the following screen:

![ANN-80 Options Screen #1]

The Piezo Enable option allows the programmer to select whether the piezo sounder on any installed ANN-80 module will ever sound. Pressing 1 while viewing the ANN-80 Options Screen #1 causes the display to toggle between Piezo Enable Yes and Piezo Enable No.

The Lock Enable option allows the programmer to select whether or not the ANN-80 annunciator must be unlocked by its key before any annunciator key presses will function. Pressing 2 while viewing the ANN-80 Options Screen #1 causes the display to toggle between Lock Enable Yes (annunciator must be unlocked for keys to function) and Lock Enable No (lock position is ignored).

The Acknowledge Button Enable (ACK BTN ENABLE) option allows the programmer to select whether the Ack/Step button on any installed ANN-80 annunciator will function normally or always be ignored. Pressing 3 while viewing the ANN-80 Options Screen #1 causes the display to toggle between Ack Btn Enable Yes (Ack/Step button functions normally) and Ack Btn Enable No (Ack/Step button never functions).

The Silence Button Enable (SIL BTN ENABLE) option allows the programmer to select whether the Silence button on any installed ANN-80 annunciator will function normally or always be ignored. Pressing 1 while viewing the ANN-80 Options Screen #2 causes the display to toggle between Sil Btn Enable Yes (Silence button functions normally) and Sil Btn Enable No (Silence button never functions).

The Reset Button Enable (RST BTN ENABLE) option allows the programmer to select whether the Reset button on any installed ANN-80 annunciator will function normally or always be ignored. Pressing 2 while viewing the ANN-80 Options Screen #2 causes the display to toggle between Rst Btn Enable Yes (Reset button functions normally) and Rst Btn Enable No (Reset button never functions).

The Drill Button Enable (DRL BTN ENABLE) option allows the programmer to select whether the Drill button on any installed ANN-80 annunciator will function normally or always be ignored. Pressing 3 while viewing the ANN-80 Options Screen #2 causes the display to toggle between Drl Btn Enable Yes (Drill button functions normally) and Drl Btn Enable No (Drill button never functions).
### 3.5.5.2 ANN-RLY Options

Pressing 1 for *ANN-RLY Options* while viewing ANN-BUS Screen #3 will cause the following screen to be displayed:

```
ANN-RLY OPTIONS
1=RELAY 1 IN ZONE 1
2=RELAY 2 IN ZONE 2
3=RELAY 3 IN ZONE 3
```

**ANN-RLY Options Screen**

The ANN-RLY module provides ten Form-C relays which can be programmed for various functions. The initial screen displays Relays 1 through 3. Pressing the down arrow key will display the remaining relays for this module.

To program any of the ANN-RLY relays, while viewing the appropriate ANN-RLY Option screen, press the number key corresponding to the relay to be programmed. Following is a list of the available programming options for each relay:

- General Alarm
- General Trouble
- General Supervisory
- AC Loss
- Waterflow Delay
- Input Zone 1
- Input Zone 2
- Input Zone 3
- Input Zone 4
- Input Zone 5
- Input Zone 6
- Input Zone 7
- Input Zone 8
- Input Zone 9
- Input Zone 10
- Silenceable Alarm
- Not Assigned
3.5.5.3 Onboard DACT
The Onboard DACT (Digital Alarm Communicator/Transmitter) provides communication to a central station. Pressing 2 while viewing the Option Module Screen will cause the following screens to be displayed:

3.5.5.3.1 Primary Phone
Press 1 while viewing Onboard DACT Screen to program the type of primary phone line being connected to the DACT. The following screen will be displayed:

Press 1 to select Touchtone dialing, 2 to select Rotary dialing with a make/break ratio of 67/33 or 3 to select Rotary dialing with a make/break ratio of 60/40.
3.5.5.3.2 Secondary Phone
Press 2 while viewing Onboard DACT Screen to program the type of secondary phone line being connected to the DACT. The following screen will be displayed:

![Secondary Phone Type Screen](image)

Press 1 to select Touchtone dialing, 2 to select Rotary dialing with a make/break ratio of 67/33 or 3 to select Rotary dialing with a make/break ratio of 60/40.

3.5.5.3.3 Central Station
Central Station programming configures the control panel DACT for contacting the central station. Pressing 3 while viewing Onboard DACT Screen will cause the following screens to be displayed:

![Central Station Screen #1](image)

Press 1 to enable the DACT for reporting FACP activity to the central station, press 1 while viewing Central Station Screen #1 so the display reads Reporting Yes. Each press of the 1 key will toggle the display between Reporting Yes and Reporting No.

3.5.5.3.3.1 Reporting
To enable the DACT for reporting FACP activity to the central station, press 1 while viewing Central Station Screen #1 so the display reads Reporting Yes. Each press of the 1 key will toggle the display between Reporting Yes and Reporting No.

3.5.5.3.3.2 Report Style
The DACT can be programmed to transmit reports to primary and/or secondary central station phone numbers as a backup. Press 2 while viewing Central Station Screen #1 to display the following screen:

![Backup Reporting Screen](image)

Press 1 to have all reports transmitted to the central station secondary phone number as a backup only if the primary phone line fails, 2 to transmit all reports to both the primary and secondary phone numbers all of the time or 3 to send reports to the first available phone number.
3.5.5.3.3 Central Station Primary and Secondary Phone Numbers

Pressing 1 for Primary or 2 for Secondary, while viewing Central Station Screen #2, will display the following screens.

Note that the following information must be entered for both the Primary and Secondary Central Station Phone Numbers.

Central Station Screen #2

Primary/Secondary Screen #1

Primary/Secondary Screen #2

Primary/Secondary Screen #3
**Test Time Interval**
Pressing / while viewing Primary/Secondary Screen #1 will cause the following screens to be displayed:

![Test Time Interval Screen #1](image)

The test report sent to the Central Station phone number may be sent once every 6, 8, 12 or 24 hours. Select the desired Test Time Interval by pressing the corresponding digit in the screens shown above.

**Account Code**
Pressing 2 while viewing Primary/Secondary Screen #1 will cause the following screen to be displayed:

![Account Codes Screen](image)

The Account Code, which is assigned by a Central Station, depends on the communication format being used. The Account Code screen will have a flashing cursor in the lower left corner. Program the supplied 4-digit account code using 0 - 9 and A- F keys. Enter the first digit, then press the right arrow key to move the cursor to the right, one position. Repeat the process until all digits are entered. Press the Enter key to store the account code in memory.
24 Hour Test Time

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

![24 Hour Test Time Screen]

Use the 24 Hour Test Time screen to program the time that the DACT will transmit the 24 Hour Test to the Central Station. A flashing cursor will appear in the lower left corner of the screen. Enter a four digit number representing the test time using military time (0000 = midnight and 2359 = 11:59PM).

Phone Number

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

![Phone Number Screen]

The Phone Number screen is used to enter the Central Station phone number that the DACT will be contacting. A maximum of 20 characters can be entered with valid entries being 0 - 9 and A - F where A = *, B = #, C = look for secondary dial tone for up to 2 seconds (then dial anyway), D = 3 second pause, E = 5 second pause and F = end of phone number (must be entered at end of phone number).

A flashing cursor will appear in the lower left corner of the screen. Enter the first digit then press the right arrow key to move the cursor to the right one position. Enter the second digit and repeat the process until all digits are entered. Press the Enter key to store the phone number in memory.

Enter the digits as you would like the number to be dialed. For example, if it’s necessary to dial 9 before dialing a number outside the building, you may wish to pause after dialing 9. Enter 9 followed by D for a three second pause or E for a five second pause then the phone number followed by an F to indicate the end of the number.
Communication Format

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

```
COMM FORMAT
1=ADEMCO CONTACT ID
2=SIA-DCS-8
3=SIA-DCS-20
```

The Communication Format is determined by the type of receiver that the DACT is transmitting to. Consult your Central Station for proper selection or consult our factory representatives. For any format chosen, the control panel automatically programs all of the event codes.

Select the Communication Format by pressing the corresponding number key while viewing the Comm Format screen. The following table describes each format:

<table>
<thead>
<tr>
<th>Screen Selection</th>
<th>Communication Format Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>ADEMCO CONTACT ID</td>
<td>Contact ID, DTMF, 1400/2300 ACK</td>
</tr>
<tr>
<td>SIA-DCS-8</td>
<td>Security Industry Association, 8 messages per call</td>
</tr>
<tr>
<td>SIA-DCS-20</td>
<td>Security Industry Association, 20 messages per call</td>
</tr>
</tbody>
</table>

Event Codes

Pressing 1 while viewing Primary/Secondary Screen #4 will cause the following screen to be displayed:

```
EVENT CODES
1=ZONE 1 ALARM
2=ZONE 2 ALARM
3=ZONE 3 ALARM
```

Pressing the down arrow key allows viewing of all Events associated with the selected Communication Format. Pressing the number corresponding to the event displayed in each screen will display its default active and restoral event codes which can be customized by the programmer.

For example, if Ademco Contact ID is the selected format, pressing 3 for Zone 3 Alarm will display the following screen which allows the Event Code to be changed from the default value:

```
ZONE 3 ACTIVE
115
```
The following table lists the Zone Alarm Types that can be programmed for zones 1 through 10 and the corresponding Event Codes for Ademco Contact ID and SIA DCS Formats. Note that Table 3.3 on page 90, Table 3.4 on page 91, Table 3.5 on page 92 and Table 3.6 on page 94 list the default settings for Zone 1 through Zone 10. These can be changed to any of the Types listed in Table 3.2.

Note: The third character in the SIA-DCS Format (x in the table below) represents the zone number.

### Table 3.2 Zone Alarm Type Event Codes

<table>
<thead>
<tr>
<th>Zone Alarm Type</th>
<th>Ademco Contact ID</th>
<th>SIA-DCS Format</th>
</tr>
</thead>
<tbody>
<tr>
<td>Pull-Station</td>
<td>115</td>
<td>FAx FHx</td>
</tr>
<tr>
<td>Waterflow</td>
<td>113</td>
<td>SAx SHx</td>
</tr>
<tr>
<td>Waterflow Nonsilenceable</td>
<td>113</td>
<td>SAx SHx</td>
</tr>
<tr>
<td>Combo</td>
<td>113</td>
<td>SAx SHx</td>
</tr>
<tr>
<td>Combo AutoResettable Supervisory</td>
<td>113</td>
<td>SAx SHx</td>
</tr>
<tr>
<td>2-Wire Detector</td>
<td>111</td>
<td>FAx FHx</td>
</tr>
<tr>
<td>Normally Open Contact</td>
<td>110</td>
<td>UAx UHx</td>
</tr>
<tr>
<td>Fire</td>
<td>110</td>
<td>FAx FHx</td>
</tr>
<tr>
<td>Tamper</td>
<td>144</td>
<td>TAx THx</td>
</tr>
<tr>
<td>Supervisory</td>
<td>200</td>
<td>FSx FVx</td>
</tr>
<tr>
<td>Supervisory AutoResettable</td>
<td>200</td>
<td>FSx FVx</td>
</tr>
<tr>
<td>Medic-Alert</td>
<td>100</td>
<td>MAx MHx</td>
</tr>
<tr>
<td>Hazard-Alert</td>
<td>150</td>
<td>PAx PHx</td>
</tr>
<tr>
<td>Tornado-Alert</td>
<td>150</td>
<td>PAx PHx</td>
</tr>
<tr>
<td>Proc-Mon</td>
<td>200</td>
<td>IAx IRx</td>
</tr>
<tr>
<td>Procmon-AR</td>
<td>200</td>
<td>IAx IRx</td>
</tr>
<tr>
<td>AC-Loss-Mon</td>
<td>301</td>
<td>AIx ARx</td>
</tr>
<tr>
<td>Drill-Switch</td>
<td>604</td>
<td>FLx FKx</td>
</tr>
<tr>
<td>Drill-Switch AutoResettable</td>
<td>604</td>
<td>FLx FKx</td>
</tr>
</tbody>
</table>

The following tables list all of the Events and their default Event Codes for the Ademco Contact ID and SIA-DCS Communication Formats.

Note: A detector *freeze* condition will be reported as a Supervisory Event Code.
Ademco Contact ID Format - Primary Central Station Phone Number

The information shown in Table 3.3 is automatically programmed for the Primary Central Station phone number Event Codes when Ademco Contact ID Format is selected. To disable event reporting, select the desired Event Code to be disabled and press 0 or Clear and then Enter to disable it. (Enter must be pressed to save the selection. Pressing Escape will not save the selection). Note that disabling the Event Code for the Primary Central Station Phone Number Event Code will also disable that Event Code for the Secondary Central Station Phone.

Table 3.3 Ademco Contact ID Primary # Event Codes

<table>
<thead>
<tr>
<th>Event Description</th>
<th>Event Code Settings</th>
</tr>
</thead>
<tbody>
<tr>
<td>Active</td>
<td></td>
</tr>
<tr>
<td>Primary # Zone 1 - 10 Alarm</td>
<td>115</td>
</tr>
<tr>
<td>Primary # Zone 1 - 10 Disabled</td>
<td>570</td>
</tr>
<tr>
<td>Primary # Drill</td>
<td>604</td>
</tr>
<tr>
<td>Primary # AC Fault</td>
<td>301</td>
</tr>
<tr>
<td>Primary # Zone 1 - 10 Fault</td>
<td>380</td>
</tr>
<tr>
<td>Primary # Zone 1 - 10 Dirty</td>
<td>380</td>
</tr>
<tr>
<td>Primary # Earth Fault</td>
<td>310</td>
</tr>
<tr>
<td>Primary # Low Battery Fault</td>
<td>302</td>
</tr>
<tr>
<td>Primary # No Battery Fault</td>
<td>311</td>
</tr>
<tr>
<td>Primary # Telco Primary Line Fault</td>
<td>351</td>
</tr>
<tr>
<td>Primary # Telco Secondary Line Fault</td>
<td>352</td>
</tr>
<tr>
<td>Primary # NAC #1 Fault</td>
<td>321</td>
</tr>
<tr>
<td>Primary # NAC #2 Fault</td>
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<tr>
<td>Primary # NAC #3 Fault</td>
<td>326</td>
</tr>
<tr>
<td>Primary # NAC #4 Fault</td>
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<td>521</td>
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<td>522</td>
</tr>
<tr>
<td>Primary # NAC #3 Disable</td>
<td>526</td>
</tr>
<tr>
<td>Primary # NAC #4 Disable</td>
<td>527</td>
</tr>
<tr>
<td>Primary # Charger Fault</td>
<td>300</td>
</tr>
<tr>
<td>Primary # Comm Trouble Primary #</td>
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<td>354</td>
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<td>Primary # Printer Fault</td>
<td>336</td>
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<tr>
<td>Primary # ANN-Bus Fault</td>
<td>330</td>
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<tr>
<td>Primary # Option Card Fault</td>
<td>333</td>
</tr>
<tr>
<td>Primary # Memory Fault</td>
<td>304</td>
</tr>
<tr>
<td>Future</td>
<td>000</td>
</tr>
<tr>
<td>Primary # System Off Normal</td>
<td>308</td>
</tr>
<tr>
<td>Primary # System Test Message</td>
<td>602</td>
</tr>
<tr>
<td>Primary # System Abnormal Test Message</td>
<td>608</td>
</tr>
</tbody>
</table>
Ademco Contact ID Format - Secondary Central Station Phone Number

The information shown in Table 3.4 is automatically programmed for the Secondary Central Station phone number Event Codes when Ademco Contact ID Format is selected. To disable event reporting, select the desired Event Code to be disabled and press 0 or Clear and then Enter to disable it. (Enter must be pressed to save the selection. Pressing Escape will not save the selection). Note that disabling the Event Code for the Primary Central Station Phone Number Event Code will also disable that Event Code for the Secondary Central Station Phone.

Table 3.4 Ademco Contact ID Secondary # Event Codes

<table>
<thead>
<tr>
<th>Event Description</th>
<th>Event Code Settings</th>
</tr>
</thead>
<tbody>
<tr>
<td>Secondary # Zone 1 - 10 Alarm</td>
<td>115</td>
</tr>
<tr>
<td>Secondary # Zone 1 - 10 Disabled</td>
<td>570</td>
</tr>
<tr>
<td>Secondary # Drill</td>
<td>604</td>
</tr>
<tr>
<td>Secondary # AC Fault</td>
<td>301</td>
</tr>
<tr>
<td>Secondary # Zone 1 - 10 Fault</td>
<td>380</td>
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<tr>
<td>Secondary # Zone 1 - 10 Dirty</td>
<td>380</td>
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<tr>
<td>Secondary # Earth Fault</td>
<td>310</td>
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<tr>
<td>Secondary # Low Battery Fault</td>
<td>302</td>
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<tr>
<td>Secondary # No Battery Fault</td>
<td>311</td>
</tr>
<tr>
<td>Secondary # Telco Primary Line Fault</td>
<td>351</td>
</tr>
<tr>
<td>Secondary # Telco Secondary Line Fault</td>
<td>352</td>
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<tr>
<td>Secondary # NAC #1 Fault</td>
<td>321</td>
</tr>
<tr>
<td>Secondary # NAC #2 Fault</td>
<td>322</td>
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<tr>
<td>Secondary # NAC #3 Fault</td>
<td>326</td>
</tr>
<tr>
<td>Secondary # NAC #4 Fault</td>
<td>327</td>
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<tr>
<td>Secondary # NAC #1 Disable</td>
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<tr>
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<td>522</td>
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<tr>
<td>Secondary # NAC #3 Disable</td>
<td>526</td>
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<td>Secondary # NAC #4 Disable</td>
<td>527</td>
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<tr>
<td>Secondary # Charger Fault</td>
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<tr>
<td>Secondary # Comm Trouble Primary #</td>
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<td>Secondary # Comm Trouble Secondary #</td>
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<td>Secondary # Printer Fault</td>
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<td>330</td>
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<tr>
<td>Secondary # Option Card Fault</td>
<td>331</td>
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<td>Secondary # Memory Fault</td>
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<tr>
<td>Future</td>
<td>000</td>
</tr>
<tr>
<td>Secondary # System Off Normal</td>
<td>308</td>
</tr>
<tr>
<td>Secondary # System Test Message</td>
<td>602</td>
</tr>
<tr>
<td>Secondary # System Abnormal Test Message</td>
<td>608</td>
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</tbody>
</table>
SIA-DCS Format - Primary Central Station Phone Number

The information shown in Table 3.5 is automatically programmed for the Primary Central Station phone number Event Codes when SIA-DCS Format is selected. To disable event reporting, select the desired Event Code to be disabled and press 0 or Clear and then Enter to disable it. (Enter must be pressed to save the selection. Pressing Escape will not save the selection). Note that disabling the Event Code for the Primary Central Station Phone Number Event Code will also disable that Event Code for the Secondary Central Station Phone.

<table>
<thead>
<tr>
<th>Event Description</th>
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</thead>
<tbody>
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<td>Primary # Zone 4 Alarm</td>
<td>FA4</td>
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<td>Primary # Zone 5 Alarm</td>
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<td>Primary # Zone 7 Alarm</td>
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<td>Primary # Drill</td>
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<td>Primary # AC Fault</td>
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<tr>
<td>Primary # Low Battery Fault</td>
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<td>Primary # No Battery Fault</td>
<td>YT0</td>
</tr>
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<tr>
<td>Primary # Comm Trouble Secondary #</td>
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</tr>
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<td>Future</td>
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<td>Primary # System Off Normal</td>
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<td>Primary # System Test Message</td>
<td>RP</td>
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<td>Primary # System Abnormal Test Message</td>
<td>RP99</td>
</tr>
<tr>
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SIA-DCS Format - Secondary Central Station Phone Number

The information shown in Table 3.6 is automatically programmed for the Secondary Central Station phone number Event Codes when SIA-DCS Format is selected. To disable event reporting, select the desired Event Code to be disabled and press **0** or **Clear** and then **Enter** to disable it. (**Enter** must be pressed to save the selection. Pressing **Escape** will not save the selection). **Note that disabling the Event Code for the Primary Central Station Phone Number Event Code will also disable that Event Code for the Secondary Central Station Phone.**

### Table 3.6 Event Codes

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<tr>
<th>Event Description</th>
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<tbody>
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<td>Secondary # Zone 1 Alarm</td>
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<td>Secondary # Zone 9 Disabled</td>
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<tr>
<td>Secondary # Zone 10 Disabled</td>
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<td>Secondary # Drill</td>
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## Table 3.6  Event Codes (Continued)

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<tr>
<th>Event Code</th>
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</tr>
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<tr>
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<td>FT9</td>
<td>FJ9</td>
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<tr>
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<td>FT10</td>
<td>FJ10</td>
</tr>
<tr>
<td>Secondary # Earth Fault</td>
<td>ET38</td>
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<td>LT1</td>
<td>LR1</td>
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<td>Secondary # Telco Secondary Line Fault</td>
<td>LT2</td>
<td>LR2</td>
</tr>
<tr>
<td>Secondary # NAC #1 Fault</td>
<td>ET32</td>
<td>ER32</td>
</tr>
<tr>
<td>Secondary # NAC #2 Fault</td>
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<td>YC2</td>
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<tr>
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<td>VR</td>
</tr>
<tr>
<td>Secondary # ANN-Bus Fault</td>
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<td>ER61</td>
</tr>
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<td>Secondary # Option Card Fault</td>
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<td>Secondary # System Off Normal</td>
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<td>Secondary # System Test Message</td>
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</tr>
<tr>
<td>Secondary # System Abnormal Test Message</td>
<td>RP99</td>
<td>000</td>
</tr>
<tr>
<td>Secondary # Power Supply Sync Fault</td>
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<td>OV</td>
</tr>
</tbody>
</table>
3.5.6 History

The History option allows an authorized user to view or erase events which have occurred in the control panel. Pressing 3 while viewing Programming Screen #2 will display the History options as shown in the following display:

![Programming Screen #2](image)

### 3.5.6.1 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 Screen](image)

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.

### 3.5.6.2 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 display the following screen:

![Erase History Screen](image)

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:

![Erase History Wait Screen](image)

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

Walktest allows an individual to test the fire alarm system without the necessity to reset the control panel after each device activation. Refer to the sections titled "Walktest" on page 101 and "Walktest" on page 112 for additional information regarding the Walktest feature. Pressing 1 while viewing the Programming Screen #3 will cause the following Walktest options to be displayed:

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:

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.

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:

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.
3.5.8 Clear Program

Pressing 2 while viewing Programming Screen #3, will select the Clear Program option. The control panel will provide a warning to the user by prompting with the following display:

![Warning Screen]

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

3.5.9 Password Change

The factory set passwords, which have been programmed into the control panel, can be changed by selecting the Password Change option. Pressing 3 while viewing Programming Screen #3 will cause the following screen to be displayed:

![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 annunciators.

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

![Enter New Five Digit Password]

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:

![Verify New Password]

The new five digit password must be re-entered to accept the change. The display will then return to the initial Password Change Screen.
3.6 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 11111) is entered, the following screen will appear:

```
PROGRAMMING
1=INPUT ZONES
2=HISTORY
3=WALKTEST
```

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=TIME-DATE
```


3.6.1 Input Zones - Enable/Disable

The Zone Setup option allows the user to enable or disable desired zones. Pressing 1 for Zone Setup, while viewing Maintenance Screen #1 will cause the following screens to be displayed:

Pressing the down arrow key will display additional Zones (Zones 4 - 5 for MS-5UD and Zones 4 - 10 for MS-10UD). Select the number corresponding to the desired zone. A screen will appear which will allow enabling or disabling of the selected zone, as illustrated in the following example:

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

3.6.2 History

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

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
```

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.

### 3.6.3 Walktest

To perform a walktest, press 3 while viewing Maintenance Screen #1. 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.
3.6.4 Time-Date

To program the time and date into the control panel, press 1 while viewing Maintenance Screen #2. The following display will appear:

![Time and Date Screen]

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

![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:

![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.

To change between 12 hour and 24 hour format, press 3 while viewing the Time and Date screen. Each press of the 3 key will toggle the display between 12 HR and 24 HR format.
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 (TROUBL to troubl). When the piezo is silenced, an acknowledge message is sent to the printer and the history file. Acknowledge also sends a silence piezo command to the optional annunciators connected to the FACP. The Acknowledge key will have no effect on the Notification Appliance Circuits.

When more than one event exists, the first press of the Acknowledge/Step key functions as described in the preceding paragraph. Subsequent pressing of the key steps through each active event.

4.1.2 Alarm Silenced

The Alarm Silenced key performs the same functions as Acknowledge/Step except it will not step through each event when multiple events are present at the panel. If an alarm exists, the Alarm Silenced key 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. The Alarm Silenced LED is turned off by pressing the Reset key, the Drill key or subsequent activation of the NACs.

Note that if Silence Inhibit has been enabled, NACs cannot be silenced for one minute following initiation of an alarm.

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 NAC outputs 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 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, 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.

Note that if Silence Inhibit has been enabled, the FACP cannot be reset for one minute following initiation of an alarm.
4.2 LED Indicators

The five 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.

**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.

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.

```
SYSTEM ALL NORMAL
10:00A 031106
```

The FACP performs the following functions at regular intervals in Normal mode:

- Monitors AC input voltage and battery voltage
- Monitors and reports status option cards and control panel
- Refreshes LCD display and updates time
- Scans control panel keypad for key presses
- Tests memory
- Updates and reads all communications busses (EIA-485, etc.)
- 30 smoke detectors will be polled for maintenance and freeze conditions on initial entry into Normal mode. Thereafter, each device will be polled every hour for freeze and every four hours for maintenance conditions

*Note:* To ensure that the system is functioning properly, the FACP will perform a freeze check five minutes after the panel is reset, followed by a maintenance check. If there is no freeze or maintenance condition, the panel will continue to monitor for freeze conditions every hour and maintenance conditions every four hours.
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 optional printer and the history buffer.
- Communicate the trouble conditions to the Central Station

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

Input Zone

For Input Zones, the following is a typical message that could appear on the LCD display for a device trouble:

```
TROUBL PULL STATION
<ADJ> <NOUN>
ZONE 10 OPEN FAULT
10:00A 030806
```

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

- First line in display:
  ✓ The type of event; in this example OPEN indicating a circuit trouble
  ✓ Device type identifier; in this example, PULL STATION indicates a manual device. Other device type identifiers which can be displayed include SMOKE for Smoke Detector, HEAT for Heat Detector, etc.

- 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 indicates Zone and the fault condition. Other possible troubles include:
  - OPEN - indicating an open circuit
  - DIRTY - maintenance alert indicating that an i3 detector is near but below the allowed alarm limit and is in need of maintenance before the performance is compromised

- 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 09 for September, 08 for the 8th day of the month and 05 for the year 2005
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 except the Alarm Silenced LED will light.

### 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, adjective/noun, associated zones and time/date
- Communicate the alarm to the Central Station
- Alarms latch and are not allowed to clear automatically
- Timers for Silence Inhibit, Autosilence and Trouble Reminder are started
- Alarms activate the alarm relay
- Silenced alarms are resounded
- 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>
ZONE 10
10:00A 090805
```

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* for Smoke Detector, *HEAT* for Heat Detector, etc.
- 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: *Zone 10* indicates the zone programmed to this device which, in this example, is Input Zone 10.
Supervisory Operation

Operating Instructions

• 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 09 for September, 08 for the 8th day of the month and 05 for the year 2005

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, adjective/noun, associated zones and time/date
• Communicate the supervisory condition to the Central Station
• 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:

```
FREEZE SUPERVISORY
<ADJ> <NOUN>
ZONE 05  FROZEN SUPRV
10:00A 090804
```

In the preceding example:

- FROZEN SUPRV - indicates zone detector is below approximately 45°F

Note that, like alarms, supervisory signals latch, except when programmed for supervisory autoresettable. 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 106, 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, adjective/noun, associated zones and time/date
- Communicate the process monitor condition to the Central Station
- 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.

4.8 Hazard/Tornado Condition Operation

Hazard/Tornado Condition operation will initiate the following events:

- The piezo sounder pulses ½ second On, ½ second Off
- The LCD displays a hazard message along with the device name, type, adjective/noun, associated zones and time/date
- Communicate the hazard condition to the Central Station
- Relays programmed for hazard will be activated
- The alarm relay is not activated
- Silenced alarms are not resounded
- Timers are not started
- Store event in history buffer
- Supervisory LED flashes ½ second On, ½ second Off

Hazard conditions latch.

4.9 Medical Alert Condition Operation

Medical Alert Condition operation will initiate the following events:

- The piezo sounder ½ second On, ½ second Off
- The LCD displays a medical alert message along with the device name, type, adjective/noun, associated zones and time/date
- Communicate the medical alert condition to the Central Station
- 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
- Supervisory LED flashes ½ second On, ½ second Off

Medical alert conditions latch.
4.10 Disable/Enable Operation

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

4.11 Waterflow Circuits Operation

If an alarm exists from a zone that is a waterflow non-silenceable type, the Alarm Silence key will not function.

4.12 Detector Functions

Maintenance Alert

i3 smoke detectors will be polled for maintenance and freeze conditions on initial entry into Normal mode. Thereafter, each device will be polled every hour for freeze and every four hours for maintenance conditions. All alarm and system trouble conditions are annunciated on the control panel’s LCD.

Note: To ensure that the system is functioning properly, the FACP will perform a freeze check five minutes after the panel is reset, followed by a maintenance check. If there is no freeze or maintenance condition, the panel will continue to monitor for freeze conditions every hour and maintenance conditions every four hours.

Important! In order to avoid false alarms, input zones must be disabled prior to any service work being done. After service is completed, the input zones must be re-enabled.

i3 Smoke Detector Replacement

If an i3 smoke detector is to be replaced, the associated zone must be disabled prior to detector replacement to prevent any unwanted alarms. The input zone must be reenabled after maintenance has been completed. Refer to Enable/Disable Zone in the section titled Input Zones which begins on page 57.

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.

4.13 Time Functions: Real-Time Clock

The FACP 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.

4.14 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 3 or 5 minutes and then changes to Temporal
4.15 Presignal

Presignal option programs an initiating device to delay the activation of NACs while allowing visual verification by a person. Once a detector 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.

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
- annunciators (if enabled) will sound the local piezo, and pulse the alarm LED and zone LED
- outputs (NACs) 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 operation requires the approval of the local Authority Having Jurisdiction.

4.16 Positive Alarm Sequence

PAS (Positive Alarm Sequence) option will program a smoke detector to delay panel activation (including alarm relay and communicator) for a period of 15 seconds.

When a detector 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
- annunciators (if enabled) will sound the local piezo, and pulse the alarm LED and zone LED
- outputs (NACs) 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 operation requires the approval of the local Authority Having Jurisdiction.
4.17 Special System Timers

4.17.1 Silence Inhibit Timer
This option, if selected, prevents the Alarm Silence key from functioning for 60 seconds following an alarm. A new alarm during the initial 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.

4.17.2 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.

4.17.3 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 Trouble Reminder feature is not selected and the trouble is not cleared within 24 hours, the piezo will resound, indicating that the trouble condition still exists.

4.17.4 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.
4.17.5 Alarm Verification (None or One Minute)

If alarm verification is selected, a smoke detector activation will cause the FACP to reset the detector by removing power for 6 seconds. Power is reapplied and a 17 second retard period begins which allows all detectors to stabilize. If no other detectors alarm, there will be no alarm indication at the FACP during the 23 second Reset/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 zone alarms any time during the first detector's Retard & Confirmation period, the panel will immediately activate all appropriate outputs and indicate the alarm condition at the FACP. If no additional detector alarms occur within 83 seconds of the first alarm (23 second Reset/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 smoke detectors.

4.18 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. In addition, i3 smoke detectors will enter their own test mode causing their LEDs to flash twice every five seconds (refer to i3 specification document).

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

IDCs and NACs 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 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.
4.19 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 MODE
2=PROGRAMMING MODE
```

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=INPUT ZONES
2=NACS
3=RELAYS
```
```
READ STATUS
1=SYSTEM SETTINGS
2=TIMERS
3=DAYLIGHT SAVINGS
```
```
READ STATUS
1=HISTORY
2=PRINTER
3=ANN-BUS
```
```
READ STATUS
1=CENTRAL STATION
2=PHONE LINES
```

Read Status Screen #1

Read Status Screen #2

Read Status Screen #3

Read Status Screen #4
4.19.1 Input Zones

Pressing 1 while viewing Read Status Screen #1 will cause the following screens to be displayed:

Pressing the down arrow key will allow the selection of Zones 4-5 for the MS-5UD and Zones 4-10 for the MS-10UD.

The operator selects the zone which is to be viewed by pressing the number corresponding to the desired zone in each screen. For example, if 1 is pressed, the display will change to a screen similar to the following:

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 (for detectors)
- PAS (Positive Alarm Sequence) Yes/No (for detectors only)
- Pre-Signal Yes/No (for detectors only)
- Adjective/Noun descriptor
- Silenceable Yes/No

4.19.2 NAC

Pressing 2 while viewing Read Status Screen #1 will display the following screen:

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. Note that NAC 3 and NAC 4 will only be displayed for the MS-10UD.
The resulting screens will display the following information:

- Enable/Disable Status
- Coding Selection (Temporal, Steady, etc.)
- Silenceable/Nonsilenceable
- Auto Silence Enable/Disable and time delay (in minutes)
- Silence Inhibit Enabled/Disabled

### 4.19.3 Relays

Pressing 3 while viewing Read Status Screen #1 will display the following screen:

```
RELAY
1=RELAY 1 ALARM
2=RELAY 2 TROUBLE
3=RELAY 3 SUPERV
```

This screen allows the operator to view the programmed option for each relay.

### 4.19.4 System Settings

Pressing 1 while viewing Read Status Screen #2 will display the following screens:

```
SYSTEM SETTINGS
TROUBLE REMIND NO
FUTURE USE
CHRGR DISABLE NO
```

```
SYSTEM SETTINGS
USER BANNER: XXX XXXXXX XXXX XXXX
```

The operator can view the system settings options that have been programmed into the FACP.
4.19.5 Timers

Pressing 2 while Read Status Screen #2 will display the following screen:

![Timers Screen](image)

These screens allow the operator to view the various timer settings.

4.19.6 Daylight Savings

Pressing 3 while Read Status Screen #2 will cause the following screens to be displayed:

![Daylight Savings Screen](image)

These screens allow the operator to view settings that have been programmed for Daylight Savings Time.
4.19.7 History

Pressing 1 while viewing Read Status Screen #3 will display the following screens:

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.

4.19.8 Print

To print program data or control panel status, press 2 while viewing Read Status Screen #3. The following screens will be displayed:

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 97 for additional information on the display.

Pressing 3 while viewing Print Screen #1 will exit the Print operation.

Pressing 1 while viewing Print Screen #2 allows the user to view the printer settings.
4.19.9 ANN-BUS

Pressing 3 while viewing Read Status Screen #3 will display the settings for the ANN-BUS options as shown in the following screens:

ANN-BUS Screen #1

ANN-BUS Screen #2

ANN-BUS Screen #1 indicates whether the ANN-BUS is enabled (Yes/No).

Pressing 1 while viewing ANN-BUS Screen #1 will display BUS Module addresses 1-8 and the devices, if any, located at those addresses.

Pressing 1 while viewing ann-bus Screen #2 will display the programmed options for the ANN-I/O Module devices connected to the ANN-BUS.

Pressing 2 while viewing ANN-BUS Screen #2 will display the programmed options for the ANN-80 devices connected to the ANN-BUS.
4.19.10 Central Station

Pressing 2 while viewing Read Status Screen #4 will display the following screens:

Central Station Screen #1

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 the 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

4.19.11 Phone Line

Pressing 1 while viewing Read Status Screen #4 will display the following screen:

This screen indicates the both the Primary and Secondary phone lines have been configured for touchtone dialing operation.
SECTION 5  Central Station Communications

The control panel transmits zone and system status reports to Central Stations via the public switched telephone network. Two supervised telephone line connections are made to interface the control panel to the telephone lines. Two optional 7 foot telephone cords are available for this purpose and can be purchased separately.

The control panel supervises both telephone lines for proper voltage. A delay of two minutes will occur before a fault in either phone line connection is reported as a trouble. When a fault is detected, an audible trouble signal will sound, the LCD display will indicate the phone line trouble and the trouble condition will be reported to the Central Station over the remaining operational phone line.

The control panel comes with line seizure capability provided for both the primary and secondary telephone line interfaces. Any time that the control panel needs to make a call to a Central Station, line seizure will disconnect any local premises phones sharing the same telephone line.

All transmissions to the Central Stations will be sent over the primary phone line. In the event of noisy phone lines, transmissions will be sent over the backup secondary phone line.

Two phone numbers must be programmed, the primary Central Station phone number and the secondary Central Station phone number. All system reports will be transmitted to the primary Central Station phone number. Reports will automatically be sent to the secondary Central Station phone number if attempts to transmit to the primary Central Station phone number are unsuccessful. If 10 total attempts to communicate are unsuccessful, a Communicator Failure report will be displayed. Note that as an option, all reports may also be sent to the secondary Central Station phone number.

The FACP meets NFPA 72 National Fire Code reporting requirements for: (a) the type of signal, (b) condition and (c) location of the reporting premises. The general priority reporting structure is:

1. Zone Alarms and Restores
2. Zone Troubles and Restores
3. System Troubles and Restores
4. 24-hour Test
5.1 Transmittal Priorities

The integral communicator transmits highest priority events first. Events, in terms of priority, are listed below in descending order:

1. Alarms (highest priority level)
   ✓ Pull stations
   ✓ Waterflow
   ✓ Smoke detector
   ✓ Other alarm types

2. Supervisory Zone

3. System Troubles
   ✓ Zone disabled
   ✓ Fire drill
   ✓ AC fail (after delay)
   ✓ Zonal faults
   ✓ Earth fault
   ✓ Low battery
   ✓ Telephone line fault
   ✓ Notification Appliance Circuits fault
   ✓ Communication trouble
   ✓ Annunciator trouble
   ✓ System off normal

4. Restoral Reports
   ✓ Zone alarm
   ✓ Supervisory
   ✓ Zone(s) enabled
   ✓ Fire drill
   ✓ AC
   ✓ Zone fault
   ✓ Earth
   ✓ Battery
   ✓ Telephone line
   ✓ Notification Appliance Circuits
   ✓ Communication
   ✓ Annunciator trouble
   ✓ System off normal

5. 24 Hour Test (lowest priority)
The table below shows UL listed receivers which are compatible with the MS-5UD and MS-10UD.

### Table 5.1 Compatible UL Listed Receivers

<table>
<thead>
<tr>
<th>Format</th>
<th>Ademco 685 (1)</th>
<th>Silent Knight 9800 (2)</th>
<th>Osborne Hoffman 2000E (3)</th>
<th>Radionics 6600 (4)</th>
<th>SurGard MLR2 (S)</th>
<th>SurGard System III (6)</th>
<th>FBI CP220FB (7)</th>
</tr>
</thead>
<tbody>
<tr>
<td>0</td>
<td>✓</td>
<td>✓</td>
<td>✓</td>
<td>✓</td>
<td>✓</td>
<td>✓</td>
<td>✓</td>
</tr>
<tr>
<td>1</td>
<td>SIA-DCS-20</td>
<td>✓</td>
<td>✓</td>
<td>✓</td>
<td>✓</td>
<td>✓</td>
<td>✓</td>
</tr>
<tr>
<td>2</td>
<td>Ademco Contact ID</td>
<td>✓</td>
<td>✓</td>
<td>✓</td>
<td>✓</td>
<td>✓</td>
<td>✓</td>
</tr>
</tbody>
</table>

1. With 685-8 Line Card with Rev. 4.4d software
2. With 124077V2.00 or later Receiver and 126047 Line Card Rev. M or later
3. With V.7301 Receiver S/W or later
4. With 01.01.03 Receiver S/W or later and Line Card 01.01.03 or later
5. With software V1.86
6. With software V1.6
7. With software V3.9

**IMPORTANT!** It is the installer’s responsibility to ensure that the Digital Alarm Communicator/Transmitter is compatible with the Central Station Receiver, utilized by the monitoring service, prior to installation. The Compatibility Table provides a list of compatible receivers and associated software versions for the receivers. Changes in the hardware and/or software by the receiver manufacturers may affect the receiver compatibility with the FACP DACT. After completing the installation, communication between the DACT and Central Station Receiver must be tested and verified.
SECTION 6  Power Supply Calculations

6.1 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

6.2 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 6-1, to determine the total amount of current, in AC amperes (A), that must be supplied to the system.

TABLE 6-1: 120 V AC Branch Circuit Requirements

<table>
<thead>
<tr>
<th>Device Type</th>
<th>Number of Devices</th>
<th>Current Draw (AC amps)</th>
<th>Total Current per Device</th>
</tr>
</thead>
<tbody>
<tr>
<td>MS-5UD-3/MS-10UD-3</td>
<td>1 X</td>
<td>1.00</td>
<td>=</td>
</tr>
<tr>
<td>MS-5UD-7/MS-10UD-7 or MS-5UD-3E/MS-10UD-3E or MS-5UD-7E/MS-10UD-7E</td>
<td>1 X</td>
<td>3.90</td>
<td>=</td>
</tr>
<tr>
<td>[ ] X</td>
<td>0.54</td>
<td>=</td>
<td></td>
</tr>
<tr>
<td>[ ] X</td>
<td>2.20</td>
<td>=</td>
<td></td>
</tr>
<tr>
<td>Sum Column for AC Branch Current Required</td>
<td>=</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
6.3 Calculating the System Current Draw

6.3.1 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 6-3 on page 125. 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 6-3 on page 125. 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 6-3 on page 125.

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 6-2 shows how to convert milliamperes and microamperes to full amperes.

TABLE 6-2: Converting to Full Amperes

<table>
<thead>
<tr>
<th>To convert...</th>
<th>Multiply</th>
<th>Example</th>
</tr>
</thead>
<tbody>
<tr>
<td>Milliamperes (mA) to</td>
<td>mA x 0.001</td>
<td>3 mA x 0.001 = 0.003A</td>
</tr>
<tr>
<td>amperes (A)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Microamperes (µA) to</td>
<td>µA x 0.000001</td>
<td>300 µA x 0.000001 = 0.0003 A</td>
</tr>
<tr>
<td>amperes (A)</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

6.3.2 How to Use Table 6-3 on page 125 to Calculate System Current Draw

Use Table 6-3 on page 125 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 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 6-4 on page 126

Following are the types of current that can be entered into Table 6-3 on page 125:

- 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.
Calculating the System Current Draw

Table 6-3 contains three 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 6-4 on page 126.

### TABLE 6-3: System Current Draw Calculations

<table>
<thead>
<tr>
<th>Device Type</th>
<th>Calculation Column 1 Primary, Non-Fire Alarm Current (amps)</th>
<th>Calculation Column 2 Primary, Fire Alarm Current (amps)</th>
<th>Calculation Column 3 Secondary, Non-Fire Alarm Current (amps)</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Qty X[current draw]= Total</td>
<td>Qty X[current draw]= Total</td>
<td>Qty X[current draw]= Total</td>
</tr>
<tr>
<td>Main Circuit Board</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>MS-5UD or MS-10UD</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>CAC-5X</td>
<td>[ ] X[0.001]=</td>
<td>[ ] X[0.001]=</td>
<td>[ ] X[0.001]=</td>
</tr>
<tr>
<td>4XTMF</td>
<td>[ ] X[0.005]=</td>
<td>[ ] X[0.011]=</td>
<td>[ ] X[0.005]=</td>
</tr>
<tr>
<td>ANN-LED</td>
<td>[ ] X[0.028]=</td>
<td>[ ] X[0.068]=</td>
<td>[ ] X[0.028]=</td>
</tr>
<tr>
<td>2-wire Detector Heads</td>
<td>[ ] X[ ] 1=</td>
<td>[ ] X[ ] 1=</td>
<td>[ ] X[ ] 1=</td>
</tr>
<tr>
<td>4-wire Detector Heads</td>
<td>[ ] X[ ] 2=</td>
<td>[ ] X[ ] 2=</td>
<td>[ ] X[ ] 2=</td>
</tr>
<tr>
<td>Power Supervision Relays</td>
<td>[ ] X[0.025]=</td>
<td>[ ] X[0.025]=</td>
<td>X[0.025]=</td>
</tr>
<tr>
<td>NAC #1</td>
<td>[ ] X[ ]</td>
<td></td>
<td></td>
</tr>
<tr>
<td>NAC #2</td>
<td>[ ] X[ ]</td>
<td></td>
<td></td>
</tr>
<tr>
<td>NAC #3</td>
<td>[ ] X[ ]</td>
<td></td>
<td></td>
</tr>
<tr>
<td>NAC #4</td>
<td>[ ] X[ ]</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Current Draw from TB9 (nonalarm)</td>
<td>[ ]</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Sum each column for totals</td>
<td>Primary Non-Alarm =</td>
<td>Primary Alarm =</td>
<td>Secondary Alarm =</td>
</tr>
</tbody>
</table>

Table Footnote

1. If using the Reverse Polarity Alarm output, add 0.005 amps; if using the Reverse Polarity Trouble output, add another 0.005 amps.
2. ANN-LED is supplied standard with the MS-5UDC and MS-10UDC.
3. Refer to the Device Compatibility Document for standby current.
4. Must use compatible listed Power Supervision Relay.
5. Current limitation of Terminal TB5 circuits is 2.5 amps per NAC for the MS-5UD-3(E), MS-10UD-3(E) and 3.0 amps per NAC for the MS-5UD-7(E), MS-10UD-7(E).
6. The total standby current must include both the resettable (TB9 Terminals 3 & 4) and nonresettable/resettable (TB9 Terminals 1 & 2) power. Caution must be taken to ensure that current drawn from these outputs during alarm does not exceed maximum ratings specified. Current limitations of TB9, Terminals 1 & 2 = 0.500 amps, filtered, 24 VDC +/-5%, 120 Hz ripple @ 10 mVRMS; nonresettable power and TB9, Terminals 3 & 4 = 0.500 amps, filtered, 24 VDC +/-5%, 120 Hz ripple @ 10mVRMS, resettable power.
7. Total current draw listed above cannot exceed 3.0 amps for MS-5UD-3(E), MS-10UD-3(E) or, 7.0 amps for MS-5UD-7(E), MS-10UD-7(E).
6.4 Calculating the Battery Size

Use Table 6-4 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 6-4 as follows:

1. Enter the totals from Table 6-3 on page 125, 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 6-4: Total Secondary Power Requirements at 24 VDC**

<table>
<thead>
<tr>
<th>Secondary Standby Load (total from Table 6-3 Calculation Column 3)</th>
<th>Required Standby Time (24 hours)</th>
<th>X[ ] = AH</th>
</tr>
</thead>
<tbody>
<tr>
<td>Primary Alarm Load (total from Table 6-3 Calculation Column 2)</td>
<td>Required Alarm Time (for 5 min., enter 0.084, for 10 min., enter 0.168)</td>
<td>X[ ] = AH</td>
</tr>
<tr>
<td>Sum of Standby and Alarm Ampere Hours</td>
<td></td>
<td>= AH</td>
</tr>
<tr>
<td>Multiply by the Derating Factor</td>
<td>X 1.2</td>
<td>= AH</td>
</tr>
</tbody>
</table>

**6.4.1 NFPA Battery Requirements**

NFPA 72 Local, Central and Proprietary Fire Alarm Systems require 24 hours of standby power followed by 5 minutes in alarm

**6.4.2 Selecting and Locating Batteries**

Select batteries that meet or exceed the total ampere hours calculated in Table 6-4. The control panel can charge batteries in the 7 AH to 26 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-55 or other UL listed external battery cabinet.
APPENDIX A

Ademco Contact ID Format

Event Code Descriptions

This appendix describes the various Event Codes and their messages which are available for the Ademco Contact ID Format.

A.1 Transmission Format Between DACT and Receiver

The transmission string for the Ademco Contact ID Format is as follows:

SSSS 18 QXYZ GG CCC

where

SSSS = Four digit Subscriber ID Account Code
18 = Identifies transmission as Contact ID to the receiver at the Central Station
Q = Event Qualifier where 1 = New Event and 3 = New Restore
XYZ = Event code
GG = Group number
CCC = Zone number

Notes:

1. 18, which is used in the reporting structure to identify the transmission as Contact ID, is not printed out in the alarm and trouble report.
2. GG Group Number is fixed at '00' and cannot be changed.
3. CCC for Zone Number is transmitted as ‘001’ for zone 1 up to ‘010’ for zone 10

A.2 Ademco Contact ID Typical Printout

A typical printout from a Central Station receiver (such as the Ademco 685) of alarm and trouble reports in the Ademco Contact ID Reporting Structure follows:

<table>
<thead>
<tr>
<th>Time</th>
<th>Date</th>
<th>Rcvr/Line ID</th>
<th>SSSS</th>
<th>QXYZ</th>
<th>GG</th>
<th>CCC</th>
</tr>
</thead>
<tbody>
<tr>
<td>11:28</td>
<td>03/25</td>
<td>11</td>
<td>7777</td>
<td>E110</td>
<td>00</td>
<td>C001 - general fire alarm on zone one</td>
</tr>
<tr>
<td>11:28</td>
<td>03/25</td>
<td>11</td>
<td>7777</td>
<td>E111</td>
<td>00</td>
<td>C002 - smoke detector alarm on zone two</td>
</tr>
<tr>
<td>11:28</td>
<td>03/25</td>
<td>11</td>
<td>7777</td>
<td>E380</td>
<td>00</td>
<td>C003 - fault on zone three</td>
</tr>
<tr>
<td>11:28</td>
<td>03/25</td>
<td>11</td>
<td>7777</td>
<td>E570</td>
<td>00</td>
<td>C009 - Zone nine disabled</td>
</tr>
<tr>
<td>11:28</td>
<td>03/25</td>
<td>11</td>
<td>7777</td>
<td>R110</td>
<td>00</td>
<td>C001 - Zone one alarm restored</td>
</tr>
<tr>
<td>11:28</td>
<td>03/25</td>
<td>11</td>
<td>7777</td>
<td>R111</td>
<td>00</td>
<td>C002 - smoke detector zone two restored</td>
</tr>
<tr>
<td>11:28</td>
<td>03/25</td>
<td>11</td>
<td>7777</td>
<td>R380</td>
<td>00</td>
<td>C003 - zone three fault restored</td>
</tr>
<tr>
<td>11:28</td>
<td>03/25</td>
<td>11</td>
<td>7777</td>
<td>R570</td>
<td>00</td>
<td>C009 - zone nine reenabled</td>
</tr>
<tr>
<td>11:28</td>
<td>03/25</td>
<td>11</td>
<td>7777</td>
<td>E158</td>
<td>00</td>
<td>C006 - high temperature, zone six</td>
</tr>
<tr>
<td>11:28</td>
<td>03/25</td>
<td>11</td>
<td>7777</td>
<td>E151</td>
<td>00</td>
<td>C007 - gas detected, zone seven</td>
</tr>
</tbody>
</table>

Notes:

1. 11 is an example of a Receiver/Line Card, showing which receiver and line card the message was transmitted to.
2. Q, which is the Event Qualifier for the reporting structure, is printed out in the report as an E for New Event or R for New Restore.
### Event Code Classifications

<table>
<thead>
<tr>
<th>100</th>
<th>200</th>
<th>300</th>
<th>400</th>
<th>500</th>
<th>600</th>
</tr>
</thead>
<tbody>
<tr>
<td>ALARMS</td>
<td>SUPERVISORY</td>
<td>TROUBLES</td>
<td>OPEN/CLOSE</td>
<td>DISABLES/</td>
<td>TEST/</td>
</tr>
<tr>
<td>Medical Fire</td>
<td>System Sounder/Relay System</td>
<td>Fire</td>
<td>Open/Close Remote</td>
<td>BYPASSES</td>
<td>MISC.</td>
</tr>
<tr>
<td>Panic Burglary General</td>
<td>Peripheral Communication</td>
<td>Protective Loop Sensor</td>
<td>Access</td>
<td></td>
<td></td>
</tr>
<tr>
<td>24 Hour</td>
<td></td>
<td></td>
<td>Access Control</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

### Event Message

**Event Code Description**

**Medical Alarms - 100**

- **100 Medical**
- **101 Pendant transmitter**
- **102 Fail to report in**

**Fire Alarms - 110**

- **110 Fire Alarm**
- **111 Smoke**
- **112 Combustion**
- **113 Waterflow**
- **114 Heat**
- **115 Pull station**
- **116 Duct**
- **117 Flame**
- **118 Near Alarm**

**Panic Alarms - 120**

- **120 Panic Alarm**
- **121 Duress**
- **122 Silent**
- **123 Audible**

**Burglar Alarms - 130**

- **130 Burglary**
- **131 Perimeter**
- **132 Interior**
- **133 24-Hour**
- **134 Entry/Exit**
- **135 Day/Night**
- **136 Outdoor**
- **137 Tamper**
- **138 Near Alarm**

**General Alarms - 140**

- **140 General Alarm**
- **141 Polling loop open**
- **142 Polling loop short**
- **143 Expansion module failure**
- **144 Sensor tamper**
- **145 Expansion module tamper**

**Message**

- EMERG - Personal Emergency - #
- EMERG - Personal Emergency - #
- EMERG - Fail to Check-in - #
- FIRE - Fire Alarm - #
- FIRE - Smoke Detector - #
- FIRE - Combustion - #
- FIRE - Waterflow - #
- FIRE - Heat Sensor - #
- FIRE - Pull Station - #
- FIRE - Duct Sensor - #
- FIRE - Flame Sensor - #
- FIRE - Near Alarm - #
- PANIC - Panic - #
- PANIC - Duress
- PANIC - Silent Panic - #
- PANIC - Audible Panic - #
- BURG - Burglary - #
- BURG - Perimeter - #
- BURG - Interior - #
- BURG - 24-Hour - #
- BURG - Entry/Exit - #
- BURG - Day/Night - #
- BURG - Outdoor - #
- BURG - Tamper - #
- BURG - Near Alarm - #
- ALARM - General Alarm - #
- ALARM - Polling Loop Open - #
- ALARM - Polling Loop Short - #
- ALARM - Exp. Module Fail - #
- ALARM - Sensor Tamper - #
- ALARM - Exp. Module Tamper - #
<table>
<thead>
<tr>
<th>EVENT</th>
<th>MESSAGE</th>
</tr>
</thead>
<tbody>
<tr>
<td>24 Hour Non-Burglary - 150 and 160</td>
<td>ALARM - 24-Hr. Non-Burg - #</td>
</tr>
<tr>
<td>150 24-Hour Non-Burg</td>
<td>ALARM - Gas Detected - #</td>
</tr>
<tr>
<td>151 Gas detected</td>
<td>ALARM - Refrigeration - #</td>
</tr>
<tr>
<td>152 Refrigeration</td>
<td>ALARM - Heating System - #</td>
</tr>
<tr>
<td>153 Loss of heat</td>
<td>ALARM - Water Leakage - #</td>
</tr>
<tr>
<td>154 Water leakage</td>
<td>ALARM - Foil Break - #</td>
</tr>
<tr>
<td>155 Foil break</td>
<td>ALARM - Day Zone - #</td>
</tr>
<tr>
<td>156 Day trouble</td>
<td>ALARM - Low Gas Level - #</td>
</tr>
<tr>
<td>157 Low bottled gas level</td>
<td>ALARM - Refrigeration - #</td>
</tr>
<tr>
<td>158 High temp</td>
<td>ALARM - Heating System - #</td>
</tr>
<tr>
<td>159 Low temp</td>
<td>ALARM - Low Temperature - #</td>
</tr>
<tr>
<td>161 Loss of air flow</td>
<td>ALARM - Air Flow - #</td>
</tr>
<tr>
<td>Fire Supervisory - 200 and 210</td>
<td>SUPER. - Fire Supervisory - #</td>
</tr>
<tr>
<td>200 Fire supervisory</td>
<td>SUPER. - Low Water Pressure - #</td>
</tr>
<tr>
<td>201 Low water pressure</td>
<td>SUPER. - Low CO2</td>
</tr>
<tr>
<td>202 Low CO2</td>
<td>SUPER. - Gate Valve - #</td>
</tr>
<tr>
<td>203 Gate valve sensor</td>
<td>SUPER. - Low Water Level - #</td>
</tr>
<tr>
<td>204 Low water level</td>
<td>SUPER. - Pump Activation - #</td>
</tr>
<tr>
<td>205 Pump activated</td>
<td>SUPER. - Pump Failure - #</td>
</tr>
<tr>
<td>206 Pump failure</td>
<td>System Troubles - 300 and 310</td>
</tr>
<tr>
<td>300 System trouble</td>
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</tr>
<tr>
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</tr>
<tr>
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<td>TROUBLE - System Low Battery</td>
</tr>
<tr>
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<td>TROUBLE - Bad RAM Checksum (restore not applicable)</td>
</tr>
<tr>
<td>304 ROM checksum bad</td>
<td>TROUBLE - Bad ROM Checksum (restore not applicable)</td>
</tr>
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<td>305 System reset</td>
<td>TROUBLE - System Reset (restore not applicable)</td>
</tr>
<tr>
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<tr>
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</tr>
<tr>
<td>308 System shutdown</td>
<td>TROUBLE - System Shutdown</td>
</tr>
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<td>309 Battery test failure</td>
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</tr>
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<td>TROUBLE - No Battery</td>
</tr>
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<tr>
<td>322 Bell 2</td>
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<tr>
<td>323 Alarm relay</td>
<td>TROUBLE - Trouble Relay</td>
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<td>324 Trouble relay</td>
<td>TROUBLE - Reversing Relay</td>
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<tr>
<td>332 Polling loop short</td>
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</tr>
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<td>Opening CLOSING</td>
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</tr>
<tr>
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<tr>
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<td>ACCESS - Access Denied - User # (restore not used)</td>
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</tr>
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<td>DISABLE - Sounder/Relay - #</td>
</tr>
<tr>
<td>521 Bell 1 disable</td>
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<td>523 Alarm relay disable</td>
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<tr>
<td>524 Trouble relay disable</td>
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<td>DISABLE - Bell/Siren - #3</td>
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<tr>
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<table>
<thead>
<tr>
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<th>MESSAGE</th>
</tr>
</thead>
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<tr>
<td>570 Zone bypass</td>
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</tr>
<tr>
<td>571 Fire bypass</td>
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</tr>
<tr>
<td>572 24-Hour zone bypass</td>
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</tr>
<tr>
<td>573 Burglar bypass</td>
<td>BYPASS - Burg. Bypass - #</td>
</tr>
<tr>
<td>574 Group bypass</td>
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</tr>
</tbody>
</table>

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<table>
<thead>
<tr>
<th>EVENT</th>
<th>MESSAGE</th>
</tr>
</thead>
<tbody>
<tr>
<td>601 Manual trigger test</td>
<td>TEST - Manually Triggered (restore not applicable)</td>
</tr>
<tr>
<td>602 Periodic test report</td>
<td>TEST - Periodic (restore not applicable)</td>
</tr>
<tr>
<td>603 Periodic RF transmission</td>
<td>TEST - Periodic Radio (restore not applicable)</td>
</tr>
<tr>
<td>604 Fire test</td>
<td>TEST - Fire Test (restore not used)</td>
</tr>
<tr>
<td>605 Status report to follow</td>
<td>STATUS - Status Follows (restore not applicable)</td>
</tr>
<tr>
<td>606 Listen-in to follow</td>
<td>LISTEN - Listen-in Active (restore not applicable)</td>
</tr>
<tr>
<td>607 Walk test mode</td>
<td>TEST - Walk Test Mode</td>
</tr>
<tr>
<td>608 System abnormal test</td>
<td>TEST - System Abnormal Test</td>
</tr>
</tbody>
</table>
APPENDIX B    NFPA Standard-Specific Requirements

The MS-5UD/MS-10UD 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-5UD/MS-10UD  Control Panel**
Contains the main control board, cabinet (backbox and door), main power supply and transformer.

**Batteries**
Refer to "Power Supply Calculations" on page 123, 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**
Onboard Digital Alarm Communicator Transmitter for connection to a compatible listed Central Station DACR or Protected Premises Receiving Unit. This unit must be installed as outlined in "Digital Alarm Communicator/Transmitter" on page 17.

OR
411UD may be installed as illustrated in Figure B.1, “MS-5UD/MS-10UD FACP Connection to 411UD,” on page 133.

OR
4XTMF Transmitter Module for connection to the RS82 Remote Station Receiver. See Figure B.3, “Remote Station Connection Using 4XTMF Module,” on page 136, 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 B.2, “Municipal Box Connected to 4XTMF Transmitter Module,” on page 135.

**NFPA 72 Proprietary Fire Alarm System**
MS-5UD/MS-10UD Alarm, Trouble and Supervisory contacts connected to Transmitter(s). See Figure B.4, “Proprietary Protective Signaling System,” on page 137, for installation instructions for this unit.
The following figure illustrates an example of Central Station/Remote Station Reporting using a 411UD. The relay contacts from the MS-5UD/MS-10UD may be used to trip any dialer UL listed for Central Station/Remote Station Reporting Services.

Figure B.1 MS-5UD/MS-10UD FACP Connection to 411UD
1. Reference the 411UD Manual for additional information
2. Program the 411UD for slave operation
3. The MS-5UD/MS-10UD must be programmed for AC Loss Reporting Delay. This prevents the immediate transmission of a trouble on the loss of AC power
4. All connections between the control panel and the 411UD must be in conduit, less than 20 feet (610 cm) in length, in the same room
5. Any zone of the 411UD can be wired to function as alarm, trouble or supervisory. In Figure B.1 on page 133, Channel 1/Zone 1 is wired to the control panel’s alarm relay, Channel 2/Zone 2 is wired to the control panel’s trouble relay and Channel 3/Zone 3 is wired to the control panel’s supervisory relay
6. Nonresettable 24 VDC power is supplied to the 411UD via TB9 terminals configured for nonresettable power on the FACP. Jumper J4 on the 411UD must be removed for 24 VDC power
7. End-of-Line resistors must terminate all 411UD circuits, including unused circuits
8. A -VDC from the 411UD Trouble Contacts will activate the Trouble Input J6 on the FACP

<table>
<thead>
<tr>
<th></th>
<th>411UD</th>
<th>FACP</th>
</tr>
</thead>
<tbody>
<tr>
<td>Alarm</td>
<td>TB2-1</td>
<td>TB8-1</td>
</tr>
<tr>
<td></td>
<td>TB2-2</td>
<td>TB8-3</td>
</tr>
<tr>
<td>Trouble</td>
<td>TB2-3</td>
<td>TB8-4</td>
</tr>
<tr>
<td></td>
<td>TB2-4</td>
<td>TB8-6</td>
</tr>
<tr>
<td>Supervisory</td>
<td>TB2-5</td>
<td>TB8-7</td>
</tr>
<tr>
<td></td>
<td>TB2-6</td>
<td>TB8-9</td>
</tr>
</tbody>
</table>

Table B.1 411UD Connections to FACP
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 JP30 on the MS-5UD/MS-10UD main circuit board to supervise placement of 4XTMF module and circuit.
3. Cut JP24 on the MS-5UD/MS-10UD main circuit board to enable FACP Supervisory relay.
4. Refer to "4XTMF Transmitter Module Installation" on page 36 for detailed information.

Figure B.2 Municipal Box Connected to 4XTMF Transmitter Module
**NFPA 72 Remote Station Protective Signaling System**

Notes:

1. Cut Jumper JP30 on the MS-5UD/MS-10UD main circuit board to supervise placement of the 4XTMF module.

2. Refer to "4XTMF Transmitter Module Installation" on page 36 for detailed information.

RS82 Remote Station Receiver UL listed. Refer to Instruction Manual for Remote Station Receiver Model RS82.

---

**Figure B.3 Remote Station Connection Using 4XTMF Module**

Cutting TBL Jumper allows the reverse polarity circuit to open with a system trouble condition if no alarm condition exists.

(Dummy load with a 4.7KΩ ¼ watt resistor when no connection is made)
NFPA 72 Proprietary Protective Signaling Systems

Fire Alarm Control Panel

FACP 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-5UD/MS-10UD and the transmitter are supervised by the transmitter.

2. This MS-5UD/MS-10UD Transmitter arrangement can be employed for NFPA 72 Proprietary Protective Signaling System.

Figure B.4 Proprietary Protective Signaling System
B.1 Central Station/Remote Station Transmitter: Connection to FACP Dry Contacts

The dry contacts of the FACP programmable relays can be used to trip a UL-864 Listed Central Station/Remote Station Transmitter. The FACP contacts must be supervised by the Central Station/Remote Station Transmitter module using End-of-Line Resistors (ELRs) with a value determined by the Transmitter manufacturer. Power is also provided by the Central Station/Remote Station Transmitter manufacturer. Refer to the Central Station/Remote Station Transmitter manufacturer’s manual for details.

*Note: The Trouble Relay is a fail-safe relay. With power applied to the FACP and no troubles in the panel, the wiring should be connected to the NO and C contacts as indicated in the illustration.

Figure B.5 FACP Dry Contacts Connection to Central Station/Remote Station Transmitter
APPENDIX C  

FACP with Keltron

The following figure illustrates the connections between the FACP and Keltron Receiver/Transmitter.

CAUTION! For reasons of wiring diagram clarity, terminal designations of Keltron modules are not shown in actual order. Follow Keltron manual and module markings for exact terminal locations to prevent severe module damage!

IMPORTANT! All connections between the FACP and Keltron modules must be made within 20 feet and enclosed within conduit or equivalently protected against mechanical injury.

Keltron 95M3158 TTM-RPS
1. Terminals 7 and 8: Remote station alarm/trouble inputs.
2. Terminals 9 and 10: Sprinkler supervisory input.

Note: Cut TBL jumper on 4XTMF module to send alarm/trouble signal from the same pair or terminals.

*Note: For more information, refer to Keltron manual.

Fire Alarm Control Panel
(terminal blocks are not shown in their actual positions in order to clarify wiring connections)
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