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FIRE PROTECTION SYSTEMS COMPANY
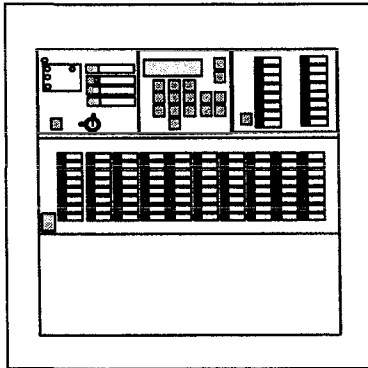
AUTOCALL®
TFX-500M/800M System Overview, Control Panel Assembly, Start-Up

Publication Number 19700367
Issue 3, January, 1997

Read and understand all instructions before proceeding.

The Autocall TFX-500M and TFX-800M fire protection systems are microprocessor based and use a mix of new and traditional technology. They are versatile, flexible, and completely suitable for application in small to medium sized premises or systems.

TFX-500M—The Autocall TFX-500M is field programmable to allow for up to 198 individual detection or annunciation points. Device points can be organized into 16 conventional zones and up to 240 control-by-event groups.

Two 2-way data circuits (multiplex) provide communication to and from a variety of input and output devices. Conventional (non-addressable) detectors may be connected, individually or in small groups, to the data circuits using the IXA-500DM or IXA-500DMA Conventional Detector Modules. The TFX-500 also connects to off-site central stations and municipal fire alarm circuits.

TFX-800M—The Autocall TFX-800M expands the capacity of the Autocall TFX-500 to allow up to 990 individual points, 80 zones, and ten 2-way data (multiplex) circuits.

Standard Features

Modular and Scalable Packaging

- Allows TFX to be sized to specific system requirements
- "Dead front," with locked access to operator control panel functions and additional locked access to electronics
- Fits standard Autocall backboxes, and uses Autocall 19- by 5.25-inch module format.
- Front Door Operator Controls—Fire Control Module, Operator Display Module, 16 Indicator Module, 80 Indicator Module, 40 x 2 Indicator Module, 16 Status control Module, 40 Status Control Module.
- Status Control Modules may be used for fan control, damper control, speaker control, zone disconnect switches, fire phone control, general purpose switches.

Programmability

- Zone identification and point messages
- Operator passcode levels
- Point to zone assignment
- General or selective alarm signalling
- Alert or Evacuation signalling
- Non-silenceable waterflow alarms
- I/O control-by-event functions grouping
- Automatic and manual detector sensitivity adjustment
- Bell mapping--defines the way the signalling appliance respond to Alert or Evacuation signal
- Test reminder--displays a warning message and sends an audible alert when the routine, weekly test is due.

Capacity

- **TFX-500M**—198 addressable devices, on two 2-way data loops (multiplex communications)—99 I/O devices per loop.
- **TFX-800M**—990 addressable devices, on ten 2-way data loops—99 I/O devices per loop.
- Two common alarm annunciation circuits (1.0 Amp max per circuit).

Functions

- Ground Fault detection
- Waterflow Alarm
- Fire Drill
- Supervisory Condition Indication
- Loop Fault
- I/O Isolation (disabling) and De-Isolation (enabling)
- Alarm Silence
- System Reset
- Device functional testing
- Solo Test
- Alarm Verification
- Manual operation of common alarm and fault relays

Optional Features

- Offsite signalling with City Box Transmitter Module--CEB-500 (P/N 940524), Reverse Polarity Transmitter Module--CVB-500 (P/N 940525), Digital Alarm Communicator Transmitter Interface Module—SRA-550 (P/N 940572).
- Auxiliary Relay Module—ARM-500 (P/N 9760130) provides eight relay outputs.
- Expansion Input/Output Modules (XIOMs)—IAA-16 Input Module (P/N 976067) and OAA-16 Output Module (P/N 976066)—provide input/output communication functions such as driving digital display outputs and accepting digital inputs from volt-free contacts.
- Two Printer Options—Autocall Printer option (P/N 976018 or 976264)—provides a permanent printed record of system activity.
- TFXnet Communications System—Up to 62 TFX-500/800 fire panels connect to a single TFXnet network (supports up to 59,400 analog/addressable points; 4800 zones). RS-485, fiber optic, and dedicated telephone wire communications between network nodes is supported.

Preface

About This Manual...This manual is intended for use by those responsible for installing and operating the AUTOCALL TFX fire control systems. The manual provides basic instructions for installing and operating a Autocall TFX fire control panel and general instructions for installing system ancillaries. If you are looking for detailed information, see "Where to Look for More Information" on page iv.

How This Manual is Organized

This book is organized into the following sections:

Section 1, "Autocall TFX-500M/800M General System Information," provides a general overview of the features and functions of the Autocall TFX-500M and TFX-800M systems. An overview of general installation procedures and enclosure installation is provided.

Section 2, "Autocall TFX-500M/800M System Modules" provides a description of each module, board, or assembly to be installed in the Autocall TFX-500M or TFX-800M control panel or remote operation/display panel.

Section 3, "Autocall TFX-500M/800M Ancillary Device Installation" provides installation instructions for each ancillary device or auxiliary unit.

Section 4, "Autocall TFX-500M/800M Operation" *Autocall TFX-500M and TFX-800M Operating Instructions,* gives "Quick Response" to alarm, supervisory, and trouble conditions. **Remove or copy these operating instructions and place them next to the appropriate control panel**

Appendix provides important reference information such as battery calculation worksheet, system wiring information, spare parts list, and removable *Operating Instructions* sheets. Remove the Operating Instructions (Publication Numbers 19700371 and 19700372) sheets at the back of this book, and post them within easy access of the TFX-500M or TFX-800M control panel(s) and remote operation panel(s).

Where to Look for More Information About...

Autocall TFX-500M/800M Ancillary Devices
Each device is packaged with its own technical guide and installation instructions.

Operating the TFX-500M and TFX-800M control panels
Autocall TFX-500M and TFX-800M operator's Manual (Publication 850516) provides operating instructions for the TFX-500M and TFX-800M control panels.

Programming the Autocall TFX-800M
TFX-500M/800M CONSYS® Programming Guide Issue (Publication Number 850463). Programming the TFX-500M and TFX-800M Fire Control Systems via a personal computer is discussed.

> Note: *Only authorized and trained personnel may perform Autocall TFX-500M and TFX-800M programming.*

Ordering System Components
Spare and Replacement Parts—Contact your local Grinnell Autocall representative or Contact Grinnell Fire Protection Systems Company, Inc., 835 Sharon Drive, Westlake, Ohio 44145, Phone (216) 871-9900.

NFPA Codes and Standards
NFPA (National Fire Protection Association) publishes codes and standards concerning all phases of fire protection. Some publications that directly concern automatic fire detection and control systems include (but are not limited to): *NFPA 70, National Electrical Code; NFPA 72, Installation, Maintenance, and Use of Protective Signalling Systems; NFPA 101, Life Safety Code.*

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Section IV. Operation

Appendix

TFX-500M and TFX-800M System Installation Guides

I. Autocall TFX-500M/800M General System Information

II. Autocall TFX-500M/800M System Modules

III. Autocall Ancillary Module Installation

IV. Autocall TFX-500M/800M Operation

V. Appendix

FCM FIRE CONTROL MODULE

ODM OPERATOR DISPLAY MODULE

16 INDICATOR MODULE

POWER

○

○ FIRE ○   PANEL SILENCE
○ TROUBLE   ALARM SILENCE
○ SUPERVISORY   SYSTEM RESET
                DRILL
LAMP
TEST   ENABLE
        OFF   I

OPERATOR DISPLAY MODULE

23 JAN 94 22:17:02   ▲

                     ▼

1 2 3

4 5 6   DELETE ENTER
          NO YES
7 8 9   FAST
      ACCESS QUIT
   0

LAMP
TEST

Figure 1.1: Autocall TFX-500M Fire Control Panel.

FCM FIRE CONTROL MODULE

QDM OPERATOR DISPLAY MODULE

```
POWER                              OPERATOR DISPLAY MODULE
 O                                  23 JAN 94 22:17:02      ▲
 O  FIRE  O       PANEL SILENCE
 O  TROUBLE       ALARM SILENCE                             ▼
 O  SUPERVISORY                      1    2    3
                  SYSTEM RESET                      DELETE ENTER
 LAMP             DRILL              4    5    6     NO   YES
 TEST          ENABLE               7    8    9    FAST
        OFF ─ ( I )                                ACCESS QUIT
                                         0
```

80 INDICATOR MODULE

Figure 1.2: Autocall TFX-800M Fire Control Panel

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TFX-800M—The Autocall TFX-800M expands the capacity of the Autocall TFX-500 to allow up to 990 individual points, 80 zones, and ten 2-way data (multiplex) circuits.

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- Loop Fault
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- System Reset
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- Auxiliary Relay Module—ARM-500 (P/N 9760130) provides eight relay outputs.
- Expansion Input/Output Modules (XIOMs)—IAA-16 Input Module (P/N 976067) and OAA-16 Output Module (P/N 976066)—provide input/output communication functions such as driving digital display outputs and accepting digital inputs from volt-free contacts.
- Two Printer Options—Autocall Printer option (P/N 976018 or 976264)—provides a permanent printed record of system activity.
- TFXnet Communications System—Up to 62 TFX-500/800 fire panels connect to a single TFXnet network (supports up to 59,400 analog/addressable points; 4800 zones). RS-485, fiber optic, and dedicated telephone wire communications between network nodes is supported.

Operator Access Passcodes

Operators gain access to system functions by entering a passcode. The level of access depends upon the user's access level. Special Passcode allows quick access by emergency personnel.

AUTOCALL TFX-500M

TFX-500M Assembly

The Autocall TFX-500M Fire Control System is supplied in sub-assembly and module form for easy assembly. A system control typically has the appropriate number of the following units:

● Control Panel Enclosure (3-, 5-, 7-module) Back-box

● Electronics Sub-Plate Assembly

● Modular Front Panel (Door) Assembly

● Option Board(s)—Multi-Purpose Interface (MPIM) Board(s), Printer Interface, Auxiliary Relay, Expansion Input/Output Modules (XIOMs), City Box Transmitter, Reverse Polarity Transmitter, Network System boards.

● Digital Alarm Communicator Transmitter

● Remote Ops/Dis Panels (Enclosure, Electronics Sub-Plate Assembly, Front Panel Sub-Assembly)

● Printer(s)

● Power Supplies and Standby Batteries

TFX-500M System Limitations

System Components	Minimum	Maximum
TFX-500M Main Control Panel	0	1
TFX-500M Remote Ops/Dis Panel	0	3
Analog-addressable Circuits (Loops)	1	2
Devices per analog-addressable loop circuit	1	99
Total devices per system	1	198
Line Isolator Modules (per loop, in line)	1	12
Zones per loop	1	16
Zones per system	1	16
Groups (for group response) Input Groups Output Groups Event Action Groups Digital I/O Points History Log (Events)	0 user-defined	124 (88 user definable) 108 (81 user definable) 270 (230 user definable) 1600 590
Printers	0	31*
Conventional detectors per IXA-500DM Module	0	20–30*
Off-site communication devices (CEB-500, CVB-500 , SRA-550)	0	1
Digital Alarm Communicator Transmitter	0	1
Network Communications devices (TLI-530, TLA-530, TLX-500)	0	1 (each)
*Depending upon circuit load.		

(a)

(b)

(c)
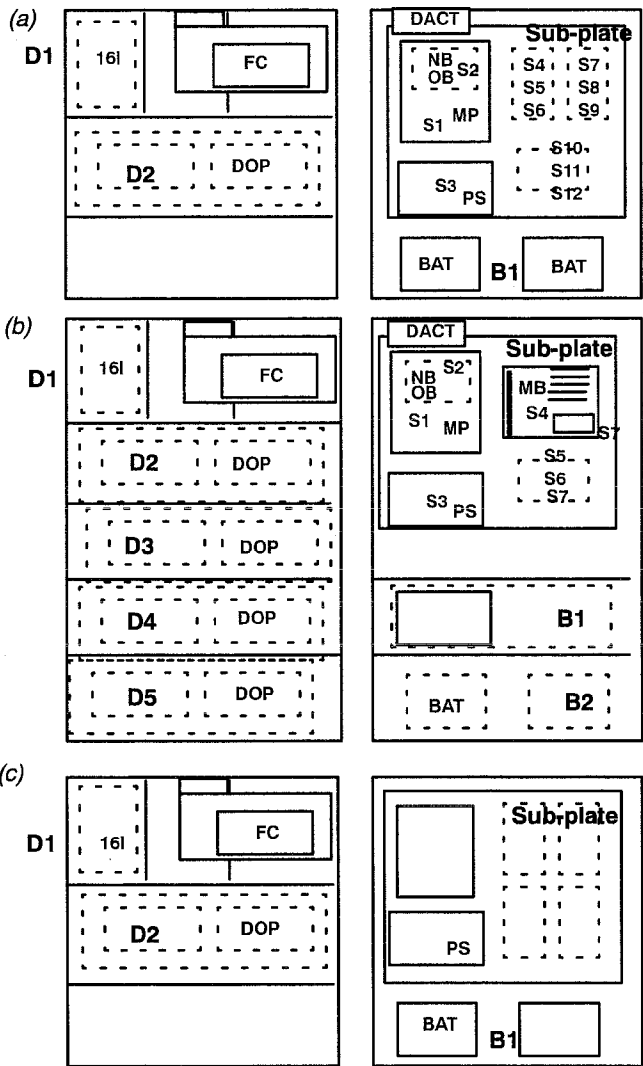
Module Location Key:
FC=FCM, ODM, MPIM   16I=16 Indicator
DOP (Door Option Panel)=80 Ind., 16 Stat., 40 x 2 Ind., 40 Stat.;with MPIMs
MP=Main Processor
MB=Motherboard with ALXMs, DCPM
PS=Power Supply
OB (Offsite Transmitter Board)=CVB, CEB, SRA
NB (Network Board)=TLI-530, TLX-500, TLA-530,
DACT=SK5128 Digital Alarm Communication Transmitter
Network Options = TLB, 530, TLO-530, TLD-530, XAI

Figure 2. TFX-500M Configuration Options. (a) TFX-500M 3-Module, (b)TFX-800 5-Module, (c) Remote Ops/Dis (3-Module).

TFX-500M System Configuration

Door			Back Box		
Configuration	D1	D2–D7	Sub-Plate	B1–B4	Other
Minimum	FCM, ODM, MPIM		MP, PS	Batteries	
Maximum (3–Box)	FCM, ODM, 16I, MPIM	DOP[1]	MP, PS, NB[2], 2 MPIMs, 10 I/O[3,] PIM[4]	Batteries	DACT, Printer
Maximum (5–Box)	FCM, ODM, 16I, MPIM	3 DOP[1]	MP, PS, NB[2], 2 MPIMs, 10 I/O[3,] PIM[4]	System Modules[5], Auxiliary Power supplies, NOM[6], Batteries	DACT, Printer
Maximum (7–Box)	FCM, ODM, 16I, MPIM	5 DOP[1]	MP, PS, NB[2], 2 MPIMs, 10 I/O[3,] PIM[4]	System Modules, Auxiliary Power supplies, NOM[6], Batteries	DACT, Printer
Remote Ops/Dis Panel (3-Box)					
Minimum	FCM, ODM, MPIM		DCPM, MPIM		
Maximum (3–Box)	FCM, ODM, 16I, MPIM	DOP[1]	PS, DCPM, 2 MPIMs, 10 I/O[3,] PIM[4,] NOM[6]	Batteries	Printer

[1]DOP = Door Option Panel:
[2]NB = Network Board: CVB-500, CEB-500, SRA-550, TLI-530, TLX-500,
[3]I/O = XIOM, ARM-550,
[4]PIM = Printer Interface Module
[5]System Modules = Any optional system module, including DirecTone Modules
[6]NOM = Network Option Modules = XAI, TLA-530, TLB-530, TLO-530, TLD-530

AUTOCALL TFX-800M

TFX-800M Assembly

The Autocall TFX-800 Fire Control System is supplied in sub-assembly and module form for easy assembly. A system control typically has the appropriate number of the following units:

- Primary Box Enclosure and Electronics Sub-Plate Assembly
- Display Box Enclosure
- Front Panel (Door) Assemblies
- Option Board(s)--Multi-Purpose Interface (MPIM) Board(s), Printer Interface, Auxiliary Relay, Expansion Input/Output Modules (XIOMs), City Box Transmitter, Reverse Polarity Transmitter
- Digital Alarm Communicator Transmitter
- Remote Ops/Dis Panels (Enclosure, Electronics Sub-Plate Assembly, Front Panel Sub-Assembly)
- Printer(s)
- Power Supplies and Standby Batteries

TFX-800M System Limitations

System Components	Minimum	Maximum
TFX-800M Control Panel	1	1
TFX-800M Remote Ops/Dis Panel	0	3
2-Way data Circuits (Loops)	2	10
Devices per 2-way data circuit	1	99
Total devices per system	1	990
Line Isolator Modules (per loop, in line)	1	12
Zones per loop	1	80
Zones per system	1	80
Groups (for group response) Input Groups	0 user defined	124 (88 user definable)
Output Groups		108 (81 user definable)
Event Action Groups		270 (230 user definable)
Digital I/O Points		1600
History Log (Events)		590
Printers	0	31
Conventional detectors per IXA-500DM Module	0	20–30*
Off-site communication devices (CEB-500, CVB-500, SRA-550)	0	1
Digital Alarm Communicator Transmitter	0	1
*Depending upon circuit load.		

TFX-800M System Configuration

Configuration	Door		Back Box		
	D1	D2–D7	Sub-Plate	B1–B4	Other
Minimum	FCM, ODM, MPIM	80 Indicator	MP, PS MB[6]	Batteries	
Maximum (5–Box)	FCM, ODM, 16I, MPIM	3 DOP[1]	MP, PS, NB[2], MB[6] 2 MPIMs, 6 I/O[3,] PIM[4], NOM[7]	System Modules[5], Auxiliary Power supplies, NOM[7], Batteries	DACT, Printer
Maximum (7–Box)	FCM, ODM, 16I, MPIM	5 DOP[1]	MP, PS, NB[2], MB[6] 2 MPIMs, 6 I/O[3,] PIM[4], NOM[7]	System Modules, Auxiliary Power supplies, NOM[7], Batteries	DACT, Printer
Remote Ops/Dis Panel (3-Box)					
Minimum	FCM, ODM, MPIM		DCPM, MPIM		
Maximum (3–Box)	FCM, ODM, 16I, MPIM	DOP[1]	PS, DCPM, 2 MPIMs, 6 I/O[3,] PIM[4], NOM[7]	Batteries	Printer

[1]DOP = Door Option Panel:
[2]OB = Offsite Transmitter Board: CVB-500, CEB-500, SRA-550
             or NB = Network Board: TLI-530, TLX-500, XAI,
             TLA-530, TLB-530
[3]I/O = XIOM, ARM-550,
[4]PIM = Printer Interface Module
[5]System Modules = Any optional system module, including
DirecTone Modules
[6]MB = Motherboard with ALXMs and DCPM
[7]NOM=Network Option Module=XAI, TLA-530, TLB-530,
TLO-530, TLD-530

Installation Procedure

Warning:
It is important to follow the site plan and the planning forms for your installation because these forms are the basis for Autocall TFX-500M/800M system programming. Any deviation from the site plan may result in incorrect programming of your system. Fire alarm systems and the associated initiating, indicating, and controlling devices must meet requirements as described in the codes and standards of the authorities having jurisdiction. Follow NFPA and NEMA guidelines for selection of, limitations of, placement of, spacing of sensors and other system devices; system installation; system testing.

1. The TFX-500M/800M Control Panel; Remote Ops/Dis panel are shipped in two parts. The enclosure ("backbox"), and the electronic sub-plate assembly and front panel ("door") assembly.
2. Mount the enclosures, leave adequate space for access.
3. Install and test wiring for all system components, initiating devices, and indicating appliances. **Do not attach any devices at this time.** Be sure to use an LRC meter for testing all wiring to system specifications (inductance, capacitance, resistance, and earth ground).
4. Install the electronics sub-plate and front panel assemblies (including power supplies).
5. Connect standby batteries.
6. Apply power to the control panel and test it. Then disconnect the power.
7. Set the appropriate address on each addressable device.
8. Install and connect devices on the 2-way data circuits (Loops "A" and "B" or Loops "A" through "K"). **Observe correct polarity.**
9. Make sure that there are no wiring errors (reverse polarity, short circuits, cross-wiring).
10. Connect the two-way data circuits (with power off).
11. Install and connect devices to Common Alarm Indicating (Sounder) Circuits A and B. **Observe correct polarity.** Make sure all indicating appliances have EMI suppression and diode polarization devices installed.
12. Install Remote Ops/Dis panel(s).
13. Connect other system options (relays, switches, etc.)
14. Install printer(s).
15. Power up system and test devices.
    a. Perform "Solo Test" as specified in the *Autocall TFX-500M/800M Operator's Manual* (Publication Number 850515).
    b. Test offsite communications devices (be sure to notify central station before testing is begun).
    c. Disconnect AC power and operate any initiating device to confirm standby battery operation.

Grinnell®
FIRE PROTECTION SYSTEMS COMPANY

AUTOCALL®
TFXnet Network Communication System

Publication Number 19700384
Issue 2, January 1997

The AUTOCALL TFXnet communications network is a collection of network interface modules and peripheral equipment that together form a robust, fault resilient, and flexible peer-to-peer communications network for Autocall TFX control panels.
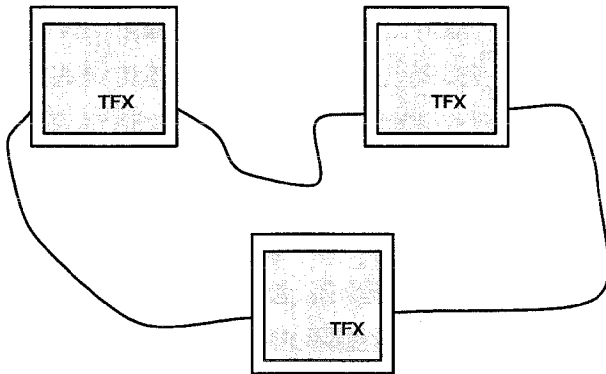
Features

TFXnet Communications

- True peer-to-peer communications; no host or master controller.
- Node failure does not affect remainder of network.
- Groups of nodes isolated due to circuit faults continue to communicate with the group.
- Supported communication media—combinations of fiber optic and twisted, shielded pair cabling.
- Plug-in module (TLI-530 network interface module) connects equipment anywhere on the network.
- Bus or ring topology.

TFX Panel Operation

- From one to 62 AUTOCALL TFX-500/800, TFX-500M/800M, TFX-MV, DirecTone 500, TGF-562, or TGX-562 (hereafter referred to as TFX) fire panels may be connected to a single TFXnet network (supports up to 59,400 analog/addressable points; 4800 zones).
- Panels maintain full stand-alone functionality.
- Each panel can be configured to respond to events from all or any subset of other panels.
- Up to 3 panels can be configured to provide full system annunciation, control, and logging. Configuring two panels as identical receiving units provides "hot backup" of central monitoring equipment.
- "Virtual Front Panel" feature allows operator interrogation and control of any panel from any other panel.

- All TFX features and capabilities are retained.
- TFX panels can be configured with integrated voice and audio evacuation equipment when required (DirecTone 500).

TFXnet Operation Summary

- Half-duplex, token passing protocol
- Peer-to-peer operation.
- Automatic fault recovery.
- Field configured baud rates ranging from 1200 baud to 38.4 k-baud.
- Asynchronous, 1 start bit, 1 stop bit, 8 data bits, no parity
- Self-configuring.
- Error detection and recovery.
- Open/short circuit detection identifies the location of the fault.
- Nodes automatically disconnect from a ring network at loss of power and when experiencing a catastrophic failure; maintaining ring integrity (not available when using fiber optic ring connections and the fiber interface modules lose power).

TFXnet Network Operation

When an AUTOCALL TFX fire control panel is connected to the TFXnet network, each panel maintains full stand-alone capability while also operating as part of a larger system.

When a TFX control panel is connected to the network, the following capabilities are provided.

Peer Event Exchange

TFX panels send and receive change-of state (event) information via the network to distribute and coordinate system control.

When operating on the TFXnet network, TFX panels accept events from other TFX panels and process these in a similar manner as events generated by local inputs. When an input change of state occurs at a TFX connected to the network, the TFX sends information regarding the event to all other panels on the network. Prior to sending the event, the TFX checks if the group to which the input is assigned is defined as "network available." If the group is network available, the event is transmitted onto the network as well as processed locally. If the group is not network available the event is only processed locally.

When a TFX panel receives an event from the network, it checks to see if the event has originated from a panel within its field configured "sub-network." Only those events originating from panels within the receiving panel's sub-network are processed by the receiving panel.

"Network zone links" provide links from a zone of one panel to a zone of a second panel. Once linked, devices assigned to both zones operate as though they were all assigned to the same zone.

"Sectors" provide for grouping related zones. The network supports up to 80 sectors into which any one, any set, or all TFX zones can be assigned. Group actions can be defined to operate on sectors instead of zones. As a result, one action can be used to control outputs of multiple select zones.

Peer Event Display

LCD display—TFX panels can optionally annunciate events received from other TFX panels to provide LCD display of events at any/all panel locations. The display identifies the panel originating the event; the event type; identification of the zone to which the point is assigned; identification of the point that changed state.

Network zone and sector LED display permits mapping of alarm, supervisory and fault status of selected TFX zones or sectors onto one or more LED zonal or sector displays. This permits one or more TFX panels to display the status of TFX zones or sectors throughout the network.

Central Event Logging

One or more TFX panels can be designated to provide central event logging. Each TFX panel is programmed with up to 3 panel addresses to which "loggable" events are sent. A panel receiving loggable events displays information about the event, prints the event, and records the event in a historical log.

TFXnet Network System Limitations

System Components	Minimum	Maximum
TFX-500, TFX-800, TFX-500M, TFX-800M control panels (Network nodes)	2	62
TLI-530 Network interface modules	2	62
TLO-530 fiber optic modem	0	
Analog addressable points	0	59,400
Zones	0	4800
Network Zone Links	0	250
Sectors	0	80
Sub-nets per system	1	62

(a)

NODE 1   NODE 2   NODE 3   NODE 4

1 TWISTED PAIR CABLE RS485

MAX. DISTANCE BETWEEN NODES IS 10,000 FEET USING NO. 18 AWG TWISTED/ SHIELDED PAIR CABLE (WEST PENN #D975 OR EQUIVALENT)

2 TYPE 62.5/125 FIBER OPTIC CABLES

TLO-530 fiber interface

MAX. DISTANCE BETWEEN NODES USING FIBER IS 13,000 FEET

NODE 7   NODE 6   NODE 5

TLO-530 fiber interface   TLO-530 fiber interface   TLO-530 fiber interface   TLO-530 fiber interface   TLO-530 fiber interface

2 TYPE 62.5/125 FIBER OPTIC CABLES

(b)

NODE 1   NODE 2   NODE 3   NODE 4

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NODE 7   NODE 6   NODE 5

TLO-530 fiber interface   TLO-530 fiber interface   TLO-530 fiber interface   TLO-530 fiber interface   TLO-530 fiber interface

2 TYPE 62.5/125 FIBER OPTIC CABLES

Figure—Network Bus Topology. showing support and requirements for mixed fiber optic/ twisted pair wiring. (a) Bus topology, (b) Ring topology.

This document is written for skilled technicians with experience installing and testing fire detection systems. These instructions do not purport to cover all the details or variations in the equipment described. Nor do they provide for every possible contingency met in connection with installation, operation, or maintenance. All specifications are subject to change without notice.

Should further information be desired or should particular problems arise which are not covered sufficiently for the user's purposes, the matter should be referred to Grinnell Fire Protection Systems Company, Inc., Westlake, Ohio 44145. Ph. (216) 871-9900.

Grinnell®
FIRE PROTECTION SYSTEMS COMPANY

AUTOCALL®

TFX-500M/800M Wiring Guidelines

Publication Number 19700370
Issue 3, January, 1997

General Wiring Guidelines

1. All wiring to be in accordance with N.E.C., local authorities, and applicable notes.
2. Make sure that all power-limited/Class 2 wiring is separated at least 0.25 inches from any wiring that is not power limited. Use cable ties to secure wiring.
3. Circuits leaving the building must be connected to a UL listed primary protector at the point the wiring exits the building (reference NEC Article 800-31).
4. All conductors are to be free of grounds.
5. All supplementary power must be fused. Use only UL listed power supply suitable for fire protective service.
6. Check that you have all equipment necessary. A suitable LCR test meter is required.
7. Follow the wiring diagrams and site plans for your system.
8. To prevent confusion and possible errors, all conductors should be tagged or otherwise coded and logged, at installation, to identify circuit assignment, polarity, and whether the wiring is outgoing or return.
9. Leave adequate slack in the wiring to allow for troubleshooting.
10. All wiring should be terminated with UL listed devices.
11. The incoming AC voltage should be stable and within the specified voltage range. This is especially important in construction projects where incoming power may be high or unstable, with temporary connections often causing large inductive voltage spikes.
12. Incoming Wiring—Life Safety Branch Circuit or as required by local code. Protect by fused disconnect or circuit breaker.
13. Earth Ground Fault Detection—
    a. All exposed metal and conduit must be grounded with a suitable earth ground wire.
    b. The power supply/battery charger and AC input should use a dedicated ground circuit, not conduit ground.
    c. All auxiliary AC power supplies on Remote Bus (including any AC-powered remote panels) must have DC Common (0 VDC) connected to DC Common (0 VDC and TB2-2) on the RPS-424 power supply at the main control panel.
    d. At no time should this system be connected to a conduit or green wire circuit that also is used to power resistance heating, motors, fans, air conditioning equipment, or fluorescent lighting circuits; since leakage currents into the ground return could damage sensitive system components.
    e. A separate earth ground or cold water pipe with properly bypassed water meter should be used.
    f. All external devices, such as horns or alarm bells, should have their housings grounded.
14. Wiring shields—
    a. It is essential that shields of all shielded wires be continuous and connected to DC Common only at the control unit.
    b. All splices of shield on shielded wires must be taped and free from connection to any circuit conduit or ground.
15. The wire shielding must NOT be connected to, or touch, the conduit, electrical boxes, or associated hardware at any point; nor can the 2-way data circuits come in contact with each other, or any other grounded device.

Installer:
It is your responsibility to ensure that the wiring, and devices installed in the system, meet the current National Electrical Code, NFPA 70 (Articles 210 and 760), and state and local building code requirements.

CAUTION: Static Control

Installers and technicians note: The TFX-500M/800M fire control panel contains static-sensitive components. It is important to control static discharges during installation and maintenance. Observe these rules and precautions to reduce the risk of static damage to sensitive components.

Handle all static-sensitive components at a static safe area. As a minimum, static safe areas should include a grounded conductive work mat and wrist strap.

Do not allow nonconductors in the work area (for example, synthetic clothing including ties, polystyrene coffee cups, insulated solder removers, etc.

Use static shielding bags during all transport.

16. Most supervised circuits use voltage and current sensing circuits which are very sensitive to induced voltages on the sensor wiring. Therefore, **do not, under any circumstances,** run AC power or other high voltage wiring, in the same conduit or in the immediate vicinity of the sensor wiring.
17. When smoke detectors and manual stations are connected on the same initiating circuit, the manual stations must be connected electrically ahead of any smoke detector trouble contacts.
18. All inductive load switching circuits must have suppression networks attached. Failure to do so voids warranty.
19. All DC alarm signals are marked showing polarity of operation. The polarity reversing DC alarm indicating circuits are marked showing polarity of supervision. Connect only 24-VDC polarized alarm signals.
20. Lightning protection—A commonly overlooked problem involving modern electronic control systems is the lack of adequate lightning protection. Make sure adequate lightning protection is provided for the incoming power at the building entry. Arrestor circuitry and earth grounding should be in accordance with article 250 of the National Electric Code.
21. Provide radio frequency interference control by correct shielding and grounding.

Warnings

1. Check wiring before any devices are attached. Use an LCR meter to check wiring parameters.
2. Caution: The panel should not be used in place of a multimeter in checking field wiring for grounds, shorts, opens, polarity, or voltage. If you do not have an appropriate meter, stop at once and get one.
3. Disconnect power and batteries before installing devices.
4. Check all circuits for correct polarity and end-of-line devices.
5. Actual field experience has shown that the most common problems can be traced to incorrect installation of initiating and indicating devices. Look for incorrect wiring (resulting in open or short circuit), missing EOLs, and incorrect polarity.

Wiring Parameters

Table 1. TFX-500M/800M Field Wiring Circuits with Wiring Parameters *(Maximum)*

Circuit / Supervision	Style	Length (ft)	Wiring/Cable	Inductance (L)	Capacitance (C)	Resistance (R)	Current Rating
2-Way Data (Addressable loops, 99 addresses each loop) Addressable loop supervised, spur circuits not supervised	Style 4 Style 6 Style 7*	6500	Twisted wire pair with shield	1.5 millihenry	0.5 microfarad (mutual)	75 ohms	
Remote Bus (EIA-RS485) 16 RBus addresses, Supervised (EOLs 150 ohm and 120 ohm)	Style 4	4000	Twisted wire pair with shield	NA	0.5 microfarad	100 ohms (total)	
Local Bus (Special), 16 LBus addresses, Supervised		Within panel (5 feet with wiring adapter)	Special	--	--	--	
Expansion Bus (Special), 80 I/O addresses, Supervised		Within panel (6 feet with wiring adapter)	Special	--	--	--	
Common Alarm (Bell) Circuits Supervised (EOL P/N 900937)	Style Y only	(See Table 2)	Twisted wire pair with shield (See Table 3)	--	--	(See Table 3)	1 amp inductive
Auxiliary Power Supply Wiring to Modules (24 VDC)			No. 16 AWG minimum	--	--	0.1 ohm max.	--
Auxiliary Power Supply to DC Common at Main Control Panel			No. 16 AWG minimum	--	--	0.1 ohm max.	--
Printer (EIA-RS232)		50 (same room)	Special serial data cable with special jack	0	2500 picofarad	100 ohms (total)	--
TFX-Net RS485 Network (30 network points maximum)	Style 6 Style 7	10,000 ft	Twisted wire pair with shield (West Penn #D975 or equivalent)	--	0.3 µf max @ 38.4 k-baud; 0.6 µf max @ 19.2 k-baud; 1.2 µf max @ 9600 baud and below	75 ohms	

*Complies with operation characteristics for NFPA Style 7 when a line isolator (CA-500LI) is connected adjacent to and via conduit, to the input and output of each addressable device). Maximum number of CA-500LI modules per analog addressable loop is 12.

Table 2. Wire Chart for Alarm Indicating Devices

Length of wire run (pair) for DC alarm indicating devices on 1 amp circuits. (1 volt maximum line loss)

	18 AWG	16 AWG	14 AWG	12 AWG
0.1 amp	780 ft	1240 ft	1980 ft	3100 ft
0.2 amp	390 ft	620 ft	990 ft	1570 ft
0.3 amp	260 ft	410 ft	660 ft	1040 ft
0.4 amp	195 ft	310 ft	490 ft	780 ft
0.5 amp	150 ft	240 ft	390 ft	625 ft
0.6 amp	130 ft	200 ft	330 ft	520 ft
0.7 amp	110 ft	170 ft	280 ft	440 ft
0.8 amp	95 ft	150 ft	240 ft	390 ft
0.9 amp	85 ft	135 ft	220 ft	340 ft
1.0 amp	75 ft	120 ft	190 ft	310 ft

Table 3. Minimum Separation Between Power and Signal Wires

Power Cable Voltage	Power Cable Separation (ft/inches)	Current	Separaton (ft/inches)
115 V	1 ft	5 amp	1 ft
240 V	1 ft, 6 inches	15 amp	1 ft
415 V	2 ft	50 amp	1 ft, 8 in
3.3 kV	3 ft, 8 inches	100 amp	2 ft

Note: If it is necessary to cross signal wires over power wires, the crossover should be made at right angles.

(a) MEASURING CAPACITANCE

DISCONNECT LOOP TO MEASURE CAPACITANCE

ADDRESSABLE LOOP
NO SPLICES

LCR METER
"C" CAPACITANCE

FLOAT   SHIELD

Left Sig.+
Left Rtn.–
Right Sig.+
Right Rtn.–

TO 0 V DCC
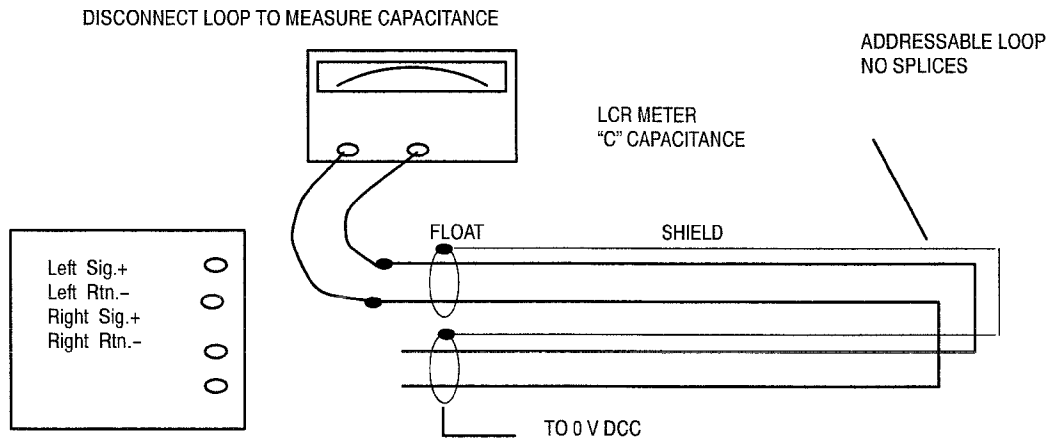
(b) MEASURING RESISTANCE AND INDUCTANCE USING TOTAL LOOP

DISCONNECT LOOP TO MEASURE RESISTANCE AND INDUCTANCE

LCR METER
"R" RESISTANCE
"L" INDUCTANCE

ADDRESSABLE LOOP
NO SPLICES

FLOAT   SHIELD

Left Sig.+
Left Rtn.–
Right Sig.+
Right Rtn.–

TO 0 V DCC

JUMPER
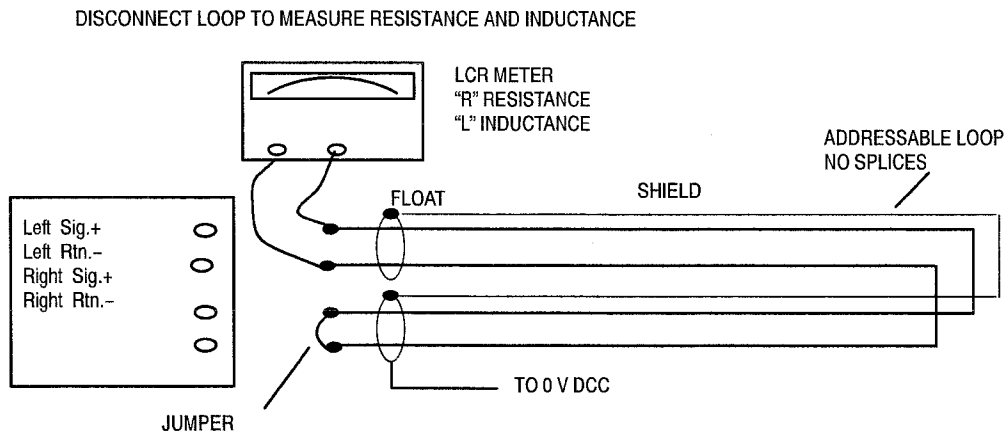
Figure 1. TFX-500M/800M System Wiring Parameter Testing Using LRC Meter., (a) capacitance, (b) resistance and inductance.
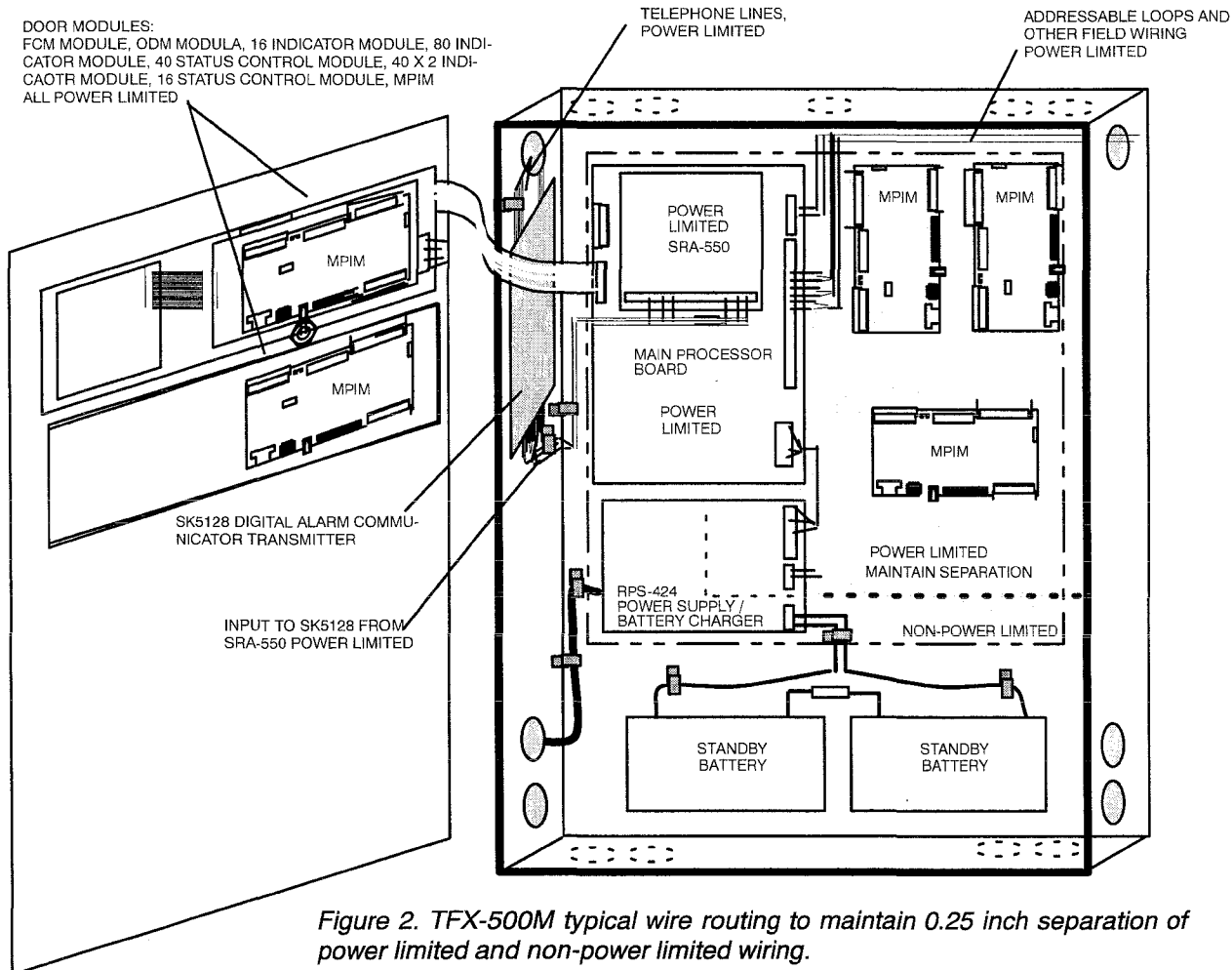
Figure 2. TFX-500M typical wire routing to maintain 0.25 inch separation of power limited and non-power limited wiring.
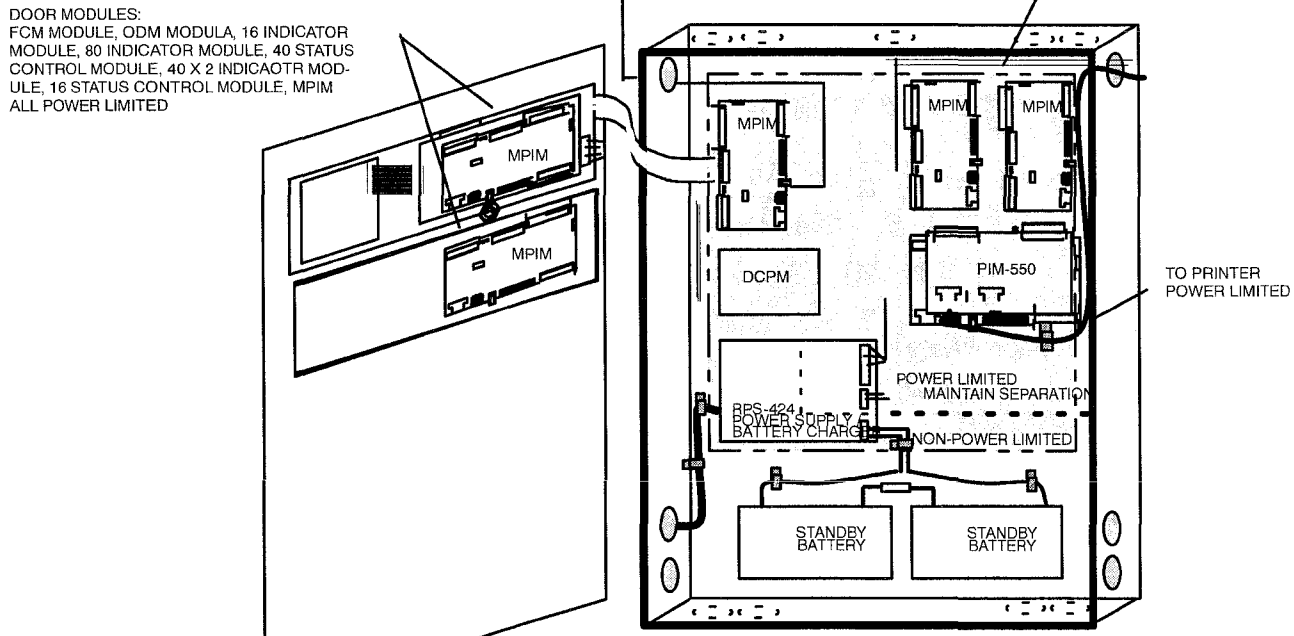
Figure 3. TFX-500M/800M Remote Operator/Display Panel (Remote Ops/Dis typical wire routing to maintain 0.25 inch separation of power limited and non-power limited wiring.

DOOR MODULES:
FCM MODULE, ODM MODULE, 16 INDICATOR MODULE, 80 INDI-
CATOR MODULE, 40 STATUS CONTROL MODULE, 40 X 2 INDI-
CAOTR MODULE, 16 STATUS CONTROL MODULE, MPIM
ALL POWER LIMITED

TO CITY BOX TRANSMITTER
NON-POWER LIMITED

UL LISTED SECONDARY PRO-
TECTOR P/N SX-TB-030-2A

ADDRESSABLE LOOPS AND
OTHER FIELD WIRING
POWER LIMITED

EXPANSION MOTHERBOARD
WITH ALXMs AND DCPM
POWER LIMITED

MPIM

MPIM

CITY BOX
TRANS-
MITTER
CEB-500

MAIN PROCESSOR
BOARD

POWER
LIMITED

PIM-550

RPS-424
POWER SUPPLY /
BATTERY CHARGER

POWER LIMITED

NON-POWER LIMITED

TO
PRINTER
POWER
LIMITED

NON-
POWER
LIMITED

NON-POW-
ER LIM-
ITED

STANDBY
BATTERY

STANDBY
BATTERY

Figure 4. TFX-800M typical wire routing to maintain 0.25 inch separation of
power limited and non-power limited wiring.

DOOR MODULES:
FCM MODULE, ODM MODULA, 16 INDICATOR MODULE, 80
INDICATOR MODULE, 40 STATUS CONTROL MODULE, 40 X 2
INDICAOTR MODULE, 16 STATUS CONTROL MODULE, MPIM
ALL POWER LIMITED

ADDRESSABLE LOOPS, TFX-NET NETWORK,
AND OTHER FIELD WIRING POWER LIMITED

MPIM

MPIM

MPIM

MPIM

TLI-530
NETWORK
INTERFACE
MODULE
POWER
LIMITED

MAIN PROCESSOR
BOARD

POWER
LIMITED

POWER LIMITED
MAINTAIN SEPARATION

RPS-424
POWER SUPPLY /
BATTERY CHARGER

NON-POWER LIMITED

STANDBY
BATTERY

STANDBY
BATTERY
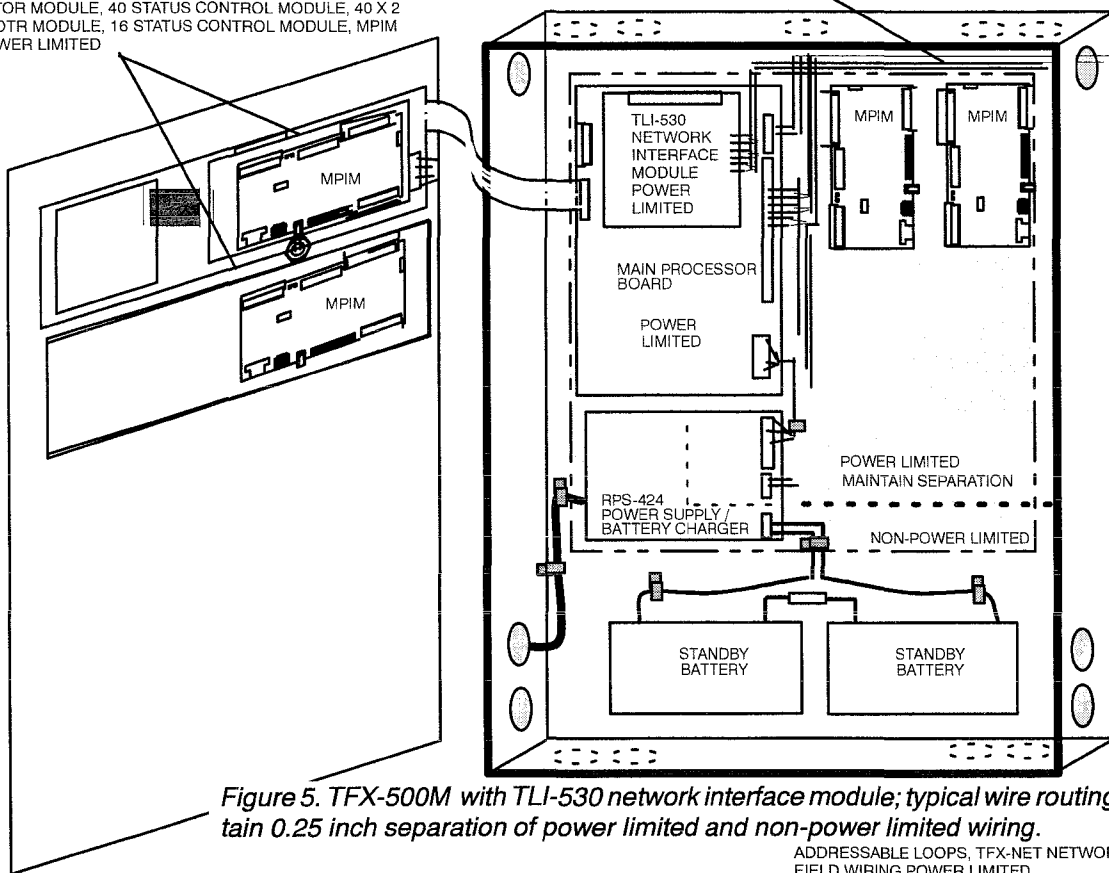
Figure 5. TFX-500M with TLI-530 network interface module; typical wire routing to maintain 0.25 inch separation of power limited and non-power limited wiring.

ADDRESSABLE LOOPS, TFX-NET NETWORK, AND OTHER
FIELD WIRING POWER LIMITED

MPIM

MPIM

MPIM

MPIM

TLA-530

MAIN PROCESSOR
BOARD

POWER
LIMITED

THRON-NET
NETWORK
POWER LIM-
ITED

TLI-530
POWER
LIMITED

CEB-500
CITY BOX
TRANS.

TO CITY BOX
TRANSMITTER
NON-POWER
LIMITED

POWER LIMITED
MAINTAIN SEPARATION

RPS-424
POWER SUPPLY /
BATTERY CHARGER

NON-POWER LIMITED

UL LISTED
SECONDARY
PROTECTOR
P/N SX-
TB-030-2A

STANDBY
BATTERY

STANDBY
BATTERY
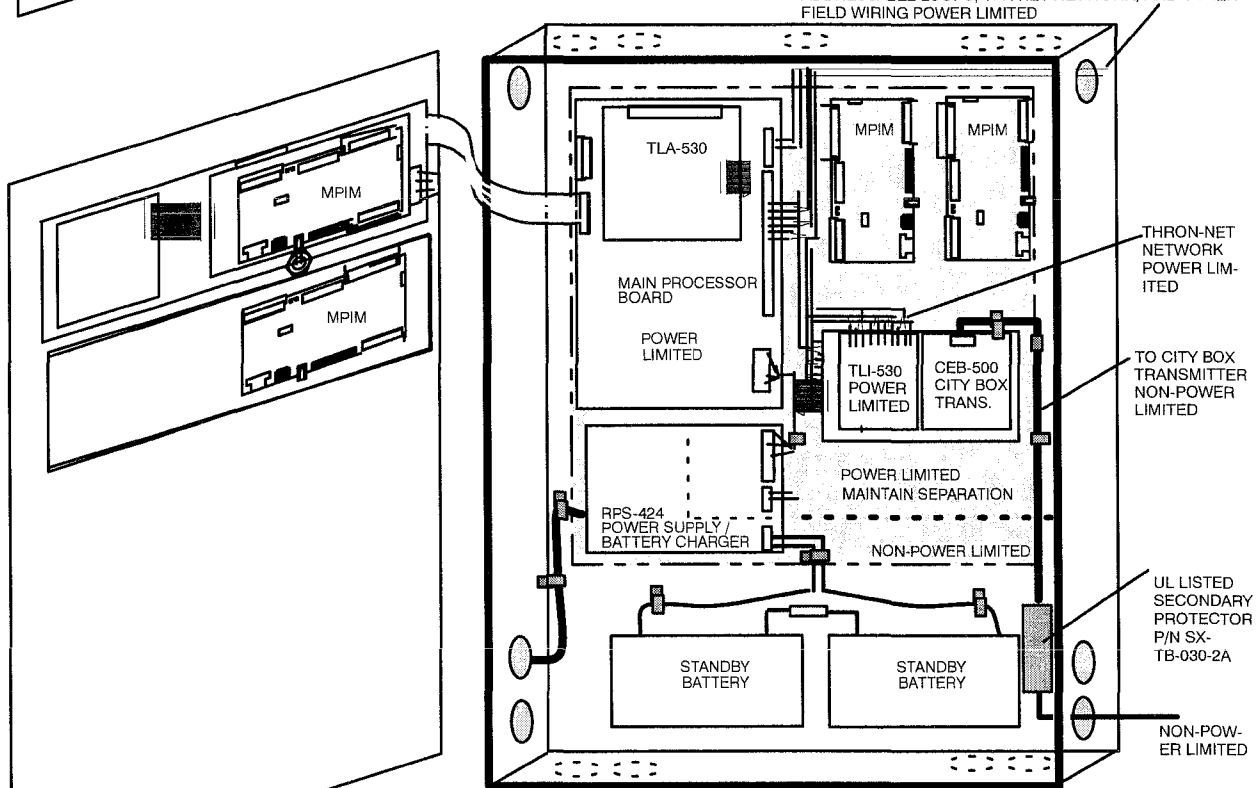
NON-POW-
ER LIMITED

Figure 6. TFX-500M/800M with TLB-530 baseboard, TLI-530 network board, TLA-530 interface board, CEB-500 city box transmitter; typical wire routing to maintain 0.25 inch separation of power limited and non-power limited wiring.

DOOR MODULES:
FCM MODULE, ODM MODULE, 16 INDICATOR MODULE, 80 INDI-
CATOR MODULE, 40 STATUS CONTROL MODULE, 40 X 2 INDI-
CAOTR MODULE, 16 STATUS CONTROL MODULE, MPIM
ALL POWER LIMITED

ADDRESSABLE LOOPS, THRON-NET
NETWORK, AND OTHER FIELD WIRING
POWER LIMITED

EXPANSION MOTHERBOARD
WITH ALXMs AND DCPM
POWER LIMITED

MPIM

MPIM

TLA-530

MAIN PROCESSOR
BOARD

POWER
LIMITED

RPS-424
POWER SUPPLY /
BATTERY CHARGER

PIM-550

TLI-530
FPOWER
LIMITED

CITY BOX
TRANS-
MITTER
CEB-500

TO
PRINTER
POWER
LIMITED

TFX-NET
NET-
WORK
POWER
LIMITED

TO CITY BOX
TRANSMITTER
NON-POWER
LIMITED

NON-
POWER
LIMITED

NON-POW-
ER LIM-
ITED

STANDBY
BATTERY

STANDBY
BATTERY

NON-POWER LIMITED

UL LISTED SECONDARY PRO-
TECTOR P/N SX-TB-030-2A

Figure 7. TFX-800M with TLA-530 interface, TLB-530 base board, TLI-530 net-
work board, CEB-500 city box transmiiter; typical wire routing to maintain 0.25
inch separation of power limited and non-power limited wiring.

Grinnell®
FIRE PROTECTION SYSTEMS COMPANY

AUTOCALL®
TFX-500M/800M Enclosures

Publication Number 19700369
Issue 3, January 1997

Take care in planning the Autocall TFX-500M/800M control cabinet location. The cabinet is for use only inside buildings which are free from exposure to rain, condensation, excessive dust, moisture, or other airborne contamination. Locate the cabinet in a low risk area (preferably on the ground floor near a building exit) for safety of the control panel operator who may be the last to leave in the event of an emergency.

Plan cabinet location to permit free access to sides, top, and/or bottom for conduit entry. Make sure conduit or wire does not interfere with module location. Also, make sure there is full clearance for the 180-degree swing-out door and adequate working space for future operation and system maintenance. Mount the cabinet at a height convenient for the lights to be seen clearly and the control panel touch-buttons can be reached by all system operators.

Environmental Limitations:

The system must not be subjected to ambient air temperatures below 32 degrees F (0 degrees C) or above 122 degrees F (50 degrees C). Humidity (RH) should not exceed 85% @ 85 deg F (non-condensing). The system must not be installed in an environment outside these limits.

Installation:

Assembly of Enclosure
1. The back box is usually shipped separately from the other enclosure components. Install the back box and field pre-wiring.
2. Fit screw heads and washers into top two keyhole slots in the back box. Slide the back box down and capture between spacers and washers. Insert bottom and middle screws.
3. Install the door to the back box.
4. After construction site has been finished and is free of dust, electronics sub-plate components and door panels may be installed.

Assembly of Plate Sub-Assembly to Box
1. Align the six holes in the electronics sub-plate with six holes in the rails at the top of the back box.
2. Tighten sub-assembly mounting screws.

Front Panel
1. Fill in Zone ID strips and insert them into the slots in each door panel. Make sure each indicator is correctly labeled
2. Install the door panel to the door with screws and washers.
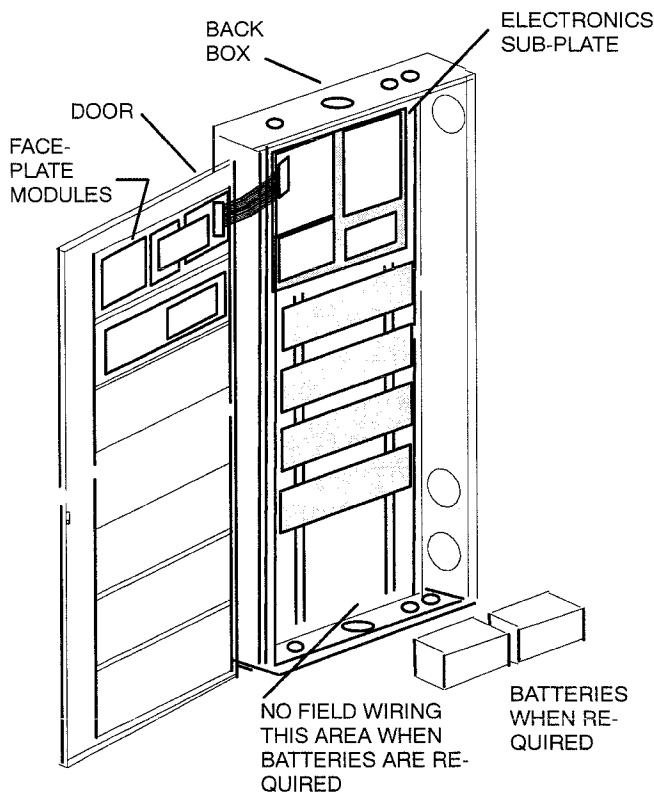
Figure 1.   Cabinet Enclosure (7-Module Back Box).
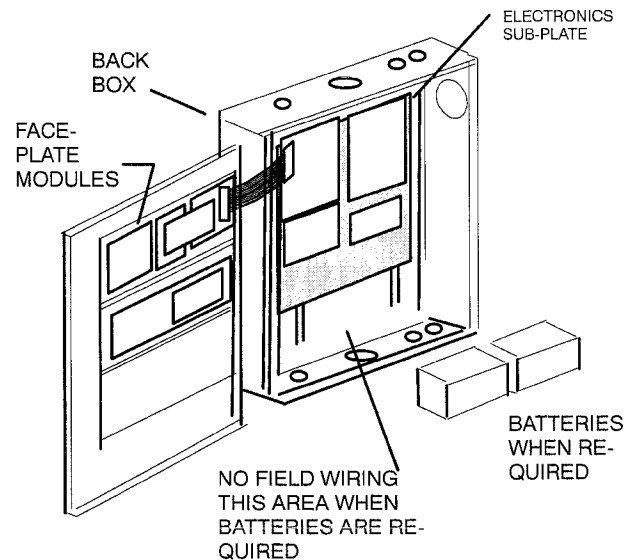
Figure 2.   3-Module Back Box
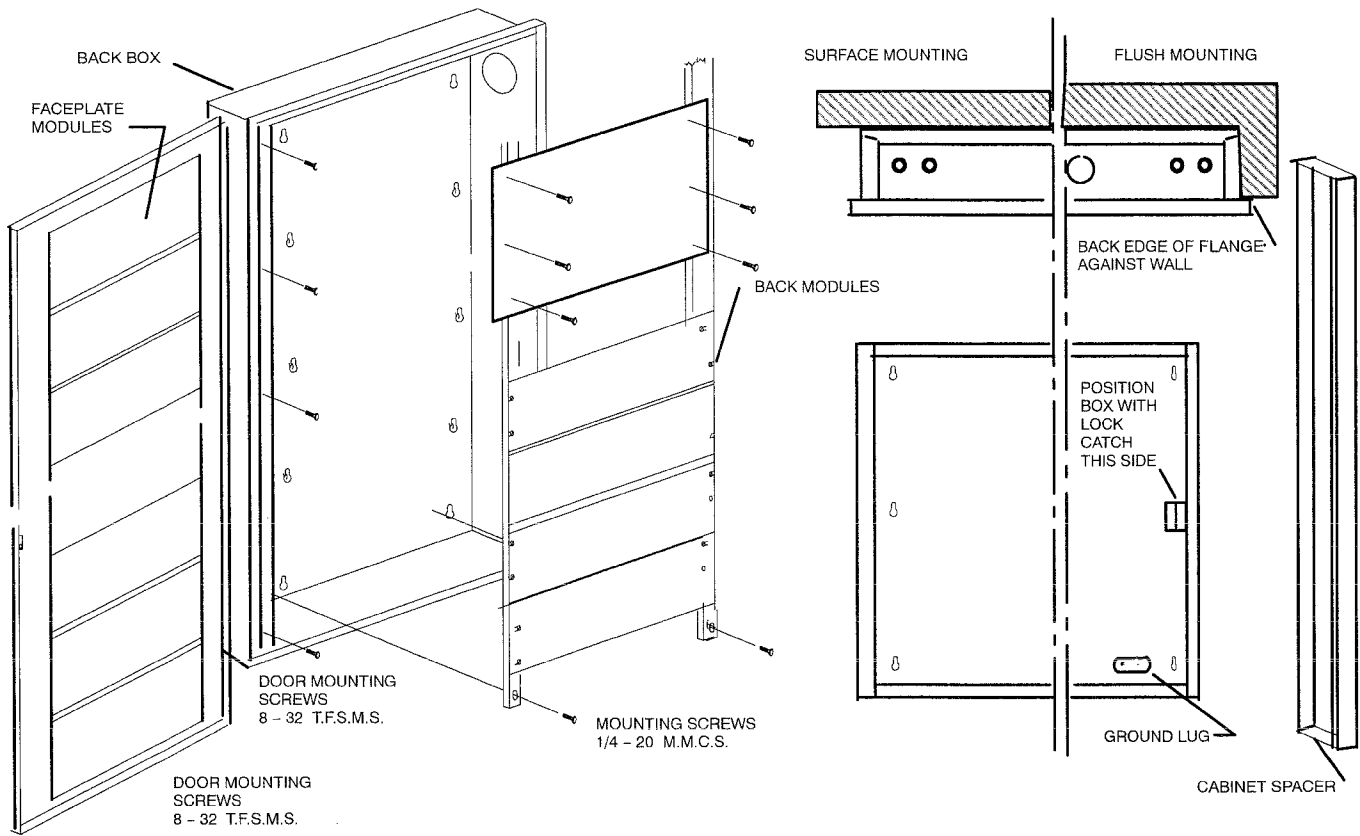
Figure 3. Cabinet dimensions and configurations.
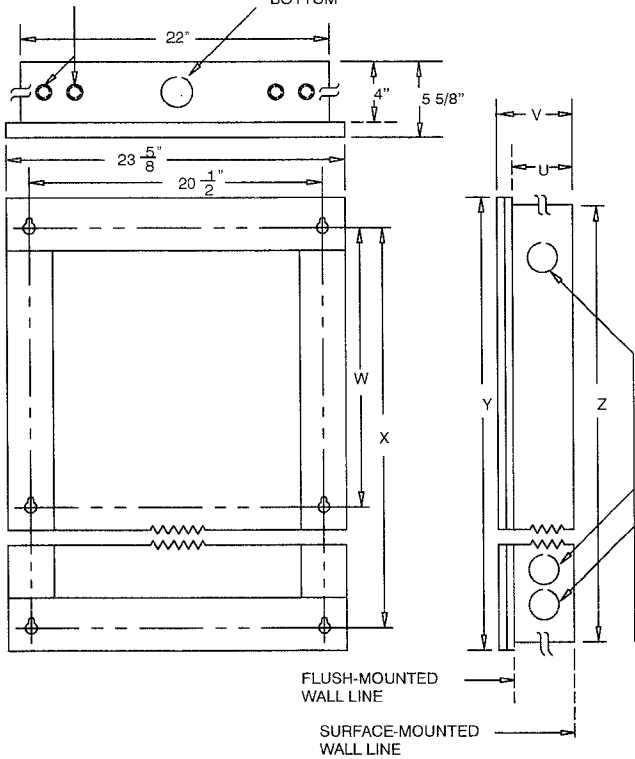
Control Unit Cabinet Dimensions

On larger systems, where more than one cabinet is required, cabinets are mounted side by side.

NO. OF MODULES	DEPTH	U	V	W	X	Y	Z
3	Standard	4"	5 9/16"	–	19"	23 1/8"	22"
5	Standard	4"	5 9/16"	–	29 1/2"	33 5/8"	32 1/2"
7	Standard	4"	5 9/16"	20"	40"	44 1/8"	43"
5	Deep	6"	7 9/16"	–	29 1/2"	33 5/8'	33 1/2'"
7	Deep	6"	7 9/16"	20"	40"	44 1/8"	43"

Grinnell
FIRE PROTECTION SYSTEMS COMPANY

AUTOCALL®
FCM Fire Control Module
Assembly No. 976127
PCB 900963

Publication Number 19700360
Issue 3, January 1997

The FCM Fire Control module assembly (with MPIM) is used in the Autocall TFX–500M/800M fire control system, to provide system alarm, trouble, and supervisory annunciation (System Condition LEDs); internal buzzer; and touch-buttons for silence, reset, drill, and lamp test functions. Silence, reset, and drill functions are enabled by two-position keyswitch.

The FCM is driven from the Autocall TFX-500M/800M control panel via the Main Processor Local Bus and an MPIM module. For system programming, refer to *TFX-500/800 CONSYS® Programming Guide,* Publication No. 850463.

Operation
1. Fire ALARM—Two red FIRE LEDs ON. An initiating device (smoke detector or other device) has detected a FIRE ALARM condition.
2. Trouble—Yellow TROUBLE LED ON. There is a trouble condition at one or more of the system devices, or with some other part of the system.
3. Supervisory—Yellow SUPERVISORY LED ON. A sprinkler system supervisory device has been activated.
4. System Power—Green LED is ON. Normal condition; indicates system power is on.
5. Panel Silence—Press the PANEL SILENCE touch-button to turn off panel buzzer.
6. Alarm Silence—Insert key in keyswitch, turn to ENABLE position, press ALARM SILENCE touch-button. System silenceable signalling devices will be silenced. Alarm Silence LED turns ON.
7. System Reset—After Alarm Silence and while the keyswitch is in the ENABLE position, press SYSTEM RESET touch-button. *Only authorized personnel may RESET the fire alarm panel.*
8. Drill—Turn keyswitch to ENABLE, press the DRILL touch-button. System signalling devices will activate.
9. Lamp Test—Press LAMP TEST touch button to turn on FCM LEDs and sound the buzzer

Module Position: _____
(See System Layout)
   1-1/2 19.5-inch door positions
Input Voltage: +5 VDC, +12 VDC
Current Draw: Standby, 10 mA; Alarm 10 mA without MPIM
   (Standby, 29 mA; Alarm 34 mA including MPIM)
Dimensions *(wld):* Assembly (with MPIM) 9 × 5.25 × 1.75 inches
   Display, 5.9 × 5.25 × 0.75 inches
   Board: 8 × 5 × 1.1 inches

Table 1.   FCM LED Indicators

Function	Color	Normal Condition	Operation
Power	Green	ON	ON continuously when power is on.
System Fire Alarm	Red	OFF	ON indicates that an initiating device has detected a Fire Alarm condition.
System Trouble	Yellow	OFF	ON indicates there is a trouble condition at one or more of the system devices or with some other part of the system.
System Supervisory	Yellow	OFF	ON indicates a sprinkler system supervisory device has been activated.
Alarm Silence	Yellow	OFF	ON indicates system annunciating devices have been Silenced.

Table 2.   FCM Touch-button Switches

Touch Button	Function	Operation
Panel Silence	Turns OFF Buzzer	Push Panel Silence touch-button.
Alarm Silence	Turns OFF System Annunciating Devices	Insert key in keyswitch, turn to Enable. Push Alarm Silence touch-button.
System Reset	Restores system to Normal operating condition	Insert key in keyswitch, turn to Enable, Silence alarms. Press System Reset touch-button.
Drill	Turns ON system annunciating devices	Insert key in keyswitch, turn to Enable. Push Drill touch-button.
Lamp Test	Turns ON LEDs for this panel	Press Lamp Test touch-button.
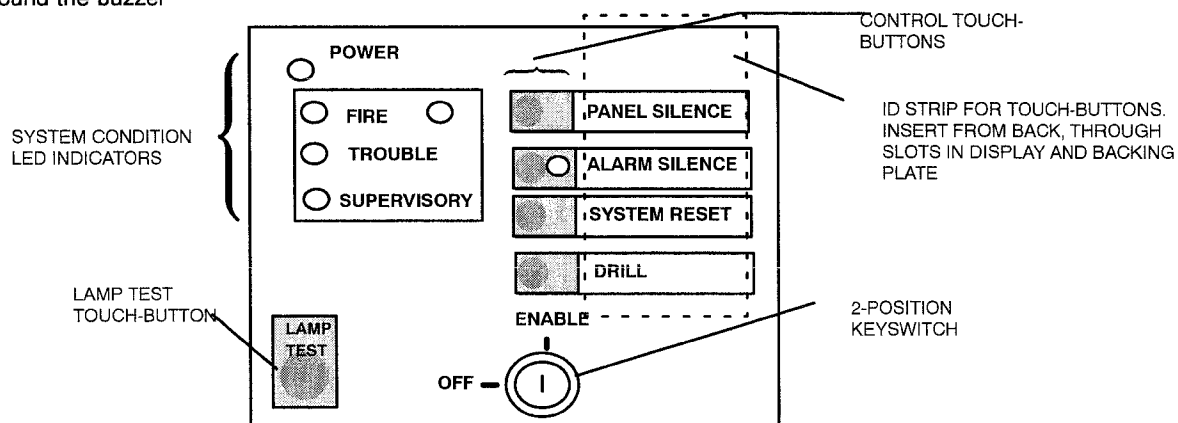
Figure 1.   FCM Fire Control Module.
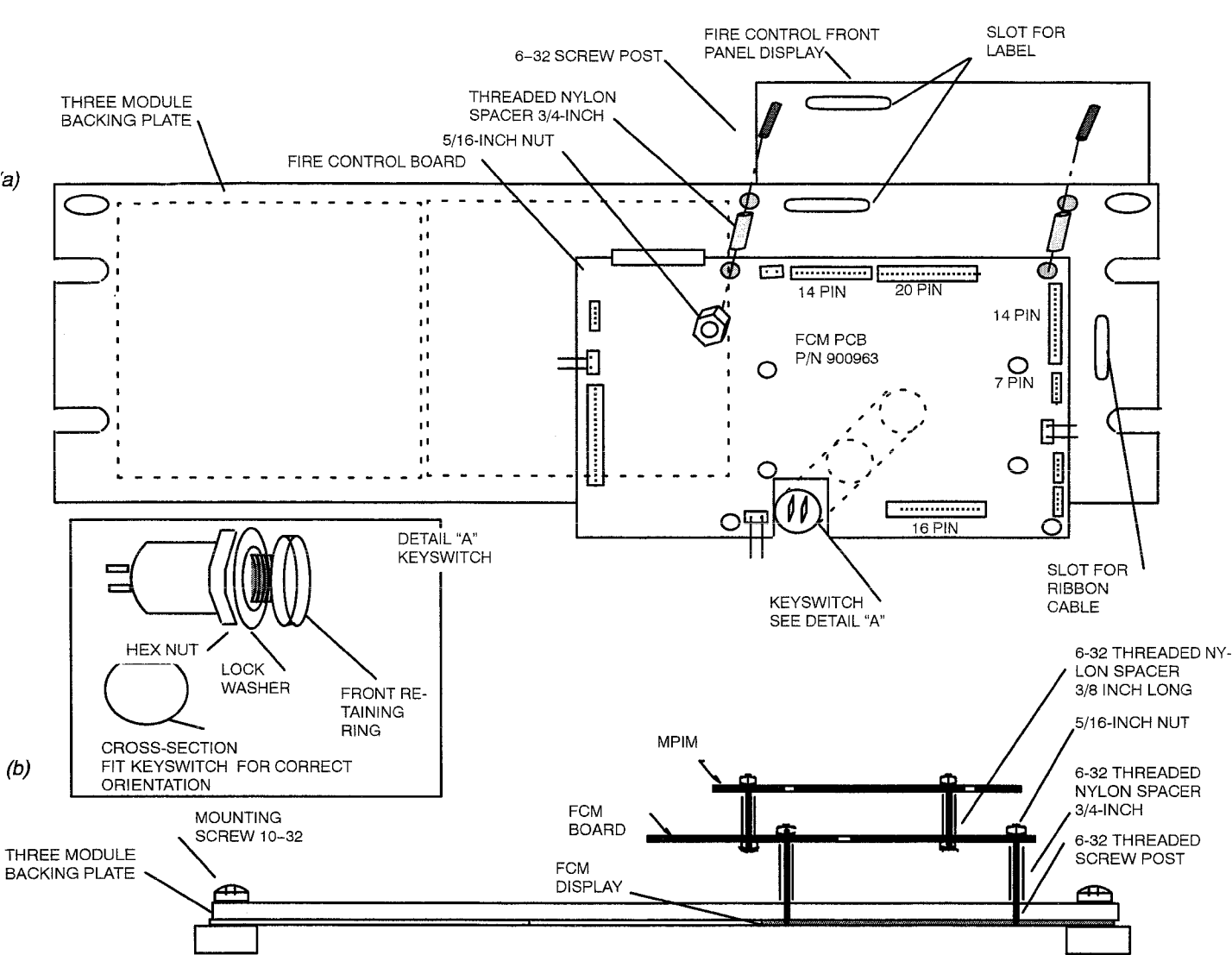
Figure 2. FCM Fire Control Module. (a) Back view with mounting plate, (b) Side view mounting installation.

Installation:

1. Mount Fire Control Display to the 19.5-inch Three Module Backing Panel:
   a. Install the Display panel to the front of the three-module backing panel so that the holes for keyswitch and LEDs are aligned correctly, the mounting screw posts extend through the holes in the backing plate, and the ribbon cable fits through its slot in the backing plate.
   b. Insert the ID strip for the front touch-buttons. Insert the strip into the slot in the back of the mounting plate and front display. Make sure that the correct label aligns with each touch-button.
   c. On the FCM board, remove keyswitch retaining ring from the keyswitch and insert the keyswitch through the hole in the three-module backing panel and the display. Make sure to orient the keyswitch correctly (flat sides of switch an hole together).

   d. Screw two plastic spacers to each of the mounting screws extending from the display panel through the backing plate.
   e. Install the retaining ring on the keyswitch.
2. Mount FCM board to display panel screw posts, above the plastic spacers.
3. Connect 7-conductor ribbon cable from display to FCM board connector PL13.
4. Mount MPIM piggy-back to the FCM board using screws and plastic standoffs.
5. Connect the keyswitch to the MPIM keyswitch terminals.
6. Connect the ribbon cables and make other wiring connections.
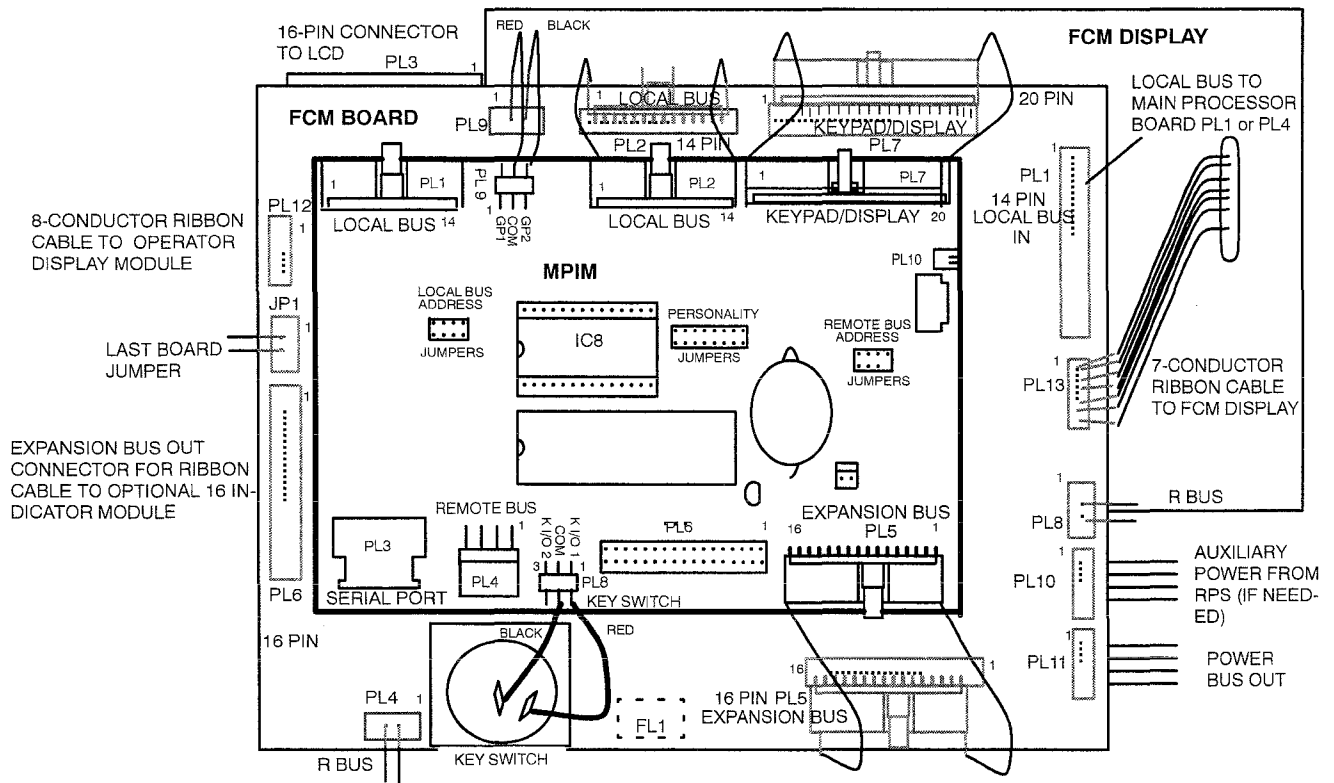
Figure 3. FCM Fire Control Module. All circuits and connections are power limited/Class2.

Wiring Notes:

1. All conductors must be free of grounds.
2. Disconnect power before servicing systems.
3. All wiring to conform to current National Electrical Code, NFPA 70, state, and local building code requirements and applicable notes. All circuits contained in this module are classified as power limited/Class 2 and shall be installed to comply with N.E.C. Article 760, Part A and Part C.
4. FCM Display connection: 7-conductor ribbon cable from FCM Display connects to FCM board PL13 (7-pin).
5. Keyswitch connections: Keyswitch red lead connects to MPIM PL8 Terminal 1; black lead connects to Terminal 2.
6. FCM board connections:
   a. PL2, Local Bus (14-pin) to MPIM PL2 Local Bus.
   b. PL1, Local Bus (14-pin) connects to Main Processor Board PL1 or PL4.
   c. PL9, (3-pin) to MPIM PL9. Terminals—2 and 3
   d. PL7, Keypad/Display (20-pin) to MPIM PL7 Keypad/Display.
   e. PL13, Display (7-pin) connects to FCM display ribbon cable.
   f. PL-4 and PL8, Remote Bus pass-through (2-pin) connects to Remote Bus.
   g. PL10 and PL11, Power Bus IN/OUT (4-pin) connect to auxilary +5 VDC.
   h. PL5, Expansion Bus (16-pin) connects to MPIM Expansion Bus PL5.
   i. PL6, Expansion Bus (16-pin), to 16-Indicator Module PL6 Expansion Bus (16-pin).
   j. JP1 Header (2-pin)—Install jumper if this is last board on Expansion Bus.
   k. PL12, Operator Touch-pad (8-pin) to Operator Display Module 8-conductor ribbon cable.

Table 3. Connections to FCM.

FCM	Description	Function	Connects to
PL1	14 Pin	Local Bus	Main Processor PL1 or PL4 Local Bus
PL2	14 Pin	Local Bus	MPIM Local Bus PL2 (or PL1)
PL3	16 Pin	LCD	LCD
PL4	PL4-1 PL4-2	(+) Remote Bus (−)	Remote Bus
PL5	16 Pin	Expansion Bus IN	Expansion Bus
PL6	16 Pin	Expansion Bus OUT	Expansion Bus
PL7	20 Pin	Keypad/Display	Touch-pad/Display
PL8	PL8-1 PL8-2	(+) Remote Bus (−)	Remote Bus
PL9	PL9-1 PL9-2 PL9-3	Not used Lamp Test (−) Lamp Test (+)	MPIM G.P. I/P 1, programmed for "Lamp Test Button"
PL10	PL10-1 PL10-2 PL10-3 PL10-4	DCC +5 VDC +5 VDC DCC	Power Bus IN (Not necessary for systems using fewer than 10 MPIM modules.)
PL11	PL11-1 PL11-2 PL11-3 PL11-4	DCC +5 VDC +5 VDC DCC	Power Bus OUT
PL12	8 Pin	Operator Display	Operator Display Module
PL13	7 Pin	FCM Display	7 conductor ribbon cable from FCM display
JP1	JP1-1–2	Last Board Jumper	Install jumper if last board on Expansion Bus

Programming Notes

Using CONSYS® program the MPIM for FCM operation. **You will need to make several changes to the default TFX operating program.**

⚠️ **BE SURE TO TEST ALL PROGRAM CHANGES DURING SYSTEM COMMISSIONING!**

1. Add User-Defined Output Group "Fire Alarm Silenced." See Figure 4.
   a. Select "Groups" menu option.
   b. At the "Groups: screen, select "Add User Group."
   c. At the "Add Group" screen, move the cursor to "Type." Press the F2 key to select "OUTPUT USER DEFINED." Press Return.
      i. The "Valid Number Range will show the group numbers that are appropriate for the group you are adding.
      ii. A "New Short Code" with the next available number will be assigned to the group you are adding. You may change this number as long as it is within the "Valid Number Range."
      iii. Move the cursor to the "Name" position. Name the group "FIRE ALARM SILENCED."
      iv. Select the ADD box to add the group.
      v. Press F5 to save the new group. Return to the "Group" menu screen.

2. Edit Event Action Group EA264, "Silence (points in alarm)" group (See Figure 5) as follows:
   a. Select the "Groups" menu option.
   b. Select "Edit Group Data."
      i. At the "Group Type List" menu select "Event Action." Move the cursor to group EA264 "Silence (points in alarm). Press RETURN.
      ii. At the Group Definition screen for group EA264, move the cursor to the "Number of Associated Actions." Change the number from "1" to "2."
      iii. Select the "EDIT ACTION" box. Move the the second associated action.
   c. Add a new "Associated Action" as follows:

   i. At "Action Type," press F2 to select "Command (to points). Press Return.
   ii. "Action Enable" will be "AFTER Delay/Coincidence Reached"
   iii. "Force Broadcast" (if available) will be "Disabled."
   iv. "Active Edge" will be "Rising Edge."
   v. Rising Edge Action" Will be "Switch On."
   vi. Falling Edge Action" will be "No Action Taken."
   vii. "Target/Group Short Code" will be OU*nnn* "FIRE ALARM SILENCED," the new user defined output group." To select this group type "OU" in the "Target/Group Short Code" position, then select the new group from the menu of user defined output groups.
   viii. "Target Area Type" must be "ZONE." Press F2 to see a menu of target area types; select "Zone."
   ix. Target Area" must be set to "0." Either type "0" or press F2 for a menu from which you select "0."
   d. Save the new action and definition for group EA264.

3. Edit Event Action Group EA014, "Alarm O/P Control" group (See Figure 6) as follows:
   a. Select the "Groups" menu option.
   b. Select "Edit Group Data."
      i. At the "Group Type List" menu select "Event Action." Move the cursor to group EA014, "Alarm O/P Control". Press RETURN.
      ii. At the Group Definition screen for group EA014, move the cursor to the "Number of Associated Actions." Change the number from "11" to "12."
      iii. Select the "EDIT ACTION" box. Move the the twelfth associated action.
   c. Add a new "Associated Action" as follows:
      i. At "Action Type," press F2 to select "Command (to points). Press Return.
      ii. "Action Enable" will be "AFTER Delay/Coincidence Reached"
      iii. "Force Broadcast" (if available) will be "Disabled."
      iv. "Active Edge" will be "Rising Edge."
      v. Rising Edge Action" Will be "Switch Off."
      vi. Falling Edge Action" will be "No Action Taken."
      vii. "Target/Group Short Code" will be OU*nnn* "FIRE ALARM SILENCED," the new user defined output group." To select this group type "OU" in the "Target/

Figure 4. Adding User Defined Group for "Fire Alarm Silenced" output.

Project : Untitled (-)   16:17

File   [Edit]   ...   ...tie

System Type	Edit Group Data
Network	Add User Group
Edit Zones	Remove User Group
Addressable Loop	
LBus	
RBus	
Digital I/O	
Events	
Bell Map	
[Groups]	
System Users	
System Options	
Programmable Timers	
Pulsing Patterns	
Reset Time	
Ground Fault	
Power Fialure Sig. Delay	
Sensitivity Switching	

Choose Required Group
Input Normal
Output Normal
Input Special
Output Special
Input User Defined
Output User Defined
Event Action
Super Group
All Groups

Choose Required Group

EA...   EA...
EA...   EA264 Silence
         (points in alarm)

Group Definition
Original Group Name: EA264 Silence (points in alarm)

Group Name:	EA264 Silence (points in alarm)
Group Scope	Local/Network
Group Activiation:	Immediate
Delay Time/Coincidence Level:	
Group Deactivation:	
Trigger Type:	All events
Group Status on Powerup/Reset:	Enabled
Point Status on Powerup/Reset:	Armed
Number of Associated Actions:	2

Change Number of Associated Acions from "1" to "2."

Action Definition
Associated Action: 2

Edit Second Associated Action.

EDIT ACTION

Action Type:	Command (to points)
Action Enable:	AFTER Delay/Coincidence Reached
Forced Broadcast	Disabled/Enabled
Active Edge:	Rising Edge
Rising Edge Action:	Switch On
Falling Edge Action:	No Action Taken
Target/Group Short Code:	OUnnn Fire Alarm Silenced
Target Area Type:	Zone
Target Area:	0

[CANCEL]   [END EDIT]   [NEXT ACTION]

Figure 5.   Editing EA264 "Silence (points in alarm) for additional associated action Output OUnnn Fire Alarm Silenced.

Group Definition
Original Group Name: EA014 Silence (points in alarm)

Choose Required Group

EA...   EA...
EA...   EA014 Alarm O/P
         Control

Group Name:	EA014 Alarm O/P Control
Group Scope	Local/Network
Group Activiation:	Immediate
Delay Time/Coincidence Level:	
Group Deactivation:	
Trigger Type:	All events
Group Status on Powerup/Reset:	Enabled
Point Status on Powerup/Reset:	Armed
Number of Associated Actions:	12

Change Number of Associated Acions from "11" to "12."

Action Definition
Associated Action: 12

Edit Twelfth Associated Action.

EDIT ACTION

Action Type:	Command (to points)
Action Enable:	AFTER Delay/Coincidence Reached
Forced Broadcast	Disabled/Enabled
Active Edge:	Rising Edge
Rising Edge Action:	Switch Off
Falling Edge Action:	No Action Taken
Target/Group Short Code:	OUnnn Fire Alarm Silenced
Target Area Type:	Zone
Target Area:	0

[CANCEL]   [END EDIT]   [NEXT ACTION]

Figure 6.   Editing EA014 "Alarm O/P Control for addition of associated action to turn off OUnnn Fire Alarm Silenced..

Group Short Code" position, then select the new group from the menu of user defined output groups.

    viii. "Target Area Type" must be "ZONE." Press F2 to see a menu of target area types; select "Zone."

    ix. Target Area" must be set to "0." Either type "0" or press F2 for a menu from which you select "0."

  d. Save the new action and definition for group EA014.

1. **(For TFX-500M ONLY)** Edit the MPIM Local Bus, address 00, personality = OIB for operation with the FCM as follows:

  a. Select the "Digital I/O" menu option. (See Figure 7.)

  b. At the "Choose address with required Digital I/O" screen, select "LBus 00 - OIB."

  c. At the "Digital Inputs/Outputs" screen, program:

    i. Program "General Purpose Input 1" for device type "I/P (Norm. Hi)," special input group IS010 "Lamp Test Button." (See Figure 7.) To do this, move the cursor to "General I/P 1." Press Return. At the "Digital Inputs/Outputs" screen program:

"Device Type,"	"I/P (Norm. Hi)
"Device Opteration,"	"No debounce"
"Group/Short Code,"	"IS010 Lamp Test Button"
"Zone/Sector":	"0"
"Norm->Act Event"	INPUT ACTIVE (not log'd)
"Act->Norm Event	CLEAR (non logging)

    ii. Re-Program the "Test Key" (See Figure 7) as follows:

"Device Type,"	"I/P (Norm. Lo)
"Device Opteration,"	"No debounce"
"Group/Short Code,"	"IS099 Buzzer Silence I/P."
Zone/Sector":	"0"
"Norm->Act Event"	INPUT ACTIVE (not log'd)
"Act->Norm Event	CLEAR (non logging)

  d. For TFX-500 "Zonal Display," program Expansion Bus I/O. See Figure 8.

    i. At the "Digital Inputs/Outputs" screen, select "Expansion Bus."

    ii. At the "Digital I/O" screen, If 16 Indicator Module is installed: remove "interleaved" Zonal Alarm Display from point #9 and point #17. Next, program "Zonal Alarm Display" at point #1 (non-interleaved):

"Device Type,"	"Zonal Alarm Display"
"Device Opteration,"	"Visual Indicator"
"Group/Short Code,"	OS191 "Zonal Alarm Display"
"Number of Outputs"	16
"First I/P Displayed"	1

and program "Zonal Trouble Display" at point #17 (non-interleaved):

"Device Type,"	"Zonal Trouble Display"
"Device Opteration,"	"Visual Indicator"
"Group/Short Code,"	OS223 "Zonal Trouble Display"
"Number of Outputs"	16
"First I/P Displayed"	1

  e. Program Expansion Bus point #81 for "Fire Alarm Silenced" as follows:

    i. At the "Digital Inputs/Outputs" screen select "Expansion Bus." At the "Digital I/O" screen, select "Point 81."

"Device Type,"	"O/P (Norm. Off)
"Device Opteration,"	"Visual Indicator"
"Group/Short Code,"	"OU*nnn* "Fire Alarm Silenced" (User Defined group)
"Zone/Sector":	"0"
"Number of Outputs"	"1"

```
Project : Untitled ( - )                    16:17   7/4/91

File   Edit    Transfer   Options   Print   Utilities

System Type
Network
Edit Zones
Addressable Loo                        Choose address with required
LBus                                          Digital I/O
RBus
Digital I/O                            CPU 00 - MPM
Events                                 LBus 00 - OIB
Bell Map                               RBus 00 - XBB
Groups
System Users
System Options
Programmable Timers
Pulsing Patterns                Digital Inputs/Outputs
Reset Time
Ground Fault           LBus:  00                          OIB - Operator I/F
Power Failure Sig. Delay
Sensitivity Switching
                        ✓  General I/P 1        ✓  Supervisory LED
                           General I/P 2        ✓  Buzzer
                           Tamper I/P           ✓  Fire Drill Key
                        ✓  RS232 ONline Det.    ✓  Silence Key
                        ✓  Key I/P 1            ✓  Reset Key
                        ✓  Key I/P 2            ✓  Test Key
                        ✓  Alarm LED            ✓  Expansion Fault
                        ✓  Trouble LED          ✓  Expansion Bus


                                            Digital I/O
                                            General I/P 1

                                      Device Type:           I/P (Norm. Lo)
                                      Device Operation:      No debounce
                                      Group/Short Code:      IS099 Buzzer Silence I/P
                                      Zone/Sector:           0

             Choose item from list    Number of Outputs:
    Device Type:                      First I/P Displayed:

    Not Attached                      Norm   Act Event:      INPUT Active (not log'd)
    I/P (Norm. Lo)                    Act    Norm Event:     CLEAR (non logging)
    I/P (Norm Hi)
    Sector I/P (Norm. Lo)
    Sector I/P (Norm. Hi)
                                            Digital I/O
                                            General I/P 1

                                   Device Type:           I/P (Norm. Hi)
                                   Device Operation:      No debounce
                                   Group/Short Code:      IS010 Lamp Test Button
                                   Zone/Sector:           0

                                   Number of Outputs:
                                   First I/P Displayed:

                                   Norm   Act Event:      INPUT Active (not log'd)
                                   Act    Norm Event:     CLEAR (non logging)
```

Figure 7.   Editing Digital I/O Inputs/Outputs for (1) General I/P 1 input, (2) Changes to Test Key operation.

Choose address with required
Digital I/O

CPU 00 - MPM
LBus 00 - OIB
RBus 00 - XBB

Project : Untitled (-)

File   Edit   Transfer

System Type
Network
Edit Zones
Addressable Loop
LBus
RBus
Digital I/O
Events
Bell Map
Groups
System Users
System Options
Programmable Timers
Pulsing Patterns
Reset Time
Ground Fault
Power Failure
Sensitivity Swit

LBus: 00   OIB - Operator I/F

   ✔ General I/P 1   ✔ Supervisory LED
     General I/P 2   ✔ Buzzer
     Tamper I/P   ✔ Fire Drill Key
   ✔ RS232 ONline Det.   ✔ Silence Key
   ✔ Key I/P 1   ✔ Reset Key
   ✔ Key I/P 2   ✔ Test Key
   ✔ Alarm LED   ✔ Expansion Fault
   ✔ Trouble LED   ✔ Expansion Bus

                    Digital I/O   Point: 9
   Expansion Bus

Device Type: Zonal Display
Device Operation: Visual Indicator
Group/Short Code: OS191 Zonal Alarm
Zone/Sector: All

Number of Outputs: 16
First I/P Displayed: 1

Norm   Act Event:
Act   Norm Event:

Note: Change TFX-500 16 Indicator
Module Display:
Point 9   Not Attached
Point 17   Not Attached
Point 1   Zonal Alarm Display
Point 17   Zonal Trouble Display

Not Attached   Remote Zonal Display
I/P (Norm. Lo)   Sector Display
I/P (Norm Hi)   Loop A Display
Sector I/P (Norm Lo)   ⇓
Sector I/P (Norm Hi)   Loop K Display
O/P (Norm Off)   L Bus Display
O/P (Norm. On)   R Bus Display
Zonal Display

                  Expansion Bus

Device: Zonal Display   Point: 9

_   -   -   -   -   -   -   -
A   -   A   -   A   -   A   -
T   -   T   -   T   -   T   -
A   -   A   -   A   -   A   -
T   -   T   -   T   -   T   -
A   -   A   -   A   -   A   -
T   -   T   -   T   -   T   -
A   -   A   -   A   -   A   -
T   -   T   -   T   -   T   -
_   -   -   -   -   -   -   -

Note: Press F10 for Expansion
Bus Map. Change 16 Indicator
Module from "interleaved" alarm
and trouble display to
"non-interleaved" display pattern.

                  Expansion Bus

Device: Zonal Display   Point: 1

A   A   A   A   A   A   A   A
A   A   A   A   A   A   A   A
T   T   T   T   T   T   T   T
T   T   T   T   T   T   T   T
-   -   -   -   -   -   -   -
-   -   -   -   -   -   -   -
-   -   -   -   -   -   -   -
-   -   -   -   -   -   -   -
-   -   -   -   -   -   -   -
-   -   -   -   -   -   -   -
O   -   -   -   -   -   -   -

Note: Program Point 81 for
Output (Norm. Off), Visual
Indicator, OUnnn Fire Alarm
Silenced"

Map Key:

Zonal Display/Sector Display
     A = Alarm
     T = Trouble
     D = Isolate
     Z = Other
Point Display
     a = Alarm
     t = Trouble
     d = Isolate
     p = Other
Single Input Point
     I = Input Point
Single Output Point
     O = Output Point

Figure 8.   Editing Expansion Bus of LBus 00 OIB for FCM operation. (1) for 16 Indicator Module, change display
from interleaved to non-interleaved; (2) Program Point 81 for Fire Alarm Silenced indicator.

5. **(For TFX-800M ONLY)** Edit the Local Bus and Remote Bus for operation with the FCM as follows:

  a. Select "LBus" menu option. Select Address "01." Change "Board Personality" from "XBB" to "No board. (that is, remove LB-01).

  b. Select "RBus" menu option. At Address "00," select "XBB" for "Board Personality."

  c. Select the "Digital I/O" menu option. (See Figure 9.)

  d. At the "Choose address with required Digital I/O" screen, select "LBus 00 - OIB."

  e. At the "Digital Inputs/Outputs" screen, program the following for LBus 00 – OIB:

    i. Program "General Purpose Input 1" for device type "I/P (Norm. Hi)," special input group IS010 "Lamp Test Button." (See Figure 9.) To do this, move the cursor to "General I/P 1." Press Return. At the "Digital Inputs/Outputs" screen program:

"Device Type,"	"I/P (Norm. Hi)
"Device Opteration,"	"No debounce"
"Group/Short Code,"	"IS010 Lamp Test Button"
"Zone/Sector":	"0"
"Norm->Act Event"	INPUT ACTIVE (not log'd)
"Act->Norm Event	CLEAR (non logging)

    ii. Re-Program the "Test Key" (See Figure 9) as follows:

"Device Type,"	"I/P (Norm. Lo)
"Device Opteration,"	"No debounce"
"Group/Short Code,"	"IS099 Buzzer Silence I/P."
Zone/Sector":	"0"
"Norm->Act Event"	INPUT ACTIVE (not log'd)
"Act->Norm Event	CLEAR (non logging)

    iii. At the "Digital I/O" screen, If 80 Indicator Module is installed on MPIM LB-00: program "Zonal **Trouble** Display" at point #1 (See Figure 10):

"Device Type,"	"Zonal Display"
"Device Opteration,"	"Visual Indicator"
"Group/Short Code,"	OS223 "Zonal Trouble Display"
"Number of Outputs"	80
"First I/P Displayed"	1

    iv. Program Expansion Bus point #81 for "Fire Alarm Silenced" as follows:
    At the "Digital Inputs/Outputs" screen select "Expansion Bus." At the "Digital I/O" screen, select "Point 81."

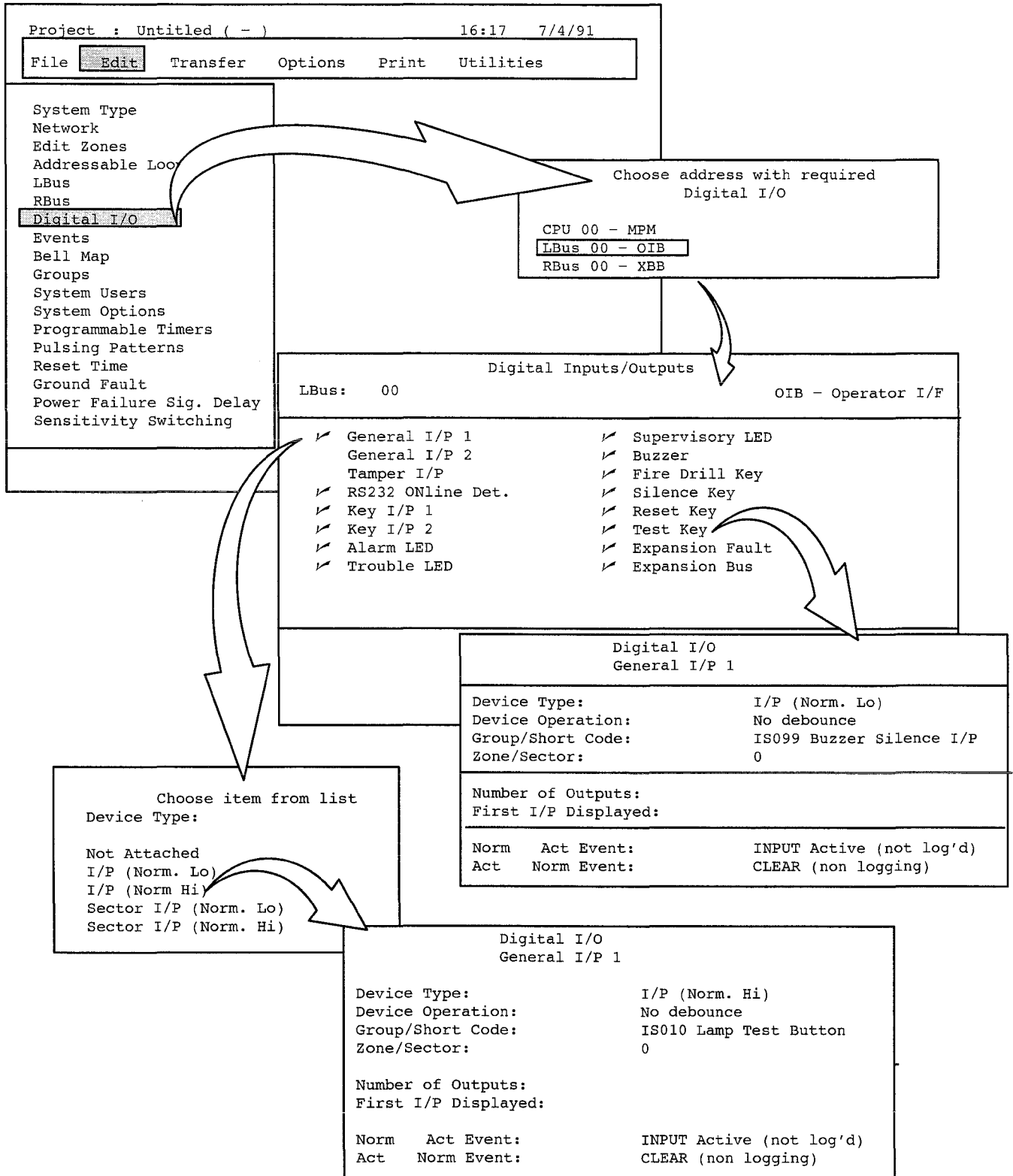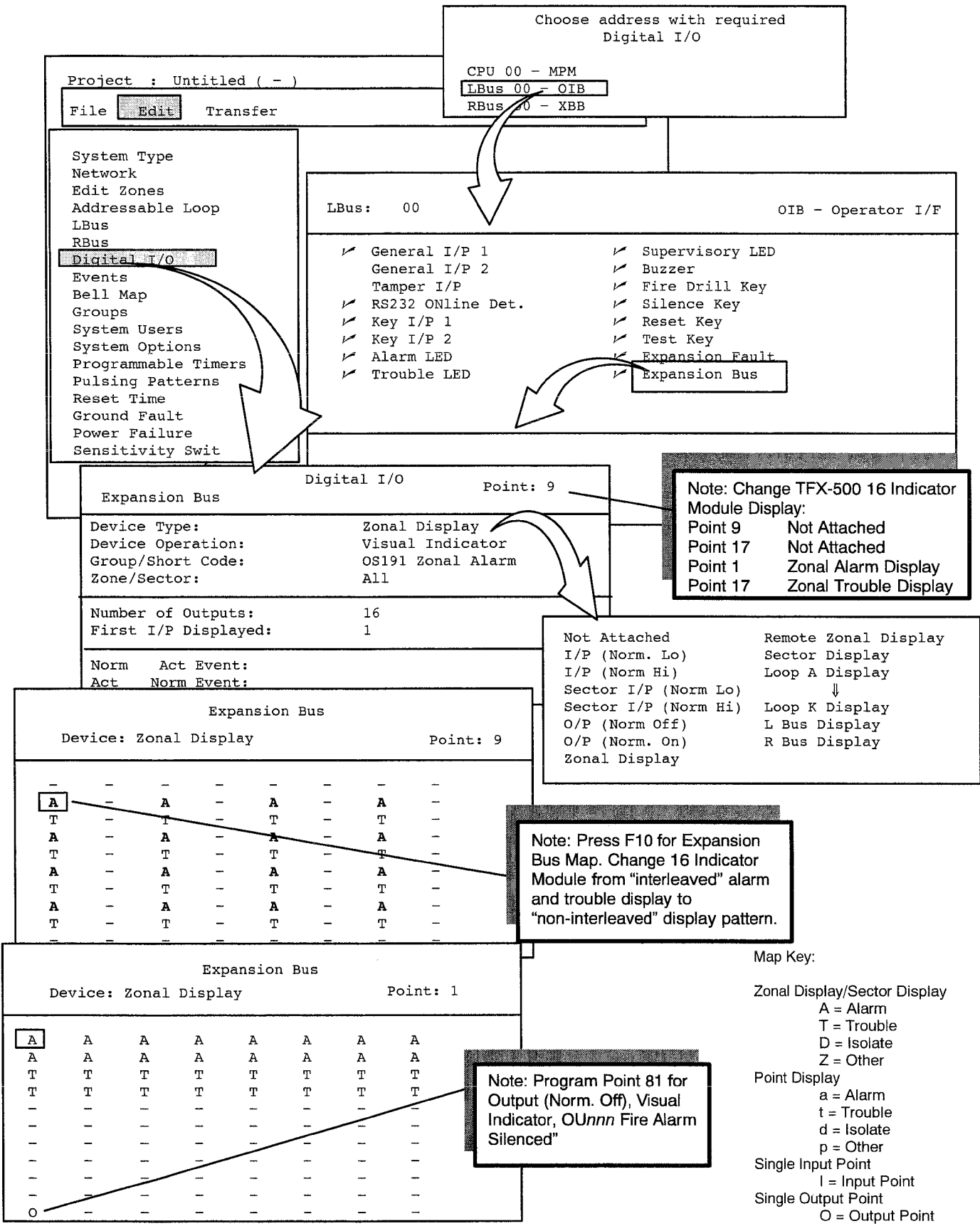|	
"Device Type,"	"O/P (Norm. Off)
"Device Opteration,"	"Visual Indicator"
"Group/Short Code,"	"OU*nnn* "Fire Alarm Silenced" (User Defined group)
"Zone/Sector":	"0"
"Number of Outputs"	"1"

  f. At the "Digital Inputs/Outputs" screen, program the following for RBus 00 – XBB with 80 Indicator Module programmed for "Zonal **Alarm** Display":
  At the "Digital I/O" screen, If 80 Indicator Module is installed on MPIM LB-00: program "Zonal **Alarm** Display" at point #1 (See Figure 10):

"Device Type,"	"Zonal Display"
"Device Opteration,"	"Visual Indicator"
"Group/Short Code,"	OS191 "Zonal Alarm Display"
"Number of Outputs"	80
"First I/P Displayed"	1

  g. Save the new Digital I/O configuration.

6. Follow the CONSYS programming manual to program the rest of the system site information. Save the program. Install the CONSYS program in the TFX panel.

Project : Untitled (-)

File Edit Transfer Opt

System Type
Network
Edit Zones
Addressable L
LBus
RBus
Digital I/O
Events
Bell Map
Groups
System Users
System Options
Programmable Timers
Pulsing Patterns
Reset Time
Ground Fault
Power Failure Sig. Delay
Sensitivity Switching

Local Bus   Addr.: 01

Board Personality: No board

Point Configuration:
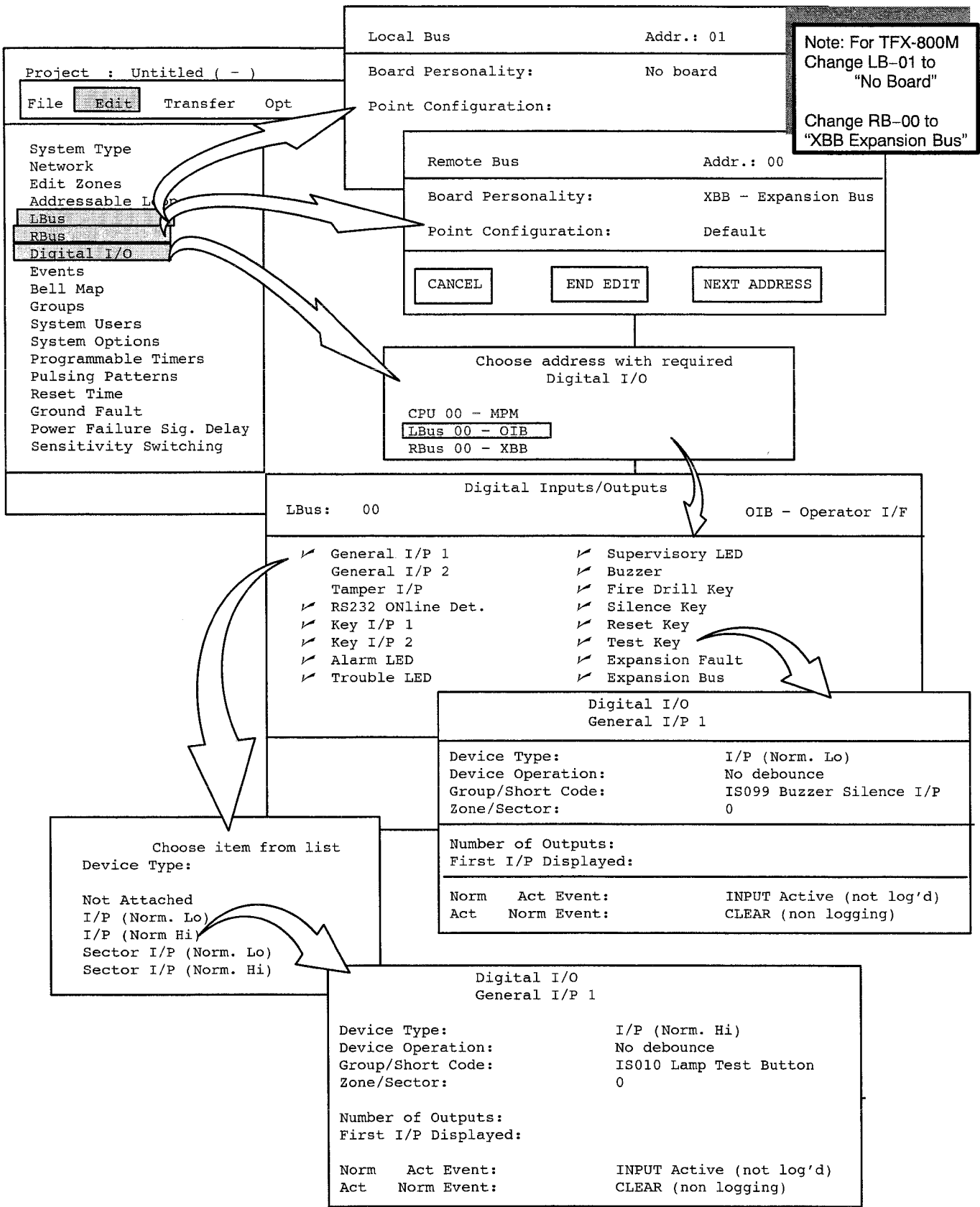
Note: For TFX-800M
Change LB-01 to
    "No Board"

Change RB-00 to
"XBB Expansion Bus"

Remote Bus   Addr.: 00

Board Personality: XBB - Expansion Bus

Point Configuration: Default

| CANCEL | END EDIT | NEXT ADDRESS |

Choose address with required
            Digital I/O

CPU 00 - MPM
LBus 00 - OIB
RBus 00 - XBB

Digital Inputs/Outputs
LBus: 00   OIB - Operator I/F

✔ General I/P 1   ✔ Supervisory LED
  General I/P 2   ✔ Buzzer
  Tamper I/P   ✔ Fire Drill Key
✔ RS232 ONline Det.   ✔ Silence Key
✔ Key I/P 1   ✔ Reset Key
✔ Key I/P 2   ✔ Test Key
✔ Alarm LED   ✔ Expansion Fault
✔ Trouble LED   ✔ Expansion Bus

Digital I/O
General I/P 1

Device Type: I/P (Norm. Lo)
Device Operation: No debounce
Group/Short Code: IS099 Buzzer Silence I/P
Zone/Sector: 0

Number of Outputs:
First I/P Displayed:

Norm Act Event: INPUT Active (not log'd)
Act   Norm Event: CLEAR (non logging)

Choose item from list
Device Type:

Not Attached
I/P (Norm. Lo)
I/P (Norm Hi)
Sector I/P (Norm. Lo)
Sector I/P (Norm. Hi)

Digital I/O
General I/P 1

Device Type: I/P (Norm. Hi)
Device Operation: No debounce
Group/Short Code: IS010 Lamp Test Button
Zone/Sector: 0

Number of Outputs:
First I/P Displayed:

Norm Act Event: INPUT Active (not log'd)
Act   Norm Event: CLEAR (non logging)

Figure 9. Editing TFX-800M LBus, RBus, and Digital I/O Inputs/Outputs for (1) General I/P 1 input, (2) Changes to Test Key operation.

Grinnell®
FIRE PROTECTION SYSTEMS COMPANY

AUTOCALL®
ODM Operator Display Module
Assembly No. 976128
LCD P/N 940506

Publication Number 19700361
Issue 2, January 1997

The ODM Operator Display module is used in the Autocall TFX–500M/800M fire control system, to provide an 80-character (4 line x 20 characters) and a touch-pad for operator interaction.

The ODM is driven from the Autocall TFX–500/800 control panel via the Fire Control Module, Assembly No. 976127.

Operation

For system operating instructions, refer to *TFX-500M/800M Operator's Manual*, Publication No. 850516.

1. The LCD display normally shows the date and time. During alarm, trouble, and supervisory conditions the LCD shows: Line 1—Condition message; Line 2—Zone message; Line 3—Point message; Line 4—Zone number, point ID, outstanding events. During user operation, the LCD shows the operation menu and system information.
2. To accept events and perform other system operations, enter your passcode on the data entry touch-buttons and press ENTER. The display will respond with a sequential operation menu. Follow the menu for the desired system operation.
3. For Fast Access to specific menu items, enter your passcode on the data entry touch-buttons and press ENTER. Press FAST ACCESS then the numeric code for the menu option you wish to access (access will be allowed depending upon your access level). See Table 3 for Fast Access Codes.
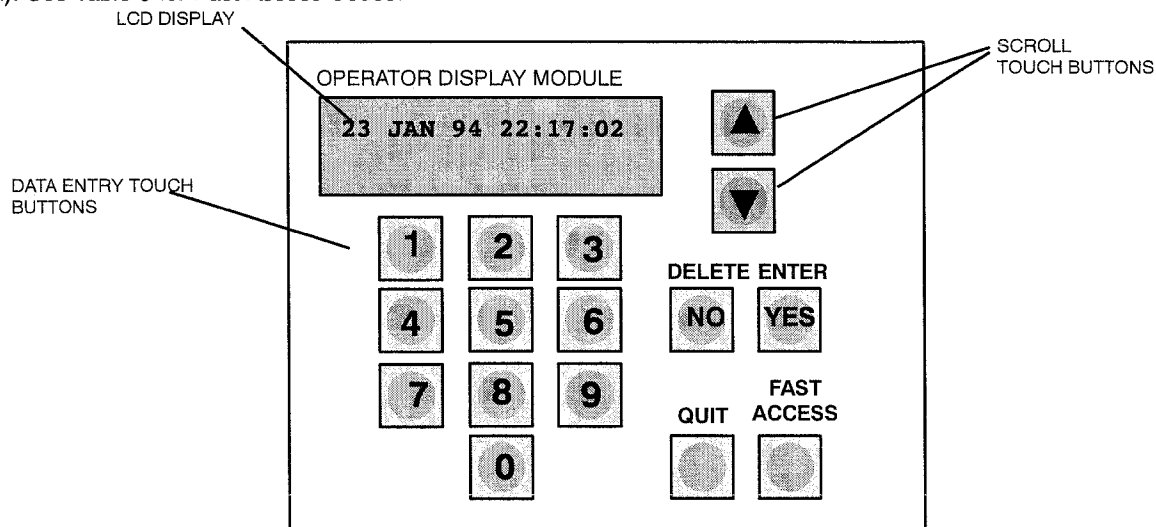
Module Position:_____
(See System Layout)
      One single-module panel of a TFX-500M/800M 19-inch door position
Input Voltage: +5 VDC, +12 VDC
Current Draw: Normal (LCD lighted) 32 mA; Alarm 32 mA

Dimensions *(wld):* Display panel: 5.9 × 5.25 × 0.75 inches
      LCD display: 3.8 × 2.4 × 0.75 inches

Table 1.   ODM Touch-Button Operation.

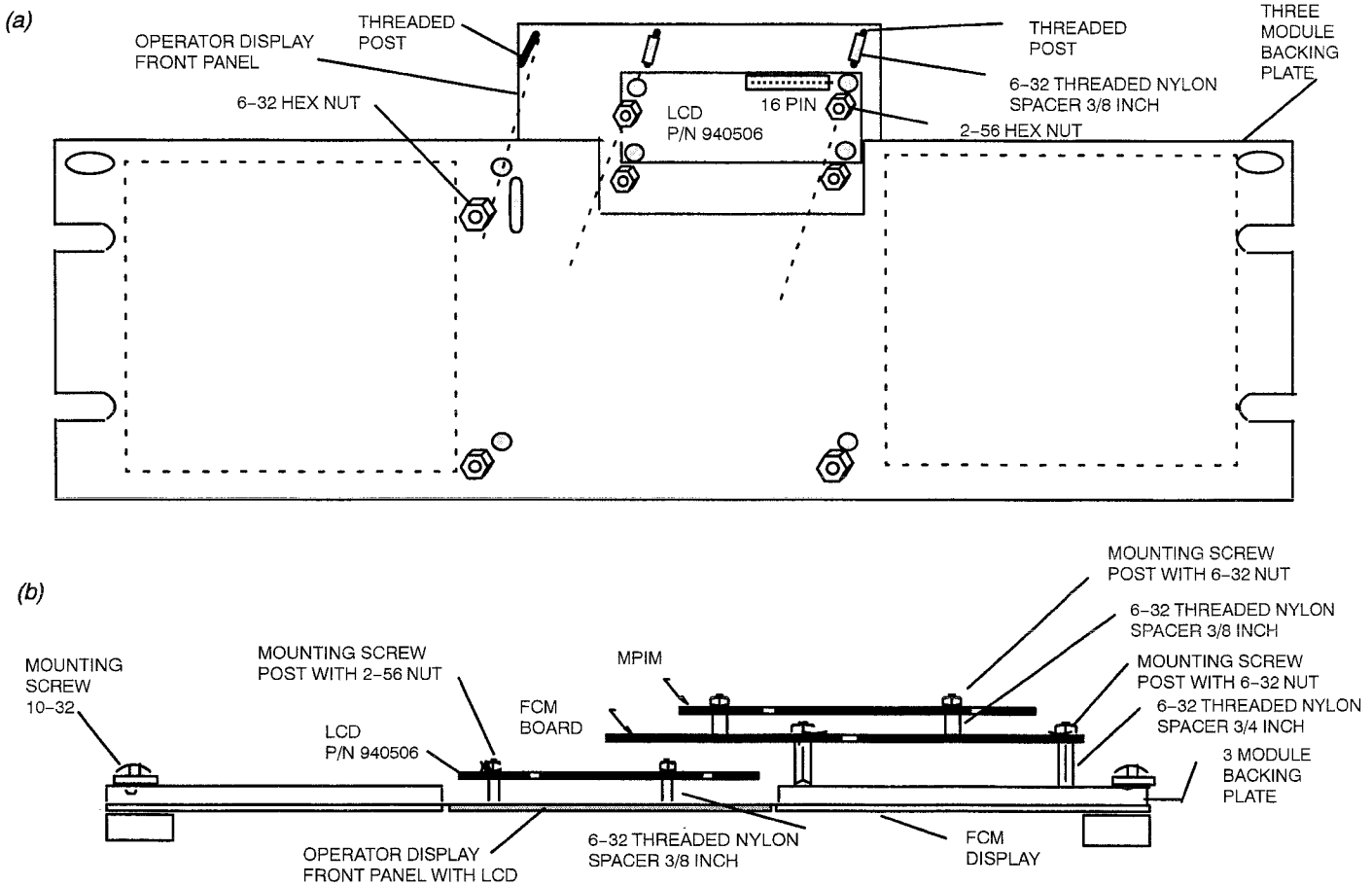| Touch Button	Operation
Scroll Down	Used to scroll downward through a display, or log one entry at a time. Auto-repeats if held down.
Scroll Up	Used to scroll upward through a display, or log one entry at a time. Auto-repeats if held down.
YES/ENTER	After you input data or numbers, YES/ENTER completes the entry and sends it to the control panel. Also a "Yes" response to questions.
NO/DELETE	After you input data or numbers, NO/DELETE erases the last entry. Also a "No" response to questions.
QUIT	Quits the current action and does not complete the command you were entering.
FAST ACCESS	Used to access a system option quickly, without using the menus. Press FAST ACCESS, enter a numeric code for the option to be accessed.
Numbers 0–9	Used to enter access codes, general data, etc.

Figure 1.   ODM Operator Display Module.

(a)

OPERATOR DISPLAY
FRONT PANEL

THREADED
POST

6-32 HEX NUT

LCD
P/N 940506   16 PIN

THREADED
POST

6-32 THREADED NYLON
SPACER 3/8 INCH

2-56 HEX NUT

THREE
MODULE
BACKING
PLATE

(b)

MOUNTING
SCREW
10-32

MOUNTING SCREW
POST WITH 2-56 NUT

LCD
P/N 940506

FCM
BOARD

MPIM

MOUNTING SCREW
POST WITH 6-32 NUT

6-32 THREADED NYLON
SPACER 3/8 INCH

MOUNTING SCREW
POST WITH 6-32 NUT

6-32 THREADED NYLON
SPACER 3/4 INCH

3 MODULE
BACKING
PLATE

OPERATOR DISPLAY
FRONT PANEL WITH LCD

6-32 THREADED NYLON
SPACER 3/8 INCH

FCM
DISPLAY

Figure 2.   ODM Operator Display Module. (a) Back view, (b) Side view with mounting plate.

Installation:

1. Mount Operator Display Module to the front of the 19.5-inch Three Module Backing Plate.
   a. Insert the 8-conductor ribbon cable through the slot in the backing plate.
   b. Fit the threaded posts through the holes in the backing plate. Install the 6-32 nuts to the threaded posts.
2. Mount the LCD to the display panel.
   a. Install the threaded nylon spacers to the four threaded screw posts at the four corners of the LCD window on the Operator Display panel.
   b. Fit the LCD board to the screw posts.
   c. Install the 2-56 nuts to secure the LCD to the display panel.
3. Install the other modules to the backing plate.
4. Connect the ribbon cables and make other wiring connections.

Table 2.   Connections to Operator Display Module.

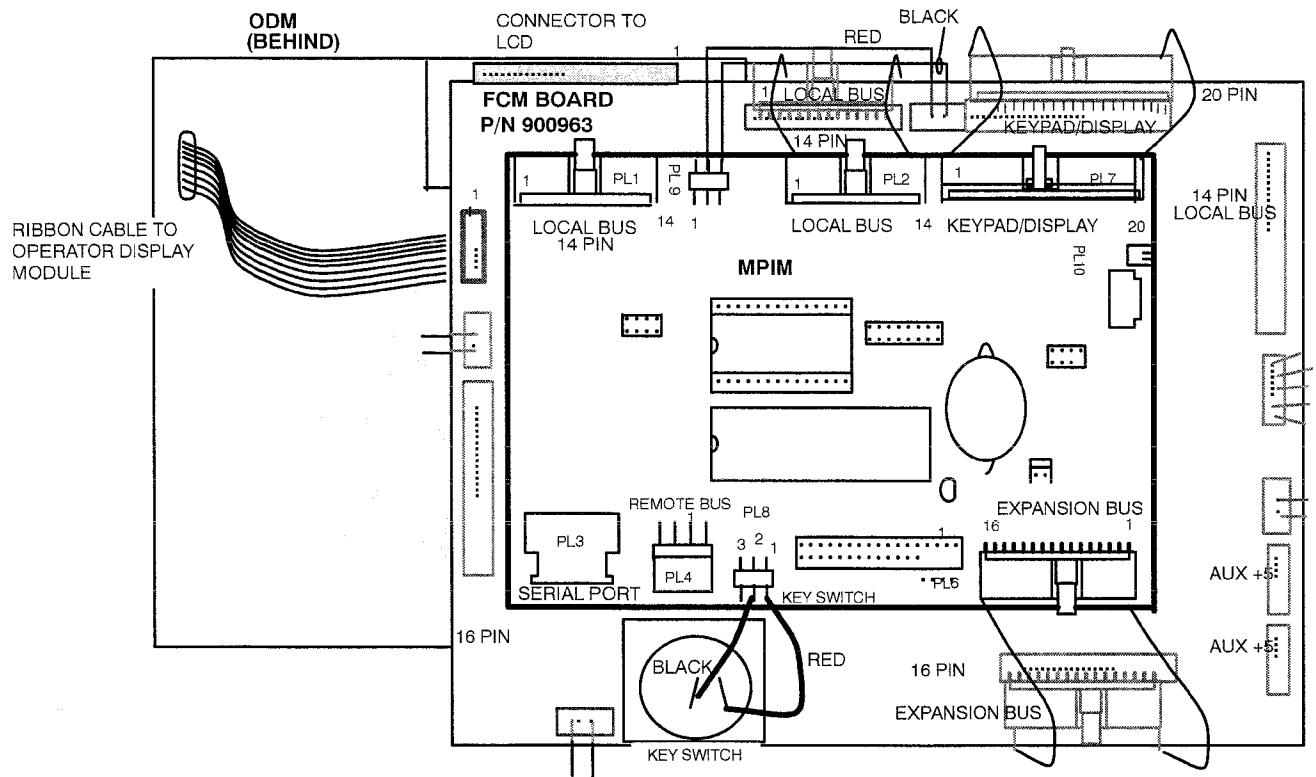| Terminal	Description	Function	Connects to
PL12	8 Conductor Cable	Operator Touch-buttons	Fire Control Module PL12
PL3	16 Pin	LCD	Fire Control Module PL3

Figure 3.   ODM Operator Display Module. All circuits and connections are power limited/Class2.

Wiring Notes

1. All conductors must be free of grounds.
2. Disconnect power before servicing systems.
3. All wiring to conform to current National Electrical Code, NFPA 70, state, and local building code requirements and applicable notes. All circuits contained in this module are classified as power limited/Class 2 and shall be installed to comply with N.E.C. Article 760, Part A and Part C.
4. Connect 8-conductor ribbon cable form Operator Display module to PL12 of the Fire Control Module (P/N 900963)
5. Connect the LCD 16-pin connector to PL3 connector of the Fire Control Module (P/N 900963).
6. Refer to *Fire Control Module Installation Guide,* Publication No. 19700360 for further information.
7. Refer to *MPIM Installation Guide,* Publication No. 19700235 for installation, wiring, and programming information
8. All wiring is classified as power limited/Class 2 and restricted to panel cabinet.

Code	TFX Menu Option	Code	TFX Menu Option	Code	TFX Menu Option
0001	Do you want to accept events?	0050	Do you want to de–isolate points?	0092	Force point off?
0009	View unrestored events?	0051	De–isolate zone? (sensors only)	0093	Unforce point?
0010	Do you want to view the log?	0052	De–isolate zone? (sounders only)	0095	Do you want to set sensitivity?
0011	Oldest event first?	0053	De–isolate point? (addr. loop only)	0096	Point sensitivity?
0012	Newest event first?	0054	Engineer de–isolate?	0097	Zone sensitivity?
0013	Highest priority event first?	0055	De–isolate signalling?	0100	View system statuses?
0016	View system Health Report?	0060	View point analogue values?	0101	View system zones alarm st?
0020	Do you want to set the clock?	0061	View point statuses?	0102	View system zones troub. st?
0021	Do you want to set the time?	0062	View loop analogue values?	0103	View system zones isol. st?
0022	Do you want to set the date?	0063	View loop point counters?	0104	View system common alarm st?
0030	Do you want to test system?	0064	Do you want to view point or loop data?	0105	View system common troub. st?
0031	View systaem Al. Cycle count?	0065	View point obscuration?	0106	View system common disa. st?
0032	Reset system Al. Cycle count?	0070	Open VFP?	1030	Do you want to solo test multi input point?
0033	View system S/W Init. count?	0080	Do you want to print data?	1200	Do you want to commission system?
0034	Reset system S/W Init. count?	0081	Print point analogue values?	1201	Enable fast fault mode?
0035	Do you want to solo test zone?	0082	Print points isolated?	1202	Enable fast open circuit scanning?
0036	Solo test sounders?	0083	Print points untested/failed?	1203	Disable rate of rise processing?
0037	Reset point threshold comp'n?	0084	Print points out of compensation?	1204	Shut down Loop?
0039	View system issue numbers	0085	Print event log backtrack?	1205	Restart Loop?
0040	Do you want to isolate points?	0086	Print points forced?	1206	Single address loop poll?
0041	Isolate zone? (sensors only)	0087	Print verifying counts?		
0042	Isolate zone? (sounders only)	0088	Print ID test result?		
0043	Isolate point? (addr. loop only)	0089	Print point obscuration data?		
0044	Engineer Isolate?	0090	Do you want to force outputs?		
0045	Isolate signalling?	0091	Force point on?		

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AUTOCALL®
16-Indicator Module
Assembly No. 976129   PCB No. 900964

Publication Number 19700362
Issue 3, January 1997

The 16-Indicator Module is used in the Autocall TFX–500M/800M fire control system, to provide 16 alarm and trouble indicators. Bi-color (red and yellow) LEDs respond to zone, sector, or other alarm and trouble indications, as programmed. The 16-Indicator Module is driven from the Autocall TFX–500M/800M control panel panel via an MPIM Expansion Bus connection.

Please refer to *Autocall TFX-500/800* CONSYS® *Programming Guide* P/N 850463 for more information.

Operation

LED indicators: Normally OFF; Pulsing Red ON indicates Alarm; Yellow ON indicates Trouble in the zone, sector, or area programmed. If LED is on continuously, alarms have been SILENCED.

Module Position:_____
(See System Layout)
     One single (1/3 of one full 19.5-inch) door position
Input Voltage: +5 VDC, +12 VDC
Current Draw: Normal (no LEDs lighted) 9 mA
     Alarm (all LEDs ON) 34 mA (2.81 mA per LED)
Dimensions *(wld):* Display panel: 6.75 × 5.25 × 0.75 inches
     Board: 5.25 × 5 × 0.5 inches

Installation:

1. Make indicator labels and insert into label slots so that labels are visible from panel front.
2. Mount 16-Indicator Display Panel to Three Module Backing Plate.
   a. Fit the Display to the backing plate so that the threaded posts extend through the holes in the backing plate.
   b. Fit the four 6-32 × 3/8-inch threaded nylon spacers over the threaded posts.
3. Mount the 16-Indicator Board.
   a. Fit board to threaded posts, above the nylon spacers.
   b. Install 6-32 nuts to secure the board to the posts.
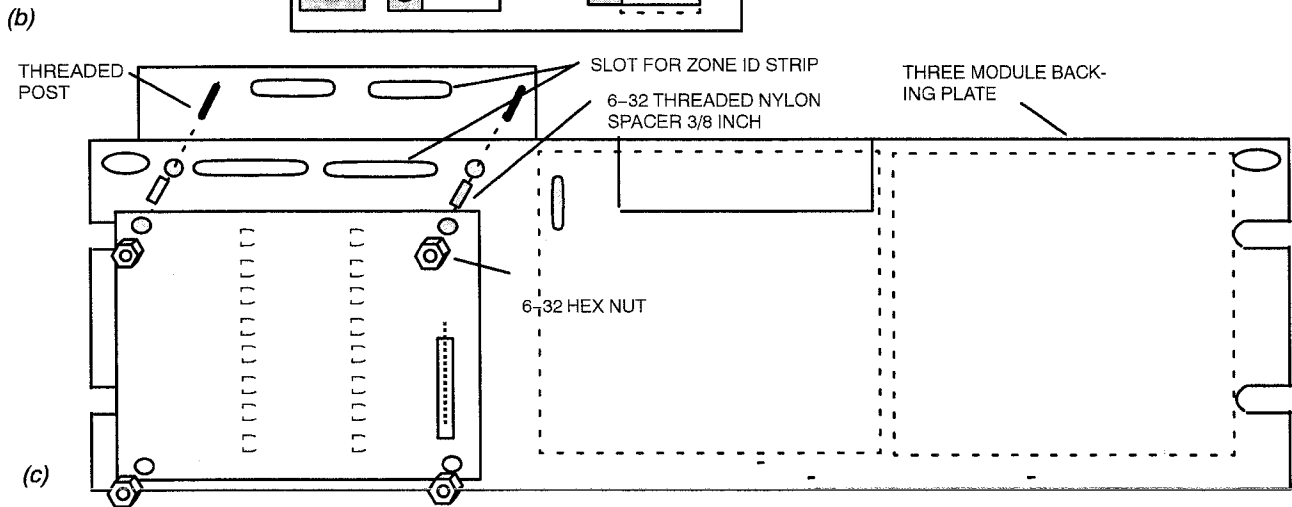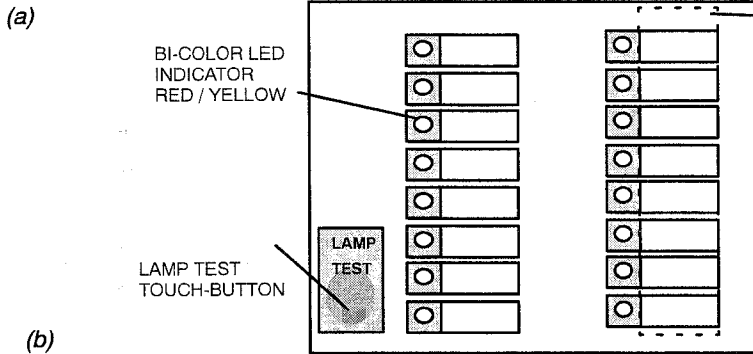4. Connect the ribbon cables and make other wiring connections.

Press Lamp Test touch-button to light LEDs.

Figure 1.   16-Indicator Module. (a) Front view, (b) Back view, typical mounting to mounting plate (c) Side view.

16-INDICATOR BOARD

DS9   DS1
DS10   DS2
DS11   DS3
DS12   DS4
DS13   DS5
DS14   DS6
DS15   DS7
DS16   DS8

PL6

16 PIN
EXPANSION BUS IN
XBUS ADDRESSES 1–32
NOTE 4

JP1   LAST BOARD
       JUMPER
       NOTE 5

PL14   1

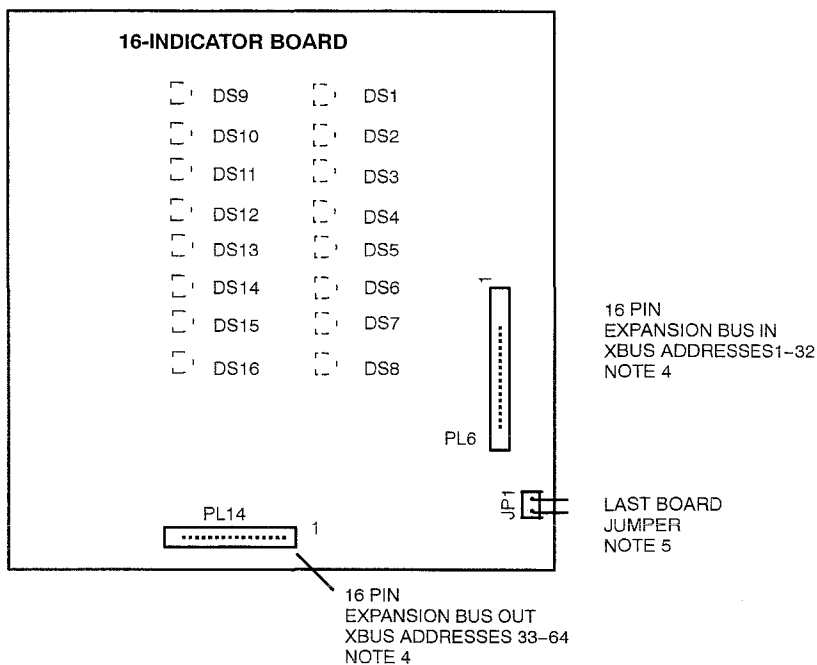16 PIN
EXPANSION BUS OUT
XBUS ADDRESSES 33–64
NOTE 4

Figure 2.   16-Indicator Module. All circuits and connections are power limited/Class2.

Wiring Notes:

1. All conductors must be free of grounds.
2. Disconnect power before servicing systems.
3. All wiring to conform to current National Electrical Code, NFPA 70, state, and local building code requirements and applicable notes. All circuits contained in this module are classified as power limited/Class 2 and shall be installed to comply with N.E.C. Article 760, Part A and Part C.
4. 16-pin ribbon cables connect Expansion Bus to the 16-Indicator Module. PL6 (XBus IN) is Expansion Bus connection for a 16-Indicator Module or a 16-Status ontrol Module. PL14 (XBus OUT) connects to other modules on the Expansion Bus. All ribbon cables and their applications are listed in Publication Number 19700260, "Autocall TFX–500/800 Spare Parts."
5. JP1 Last Board Jumper Link—install jumper link if this is the last board on the Expansion bus. Remove last-board link from boards that precede on the Expansion Bus.
6. All wiring is classified as power limited and restricted to the panel enclosure.
7. This wiring diagram is typical only.

Programming Notes

Using CONSYS® program the MPIM for 16 Indicator Module operation. **You will need to make several changes to the default TFX operating program.**

⚠ **BE SURE TO TEST ALL PROGRAM CHANGES DURING SYSTEM COMMISSIONING!**

When programming the system for this module's operation, it is a good idea to program the LEDs in sequence.

1. Edit the MPIM Local Bus, address 00, personality = OIB for operation with the FCM as follows:
a. Select the "Digital I/O" menu option.
b. At the "Choose address with required Digital I/O" screen, select "LBus 00 - OIB."
c. At the "Digital Inputs/Outputs" screen, program the following:
d. For TFX-500 "Zonal Display," program Expansion Bus I/O. See Figure 3.
   i. At the "Digital Inputs/Outputs" screen, select "Expansion Bus."
   ii. At the "Digital I/O" screen, If 16 Indicator Module is installed: remove "interleaved" Zonal Alarm Display from point #9 and point #17. Next, program "Zonal Alarm Display" at point #1 (non-interleaved):

"Device Type,"	"Zonal Display"
"Device Opteration,"	"Visual Indicator"
"Group/Short Code,"	OS191 "Zonal Alarm Display"
"Zone/Sector":	
"Number of Outputs"	16
"First I/P Displayed"	1

and program "Zonal Trouble Display" at point #17 (non-interleaved):

"Device Type,"	"Zonal Display"
"Device Opteration,"	"Visual Indicator"
"Group/Short Code,"	OS223 "Zonal Trouble Display"
"Zone/Sector":	
"Number of Outputs"	16
"First I/P Displayed"	1

Project : Untitled

File Edit Transfer

System Type
Network
Edit Zones
Addressable Loop
LBus
RBus
Digital I/O
Events
Bell Map
Groups
System Users
System Options
Programmable Timers
Pulsing Patterns
Reset Time
Ground Fault
Power Failure Sig. Delay
Sensitivity Switching

Choose address with required
Digital I/O

CPU 00 - MPM
LBus 00 - OIB
RBus 00 - XBB

LBus: 00   OIB - Operator I/F

    ✓ General I/P 1   ✓ Supervisory LED
       General I/P 2   ✓ Buzzer
       Tamper I/P   ✓ Fire Drill Key
    ✓ RS232 ONline Det.   ✓ Silence Key
    ✓ Key I/P 1   ✓ Reset Key
    ✓ Key I/P 2   ✓ Test Key
    ✓ Alarm LED   ✓ Expansion Fault
    ✓ Trouble LED   ✓ Expansion Bus

Note: Change TFX-500 16 Indicator
Module Display:
Point 9   Not Attached
Point 17   Not Attached
Point 1   Zonal Alarm Display
Point 17   Zonal Trouble Display

                    Digital I/O   Point: 9
    Expansion Bus

    Device Type: Zonal Display
    Device Operation: Visual Indicator
    Group/Short Code: OS191 Zonal Alarm Dis
    Zone/Sector:

    Number of Outputs: 16
    First I/P Displayed: 1

    Norm   Act Event:
    Act   Norm Event:

    Not Attached   Remote Zonal Display
    I/P (Norm. Lo)   Sector Display
    I/P (Norm Hi)   Loop A Display
    Sector I/P (Norm Lo)   ⇓
    Sector I/P (Norm Hi)   Loop K Display
    O/P (Norm Off)   L Bus Display
    O/P (Norm On)   R Bus Display
    Zonal Display

                Expansion Bus

    Device: Zonal Display   Point: 9

    —   —   A   —   A   —   A   —
    A   —   A   —   T   —   T   —
    T   —   T   —   A   —   A   —
    A   —   A   —   T   —   T   —
    T   —   T   —   A   —   A   —
    A   —   A   —   T   —   T   —
    T   —   T   —   A   —   A   —
    A   —   A   —   T   —   T   —
    T   —   T   —   —   —   —   —

Note: Press F10 for Expansion
Bus Map. Change 16 Indicator
Module from "interleaved" alarm
and trouble display to
"non-interleaved" display pattern.

                Expansion Bus

    Device: Zonal Display   Point: 1

    A   A   A   A   A   A   A   A
    A   A   A   A   A   A   A   A
    T   T   T   T   T   T   T   T
    T   T   T   T   T   T   T   T
    —   —   —   —   —   —   —   —
    —   —   —   —   —   —   —   —
    —   —   —   —   —   —   —   —
    —   —   —   —   —   —   —   —
    —   —   —   —   —   —   —   —
    —   —   —   —   —   —   —   —

Map Key:

Zonal Display/Sector Display
    A = Alarm
    T = Trouble
    D = Isolate
    Z = Other
Point Display
    a = Alarm
    t = Trouble
    d = Isolate
    p = Other
Single Input Point
    I = Input Point
Single Output Point
    O = Output Point

Figure 3.   Editing Expansion Bus of LBus 00 OIB for FCM operation. for 16 Indicator Module, change display
from interleaved to non-interleaved.

2. When programming the 16 Indicator Module for single LED operation, it is a good idea to program the LEDs in sequence. See Table 1.

Table 1. Typical MPIM Expansion Bus Addressing Scheme for 16-Indicator Module LEDs.

Red LED	XBus I/O Address	Yellow LED	XBus I/O Address
DS1	1	DS1	17
DS2	2	DS2	18
DS3	3	DS3	19
DS4	4	DS4	20
DS5	5	DS5	21
DS6	6	DS6	22
DS7	7	DS7	23
DS8	8	DS8	24
DS9	9	DS9	25
DS10	10	DS10	26
DS11	11	DS11	27
DS12	12	DS12	28
DS13	13	DS13	29
DS14	14	DS14	30
DS15	15	DS15	31
DS16	16	DS16	32

```
16 Indicator
Column A
Panel #

—

—

—

—

—

—

—
```

Figure 4   Zone ID Label.

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AUTOCALL®
80-Indicator Module
Assembly No. 976136 (with 1 MPIM)
Assembly No. 976137 (with 2 MPIMs)
Assembly No. 976138 (without MPIM)
PCB P/N 900965

Publication Number 19700366
Issue 3, January 1997

The 80-Indicator Module is used in the TFX–500M/800M fire control system, to provide individual address point Alarm and Trouble status. The 80-Indicator Module provides 80 bi-color LED individual address output points.

The 80-Indicator Module is driven from the control panel or display panel via MPIM Expansion Bus.

Operation

Bi-color (red/yellow) LEDs light for programmed event, zone, sector, or other reference point. They may be programmed as normally-off or normally-on, and with pulse patterns.

Press Lamp Test touch-button to light programmed LEDs.

Module Position:_____
(See System Layout)
    One 19.5-inch door position
Input Voltage: +5 VDC, +12 VDC
Current Draw: Without MPIM: Normal (no LEDs lighted) 9 mA,
    Alarm 234 mA (All LEDs ON); (2.81 mA per LED)
    In addition, each MPIM draws: Normal 19 mA,
    Alarm 24 mA
Dimensions *(wld):* Assembly, 19.5 × 5.25 × 1.25 inches;
    Board, 17.25 × 5 × 1 inches;
    Mounting Plate/Display, 19.5 × 5.25 × 0.2 inches

Installation:

1. If 80-Indicator Module is not already assembled, Attach the circuit board to the display/backing plate.
   a. Fit six threaded 6-32 × 3/8-inch nylon space to the threaded post on the display/mounting plate.
   b. Fit the 80-Indicator circuit board to the threaded posts.
   c. Install six 6-32 nuts to secure the circuit board.
2. Mount 80-Indicator Module to panel door with 4 10-32 mounting screws.
3. Mount MPIM piggy-back to 80-Indicator Module using stand-offs and screws.
4. Connect the ribbon cables and make other wiring connections.
5. Make Zone I.D. strips and insert into slots at the back of the display apnel and backing plate. Align the strips so that zone labels are visible from panel front and correspond to correct indicators.
6. Apply system power and push Lamp Test touch-button to test indicator LEDs.
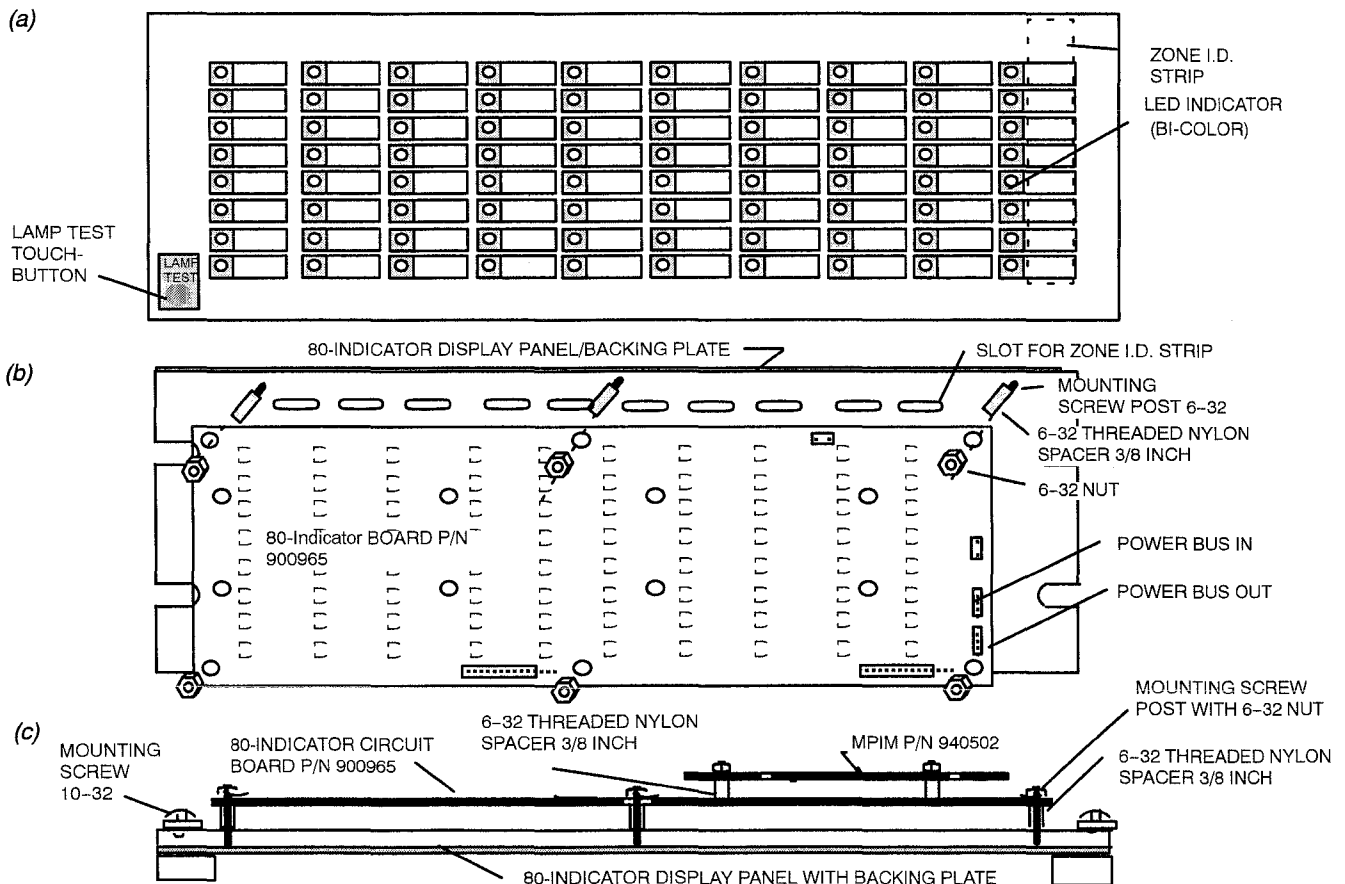
Figure 1. 80-Indicator Module. (a) Front view, (b) Back view, (c) Side view.

TO MPIM PL9
G.P. I/P 1

TO RIBBON CABLE
TO DISPLAY

POWER BUS IN

POWER BUS
OUT

16 PIN EXPANSION BUS IN
(ADDRESSES 1–80 YELLOW)

16 PIN EXPANSION BUS IN
(ADDRESSES 1–80 RED)
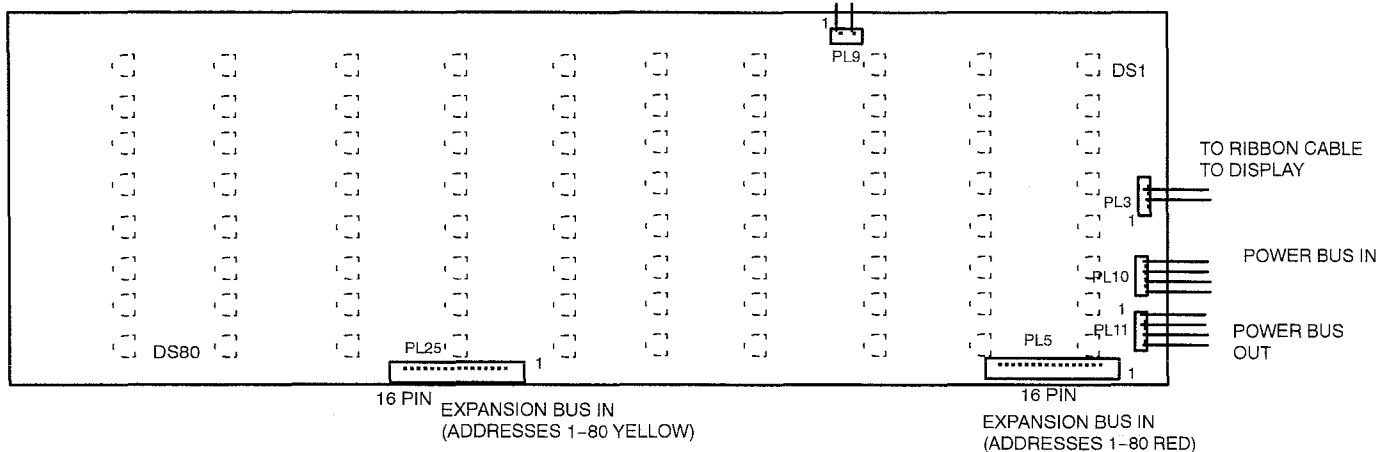
Figure 2. 80-Indicator Module. All circuits and connections are power limited/Class2.

Wiring Notes:

1. All conductors must be free of grounds.
2. Disconnect power before servicing systems.
3. All wiring to conform to current National Electrical Code, NFPA 70, state, and local building code requirements and applicable notes. All circuits contained in this module are classified as power limited/Class 2 and shall be installed to comply with N.E.C. Article 760, Part A and Part C.
4. PL3 connects to 2-conductor ribbon cable from Lamp Test touch-button of the 80-Indicator front panel.
5. PL9 connects to General Purpose Input1 (PL9) of the MPIM.
6. PL5, Expansion Bus IN, connects to 16-conductor ribbon cable Expansion Bus (from MPIM) for Expnasion Bus I/O addresses 1–80 for red LEDs. PL25, Expansion Bus IN, connects to 16-conductor ribbon cable Expansion Bus (from MPIM) for Expnasion Bus I/O addresses 1–80 for yellow LEDs. All ribbon cables and their applications are listed in Publication Number 19700260, "Autocall TFX–500/800 Spare Parts."
7. PL10 and PL11, Power Bus In/Out, provide +5 VDC for board operation.

Programming Notes

There are some limitations in how the output points are configured. All points are not completely independent of each other. Please refer to *Autocall TFX-500/800* CONSYS® *Programming Guide* P/N 850463 for more information.

1. One MPIM may be used to configure 80 Expansion Bus I/O point addresses 1–80. *Suggestion: use one MPIM to drive LEDs 1–80 Red LEDs configured as Zonal Alarm, and a second MPIM to drive LEDs 1–80 Yellow LEDs configured as Zonal Trouble or Supervisory.*
2. Program the MPIM "General Purpose Input 1" as an "Input (Norm. Hi)," and configured in the Special Input group IS053 "Dual Lamp Test Button."

Table 1. Connections to 80-Indicator Module.

Terminal	Description	Function	Connects to
PL3	2-Pin	Lamp Test	Lamp Test touch-button
PL5	16 Pin	Expansion Bus In	MPIM Expansion Bus
PL25	16 Pin	Expansion Bus In	MPIM Expansion Bus
PL9	2 Pin	Lamp Test	MPIM PL9 G.P. I/P 1
PL10	PL10-1 PL10-2 PL10-3 PL10-4	DCC +5 VDC + 5VDC DCC	Power Bus IN
PL11	PL11-1 PL11-2 PL11-3 PL11-4	DCC +5 VDC + 5VDC DCC	Power Bus OUT

80 Indicator Column A Panel #	80 Indicator Column B Panel #	80 Indicator Column C Panel #	80 Indicator Column D Panel #	80 Indicator Column E Panel #
—	—	—	—	—
—	—	—	—	—
—	—	—	—	—
—	—	—	—	—
—	—	—	—	—
—	—	—	—	—
—	—	—	—	—
—	—	—	—	—

Figure 3. Zone ID Labels

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AUTOCALL®
40 x 2-Indicator Module
Assembly No. 976130 (with MPIM)
Assembly No. 976131 (without MPIM)
PCB P/N 900966

Publication Number 19700365
Issue 2, January 1997

The 40 x 2-Indicator Module is used in the Autocall TFX–500M/800M fire control system for individual address point annunciation. The 40 x 2-Indicator Module provides 80 pluggable LEDs for system alarm, trouble, supervisory, or other indication for zones, sectors, points, or other programmed operation.

The 40 x 2-Indicator Module is driven from the TFX–500M/800M control panel or display panel via MPIM Expansion Bus.

Operation

Pluggable LEDs may be programmed for operation as zone, sector, point, or other indication. Operation may be activated by alarm, trouble, supervisory, or other event.

Press Lamp Test touch-button to turn on LEDs in sequence (un-programmed LEDs will not light).

Module Position:_____
(See System Layout)
    One 19.5-inch door position
Input Voltage: +5 VDC, +12 VDC
Current Draw: Normal (no LEDs lighted) 8 mA;
    Alarm (all LEDs lighted) 96 mA; (1.1 mA per LED)
    In addition, each MPIM draws: Normal 19 mA,
    Alarm 24 mA
Dimensions *(wld):* Assembly, 19.5 × 5.25 × 1 inches;
    Board:17.25 × 5 × 1 inches;
    Display/Mounting plate: 19.5 × 5.25 × 0.2 inches

Installation:
1. If 40 x 2-Indicator Module is not already assembled, Attach the circuit board to the display/backing plate.
   a. Fit six threaded 6-32 × 3/8-inch nylon space to the threaded post on the display/mounting plate.
   b. Fit the 40 x 2-Indicator circuit board to the threaded posts.
   c. Install six 6-32 nuts to secure the circuit board.
2. Mount 40 x 2-Indicator Module to panel door with 4 10-32 mounting screws.
3. Mount MPIM piggy-back to 40 x 2-Indicator Module using stand-offs and screws.
4. Connect the ribbon cables and make other wiring connections.
5. Make Zone I.D. strips and insert into slots so that zone labels are visible from panel front.
6. Apply system power and push Lamp Test touch-button to test indicator LEDs.
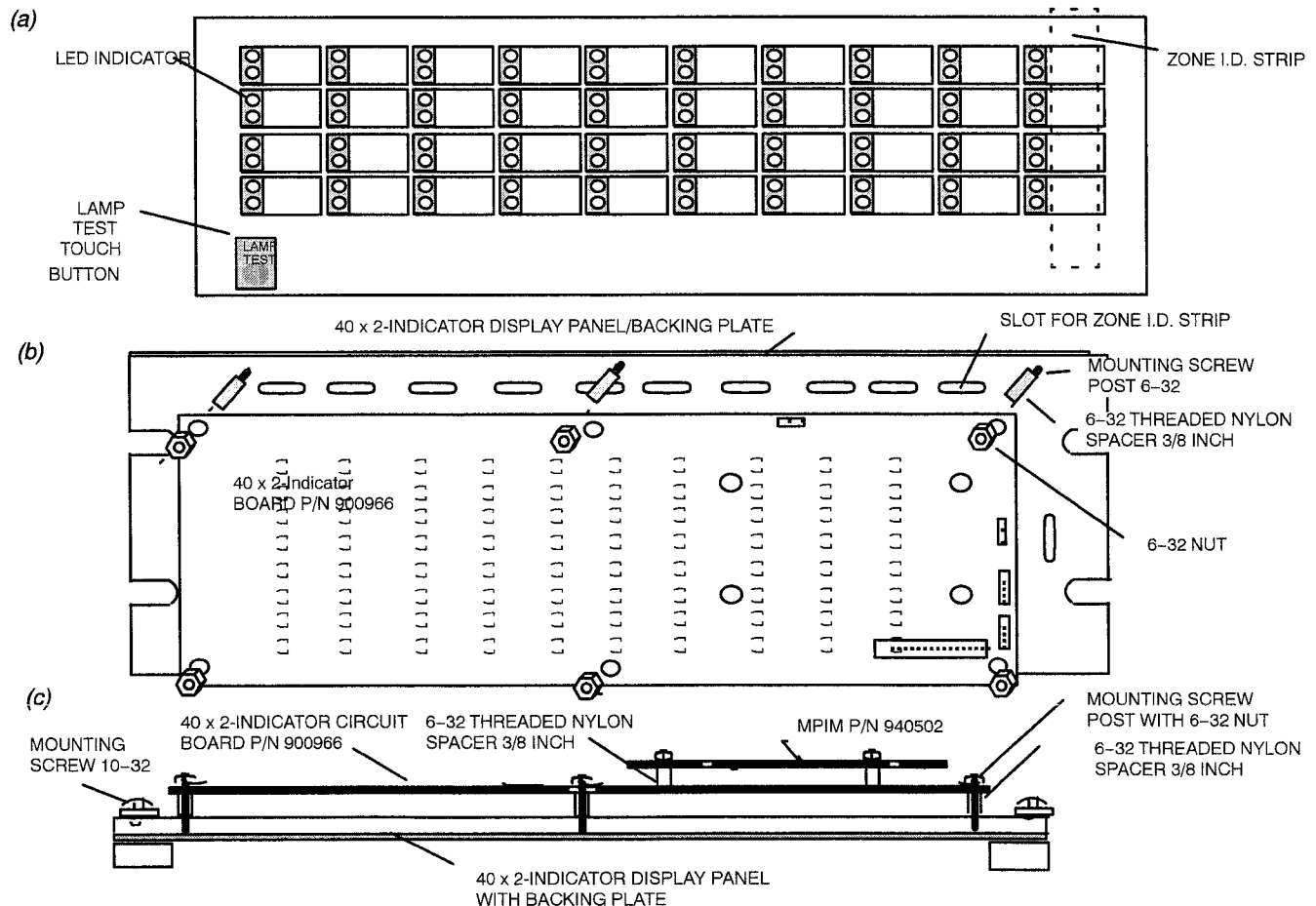
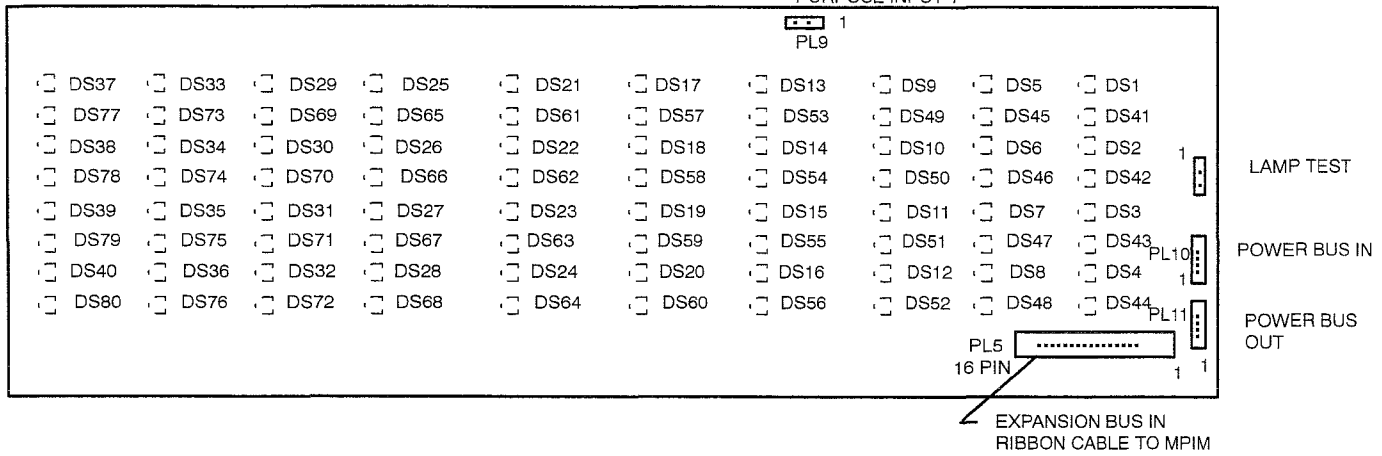Figure 1. 40 X 2-Indicator Module. (a) Front view, (b) Back view, (c) Side view.

Figure 2.   40 x 2-Indicator Module. All circuits and connections are power limited/Class2.

Wiring Notes:

1. All conductors must be free of grounds.
2. Disconnect power before servicing systems.
3. All wiring to conform to current National Electrical Code, NFPA 70, state, and local building code requirements and applicable notes. All circuits contained in this module are classified as power limited/Class 2 and shall be installed to comply with N.E.C. Article 760, Part A and Part C.
4. PL5, Expansion Bus IN, connects to 16-conductor ribbon cable Expansion Bus (from MPIM). All ribbon cables and their applications are listed in Publication Number 19700260, "Autocall TFX–500/800 Spare Parts."
5. PL10 and PL11, Power Bus In/Out, provide +5 VDC for board operation.

Programming Notes

There are some limitations in how the output points are configured. All points are not completely independent of each other. Please refer to *Autocall TFX-500/800* CONSYS *Programming Guide* P/N 850463 for more information.

One MPIM may be used to configure 80 Expansion Bus I/O point addresses. LEDs DS1–DS20 and DS41–60 should be programmed with I/O addresses 1–20 and 41–60; LEDs DS21–DS40 and DS61–DS80, with I/O addresses 21–40 and 61–80.

Important: Note that Figure 2, above, shows the LEDs as they are configured for CONSYS programming of the I/O points. That is, DS1, DS41, DS2, DS42, etc. (DS1–DS40 are red LEDs; DS41–DS80 are yellow LEDs). Use this configuration rather than the configuration printed on the board.

Program the MPIM General Purpose Input 1 for Lamp Test.

Table 1.   Connections to 40 X2-Indicator Module.

Terminal	Description	Function	Connects to
PL5	16 Pin	Expansion Bus In	MPIM Expansion Bus
PL1	2 Pin	Lamp Test	Lamp Test touch-button
PL9	2 Pin	Lamp Test	MPIM PL9, General Purpose Input 1
PL10	PL10-1 PL10-2 PL10-3 PL10-4	DCC +5 VDC + 5VDC DCC	Power Bus IN
PL11	PL11-1 PL11-2 PL11-3 PL11-4	DCC +5 VDC + 5VDC DCC	Power Bus OUT

40 x 2 Indicator Column A Panel #	40 x 2 Indicator Column B Panel #	40 x 2 Indicator Column C Panel #	40 x 2 Indicator Column D Panel #	40 x 2 Indicator Column E Panel #

Figure 3. Zone ID Labels.

AUTOCALL®
16-Status Control Module
Assembly No. 976134 (with MPIM),
Assembly No. 976135 (without MPIM)

Publication Number 19700363
Issue 2, January 1997

The 16-Status Control module is used in the Autocall TFX–500M/800M fire control system, to provide 16 touch-button switches and 16 separately programmable indicating LEDs. The LEDs are removable for easy selection of LED color.

The 16-Status Control Module is driven from the TFX–500M/800M control panel or display panel via MPIM Expansion Bus.

Operation:

The touch-button switches may control output devices or select control options in the TFX-500M/800M system. The LEDs indicate the status for system output devices or control options. The switches and LEDs can be programmed independently (there is no pre-defined switch to LED association) using CONSYS®.

Press Lamp Test touch-button to light programmed LEDs in sequence.

Module Position:_____
(See System Layout)
    One 19.5-inch door position
Input Voltage: +5 VDC, +12 VDC
Current Draw: Normal (no LEDs lighted) 7 mA;
    Alarm (all LEDs ON) 25 mA (1.1 mA per LED)
    In addition, each MPIM draws: Normal 19 mA,
    Alarm 24 mA
Dimensions *(wld):* Assembly, 19.5 × 5.25 × 1.25 inches
    Board: 17.25 × 5 × 1 inches
    Display/Mounting plate: 19 × 5.25 × 0.2 inches

Installation:

1. If 16-Status Control Module is not already assembled, Attach the circuit board to the display/backing plate.
    a. Fit six threaded 6-32 × 3/8-inch nylon space to the threaded post on the display/mounting plate.
    b. Fit the 80-Indicator circuit board to the threaded posts.
    c. Install six 6-32 nuts to secure the circuit board.
2. Mount 16-Status Control Module to panel door with 4 10-32 mounting screws.
3. Optional MPIM mounts piggy-back to 16-Status Control Module using stand-offs and screws.
4. Connect the ribbon cables and make other wiring connections.
5. Make Zone I.D. strips and insert into slots in the back of the indicator panel and backing plate. Align ID labels so that zone labels are visible from panel front.
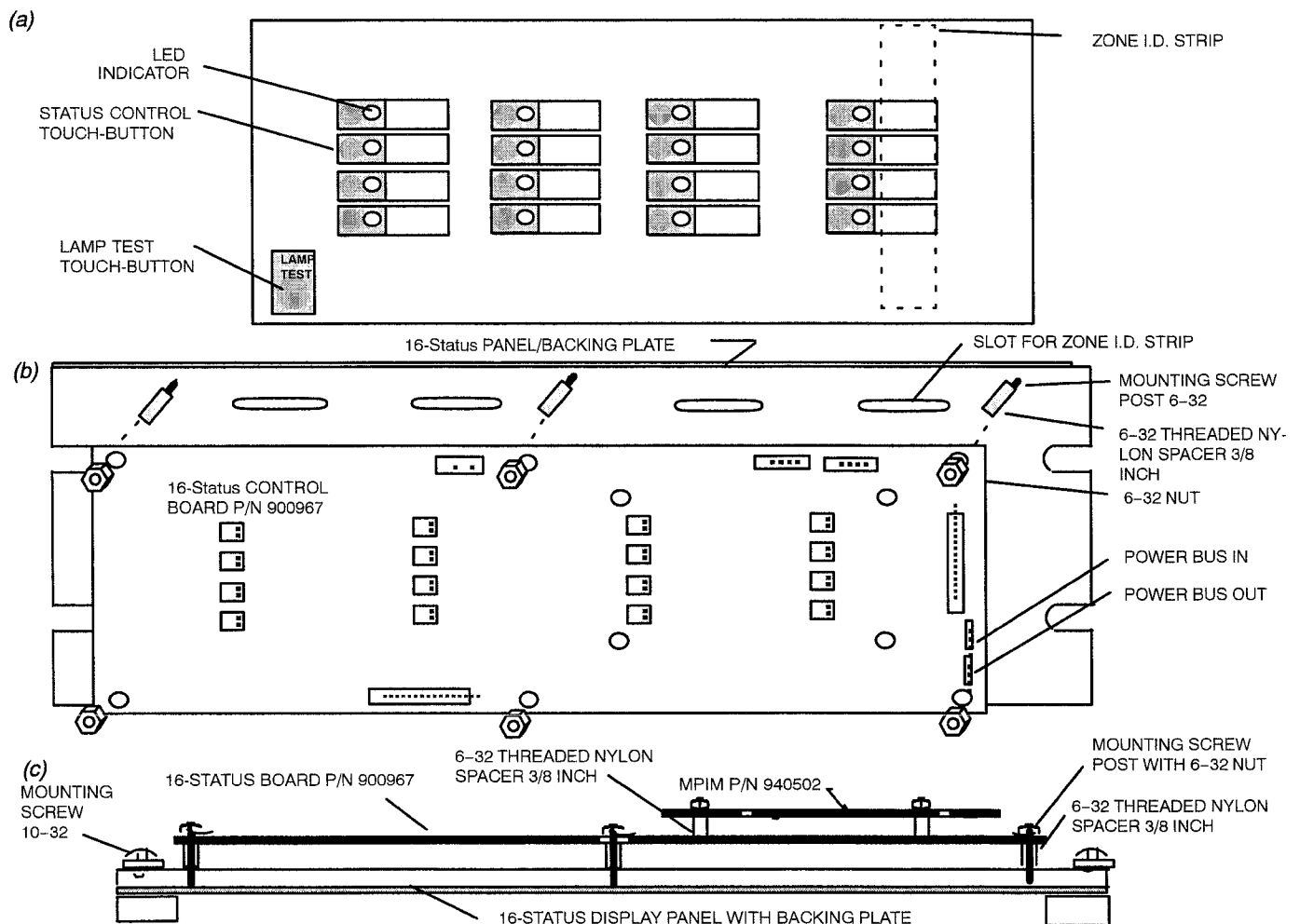6. Apply system power and push Lamp Test touch-button to test indicator LEDs.

Figure 1. 16-Status Control Module. (a) Front view, (b) Back view with mounting plate (c) Side view with MPIM.
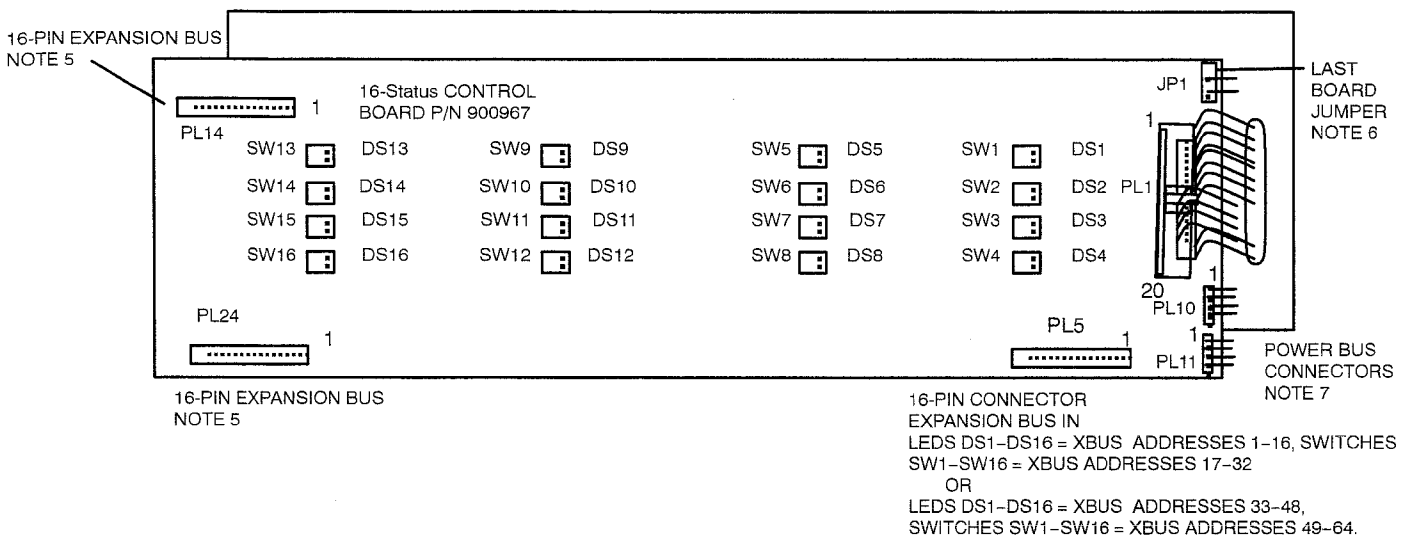
Figure 2. 16-Status Control Module. All circuits and connections are power limited/Class2.

Wiring Notes:

1. All conductors must be free of grounds.
2. Disconnect power before servicing systems.
3. All wiring to conform to current National Electrical Code, NFPA 70, state, and local building code requirements and applicable notes. All circuits contained in this module are classified as power limited/Class 2 and shall be installed to comply with N.E.C. Article 760, Part A and Part C.
4. PL1 connects to 20-conductor ribbon cable from 16-Status Control front panel.
5. PL5, Expansion Bus IN, connects to 16-conductor ribbon cable Expansion Bus (from MPIM). PL14 and PL24 provide for Expansion Bus pss-through; connects previous module to next module on the Expansion Bus. All ribbon cables and their applications are listed in Publication Number 19700260, "Autocall TFX–500/800 Spare Parts."
6. Install jumper across JP1 if this is last board on Expansion Bus (remember to remove jumpers for prior boards on the bus).
7. PL10 and PL11 (Power Bus IN/OUT) provide for +5VDC power to the board.

Table 1. Connections to 16-Status Control Module.

Terminal	Description	Function	Connects to
PL1	20-Pin	Keypad/Display	Control/Display
PL5	16 Pin	Expansion Bus In	MPIM Expansion Bus
PL24	16 Pin	Expansion Bus pass-through	MPIM Expansion Bus
PL14	16 Pin	Expansion Bus pass-through	MPIM Expansion Bus
PL10	PL10-1 PL10-2 PL10-3 PL10-4	DCC +5 VDC +5VDC DCC	Power Bus IN
PL11	PL11-1 PL11-2 PL11-3 PL11-4	DCC +5 VDC +5VDC DCC	Power Bus OUT

Programming Notes

The switches and LEDs are programmed using CONSYS® as Expansion Bus I/O devices. LEDs may be programmed as "Unconfigured," "Normally ON," "Normally OFF," "Pulse Pattern 1," or "Pulse Pattern 2." Switches may be programmed as "Unconfigured," independent ON/OFF toggle operation, switch pair operation (dedicated ON switch or dedicated OFF switch), switch trio operation (Hand, Off, Auto), switch group control function (Auto mode, Manual mode). Configure the switch "debounce" for "Fast Input (MPIM 2)"; this provides faster switch response from the MPIM (available on MPIM Version 2.0 or above).

Table 2. Typical MPIM Expansion Bus Addressing Scheme for 16-Indicator Module LEDs. (Note, addressing scheme may begin with Address 33 and end with Address 64).

LED	XBus I/O Address	Switch	XBus I/O Address
DS1	1 (33)	SW1	17 (49)
DS2	2 (34)	SW2	18 (50)
DS3	3 (35)	SW3	19 (51)
DS4	4 (36)	SW4	20 (52)
DS5	5 (37)	SW5	21 (53)
DS6	6 (38)	SW6	22 (54)
DS7	7 (39)	SW7	23 (55)
DS8	8 (40)	SW8	24 (56)
DS9	9 (41)	SW9	25 (57)
DS10	10 (42)	SW10	26 (58)
DS11	11 (43)	SW11	27 (59)
DS12	12 (44)	SW12	28 (60)
3213	13 (45)	SW13	29 (61)
DS14	14 (46)	SW14	30 (62)
DS15	15 (47)	SW15	31 (63)
DS16	16 (48)	SW16	32 (64)

16 Status Column D Panel #

16 Status Column C Panel #

16 Status Column B Panel #

16 Status Column A Panel #

Figure 3.   Zone ID Labels

Grinnell
FIRE PROTECTION SYSTEMS COMPANY

AUTOCALL®
40-Status Control Module
Assembly No. 976132 (with MPIM),
Assembly No. 976133 (without MPIM)
PCB No. 900968

Publication Number 19700364
Issue 2, January 1997

The 40-Status Control module is used in the Autocall TFX–500M/800M fire control system, to provide individual address point status and control.

The 40-Status Control Module is driven from the TFX–500M/800M control panel or display panel via MPIM Expansion Bus.

Operation:

The touch-button switches may be prgrammed using CONSYS® to control output devices or select control options in the TFX-500M/800M system. The LEDs may be programmed to provide indicators of the status for system output devices or control options. The switches and LEDs can be programmed independently (there is no pre-defined switch to LED association).

Press Lamp Test touch-button to light LEDs in sequence (un-programmed LEDs will not light).

Module Position:_____
(See System Layout)
　　One 19.5-inch door position
Input Voltage: +5 VDC, +12 VDC
Current Draw: Without MPIM—Normal (no LEDs lighted)　7 mA;
　　Alarm 51 mA (1.1 mA per LED)
　　In addition, each MPIM draws: Normal 19 mA,
　　Alarm 24 mA
Dimensions *(w/d):* Assembly, 19.5 × 5.25 × 1.25 inches
　　Board:　17.25 × 5 × 1 inches
　　Display/Mounting plate: 19 × 5.25 × 0.2 inches

Installation:
1. If 40-Status Control Module is not already assembled, Attach the circuit board to the display/backing plate.
   a. Fit six threaded 6-32 × 3/8-inch nylon space to the threaded post on the display/mounting plate.
   b. Fit the 40-Status Control circuit board to the threaded posts.
   c. Install six 6-32 nuts to secure the circuit board.
2. Mount 40-Status Control Module to panel door with 4 10-32 mounting screws.
3. Optional MPIM mounts piggy-back to 40-Status Control Module using stand-offs and screws.
4. Connect the ribbon cables and make other wiring connections.
5. Make Zone I.D. strips and insert into slots on the back side of the panel and backing plate. Align the strip so that zone labels are visible from panel front and line up with correct zone.
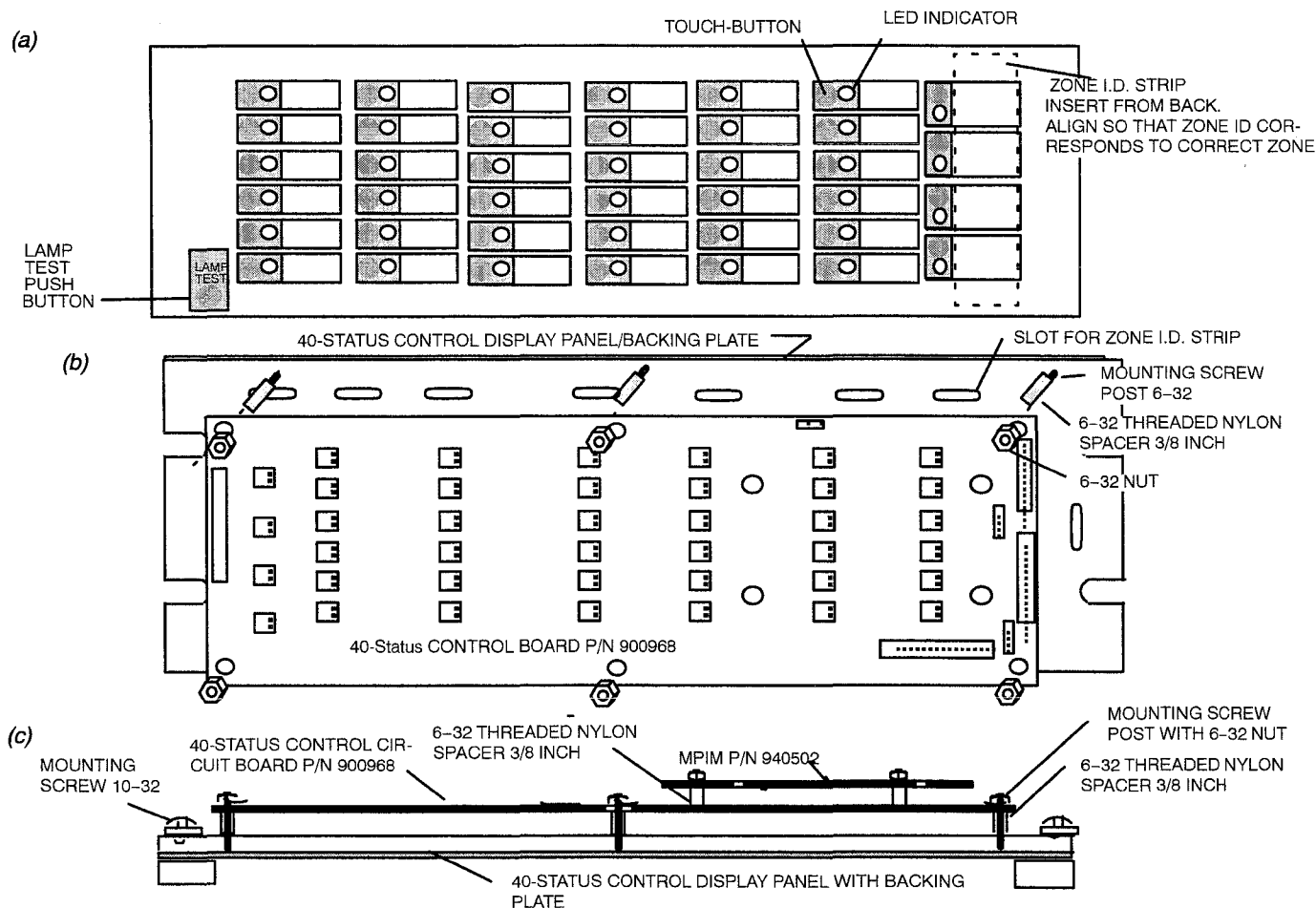

Figure 1.　40-Status Control Module.　(a) Front view, (b) Back view, (c) Side view.
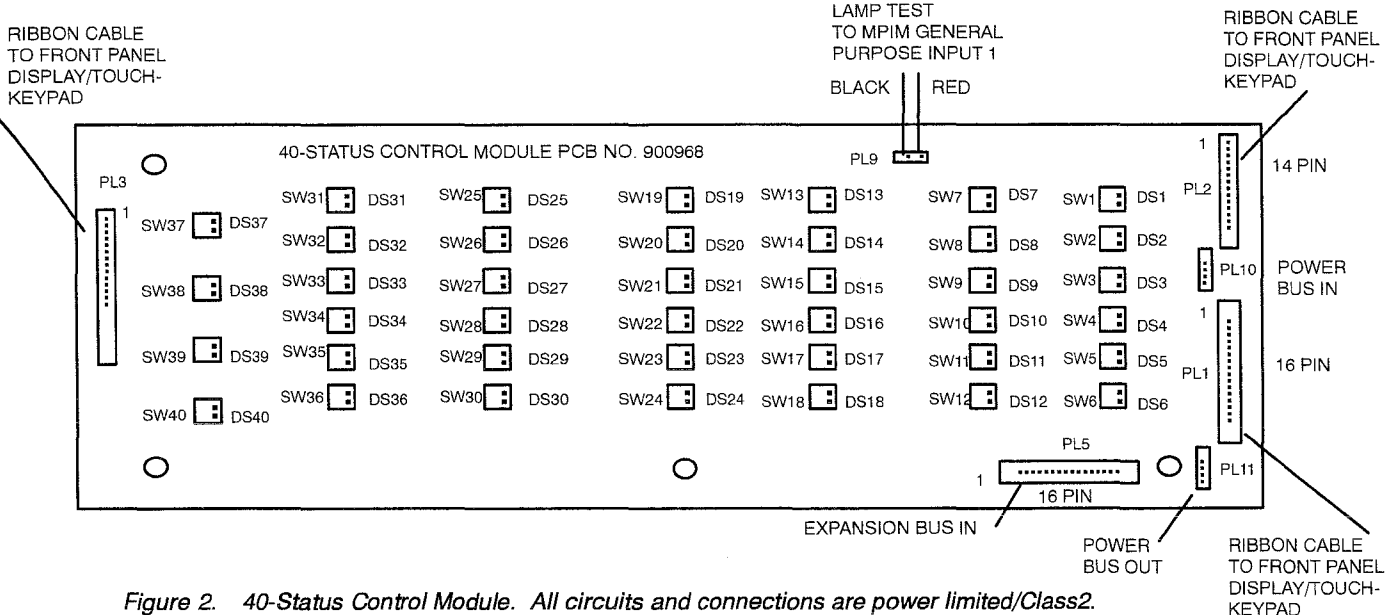
Figure 2. 40-Status Control Module. All circuits and connections are power limited/Class2.

Wiring Notes:

1. All conductors must be free of grounds.
2. Disconnect power before servicing systems.
3. All wiring to conform to current National Electrical Code, NFPA 70, state, and local building code requirements and applicable notes. All circuits contained in this module are classified as power limited/Class 2 and shall be installed to comply with N.E.C. Article 760, Part A and Part C.
4. PL1 connects to 16-conductor ribbon cable from 40-Status Control front panel.
5. PL2 connects to 14-conductor ribbon cable from 40-Status Control front panel.
6. PL3 connects to 20-conductor ribbon cable from 40-Status Control front panel.
7. PL5, Expansion Bus IN, connects to 16-conductor ribbon cable Expansion Bus (from MPIM). All ribbon cables and their applications are listed in Publication Number 19700260, "Autocall TFX-500/800 Spare Parts."
8. PL9 (2 pin), Lamp Test, connects to MPIM PL9, General Purpose Input 1.
9. PL10 and PL11, Power Bus In/Out, provide +5 VDC for board operation.

Programming Notes

The switches and LEDs are programmed as Expansion Bus I/O devices. LEDs may be programmed as "Unconfigured," "Normally ON," "Normally OFF," "Pulse Pattern 1," or "Pulse Pattern 2." Switches may be programmed as "Unconfigured," independent ON/OFF toggle operation, switch pair operation (dedicated ON switch or dedicated OFF switch), switch trio operation (Hand, Off, Auto), switch group control function (Auto mode, Manual mode).
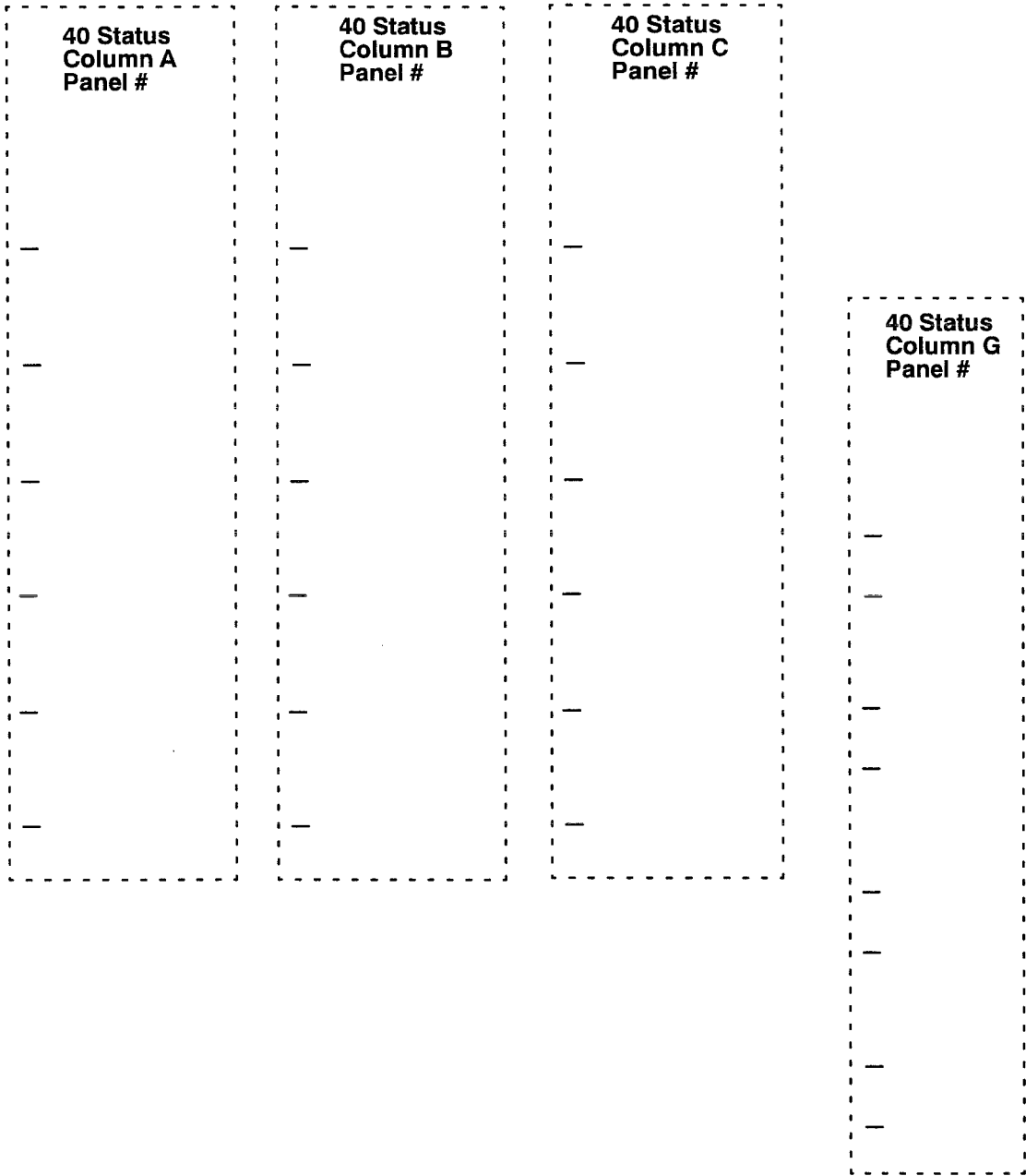
Configure the switch "debounce" for "Fast Input (MPIM 2)"; this provides faster switch response from the MPIM (available on MPIM Version 2.0 or above).

When assigning Expansion Bus addresses, LEDs DS1–DS40 are addressed I/O 1–40; Switches SW1–SW40 are addressed I/O 41–80.

Program the MPIM General Purpose Input 1 for special input group "IS010, Lamp Test Button".

Table 1. Connections to 16 Status Control Module.

Terminal	Description	Function	Connects to
PL1	16 Pin	Touch Keys/Display	Control/Display
PL2	14 Pin	Touch Keys/Display	Control/Display
PL3	20-Pin	Touch Keys/Display	Control/Display
PL5	16 Pin	Expansion Bus In	MPIM Expansion Bus
PL9	2 Pin	Lamp Test	MPPIM PL9 General Purpose Input 1
PL10	PL10-1 PL10-2 PL10-3 PL10-4	DCC +5 VDC + 5VDC DCC	Power Bus IN
PL11	PL11-1 PL11-2 PL11-3 PL11-4	DCC +5 VDC + 5VDC DCC	Power Bus Out

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│ Column A        │   │ Column B       │   │ Column C       │
│ Panel #         │   │ Panel #        │   │ Panel #        │
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Figure 3.   Zone ID Labels

Grinnell
FIRE PROTECTION SYSTEMS COMPANY

AUTOCALL®
MP-500 Main Processor Board

PCB No. 940500

Order P/N No. 976037, TFX-500; 976099, TFX-800

Publication Number 19700247
Issue 5, January 1997

The MP-500 Main Processor (MP) board is required for all AUTOCALL TFX-500/500M and TFX-800/800M systems. It is the signal processing unit for the system. All alarm, trouble, and system supervisory signals are sent to the MP.

Install in accordance with NFPA 70, National Electrical Code; NFPA 72, Installation, Maintenance, and Use of Protective Signaling Systems.

- The Main Processor EEPROM must be programmed with site-specific configuration data. **Only Grinnell authorized and trained personnel may program the AUTOCALL TFX-500/800 MP EEPROM.** The EEPROM may be programmed prior to its installation in the MP board.

- Two multiplex communication (2-way data) circuits for AUTOCALL TFX-500/500M configuration only (Addressable Loop "A" and Loop "B") connect a total of 198 input and output devices, in 16 zones. Up to 99 AUTOCALL TFX compatible addressable or analog-addressable devices may be connected to each loop, in any order. The system continuously monitors the condition of all devices.

- Two common alarm indicating circuits (SDR "A" and SDR "B") are activated to signal Alarm and Fire Drill.

- Two Local Bus ports provide for serial communication to Multi-Purpose Interface Modules (MPIMs) and for connection to the Expansion Motherboard (in AUTOCALL TFX-800/800M applications only).

Module Position: _____
(See System Layout)
Space Requirement: One B1 or BPI, Main Processor Board position
Dimensions (lwd): 10.5 x 6.3 x 2.5 inches

Electrical Specifications		
Input Voltage	24 V$_{DC}$	
Output Voltages		
+5 V$_{DC}$ @ 2.5 mA max		
+12 V$_{DC}$ @ 55 mA max.		
+26 V$_{DC}$ @ 200 mA		
Current Draws		
	Standby	Alarm
From +5 V$_{DC}$	200 mA	420 mA
From 26 V$_{DC}$ Board	16 mA	16 mA
Each data Circuit (TFX-500/500M)	8 mA	4 mA
From 24 V$_{DC}$ (Common Alarm Sdr Circuits)	1 A max	1 A max

- Remote Bus communication (RS485) connects remote peripheral devices.

- Power supply and battery are constantly monitored.

- Remote network connection is provided for one off-site communication device such as, city box, reverse polarity, or digital alarm communicator transmission devices. It also is the connection for TLI-530 interfaceTFX Network and TLX-500 interface to XA functions.

- Separate Alarm and Fault relay outputs are provided for and are monitored.

- Occupied Premises Input provides for programming the system to respond differently depending upon whether the premises are occupied or not.

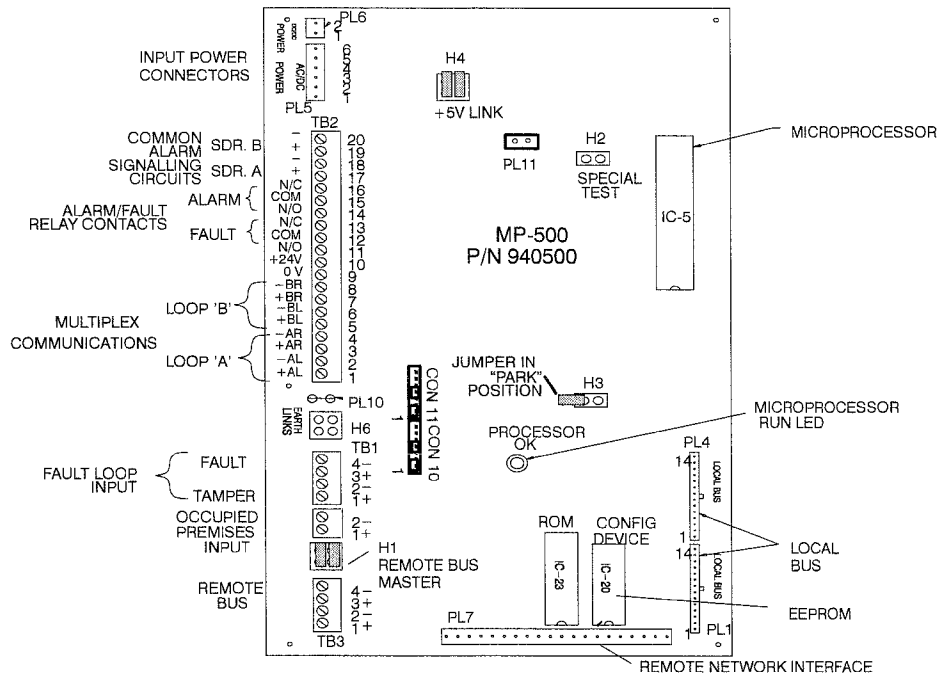- Electrical supervision is provided to NFPA 72 standards.

Figure 1.   TFX-500/800, TFX-500M/800M Main Processor Board P/N 940500.

Figure 2. Typical circuits, Main Processor Board, P/N 940500. All circuits and connections are power limited/Class 2.

Table 1. TFX-500/800, TFX-500M/800M Main Processor Board Circuit Characteristics (all circuits are power limited/Class 2).

Circuit	Current Rating	Voltage Rating	Circuit Style	Supervision
Common Alarm Sounders A/B	1 A max	24 V$_{DC}$	Style Y	YES (E.O.L)
Multiplex 2-way data circuits A/B maximum distance 6500 ft (**TFX-500 only**)	1 A max	24 V$_{DC}$	Style *	YES
Remote Bus (RS485) maximum distance 4000 ft				YES
Local Bus (data communications)				YES
Volt-free relay (alarm)	1 A max	24 V$_{DC}$		Coil supervised, output not supervised
Volt-free relay (fault)	1 A max	24 V$_{DC}$		Coil supervised, output not supervised
Fault loop TB1-3/TB1-4	5 mA	24 VDC		YES (E.O.L. 10 k-ohm)
Tamper/GF				YES
Occupied Premises				NO
24 VDC Output	1 A	24 VDC		NO
AC/DC Power PL5				YES

*Complies with operation characteristics for NFPA Style 6. Complies with operation characteristics for NFPA Style 7 when a line isolater (CAA-500LI) is connected adjacent to and via conduit, to the input and output of each addressable device.

Notes:

1. All references below refer to both AUTOCALL TFX-500/500M and AUTOCALL TFX-800/800M applications unless explicitly stated otherwise.
2. All conductors must be free of grounds.
3. **Disconnect power before servicing system.**
4. (a) Input power connections (UL listed regulated 24 V power limited)—Using cable P/N 19600206 connect JP1 of the RPS-424 Power Supply/Battery Charger (P/N 976957) to PL5 (see Publication Number 19700323). Connect cable P/N 19600190 from PL5 of the Main Processor Board. Terminal PL5-6 is not used. Power to the Main Processor Board may be removed by disconnecting the connection to PL5 **(Caution: this does not disconnect AC to the RPS-424).**
   (b) PL6 is not used.
   (c) PL 11 is not used.
5. Supervised common alarm indicating circuits, "SDR A" and "SDR B," are rated at 1 A maximum. UL listed end-of-line device P/N 900937 must be connected across terminals when circuits are not connected. EOL must be connected to last device in the circuit. All indicating appliances must have EMI suppression installed.
6. Four volt-free relay outputs are rated at 1A maximum, and are to be connected to UL 864 listed power limited sources only.
   (a) "Alarm" relay contacts are normally-open (N.O.) or normally-closed (N.C.)
   (b) "Fault" relay contacts (N.O. and N.C.)
7. Terminals TB2-9 (0 V) and TB2-10 (24 V) provide supervised 24 VDC for powering peripheral devices.

8. TFX-500/500M application ONLY—Two multiplex communications circuits (Loop "A" and Loop "B"): Maximum line resistance is 75 ohms; maximum line capacitance is 0.5 microfarad (mutual); maximum line inductance is 1.5 millihenry (total); maximum continuous distance is 6500 feet. Use UL listed, shielded wire pair that allows for these parameters. Connect the shield to the common shield connection point that is connected to DC Common of the main power supply.
9. Fault inputs.
   a. Optional fault loop input (TB1-3/TB1-4) may be connected to digital dialer communications fault output. When this input is not used, UL listed 10-k ohm resistor must be installed across TB1-3 and TB1-4.
   b. Ground Fault ("Tamper") loop (TB1-1/TB1-2) may be used to receive input from a ground fault detection signalling point.
10. Occupied Premises Input (TB4-1/TB4-2) may be connected to an "occupied premises" input device.
11. Remote Bus usually connects to Remote Ops/Dis panel terminal block (see Publication Number 19700257 or 19700258). Install UL listed, 150 ohm end-of-line resistor (P/N 976064) across TB3-3 to TB3-4. Remote Bus wiring parameters; 100 ohms total maximum line resistance, 30 picofarad-per-foot (mutual) maximum capacitance, 4000 feet maximum distance. Use shielded, twisted pair wiring that meets these parameters. Connect the sheilds to a common point connected to DC Common on the main power supply.
12. Header H1, Remote Bus Master, is configured for jumpers 1-2 and 3-4 to be installed for TFX-500/800 and TFX-500M/800M.
13. Header H3, EEPROM Programming Header, should be configured as follows:
   a. No jumper link installed for normal operation.
   b. Jumper link installed only during EEPROM programming.
14. H6, "Earth Links," provides a short to earth ground. It is used when the "Ground Fault Detection" option is not used. Set jumper links as follows:
   a. Ground Fault Detection enabled—No jumper links (default).
   b. Install jumper 1-2 and 3–4 for ground fault selection disable.
15. EEPROM must be installed and programmed for normal operation.
16. Remote network interface, PL7, accommodates network and offsite communications modules.
17. Local Bus connection PL1 and PL4 connect to MPIM (P/N 940502) Local Bus connectors. See Publication 19700235. For TFX-800/800M, Local Bus connection to PL7 of Expansion Motherboard. See Publication number 19700277, "*AUTOCALL IAM-800 Expansion Motherboard*" P/N 940562.
18. PL10, "Earth Ground" tab is the earth ground connection point for add-on boards.
19. Header H2, Test--No jumper installed for normal operation.
20. Header H4, Test +5 V Isolate--Jumper link 1-2 and link 3-4 are installed for normal operation.
21. "Microprocessor OK," green LED--"ON" indicates normal microprocessor operation.
22. All wiring to conform to current National Electrical Code, NFPA 70, state, and local building code requirements and applicable notes. All circuits contained in this module are classified as power limited and shall be installed to comply with N.E.C. Article 760, Part A and Part C.
23. Con 10 and Con 11 are not used. Jumpers are factory installed on positions 1–2 and 4–5 for normal operation.

Table 2. Compatible Devices—The following devices are UL listed for use on the two 2-way data loops TFX-500/500M application).

Model	Part No.	Ass'y No.	Standby Current	Max. No. per Addr. Loop
IXA-500DM	940523	976022	20 mA	99
IXA-500DMA	940576	976093	20 mA	99
IXA-500CM	940528	976027	0.27 mA	99
IXA-500CMA	940575	976092	0.27 mA	99
IXA-502CMA	940581	976185	0.27 mA	99
IXA-501CM	940573	976081	0.27 mA	99
OXA-500SD	940526	976023	8.2 mA	99
OXA-500SDA	940574	976091	0.18 mA	99
OXA-501SDA	940582	976186	0.18 mA	99
505SDA	900989	976377	0.35 mA	99
506SDA	900989	976378	0.35 mA	99
OXA-504SDA	940574	976216	0.18 mA	99
OXA-500RM	940525	976025	0.27 mA	99
OXA-501RM	940580	976187	0.27 mA	99
OXA-502RM	940586	976258	0.27 mA	99
OXA-503RM	940587	976259	0.27 mA	99
OXM-501 RM/SDA Motherboard	900981	976253	0 mA	99
IXM-500 CMA Motherboard	900973	976184	0 mA	99
CAA-500LI*	940529	976026	2.7 mA	12 (in line to control panel)
OXA-500SB**	940527	976024	85 mA	one max per OXA-500SD

*Not addressable

**Not addressable, does not connect directly to 2-way data circuit; requires input from OXA-500SD

Detector Model, Part No.	Standby Current (Head + Base)	Base Model, Part No.	Max. No. per data circuit
ISA-412P 940518	0.22 mA	IBN-512A 940522	99
ISA-412I 940517	0.18 mA		99
ISN-512P 940520	0.22 mA		99
ISN-512I 940519	0.18 mA		99
550 Series detectors			
ISN-550I 920095	0.20 mA	IBN-550, 920099; IBN-551, 920100; IBN-553, 920194	99
ISN-550P 920096	0.30 mA		99
IHN-135 920097	0.25 mA		99
IHN-200 920098	0.30 mA		99
ISN-550I 920095	0.23 mA	IBN-554, 920195	99
ISN-550P 920096	0.23 mA		99
IHN-135 920097	0.33 mA		99
IHN-200 920098	0.33 mA		99
ISN-550DI, 920102	0.20 mA	(Duct System, base included)	99
ISN-550DP, 920103	0.30 mA		99

Table 3. MP-500 Terminal Designations

Terminal	Function	Terminal	Function
TB1–1	Tamper (+)	TB3–1	Remote Bus (+)
TB1–2	Tamper (–)	TB3–2	Remote Bus (–)
TB1–3	Fault (+)	TB3–3	Remote Bus (+)
TB1–4	Fault (–)	TB3–4	Remote Bus (–)
TB2–1	Loop A L (+)	TB4–1	Occupied Prem. I/P (+)
TB2–2	Loop A L (–)	TB4–2	Occupied Prem. I/P (–)
TB2–3	Loop A R (+)	PL5–1	0 VDC
TB2–4	Loop A R (–)	PL5–2	+ 24 VDC
TB2–5	Loop B L (+)	PL5–3	Battery Test
TB2–6	Loop B L (–)	PL5–4	Battery Monitor
TB2–7	Loop B R (+)	PL5–5	AC Failure
TB2–8	Loop B R (–)	PL5–6	(Not Used)
TB2–9	0 VDC	PL6–1	0 VDC (Not Used)
TB2–10	+24 VDC	PL6–2	+ 24 VDC (Not Used)
TB2–11	Fault Relay N.O.	PL10	Earth Ground Tap
TB2–12	Fault Relay Com	PL11–1	Not Used
TB2–13	Fault Relay N.C.	PL11–2	Not Used
TB2–14	Alarm Relay N.O.		
TB2–15	Alarm Relay Com		
TB2–16	Alarm Relay N.C.		
TB2–17	Com. Alarm Sndr. A (+)		
TB2–18	Com. Alarm Sndr. A (–)		
TB2–19	Com. Alarm Sndr. B (+)		
TB2–20	Com. Alarm Sndr. B (–)		

This document is written for skilled technicians with experience installing and testing fire detection systems. These instructions do not purport to cover all the details or variations in the equipment described. Nor do they provide for every possible contingency met in connection with installation, operation, or maintenance. All specifications are subject to change without notice.

Should further information be desired or should particular problems arise which are not covered sufficiently for the user's purposes, the matter should be referred to Grinnell Fire Protection Systems Company, Inc., Westlake, Ohio 44145. Ph. (216) 871-9900.

Grinnell
FIRE PROTECTION SYSTEMS COMPANY

AUTOCALL®
RPS-424 Power Supply/Battery Charger

P/N 900957   Assembly No. 910683

Publication Number 19700323
Issue 3, January 1997

The AUTOCALL RPS-424 Power Supply is a regulated 24 V_{DC} 4 amp, isolated switching power supply that can operate from 120-240VAC 50/60Hz. The RPS-424 power supply provides power for a wide range of AUTOCALL fire and access control system devices. This supply can be used as the primary power supply or as an auxiliary power supply.

Features
- Brownout or loss of AC power causes immediate changeover to standby 24 volt battery input. AC line and battery condition can be monitored by the control panel.
- Automatic input ranging for 120/240 VAC operation.
- Grounds and Ground Faults—DC common floats at −14 V_{DC} below earth ground so that control unit will be capable of operating through one ground fault. A ground fault sensing circuit monitors shorts between earth ground and 24 V_{DC} (DC Common and 24V_{DC}). A ground fault signal to control panel is provided to light a ground fault LED.
- Battery fault sensing circuit monitors battery charging voltage for low battery voltage, missing or reverse battery and shorted battery wire. Also has battery charge current limiting.
- Resettable +24 V_{DC} circuit—The resettable 24 V_{DC} output will remain at its regulated voltage when system RESET input is high (open). When RESET is held low, the resettable 24 V_{DC} output is pulled down and power removed from peripheral devices.
- The RPS-424 may be used as an auxiliary power supply.
- Meets FCC Class "A" emission standards.
- Power limited/Class 2 24V_{DC} outputs.
- Supplies panel power—regulated 5V_{DC} @ 4amps.

Install in accordance with NFPA 72, *Installation, Maintenance, and use of Protective Signaling Systems;* NFPA 70, *National Electrical Code.*

⚠ **WARNING:** Electrical Hazard! Panel contains high voltage! Disconnect electrical power before servicing. Electric shock could cause injury or death.

Installation–Primary Power Supply
1. Remove AC power and disconnect battery.
2. Remove metal cover.
3. Mount to power supply position using appropriate mounting hardware.
4. Connect AC wiring to TB1. See Figure 1.
5. Replace metal cover.
6. Connect DC wiring.

Module Position: _____
(See System Layout)
Space Requirement: Power Supply location
Input Voltage: 120/240 V_{RMS}, 50/60 Hz (Auto-ranging)
Input Current: 1.5A_{RMS}
Output Voltage: 24V_{DC} regulated (+10% / −5%)
Battery Charging Capacity: 5 to 85 Ah
Battery Charging Voltage: 27.6 V_{DC}
Battery Charging Current: 2.5 A Max
Regulated Panel Circuits (For panel only; power limited/ Class 2):
     One +24 V_{DC} circuit at 4 A - Non-resettable
     One +24 V_{DC} circuit at 2 A - Resettable
     One +15 V_{DC} output at 100 mA
     5 V_{DC} @ 4A
Regulated Output Circuits (For field connections only; power limited/Class 2): Two +24 V_{DC}, each rated at 2 A (one resettable)
  Total current limited to: 2.5 A (standby), 5 A (alarm)
  Maximum Ripple voltage: maximum 2% of output V_{DC}
Current Draw: 100 mA standby; 100 mA Alarm
Dimensions (lwh): 4.5 x 7.5 x 2 inches
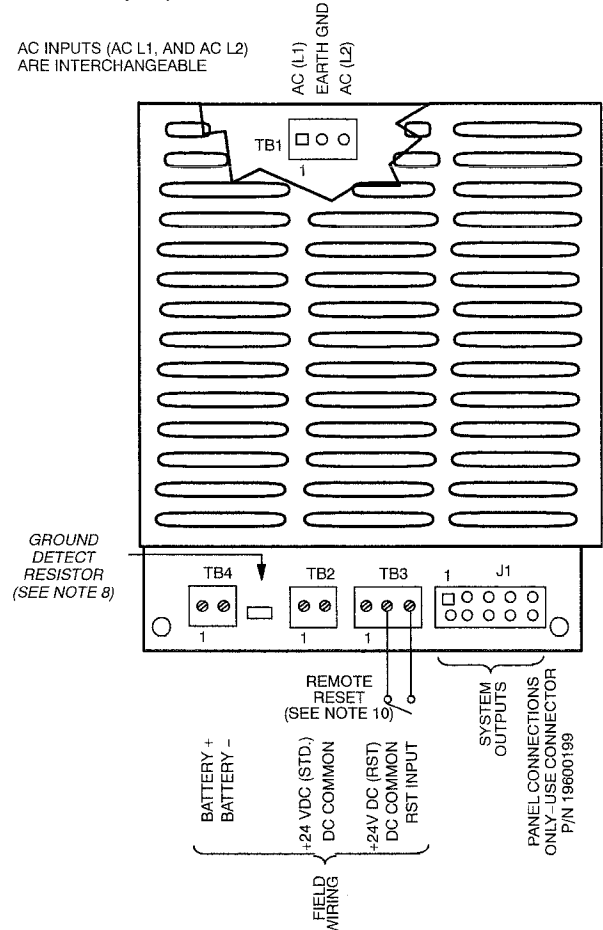
Figure 1   RPS-424 Power Supply

Installation–Auxiliary Supply (See Figure 3)

1. Remove AC power and disconnect battery.
2. Remove metal cover.
3. Mount auxiliary power supply to top left-hand option module position using appropriate mounting hardware.
4. Connect AC wiring to TB1. See Figure 1.
5. Auxiliary Power Supply Wiring:
   a. 16 AWG wire between TB1-1 of primary power supply and TB1-1 of the auxiliary supply.
   b. 16 AWG wire between TB1-2 of primary power supply and TB1-2 of the auxiliary supply.
   c. 16 AWG wire between TB1-3 of primary power supply and TB1-3 of the auxiliary supply.
   d. Connect earth ground to TB1-2 of primary power supply.
6. Replace metal cover on each power supply.
7. Connect standby battery leads to auxiliary power supply board. TB4-1 (+) and TB4-2 (–). Observe proper polarity for correct operation.

Table 1 TB1 Connections, AC

Terminal	Function
TB1-1	AC Line 1 (line or neutral)
TB1-2	Earth Ground
TB1-3	AC Line 2 (line or neutral)

Table 2 TB2 Connections, Non-resettable 24V_{DC}

Terminal	Function
TB2-1	+24 V_{DC} 2A power limited/Class 2
TB2-2	DC Common

Table 3 TB3 Connections, Resettable 24V_{DC}

Terminal	Function
TB3-1	+24 V_{DC} (RST) power limited
TB3-2	DC Common
TB3-3	RST Input (Remote Reset Switch input)

Table 4 TB4 Connections, Battery

Terminal	Function
TB4-1	Battery +
TB4-2	Battery -

Table 5. J1 Connections

PIN	FUNCTION
-1	+15 V_{DC}
-2	Reset
-3	DC Common
-4	AC OK
-5	+24V_{DC}
-6	Ground Fault
-7	DC Common
-8	Battery Monitor
-9	+5V_{DC}
-10	+24V_{DC} Resettable

Notes:

1. All wiring to be in accordance with N.E.C. Article 760 (National Electrical Code), local authorities, and applicable notes.
2. Designated circuits and connections are power limited/Class 2 and must be installed to comply with N.E.C. Article 760, Part A and Part C.
3. Supply side wiring per N.E.C. Article 760. AC input L1 and L2 are interchangeable.
4. Connect DC Common (0 V_{DC}) to DC Common (0 V_{DC}) of the AC Power Module at the main control panel. Maximum ripple voltage less than 2% of output.
5. **Caution: To avoid possible electrical shock, disconnect power before removing cover.**
6. Make sure that all power-limited wiring is separated at least 0.25 inch from any wiring that is not power limited. Use cable ties to secure wiring. (See Figure 2)
7. Make standby battery connections BATT –VE to negative battery terminal and BATT +VE to positive battery terminal. Install Battery Fuse Assembly P/N 910691 between battery-1 terminal (–) and battery-2 terminal (+). Select the correct battery capacity for the system using the Standby Battery Capacity Table.
8. When used as an auxiliary power supply, remove Ground Detector Resistor. (See Figure 3)
9. When used with an auxiliary power supply, the reset line (TB3) of each supply should be connected together. (See Figure 3)
10. Non-supervised, power limited/Class 2 remote reset connection is normally high when function is not activated. Connect normally-open switch to DC Common. Remote reset must be held closed for at least six seconds to activate reset.
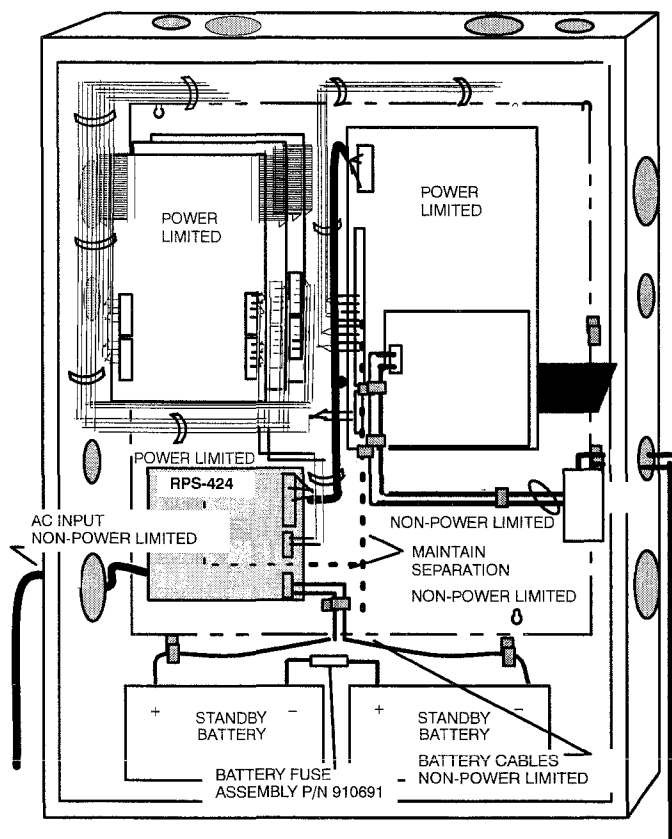
Figure 2 **Typical TFX cabinet wiring showing separation of power limited/Class 2 wiring from non-power limited wiring.**
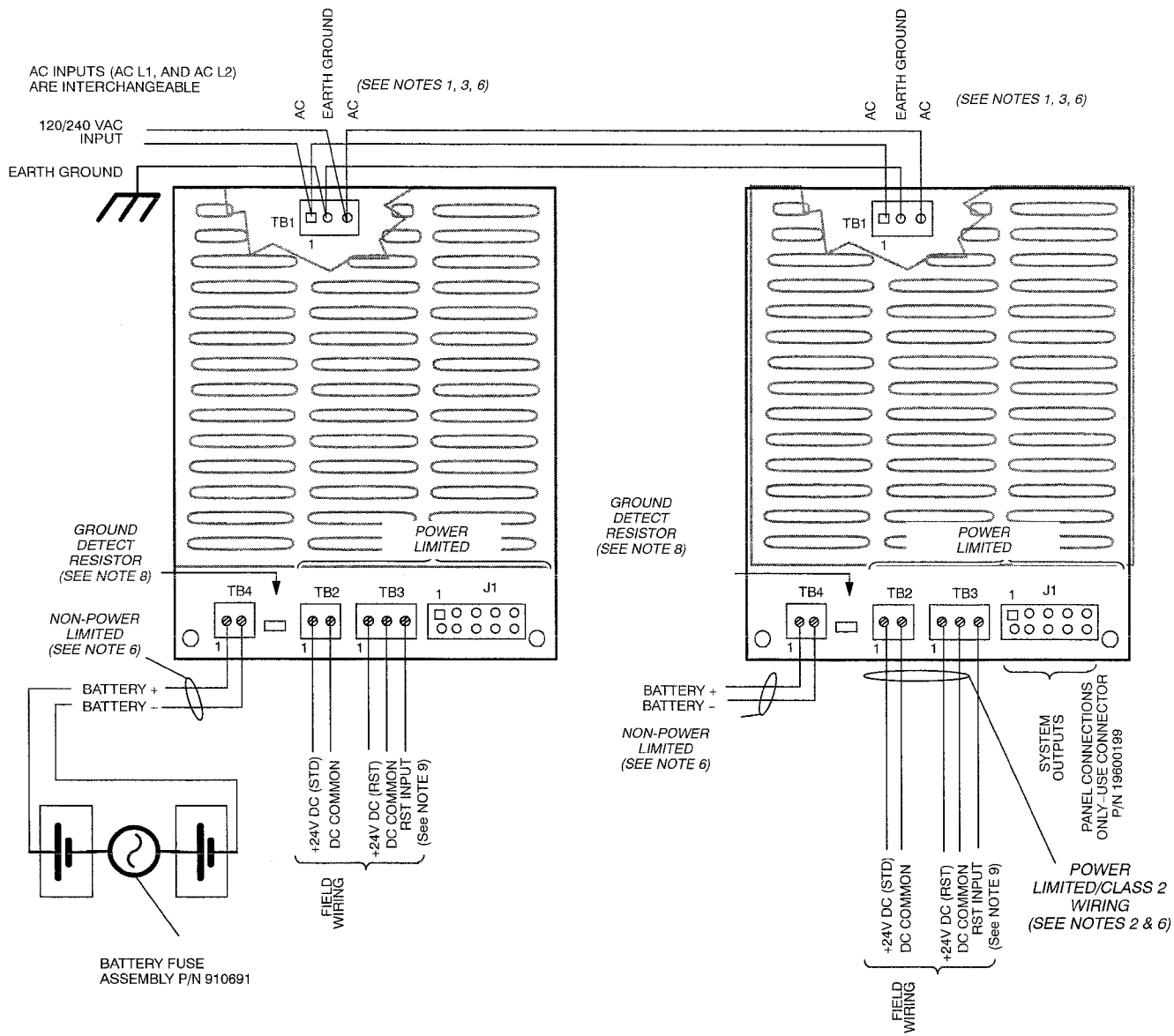
Figure 3   Auxiliary Power Supply Wiring

#8−32 SCREWS PROVIDED WITH AUXILIARY MOUNTING PLATE (QTY 4)

#4−40 SCREWS PROVIDED WITH POWER SUPPLY MONITOR ASSY (QTY 2)

RPS−424 POWER SUPPLIES MOUNTED IN MODULE POSITION 6

AC WIRING NON−POWER LIMITED

BATTERY WIRING NON−POWER LIMITED

#6−32 SCREWS PROVIDED WITH RPS−424 (QTY 4)

BATTERY FUSE ASSY FOR RPS−424 P/N 910691

#4−40 SCREWS PROVIDED WITH RPS−424 (QTY 2)

Note: When the RPS-424 is used in this non-power limited system, cover all "POWER LIMITED" markings on the power supply with tape or some other covering material.

Figure 4   RPS-424 installation in AL-1500/AL-1500E cabinet.

CS00013

This document is written for skilled technicians with experience installing and testing fire detection systems. These instructions do not purport to cover all the details or variations in the equipment described. Nor do they provide for every possible contingency met in connection with installation, operation, or maintenance. All specifications are subject to change without notice.

Should further information be desired or should particular problems arise which are not covered sufficiently for the user's purposes, the matter should be referred to Grinnell Fire Protection Systems Company, Inc., Westlake, Ohio 44145. Ph. (216) 871-9900.

Grinnell®
FIRE PROTECTION SYSTEMS COMPANY

AUTOCALL®
Power Monitor

500PSM TFX-Addressable Power Supply Monitor

   PCB P/N 900960,   Assembly No. 976122

PSM Power Supply Monitor

   PCB P/N 900961,   Assembly No. 976123

Publication Number 19700340
Issue 3, January 1995

The PSM Power Supply Monitor Board (P/N 976123) allows the RPS-424 Power Supply to be used with compatible AUTOCALL products by providing visual trouble indicators and field wiring connections.

The 500PSM TFX-Addressable Power Supply Monitor (P/N 976122) provides interface to the TFX data circuits for the RPS-424 Power Supply/Battery Charger so that the RPS-424 can be supervised over the addressable loop. The 500PSM provides for an address on the TFX, TFX–M, TFX-MV, DirecTone 500 analog addressable loop. In some Remote Bus power applications it can be used in place of a DCPM for power to an MPIM.

Features

- Provides detection of loss or low voltage AC input; ground fault to common; ground fault to positive voltage; and battery fault due to low battery voltage, missing or reverse battery, or open battery wire. These faults are indicated by yellow trouble LEDs and a dry contact fault output.
- Provides detection of low output voltages for all J1 power supply outputs: +24V @ 4A, +24V @ 2A switched, +15V @ 0.25A, and +5V @ 4A.
- Green LED (DC OK) to indicate all J1 outputs are OK.
- All circuits are power limited and are to be used with power limited sources.
- TFX compatible 14-pin connector to provide +5V, +12 V, +24V, 0V to MPIM modules.
    Note: The Power Supply Monitor Board does not provide –12V output; therefore for printer applications the MPIM and PIM-550 must be used with a DCPM.
- Field wiring terminal blocks are provided for the power supply J1 regulated outputs: +24 V @ 4 A, +12 V @ 0.10 A, +5 V @ 4 A

Module Position: _____
(See System Layout)

Space Requirement: Mounts to top cover of an RPS-424 Power Supply/Battery Charger using power supply cover mounting holes; or, mounts to a sub-plate with similar hole spacing.

Normal Input :   +24 VDC @ 62 mA (Battery Requirement)

Regulated Output Circuits (Available from RPS-424 Power Supply) :
   +24 VDC circuit at 4 A
   +12 VDC output at 100 mA
   +5 VDC @ 4A

Maximum Ripple voltage: maximum 2% of output VDC

Relay Contact Rating: 1 A @ 30 VDC resistive

Dimensions (lwh): 4 15/16 x 2 1/4 x 1 inches

Table 1.   LED Indicators

LED		Function	Normal Condition
DS1	Yellow	0 Volt Ground Fault	OFF
DS2	Yellow	AC Fault	OFF
DS3	Yellow	+VDC Ground Fault	OFF
DS4	Yellow	Battery Fault	OFF
DS5	Green	DC OK	ON

Important: Relay K1—for contact monitor wiring—contact normal status is ENERGIZED.

Install in accordance with NFPA 72, *Installation, Maintenance, and use of Protective Signaling Systems;* NFPA 70, *National Electrical Code.*
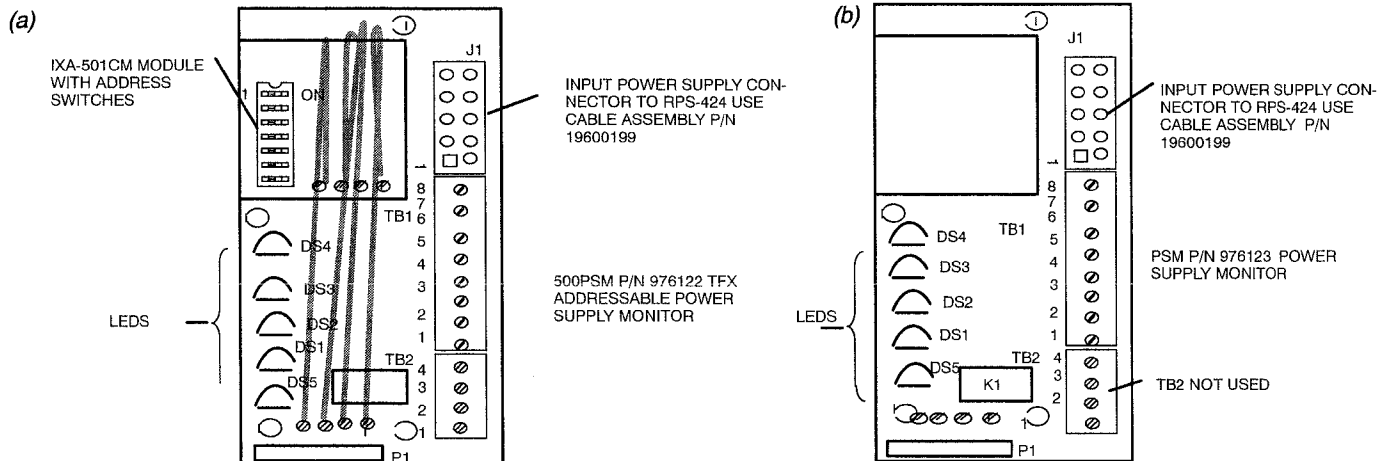
Figure 1   Power Supply Monitor Boards (a) 500PSM TFX Addressable Option Assemby No.976122, P/N 900960, (b) PSM Power Supply Monitor Assembly No. 976123, P/N 900961.
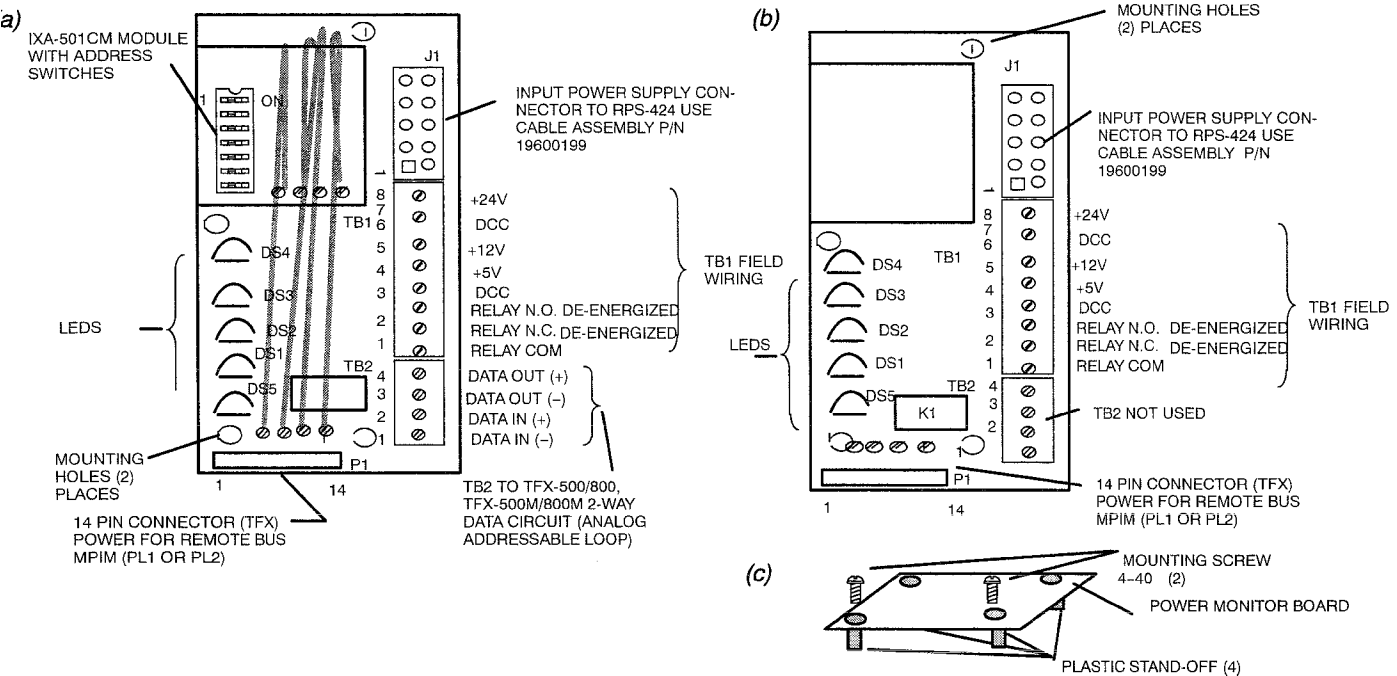
Figure 2   Power Supply Monitor Boards (a) 500PSM TFX Addressable Option Assemby No.976122, P/N 900960, (b) PSM Power Supply Monitor Assembly No. 976123, P/N 900961, (c) Side view of mounting hardware.

Installation

1. On 500PSM TFX-Addressable Model No. 976122, set address according to site plan. For example, for address 29, turn on switches 5, 4, 3, and 1 (value 16+8+4+1=29). Switch ON Values:

Sw. Pos.	Value	Sw. Pos.	Value
1	1	5	16
2	2	6	32
3	4	7	64
4	8		

2. Mount to power supply using appropriate mounting hardware. (See Figure 3.) Refer to Publication No. 19700323.
   a. Remove two top mounting screws from power supply.
   b. Align mounting holes of monitor board.
   c. Secure the monitor board using the screws provided.
3. Connect J1 of Monitor Board to J1 of RPS-424 using connector P/N 1900199. Refer to Publication No. 19700323.
4. Connect field wiring to terminal blocks or P1 connector.
5. Connect AC wiring to TB1 of RPS-424 (P/N 910683). Refer to Publication No. 19700323
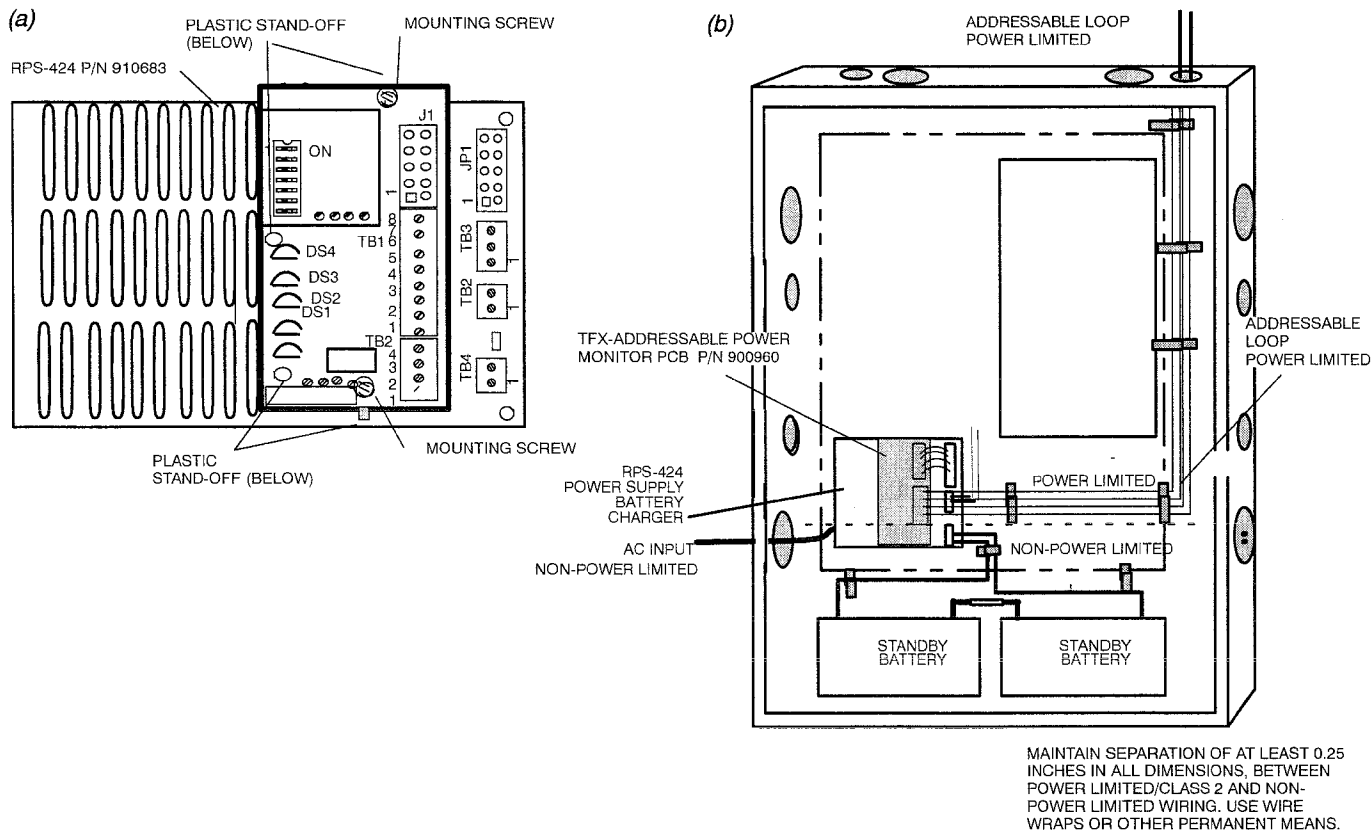
Figure 3 Typical installation of Power Supply Monitor Board to top cover of RPS-424 Power Supply (a) Mounting Power Monitor to RPS-424; (b) Wire routing for separation of power limited/Class 2 wiring from non-power limited wiring in remote TFX cabinet on addressable loop.

Table 2. Terminal Block Connections

Terminal	Function
TB1-1	Relay Common
TB1-2	Relay Normally Closed (De-Energized)
TB1-3	Relay Normally Open (De-Energized)
TB1-4	DCC
TB1-5	+5 V
TB1-6	+12 V
TB1-7	DCC
TB1-8	+24 V
TB2-1	Data Circuit IN (–)
TB2-2	Data Circuit IN (+)
TB2-3	Data Circuit OUT (–)
TB2-4	Data Circuit OUT (+)

> ⚠️ **WARNING:** Electrical Hazard! Power supply contains high voltage! Disconnect electrical power before servicing. Electric shock could cause injury or death.

Notes (See Figure 4):

1. All wiring to be in accordance with N.E.C. Article 760 (National Electrical Code), local authorities, and applicable notes.
2. All circuits and connections to the Power Supply Monitor Board are power limited and must be installed to comply with N.E.C. Article 760, Part A and Part C.
3. Make sure that all power-limited wiring is separated at least 0.25 inch from any wiring that is not power limited. Use cable ties to secure wiring.
4. All conductors must be free of grounds.
5. Disconnect power before servicing systems.
6. Do not loop wires. Break wire run to provide supervision.
7. Connect relays to UL listed power limited source suitable for fire protective signalling service.
8. Use appropriate UL listed end-of-line resistor as required by monitoring device.
9. The total load on the power supply 24 V outputs should not exceed 2.5 A (standby) or 5 A (alarm).

500PSM Programming

The 500PSM is programmed as an IXA-501CM Mini Contact Monitoring Module in CONSYS.

(a)
AUTOCALL
TFX-500/800, TFX-500M/800M
TFX-500MV/800MV, DirecTone 500
2-WAY DATA CIRCUIT
ANALOG ADDRESSABLE LOOP

CONTROL UNIT

TO RPS-424 POWER SUPPLY/ BATTERY CHARGER
TO NEXT DEVICE
SUPERVISED POWER LIMITED CLASS 2

TB2

POWER SUPPLY MONITOR BOARD ASSEMBLY NO. 976122 P/N 900960

ON

ADDRESS SWITCHES

(b)
TO RPS-424 POWER SUPPLY/ BATTERY CHARGER

POWER SUPPLY MONITOR BOARD ASSEMBLY NO. 976122 P/N 900960 OR ASSEMLBY NO. 976123 P/N 900961

POWER TO REMOTE BUS MPIM (PL1 OR PL2)

POWER LIMITED CLASS 2

RESTRICTED WITHIN CABINET ONLY

(c) TROUBLE CONFIGURATION (N.O., ENERGIZED) CONTACT MONITOR WIRING TO 2-WIRE SUPERVISED ZONE CIRCUIT OR OTHER COMPATIBLE SYSTEM

TO RPS-424 POWER SUPPLY/ BATTERY CHARGER

NOTE 8 EOL
SUPERVISED POWER LIMITED CLASS 2

N.C. C

8 7 6 5 4 3 2 1

TB1

POWER SUPPLY MONITOR BOARD ASSEMLBY NO. 976123 P/N 900961

ENERGIZED

(d) TROUBLE CONFIGURATION (N.C., ENERGIZED) CONTACT MONITOR WIRING TO 2-WIRE SUPERVISED ZONE CIRCUIT OR OTHER COMPATIBLE SYSTEM

TO RPS-424 POWER SUPPLY/ BATTERY CHARGER

NOTE 8 EOL
SUPERVISED POWER LIMITED CLASS 2

N.O. N.C. C

8 7 6 5 4 3 2 1

TB1

POWER SUPPLY MONITOR BOARD ASSEMLBY NO. 976123 P/N 900961

ENERGIZED

Figure 4. Typical Wiring Diagram (a) 500PSM TFX addressable loop application. (b) 500PSM Local Bus TFX Configuration. Other applications (c) PSM Alarm Configuration, (d) PSM Trouble Configuration.

Grinnell®
FIRE PROTECTION SYSTEMS COMPANY

AUTOCALL®
DCPM DC Power Module

PCB P/N 940503   **Assembly No. 976040**

Publication Number 19700252
Issue 4, January 1997

The DCPM DC Power Module is used to convert 24 VDC from an AC Power Supply (either at the main control panel or UL listed auxiliary power limited supply) to the necessary supplies of the TFX-500/800, TFX-500M/800M, TFX-500MV/800MV, and Direc-Tone 500 ("TFX") modules (for example, ALXM loop expansion modules).

Install in accordance with NFPA 72, Installation, Maintenance and use of Protective Signaling Systems; NFPA 70, National Electrical Code.

Module Position _____
(See System Layout)
Space Requirement: DCPM power module location
Input Voltage: 24 VDC (nominal)
Output Circuits: Special bus application only (two outputs)
Supervisory Current Draw: 50 mA (unloaded)
Alarm Current Draw: 50 mA (unloaded)
Dimensions (lwh): 3.6 x 5.4 x 2.1 inches
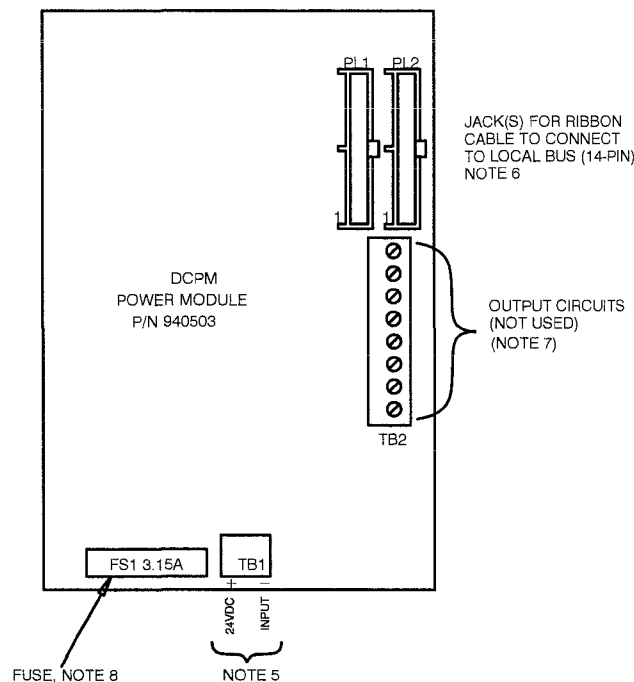
Figure 1. DCPM DC to DC Converter Module P/N 940503. All circuits and connections are power limited/Class 2.

Notes:
1. All wiring to conform to current National Electrical Code, NFPA 70, state, and local building code requirements and applicable notes. All circuits contained in this module are classified as power limited/Class 2 and shall be installed to comply with N.E.C. Article 760, Part A and Part C.
2. All conductors to be free of grounds.
3. Disconnect power before servicing systems.
4. All power supply wiring to be No. 14 AWG.
5. Input regulated, power limited 24 VDC comes typically from UL listed RPS-424 Power Supply/Battery Charger (P/N 910683, Assembly No. 976040), either at the main panel, or on the Remote Ops/Dis sub-plate.

6. Local Bus connection is used to drive intelligent peripherals within the enclosure. Typically connects to MPIM on front panel.
7. Output circuits are not used in AUTOCALL TFX applications.
8. Warranty void if fused improperly. Fuse FS1 is 3.15 A (UL listed, P/N 18400351).
9. Meets FCC Class "A" emission standards.

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Grinnell
FIRE PROTECTION SYSTEMS COMPANY

AUTOCALL®
MPIM Multi-Purpose Interface Module

PCB 940502 **Assembly 976015**
Publication Number 19700235
Issue 5, January 1997

Module Position
(See System Layout)
Space Requirements: MPIM panel location
Input Voltage: +5 VDC max @ 65 mA
Supervisory Current Draw: 19 mA
Alarm Current Draw: 24 mA
Dimensions (lwh): 6.6 x 3.625 x 1.0 inches

The MPIM is used by the AUTOCALL TFX-500/800, TFX-500M/800M, TFX-500MV/800MV, and DirecTone 500 ("TFX") control panels as an interface between the main processor (MP) and a number of different peripherals. Each MPIM must be configured to one of six "personalities" (see Table 1).

Figure 1. Multi-Purpose Interface Module (MPIM) P/N 940502. All circuits and connections are power limited/Class 2.

Notes:

1. All wiring to conform to current National Electrical Code, NFPA 70, state, and local building code requirements and applicable notes. All circuits contained in this module are classified as power limited/Class 2 and shall be installed to comply with N.E.C. Article 760, Part A and Part C.
2. Disconnect power before servicing the system.
3. All conductors must be free of grounds.
4. The personality header, H2, uses jumpers to enable the functions for each personality. See Table 1.
5. H1 and H3 Address Headers—Use header H1 (local) or H3 (remote) depending on whether the MPIM is used as local or remote interface. See Table 2.
6. LEDs—"Power ON" LED, seen from front panel, indicates system power status. "Fault" LED indicates trouble in the system.
7. Buzzer operates to alert operators of alarm or trouble status. Buzzer produces pulsed tone for Trouble, continuous tone for Alarm
8. Refer to Cable Application Chart in *AUTOCALL TFX-500/800 Spare Parts*, Publication Number 19700260 or *TFX-500M/800M Spare Parts*, Publication Number 19700373, for details.
9. Parallel Port is not used.
10. Serial Interface, IC8 should be configured as follows:

    a. Not installed for personalities OIB and XBB.
    b. Installed for PIB personalities only.
11. Supervised Remote Bus connects to TFX MP-500 Main Processor Board TB3, remote bus. Bus wiring parameters: 100 ohm total maximum line resistance, 30pF/foot (mutual) maximum capacitance, 4000 feet maximum distance. EOL is UL listed 120 ohm (P/N 976048). Use shielded, twisted pair wire. Connect shield to common shield connection point that connects to DC Common of main power supply.
12. Serial Port, PL3, connects to PIM-550 Printer Interface Module, PL5 (within cabinet). For cable connection, see "Thorn AUTOCALL TFX-500/800 Spare Parts," publication number 19700260 or *TFX-500M/800M Spare Parts*, Publication Number 19700373,.
13. In Front Panel application, OIB-L personality, connect PL10 to Expansion bus Connector of LCD board, pins 15 and 16.
14. PL9 provides for two N.O. switch inputs. Terminals are +VE (2) and 0V.
15. To increase contrast of LCD alpha-numeric display, turn potentiometer counter-clockwise.
16. Connect the Earth Ground Tab PL11 to the nearest convenient chassis ground point for protection of the Remote Bus electronics.

CAUTION: Connect the MPIM either to the Local Bus (PL1, PL2) OR to Remote Bus (PL4), **not both.**

MPIM Personality:

"Personality" is jumper-enabled configuration of the MPIM module that permits or excludes specific board functions, such as serial printer interface.

Table 1. MPIM Personality Headers
X = Jumper link installed

MPIM Board Personality	Header (H2) Links (P–)							
	0	1	2	3	4	5	6	7
OIB–L Operator Interface Board (Local)		x				x	x	
OIB–R Operator Interface Board (Remote)	x	x						x
XBB–L Expansion Bus Board (Local)		x		x				
XBB–R Expansion Bus Board (Remote)	x	x		x				x
PIB–L Printer Interface Board (Local)*		x	x	x	x			
PIB–R Printer Interface Board (Remote)*	x	x	x	x	x			x

* See Note 10

Table 2. H1, H3 Address Headers. Set address according to site plan.

Jumper Installed	Address Value
No link	0
A0	1
A1	2
A2	4
A3	8

Examples: For Address 3, install links on A0 and A1 (1 + 2); for address 13, install links on A3, A2, A0 (8 + 4 + 1); etc.

Table 3. MPIM Personality Configurations

Personality	Header Links	Functions						
		Keypad	**Display**	**Local Bus**	**Remote Bus**	**Expansion Bus**	**Serial Port**	**Parallel Port**
OIB–L Operator Interface Board (Local)	P 1,5,6	✓	✓	✓		✓	✓	
OIB–R Operator Interface Board (Remote)	P 0,1,7	✓	✓		✓	✓		
XBB–L Expansion Bus Board (Local Relay)	P 1,3			✓		✓		
XBB–R Expansion Bus Board (Remote)	P 0,1,3,7				✓	✓		
PIB–L Printer Interface Board (Local)*	P 1,2,3,4			✓		✓	✓	✓
PIB–R Printer Interface Board (Remote)*	P 0,1,2,3,4,7				✓	✓	✓	✓
*Install IC8, Serial Interface, for personalities PIB–L and PIB–R; do not install for other personalities.								

Table 4. MPIM Connectors and Terminals

MPIM Local Bus PL1 and PL2					
PL1/2–1	0 V	PL1/2–6	–RS232	PL1/2–11	SS2
PL1/2–2	MISO	PL1/2–7	+RS232	PL1/2–12	SS0
PL1/2–3	SCK	PL1/2–8	+26 V	PL1/2–13	MOSI
PL1/2–4	SS1	PL1/2–9	N/C	PL1/2–14	0V
PL1/2–5	SS3	PL1/2–10	+5V		

MPIM Remote Bus PL4					
PL4–1	(+)	PL4–3	(+)		
PL4–2	(–)	PL4–4	(–)		

MPIM Expansion Bus PL5					
PL5–1	Data	PL5–7	Expansion 1--16	PL5–13	0V
PL5–2	A0	PL5–8	Expansion 17--32	PL5–14	+5V
PL5–3	A1	PL5–9	Expansion 33--48	PL5–15	Ident
PL5–4	A2	PL5–10	Expansion 49--64	PL5–16	+12V
PL5–5	A3	PL5–11	Expansion 65--80		
PL5–6	Expansion 0	PL5–12	Reset		

MPIM Keypad/Display Interface PL7					
PL7–1	data—DB7	PL7–8	Vo	PL7–15	Row 4
PL7–2	data—DB6	PL7–9	LCD (+V_e)	PL7–16	Row 5
PL7–3	data—DB5	PL7–10	0V	PL7–17	Column 4
PL7–4	data—DB4	PL7–11	Not used	PL7–18	Column 3
PL7–5	(E) Clock	PL7–12	Row 1	PL7–19	Column 2
PL7–6	(R/W) Read–not–write	PL7–13	Row 2	PL7–20	Column 1
PL7–7	(RS) Register Select	PL7–14	Row 3		

MPIM Serial Port PL3					
PL3–1	0V	PL3–4	CTS		
PL3–2	transmit data	PL3–5	DSR		
PL3–3	receive data	PL3–6	DTR		

PL8	MPIM Keyswitch PL8	PL8-1 (+VE), PL8-2 (0V), PL8-3 (+VE)
PL9	General Purpose Input	PL9-1 (+VE), PL9-2 (0V), PL9-3 (+VE)
PL10	Connection to LCD display light	PL10-1 (+), PL10-2 (–)
PL11	Ground Tab	

MPIM Parallel Port PL6 (NOT USED)					
D1	data	D6	data	DS	Data strobe
D2	data	D7	data	BUSY	Busy
D3	data	D8	data	PAPER	Out-of–Paper
D4	data	PRIME	Reset	SEL	Select
D5	data	ACK	Acknowledge		

Grinnell
FIRE PROTECTION SYSTEMS COMPANY

IAM-800 Expansion Motherboard
PCB P/N 940562   **Order P/N 976063**

Publication Number 19700277
Issue 4, January 1997

The AUTOCALL IAM-800 Expansion Motherboard is used in the AUTOCALL TFX-500/800, TFX-500M/800M, TFX-500MV/800MV, DirecTone 500 ("TFX") fire control panels. It provides for mounting of the DCPM DC power module and the IIB-800 ALXM Loop Expansion Boards. The IAM-800 motherboard provides signal and power interconnections between the Main processor (MP), ALXMs, DCPM, and the 2-way data circuits (addressable loops).

Alarm and Fault relays are provided for fail-safe alarm and fault signalling should communications to the Main Processor board be lost. If communications to the MP-500 Main Processor are active, these relays will **not** switch. The relays will switch **only** if communications to the Main Processor are lost.

Module Position _____
(See System Layout)
Space Requirement: One PB3, Expansion Motherboard position; Optional DCPM (see Note 5), ALXM positions (2 minimum, 5 maximum)
Input Voltage: 24 VDC, regulated, power limited
Output Voltages (Optional DCPM): (see Publication No. 19700252, *DCPM DC Power Module*.)
Current Draw (IAM-800 board):
                22 mA supervisory
                20 mA alarm
Addressable Loop Capacity: Ten 2-way data circuits, connected to 5 ALXM boards
Relay Contact Rating: 1A @ 24 VDC, 0.6 Power Factor
Dimensions (*lwd* with ALXMs installed): 10.5 x 7.625 x 4 inches
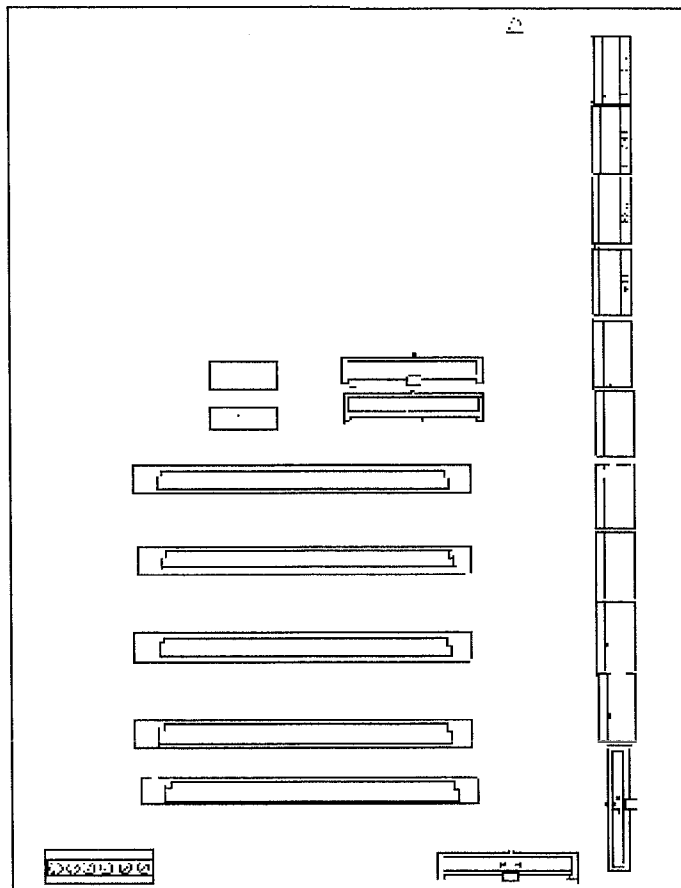
Figure 1.   IAM-800 Expansion Motherboard P/N 976063.

Installation:

1. The IAM-800 mounts to the subplate in the backbox (primary box) of the main control panel using plastic stand-offs.
2. A DCPM power module is required if three or more ALXM boards are installed.
3. Ten 2-way data circuits are wired to screw-type terminal blocks at the right-hand side of the board, as follows:

TB1—Loop A	TB6—Loop F
TB2—Loop B	TB7—Loop G
TB3—Loop C	TB8—Loop H
TB4—Loop D	TB9—Loop J
TB5—Loop E	TB10—Loop K

4. Five IIB-800 ALXM loop expansion boards connect to the IAM-800 motherboard and control pairs of 2-way data circuits (loops).

ALXM	Board Connector	Associated Loops
1	PL2	A and B
2	PL3	C and D
3	PL4	E and F
4	PL5	G and H
5	PL6	J and K

Notes:

1. All wiring to conform to current National Electrical Code, NFPA 70, state, and local building code requirements and applicable notes. All circuits contained in this module are classified as power limited and shall be installed to comply with N.E.C. Article 760, Part A and Part C.
2. All conductors must be free of grounds.
3. Disconnect power before servicing systems.
4. PL2 through PL6, connections for IIB-800 ALXM loop expansion modules. See Publication Number 19700287 for specifications.
5. PL1 and PL8 provide connection to optional DCPM DC power module P/N 940503. Install DCPM when 3 or more ALXMs are installed (special bus application) See Publication No. 19700252, *AUTOCALL DCPM DC Power Module*. Position the DCPM as shown in the diagram. Install it on the plastic standoffs supplied with the DCPM.
6. Ten supervised multiplex communications circuits (Loops "A" through "K") are attached to TB1—TB10. Specifications for each loop: Maximum line resistance is 75 ohms; maximum line capacitance is 0.5 microfarad (mutual); maximum line inductance is 1.5 millihenry (total); maximum continuous distance is 6500 feet. Use UL listed, shielded wire pair that allows for these parameters. Connect the shields to one common system shield connection point that connects to DC Common on the main power supply. See Tables 1 and 2 for list of compatible UL listed devices.
7. PL7 connects to the Local Bus of the Main Processor board. See Publication 19700247, "MP-500 Main Processor Board."
8. TB11 Fault and Alarm relay connections: Connect to regulated 24 V UL listed power limited source suitable for fire protective signalling service. Relays RL1 and RL2 are driven by ALXMs (only when the ALXMs lose communication to the motherboard). The "Alarm" relay will operate when an alarm is detected by the ALXMs. The "Fault" relay will operate when a trouble is detected by the ALXMs.
9. PL9 provides connection for Local Bus (add-on peripherals).
10. See Publication Number 19700260, "Autocall TFX-500/800 Spare Parts," or Publication Number 19700373, "Autocall TFX-500M/800M Spare Parts," for cable designations.

Table 1. Compatible Devices—The following Grinnell devices are UL listed for use on the two data loops.

Model	Part No.	Ass'y No.	Standby Current	Max. No. per Addr. Loop
IXA-500DM	940523	976022	20 mA	99
IXA-500DMA	940576	976093	20 mA	99
IXA-500CM	940528	976027	0.27 mA	99
IXA-500CMA	940575	976092	0.27 mA	99
IXA-502CMA	940581	976185	0.27 mA	99
IXA-501CM	940573	976081	0.27 mA	99
OXA-500SD	940526	976023	8.2 mA	99
OXA-500SDA	940574	976091	0.18 mA	99
OXA-501SDA	940582	976186	0.18 mA	99
505SDA	900989	976377	0.35 mA	99
506SDA	900989	976378	0.35 mA	99
OXA-504SDA	940574	976216	0.18 mA	99
OXA-500RM	940525	976025	0.27 mA	99
OXA-501RM	940580	976187	0.27 mA	99
OXA-502RM	940586	976258	0.27 mA	99
OXA-503RM	940587	976259	0.27 mA	99
OXM-501 RM/SDA Motherboard	900981	976253	0 mA	99
IXM-500 CMA Motherboard	900973	976184	0 mA	99
CAA-500LI*	940529	976026	2.7 mA	12 (in line to control panel)
OXA-500SB**	940527	976024	85 mA	one max per OXA-500SD

*Not addressable

**Not addressable, does not connect directly to 2-way data circuit; requires input from OXA-500SD

Detector Model	Standby Current (includes base)	Base Model	Det./Base Part Number	Max. Detectors per data circuit
ISA-412P	0.22 mA	IBN-512A	940518 / 940522	99
ISA-412I	0.18 mA	IBN-512A	940517 / 940522	99
ISN-512P	0.22 mA	IBN-512A	940520 / 940522	99
ISN-512I	0.18 mA	IBN-512A	940519 / 940522	99
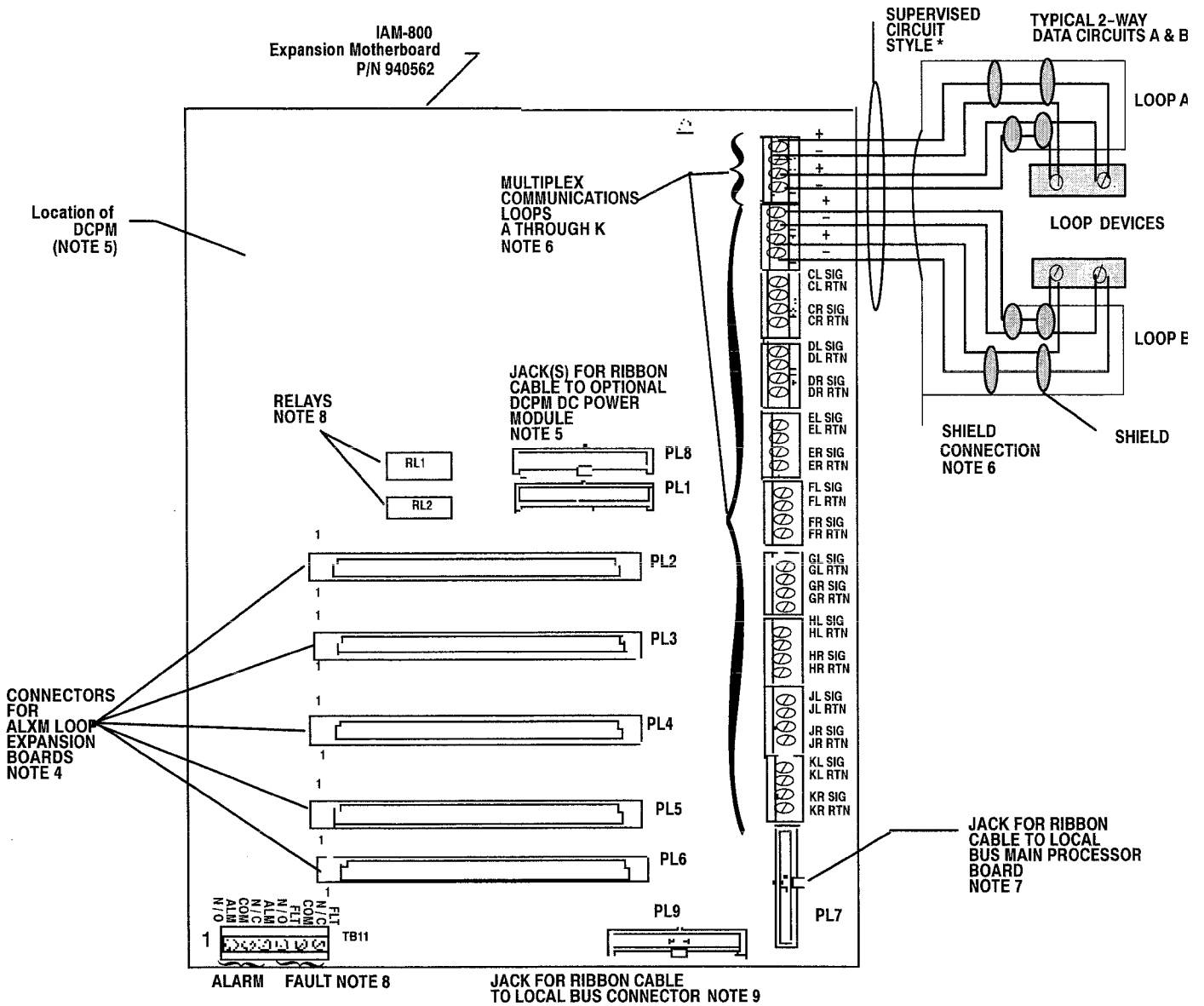
Figure 2.   IAM-800 Expansion Motherboard P/N 940562. All circuits and connections are power limited/Class 2.

*Complies with operation characteristics for NFPA Style 6. Complies with operation characteristics for NFPA Style 7 when a line isolator (CAA-500LI) is connected adjacent to and via conduit, to the input and output of each addressable device.

Table 2.   Compatible Devices—The following 550 Series detectors are UL listed for use on the two data loops.

Detector Model, Part No.	Standby Current (Head + Base)	Base Model, Part No.	Max. No. per data circuit
ISA-412P 940518	0.22 mA	IBN-512A 940522	99
ISA-412I 940517	0.18 mA		99
ISN-512P 940520	0.22 mA		99
ISN-512I 940519	0.18 mA		99
550 Series detectors			
ISN-550I 920095	0.20 mA	IBN-550, 920099; IBN-551, 920100; IBN-553, 920194	99
ISN-550P 920096	0.30 mA		99
IHN-135 920097	0.25 mA		99
IHN-200 920098	0.30 mA		99
ISN-550I 920095	0.23 mA	IBN-554, 920195	99
ISN-550P 920096	0.23 mA		99
IHN-135 920097	0.33 mA		99
IHN-200 920098	0.33 mA		99
ISN-550DI, 920102	0.20 mA	(Duct System, base included)	99
ISN-550DP, 920103	0.30 mA		99

This document is written for skilled technicians with experience installing and testing fire detection systems. These instructions do not purport to cover all the details or variations in the equipment described. Nor do they provide for every possible contingency met in connection with installation, operation, or maintenance. All specifications are subject to change without notice.

Should further information be desired or should particular problems arise which are not covered sufficiently for the user's purposes, the matter should be referred to Grinnell Fire Protection Systems Company, Inc., Westlake, Ohio 44145. Ph. (216) 871-9900.

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FIRE PROTECTION SYSTEMS COMPANY

IIB-800 ALXM Loop Expansion Board

PCB P/N 940563   **Order P/N 976062**

Publication Number 19700278
Issue 2, January 1997

The AUTOCALL IIB-800 ALXM Loop Expansion Board is used to expand the capacity of the AUTOCALL TFX-800 (TFX-800M, TFX-800MV). Each ALXM monitors two 2-way data circuits and up to 5 ALXMs can be fitted in an AUTOCALL TFX-800/800M panel. This enables it to handle up to ten 2-way data circuits (multiplex loops). Each ALXM monitors and processes signals from devices on those 2-way data circuits. The ALXM communicates significant events on the 2-way data circuits to the main processor board (MP-500). Commands from the MP-500 are also communicated to the 2-way data circuits (for example, zone walk test commands).

Each ALXM is also connected to common Alarm and Fault relays on the Expansion Motherboard, to provide failsafe external signalling only in the event of failure of the Main Processor.

If more than two ALXMs are installed, an additional DCPM DC Power Module must be installed on the Expansion Motherboard to provide power to the additional ALXMs.

Installation:
1. Orient the ALXM board so that the component-side of the board faces the top of the enclosure.
2. Loosen the retainer clips on the board guides so that the board slips along the tracks.
3. Secure the board retainer clips.

Module Position_____
(See System Layout)
Space Requirement: One ALXM, Loop Expansion Board position
Input Voltage: +5 VDC and +26 VDC (regulated, power limited)
Input Current: 60 mA and 50 mA respectively
Data Bus Supervisory Current Draw: 60 mA
Data Bus Alarm Current Draw: 60 mA
Addressable Loop Supervisory Current Draw: 20 mA per loop
Addressable Loop Alarm Current Draw: 24 mA per loop
Dimensions (lwd): 3.625 x 6.125 x 0.5 inches

Notes:
1. All conductors must be free of grounds.
2. Disconnect power before servicing systems.
3. Green LED, D16, "Processor OK," should be ON for normal operation. Yellow LED, D27, "Fault," ON indicates a microprocessor fault, or communication of an external fault to the motherboard.
4. H1, Special Test, no jumper is installed for normal operation.
5. H2, EEPROM Write Enable, should be configured as follows:
   a. No jumper link installed for normal operation.
   b. Jumper link installed only during EEPROM programming.
6. EEPROM must be installed and programmed for normal operation.
7. PL1 connects the ALXM to the Expansion Motherboard P/N 940562. Refer to Publication No. 19700277, "Autocall IAM-800 Expansion Motherboard". This connection provides power to the ALXM board, communication of microprocessor information to/from the 2-way data circuits, alarm relay drive, and fault relay drive.
8. All wiring to conform to current National Electrical Code, NFPA 70, state, and local building code requirements and applicable notes. All circuits contained in this module are classified as power limited/Class 2 and shall be installed to comply with N.E.C. Article 760, Part A and Part C.
9. H3 Ground Links. No links installed for normal operation. Do NOT install jumper links.
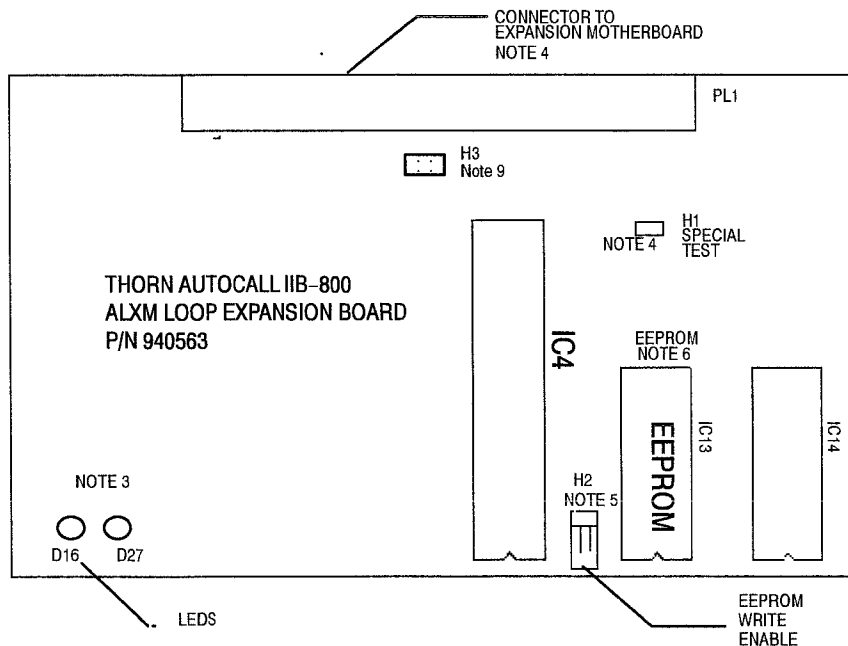
Figure 1.   IIB-800 ALXM Loop Expansion Board P/N 940563.All circuits and connections are power limited/Class 2.

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ARM-500 Auxiliary Relay Module
PCB P/N 900928   Assembly No. 976014

Publication Number 19700236,
Issue 3, January 1997

The AUTOCALL ARM-500 Auxiliary Relay Module is an optional board that provides eight zonal dry contact relay outputs for the AUTOCALL TFX-500/800, TFX-500M/800M, TFX-500MV/800MV, DirecTone 500 ("TFX") fire control systems. The ARM-500 interacts with the AUTOCALL TFX Main Processor (MP-500) via an additional Multi-Purpose Interface Module (MPIM, any personality). Eight relay contacts may be set normally-open (N.O.) or normally-closed (N.C.), selectable (by jumper). The ARM-500 may be used to switch either power limited or non-power limited circuits (or both)

Module Position
(See System Layout)
Space Requirements: Position B4 or B5 (maximum 5 per MPIM) or "piggy-back" to any MPIM
Input Voltage: 24 VDC
Supervisory Current Draw: 5 mA plus 27 mA per energized relay
Alarm Current Draw: 5 mA plus 27 mA per energized relay
Maximum Current: 221 mA
Contact Rating: 5 A @ 30 VDC or 277 VAC
Dimensions (lwh): 6.6 x 3.6 x 0.90 inches

Installation Notes:
1. Disconnect system power.
2. Install ARM-500 module using stand-offs.
3. Make MPIM cable connection.
4. If installing multiple ARM-500 modules, connect Output Pin 1 of first module to Input Pin 16 of second module. A maximum of five ARM-500 modules may be connected to one MPIM.
5. Install header in JP9 of the last board of the MPIM Expansion Bus.
6. Make field wiring connections.
7. Make power connections.
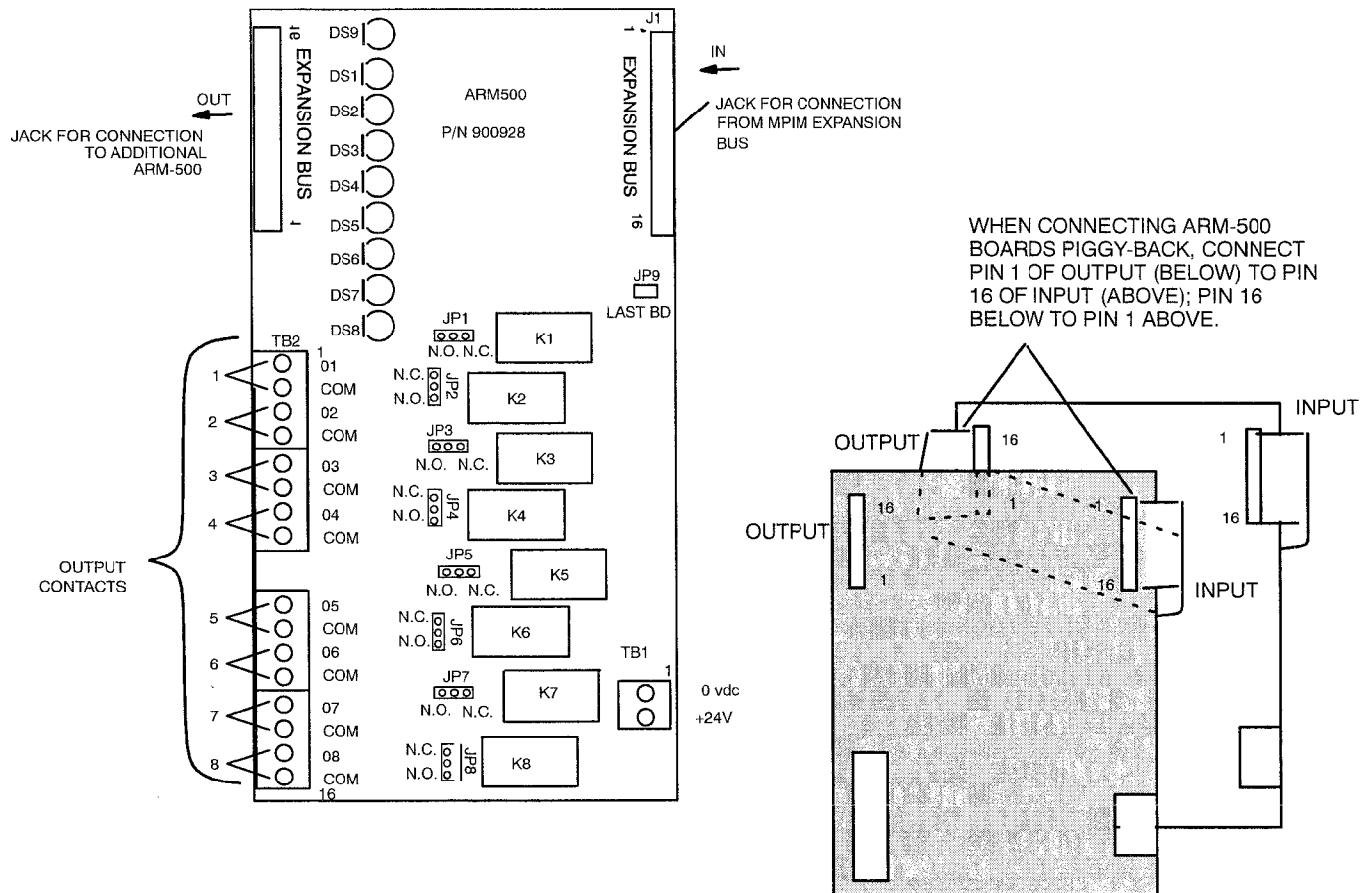
Figure 1.   ARM-500 Auxiliary Relay Module P/N 976014 (PCB No. 900928). Installation. When installing mumtiple ARM-500 modules, connect output of first ARM-500 to input of next ARM-500. Use correct polarity.
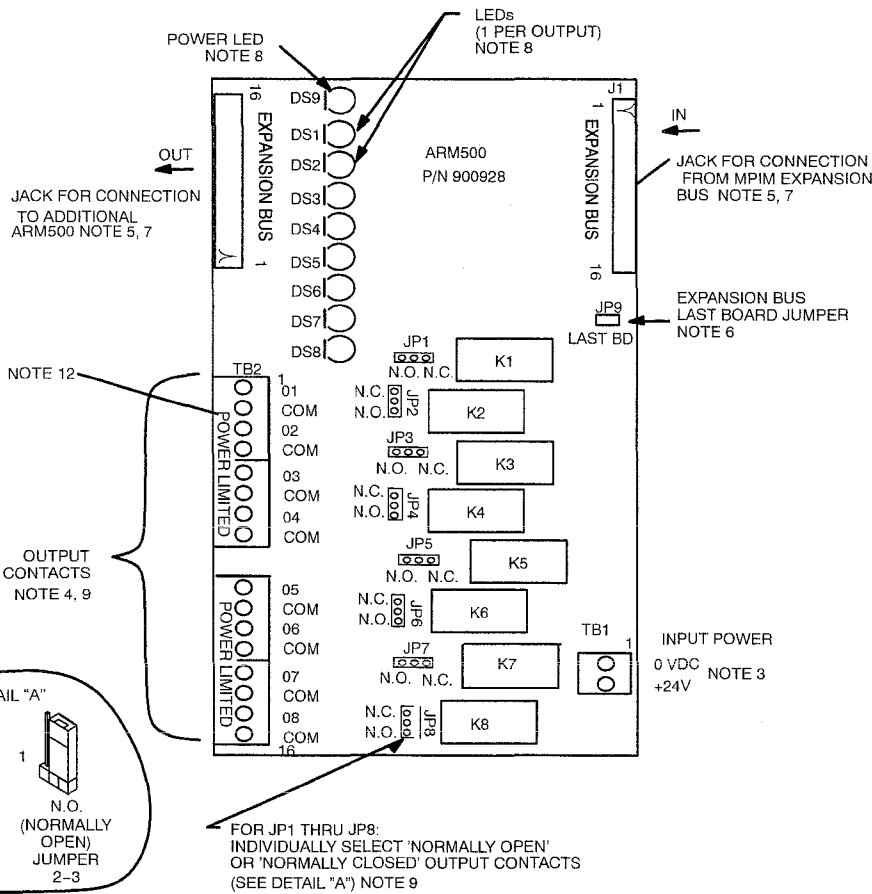
Table 1. ARM-500 Contacts, LEDs, Terminals

Output Number	Contact Select
1	JP1
2	JP2
3	JP3
4	JP4
5	JP5
6	JP6
7	JP7
8	JP8

Indicating LED	Output Terminals
DS1	01/Com
DS2	02/Com
DS3	03/Com
DS4	04/Com
DS5	05/Com
DS6	06/Com
DS7	07/Com
DS8	08/Com

Figure 2. ARM-500 Auxiliary Relay Module P/N 976014 (PCB No. 900928).

Wiring Notes:

1. Disconnect power before servicing the system.
2. All conductors to be free of grounds.
3. Typically connects to 24 VDC output of AC Power Module.
4. Wiring to terminal blocks TB2 may be connected to non-power limited sources. Make sure that all power-limited/Class 2 wiring is separated at least 0.25 inches from any wiring that is not power limited. Use cable ties or other permanent means to secure wiring.
5. See Publication Number 19700260, "*AUTOCALL TFX-500/800 Spare Parts*," or Publication Number 19700373, "*AUTOCALL TFX-500M/800M Spare Parts*," for cable connection applications.
6. Jumper JP9 is installed only on the last board of the expansion bus.
7. Up to four additional ARM-500 modules may be connected "piggy-back" to the first. Connect expansion bus from one to expansion bus of the other. A maximum of five ARM-500s may be connected to one MPIM. When making the connection, connect Pin 1 of first ARM-500 to Pin 16 of the next.
8. The status of each relay is visually indicated by the red LEDs DS1 through DS8. The green LED, DS9, "ON" indicates +5 VDC power.
9. Jumpers are used to select contacts as either normally-open (N.O.) or normally-closed (N.C.). Jumpers JP1 through JP8 correspond to contacts 1 through 8. (See Table)
10. It is necessary to program the AUTOCALL TFX Main Processor EEPROM for ARM-500 operation. Include for each relay: XBus address, device type, device operation, zone, and other information that may relate to relay operation.
11. All wiring to conform to current National Electrical Code, NFPA 70, state, and local building code requirements and applicable notes. When installed to comply with N.E.C. Article 760, Part A and Part B, these circuits are classified as **non-power limited**. When installed to comply with N.E.C. Article 760, Part A and Part C, these circuits are classified as power limited.
12. For non-power limited applications, remove the "POWER LIMITED" label from the terminal block.

This document is written for skilled technicians with experience installing and testing fire detection systems. These instructions do not purport to cover all the details or variations in the equipment described. Nor do they provide for every possible contingency met in connection with installation, operation, or maintenance. All specifications are subject to change without notice.

Should further information be desired or should particular problems arise which are not covered sufficiently for the user's purposes, the matter should be referred to Grinnell Fire Protection Systems Company, Inc., Westlake, Ohio 44145. Ph. (216) 871-9900.

Grinnell
FIRE PROTECTION SYSTEMS COMPANY

OAA-16 XIOM 16 Output Module
PCB P/N 940564   Assembly No. 976066

Publication Number 19700285
Issue 2, January 1997

The AUTOCALL OAA-16 Expansion 16 Output Module is used in the AUTOCALL TFX-500M/800M, TFX-500MV/ 800MV, Direc-Tone 500 ("TFX") fire control systems to drive 16 digital outputs such as "mimic" panel LEDs.

The OAA-16 XIOM module connects to the expansion bus of an MPIM. Up to five XIOMs may be connected ("daisy-chained") to an MPIM. The XIOM may be mounted "piggy-back" to the MPIM or mounted on the sub-plate within the same enclosure. The XIOM modules may be "piggy-backed" as space permits.

Module Position: _____

(See System Layout)
Space Requirement: Requires one MPIM per five XIOMs;Positions D4–D8, DB2–DB6, etc.; boards may be "piggy-backed" and connected "daisy-chain" within the same enclosure.
Input Voltage: +5 VDC (regulated, power limited)
Input Current: 11 mA
Output Voltage: +5 VDC
Output Current: 16 outputs @ 10 mA each (max 160 mA)
Current Draw Data Bus, Supervisory: 11 mA + 10 mA per active LED driver output
Current Draw Data Bus, Alarm: 11 mA + 10 mA per active LED driver output
Dimensions *(lwd):* 5.625 x 3.375 x 0.75 inches

Installation:
1. Check the OAA-16 XIOM module header configuration for correct output function. See Notes.
2. Attach terminal blocks (supplied). Wire output connections.
3. Install module on nylon stand-offs "piggy-back" to MPIM or another XIOM or on sub-plate in same enclosure as the MPIM driving it.
4. Connect the ribbon cables and power cables.

Figure 1.   (a) OAA-16 Expansion Output Module PCB 940564, Ass'y No. 976066, (b) Separation of power limited/ Class 2 circuits from non-power limited circuits.

Notes:

1. All conductors must be free of grounds.
2. Disconnect power before servicing systems.
3. See Publication Number 19700260, "AUTOCALL TFX–500/800 Spare Parts," or Publication Number 19700373, "AUTOCALL TFX–500M/800M Spare Parts," for cable connection applications.
4. PL1 and PL2, 16-pin expansion bus connection from MPIM to XIOM and from XIOM to XIOM, are power limited. A maximum of five XIOMs may be connected to one MPIM. "Piggy-back" the modules a maximum of three boards deep; install all boards in the same cabinet.
5. Headers H3 and H4 are factory configured with jumper installed across the O/P header to configure the OAA-16 for normal operation.
6. Header Link LK1––install jumper link to the last board on the expansion bus "daisy chain."
7. Headers H1 and H2 are factory configured with jumper installed across header 3–4 on both H1 and H2 for normal operation.
8. Terminal blocks TB1, TB2, TB4, and TB5 connect to output circuits (+ terminal). Typical connections are to LEDs. Use wire gauge No. 22 to 14 AWG. Wiring to terminal blocks may be connected to non-power limited sources. Make sure that all power-limited/Class 2 wiring is separated at least 0.25 inches from all wiring that is non-power limited. Use cable ties or other permanent means to secure wiring. Remove the "power limited" label from the non-power limited terminal blocks.
9. TB6 and TB7 provide a 0 V connection (– terminal) to the outputs; DC Common connection for sinking LED drive currents.
10. TB3 is not used in the OAA-16 application.
11. "Power On" LED is lighted when the protected +5 VDC supply is present.
12. Fuse FS1, UL listed 2.0 amp P/N 18400355. Warranty void if fused improperly.
13. It is necessary to program the AUTOCALL TFX-500/800 and TFX-500M/800M for XIOM digital output operation. Include for each: XBus address, device type, device operation, zone, and other information that may relate to digital output operation.
14. Typical wiring configuration. Each output will drive a 10-mA LED.
15. These are restricted outputs, and as such, all wiring to/from LEDs must remain within the same room.
16. All wiring to conform to current National Electrical Code, NFPA 70, state, and local building code requirements and applicable notes. When installed to comply with N.E.C. Article 760, Part A and Part B, these circuits are classified as **non-power limited.** When installed to comply with N.E.C. Article 760, Part A and Part C, these circuits are classified as power limited.

Grinnell
FIRE PROTECTION SYSTEMS COMPANY

IAA–16 XIOM 16 Input Module

PCB P/N 940564   Assembly No. 976067

Publication Number 19700286
Issue 2, January 1997

The AUTOCALL IAA-16 XIOM Expansion 16 Input Module is used in the AUTOCALL TFX-500M/800M, TFX-500MV/800MV, Direc-Tone 500 ("TFX") fire control systems to provide communication functions such as accepting volt-free contact inputs.

The IAA-16 XIOM connects to the Expansion Bus of an MPIM. Up to five XIOMs may be connected ("daisy-chained") to an MPIM. The XIOM may be mounted "piggy-back" to the MPIM or mounted on the sub-plate within the same enclosure. The XIOM modules may be "piggy-backed" as space permits.

Module Position: _____
(See System Layout)
Space Requirement: Requires one MPIM per five XIOMs;Positions D4--D8, DB2--DB6, etc.; boards may be "piggy-backed" and connected "daisy-chain" within the same enclosure.
Input Voltage: +5 VDC (regulated, power limited)
Input Current: 11 mA
Output Voltage: +5 VDC
Output Current: Current limited at 120 mA
Current Draw Data Bus, Supervisory: 5 mA per active switch input
Current Draw Data Bus, Alarm: + 5 mA per active switch input
**Dimensions *(lwd):* 5.625 x 3.375 x 0.75 inches

Installation:
1. Check the IAA-16 XIOM module header configurations for correct input function. See Notes.
2. Attach terminal blocks (supplied). Wire input connections.
3. Install module on nylon stand-offs "piggy-back" to MPIM or another XIOM or on sub-plate in same enclosure as the MPIM driving it.
4. Connect the ribbon cables and power cables.
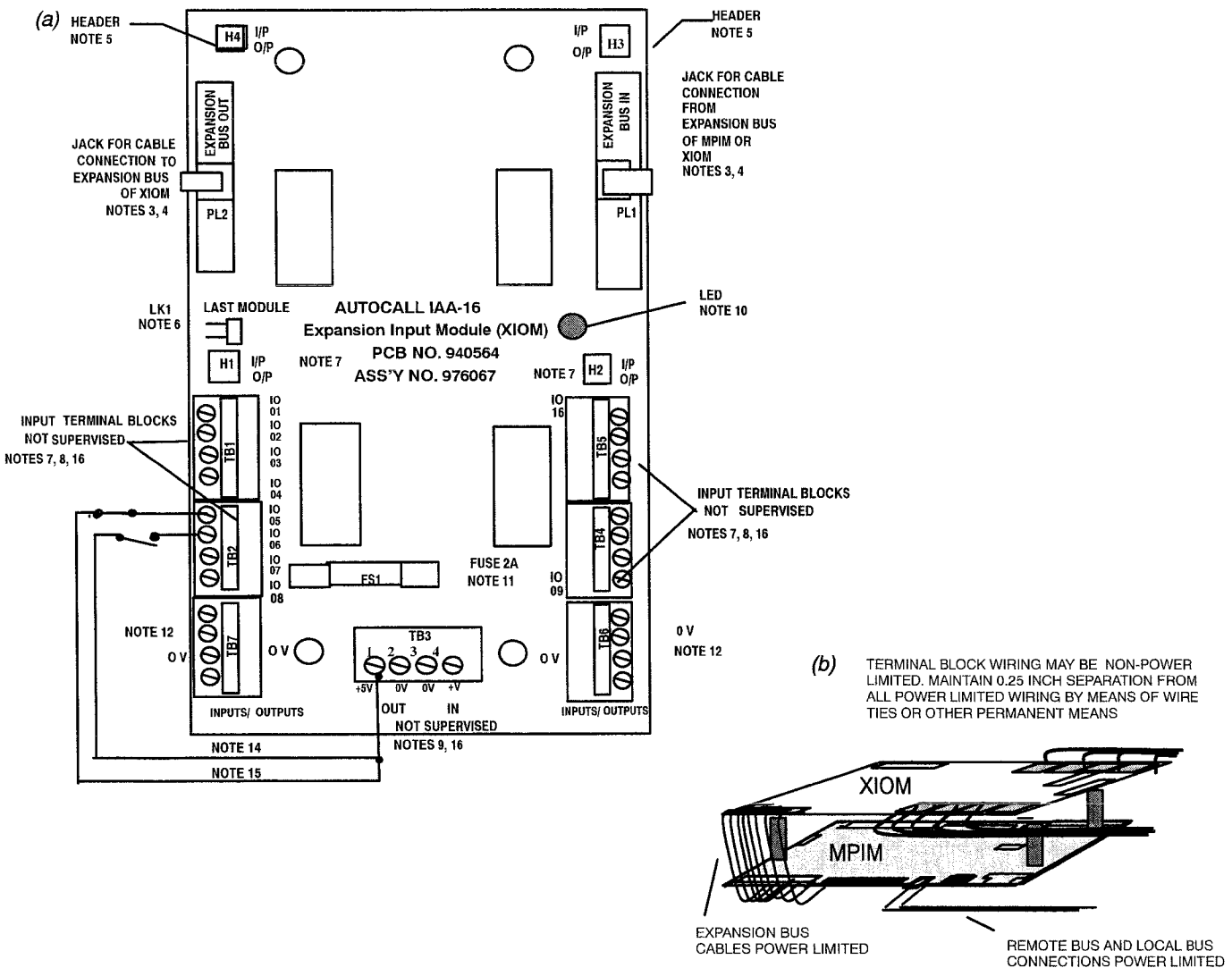
Figure 1.   (a) IAA-16 Expansion Input Module PCB No. 940564, P/N 976067, (b) Separation of power limited/Class 2 circuits from non-power limited circuits..

Notes:

1. All conductors must be free of grounds.
2. Disconnect power before servicing systems.
3. See Publication Number 19700260, "AUTOCALL TFX-500/800 Spare Parts," or Publication Number 19700373, "AUTOCALL TFX-500M/800M Spare Parts," for cable connection applications.
4. PL1 and PL2, 16-pin Expansion Bus connection from MPIM to XIOM and from XIOM to XIOM, are power limited/Class 2. A maximum of five XIOMs may be connected to one MPIM. "Piggy-back" the modules a maximum of three boards deep; install all boards in the same cabinet.
5. Headers H3 and H4 are factory configured with jumper installed across the I/P header for normal IAA-16 operation.
6. Header Link LK1—install jumper link to the last board on the expansion bus "daisy chain."
7. Headers H1 and H2 are factory configured with jumper installed across header1–2 on both H1 and H2 for normal operation.
8. Terminal blocks TB1, TB2, TB4, and TB5 connect to input circuits. Typical connections are to input relays. Use wire gauge No. 22 to 14 AWG. Wiring to terminal blocks may be connected to non-power limited sources. Make sure that all power-limited/Class 2 wiring is separated at least 0.25 inches from all wiring that is non-power limited. Use cable ties or other permanent means to secure wiring. Remove "power limited" label from non-power limited terminal blocks.
9. TB3 provides a +5 VDC supply for use with volt-free contacts.
10. "Power On" LED is lighted when the protected +5 VDC supply is present.
11. Fuse FS1, UL listed 2.0 amp P/N 18400355. Warranty void if fused improperly.
12. TB6 and TB7 are not used in IAA-16 application.
13. It is necessary to program the AUTOCALL TFX-500/800 and TFX-500M/800M for IAA-16 XIOM digital input operation. Include for each: XBus address, device type, device operation, zone, and other information that may relate to digital input operation.
14. Typical normally-low configured input (Normally-Open contact).
15. Typical normally-high configured input (Normally-Closed contact).
16. These are restricted inputs, and as such, all wiring to/from the inputs must remain within the same room.
17. All wiring to conform to current National Electrical Code, NFPA 70, state, and local building code requirements and applicable notes. When installed to comply with N.E.C. Article 760, Part A and Part B, these circuits are classified as **non-power limited**. When installed to comply with N.E.C. Aritcle 760, Part A and Part C, these circuits are classified as power limited.

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XAA-16 8-Input/8-Output Contact Monitor/Relay Driver Module (XIOM)

PCB P/N 940564 **Assembly No. 976098**

Publication Number 19700338
Issue 2, January 1997

The AUTOCALL XAA-16 8-Input/8-Output Contact Monitor/Relay Driver Module is used in the AUTOCALL TFX-500/800, TFX-500M/800M, TFX-500MV/800Mv, DirecTone 500 ("TFX") fire control systems to provide the following input/output communication functions:

- Drive relay outputs
- Accept digital inputs.
- Monitor volt-free relay contacts

The XIOM connects to the Expansion Bus of an MPIM (any personality). Up to five XIOMs may be connected ("daisy-chained") to an MPIM. The XIOM may be mounted "piggy-back" to the MPIM or mounted on the sub-plate within the same enclosure. The XAA-16 modules may be "piggy-backed" as space permits.

The XAA-16 is configured for 8 outputs and 8 inputs.

Module Position _____
(See System Layout)
Space Requirement: Requires one MPIM per five XAA-16s; Positions D4–D8 or DB2–D6, etc.; boards may be "piggy-backed" and connected "daisy-chain" within the same enclosure.
Standby Current: 4 mA
+ 9 mA per active LED output
+ 50 mA per active relay output drive
+ 5 mA per configured input
Alarm Current: (same as Standby)
+5V Output Current: (TB3-1) Limited to 120 mA
Input Supply Voltage: (TB3-4 to drive relay output drivers)
5 V to 24 V, regulated and limited to 2 A
Output Ratings: LED, 10 mA max
Relay Coil Drive, 100 mA max
Dimensions (lwd): 5.625 x 3.375 x 0.75 inches

Installation:
1. Check the XAA-16 module for correct input/output configuration by checking header jumper links. See Notes.
2. Attach terminal blocks (supplied). Wire input/output connections.
3. Install module on metal stand-offs "piggy-back" to MPIM or another XAA-16 or on sub-plate in same enclosure as the MPIM driving it.
4. Connect the ribbon cables and power cables.
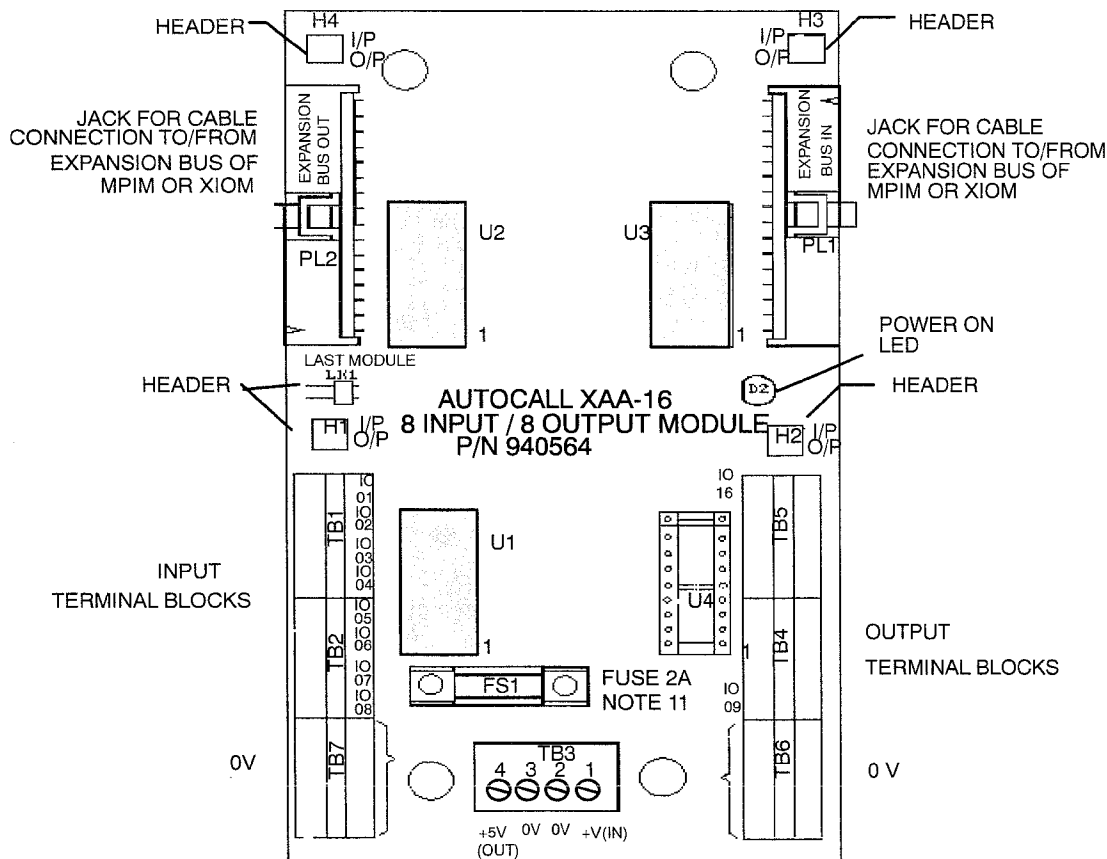
Figure 1.   AUTOCALL XAA-16 8-Input/8-Output Module PCB No. 940564, Ass'y. No. 976098.

Table 1. XAA-16 Terminal and Header Designations

Function / Mode	Terminal	Input/Output Port	Header Jumper Link
Input—volt free	TB1-1 to TB1-4	1–4 (Input)	H1 link 1–2,
	TB2-1 to TB2-4	5–8 (Input)	H4 link 1–2
Output—relay driver	TB4-1 to TB4-4	9–12 (Output)	H2 link 3–4,
	TB5-1 to TB5-4	13–16 (Output)	H3 link 3–4

Notes:

1. All conductors must be free of grounds.
2. Disconnect power before servicing systems.
3. See Publication Number 19700260, "AUTOCALL TFX-500/800 Spare Parts," for cable connection applications.
4. PL1 and PL2, 16-pin Expansion Bus connection from MPIM to XAA-16 and from XAA-16 to XAA-16 are power limited. A maximum of five XAA-16s may be connected to one MPIM. "Piggy-back" the modules a maximum of three boards deep; install all boards in the same cabinet.
5. Header Link LK1—install jumper link in LK1 into the last board on the Expansion Bus "daisy chain."
6. Headers H1, H2, H3, and H4 configure terminal blocks for input or output functions. See Table 1 for header position related to terminal block operation.

7. Terminal blocks TB1, TB2, TB4, and TB5 connect to input/output circuits. Typical connections are to LEDs, input relays, or output relays. Use wire gauge No. 22 to 14 AWG. (See Figure 2). Wiring to terminal blocks may be connected to non-power limited sources. Make sure that all power-limited/Class 2 wiring is separated at least 0.25 inches from all wiring that is non-power limited. Use calbe ties or other permanent means to secure wiring. Remove the "power limited" label from the non-power limited terminal blocks.
8. TB3 provides a 120 mA current limited output +5 VDC supply for use with volt-free contacts.
9. "Power On" LED is lighted when the protected +5 VDC supply is present.
10. Fuse FS1, UL listed 2 amp P/N 18400355. Warranty void if fused improperly.
11. It is necessary to program the AUTOCALL TFX conatrol panel for XAA-16 digital input/output operation. Include for each: XBus address, device type, device operation, zone, and other information that may relate to digital input/output operation.
12. All circuits connected to the XAA-16 are classified as power limited/Class2.
13. All wiring to conform to current National Electrical Code, NFPA 70, state, and local building code requirements and applicable notes. When installed to comply with N.E.C. Article 760, Part A and Part B, these circuits are classified as **non-power limited.** When installed to comply with N.E.C. Article 760, Part A and Part C, these circuits are classified as power limited.
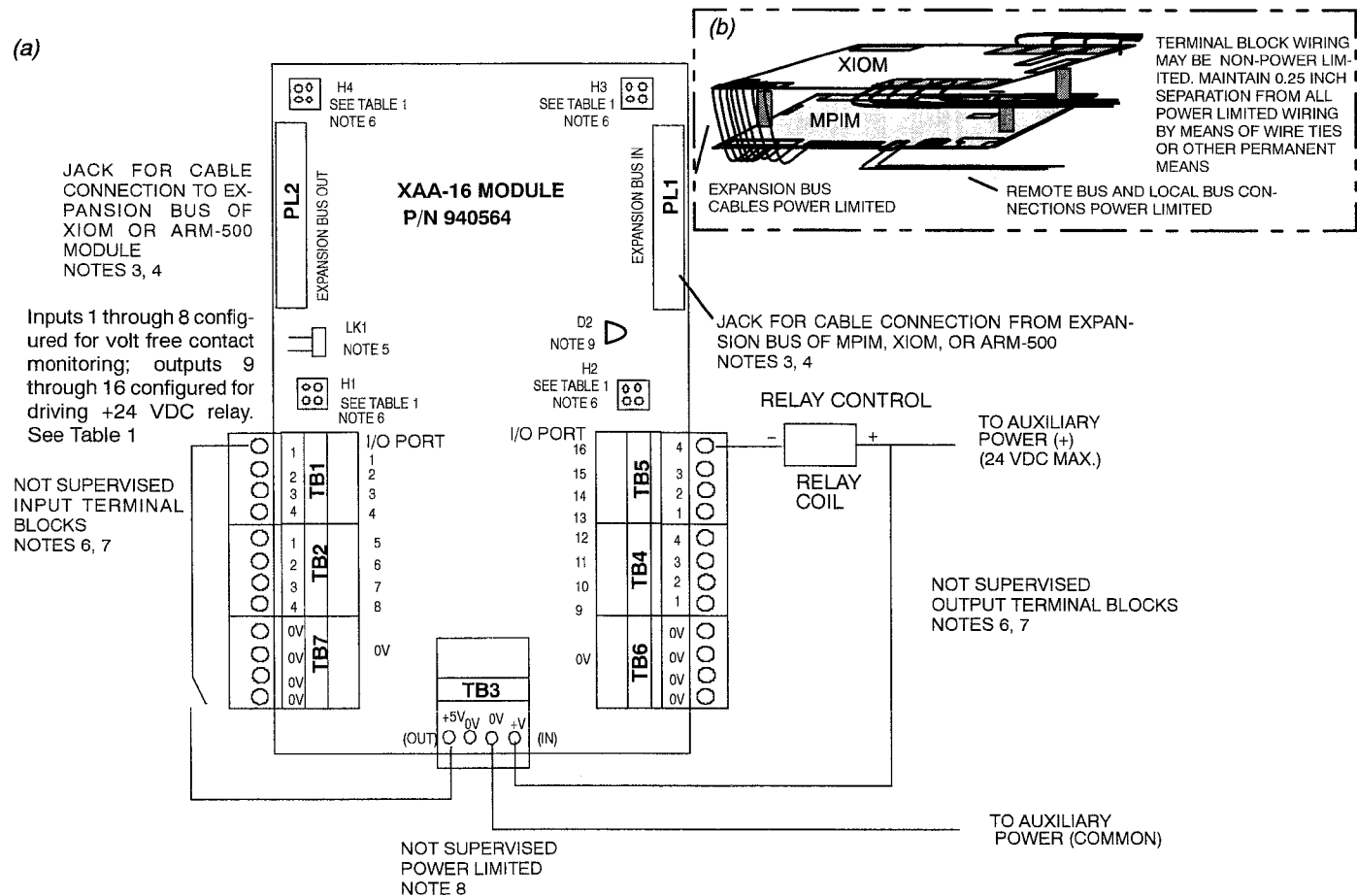
Figure 2.   (a) Typical AUTOCALL XAA-16 Wiring. (b) Separation of power limited/Class 2 circuits from non-power limited circuits.

Grinnell®
FIRE PROTECTION SYSTEMS COMPANY

PIM-550 Printer Interface Module

PCB P/N 940545   **Assembly No. 976018**

Publication Number 19700253
Issue 4, January 1997

The Printer Interface Module provides galvanic isolation between the AUTOCALL TFX-500/500M or TFX-800/800M fire control panel and a serial interface UL listed printer (P/N 920020).

Module Position _____
(See System Layout)
Space Requirement: Location D4 or D5 ("piggyback" to MPIM on front panel or auxiliary housing)
Input Voltage: regulated and power limited;+5 VDC @ 80 mA max, –12 VDC @ 5 mA max, +12 VDC @ 5 mA max
Supervisory Current: 20 mA
Data Communications: RS232 serial
Baud rate = 4800
Dimensions (lwh): 6.6 x 3.6 x 0.75 inches

PIM-550
P/N 940545

PL1

JACK FOR
RIBBON CABLE
CONNECTION TO MPIM
(NOTE 3)

CONNECTION
TO MPIM
(NOTES 4 & 5)

PL2

PL3

JACK FOR
RIBBON CABLE
CONNECTION TO MPIM
(NOTE 3)

CONNECTION
TO PRINTER
(NOTES 4 & 5)

PL4

EARTH
TAG

PL5

NOTE 7
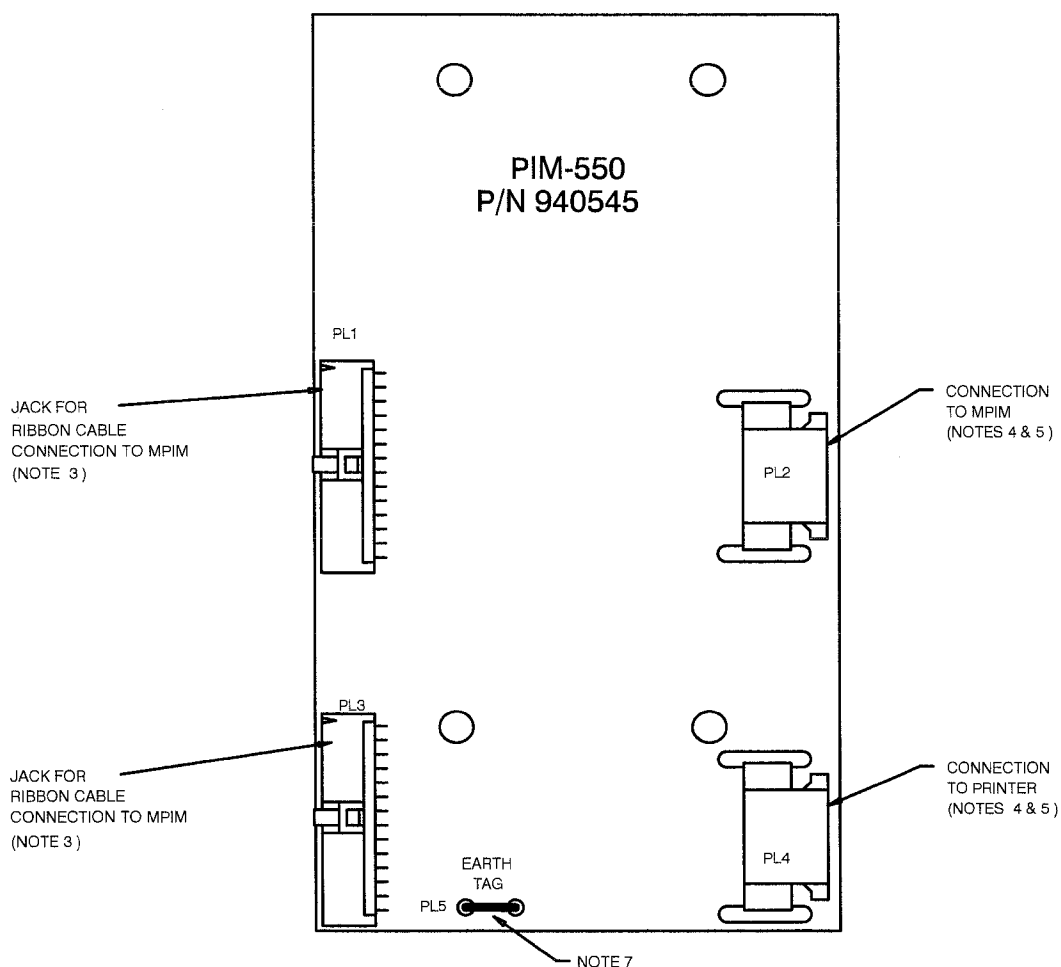
Figure 1.   PIM-550 Printer Interface Module (PCB P?N 940545, Ass'y. No. 976018). All circuits and connections are power limited/Class 2.

Notes:
1. Remove power before servicing systems.
2. All conductors must be free of grounds.
3. Connect either PL1 or PL3 to Local Bus connection of MPIM (to provide input power).
4. PL2 (IN) connects to serial port of MPIM.
5. PL4 (OUT) connects to serial port of UL listed printer (P/N 920020). Maximum cable distance is 50 feet, restricted to same room.

6. See Publication Number 19700260, "*AUTOCALL TFX-500/800 Spare Parts*," or Publication Number 19700373, "*AUTOCALL TFX-500M/800M Spare Parts*," for cable designations.
7. Connect PL5, "Earth Tag," to chassis.See Publication Number 19700260, "*AUTOCALL TFX-500/800 Spare Parts*," for cable designation.

B. All wiring to conform to current National Electrical Code, NFPA 70, state, and local building code requirements and applicable notes. All circuits contained in this module are classified as power limited/Class 2 and shall be installed to comply with N.E.C. Article 760, Part A and Part C.

Table 1. PIM–550 Printer Interface Connections

PL1 and PL3		PL2 and PL4	
Pin	Function	1	0 V
1	0 V	2	TXD
2	MISO	3	RXD
3	SCK	4	CTS
4	SS1	5	DSR
5	SS3	6	DTR
6	–12 V		
7	+12 V	PL5 Earth Ground Tag	
8	+26 V	PL5	Earth Ground
9	N/C		
10	+5 V		
11	SS2		
12	SS0		
13	MOSI		
14	0 V		

This document is written for skilled technicians with experience installing and testing fire detection systems. These instructions do not purport to cover all the details or variations in the equipment described. Nor do they provide for every possible contingency met in connection with installation, operation, or maintenance. All specifications are subject to change without notice.

Should further information be desired or should particular problems arise which are not covered sufficiently for the user's purposes, the matter should be referred to Grinnell Fire Protection Systems Company, Inc., Westlake, Ohio 44145. Ph. (216) 871-9900.

![Grinnell logo] **Grinnell**
FIRE PROTECTION SYSTEMS COMPANY

CEB–500 City Box Transmitter
PCB P/N 940524   Assembly 976031

Publication Number 19700249
Issue 4, Jafnuary 1997

The AUTOCALL CEB–500 City Box Transmitter provides an interface between the TFX (TFX-500/800, TFX-500M/800M, kTFX-500MV/800MV, DirecTone 500) fire control panel and a standard coded municipal transmitter. The CEB–500 sends a 'System Alarm' signal from the control panel to the city box and generates a 'Signalling Started' event when the city box trips. It also monitors for a 'Coil Fault' at the city box and causes a 'Signalling Fault' message at the fire control panel.

Module Position: _____
(See System Layout)
Space Requirement: One Module position B2 or PB2
Input Voltage: regulated and power limited; 24 VDC at 1.5 A max, 5 VDC at 20 mA
Supervisory Current: 5 mA
Maximum Current: City Box load 1.5 A max
Maximum Output Voltage: 28.5 VDC
Maximum Wiring Impedance to City Box: 4.5 ohm
Dimensions *(lwd)*: 3.5 x 4.6 x 1 inches

Install in accordance with NFPA 70, National electrical Code, NFPA 72, *Installation, Maintenance, and use of Protective Signaling Systems.*
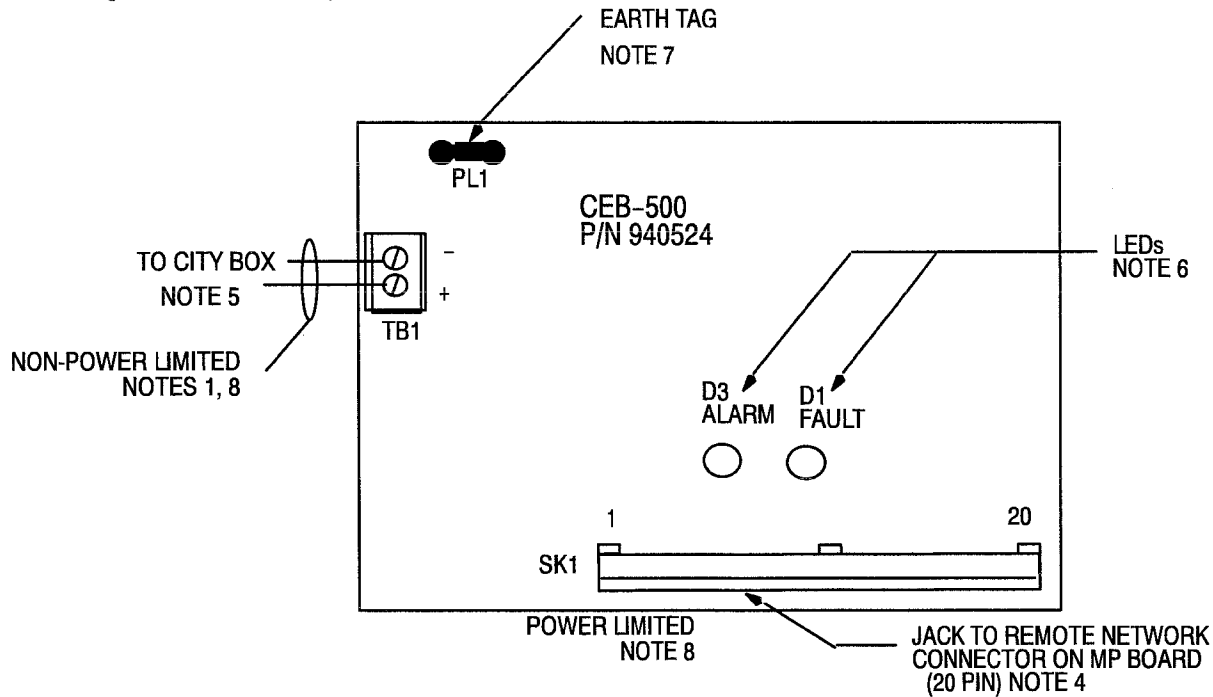
Figure 1.   CDB-500 City Box Transmitter Module (PCB P?N 940524, Ass'y. No. 976031).

Notes:
1. All wiring to conform to current National Electrical Code, NFPA 70, state, and local building code requirements and applicable notes.
2. Disconnect power before servicing systems.
3. All conductors to be free of grounds.
4. Fit plastic stand–offs to the TFx-500/800, TFX-500M/800M Main Processor board. Carefully match the 20–pin connector on the CEB–500 board to the 20–pins of PL7 remote network connector on the MP board. Lower the board until connectors are firmly seated and plastic stand–offs snap into holes in the board.
5. Connect TB1 to a UL Listed City Box having the following ratings: Trip Current 250 mA, Coil Resistance 14.5 ohms. (Circuit not supervised for shorts.) Refer to Wiring Diagram No. 19700243 for connection details.
6. The red "Alarm" LED indicates Alarm and activation of the output circuit. The yellow "Fault" LED indicates Trouble.

7. Connect PL1, "Earth Tag," to PL10, "Earth Ground Tag, on the MP-500 Main Processor board for the TFX control panel. See "AUTOCALL TFX–500/800 Spare Parts," Publication Number 19700260 or "AUTOCALL TFX–500M/800M Spare Parts," Publication Number 19700373 for cable designation.
8. The field wiring connections to TB1 of this module are non-power limited. These wires must be routed and secured to maintain a minimum of 0.25 inch separation from power limited/Class 2 wiring. Refer to "Wiring Guidelines," Publication No. 19700259 and wiring diagram No. 19700243 for connection details.

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FIRE PROTECTION SYSTEMS COMPANY

CVB-500 Reverse Polarity Transmitter
PCB P/N 940525   **Order P/N 976030**

Publication Number 19700250
Issue 4, January 1997

The AUTOCALL CVB-500 Reverse Polarity Transmitter provides an interface between the AUTOCALL TFX (TFX-500/800, TFX-500M/800M, TFX-500MV/800MV, DirecTone 500) fire control panel and a municipal or commercially operated central alarm receiving station. The CVB-500 transmits "System Alarm" and "System Trouble" signals. It also generates a "Signalling Started" message at the control panel when the CVB-500 trips.

Module Position: _____
(See System Layout)
Space Requirement: One position B2 or PB2. Cannot be installed if City Box Transmitter module is installed.
Input Voltage: 24 VDC (regulated, power limited/Class 2)
Output Voltage: 24 VDC
Maximum Current Draw: 10 mA (Alarm)
Maximum Output Circuit Inpedance (Includes wiring and receiver impedance):   15 k-ohm
Maximum Source Current: 6.5 mA
Dimensions *(lwd):* 3.5 x 4.625 x 1 inches

Install in accordance with NFPA 72, Installation, Maintenance and use of Protective Signaling Systems, and NFPA 70, National Electrical Code.
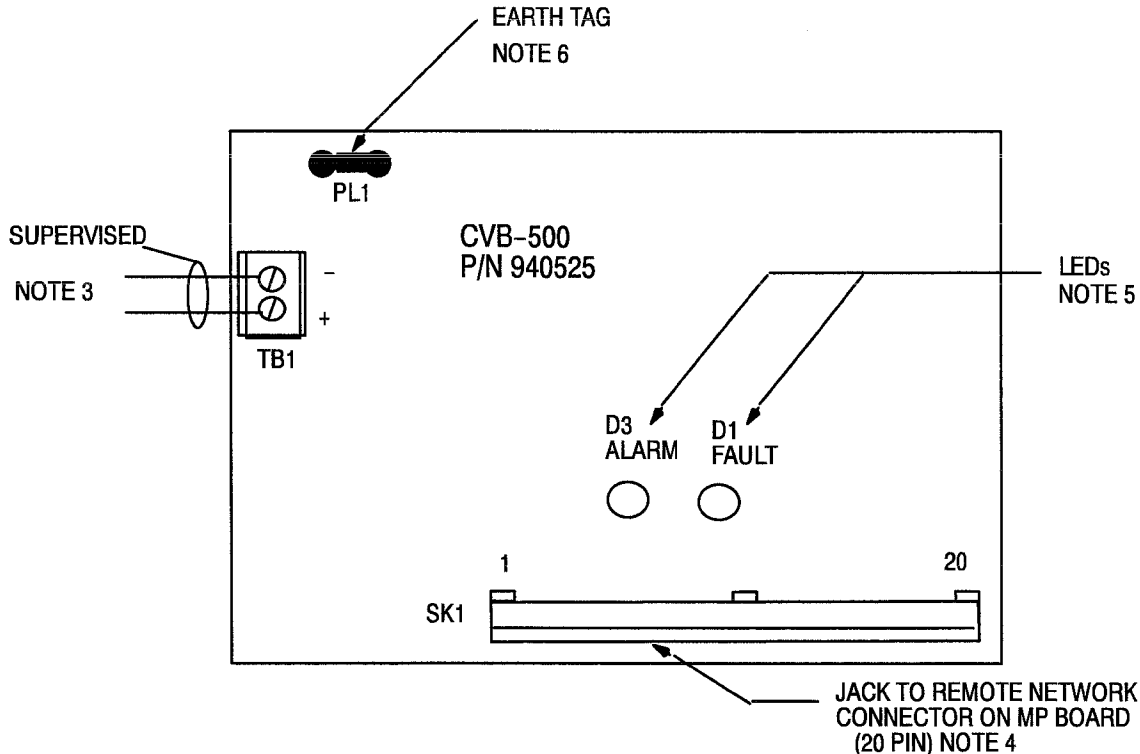
Figure 1.   AUTOCALL CVB-500 Reverse Polarity Transmitter P/N 940525. All circuits and connections are power limited/Class2.

Notes:
1. Disconnect power before servicing the system.
2. All conductors must be free of grounds.
3. Connect to UL listed remote station (refer to Figure 2 for parameters.) Refer to Wiring Diagram No. 19700244 for connection details.
4. Fit plastic stand-offs to the AUTOCALL MP-500 Main Processor board (P/N 940500). Carefully match the 20-pin connector on the CVB-500 board to the 20 pins of PL7, the remote network connector of the MP board. Lower the board until connectors are firmly seated and plastic stand-offs snap into holes in the board.
5. Red LED indicates Alarm, yellow LED indicates Trouble.
6. Connect PL1, "Earth Tag," to PL10, "Earth Ground Tag," on the Main Processor board. See "AUTOCALL TFX-500/800 Spare Parts," Publication Number 19700260 or "AUTOCALL

TFX-500M/800M Spare Parts," Publication Number 19700373 for cable designation.
7. All wiring to conform to current National Electrical Code, NFPA 70, state, and local building code requirements and applicable notes. All circuits contained in this module are classified as power limited/Class 2 and shall be installed to comply with N.E.C. Article 760, Part A and Part C.

CVB-500 Output Wiring Parameters

To determine maximum allowable wiring resistance, first determine receiver current requirements and receiver imput impedance. Then use the graph in Figure 2 to determine the maximum wiring resistance.

For example, if your receiver requires 4.5 mA and has 1000 ohm input impedance, find the corresponding impedance for 4.5 mA on the chart; subtract the input impedance. The maximum wiring impedance is

4200 ohms − 1000 ohms = 3200 ohms
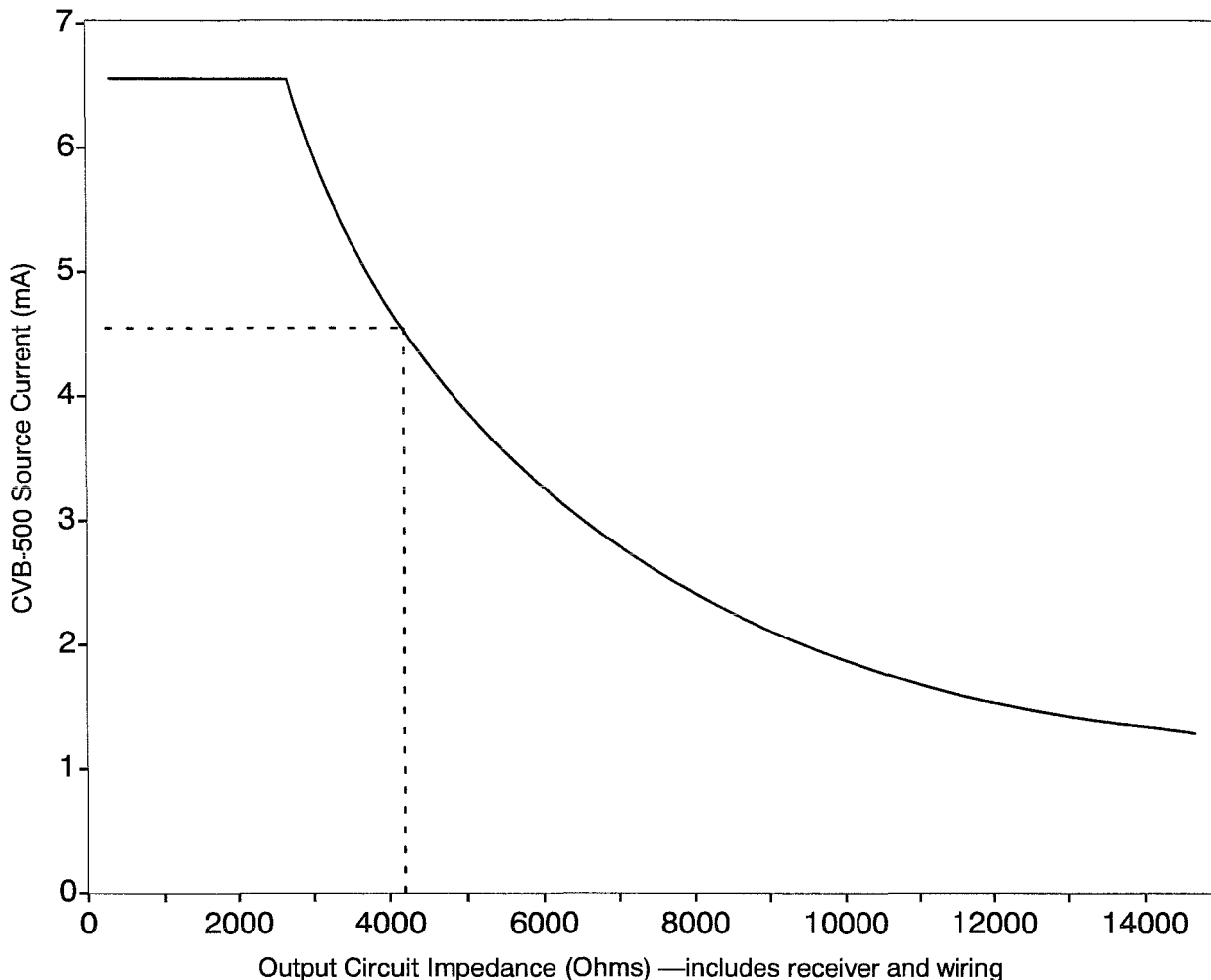
Receiver Current Requirement	Maximum Circuit Inpedance (Receiver + Wiring)
6.5 mA	2700 ohms
6.0 mA	3000 ohms
5.0 mA	3650 ohms
4.0 mA	4650 ohms
3.0 mA	6350 ohms
2.5 mA	7200 ohms
1.25 mA	15,000 ohms

Figure 2.   CVB-500 Source Current vs Output Circuit Impedance.

This document is written for skilled technicians with experience installing and testing fire detection systems. These instructions do not purport to cover all the details or variations in the equipment described. Nor do they provide for every possible contingency met in connection with installation, operation, or maintenance. All specifications are subject to change without notice.

Should further information be desired or should particular problems arise which are not covered sufficiently for the user's purposes, the matter should be referred to Grinnell Fire Protection Systems Company, Inc., Westlake, Ohio 44145. Ph. (216) 871-9900.

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FIRE PROTECTION SYSTEMS COMPANY

SRA-550 Digital Alarm Communicator Transmitter (DACT) Interface Module

PCB P/N 940572   **Assembly No. 976080**

Publication Number 19700292
Issue 3, January 1997

The AUTOCALL SRA-550 Digital Alarm Communicator Transmitter Interface Module provides an interface between the AUTOCALL TFX (TFX-500/800, TFX-500M/800M, TFX-500MV/800MV, DirecTone 500) fire control panel and a compatible Digital Alarm Communicator Transmitter (DACT). The SRA-550 meets UL864 Standards for Control Units for Fire-Protective Signalling Systems; NFPA 72, "Installation, Maintenance and Use of Protective Signalling Systems"; and NFPA 71, "Signalling Systems for Central Station Service."

The SRA-550 monitors the control panel and activates one or more of seven relay outputs (user selectable as normally-open or normally-closed). The seven outputs are controlled by the following TFX-500/800 Event Groups:

OP1	ON188 Alarm Signalling
OP2	OS178 Supervisory Signalling
OP3	OS177 Suppression Signalling
OP4	OS179 Smoke Sensor Signalling
OP5	OS180 Alarm Station Signalling
OP6	OS181 Waterflow Signalling
OP7	OS221 Trouble Signalling

Module Position: _____
(See System Layout)
Space Requirement: One position B2 or PB2. Cannot be installed if City Box Transmitter module or Reverse Polarity Transmitter module is installed.
Standby Current Draw: 10 mA
Alarm Current Draw: 30 mA
Output Voltage: +24 VDC @ 1.0 A

Dimensions *(lwd)*: 3.5 × 4.625 × 1 inches

The trouble output (OP7) relay is normally energized and de-energizes on a trouble condition or loss of power.

In addition to the seven outputs there is a single, active-low, fault input to the SRA-550 that may be connected to a fault output on the DACT. If unused, this line should be tied to high.

Installation:
1. Disconnect power before servicing the system.
2. Install plastic stand-offs on the AUTOCALL MP-500 Main Processor board (P/N 940500).
3. Carefully match the 20-pin connector on the SRA-550 board to the 20 pins of PL7, Remote Network Connector of the MP board.
4. Push down to make positive connection.

Terminal Block TB1

TB1-1	+24VDC	
TB1-2	0VDC	
TB1-3	OP1 SIG	Alarm
TB1-4	OP1 COM	
TB1-5	OP2 SIG	Supervisory
TB1-6	OP2 COM	
TB1-7	OP3 SIG	Suppression
TB1-8	OP3 COM	
TB1-9	OP4 SIG	Smoke Sens.
TB1-10	OP4 COM	
TB1-11	OP5 SIG	Alarm.Station
TB1-12	OP5 COM	
TB1-13	OP6 SIG	Waterflow
TB1-14	OP6 COM	
TB1-15	OP7 SIG	Trouble
TB1-16	OP7 COM	
TB1-17	Fault I/P	
TB1-18	Earth Ground	
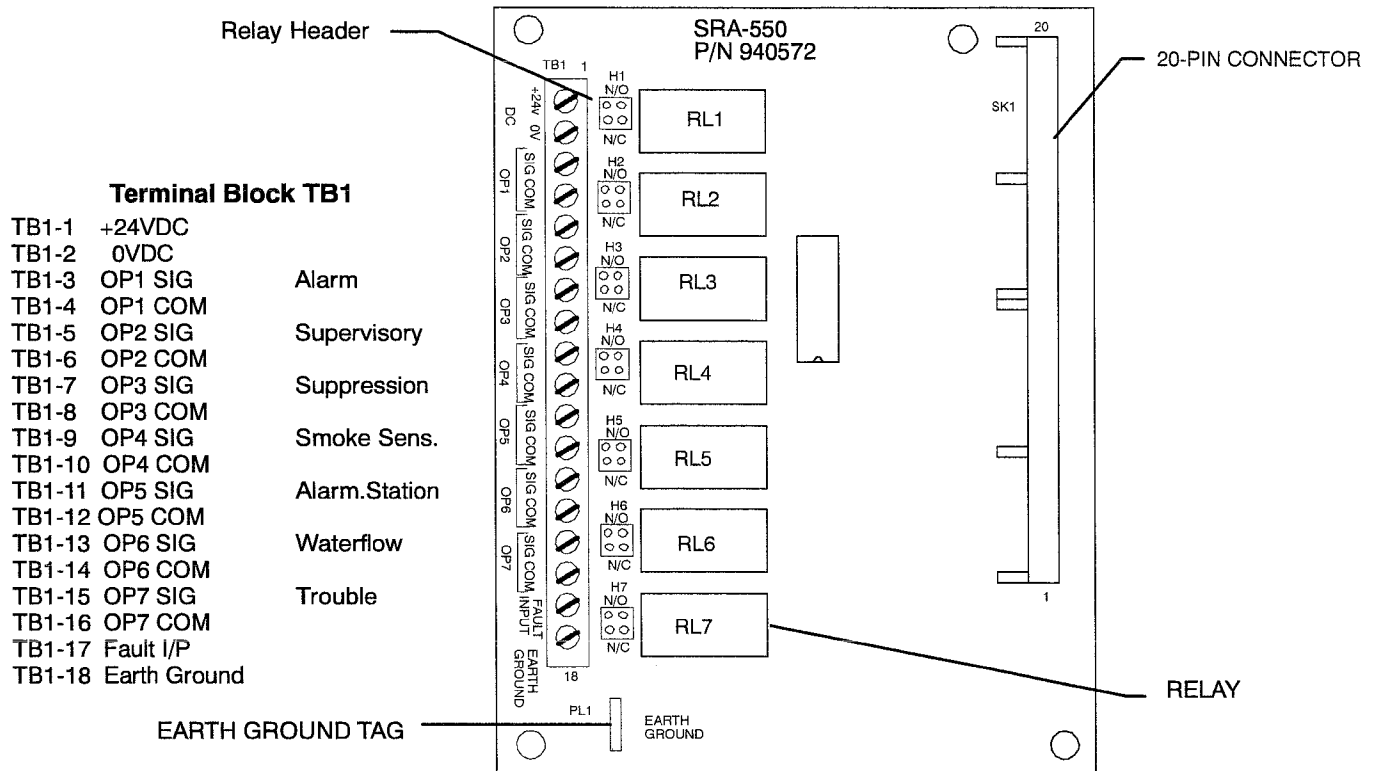
Figure 1.   SRA-550 Digital Alarm Communicator Transmitter (DACT) Interface Module (PCB P/N 940572, Ass'y. No. 976080).

SRA-550
TB1-1 24 V
TB1-2 DCC
TB1-3 OP1 SIG Alarm
TB1-4 OP1 COM
TB1-5 OP2 SIG Supervisory
TB1-6 OP2 COM
TB1-15 OP7 SIG Trouble
TB1-16 OP7 COM
TB1-17 Fault I/P

SK5128
Red 24 V, optional Relay COM
Black DCC
Gray Fire Alarm
Violet Gnd
Yellow Supervisory
Orange Gnd
Blue Trouble
Green Gnd
Optional Relay NC

UL LISTED
COMMUNICATION CABLE
SUPERVISED

UL LISTED CENTRAL STATION

UL LISTED PRIMARY TELCO STATION PROTECTOR

UL LISTED PRIMARY TELCO STATION PROTECTOR

LOCATED AT BUILDING ENTRANCE OF PROTECTED PREMISES NOTE 10

UL LISTED COMMUNICATION CABLE SUPERVISED

NOT SUPERVISED RESTRICTED ALL WIRING WITHIN CABINET

CONNECT TO CABINET GROUND

NOTE 8

NOTE 7

CONFIGURATION OF HEADERS NOTE 5 TABLE 1

Autocall SRA-550 DACT Interface Module P/N 940572

RELAYS: RL7 (N.C.), RL6 (N.O.), RL5 (N.O.), RL4 (N.O.), RL3 (N.O.), RL2 (N.O.), RL1 (N.O.)
EARTH GROUND

CONNECTION TO MAIN PROCESSOR BOARD PL7

RED / BLACK — P1 DC POWER

YELLOW / ORANGE / RED / BROWN — P4 PROGRAMMING CABLE P/N 920245 (NOT SUPPLIED) TO MODEL 5230 REMOTE ANNUNCIATOR NOTES 6, 9

GRAY / VIOLET / BLUE / GREEN / YELLOW / ORANGE — P2 CHANNEL INPUTS NOTE 6

SK5128 910688

NC — RED
NC — BROWN
NC — WHITE
NC — BLACK — P3 AC MONITOR

NC / COM / NO — RELAY TERMINALS NOTE 6

OPTIONAL SEE NOTE 11

EARTH GROUND
TELCO #1 RING
TELCO #1 TIP
HOUSE #1 TIP
HOUSE #1 RING
HOUSE #2 RING
HOUSE #2 TIP
TELCO #2 TIP
TELCO #2 RING

RED / GREEN / GRAY — BROWN — PRIMARY PHONE LINE
BROWN / GRAY / GREEN / RED — ALTERNATE PHONE LINE

MODEL SK5128 SLAVE COMMUNICATOR
REFER TO PUBLICATION NO. 19700327

SUPERVISED TELEPHONE CONNECTIONS

Figure 2. Wiring SRA-550 to SK5128 DACT Module. All circuits and connections are power limited/Class 2.

Wiring Notes (Figure 2):

1. Disconnect power before servicing the system.
2. All wiring to conform to current National Electrical Code, NFPA 70, state, and local building code requirements and applicable notes. All circuits contained in this module are classified as power limited/Class 2 and shall be installed to comply with N.E.C. Article 760, Part A and Part C.
3. All conductors must be free of grounds.
4. Use wire gauge No. 14 to No. 18 AWG to connect to SRA-550 Terminal TB1.
5. Install jumpers to relay headers H1 through H7 for desired relay operation (Normally-Open, N.O., or Normally-Closed, N.C.) See Table 1. Connect relays to UL listed power limited source suitable for fire protective signalling service.
6. See Publication Number 19700327, "AUTOCALL SK5128 Digital Alarm Communicator Transmitter," for installation, wiring, and programming instructions.
7. Terminals TB1-7 through TB1-14 not used.
8. Connect PL1, "Earth Tag," to PL10, "Earth Ground Tag," on the Main Processor board. See "AUTOCALL TFX-500/800 Spare Parts," Publication Number 19700260 or "AUTOCALL TFX-500M/800M Spare Parts," Publication Number 19700373 for cable designation.

9. Connect programming cable (available separately under P/N 920245) to Model 5320 remote annunciator. This is a temporary connection for programming only. Program the SK5128 with the following functions:
   a. Zone inputs—UNSUPERVISED
   b. Alarm Input—Active Low
   c. Trouble Input—Active Low
   d. Supervisory Input—Active Low
   e. AC Failure—Active High (To prevent AC fail from activating, leave the AC monitor terminals unconnected; AC failure will be reported as a Trouble after specified delay).
10. Circuits leaving the building must be connected to a UL listed primary protector at the point the wiring exits the building.
11. Optional supervision of SK5128 can be incorporated by connecting the relay output as shown in Figure 2 and programming the SK5128 for trouble reporting. This will report dialer trouble as well as system trouble. The TFX control panel must also be programmed to monitor input at Terminal 17 of the SRA-550 module.

Table 1. SRA-550 Relay Operation ; CONSYS default configuration (not user configurable).

Relay	Header	Device Type	Device Operation	Group	Zone
RL1	H1 N.O.	O/P Norm. OFF	Gen. Purpose O/P	ON188 Alarm	All
RL2	H2 N.O.	O/P Norm OFF	Gen. Purpose O/P	OS178 Supervisory	All
RL7	H7 N.O.	O/P Norm. OFF	Gen. Purpose O/P	OS221 Trouble	All

Grinnell
FIRE PROTECTION SYSTEMS COMPANY

SK5128 Digital Alarm Communicator

Silent Knight Model 5128 Fire Slave Communicator
P/N 910688

Publication Number 19700327
Issue 3, January 1997

The *SK5128* Digital Alarm Communicator Option P/N 910688 employs the Silent Knight Model 5128 Fire Slave Communicator. This unit features:

- UL 864, NFPA 71 listing for Central Station Fire-Protective Signaling Systems service, UL 864; and NFPA 72 listing for Remote Station Fire-Protective Signaling Systems and Proprietary Protected Premises.
- Four channel inputs: fire alarm, system trouble, supervisory, user-configurable channel.
- Can transmit information in 8 different formats
- Programmable two-number dialing with same or different account codes and reporting formats.
- Dual phone line monitor circuits; built-in dual phone line-seizure circuit.
- English-language programming using Model 5230 Remote Annunciator.
- Real-time programmable 24-hour communicator test; manual communicator test.
- Power loss reporting. The AC report delay time can be programmed as 0 or in the range of 6–15 hours.

For NFPA 71, AC report time must be 6–12 hours.

Module Position: _____
(See System Layout)
Space Requirement: *Firequest 300*—Large Enclosure, One left-hand rail position X10–X15; Standard Enclosure, Side position
  TFX-500/800:   Door mount
  TFX-500M/800M, TFX-500MV/800MV, DirecTone 500
                 Side position or one rear module space
  AL-1500   One rear module space
Input Voltage: 18–40 VDC (regulated, power limited)
Current Draw (standby):   143 mA max. with annunciator attached; 84 mA max. without annunciator attached
Current Draw (alarm):   227 mA max. with annunciator attached; 154 mA max. without annunciator attached
Watchdog Response Time: 50 seconds maximum
Relay Rating: 1 A @ 24 VDC, 1A @ 24VAC
Dimensions (lwh):
Model 5128 (mounts inside *Firequest 300* cabinet): 8-5/8 × 4 × 1-3/8 inches
Mounting Hardware options:
   (a) Velcro™ strips (P/N 19240322/19240323—included)
   (b) Five (5) 6–32 x 1/4 inch self-tapping screws (not included)—four for mounting, one for earth ground to cabinet.

It is necessary to have the Silent Knight Model 5128 Fire Slave Communicator programmed with site-specific information. Programming requires Silent Knight Remote Annunciator Model 5230 (Grinnell P/N 920157).

Refer to *Silent Knight Model 5128/29 Fire Slave Communicator Installation Manual (Silent Knight   P/N 150805)*.
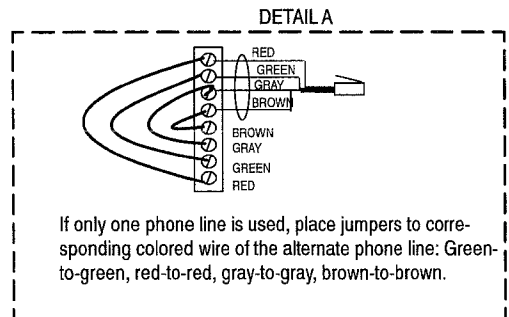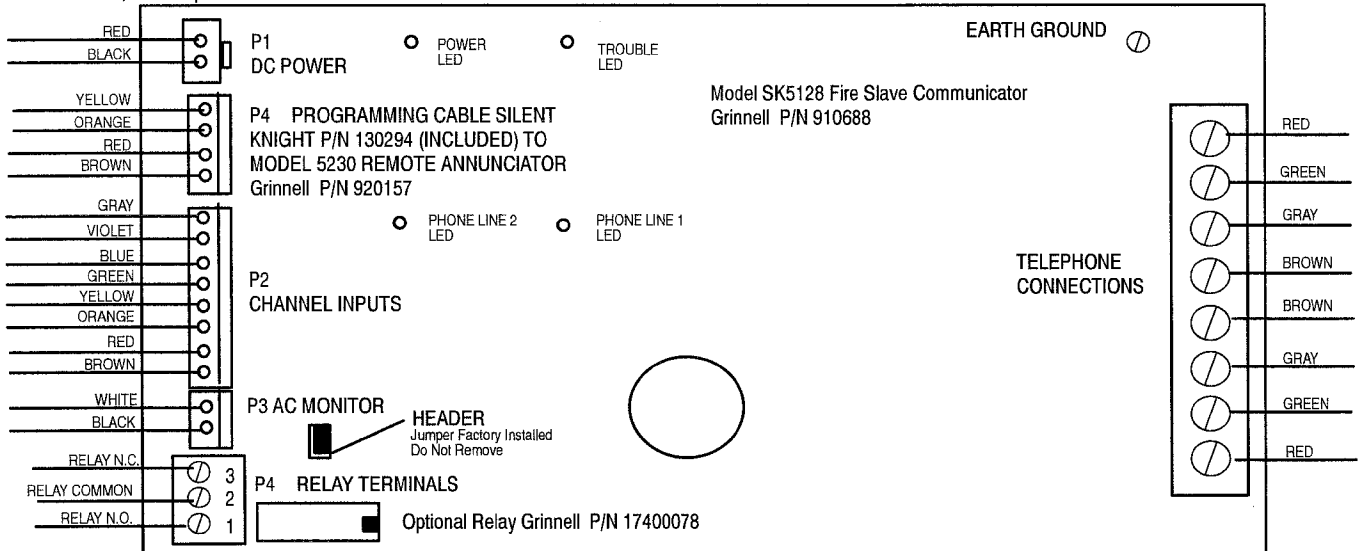
Figure 1. Model SK5128 Fire Slave Communicator. All circuits and connections are power limited/Class2.

Telephone Requirements

1. If requested by the telephone company, the following information must be provided before connecting this device to the phone lines:
   a. Manufacturer: Silent Knight Security Systems
   b. Model Number: 5128
   c. FCC Registration Number: AC6USA-75160-AL-E
   d. Ringer equivalence: 0.9B
   e. Type of jack (to be installed by the telephone company): RJ31X.
2. This device may not be directly connected to coin telephone or party line services. This device cannot be adjusted or repaired in the field. In case of trouble with the device, notify the installing company or return to:

   Grinnell Fire Protection Systems Company
   835 Sharon Drive
   Westlake, Ohio 44145
   (216)871-9900
3. If the Model 5128 causes harm to the telephone network, the telephone company will notify the user in advance that temporary discontinuance of service may be required. If advance notice is not practical, the telephone company will notify the user as soon as possible. The user has the right to file a complaint with the Federal Communications Commission if he or she believes it is necessary.

4. The telephone company may make changes in its facilities, equipment, operations, or procedures that could affect the operation of the equipment. If this happens, the telephone company will provide advance notice to allow you to make the necessary modifications to maintain uninterrupted service.

Table 1.   Model SK5128 LED Indicators

LED Color	Description	Normal Condition
Yellow	Trouble	OFF
Green	DC Power	ON
Red	Phone Line 1	OFF
Red	Phone Line 2	OFF

Table 2. Model SK5128 Slave Communicator Connector and Terminal Descriptions

P1	DC Power	Control Panel Connection		Phone Line #1	Phone Line #2
Red	Power	Non-resettable (Non-switched) +24 VDC.	Red	Telco #1 Ring	Telco #2 Ring
Black	Circuit Ground	DC Common	Green	Telco #1 Tip	Telco #2 Tip
P2	**Channel Inputs**	**Control Panel Connection**	Gray	House #1 Tip	House #2 Tip
Gray	Fire Alarm Channel	System Alarm pulldown (N.O.)	Brown	House #1 Ring	House #2 Ring
Violet	Circuit Ground		Optional Relay Contacts (Rated at 1A @ 24 VDC, not supervised)		
Blue	System Trouble Channel	System Trouble pulldown (N.O.)	1	Normally Closed Relay Contact	
Green	Circuit Ground		2	Relay Common Contact	
Yellow	Sprinkler Supervisory Channel	System Supervisory Pulldown.	3	Normally Open Relay Contact	
Orange	Circuit Ground		P4 Programmer Connection		Connection to Silent Knight Model 5230 (temporary, for programming and troubleshooting only)
Red	Undefined Alarm Channel	User Defined. Typically connects to another Supervisory Zone, Alarm/Supervisory Pulldown.	Yellow	SK IN	to Yellow, SK IN
Brown	Circuit Ground		Orange	SK OUT	to Orange, SK OUT
P3	**AC Monitor**	**Control Panel Connection**	Red	Annunc. Power	to Red, Annunc. Power
White	AC loss reporting	AC Failure, Active High (+24 VDC)	Brown	Annunc. Ground	to Brown, Annunc. Ground
Black	AC loss reporting				

(a)

Fire Slave Communicator
Model SK5128

FACE PLATE

CIRCUIT BOARD
CASE

Mounting option "A" Hook/
Loop strips

Mounting option "B" 6-32 ×
1/4 self-tapping screws

(b)

OPTION "A",
TYPICAL CONTROL PANEL
INSTALLATION ON FRONT PANEL
(DOOR). EARTH GROUND TO
STUD ON DOOR.

FOR TFX-500/800
WIRING REFER TO
SRA-550 DIGITAL ALARM
COMMUNICATOR
TRANSMITTER INTERFACE
MODULE PUBLICATION
NO. 19700292

TFX-500/800

SRA
550

EARTH GROUND

TELEPHONE LINES

SK5128
DIGITAL ALARM
COMMUNICATOR
TRANSMITTER

DACT CONNECTIONS
TO SRA–550

(c)

Firequest 300
Standard Cabinet

OPTION "A",
TYPICAL STANDARD EN-
CLOSURE INSTALLATION
REQUIRES THAT BAT-
TERIES BE INSTALLED IN
SEPARATE ENCLOSURE
SO THAT SK5128 WIRING
ON RIGHT HAND WALL
OF CABINET DOES NOT
INTERFERE WITH NON-
POWER LIMITED WIRING.
EARTH GROUND TO CAB-
INET WALL.

MAKE SURE ALL WIRING
MAINTAINS SUFFICIENT
CLEARANCE FROM ALL
NON-POWER LIMITED
CIRCUITS   NOTE 16

PS   CF

X1
X2
X3

BATT   BATT

Firequest 300
Large Cabinet

OPTION "B"
TYPICAL LARGE ENCLO-
SURE INSTALLATION ON
LEFT-HAND RAIL

PS   CF

APS   X1
X2
X15   X3
X14   X4
X13   X5
X12   X6
X11   X7
X10   X8
X9

BATT   BATT

(d)   TFX-500M/800M
TFX-500MV/800MV
DirecTone 500

AUTOCALL AL-1500, AL-1500E

RELAY MODULE

CABINET
GROUND

OPTION "A",
TYPICAL STANDARD ENCLOSURE INSTALLA-
TION ON RIGHT-HAND CABINET WALL. EARTH
GROUND TO CABINET GROUND STUD.

Figure 2. Typical mounting in AUTOCALL systems for the Model SK5128 Fire Slave Communicator. (a) SK5128 mounting, (b) TFX-500/800 application, (c) Firequest 300 application, (d) AL-1500 / AL-1500E , TFX-500M/800M, TFX-500MV/800MV, or DirecTone 500 application.

Installation

1. Disconnect power and batteries from the control panel.
2. Slide off the front face plate of the Model 5128 unit.
3. Carefully remove the circuit board from the Model SK5128 by applying pressure to the sides of the module to release the board from its holding slot.
4. Mount the Model 5128 case in the control panel cabinet (see Figure 2).
   a. Option "A" using four Velcro ™ strips P/N 19240322 (hook) 19240323 (nap).
   b. Option "B"— Drill mounting holes in the control panel cabinet. Mount the Model SK5128 case in the control panel cabinet using four 6-32 x 1/4 inch self-tapping screws (not included).
5. To enable optional auxiliary relay, install optional relay P/N 17400078 on the Silent Knight Model 5128 circuit board (see Figure 1). Observe correct orientation and polarity.

6. Connect wiring to 5128 Slave Communicator circuit board (see Figure 3).
7. Connect Phone lines.
8. Connect the programming cable.
9. Install the circuit board in the Model 5128 case. Be careful to seat the board in its slot. Install the face plate.
10. Install earth ground connection. Use rail mounting connection of an adjacent board or drill hole in Firequest 300 cabinet, clean or sand paint for good connection, and use self-tapping screw.
11. Apply power.
12. Program the Silent Knight Model 5128 unit. Refer to *Silent Knight Model 5128/29 Fire Slave Communicator Installation Manual, Silent Knight* Part Number 150805.
13. Disconnect programming cable from the Model 5128 unit.
14. Perform communications test as applicable.
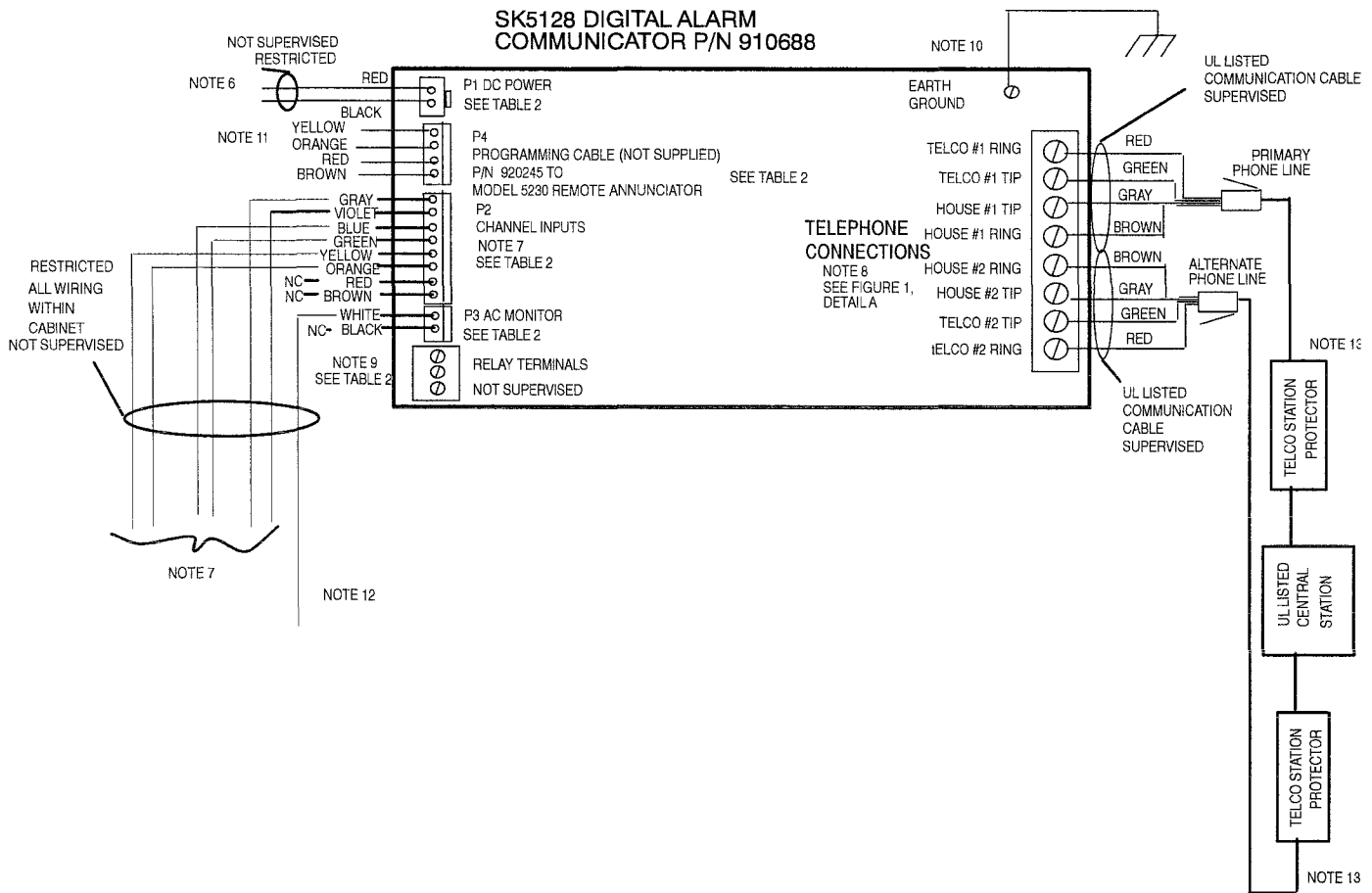
Figure 3. Typical SK5128 Module wiring application.

Wiring Notes

1. All wiring to conform to current National Electrical Code, NFPA 70, state, and local building code requirements and applicable notes. When installed to comply with N.E.C. Article 760, Part A and Part B, these circuits are classified as non-power limited. When installed to comply with N.E.C. Article 760, Part A and Part C, these circuits are classified as power limited.
2. All conductors to be free of grounds.
3. To meet NFPA requirements for remote station systems, standby batteries must have the capacity to provide 60 hours of supervisory current and 10 minutes of alarm current (NFPA 72, Paragraph 5–3.3).
4. Disconnect power before servicing systems.
5. Do not connect field wiring to terminals marked "no connection, or NC"
6. Connect control panel+24 V to 24 VDC of the SK5128 (Red), and control panel DCC, to DCC (Black).
7. P2 connections typically connect as follows:
   a. Gray (alarm) to panel alarm, Violet (gnd) to DCC
   b. Blue (trouble) to panel trouble, Green (gnd) to DCC
   c. Yellow (supervisory) to panel supervisory, Orange (gnd) to DCC
   d. Red (undefined) no connection, Brown (gnd) no connection
8. To meet NFPA 71 requirements, both telephone lines must be installed. Use RJ31X type phone jack. (For single line operation, outputs must be in parallel. See Figure 1, Detail A).
9. Optional auxiliary relay contacts (Relay P/N 17400078 installed) rated 1A @ 24 VDC or 24 VAC. Connect relays to UL listed power limited source suitable for fire protective signalling service.
10. Earth Ground connection (see Installation Note 14).
11. Connect programming cable (available separately under P/N 920245) to Model 5320 remote annunciator. This is a temporary connection for programming only.
    Typical programming for the SK5128 includes the following functions:
    a. Zone inputs as UNSUPERVISED
    b. Alarm input as Active Low
    c. Trouble input as Active Low
    d. Supervisory input as Active Low
    e. AC Failure as Active High
12. Terminal P3 (White) typically connects to a system terminal that provides active high for AC failure detection and reporting.
13. Circuits leaving the building must be connected to a UL listed primary protector at the point the wiring exits the building.

Grinnell
FIRE PROTECTION SYSTEMS COMPANY

AIS-800 Expansion Bus Cable Converter Board

PCB P/N 900950   Assembly 976065

Publication Number 19700287
Issue 2, January 1997

The AUTOCALL AIS-800 Expansion Bus Cable Converter Board may be used to provide connection from ribbon cable to ribbon cable or from ribbon cable to single-wire cable. This provides a means for external cabling of data busses between AUTOCALL TFX-800 cabinets and TFX-500M/800M (TFX-500MV/800MV, DirecTone 500) cabinets.

Plan cabinet locations so that external cable length is minimal. Make sure conduit or wire does not interfere with batteries or other system components.

Installation

1. Connect wires and cables to connectors and terminal blocks of the AIS-800.
2. Mount the AIS-800 inside the control panel cabinet using metal stand-offs.

Module Position: _____
(See System Layout)

Space Requirement: Positions D3–D8, DB1–DB6, PB4–PB6; internal cabinet installation only
Dimensions *(lwd):* 6.625 x 3.37 x 0.5 inches

Wiring

1. All wiring to conform to current National Electrical Code, NFPA 70, state, and local building code requirements and applicable notes. All circuits contained in this module are classified as power limited/Class 2 and shall be installed to comply with N.E.C. Article 760, Part A and Part C.
2. Disconnect power before servicing systems.
3. All conductors to be free of grounds.
4. The following terminal blocks and connectors are connected:
       P1 to TB1, and P3 to TB3.
5. Use wire gauge No. 18 to 14 AWG.
6. Refer to Publication Number 19700260, *AUTOCALL TFX-500/800 Spare Parts,* for cable designations. Refer to *AUTOCALL TFX-500 and TFX-800 Operator's Guide and Installation Manual* for TFX-500/800; *TFX-500M and TFX-800M Operator's Guide and Installation Manual* system installation information.
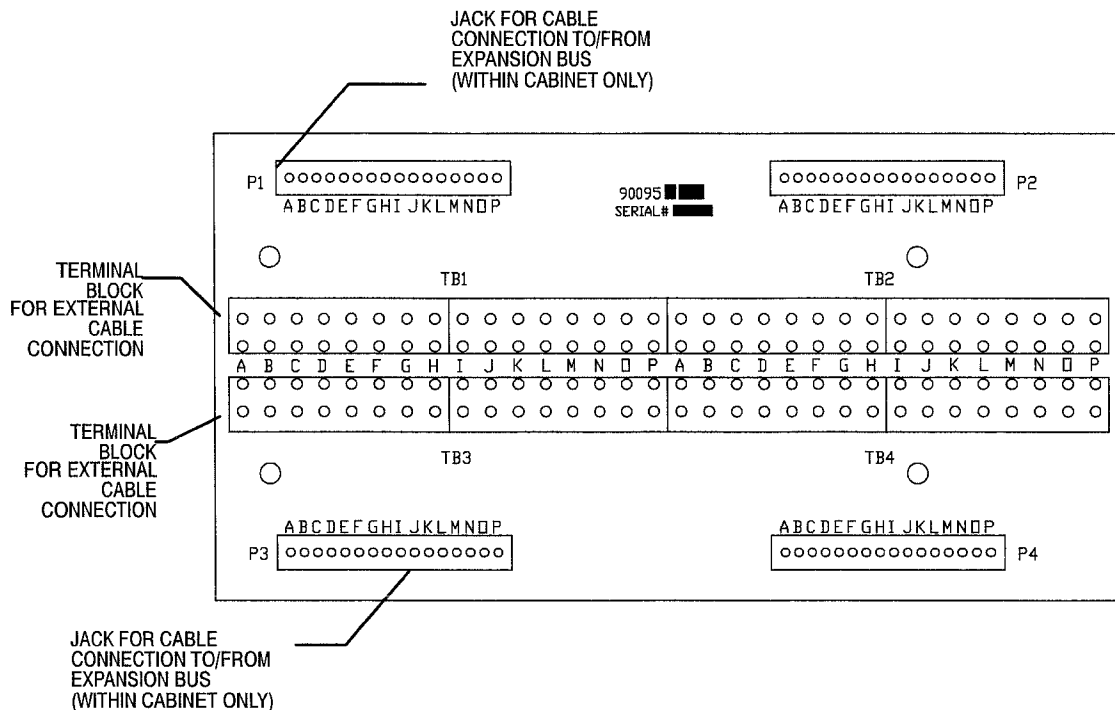
Figure 1. AIS-800 Expnasion Bus Cable Converter Board. All circuits and connections are power limited/Class 2.

Grinnell
FIRE PROTECTION SYSTEMS COMPANY

Network Interface Module
PCB P/N 125-585-200

TLI-530   **Assembly 976165**
TLX-500   **Assembly 976121**

Publication Number 19700344
Issue 4, January 1997

The AUTOCALL network interface modules (TLI-530 and TLX-500) provide an interface for network connection for a variety of applications. The TLI-530 is used to connect networked TFX control panels. The TLX-500 is used with an XAI module to allow TFX-500 control panels to communicate on Auotcall XA multiplex loops.

Features

- Non-volatile memory and intelligent processor.
- Multiple "personality" configurations.
- Most applications require no programming of the TLI-530 other than setting switches and jumpers.

Module Position: _____

(See System Layout)
Space Requirement: In TFX (TFX-500/800, TFX-500M/800M, TFX-500MV/800MV, DirecTone 500), installs piggy-back to MP-500 Main Processor Board or TLB-530,TFXnet Baseboard

Input Voltage:	$24\ V_{DC}$, $+5\ V_{DC}$
Supervisory Current:	125 mA
Alarm Current:	125 mA
Fault Pulldown Output:	Rated for $+5\ V_{DC}$ @ 50 mA
Dimensions *(lwd)*:	3.5 x 4.6 x 1 inches

Table 1. LED Designations

LED	Function	LED	Function
DS1 green	Processor Run (Normally ON)	DS4 red	Network Port L Receive (ON when receiving)
DS2 yellow	Network Ground Fault (Normally OFF)	DS5 red	Network Port R Receive (ON when receiving)
DS3 red	Network Port L Transmit (ON when transmitting)	DS6 red	Network Port R Transmit (ON when transmitting)
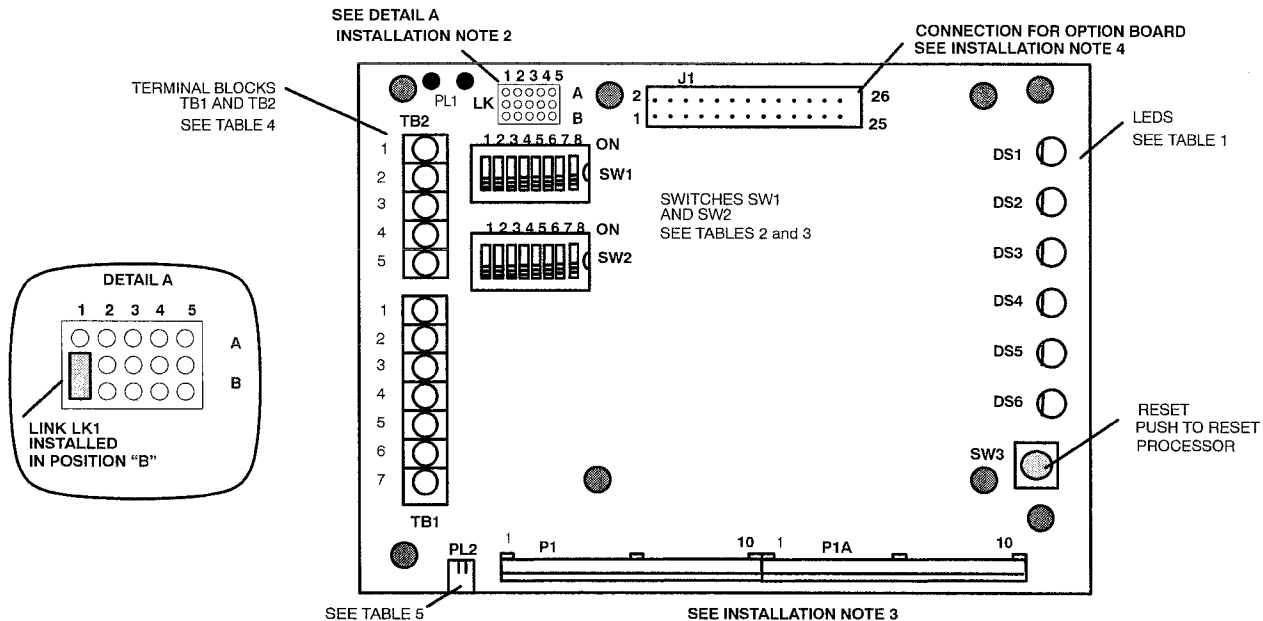
Figure 1.   Network interface module, TLI-530 or TLX-500.

Installation Notes:
1. Disconnect power before servicing the system.
2. Set switches and jumpers on network interface module.
3. For TFX application, install piggy-back to the MP-500 Main Processor Board (PCB P/N 940500) or on TFXnet Baseboard, TLB-530 (PCB P/N 900962). Carefully match the 20-socket connector (P1, P1A) on the network interface board to the 20 pins of PL7, remote network connector of the Main Processor board or J2, J3 of TLB-530. Gently press the connectors together until the stand-offs snap into the holes in the lower board.
4. Connector J1 is provided for connection to an XA Interface Board, XAI (PCB P/N 900959) in TLX-500 applications. Be careful to observe correct polarity on cable connections.

5. Connect field wiring as required for the application. Be careful to observe correct polarity on all connections.
6. PL2 provides RS232 connection. Make cable connection as required for the application (See Table 5). Observe correct polarity and pin connections. May be used for temporary connection to serial communication port of a PC for programming the EEPROM of the module.

Switch Settings

Switches SW1 and SW2 Configure the module for a variety of applications.

For the TLX-500 TFX-to-XA interface application, only switches 1-1, 1-2, 1-3; and 2-8 are used. See Tables 2 and 3.

For TLI-530 TFXnet application, all switches are used.

Table 2. Switch SW1 Designations **NOTE THAT OFF = VALUE (1 = OFF, 0 = ON)**

Switch Position 1-1	1-2	1-3	Application	Switch Position 1-4	1-5	1-6	Network BAUD Rate	Switch Position 1-7	1-8	Network Topology
ON	ON	ON	TFXnet Gateway Application	ON	ON	ON	1200	ON	ON	Bus
ON	ON	OFF	TFXnet Hub Application	OFF	ON	ON	2400	ON	OFF	Star
ON	OFF	ON	TFXnet Bridge Application	ON	OFF	ON	9600	OFF	ON	Ring
ON	OFF	OFF	Not Used	OFF	OFF	ON	19200	OFF	OFF	Redundant Star
OFF	ON	ON	TFX-to-XA Normal Operation	ON	ON	OFF	38400			
OFF	ON	OFF	TFX--to-XA Configuration Programming, TFXnet Bridge Programming	OFF	ON	OFF	(Reserved)			
OFF	OFF	ON	(Reserved)	ON	OFF	OFF	(Reserved)			
OFF	OFF	OFF	(Reserved)	OFF	OFF	OFF	(Reserved)			

Table 3. Switch SW2 and SW3 Designations. **NOTE THAT OFF = VALUE (1 = OFF, 0 = ON)**

Switch SW2-1 through SW2-7 are binary address values (Value with Switch OFF)				Switch 2-8	
Switch Pos.	Value (OFF)	Switch Pos.	Value (OFF)	Position	Function
1	1	5	16	ON (Normal Operation)	TFX TTL Port
2	2	6	32	OFF	RS232 Port (PL2)
3	4	7	64	**Switch SW3**	
4	8			Momentary Switch PUSH to RESET the board processor	

Table 4. Terminal Block Designations (Not Used in TLX-500 Application)

Terminal	Function	Terminal	Function
TB1-1	+24 VDC IN **(NOT USED)**	TB2-1	RS-485 Net Port L+
TB1-2	+5 VDC IN **(NOT USED)**	TB2-2	RS-485 Net Port L–
TB1-3	DC Common IN **(NOT USED)**	TB2-3	SHIELD (See Wiring Note 6)
TB1-4	+5 VDC OUT **See Network Wiring Note 9**	TB2-4	RS-485 Net Port R+
TB1-5	DC Common OUT **See Network Wiring Note 9**	TB2-5	RS-485 Net Port R–
TB1-6	Fault OUT		
TB1-7	G/P OUT **(NOT USED)**		

Table 5. PL2 Pin Connector Configuration

Pin	Designation	Pin	Designation
1	Signal Common	4	RTS TO TLI-530
2	Data IN	5	CTS FROM TLI-530
3	Data OUT	6	(Not Used)

Table 6. LK Header Configuration

Header	Link A	Link B	Header	Link A	Link B
1	Network disconnected; data sent to TB2-1-4	Normal Operation	4	Not Used	Normal Operation
2	Not Used	Normal Operation	5	Not Used	Normal Operation
3	Not Used	Normal Operation			

Programming for Network Module Applications

When used in TFX applications, the MP-500 Main Processor needs to be programmed for network interface module operation. Refer to *TFX-500/800 CONSYS Programming Guide*, Publication No. 850463 for complete programming information.

For TFXnet Bridge application use Bridge Configurator Software P/N 976223. Refer to publication 19700404.

For other applications, the module itself needs to be programmed. For TLX-500 XA interface applications, use the *TFX-to-XA Utility Software Program*; Refer to Publication No. 850514.

Wiring Notes TLX-500 Application (See Figure 1):

1. All wiring to conform to current National Electrical Code, NFPA 70, state, and local building code requirements and applicable notes. All circuits contained in this module are classified as power limited/Class 2 and shall be installed to comply with N.E.C. Article 760, Part A and Part C.
2. Disconnect power before servicing systems.
3. All conductors to be free of grounds.
4. TB1 and TB2 Not used in XA interface application.
5. TLX-500 application—Connect 26-conductor flat cable P/N 8646-101 from J1 on the TLX-500 to J1 on the XA Interface board. Observe correct orientation—the cable connectors are keyed (pin 8 is plugged at each end). A pin/pin header adapter (P/N 16400135) is required at the TLX-500 end of the cable. This is also keyed.
6. Connect PL1, "Earth Tag," to PL10, "Earth Ground Tag," on the MP-500 Main Processor board. See "AUTOCALL TFX-500/800 Spare Parts," Publication Number 19700260 or "AUTOCALL TFX-500M/800M Spare Parts," Publication Number 19700373 for cable designation.
7. PL2 TLX-500 configuration connector (RS232) port connects to the serial communications port of a personal computer via RJ-11 style connector. The connection is temporary for loading of configuration data to the EEPROM of the TLX-500. You may need to use a 9-pin-to-25-pin adaptor if the computer has a 25-pin connector.

Figure 2. TFXnet Typical wiring.

Wiring Notes Network Application (See Figure 2):

1. All wiring to conform to current National Electrical Code, NFPA 70, state, and local building code requirements and applicable notes. All circuits contained in this module are classified as power limited/Class 2 and shall be installed to comply with N.E.C. Article 760, Part A and Part C.

2. Disconnect power before servicing systems.

3. All conductors to be free of grounds.

4. Terminal block TB1 wiring specifications—Use wire size No. 24 to 12 AWG wire, solid or stranded.

5. TFXnet wiring specifications—Use good quality twisted, shielded pair wire. Maximum wiring distance between panels depends upon the TFXnet baud rate and physical properties of cable chosen. Wire parameters:

   Maximum resistance = 75 ohms (all baud rates)
   Maximum wire-to-wire capacitance:

Baud Rate	Capacitance
38400	0.3 μF
19200	0.6 μF
9600	1.2 μF
2400	1.2 μF
1200	1.2 μF

   Network cabling may share the same conduit as any other TFX related fire alarm cabling. TFXnet cabling is power limited.

6. The shield for each network link should be tied to Earth Ground at one end only. This is accomplished by landing one shield at TB2-3 and then connecting another wire from TB2-3 to the common chassis earth ground point.

7. Connect PL1, "Earth Tag," to PL10, "Earth Ground Tag," on the TFX–500/800 Main Processor board or earth ground tags on the TLB-530 baseboard. See "AUTOCALL TFX–500/800 Spare Parts," Publication Number 19700260 for cable designation.

8. TLI-530 fault pulldown output capable of sinking up to 75 mA from TFX-500/800 panel 24-VDC power supply. Normal condition is current sink. TLI-530 fault condition opens the current sink. Typically used to energize an external relay coil.

9. The +5V output (+5V and DC Common Out, TB1-4 and TB1-5) is only used to power TLD-530 Line Dirvers (Assembly No. 976167, PCB P/N 920197). Refer to Publication 19700401 for further information.

10. For the panels located at the end of a bus or spoke of a star, the network wiring should be termnated at the RS-485 Network Port L (TB2-1, TB2-2). The unused Network Port R should be terminated with a UL listed end-of-line 120-ohm resistor (P/N 976048).

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XAI   XA Interface Board

(for TLX-500 interface module application)
P/N 900959, Assembly No. 976124

Publication Number 19700345,
Issue 2, January 1997

Description

The XAI Interface Board (PCB 900959) is used along with a TLX-500 network interface module (PCB 900958) to allow TFX (TFX-500/800, TFX-500M/800M, TFX-500MV/800MV, and Direc-Tone 500), and AUTOCALL XA/TXA Input Module systems to communicate with each other using the the analog-addressable loops of the TFX and the XA multiplex loops of the AUTOCALL system.

Features

- Up to 250 points (alarm/trouble combination) may be transferred from a TFX control panel to an XA/TXA Input Module (P/N 5200–422).
- Up to 250 XA commands may be used to activate TFX groups.
- Field programming of the TLX-500 network interface module and TFX-500/500M via a PC permits the offsite mapping of TFX points to XA points and XA commands to TFX groups to meet changing system requirements.

MODULE POSITION _____
(See System Layout)

Space Requirement: TFX-500/800 cabinet mounting: 1 position B3–B5; 3800 System mounting: 1 rear module space and 1 door module space (rear mount)

Supervisory Current: 20 mA

Alarm Current: 20 mA

Dimensions (whd):   5 13/16 × 3 5/8 × 3/8 inches

Installation Notes

1. Disconnect power before servicing the system.

2. All wiring must be free of grounds.

3. LEDs indicate point activity on the XA loop: Red, Alarm, normally OFF; Green, Normal, normally ON (the LEDs will appear to pulse with the sequential point activity).

4. Install board in cabinet using four 4-40 × 3/8 inch screws (supplied).

5. Connect 26-conductor flat cable P/N 8646–101 from J1 on the XA Interface board to J1 on the TLX-500 network interface module. The cable connectors are keyed (pin 8 is plugged at each end). A pin/pin header adapter (P/N 16400135) is required at the TLX-500 network interface module end of the cable. This is also keyed.

> For correct operation, this board must be connected to a TLX-500 network interface module that has been programmed with system configuration information.
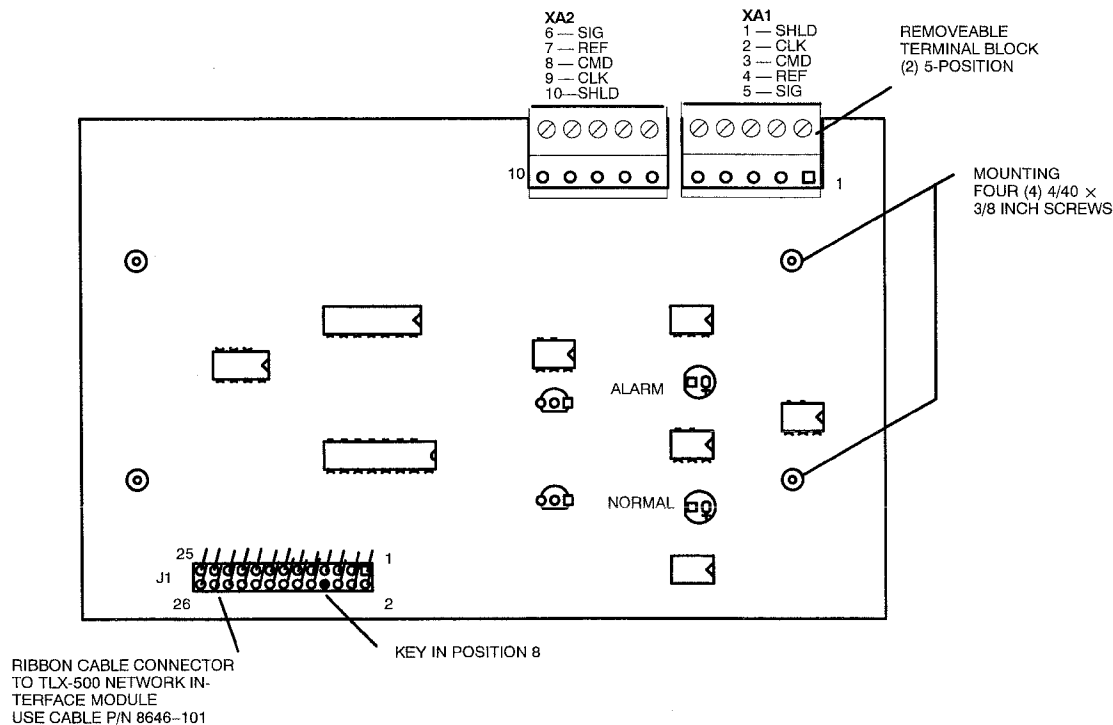
Figure 1.   XAI XA Interface Board installation.

NOTES 5, 6, 7, 9

NOTES 5, 6, 7, 9

XA2

XA1

SIGNAL
REFERENCE
COMMAND
CLOCK
SHIELD

SIGNAL
CLOCK
COMMAND
REFERENCE
SHIELD

NOTE 8

NOTE 8

10

1

25

1

26

2

POWER LIMITED
RESTRICTED TO CABINET EN-
CLOSURE

CONNECTION TO TLX-500 MODULE
P/N 900958 (ASSEMBLY NO. 976121).
USE RIBBON CABLE P/N 8646-101

NOTE 4
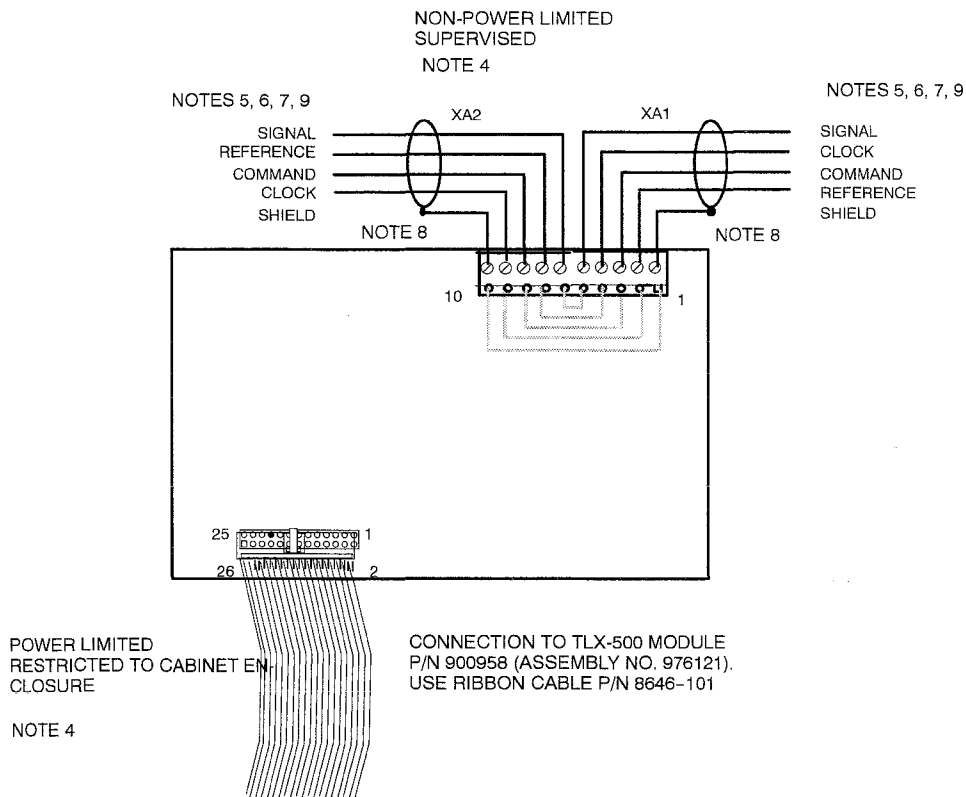
Figure 2.   XA Interface typical wiring to XA loop and TFX-500.

WIRING NOTES

1. Disconnect power before servicing system.

2. All conductors must be free of grounds.

3. All wiring is to be in accordance with N.E.C. (National Electrical Code), local authorities, and applicable notes.

4. When installed to comply with N.E.C. Article 760, Part A and Part C, these circuits are classified as power limited. When installed to comply with N.E.C. Article 760, Part A and Part B, these circuits are classified as non-power limited. Maintain at least 0.25 inch clearance from all power limited wiring with cable ties or other permanent means.

5. Supervised Circuits.

6. Maximum loop resistance 100 ohms, maximum capacitance 1.5mF (one conductor to all other conductors tied to shield).

7. Circuit limitations: 24 VDC; normal supervision current is 250 mA; maximum alarm current is 250 mA; frequency is 250 Hz, ripple voltage 100%.

8. Shields must be tied to DC Common only as shown on field wiring drawing (one end at control unit only). Must be free of grounds.

9. XA loop terminals are internally connected: 1-10, 2-9, 3-8, 4-7, and 5-6. Loops may be connected in Style 4 or Style 6. XA loops terminate at an XA/TXA Input Module (5200-422). Refer to Publication No. MP-24.

10. This drawing is typical only.

Grinnell
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TFX-AutoPlex Control Panel Assembly
Assembly No. 976096

Publication Number 19700346
Issue 2, Revision A, May 1997

The AUTOCALL TFX-AutoPlex Control Panel Assembly provides a TLX-500 network interface board, XAI XA interface board, and MP-500 main processor board; powered by an RPS-424 power supply/battery charger. The MP-500 main processor board provides for two 99-device analog-addressable loops. The TLX-500 and XAI allow the TFX-500 to communicate with an XA/TXA Input Module P/N 5200–422 over the standard Autocall XA multiplex loop.

Front Panel Assembly provides local alarm and/or trouble annunciation for 16 zones (LCD display). It provides internal buzzer and 80-character (4-line × 20 characters) LCD message display. The touch-pad provides for service and diagnostic operation.

Device Location _____
(See System Layout)
Space Requirement: Two top or bottom (or three center) 19-inch by 5.5-inch rear module spaces

Input Voltage: 120/240 V_{RMS}, 50/60 Hz (auto-ranging), 1.5 A_{RMS}
Current Draw:

	Supervisory	Alarm
MP-500 Main Processor Board	200 mA *	420 mA*
TLX-500 Network Interface Board	150 mA	150 mA
XAI XA Interface Module	20 mA	20 mA
MPIM	19 mA	24 mA
RPS-424 Power Supply	100 mA	100 mA
LCD backlight	150 mA (keyswitch ON)	150 mA (keyswitch ON)

* Rrefer to Publication No. 19700247.

Dimensions (lwh): 11.75 × 19 × 3.5 inches
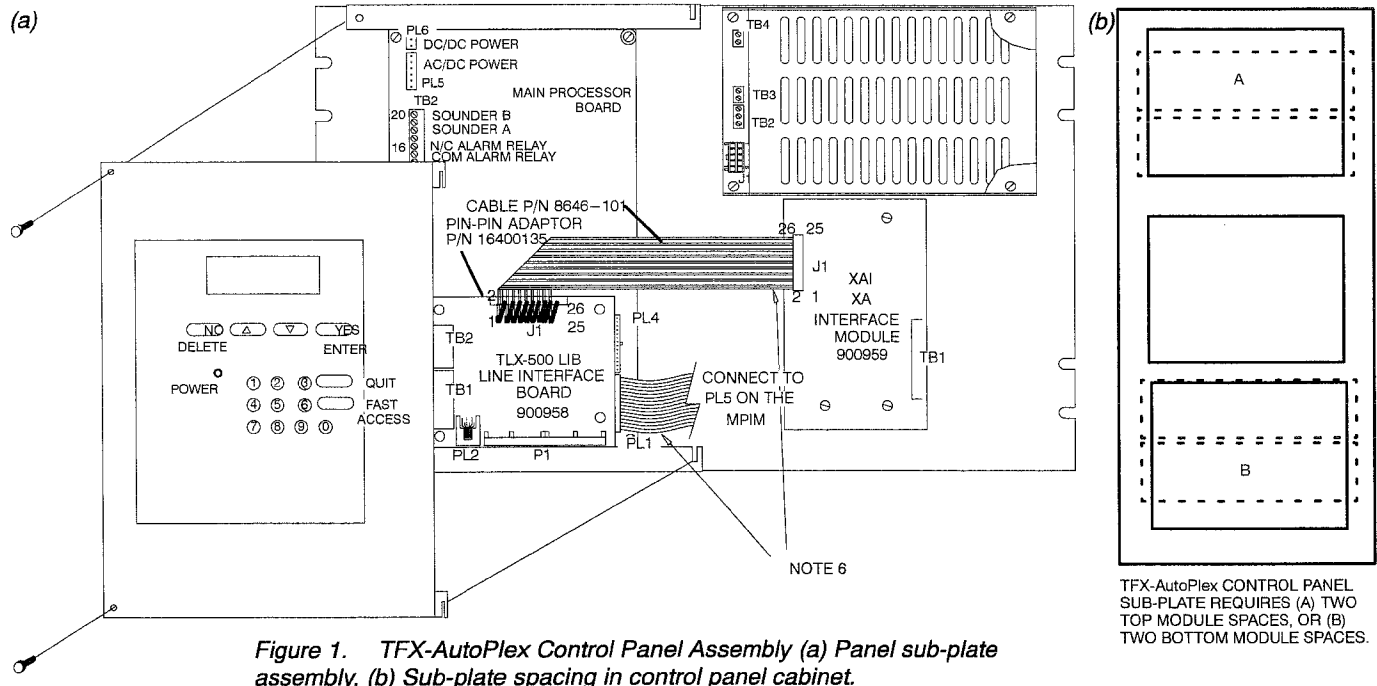
Figure 1. TFX-AutoPlex Control Panel Assembly (a) Panel sub-plate assembly, (b) Sub-plate spacing in control panel cabinet.

TFX-AutoPlex CONTROL PANEL SUB-PLATE REQUIRES (A) TWO TOP MODULE SPACES, OR (B) TWO BOTTOM MODULE SPACES.

Installation Notes:
1. Disconnect power and batteries before servicing system.
2. Install TFX-AutoPlex Control Panel Assembly to the cabinet rails.
3. Refer to the following publications for individual module specifications and application information:
   a. RPS-424 Power Supply/Battery Charger Installation Guide, Publication No. 19700323.
   b. MP-500 Main Processor Board Installation Guide, Publication No. 19700247.
   c. MPIM Installation Guide, Publication No. 19700235.
   d. TLX-500 Network Interface Board Installation Guide, Publication No. 19700344.
   e. XAI XA Interface Module Installation Guide, Publication No. 19700345.
   f. TFX-500/500M analog-addressable loop ancilllary modules, refer to *TFX-500/800 Operator's Manual and*

Installation Guide, Publication No. 850462 or *TFX-500M/800M Operator's Manual and Installation Guide*, Publication No. 850515.
   g. XA/TXA Input Modules and programming, refer to Publication No. MP-24.
4. Connect field wiring
5. Program the modules (Refer to the following publications: *TFX-500/800 CONSYS® Programming Guide*, Publication No. 850463; *TFX-AutoPlex Configuration Utility Software Manual*, Publication No. 850514.
6. All ribbon cables and their applications are listed in Publication Number 19700260, *"Autocall TFX-500/800 Spare Parts"* or Publication Number 197002373, *"Autocall TFX-500M/800M Spare Parts."*
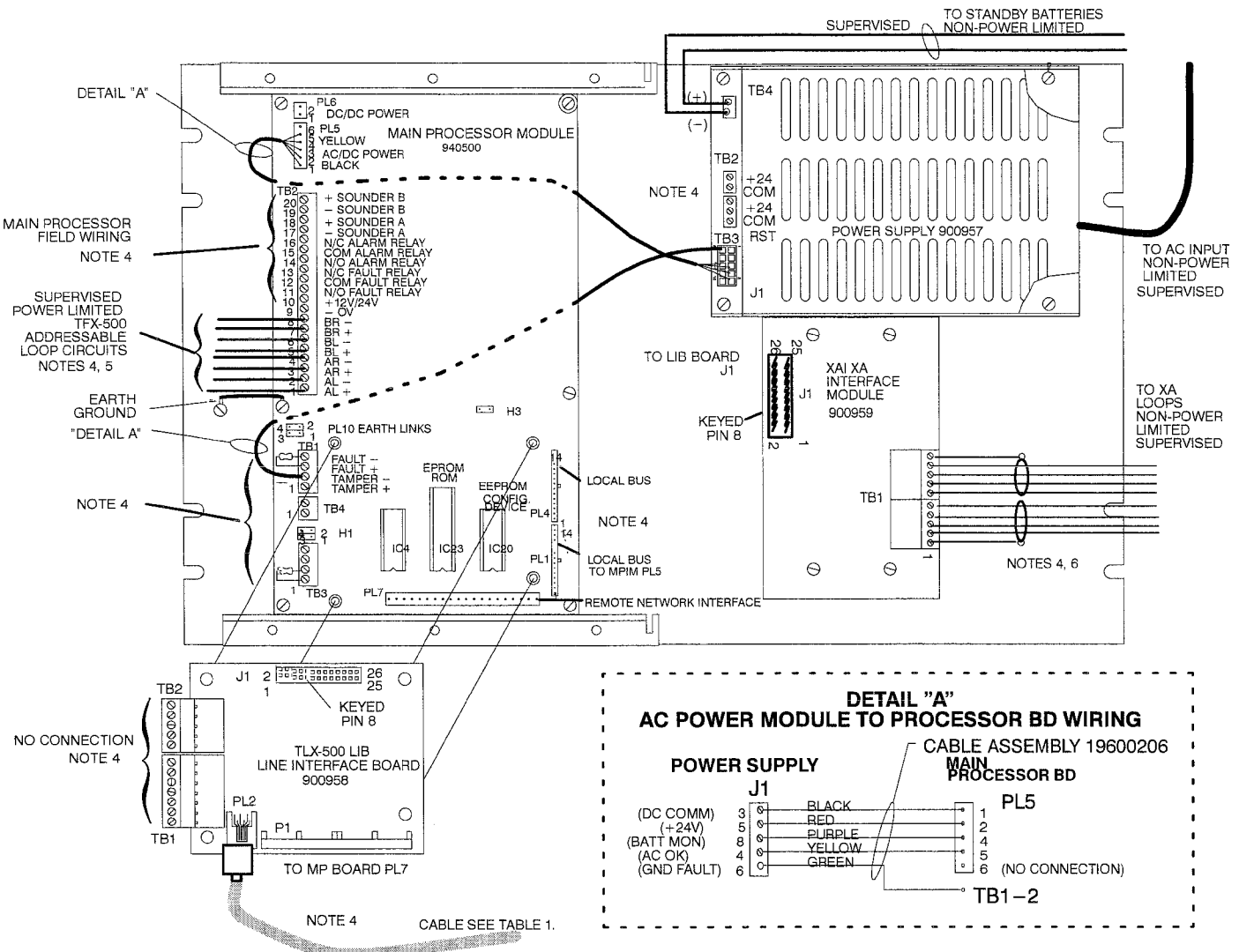
Figure 2.   Wiring connections for TFX-AutoPlex Control Panel Assembly.

Wiring Notes:

1. All wiring to conform to current National Electrical Code (NEC), NFPA 70, state, and local building code requirements and applicable notes. All circuits contained in this module are classified as power limited and shall be installed to comply with NEC Article 760, Part A and Part C.
2. Disconnect power before servicing the system.
3. All conductors to be free of grounds.
4. Refer to the following publications for individual module wiring and application information:
    a. RPS-424 Power Supply/Battery Charger Installation Guide, Publication No. 19700323.
    b. TFX-500/800 Main Processor Board Installation Guide, Publication No. 19700247.
    c. MPIM Installation Guide, Publication No. 19700235.
    d. TLX-500 network interface Installation Guide, Publication No. 19700344.
    e. XAI XA Interface Module Installation Guide, Publication No. 19700345.
5. Connect TFX-500 addressable loops (2-way data circuits) to Main Processor board terminals TB2-1–8. Maximum line resistance 75 ohms; maximum line capacitance 0.5 microfarad

(mutual); maximum line inductance 1.5 millihenry (total); maximum continuous distance 6500 feet. Use shielded wire pair that allows for these parameters. Connect shield to the common shield connection point that is connected to DC Common of the main power supply.

6. Connect XA loop wiring to XA/TXA Input Module P/N 5200-422. Refer to Publication MP-24. Maximum line resistance 100 ohms; maximum line capacitance 1.5 microfarad (one conductor to all other conductors tied to shield). Connect shield to DC Common only as shown on applicable Autocall 3800 System field wiring drawing.
7. Connect 26-conductor flat cable P/N 8646-101 from J1 on the TLX-500 board to J1 on the XAI interface board. Observe correct orientation—the cable connectors are keyed (pin 8 is plugged at each end). A pin/pin header adaptor (P/N 16400135 is required at the TLX-500 end of the cable. This is also keyed.
8. Connect PL1 "Earth Tag" on the TLX-500 to PL10 "Earth Tag" on the Main Processor Board.

9. PL2 TLX-500 configuration connector (RS232) port connects to the serial communications port of a personal computer via RJ–11 style connector The connection is temporary for loading of configuration data to the EEPROM of the TLX-500. You may need to use a 9-pin-to-25-pin adaptor if the computer has a 25-pin connector.

Table 1. TLX-500 PL2 Pin Connections and Cable Connector Equivalents

TELCO	DB9 Connector	DB25 Connector
Pin 2 (Data IN)	Pin 3	Pin 2
Pin 3 (Data OUT)	Pin 2	Pin 3
Pin 1 (Signal Common)	Pin 5	Pin 7

10. Refer to Figure 3 for correct wire routing to maintain separation of power limited from non-power limited system wiring. All power limited wiring must maintain separation of at least 0.25 inches by means of wire ties or other permanent means.

Programming Notes

1. Program the TFX MP-500 Main Processor using CONSYS® .(refer to *TFX-500/800 CONSYS Programming Guide,* Publication No. 850463.
   a. Program "System Type."
   b. Program "LNet" information
      (1) Select "HBus Parameters", ("TFXnet")
      (2) "Sub-net Map"—set **"O"** for "own address," with **all** other addresses as **"S"** for "sub-net node."
      (3) Set "Incoming Logging of Broadcasted Sub-net Events" as "Enabled."
      (4) Set "Outgoing Broadcast of Events to Sub-net" to "Enabled." Set "Outgoing Zonal Alarm Status to Sub-net" and "Outgoing Zonal Trouble Status to Sub-net" to Disabled."
      (5) Leave "Network String Fetch" as "all."
      (6) Leave "NET Module Parameters" as default settings.
      (7) Leave "NET Module Fault Reporting as all "Enabled."
   c. Program LBus, RBus, and IO information
   d. Program Groups, Zones, Addressable Loops.
   e. Program other system functions.
2. Program the TLX-500 for TFX-AutoPlex Configuration data transfer using TFX-AutoPlex Configuration Utility Software (Refer to *TFX-AutoPlex Configuration Utility Software Manual,* Publication No. 850514.
   a. Create the TFX-AutoPlex data file using the software utility.
   b. Tranfer the data to the TLX-500 using a PC and communications program.
      (1) Connect Cable to PL2 on the TLX-500 board. Connect the cable to a PC (use an adaptor if necessary).
      (2) Set TLX-500 switches: SW1-1 OFF (OPEN), SW1-2 ON (CLOSED), SW1-3 OFF (OPEN), SW2-8 ON (CLOSED).
      (3) Set up your communications program for: 1200 Baud, no parity, 8-bit word, 1 stop bit.
      (4) Use communications software to transfer the configuration data file to the TLX-500. (The yellow LED on the TLX-500 will be ON for this operation)
      (5) After successful transfer, set SW1-3 to ON (CLOSED) and press SW3 on the TLX-500 to RESET.

Panel Operation

During normal operation the panel needs no operator intervention.
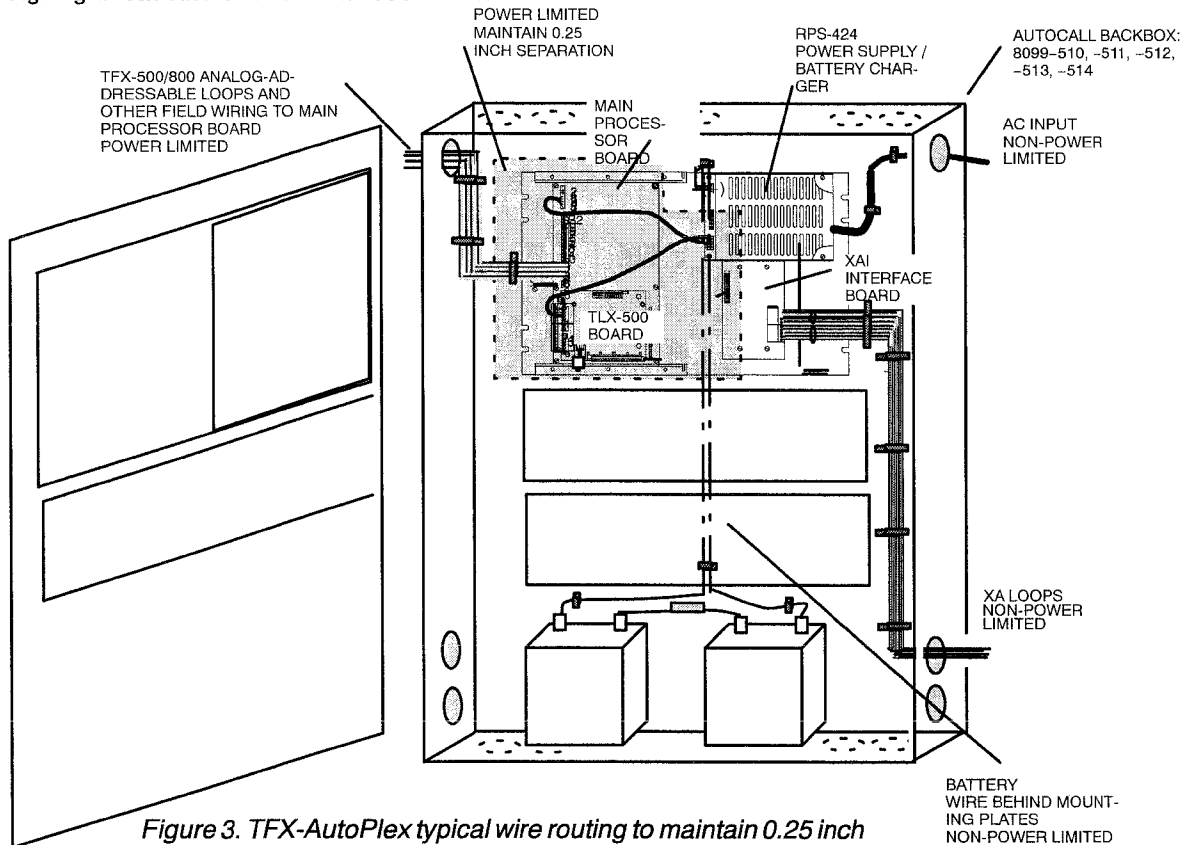
Figure 3. TFX-AutoPlex typical wire routing to maintain 0.25 inch separation of power limited and non-power limited wiring.

![Grinnell logo] **Grinnell**
FIRE PROTECTION SYSTEMS COMPANY

AUTOCALL TFX–XA Interface Module
Assembly P/N 976382   PCB 900997
TFX–XA Expansion Board
Assembly P/N 976383   PCB 900998

Publication Number 19700476
Issue 1, Revision A, May 1997
TFX–XA Interface Module P/N 976382

The AUTOCALL TFX–XA Interface Module allows a TFX address-able loop to "speak" to XA addressable devices. The TFX–XA Interface Module supports connection to six TFX addressable loops: three TFX loop interface circuits are contained on-board and three TFX loop interface circuits can be added via a plug-in option module. These six loops can provide enough TFX addressable loop points to map the 255 XA input devices and 255 command points which may reside on an existing XA loop. A configurator is required to set up the mapping and functionality of the module (for more information see "Operation").

The TFX loops will normally be dedicated to the TFX–XA Interface Module connection, but this is not a requirement. The TFX–XA Interface Module only responds to those TFX loop addresses for which it has been configured. Other TFX devices may be placed on the TFX loop as long as there are addresses available.

The multiple TFX loops do not need to come from the same TFX panel. Unused loop addresses may be used by other devices.

TFX–XA Expansion Board P/N 976383

The optional TFX–XA Expansion Board increases the capability of the TFX–XA Interface Module to six TFX TFX addressable loops.

MODULE POSITION _____
(See System Layout)
Space Requirement: 1 rear module space and 1 door module space (rear mount) for 4-inch deep cabinet

Input Voltage: +24 V$_{DC}$ Nominal

Current Requirements: 100 mA for TFX–XA Interface Module (150 mA with Expansion Board) plus 1 mA for each XA transmitter address and 1 mA for each XA receiver address

Maximum XA Loop Resistance per wire = 100 ohm. Maximum Capacitance 2.0 mf line-to-line or line-to-ground.

Dimensions with Loop Exp. Bd. (hwd): 5.25 ×19 × 2 inches

	TFX–XA Interface Module P/N 976382	with optional TFX–XA Expansion Board P/N 976383	
Battery Requirements:			
Standby Current	100*	150*	mA
Alarm Current	100*	150*	mA
*Plus 1 mA for each XA transmitter address and 1 mA for each XA receiver address			

Addressable Loop Currents:			
	Input Device	**Output Device**	mA
Ident. Current	3.0 – 4.0	16.2 – 19.9	mA
Normal Condition	4.7 – 7.5	Operated: 4.4 – 6.5 Not operated: 2.0 – 4.4	mA
Fault/Invalid Condition	3.0 – 4.7	Greater than 6.5	mA
Alarm Current	7.5 – 20	--	mA

Addressable Loop Load:			
Each TFX–XA TFX Loop Circuit is equivalent to 20 Unit Loop Loads (See "TFX Addressable Loop Circuit Load" section on page 3 for sample calculation.)			
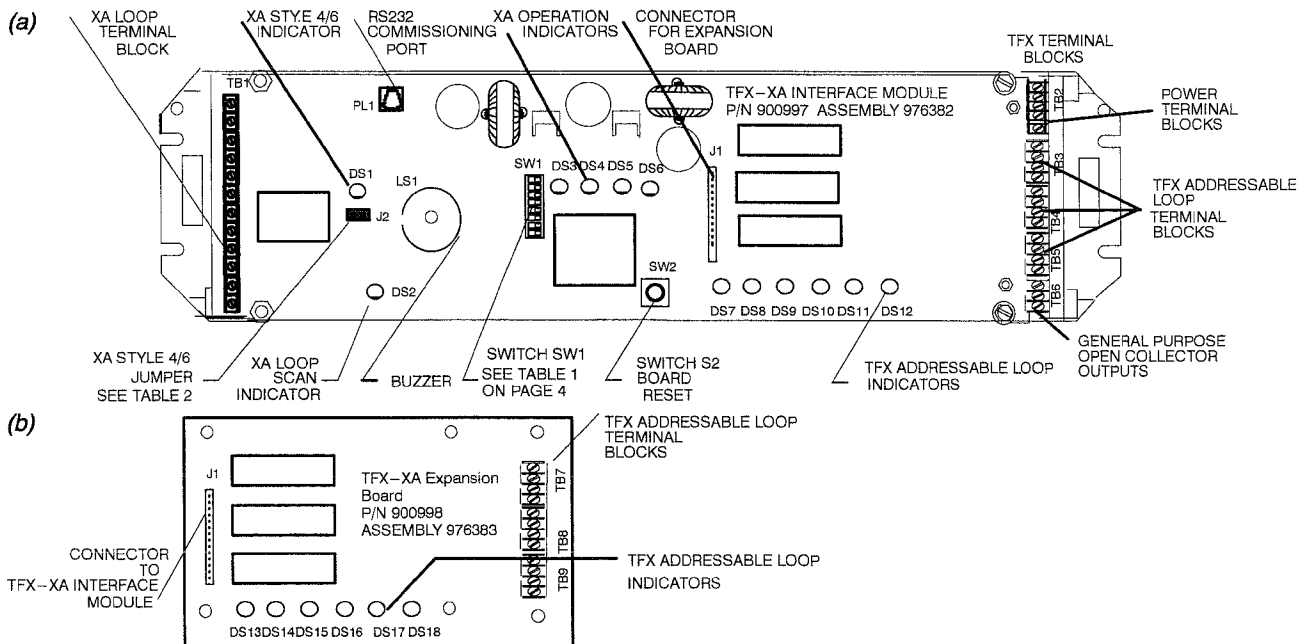
Figure 1.   Autocall TFX–XA Interface Modules (a) TFX–XA Interface Module, (b) TFX–XA Expansion Board.

DOOR MODULES:
FCM MODULE, ODM MODULE, 16 INDICATOR MODULE. 80 INDI-
CATOR MODULE, 40 STATUS CONTROL MODULE, 40 X 2 INDI-
CAOTR MODULE, 16 STATUS CONTROL MODULE, MPIM
ALL POWER-LIMITED

EXPANSION MOTHERBOARD
WITH ALXMs AND DCPM
POWER-LIMITED

MAIN PROCESSOR
BOARD
POWER-LIMITED

POWER-LIMITED

RPS-424
POWER SUPPLY /
BATTERY CHARGER

POWER-LIMITED

NONPOWER-LIMITED

THE TFX–XA INTERFACE MODULE
MUST BE POWERED BY A POWER
SUPPLY OTHER THAN THE ONE
THAT POWERS THE CONTROL PAN-
EL MODULES. THE SECOND POW-
ER SUPPLY NEEDS SEPARATE
STANDBY BATTERIES.

TFX ADDRESSABLE
LOOPS AND OTHER
FIELD WIRING
POWER-LIMITED

XA LOOPS AND OTHER
FIELD WIRING
NONPOWER-LIMITED

RPS-424
POWER SUPPLY /
BATTERY CHARGER

POWER-LIMITED

NONPOWER-LIMITED

NONPOWER-LIMITED

AC INPUT NON-
POWER-LIMITED

STANDBY
BATTERY

STANDBY
BATTERY

BATTERY WIRING TO AUXILIARY
CABINET MUST BE IN CONDUIT

NONPOWER-LIMITED

OPTIONAL AUXILIARY
BATTERY CABINET

STANDBY
BATTERY

STANDBY
BATTERY

Figure 2.   *TFX-800M typical wire routing to maintain 0.25 inch*
separation of power limited and non-power limited wiring.
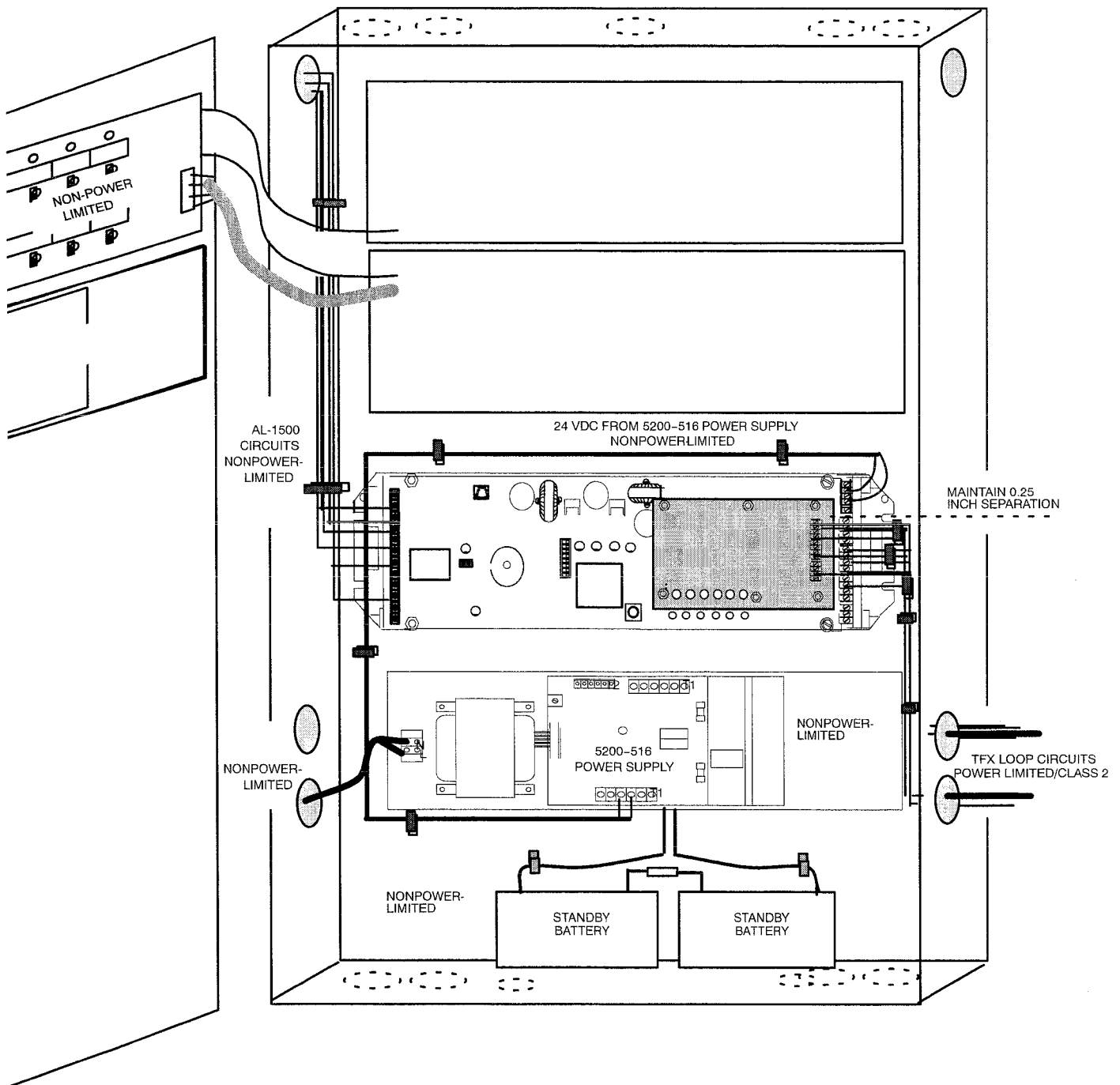
Figure 3.   *AL-1500 typical wire routing to maintain 0.25 inch separation of power-limited and nonpower-limited wiring.*

TFX Addressable Loop Circuit Load

Each TFX–XA Interface Module TFX loop circuit places more than a single unit load on the TFX addressable loop. Each loop circuit is equivalent to 20 TFX Addressable Loop Load Units. Since the maximum number of Loop Load Units available on a TFX loop is 99, then the maximum number of unit loads left when mixing TFX–XA loop circuits and other loop devices, use the formula:

Remaining Unit Loads   =   99 – 20
                          =   79 unit loads available
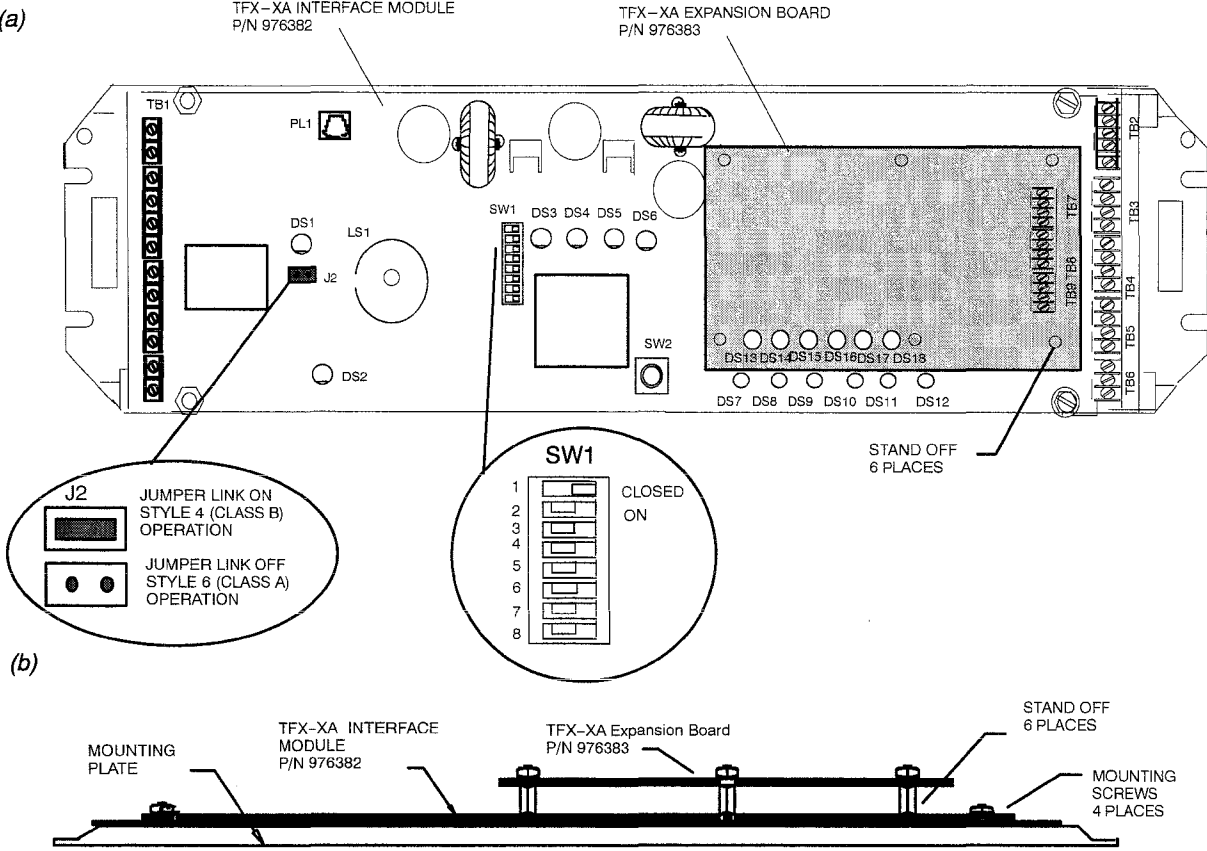
Figure 4. TFX–XA Interface Module with TFX–XA Expansion Board (a) Top View, (b) Side View.

Installation Notes

11. Disconnect power before servicing the system.
12. If required, iInstall optional TFX–XA Expansion Board.
13. Install stand-offs to the TFX–XA Interface Module (6 places).
14. Carefully match J1 pins on the Expansion Board to J1 socket on the TFX–XA Interface Module. Gently press the boards together.
15. Install Shunt on J2 for Style 4 (Class B) XA loop operation. Remove jumper shunt for Style 6 (Class A) XA loop operation.
16. Install the mounting plate with TFX–XA Interface Module in the cabinet with screws (4) provided.
17. Install field wiring.
18. Program the TFX-XA Interface Module.

Table 1. Switches SW1–SW2

Switch	CLOSED (ON)	OPEN (OFF)
SW1-S1	Configuration Mode	Normal Operation Mode
SW1-S2	Commissioning Mode	Normal Operation Mode
SW1-S3	(Not Used)	(Not Used)
SW1–S4	Auto Restore XA Loop Mode	Manual Restore XA Loop Mode
SW1-S5	Disable Fault Buzzer	Buzzer Enabled
SW1-S6	(Not Used)	(Not Used)
SW1-S7	(Not Used)	(Not Used)
SW1-S8	(Not Used)	(Not Used)
SW2	Push to Reset TFX–XA Interface Module	
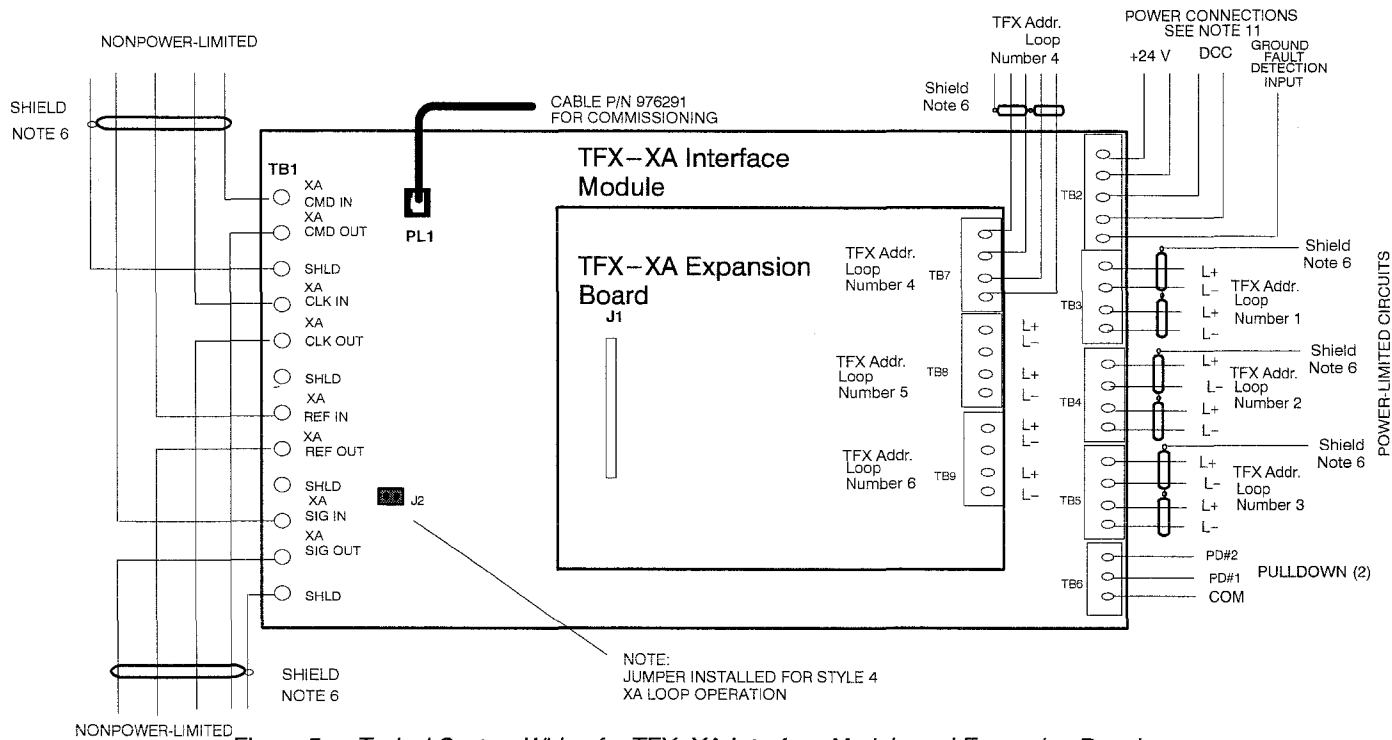
Figure 5. Typical System Wiring for TFX–XA Interface Module and Expansion Board.

WIRING NOTES

1. All wiring to conform to current National Electrical Code, NFPA 70, state, and local building code requirements and applicable notes. When installed to comply with NEC Article 760, Part A and Part B, these circuits are classified as **non-power-limited**. When installed to comply with NEC Article 760, Part A and Part C, these circuits are classified as power-limited.

2. Make sure that all power-limited/Class 2 wiring is separated at least 0.25 inches from any wiring that is not power-limited. Use cable ties to secure wiring.

3. All circuits and connections are power-limited/Class 2, unless otherwise noted as nonpower-limited.

4. Disconnect power before servicing system.

5. All conductors must be free of grounds.

6. Shields must be tied to DCC only as shown on field wiring drawing (one end at control unit only); must be free of grounds.

7. Supervised Circuits. Cut wire run at the terminal connection to provide supervision.

8. Connect pulldown outputs to UL listed power limited source suitable for fire protective signaling service.

9. All power wiring must be minimum No. 18 AWG.

10. See Form 1195 for wiring limitations.

11. Power connections:

12. 5200-459: Connect terminal 5, 6, 7, or 8 of the 5200-459 to +24V$_{DC}$ terminal TB2-1 or TB2-2 of the TFX-XA Interface Module. Connect Terminal 9, 10, 11, or 12 of the 5200-459 to DCC terminal TB2-3 or TB2-4 of the TFX-XA Interface Module.

13. 5200-516: Connect Terminal T1-2 or T1-3 of the 5200-516 to +24V$_{DC}$ terminal TB2-1 or TB2-2 of the TFX-XA Interface Module. Connect Terminal T1-5 or T1-6 of the 5200-516 to DCC terminal TB2-3 or TB2-4 of the TFX-XA Interface Module. For reporting of Ground Faults on the XA circuit connect TB2-5 of the TFX-XA Interface Module to terminal T2-2 of the 5200-516 power supply.

14. RPS-424: Connect Terminal TB2-1 of the RPS-424 to +24V$_{DC}$ Terminal TB2-1 or TB2-2 of the TFX-XA Interface Module. Connect Terminal TB2-2 of the RPS-424 to DCC terminal TB2-3 or TB2-4 of the TFX-XA Interface Module. For reporting of Ground Faults on the XA circuit connect terminal TB2-5 of the TFX-XA Interface Module to P1, Pin 6 of the RPS-424 power supply.

15. RPS-424 with 500PSM Power Supply Monitor Board (P/N 976122): Connect Terminal TB1-8 of the 500PSM to +24V$_{DC}$ terminal TB2-1 or TB2-2 of the TFX-XA Interface Module. Connect Terminal TB1-7 of the 500PSM to DCC terminal TB2-3 or TB2-4 of the TFX-XA Interface Module. For reporting of Ground Faults on the XA circuit connect terminal TB2-5 of the TFX-XA Interface Module to P1, Pin 6 of the 500PSM.

Table 2. Connectors

Jumper	Function	Connector	Operation
	TFX–XA Interface Module		
J1	Expansion Board Connection	Connects to Expansion Board J1	
J2	XA Class A Jumper	Jumper ON	XA Loop Style 4
		Jumper OFF (NORMAL)	XA Loop Style 6
PL1	RS232 Communications	Connects to PC for Programming Programming Cable P/N 976291 (Baud = 1200, no parity, 8 bits, 1 stop)	Pin Outs: 1 Ground 2 RS232 RXD 3 RS232 TXD 4 Not Used 5 Not Used 6 Ground
	Expansion Board		
J1	TFX–XA Interface Module Connection	Connects to TFX–XA Interface Module J1	

Table 3. Terminals

Terminal	Function	Terminal	Function
	TFX–XA Interface Module		
TB1–1	XA Command In	TB3–1	TFX Channel 1 Loop In +
TB1–2	XA Command Out	TB3–2	TFX Channel 1 Loop In –
TB1–3	XA Shield	TB3–3	TFX Channel 1 Loop Out +
TB1–4	XA Clock In	TB3–4	TFX Channel 1 Loop Out –
TB1–5	XA Clock Out	TB4–1	TFX Channel 2 Loop In +
TB1–6	XA Shield	TB4–2	TFX Channel 2 Loop In –
TB1–7	XA COM	TB4–3	TFX Channel 2 Loop Out +
TB1–8	XA Reference In	TB4–4	TFX Channel 2 Loop Out –
TB1–9	XA Shield	TB5–1	TFX Channel 3 Loop In +
TB1–10	XA Signal In	TB5–2	TFX Channel 3 Loop In –
TB1–11	XA Signal Out	TB5–3	TFX Channel 3 Loop Out +
TB1–12	XA Shield	TB5–4	TFX Channel 3 Loop Out –
TB2–1	+24 V_{DC}	TB6–1	PD#2 External Pulldown #2
TB2–2	+24 V_{DC}	TB6–2	PD#1 External Pulldown #1
TB2–3	DCC	TB6–3	COM External Relay Common
TB2–4	DCC		
TB2–5	EGND Ground Detection Input		
	Expansion Board		
TB7–1	TFX Channel 4 Loop In +	TB9–1	TFX Channel 6 Loop In +
TB7–2	TFX Channel 4 Loop In –	TB9–2	TFX Channel 6 Loop In –
TB7–3	TFX Channel 4 Loop Out +	TB9–3	TFX Channel 6 Loop Out +
TB7–4	TFX Channel 4 Loop Out –	TB9–4	TFX Channel 6 Loop Out –
TB8–1	TFX Channel 5 Loop In +		
TB8–2	TFX Channel 5 Loop In –		
TB8–3	TFX Channel 5 Loop Out +		
TB8–4	TFX Channel 5 Loop Out –		

Operation

The TFX–XA Interface Module performs mapping between XA loop devices and TFX addressable loop addresses. The XA devices can only signal three states: normal, alarm, and fault. The fault signal is the same as "no response."

TFX devices use analog signaling. On the TFX–XA Interface Module, XA devices mapped to a TFX addressable loop will "look like" IXA-500CM Contact Monitoring Modules for input and OXA-500RM Addressable Relay Modules for output.

When a mapped XA input signals ALARM, the associated "CM" signals an ALARM condition. When the XA signal restores, the "CM" condition current is returned to normal. If an XA address indicates FAULT, the "CM" does not report—this generates a "No Response" Fault at the TFX control panel.

An output command from the TFX is mapped to the XA Command addresses. Activating the associated TFX device will cause the mapped XA Command to become active. When the TFX output is restored, the associated XA Command will be restored.

Table 4. Indicators

Indicator	Color/Sound	Indication	Normal Condition
DS1	Red LED	ON when Class A relay is activated (a) Shunt is installed on J2 (b) Relay closes due to problem on XA loop	OFF
DS2	Red LED	Flashing ON at the end of an XA loop scan	OFF
DS3	Red LED	**ALARM:** ON during for ALARM condition at an XA loop address. **Main Processor RAM Failure:** ON steadily with DS6 **Main Processor ROM Failure:** Blinking ON with DS6	OFF
DS4	Green LED	**Normal Mode:** ON for NORMAL operation of TFX–XA Interface Module **Configure Mode:** Blinks when module is in Configure Mode	ON
DS5	Yellow LED	**Normal Mode:** Blinking ON indicates configuration data error. **Configuration Mode:** Blinking ON indicates configuration data being loaded.	OFF
DS6	Red LED	**XA Command:** ON during activation of an XA Command **Main Processor RAM Failure:** ON steadily with DS3 **Main Processor ROM Failure:** Blinking ON with DS3	OFF
DS7, DS9, DS11, DS13*, DS15*, DS17*	Green LED	Flashes when TFX scans addressable loop address "0"	OFF
DS8, DS10, DS12, DS14*, DS16*, DS18*	Yellow LED	TFX–XA inter-processor communications fault	OFF
LS1	Buzzer	Turns on during ALARM or FAULT	OFF
*On the Expansion Board			

Notes for Programming the TFX Control Panel Using CONSYS

The TFX control panel(s) must be programmed so that the XA devices are mapped to corresponding TFX TFX addressable loop addressed "pseudo CM" and "pseudo RM" devices. Refer to Publication 850463, *TFX-500/800 CONSYS Programming Guide.*

To program the AL to TFX addressable loop Translator Module:

1. XA Command points are programmed as OXA-500RM Addressable Relay Modules. In CONSYS, select the Panel, Loop, and Address for each point that is mapped from an XA Command Point. Select OXA-500RM as the "device type."
2. XA Signal points are programmed as IXA-500CM Contact Monitoring Modules. In CONSYS, select the Panel, Loop, and Address for each point that is mapped from an XA Signal Point. Select IXA-500CM as the "device type."

Programming the TFX–XA Interface Module Using the TFX–XA Configuration Utility Program

The TFX-XA Interface Module must be configured before it can be used in an application. This is accomplished by loading it with a file created by the TFX-XA Configuration Utility software (P/N 976384). Refer to Publication 850527, *TFX-XA Interface Configuration Utility Software Manual.*

The following steps are used to load a file to a TFX–XA Interface Module (see detailed steps in following sections):

1. Generate a configuration data file using the Configurator program.
2. Connect communications cable.
3. Enable Configuration Mode.
4. Run a communications program on the PC (such as Windows Terminal, Procomm, or CrossTalk).
5. Transfer configuration file between PC to Translator Module.
6. Verify successful transfer

You transfer a configuration file (*.BIN) to the TFX–XA Interface Module by loading it through an RS232 port on the TFX–XA Interface Module. Use an RJ-to-DB9 or RJ-to-DB25 communications cable. Connect the RJ connector to the PL1 connector on the TFX–XA Interface Module. See Figures 6 and 7 . Connect the DB9 or DB25 to a serial communication port on your PC.
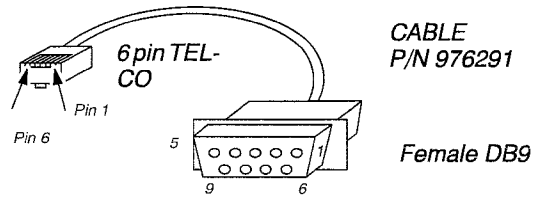
Figure 6. RJ-to-DB9 Communications Cable

Required connections:
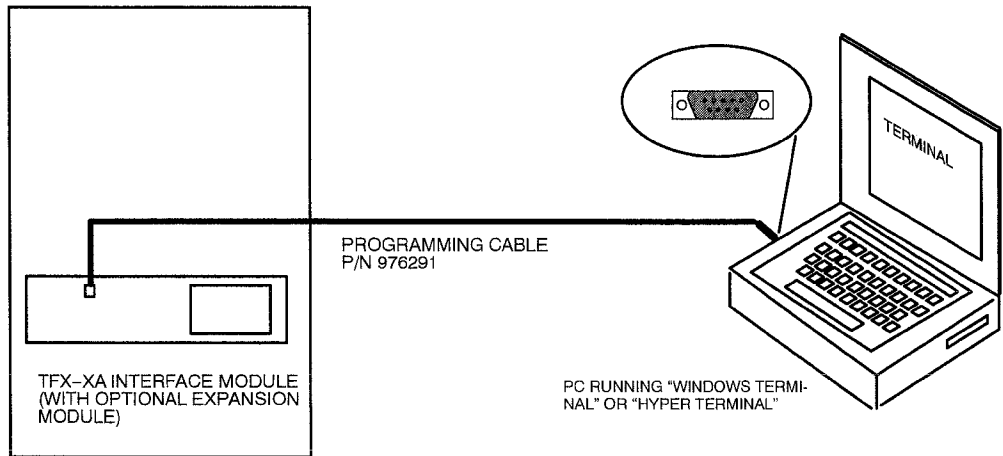
Figure 7. Connecting the TFX–XA Interface Module to a PC for XLTCFG Program Downloading.

RJ11 TELCO	DB9 (Computer COM Port)	DB25 (Computer COM Port)
Pin 2	Pin 3	Pin 2
Pin 3	Pin 2	Pin 3
Pin 1 or 6	Pin 5	Pin 7

Set Up Communications Program

To send files to or receive files from the TFX–XA Interface Module, your communications program (Windows Terminal, Procomm, CrossTalk) must be set to the following parameters:

Baud Rate	1200
Parity	None
Word Size	8-bit
Stop Bits	1

No hand-shaking (flow control)

These parameters are sometimes selected together and abbreviated '1200 N81'.

Entering the TFX–XA Interface Configuration Mode

1. Connect communications cable from PC to the TFX–XA Interface Module PL1.
2. Set Switch SW1–S1 to CLOSED (ON) to enable Configuration Mode.
3. Press the TFX-XA Interface Module Reset button SW2.

Sending a Configuration File to the TFX–XA Interface Module

1. Make sure the TFX–XA Interface Module is in Configuration Mode.
2. Enter the communications program (Windows Terminal, Windows HyperTerminal, or other communications program).
3. Select the Xmodem protocol.
4. Enter the name of the file be sent. This must be the binary file that was written by the XLTCFG program.

As the file is loading, the Yellow Configure LED (DS5) flashes. This may take some time as the proper Xmodem protocol must be negotiated between the PC and the TFX–XA Interface Module.

As soon as the file is received, the TFX–XA Interface Module terminates the Xmodem transaction and the communications program will indicate a successful transfer. The TFX–XA Interface will then write the new configuration into EEPROM. This process can take several seconds. The yellow LED (DS5) will remain ON steadily during this process. Do not do anything until the LED goes off.

After the yellow LED goes OFF, you may return to normal operation, re-send the file, or read the XLTCFG Configuration file back into the PC to verify the transfer operation.

Receiving a File from the TFX–XA Interface Module

It is useful to read a file from an TFX–XA Interface Module. This file can be loaded into another TFX–XA Interface Module or edited with the XLTCFG program.

The procedure for receiving a file is the same as for sending, except that you choose the receive option in the file transfer package.

1. Make sure the TFX–XA Interface Module is in Configuration Mode.
2. Enter the communications program (Windows Terminal, Windows HyperTerminal, or other communications program).
3. Select the Xmodem protocol.
4. Enter the name of the file be received.

Important: Because of the way the communications program works, there may be a couple of timeouts when the file transfer begins. Eventually, the transfer will take place.

As soon as the file is received, the TFX–XA Interface Module terminates the Xmodem transaction and the communications program will indicate a successful transfer.

It is recommended that you read the file back to verify it was correctly received and actually installed in the EEPROM.

You may now return to normal operation, send a file to the TFX–XA Interface Module, or re-read the XLTCFG configuration file.

Returning to Normal Operation

After transferring files to or from the TFX–XA Interface Module, the TFX–XA Interface Module must be returned to normal operation for it to function with the TFX.

1. Set switch SW1–S1 to OPEN (OFF) for Normal Operation Mode.

2. Press the TFX–XA Interface Module reset button SW2.

3. Remove the communications cable.

Using the Commissioning Mode while in Configuration Set-Up

The Commissioning Mode shows the status changes on the XA loop. While in Configuration set-up (with the PC connected to the TFX-XA Interface Module) you may view events on the XA loop on the PC screen. Each event logged contains the type ("P" for input signal point; "C" for an output command), the address, and the state of the device ("A" for alarm or active, "R" for restored, or "T" for trouble (inputs only). A partial listing of an example follows:

> P125A
> P045R
> P205T
> C100A
> C100R

This indicates that XA Signal point 125 is in alarm, Signal point 45 is restored, and Signal point 205 is reporting a trouble condition (possibly a missing device). XA Command address 100 was active for a while and then was restored to the normal state.

Entering the TFX–XA Interface Commissioning Mode

1. With PC connected to the TFX-XA Interface Module:

2. Set Switch SW1-S1 to OPEN (OFF—Normal Operation Mode).

3. Set Switch SW1–S2 to CLOSED (ON—Print Events).

4. Press the TFX-XA Interface Module Reset button SW2.

Using XA Loop Auto-Restore Mode

If the XA Loop is wired Style 6 (Class A), and a problem (open circuit) is detected in the loop wiring, the TFX-XA Interface will automatically energize the Class A relay to restore communications to all devices on the XA Loop. With SW1–4 set to the Auto-Restore mode, the TFX-XA Interface will check the circuit wiring approximately once every 5 minutes to see if the fault has cleared. and if it has, the Class A relay will be de-energized. With SW1–4 set in the Manual Restore mode, the wiring fault is latched and can only be cleared (providing the wiring fault is corrected) by moving SW1–4 to the Auto-restore position for at least two seconds and then back to Manual restore. This action can be repeated as often as necessary until the fault is corrected.

Grinnell
FIRE PROTECTION SYSTEMS COMPANY

TLA-530 TFXnet Adaptor Board
PCB P/N 900970 Assembly No. 976169

Publication Number 19700378
Issue 2, January 1997

Space Requirement:	One module space piggy-back to MP-500 Main Processor Board at PL7
Supervisory Current:	0 mA
Alarm Current:	0 mA
Dimensions *(lwd)*:	3.5 × 4.6 × 0.75 inches

The AUTOCALL TLA-530 TFXnet Adaptor Board provides a means for connecting multiple modules to the PL7 Remote Network bus connector of the TFX MP-500 Main Processor Board, when used in conjunction with the TLB-530, TFXnet Baseboard. This module is only used in TFXnet applications when a remote signalling option is used.
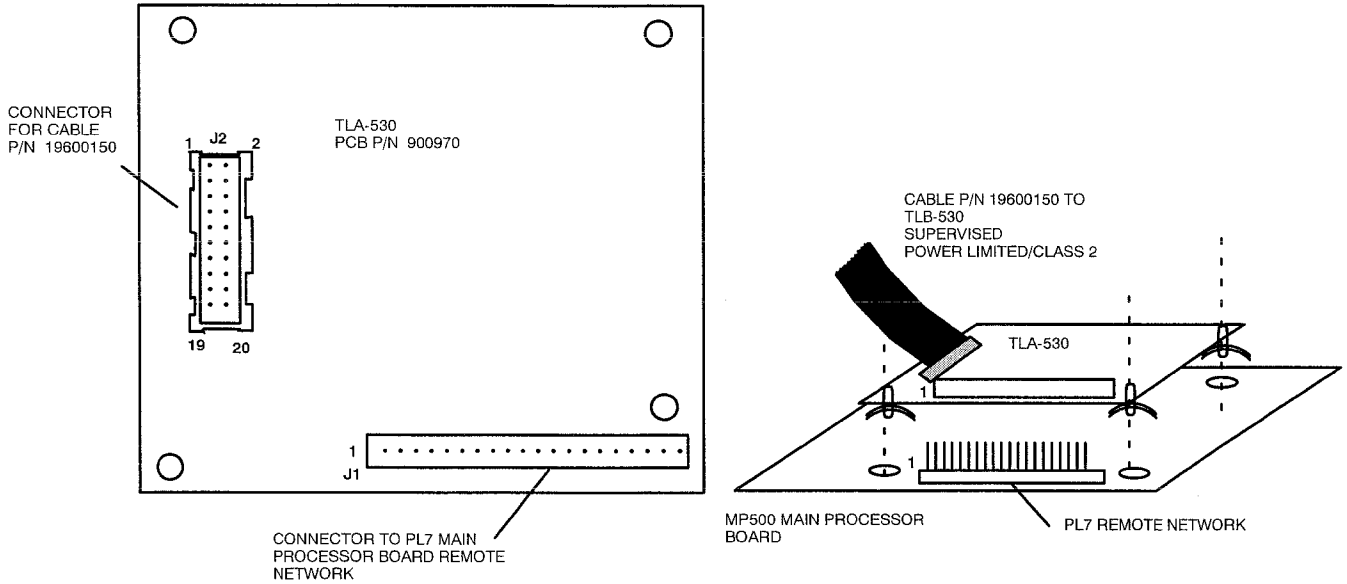
Figure 1.   TLA-530 TFXnet Adaptor Board Installation and Wiring.

Installation Notes:
1. Disconnect power before servicing the system.
2. Connect J2 to cable P/N 19600150 for connection to TLB-530 TFXnet Baseboard. Socket is keyed for correct orientation.
3. Carefully match the 20-socket J1 connector to the 20-pin connector PL7 remote network connection on the Main Processor Board. Gently press the conectors together until the stand-offs snap into the holes in the main processor board.

Wiring Notes:
1. All wiring to conform to current National Electrical Code, NFPA 70, state, and local building code requirements and applicable notes. All circuits contained in this module are classified as power limited/Class 2 and shall be installed to comply with N.E.C. Article 760, Part A and Part C.
2. Disconnect power before servicing systems.
3. All conductors to be free of grounds.

TLB-530 TFXnet Baseboard
PCB P/N 900962   Assembly No. 976168

Publication Number 19700379
Issue 3, January 1997

Applications

TFX Application—The AUTOCALL TLB-530 TFXnet Baseboard, when used in conjunction with the TLA-530 TFXnet Adaptor, provides a means for connecting a remote signalling option board to a TFX-500/800 installed in a TFXnet application. The TLB-530 provides a mounting platform for installing the TLI-530 network linterface module and a remote signalling option board such as the CEB-500 City Box Transmitter, CVB-500 Reverse Polarity Transmitter, or the SRA-550 DACT Interface Module.

TFXnet Applications—The TLB-530 provides a base for connecting TLI-530 network interface modules in a variety of configurations.

● **Bridge**—A bridge allows two TFXnet circuits with independent topologies (such as a ring and a star) to communicate. A bridge is comprised of two TLI-530 modules mounted on a TLB-530 board (see Figure 4). Each TLI-530 module "resides" on its own TFXnet circuit, while communicating with each other via the TLB-53; thereby "bridging" the two networks. (Both networks, and the bridge, must operate at the same baud rate; with a maximum baud rate of 19.2 k-baud.)

● **Hub**—The hub is the center configuration in either a star or a redundant star network topology. A hub consists of a "daisy chained" series of TLB-530 boards (see Figure 5) each with two TLI-530 modules. The TLI-530 modules interface the device on their associated star "arm" (or "spoke") to devices on another arm via the hub. (The TLB-530 boards provide the hub communication path. The maximum baud rate for a star or redundant star network is 19.2 k-baud.)

Module Position: _____
(See System Layout)

Space Requirement:	TFX-500 Cabinet—B3
	TFX-800 Cabinet (0 loops)—PB3
	TFX-500M/800M Cabinet—One-half module space
Supervisory Current:	100 mA
Alarm Current:	100 mA
Dimensions *(lwd):*	8.25 × 4.8 × 1.5 inches

Table 1.   Terminal Block, Jumper, and Resistor Designations

TB1–	Function	JP-	Function
1	+24 V	1	TFX
2	+24 V	2	BRIDGE
3	0 V	3	HUB (DEFAULT)
4	0 V		
5	Earth Ground	R2	0-ohm; Remove when local power is used
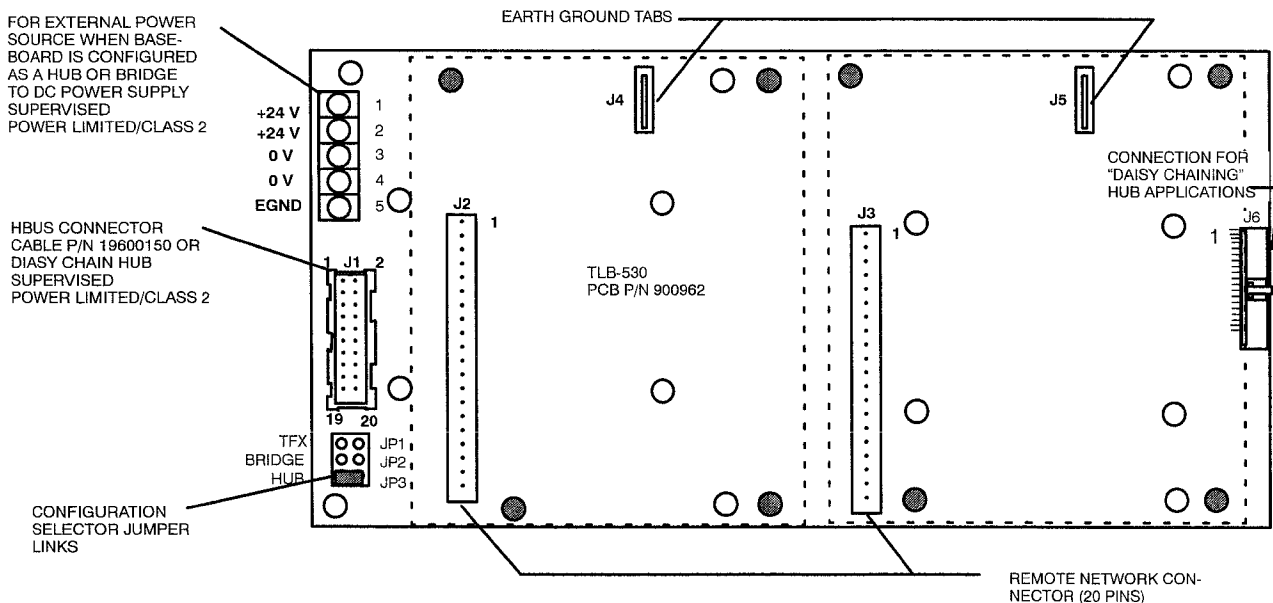
Figure 1.   TFXnet Baseboard TLB-530.
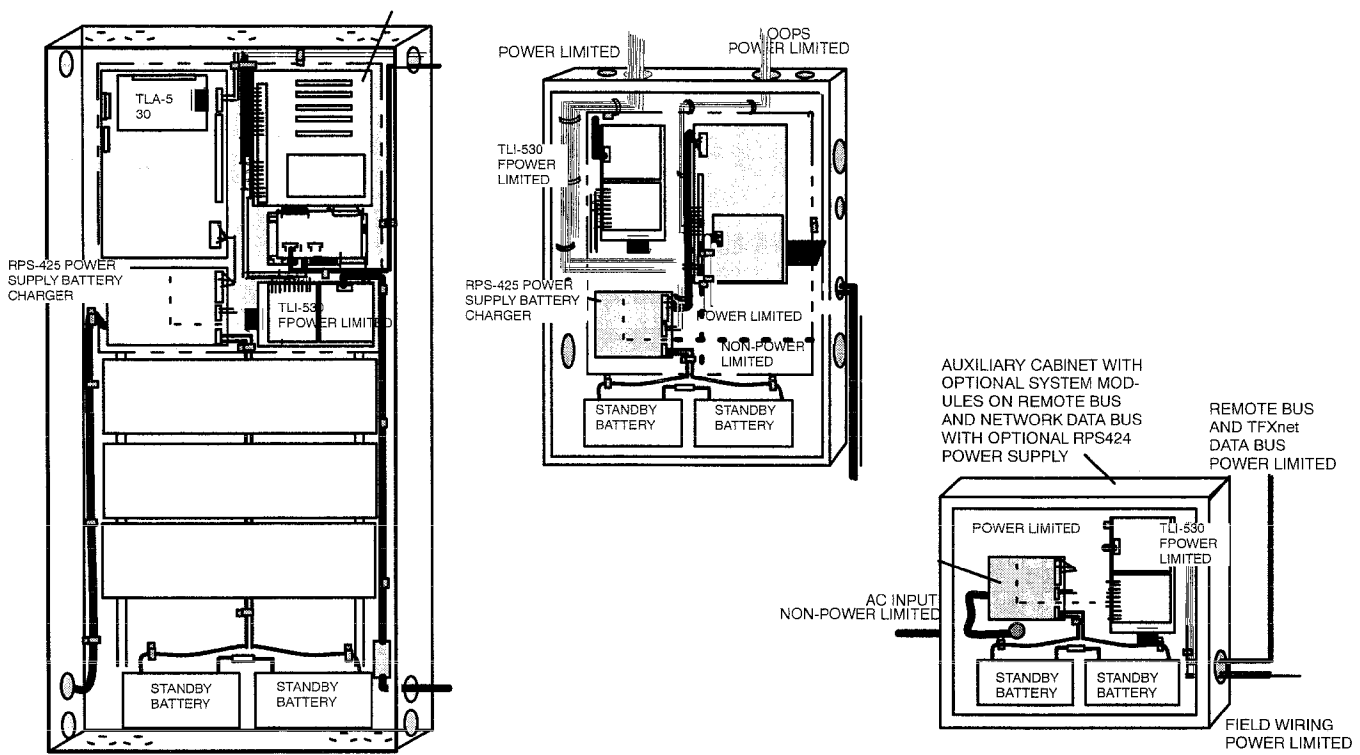
Figure 2. Typical installations (a) TFX-800M control panel cabinet (b) TFX-500 control panel cabinet (c) remote auxiliary cabinet.

Installation Notes:

1. Disconnect power before servicing the system.
2. Set switches and jumpers on TLI-530 board that will be mounted to the TLB-530 Baseboard.
3. Mount TLB-530 in the panel using hardware provided.

4. **TFXnet Remote Signalling Application (See Figure 3):**
   a. Install TLB-530 in cabinet.
   b. install jumper link in J1 for "TFX" configuration.
   c. Install TLI-530 (PCB P/N 900958 refer to Publication No. 19700344) and Remote Signalling Option board (CEB-500 PCB P/N 940524 refer to Publication No. 19700249, CVB-500 PCB P/N 940525 refer to Publication No. 19700250, SRA-550 PCB P/N 942572 refer to Publication No. 19700292) by carefully matching the 20-socket connector to the 20-pin connector J2 or J3 on the TLB-530. Gently press the connectors together until the stand-offs snap into the holes in the TLB-530 board. The TLI-530 and remote signalling option board may be installed in either location on the TLB-530.
   d. Connect Earth Ground Tab on the TLI-530 and Remote Signalling Option board to J4 and J5 on the TLB-530. Connect a wire from TB1-5 (EGRND) to the common chassis earth ground point.
   e. Using cable (P/N 19600150) connect J1 of TLB-530 to J2 of TFXnet Adaptor Board, TLA-530.
   f. Install TLA-530 on TFX MP-500 Main Processor Board.
   g. Make other connections to TLI-530 and remote signalling option board.

5. **Bridge Network Configuration (See Figure 4):**
   a. Install TLB-530 in cabinet.
   b. Install jumper link in J2 (remove link from J1, J3) for Bridge configuration.
   c. Configure the TLI-530 modules for "Bridge" operation (refer to Publication No. 19700344).

   d. Install two TLI-530 modules (PCB P/N 900958 refer to Publication No. 19700344) by carefully matching the 20-socket connector to the 20-pin connector J2 or J3 on the TLB-530. Gently press the connectors together until the stand-offs snap into the holes in the TLB-530 board.
   e. Connect Earth Ground Tab on the TLI-530 boards to J4 and J5 on the TLB-530. Connect a wire from TB1-5 (EGRND) to the common chassis earth ground point.
   f. Install connections for TFXnet sub-loop communications to TLI-530 modules, Channel A and Channel B. *Note: When programming in CONSYS, Channel = Port L; Channel B = Port R.*
   g. Connect +24 V to TB1-1 and DC Common to TB1-3.

6. **Hub Network Configuration (See Figure 5):**
   a. Install TLB-530 in cabinet.
   b. Install jumper link in J3 (remove link from J1, J2) for Hub configuration.
   c. Configure the TLI-530 modules for "Hub" operation (refer to Publication No. 19700344).
   d. Install two TLI-530 modules (PCB P/N 900958 refer to Publication No. 19700344) by carefully matching the 20-socket connector to the 20-pin connector J2 or J3 on the TLB-530. Gently press the connectors together until the stand-offs snap into the holes in the TLB-530 board.
   e. Connect Earth Ground Tab on the TLI-530 boards to J4 and J5 on the TLB-530. Connect a wire from TB1-5 (EGRND) to the common chassis earth ground point.
   f. Install connections for TFXnet sub-loop hub communications to TLI-530 modules. For star topology, use either Channel A; for redundant star topology, use both Channel A and Channel B. *Note: When programming in CONSYS, Channel = Port L; Channel B = Port R.*
   g. Connect +24 V to TB1-1 and DC Common to TB1-3.

Wiring Notes:

1. All wiring to conform to current National Electrical Code, NFPA 70, state, and local building code requirements and applicable notes. All circuits contained in this module are classified as power limited/Class 2 and shall be installed to comply with N.E.C. Article 760, Part A and Part C.

2. Disconnect power before servicing systems.
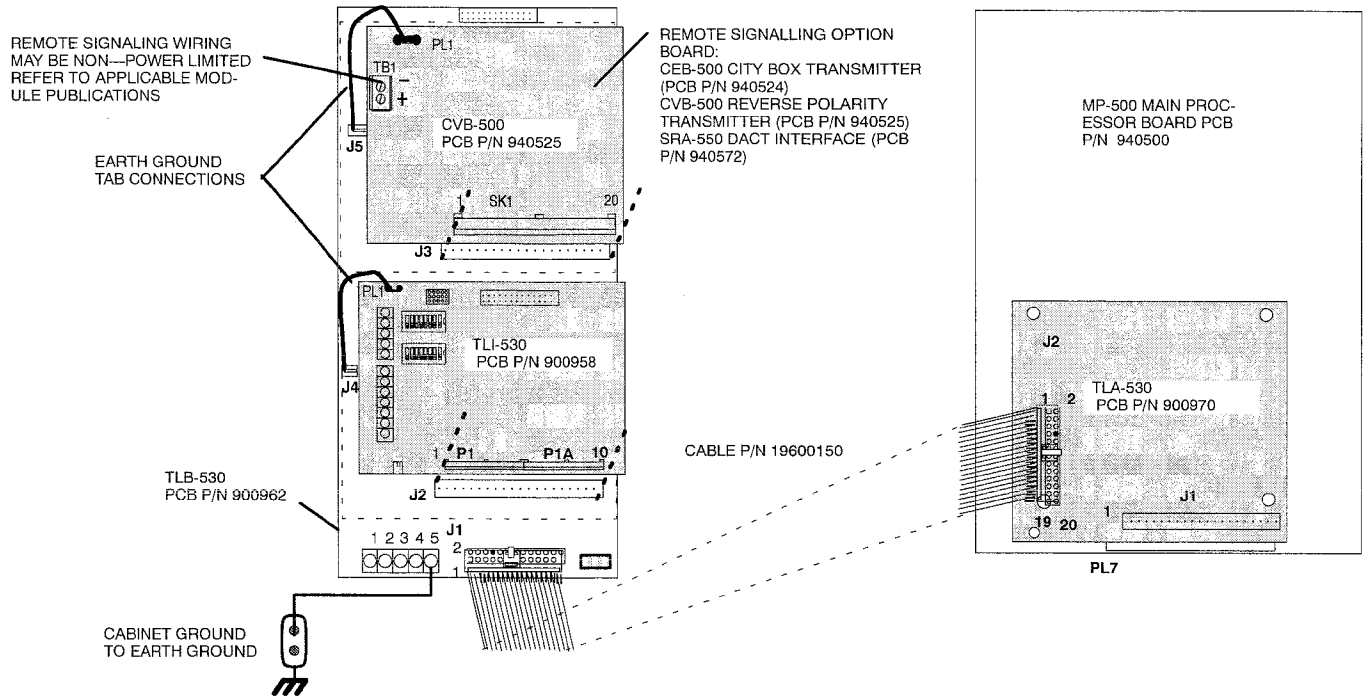3. All conductors to be free of grounds.

REMOTE SIGNALING WIRING MAY BE NON—POWER LIMITED REFER TO APPLICABLE MODULE PUBLICATIONS

EARTH GROUND TAB CONNECTIONS

REMOTE SIGNALLING OPTION BOARD:
CEB-500 CITY BOX TRANSMITTER (PCB P/N 940524)
CVB-500 REVERSE POLARITY TRANSMITTER (PCB P/N 940525)
SRA-550 DACT INTERFACE (PCB P/N 940572)

CVB-500 PCB P/N 940525

MP-500 MAIN PROCESSOR BOARD PCB P/N 940500

TLI-530 PCB P/N 900958

TLA-530 PCB P/N 900970

CABLE P/N 19600150

TLB-530 PCB P/N 900962

CABINET GROUND TO EARTH GROUND

Figure 3. One TLI-530 and One Remote Signalling Option Board, with Connection to TLB-530.

SEE INSTALLATION NOTE 5F

SEE INSTALLATION NOTE 5F

Note: When programming in CONSYS, Channel A = Port L; Channel B = Port R

TO RPS-424 POWER SUPPLY/ BATTERY CHARGER WITH POWER MONITOR

TFXnet Channel B
TFXnet Channel A
TFXnet Channel B
TFXnet Channel A

EARTH GROUND TAB CONNECTIONS

+24 VDC

0 VDC

TLI-530 PCB P/N 900958

TLI-530 PCB P/N 900958

TLB-530 PCB P/N 900962

CABINET GROUND TO EARTH GROUND

Figure 4. Two TLI-530 Boards, in Bridge Configuration.
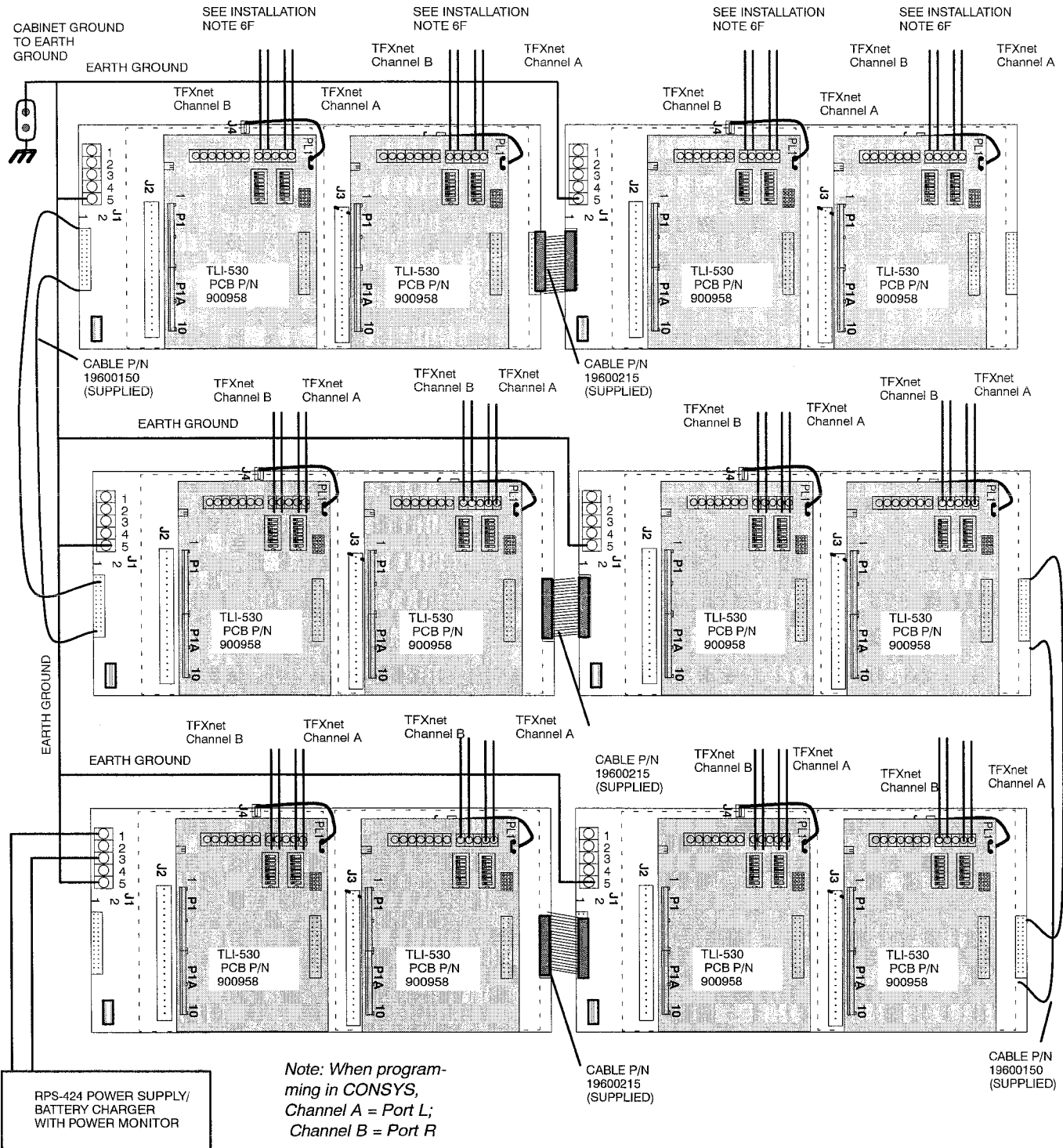
Figure 5. Two TLB-530 boards, each with two TLI-530 boards, in Hub Configuration.

Grinnell®
FIRE PROTECTION SYSTEMS COMPANY

TLO-530 Fiber Optic Modem Module
Assembly 976166

Publication Number 19700380
Issue 2, January 1997

The TLO-530 Fiber Optic Modem (Part Number 976166) converts RS-485 digital data current pulses to light pulses. The light pulses are then carried over fiber optic cabling. This method of communication provides a more reliable signal because of its greater immunity to radio frequency interference and electromagnetic interference. This increases system reliability.

Features
- True tri-state output
- Data re-clocking
- Data rates to 200 Kbaud
- Distances to 13,000 ft (4 km)

Application:
The TLO-530 Fiber Optic Modem is designed and approved for use with the UL listed AUTOCALL® TFX (TFX-500/800, TFX-500M/800M, TFX-500MV/800MV, DirecTone 500, FireGraph) TFXnet network systems. Together they form an interactive, supervised, optical transmitting communications system.

Fire alarm system applications of the TLO-530 Fiber Optic Modem include industrial, commercial, and institutional installations; recommended for outdoor cabling. Install the fiber optic cabling in accordance with UL 864, NFPA 70, NFPA 72, NFPA 101, and all local codes and ordinances.

Modem Location and Mounting:
Locate the TLO-530 Fiber Optic Modem within the enclosure of the TFX-500, TFX-500M, TFX-800 display box, TFX-800M control panel, in an auxiliary cabinet (must be in same room as control panel), or mounted externally next to the control unit. See Figure 2. Hold the modem unit against the mounting surface and mark the locations of the keyhole slots on the rear mounting brackets. Install the No. 6 mounting screws (supplied) to the keyhole slot marks, allowing leeway under the screw heads for the modem unit to be mounted. Align the unit and tighten the screws. When mounting two TLO-530 modems in a TFX-500 or TFX-800 display box, mount the units piggy-back using hardware supplied.

LED Indicators
The red power LED will light steadily when voltage is applied to the unit. A yellow LED will pulse when incoming light pulses are received. The green LED flashes when light pulses are placed on the outgoing fiber.
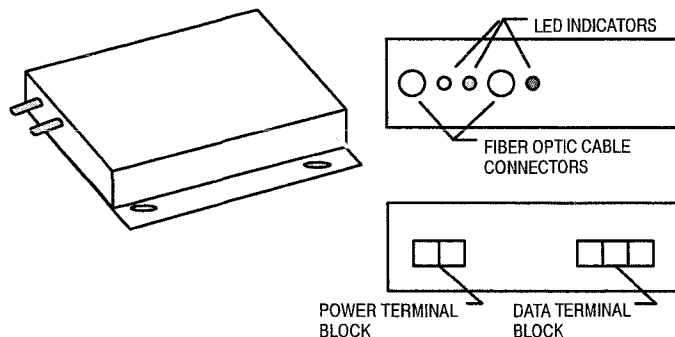
Figure 1.   TLO-530 Fiber Optic Modem.

Table 1: Specifications

Power Requirement	24 VDC (nominal) from RPS-424 Power Supply
Current Draw	Alarm: 125 mA max. Supervisory 125 mA max.
Data	RS-485 (Tri-state); EOL 120 ohm UL listed P/N 976048
Data Rate	DC-200 Kbaud
Wavelength	850 nm
Transmitter Power	20 µw (-17dBm)
Receiver Sensitivity	1 µw (-30dBm)
Optical Power Budget	62.5/125 Fiber: 13 dB 50/125 Fiber: 9 dB
Maximum Cable Distance	13,000 ft (4 km)
Unit Size (base)	7.2 x 4.9 x 1.0 inches
Operating Temperature	-4° F to +158° F (-20° C to +70° C)
Power/Data Connectors	Terminal block with screw clamps
Optical Connectors	ST type

Power and Signal Connections:
Make power and signal connections to the Fiber Optic Modem as shown in Table 2 and Figure 3.

## Fiber Optic Cable Connection:
Select good quality UL listed 62.5/125 or 50/125 fiber optic cable. Attach an ST style fiber optic connector, identifiable by the bayonet appearance of the connector housing (do not use SMA type that has internal screw threads). Follow the connector manufacturer's recommended procedures. Connect the incoming fiber optic cable to the Optical Receiver connection, beside the yellow LED. Connect the outgoing cable to the Optical Transmitter connection, beside the green LED.

Table 2: Power & Signal Connections

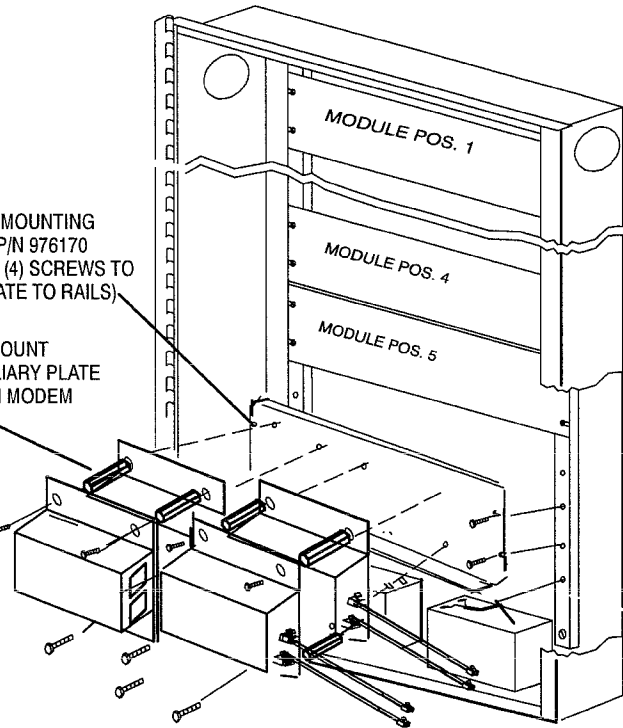| Modem Term	TFX	Notes
Power 1 (24VDC)	+24VDC	Power In
Power 2 (GRD)	0 V	DC Common
Data 1 (D)	L + or R+	Data (polarity sensitive)
Data 2 (GRD)	Shield	Data Circuit Wiring Shield
Data 3 (D̄)	L– or R–	Complimentary Data (polarity sensitive)
Optical Data Receive. (DATA REC)		Fiber Optic Cable
Optical Data Transmit (DATA XTMR)		Fiber Optic Cable

(a) Mounting in auxiliary enclosure.

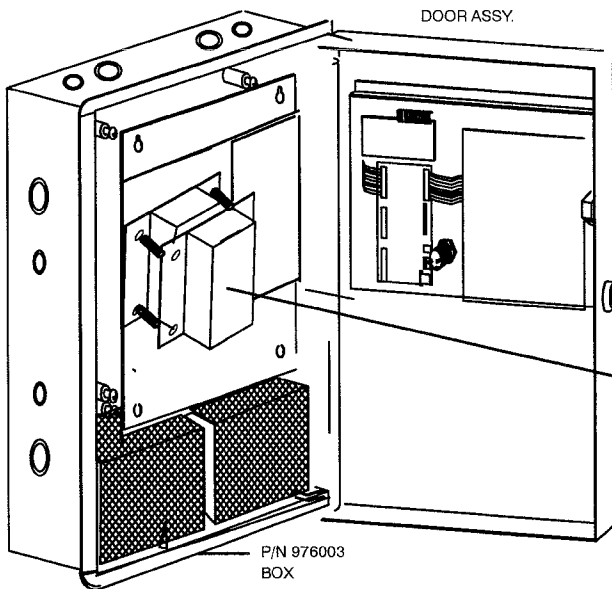*(b) Mounting in AUTOCALL 19-inch rail enclosure.*
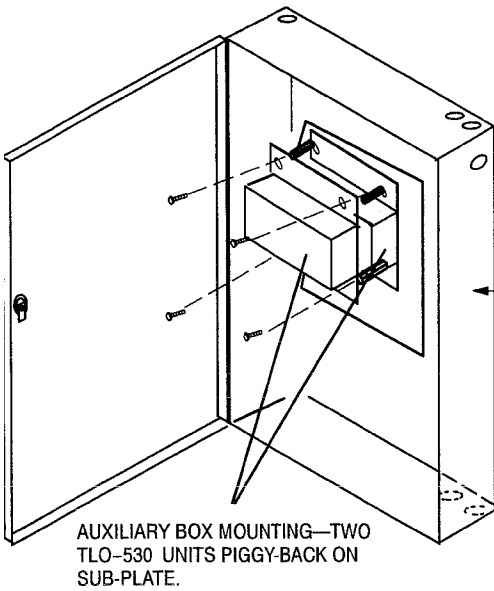
AUXILIARY ENCLOSURE 976010

AUXILIARY MOUNTING PLATE KIT P/N 976170 (INCLUDES (4) SCREWS TO MOUNT PLATE TO RAILS)

HARDWARE TO MOUNT MODEM TO AUXILIARY PLATE FURNISHED WITH MODEM

MODULE POS. 1

MODULE POS. 4

MODULE POS. 5

AUXILIARY BOX MOUNTING—TWO TLO-530 UNITS PIGGY-BACK ON SUB-PLATE.

(c) Mounting in TFX-500 or TFX-800 display box.

DOOR ASSY.

ORIENT THE TLO-530 FIBER OPTIC MODEM UNITS SO THAT THE FIBER OPTIC CABLES ARE LOCATED TOWARD THE SIDES OF THE CABINET.

TFX-500 OR TFX-800 DISPLAY BOX MOUNTING—TWO TLO-530 UNITS PIGGY-BACK ON SUB-PLATE.

P/N 976003 BOX

(d) Mounting outside control panel. Fiber optic modem units must be located in the same room as the control panel. Fiber optic modem units may be mounted directly to the wall or to a backing plate.

WIRING IN SAME ROOM AS CONTROL PANEL
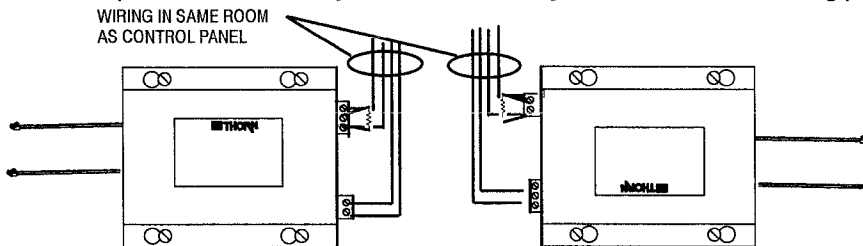
Figure 2.   TLO-530 Fiber Optic Modem Mounting (a) Auxiliary cabinet, (b) TFX-500M/TFX-800M cabinet, (c) TFX-500 or TFX-800 display box, (c) mounting outside cabinet.
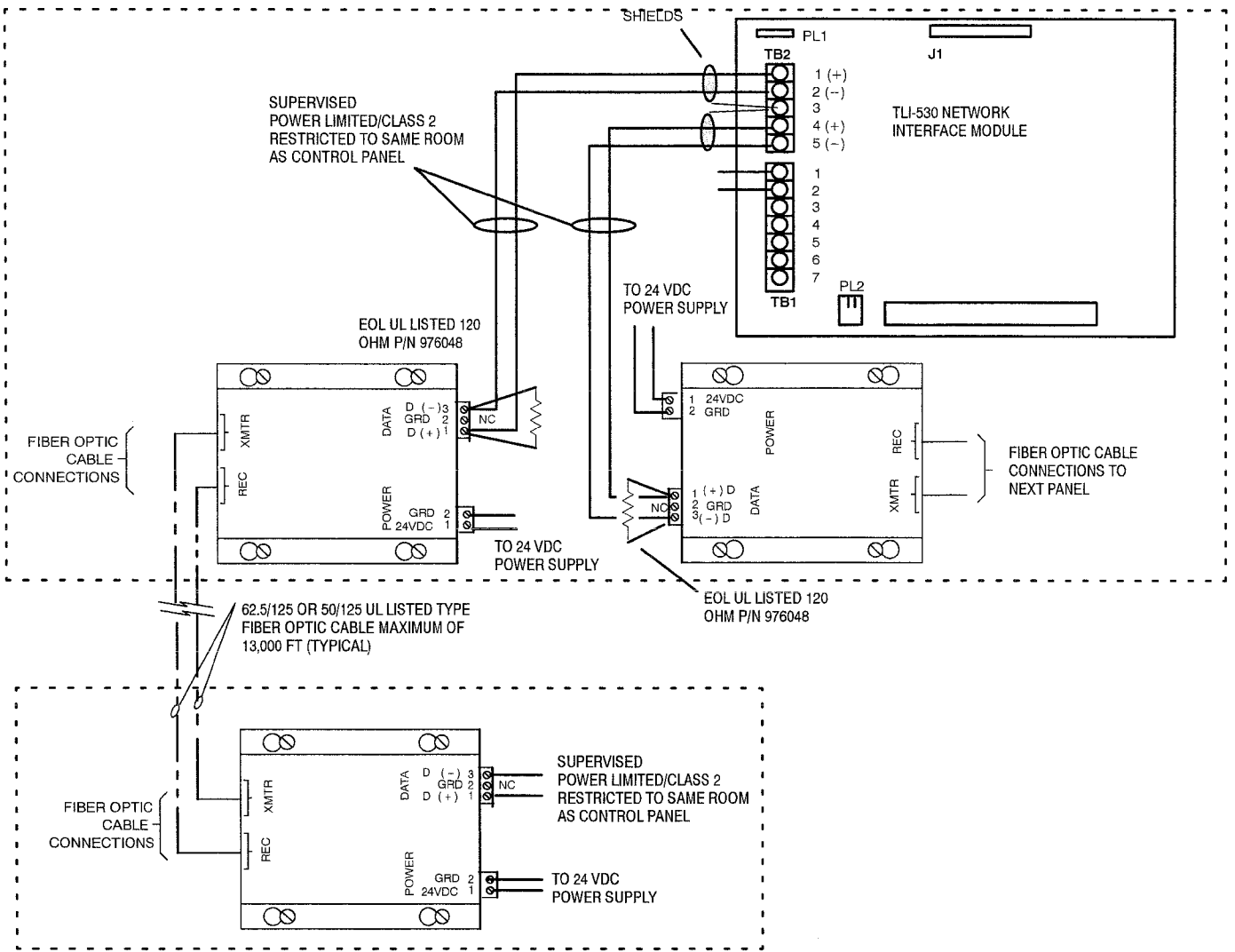
Figure 3: Typical Fiber Optic Modem Configuration. Note that Fiber Optic Modem communication may be used on either or both channels of the TLI-530 network module.

Wiring Notes:

1. All wiring to conform to current National Electrical Code, NFPA 70, state, and local building code requirements and applicable notes. All circuits contained in this module are classified as power limited/Class 2 and shall be installed to comply with N.E.C. Article 760, Part A and Part C.
2. Disconnect power before servicing systems.
3. All conductors to be free of grounds.
4. Data circuit is supervised, power limited/Class 2 and restricted. The TLO-530 Fiber Optic Modem must be in the same room as the panel it is connected to. Wire need not be shielded. Use twisted wire pair 18–24 AWG (If shielded wire is used, make sure shield is continuous over the length of the circuit. The shield should be connected to DC Common.)
5. End-of-line resistor UL listed 120 ohms, P/N 976048 must be connected across all modem data circuit connections.
6. Power supply wiring—Connect to +24VDC from MP-500 main processor board or RPS-424 Power Supply/Battery Charger.

Power Up and Testing:

1. Check to see that signal cables and fiber optic cables are properly connected and are of the correct polarity.
2. Apply power to the system. The red Power LED should be lighted.
3. Check for transmit/receive operation. Look for a lighted green Transmit LED at one end of the fiber cable and a lighted yellow Receive LED at the other end (on a different unit).

Table 3: Transmit/Receive Troubleshooting

Transmit Green	Receive Yellow	Notes
OFF	OFF	Check power, units, cable connections.
ON	ON	Data transmitting normally.
ON	OFF	Check continuity and signal loss in cable.
OFF	ON	Check units for operation.

4. Check for continuity and signal loss.
   a. Measure the actual signal loss in the cable using an optical power meter. Loss should be less than specified, for the fiber size being used (see Table 1, Specifications). If the fiber optic cable is shorter than the specified maximum distance and these loss numbers have been exceeded, there is excess loss in either the cable, due to bending or breakage, or in the connectors.
   b. Measure connector loss. Inspect, under magnification, the connector end face. Look for chips, cracks, pits, or other flaws. Check to see if there is adequate strain relief at the base of the connector. Often, connector problems occur due to a broken fiber at the junction of the cable and connector, under the strain relief boot, due to improper handling. If in doubt change the cable termination.

WARNING: Fiber Optic Modem units are part of a complete system. Fiber Optic Modem units are designed to communicate access control or emergency action signals, but will do so only when used in conjunction with other equipment.

WARNING: Fiber Optic Modem units will not work without power. DC powered Fiber Optic Modem units will not work if the power supply from the unit fails or is disconnected.

WARNING: Fiber Optic units may wear out. Fiber Optic Modem units contain electronic parts that could potentially fail at any time. Therefore, test your system per NFPA 72 at least semiannually.

Grinnell
FIRE PROTECTION SYSTEMS COMPANY

TLD-530 TFXnet Line Driver
PCB 920197   Assembly 976167

Publication Number 19700401
Issue 2, January 1997

The TLD–530 is a two–channel RS-485 to Line Driver interface which will support point to point communication on a dedicated pair of wires. Typically, these wires are a single, unshielded, #24AWG, twisted pair, contained in a multi-conductor cable (the multi-conductor cable may already exist at the installation site).

Features

● Two independent channels.

● Each channel can communicate over a maximum distance of four miles over a single No. 24 AWG twisted wire-pair. Removable screw terminal connectors provide for ease of wiring.

● Data rates up to 38.4 K-baud are supported.

Application:

The TLD-530 TFXnet Line Driver is designed and approved for use with the UL listed AUTOCALL® TFX (TFX-500/800, TFX-500M/800M, TFX-500MV/800MV, DirecTone 500, FireGraph) TFXnet network systems. The TLD-530 provides two independent channels which interface TFXnet RS-485 communications to a proprietary prootocol line driver. A TLD-530 pair inserted in a TFXnet RS-485 link provides an intermediate line driver link which is capable of operating over a four-mile distance using No. 24 AWG unshielded, twisted wire pair cable. The TLD-530 will support data rates of 9600 Baud, 19.2 K-Baud, and 38.4 K-Baud.

Fire alarm system applications of the TLD-530 TFXnet Line Driver include industrial, commercial, and institutional installations; recommended for indoor and outdoor cabling. The TLD-530 contains on-board circuit protection, eliminating the need for a secondary protection device when the line driver cabling is routed outdoors. Install the cabling in accordance with UL 864, NFPA 70, NFPA 72, NFPA 101, and all local codes and ordinances.

TLD-530 Location and Mounting:

Locate the TLD-530 TFXnet Line Driver within the enclosure of the TFX-500, TFX-500M, TFX-800 display box, TFX-800M control panel, or in an auxiliary cabinet (must be in same room as control panel).

Module Position: _____
(See System Layout)
Space Requirement: TFX-500/800 Cabinet—B3
         TFX-500M/800M Cabinet—One-half module space

Specifications

Operating Temperature: 32 °F to 122°F (0 °C to 50 °C)
Operating Humidity: up to 85% (non-condensing)
Dimensions *(lwd)*:   6.63 × 4.5 × 0.75 inches

Table 1: Electrical Specifications

Battery Requirements		
Standby Current	25	mA
Alarm Current	25	mA
Line Driver Wire Parameters		
24 AWG, twisted wire pair, 4 miles maximum distance		
Power Parameters		
Isolated +5 VDC from TLI-530		

LED Indicators

The red TX-A or TX-B LED will light intermittently when Line A or Line B is transmitting data. The red RX-A or RX-B LED will light intermittently when Line A or Line B is receiving data.

Power and Signal Connections:

Make power and signal connections to the TLD-530 Line Driver as shown in Table 3 and Figure 2.

Important: The +5 VDC power must be the isolated +5 V_{DC} supplied by the TLI-530 module.

The line driver cable is connected from one TLD-530 module to another TLD-530 module at TB1. Maximum distance is 4 miles.

RS-485 Cable Connections—The RS-485 twisted shielded pair cable is connected from the TLD-530 to the TLI-530. The shield should be connected to earth ground in the TFX cabinet at one end of the cable only.

Switch Settings

Switches SWA and SWB configure the RS485 and line driver communication parameters for Channel A and Channel B, respectively. For each of these, switches 1, 2, and 3 configure the operating line dirver wire length; switches 4, 5, and 6 configure the RS-485 data rate; and switch 7 is factory configured for on-board end-of-line termination for RS485 lines; switch 8 is not used. (See Table 2.)
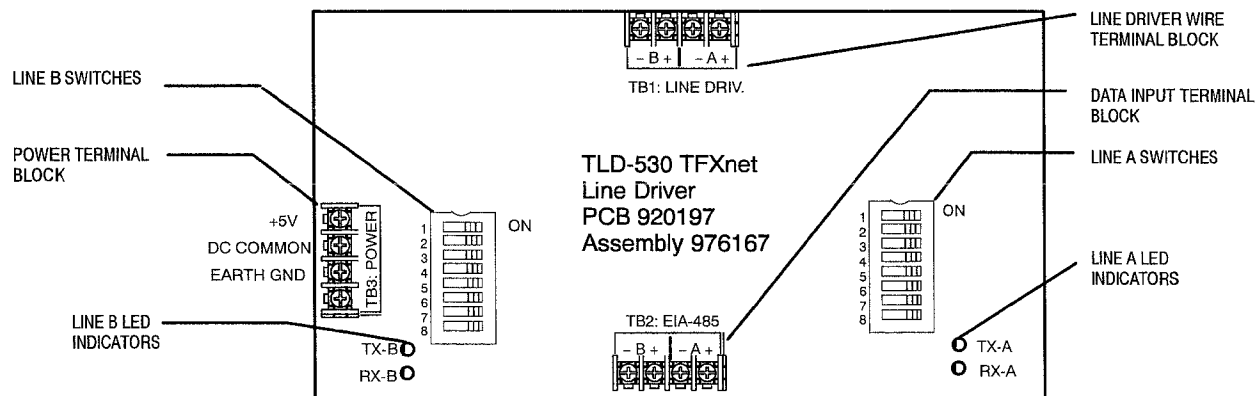

LINE DRIVER WIRE TERMINAL BLOCK
DATA INPUT TERMINAL BLOCK
LINE A SWITCHES
LINE A LED INDICATORS
LINE B SWITCHES
POWER TERMINAL BLOCK
LINE B LED INDICATORS
+5V
DC COMMON
EARTH GND
TB3: POWER
TX-B
RX-B
TB1: LINE DRIV.
– B + – A +
TLD-530 TFXnet Line Driver
PCB 920197
Assembly 976167
TB2: EIA-485
– B + – A +
ON
TX-A
RX-A

Figure 1.   TLD-530 TFXnet Line Driver.

Table 2: Switch Settings SWA and SWB

1	2	3	Set line length	Resistance for 24 AWG twisted wire pair (Ohms)
ON	OFF	OFF	0 – 1 miles	0 – 134
ON	ON	OFF	1–2 miles	135–270
ON	ON	ON	2–3 miles	271–405
OFF	ON	ON	3–4 miles	406–542
4	**5**	**6**	**Set Data Rate**	
ON	OFF	OFF	38,400 Baud	
OFF	ON	OFF	19,200 Baud	
OFF	OFF	ON	9600 Baud	
7	**8***			
ON	— —		Enables on-board end-of-line device	
	— —		*Switch 8 not used	

Table 3: Power & Signal Connections

Terminal	Legend	Function
TB1–1	A+	Line Driver Channel A (+)
TB1–2	A–	Line Driver Channel A (–)
TB1–3	B+	ine Driver Channel B (+)
TB1–4	B–	Line Driver Channel B (–)
TB2–1	A+	RS-485 Channel A (+)
TB2–2	A–	RS-485 Channel A (–)
TB2–3	B+	RS-485 Channel B (+)
TB2–4	B–	RS-485 Channel B (–)
TB3–1	+5 V	+5 VDC
TB3–2	DC COMMON	DC COMMON
TB3–3	EARTH GND	EARTH GROUND
TB3–4		(NOT USED)
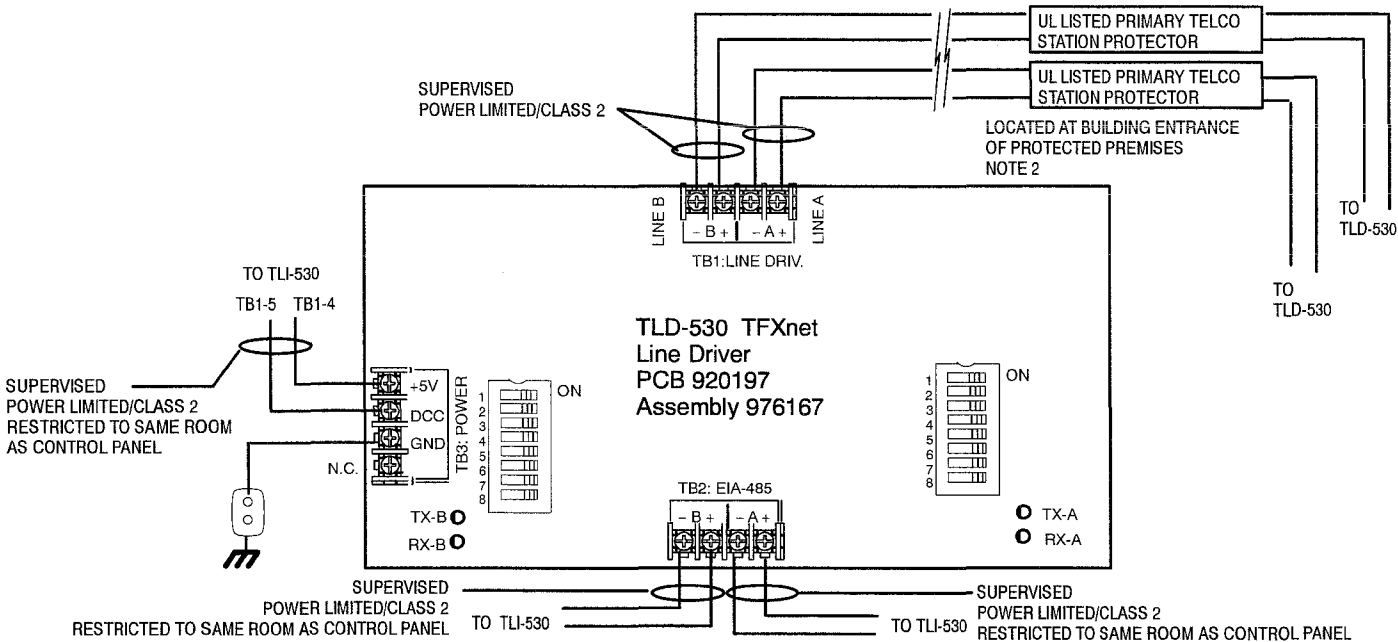
Figure 2: Typical TLD-530 Wiring Configuration. Note that line driver line communication may be used on either or both channels of the TLI-530 network module.

Wiring Notes:

1. All wiring to conform to current National Electrical Code, NFPA 70, state, and local building code requirements and applicable notes. When installed to comply with N.E.C. Article 760, Part A and Part B, these circuits are classified as **non-power limited.** When installed to comply with N.E.C. Article 760, Part A and Part C, these circuits are classified as power limited.
2. Circuits leaving the building must be connected to a UL listed primary protector at the point the wiring exits the building.
3. Disconnect power before servicing systems.
4. All conductors to be free of grounds.
5. Data circuit is supervised, power limited/Class 2. Wire need not be shielded. Wire must not contain any taps or branches. Only point-to-point connections are supported. Use twisted wire pair 18–24 AWG (If shielded wire is used, make sure shield is continuous over the length of the circuit. The shield should be connected to Earth Ground.)
6. Power supply wiring—Connect to +5V$_{DC}$ from TLI-530, TB1-4 (+5V) and TB1-5 (DCC).

7. Check for transmit/receive operation. Look for a lighted red Transmit LED at one end of the line driver cable and a lighted red Receive LED at the other end (on a different unit).

This document is written for skilled technicians with experience installing and testing fire detection systems. These instructions do not purport to cover all the details or variations in the equipment described. Nor do they provide for every possible contingency met in connection with installation, operation, or maintenance. All specifications are subject to change without notice.

Should further information be desired or should particular problems arise which are not covered sufficiently for the user's purposes, the matter should be referred to Grinnell Fire Protection Systems Company, Inc., Westlake, Ohio 44145. Ph. (216) 871-9900.

Grinnell
FIRE PROTECTION SYSTEMS COMPANY

CAA-500LI Line Isolator Module

PCB P/N 940529   **Assembly No. 976026**

Installation Guide

Publication Number 19700223
**Issue 3, January 1997**

The CAA-500LI Line Isolator Module (P/N 940529) is designed to be used only with the AUTOCALL TFX fire control panels. The purpose of the Line Isolator is to ensure that no short circuit fault on the 2-way data (multiplex) circuit can disable more detection devices than would be lost on a conventional non-addressable fire circuit. The module monitors the condition of the 2-way data circuits. When a short circuit is detected, it isolates the affected section and allows the rest of the 2-way data circuit to function normally. The yellow LED turns ON when the module is isolating.

The Line Isolator Modules should be installed only after all other devices have been installed and tested.

Installation:

The CAA-500LI module consists of a printed circuit board (PCB) which is mounted to a cover plate. The wiring connectors are exposed through the back of the base. After the wiring is complete, the cover plate is mounted to a UL listed electrical box.

1. Check that there is continuity on all the circuits and that no short circuits exist.
2. Wire each CAA-500LI module onto the 2-way data circuit according to the site plan. Make sure polarity is correct.
3. Mount the cover plate to the electrical box.
4. Screw the cover in place.
5. Check that the yellow LED on the module is not lighted (if it is, a short circuit exists in the circuit wiring).
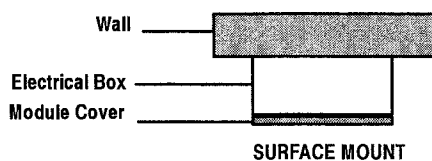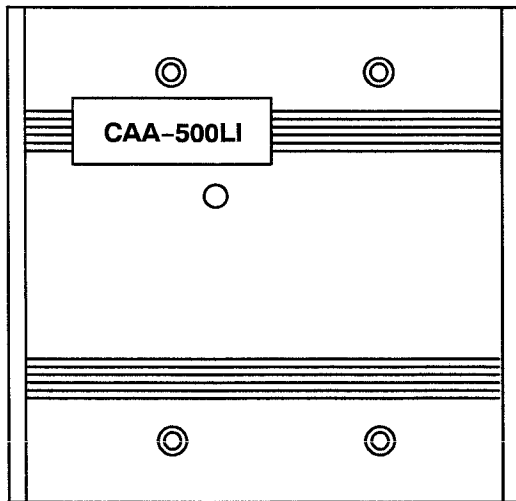
Specifications:

Environment: Indoor Application Only
Operating Temperature: 32°F to 120°F
Operating Humidity: 85% (non-condensing)
Compatibility: Use only the AUTOCALL TFX Fire Control System. Maximum number of CAA-500LI modules per 2-way data circuit is 12.

Electrical:

Minimum Current 2-Way Data Circuit: 2 mA
Maximum Current 2-Way Data Circuit: 18 mA per pair (tripped, maximum two devices)
Terminal Block Wiring: No. 12 to 19 AWG shielded, twisted pair
Addressable Circuit Voltage: 28 VDC (POLARITY SENSITIVE)
**Maximum Series Resistance:** (Isolator ON) = 1.6 ohm
Base/Cover Material: "Bayblend" polycarbonate ABS alloy
Dimensions (lwh): 4.9 x 4.9 x 1 inch
Shipping Weight: 3.6 ounces
Mounting: Requires UL listed electrical box of sufficient depth to accommodate wiring (dimensions depend upon application-flush or surface mount):

- Surface - 2-gang switch box
- Surface - 2-gang tile box
- Flush - 4-inch square box with 2-gang adapter (provides more wiring depth)
- Flush - cast box with 2-gang switch plate mounting

SURFACE MOUNT

FLUSH MOUNT
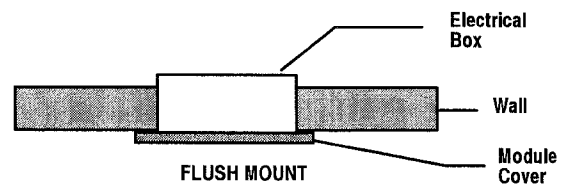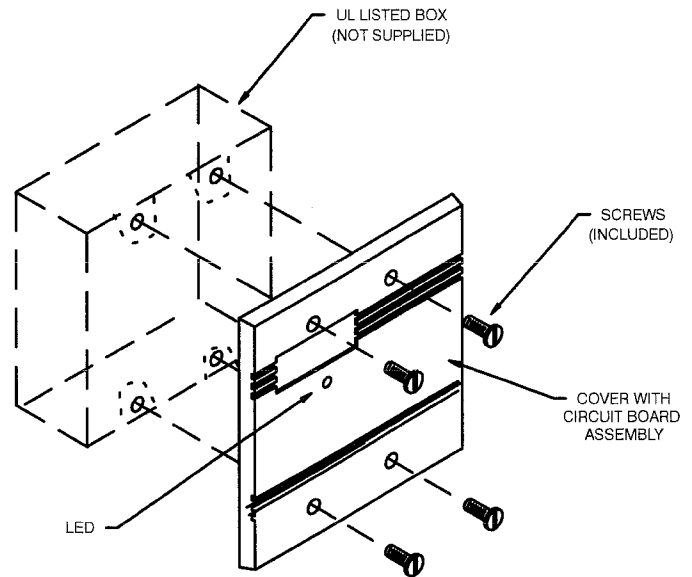
Wiring:

1. Before connecting any module or device on the 2-way data circuit, make sure that the wiring is correct, has been tested for continuity, and that no short circuits exist.
2. All wiring to conform to current National Electrical Code, NFPA 70, state, and local building code requirements and applicable notes. All circuits contained in this module are classified as power limited/Class 2 and shall be installed to comply with N.E.C. Article 760, Part A and Part C.
3. All conductors to be free of grounds.
4. Disconnect power from the circuit before installing modules.
5. When making connections, break wire run, strip 3/8-inch insulation from the end of the wires, slide the bare end of the wires under the terminal clamping plate, and tighten the clamping screw.
6. Four pairs of connection terminals (L+ and L–) are provided on the terminal block. The terminals are divided into LINE IN connections and LINE OUT connections. One LINE IN pair and one LINE OUT pair are used to connect the module onto the 2-way data circuit. The other LINE IN and LINE OUT pair are used to provide 'tee-tapped' or 'spur' circuits.
7. Spur circuits are susceptible to the effects of an open circuit, since communications will be lost with all devices after the break. With a looped circuit, a SINGLE open circuit will not disable any device because there are always two communication paths.
8. LED operation—yellow LED "ON" indicates circuit isolation.
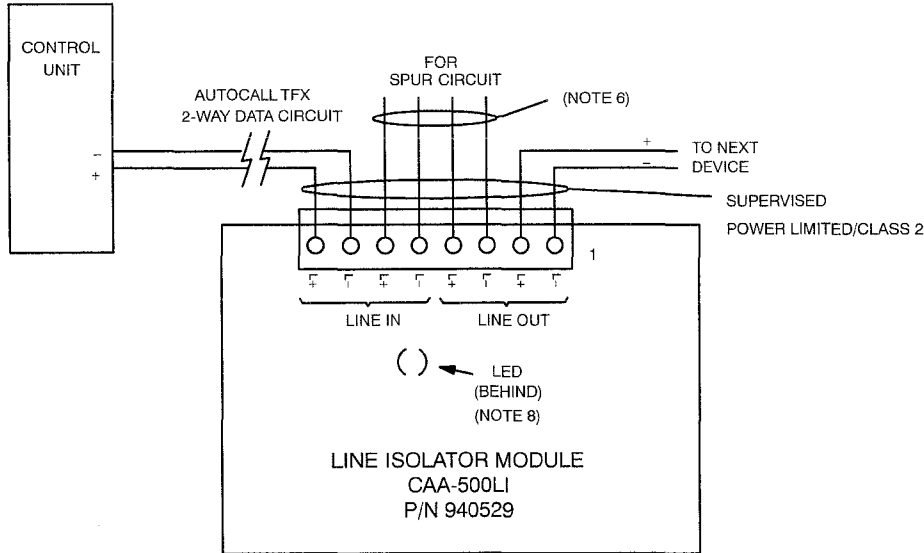
All circuits and connections are power limited/Class2.

This document is written for skilled technicians with experience installing and testing fire detection systems. These instructions do not purport to cover all the details or variations in the equipment described. Nor do they provide for every possible contingency met in connection with installation, operation, or maintenance. All specifications are subject to change without notice.

Should further information be desired or should particular problems arise which are not covered sufficiently for the user's purposes, the matter should be referred to Grinnell Fire Protection Systems Company, Inc., Westlake, Ohio 44145. Ph. (216) 871-9900.

Grinnell
FIRE PROTECTION SYSTEMS COMPANY

IXA-500CM Contact Monitoring Module

PCB P/N 940528   **Assembly No. 976027**

Publication Number 19700225
Issue 4, January 19097

The Contact Monitoring Module is used to monitor fire contacts such as a fire alarm pull station, heat detector, or waterflow switch. The module provides one identifiable detection loop which is capable of monitoring normally-open contacts or normally-closed contacts.

The Contact Monitoring Module is capable of identifying and signalling to the control panel whether a contact is OPEN or CLOSED.

Install in accordance with NFPA 70, National Electrical Code, NFPA 72, Installation, Maintenance, and use of Protective Signaling Systems.

Installation:

The printed circuit board is mounted to a cover plate. The connection terminals and address setting switches are accessible on the back. After connections have been made and the address switches set, the cover plate is mounted onto the UL listed electrical box. The LED extends through the front of the cover plate and provides indication of unit operation.

Address Setting:

Each module installed on the 2-way data (multiplex) circuits requires an address. Set the address before wiring the module into the circuit.

The address for each module is set on a 7-position DIP switch marked 1 to 7. For example, to set a module to address 26, set switches 2, 4, and 5 to ON (1) and switches 1,3,6, and 7 to OFF (0).

System Compatibility: AUTOCALL TFX Fire Control System
Device Location: The location of each device should have been determined according to the site plan. *(See System Layout)*

Specifications:

Environment: Indoor Application Only
Operating Temperature: 32°F to 120°F
Operating Humidity: 85% (non-condensing)
Base/Cover Material: "Bayblend" polycarbonate ABS alloy
Addressable Circuit Voltage: 28 VDC (POLARITY SENSITIVE)
Contact Rating: Use with contact that has minimum current of <500 micro-ampere; maximum current of >50 mA
Contact Supervisory Current: 3 mA minimum, 18 mA maximum
Addressable Loop Supervisory Current: 0.18 mA maximum
Addressable Loop Alarm Current: 0.18 mA maximum
Supervision EOL: 1K ohm (UL listed, P/N 976045, supplied)
Identity Resistor: 2.2K ohm (UL listed, P/N 976044, supplied)
**Line Impedance (subcircuit):** 10 ohm
Terminal Block Wiring: No. 12 to 19 AWG shielded, twisted pair
**Dimensions (lwd):** 4.9 x 4.9 x 1 inch
Shipping weight: 3.6 ounces
Mounting Requirements: One UL listed electrical box of sufficient depth to accommodate wiring (dimensions depend upon application-flush or surface mount):

- Surface - 2-gang switch box
- Surface - 2-gang tile box
- Flush - 4-inch square box with 2-gang adapter (provides more wiring depth)
- Flush - cast box with 2-gang switch plate mounting
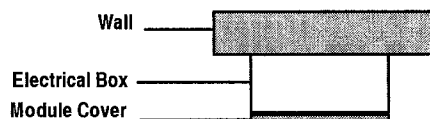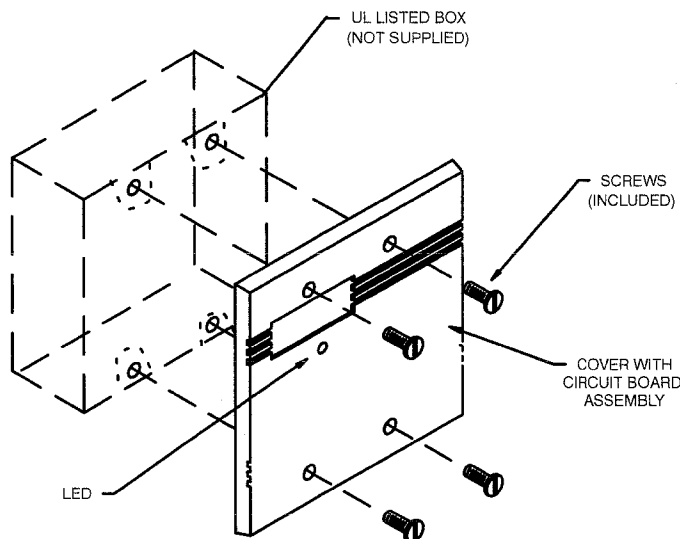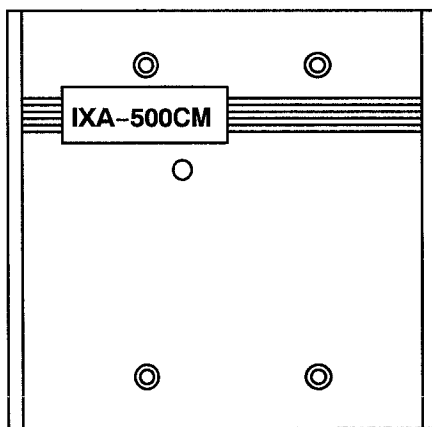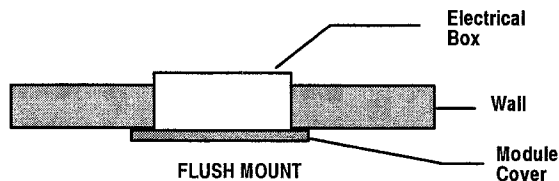
Figure 1.Mounting IXA-500CM Contact Monitor Module.

Wiring:

1. Before connecting any module or device on the 2-way data circuit, make sure that the wiring is correct and has been tested.
2. All wiring to conform to current National Electrical Code, NFPA 70, state, and local building code requirements and applicable notes. All circuits contained in this module are classified as power limited/Class 2 and shall be installed to comply with N.E.C. Article 760, Part A and Part C.
3. All conductors to be free of grounds.
4. Disconnect power from the circuit before installing modules.
5. When making connections, break wire run, strip 3/8-inch insulation from the end of the wires, slide the bare ends of the wire under the terminal clamping plate, and tighten the clamping screw.
6. Install the 2.2 k-ohm identity resistor (UL listed, P/N 976044, supplied) across CCT1 +VE and –VE terminals.
7. Connect the UL listed monitored contact device to the CCT2 +VE and –VE terminals.
8. Install the EOL resistor (1 k-ohm, UL listed, P/N 976045, supplied) into the circuit of the monitored contact device (see Figure 2).
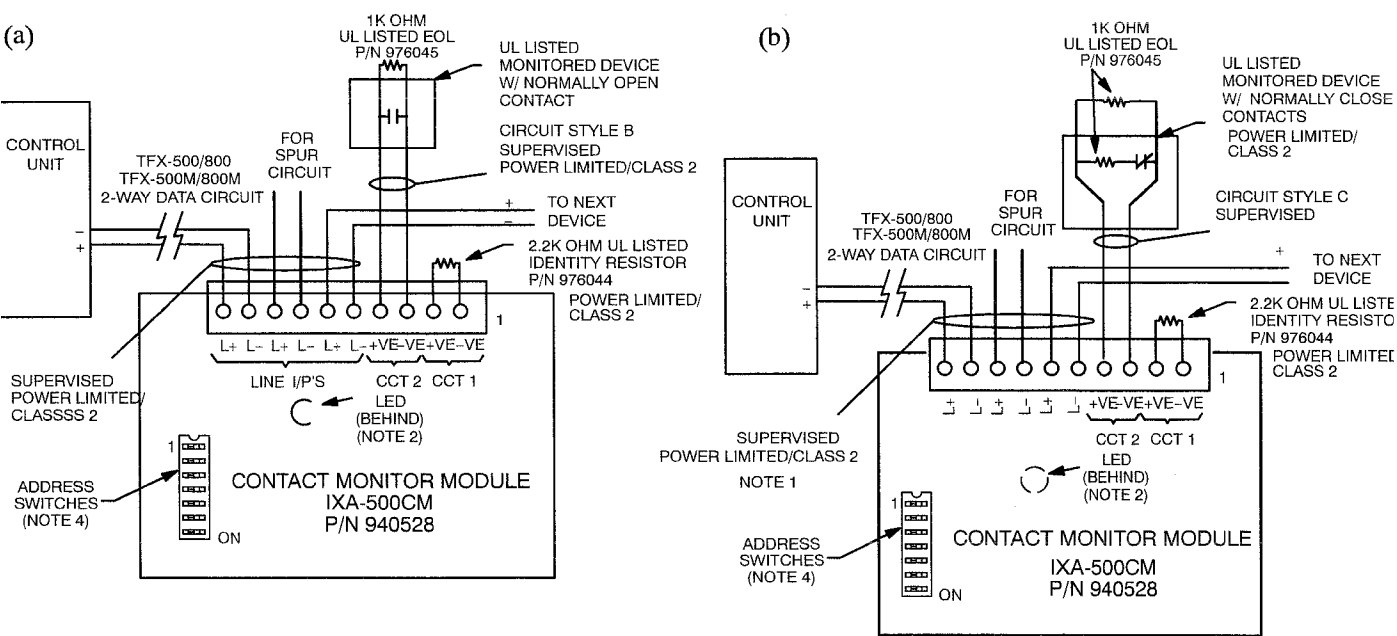9. Break wire run to provide supervision.

Figure 2. Typical wiring configurations (a) Normally Open Contact Style B Initiating Circuit, (b) Normally Closed Contact Style C Initiating Circuit.

Notes:

1. All field wiring connected to the IXA-500CM is considered power limited.
2. The red LED (seen from front) is ON when the contact being monitored has operated and the control panel has acknowledged it.
3. The detection circuit is monitored for open circuit and device fault conditions.
4. Set address according to site plan. Switch ON Values:

Sw. Pos.	Value	Sw. Pos.	Value
1	1	5	16
2	2	6	32
3	4	7	64
4	8		

Grinnell®
FIRE PROTECTION SYSTEMS COMPANY

IXA-500CMA, IXA-502CMA Contact Monitoring Module

IXA-500CMA   PCB P/N 940575   Ass'y No. 976092
IXA-502CMA   PCB P/N 940581   Ass'y No. 976185

Publication Number 19700333
Issue 3, January 1997

The IXA-500CMA and IXA-502 Contact Monitoring Module is used to monitor fire alarm system contacts such as manual pullstations, heat detectors, water flow switches and other initiating devices. The module provides a single initiating circuit that may be wired in NFPA Styles B, C, D or E to monitor normally-open or normally closed contacts.

The IXA-500/502CMA Contact Monitoring Module is capable of identifying and signalling to the control panel the status of the monitored contact and the status of the wiring to the contact.

Installation:

The IXA-500CMA printed circuit board is mounted to a cover plate. The connection terminals and address setting switches are accessible on the back. After connections have been made and the address switches set, the cover plate is mounted onto the UL listed electrical box. The LED extends through the front of the cover plate and provides indication of unit operation.

The IXA-502CMA printed circuit board mounts by connector to an interface board such as an IXM-500 Motherboard or ATM-500 Addressable Telephone Module. First set the address switches, then mount the IXA-502CMA to its socket, being careful to orient the board correctly. The LED provides indication of unit operation.

Address Setting:

Each module installed on the TFX addressable loop circuits requires an address. Set the address before wiring the module into the circuit.

The address for each module is set on a 7-position DIP switch marked 1 to 7. For example, to set a module to address 26, set switches 2, 4, and 5 to ON (1) and switches 1,3,6, and 7 to OFF (0).
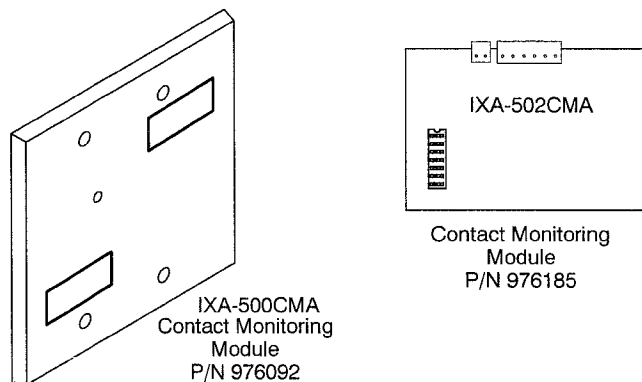

Figure 1 (a) IXA-500CMA Contact Monitoring Module, stand-alone; (b) IXA-502CMA plug-in module..

System Compatibility: AUTOCALL TFX Fire Control System, CONSYS® Issue 3.0 and above .

Specifications:
Environment: Indoor Application Only
Operating Temperature: 32°F to 120°F
Operating Humidity: 85% (non-condensing)
Base/Cover Material: "Bayblend" polycarbonate ABS alloy

Electrical (IXA-500CMA and IXA-502CMA):
Addressable Circuit Voltage: 28 VDC (POLARITY SENSITIVE)
Contact Rating: Use with contact with current rating of >50 µA (>0.5 mA) to <50 mA

Dimensions (hwd): 4.5 x 4.5 x 1 inch
Shipping weight: 4 ounces
Mounting Requirements IXA-500CMA: One UL listed electrical box of sufficient depth to accommodate wiring (dimensions depend upon application—flush or surface mount):
* Surface — 2-gang switch box
* Surface — 2-gang tile box
* Flush — 4-inch square box with 2-gang adapter (provides more wiring depth)
* Flush — cast box with 2-gang switch plate mounting

Table 1.   Electrical Specifications

Battery Requirements:		
Addressable Loop	**Single Contact Application**	
	Figures 3 and 5	Figures 4 and 6
Standby Current	0.18 mA	0.18 mA
Alarm Current	0.18 mA	0.18 mA
Circuit Resistors		
Identity	2.2 k-Ohm P/N 976044	2.2 k-Ohm P/N 976044
Supervision (Contact #1)	--	1 k-Ohm P/N 976045
Supervision (Contact #2)	--	--
Supervision (End-of-Line)	1 k-Ohm P/N 976045	1 k-Ohm P/N 976045
MONITORED CONTACT CIRCUIT Requirements		
Maximum Line Impedance (sub-circuit)	10 Ohm	10 Ohm
Addressable Loop Currents		
ID Current	3.0 - 4.0 mA mA	3.0 - 4.0 mA
Condition Current		
Open Circuit Fault	0.0 - 2.9 mA	0.0 - 2.9 mA
ID in condition Fault	3.0 - 4.6 mA	3.0 - 4.6 mA
Normal	4.7-7.5 mA	7.5- 11.1 mA
N/O Contact Closed	> 7.5 mA	--
N/C Contact Open	--	4.7 - 7.5 mA
	--	> 11.1 mA
Terminal Block Wiring Requirements		
No. 12 (max.) AWG shielded, twisted wire pair		

(a)

IXA-5O2CMA PLUG-IN
CONTACT MONITORING
MODULE PCB P/N 940539

J1B

J1A

TB1

IXM-500 OR ATM-500

NOTE:
INSTALL IXA-502CMA IN CONTROL
PANEL CABINET ONLY—DO NOT
INSTALL IN ELECTRICAL BOX.

ADDRESS
SWITCHES
(NOTE 5)
LED
(BEHIND)
(NOTE 3)

IXA-502CMA

ON

Contact Monitoring Module
IXA-502CMA P/N 976185

(b)

UL LISTED BOX
(NOT SUPPLIED)

IXA-500CMA
Assembly 976092

SCREWS
(INCLUDED)

COVER WITH
CIRCUIT BOARD
ASSEMBLY

LED

Electrical
Box

Wall

Wall

Module
Cover

FLUSH MOUNT
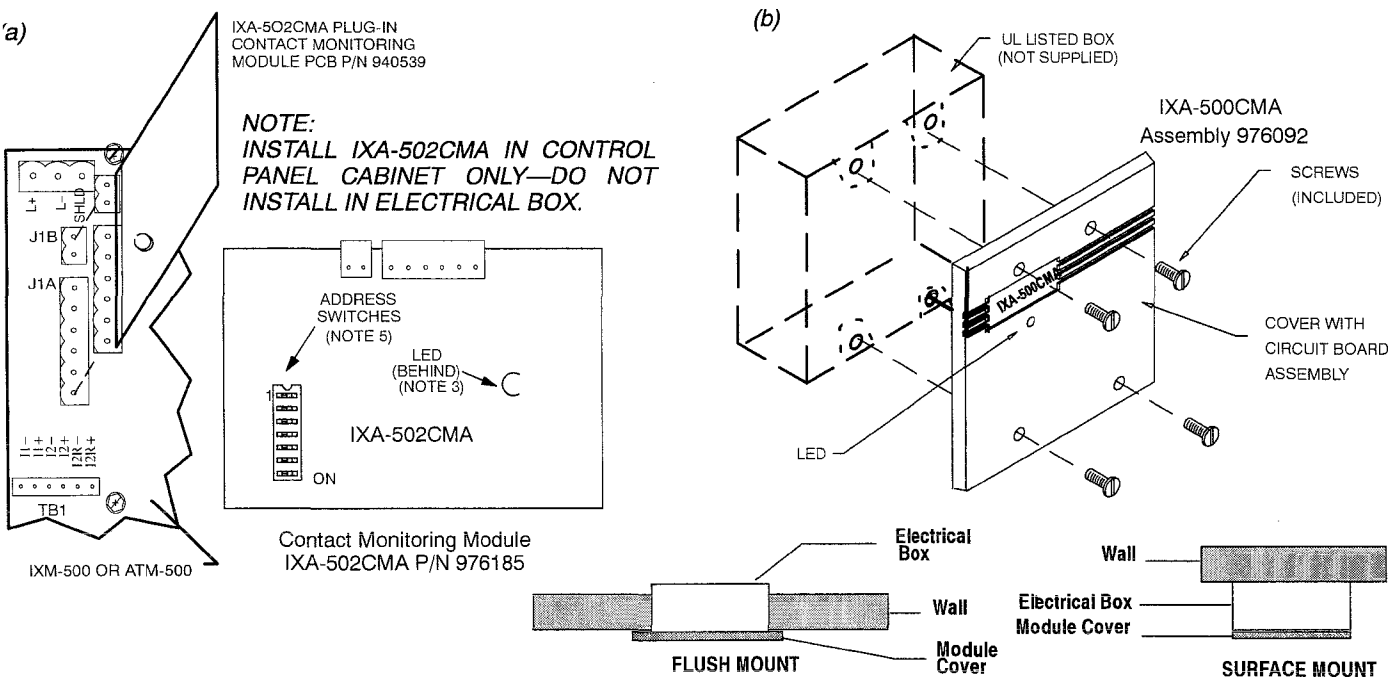
Electrical Box
Module Cover

SURFACE MOUNT

Figure 2 (a) IXA-502CMA connecting to carrier board. (b) IXA-500CMA Contact Monitoring Module Mounting to electrical box.

Table 2. Address Setting Switch Values

Sw. Pos.	Value (ON)	Sw. Pos.	Value (ON)
1	1	5	16
2	2	6	32
3	4	7	64
4	8		

Wiring:
1. Before connecting any module or device on the TFX addressable loop circuit, make sure that the wiring is correct and has been tested. Refer to Publication 19700370 *TFX-500/800 Wiring Guidelines.*
2. All wiring to conform to current National Electrical Code, NFPA 70, state, and local building code requirements and applicable notes. All circuits contained in this module are classified as power limited/Class 2 and shall be installed to comply with N.E.C. Article 760, Part A and Part C.
3. All conductors to be free of grounds.
4. Shut down the TFX control panel(s) and disconnect power from the circuit before installing modules.
5. When making connections, break wire run, strip 3/8-inch insulation from the end of the wires, slide the bare ends of the wire under the terminal clamping plate, and tighten the clamping screw.

6. Install the identity resistor across I1+ (TB-1) and I1– (TB-2). (See Table 1 for value.)
7. Connect the UL listed monitored contact device(s) as shown in Figure 3, 4, 5, 6, or 7.
8. Install the EOL resistor(s) into the circuit of the monitored contact device(s) as shown in Figure 3, 4, 5, 6, or 7. (See Table 1 for value.)

Notes Figures 3, 4, 5, 6—Single Contact Application:
1. All circuits connected to this module, IXA-500CMA (P/N 940575) are classified as power limited.
2. The red LED (seen from front) is ON when the contact being monitored has operated and the control panel has received the event. LED indications:
   a. ON continuously = Contact Activated
   b. ON pulsing = Polling
   c. OFF = Not Polling
3. The detection circuit is monitored for open circuit and device fault conditions.
4. Set address according to site plan. See Table 2
5. For monitoring Normally Closed (N.C.) devices, employ series resistor UL listed 1 k-ohm P/N 976045.
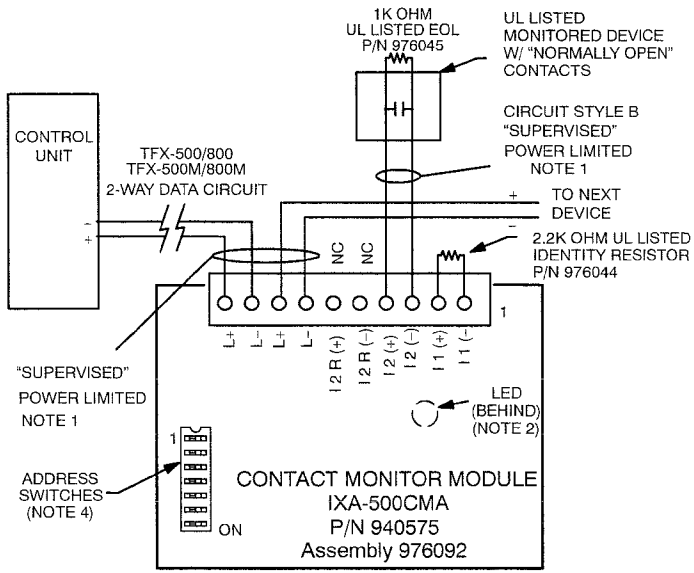
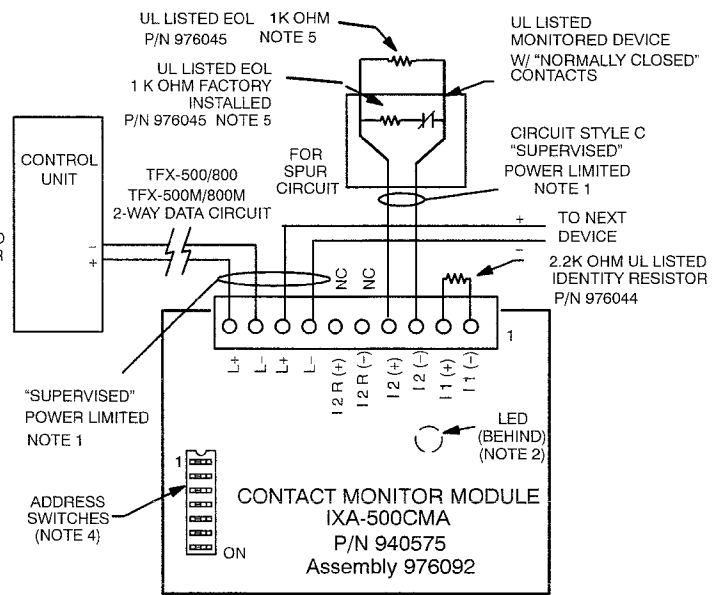*Figure 3 Typical Style B. All circuits and connections are power limited/Class2.*

Figure 4 Typical Style C. All circuits and connections are power limited/Class2.
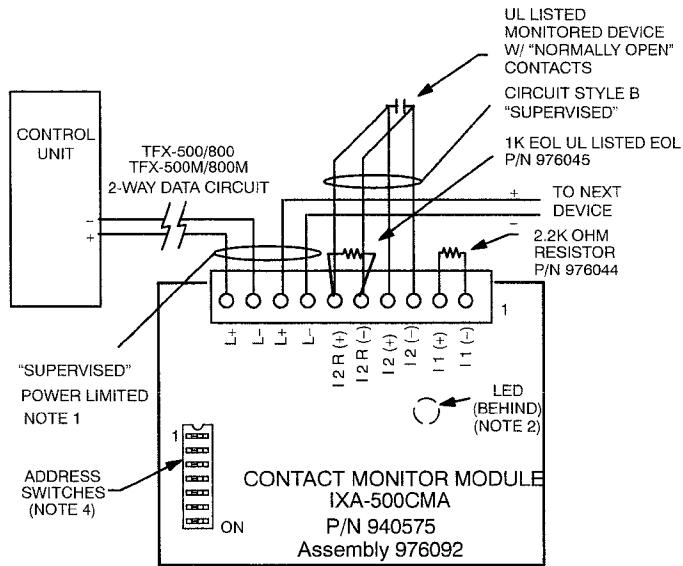

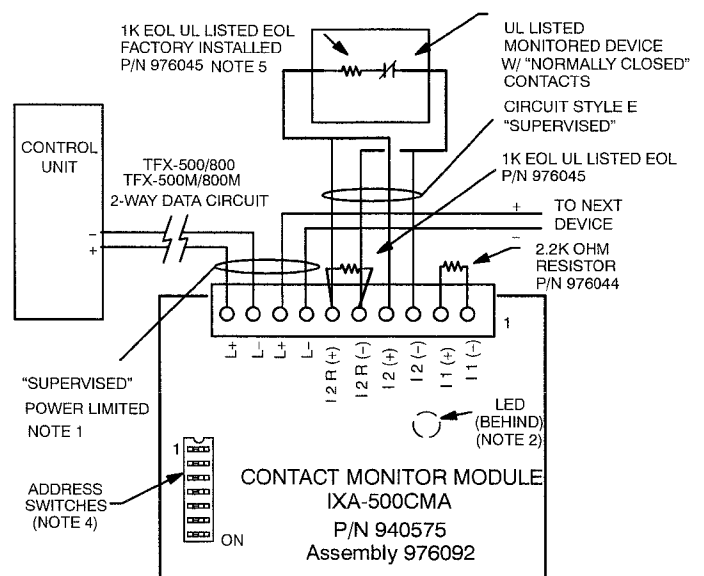*Figure 5 Typical Style D. All circuits and connections are power limited/Class2.*

Figure 6 Typical Style E. All circuits and connections are power limited/Class2.

Grinnell
FIRE PROTECTION SYSTEMS COMPANY

IXA-501CM Mini Contact Monitoring Module

PCB P/N 940573   **Assembly No. 976081**

Publication Number 19700293
Issue 2, January 1997

The IXA-501 Mini Contact Monitoring Module is used to monitor fire contacts such as a fire alarm pull station, heat detector, or waterflow switch. The module provides one Style B initiating circuit which is capable of monitoring normally-open contacts.

The Contact Monitoring Module is capable of identifying and signalling to the control panel whether a normally-open contact is OPEN or CLOSED.

Install in accordance with NFPA 70, National Electrical Code, NFPA 72, Installation, Maintenance, and use of Protective Signaling Systems.

Installation:

The printed circuit board is encased, with only the connection wires and address setting switches accessible. After connections have been made and the address switches set, the IXA-501CM is installed in A UL listed electrical box.

Address Setting:

Each module installed on the 2-way data (multiplex) circuits requires an address. Set the address before wiring the module into the circuit.

The address for each module is set on a 7-position DIP switch marked 1 to 7. For example, to set a module to address 26, set switches 2, 4, and 5 to ON (1) and switches 1,3,6, and 7 to OFF (0).

FLUSH MOUNT

SURFACE MOUNT

System Compatibility: AUTOCALL TFX Fire Control System
Device Location: The location of each device should have been determined according to the site plan. *(See System Layout)*

Specifications:

Environment: Indoor Application Only
Operating Temperature: 32°F to 120°F
Operating Humidity: 85% (non-condensing)
Base/Cover Material: "Bayblend" polycarbonate ABS alloy
Addressable Circuit Voltage: 28 VDC (POLARITY SENSITIVE)
Contact Rating: Use with contact that has minimum current of <500 micro-ampere; maximum current of >50 mA
Contact Supervisory Current: 7 mA typical
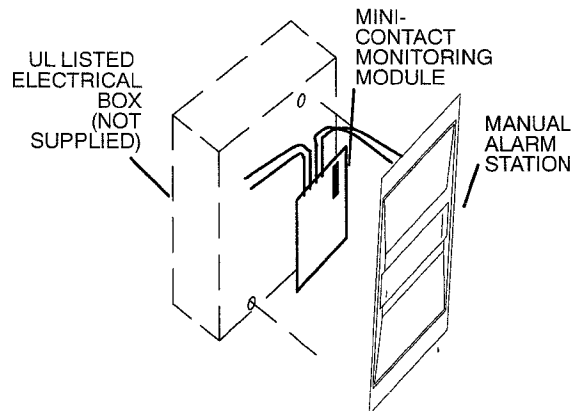**Addressable Loop Supervisory Current:** 0.18 mA maximum
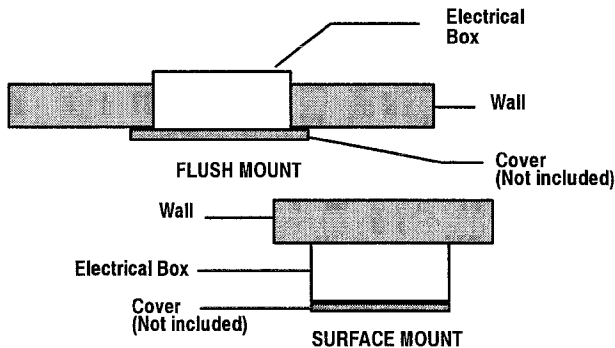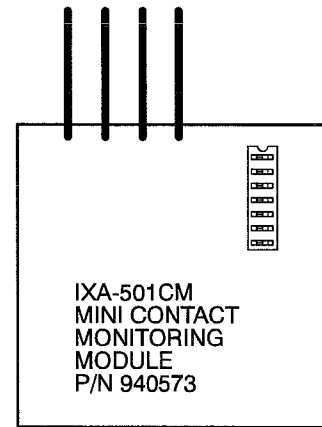**Addressable Loop Alarm Current:** 0.18 mA maximum
Supervision EOL: 619-ohm, 0.25 watt (UL listed, P/N 976082)
Line Impedance (subcircuit): 10 ohm
Dimensions (lwd): 1.4 × 1.5 × 0.5 inches
**Mounting Requirements:** One UL listed electrical box of sufficient depth to accommodate wiring.

IXA-501CM
MINI CONTACT
MONITORING
MODULE
P/N 940573

TYPICAL APPLICATION

Wiring:

1. Before connecting any module or device on the 2-way data circuit, make sure that the wiring is correct and has been tested.
2. All wiring to conform to current National Electrical Code, NFPA 70, state, and local building code requirements and applicable notes. All circuits contained in this module are classified as power limited/Class 2 and shall be installed to comply with N.E.C. Article 760, Part A and Part C.
3. All conductors to be free of grounds.

4. Disconnect power from the circuit before installing modules.
5. Connect the Red wire of the IXA-501CM to the positive (+) 2-way data circuit wire to the control panel. Connect the Black wire of the IXA-501CM to the negative (−) leg of 2-way data circuit. When making connections, break wire run, strip 3/8-inch insulation from the end of the wires, connect bare ends of the wire using a wire nut.
6. Connect the UL listed monitored contact device to the Purple and Yellow wires of the IXA-501CM.
7. Install the EOL resistor (619-ohm, 0.25 watt, UL listed, P/N 976082) into the circuit of the monitored contact device.
8. Break wire run to provide supervision.
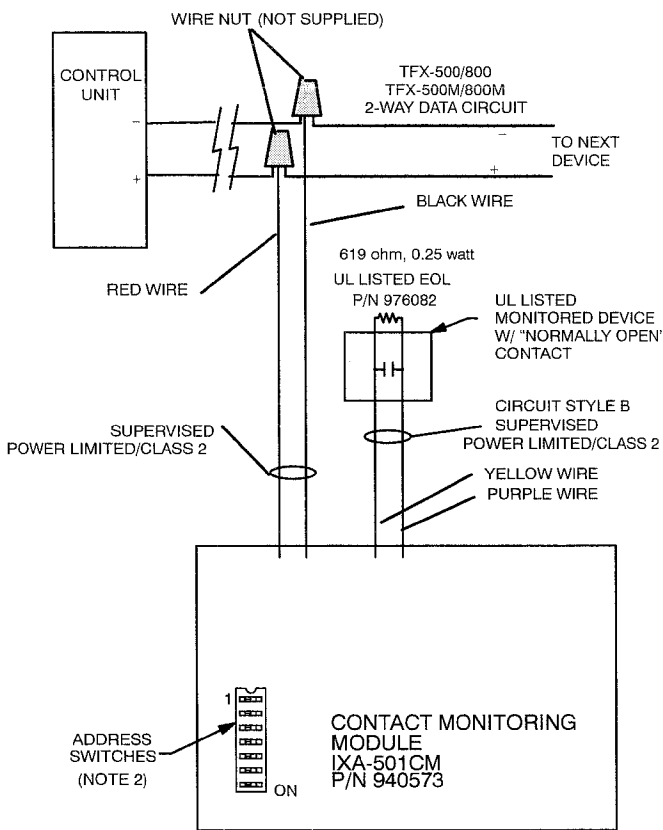
Notes:

1. The detection circuit is monitored for open circuit and device fault conditions.
2. Set address according to site plan. Switch ON Values:

Sw. Pos.	Value	Sw. Pos.	Value
1	1	5	16
2	2	6	32
3	4	7	64
4	8		

All circuits and connections are power limited/Class2.

Grinnell
FIRE PROTECTION SYSTEMS COMPANY

MDM521 Multi Detector Monitor Module
PCB P/N 940607   Assembly 976375

IXA-500DM Detector Monitor Module
PCB P/N 940523   Assembly 976022

Publication Number 19700220
Issue 5, January 1997

The Detector Monitor Modules can be used to connect to zones of conventional 24 V detector systems and interface them to the AUTOCALL TFX Fire Control Systems. The Detector Monitor Modules will monitor and signal alarms from a conventional detector loop of 24 V detectors; but, the detectors in these conventional zones will not be individually addressable. The modules are compatible with 2-wire or 4-wire UL listed low-voltage conventional point-type detectors, or normally open contact initiating devices.

The IXA-500DM Detector Monitor Module provides one Style B, Class B, zone for two-wire detectors or initiating devices.

The MDM521 Multi Detector Monitor Module provides eight Style B, Class B, zones. Resettable 24 V_{DC} is provided for using four-wire detectors.

Operation
1. The red LED turns ON to indicate an alarm condition in the detector circuit.
2. Operation of the TFX RESET switch drops the voltage at the resettable outputs of the IXA-500DM or MDM521 to less than 100 mV, for a minimum of 5 seconds and a maximum of 15 seconds, to reset detectors for each zone.
3. The module monitors the condition of the wiring and signals to the control panel if an open circuit or alarm is detected.
4. A power supply unit fault is signaled if the external power supply to the module fails.

(a) IXA-500DM Detector Monitor Module

FRONT   REAR

(b) MDM521 Multi Detector Monitor Module

Figure 1.   (a) IXA-500DM Detector Monitor Module;
(b) MDM521 Multi Detector Monitor Module.

System Compatibility: AUTOCALL TFX Fire Control System
Compatibility Identifier: 500A

Maximum Detectors per IXA-500DM Module or per MDM521 Zone: 20 or 30 (see list of compatible devices, Publication 19700411, *Detector Compatibility Chart*) Maximum of 240 detectors per 8 zones for the MDM521 module

Operating Temperature: 32°F to 120°F

Operating Humidity: 85% (noncondensing)

Cover Material: Polycarbonate ABS alloy

Terminal Block Wiring: No. 12 to 19 AWG shielded

Dimensions (hwd): IXA-500DM 4.9 x 4.9 x 1 inch
MDM521 3.6 x 11.4 x 1 inch

Mounting Requirements for IXA-500DM: UL listed electrical box of sufficient depth to accommodate wiring (dimensions depend upon application—flush or surface mount). Surface mount: two-gang switch box or a two-gang tile box. Flush mount: 4-inch square box with two-gang adapter (provides more wiring depth), or a cast box with two-gang switch plate mounting.

Mounting Requirements for MDM521: UL listed backbox (recommend AUTOCALL box with Auxiliary Mounting Plate, P/N 976399). MDM521 occupies 3/4 of one 19-inch space.

Table 1.   Electrical Specifications

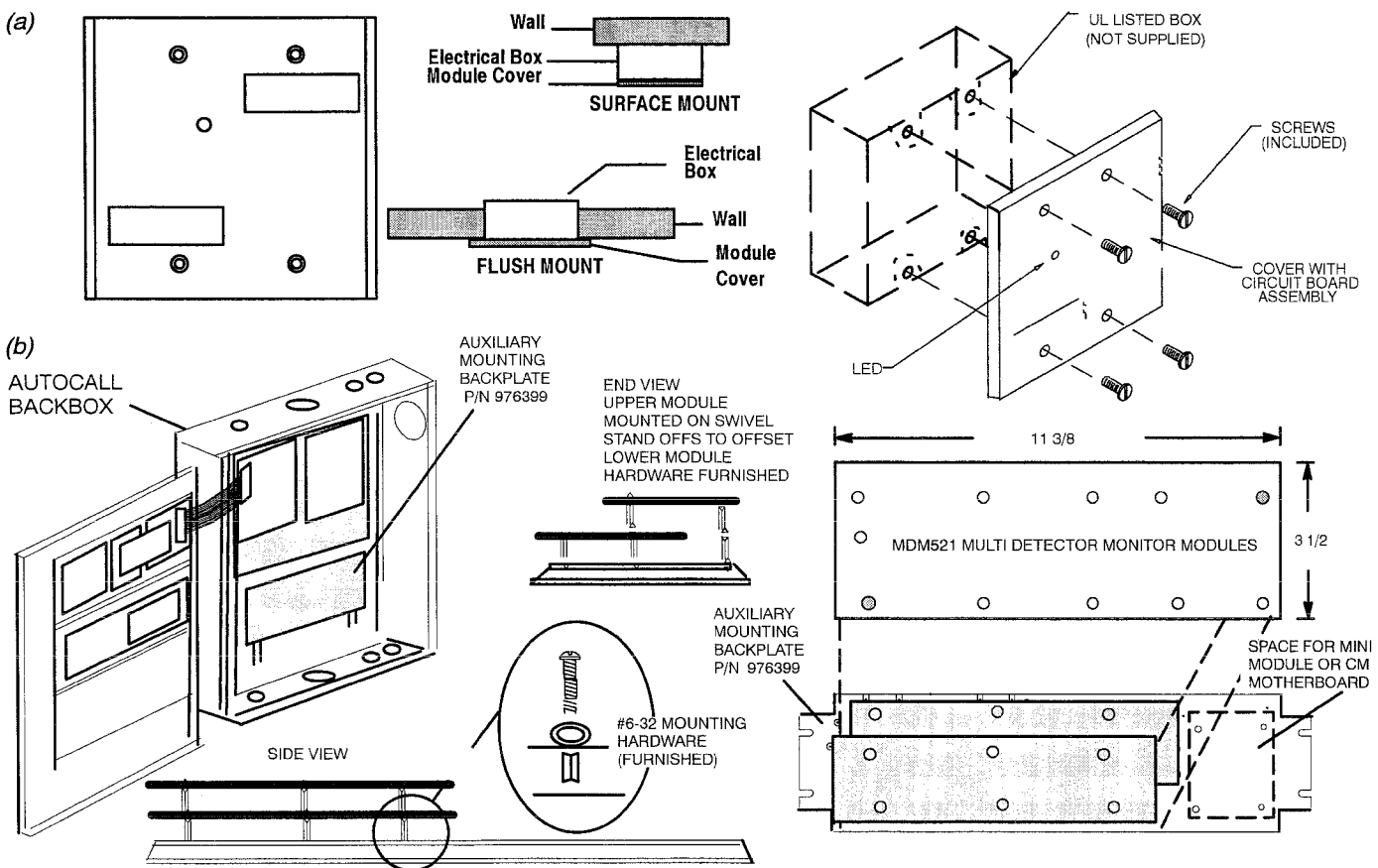| Battery Requirements:		
Addressable Loop		
Standby Current	0.18 mA per IXA-500DM Module 1.44 mA per MDM521 Module	
Alarm Current	0.70 mA (Module/Zone Alarm Current) plus alarm current for devices on initiating zone subcircuit	
Current Draw from Power Supply (For each Alarm Initiating Zone Circuit)		
Standby Current	20 mA plus 2 mA (typical standby) for each 24-volt initiating zone subcircuit	
Alarm Current	84 mA per initiating zone subcircuit	
Circuit Parameters		
Alarm Initiating Ckt. Max. Impedance	100 ohms	
Alarm Initiating Ckt. Voltage (D+ to D– or +VE to –VE)	16.9 to 22.2 V_{DC} (with EOL connected)	
Alarm Initiating Ckt. Maximum Current	74 mA	
Alarm Initiating Ckt. Ripple Voltage	500 mV peak-to-peak maximum	
Other		
Maximum total devices per loop	IXA-500DM 99 (Addressable Loop Load = 1 Loop Load Unit per IXA-500Module) MDM521 12 (Addressable Loop Load = 8 Loop Load Units per MDM521 Module)	
Maximum detectors per zone on MDM521 Module	30 (Refer to Pulbication 19700411, Detector Compatibility Chart.)	
Supervision EOL	UL listed 4.7 k-ohm, P/N 976047	
Input Voltage	24 V_{DC} (nominal)	
Addressable Circuit Voltage	28 V_{DC} (Polarity Sensitive)	
Resettable 24 V current	1 A maximum	
Addressable Loop Currents		
ID Current		16.2–19.9 mA
Condition Current		
PSU Fault		0.0 – 3.0 mA
Normal/Clear/Restore		3.0–5.7 mA
Line Fault		5.7–9.5 mA
Fire Alarm		9.5–13 mA
Device Fault		13–20 mA

Figure 2. Typical Installation. (a) IXA-500DM Detector Monitor Module; (b) Typical MDM521 Multi Detector Monitor Module.

Compatible Conventional Detectors

Refer to Publication Number 19700411, *Detector Compatibility Chart,* for the UL listed detectors that may be used with the AUTOCALL TFX fire control systems when attached to an IXA-500DM Conventional Detector Monitor Module or MDM521 Multi Detector Monitor Module. Note: only the IXA-500DM or MDM521 zone address will be the "addressable point" on the system.

NOTE: If a combination of detectors is used, calculations must be made such that the total standby current of the detectors does not exceed the maximum normal standby detector load current rating of 2 mA for each of the eight circuits.

Installation:

Install in accordance with NFPA 70, National Electrical Code, NFPA 72, Installation, Maintenance, and use of Protective Signaling Systems.

1. The IXA-500DM printed circuit board is mounted to the cover plate. The LED extends through the front of the cover plate and provides indication of unit operation.
   a. Set the address switches.
   b. **Make sure that the jumper link is installed in LK1 across position S/C ALARM.**
   c. Connect the wiring.
   d. Mount the cover plate to the electrical box.
   e. Before connecting any module or device on the TFX addressable loop circuit, make sure that the wiring is correct and has been tested and is in compliance with NFPA standards.

2. The MDM521 Multi Detector Monitor Module is mounted within a TFX control panel or in an auxiliary cabinet. Use only a UL listed enclosure.
   a. Set the address switch.
   b. **Make sure that the jumper link for each circuit is installed across position SCA (ALARM).** See Table 5.
   c. **Make sure that the jumper link for each installed circuit is NOT installed in position PK.** See Table 5 and "Address Setting" section.
   d. Mount the MDM521 module(s) to the auxiliary mounting plate or subplate in the backbox.
   e. Connect wiring.

Address Setting:

1. Each IXA-500DM module installed on the TFX addressable loop requires an address. Set the address before wiring the module to the circuit.
   a. The address for each module is set on a 7-position DIP switch marked 1 to 7. For example, to set a module to address 26, set switches 2, 4, and 5 to ON (1) and switches 1,3,6, and 7 to OFF (0).
   b. Set address according to site plan. Switch ON values:

Table 2. Address Switch 7-Position DIP Switch

Sw. Pos.	Value (ON)	Sw. Pos.	Value (ON)
1	1	5	16
2	2	6	32
3	4	7	64
4	8		

2. Each MDM521 Multi Detector Monitor Module installed on the TFX addressable loop requires from 1 to 8 sequential addresses. Set the address before wiring the module to the circuit. See Table 3.

   a. The base address for Zone 1 is set on a 4-position DIP switch marked 1 to 4. The base addresses are in multiples of eight. For example, to set a module to base address 40, set switches 1 and 3 to ON (1) and switches 2 and 4 to OFF (0). The addresses for the remaining zones are consecutive from the base address. That is, if Zone 1 has address 40, Zone 2 is 40 + 1 = 41; Zone 3 is 40 + 2 = 42, etc.

   b. Set address according to site plan. Switch ON values:

Table 3. Zone Addresses Using 4-Pos. DIP Switch

Sw. Pos. 1, 2, 3, 4	Base Value (1 = ON)	Zone Addresses						
		+1	+2	+3	+4	+5	+6	+7
0000	0 (not used)	--	--	--	--	--	--	--
1000	**8**	9	10	11	12	13	14	15
0100	**16**	17	18	19	20	21	22	23
1100	24	25	26	27	28	29	30	31
0010	**32**	33	34	35	36	37	38	39
1010	40	41	42	43	44	45	46	47
0110	48	49	50	51	52	53	54	55
1110	56	57	58	59	60	61	62	63
0001	**64**	65	66	67	68	69	70	71
1001	72	73	74	75	76	77	78	79
0101	80	81	82	83	84	85	86	87
1101	88	89	90	91	92	93	94	95
0011	96	97	98	99	100	101	102	103
1011	104	105	106	107	108	109	110	111
0111	112	113	114	115	116	117	118	119
1111	120	121	122	123	124	125	126	--

   c. If a zone is not used, place the associated "Park Link" in the "Park (PK)" position to disable that address (See Tables 3 and 5). That address may then be used for a different device.

Hint: When choosing unused addresses for the "Park Link," start from the highest address and work backwards.

Table 4. IXA-500DM Terminal Designations

Terminal	Legend	Function	Terminal	Legend	Function
TB1-1	0V	Power Supp.	TB1-7	L-	Loop Out
TB1-2	24V	Power Supp.	TB1-8	L+	Loop Out
TB1-3	NC	Not Used	TB1-9	L-	Loop Spur
TB1-4	NC	Not Used	TB1-10	L+	Loop Spur
TB1-5	D-	Detector (-)	TB1-11	L-	Loop In
TB1-6	D+	Detector (+)	TB1-12	L+	Loop In

Table 5. MDM521 Terminal Designations, Associated LED Indicators, and Jumper Links

Legend	Terminal	Function	Assoc. LED	Assoc. Alm Link	Assoc. Park Link
TFX Addr. Data Loop	TB1-1	Loop Out (+)			
	TB1-2	Loop Out (-)			
	TB1-3	Loop In (-)			
	TB1-4	Loop In (+)			
Module Power	TB2-1	Power (0V)			
	TB2-2	Power (0V)			
	TB2-3	Power (+24 V)			
	TB2-4	Power (+24 V)			
Zone 1	TB3	Det. Ckt. (+/-)	D95	LK1	N.A.
Zone 2	TB4	Det. Ckt. (+/-)	D94	LK2	LK3
Zone 3	TB5	Det. Ckt. (+/-)	D93	LK4	LK5
Zone 4	TB6	Det. Ckt. (+/-)	D92	LK6	LK7
Zone 5	TB7	Det. Ckt. (+/-)	D91	LK8	LK9
Zone 6	TB8	Det. Ckt. (+/-)	D90	LK10	LK11
Zone 7	TB9	Det. Ckt. (+/-)	D89	LK12	LK13
Zone 8	TB10	Det. Ckt. (+/-)	D88	LK14	LK15
Reset-table 24V Power	TB11-1	Power (+24 V)			
	TB11-2	Power (24 V)			
	TB11-3	Power (0V)			
	TB11-4	Power (0V)			

Wiring Notes (See Figures 3 and 4):

1. All wiring to conform to current National Electrical Code (NEC), NFPA 72, state, and local building code requirements, and applicable notes. All circuits contained in this module are classified as power-limited/Class 2, and shall be installed to comply with NEC Article 760, Part A and Part C.
2. All conductors to be free of grounds.
3. Disconnect power from the circuit before installing modules.
4. Connect the detector circuit at D+ and D- (+VE and -VE) terminals making sure the polarity is correct.
5. Install the EOL resistor (UL listed, 4.7K ohm, P/N 976047, supplied) into the last detector.
6. Connect the 24 V output from the power supply unit (or control panel) to the negative (0V) and positive (24V) terminals.
7. Resettable +24 V_{DC} @ 1 A output via a four-way terminal block provides powering of four-wire detectors.
8. Terminals marked N.C. are not used.
9. The detection circuit is monitored for open circuit.
10. Break wire run at terminal connection to provide supervision. When making connections, break wire run, strip 3/8-inch insulation from the ends of the wire, slide the bare ends of the wire under the terminal clamping plate, and tighten the clamping screw.
11. Use only a UL listed 24-volt regulated power-limited supply, suitable for fire protective signaling service.
12. Terminals for TFX addressable loop spur circuit. No connection if not used.
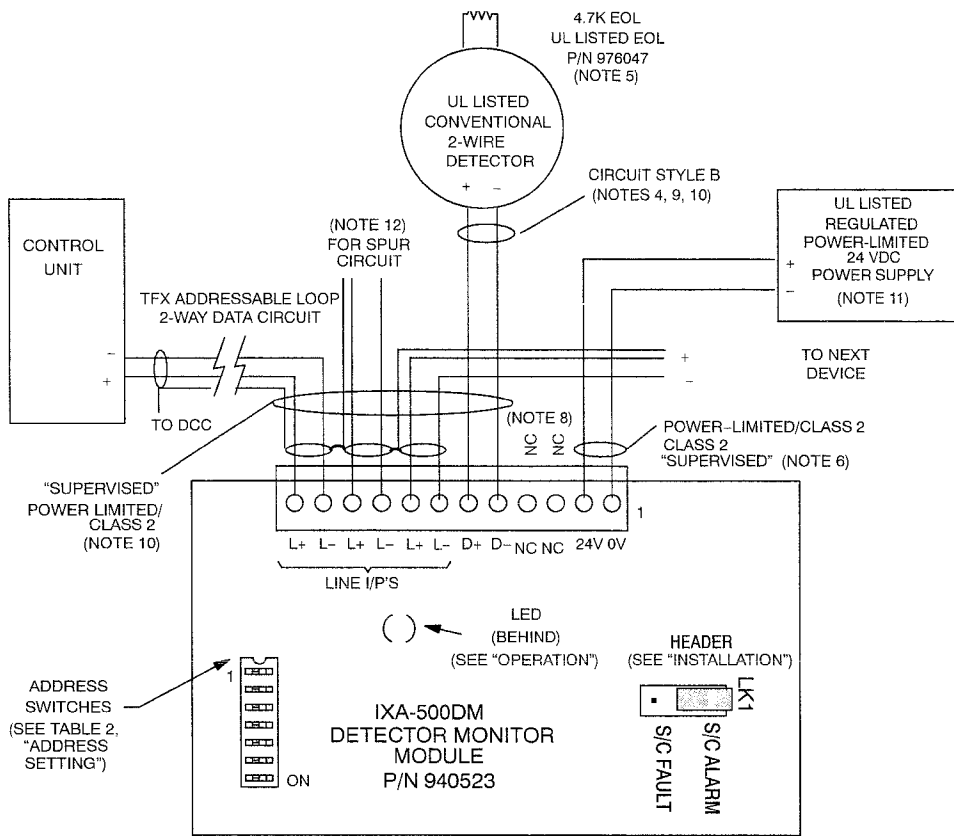
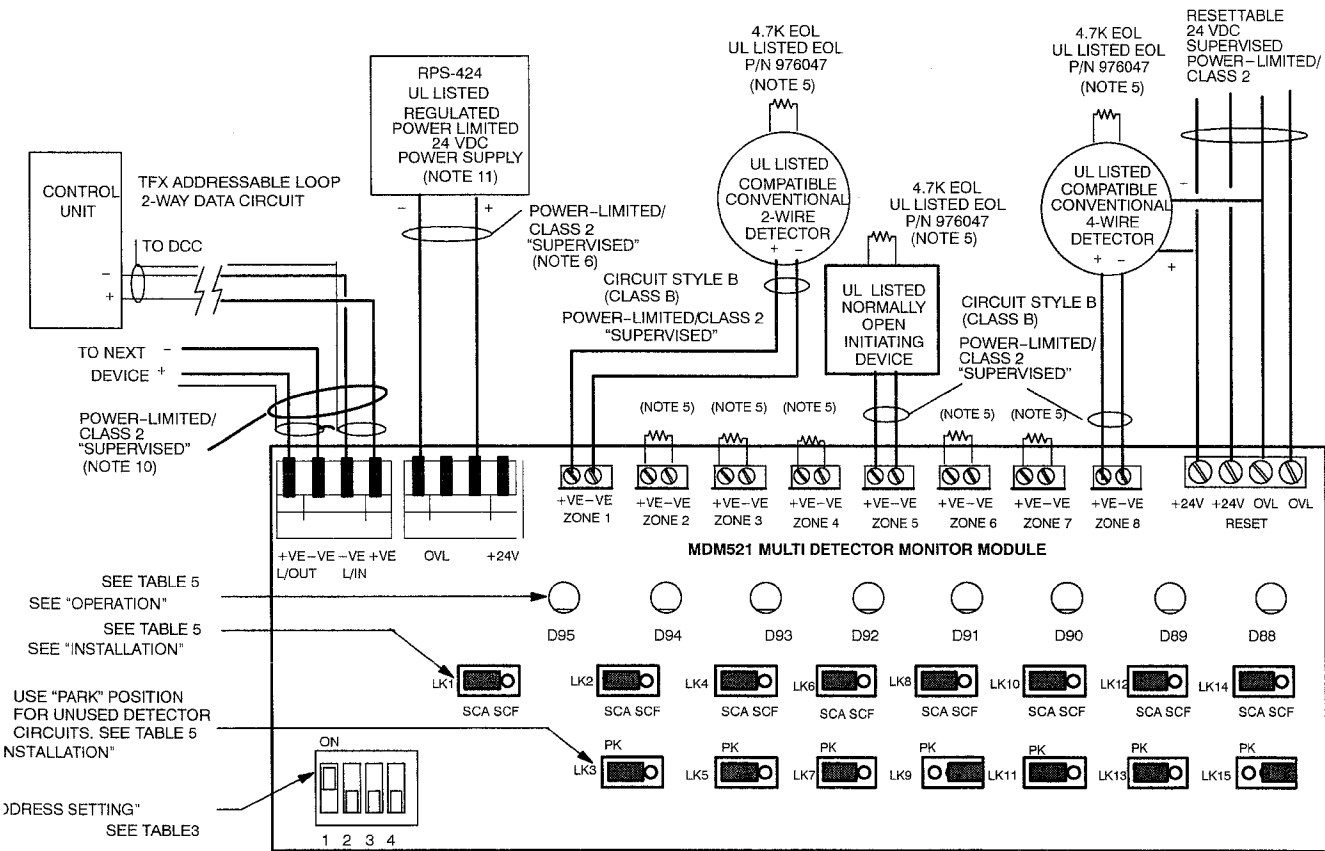Figure 3. IXA-500DM Wiring. All circuits and connections are power limited/Class2.

Figure 4. MDM521 Typical Wiring. All circuits and connections are power-limited/Class2.

Grinnell®
FIRE PROTECTION SYSTEMS COMPANY

IXA-500DMA Detector Monitor Module

PCB P/N 940576 **Assembly No. 976093**

Publication Number 19700334
Issue 2, January 1997

The IXA-500 Detector Monitor Module is used to connect to zones of conventional 24 V detectors and interface them to the AUTOCALL TFX Fire Control System. The IXA-500DMA Detector Monitor Module will monitor and signal alarms from a conventional loop of 24 V detectors. Although the IXA-500DMA is an addressable device, the conventional detectors attached to the IXA-500DMA are not individually addressable. The module is compatible with UL listed low-voltage conventional point type detectors such as the ISC-350 series or other conventional 2-wire detectors (see Table 1). The conventional detectors may be installed in an NFPA 72 Style D (Class A) or NFPA 72 Style B (Class B) configuration. In addition, the IXA-500DMA can interface directly to 4-wire type conventional detectors.

Install in accordance with NFPA 70, National Electrical Code, NFPA 72, Installation, Maintenance, and use of Protective Signaling Systems.
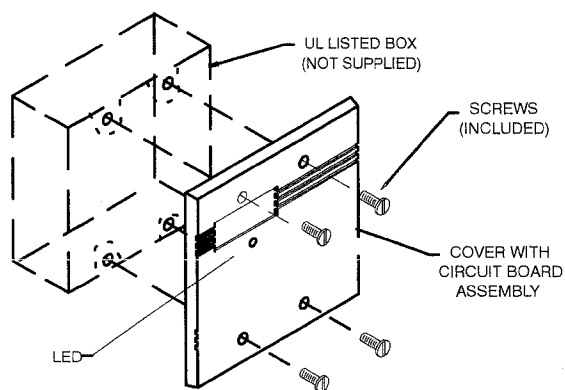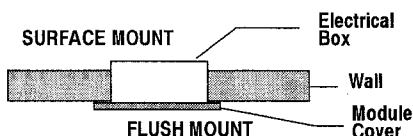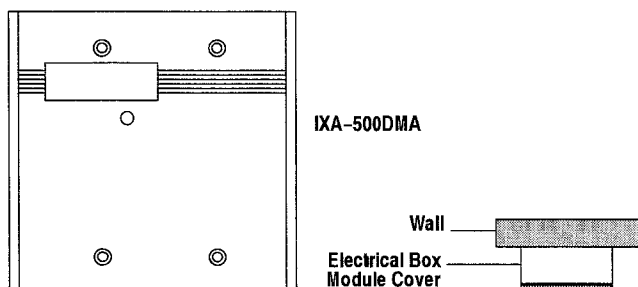
Figure 1 IXA-500DMA Detector Monitor Module Mounting

System Compatibility: AUTOCALL TFX Fire Control System, CONSYS® Issue 3.0 and above
Compatibility Identifier: 500A
Device Location: The location of each device should have been determined according to the site plan. *(See System Layout)*

Specifications:
Maximum Detectors per Module: 15 to 30 (see list of compatible devices, Publication Number 19700411, *Detector Compatibility Chart*))
Environment: Indoor Application Only
Operating Temperature: 32°F to 120°F
Operating Humidity: 85% (non-condensing)
Base/Cover Material: "Bayblend" polycarbonate ABS alloy
Terminal Block Wiring: No. 12 to 19 AWG
Dimensions (lwd): 4.5 x 4.5 x 1 inch
Mounting Requirements: UL listed electrical box of sufficient depth to accommodate wiring (dimensions depend upon application—flush or surface mount):

- Surface — 2-gang switch box
- Surface — 2-gang tile box
- Flush — 4-inch square box with 2-gang adapter (provides more wiring depth)
- Flush — cast box with 2-gang switch plate mounting

Shipping Weight: 3.6 ounces

Battery Requirements:		
Addressable Loop		
Standby Current	0.25 mA	
Alarm Current	0.25 mA	
Current Draw from Power Supply		
Standby Current	20 mA	
Alarm Current	110 mA	
Circuit Parameters		
Detector Circuit Maximum Impedance	25 ohms	
Detector Circuit Voltage (D+ to D–)	16.9 to 22.2 V_{DC} (with EOL connected)	
Detector Circuit Maximum Current	74 mA	
Device Circuit Ripple Voltage	500 mV peak-to-peak maximum	
Line Impedance (subcircuit)	25 ohms	
Other		
Maximum IXA-500DM devices per loop	99	
Maximum total devices per loop	99	
Supervision EOL (Style B Only)	UL listed 4.7 k-ohm, P/N 976047	
Supervision EOL Relay for 4-Wire Detector Circuit	UL listed P/N 19240410	
Output Rating, 4-Wire Detectors, Switched 24 V_{DC}	250 mA	
Input Voltage	24 V_{DC} (nominal)	
Addressable Circuit Voltage	28 V_{DC} (Polarity Sensitive)	
Addressable Loop Currents		
ID Current		16.2–19.9 mA
Condition Current		
PSU Fault		0.0 – 3.0 mA
Normal/Clear/Restore		3.0–5.7 mA
Line Fault		5.7–9.5 mA
Fire Alarm		9.5–13 mA
Device Fault		13–20 mA

Compatible 2-Wire Conventional Detectors

Refer to Publication Number 19700411, *Detector Compatibility Chart,* for the UL listed detectors may be used with the AUTOCALL TFX fire control systems when attached to an IXA-500DMA Conventional Detector Module. Note: only the IXA-500DMA will be the "addressable point" on the system.

Installation:

The printed circuit board is mounted to the cover plate. The connection terminals and address setting switches are accessible on the back. After connections have been made, the address switches set, and the jumper set, the cover plate is mounted onto the electrical box. The LED extends through the front of the cover plate and provides indication of unit operation.

Address Setting:

Each module installed on the 2-way data circuits requires an address. Set the address before wiring the module into the circuit.

The address for each module is set on a 7-position DIP switch marked 1 to 7. For example, to set a module to address 26, set switches 2, 4, and 5 to ON (1) and switches 1, 3, 6, and 7 to OFF (0).

Wiring:
1. Before connecting any module or device on the 2-way data (multiplex) circuit, make sure that the wiring is correct and has been tested.
2. All wiring to conform to current National Electrical Code, NFPA 70, state, and local building code requirements and applicable notes. All wiring to conform to current National Electrical Code, NFPA 70, state, and local building code requirements and applicable notes. All circuits contained in this module are classified as power limited and shall be installed to comply with N.E.C. Article 760, Part A and Part C.
3. All conductors to be free of grounds.
4. Disconnect power from the circuit before installing modules.

5. When making connections, break wire run, strip 3/8-inch insulation from the ends of the wire, slide the bare ends of the wire under the terminal clamping plate, and tighten the clamping screw.
6. Connect the output from the power supply unit (or control panel) to the negative (0V) and positive (24V) terminals.
7. Connect the detector circuit making sure of correct polarity. See Figures 2, 3, and 4.
8. For Style B circuits, install the EOL resistor (UL listed, 4.7K ohm, P/N 976047, supplied) into the last detector. For Style D configuration, EOL is not required.
9. Four-wire detector circuit requires UL listed end-of-line relay P/N 19240410. See Figure 4.

Notes (see Figures 2, 3, 4):
1. All circuits connected to this module, IXA-500DMA (P/N 940576) are classified as power limited.
2. The LED (seen from front), when lighted, indicates that an alarm or trouble condition exists. Red color LED ON indicates ALARM. For Style D configuration only, yellow color LED ON indicates TROUBLE.
3. Terminals marked N.C. are not used.
4. The detection circuit is monitored for open circuit.
5. Set address according to site plan. Switch ON values:

Sw. Pos.	Value	Sw. Pos.	Value
1	1	5	16
2	2	6	32
3	4	7	64
4	8		

6. Break wire run to provide supervision.
7. Use only UL listed regulated 24 V power limited supply suitable for fire protective signalling service.
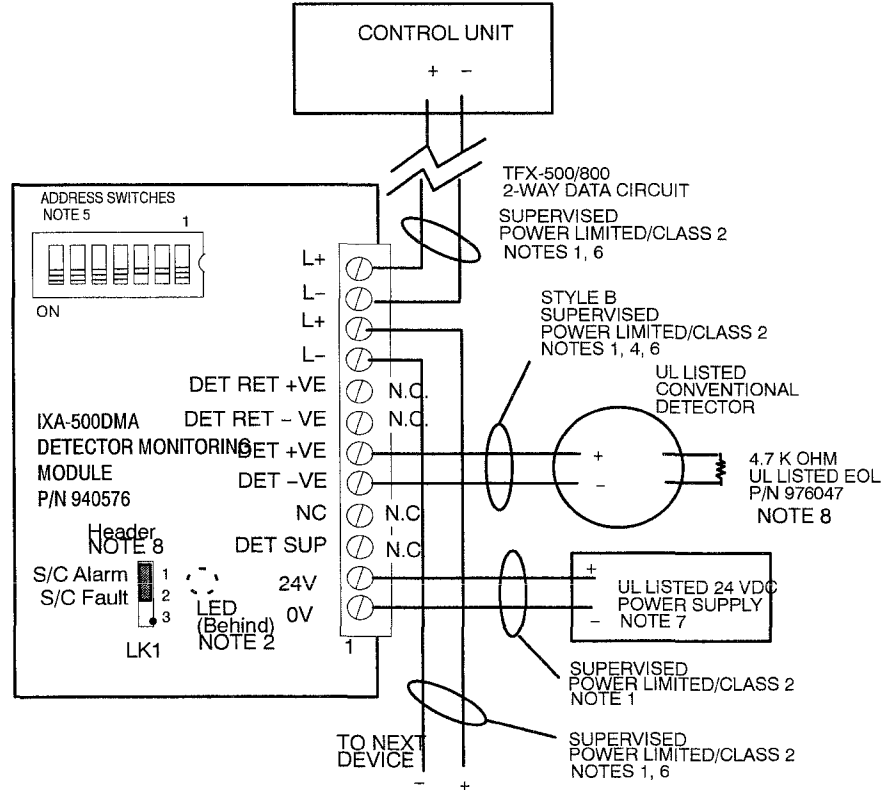8. Verify jumper link is installed in LK1 in position S/C ALARM, pins 1 and 2.

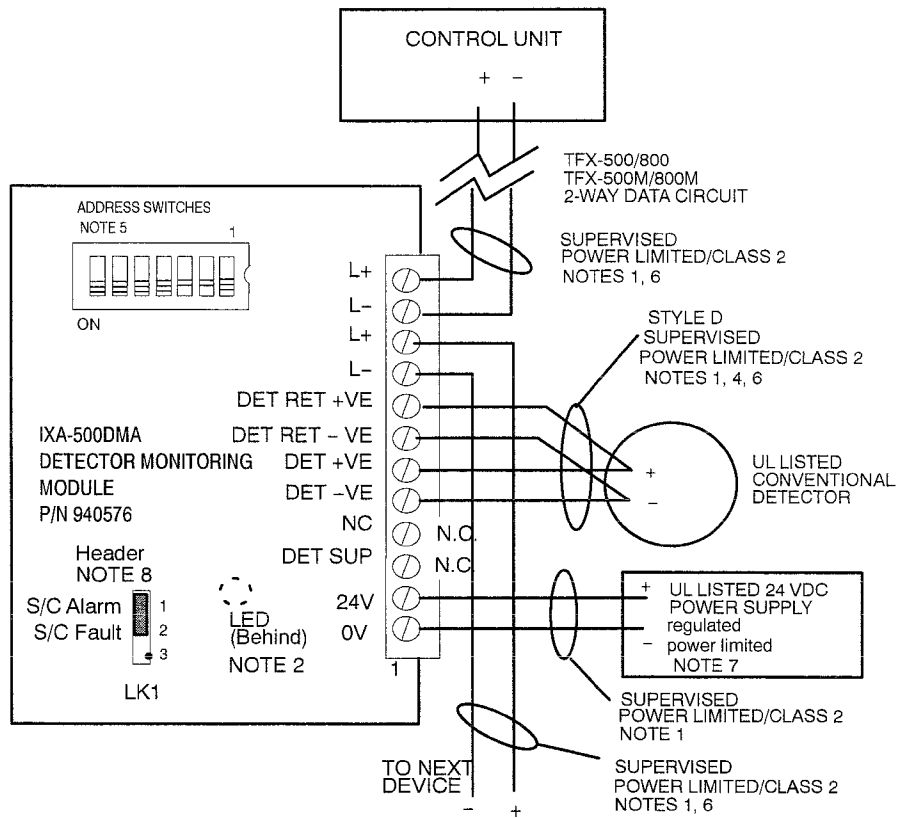Figure 2 Typical 2-Wire Conventional Detector Circuit, Style B

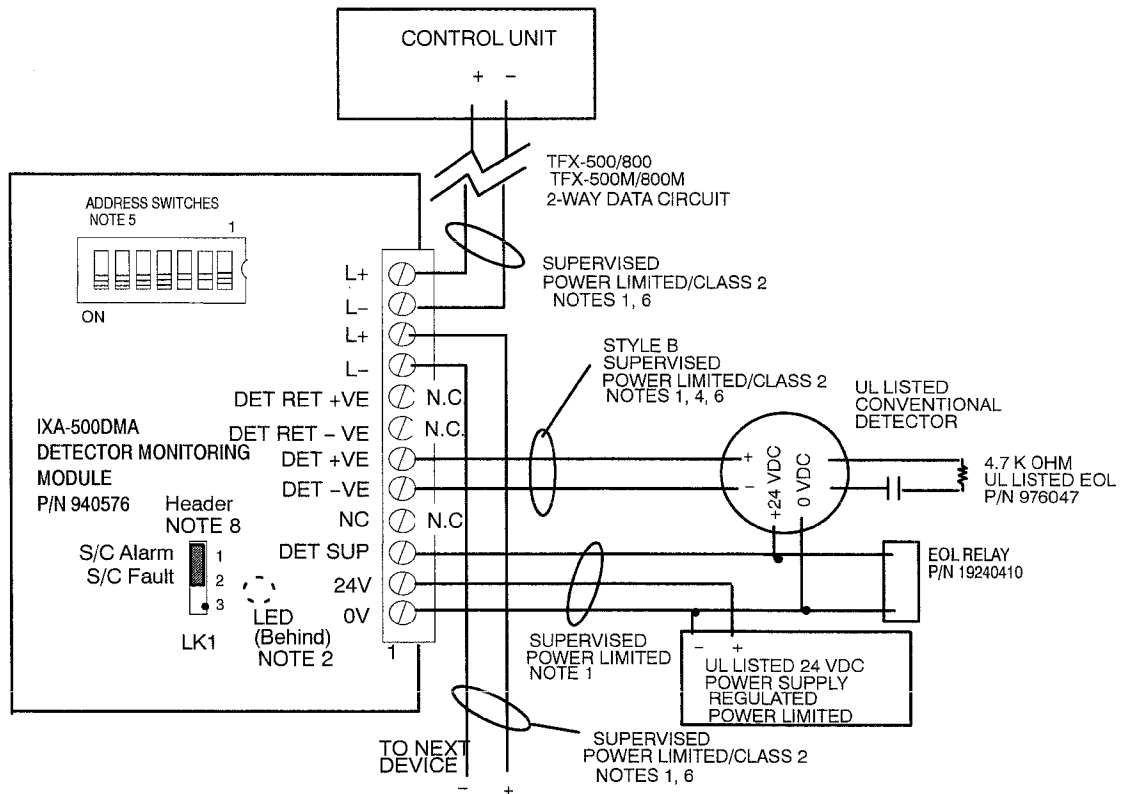Figure. Typical 2-Wire Conventional Detector Circuit, Style D

Figure. Typical 4-Wire Conventional Detector Circuit, Style B

Grinnell
FIRE PROTECTION SYSTEMS COMPANY

OXA-502RM, OXA-503RM
Addressable Relay Module

PCB P/N 940586 (Stand-alone) Assembly No. 976258
PCB P/N 940587(Plug-in)   Assembly No. 976259

Publication Number 19700415
Issue 2, January 1997

The Addressable Relay Module provides one volt-free changeover relay contact on a latching relay. The relay is controlled by a command sent from the fire control panel via the 2-way data (multiplex) circuit. The relay state (activated or deactivated) is reported back to the controller. The red LED flashes when the module is polled every two seconds and is turned ON temporarily for five seconds when the relay is latched in the ON state.

OXA-502RM stand-alone model installs in electrical box. OXA-503RM plug-in model installs on a motherboard such as OXM-501 RM/SDA Motherboard or CSM-500 Channel Select board.

(a) OXA-502RM
Stand-alone modules install to electrical box.
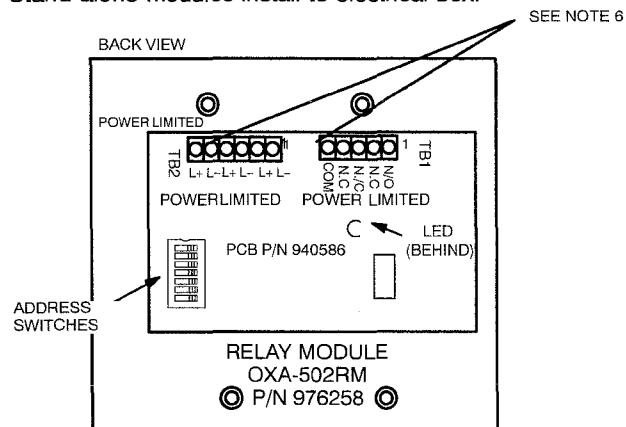
(b) OXA-503RM Plug-in modules typically install in RM/SDA Motherboard.

NOTE: INSTALL OXA-503RM IN CONTROL PANEL CABINET ONLY. DO NOT INSTALL IN ELECTRICAL BOX
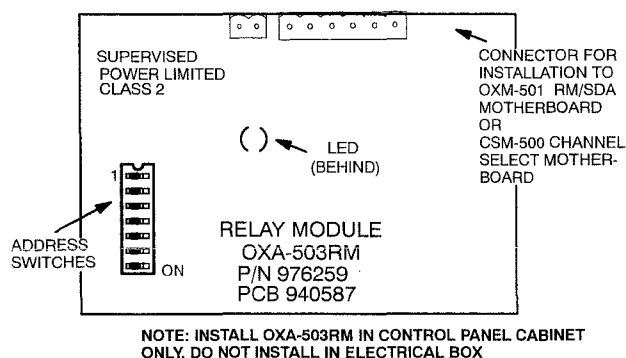
Figure 1. OXA-502RM and OXA-503RM Addressable Relay Modules.

System Compatibility: Use only with AUTOCALL TFX Fire Control Systems
Specifications:
Environment: Indoor Application Only
Operating Temperature: 32°F to 120°F
Operating Humidity: 85% (non-condensing)
Base/Cover Material: "Bayblend" polycarbonate ABS alloy
Dimensions (lwd): 4.9 x 4.9 x 1.3 inch
Mounting Requirements (OXA-502RM): One UL listed electrical box of sufficient depth to accommodate wiring (dimensions depend upon application-flush or surface mount):

- Surface - 2-gang switch box
- Surface - 2-gang tile box
- Flush - 4-inch square box with 2-gang adapter (provides more wiring depth)
- Flush - cast box with 2-gang switch plate mounting

Table 1.   Electrical Specifications

Battery Requirements:		
Addressable Loop		
Standby Current		0.18 mA
Alarm Current		0.18 mA
Relay Contact Rating		
DC		2 A @ 24 V_{DC}
AC		0.6 A @ 120 V_{AC}
Relay Circuit Requirements		
Line Impedance (sub-circuit)		10 Ohm
Addressable Loop Currents		
ID Current		16.2–19.9 mA
Condition Current		
Device Fault		0.1 – 2 mA
Normal/Relay Off		2 – 4.4 mA
Relay Operated		4.4 – 6.5 mA
Invalid Response		6.5 – 20 mA
Terminal Block Wiring Requirements		
No. 12 (max.) AWG shielded, twisted wire pair		

Installation:

The OXA-502RM printed circuit board is mounted to the cover plate. The connection terminals and address setting switches are accessible on the back. After connections have been made and the address switches set, the cover plate is mounted onto the electrical box. The LED extends through the front of the cover plate and provides indication of unit operation.
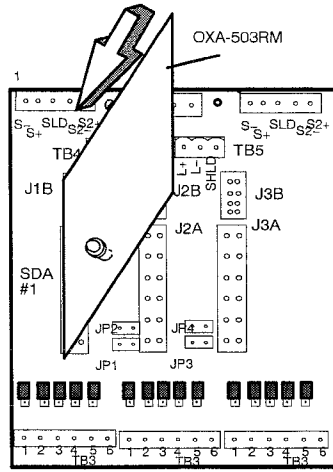
The OXA-503RM printed circuit board mounts to an OXM-501 RM/SDA Motherboard or CSM-500 Channel Select Motherboard. First set the address switches. Install the OXA-503RM into the socket on the motherboard. Be sure to orient the board correctly (the socket is keyed for correct alignment). The LED provides indication of unit operation.

Address Setting:

Each module installed on the 2-way data circuits requires an address. Set the address before wiring the module into the circuit.

The address for each module is set on a 7-position DIP switch marked 1 to 7. For example, to set a module to address 26, set switches 2, 4, and 5 to ON (1) and switches 1,3,6, and 7 to OFF (0).
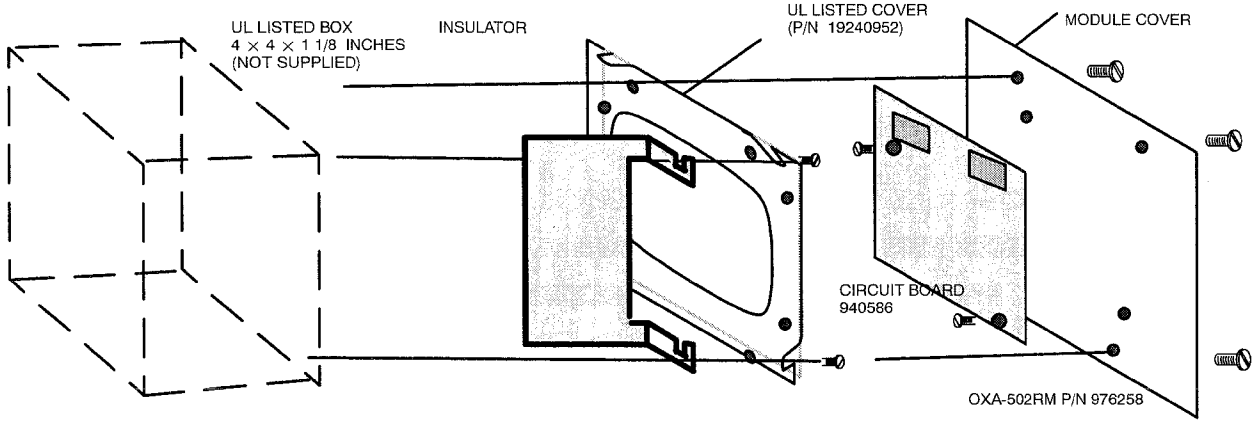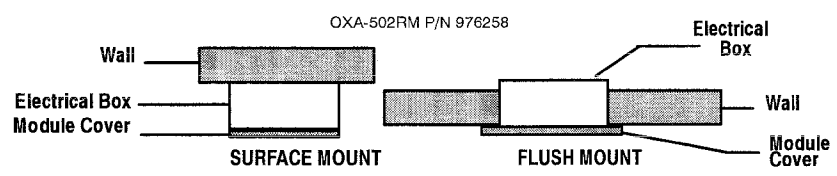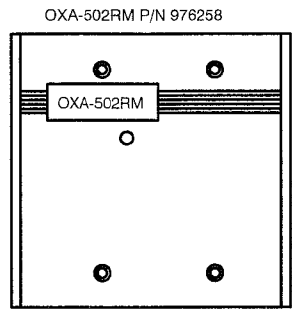
(a)

OXA-503RM

1

S–/S+ SLD S2–

TB4

TB5

J1B

J2B L+/L– SHLD J3B

J2A J3A

SDA #1

JP2 JP4

JP1 JP3

1 2 3 4 5 6 1 2 3 4 5 6 1 2 3 4 5 6
TB3 TB3 TB3

OXM-501 RM/SDA MOTHER-
BOARD (P/N 976253, PCB 900981)
OR
CSM-500 CHANNEL SELECT MO-
THERBOARD (P/N 976179, PCB
900972)

NOTE:
INSTALL OXA-503RM IN
CONTROL PANEL CABINET
ONLY—DO NOT INSTALL IN
ELECTRICAL BOX.

(b)

OXA-502RM P/N 976258

OXA-502RM

OXA-502RM P/N 976258

Wall

Electrical Box
Module Cover

SURFACE MOUNT

Electrical Box

Wall

Module Cover

FLUSH MOUNT

UL LISTED BOX
4 × 4 × 1 1/8 INCHES
(NOT SUPPLIED)

INSULATOR

UL LISTED COVER
(P/N 19240952)

MODULE COVER

CIRCUIT BOARD
940586

OXA-502RM P/N 976258

FOR NON-POWER LIMITED APPLICATIONS, ADD THE BLANK
LABEL TO COVER THE POWER LIMITED NOTATION.

ROUTE WIRING TO THE RIGHT FOR NON-POWER LIM-
ITED WIRING, ROUTE WIRING TO THE LEFT FOR POW-
ER LIMITED/CLASS 2. MAINTAIN AT LEAST 0.25 INCH-
ES OF SEPARATION BETWEEN POWER LIMITED AND
NON-POWER LIMITED WIRING BY MEANS OF WIRE
TIES OR OTHER PERMANENT MEANS.

FOR NON-POWER LIMITED
WIRING, USE UL LISTED
DEEP BOX
4 × 4 × 2 1/8 INCHES
(NOT SUPPLIED)

POWER LIMITED/
CLASS 2

NON-POWER
LIMITED
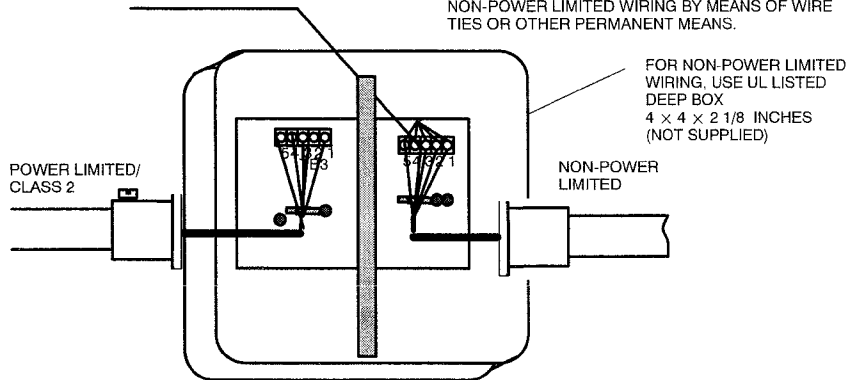
*Figure 1.   (a) OXA-503RM installation in OXM-501 RM/SDA Motherboard or CSM-500 Channel Select Mother-
board; (b) OXA-502RM installation to electrical box.*

a. OXA-502RM Addressable Relay Module, dry contact
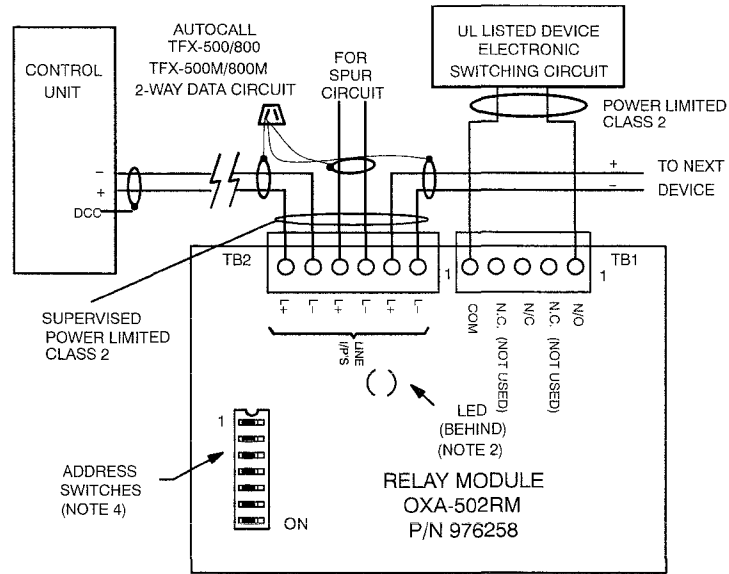
b. OXA-502RM Addressable Relay Module, powered relay circuit
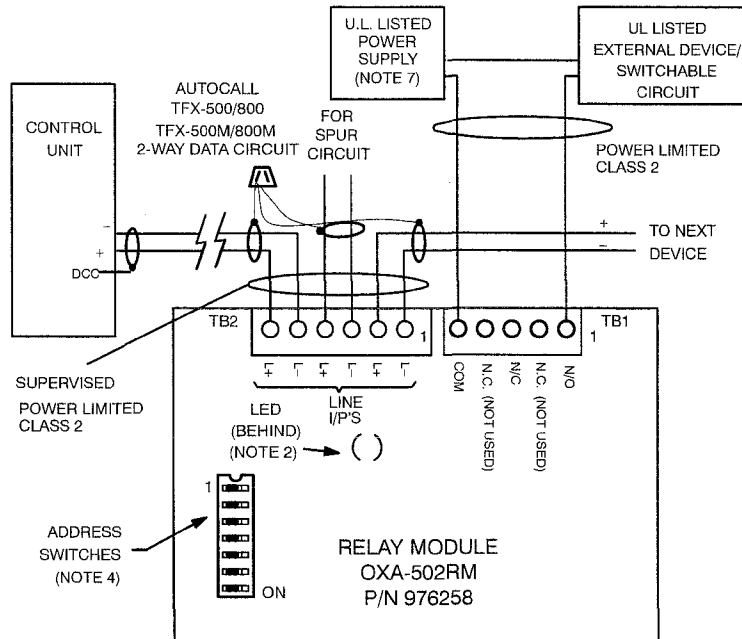
c. OXA-503RM Addressable Relay Module, connector for installation in OXM-501 RM/SDA Motherboard or CSM-500 Channel Select Motherboard.
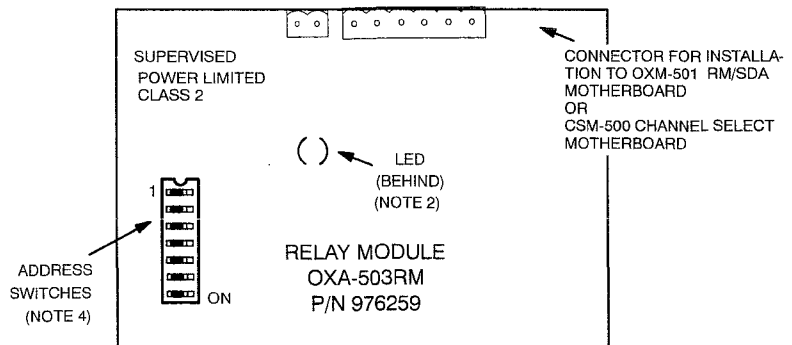

Figure 2. Wiring (a) OXA-502RM dry contact, (b) OXA-502RM powered relay circuit, (c) OXA-503 connection to motherboard.

Table 2. Terminal Designations

OXA-502RM		OXA-503RM	
Terminal	Function	Terminal	Function
TB1-1 (N/O)	Relay Norm. Open	P1-1	
TB1-2 (N.C.)	Not Used	P1-2	
TB1-3 (N/C)	Relay Norm Closed	P1-3	
TB1-4 (N.C.)	Not Used	P1-4	
TB1-5 COM	Relay Common	P1-5	
TB2-1 (L-)	Loop (-)	P1-6	
TB2-2 (L+)	Loop (+)	P1-7	
TB2-3 (L-)	Loop (-)	P1-8	
TB2-4 (L+)	Loop (+)		
TB2-5 (L-)	Loop (-)		
TB2-6 (L+)	Loop (+)		

4. Set address according to site plan. Switch ON Values:

Sw. Pos.	Value	Sw. Pos.	Value
1	1	5	16
2	2	6	32
3	4	7	64
4	8		

5. Break wire run to provide supervision
6. For non-power limited circuit application, add blank label to cover the "POWER LIMITED" reference. Make sure that all power-limited/Class 2 wiring is separated at least 0.25 inches from any wiring that is not power limited. Use cable ties or other permanent means to secure wiring.
7. Use only UL listed 24 V power limited supply suitable for fire protective signalling service.

Wiring:

1. Before connecting any module or device on the 2-way data circuit, make sure that the wiring is correct and has been tested.
2. All wiring to conform to current National Electrical Code, NFPA 70, state, and local building code requirements and applicable notes.
3. All conductors to be free of grounds.
4. Disconnect power from the circuit before installing modules.
5. When making connections, break wire run, strip 3/8-inch insulation from the ends of the wire, slide the bare ends of the wire under the terminal clamping plate, and tighten the clamping screw.
6. OXA-502RM relay circuit wiring:
   a. For dry contact switching, connect the external circuit to the COM and N/O or N/C terminals for normally-open or normally-closed contacts as required.
   b. For powered circuit operation, connect one power supply terminal to the COM and one circuit connection to the N/O or N/C terminal for normally-open or normally-closed contacts as required. Connect relays to UL listed power limited source suitable for fire protective signalling service.
7. OXA-503RM connects directly to OXM-501 RM/SDA Motherboard (PCB P/N 900981) or CSM-500 Channel Select Motherboard (PCB P/N 900972).
8. OXA-502RM Addressable Loop (2-way data circuit) Wiring— Connect L+ to Addressable Loop (+); L- to Addressable Loop (-). Make sure shields are continuous and do not make contact with other wiring, conduit, or box.

Notes:

1. All wiring to conform to current National Electrical Code, NFPA 70, state, and local building code requirements and applicable notes. When installed to comply with N.E.C. Article 760, Part A and Part B, these circuits are classified as **non-power limited**. When installed to comply with N.E.C. Article 760, Part A and Part C, these circuits are classified as power limited.
2. The red LED (seen from front) indicates the following when addressed by the control panel:
   a. When scanning normally (relay deactivated), the LED will illuminate once every two seconds when the module address is scanned.
   b. When the relay is initially activated, the LED will illuminate for a short period, then illuminate once every two seconds when the address of the module is scanned. The LED will be brighter than when the relay is deactivated.
3. Terminals marked "N.C." are not used.

Grinnell®
FIRE PROTECTION SYSTEMS COMPANY

OXA-500SD Signal Driver Module

PCB P/N 940526   **Assembly No. 976023**

Publication Number 19700221
Issue 4, January 1997

The Signal Driver Module is used to activate signalling appliances in response to a command sent from the fire control panel. The signalling appliances are powered from a separate UL listed power supply. The module is capable of passing current up to 500 mA maximum. The current capability of the module may be increased by using a Signal Expander Module (P/N 940527). The module is capable of monitoring and reporting the following conditions when the signalling circuit is supervised via a 22k ohm EOL resistor (P/N 976042): Normal condition, power supply fault, open/short circuit, relay coil fault, signalling appliance relay correct operation.

Install in accordance with NFPA 70, National Electrical Code, NFPA 72, Installation, Maintenance, and use of Protective Signaling Systems.

Installation:

The printed circuit board is mounted to the cover plate. The connection terminals and address setting switches are accessible on the back. After connections have been made and the address switches set, the cover plate is mounted onto the electrical box. The LED extends through the front of the cover plate and provides indication of unit operation.

Address Setting:

Each module installed on the 2-way data (multiplex) circuits requires an address. Set the address before wiring the module into the circuit.

The address for each module is set on a 7-position DIP switch marked 1 to 7. For example, to set a module to address 26, set switches 2, 4, and 5 to ON (1) and switches 1,3,6, and 7 to OFF (0).
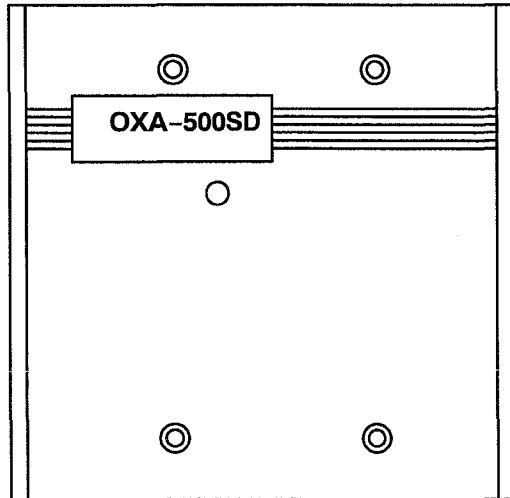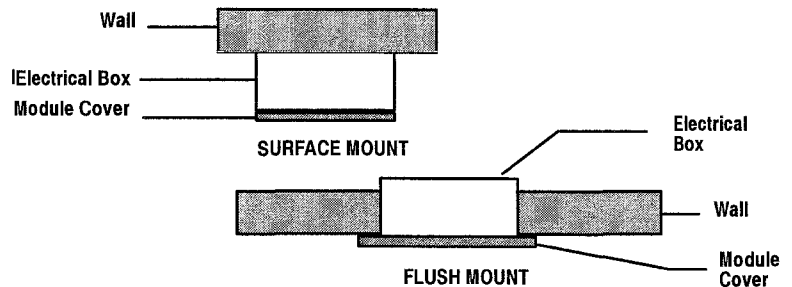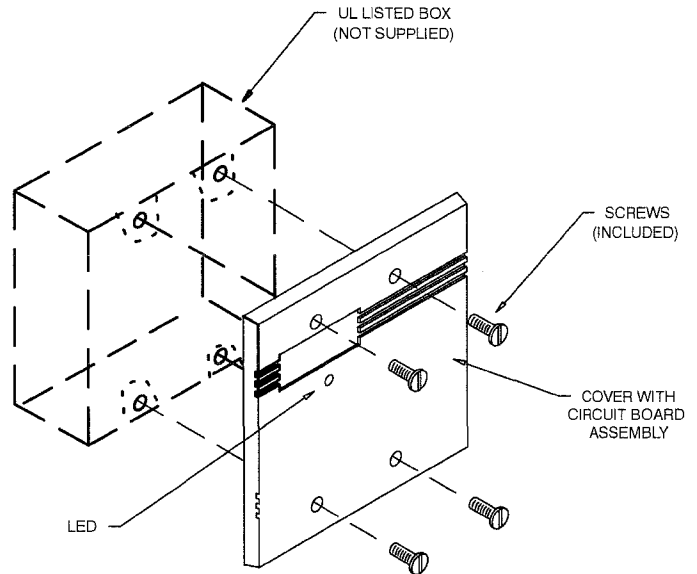
System Compatibility: AUTOCALL TFX Fire Control Systems
Device Location: *(See System Layout)*

Specifications:

Environment: Indoor Application Only
Operating Temperature: 32°F to 120°F
Operating Humidity: 85% (non-condensing)
Cover Material: "Bayblend" polycarbonate ABS alloy
Addressable Circuit Voltage: 28 VDC (POLARITY SENSITIVE)
Addressable Circuit Supervisory Current: 0.18 mA
Addressable Circuit Alarm Current: 0.70 mA (Alarm)
Input Voltage: 24 VDC (nominal)
Current Draw from Power Supply: 8 mA standby, 45 mA alarm
Output Rating: 500 mA maximum
Line Impedance (subcircuit): 5 ohms
Signaling Appliance Wiring: Open circuit 100K ohms, Short circuit 2K ohm
Terminal Block Wiring: No. 12 to 19 AWG shielded, twisted pair
EOL: UL listed 22K ohm, P/N 976042, supplied
Dimensions (lwd): 4.9 x 4.9 x 1 inch
Shipping weight: 3.6 ounces
Mounting Requirements: One UL listed electrical box of sufficient depth to accommodate wiring (dimensions depend upon application-flush or surface mount):

- Surface - 2-gang switch box
- Surface - 2-gang tile box
- Flush - 4-inch square box with 2-gang adapter (provides more wiring depth)
- Flush - cast box with 2-gang switch plate mounting

Figure 1. OXA-500SD Installation.

Wiring:

1. Before connecting any module or device on the 2-way data circuit, make sure that the wiring is correct and has been tested.
2. All wiring to conform to current National Electrical Code, NFPA 70, state, and local building code requirements and applicable notes.
3. All conductors to be free of grounds.
4. Disconnect power from the circuit before installing modules.
5. When making connections, break wire run, strip 3/8-inch insulation from the ends of the wire, slide the bare ends of the wire under the terminal clamping plate, and tighten the clamping screw.
6. Connect the 24 V output from the power supply unit to the negative (0V) and positive (24V) terminals.
7. Connect the UL listed signalling appliance to terminals SDR +VE and SDR –VE. Make sure the polarity is correct.
8. Install the EOL resistor (UL listed 22 k ohm, P/N 976042) into the last device.
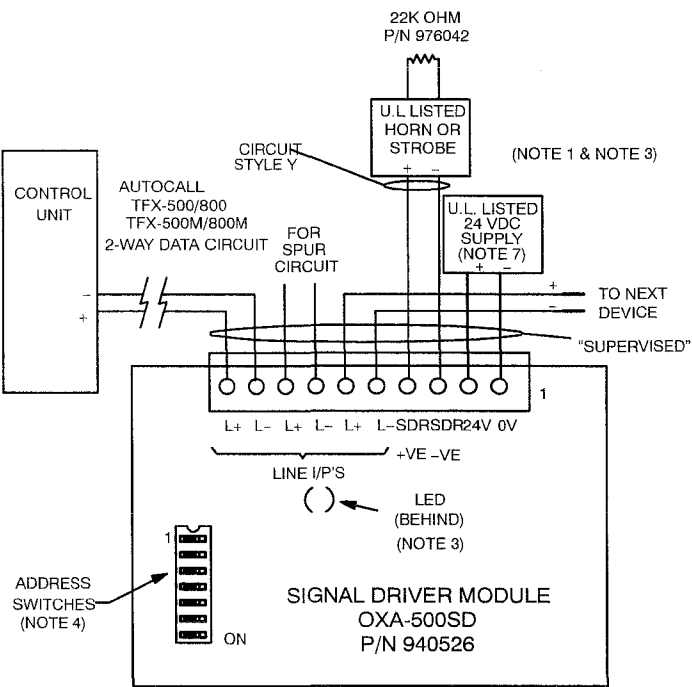
Figure 2.   Wiring OXA-500SD. All circuits and connections are power limited/Class2.

Notes:

1. All wiring to conform to current National Electrical Code, NFPA 70, state, and local building code requirements and applicable notes. All circuits contained in this module are classified as power limited and shall be installed to comply with N.E.C. Article 760, Part A and Part C.
2. The power supply to the signalling appliance circuit is limited to 730 mA by a thermistor which acts as a resetable fuse.
3. The red LED (seen from front) is ON when the signalling appliance relay is operated.
4. Signalling appliances must be equipped with EMI suppression and diode polarization devices.
5. Set address according to site plan. Switch ON Values:

Sw. Pos.	Value	Sw. Pos.	Value
1	1	5	16
2	2	6	32
3	4	7	64
4	8		

6. Break wire run for supervision.
7. Use only RPS-424 (P/N 910683) UL listed regulated 24-volt power supply.

This document is written for skilled technicians with experience installing and testing fire detection systems. These instructions do not purport to cover all the details or variations in the equipment described. Nor do they provide for every possible contingency met in connection with installation, operation, or maintenance. All specifications are subject to change without notice.

Should further information be desired or should particular problems arise which are not covered sufficiently for the user's purposes, the matter should be referred to Grinnell Fire Protection Systems Company, Inc., Westlake, Ohio 44145. Ph. (216) 871-9900.

OXA-500SDA, OXA-501SDA, OXA-504SDA DC Signal Driver Module

PCB P/N 940574, OXA-500SDA, Assembly No. 976091
PCB P/N 940574, OXA-504SDA, Assembly No. 976216
PCB P/N 940582 (plug-in), OXA-501SDA, Ass'y 976186

Publication Number 19700332
Issue 3, January 1997

The Signal Driver Module is used to activate signalling appliances in response to a command sent from the fire control panel. The signalling appliances may be installed in an NFPA 72 Style Z or NFPA 72 Style Y configuration. The signalling appliances are powered from a separate UL listed power supply. The module is capable of monitoring and reporting the following conditions when the signalling circuit is supervised via a 22k ohm EOL resistor (P/N 976042): Normal condition, power supply fault, open/short circuit, relay coil fault, signalling appliance relay correct operation.

Installation:

The OXA-500/504SDA printed circuit board is mounted to the cover plate. The connection terminals and address setting switches are accessible on the back. After connections have been made and the address switches set, the cover plate is mounted onto the electrical box. The LED extends through the front of the cover plate and provides indication of unit operation.

The OXA-501SDA board typically mounts to a Local RM/SDA Motherboard (P/N 976253). First set the address switches. Install the OXA-501SDA into the socket on the motherboard. Be sure to orient the board correctly (socket is keyed for correct alignment). The LED provides indication of unit operation.

Address Setting:

Each module installed on the 2-way data (multiplex) circuits requires an address. Set the address before wiring the module into the circuit.

The address for each module is set on a 7-position DIP switch marked 1 to 7. For example, to set a module to address 26, set switches 2, 4, and 5 to ON (1) and switches 1,3,6, and 7 to OFF (0).

System Compatibility: AUTOCALL TFX Fire Control Systems, CONSYS® Issue 3.0 and above
Device Location: *(See System Layout)*

Specifications:

Environment: Indoor Application Only
Operating Temperature: 32°F to 120°F
Operating Humidity: 85% (non-condensing)
Base/Cover Material (OXA-500/504): "Bayblend" polycarbonate ABS alloy

Electrical (OXA-500/504SDA and OXA-501SDA)
Addressable Circuit Voltage: 28 VDC (POLARITY SENSITIVE)
Addressable Circuit Supervisory Current: 0.35 mA
Addressable Circuit Alarm Current: 0.35 mA
Input Voltage: 24 VDC (nominal)
Current Draw from Power Supply: 10 mA standby, 150 mA alarm
Output Rating: OXA-500SDA Assembly 976091, 1.8 A_{RMS} maximum; OXA-504SDA Assembly 976216, 2.5 A_{RMS} maximum; OXA-501SDA (plug-in) Assembly 976186, 2.0 A_{RMS} maximum
Line Resistance (subcircuit): 1 ohm (at maximim rated output current)
Terminal Block Wiring (OXA-500/504): No. 12 to 19 AWG
**Supervision EOL (for Style B only):** UL listed 22K ohm, (P/N 976042)

Dimensions (lwd): 4.5 x 4.5 x 1.25 inch
Shipping weight: 4 ounces
Mounting Requirements OXA-500/504SDA: One UL listed electrical box of sufficient depth to accommodate wiring (dimensions depend upon application—flush or surface mount):

- Surface — 2-gang switch box
- Surface — 2-gang tile box
- Flush — 4-inch square box with 2-gang adapter (provides more wiring depth)
- Flush — cast box with 2-gang switch plate mounting
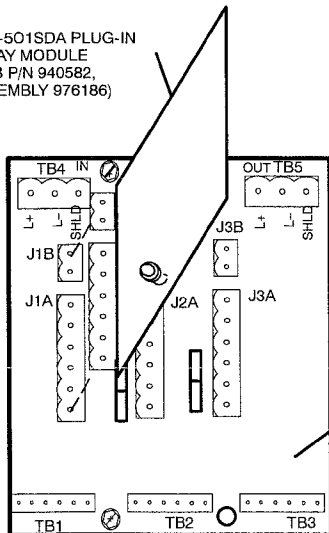
NOTE:
INSTALL OXA-501SDA IN CONTROL PANEL CABINET ONLY—DO NOT INSTALL IN ELECTRICAL BOX.
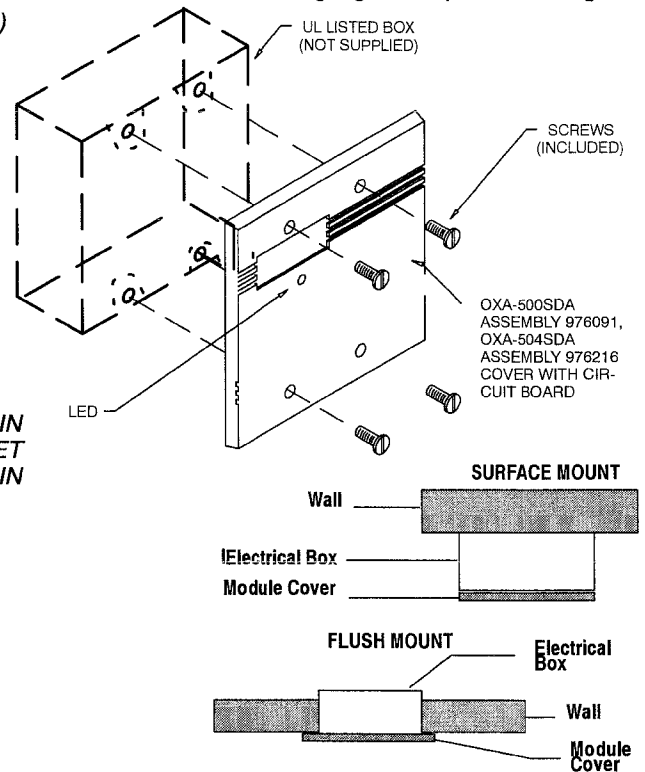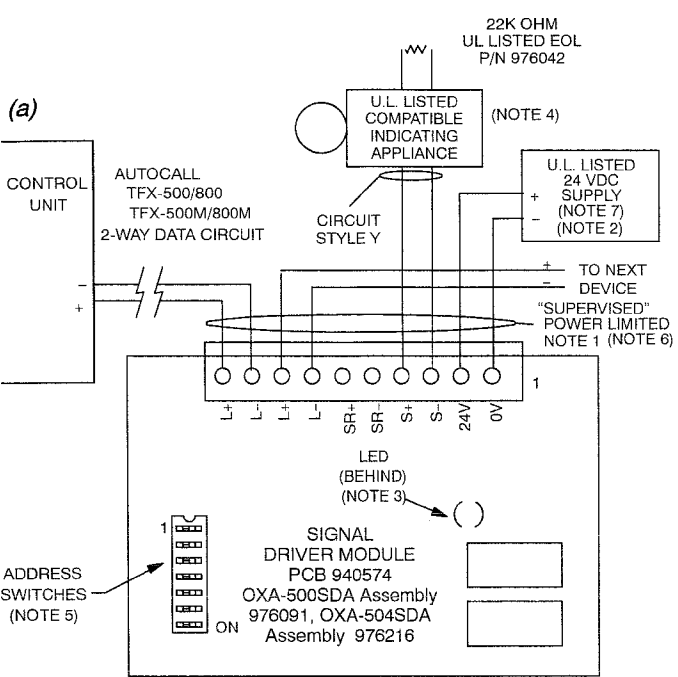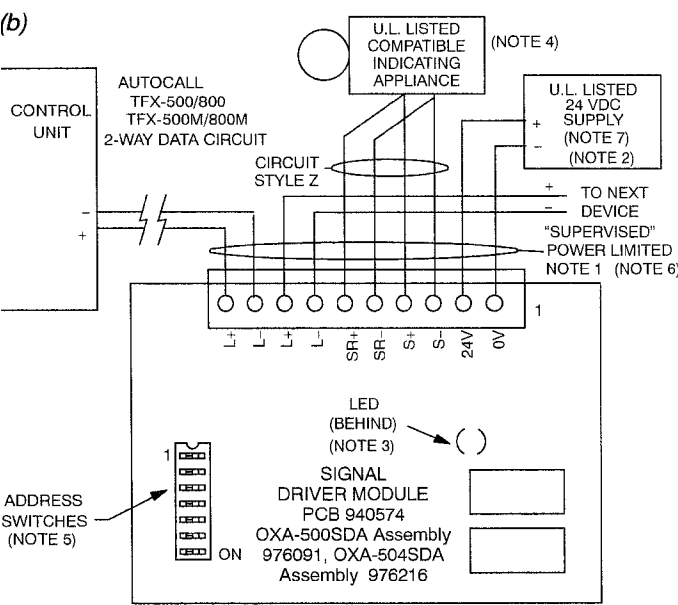
Figure 1   (a) OXA-501SDA installation in Local SDA Motherboard; (b) OXA-500/504SDA installation to electrical box.

(a)

All circuits and connections are power limited/Class2.

(b)

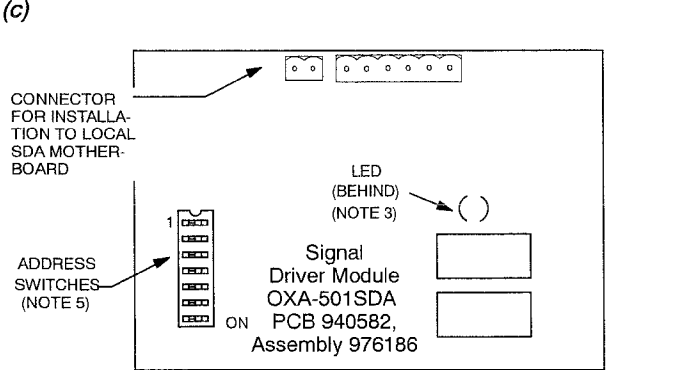All circuits and connections are power limited/Class2.

(c)

Figure 2. Wiring (a) OXA500/504SDA NFPA Style Y, (b) OXA-500SDA NFPA Style Z, (c) OXA-501SDA connection to motherboard.

Wiring:

1. Before connecting any module or device on the 2-way data circuit, make sure that the wiring is correct and has been tested.
2. All wiring to conform to current National Electrical Code, NFPA 70, state, and local building code requirements and applicable notes.
3. All conductors to be free of grounds.
4. Disconnect power from the circuit before installing modules.
5. When making connections, break wire run, strip 3/8-inch insulation from the ends of the wire, slide the bare ends of the wire under the terminal clamping plate, and tighten the clamping screw.
6. Connect the output from the power supply unit to the negative (0V) and positive (24V) terminals.
7. OXA-500/504SDA Wiring:
   a. Connect the UL listed signalling appliance to terminals S+ and S-. For Style Z connect the return wiring to SR+ and SR-. Make sure the polarity is correct.
   b. For Style Y, install the EOL resistor (UL listed 22 k ohm, P/N 976042) into the last device.
8. OXA-501SDA typically connects directly to RM/SDA Mother-board (P/N 976253). Socket is keyed for correct alignment.

Notes:

1. All circuits connected to OXA-500/504SDA P/N 940574 are classified as power limited/Class 2. *(See Note 8.)*
2. *(deleted)*
3. The LED (seen from front) is ON (red) when the signalling appliance relay is operated. The LED is ON (yellow) when there is a sounder circuit fault.
4. Signalling appliances must be equipped with EMI suppression and diode polarization devices.
5. Set address according to site plan. Switch ON Values:

Sw. Pos.	Value	Sw. Pos.	Value
1	1	5	16
2	2	6	32
3	4	7	64
4	8		

6. Break wire run for supervision.
7. Use only RPS-424 (P/N 910683) UL listed regulated 24-volt power supply.
8. All wiring to conform to current National Electrical Code, NFPA 70, state, and local building code requirements and applicable notes. All circuits contained in this module are classified as power limited and shall be installed to comply with N.E.C. Article 760, Part A and Part C.

This document is written for skilled technicians with experience installing and testing fire detection systems. These instructions do not purport to cover all the details or variations in the equipment described. Nor do they provide for every possible contingency met in connection with installation, operation, or maintenance. All specifications are subject to change without notice.

Should further information be desired or should particular problems arise which are not covered sufficiently for the user's purposes, the matter should be referred to Grinnell Fire Protection Systems Company, Inc., Westlake, Ohio 44145. Ph. (216) 871-9900.

Grinnell®
FIRE PROTECTION SYSTEMS COMPANY

505SDA, 506SDA Notification Appliance Modules

505SDA, Plug-in   Assembly 976377
506SDA, Stand-alone   Assembly 976378

Publication Number 19700473

■ **Issue 1, Revision B, July 1997**

The 505/506SDA Notification Appliance Module is used to activate notification appliances in response to a command sent from the fire control panel. The notification appliance circuit is supervised and may be configured as an NFPA 72 Style Z circuit or NFPA 72 Style Y circuit. The notification appliances may be powered from either a UL listed audio source or a separate power supply (UL listed for fire signaling applications). For agent releasing applications see Publication No. 19700475 and Publication No. 850526.

When used with the UL listed RPS-424 power supply, or any other power-limited input source that is UL listed for fire signaling applications, all wiring terminals are power-limited.

The unit can be used with other nonpower-limited UL listed input sources. If power-limited output is required for those applications, the optional plug-in boards provide power-limiting output for either 24 V_{DC}/25 V_{RMS} (P/N 976379) or 70 V_{RMS} (P/N 976380).

(a) **506SDA**
Stand-alone modules install to electrical box.
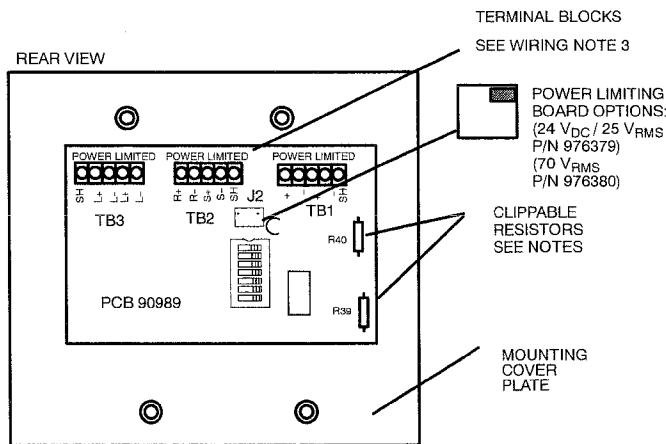
(b) **505SDA**
Plug-in modules typically install in RM/SDA Motherboard.
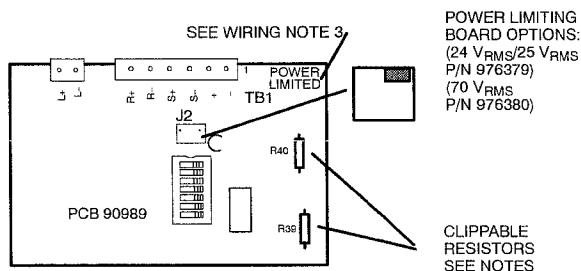

Figure 1. 506SDA (stand-alone) and 505SDA (plug-in) Notification Appliance Modules.

System Compatibility: AUTOCALL TFX Fire Control Systems Compatible with CONSYS® Issue 3.0 and above for notification applications; compatible with CONSYS Issue 10 and above for agent releasing applications.

Specifications:

Environment: Indoor Application Only
Operating Temperature: 32°F to 120°F
Operating Humidity: 85% (non-condensing)
Cover Material 506SDA: Polycarbonate ABS alloy
Dimensions 506SDA (hwd): 4.5 x 4.5 x 1.25 inches
Mounting Requirements 506SDA: One UL listed electrical box of sufficient depth to accommodate wiring (dimensions depend upon application—flush or surface mount):

- Surface — two-gang switch box
- Surface — two-gang tile box
- Flush — 4-inch square box with two-gang adapter (provides more wiring depth)
- Flush — cast box with two-gang switch plate mounting

Terminal Block Wiring (506SDA): No. 12 AWG maximum

Table 1. Electrical Specifications

Battery Requirements:		
Addressable Loop		
Standby Current		0.35 mA
Alarm Current		0.35 mA
Input at TB1–1 to TB1–4 (Power Supply)		0.08 mA$_{DC}$
Addressable Loop Currents		
ID Current		12.8–15.8 mA
Condition Current	LED Indication	
Power Supply Fault	Pulsed, Dim	0 – 3.0 mA
Device Fault (Relay Coil)	Pulsed, Dim	3.0 – 5.5 mA
Normal	Pulsed Green	5.5 – 9.5 mA
Fault (Output Line)	Pulsed Dim	9.5 – 13.0 mA
Operated	Pulsed Red	13.0 – 17.5 mA
Addressable Loop Unit Load		
Each 505SDA or 506SDA module requires more than a single unit load on the addressable loop; therefore fewer than 99 addressable devices may be attached to a TFX loop containing 505/506SDA modules. See Installation "Addressable Loop and Address Setting" on page 3.		1.43 Loop Load Units per module
Module Output Maximum Switched Rating		
Input Voltage at TB1–1 to TB1–4		
24 VDC		2 A$_{DC}$
25 V$_{RMS}$ Audio		2 A$_{RMS}$ (50 Watt)
70 V$_{RMS}$ Audio		0.71 A$_{RMS}$(50 Watt)
Other		
Maximum Notification Circuit Voltage Drop (at maximum rated output)		
24 V$_{dc}$	with shunt	3.0 V$_{DC}$
	with 25 V Pwr. Lim. Bd.	2.9 V$_{DC}$
25 V$_{RMS}$ Audio	with shunt	3.8 V$_{RMS}$
	with 25 V Pwr. Lim. Bd	3.7 V$_{RMS}$
70 V$_{RMS}$ Audio	with shunt	12.8 V$_{RMS}$
	with 70 V Pwr. Lim. Bd.	11.1 V$_{RMS}$
Notification Circuit EOL (Style Y only) P/N 976250		27 k-ohm, 1 Watt
Releasing application suppression device		P/N 976289
Audio Riser EOL P/N 4281–050		5.1 k-ohm, 2 Watt

(a)

UL LISTED TWO-GANG BOX
(NOT SUPPLIED)

SCREWS
(INCLUDED)

506SDA
ASSEMBLY
976378,
COVER WITH
CIRCUIT BOARD

LED

ROUTE WIRING TO THE RIGHT FOR NONPOWER-LIMITED WIRING, ROUTE WIR-
ING TO THE LEFT FOR POWER LIMITED/CLASS 2. MAINTAIN AT LEAST 0.25
INCHES OF SEPARATION BETWEEN POWER-LIMITED AND NONPOWER-LIMITED
WIRING BY MEANS OF WIRE TIES OR OTHER PERMANENT MEANS.

FOR NONPOWER-LIMITED
APPLICATIONS, ADD THE
BLANK LABEL TO COVER THE
POWER LIMITED NOTATION.

FOR NON-POWER LIMITED WIR-
ING, USE UL LISTED DEEP BOX
4 × 4 × 2 1/8 INCHES
(NOT SUPPLIED)

POWER-LIMITED/
CLASS 2

NONPOWER-
LIMITED

USE TYPE FPL, FPLR, OR FPLP CABLE AND MAIN-
TAIN 0.25 INCH SEPARATION OF NONJACKETED
WIRE BETWEEN POWER-LIMITED AND NONPOW-
ER-LIMITED WIRING.

SURFACE MOUNT

Wall

Electrical Box
Module Cover

FLUSH MOUNT

Electrical
Box

Wall

Module
Cover

UL LISTED BOX
4 × 4 × 2 1/8 INCHES
(NOT SUPPLIED)

UL LISTED
COVER (P/N
19240952)

MODULE
COVER

506SDA
ASSEMBLY
976378,
COVER WITH
CIRCUIT BOARD

CIRCUIT
BOARD

(b)

505SDA PLUG-IN NOTIFI-
CATION APPLIANCE MODULE
ASSEMBLY 976377

TYPICAL OXM-501 RM/
SDA MOTHERBOARD
(P/N 976253)

S-, S+, SLD, S2-, S2+
TB4
J1B
J2B
J2A
J3B
J3A
TB5
JP2
JP1
JF4
JP3
TB3

NOTE:
INSTALL 505SDA IN CONTROL PANEL
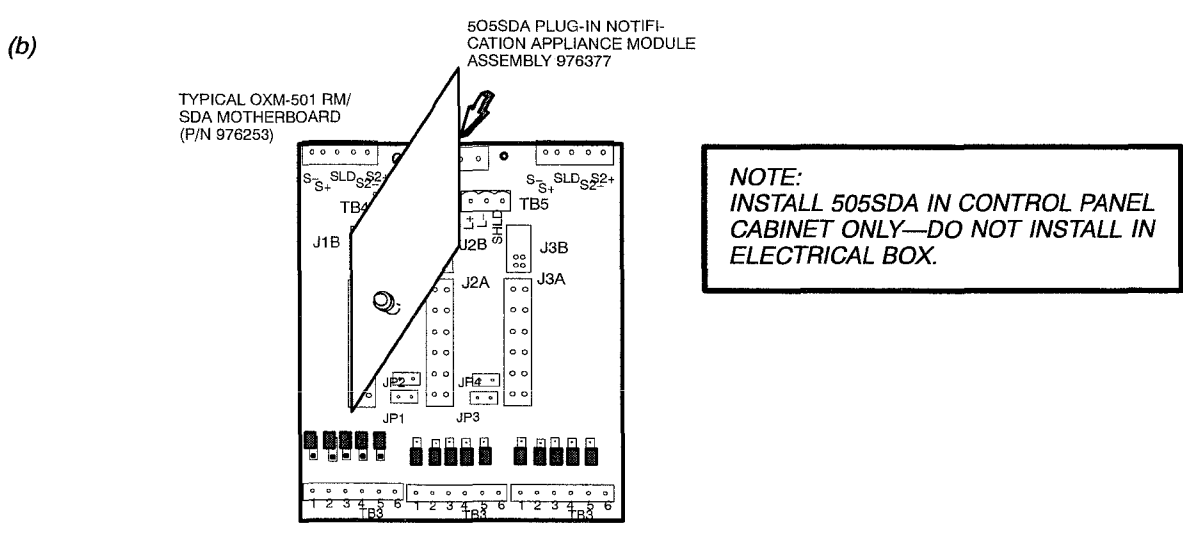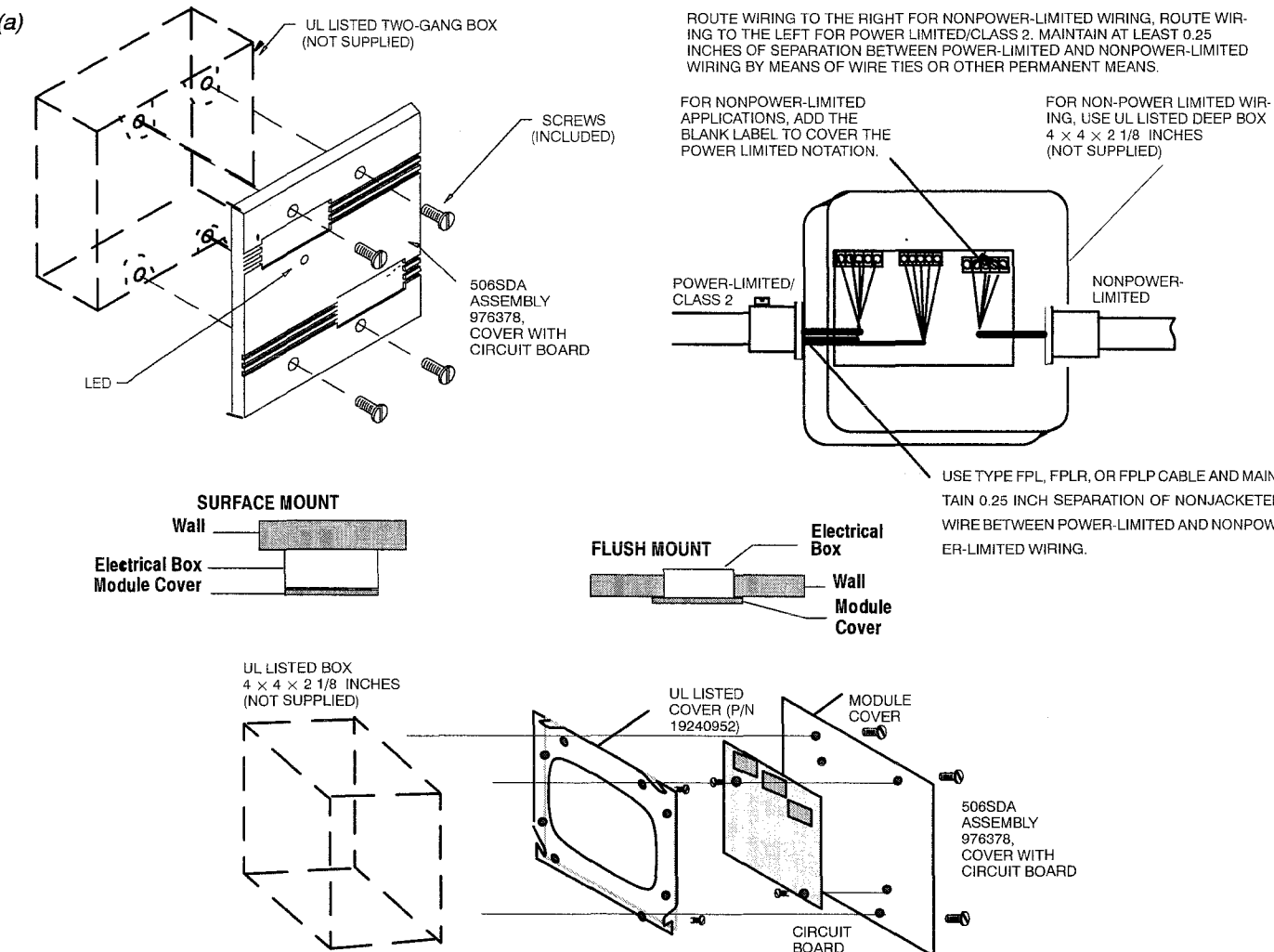CABINET ONLY—DO NOT INSTALL IN
ELECTRICAL BOX.

Figure 2   (a) 506SDA installation to electrical box; (b) 505SDA installation on Local SDA Motherboard.

Releasing Function Applications

When used for releasing control, the 505/506SDA Notification Appliance Module is UL listed for fire alarm and releasing service and meets the requirements of NFPA Standards: NFPA 12, CO_2 Extinguishing Systems (High Pressure Only); NFPA 12A, Halon 1301 Extinguishing System; NFPA 12B, Halon 1211 Extinguishing System; NFPA 13, Sprinkler Systems; NFPA 15, Water Spray Systems; NFPA 16, Foam-Water Deluge and Foam-Water Spray Systems; NFPA 17, Dry Chemical Extinguishing Systems; NFPA 17A, Wet Chemical Extinguishing Systems. For details regarding these applications refer to Publications No. 19700475 and 850526.

WARNING: When installing releasing equipment, do not connect releasing equipment circuits until the system has been verified to be working in accordance with NFPA requirements.

Operation

The 505/506SDA can monitor and report the following conditions:

- Normal Condition (polled green LED)

- Operated condition (polled red LED)

- Trouble condition (dimly polled LED)

    - Input power fault

    - Relay coil operation fault

    - Sounding circuit fault (open or short circuit)

Note: The unit will not operate into a shorted sounding circuit fault.

Addressable Loop and Address Setting:

Each 505SDA or 506SDA module requires more than a single unit load on the TFX addressable loop. Each 505SDA/506SDA module is equivalent to 1.43 Loop Load Units. Since the maximum number of Loop Load Units available on a TFX loop is 99, then the maximum number of 505SDA/506SDA modules possible is:

$$99 \div 1.43 = 69 \text{ SDA modules.}$$

To determine the maximum number of unit loads left when mixing SDA and other loop devices, use the formula:

Remaining Unit Loads = 99 − (1.43 × Number of SDAs)
For example, If thirty 505SDA modules are used, then the number of remaining unit loads is:

$$99 - (1.43 \times 30) = 56 \text{ unit loads}$$

Each module installed on the addressable loop (multiplex) circuits requires a separate, unique address. Set the address before wiring the module into the circuit.

The address for each module is set on a 7-position DIP switch marked 1 to 7. For example, to set a module to address 26, set switches 2, 4, and 5 to ON (1) and switches 1,3,6, and 7 to OFF (0).

Table 2.   Address Switch Values

Sw. Pos.	Value	Sw. Pos.	Value
1	1	5	16
2	2	6	32
3	4	7	64
4	8		

Installation

The 506SDA stand-alone module:

1. On the circuit board, set the address switches to the TFX loop address.

2. If needed, Install optional audio power-limiting option boards:
    a. Shunt is factory installed for normal power-limited operation using the RPS-424 Power Supply/Battery Charger.
    b. When a nonpower-limited power supply is used, $24 V_{DC}/25 V_{RMS}$ power-limiting is achieved by removing the shunt and installing option board P/N 976379. Carefully seat the option board over header J2 and press.
    c. For $70 V_{RMS}$ power-limiting, remove the shunt and install option board P/N 976380. Carefully seat the option board over header J2 and press.

3. For audio applications clip resistor R39 and R40 open:
    a. Clipping R39 open disables DC input supervision. Input supervision must then be furnished by the audio source.
    b. Clipping R40 removes the DC input filter capacitor, which otherwise would short out an audio input.

4. Connect the wiring to the terminals.

5. Mount the circuit board to the cover plate making sure that the LED is visible from the front.

6. Install the module cover to the UL listed electrical box cover P/N 19240952.

7. Fit the assembly to the UL listed electrical box (not supplied). Use 4 x 4 x 2 1/8 inch box for nonpower-limited applications.

505SDA Installation: The 505SDA plug-in module board typically mounts to an OXM-501 RM/SDA Motherboard (P/N 976253):

1. On the circuit board, set the address switches to the TFX loop address.

2. If needed, install optional audio power limiting option boards:
    a. For $24 V_{DC}/25 V_{RMS}$ power limiting, install option board P/N 976379. Carefully seat the option board over header J2 and press.
    b. For $70 V_{RMS}$ power limiting, install option board P/N 976380. Carefully seat the option board over header J2 and press.

3. For audio applications clip resistor R39 and R40 open:
    a. Clipping R39 open disables DC input supervision. Input supervision must then be furnished by the audio source.
    b. Clipping R40 removes the DC input filter capacitor, which otherwise would short out an audio input.

4. Install the 505SDA into the socket on the motherboard. Be sure to orient the board correctly (socket keyed for correct alignment). The LED provides indication of unit operation.

Table 3.   Terminal Designations

| 506SDA		505SDA	
Terminal	Function	Terminal	Function
TB1–1 (SH)	Shield	P1–1 (–)	Input (–)
TB1–2 (I–)	Input In (–)	P1–2 (+)	Input (+)
TB1–3 (I+)	Input In (+)	P1–3 (S–)	Sounder Signal (–)
TB1–4 (I–)	Input Out (–)	P1–4 (S+)	Sounder Signal (+)
TB1–5 (I+)	Input Out (+)	P1–5 (R–)	Sounder Return (–)
TB2–1 (SH)	Shield	P1–6 (R+)	Sounder Return (+)
TB2–2 (S–)	Sounder Signal (–)	P1–7	(not used)
TB2–3 (S+)	Sounder Signal (+)	P1–8 (L+)	Loop (+)
TB2–4 (R–)	Sounder Return (–)	P1–9 (L–)	Loop (–)
TB2–5 (R+)	Sounder Return (+)		
TB3–1 (L–)	Loop Out (–)		
TB3–2 (L+)	Loop Out (+)		
TB3–3 (L–)	Loop In (–)		
TB3–4 (L+)	Loop In (+)		
TB3–5 (SH)	Shield		

Wiring Notes:

1. Before connecting any module or device on the data circuit, make sure that the wiring is correct and has been tested.

2. All wiring to conform to current National Electrical Code (NEC), NFPA 70, state, and local building code requirements and applicable notes. When installed to comply with NEC. Article 760, Part A and Part B, these circuits are classified as **nonpower-limited**. When installed to comply with NEC. Article 760, Part A and Part C, these circuits are classified as power-limited.

3. For nonpower-limited circuit application, add blank labels to cover the "POWER LIMITED" references. Make sure that all power-limited/Class 2 wiring is separated at least 0.25 inches from any wiring that is not power-limited. Use cable ties or other permanent means to secure wiring. Refer to Table 4 for compatible audio devices.

4. Maintain 0.25-inch separation of nonjacketed wiring between power-limited and non power-limited wiring. Use type FPL, FPLR, or FPLP cable for nonpower-limited wiring. Refer to NEC Section 760-54 for further details.

5. All conductors to be free of grounds.

6. Disconnect power from the circuit before installing modules.

7. Use only RPS-424 or other regulated, power-limited 24V UL listed power supply suitable for fire protective signalling service.

8. Use only devices UL listed as suitable for fire protective signalling service.

9. For compatible speakers refer to Table 4.

10. When making connections, break wire run, strip 3/8-inch insulation from the ends of the wire, slide the bare ends of the wire under the terminal clamping plate, and tighten the clamping screw.

11. Connect the output from the power supply unit,or audio circuit, to the negative (–) and positive (+) terminals as required.

12. 506SDA Wiring:
    a. Connect the UL listed notification appliance to terminals S+ and S–. For Style Z connect the return wiring to R+ and R–. Make sure the polarity is correct.
    b. For notification circuit Style Y (DC application), install the EOL resistor (UL listed 27 k ohm, 1 Watt P/N 976250) into the last device.
    c. For audio notification circuit Style Y (audio applications), install the EOL resistor (UL listed 27 k ohm, 1 Watt P/N 976250) into the last device. In the last device on the audio riser, install EOL resistor 5.1 k-ohm, 2 Watt P/N 4281–050 (DirecTone applications).
    d. For releasing control circuit Style Y (24 V_{DC}), install the UL listed suppression device P/N 976268 across the releasing control device terminals.

13. 505SDA typically connects directly to OXM-501 RM/SDA Motherboard (P/N 976253). The socket is keyed for correct alignment.

14. Notification appliances must be equipped with diode polarization or DC blocking.

15. Set address according to site plan. See Table 2 for Switch ON Values.

16. For power-limited wiring with a nonpower-limited input source, install the optional audio power-limiting option boards:
    a. For 24 V_{DC} / 25 V_{RMS} power-limiting, remove the shunt and install option board P/N 976379. Carefully seat the option board over header J2 and press.
    b. For 70 V_{RMS} power-limiting, remove the shunt and install option board P/N 976380. Carefully seat the option board over header J2 and press.

17. For audio applications clip resistor R39 and R40 open:
    a. Clipping R39 open disables DC input supervision. Input supervision must then be furnished by the audio source.
    b. Clipping R40 removes the DC input filter capacitor, which otherwise would short out an audio input.

18. For releasing applications, install an OXA-502RM Relay Module (P/N 976**258**) as shown in Figure 5. Refer to Publication 19700**415** for information concerning the OXA-502RM module.

Programming for Releasing Applications

Refer to Publication 850526, *TFX Releasing Option User's Guide* and *TFX-500* and Publication 850463, *TFX-800 CONSYS Programming Manual* for information concerning programming for agent releasing functions.

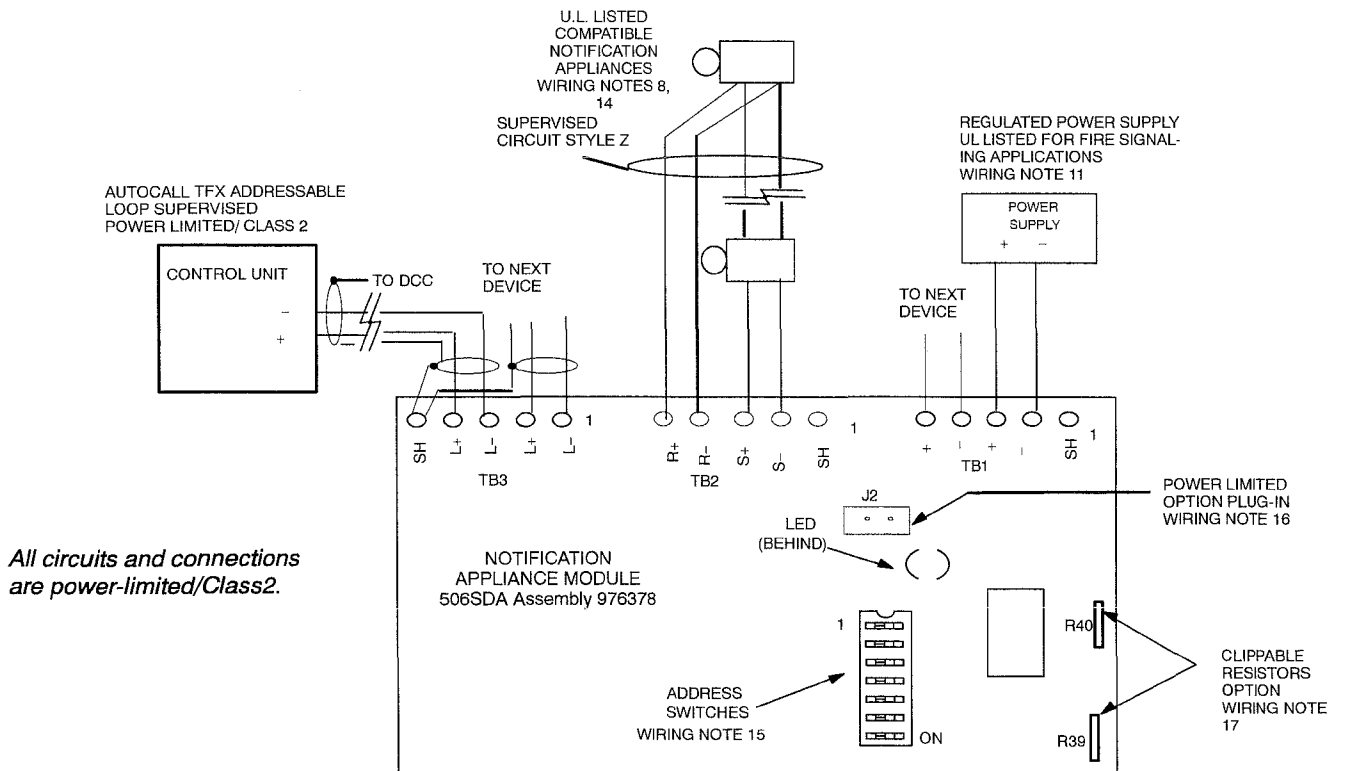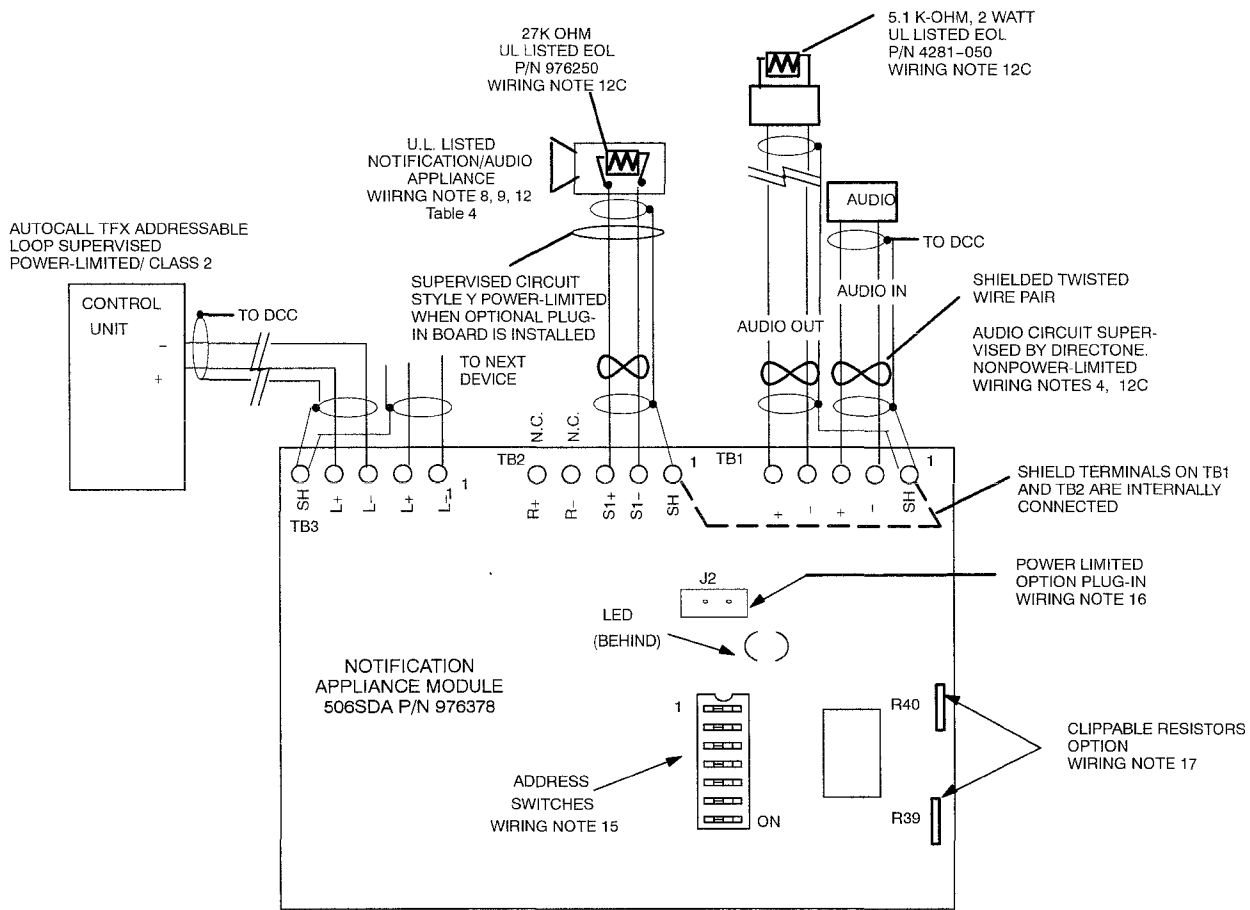## (a) 506SDA, Style Y, 24 VDC
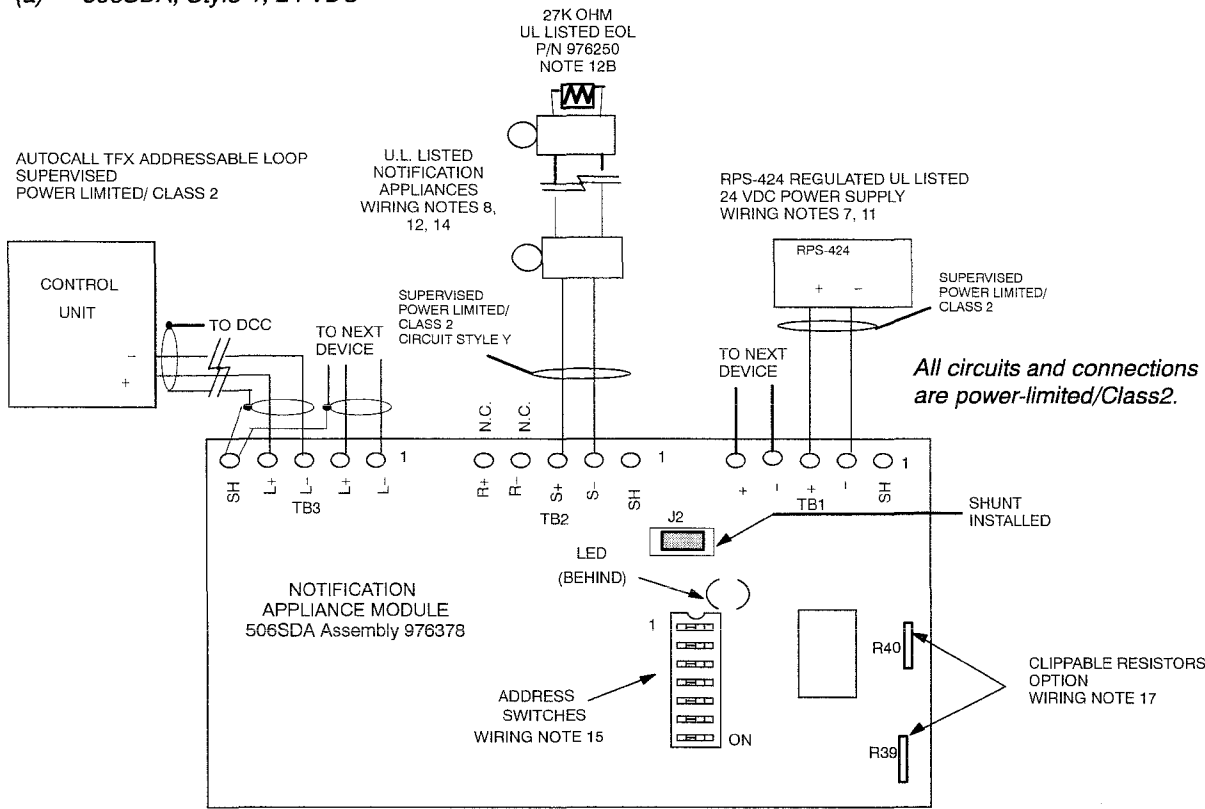
(b) 506SDA, Style Z, 24 VDC

Figure 3. Wiring (a) 506SDA NFPA Style Y, 24 VDC Power; (b) 506SDA NFPA Style Z, 24 VDC Power.

(a) *506SDA, Style Y, Audio Power*

27K OHM
UL LISTED EOL
P/N 976250
WIRING NOTE 12C

5.1 K-OHM, 2 WATT
UL LISTED EOL
P/N 4281-050
WIRING NOTE 12C

U.L. LISTED
NOTIFICATION/AUDIO
APPLIANCE
WIIRNG NOTE 8, 9, 12
Table 4

AUTOCALL TFX ADDRESSABLE
LOOP SUPERVISED
POWER-LIMITED/ CLASS 2

AUDIO

TO DCC

CONTROL
UNIT

TO DCC

AUDIO IN

SHIELDED TWISTED
WIRE PAIR

AUDIO OUT

AUDIO CIRCUIT SUPER-
VISED BY DIRECTONE.
NONPOWER-LIMITED
WIRING NOTES 4, 12C

SUPERVISED CIRCUIT
STYLE Y POWER-LIMITED
WHEN OPTIONAL PLUG-
IN BOARD IS INSTALLED

TO NEXT
DEVICE

N.C.   N.C.

TB2   TB1

SH   L+   L-   L+   L- 1   R+   R-   S1+ S1- SH   1   + | + | SH   1

TB3

SHIELD TERMINALS ON TB1
AND TB2 ARE INTERNALLY
CONNECTED

J2

LED
(BEHIND)

POWER LIMITED
OPTION PLUG-IN
WIRING NOTE 16

NOTIFICATION
APPLIANCE MODULE
506SDA P/N 976378

1

R40

CLIPPABLE RESISTORS
OPTION
WIRING NOTE 17

ADDRESS
SWITCHES
WIRING NOTE 15

ON   R39

*Input connections may be nonpower-limited. Maintain separation of 0.25 inches between
power-limited/Class 2 wiring and nonpower-limited wiring by means of wire ties or other
permanent means. In order to obtain power-limited outputs an optional plug-in board
P/N 976379 or 976380 must be installed.*
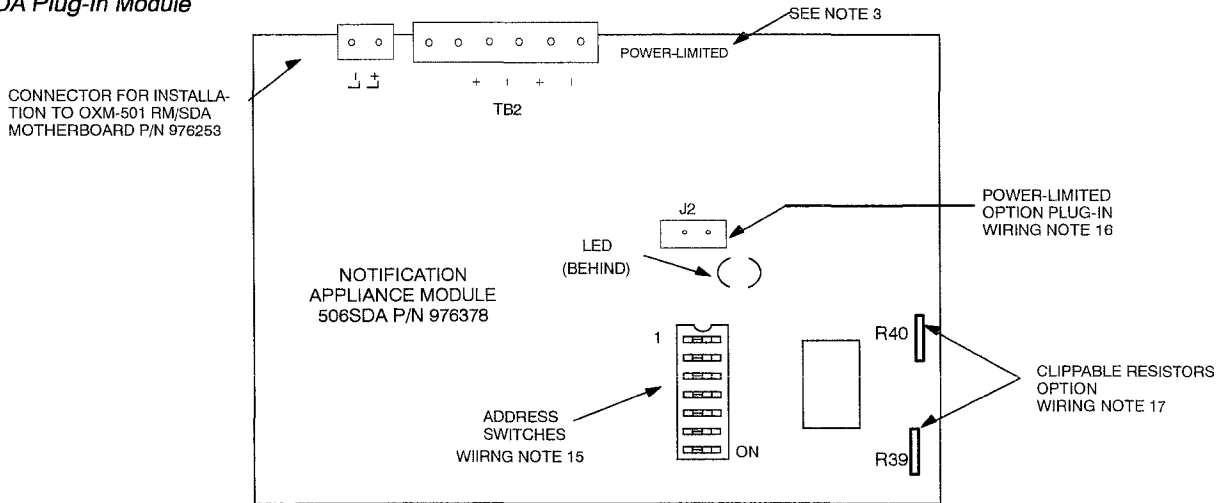
(b) *505SDA Plug-in Module*

SEE NOTE 3

POWER-LIMITED

CONNECTOR FOR INSTALLA-
TION TO OXM-501 RM/SDA
MOTHERBOARD P/N 976253

L +   + | + |
TB2

POWER-LIMITED
OPTION PLUG-IN
WIRING NOTE 16

J2

LED
(BEHIND)

NOTIFICATION
APPLIANCE MODULE
506SDA P/N 976378

1

R40

ADDRESS
SWITCHES
WIIRNG NOTE 15

ON   R39

CLIPPABLE RESISTORS
OPTION
WIRING NOTE 17

Figure 4.   Wiring (a) 506SDA NFPA Style Y, Audio Power; (b) 505SDA connection to motherboard.

SPRINKLER OR AGENT RELEASING CIRCUIT SUPERVISED POWER-LIMITED.
INSTALL UL LISTED RELEASING SUPPRESSION DEVICE P/N 976268 (USED FOR
SPRINKLER SOLENOIDS ONLY).
WIRING NOTE 12D

U.L. LISTED
RELEASING CONTROL DEVICE

RELEASING
CONTROL

UL LISTED SUPPRESSION
DEVICE
P/N 976268
WIRING NOTE 12D

RPS-424 REGULATED UL LISTED
FOR FIRE SIGNALING APPLICATIONS
24 VDC POWER SUPPLY
WIRING NOTES 7, 11

RPS-424

AUTOCALL TFX
ADDRESSABLE LOOP
SUPERVISED
POWER-LIMITED/ CLASS 2

CONTROL
UNIT

TO DCC

TO NEXT
DEVICE

CIRCUIT
STYLE Y

TO NEXT
DEVICE

27K OHM
UL LISTED
EOL
P/N 976250
WIRING NOTE
12C

SHUNT
INSTALLED

TB2   TB1

TB3   TB2   JP2   TB1

NOTIFICATION
APPLIANCE MODULE
506SDA P/N 976378
or 505SDA P/N 976377

LED
(BEHIND)

LED
(BEHIND)

RELAY MODULE
OXA-502RM
P/N 976258

ADDRESS
SWITCHES
(NOTE 15)

ON

ADDRESS
SWITCHES
WIRING NOTE 15

ON

R40

R39

Figure 5.   Typical use of SDA module in releasing application. For further details, refer to Publication 19700475, Fire Suppression Agent Releasing Stations Installation Guide, and Publication 850526, AUTOCALL TFX Releasing Option User's Guide.

Table 4. Compatible Audio Devices

Compatible UL-listed audio notification devices and associated current requirements for calculating battery capacity.

Model Number	Description	Part Number	Manufacturer	I Oper.
	24–VDC Compatible Indicating Appliances			
ET–1010–WS–24–HF–R	Strobe/Speaker 8000 Candlepower	960450	WHELLOCK	25mA
ET–1070–WS–24–VF–R	Strobe/Speaker 8000 Candlepower	960451	WHEELOCK	25mA
ET–1080–WS–24–HF–R	Strobe/Speaker 8000 Candlepower	960453	WHEELOCK	25mA
ET–1090–WS–24–CF–W	Strobe/Speaker 8000 Candlepower	960511	WHEELOCK	25mA
E–7025–WM–24–VF–R	Speaker with Strobe, 117 Candella, 25 VRMS, 2W multi–tap	E–7025–WM–24–VF–R	WHEELOCK	88mA
E–7025–WM–24–VF–W	Speaker with strobe, 117 Candella, 25 VRMS, 2W multi–tap	E–7025–WM–24–VF–W	WHEELOCK	88mA
E–7070–WM–24–VF–R	Speaker with Strobe, 117 Candella, 70 VRMS, 2W multi–tap	E–7070–WM–24–VF–R	WHEELOCK	88mA
E–7070–WM–24–VF–W	Speaker with Strobe, 117 Candella, 70 VRMS, 2W multi–tap	E–7070–WM–24–VF–W	WHEELOCK	88mA
ET–1070–WM–24–VF–R	Speaker with Strobe, 117 Candella, 8W multi–tap	ET–1070–WM–24–VF–R	WHEELOCK	88mA
ET–1070–WM–24–VF–W	Speaker with Strobe, 117 Candella, 8W multi–tap	ET–1070–WM–24–VF–W	WHEELOCK	88mA
ET–1080–WM–24–VF–R	Speaker with Strobe, 117 Candella, 8W multi–tap	ET–1080–WM–24–VF–R	WHEELOCK	88mA
ET–1080–WM–24–VF–W	Speaker with Strobe, 117 Candella, 8W multi–tap	ET–1080–WM–24–VF–W	WHEELOCK	88mA
ET–1010–WS–24–HF–R	Strobe/Speaker, 25 and 70.7 VRMS. Strobe 25 mA, 1.5 cd	960450	WHEELOCK	25mA
ET–1070–WS–24–VF–R	Strobe/Speaker, 25 and 70.7 VRMS. Strobe, 1.5 cd	960451	WHEELOCK	25mA
ET–1080–WS–24–VF–R	Strobe/Speaker, 25 and 70.7 VRMS. Strobe, 1.5 cd	960453	WHEELOCK	25mA
ET–1080–WS–24–CF–R	Strobe/Speaker, 25 and 70.7 VRMS. Strobe, 8000 cp	ET–1080–WS–24–CF–R	WHEELOCK	25mA
ET–1090–WS–24–CF–W	Strobe/Speaker, 25 and 70.7 VRMS. Strobe, 1.5 cd	960511	WHEELOCK	25mA
E–7025–R	Speaker 25 VRMS, 96 dBA	E–7025–R	WHEELOCK	
E–7070–R	Speaker 70 VRMS, 96 dBA	E–7070–R	WHEELOCK	
E–7025–LS–24–VF–R	Speaker with 15 cd Strobe, 25 volt speaker	E–7025–LS–24–VF–R	WHEELOCK	80mA
E–7070–LS–24–VF–R	Speaker with 15 cd Strobe, 70 volt speaker	E–7070–LS–24–VF–R	WHEELOCK	80mA
E–7070–LS–24–VF–W	Speaker with 15 cd Strobe, 70 volt speaker	E–7070–LS–24–VF–W	WHEELOCK	80mA
E9025–LS–24–CF–W	Speaker with Strobe, 15 VRMS, 15 cd	E9025–LS–24–CF–W	WHEELOCK	80mA
E9070–LS–24–CF–W	Speaker with Strobe, 70 VRMS, 15 cd	E9070–LS–24–CF–W	WHEELOCK	80mA
SPAFV25RHR	Speaker/Strobe. 25 VRMS. Strobe, 0.25 cd/sec	SPAFV25RHR	Federal Signal	33 mA
SPAFV70RHR	Speaker/Strobe. 70.7 VRMS; Strobe, 0.25 cd/sec	SPAFV70RHR	Federal Signal	33 mA
SPAFV25PSR	Speaker/Strobe. 25 VRMS; Strobe, 0.25 cd/sec	SPAFV25PSR	Federal Signal	33 mA
SPAFV70PSR	Speaker/Strobe. 70.7 VRMS; Strobe, 0.25 cd/sec	SPAFV70PSR	Federal Signal	33 mA
SPAFV25PSW	Speaker/Strobe. 25 VRMS; Strobe, 0.25 cd/sec	SPAFV25PSW	Federal Signal	33 mA
SPAFV70PSW	Speaker/Strobe. 70.7 VRMS; Strobe, 0.25 cd/sec	SPAFV70PSW	Federal Signal	33 mA
SPAFV25PRW	Speaker/Strobe. 25 VRMS; Strobe, 0.25 cd/sec	SPAFV70PRW	Federal Signal	33 mA
SPAFV70PRW	Speaker/Strobe. 70.7 VRMS; Strobe, 0.25 cd/sec	SPAFV70PRW	Federal Signal	33 mA

Note: The speaker appliances listed above are the only speakers that may be used. However, any UL listed, 24 V_{DC} nonspeaker appliances (ie., horns, bells, strobes) may be used when using the RPS-424 Power Supply/Battery Charger that is regulated and UL listed for fire signalling applications.

Grinnell
FIRE PROTECTION SYSTEMS COMPANY

OXA-500SB Signal Expander Module

PCB P/N 940527   **Assembly No. 976024**

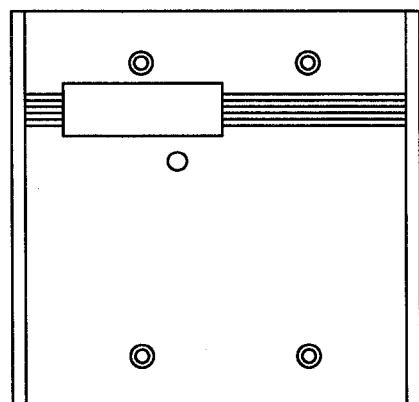**Publication Number 19700222**
Issue 4, January 1997

The Signal Expander Module is used to activate signalling appliances in response to an input from the common alarm (sounder) output of the fire control panel or a Signal Driver Module. The main use of the module is to increase the current driving capabilities of the control panel or Signal Drivers so that high-current devices such as Xenon lights, horns, etc. can be driven. The module is capable of passing current up to 4 A maximum. The signalling appliances are powered from a separate UL listed power supply suitable for fire protective signalling service..

Using the Signal Expander Module allows the signalling appliance circuits (and module itself) to be supervised via end-of-line devices. Signalling appliances must be equipped with EMI suppression and diode polarization devices.

Install in accordance with NFPA 70, National Electrical Code, NFPA 72, Installation, Maintenance, and use of Protective Signaling Systems; NFPA 72G, Guide for the Installation, Mainte-nance, and Use of Notification Appliances for Protective Signalling Systems.

Installation:

The printed circuit board is attached to the cover plate. The connection terminals are accessible on the back. After connections have been made, the cover plate is mounted onto the electrical box. The LED extends through the front of the cover plate and provides indication of unit operation.

System Compatibility: AUTOCALL TFX Fire Control Systems
Device Location: *(See System Layout)*

Specifications:

Environment: Indoor Application Only
Operating Temperature: 32°F to 120°F
Operating Humidity: 85% (non-condensing)
Base/Cover Material: "Bayblend" polycarbonate ABS alloy
Input Voltage: 24 VDC (nominal)
Maximum Current: 4 A @ 24 VDC
Signalling Appliance Wiring:
    Open circuit 5 k-ohm,
    Short circuit 70 ohm
Supervisory Current Draw: 85 mA
Alarm Current Draw: 90 mA (no signalling appliances--EOL only)
End-of-Line: UL listed 270 ohm, 5 W, wire wound (P/N 976043); UL listed 22 k-ohm (P/N 976042)
Terminal Block Wiring: No. 12 to 19 AWG shielded
Dimensions (lwd): 4.9 x 4.9 x 1 inch
Shipping weight: 3.6 ounces
Mounting Requirements: One UL listed electrical box of sufficient depth to accommodate wiring (dimensions depend upon application-flush or surface mount):

- Surface - 2-gang switch box
- Surface - 2-gang tile box
- Flush - 4-inch square box with 2-gang adapter (provides more wiring depth)
- Flush - cast box with 2-gang switch plate mounting
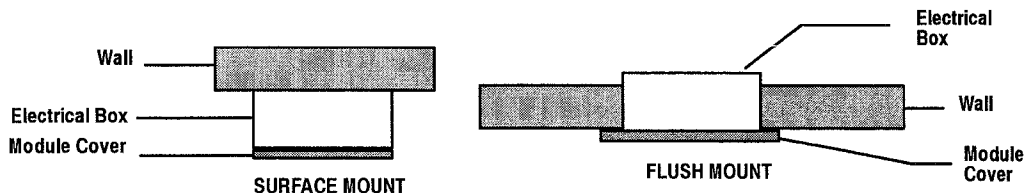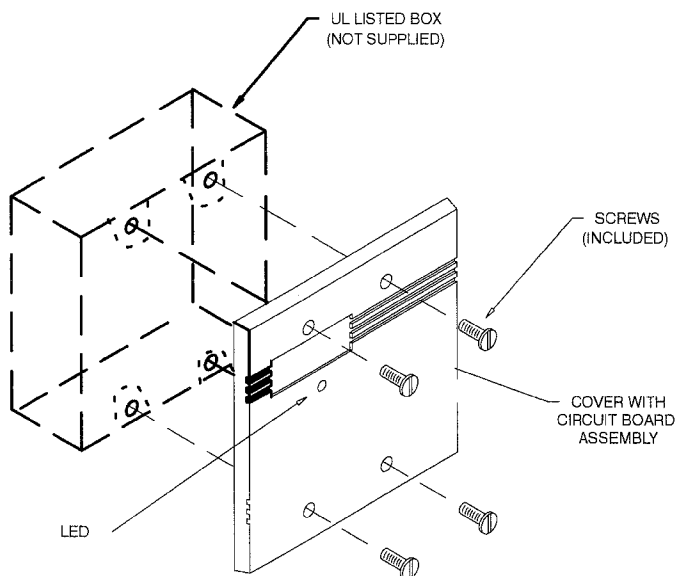

OXA-500SB

Figure 1.   OXA-500SB Signal Expander Module Installation.

Wiring:

1. Before connecting any module or device, make sure that the wiring is correct and has been tested.
2. All wiring to conform to current National Electrical Code, NFPA 70, state, and local building code requirements and applicable notes.
3. All conductors to be free of grounds.
4. Disconnect power from the circuit before installing modules.
5. When making connections, break wire run, strip 3/8-inch insulation from the ends of the wire, slide the bare ends of the wire under the terminal clamping plate, and tighten the clamping screw.

6. This module requires no address setting since it is not connected to the 2-way (multiplex) data circuit.
7. Connect terminals I/P+ and I/P- to the Signal Driver Module (OXA-500SM P/N 940526) output. Make sure the polarity is correct.
8. Connect the UL listed 22 k-ohm EOL resistor (P/N 976042) to EOL terminals (–) and (+).
9. Connect the 24 V output from the UL listed regulated power limited supply unit to the negative (0V) and positive (24V) terminals.
10. Connect the UL listed signalling appliance making sure of correct polarity. Connect UL listed 270-ohm, 5-W EOL device (P/N 976043) to SDR+ and SDR–.
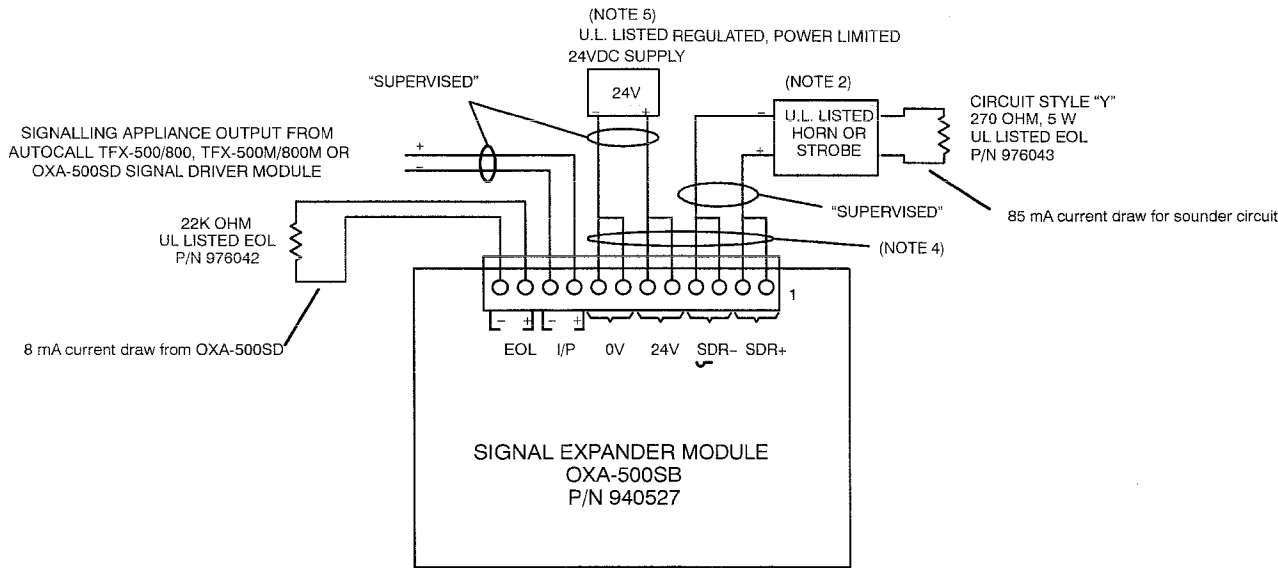11. Make sure EMI suppression device is installed.

Figure 2.   OXA-500SB Signal Expander Wiring. All circuits and connections are power limited/Class2.

Notes:

1. All wiring to conform to current National Electrical Code, NFPA 70, state, and local building code requirements and applicable notes. All circuits contained in this module are classified as power limited/Class 2 and shall be installed to comply with N.E.C. Article 760, Part A and Part C.

2. Signalling appliances must be equipped with EMI suppression and diode polarization devices.
3. Break wire run to provide supervision.
4. Duplicate terminals are not used in AUTOCALL TFX application.
5. Use only RPS-424 (P/N 910683) UL listed regulated 24-volt power supply.

Grinnell®
FIRE PROTECTION SYSTEMS COMPANY

OXM-501 RM/SDA Motherboard

PCB 900981   Assembly No. 976253

Publication Number 19700382
Issue 3, January 1997

The OXM-501 RM/SDA Motherboard provides connections for combinations of OXA-501RM or OXA-503RM Relay Modules, OXA-501SDA Signal Driver Modules and/or 505SDA Notification Appliance Modules. Up to four OXM-501 RM/SDA Motherboards can be mounted on a standard back plate.

The OXA-501 can accommodate the following combinations of plug-in boards: 1 to 3 OXA-501RM Relay Modules; 1 to 3 OXA-501SDA Signal Driver Modules; 1–3 505SDA Notification Appliance Modules.

Features

- Two three-position terminal blocks provide for wiring TFX addressable loop.
- Three sets of two pluggable terminal blocks for relay and/or signal driver module installation. Module terminal blocks are keyed for correct board orientation during installation.
- Three sets of output terminal blocks for sounder circuit output field wiring.
- Three terminal blocks for relay and/or signal driver module field wiring.

MODULE POSITION _____
(See System Layout)

Space Requirement: 1/4 rear module space and 1 door module space (rear mount)

Dimensions (whd): 4 × 5 1/4 × 3 1/8 inches (with plug-in modules installed)

Table 1.   Electrical Specifications

Battery Requirements	
Addressable Loop	
Standby Current	0 mA
Alarm Current	0 mA
Addressable Loop Currents	
For plug-in-modules	per plug-in module

INSTALLATION NOTES

1. Set loop address for each OXA-501RM module (Refer to Publication No. 19700224) or each OXA-503RM module (refer to Publication 19700415); each OXA-501SDA module (Refer to Publication No. 19700332); each 505SDA module (Refer to Publication No. 19700473).

2. Install the RM and/or SDA modules in the correct sockets on the OXM-501 RM/SDA Motherboard. Make sure each board is oriented correctly.

    Important: When installing SDA modules, install the first SDA in position J1A–J1B. That is, always install SDA modules from left-to-right.

3. When one or more modules are powered from the same source, jumpers JP1–JP4 can be installed to connect the input power from Module 1 (TB1) to Module 2 and Module 3. Install jumpers JP1 and JP2 to connect input power from Module 1 (TB1) to Module 2 (TB2); Install jumpers JP3 and JP4 to connect input power from Module 1 to Module 3 (TB3).
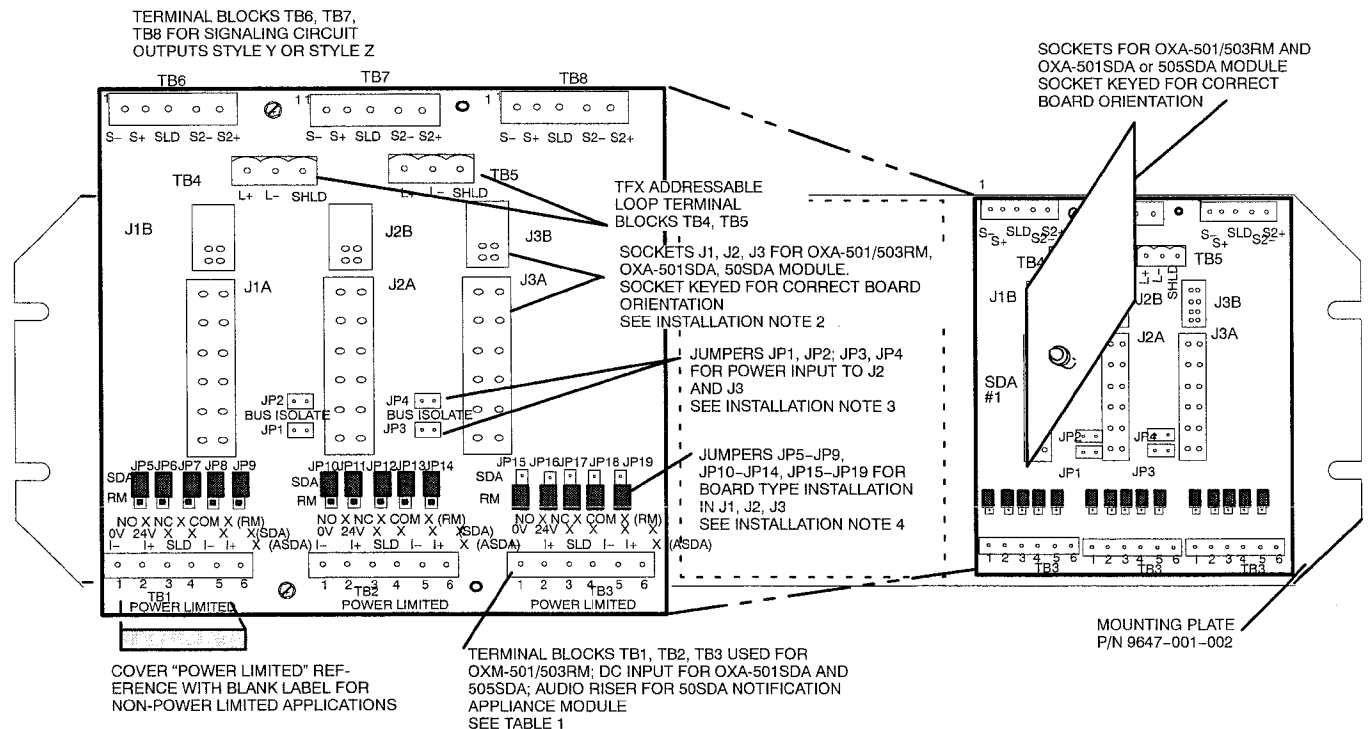
Figure 1.   OXM-501 RM/SDA Motherboard Installation.

4. Install Jumpers JP5–9, JP10–JP14; JP15–JP19 in the "SDA" position when OXA-501SDA or 505SDA are installed in the adjascent connector. Install Jumpers JP5–9, JP10–JP14; JP15–JP19 in the "RM" position when OXA-501/503RM modules are installed in the adjascent connector.

5. Install field wiring to terminal blocks.

6. Add blank label to cover the "POWER LIMITED" notation on the terminal block if terminal block is to be used with non-power limited source.

Table 1.   Terminal Block and Jumper Designations
*NOTE: When mixing SDA and RM modules, an SDA **must** be mounted in J1A, J1B; RM in J3A, J3B.*

TB1 (RM #3)		Jumpers	TB2 (RM #2)		Jumpers	TB3 (RM #1)		Jumpers
1	N/O	Jumpers JP5–JP9 in "RM" position	1	N/O	Jumpers JP10–JP14 in "RM" position	1	N/O	Jumpers JP15–JP19 in "RM" position
2	(Not used)		2	(Not used)		2	(Not used)	
3	N/C		3	N/C		3	N/C	
4	(Not used)		4	(Not used)		4	(Not used)	
5	COM		5	COM		5	COM	
6	(Not Used)		6	(Not Used)		6	(Not Used)	
(OXA-501SDA or 505SDA DC Application #1) DC Input Circuit TB1		Jumpers	**(OXA-501SDA or 505SDA DC Application #2) DC Input Circuit TB2**		Jumpers	**(OXA-501SDA or 505SDA DC Application #3) DC Input Circuit TB3**		Jumpers
1	0V	No Jumpers in JP1 and JP2 Jumpers JP5–JP9 in "SDA" position	1	0V	Install JP1 and JP2 See Installation Note 3 Jumpers JP10–JP14 in "SDA" position	1	0V	Install JP3 and JP4 See Installation Note 3 Jumpers JP15–JP19 in "SDA" position
2	24V		2	24V		2	24V	
3	SLD		3	SLD		3	SLD	
4	I–		4	I–		4	I–	
5	I+		5	I+		5	I+	
6	(Not Used)		6	(Not Used)		6	(Not Used)	
Signaling Circuit TB6			**Signaling Circuit TB7**			**Signaling Circuit TB8**		
1	S–		1	S–		1	S–	
2	S+		2	S+		2	S+	
3	SLD		3	SLD		3	SLD	
4	S2–		4	S2–		4	S2–	
5	S2+		5	S2+		5	S2+	
(505SDA #1) [Notification Appliance Module] Audio Riser TB1		Jumpers	**(505SDA #2) [Notification Appliance Module] Audio Riser TB2**		Jumpers	**(505SDA #3) [Notification Appliance Module] Audio Riser TB3**		Jumpers
1	I–	No Jumpers in JP1 and JP2 Jumpers JP5–JP9 in "SDA" position	1	I–	Install JP1 and JP2 See Installation Note 3 Jumpers JP10–JP14 in "SDA" position	1	I–	Install JP3 and JP4 See Installation Note 3 Jumpers JP15–JP19 in "SDA" position
2	I+		2	I+		2	I+	
3	SLD		3	SLD		3	SLD	
4	I–		4	I–		4	I–	
5	I+		5	I+		5	I+	
6	(Not Used)		6	(Not Used)		6	(Not Used)	
Signaling Circuit TB6			**Signaling Circuit TB7**			**Signaling Circuit TB8**		
1	S–		1	S–		1	S–	
2	S+		2	S+		2	S+	
3	SLD		3	SLD		3	SLD	
4	S2–		4	S2–		4	S2–	
5	S2+		5	S2+		5	S2+	

WIRING NOTES

1. All wiring is to be in accordance with N.E.C. (National Electrical Code), local authorities, and applicable notes. When installed to comply with N.E.C. Article 760, Part A and Part B, these circuits are classified as **non-power limited**. When installed to comply with N.E.C. Article 760, Part A and Part C, these circuits are classified as power limited.

2. Disconnect power before servicing system.

3. All conductors must be free of grounds.

4. All power wiring must be No. 14 AWG maximum.

5. Addressable loop circuit parameters: Maximum line resistance is 75 ohms; maximum line capacitance is 0.5 microfarad (mutual); maximum line inductance is 1.5 millihenry (total); maximum continuous distance is 6500 feet. Use UL listed shielded wire pair that allows for these parmeters. Shield must be continuous and connected to DC Common at the main power supply.

6. Wiring to OXA-501RM or OXA-503RM relay terminals (see Figure 2):

7. For dry contact switching, connect the external circuit to the COM and NO or NC terminals for normally-open or normally-closed contacts as required.

8. For powered circuit operation, connect one power supply terminal to the COM and one circuit connection to the NO or NC terminals for normally-open or normally-closed contacts as required. Use only UL listed power supply suitable for fire protective signalling service.

9. TBn-2, TBn-4, and TBn-6 (where n is TB1, TB2, TB3) are not used in this application.

10. Wiring to OXA-501SDA signalling circuit terminals (see Figure 3):

11. For NFPA Style Y circuit, connect UL listed signalling appliances to terminals TBn-1 and TBn-2 (where n is TB6, TB7, TB8). Install UL listed 22 k-ohm end-of-line resistor (P/N 976042) into the last device. Connect shield to TBn-3.

12. For NFPA Style Z circuit operation, connect UL listed signalling appliances to terminals TBn-1, TBn-1, TBn-4, and TBn-5 (where n is TB6, TB7, TB8). Connect shield to TBn-3. Make sure the polarity of devices is correct (signalling appliances must be equipped with diode polarization). End-of-line device for Style Z circuit is located on OXM-500 board, no installation needed.

13. Connect TBn-1 to DCC and TBn-2 (where n is TB1, TB2, TB3) to +24 VDC of power supply. Use only UL listed power supply suitable for fire protective signalling service. Cover the "power limited" reference on terminal block with a blank label, if source is non-power limited. Maintain at least 0.25 inches separation of all non-power limited wiring from all power limited/Class 2 wiring.

14. Wiring to 505SDA Audio Input Application signalling circuit terminals (see Figure 4):

15. For NFPA Style Y circuit, connect UL listed signalling appliances to terminals TBn-1 and TBn-2 (where n is TB6, TB7, TB8). Install UL listed 27 k-ohm end-of-line resistor (P/N 976250) into the last device. Connect shield to TBn-3.

16. For NFPA Style Z circuit operation, connect UL listed signalling appliances to terminals TBn-1, TBn-1, TBn-4, and TBn-5 (where n is TB6, TB7, TB8). Connect shield to TBn-3. Make sure the polarity of devices is correct (signalling appliances must be equipped with DC blocking for audio operation). End-of-line device for Style Z circuit is located on OXM-500 board, no installation needed.

17. Connect TBn-1 to Audio Riser (–)and TBn-2 to Audio Riser (+) (where n is TB1, TB2, TB3). Cover the "power limited" reference on terminal block with a blank label, if source is non-power limited. Maintain at least 0.25 inches separation of all non-power limited wiring from all power limited/Class 2 wiring.

18. When this device is the last device on the audio riser circuit, install audio riser end-of-line UL listed 5.1 k-ohm, 2Watt resistor (P/N 4281–050) across terminals TBn-4 and TBn-5 (where n is TB2, or TB3).

19. Wiring to 505SDA DC Input Application signalling circuit terminals (see Figure 5):

20. For NFPA Style Y circuit, connect UL listed signalling appliances to terminals TBn-1 and TBn-2 (where n is TB6, TB7, TB8). Install UL listed 27 k-ohm end-of-line resistor (P/N 976250) into the last device. Connect shield to TBn-3.

21. For NFPA Style Z circuit operation, connect UL listed signalling appliances to terminals TBn-1, TBn-1, TBn-4, and TBn-5 (where n is TB6, TB7, TB8). Connect shield to TBn-3. Make sure the polarity of devices is correct (signalling appliances must be equipped with diode polarization). End-of-line device for Style Z circuit is located on OXM-500 board, no installation needed.

22. Connect TBn-1 to DCC and TBn-2 (where n is TB1, TB2, TB3) to +24 VDC of power supply. Use only UL listed power supply suitable for fire protective signalling service. Cover the "power limited" reference on terminal block with a blank label, if source is non-power limited. Maintain at least 0.25 inches separation of all non-power limited wiring from all power limited/Class 2 wiring.

23. Each shield is connected separately on the OXM-501 Motherboard from the input to output connectors. The shield for the audio cables should be tied (at one point only) at the amplifier source to system DC Common. The speaker end of the shield should be left unterminated.

24. These drawings are typical only and not intended to show actual quantity or locations of devices in a circuit.

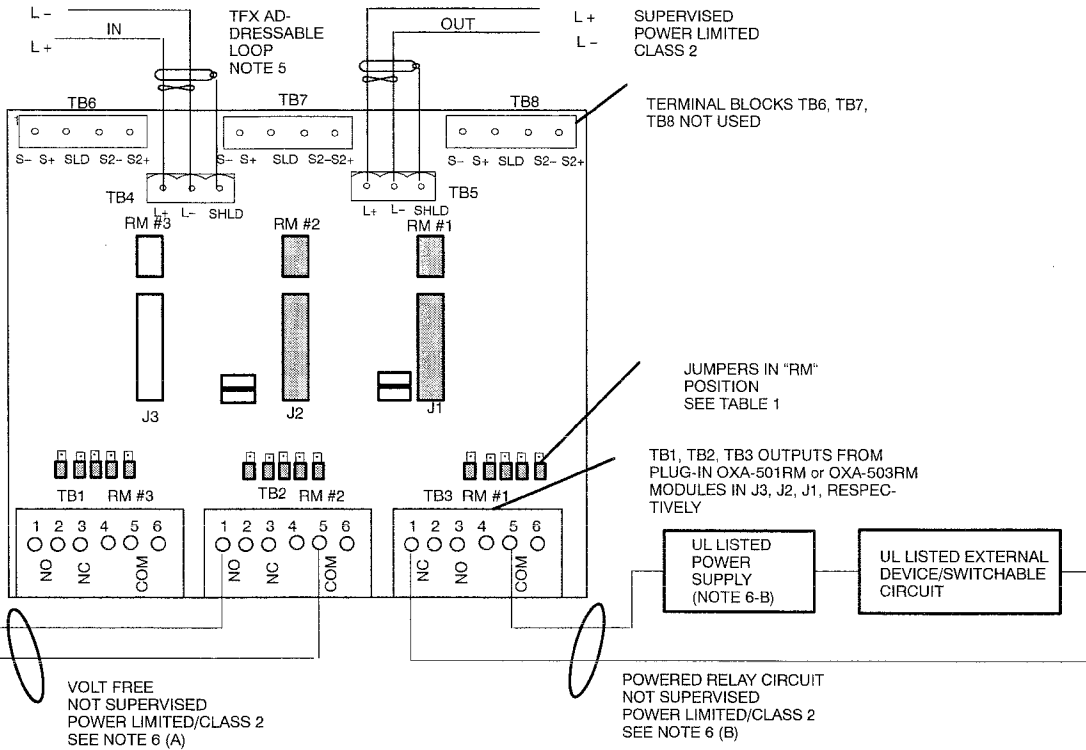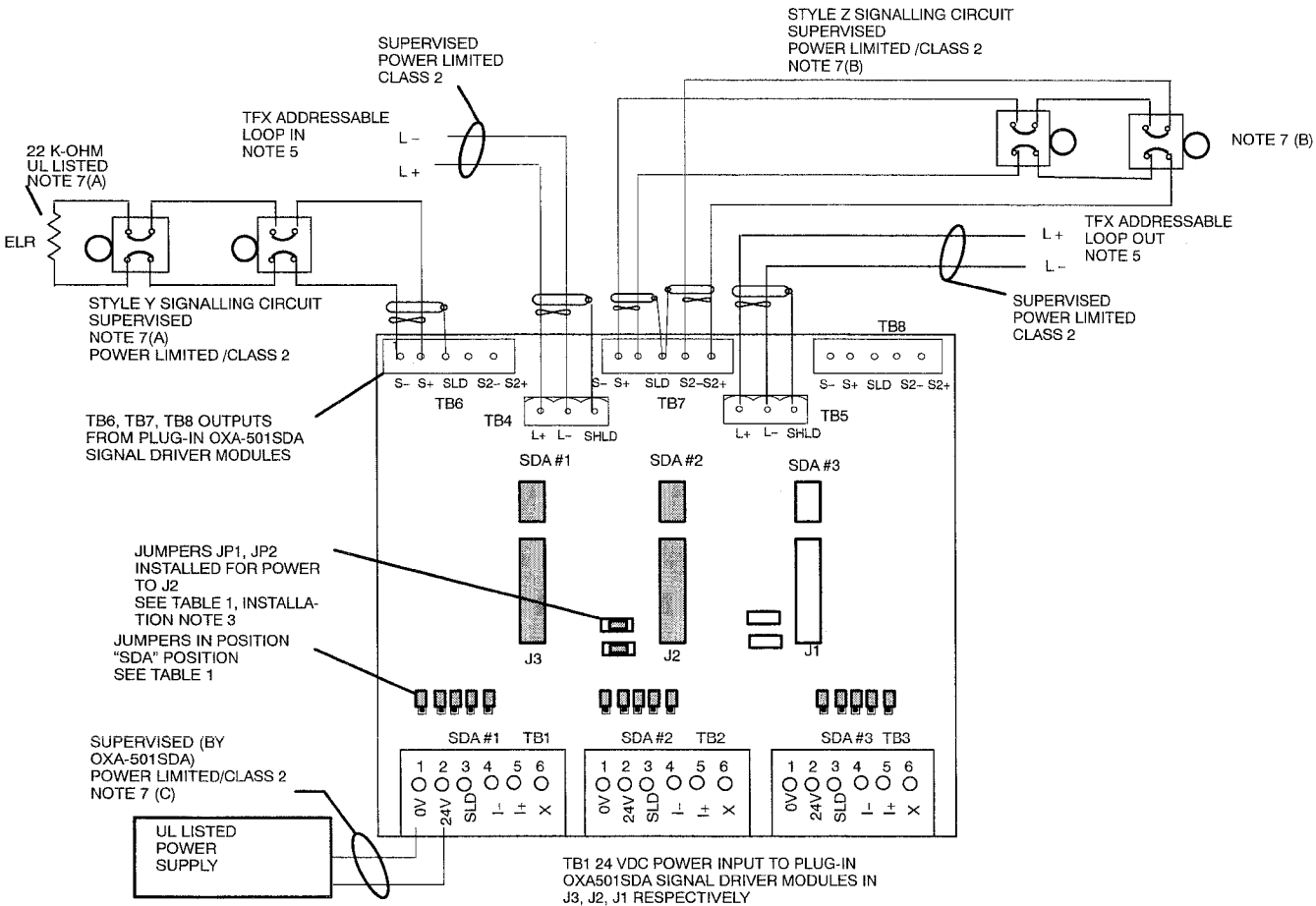Figure 2. Typical wiring diagram for two OXM-501RM or OXA-503RM relay modules.

Figure 3. Typical Wiring for Signaling Circuit, OXA-501SDA Modules Installed on OXM-501 RM/SDA Motherboard.
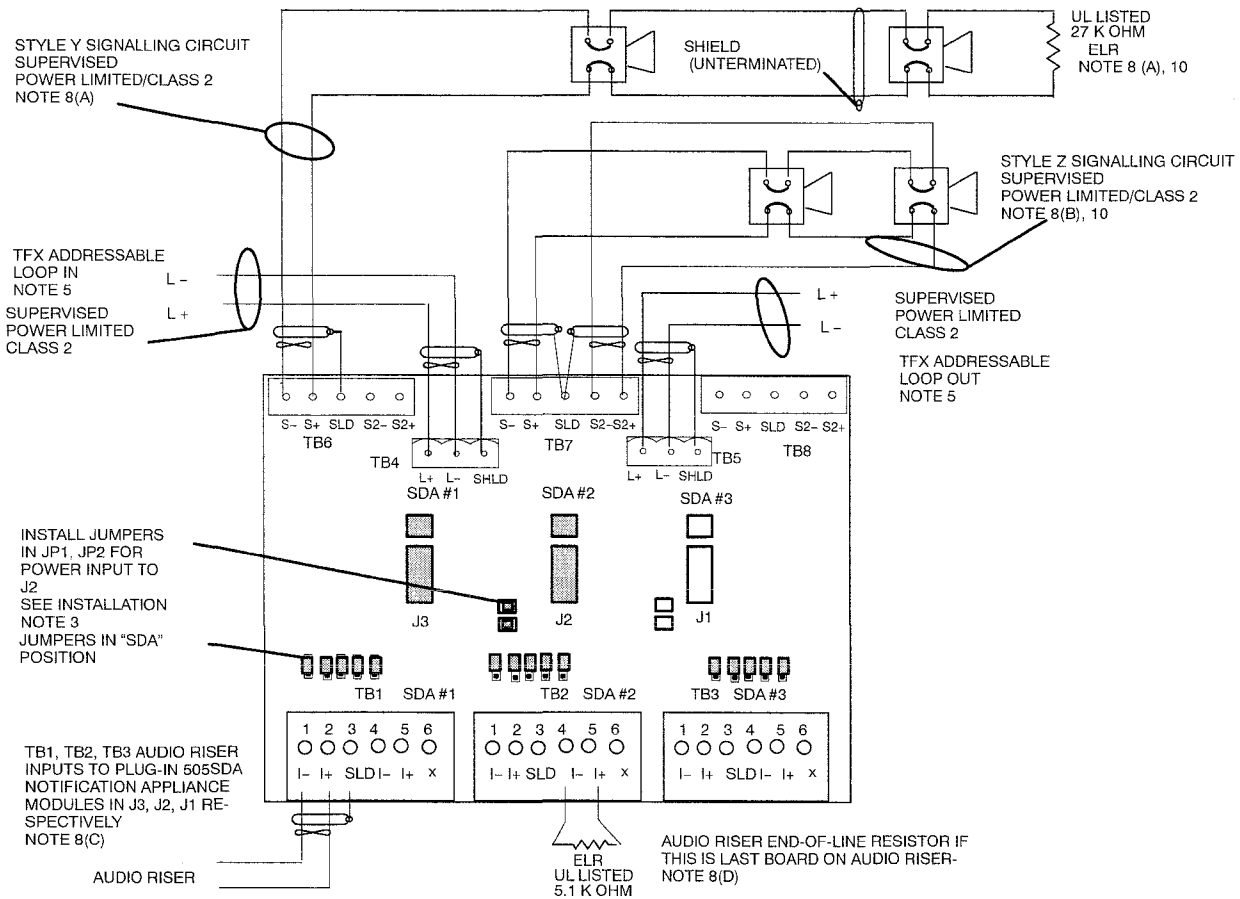
Figure 4. Typical Wiring for 505SDA Modules, Audio Application, Installed on OXM-501 RM/SDA Motherboard.
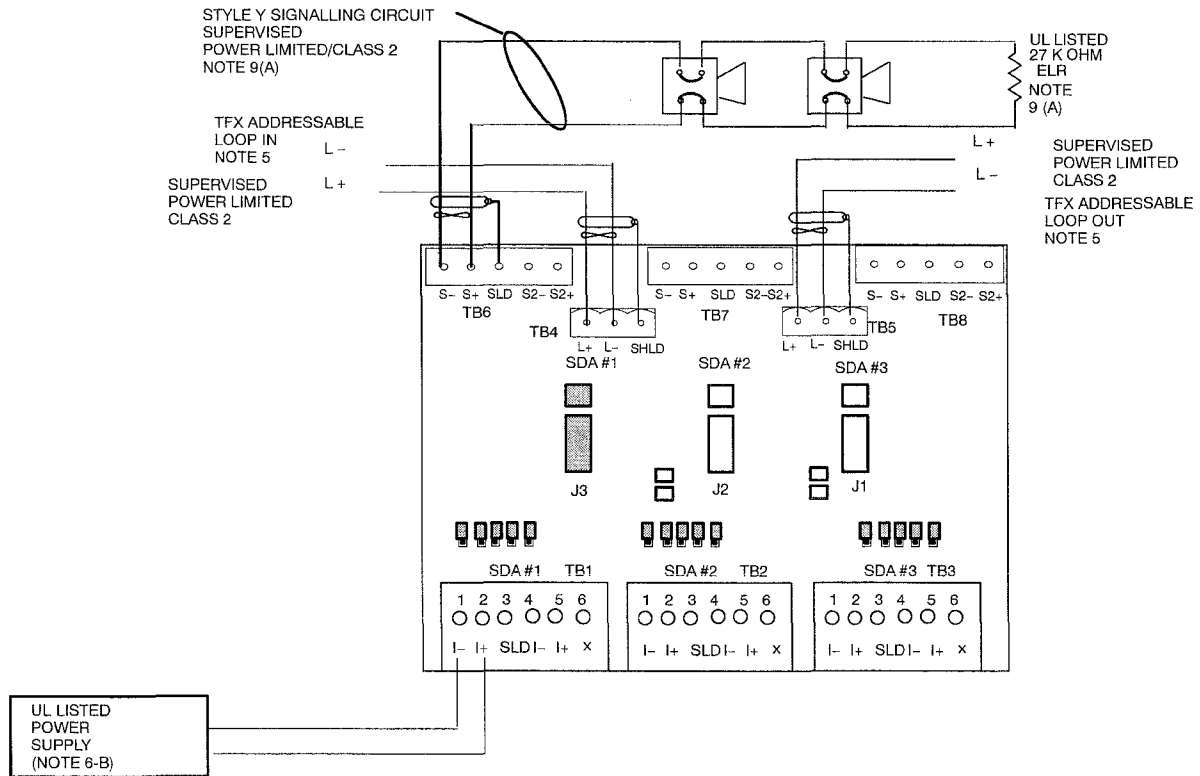
Figure 5. Typical Wiring for 505SDA Module, DC Application, Installed on OXM-501 RM/SDA Motherboard.

This document is written for skilled technicians with experience installing and testing fire detection systems. These instructions do not purport to cover all the details or variations in the equipment described. Nor do they provide for every possible contingency met in connection with installation, operation, or maintenance. All specifications are subject to change without notice.

Should further information be desired or should particular problems arise which are not covered sufficiently for the user's purposes, the matter should be referred to Grinnell Fire Protection Systems Company, Inc., Westlake, Ohio 44145. Ph. (216) 871-9900.

Grinnell
FIRE PROTECTION SYSTEMS COMPANY

IXM-500 CMA Motherboard

PCB P/N 900973,
Assembly No. 976184

Publication Number 19700383,
Issue 2, January 1997

The IXM-500 CMA Motherboard provides connections for combination of 1 to 3 IXA-502CMA Contact Monitoring Modules. Up to four IXM-500 Motherboards can be mounted on a standard back plate.

Features

- Pluggable three-position terminal blocks provide for wiring TFX addressable loop.
- Three sets of two terminal blocks for monitoring contacts. Module terminal blocks are keyed for correct board orientation during installation.
- Terminal blocks for addressable loop and contact monitoring module field wiring.

MODULE POSITION _____
(See System Layout)

Space Requirement: 1/4 rear module space and 1 door module space (rear mount)

Dimensions (whd): 4 × 5 1/4 × 3.125 inches (with plug-in modules installed)

Battery Requirements		
	Standby	Alarm
IXM-500 CMA Motherboard	0 mA	0 mA
Each Plug-in CMA Module	0.27 mA	0.27 mA

Installation Notes

1. Set loop address for each IXA-502CMA module (Refer to Publication No. 19700333).

2. Install the CMA modules in the correct sockets on the IXM-500 CMA Motherboard. Make sure each board is oriented correctly. When installing CMA modules, install the first CMA in position J1A–J1B.

3. Install field wiring to terminal blocks.

4. Remove "Power Limited" label for TB1 if used with non-power limited source(s).
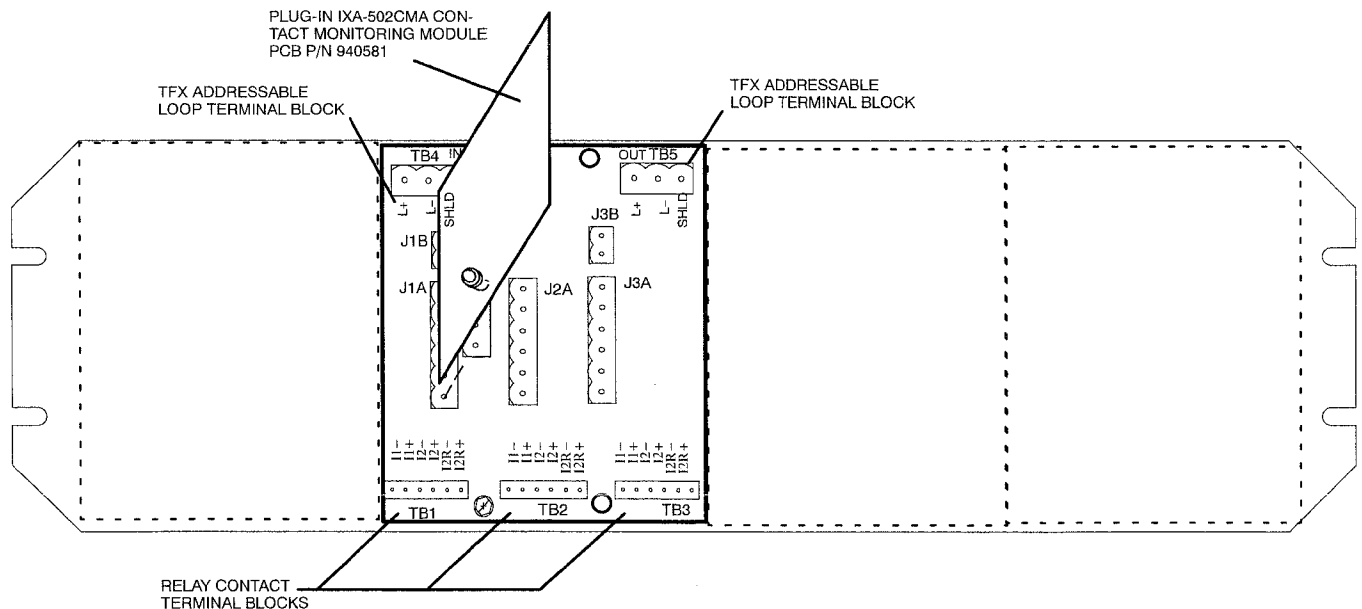

Figure 1.   *IXM-500 IXA-502CMA Motherboard Installation.*

Table 1. IXM-500 Terminal Block and Jumper Designations

TB1 (CMA #1)			TB2 (CMA #2)			TB3 (CMA #3)		
1	I1−	(Not Used, See Note 5)	1	I1−	(Not Used, See Note 5)	1	I1−	(Not Used, See Note 5)
2	I1+	(Not Used, See Note 5)	2	I1+	(Not Used, See Note 5)	2	I1+	(Not Used, See Note 5)
3	I2−		3	I2−		3	I2−	
4	I2+		4	I2+		4	I2+	
5	I2R−		5	I2R−		5	I2R−	
6	I2R+		6	I2R+		6	I2R+	

TB4 Addressable Loop IN		TB5 (Addressable Loop OUT)			
1	L+	1	L+		
2	L−	2	L−		
3	Shield	3	Shield		

WIRING NOTES

1. All wiring is to be in accordance with N.E.C. (National Electrical Code), local authorities, and applicable notes. When installed to comply with N.E.C. Article 760, Part A and Part B, these circuits are classified as **non-power limited**. When installed to comply with N.E.C. Article 760, Part A and Part C, these circuits are classified as power limited. Remove "Power Limited" label from TB1-3 if used with non-power limited source.

2. Disconnect power before servicing system.

3. All conductors must be free of grounds.

4. When making connections, break wire run, strip 3/8-inch insulation from the end of the wires, slide the bare ends of the wire under the terminal clamping plate, and tighten the clamping screw.

5. The 2.2 k-ohm identity resistor is located on the motherboard for the CMA modules.

6. Connect the UL listed monitored contact device as shown in Figure 2 (a), (b), (c), (d).

7. For circuits Style C and Style E, install the end-of-line resistor (1 k-ohm, UL listed, P/N 976045) into the circuit of the monitored contact device. For Style D, and Style E, the 1 k-ohm end-of-line resistor is located on the motherboard.

8. Addressable loop circuit parameters: Maximum line resistance is 75 ohms; maximum line capacitance is 0.5 microfarad (mutual); maximum line inductance is 1.5 millihenry (total); maximum continuous distance is 6500 feet. Use UL listed shielded wire pair that allows for these parmeters. Shield must be continuous and connected to DC Common at the main power supply.

9. This drawing is typical only and is not intended to show actual quantity or locations of devices in a circuit.
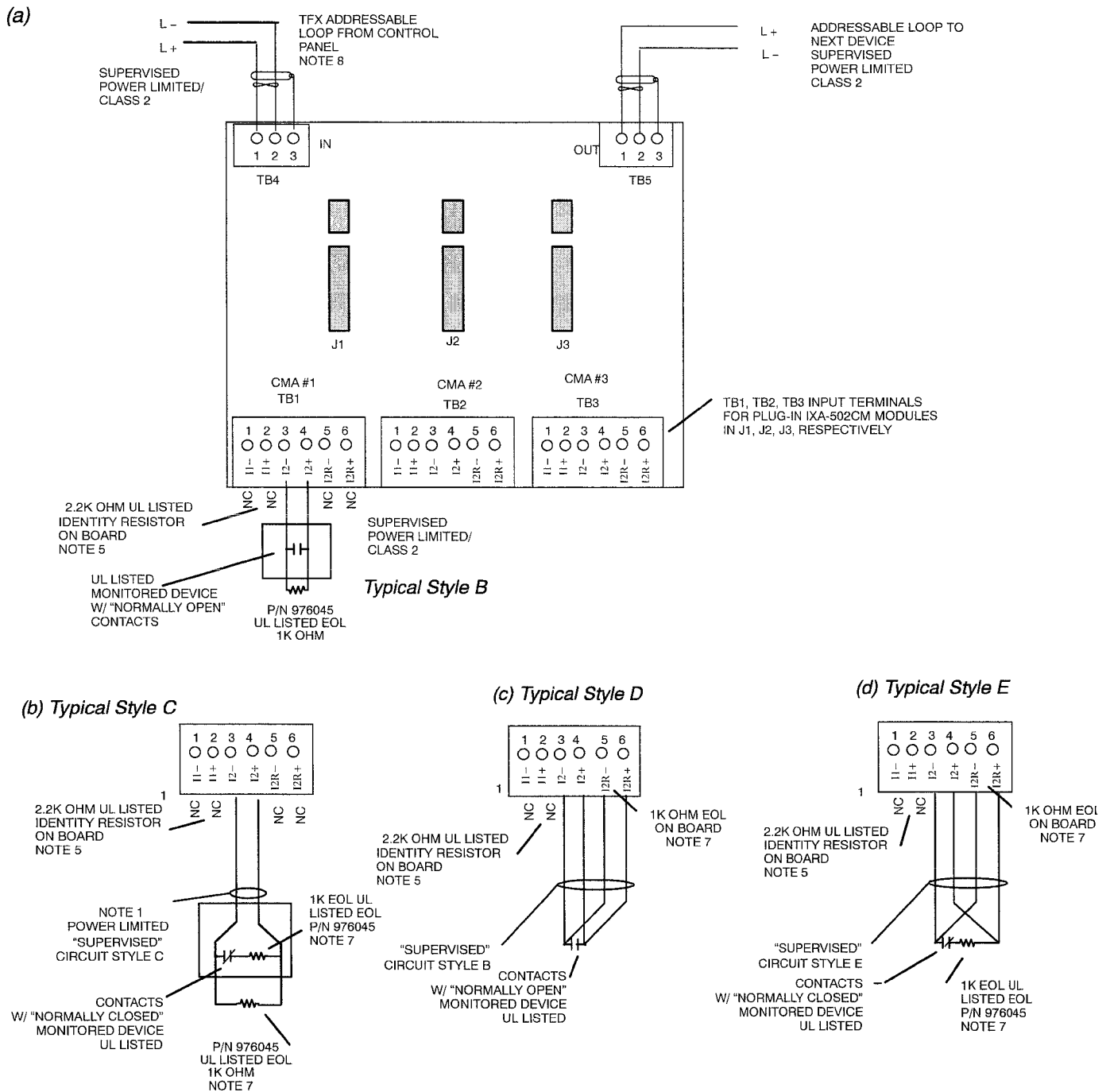
Figure 2.   Typical Wiring for IXA-502CMA Modules (a) Style B, (b) Style C, (c) Style D, (d) Style E.

550 Series Analog Addressable Detectors and Bases

Publication Number 850505
Issue 3, January 1997

General Description

| Model	Part Number	Description
IBN-552	920192	6-inch Addressable Low Profile Base
IBN-553	920194	6-inch Addressable Base with Relay
IBN-554	920195	6-inch Addressable Base with Sounder
ISN-550I	920095	Ionization Smoke Analog Addressable Detector Head
ISN-550P	920096	Optical Smoke Analog Addressable Detector Head
IHN-135	920097	135 deg.F Heat Analog Addressable Detector Head
IHN-200	920098	200 deg. F Heat Analog Addressable Detector Head
IAN-ADD	920101	Addressable XPERT Card
IBN-550	920099	4-inch Addressable Base (not available in U.S.)

The 550 Series Analog Addressable Detectors and Bases (Figure 1) are used with Autocall TFX fire control panels. The ISN-550I, ISN-550P, IHN-135 and IHN-200 detector heads plug in to the IBN-550 four-inch detector base and in to the IBN-552, IBN-553, and IBN-554 six-inch detector bases and are interchangeable. The ISN-550 series smoke detectors meet the requirements of UL268 and 268A; the IHN heat detectors meet the requirements of UL521 for use in fire alarm signalling systems. They may be either ceiling or wall mounted.

The IBN-552 Low Profile Base is intended for use in a 2-wire, Style B or Style D conventional input zone.

The IBN-553 Relay Base has a relay with two sets of voltage-free changeover contacts (form C). The contacts transfer when the detector alarms or when the 24VDC polarity is reversed. The base provides a yellow LED that turns on when the relay coil is energized. Optionally, a group of relay bases in a zone may be activated by reversing the 24VDC polarity. An end-of-line relay provides supervision of the 24 VDC power.

The IBN-554 Sounder Base has a built-in notification appliance (sounder). The sounder activates when the detector alarms. Optionally, a group of sounder bases in a zone may be activated by reversing the 24 VDC polarity. An end-of-line relay and a contact monitoring module provides supervision of the 24 VDC power.
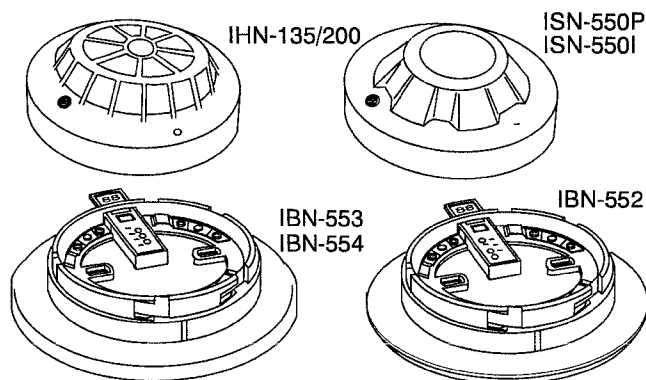
Figure 2   Detector Heads and Bases

The device address is set by inserting a programmed Addressable Xpert Card into the slot on the side of the base. (A programmable universal Addressable Xpert Card is supplied with each base.) Sets of factory-set Addressable Xpert Cards are available for ease of installation.

Specifications

Environmental Specifications:
Operating Temperature: 32 °F to 100°F (0 °C to 38 °C)
Operating Humidity: up to 85% (non-condensing)
Electrical Specifications:
Input Voltage: 17 V_{DC} to 30 V_{DC} (may be remote)
Wave Form: Filtered DC, 2 V ripple
Relay Rating: 0.4 A @ 125 V_{AC} resistive loading
2 A @ 30 V_{DC} resistive loading
Wire Size (terminal blocks on IBN-553 and IBN-554): 14 AWG   maximum
Audible Intensity (Base IBN-554): 85 dB at 10 feet

	Ionization	Photoelectric	Heat 135	Heat 200	
Model	ISN-550I	ISN-550P	IHN-135	IHN-200	
Battery Requirements:					
Max. Standby Current:					
Base IBN-550	0.20	0.30	0.30	0.30	mA
Base IBN-552	0.20	0.30	0.30	0.30	mA
Base IBN-553	0.20	0.30	0.30	0.30	mA
Base IBN-554	0.23	0.23	0.33	0.33	mA
Max. Alarm Current:					
Base IBN-550	4.00	4.20	3.90	4.50	mA
Base IBN-552	4.00	4.20	3.90	4.50	
Max Alarm Current W/LED	5.70	5.90	5.60	6.20	mA
Base IBN-554 (sounder activated)	50.0	50.0	50.0	50.0	
Base IBN-553 (relay activated)	36.0	36.0	36.0	36.0	
Addressable Loop Currents:					
Ident.. Current	3.0-4.0	5.2-6.8	12.6-16.3	6.3-8.1	mA
Clean Air/Room Temperature	4.6-8.0	7.0-10.0	3.0-7.7	4.0-8.0	mA
Alarm Threshold	Above 11.4	Above 10.7	Above 14.4	Above 17	mA
Other:					
Max devices per loop	99	99	99	99	
Remote LED Current	4.5	4.5	4.5	4.5	mA
Light/Radioactivity Source	Americium 241 (0.9 µCuries)	GaAs Infra-red Emitting Diode	N/A	N/A	
Heat Detector Characteristics:					
Ceiling Spacing			70	70	Feet
Identification Mark *			White Disk	Black Circle on a white background	
Detector Type			Fixed Temperature	Fixed Temperature	
Grade			Normal	Intermediate	
Fixed Temperature			135	200	°F

* White Disk — Black Circle on a white background

Dimensions:
6-inch diameter × 2-3/4-inches depth (Base IBN-553/554)
6-inch diameter × 2-inch depth (Base IBN-552)

Electrical Box Mounting Requirements:
3-1/2-inch square, OR 4-inch square, OR 4-inch octagonal

Sensitivity:

Sensitivity range may be selected during system programming using TFX-500/800 CONSYS, Version 3.0 and above and Firmware Version 3.2 and above. Refer to Publication 850463, *TFX-500/800 CONSYS Programming Guide.*

Address Cards

Sets of factory-set Addressable Xpert Cards are available. Use the following part numbers to order.

Addresses	Part Number
A1-A80	920168
B1-B80	920169
C1-C80 D1-D80	920170
E1-E80 F1-F80	920171
G1-G80 H1-H80	920172
J1-J80 K1-K80	920173
A81-A126 B81-B126	920174
C81-C126 D81-D126	920175
E81-E126 F81-F126	920176
G81-G126 H81-H126 J81-J126 K81-K126	920177
Blank Card Set (50)	920178

> **WARNING:** Disengage all alarm signalling devices, extinguishing systems, and releasing devices before testing the circuit.
>
> **WARNING:** Do not connect addressable loop wiring to the control panel until continuity checks are complete.

Before installing detector heads, read the installation instructions and system site plans. Check for correct sensor spacing, placement, zoning, and special circuit applications. Refer to NFPA 72 and the NEMA *Guide for Proper Use of System Smoke Detectors,* P/N 850460.

ISN-550I Ionization Detector

The ISN-550I Ion Chamber Smoke Detector responds to visible and invisible particles produced in fires using an ionization chamber. It does not detect gas, heat, or flames.

When smoke particles enter the ionization chamber, ions become attached to them. See Figure 2. The result is that current flow through the ionization chamber decreases. This effect is greater in the smoke chamber than in the reference chamber and the imbalance causes the detector to go into alarm.

The reference chamber is relatively insensitive to smoke and provides a comparison for the detection chamber. This chamber makes the ISN-550I remarkably stable in a wide range of environmental conditions.

After an ion chamber smoke detector has been cleaned or replaced, reset the point threshold compensation:

6. At the TFX control panel, select the "Reset point threshold compensation" menu option from the System Test Menu or enter Fast Access Code 0037.
7. Select the loop on which the detector is installed.
8. Enter the point address number of the device. The display will show **[point no. xx update successful]** where xx is the actual point number. If the selected device has not been configured, the display will show **[Point not found]**. If the device is not an analog addressable detector, the display will show **[invalid, try again]**.

ISN-550P Photoelectric Detector

The ISN-550P Photoelectric Smoke Detector responds to visible smoke particles from flaming and smoldering fires using light scattering properties of those particles. It does not detect gas, heat, or flames.

An infrared LED inside the chamber emits a burst of collimated light every 0.5 second which in clean air conditions can not be scattered into the sensing photo-diode. See Figure 3. When smoke does enter the chamber, light is scattered by the smoke particles and detected by the photo-diode and the detector goes into alarm.
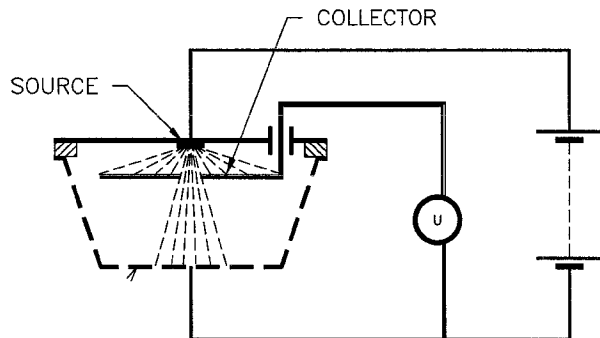
Figure 3   Detector Type - Ionization
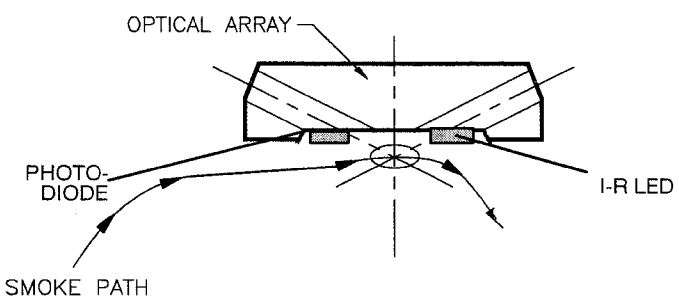
Figure 4   Detector Type - Photoelectric
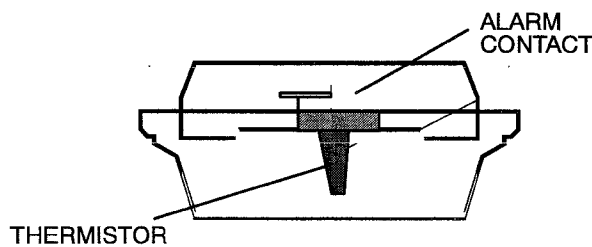
Figure 5   Detector Type - Heat

IHN-135/200 Heat Detectors

The IHN-135/200 heat detectors make use of a negative temperature coefficient thermistor to sense the temperature of the surrounding air. A fixed value resistor in series with the insulated thermistor is used to determine the fixed temperature response of the detector at high temperatures. See Figure 4.

There are two fixed temperature detectors in the IHN analog addressable heat detector series. The (IHN-135) is rated as Normal and alarms at 135 °F. The (IHN-200) is rated as Intermediate and alarms at 200 °F.

IBN-553 Relay Base and IBN-554 Sounder Base Programming of RESET time

When "power off" is used to reset either theIBN-553 Analog Addressable Relay Base (P/N 920194) or IBN-554 Analog Addressable Sounder Base (P/N 920195), at least four (4) seconds of "power off" is required for RESET. Use CONSYS to program a delay of at least four (4) seconds before power is restored to these detector bases. See Figures 9 and 11.

Detector Operation and Application

Under normal standby conditions, the detector LED flashes when the detector is polled. When the smoke level exceeds the alarm threshold, an alarm is triggered at the control panel. The detector LED then lights steadily.

The 550 Series Smoke and Heat Detectors meet the requirements of UL 268, 268A, and 521 for use in fire alarm signalling systems as well as for dust, corrosion, vibration, shock, and impact resistance.

Fire alarm system applications of the 550 Series detectors include industrial, commercial, and institutional ceiling or wall installations. Install the 550 Series detectors in accordance with UL 268, 268A, 521, NFPA 72, and all local codes and ordinances.

Smoke Detector Location

By following the items listed in NFPA 72, base the number and location of detectors on an engineering survey of the area to be protected.

Consider:

- Contents to be protected
- Type of construction and use
- Is there human occupancy
- Burning characteristics of contents
- Space involved
- Height of ceilings
- Surface condition of ceilings
- Total area
- Air movement--stratification
- Vent locations--velocities--dilution
- Deflections and obstructions

In general, some rules may be followed:

One smoke detector to cover each 450 to 900 square feet. Local conditions and codes supplemented with engineering evaluations can provide the proper spacing and coverage.

Example: Where smooth ceilings are present, 30 foot spacing may be considered. Areas that employ beams or other obstructions extending more than 18 inches below the ceiling such obstructions should designate a new separation point and be considered a new section. Areas that employ beams or other obstructions extending more than 8 inches but less than 18 inches, spacing should be reduced at the perpendicular of such obstruction to compensate.

For differing styles of construction consult NFPA Handbook, Section 72.

Remember: In order for a detector to operate, combustion products must enter the outer chamber. Air flow, stratification, velocity, stagnation, and migration all affect the efficiency and accuracy of the installation. Air flow meters may be utilized.

- DO NOT INSTALL smoke detectors in areas where temperatures are likely to exceed 100 degrees F or fall below 32 degrees F.
- DO NOT INSTALL detectors closer than 4 inches to side wall.
- DO NOT INSTALL detectors where forced ventilation can dilute the smoke from a fire.
- DO NOT INSTALL detectors near air conditioning vents.
- DO NOT INSTALL ion or photo detectors in known areas of combustion such as kitchens, furnace rooms, etc.

Testing the Wiring

Before connecting any module or device on the input zone circuit, make sure that the wiring is correct and has been tested.

Base Installation

The IBN-553/554 bases mount directly to 4-inch square and 4-inch octagonal electrical boxes. The IBN-552 base mounts directly to 3-1/2-inch square, 4-inch square, and 4-inch octagonal electrical boxes. See Figure 6. and Figure 7.

> **WARNING:** Ceiling bases should be mounted at least 4 inches from the wall. Wall bases should be mounted between 4 and 12 inches from the ceiling.

A. IBN-553/554 Installation

9. Orient the base so that its LED can be easily viewed after the detector is installed. Use the Alignment Mark (raised line) on the base as a guide to orient the base (when the head is installed, the LED will be aligned with the alignment mark). See "Installing the Detector to the Base" in this guide.
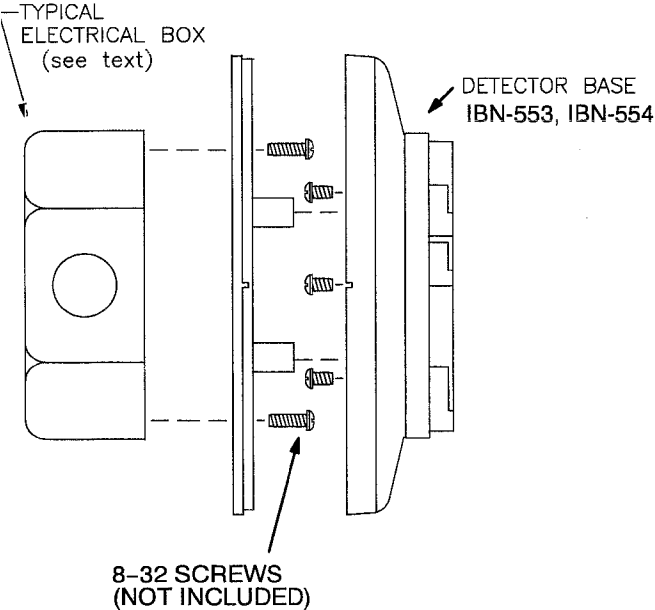
Figure 6   Base Installation, IBN-553, IBN-554

10. Secure the base to the electrical box with two 8-32 pan-head, zinc-plated steel screws (not supplied) as shown in Figure 6.

B. IBN-552 Installation

1. Orient the base so that the LED on the detector can be easily viewed after the detector is installed. Use the Alignment Mark (raised line) on the base as a guide to orient the base. When the detector is installed, the LED will be aligned with the alignment mark. See "Installing the Detector to the Base" in this guide.
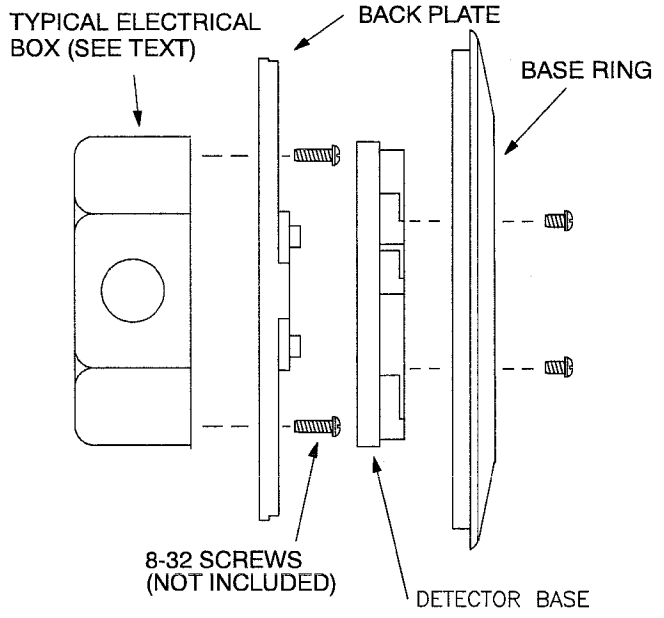
Figure 7   Base Installation, IBN-552

2. Secure the base to the electrical box with the two 8-32 pan-head, zinc-plated steel screws (not supplied) as in Figure 7.

Note: For some electrical boxes, you may have to separate the back plate from the detector base, secure the back plate to the electrical box with the two 8-32 pan-head, zinc-plated steel screws (not supplied), and then secure the base to the back plate with two 8-32 steel screws (supplied) as shown in Figure 7.

3. Carefully snap the base ring onto the base.

Base Wiring

> **WARNING:** Remove power from the circuit before installing bases or sensors.

All wiring must conform to current National Electrical Code NFPA 70, and state and local building code requirements. All wiring must conform to the guidelines set forth in the Autocall TFX-500/800 Operation Manual and Installation Guide.

Connect to the base terminals as shown in Figure 8.

When making connections, break wire run, strip about 3/8-inch insulation from the ends of the wires, slide the bare ends of the wires under the terminal screw, and tighten the screw.

Connect the bases in the input zone circuits as shown in Figure 9.

CAUTION: The addressable loop connections of the detector are not polarity sensitive. However, polarity may be

Figure 8   Base Terminals
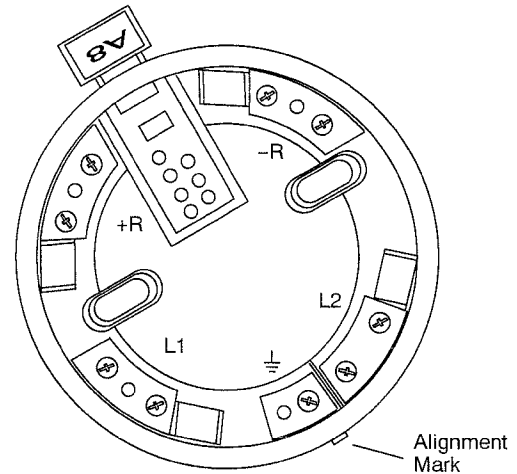
CAUTION! DO NOT USE LOOPED WIRE UNDER TERMINALSL1 AND L2, BREAK WIRE RUN TO PROVIDE SUPERVISION OF CONNECTIONS.
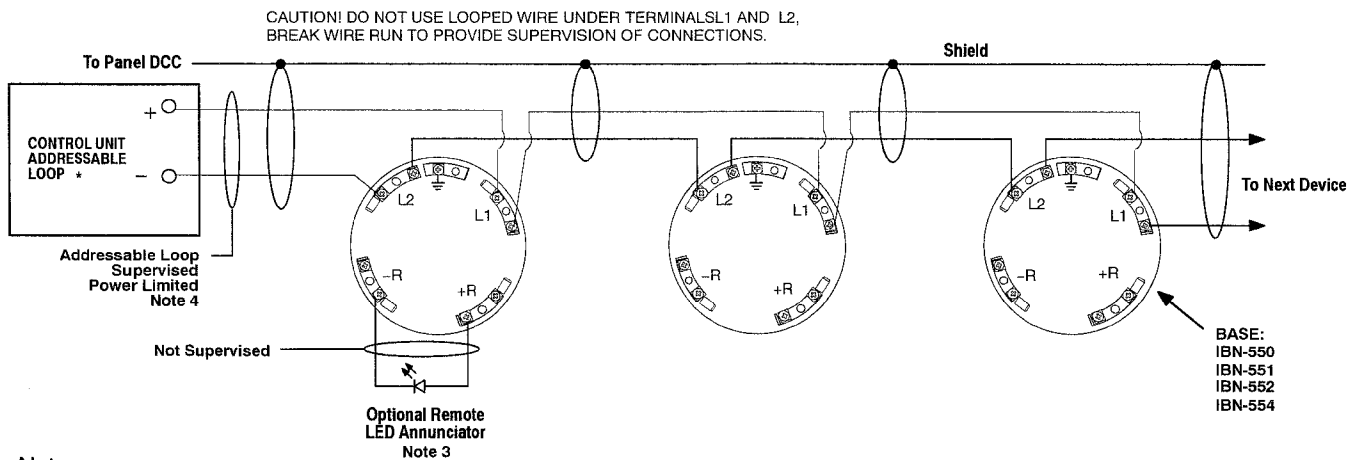
Notes:
1. Earth Ground terminal is provided for easier installation and is not required by the detector head.
2. The detector heads are NOT polarity sensitive. Identification of positive and negative lines L1 and L2 is not important.
3. Connect optional remote annunciator to R+ and R−. Observe correct polarity on these connections.
4. All circuits connected to this module are power limited.

Figure 9   Typical Addressable Loop Circuit Wiring Configuration - Three Detectors and Optional Remote Annunciator

CAUTION! DO NOT USE LOOPED WIRE UNDER RELAY BASE TERMINALS.
BREAK WIRE RUN TO PROVIDE SUPERVISION OF CONNECTIONS.

SHIELD

To Panel DCC

AUTOCALL TFX-500/800 2-WAY
DATA SIGNALLING CIRCUIT

CONTROL UNIT
CIRCUIT

TO NEXT DEVICE

U.L. LISTED 24
VOLT EOL RELAY *

N.C. CONTACT
SEE NOTE 1

L2   N.O. N.C. COM.   L1

L2   N.O. N.C. COM.   L1

TB3

RESET INPUT 3
DCC 2
RESETTABLE +24 V+ 1

-R   R+

-R   R+

BASE
IBN-553

BASE
IBN-553

619 ohm, 0.25 watt
UL LISTED EOL
P/N 976082
* NOT INCLUDED
RECOMMEND AIR PROD-
UCTS PAM–2 P/N 19240410
N.C. CONTACTS, OPEN DUR-
ING NORMAL OPERATION.

CONTACT
MONITORING
MODULE
IXA-501CM
P/N 976081

NOT SUPERVISED

RPS-424
24V_DC
POWER
SUPPLY
UL listed for Fire
Protective Signaling

(2 mA LED)
OPTIONAL REMOTE
LED ANNUNCIATOR
(CONSULT FACTORY
FOR DETAILS)

Note 1:
This contact is needed to restore the relay when the panel is
reset (relay is open duirng normal operation). Use any
available normally-closed TFX relay contacts (for example,
alarm or trouble contacts on the Main Processor board) or
OXA-502/503RM relay module (addressable relay module).
When programming the TFX control panel, assign the relay as
"output normally ON," "General Purpose output," assign the
relay to Group OS174 "RESET in Progress O/P All Zones."

General Note:
Relays are non-silenceable, but restorable on panel reset.

Figure 10 Wiring Schematic for IBN-553 Relay Base (Provides individual non-silenceable, resettable, relay base activation—wiring is shown in supervisory state.) Resettable 24 V_{DC} must be off for at least 4 seconds to reset the IBN-553 Relay Base.

CAUTION! DO NOT USE LOOPED WIRE UNDER RELAY BASE TERMINALS.
BREAK WIRE RUN TO PROVIDE SUPERVISION OF CONNECTIONS.

SHIELD

TO PANEL DCC

CONTROL
UNIT

+   –

AUTOCALL
TFX-500/800
2-WAY DATA
CIRCUIT

L2 N.O. N.C. COM.   L1

L2 N.O. N.C. COM.   L1

TO NEXT
DEVICE

ON

OXA-501SDA
OXA-504SDA
SIGNAL
DRIVER MODULE**

L+
L–
L+
L–
SR+
SR–
S+
S–
24+
0V

CIRCUIT
STYLE Y

-R   R+

-R   R+

BASE
IBN-553

BASE
IBN-553

27K OHM
U.L. LISTED EOL
P/N 976250
* NOT INCLUDED

LED
(BEHIND)

"SUPERVISED"
POWER LIMITED

– +
24V_DC
POWER
SUPPLY
UL listed for Fire
Protective
Signaling

**MAXIMUM NUMBER OF 30 BASES MAY BE INSTALLED PER OXA-501SDA OR
OXA-504SDA SIGNAL DRIVER MODULE. FOR MORE SIGNAL DRIVER MODULE
INFORMATION, REFER TO PUBLICATION 19700332.

Figure 11 Wiring Schematic for IBN-553 Relay Base with OXA-501SDA or OXA-504SDA Signal Driver Module (Provides zone non-sillenceable, resettable relay base activation. (All base relays activate at the same time—wiring shown in supervisory state.)
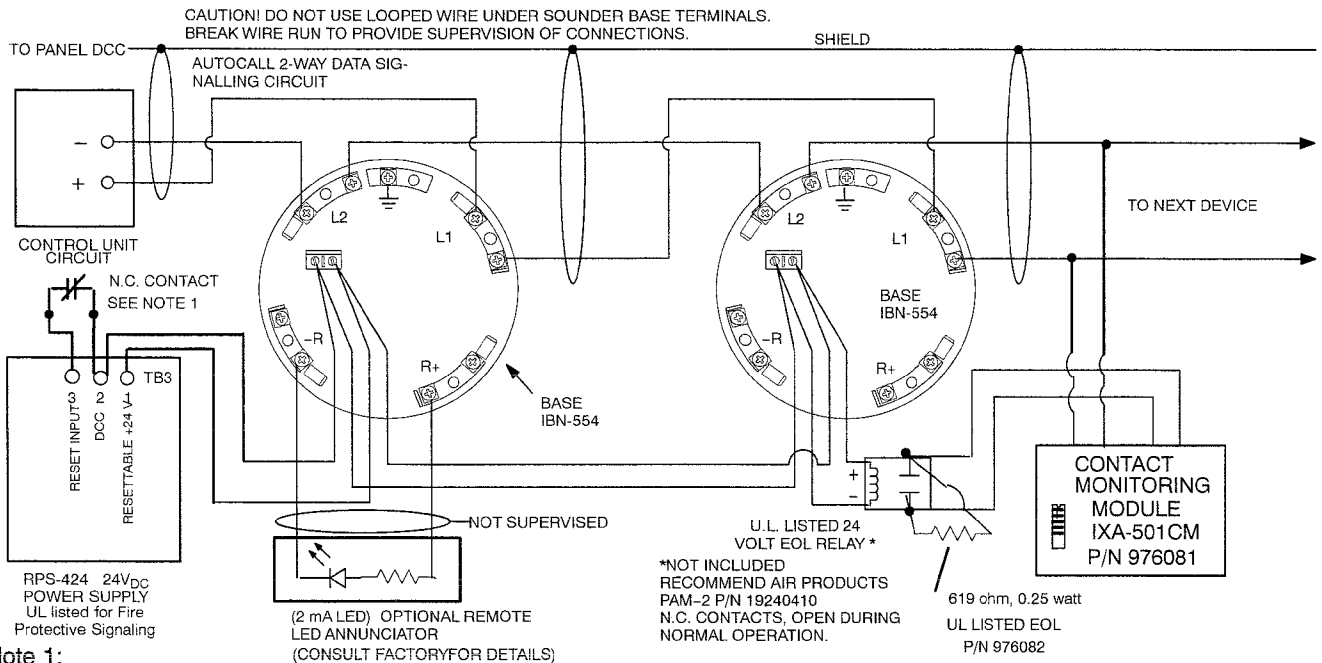
Note 1:
This contact is needed to restore the sounder when the panel is reset (it is open during normal operation). Use any available normally-closed TFX relay contacts (for example, alarm or trouble relay on the Main Processor board) or OXA-502/503RM addressable relay module. When programming the TFX control panel, assign the relay as "output normally ON," "General Purpose output," assign the relay to Group OS174 "RESET in Progress O/P All Zones."

General Note: Sounders are non-silencable, but restorable on panel reset.

Figure 12 Wiring Schematic for IBN-554 Sounder Base (Provides individual non-silenceable, resettable audible alarm—wiring shown with base in supervisory state.) Resettable 24 V_{DC} must be off for at least 4 seconds to reset the IBN-554 Sounder Base.
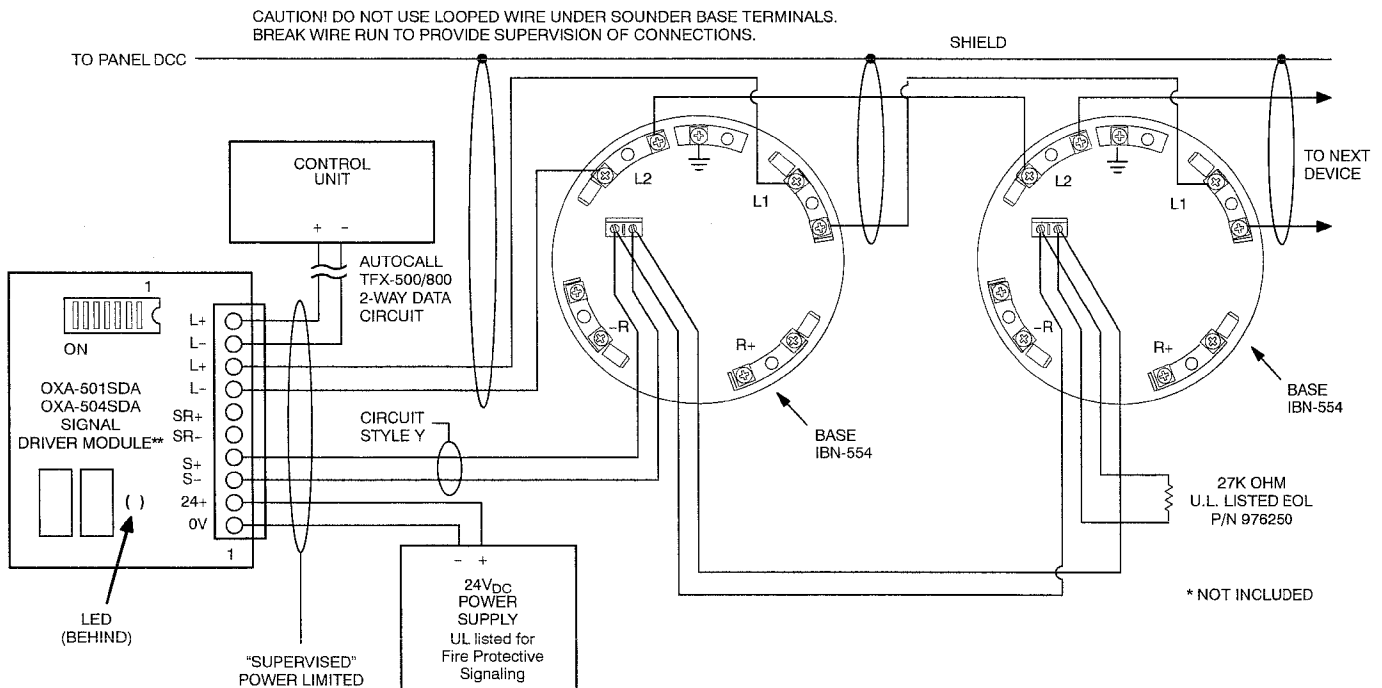
**MAXIMUM NUMBER OF 30 BASES MAY BE INSTALLED PER OXA-501SDA OR OXA-504SDA SIGNAL DRIVER MODULE. FOR MORE SIGNAL DRIVER MODULE INFORMATION, REFER TO PUBLICATION 197004332.

Figure 13 Wiring Schematic for IBN-554 Sounder Base with OXA-501SDA or OXA-504SDA Signal Driver Module. Provides zonal non-silenceable, resettable sounder base activation (All bases sound alarm at the same time—wiring shown is for base in supervisory state.)

CAUTION! DO NOT USE LOOPED WIRE UNDER RELAY BASE TERMINALS.
BREAK WIRE RUN TO PROVIDE SUPERVISION OF CONNECTIONS.

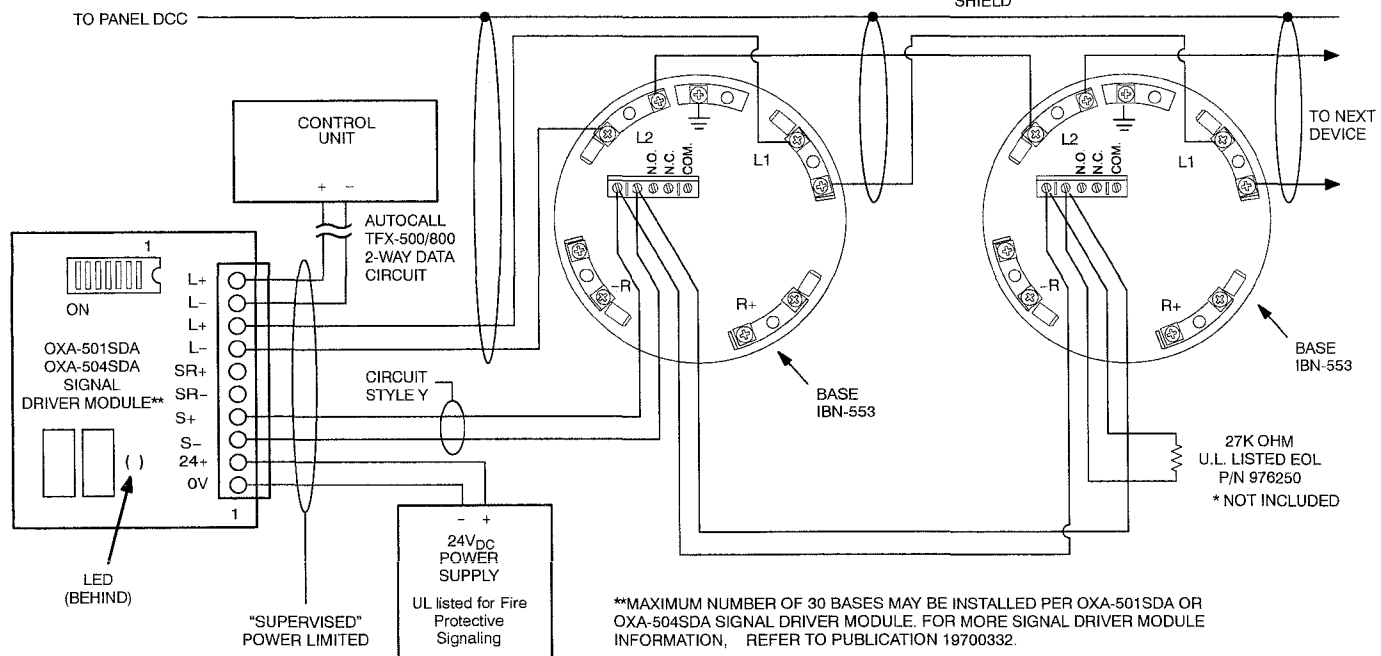K1 = RELAY CAN BE ANY 2 FORM C (BREAK BEFORE MAKE) 24 V UL LISTED FOR FIRE PROTECTIVE SIGNALING SERVICE. POWER SUPPLY MUST BE RPS-424 OR OTHER REGULATED 24 V SUPPLY LISTED FOR FIRE PROTECTIVE SIGNALING SERVICE.

K2 = U.L. LISTED EOL RELAY (Air Products & Controls Model PAM-2 P/N 19240410 EOL RELAY * NOT INCLUDED

619 ohm, 0.25 watt
UL LISTED EOL
P/N 976082
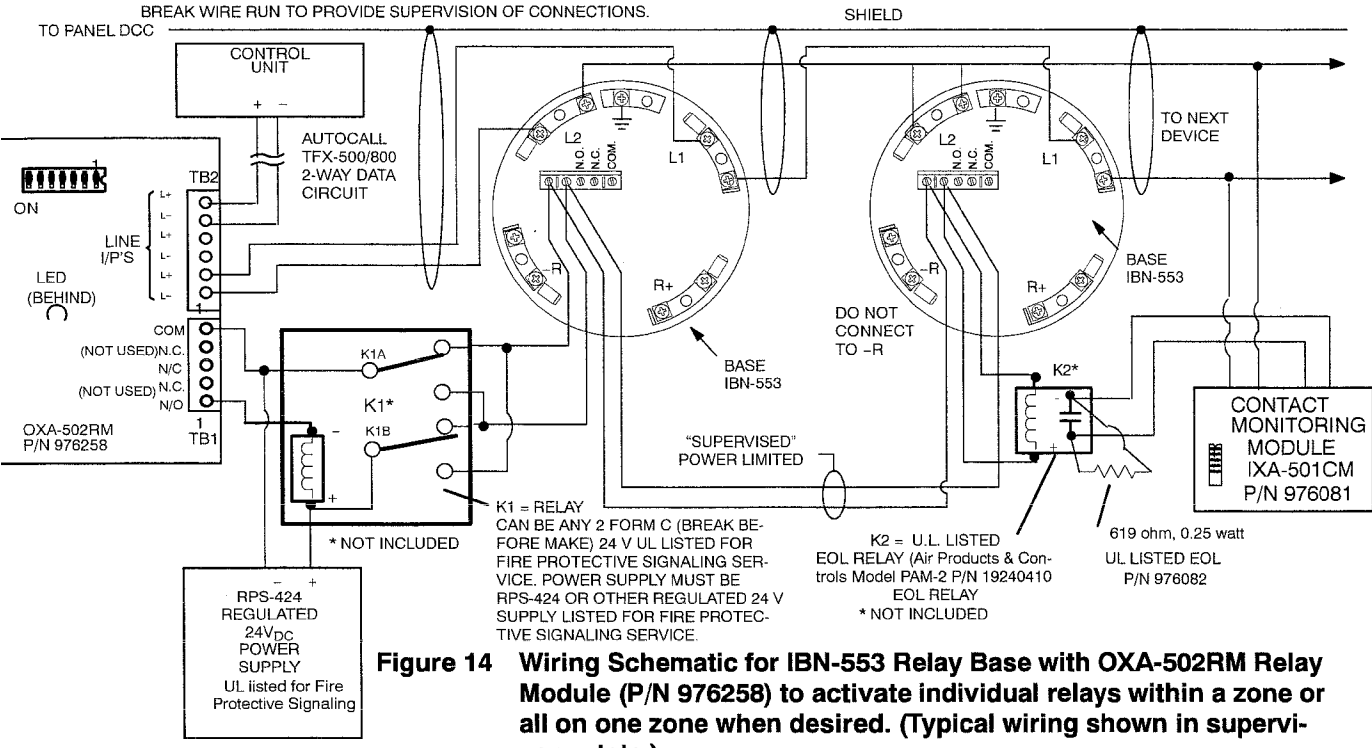
Figure 14   Wiring Schematic for IBN-553 Relay Base with OXA-502RM Relay Module (P/N 976258) to activate individual relays within a zone or all on one zone when desired. (Typical wiring shown in supervisory state.)

CAUTION! DO NOT USE LOOPED WIRE UNDER TERMINALS L1 AND L2.
BREAK WIRE RUN TO PROVIDE SUPERVISION OF CONNECTIONS.

K1 = RELAY CAN BE ANY 2 FORM C (BREAK BEFORE MAKE) 24 V UL LISTED FOR FIRE PROTECTIVE SIGNALING SERVICE. POWER SUPPLY MUST BE RPS-424 OR OTHER REGULATED 24 V SUPPLY LISTED FOR FIRE PROTECTIVE SIGNALING SERVICE. * NOT INCLUDED

K2 = U.L. LISTED EOL RELAY (Air Products & Controls Model PAM-2 P/N 19240410 EOL RELAY * NOT INCLUDED

619 ohm, 0.25 watt
UL LISTED EOL
P/N 976082
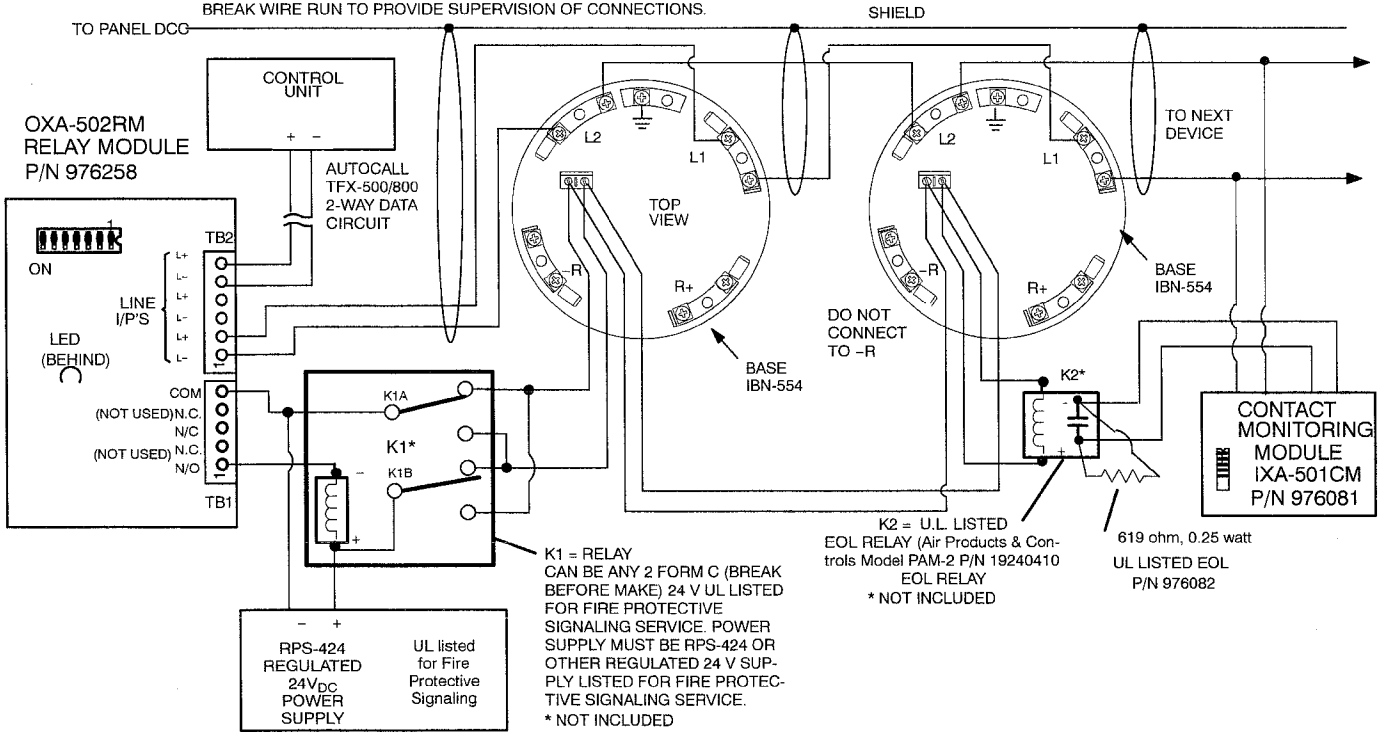
Figure 15   Wiring Schematic for IBN-554 Sounder Base with OXA-502RM Relay Module to activate individual sounders within a zone or all on one zone when desired. (Typical wiring shown is for base in supervisory state.)

550 Series Address Data Card

Address	Remove Buttons	Address	Remove Buttons	Address	Remove Buttons
1-	(2)(4)(8)(16)(32)(64)	43-	(4)(16)(64)	85-	(2)(8)(32)
2-	(1)(4)(8)(16)(32)(64)	44-	(1)(2)(16)(64)	86-	(1)(8)(32)
3-	(4)(8)(16)(32)(64)	45-	(2)(16)(64)	87-	(8)(32)
4-	(1)(2)(8)(16)(32)(64)	46-	(1)(16)(64)	88-	(1)(2)(4)(32)
5-	(2)(8)(16)(32)(64)	47-	(16)(64)	89-	(2)(4)(32)
6-	(1)(8)(16)(32)(64)	48-	(1)(2)(4)(8)(64)	90-	(1)(4)(32)
7-	(8)(16)(32)(64)	49-	(2)(4)(8)(64)	91-	(4)(32)
8-	(1)(2)(4)(16)(32)(64)	50-	(1)(4)(8)(64)	92-	(1)(2)(32)
9-	(2)(4)(16)(32)(64)	51-	(4)(8)(64)	93-	(2)(32)
10-	(1)(4)(16)(32)(64)	52-	(1)(2)(8)(64)	94-	(1)(32)
11-	(4)(16)(32)(64)	53-	(2)(8)(64)	95-	(32)
12-	(1)(2)(16)(32)(64)	54-	(1)(8)(64)	96-	(1)(2)(4)(8)(16)
13-	(2)(16)(32)(64)	55-	(8)(64)	97-	(2)(4)(8)(16)
14-	(1)(16)(32)(64)	56-	(1)(2)(4)(64)	98-	(1)(4)(8)(16)
15-	(16)(32)(64)	57-	(2)(4)(64)	99-	(4)(8)(16)
16-	(1)(2)(4)(8)(32)(64)	58-	(1)(4)(64)	100-	(1)(2)(8)(16)
17-	(2)(4)(8)(32)(64)	59-	(4)(64)	101-	(2)(8)(16)
18-	(1)(4)(8)(32)(64)	60-	(1)(2)(64)	102-	(1)(8)(16)
19-	(4)(8)(32)(64)	61-	(2)(64)	103-	(8)(16)
20-	(1)(2)(8)(32)(64)	62-	(1)(64)	104-	(1)(2)(4)(16)
21-	(2)(8)(32)(64)	63-	(64)	105-	(2)(4)(16)
22-	(1)(8)(32)(64)	64-	(1)(2)(4)(8)(16)(32)	106-	(1)(4)(16)
23-	(8)(32)(64)	65-	(2)(4)(8)(16)(32)	107-	(4)(16)
24-	(1)(2)(4)(32)(64)	66-	(1)(4)(8)(16)(32)	108-	(1)(2)(16)
25-	(2)(4)(32)(64)	67-	(4)(8)(16)(32)	109-	(2)(16)
26-	(1)(4)(32)(64)	68-	(1)(2)(8)(16)(32)	110-	(1)(16)
27-	(4)(32)(64)	69-	(2)(8)(16)(32)	111-	(16)
28-	(1)(2)(32)(64)	70-	(1)(8)(16)(32)	112-	(1)(2)(4)(8)
29-	(2)(32)(64)	71-	(8)(16)(32)	113-	(2)(4)(8)
30-	(1)(32)(64)	72-	(1)(2)(4)(16)(32)	114-	(1)(4)(8)
31-	(32)(64)	73-	(2)(4)(16)(32)	115-	(4)(8)
32-	(1)(2)(4)(8)(16)(64)	74-	(1)(4)(16)(32)	116-	(1)(2)(8)
33-	(2)(4)(8)(16)(64)	75-	(4)(16)(32)	117-	(2)(8)
34-	(1)(4)(8)(16)(64)	76-	(1)(2)(16)(32)	118-	(1)(8)
35-	(4)(8)(16)(64)	77-	(2)(16)(32)	119-	(8)
36-	(1)(2)(8)(16)(64)	78-	(1)(16)(32)	120-	(1)(2)(4)
37-	(2)(8)(16)(64)	79-	(16)(32)	121-	(2)(4)
38-	(1)(8)(16)(64)	80-	(1)(2)(4)(8)(32)	122-	(1)(4)
39-	(8)(16)(64)	81-	(2)(4)(8)(32)	123-	(4)
40-	(1)(2)(4)(16)(64)	82-	(1)(4)(8)(32)	124-	(1)(2)
41-	(2)(4)(16)(64)	83-	(4)(8)(32)	125-	(2)
42-	(1)(4)(16)(64)	84-	(1)(2)(8)(32)	126-	(1)

Address Setting

Insert the appropriate programmed Addressable Xpert Card into the slot on the side of the base. Make sure it locks into position. See Page 2 for part numbers of programmed Address Xpert Card sets.

A universal Addressable Xpert Card is supplied with each base. If one is to be used, refer to the TP90 address data sheet to determine which DOTS to remove. The sum of the remaining buttons must equal the desired address. For example, for address 32, remove all buttons except the 32 button. For address 3, remove buttons 4, 8, 16, 32 and 64.

Insert screwdriver to remove the DOT.
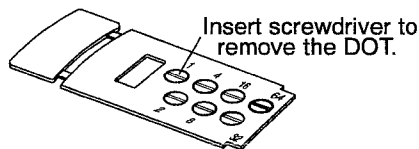
Figure 16   Setting the Address

1. Lay the card on a flat surface. Insert a screwdriver in the slot on the back of the DOT to be removed.
2. Twist to remove the DOT.
3. When the card has been coded, slide it into the slot on the side of the base. Make sure it locks into position.
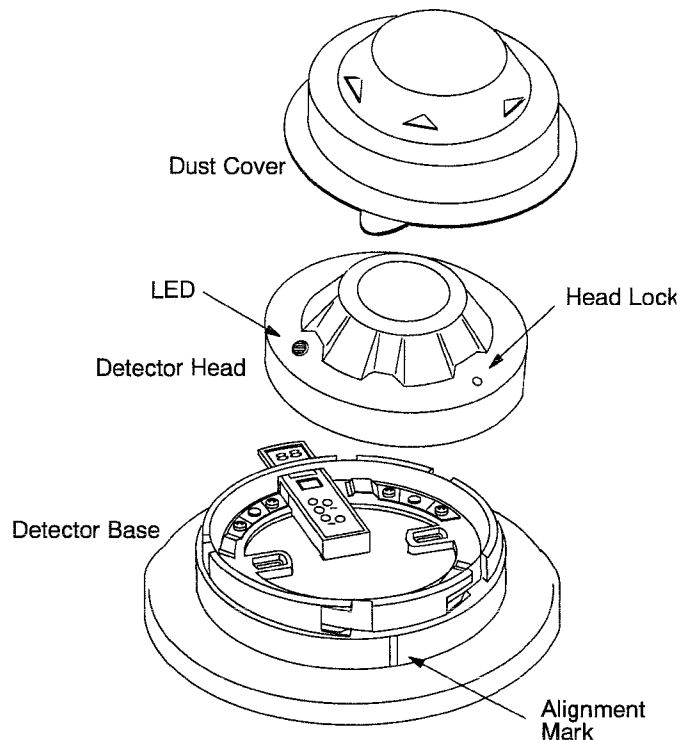
Installing the Detector to the Base

Figure 17   Detector Installation

CAUTION: Be sure that only ISN-550 and IHC-135/200 Series detectors are plugged into IBN-552, IBN-553, or IBN-554 detector bases. The use of any other type of detector could damage the base, detector, or both.

Connect the detector head to the base as follows:

1. Locate the Alignment Mark (raised line) on the detector base.
2. Align the LED on the side of the detector head with the alignment mark on the base. See Figure 17.
3. Place the detector onto the base and turn counterclockwise until the head seats into the base.
4. Firmly turn the detector clockwise (about 1/4-inch) until it can not be turned further. At this position, the LED indicator should be aligned with the alignment mark on the detector base.

NOTE: If the detector is not rotated to the position noted in step 4., the detector may generate a trouble signal in the panel.

5. To lock the detector head in place, insert a 1/16-inch Hex wrench into the head lock and turn clockwise.
6. Detector Removal—Reverse the installation procedure. Unlock the head by inserting a 1/16-inch hex wrench into the head lock and turn counter-clockwise (see Figure 17). Turn the detector head counterclockwise.
7. Do not leave a detector in a partly-installed position.
8. Remove the dust cover once construction is complete.

CAUTION: Keep the detector head covered with its dust cover until construction is completed to prevent dust and dirt from contaminating the smoke sensing components in the detector head.

Device Testing

Sensitivity testing of each detector is not required. The TFX-500/800 provides drift compensation when used with model SN-550P and model ISN-550I smoke detectors. The drift compensation feature meets the periodic testing and maintenance requirements of NFPA Standard 72 without the need for manually removing and testing each smoke detector in an installed system. A trouble indication traceable to a specific dirty smoke detector requiring cleaning is generated prior to its response characteristics to smoke becoming impaired.

After the TFX-500/800 has been programmed with the correct device address and other functional information, test the device in the system. This can be done by verifying that the clean air or room temperature condition current of each detector is within the range shown in the Electrical Specifications Table. For further information, refer to Autocall *TFX-500/800 Operation Manual and Installation Guide*, Publication No. 850462.
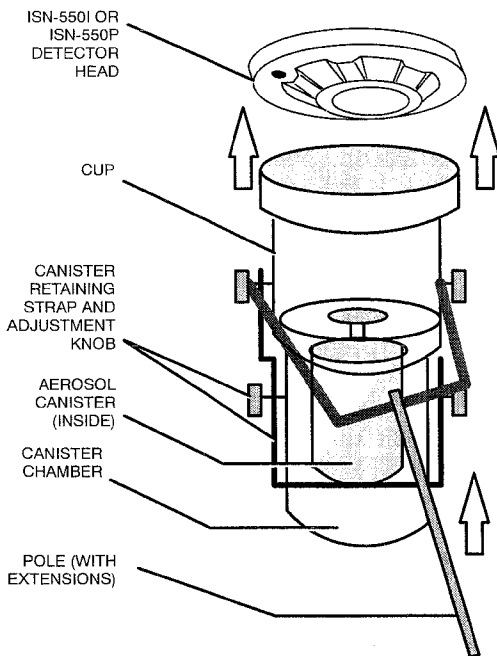
Testing Using an IA-MED Smoke Detector Test Pole

The IA-MED Smoke Detector Test Pole P/N 920109 is used with IA-MTA Test Gas Canister P/N 920111. The IA-MED is designed to contain and control the spray of the aerosol used for testing smoke detectors.

Figure 18   Using IA-MED Test Pole and IA-MTA Test Gas Canister.

CAUTION: This test equipment has been tested for use only for ISN-550I and ISN-55P detector heads. No claims are made or inferred as to the compatibility of this test equipment with any other detectors.

CAUTION: Do not spray aerosol test gas directly from the test gas container into detector heads (always use the IA-MED test pole equipment). Residue from direct application can damage the detector head.

1. Install the aerosol canister in the chamber. Loosen the knobs on the retaining strap and swing the strap away from the

chamber. Insert the canister with the nozzle at the top of the chamber. Adjust the strap so that the aerosol fits snugly to the top of the chamber. Tighten the retaining strap.

2. To use the test pole to test ISN-550I and ISN-550P detectors:
    a. Place the cup of the IA-MED over the detector to be tested.
    b. Release a burst of gas by compressing the IA-MED against the ceiling for two (2) seconds, keeping the cup in place over the detector.
    c. After twenty (20) seconds the detector being tested should have sufficient time to respond. The LED on the unit should change from a flashing (polling) status to a steady (alarm) status.
    d. If the detector has not responded, cover the unit again and spray in repeated bursts of one second at approximately five (5) to ten (10) second intervals. The total number of sprays should not exceed five (5).
    e. If the detector has not been activated it may be defective and should be replaced.

3. Test pole maintenance—If an oily residue accumulates within the cup, wipe the interior of the cup with a soft, lint free cloth. The dispenser can also be washed in warm, soapy water and a soft, lint free cloth used to dry it.

4. To prevent the aerosol from discharging when in transit, loosen the retaining strap on the aerosol canister.

Detector Maintenance

When a detector fault is recorded at the panel, replacement with a known good detector is recommended. If necessary, you can try cleaning dust from the detector head by using suction from a vacuum cleaner. Use one of the following procedures.

CAUTION: Do not paint the detector head or base. Paint on the detectors may reduce the sensitivity of the detector.

IHC Heat Detector Cleaning

IMPORTANT: Before removing a detector for cleaning, notify the appropriate authorities that the fire alarm system is undergoing maintenance and that the system will be temporarily out of service. Disable the zone or system undergoing maintenance to prevent unwanted alarms.

In the majority of cases, the heat detectors will require very little cleaning. Usually, dust and other debris will not settle out around the sensing element. However, if the detector does require cleaning, follow these steps:

1. Remove the detector head from the base.
2. Holding the detector firmly, wipe off any exterior dust or deposits with a cloth. Ensure that the cloth is not pushed inside the detector causing damage to the sensing element.
3. Use a vacuum cleaner to remove dust from inside the sensing area of the heat detector making sure that the hose of the vacuum cleaner does not come into contact with the sensing element.
4. Re-install the detector in its base.
5. Test that the detector is functioning by gently warming it with a domestic hair dryer until it operates.
6. Allow the detector a period of 4 to 5 minutes to cool down before re-activating the fire alarm system.
7. Notify the appropriate authorities that the cleaning operation is complete and the system is active again.

Cleaning Photoelectric Detector

1. Remove the detector head from the base.
2. Use a Phillips screwdriver to remove the two securing screws located on the under side of the detector. Lift the white smoke lid away to expose the black photoelectric chamber.
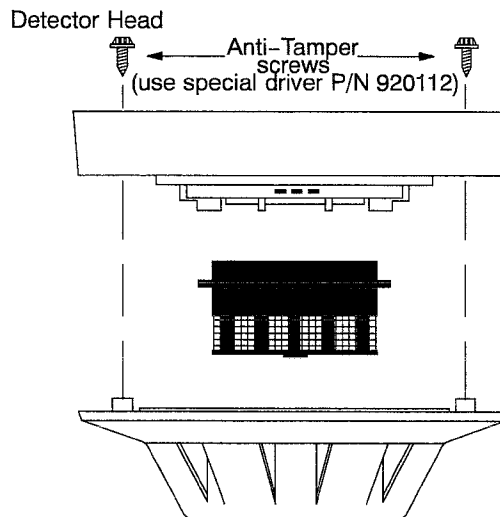
3. Gripping the photoelectric chamber firmly, rotate it counter-clockwise and lift it away from the detector.
4. Use a vacuum cleaner to remove any dirt from both the bug screen and the baffles inside the photoelectric chamber.
5. A clean artist's paint brush can also be used to remove dust particles from within the baffles. Do not use the paint brush to remove dust from the bug screen––the screen may be damaged.
6. After cleaning replace the black photoelectric chamber and rotate it clockwise until it snaps into position. Replace the white smoke lid and secure it using the two Phillips screws.
7. Re-install the detector in its base.
8. Test the device in the system. Refer to Autocall *TFX-500/800 Operation Manual and Installation Guide*, Publication No. 850462, for further information.
9. Notify the appropriate authorities that the cleaning operation is complete and the system is active again.

Cleaning ISN-550I Ionization Detector

When a Detector Condition Monitoring (DCM) fault is recorded at the panel, replacement with a known good detector is recommended. If necessary, you can try cleaning dust from the detector head by using suction from a vacuum cleaner. Use the following procedure.

CAUTION: In order to clean the bug screen in this detector the unit must be partially dismantled to a stage which exposes the radioactive Americium 241 foil to the person carrying out the maintenance work. Cleaning operations which involve exposing the radioactive foil shall only be carried out by maintenance personnel who have received appropriate training and are authorized under relevant legislation to do so. **Read these instructions carefully before proceeding to clean the detector.**

1. Remove the detector head from the base. See Figure 19.
2. Using the special anti-tamper screwdriver, P/N 920112, remove the two anti-tamper screws located on the under side of the detector and lift off the smoke lid.
3. Hold the main body of the detector firmly in one hand and grip the ionization chamber in the other. Rotate the ionization chamber counter-clockwise until it snaps free and then lift it off the detector. The radioactive foil is gold-colored and is located behind the hole in the center of the metal disk that is exposed when the ionization chamber is removed.
4. At this point the radioactive foil is exposed. Be careful not to touch the foil or cause dust or other contamination to get onto it. Dust particles or fibers present on the foil will impair the operation of the detector.
5. The ionization chamber can be cleaned on the inside and outside using a vacuum cleaner. A clean artist's paint brush can be used to remove dust from between the fins inside the smoke chamber. Avoid damaging the bug screen when using an artist's brush.
6. After cleaning, replace the ionization chamber. Make sure it snaps back into position when it is rotated clockwise. The detector will not operate properly if it is not seated correctly.
7. Replace the smoke lid and secure it in position using the two anti-tamper screws.
8. Re-install the detector to its base.
9. Reset the Point Threshold Compensation.
   a. At the TFX control panel, select the "Reset point threshold compensation" menu option from the "System Test" menu or enter Fast Access Code 0037.
   b. Select the loop on which the detector is installed.

c. Enter the point address number of the device. The display will show **[point no. xx update successful]** where xx is the actual point number. If the selected device has not been configured, the display will show **[Point not found]**. If the device is not an analog addressable detector, the display will show **[invalid, try again]**.
10. Test the device in the system. Refer to Autocall *TFX-500/800 Operation Manual and Installation Guide*, Publication No. 850462, for further information.
11. Notify the appropriate authorities that the cleaning operation is complete and the system is active again.

Figure 19   Disassembly of Ionization Detector Head for Cleaning

Warnings and Limitations

Smoke detectors will not work without power. System powered smoke detectors will not work if the power supply or connections to the fire control panel are cut off for any reason. Interconnecting wiring must be able to carry the total indicating appliance current, in alarm, without excessive line voltage drop.

Smoke must reach the detector. Smoke from fires in enclosed places, roofs, or behind closed doors may not reach the detector to alarm it.

Smoke detectors may not sense all fires: Rapidly spreading fires or explosions caused by escaping gas and improper storage of flammable materials or arson may not be detected.

Smoke detectors wear out. Smoke detectors contain electronic parts that could fail at any time.

Radioactive Material: ISN-550I Smoke detectors contain less than 0.9 microcuries Americium 241. Do not attempt disassembly of the sensing chamber. This assembly must remain sealed for your protection. For service or disposal, return detector head, intact, to: Grinnell Fire Protection Systems Company, Inc, 835 Sharon Drive, Westlake, Ohio 44145.

This document is written for skilled technicians with experience installing and testing fire detection systems. These instructions do not purport to cover all the details or variations in the equipment described. Nor do they provide for every possible contingency met in connection with installation, operation, or maintenance. All specifications are subject to change without notice.

Should further information be desired or should particular problems arise which are not covered sufficiently for the user's purposes, the matter should be referred to Grinnell Fire Protection Systems Company, Inc., Westlake, Ohio 44145. Ph. (216) 871-9900.

Grinnell
FIRE PROTECTION SYSTEMS COMPANY

ISN-550 Series Analog Addressable Smoke Duct System
ISN-550DI (P/N 920102)
ISN-550DP (P/N 920103)

Publication Number 850507
Issue 2, January 1997

The Series ISN-550 Analog Addressable Smoke Duct Systems (Figure 1) are designed for use with Autocall TFX-500 and TFX-800 fire control panels. They are designed to provide early detection of smoke and combustion by-products present in the air moving through an HVAC duct. The series ISN-550 systems are available in ionization or photoelectric types. Refer to Publication Number 850505, *550 Series Analog Addressable Detectors and Bases*.

The ISN-550DP Photoelectric Smoke Duct System responds to visible smoke particles from flames and smoldering fires using light scattering techniques. The ISN-350DI Ionization Smoke Duct System responds to visible and invisible particles produced in fires using ionization techniques. Neither of these detects gas, heat, or flames.

Fire alarm system applications of the Series ISN-550 Systems include industrial, commercial, and institutional HVAC duct installations. Install the Series ISN-550 Systems in accordance with UL 268A, NFPA 72, NFPA 90A, and all local codes, regulations, and ordinances. Refer to the NEMA *Guide for Proper Use of System Smoke Detectors,* Publication No. 850460.

Series ISN-550 Systems are not intended for open area protection nor should they be used for same.
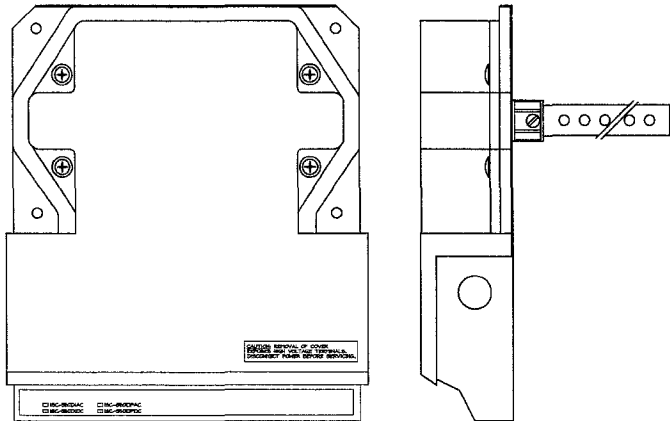

Figure 1: The ISN-550 Series Smoke Duct System

Specifications

Environment:
Operating Temperature: 32°F to 100°F (0°C to 38°C)
Air Flow Velocity: 300 to 4000 feet per minute.
Operating Humidity: 10% to 85% (non-condensing)

Electrical:

	Ionization ISN-550DI	Photoelectric ISN-550DP
Battery Requirements Current Draw		
Standby Current	0.20 mA	0.30 mA
Alarm Current	4.00 mA	4.20 mA
Alarm with remote LED	5.70 mA	5.90 mA
Addressable Loop Currents		
ID Current	3.0-4.0 mA	5.2-6.8 mA
Clean Air Condition Current (Normal Condition)	4.6-8.0 mA	7.0-10.0 mA
Alarm Threshold (selectable through programming)	Above 11.4 mA	Above 10.7 mA
Other		
Max Devices per loop	99	99
Remote LED Max Current	4.5 mA	4.5 mA
Light/Radioactivity Source	Americium 241 (0.9 μCuries)	GaAs Infra-red Emitting Diode

Sensitivity: Sensitivity range may be selected during system programming using TFX-500/800 CONSYS, Version 3.0 and TFX-500/800 Firmware Version 3.2 and above. Refer to Publication No. 850463, *TFX-500/800 CONSYS Programming Guide*.

Dimensions (HWD): 10 × 8.25 × 2.25 inches.

Shipping Weight: 4.0 Lbs.

Mounting Requirements: Template and hardware supplied. The ISN-550 Series Smoke Duct System will accept any of three accessory Intake Sampling Tubes. The tube lengths available are:

Model	Tube Length	For Duct Widths of
IA-2.5	2 feet-6-inches	1 foot to 2.5 feet
IA-5.0	5 feet	2.5 feet to 5.0 feet
IA-10.0	10 feet	5.0 feet to 10.0 feet

The installation requires that these intake sampling tubes be ordered in the closest appropriate length and then cut to the exact length needed to cover the full width of the duct on which the unit is installed.

> **WARNING:** Disengage all alarm signaling devices, extinguishing systems, and releasing devices before testing the circuit.
>
> **WARNING:** Do not connect addressable loop wiring to the control panel until continuity checks are complete.

Mechanical Installation

I. MOUNTING

CAUTION: Extreme temperatures, high humidity, gasses and dust in the duct air will prevent proper operation of the detector and cause a Detector Condition Monitoring (DCM) Fault. Refer to *550 Series Analog Addressable Detectors and Bases Technical Reference Guide,* Publication No. 850505, and *TFX-500/800 Application Guide and Maintenance Manual,* Publication No. 850481.

CAUTION: Ionization models must be side mounted only.

A. DUCT PREPARATION

1. Peel backing from the mounting template and affix to the duct in the desired location.
2. Using the template as a guide, drill the four 3/32-inch holes for the mounting screws and the two 1-3/8-inch holes for the sampling tubes.

B. VERIFY AIR FLOW AND DIRECTION

1. Determine direction of air flow through the duct.
2. Air velocity must be within a range of 300 to 4000 feet per minute.

C. SAMPLING TUBE ASSEMBLY

The intake sampling tube must be cut to a length that matches the full width of the duct. The exhaust tube is approximately 7-1/2-inches in length for all installations.

1. Cut the intake sampling tube to the necessary length.

NOTE: No extra holes needs to be drilled in the Model IA-2.5 intake sampling tube that is cut to a one-foot length.

2. Insert the stopper into the end of the intake sampling tube that is opposite the end that has the set screw hole (see Figure 2:).

D. MOUNTING SAMPLING TUBES

1. Sampling tubes may be mounted in either position on the ISN-550 System body (to accommodate space or design requirements).
2. Use the airflow direction to determine which position gets the intake sampling tube (see figure 2). The intake tube inlet holes must be upwind and facing the airflow.
3. Insert the intake sampling tube into the connector. Align the set screw hole in the tube and tighten the screw firmly.
4. Insert the exhaust sampling tube into the connector. Align the set screw hole in the tube and tighten the screw firmly.

E. MOUNTING DUCT HOUSING

1. Remove detector head from detector base.
2. Align duct housing (with sampling tubes installed) with the duct mounting holes.
3. Mount the housing using the (4) #12 x 1/2-inch sheet metal screws. See Figure 4.
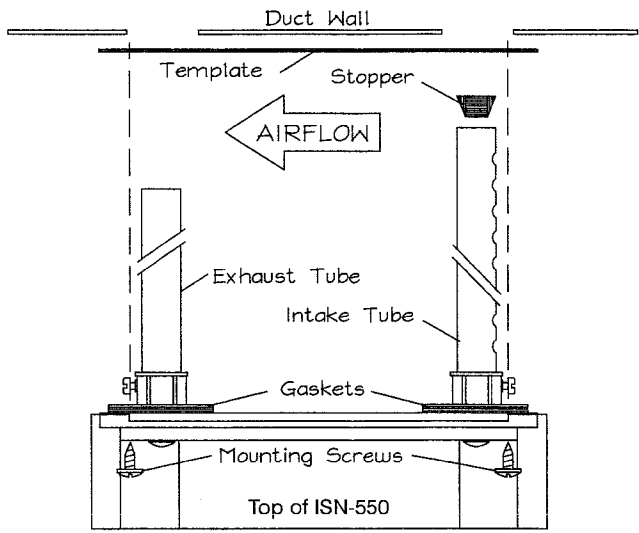
Figure 2:   Mounting Diagram.

F. AIR SAMPLING VERIFICATION

1. Test using an appropriate instrument such as the Dwyer model 4000 or equivalent differential pressure gauge. Set up for the test by placing the instrument pressure tubes into #0 rubber stoppers. (See Figure 3.)
2. Remove the cover from the detector unit.
3. Place the stopper containing the high pressure tube into the intake sampling tube connector.
4. Place the stopper with the low pressure tube attached into the exhaust tube connector.
5. Start air flow through the duct.
6. The pressure differential between the intake and exhaust sampling tubes must be no less than 0.01 inch and no greater than 1.2 inches of water. (If pressure is outside of range, consult factory.)
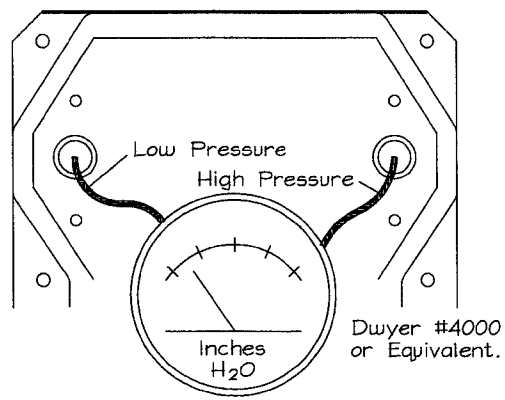
Figure 3:   ISN-550 Detector - Differential Pressure Test.

II. ELECTRICAL INSTALLATION

A. GENERAL INFORMATION

Wiring must conform to applicable local codes, ordinances, and regulations covering this type of device. Terminals are capable of accepting up to #14 AWG wire.

B. DETECTOR WIRING AND ADDRESSING

CAUTION: Wires should not be looped under the terminals 1, or 2.

1. If the detector head was not removed previously, remove it.
2. De-energize the power source.
3. Install address XPERT Card.
4. Wire the detector according to the engineering drawings for this installation. (See Figure 5.)

C. TESTING THE INSTALLATION

1. Install the detector head. Locate the Alignment Mark (raised line) on the detector base, align the LED on the side of the detector head with the alignment mark on the base. Place the detector onto the base and turn counterclockwise until the head seats into the base.
2. With all wiring in place, verify proper voltage and connections then energize the detector power source.
3. After the TFX-500/800 has been programmed with the correct device address and other functional information, test the device in the system. This can be done by verifying that the clean air condition current is within the range shown in the electrical specification table. For further information refer to *TFX-500/800 Operator's Manual and Installation Guide*, Publication No. 850462.
4. Replace the cover.
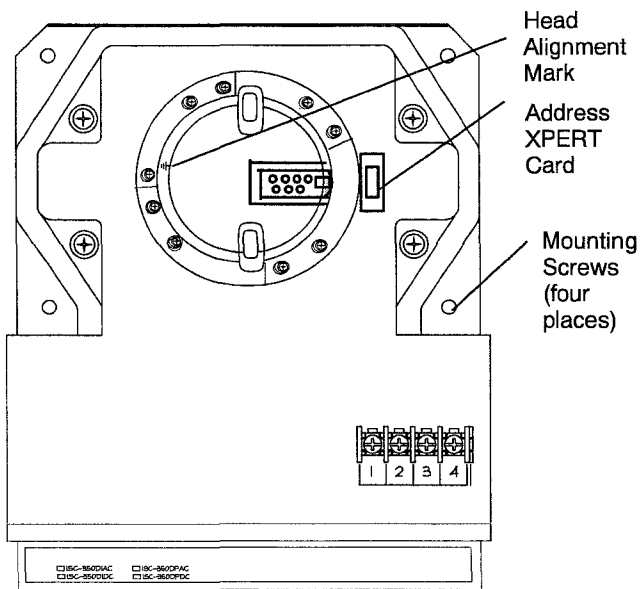
Figure 4: Detector Base and Connections for ISN-550 Series.
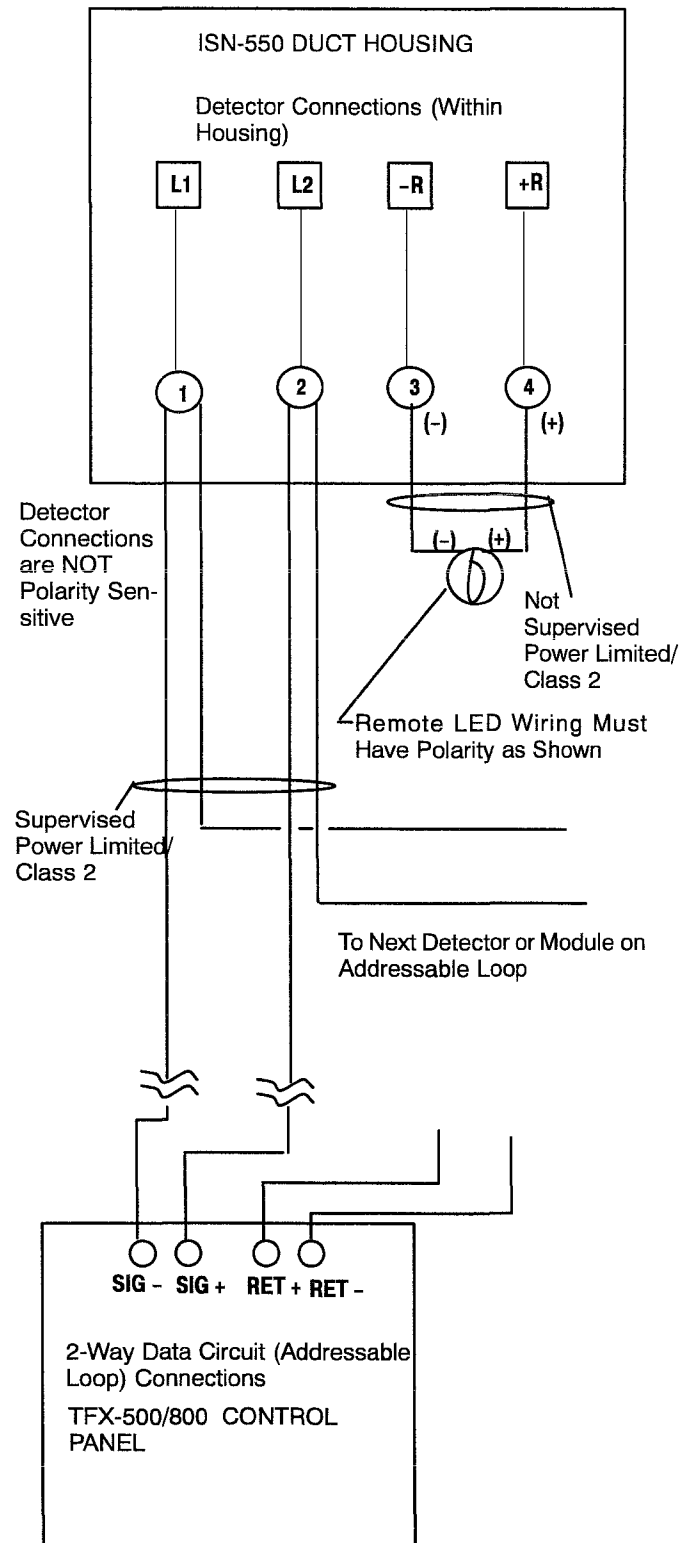
Figure 5: System Wiring Diagram.

Warnings and Limitations

> **CAUTION:**
> Do not install the detector head until construction is completed to prevent dust and dirt from contaminating the smoke sensing components in the detector head.

ISN-550 Series Smoke Duct Systems are designed to activate and initiate emergency action, but will do so only when used in conjunction with other equipment. They are designed for installation in accordance with UL 268A, NFPA 72, and local codes, regulations and ordinances.

ISN-550 Series Smoke Duct Systems will not work if the power supply or connections to the fire control panel are cut off for any reason.

Smoke must reach the detector. Smoke from fires external to the duct being protected may not reach the detector to trigger it. Additional area protecting devices are therefore recommended.

Smoke detectors may not sense all fires: Rapidly spreading fires or explosions caused by escaping gas and improper storage of flammable materials or arson may not be detected.

Detector Maintenance

Smoke detectors wear out. Smoke detectors contain electronic parts that could fail at any time.

The Autocall TFX-500/800 provides drift compensation utilizing the Model ISN-550I and ISN-550 P (ION/Photo) smoke detectors. The drift compensation feature meets the periodic testing and maintenance requirements of NFPA Standard 72 without the need for manually removing and testing each smoke detector in an installed system. A Trouble indication traceable to a specific dirty smoke detector requiring cleaning is generated prior to its response characteristics to smoke becoming impaired.

> Radioactive Material: ISN-550DI Analog Addressable Duct Smoke Detectors contain less than 1.0 microcuries Americium 241. Do not attempt disassembly of the sensing chamber. This assembly must remain sealed for your protection. For service or disposal, return detector head, intact, to: Grinnell Fire Protection Systems Company, Inc, 835 Sharon Drive, Westlake, Ohio 44145.

Operating Temperature: 32° F to 120° F
Operating Humidity: 85% (non-condensing)
Dimensions (wdh): 14.4 × 10.8 × 5.2 inches

![Grinnell FIRE PROTECTION SYSTEMS COMPANY logo]

LX-300 9-Pin Dot Matrix Printer
P/N 976264

Publication Number 19700421
Issue 2, January 1997

AUTOCALL Model LX-300 printer provides a permanent record *in English* of system data. The LX-300 Printer is recommended for use at the system control unit or at remote location(s) when the printer is used as a secondary annunciator. English-language characters are printed at a rate of 220 characters per second with up to 80 characters per line. Applicable Systems include: AUTOCALL 3800 Series, AUTOCALL AL-1500 and AL-1500E; AUTOCALL TFX-500, TFX-500M, TFX-500MV; TFX-800, TFX-800M, TFX-800MV; (for AutoCommand®-II, AUTOGRAPH®, or other system applications consult your system representative).

TECHNICAL DATA:
- Print method: Serial impact dot matrix
- Print head: 9 pin
- Print Direction: Bi-directional
- Paper feed: Friction feed or pin feed tractor
- Paper width: Fanfold (4 to10 inch)
- Character Set: ASCII 96 characters
- Interface: EIA-232D serial (factory configured)

Installation Notes

10. Disconnect power before servicing the system or printer.
11. All wiring and printer must be free of grounds.
12. **Caution:** To prevent damage to the printer, do not use the parallel interface connections.
13. Refer to the manual supplied with the printer for additional information.
14. Program the LX-300 Printer for operation with AUTOCALL systems (refer to Tables 3, 4, 5, and 7)
15. May be used with 5200-477 DC / AC Inverter for Battery Stand-by. Refer to publication MP-52 for more information.

Table 1: *Electrical Specifications*

Operating Current*	1.0 amp
Operating Voltage	120 V$_{AC}$
Power Consumption:	30 W (approx.)
*For current draw of Serial Interface Module P/N 976262, Refer to Publication 19700419	

Table 2: *Socket S1 Pin-out designations*

Pin	Signal name	Direction	Description
1	Protective Ground	---	Printer's chassis ground
2	Transmitted data (TXD/SD)	Out	Printer has transmitted serial data
3	Received data (RXD/RD)	In	Printer has received serial data
4	Request to Send (RTS/RS)	Out	Always positive
5	Clear to Send (CTS/CS)	In	Ignored
6	--	--	Not used
7	Signal Ground (SG)	--	Return path for data control signals
8–10	--	--	Not used
9	--	---	Not used
12–19	--	---	Not used
20	Data Terminal Ready (DTR/ER)	Out	Positive when the printer is ready to accept data, and negative when the printer is not ready
21–25	--	---	Not used

Connector Pin Configuration

The 25-pin serial input connector information is given so that if an adaptor is needed, correct pin function can be accommodated.

SERIAL INPUT 25-POSITION

```
13 OOOO OOOO OO OOO  1
25 OOOO OOOO OO OOO  14
```


Figure 1 labels (left): Edge guides, Paper release lever, Paper-feed knob, Power switch, Control panel, Printer cover

Figure 1 labels (right): Cable Ground Connector, 25-Pin Serial Input Connector

Figure 1: LX-300 Printer P/N 976264.

CS00006

120 V$_{AC}$ 60 HZ

NON-POWER LIMITED SUPERVISED

P/N 940578
Cable Assembly
Maximum Length 50 ft
See Detail "A"
NOTES 3, 4

PIM-550
P/N 976018
Note 1

NOTE 2
RS-232

Jack for
Ribbon Cable
to MPIM

PL1

PL2

TO MPIM P/N/ 976015
SERIAL PORT
NOTE 1

SERIAL PORT

PRINTER

Jack for
Ribbon Cable
to MPIM

PL3   PL4

RS–232
Supervised
Power Limited

IN SAME ROOM

DETAIL "A"

Figure 2: AUTOCALL TFX-500/800, TFX-500M/800M, TFX-500MV/800MV System using PIM-550 Printer Interface Module and MPIM. All circuits and connections are power limited/Class 2 unless otherwise noted as non-power limited.

Notes, Figure 2: TFX-500/800, TFX-500M/800M, TFX-500MV/800MV Application with PIM-550 Module

1. Refer to Publication 19700253, *AUTOCALL PIM-550 Printer Interface Module P/N 976018,* and Publication No. 19700235, *AUTOCALL TFX Multi-Purpose Interface Module (MPIM) P/N 976015,* for more information. Refer to the User's Manual supplied with the LX-300 printer for setup information.
2. For use with the TFX-500/800, TFX-500M/800M, TFX-500MV/800MV, the LX-300 printer must be configured as shown in Table 3:.
3. Maximum cable length should not exceed 50 feet. Use Cable P/N 940578. Connect to RS232 serial port of LX-300 printer Interface Board (P/N 940545).
4. Maintain at least 0.25 inch clearance between power limited and non-power limited circuit wiring. Use cable ties or some other permanent means.

TFX Programming for LX-300 Operation

TFX-500/500M, TFX-800/800M, and TFX-500MV/800MV require programming using *CONSYS*. The following printer parameters need to be programmed:

1. Select "Digital I/O" Menu Option.
2. Select the MPIM to which the PIM–550 module is attached (for example, MPIM Local Bus 01, PIB–L).
3. Define device as I/P (Norm. Lo) which enables RS232 Online Detect.

Table 3: *LX-300 Settings for TFX-500/500M, TFX-800/800M, TFX-500MV/800MV with PIM-550 Module Printer Configuration*

Function	Setting
Character spacing	10 cpi
Shape of zero	Ø
1 inch skip-over-perforation	OFF
Character table	PC 437
Auto line feed	OFF
Page length	11 inches
Auto tear off	OFF
Tractor	Single
Interface	Auto selection (10 sec.)
Serial I/F bit rate	4800 bps
Serial I/F parity bit	None
Serial I/F data length	8 bit
Serial I/F ETX/ACK	ON

DETAIL "A"

Figure 3: *AUTOCALL TFX-500/800, TFX-500M/800M, TFX-500MV/800MV System with Serial Interface Module 976262 Typical Printer Application Wiring Diragram. All circuits and connections are power limited/Class 2 unless otherwise noted as non-power limited.*

Notes, Figure 3: TFX-500/800, TFX-500M/800M, TFX-500MV/800MV Application with Isolator Module

1. Refer to Publication 19700419, *Serial Interface Module P/N 976262,* and Publication 19700235, *AUTOCALL TFX Multi-Purpose Interface Module (MPIM) P/N 976015,* for more information. Refer to the User's Manual supplied with the LX-300 printer for setup information.
2. For use with the TFX-500/800, TFX-500M/800M, TFX-500MV/800MV the LX-300 printer must be configured as shown in Table 4:.
3. Maximum cable length should not exceed 50 feet. Use Cable P/N 940578. Connect RS232 serial port PL3 of MPIM to RS232 serial port S1 of Serial Interface Module P/N 976262; connect cable 19600221 to RS232 serial port of LX-300 printer.
4. Maintain at least 0.25 inch clearance between power limited and non-power limited circuit wiring. Use cable ties or some other permanent means.

TFX Programming for LX-300 Operation

TFX-500/500M and TFX-800/800M require programming using *CONSYS.* The following printer parameters need to be programmed:

1. Select "Digital I/O" Menu Option.
2. Select the MPIM to which the printer is attached (for example, MPIM Local Bus 00, OIB–L).
3. Define device as I/P (Norm. Lo) which enables RS232 Online Detect.

Table 4: *LX-300 Settings for TFX-500/500M, TFX-800/800M, TFX-500MV/800MV with Serial Interface Module 976262 Printer Configuration*

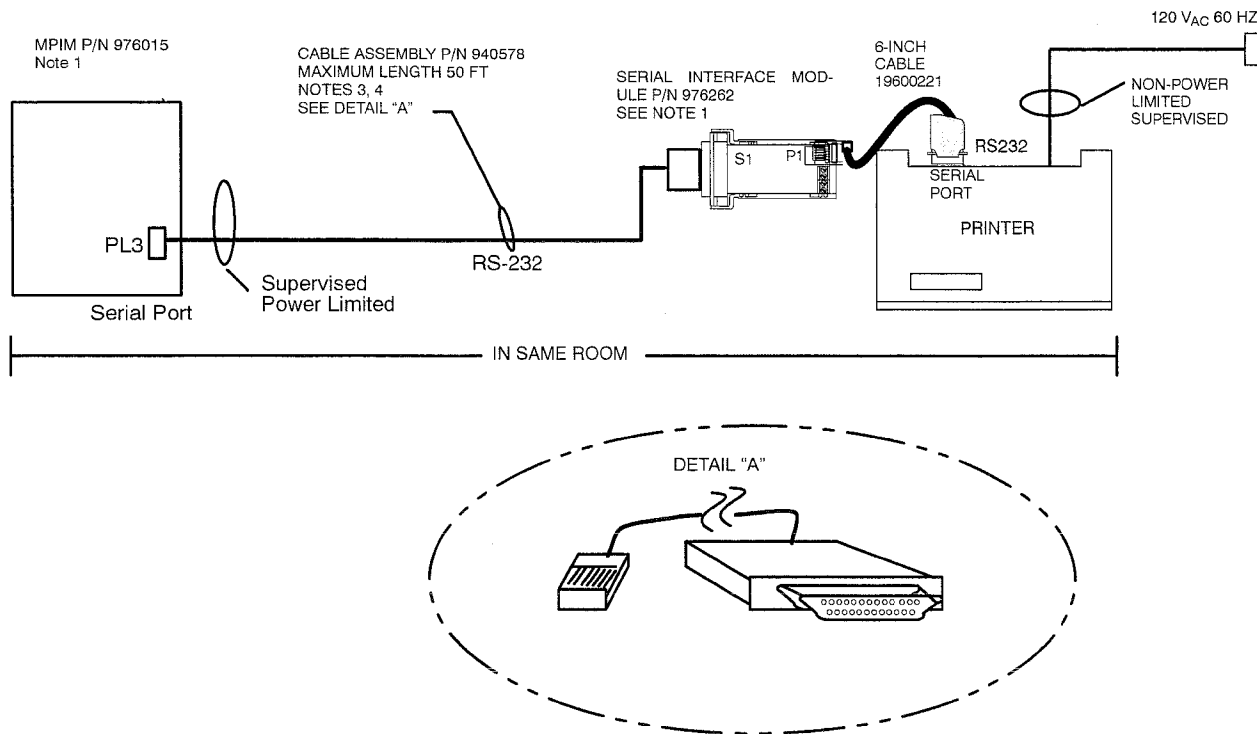| Function	Setting
Character spacing	10 cpi
Shape of zero	$\emptyset$
1 inch skip-over-perforation	OFF
Character table	PC 437
Auto line feed	OFF
Page length	11 inches
Auto tear off	OFF
Tractor	Single
Interface	Auto selection (10 sec.)
Serial I/F bit rate	4800 bps
Serial I/F parity bit	None
Serial I/F data length	8 bit
Serial I/F ETX/ACK	ON

Figure 4: AL-1500 Application using printer port of V-Master Logic Module P/N 5200–469 or V–Expander Module 5200–478 and Serial Interface Module P/N 976262. All circuits are non-power limited.

Notes Figure 4: AUTOCALL AL-1500 and AL-1500E Applications, RS-232 Communications

1. Refer to Publication 19700419, *Serial Interface Module P/N 976262*, and Publication No. MP-38 *V-Master Logic Module P/N 5200–469*, Publication No. MP-54, *AUTOCALL V-Expander Module Assembly P/N 5200–478*, for installation and wiring details. for more information. Refer to the User's Manual supplied with the video terminal for setup information.

2. This V-Master Logic Module must be the main V-Master Logic Module for the system. For use with the AL-1500 V-Master Logic Module, the LX-300 printer must be configured as shown in Table 5:.

3. Maximum cable length should not exceed 50 feet. Use Cable P/N 19600222. Connect J4 serial port of the V-Master Logic Module to RS232 port (S1) of Serial Interface Board (P/N 976262); connect cable P/N 19600221 to RS232 serial port of LX-300 printer.

Table 5: *LX-300 Settings for AL-1500/AL-1500E V-Master Logic RS232 Serial Printer Output System Configuration*

Function	Setting
Character spacing	10 cpi
Shape of zero	$\emptyset$
1 inch skip-over-perforation	OFF
Character table	PC 437
Auto line feed	OFF
Page length	11 inches
Auto tear off	OFF
Tractor	Single
Interface	Auto selection (10 sec.)
Serial I/F bit rate	Configuration dependent upon AL-1500 firmware programming
Serial I/F parity bit	ODD
Serial I/F data length	7 bit
Serial I/F ETX/ACK	ON

5200-478 V-EXPANDER MODULE

NOTE 5 Shield

Return (DCC)

Serial OUT−

20 mA SERIAL LOOP TYPICAL

SEE DETAIL "A"

WIRING THAT LEAVES THE BUILDING MUST BE RUN UNDERGROUND AND AWAY FROM ANY HIGH VOLTAGE WIRING.

20 mA NOT SUPERVISED
MAX WIRE GAUGE NO. 12 AWG
MAXIMUM LENGTH 240,000 FT FOR NO. 12 AWG
NOTE 4

SERIAL INTERFACE MODULE P/N 976262
SEE NOTES 1, 4
6-INCH CABLE 19600221 MAX. 50 FT

SERIAL PORT

PRINTER

RS232

120 V$_{AC}$ 60 HZ

NOTE: Jumper Plug 8646-280 required if no printer is used.

DETAIL "A"

TO A8 TO A6

Figure 5: AL-1500 Application using printer port of V-Master Logic Module 20 mA communications and Serial Interface Module P/N 976262 (all circuits are non-power limited).
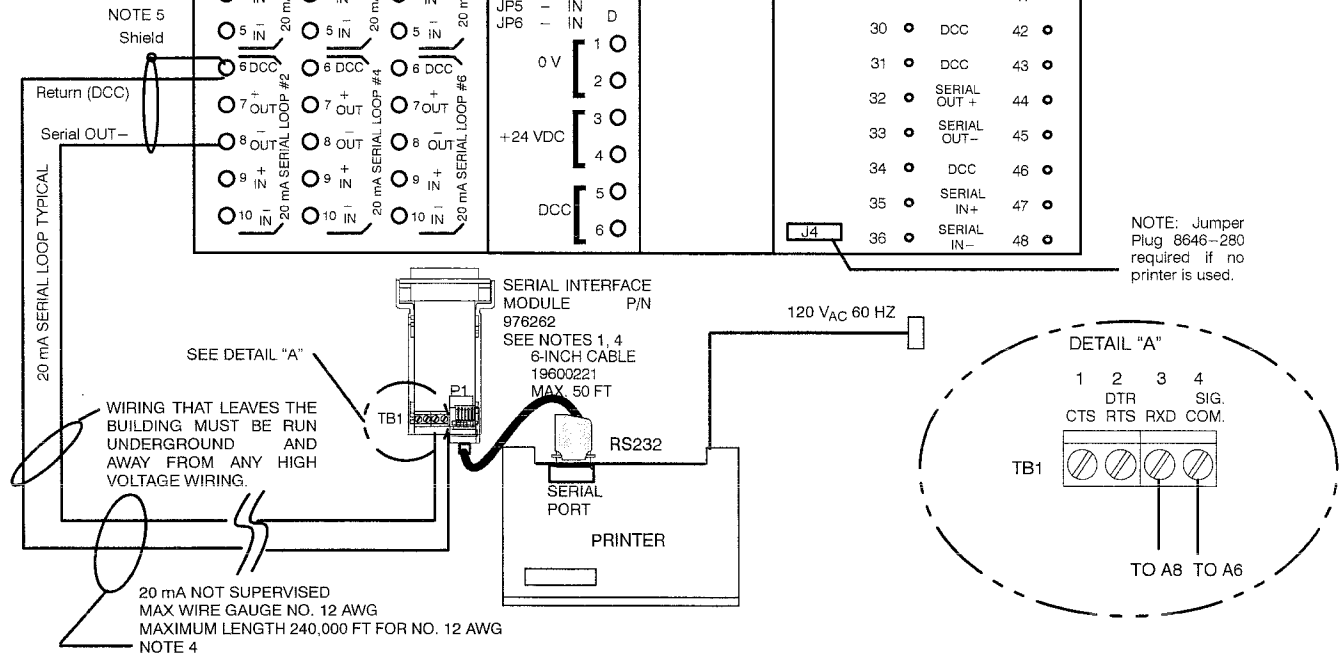
Notes Figure 5: AUTOCALL AL-1500 and AL-1500E Applications, 20 mA Communications

1. Refer to Publication 19700419, *Serial Interface Module P/N 976262*, and Publication No.MP-38, *V-Master Logic Module*, and Publication MP-54, *V-Expander Module P/N 5200-478*, for more information. Refer to the User's Manual supplied with the video terminal for setup information.
2. This V-Master Logic Module must be the main V-Master Logic Module for the system. For use with the AL-1500 V-Master Logic Module/V-Exapnder Module, the LX-300 printer must be configured as shown in Table 7:.
3. In the AL-1500E application, typically, printer outputs are located on the 5200-478 module, and designated as 20-mA Serial Loops #2, #4, and #6. See Table 6:.

Table 6: *AL-1500E Circuits 1-6 Configurable as Printer Ports. Terminals, Jumpers, and LEDs*

| Serial Output Circuit | AL-1500E Terminal Connect to Serial Interface Module P/N 976262: | | AL-1500E Jumper Installed | AL-1500E LED |
	TB1-4 (SIG. COM.)	TB1-1 (CTS)		
1	A1	A3	JP1	TXD1
2	A6	A8	JP2	TXD2
3	B1	B3	JP3	TXD3
4	B6	B8	JP4	TXD4
5	C1	C3	JP5	TXD5
6	C6	C8	JP6	TXD6

4. Maximum length should be calculated for the wire gauge used. Refer to Publication Form 1195, "20 mA Serial Loop Cabling." Connect to 20 mA circuit from 5200-478 V-Expander Module to 20 mA terminal block TB1 serial port of Serial Interface Board (P/N 976262). See Table 6:.

5. Shields must be tied to DCC only as shown on field wiring drawing (one end at control unit only) and must be free of other grounds.

Table 7: *LX-300 Printer Settings for AL-1500/AL-1500E, 20 mA*

Function	Setting
Character spacing	10 cpi
Shape of zero	Ø
1 inch skip-over-perforation	OFF
Character table	PC 437
Auto line feed	OFF
Page length	11 inches
Auto tear off	OFF
Tractor	Single
Interface	Auto selection (10 sec.)
Serial I/F bit rate	Configuration dependent upon AL-1500 firmware programming
Serial I/F parity bit	ODD
Serial I/F data length	7 bit
Serial I/F ETX/ACK	ON

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Should further information be desired or should particular problems arise which are not covered sufficiently for the user's purposes, the matter should be referred to Grinnell Fire Protection Systems Company, Inc., Westlake, Ohio 44145. Ph. (216) 871-9900.

Grinnell®
FIRE PROTECTION SYSTEMS COMPANY

Serial Interface Module
PCB 900982   Assembly No. 976262

Publication Number 19700419
Issue 2, January 1997

The Serial Interface Module P/N 976262 provides an isolated interface between AUTOCALL TFX, AL-1500 and AL-1500E control panel RS232 or 20 mA circuits and peripheral devices such as printers and video terminals.

Features:

● Provides electrical ground isolation between control equipment and UL listed printer, video terminal, or any other UL listed peripheral devices. Isolation allows for proper ground fault monitoring of the RS-232 cable.

● Converts 20 mA signals to RS232 levels to drive UL listed terminal devices.

● Eliminates the need for a separate printer interface module, required by the TFX for isolation.

Operation:

For AUTOCALL TFX applications the Serial Interface Module connects directly to any TFX MPIM–OIBL serial port PL3 (or other MPIM with personality that accommodates serial communications), providing electrical isolation from the peripheral device. (Refer to Publication 19700235, *MPIM Installation Guide*.)

For AL-1500/AL-1500E applications the Serial Interface Module connects to either J4 (DB9) printer port on the V-Master Logic Module or to one of the six 20 mA outputs of the V-Expander Module. The Serial Interface Module provides electrical isolation from the printer when connected to the printer port, and converts the 20 mA signal to RS232 levels when connected to the V-Expander Module.

Specifications

Environment:	Indoor Application Only
Operating Temperature:	32°F to 120°F
Operating Humidity:	85% (non-condensing)
Base/Cover Material:	A.B.S. 94HB
Dimensions (lwd):	2.25 × 4.4 × 1 inch

Table 8: *Electrical Specifications*

Battery Requirements:			
Current Draw from TFX-500/500M TFX-800/800M TFX-500MV/800MV 24 V$_{DC}$			
		Standby Current	8 mA
		Alarm Current	8 mA
Current Draw from AL-1500/AL-1500E 24 V$_{DC}$			
	Printer Port J4	Standby Current	4 mA
	Printer Port J4	Alarm Current	4 mA
	V-Expansion Module	20 mA Output	20 mA

Table 9: *Indicator LED DS1*

LED	Function
ON	Ready for data.
OFF	Printer (or other peripheral device) is in fault (not ready or connections not properly made).
BLINKING	Data is being transferred.

Installation:

1. Disconnect power before servicing the system.
2. Connect control panel circuit to the Serial Interface Module. Use the 25-pin connector S1 for RS232 serial communication; use terminal block TB1 for 20 mA communication
3. Connect the printer or other peripheral device to Serial Interface Module P1 output jack using cable P/N 19600221.

Figure 6:   Serial Interface Module P/N 976262 (a) Module, (b) Cable.

Table 10: *Connector P1 Output Control*

P1 Output Control (to Peripheral Device)	Direction	Function
P1–1, Signal Ground (SG)	––	Signal return path
P1–2, Request to Send (RTS)	OUT	Tied to CTS via 0-ohm clippable resistor R1
P1–3, Receive Data (RXD)	IN	Negative voltage source
P1–4, Clear to Send (CTS)	IN	Positive voltage source
P1–5, DSR	IN	Positive when the terminal equipment is ready; Negative when not ready.
P1–6, Transmit Data (TXD)	OUT	Data output to terminal device

Table 11: *Terminals TB1 20 mA Input Control*

TB1, 20 mA Input Control	Direction	Function
TB1–1, Clear to Send (CTS)	IN	Positive voltage source
TB1–2, Request to Send (DTR/RTS)	OUT	Terminal equipment status. Positive when ready.
TB1–3, Receive Data (RXD)	IN	Data input
TB1–4, Signal Ground (SG)	––	Data return path.

Connector Pin Configuration

The 25-pin serial input connector information is given so that if an adaptor is needed, correct pin function can be accommodated.

SERIAL INPUT 25-POSITION

Table 12: *DB25-Pin Connector S1, Pin Configuration*

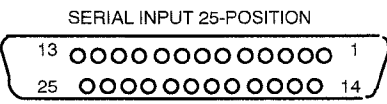| Pin	Signal name	Direction	Description
1–2	––	––	Not Used
3	Received Data (RXD)	IN	Data Input
4	Request to Send (RTS)	IN	Control Status. Positive when ready.
5	Clear to Send (CTS)	OUT	Tied to RTS
6	Data Set Ready (DSR)	OUT	Tied to RTS
7	Signal Ground (SG)	––	Data Return Path
8–19	––	––	Not Used
20	Data Terminal Ready (DTR/RTS)	OUT	Positive when equipment is ready.
21–25	––	––	Not Used

Wiring Notes:

1. Disconnect power before servicing the system.
2. All wiring to conform to current National Electrical Code, NFPA 70, state, and local building code requirements and applicable notes. When installed to comply with N.E.C. Article 760, Parts A and B, these circuits are classified as non-power limited. When installed to comply with N.E.C. Article 760, Parts A and C, these circuits are classified as power limited.
3. All conductors must be free of grounds.
4. LX-300 Printer applications: Refer to Publication 19700421, LX-300 9-Pin Dot Matrix Printer Installation Guide for typical wiring diagrams for TFX-500/500M, TFX-800/800M, TFX-500MV/800MV, AL-1500, AL-1500E applications.
5. For video terminal application, the terminal must be used in READ ONLY MODE. The keyboard may not be used in this application.
6. For TFX-500/800 applications refer to Publication 850462, TFX-500/800 Operator's Manual and Installation Guide; for TFX-500M/800M applications refer to Publication 850515, TFX–500M/800M Operator's Manual and Installation Guide.
7. For AL-1500/AL-1500E applications, refer to Publication 0022-136, Autocall 3800 System Installation and Operating Instructions, AL-1500 and AL-1500E; Publication MP-38, V-Master Logic Module Installation Guide; Publication MP-54, V-Expander Module Installation Guide.
8. For proprietary systems use model LX-300 Printer P/N 976264 or any UL 864 listed printer rated for fire protective signaling service. For local type systems any UL 1950 listed printer is acceptable.

(a)
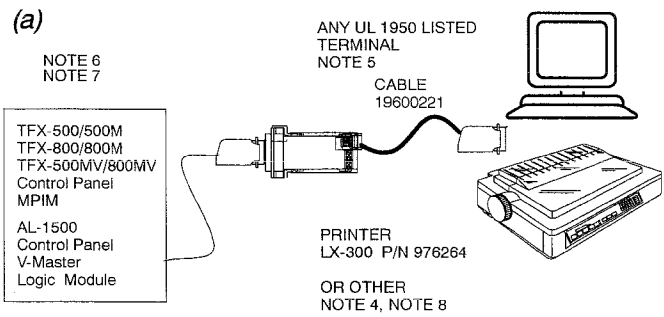
Figure 7: *Typical Configuration RS-232 input from TFX MPIM or AL-1500 V-Master Logic Module.*

(b)
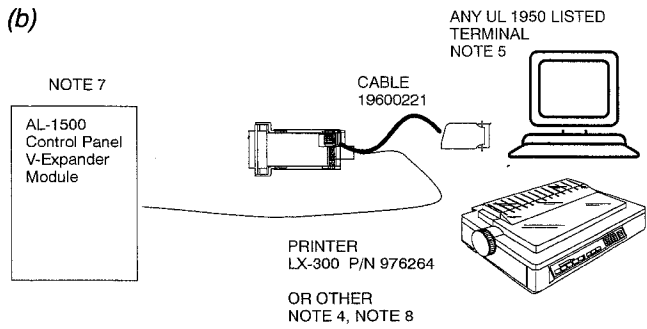
Figure 8: *Typical Configuration 20 mA input from AL-1500/AL-1500E V-Expander Module.*

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Should further information be desired or should particular problems arise which are not covered sufficiently for the user's purposes, the matter should be referred to Grinnell Fire Protection Systems Company, Inc., Westlake, Ohio 44145. Ph. (216) 871-9900.

Grinnell®
FIRE PROTECTION SYSTEMS COMPANY

SX-TB-030-2A Secondary Protector

P/N 19240949 Assembly No. 910692

Publication Number 19700343
Issue 2, January 1997

The SX-TB-030-2A is a non-resettable secondary surge protector that provides over-voltage protection for circuits that leave the premises.

Installation:
1. Disconnect power before servicing the system.
2. Locate SX-TB-030-2A to control panel inside wall so that it is convenient for wiring to equipment circuit, line circuit, and cabinet ground.
3. Use the SX-TB-030-2A as a template to mark position of two mounting holes in cabinet. Drill two holes in the cabinet 0.104-inch diameter. Mount the SX-TB-030-2A using two 6-32 x 3/8 self tapping screws (P/N 19300374, included).
4. Connect wiring.

Important: The SX-TB-030-2A contains non-replaceable fuses. Make sure wiring is checked for short circuits before installing this device.

Module Position: _____
(See System Layout)
Space Requirement: Attach to inside cabinet wall in location convenient to module circuit, line, and cabinet ground.

Rated Voltage: 30 VDC maximum
Breakdown Voltage: 36 V line-to-line and line-to-ground
Let-through Current: 2 A maximum

**Dimensions *(lwd):* 2.8 × 2.1 × 1.53 inches

### Wiring Notes:
1. Disconnect power before servicing the system.
2. All wiring to conform to current National Electrical Code, NFPA 70, state, and local building code requirements and applicable notes. When installed to comply with N.E.C. Article 760, Parts A and B, these circuits are classified as non-power limited. When installed to comply with N.E.C. Article 760, Parts A and C, these circuits are classified as power limited.
3. All conductors must be free of grounds.
4. Use wire gauge No. 14 to No. 18 AWG to connect to line circuit and equipment circuit; use minimum No. 12 AWG for connecting to cabinet ground/earth ground.
5. Connect GND, to cabinet ground on the control panel cabinet.
6. Connect "LINE" terminals to wiring that connects to primary protector at building entrance.
7. Connect "EQUIP" terminals to equipment output circuit.
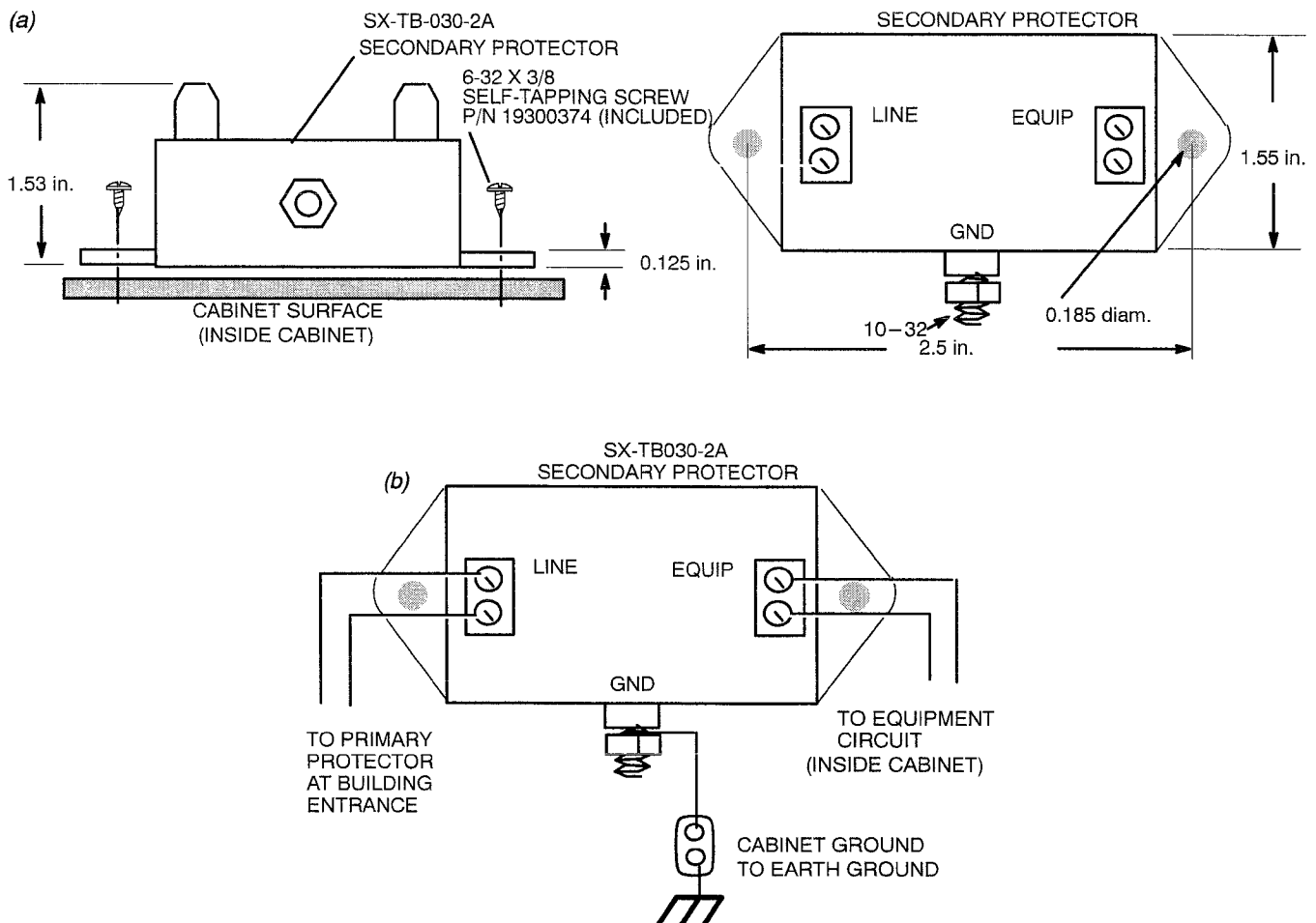
Figure 1. SX-TB-030-2A Secondary Surge Protector (a) Installation, (b) Wiring.

This document is written for skilled technicians with experience installing and testing fire detection systems. These instructions do not purport to cover all the details or variations in the equipment described. Nor do they provide for every possible contingency met in connection with installation, operation, or maintenance. All specifications are subject to change without notice.

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Grinnell
FIRE PROTECTION SYSTEMS COMPANY

Auxiliary Housing
Assembly No. 976010

Publication Number 19700219
Issue 4, January 1997

The Auxiliary Housing may be used to enclose an auxiliary AC power supply and standby batteries; a DCPM DC Power Module, MPIM, ARM-500 Auxiliary Relay Module, DCB-501 Digital Alarm Communicator Transmitter, PIM-550 Printer Interface Module and/or XIOM Expansion Input/Output Modules for the AUTOCALL TFX fire control systems.

Plan cabinet location to permit free access to sides, top, and/or bottom for conduit entry. Make sure conduit or wire does not interfere with battery location. Also, make sure there is full clearance for the 180-degree swing-out door.

Specifications:
Environment: Indoor installation only
The unit should not be subjected to ambient air temperatures below 32 degrees F or above 122 degrees F. Humidity should not exceed 85% (noncondensing).
Dimensions (lwd): 14.00 x 12.50 x 4.75 inches
Conduit knockouts for 0.50 inch fittings
#6-32 x 0.38 lg PEM nut fittings

POWER SUPPLY AND SUBPLATE NOT INCLUDED.

USE WITH SUBPLATE ASSEMBLIES 976034 OR 976009

RED   BLACK

NON-POWER LIMITED
BATTERY BUS CABLE
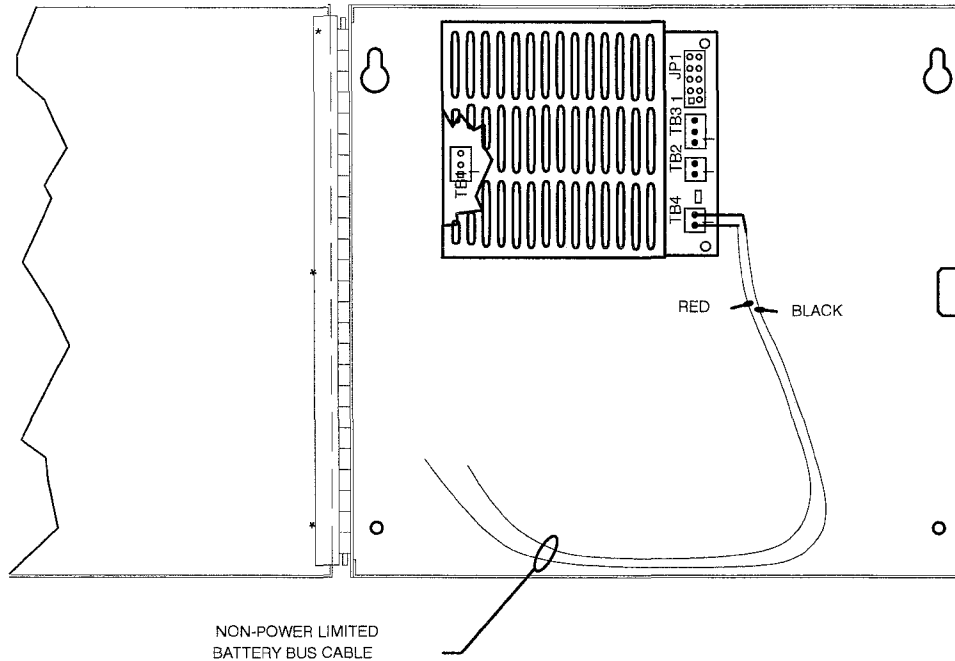
Wiring:
1. All conductors to be free of grounds.
2. Disconnect power before servicing systems.
3. See Module installation guides for unit wiring. See Publication Number 19700262, "AUTOCALL TFX-500/800 Battery Calculation Worksheets," or TFX-500M/800M, Publication No. 19700368, to select correct capacity standby batteries for system requirements.

nstallation:

1. Install top mounting screws. Fit screwheads and washers into keyhole slots in housing. Slide cabinet down and capture housing. Tighten screws. Install bottom screws.
2. Mount power supply unit or other auxiliary module to cabinet using 6-32 x 0.38 screws.
3. Install standby batteries (if required).
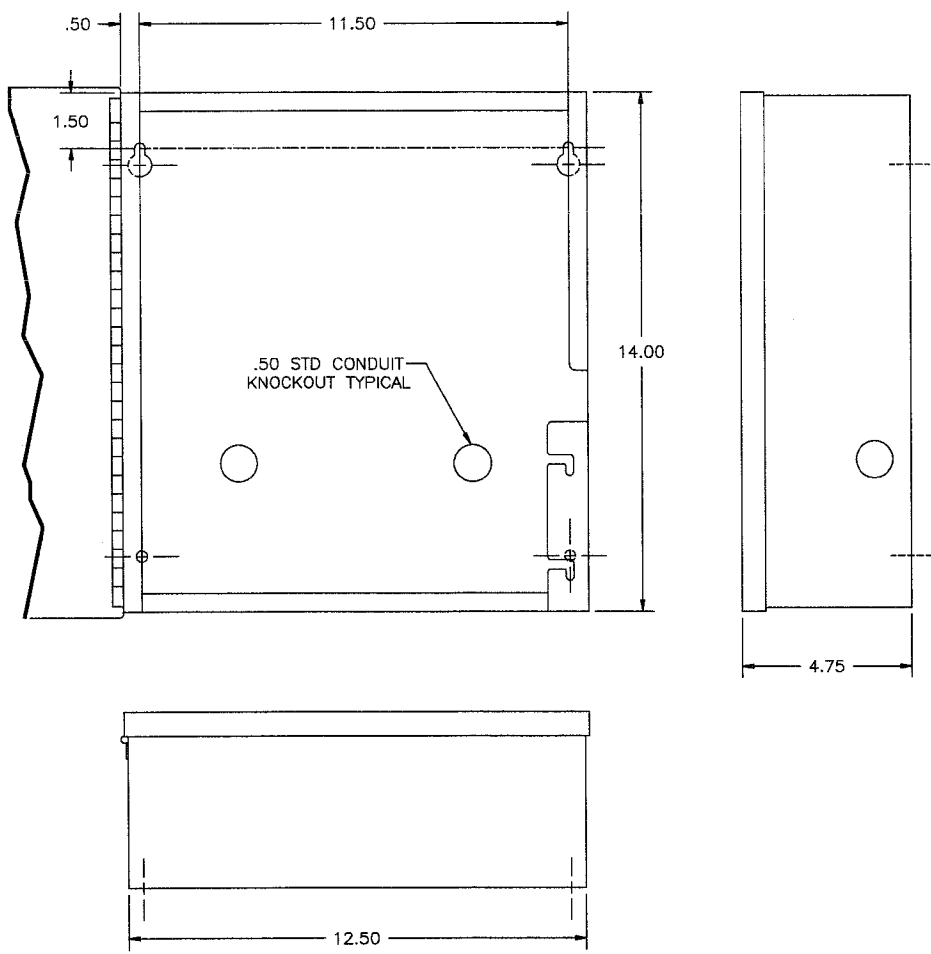
.50 STD CONDUIT
KNOCKOUT TYPICAL

.50

11.50

1.50

14.00

4.75

12.50

4050 Series Fire Alarm Stations (Non-Coded)

4050-211T	Single-Action
4050-211TB	Single-Action
4053-001-101	XA Addressable
4052-505-101	XA Addressable with Patrol
4059-001-101	AutoPlex Addressable

**Publication Number 19700405,
Issue 2, January 1997**

Type 4050 non-coded fire alarm stations use normally-open (N.O.) contacts; operate and reset easily; and may be mounted semi-flush or surface. Optional break-away shield (P/N 8462–657) is available.

Operation

Single-action alarm stations:

1. If break shield option is installed, lift and break the shield.
2. Slide the handle down firmly.
   (a) Actuating switch will close.
   (b) Address switch will report to the control panel.
3. Reset the alarm station.
   (a) Remove the screw from the front of the alarm station.
   (b) Toggle the reset switch to the UP position.
   (c) Close the station and re-secure the screw.
4. To replace the optional break shield:
   (a) Open the alarm station
   (b) Slide the tab of the new shield between the handle plate and the station front.
   (c) When the station is closed, the hole in the shield will engage the retaining pin, holding the shield in place.

Model 4052-505-101 Patrol Station—Inserting the patrol key into the patrol keyswitch immediately causes a patrol condition to be reported to the control unit.

General Wiring Notes

1. Disconnect power before servicing system.
2. All conductors must be free of grounds.
3. All wiring is to be in accordance with N.E.C. (National Electrical Code), local authorities, and applicable notes.
4. When installed to comply with N.E.C. Article 760, Part A and Part C, these circuits are classified as power limited. When installed to comply with N.E.C. Article 760, Part A and Part B, these circuits are classified as non-power limited. Maintain at least 0.25 inch clearance from all power limited wiring with cable ties or other permanent means.
5. These drawings are typical only.

Table 1. Specifications 4050 Series Fire Alarm Stations

Description				
Model/Part No.	Description	Action	Application	Back Box
4050-211T	Conventional Alarm Station: Terminals, N.O. Contacts	1	Conventional Alarm Station.	9090-006-001 4050BB
4050-211TB	Conventional Alarm Station: Terminals, N.O. Contacts	1	Conventional Alarm Station (TFX-addressable with optional IXA-501CM)	9090-006-001 4050BB
4050-271-101	Pre-Signal and Alarm Terminals, N.O. Contacts	2	Conventional Pre-signal contact and alarm contact.	9090-006-001
4053-001-101	Terminals, N.O. Contacts, Addressable AutoCommand, AutoMonitor	1	Single Transponder to AUTOCALL XA/TXA Module 5200-422	9090-006-001
4052-505-101	Terminals, N.O. Contacts, Addressable for AutoPlex	1	Single Transponder to AUTOCALL XA/TXA Module 5200-422; Patrol Box	9091-043 (Supplied)
4059-001-101	Terminals, N.O. Contacts, Addressable for AutoPlex	1	Single Transponder to AUTOCALL AutoPlex Module 5200-442	9090-006-001

Switch Contact Electrical Rating		
	6.0 amps at 24 VDC resistive	3.0 amps at 24 VDC inductive

Standby Battery Requirements		
	Supervisory Current	Alarm Current
4050-211T	--	--
4050-211TB	--	--
4053-001-101	1 mA	1 mA
4052-505-102	1 mA	1 mA
4059-001-101	Negligible	Negligible

Installation Notes

1. Installation must be in compliance with local codes having jurisdiction.
2. Stations should be mounted not less than 4.5 feet or more than 6 feet from floor levels. Usually the 4.5 feet height is preferred. Location should be in normal exit paths and distributed no more than 200 feet from any point in the building. Stations should be unobstructed and readily accessible.
3. Address setting for addressable alarm stations.
   (a) For digital DIP switches, use a small screw driver or plastic tool to set address switches (do not use a pencil, graphite particles may damage the switch). Address is equal to the sum of the switch values placed in the ON position. For example, for address

FRONT VIEW

REMOVE SCREW TO OPEN ALARM STATION FOR RESETTING

FRONT VIEW COVER REMOVED

| Alarm Station | Break Optional Shield, Lift and Break | Pull Handle Down | To Reset, Toggle Switch. |
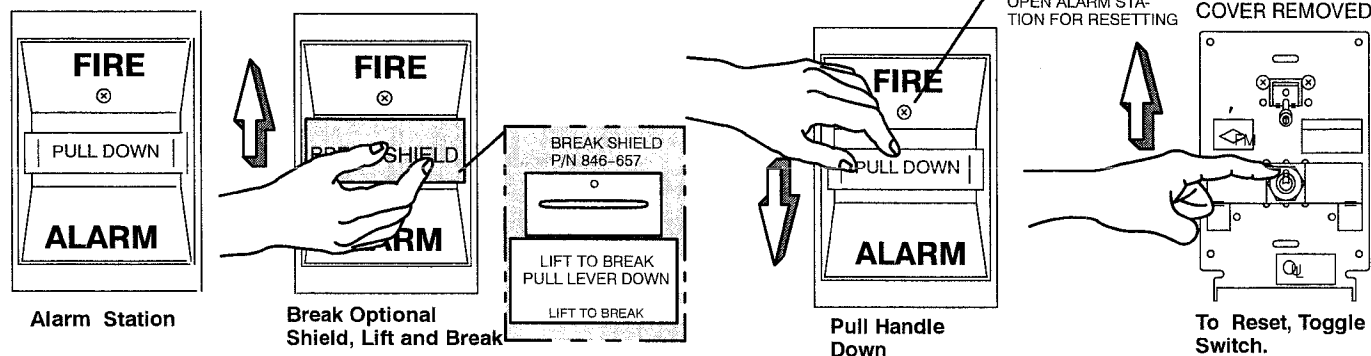
Figure 1. 4050 Series Alarm Station Operation and Reset.

WALL LINE FOR SEMI-FLUSH MOUNTING

CORRECT

NO

NO

WIRE TERMINALS CORRECTLY TO ASSURE ELECTRICAL SUPERVISION

$3\frac{3}{8}"$ $3\frac{1}{2}"$ $2\frac{1}{2}"$ $5\frac{1}{8}"$ $4"$

BACK BOX

4050-211T
4050-211T???

STANDARD SINGLE GANG BACKBOX (BY OTHERS)

WALL LINE FOR SEMI-FLUSH MOUNTING

$3\frac{3}{8}"$ $3\frac{3}{4}"$ $2\frac{1}{4}"$ $5\frac{1}{8}"$ $4"$

BACK BOX

4050-211T, 4050-211T?? (with IXA-501CM), 4053-001-101, 4059-001-101

PLASTER RING (BY OTHERS)

4" SQUARE BACKBOX (BY OTHERS)

9091-043 BACKBOX PROVIDED MEASURES 1-1/8 INCHES HIGH BY 2-7/8 INCHES DEEP

WALL LINE

SURFACE MOUNTING

WALL LINE

$3\frac{3}{8}"$ $2\frac{1}{2}"$ $1\frac{1}{2}"$ $5\frac{1}{8}"$

SURFACE STYLE SHALLOW BACKBOX P/N 4050BB

4050-211T
4050-211T??

1/2" KNOCKOUT TOP & BOTTOM

WALL LINE

$3\frac{3}{8}"$ $4"$ $3"$ $5\frac{1}{8}"$

SURFACE STYLE DEEP DEPTH BACKBOX PART NO. 9090-006

4050-211T, 4050-211T?? (with IXA-501CM), 4053-001-101, 4059-001-101

3/4" X 1" COMB. KNOCK OUT TOP & BOTTOM

WALL LINE

$5\frac{5}{16}"$

4052-505-102 GENERAL ALARM W/ PATROL STATION

WALL LINE

$1"$ $3\frac{1}{8}"$ $5\frac{5}{16}"$

SURFACE STYLE DEEP DEPTH BACKBOX PART NO. 9091-043 (SUPPLIED)

3/4" X 1" COMB. KNOCK OUT TOP & BOTTOM

Figure 2. Installation of 4050 Series Fire Alarm Stations.

29, turn on switches 5, 4, 3, 1 (Value 16 + 8 + 4 + 1). Switch values in ON position:

Sw. Pos.	Value	Sw. Pos.	Value
1	1	5	16
2	2	6	32
3	4	7	64
4	8	8*	128

(b) Model 4053-001, addressable alarm station application with Autocall 3800 control panel, 5200–422 Module. Address switch S1 is located under the insulator of the electronic component assembly. Switch values in ON position:

(c) For rotary address switches (model 4059), use a small screwdriver to rotate the indicator and position the indicator dot to the correct position on each switch: for example, E4:
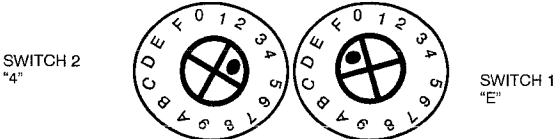
SWITCH 2 "4"

SWITCH 1 "E"

(d) TFX-500/800 application set address on IXA-501CM Module. Switch is 7-position (position 8* not available) values in ON position. Refer to Publication Number 19700293.

4. Install alarm station wiring.

5. For NFPA Style 6 wiring and semi-flush mounting use a standard 4-inch by 4-inch by 2 1/8-inch outlet box fitted with a 3/4-inch deep single gang plaster ring set flush to the plaster line.

6. For NFPA Style 4 ("T-Tap") wiring and semi-flush mounting, use a standard single gang outlet box, 2 1/4-inch minimum depth, set flush to the plaster line.

7. For surface mounting, use Autocall P/N 9090-006 steel back box (3 inches deep).

WIRING NOTES—Model 4050-211T (Figure 3)

1. Connect terminals to initiating circuit.
2. Install end-of-line device as required for supervision.

WIRING NOTES—Model 4050-211TB (with optional IXA-501CM Contact Monitoring Module—Figure 4)

1. Set address on IXA-501CM Mini Contact Monitoring Module (P/N 976081) according system site plan. Refer to Publication 19700293.

2. Break wire run to provide supervision. Install UL listed end-of-line device as required by the control system for supervision.

(a) Install the EOL resistor (619-ohm, 0.25 watt, UL listed, P/N 976082) into the circuit of the monitored contact device. Refer to Publication 19700293.

(b) IXA-501CM connections to TFX signalling line circuit (addressable loop): Terminal 1 (+) to addressable loop (+); Terminal 2 (–) to addressable loop (–). Refer to Publication 19700293 for circuit parameters.

BACK VIEW
4050-211T

TERMINAL BLOCK

UL LISTED EOL AS NEEDED FOR SUPERVISION

4050-211T   UL LISTED EOL AS NEEDED FOR SUPERVISION

4050-211T   4050-211T   4050-211T

CONTROL UNIT

Figure 3. 4050-211T Wiring.

TFX-500/800 CONTROL UNIT   +   + TO NEXT DEVICE
                              −   −

TERMINAL BLOCK

4050-211TB

BLACK   RED

YELLOW   PURPLE

                               UL LISTED 619 OHM, 1/4W, 1% RESISTOR

ADDRESS SWITCHES

                               IXA−501CM MINI CONTACT MONITORING MODULE P/N 976081

Figure 4. 4050-211TB with optional IXA-501CM Mini Contact Monitoring Module for application to TFX-500/800 addressable loop.

WIRING NOTES—4059-001-101 AutoPlex Control Panel Application—Figure 5

1. Maximum line resistance 20 ohms, per wire. Capacitance 0.25 mF (wire to wire and wire to shield).

2. Circuit limitations: 24 VDC; normal supervision current is 250 mA; maximum alarm current is 250 mA; frequency is 250 Hz, ripple voltage 100%.

3. Shields must be tied to DC Common only as shown on field wiring drawing (one end at control unit only). Must be free of grounds.

4. Loops terminate at an AutoPlex Module (5200–442). Refer to Publication No. MP–25. AutoPlex loop terminals are connected to terminals: In (+) 1, (SIG) 2, (−) 3; Out (+) 10, (SIG) 11, (−) 12. Loops may be connected in Style 4 or Style 6. Shield connects at one point only.

5. Each station requires a unique and predetermined address for the location at which it will be used, as contained in, and defined by, the job information. This address must be set by rotating the indicator of switch 1 to match the first (most significant) digit of the assigned address and then rotating the indicator of switch 2 to match the second (least significant) digit. A maximum of 250 uniquely addressed devices of all types including fire stations may connect to a single AutoPlex loop.

WIRING NOTES—4053-001-101 XA Interface to Control Panel Application—Figure 6

1. Maximum line resistance 100 ohms, per wire. Capacitance 1.5 mF (wire to wire and wire to shield).

2. Circuit limitations: 24 VDC; normal supervision current is 250 mA; maximum alarm current is 250 mA; frequency is 250 Hz, ripple voltage 100%.

3. Shields must be tied to DC Common only as shown on field wiring drawing (one end at control unit only). Must be free of grounds.

4. XA loop terminals are internally connected: 1–10, 2–9, 3–8, 4–7, and 5–6. Loops may be connected in Style 4 or Style 6. XA loops terminate at an XA/TXA Input Module (5200–422). Refer to Publication No. MP–24.

5. Each station requires a unique and predetermined address for the location at which it will be used, as contained in, and defined by, the
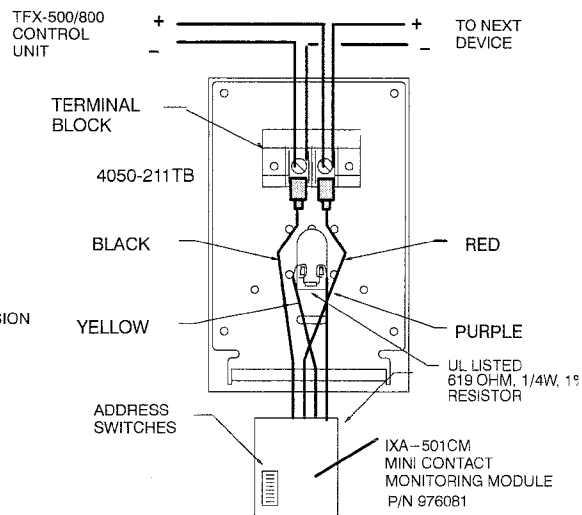
job information. This address must be set on switch 1 located under the insulator of the electronic component assembly. The address is equal to the sum of the switch values placed in the ON condition.
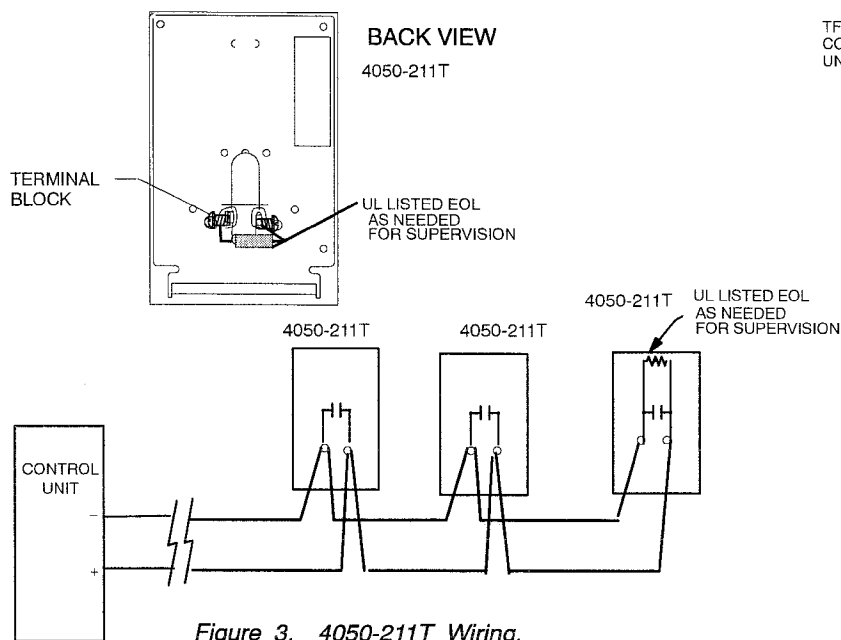
WIRING NOTES—4052-505-101 XA Interface with Patrol Station—Figure 7

1. Maximum line resistance 100 ohms, per wire. Capacitance 1.5 mF (wire to wire and wire to shield).

2. Circuit limitations: 24 VDC; normal supervision current is 250 mA; maximum alarm current is 250 mA; frequency is 250 Hz, ripple voltage 100%.

3. Shields must be tied to DC Common only as shown on field wiring drawing (one end at control unit only). Must be free of grounds.

4. Install UL listed 1 k-ohm end-of-line resistor P/N 4280-068 in UL listed, normally-open contact initiating device (patrol box). When ELR is remote, R15 must be removed from PC board assembly located next to terminals 4 and 5.

5. Patrol box connects to Terminals 4 and 5.

6. XA loop terminals are internally connected: 1–10, 2–9, 3–8, 4–7, and 5–6. Loops may be connected in Style 4 or Style 6. XA loops terminate at an XA/TXA Input Module (5200–422). Refer to Publication No. MP–24.

7. Each station requires a unique and predetermined address for the location at which it will be used, as contained in, and defined by, the job information. This address must be set on switches 1 and 2 located on the electronic component assembly. Switch 1 sets address for circuit 1, leads to patrol keyswitch. Switch 2 addresses circuit 2, terminals 4 and 5, to patrol box. The address is equal to the sum of the switch values placed in the ON condition. Refer to Installation Note 6.

8. Switch S3 needs to be set to program the circuits that are used:

Switch Position	ON =	OFF =
1	Circuit 1 Used	Circuit 1 Not Used
2	Circuit 2 Used	Circuit 2 Not Used
3 (Not Connected)	––	––
4 (Not Connected)	––	––
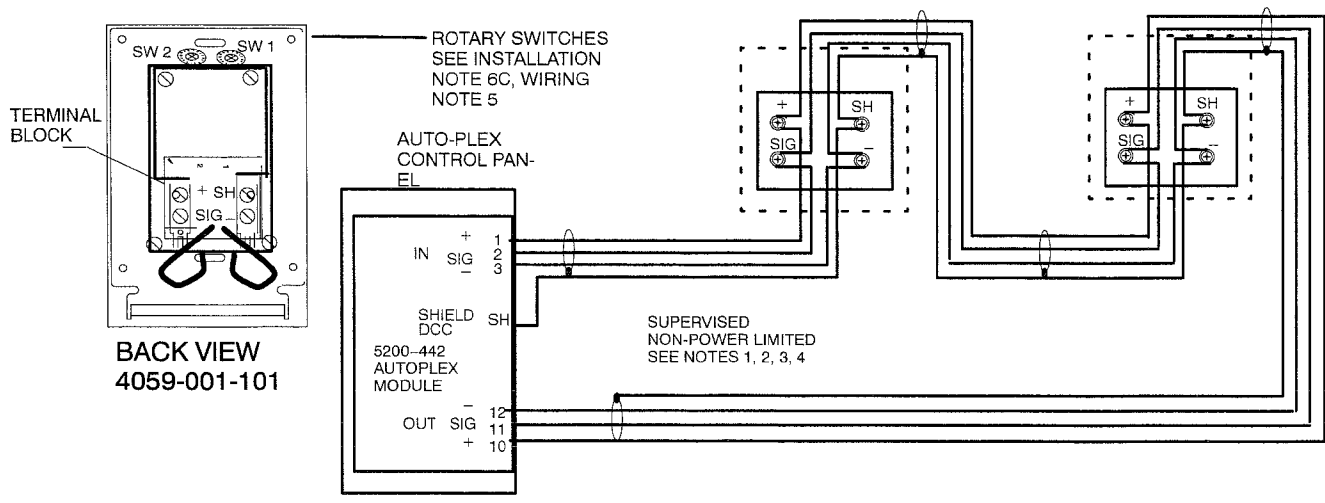
Figure 5. 4059-001-101 Application to AutoPlex Control Panel.
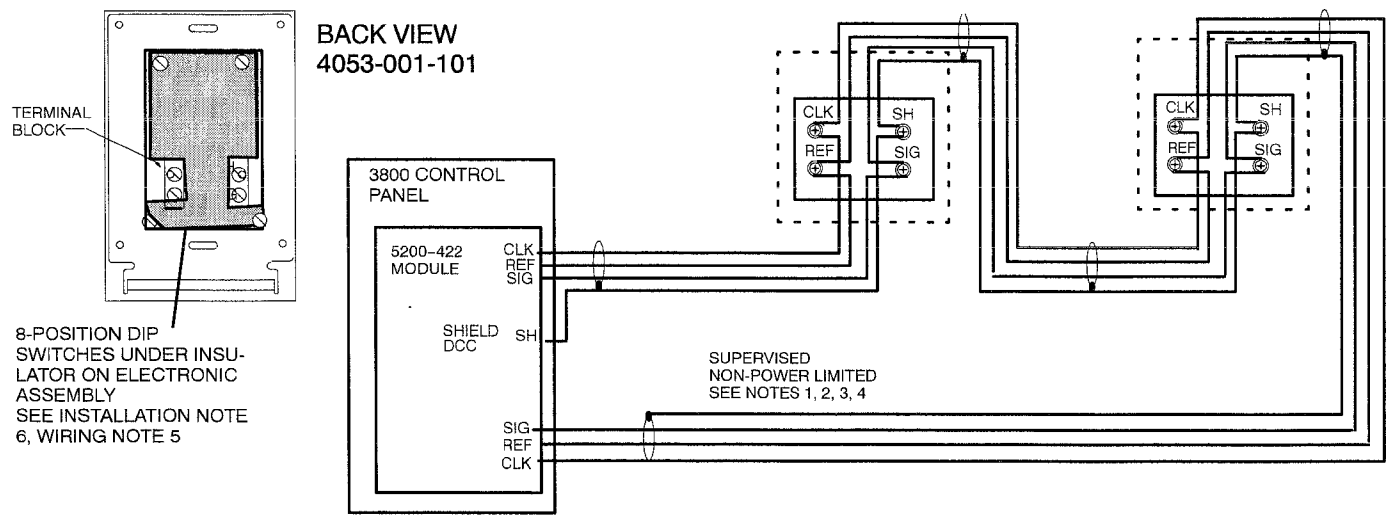
Figure 6. 4053-100-101 XA Interface typical wiring to XA loop at 5200-422 Module.
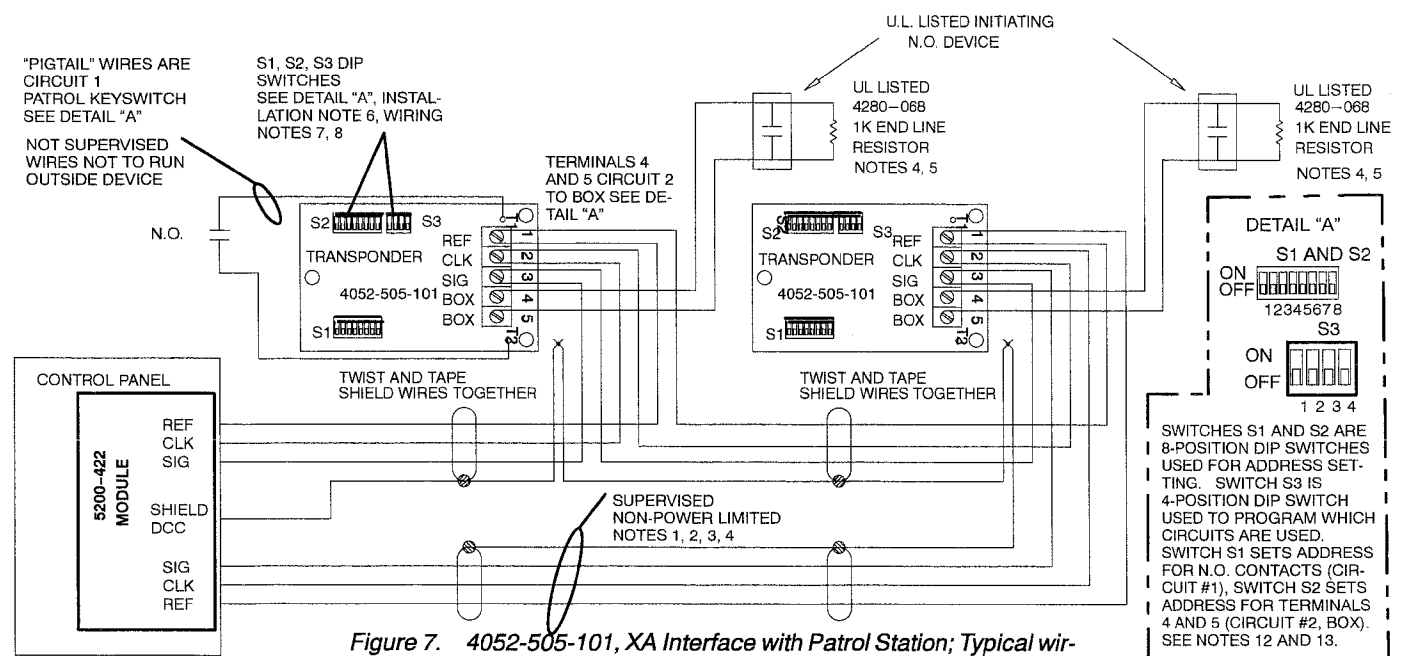
Figure 7. 4052-505-101, XA Interface with Patrol Station; Typical wiring to XA loop at 5200-422 Module.

TFX-500M Fire Control Panel

A. FIRE ALARM LED—red
B. TROUBLE LED—yellow
C. SUPERVISORY LED—yellow
D. ZONE ALARM LED—red
E. ZONE TROUBLE LED—yellow
F. ALPHANUMERIC DISPLAY
G. NO/DELETE touch-button

H. SCROLL UP touch-button
I. SCROLL DOWN touch-button
J. YES/ENTER touch-button
K. POWER LED—green
L. QUIT touch-button
M. FAST ACCESS touch-button
N. NUMERIC touch-pad

O. KEYSWITCH
P. PANEL SILENCE touch-button
Q. ALARM SILENCE touch-button
R. SYSTEM RESET touch-button
S. DRILL touch-button
T. LAMP TEST touch-button

AUTOCALL® TFX-500M Operating Instructions
Attention!   Look at lights and displays!

	What You See	What It Means
A	Red Light ON.	FIRE ALARM! An initiating device (smoke detector or other device) has detected a FIRE ALARM condition. See **D** or **F**.
B	Yellow Light ON.	TROUBLE. There is a trouble condition at one or more of the system devices, or with some other part of the system. See **E** or **F**.
C	Yellow Light ON.	SUPERVISORY. A sprinkler system supervisory device has been activated. See **F**.
D	Zone Red Light ON	FIRE ALARM in the ZONE indicated by the Zone Number next to the light. See **F**. If light **Q** is on, alarms have been silenced.
E	Zone Yellow Light ON.	TROUBLE in the Zone indicated by the Zone Number next to the light. See **F**.

F	Display MESSAGE.	Shows information about the zone and device in alarm.
		• Line 1—Alarm or System Message. Shows type of Alarm or Trouble.
		    Shows date and time under Normal conditions.
		    Shows "REMOTE LOCKOUT" if another system control panel or
		        Remote Ops/Dis panel is being accessed. Only one
		        operator may be logged on to operate the system at one time.
		• Line 2—Zone Message.
		• Line 3—Point Message.
		• Line 4—Zone number, point ID, outstanding events.

K	Green Light ON.	System POWER is on.

ACCEPT EVENTS: Enter your PASSCODE or 0911 at Touch-pad **N**, follow menu shown on Display **F**.

PANEL SILENCE: Insert Key in Keyswitch **O**, turn to ENABLE, press PANEL SILENCE **P**; the panel buzzer turns OFF.

ALARM SILENCE: Insert Key in Keyswitch **O**, turn to ENABLE, press ALARM SILENCE **Q**.

RESET: Insert Key in Keyswitch **O**, turn to ENABLE, press ALARM SILENCE **Q**, press RESET **R**.
WARNING—Do not RESET the panel until events are ACCEPTED and alarms are SILENCED.

WARNING! Never leave a panel in TROUBLE or SUPERVISORY condition. The system may be unable to detect or annunciate a fire alarm and lives may be lost.

Refer to the *Autocall TFX-500M/800M Operator's Manual*, P/N 850516, for information on alarm, trouble, and supervisory conditions; alarm SILENCE, system RESET, lamp TEST, and fire DRILL operation.

Test the Autocall TFX-500M fire control system periodically as necessary to comply with NFPA, state, and local codes and ordinances of authorities having jurisdiction.

Remove or copy this sheet, frame, and place within sight of all Autocall TFX-500M fire control panels, display panels, and Remote Ops/Dis panels.

In case of trouble with this equipment, please contact:
Name:_____Company:_____
Address:_____Telephone:_____

TFX-800M
Fire Control Panel

A. FIRE ALARM LED—Red
B. TROUBLE LED—Yellow
C. SUPERVISORY LED—Yellow
D. ZONE ALARM LED—Red
E. ZONE TROUBLE LED—Yellow
F. ALPHANUMERIC DISPLAY
G. NO/DELETE touch-button
H. SCROLL UP touch-button
I. SCROLL DOWN touch-button
J. YES/ENTER touch-button
K. POWER LED—Green
L. QUIT touch-button
M. FAST ACCESS touch-button
N. NUMERIC touch-pad
O. KEYSWITCH
P. PANEL SILENCE touch-button
Q. ALARM SILENCE touch-button,
   Yellow LED
R. SYSTEM RESET touch-button
S. DRILL touch-button
T. LAMP TEST touch-button

Panel diagram labels: K, P, Q, F, H, I; POWER, FIRE, TROUBLE, SUPERVISORY, PANEL SILENCE, ALARM SILENCE, SYSTEM RESET, DRILL, ENABLE, OFF, LAMP TEST, 23 JAN 97 22:17:02, DELETE ENTER, NO YES, FAST QUIT ACCESS, A, B, C, T, R, O, S, N, G, L, M, J, D, E, LAMP TEST

AUTOCALL® TFX-800M Operating Instructions
Attention!   Look at lights and displays!

	What You See	What It Means
A	Red Light ON.	FIRE ALARM! An initiating device (smoke detector or other device) has detected a FIRE ALARM condition. See **D** or **F**.
B	Yellow Light ON.	TROUBLE. There is a trouble condition at one or more of the system devices, or with some other part of the system. See **E** or **F**.
C	Yellow Light ON.	SUPERVISORY. A sprinkler system supervisory device has been activated. See **F**.
D	Zone Red Light ON	FIRE ALARM in the ZONE indicated by the Zone Number next to the light. See **F**. If light **Q** is on, alarms have been silenced.
E	Zone Yellow Light ON.	TROUBLE in the Zone indicated by the Zone Number next to the light. See **F**.

F	Display MESSAGE.	Shows information about the zone and device in alarm.
		• Line 1—Alarm or System Message. Shows type of Alarm or Trouble.
		    Shows date and time under Normal conditions.
		    Shows "REMOTE LOCKOUT" if another system control panel or
		        Remote Ops/Dis panel is being accessed. Only one
		        operator may be logged on to operate the system at one time.
		• Line 2—Zone Message.
		• Line 3—Point Message.
		• Line 4—Zone number, point ID, outstanding events.

K	Green Light ON.	System POWER is on.

ACCEPT EVENTS: Enter your PASSCODE or 0911 at Touch-pad **N**, follow menu shown on Display **F**.

PANEL SILENCE: Insert Key in Keyswitch **O**, turn to ENABLE, press PANEL SILENCE **P**; the panel buzzer turns OFF.

ALARM SILENCE: Insert Key in Keyswitch **O**, turn to ENABLE, press ALARM SILENCE **Q**.

RESET: Insert Key in Keyswitch **O**, turn to ENABLE, press ALARM SILENCE **Q**, press RESET **R**.
WARNING—Do not RESET the panel until events are ACCEPTED and alarms are SILENCED.

WARNING! Never leave a panel in TROUBLE or SUPERVISORY condition. The system may be unable to detect or annunciate a fire alarm and lives may be lost.

Refer to the *Autocall TFX-500M/800M Operator's Manual*, P/N 850516, for information on alarm, trouble, and supervisory conditions; alarm SILENCE, system RESET, lamp TEST, and fire DRILL operation.

Test the Autocall TFX-500M fire control system periodically as necessary to comply with NFPA, state, and local codes and ordinances of authorities having jurisdiction.

Remove or copy this sheet, frame, and place within sight of all Autocall TFX-800M fire control panels, display panels, and Remote Ops/Dis panels.
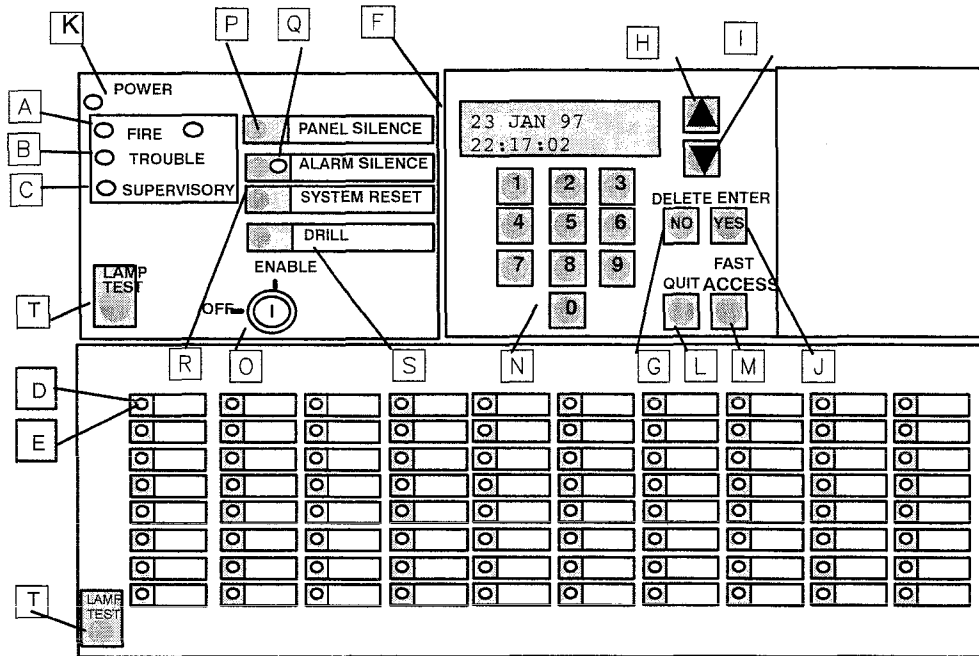
In case of trouble with this equipment, please contact:
Name:_____ Company:_____
Address:_____ Telephone:_____

Grinnell
FIRE PROTECTION SYSTEMS COMPANY

AUTOCALL®

TFX-500M/800M Battery Calculation Worksheets

Publication Number 19700368
Issue 3, January 1997

Standby Battery Capacity

1. Battery Standby current (total of all system standby (normal) loads).   1.   _____ A

2. Battery duty multiplier
    (a) Enter 26.4 for 24 hour standby (local protective signalling requirement)
    (b) Enter 66 for 60 hour standby (remote station protective signalling requirement)
    2.   × _____ hr

3. *Multiply Line 1 by Line 2.*   3.   _____ Ah

4. Battery Alarm current   4.   _____ A

5. Battery duty multiplier
    (a) Enter 0.084 for 5 minutes alarm (local protective signalling requirement)
    (b) Enter 0.167 for 10 minutes alarm
    (c) Enter 0.25 for 15 minutes alarm (required if audio voice amplification is used)
    5.   × _____ hr

6. *Multiply Line 4 by Line 5.*   6.   _____ Ah

7. Total *(add Line 3 to Line 6).*   7.   _____ Ah

8. Form Factor—Allowance for not totally charging batteries to capacity.   8.   × 1.10

9. Minimum nominal battery capacity required. *Multiply Line 7 by Line 8.*   9.   _____ Ah

---

Maximum standby battery capacity not to exceed 85 Ah.

Be sure to include the 100 mA current draw of the RPS-424 in alarm and standby current draw calculations.

To comply with Factory Mutual requirements, the maximum current load on 85-Ah batteries for a 60-hour back-up application must not exceed 1.16 amperes.

Battery Calculation Worksheets

The following current draw values have been adjusted for TFX-500/800 power supply charging efficiency and other system variables. They are all expressed as equivalent current draw from the 24 VDC supply.

Suggestion: Duplicate this sheet and use one sheet for each 2-way data circuit. 2-Way Data Circuit Loop _____

Modules (Detectors include base)	Normal Condition					Alarm Condition				
	Number	×	Load (mA)	=	Total	Number	×	Load (mA)	=	Total
IBN-512A Analog/Addressable Detector Base			0.23					0.23		
ISA-412P Addressable Photoelectronic Detector			0.22				*	0.22		
ISA-412I Addressable Ion Chamber Detector			0.18				*	0.18		
ISN-512P Analog/Addr. Photolelectronic Sensor			0.22				*	0.22		
ISN-512I Analog/Addr. Ion Chamber Sensor			0.18				*	0.18		

ISN-550P Analog Addr. Photoelectronic Detector
     Base IBN-550/551
     Base IBN-552
     Base IBN-553
     Base IBN-554
			0.30
			0.30
			0.30
			0.23
							*	4.20
								4.20
								4.20
								4.20		

ISN-550I Analog/Addr. Ionization Detector
     Base IBN-550/551/552
     Base IBN-553
     Base IBN-554
			0.20
			0.20
			0.23
							*	4.00
								4.00
								4.00		

IHN-135 Analog/Addr. Heat Sensor
     Base IBN-550/551
     Base IBN-552
     Base IBN-553
     Base IBN-554
			0.30
			0.30
			0.30
			0.33
							*	3.90
								3.90
								3.90
								3.90		

IHN-200 Analog/Addr. Heat Sensor
     Base IBN-550/551
     Base IBN-552
     Base IBN-553
     Base IBN-554
			0.30
			0.30
			0.30
			0.33
							*	4.50
								4.50
								4.50
								4.50		

ISN-550DI Analog Addressable Ion Duct system with remote LED			0.20				*	4.00 5.70		
ISN-550DP Analog/Addr. Photolelectr. Duct System with remote LED			0.30				*	4.20 4.90		
IXA-500CM Contact Module			0.27				*	0.27		
IXA-500CMA, IXA-502CMA Contact Modules			0.27				*	0.27		
IXA-501CM Mini-Contact Module			0.27				*	0.27		
IXA-500DM Conventional Detector Module			20				*	84		
IXA-500DMA Conventional Detector Module			20				*	110		
CAA-500LI Line Isolator Module			2.7					2.7		
OXA-500RM, OXA-501RM, OXA-502RM, OXA-503RM Relay Modules			0.27					0.27		
OXA-500SD Signal Driver Module			8.2					45		
OXA-500SDA, OXA-501SDA, OXA-504SDA Signal Driver Modules			10					150		
OXM-501 RM/SDA Motherboard; IXM-500 CMA Motherboard			0 (plus each plug-in board)					0 (plus each plug-in board)		
505SDA, 506SDA, Signal Driver Modules			0.8					1.8		
Load on OXA-500SD, OXA-50nSDA Module										
OXA-500SB Signal Expander Module			85					90		
Load on OXA-500SB Module										
Other										
Total										

*Maximum additional alarm current of 50 mA per loop to activate a maximum of 5 device LEDs (after 5 alarms on the loop, the system does not light any more LEDs on the loop).

Battery Calculation Worksheets

The following current draw values have been adjusted for power supply charging efficiency and other system variables. They are all expressed as equivalent current draw from the 24 VDC supply.

Suggestion: duplicate this sheet and use one sheet for each panel enclosure.Control Panel: _____

Control Panel Module Loads									
Modules	**Normal Condition**					**Alarm Condition**			
	Number	×	Load (mA)	=	**Total**	**Number**	×	Load (mA)	=	**Total**
RPS-424			100					100		
Main Processor Board			98					175		
MPIM Multi–Purpose I/F Module			19					24		
FCM Fire Control Module (without MPIM)			10					10		
ODM Operator Display Module			32					32		
16 Indicator Module			9					34		
16 Status Control Module (without MPIM)			7					26		
80 Indicator Module (without MPIM)			9					234		
40 x 2 Indicator Module (without MPIM)			8					96		
40 Status Module (without MPIM)			7					51		
Expansion Motherboard			22					20		
ALXM Loop Expansion Module			50					50		
XIOM Expansion I/O Module			4					4		
ARM–500 Auxiliary Relay Module			5 + 27 per energized relay					5 + 27 per energized relay		
PIM–550 Printer Interface Module			28					28		
TLX-500 or TLI-530 Network Interface Board			125					125		
XAI XA Interface Board			20					20		
TLB-530 TFXNet Baseboard			100					100		
TLA-530 TFXNet Adaptor			0					0		
TLO-530 Fiber Optic Modem			125					125		
TLD-530 Line Driver Module			25					25		
CEB–500 City Box Transmitter			1.9					16		
CVB–500 Reverse Polarity Transmitter			5.7					21		
SRA-550 DACT Interface Module			10					30		
SK5128 Digital Alarm Communicator			143					227		
Other										
Total										

The following current draw values have been adjusted for power supply charging efficiency and other system variables. They are all expressed as equivalent current draw from the 24 VDC supply.

Control Panel External Loads										
Modules	**Normal Condition**					**Alarm Condition**				
	Number	×	**Load (mA)**	=	Total	**Number**	×	**Load (mA)**	=	Total
Common Alarm Signalling Circuits (SDR A & B)										
XIOM inputs and outputs										
ARM–500 relays										
Other 24 VDC loads										
Total										

Grinnell
FIRE PROTECTION SYSTEMS COMPANY

AUTOCALL®

TFX-500M and TFX-800M Spare Parts and Compatible Devices

Publication Number 19700373
Issue 3, January 1997

Detector Compatibility

The following list shows which detectors are compatible with the Autocall TFX–500M and TFX–800M Fire Control Panels, the standby current for each detector model, the detector base, and identifier, and the maximum detectors per 2–way data circuit loop for each detector. The following detectors may be connected directly to the TFX 2-way data circuits.

Mfr.	Detector Model/ Part Number	Standby Current	Base Model/ Part Number	Maximum Detectors per Loop
Thorn Security	ISA–412P/940518	0.100 mA	IBN–512A /940522	99
Thorn Security	ISA–412I/ 940517	0.100 mA	IBN–512A / 940522	99
Thorn Security	ISN–512P/940520	0.120 mA	IBN–512A / 940522	99
Thorn Security	ISN–512I/940519	0.120 mA	IBN–512A / 940522	99
Thorn	ISN–550I/ 920095	0.20 mA 0.20 mA 0.23 mA	IBN–551 920100, IBN–552 920192, (IBN–550 920099) IBN–553 920194, IBN–554 920195	99
Thorn	ISN–550P/ 920096	0.30 mA 0.30 mA 0.30 mA 0.23 mA	IBN–551 920100, (IBN–550 920099) IBN–552 920192, IBN–553 920194, IBN–554 920195,	99
Thorn	IHN–135/920097	0.30 mA 0.30 mA 0.30 mA 0.33 mA	IBN–551 920100, (IBN–550 920099) IBN–552 920192, IBN–553 920194, IBN–554 920195,	99
Thorn	IHN–200/920098	0.30 mA 0.30 mA 0.30 mA 0.33 mA	IBN–551 920100, (IBN–550 920099) IBN–552 920192, IBN–553 920194, IBN–554 920195,	99
Thorn	ISN–550DI / 920102	0.20 mA	Duct System (ionization)	99
Thorn	ISN–550DP / 920103	0.30 mA	(Duct System (photoelectric)	99

The UL listed conventional detectors listed in Publication 19700411, *Smoke Detector Compatibility Chart,* may be used when they are attached to an IXA–500DM or IXA–500DMA Conventional Detector Module. Note: only the IXA–500DM will be the "addressable point" on the system. TFX–500/800 Zone ID is 500A.

TFX–500M/800M End–of–Line Devices

Part Number	Description	Application(s)
900937	Special	Common alarm (SDR) loops, Main Processor
18000259	10k-ohm	Fault Loop, Main Processor, TB1–3, TB1–4
976064	150 ohm	Main Processor, Remote Bus EOL
976048	120 ohm	MPIM Remote Bus, Last Device EOL
976043	270 ohm, 6 W, wire–wound	OXA–500SB Signal Expander Module
976042	22 k-ohm	OXA–500SD, OXA–50SDA, OXA–501SDA, OXA–504SDA Signal Driver Module, OXA–500SB Signal Expander Module
976044	2.2 k-ohm	IXA–500CM, IXA–500CMA Contact Monitoring Module
976045	1 k-ohm	IXA–500CM, IXA–500CMA Contact Monitoring Module, IXM–500 Motherboard with IXA–500CMA
197046	2 k-ohm	IXA–500CM, IXA–500CMA Contact Monitoring Module
976047	4.7 k-ohm	IXA–500DM, IXA–500DMA Detector Moniitoring Module
976082	619 ohm	IXA–501CM Mini–Contact Monitoring Module
976250	27 k-ohm, 1 Watt	OXA–502SDA, OXA–503SDA DC/Audio Signal Driver DC or audio applications, Style Y, last device EOL
4281–050	5.1 k-ohm, 2 Watt	OXM–501SDA (with OXA–502SDA) DC/Audio Signal Driver audio riser Style Y last device EOL; CSM–500 (with OXA–502SDA) Channel Select Module audio circuit Style Y last device EOL
19240410	relay	OXA–503SDA DC/Audio Signal Driver, install in DC return circuit for supervision of DC power limited/Class 2 operation

TFX-500M/800M Cable Applications

Part Number	Connector	Wires	Length	Keying	System Application(s)
	Cable Description				
19600206	1 end Molex, 1 end bare	5 wires	16 inches		RPS-424 Power Supply TB1 to Main Processor Board PL5
13100076	2 ends, 14 pin	flex	12 inches	Up-Down	Local Bus--**NOT for use between FCM and Main Processor**
13100077	2 ends, 16 pin	flex	6 inches	Up-Down	Expansion Bus--Front Panel MPIM to Zone Indicator board
13100078	2 ends, 14-pin	flex	24 inches	Up-Down	Local Bus--Main Processor to MPIM in position B3 **Not for use between FCM and Main Processor**
13100079	2 ends, 14 pin	flex	6 inches	Up-Down	Local Bus--MPIM to MPIM
13100080	2 ends, 16 pin	flex	4 inches	Up-Up	Expansion Bus--MPIM to ARM-500 or XIOM
13100081	8 conductor	Special (telcom)	18 inches		Digital Alarm Communicator Module
13100083	2 ends, 14 pin	flex	4 inch	Up-Up	Local Bus
13100084	2 ends, 20 pin	flex	4 inch	Up-No Key	Keypad Bus
13100085	2 ends, 16 pin	flex	2 inch	Up-Down	Expansion Bus
13100086	2 ends, 16 pin	flex	12 inch	Up-Down	Expansion Bus
13100087	2 ends, 14 pin	flex	12 inch	Up-Up	Local Bus—**For Use Between FCM and Main Processor**
13100092	2 ends, 14 pin	flex	13 inch	Up-Up	Local Bus—**For Use Between FCM and Main Processor**
13100093	2 ends, 16 pin	flex	12 inch	Up-Up	MPIM to Ribbon Cable Converter Board
13100094	2 ends, 14 pin	flex	18 inch	Up-Down	Main Processor to RM/SDA Motherboard
13100095	2 ends, 16 pin	flex	4 inch	Up-Down	Expansion Bus MPIM to first XIOM or ARM
13100100	2 ends, 14 pin	flex	24 inch	Up-Up	Local Bus—**For use between FCM and DC Converter or PSM**
19600193	1 end Molex, 1 end bare	4 wire			Remote Bus--DCPM terminal block to MPIM
940547	2 ends special	Special	6 inches		Special Serial Cable, MPIM to Printer Interface Board
19600194	2 ends bare	2 wires	12 inches		RPS-424 to ARM-500
940577	1 end special, 1 end DB9 (pin)	Special	15 feet		Programming Cable (Special)
940578	1 end special, DB25 (pin)	Special	25 feet		Printer Cable (Special)
940579	1 end special, DB25 (socket)	Special	25 feet		Printer Cable (Special)
19600188	1 end Fast-on (fem.), 1 end bare				Battery Harness RPS-424 to batteries
19600196	2 ends #6 Ring Terminal	1 wire	8 inches		Door to Backbox (ground)
19600067	2 ends #6 Ring Terminal	1 wire	3 inches		Main Processor to Earth Ground
19600194	4 ends bare (twisted pair)	2 wires2	12 inches		ARM-500 to RPS-424
976065		--	--		Ribbon Cable Converter Board

TFX-500M/800M Fuses

Assembly Number	Part Number	Description	Application(s)
976019	18400351	3.15 amp	DCPM DC Power Module P/N 940503
	18400352	6.3 amp	ACPM AC Power Module P/N 940501, APS-500 Addressable Power Supply P/N 940504
	18400355	2 amp	XIOM Modules IAA-16, OAA-16

TFX–500M and TFX–800M Spare Parts

18000259	EOL 10 k–Ohm resistor
18400351	Fuse––3.15 amp (See 976019)
18400352	Fuse––6.3 amp (See 976019)
18900235	TFX-500 Main processor EPROM V. 1.0
18900236	TFX-500 Main processor EEPROM V. 1.0
18900237	TFX-800 Main processor EPROM V. 2.1
18900238	TFX-800 Main processor EEPROM V. 2.0
18900239	TFX-800 ALXM EPROM V. 2.1
18900240	TFX-800 ALXM EEPROM V. 2.0
18900249	TFX-500 Main processor EPROM V. 2.1
18900250	TFX-500 Main processor EEPROM V. 2.0
18900259	TFX-500 Main processor EPROM V. 3.1
18900260	TFX-500 Main processor EEPROM V. 3.0
18900261	TFX-800 Main processor EPROM V. 3.1
18900262	TFX-800 Main processor EEPROM V. 3.0
18900263	TFX-800 ALXM EPROM V. 3.1
18900264	TFX-800 ALXM EEPROM V. 3.0
19240248	12V 25AH Battery
19240269	12V 10AH Battery
19240410	End-of-line Relay
19240890	MF312 Conventional Ion Chamber Detector
19240891	MR312 Conventional Photoelectronic Detector
19240892	M310 Conventional Detector Base
19240940	Card guides for Expansion Motherboard
19400831	Auxiliary Housing Subplate
19600150	Cable, TLA–530 to TLB–530
19600188	Battery Harness Assembly
19600206	Cable MP to RPS–424
19600215	Cable TLB–530 to TLB–530
19600221	Cable 6-inch for Serial Interface Module
4050–211T	Conventional Alarm Station
4050–211TB	Conventional Alarm Station with Optional IXA–501CM
4281–050	End-of-line Resistor, 5.1 k-ohm, 2 W
8099–510	Backbox, 2 Module, 4-inch deep
8099–511	Backbox, 3 Module, 4-inch deep
8099–512	Backbox, 5 Module, 4-inch deep
8099–513	Backbox, 7 Module, 4-inch deep
8099–514	Backbox, 7 Module, 6-inch deep
8099–515	Backbox, 10 Module, 6-inch deep
8099–516	Backbox, 5 Module, 6-inch deep
850463	"TFX–500/800 CONSYS Programming Guide, Issue 3, 1994 (Available only to THORN Automated Systems trained and authorized personnel)"
850481	"TFX–500/800 Application Guide and Maintenance Manual, Issue 2, August, 1992 (Available only to THORN Automated Systems trained and authorized personnel)"
850515	TFX-500M and TFX-800M Operator's Manual and Installation Guide.
850516	TFX-500M and TFX-800M Operator's Manual
900937	End-of-line, Special, for Common Alarm (Sounder) Ckt.
910683	RPS–424 Power Supply/Battery Charger
910688	SK5128 Digital Alarm Communicator Transmitter
910692	SX-TB-030-2A Secondary Protector
920020	TFX–500/800 Printer (LA75)
920067	ISC-350I Conventional Ionization Detector Head
920068	ISC-350P Conventional Photoelectric Smoke Detector Head
920070	IHC-115 Conventional Heat Detector Head —(115 °F)
920071	IHC-135 Conventional Heat Detector Head —(135 °F)
920072	IHC-160 Conventional Heat Detector Head —(160 °F)
920073	IHC-210 Conventional Heat Detector Head —(210 °F)
920083	IBC-351 Conventional Detector Base, 6-inch, 2-wire, compatible with Remote LED
920095	ISN–550I, Ion Smoke Detector Head
920096	ISN–550P, Photo Smoke Detector Head
920097	IHN–135 Heat Detector Head, 135 deg.
920098	IHN–200 Heat Detector Head, 200 deg.
920099	IBN–550 Detector Base, 4-inch (Not available in U.S.)
920100	IBN–551 6-inch Addressable Detector Base
920101	IAN–ADD Addressable XPERT Card for 550 Detector Heads
920102	ISN–550DI Ion Duct System
920103	SIN–550DP Photo Duct System
920109	IA–MED Detector Test Pole
920111	IA–MTA Detector Test Gas Aerosol

920144	RS232 to MMF Serial Cable Converter
920192	IBN–552 6-inch Addressable Detector Base, Low Profile
920194	IBN–553 6-inch Addressable Detector Base, w/ Relay
920195	IBN–554 6-inch Addressable Detector Base, w/ Sounder
940517	ISA–412I Addressable Ion Detector
940518	ISA–412P Addressable Photo Detector
940519	ISN–512I Analog/Addressable Ion Sensor
940520	ISN–512P Analog/Addressable Photo Sensor
940522	IBN–512A Analog/Addressable Detector Base
940530	TS–300 Detector Test Set
940547	Serial Printer Cable
940577	Programming Cable
940578	Cable RS232 Serial Printer Cable
975163	"2LR External Battery Cabinet (See KDR1000 Owner's Manual, P/N 850175, Rev. B, March 1989)"
976010	TFX Auxiliary Housing Assembly
976011	SFE–500 TFX–500 CONSYS Software Package (Available only to THORN Automated Systems trained and authorized personnel)
976013	"Auxilary Relay Option – 8 Ass'y (976014, 976015)"
976014	ARM500 Auxiliary Relay Module Assembly
976015	MPIM Subassembly
976016	IAS–500 End-of-Line Device Assembly
976018	"Printer Option Assembly (940545, 940548, 13100076)"
976019	Spare Fuse Kit Assembly
976022	IXA–500DM Detector Monitor Module
976023	OXA–500SD Signal Driver Module
976024	OXA–500SB Signal Expander Module
976025	OXA–500RM Addressable Relay Module
976026	CAA–500LI Line Isolator Module
976027	IXA–500CM Contact Monitor Module
976030	CVB–500 Reverse Polarity Transmitter Option
976031	CEB–500 City Box Transmitter Option
976032	Remote Ops/Dis Printer Option
976034	DCPM DC/DC Converter Subplate Assembly
976037	Main Processor Board–– Spare Part
976040	DCPM DC Power Module––Spare Part
976041	PIM–550 Printer Interface Board––Spare Part
976042	EOL Assembly – 22 k–Ohm resistor
976043	EOL Assembly – 270 Ohm resistor, 6W
976044	EOL Assembly – 2.2 k–Ohm resistor
976045	EOL Assembly – 1 k–Ohm resistor
976046	EOL Assembly – 2 k–Ohm resistor
976047	EOL Assembly – 4.7 k–Ohm resistor
976048	EOL Assembly – 120 Ohm resistor
976062	IIB–800 ALXM Assembly
976063	IAM–800 Motherboard––Spare part
976064	EOL Assembly – 150 Ohm resistor
976065	AIS–800 Expansion Bus Cable Converter Board
976066	OAA–16 XIOM 16 Output Module
976067	IAA–16 XIOM 16 Input Module
976080	SRA–550 DACT Interface Module
976081	IXA–501CM Mini Contact Monitor Module
976082	End-of-line Resistor 619 ohm, 0..25 W
976091	OXA–500SDA Signal Driver Module
976092	IXA–500CMA Contact Monitoring Module
976093	IXA–500DMA Detector Monitor Module
976094	TFX to XA Control Panel Assembly
976098	XAA–16 8 Input/8 Output XIOM
976121	TLX–500 XA Network Interface Module
976122	500PSM Power Monitor (TFX Addressable)
976123	PSM Power Monitor (Non–addressable)
976124	XAI XA Interface Board
976127	FCM Fire Control Module
976128	ODM Operator Display Module
976129	16-Indicator Module
976130	40 x 2-Indicator Module (with MPIM)
976131	40 x 2-Indicator Module (without MPIM)
976132	40-Status Control Module (with MPIM)
976133	40-Status Control Module (without MPIM)
976134	16-Status Control Module (with MPIM)
976135	16-Status Control Module (without MPIM)
976136	80-Indicator Module (1 MPIM)
976137	80-Indicator Module (2 MPIMs)
976138	80-Indicator Module (without MPIM)
976139	Blank Module (full)
976165	TLI–530 ThornNet Network Interface Module
976166	TLO–530 Fiber Optic Modem Module
976167	TLD–530 ThornNet Line Driver Module
976168	TLB–530 ThornNet Baseboard
976169	TLA–530 ThornNet Adaptor Board
976170	Auxiliary Mounting Plate
976184	IXM–500 CMA Motherboard
976185	IXA–502CMA Contact Monitor Module
976186	OXA–501SDA Signal Driver Module (Plug-in)

976187	OXA–501RM Relay Module
976216	OXA–504SDA Signal Driver Module
976217	OXA–502SDA Signal Driver Module (Plug-in)
976218	OXA–503SDA Signal Driver Module
976250	End-of-line Resistor, 27 k-ohm
976253	OXM–501 RM/SDA Motherboard
976258	OXA–502RM Relay Module
976259	OXA–503 Relay Module (plug-in)
976262	Serial Interface Module
976264	LX–300 9-Pin Dot Matrix Printerr
976297	TFX–500 Main Processor EPROM, Version 10
976298	TFX–800 Main Processor EPROM Version 10
976299	TFX-800 ALXM EPROM Version 10
976301	TFX–500 Main Processor EEPROM Version 10
976302	TFX–800 Main Processor EEPROM Version 10
976303	TFX–800 ALXM EEPROM Version 10

Smoke Detector Compatibility Chart

Introduction

This compatibility chart shows which smoke detectors are compatible with both Grinnell and non-Grinnell fire control panels.

The chart is divided into two tables. Table 1 shows the smoke detectors compatible with Grinnell and Grinnell Autocall fire control panels. Table 2 shows the smoke detectors compatible with non-Grinnell fire control panels. Footnotes are provided to identify pertinent information.

The compatibility chart contains the following information:

Component	Lists	Example
Panel	the model of the fire control panel.	AI-1500
Zone Model	the model of the module used in the fire control panel.	5200-432
Panel Loop Style[1]	the panel circuit style used in the fire control panel.	B
Standby Current (mA)	the standby current, in mA, of the smoke detector.	.057
Manufacturer	the manufacturer of the smoke detector.	Tyco International, Inc.
Detector {Identifier}	the model number and identifier of the smoke detector.	IHC-115 {IHC}
Base Model (Identifier)	the model number and identifier of the smoke detector base.	IBC-350 (IBC-350)

[1] Panel Loop Styles are found only in Table 2.

Using the Compatibility Chart

For example, let's say you need to know the maximum number of Tyco International IHC-115 detectors (with IBC-350 bases) used in a Merlin fire control panel containing a 5130-074-21 module. Determine the maximum number of detectors from the chart by performing the following steps: (see Figure 1.)

Figure 9. Using the Compatibility Chart

1. Locate the "Merlin" fire control panel in the row of panels. See (a).

2. Locate "Grinnell" under "Manufacturer". See (b).

3. Locate "Detector" IHC-115. See (c).

4. Locate detector "Base Model" IBC-350. See (d).

5. Locate module 5130-074-21 in the "Zone Model" row. See (e).

6. Follow the 5130-074-21 Zone Model column vertically down and the IBC-350 Base Model row horizontally across. The maximum number of detectors per zone is 30. See (f). Note that the maximum standby current for the detector is .057 mA.

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Manufacturer / Detector {Identifier} / Base Model (Identifier)	Standby Current (mA)	Merlin, MP-400, AP-400, ACII, AL-1500, AL-1500E				MDK(1)(2), MDK2(11)(12)					FireQuest 300			KDR-1000							TFX-500/800, 500M/800M, 500MV/800MV			FireQuest 200						FireQuest 100	
		5130-106-10 (1)(2)(3)	5200-432 (1)(2)(4)	5200-433 (1)(2)(5)	5130-074-21 (1)(2)(6)	5130-106-10 (3)	5130-044-02 (7)	5130-044-03 (8)	5130-044-04 (9)	5130-044-05 (10)	CFB & ZIB with DIB	CFB with AVA or ZIB/DIB with AVA	ZIB	BIZ-5	AIZ-2	AIZ	BIZ-1	BIZ-2	DZM	MIZP	IXA-500DM	IXA-500DMA	MDM-521 (per circuit)	Common Cntrl Brd, Rev U	Common Cntrl Brd Rev W	AVM	2ZX	4ZX	4ZXD	Panel Zone ID 10124A	Panel Zone ID 1012A
Grinnell Fire Protection Systems Co.																															
IHC-115, 135, 160, 210 {IHC}																															
IBC-350/351/353 (IBC-350,351,353)	.057	25	35	35	30	25	35	35	35	35	30	30	30	–	–	–	–	–	–	–	25	25	25	30	30	30	30	30	30	30	–
IBC-352 (IBC-352), IBC-354/355 (IBC-354, 355)		25	35	35	30	25	35	35	35	35	30	30	30	–	–	–	–	–	–	–	25	25	25	30	30	30	30	30	30	30	–
ISC-35OI {ISC-35OI}																															
IBC-350/351/353 (IBC-350,351,353)	.059	25	35	35	30	25	35	35	35	35	30	30	30	–	–	–	–	–	–	–	20	20	20	30	30	30	30	30	30	30	–
IBC-352 (IBC-352), IBC-354/355 (IBC-354, 355)	.080	35	35	35	23	35	35	35	35	35	25	25	25	–	–	–	–	–	–	–	23	23	23	25	25	25	25	25	25	–	–
ISC-350P {ISC-350P}																															
IBC-350/351/353 (IBC-350,351,353)	.110	25	25	25	15	25	25	25	25	25	18	18	18	–	–	–	–	–	–	–	15	15	15	18	18	18	18	18	18	20	–
IBC-352 (IBC-352), IBC-354/355 (IBC-354, 355)	.130	20	20	20	13	20	20	20	20	20	15	15	15	–	–	–	–	–	–	–	13	13	13	15	15	15	15	15	15	–	–
ISC-351DI {ISC-35OI}																															
IBC-350 (IBC-350)	.059	35	35	35	25	35	35	35	35	35	35	35	35	–	–	–	–	–	–	–	30	30	30	35	35	35	35	35	35	–	–
ISC-351DP {ISC-350P}																															
IBC-350 (IBC-350)	.110	20	20	20	15	20	20	20	20	20	20	20	20	–	–	–	–	–	–	–	15	15	15	20	20	20	20	20	20	–	–
MR-312 {MR-312}																															
M310 (M310)	.140	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	14	14	14	–	–	–	–	–	–	–	–
MF312 {MF312}																															
M310 (M310)	.120	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	16	16	16	–	–	–	–	–	–	–	–
Autocall																															
4261-501 {X6}, 4261-502 {X6}																															
4261-511 (Y1)	.140	21	21	21	14	21	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–
4261-503 {X5}, 4261-504 {X5}																															
4261-511 (Y1)	.110	26	26	26	17	26	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–
4261-541 {X5} (15)	.110	26	26	26	17	26	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–

Manufacturer Detector {Identifier} Base Model (Identifier)	Zone Model Standby Current (mA)	Merlin, MP-400, AP-400, ACII, AL-1500, AL-1500E				MDK(1)(2), MDK2(11)(12)					FireQuest 300			KDR-1000							TFX-500/800, 500M/800M, 500MV/800MV			FireQuest 200						FireQuest 100	
		5130-106-10 (1)(2)(3)	5200-432 (1)(2)(4)	5200-433 (1)(2)(5)	5130-074-21 (1)(2)(6)	5130-106-10 (3)	5130-044-02 (7)	5130-044-03 (8)	5130-044-04 (9)	5130-044-05 (10)	CFB & ZIB with DIB	CFB with AVA or ZIB/DIB with AVA	ZIB	BIZ-5	AIZ-2	AIZ	BIZ-1	BIZ-2	DZM	MIZP	IXA-500DM	IXA-500DMA	MDM-521 (per circuit)	Common Cntrl Brd, Rev U	Common Cntrl Brd Rev W	AVM	2ZX	4ZX	4ZXD	Panel Zone ID 10124A	Panel Zone ID 1012A
System Sensor (formerly BRK)																															
1451 {A}, 2451TH {A}																															
B401B (A)	.120	25	25	25	16	25	25	25	25	25	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–
1851B {A}, 2851B {A}, 2851BTH {A}																															
B101B (A)	.120	25	25	25	16	25	25	25	25	25	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–
2451 {A}																															
B401B (A)	.120	25	25	25	16	25	25	25	25	25	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–
DH1851DC {A} (15)	.120	25	25	25	16	25	25	25	25	25	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–
DH2851DC {A} (15)	.120	20	20	20	12	20	20	20	20	20	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–
Detection Systems																															
DS200/DS200HD {A}																															
MB200-2W (A)	.080	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	25	–	25	25	25	–	–
E.S.L.																															
420C {S10}, 420CT {S10}, 425C {S10}, 425CT {S10}, 420CR {S11}, 420CRT {S11}, 425CR {S11}, 425CRT {S11}																															
See (15)	.050	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	50	50	–	–	–	–	–	–	–	–	–	–	–
611U {S10}, 611UT {S10}, 612U {S10}, 613U5 {S10}, 611UD {S10}, 612UD {S10}																															
601U (S00), 609U10 (S00), 609U11 (S02)	.050	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	50	50	–	–	–	–	–	–	–	–	–	–	–
Fenwal																															
CPD-7051 {I51FE1}																															
2WIRE (FE51A), 2WRB (FE53A), 2WRBwLED (FE55A), 2WRLT (FE52A), 70-201000-001 with MA-001 (14) (FE01A with MAFE1), 70-201000-002 with MA-001 (14) (FE02A with MAFE1), 70-201000-003 with MA-001 (14) (FE03A with MAFE1)	.060	–	–	–	–	–	–	–	–	–	20	20	20	25	25	25	25	25	25	25	20	20	20	20	20	20	20	20	20	25	–
DH51 (DH22FE5), DH-22 (DH22FE1)		–	–	–	–	–	–	–	–	–	20	20	20	–	–	–	–	–	–	25	20	20	20	–	20	20	20	20	20	25	–

Panel groups: **Merlin, MP-400, AP-400, ACII, AL-1500, AL-1500E** (5130-106-10, 5200-432, 5200-433, 5130-074-21) · **MDK[1][2], MDK2[11][12]** (5130-106-10, 5130-044-02, 5130-044-03, 5130-044-04, 5130-044-05) · **FireQuest 300** (CFB & ZIB with DIB, CFB with AVA or ZIB/DIB with AVA, ZIB) · **KDR-1000** (BIZ-5, AIZ-2, AIZ, BIZ-1, BIZ-2, DZM, MIZP) · **TFX-500/800, 500M/800M, 500MV/800MV** (IXA-500DM, IXA-500DMA, MDM-521 per circuit) · **FireQuest 200** (Common Cntrl Brd Rev U, Common Cntrl Brd Rev W, AVM, 2ZX, 4ZX, 4ZXD) · **FireQuest 100** (Panel Zone ID 10124A, Panel Zone ID 1012A)

Manufacturer / Detector {Identifier} / Base Model (Identifier)	Standby Current (mA)	5130-106-10 [1][2][3]	5200-432 [1][2][4]	5200-433 [1][2][5]	5130-074-21 [1][2][6]	5130-106-10 [3]	5130-044-02 [7]	5130-044-03 [8]	5130-044-04 [9]	5130-044-05 [10]	CFB & ZIB with DIB	CFB with AVA or ZIB/DIB with AVA	ZIB	BIZ-5	AIZ-2	AIZ	BIZ-1	BIZ-2	DZM	MIZP	IXA-500DM	IXA-500DMA	MDM-521 (per circuit)	Common Cntrl Brd, Rev U	Common Cntrl Brd Rev W	AVM	2ZX	4ZX	4ZXD	Panel Zone ID 10124A	Panel Zone ID 1012A
Fenwal (Cont.)																															
CPD-7021 {I1FE1}																															
70-201000-001 (FE01A)	.060	–	–	–	–	30	30	30	30	30	30	30	30	–	–	–	–	–	40	40	30	30	30	30	30	30	30	30	30	25	–
70-201000-002 (FE02A)		–	–	–	–	30	30	30	30	30	30	30	30	40	40	40	40	40	40	40	30	30	30	30	30	30	30	30	30	25	–
70-201000-003 (FE03A)		–	–	–	–	–	–	–	–	–	30	30	30	–	–	–	–	–	40	40	30	30	30	30	30	30	30	30	30	25	–
70-201000-005 (FE05A)		–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	30	30	30	–	–	–	–	–	–	25	–
CPD-7126 {P6FE1}																															
70-201000-001 (FE01A), 70-201000-002 (FE02A), 70-201000-003 (FE03A)	.070	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	30	30	30	30	30	30	25	–
70-201000-005 (FE05A)		–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	25	
PSD-7155 {P55FE1}																															
2WIRE (FE51A), 2WRB (FE53A), 2WRBwLED (FE55A), 2WRLT (FE52A), 70-201000-001 with MA-001 [14] (FE01A with MAFE1), 70-201000-002 with MA-001 [14] (FE02A with MAFE1), 70-201000-003 with MA-001 [14] (FE03A with MAFE1)	.070	–	–	–	–	–	–	–	–	–	20	20	20	25	25	25	25	25	25	25	20	20	20	20	20	20	20	20	20	25	–
DH51 (DH22FE5), DH-22 (DH22FE1)		–	–	–	–	–	–	–	–	–	20	20	20	–	–	–	–	–	–	–	20	20	20	–	20	20	20	20	20	25	–
PSD-7156 [13] {P56FE1}																															
2WIRE (FE51A), 2WRB (FE53A), 2WRBwLED (FE55A), 2WRLT (FE52A), 70-201000-001 with MA-001 [14] (FE01A with MAFE1), 70-201000-002 with MA-001 [14] (FE02A with MAFE1), 70-201000-003 with MA-001 [14] (FE03A with MAFE1)	.070	–	–	–	–	–	–	–	–	–	20	20	20	–	–	–	–	–	–	–	20	20	20	20	20	20	20	20	20	25	–
DH51 (DH22FE5), DH-22 (DH22FE1)		–	–	–	–	–	–	–	–	–	20	20	20	–	–	–	–	–	–	–	20	20	20	–	–	–	–	–	–	–	–

Manufacturer Detector {Identifier} Base Model (Identifier)	Standby Current (mA)	Merlin, MP-400, AP-400, ACII, AL-1500, AL-1500E				MDK(1)(2), MDK2(11)(12)					FireQuest 300			KDR-1000							TFX-500/800, 500M/800M, 500MV/800MV			FireQuest 200						FireQuest 100	
		5130-106-10 (1)(2)(3)	5200-432 (1)(2)(4)	5200-433 (1)(2)(5)	5130-074-21 (1)(2)(6)	5130-106-10 (3)	5130-044-02 (7)	5130-044-03 (8)	5130-044-04 (9)	5130-044-05 (10)	CFB & ZIB with DIB	CFB with AVA or ZIB/DIB with AVA	ZIB	BIZ-5	AIZ-2	AIZ	BIZ-1	BIZ-2	DZM	MIZP	IXA-500DM	IXA-500DMA	MDM-521 (per circuit)	Common Cntrl Brd, Rev U	Common Cntrl Brd Rev W	AVM	2ZX	4ZX	4ZXD	Panel Zone ID 10124A	Panel Zone ID 1012A
Fenwal (Cont.)																															
PSD-7125 {P5FE1}																															
70-201000-001 (FE01A), 70-201000-002 (FE02A)	.070	–	–	–	–	–	30	30	30	30	30	30	30	–	–	–	–	–	38	38	20	20	20	30	30	30	30	30	30	25	–
70-201000-003 (FE03A)	.070	–	–	–	–	–	–	–	–	–	30	30	30	–	–	–	–	–	38	38	20	20	20	30	30	30	30	30	30	25	–
70-201000-005 (FE05A)		–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	20	20	20	–	–	–	–	–	–	–	–
PSD-7125D {P5DFE1}																															
70-201000-007 (FE07A)	.070	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	38	38	–	–	–	–	–	–	–	–	–	–	–
PSD-7126 {P6FE1}																															
70-201000-001 (FE01A), 70-201000-002 (FE02A)	.070	–	–	–	–	–	30	30	30	30	30	30	30	–	–	–	–	–	38	38	20	20	20	30	30	30	30	30	30	25	–
70-201000-003 (FE03A)		–	–	–	–	–	–	–	–	–	30	30	30	–	–	–	–	–	–	38	20	20	20	30	30	30	30	30	30	25	–
70-201000-005 (FE05A)	.077	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	25	–
PSD-7129 {P9FE1}																															
DH-22 (D22FE2)	.070	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	20	20	20	–	–	–	–	–	–	–	–
PSD-7130 {P10FE1}, PSD-7131 {P11FE1} (13)																															
70-201000-001 (FE01A), 70-201000-002 (FE02A)		–	–	–	–	–	30	30	30	30	25	25	25	–	–	–	–	–	35	35	15	15	15	25	25	25	25	25	25	25	–
70-201000-003 (FE03A)	.077	–	–	–	–	–	–	–	–	–	25	25	25	–	–	–	–	–	–	35	15	15	15	25	25	25	25	25	25	25	–
70-201000-005 (FE05A)		–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	25	–
Gentex																															
DS200/DS200HD {A} (15)	.100	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–
224 (390 OHMS) {–1} (15)	.100	–	–	–	–	–	–	–	–	–	–	–	–	25	25	25	25	25	25	25	–	–	–	20	20	–	20	20	20	–	–
Pyrotector																															
3124(N)(T)(R) {X5}																															
B92 (Y1)	.115	–	–	–	–	–	–	–	–	–	–	–	–	20	20	20	20	20	20	20	–	–	–	15	15	–	15	15	15	–	–
7124(N)(T)(R) {X6}																															
B92 (Y1)	.140	–	–	–	–	–	–	–	–	–	–	–	–	20	20	20	20	20	20	20	–	–	–	15	15	–	15	15	15	–	–

Table 1 — Grinnell Fire Protection Systems and AUTOCALL® Fire Control Panels Fire Detector Compatibility Chart

Manufacturer Detector {Identifier} Base Model (Identifier)	Standby Current (mA)	Merlin, MP-400, AP-400, ACII, AL-1500, AL-1500E 5130-106-10 (1)(2)(3)	5200-432 (1)(2)(4)	5200-433 (1)(2)(5)	5130-074-21 (1)(2)(6)	MDK(1)(2), MDK2(11)(12) 5130-106-10 (3)	5130-044-02 (7)	5130-044-03 (8)	5130-044-04 (9)	5130-044-05 (10)	FireQuest 300 CFB & ZIB with DIB	CFB with AVA or ZIB/DIB with AVA	ZIB	KDR-1000 BIZ-5	AIZ-2	AIZ	BIZ-1	BIZ-2	DZM	MIZP	TFX-500/800, 500M/800M, 500MV/800MV IXA-500DM	IXA-500DMA	MDM-521 (per circuit)	FireQuest 200 Common Cntrl Brd, Rev U	Common Cntrl Brd Rev W	AVM	2ZX	4ZX	4ZXD	FireQuest 100 Panel Zone ID 10124A	Panel Zone ID 1012A
System Sensor																															
1400 {A}	.120	–	–	–	–	–	–	–	–	–	18	18	18	25	25	25	25	25	25	25	20	20	20	18	18	18	18	18	18	25	4
1451 {A}, 2451 {A}, 2451TH {A}																															
B401 (A)		–	–	–	–	–	–	–	–	–	18	18	18	25	25	25	25	25	25	25	16	16	16	18	18	18	18	18	18	25	4
B401B (A)	.120	–	–	–	–	–	–	–	–	–	18	18	18	25	25	25	25	25	25	25	–	–	–	18	18	18	18	18	18	25	4
B406B (A)		–	–	–	–	–	–	–	–	–	18	18	18	25	25	25	25	25	25	25	16	16	16	–	18	18	18	18	18	25	–
1451DH {A}, 2451 {A}																															
DH400 (A)	.120	16	16	16	16	16	16	16	16	16	–	–	–	25	25	25	25	25	25	25	–	–	–	–	–	–	–	–	–	25	–
1851DH {A}																															
DH1851DC (A)	.120	–	–	–	–	–	–	–	–	–	–	–	–	25	25	25	25	25	25	25	16	16	16	18	18	18	18	18	18	25	–
2400 {A} (15)		–	–	–	–	–	–	–	–	–	18	18	18	25	25	25	25	25	25	25	16	16	16	18	18	18	18	18	18	25	4
2400TH {A} (15)	.120	–	–	–	–	–	–	–	–	–	18	18	18	25	25	25	25	25	25	25	16	16	16	18	18	18	18	18	18	25	–
2851DH {A}																															
DH2851DC (A)	.120	–	–	–	–	–	–	–	–	–	–	–	–	25	25	25	25	25	25	25	16	16	16	18	18	18	18	18	18	25	4
2851TH {A}																															
B406B (A)	.120	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	16	16	16	–	–	–	–	–	–	–	–

(1) Optional LED annunciator - use BRK Model RA400 with BRK Detectors; use Autocall 4261-521 with Autocall Detectors.

(2) The following detectors may be mixed in any quantity up to the maximum on a single circuit:
- BRK 1851B ionization and BRK 2851B/2851BTH photoelectric.
- BRK 1451 ionization and BRK 2451/2451TH photoelectric.
- Autocall 4261-501 ion and Autocall 4261-503/504 photo.
Duct detectors may not be mixed on a circuit.

(3) Alarm verification retard reset time is field adjustable from 0 to 26 seconds maximum.

(4) 8 zone Style D (formerly called Class "A"). Compatibility identifier 01A.

(5) 16 zone Style B (formerly called Class "B"). Compatibility identifier 01A.

(6) Transponder, 4 Style D Smoke Circuits. Compatibility identifier 01A.

(7) Dual circuit, Style B (formerly called Class "B"). Compatibility identifier 01A.

(8) Dual circuit, Style B with test switch. Compatibility identifier 01A.

(9) Dual circuit, Style D (formerly called Class "A"). Compatibility identifier 01A.

(10) Dual circuit, Style D with test switch. Compatibility identifier 01A.

(11) Optional LED annunciator - use BRK Model RA400 with BRK Detectors; use Fenwal Model RA12 with Fenwal detectors.

(12) The following detectors may be mixed in any quantity up to the maximum on a single circuit:
- BRK 1451 ionization and BRK 2451/2451TH photoelectric.
- Fenwal CPD-7021 ionization and Fenwal PSD-7125/PSD-7126/PSD-7130/PSD-7131 photoelectric.
Duct detectors may not be mixed on a circuit.

(13) If using these detectors with:
AVM Module (P/N 910666), set the AVM alarm verification time to the minimum.
VSD Module (P/N 910290), set the VSD alarm verification time to zero (0).

(14) Base with Adaptor MA-001 (MAFE1) P/N 920126.

(15) Base is built in to detector.

Table 2 Other Fire Control Panels Compatible with Grinnell 350 Series Detectors

Manufacturer / Detector {Identifier} / Base Model (Identifier)	Standby Current (mA) / Zone Model	Faraday 15220, 15240, 852, 854 [N/A]	Faraday 15108BL(1), 15112BL(1), 15116BL(1) [N/A]	Faraday MPC-2000, 19000A, 19000A EVAC 401126(1)	401127(1)	401310(1)	401311(1)	401312(1)	Federal Signal Corp. Firelarm 2000(2) [N/A]	Gamewell Co. ZANS 400, FLEX 300, FS140(2) VZ(3)	Z2V(4)	Z3A(4)	Z4B(2)	Harrington Signal Co. HS-2200 FFC-2000(2), HS-2400 FFC-4000(2) [N/A]	National Time & Signal 7000 7108(2)	Silent Knight 5204(5) 5207(5) [N/A]
Grinnell Fire Protection Systems Co.																
ISC-350I {ISC-350I}																
IBC-350/351/353 (IBC-350, 351, 353)	.059	–	–	–	–	–	–	–	35	25	25	25	25	25	35	25
IBC-352 (IBC-352)	.080	–	–	–	–	–	–	–	30	–	–	–	–	25	–	–
IBC-354/355 (IBC-354, 355)	.080	30	18	18	18	30	30	30	30	–	–	–	–	25	35	–
ISC-350P {ISC-350P}																
IBC-350/351/353 (IBC-350, 351, 353)	.110	–	–	–	–	–	–	–	22	25	25	25	25	20	30	25
IBC-352 (IBC-352)	.130	–	–	–	–	–	–	–	22	–	–	–	–	20	–	25
IBC-354/355 (IBC-354, 355)	.130	25	12	12	12	25	25	25	20	–	–	–	–	20	25	25

(1) This panel uses circuit styles B and D.
(2) This panel uses circuit style B.
(3) This panel uses circuit style A, B, C, D.
(4) This panel uses circuit style D.
(5) This panel uses circuit style A.

Grinnell

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