ZX400/ZX410

SECURITY SYSTEM CONTROL

SPECIFICATION & INSTALLATION GUIDE

Table of Contents

New Features

- **12 Zones with Moose's unique "2 in 1" Zoning™**
- **Plus one 2-wire fire zone**
- **Expandable to 28 zones, plus two 2-wire fire zones**
- **Two truly independent partitions**
- **Up to 50 user codes with 15 levels of authority**
- **75 event log**
- **Four interchangeable control stations to choose from**
- **Customized scheduling with special supervisory report**
- **Ideal for residential, commercial, and industrial applications**
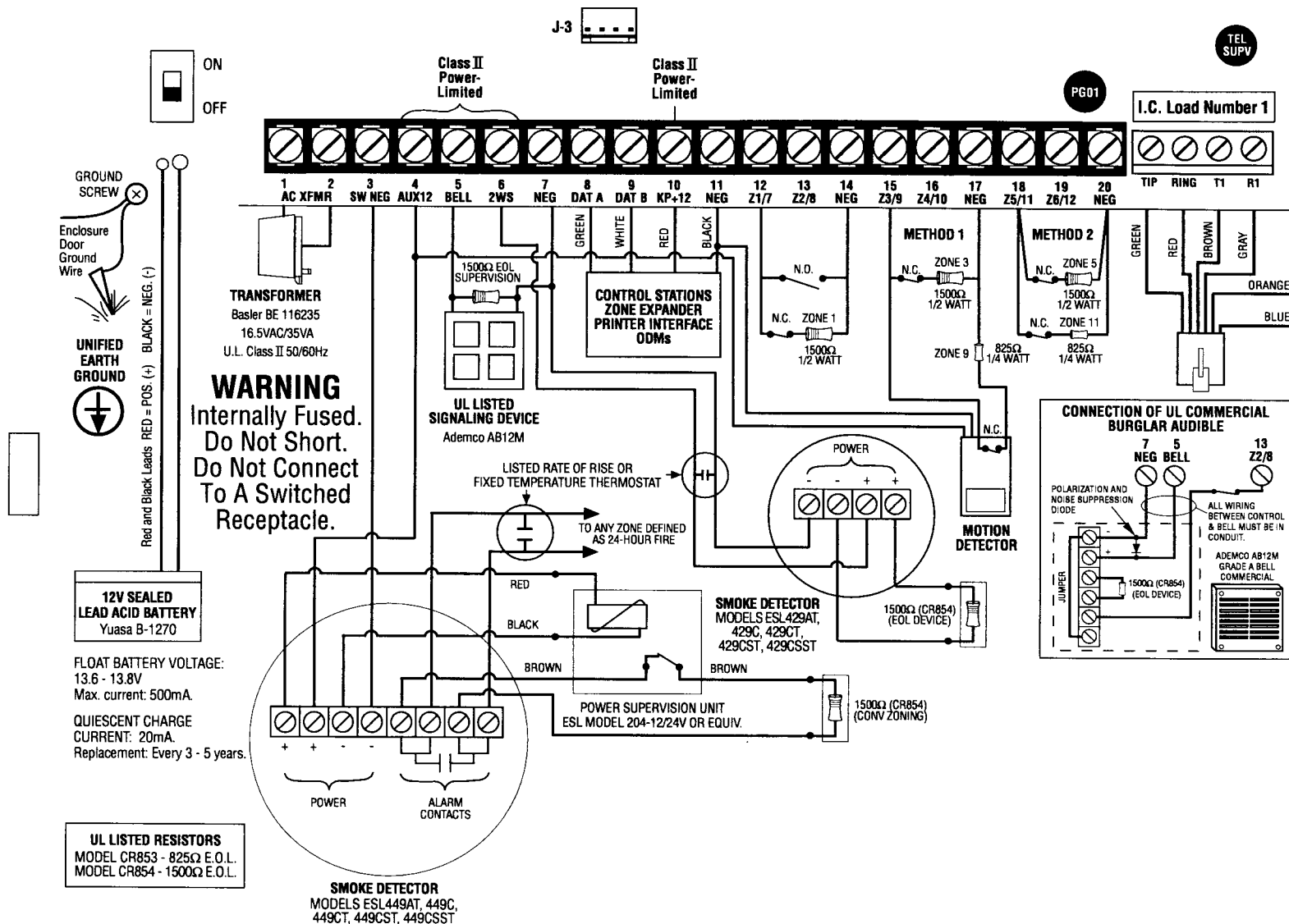- **Control Station programming in less than 2 minutes with factory defaults**

The Moose ZX400/ZX410 Security Control features ease of installation and programming. The ZX400/ZX410 is easily programmed with any one of four ZX400/ZX410 Control Stations (LCD, LED, SSD, or VFD). The control may also be programmed remotely with the aid of a personal computer (PC) and a modem using Moose's remote programming software (RPM2PRO) and a panel support module (PRO400). The Control Stations are easy-to-operate and contain features such as cross-zoning, delay-before-dialing and an audibles "mute" function to help reduce false alarms.

The ZX400/ZX410 Security Control is pre-programmed from the factory with twelve burglar zones (one delay, two interior, and nine instant) and one 2-wire smoke detector zone to allow for out-of-box power-up and operation. The twelve burglar zones have been configured in a 'paralleled' condition using Moose's unique "2 in 1" Zoning™. A zone expander may be added to provide an additional 2-wire smoke detector zone and, with the use of "2 in 1" Zoning™, up to 16 additional zones.

The Control's on-board RAM maintains its data even with the power disconnected. A "Watchdog" timer monitors the microprocessor to ensure the operational integrity of the system. One high current output is assignable to provide +12 VDC upon any or all Fire, Burglar, Auxiliary, or Emergency alarm conditions. One low current programmable output is also available on the control for a variety of functions. In addition, two ZXODMs (Output Driver Modules) can be added to provide 20 more programmable low current outputs which may be used to trigger other devices.

The ZX400 Security Control may be purchased in the ZX410 pre-configured package assembly. This assembly incorporates the ZX400 Control Board mounted inside a larger 14" x 14" x 3.5" enclosure, EX1414. The ZX410 must be purchased for Commercial and Industrial UL Listed applications.

See *Specification and Features* section for a complete list of compatible accessories.
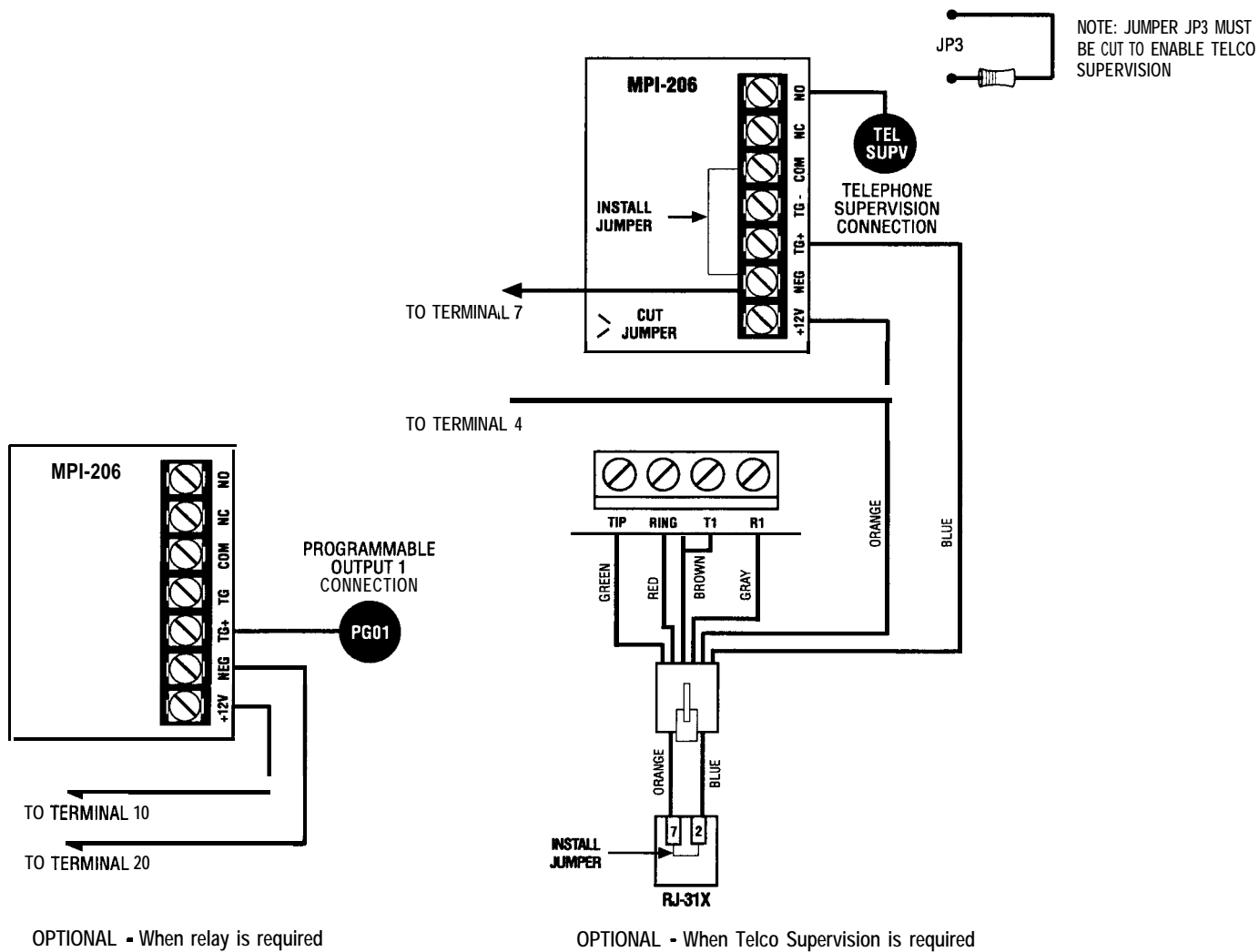
J-3

ON
OFF

Class II Power-Limited

Class II Power-Limited

PG01

TEL SUPV

I.C. Load Number 1

1 AC XFMR	2 SW NEG	3 AUX12	4 BELL	5	6 2WS	7 NEG	8 DAT A	9 DAT B	10 KP+12	11 NEG	12 Z1/7	13 Z2/8	14 NEG	15 Z3/9	16 Z4/10	17 NEG	18 Z5/11	19 Z6/12	20 NEG

TIP   RING   T1   R1

GROUND SCREW

Enclosure Door Ground Wire

UNIFIED EARTH GROUND

BLACK = NEG. (-)   RED = POS. (+)

Red and Black Leads

TRANSFORMER
Basler BE 116235
16.5VAC/35VA
U.L. Class II 50/60Hz

WARNING
Internally Fused.
Do Not Short.
Do Not Connect
To A Switched
Receptacle.

12V SEALED
LEAD ACID BATTERY
Yuasa B-1270

FLOAT BATTERY VOLTAGE:
13.6 - 13.8V
Max. current: 500mA.

QUIESCENT CHARGE
CURRENT: 20mA.
Replacement: Every 3 - 5 years.

UL LISTED RESISTORS
MODEL CR853 - 825Ω E.O.L.
MODEL CR854 - 1500Ω E.O.L.

1500Ω EOL SUPERVISION

UL LISTED SIGNALING DEVICE
Ademco AB12M

GREEN   WHITE   RED   BLACK

CONTROL STATIONS
ZONE EXPANDER
PRINTER INTERFACE
ODMs

LISTED RATE OF RISE OR
FIXED TEMPERATURE THERMOSTAT

TO ANY ZONE DEFINED
AS 24-HOUR FIRE

N.O.

N.C.   ZONE 1

1500Ω
1/2 WATT

METHOD 1
N.C.   ZONE 3
1500Ω
1/2 WATT

ZONE 9

METHOD 2
N.C.   ZONE 5
1500Ω
1/2 WATT

N.C.   ZONE 11

825Ω   825Ω
1/4 WATT   1/4 WATT

GREEN   RED   BROWN   GRAY
ORANGE
BLUE

N.C.

POWER

MOTION DETECTOR

RED
BLACK
BROWN

SMOKE DETECTOR
MODELS ESL429AT,
429C, 429CT,
429CST, 429CSST

1500Ω (CR854)
(EOL DEVICE)

BROWN

POWER SUPERVISION UNIT
ESL MODEL 204-12/24V OR EQUIV.

1500Ω (CR854)
(CONV ZONING)

+   +   -   -

POWER   ALARM
               CONTACTS

SMOKE DETECTOR
MODELS ESL449AT, 449C,
449CT, 449CST, 449CSST

CONNECTION OF UL COMMERCIAL
BURGLAR AUDIBLE

7   5   13
NEG   BELL   Z2/8

POLARIZATION AND
NOISE SUPPRESSION
DIODE

ALL WIRING
BETWEEN CONTROL
& BELL MUST BE IN
CONDUIT.

ADEMCO AB12M
GRADE A BELL
COMMERCIAL

JUMPER

1500Ω (CR854)
(EOL DEVICE)

NOTE: JUMPER JP3 MUST BE CUT TO ENABLE TELCO SUPERVISION

MPI-206

INSTALL JUMPER →

TO TERMINAL 7

CUT JUMPER

TEL SUPV

TELEPHONE SUPERVISION CONNECTION

NO NC COM TG - TG+ NEG +12V

TO TERMINAL 4

MPI-206

PROGRAMMABLE OUTPUT 1 CONNECTION

PG01

NO NC COM TG TG+ NEG +12V

TO TERMINAL 10

TO TERMINAL 20

TIP RING T1 R1

GREEN RED BROWN GRAY

ORANGE BLUE

INSTALL JUMPER →

7 2

RJ-31X

OPTIONAL - When relay is required

OPTIONAL - When Telco Supervision is required

FIGURE 2   Programmable Output And Telco Supervision Wiring Diagram

Control Board Terminal Descriptions

Terminal	Function	Description
1, 2	AC Input	Connect a 16.5 VAC 15 VA UL Class II transformer or an optional 16.5 VAC 35 VA transformer using 18 gauge minimum 2 conductor wire. Do not exceed 50 feet.
3	Switched Negative	(-) Current limited 100 mA terminal. Negative connection for 4-wire smoke detectors, glass break detectors, and devices requiring resettable power.
4	Auxiliary Power (power limited)	(+)12 VDC 500 mA continuous power. Overcurrent protected at 1.85 amps (PTC4). Used for powering motion detectors, 4-wire smoke detectors, glass break detectors, and other accessories. **CAUTION: Use terminals 4 and 10 when calculating total current drain.**
5	Supervised Bell Output (power limited)	(+)12 VDC. Combined alarm current should not exceed 1.5 amps. Overcurrent protected at 1.85 amps (PTC2). A 1500Ohm EOL resistor (CR-854) **must be connected** between terminals 5 and 7; otherwise a bell output fault will occur.
6	Two-Wire Smoke (Zone 30) (power limited)	(+)12VDC of two-wire smoke detectors connected to this terminal. A 1500 Ohm EOL resistor (CR-854) **must be connected** between terminals 6 and 7 regardless of whether a two-wire smoke detector is used or not. The maximum series resistance is 60 Ohms.
7, 11	Common Negative	**BLACK WIRE** - (-)12 VDC. Negative connection for control stations, zone expander, printer interface, ODMs, 2-wire smoke detectors, motion detectors, and other devices.
8	Local Data Bus In (A)	**GREEN WIRE** - Connection for control stations, zone expander, printer interface, and ODMs. Use 22 guage wire up to 1000 ft. Use 18 guage wire up to 2000 ft.
9	Local Data Bus Out (B)	**WHITE WIRE** - Connection for control stations, zone expander, printer interface, and ODMs. Use 22 guage wire up to 1000 ft. Use 18 guage wire up to 2000 ft.
10	Keypad Power (power limited)	**RED WIRE** - (+)12 VDC 500 mA continuous power connection for control stations, zone expander, printer interface, and ODMs. Overcurrent protected at 1.85 amps (PTC4). **CAUTION: Use terminals 4 and 10 when calculating total current drain.**
12	Zone 1/7 Loop (+)	
13	Zone 2/8 Loop (+)	Each loop requires a 1500 Ohm end-of-line resistor (P/N CR854) for the primary zone, and an 825 Ohm end-of-line resistor (P/N CR853) for the secondary zone. A common negative is shared among all zones. The need for end-of-line resistors may be eliminated on all Burglar defined zones through programming. See Figure 1 for "2 in 1" Zoning™ wiring examples.
14	Common Negative	
15	Zone 3/9 Loop (+)	
16	Zone 4/10 Loop (+)	
17	Common Negative	
18	Zone 5/11 Loop (+)	
19	Zone 6/12 Loop (+)	

20	Common Negative	
Terminal	**Function**	**Description**
TIP	Incoming Telephone Line	GREEN wire from RJ-31X direct connect telephone cord.
RING	Incoming Telephone Line	RED wire from RJ-31X direct connect telephone cord.
T1	House Phone Connection	BROWN wire from RJ-31X direct connect telephone cord.
R1	House Phone Connection	GRAY wire from RJ-31X direct connect telephone cord.
PG01	Programmable Output 1	+12V, 40 mA programmable output. See Figure 2.
TEL SUPV	Telephone Supervision	Telephone line trouble input. See Figure 2.

NOTE

If a Normally Open Device (i.e., 4-wire smoke detector) is used with "2 in 1" Zoning™, a short will occur across both zone loops when that device goes into alarm. It is recommended that these types of devices be used with Conventional Zone wiring only.

The Moose ZX400/ZX410 Security Control introduces an all new method of wiring zones that saves both time and wire costs. "2 in 1" Zoning™ allows the installer to wire two separate zones in parallel into one set of terminals.

Each zone is uniquely identified by its end-of-line resistor. The Primary Zone (zones 1-6) in each terminal is identified by a 1500 Ohm EOL resistor. The Secondary Zone (zones 7 - 12) is identified by an 825 Ohm EOL resistor. The Primary and Secondary zones operate as two independent zones to provide separate reporting, programming, and displays. Each zone is fully programmable as described in the *ZX400/ZX410 Programming Manual*. The zones are for Form A, Form B, or Form C sensors. **Maximum total loop wire and contact resistance (not including EOL) must not exceed 100 Ohms for the loop to function properly.**

There are two methods of wiring for "2 in 1" Zoning™. Method 1 wires one zone loop back to the control while a second zone loop is added in parallel off the first. This method may be employed in system retrofits, system expansions, or just simply to save wire cost and labor.
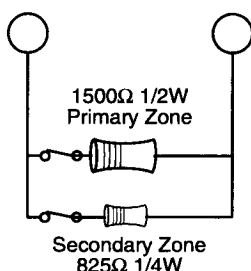

Figure 3   "2 in 1" Zoning™ Wiring - Method 1

Method 2 wires two separate zone loops back into one set of terminals. The panel recognizes each loop independently because two different EOL resistor values are used to differentiate between the Primary Zone (1500 Ohm 1/2 Watt) and the Secondary Zone (825 Ohm 1/4 Watt). This method provides two zones with one set of terminals and is ideal for pre-wire or already installed wiring.
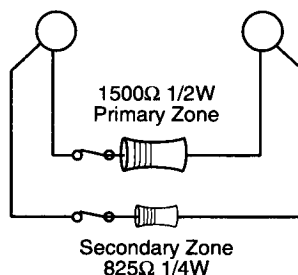

Figure 4   "2 in 1" Zoning™ Wiring - Method 2

NOTE

The resistors in Figure 3 & 4 are 1% values to maintain proper loop resistance values. If replacements are required, please refer to the manufacturer for correct replacements. The 1500 Ohm resistor is color coded Brown•Green• Black•Brown•Brown. The 825 Ohm resistor is color coded Gray•Red•Green•Black•Brown.

All zones sense five different voltage levels enabling one zone to act as two. Troubleshooting is simple using just a voltmeter at the control. The control monitors the voltage level across the zone and uses the voltage levels in Table 1 to determine whether the zone is normal, open, or shorted.

Condition	Nominal Loop Resistance	Voltage Reading
Primary Zone and Secondary Zone Open Contacts; Loop Cut or Open	Infinite Ohms	5.24 - 8.25 V
Secondary Zone Open Contact, Primary Zone Normal	1500 Ohms	4.24 - 5.23 V
Primary Zone Open Contact, Secondary Zone Normal	825 Ohms	3.24 - 4.23 V
Primary Zone and Secondary Zone Normal	825 Ohms in parallel with 1500 Ohms = 532 Ohms	2.00 - 3.23 V
Primary Zone and Secondary Zone Shorted	0 Ohms	0 - 1.99 V

TABLE 1 "2 in 1" Zoning™ Troubleshooting Chart

Conventional Methods of Wiring

Class 'B' End-Of-Line Resistor Supervised Zones

A Class 'B' zone must be supervised with a 1,500 Ohm 1/2 Watt end-of-line resistor (P/N CR854). This resistor should be installed in series at the furthest point from the control. This configuration must be used whenever both Form A and Form B devices are connected and provides a high degree of protection against compromise or tampering. The control monitors the voltage level across the Primary zone and uses the Primary zone voltage levels in Table 1 to determine whether the zone is normal, open, or shorted. The operation of a zone is programmable as described in the *ZX400/ZX410 Programming Manual*. **Maximum total loop wire and contact resistance (not including EOLs) must not exceed 100 Ohms for the loop to function properly. The 1500 Ohm EOL resistor is optional for Form A connections but is required for Form B.**
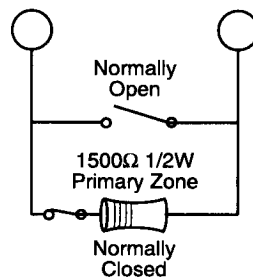
NOTE

For UL Listed systems, EOL Supervision is required.

Figure 5   Conventional Zone Wiring Method

Non-Supervised Closed Circuit Loop (No EOL Resistor Supervision)

The EOL resistor is not required on Burglar zones. A conventional closed circuit loop may be connected directly to a primary zone and the zone will have either a short or an open condition. See the *ZX400/ZX410 Programming Manual* for programming an unsupervised zone. Fire zones may not be installed as unsupervised. **Only Burglar defined zones may be wired non-supervised. "2 in 1" Zoning™ is not allowed.**

11

## *Control Station Addressing and Supervision*

All control stations are shipped from the factory as Control Station #1 and supervised. They may be set to other addresses and to unsupervised as described below.

A supervised control station is reported as missing when the system fails to get any response from it. In order to maintain supervision, each supervised control station must have its own unique address.

An unsupervised control station can be removed from the system without the system detecting that it is missing. The advantage of an unsupervised control station is that a system can have as many control stations as the power supply can support. By adding additional power supplies, like the HCP-12SUL, control stations may be added up to a total of 13 bus devices on the system. For UL listed systems, unsupervised control stations are **not** allowed.

SSD, LCD, and VFD Control Stations

These control stations have a four position DIP switch on the circuit board to set the address and supervision. To change the control station to unsupervised, move DIP switch 4 to the ON position. To change the address, the DIP switch setting must be positioned according to Figure 6.
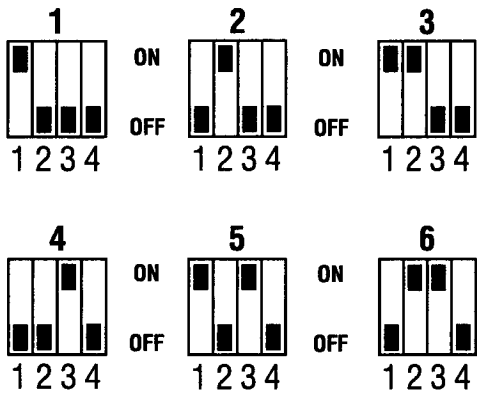
NOTE

When unsupervised control stations are used, <u>ALL</u> unsupervised LED Control Stations *must be* addressed as 1 or 2, <u>ALL</u> unsupervised SSD Control Stations *must be* addressed as 3 or 4, and <u>ALL</u> unsupervised LCD/VFD Control Stations *must be* addressed as 5 or 6.

FIGURE 6   Control Station DIP Switch Settings

LED Control Stations

These control stations have two jumpers on the circuit board to set the address and supervision. To change the address of the Control Station #1 to Control Station #2, remove JP2 (see Figure 7). To change a control station to unsupervised, remove JP1 (see Figure 7).

Remove JP1 to unsupervise

Remove JP2 for keypad 2

JP1   JP2

FIGURE 7   LED Control Station Jumpers

Control Station Troubleshooting

If a control station is incorrectly wired, it will not accept keystroke entries. The following symptoms may appear:

Black or Red Wire removed or cut   No control station LED's or display.

Green Wire removed or cut   No response from key presses

White Wire removed or cut   LED's flash and may display "No Communication From Control" code.

Green/White Wires reversed   LED's flash and may display "No Communication From Control" code.

Green & White Wires shorted together   LED's flash and may display "No Communication From Control" code.

The nominal voltage at the control should measure as follows:

from Common Negative (Terminal 7 or 11) to Data A (Terminal 8)   ~ 8.7 VDC

from Common Negative (Terminal 7 or 11) to Data B (Terminal 9)   ~ 3.5 VDC

from Common Negative (Terminal 7 or 11) to Keypad Power (Terminal 10)   ~13.8 VDC
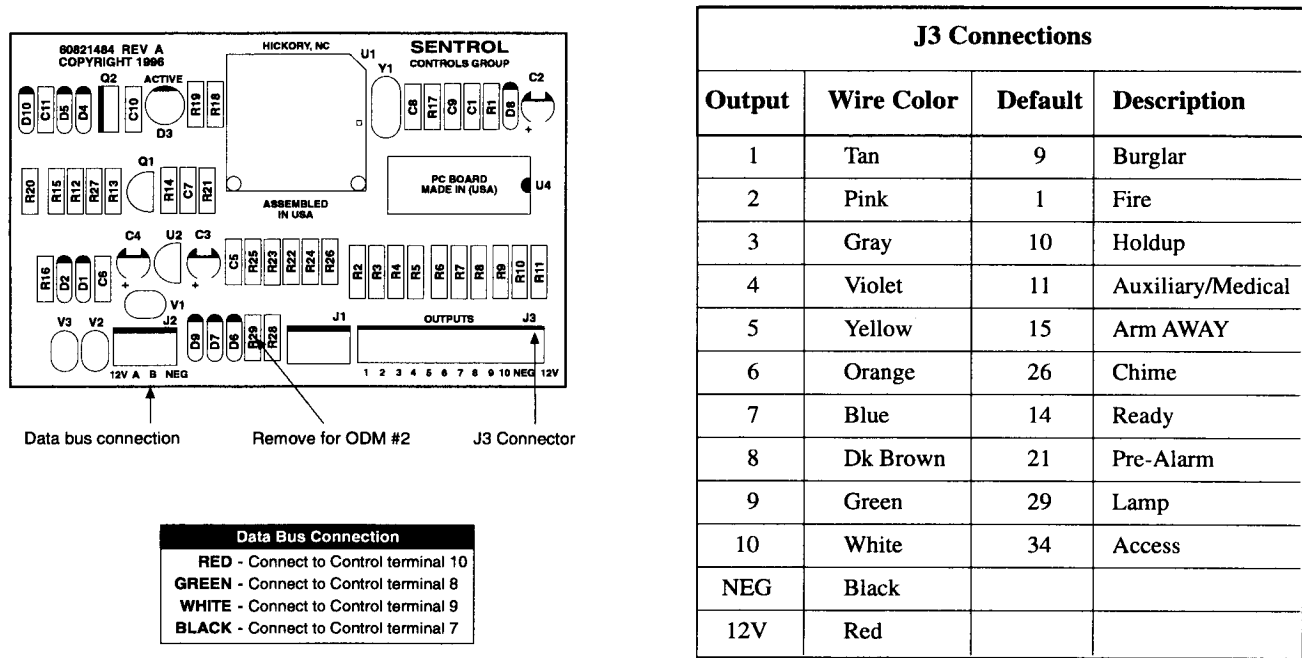
12 VDC Outputs

The control is supplied with one switched negative output, one keypad power output, one auxiliary power output, one 2-wire smoke power terminal, one bell output, and one programmable (PGO1) low current output. (See Figure 1.)

Additional Outputs

Additional outputs can be added with the ZXODM Output Driver Modules. Each module receives its data from the local data bus and provides ten additional programmable outputs. The outputs provide +12 VDC on activation and must be limited to 40 mA of current draw. ODM1 has 10 unique outputs. ODM2 also has 10 unique outputs.

The ODMs may be addressed as ODM1 or ODM2. You may use multiple ODMs at a given address provided that power restrictions are followed. The ODMs come defaulted from the factory as ODM1. To change from ODM1 to ODM2, remove power, cut resistor R29, and re-apply power. Connect the ODMs to the control as shown in Figure 8. Use the twelve (12) wire cable provided with the ODMs for the outputs as shown.

Output conditions can be programmed as one of many conditions. Refer to the *ZX400/ZX410 Programming Manual* for programming information and restrictions.


Data bus connection   Remove for ODM #2   J3 Connector

Data Bus Connection
RED - Connect to Control terminal 10
GREEN - Connect to Control terminal 8
WHITE - Connect to Control terminal 9
BLACK - Connect to Control terminal 7

J3 Connections			
Output	Wire Color	Default	Description
1	Tan	9	Burglar
2	Pink	1	Fire
3	Gray	10	Holdup
4	Violet	11	Auxiliary/Medical
5	Yellow	15	Arm AWAY
6	Orange	26	Chime
7	Blue	14	Ready
8	Dk Brown	21	Pre-Alarm
9	Green	29	Lamp
10	White	34	Access
NEG	Black		
12V	Red		

NOTE

The outputs on this module have limited transient immunity and should not leave the enclosure. Mount module via the double-sided tape provided on the back of the ODM to the inside of the control enclosure.

FIGURE 8   ZXODM Wiring Diagram

Outputs may be wired to indicator devices or relay module triggers (like the MPI-206) provided the 40 mA current draw condition is not exceeded. Figure 9 shows a wiring example for a relay to ODM 1 Output 2. Figure 10 shows a wiring example of ODM 1 Output 1 to trigger an LED.
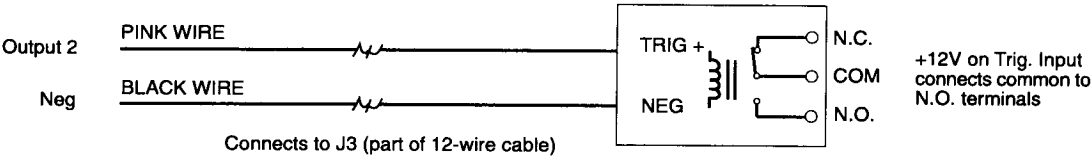
NOTE

Do not exceed 250 mA of total current through the Red (+12V) and Black wires (Negative) of the twelve wire cable. Add 18 gauge wire from the appropriate control panel terminals for total current drains in excess of 250 mA.

FIGURE 9   Output Connected to a Relay
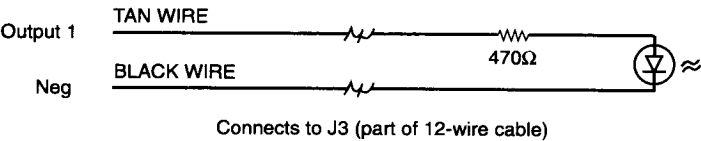
NOTE

The LED & 470 Ohm current limiting resistor shown in Figure 10 are not supplied.

FIGURE 10   Output Connected to an LED

ZXEXP Zone Expander Module

This module provides an additional 8 zones for the ZX400/ZX410 Control. If "2 in 1" Zoning™ is desired, this module provides 16 zones. All zones are fully programmable (see the *ZX400/ZX410 Programming Manual*). The Zone Expander terminals map into zones on the control as shown in Table 2. An additional Two-Wire Smoke loop is also provided on this module (Zone 29). This loop follows the same wiring restrictions as Terminal 6 on the ZX400/ZX410 Control. Fast zones may not be used on the Zone Expander Module.

Ten programmable outputs are available on the ZXEXP Zone Expander Module. These outputs are identical to the 10 outputs on ODM2. Connect the outputs to J2 on the ZXEXP in the same manner as J3 on the ZXODM. When using the outputs on this module, make sure all restrictions mentioned in the ZXODM section for power and negative are observed. The outputs have limited transient protection and should be properly protected (buffered by relays, etc.). They should be mounted in a suitable enclosure such as an EB1511 or EX1414 (part #13000421).

Installation:

1. Remove the plastic lid from the ZXEXP Zone Expander Module. Choose a suitable mounting place and mount the module with the two screws provided. It is recommended that the module be placed in a suitable enclosure like the EB1511 for additional environmental protection.

2. Connect the ZXEXP to the ZX400/ZX410 local data bus. **For a UL Household Fire System, the ZXEXP must be mounted within 500 ft. of the ZX400/ZX410 and the maximum Smoke Zone resistance is 20 Ohms.**
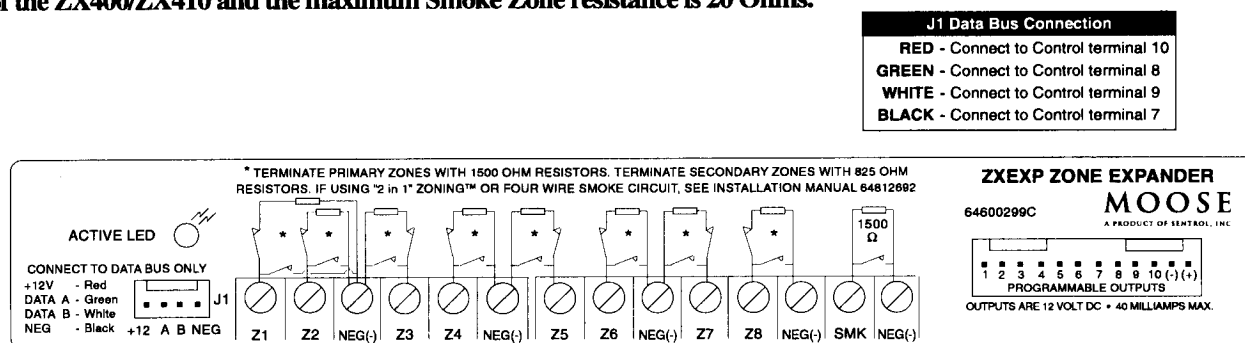
J1 Data Bus Connection
RED - Connect to Control terminal 10
GREEN - Connect to Control terminal 8
WHITE - Connect to Control terminal 9
BLACK - Connect to Control terminal 7

FIGURE 11   ZXEXP Zone Expander Module

3. Wire the required zones to the ZXEXP zone expansion module to the initiating devices (see Table 2). Follow the same guidelines for "Hardware Zone Wiring" as completed for the control zones.

ZXEXP Zone Expander Terminal	Programs As Control Zone Number	
	Conventional Zoning	"2 in 1" Zoning™
1	13	13, 21
2	14	14, 22
3	15	15, 23
4	16	16, 24
5	17	17, 25
6	18	18, 26
7	19	19, 27
8	20	20, 28
SMK (SMOKE)	29	-

TABLE 2   ZXEXP Zone Expander Terminals

4. Use the 12 wire cable to connect outputs as described in the ZXODM section.

5. The "Active" LED will flash to indicate the ZXEXP is communicating with the control.

16

ZXPTR Printer Interface Module

The optional ZXPTR Printer Interface Module connects to the local data bus and can be used for printing events in real-time or on command. This module interfaces with any Centronics-style parallel printer. Only one printer may be used per system. Note that the printer connection is not supervised.

1. To install the ZXPTR, choose a suitable location, but not more than 25 feet from the Centronics-style parallel printer, following the wiring description on page 6.

2. Remove the cover and circuit board and mount the base to an appropriate wall or desktop.

3. Attach the printer cable to the ZXPTR printer port and affix with screws if desired.

4. Wire the local data bus to the terminals: +12V is red; Data A is green; Data B is white; NEG is Black.

5. Reinstall the circuit board and cover.

6. The "Active" LED will flash to indicate the ZXPTR is communicating with the control.

Specifications And Features

ZX400/ZX410 Control Board:
- Six (6) two-wire zones, each supervised with a 1500 Ohm end-of-line resistor. "2 in 1" Zoning™ provides twelve (12) fully programmable zones with 1500 and 825 Ohm resistors. System expansion to 28 fully programmable zones via Zone Expander Module, ZXEXP
- Dedicated two-wire smoke detector zones on control (zone 30) and zone expander (zone 29)
- Three (3) Control Station activated panic zones
- Nominal current drain for control board only 126 - 154 mA
- Watchdog microprocessor monitoring
- On/Off power switch
- Superior six (6) stage lightning/transient protection
- One assignable high current alarm output. (Supervised Bell Output)
- One assignable low current output (40 mA)
- One switched negative output (100 mA)
- Expandable to twenty-one (21) low current outputs via two output driver modules, and/or a zone expander
- Continuous battery monitoring
- Low voltage detection monitoring @ 11.3 volts threshold
- Automatic system shutdown if voltage falls below 9.8V.
- Operating temperature range inside the enclosure: 32°F to 122°F (0°C to +50°C)
- Two and four-wire smoke zones available
- Keypad Programmable
- Upload/Download via RPM/2 Pro
- Loop response time: 320 msec (general purpose hardwired zones), 1600 msec (two-wire smoke zones)
- Fast zone loop response time: 80 msec (zones 1 - 6), 20 msec (zones 7 - 12)

Power Supply:
- Fully regulated 13.8 volt 900 mA supply available with a 16.5 VAC 35 VA transformer
- Optional 16.5V 15 VA transformer provides 450 mA power (not UL Listed)
- Reverse polarity protection on battery inputs
- Float charging circuit: 13.8 volts DC

Recommended Battery:
- Rechargeable 12 VDC 7 Ah sealed lead acid. Use two (2) batteries to meet CSFM and Household Fire requirement of 24-hour standby at 450 mA
- Rechargeable 12 VDC 17.2 Ah sealed lead acid. Use one (1) battery to meet CSFM requirement of 24 hours of standby at 450 mA

Recommended Transformer:
- UL Listed Class II plug-in; 16.5 VAC 35 VA secondary; 120 V 60 Hz primary connected to 24-hour unswitched outlet
- Optional UL Listed Class II plug-in 16.5 VAC 15 VA secondary, 120 V 60 Hz primary connected to 24-hour unswitched outlet

Enclosure:
- Twenty (20) gauge metal cabinet with knockout for optional cam lock. Dimensions: 9"W x 10"H x 2.875"D (228.6 mm x 254 mm x 73.02 mm)
- Optional EX1414 20 gauge locking metal cabinet with two keys. Dimensions 14"W x 14"H x 3.5"D (356 mm x 356 mm x 89 mm)
- TC1100 Tamper Resistant Enclosure: extra high security cover (uses EX1414 option)
- Optional pre-configured assembly: ZX410 (ZX400 Control Board mounted into the EX1414 enclosure)

Digital Communicator:

- DTMF Touchtone™ or Rotary (pulse) dialing. Rotary speed: 10pps, (selectable U.S. style 60% break, 40% make or International style 66% break, 33% make).
- Ringer equivalence: 0.0B.
- Transmission formats include: Contact ID, 20 and 40 baud Pulse Formats (3/1, 4/1, 4/2, Hexadecimal Reporting), Non-Telco Contact ID, Pager.
- Reports to most major Central Station receivers.
- Primary phone number can have up to 16 digits.
- Secondary phone number can have up to 24 digits.
- Remote programming phone number can have up to 16 digits.
- Reporting capabilities: two 6-digit account codes per area, report by zone, opening and closing reports, force arm/bypass reports, restoral reports, trouble reports, cancel reporting, low battery, AC failure/restoral.
- Dual and split reporting capability.
- Pager capability.
- Moose communication defaults for quick programming.
- Disable call waiting.

Control Stations

- Color-coded four-wire data bus connection.
- 19-Button keypad with audible feedback.
- Three (3) Control Station panic button zones.
- Surface mountable; mounts to any standard single or double gang electrical box.
- Built-in piezo sounder.
- Easy-to-read arming level: AWAY, STAY, and NIGHT backlit LEDs.
- Backlit keys with door.
- Unsupervised Control Stations allows up to 12 Control Stations.

ZXLCD Control Station

- LCD backlighting.
- Two lines x 16 characters LCD display.
- Area assignable/Multi-area.
- Addressable with DIP switches, supervised/unsupervised.
- Plain English display.
- Nominal current drain: 20mA - 110mA.
- Up to six (6) supervised Control Stations per system.
- Size: 5.33"H x 6.08"W x 1.024"D (135.4 mm x 154.4 mm x 26.0 mm).

ZXVFD Control Station

- Two lines x 16 characters VFD display.
- Area assignable/Multi-area.
- Addressable with DIP switches, supervised/unsupervised.
- Plain English display.
- Nominal current drain: 20 - 170 mA.
- Up to six (6) supervised Control Stations per system.
- Size: 5.33"H x 6.08"W x 1.024"D (135.4 mm x 154.4 mm x 26.0 mm).

ZXLED12 Control Station

- Thirteen (13) LEDs annunciate general purpose zones 1 through 12 and control board Two-Wire Fire zone.
- Ready & trouble LEDs.
- Addressable as Control Station #1 or #2. Jumper change makes Control Station unsupervised.
- Area assignable/Single area.
- Nominal Current Drain: 23 - 31 mA.
- Size: 5.0"H x 4.5"W x 1.0"D (127 mm x 114.3 mm x 25.4 mm)

ZXSSD Control Station
- Three 0.56" (14.2 mm) seven segment display digits
- Ready & trouble LEDs
- Up to six (6) supervised Control Stations per system
- Area assignable/Multi-area
- Addressable with DIP switches, supervised/unsupervised
- Nominal Current Drain: 23 - 116 mA.
- Size: 5.0"H x 4.5"W x 1.0"D (127 mm x 114.3 mm x 25.4 mm)

Optional Accessories
- ZXEXP Zone Expander Module: Expands the control to 8/16 additional zones. Provides an additional two-wire smoke zone Provides 10 additional programmable outputs. Nominal current drain: 60 - 72 mA with no outputs connected
- ZXODM: Output Driver Module: Provides ten (10) fully programmable 40 mA + 12 VDC outputs. Nominal current drain: 10 - 13 mA with no outputs connected
- ZXPTR Printer Interface Module: Allows connection of a standard parallel printer via interface. Nominal current drain: 45 - 55 mA without printer connected
- ZX410 - ZX400 Control Board mounted in EX1414 enclosure (The ZX410 assembly is required for Burglary applications.)
- F2600 Transformer Enclosure: Ensures that the AC plug-in transformer remains securely fixed to the AC wall outlet
- T-1615 Transformer: UL Listed Class II plug-in 16.5 VAC 15 VA secondary
- T-1635 Optional Transformer: UL Listed Class II plug-in 16.5 VAC 35 VA secondary
- HCP-12SUL Power Supply: Provides a 12 or 24 VDC power limited output with a current rating of 2.0 A continuous while the AC primary power source is present
- CR860 Dual Battery Harness: Allows for an additional 12 VDC 7 Ah sealed lead acid battery connection to the control to meet additional standby requirements
- CR861 Battery Harness: Allows for 12 VDC 17.2 Ah sealed lead acid battery connection to the control to meet additional standby requirements
- EB1511 Auxiliary Enclosure: 15" x 11" x 4" enclosure with cam lock allows wall mounting of accessories and batteries
- EX1414 Optional Larger Enclosure: 14" X 14" x 3.5"
- AE912 Raucous Sounder: Current consumption: 28 mA @ 12 VDC
- MPI-266 Battery Cut-Off Module: Disconnects battery from deep discharges
- MPI-267 Power Disconnect Module: Disconnects battery from deep discharges
- MPI-268 Earth Ground Fault Detector: Current consumption: less than 20 mA
- MPI-206 General Purpose Relay Module

Output Provisions:
- Low Current Trigger Outputs: Current output of 40 mA each. One output on main board, expandable to 21 with ZXODM Output Driver Modules and/or ZXEXP Zone Expander Module
- Maximum combined continuous current drain at Terminals 4, 5, 6, 10, and PG01 is 0.9 amps with 16.5 VAC 35 VA transformer
- Current Limits: The combined current at Bell Output Terminal 5 is limited to 1.85 amps (PTC2). The 12V Auxiliary current is limited by PTC4 to 1.85 amps. Reverse battery protection is limited to 1.85 amps (PTC3)

List Of Compatible Accessories

ESL Two-Wire Smoke Detectors
429 AT, C, CT, CRT, CST: Input voltage: 8.5-33 VDC; Standby Current: 70 μA max. (Max. of 20 detectors per zone)
521 B, BXT, CRXT: Input Voltage: 6.5-33 VDC; Standby Current: 70 μA max. (Max. 20 detectors per zone)
711U, 712U, 713-5U, 713-6U: Input Voltage: 8.5-33 VDC; Standby Current: 70 μA max. (Max. 20 detectors per zone)
721U, 721UT, 721UD, 722U, 722UD: Input Voltage: 8.5-33 VDC; Standby Current: 70 μA max. (Max. 20 detectors per zone)
731U, 732U: Input Voltage: 8.5-33 VDC; Standby Current: 70 μA max. (Max. 20 detectors per zone)

ESL Four-Wire Smoke Detectors
445 AT: Input Voltage: 5.1-19.8 VDC; Standby Current: 500μA @ 6 V; 1.5 mA @ 15 V
445 C, CR, CRT, CS, CSH, CST, CSR, CSRT: Input Voltage: 8.5-33 VDC; Standby Current: 40 μA @12 V; 100 μA @ 24 V
449 CTE: Input voltage: 8.5-33 VDC; Standby Current: 10 mA max
449 C, CT, CRT, CST, CSRT, CSRH, CSST: Input Voltage 8.5-33; Standby Current: 70 μA max

System Sensors Two-Wire Smoke Detectors

1100 Ionization   2100T Photoelectric
1400 Ionization   2400 Photoelectric
1400TH Ionization   2400AT Photoelectric
2100 Photoelectric   2400TH Photoelectric

System Sensors Four-Wire Smoke Detectors

1112, 1112 Ionization   2412B Photoelectric
1412B Ionization   2412THB Photoelectric
1451 Ionization   2412AT Photoelectric
2112, 212 Photoelectric   2451 Photoelectric
2112, 2124T Photoelectric   2451TH Photoelectric
2112, 2124TSR Photoelectric

Wheelock

34T-12R Horn: Input voltage: 9-15.6 VDC; Rated Current: 0.125 A
EH-DL1-R Electronic Horn: Input voltage 12/24 VDC; Input Current; (@ 12 VDC) 0.015 A/(@24 VDC) 0.017 A
EH-DL2-R Electronic Horn: Input voltage: 12 VDC; Input Current: 0.047 A
EH-EL1-R Electronic Horn: Input voltage: 12/24 VDC; Input Current: (@12 VDC) 0.015 A/(@ 24 VDC) 0.017 A
EH-EL2-R Electronic Horn: Input voltage: 12 VDC; Input Current: 0.047 A
AES-DL2-R Multi-tone Electronic Signal: voltage: 12 VDC; Current (High): 0.050 A; Current (Low): 0.025 A
AES-EL2-R Multi-tone Electronic Signal: voltage: 12 VDC; Current (High): 0.0100 A; Current (Low): 0.050 A
MIZ-12-R Mini horn: voltage: 12 VDC; Current: 0.010 A
MIZ-12-W Mini-horn: voltage: 12 VDC; Current 0.010 A
CH-BF2-R Fire Chime: Input voltage: 12 VDC; Input Current: 0.020 A
CH-CF2-W Fire Chime: Input voltage: 12 VDC; Input Current: 0.020 A
CH-DF2-R Fire Chime: Input voltage: 12 VDC; Input Current: 0.020 A
46T-G4-12-R DC Vibrating Bells: Shell Size: 4 Inches; Input voltage: 12 VDC; Input Current: 0.125 A
46T-G6-12-R DC Vibrating Bells: Shell Size: 6 Inches; Input voltage: 12 VDC; Input Current: 0.125 A
46T-G10-12-R DC Vibrating Bells: Shell Size: 10 Inches; Input voltage: 12 VDC; Input Current: 0.080 A

Compatible Central Station Receivers

UL permits communication with the following UL Listed Central Station receivers (see the *ZX400/ZX410 Programming Guide*, P/N 64812702, for format):

Manufacturer	Model Number
Ademco	685
Fire Burglary Instruments	CP-220
Osborne-Hoffman	Quick Alert II
Radionics	6000
Radionics	6500
Silent Knight	9000
Sur-Gard	MLR2-DG

Agency Requirements

UL and ULC Listings

APPLICATION	UL LISTING
Household Burglary	UL 1023
Household Fire	UL 985
Household Burglary/Household Fire Combination	UL 1023 / UL 985
Local Burglar Alarm Grades A, B and C Central Station	UL 609
Police Station Connect Burglar Alarm Unit	UL 365
Digital Alarm Communicator System	UL 1635
Home Health Care Signal System	UL 1637
Central Station Burglar Alarm Unit	UL 1610
California State Fire Marshal	TBD
Residential Burglar System	ULC 5310
Local Burglar Alarm	ULC 5303
Central Station	ULC 5301
Commercial Burglary	ULC 5302
Burglar Alarm Units Central & Monitoring	ULC 5304

TABLE 3   UL and ULC Listings

UL has established certain requirements which pertain to the installation, use, and programming of this equipment. The local Authority Having Jurisdiction (AHJ) and/or UL may have other requirements which apply to the installation of this system that are not detailed in this manual. It is the responsibility of the installing dealer to check with the AHJ and/or UL before installing this system. The following table details guidelines that must be followed in order to comply with the UL listings as stated above.

For Home Health Care systems, two (2) Control Stations are required.

Application	Listing	Max. Continuous Current Drain (mA) w/ 7 AH Battery	Minimum Battery Standby Time In Hours	LCD or LED Control Stations	SSD or VFD Control Stations	Smoke Detector ESL 429 & 700 series, System Sensors 1400 & 2400 series	Auxiliary Equipment Required
Home Health Care Household Burglary	UL1637 UL1023	400	4	6	4	N/A	UL listed signaling device
Household Fire	CSFM	400	24	6	4	Required	UL listed signaling device
Household Fire	CSFM	400	24	6	4	Required	UL listed signaling device
Household Burglary / Fire Combination	UL 1023 UL 985	400	4 24	6	4	Required	UL listed signaling device
Central Station Burglary (Grade C)	UL 1610 UL 1635	400	4	6	4	N/A	TC 1100 Tamper Resistant cover with a ZX410
Central Station Burglary (Grade B)	UL 1610 UL 1635	400	4	6	4	N/A	TC 1100 Tamper Resistant cover with a ZX410 and a UL Listed audible device (AB12M recommended)
Local Burglary (Grade A)	UL 609	400	4	6	4	N/A	TC 1100 Tamper Resistant cover with a ZX410 and a UL Listed audible device (AB12M recommended)
Police Station Burglary Connection (Grade A)	UL 365	400	4	6	4	N/A	TC 1100 Tamper Resistant cover with a ZX410 and a UL Listed audible device (AB12M recommended)

Maximum combined continuous current drain (standby) refers to terminals 4, 5, 6, 10, and PGO1. Under alarm conditions, the combined output current drain should not exceed 900 mA with 16.5 VAC 35 VA transformer. For 24 hr standby, UL Household Fire & CSFM, two 7 Ah batteries are required.

TABLE 4   Agency Power and Configuration Requirement

National Fire Protection Association (NFPA) Rules

The National Fire and Burglar Alarm Association (NFPA) has established rules to follow pertaining to fire prevention and the installation of fire detection equipment.

Smoke Detector Locations

For residential applications, install smoke detectors in each bedroom and outside each separate sleeping area in the immediate vicinity of the bedrooms and on each additional story of the family living unit including basement and excluding crawl spaces and unfinished attics. In new construction, a smoke detector should also be installed in each sleeping area. For family living units with one or more split levels (i.e.: adjacent levels with less than one full story separation between levels), a smoke detector required by the above is sufficient for an adjacent lower level, including basements. EXCEPTION: Where there is an intervening door between one level and the adjacent lower level, install a smoke detection on the lower level. For commercial applications, install smoke detectors in each separate work area, including hallways and storage areas.

Install ceiling-mounted smoke detectors in the center of the room or hall, not less than 4 inches from any wall. When mounting the detector on a wall, place the top of the detector 4 to 12 inches from the ceiling.

Do not install smoke detectors where normal ambient temperatures are above 100°F. (37.8°C.)

Do not position smoke detectors in front of air conditioners, heating registers, ceiling fans, or other locations where normal air circulation will keep smoke from entering the detector.

Heat from a fire rises to the ceiling, spreads out across the ceiling surface and begins to bank down from the ceiling. Corners where the ceiling and walls meet create air spaces in to which heat has difficulty penetrating. Usually, these dead air spaces measure about four (4) inches (0.1m) along the ceiling from the corner and four (4) inches (0.1m) down the wall. Do not place heat or smoke detectors in these dead air spaces.

Testing

This system should be tested weekly. All switches, contacts, and accessories must be UL Listed devices . This equipment should be installed in accordance with the National Fire Protection Association Standard No. 72 (National Fire Protection Association, Batterymarch Park, Quincy MA 02269). Control panel specifications are subject to change without notice.
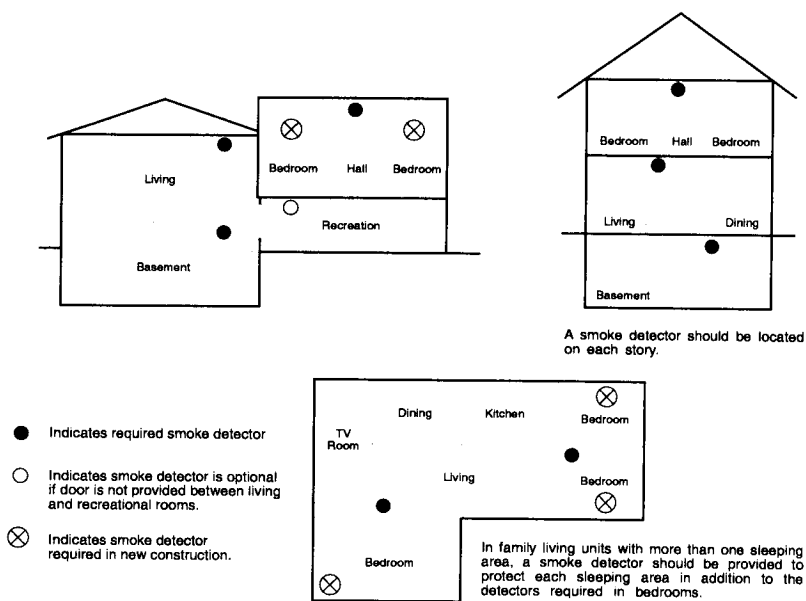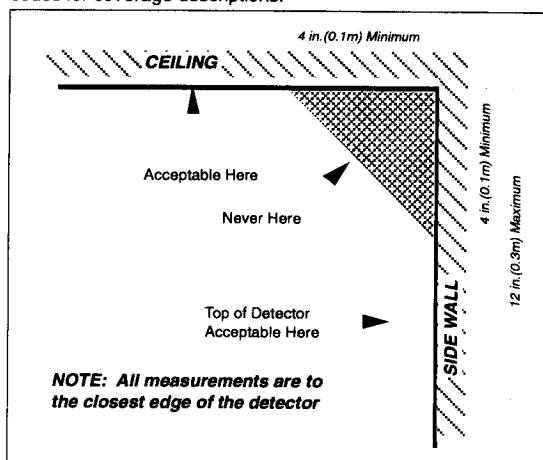

FIGURE 12   Smoke Detector Placement