

SENTROL ZX300/ZX310

Expandable Security System Control

Installation/
Programming

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ZX300/ZX310 Wiring Diagram

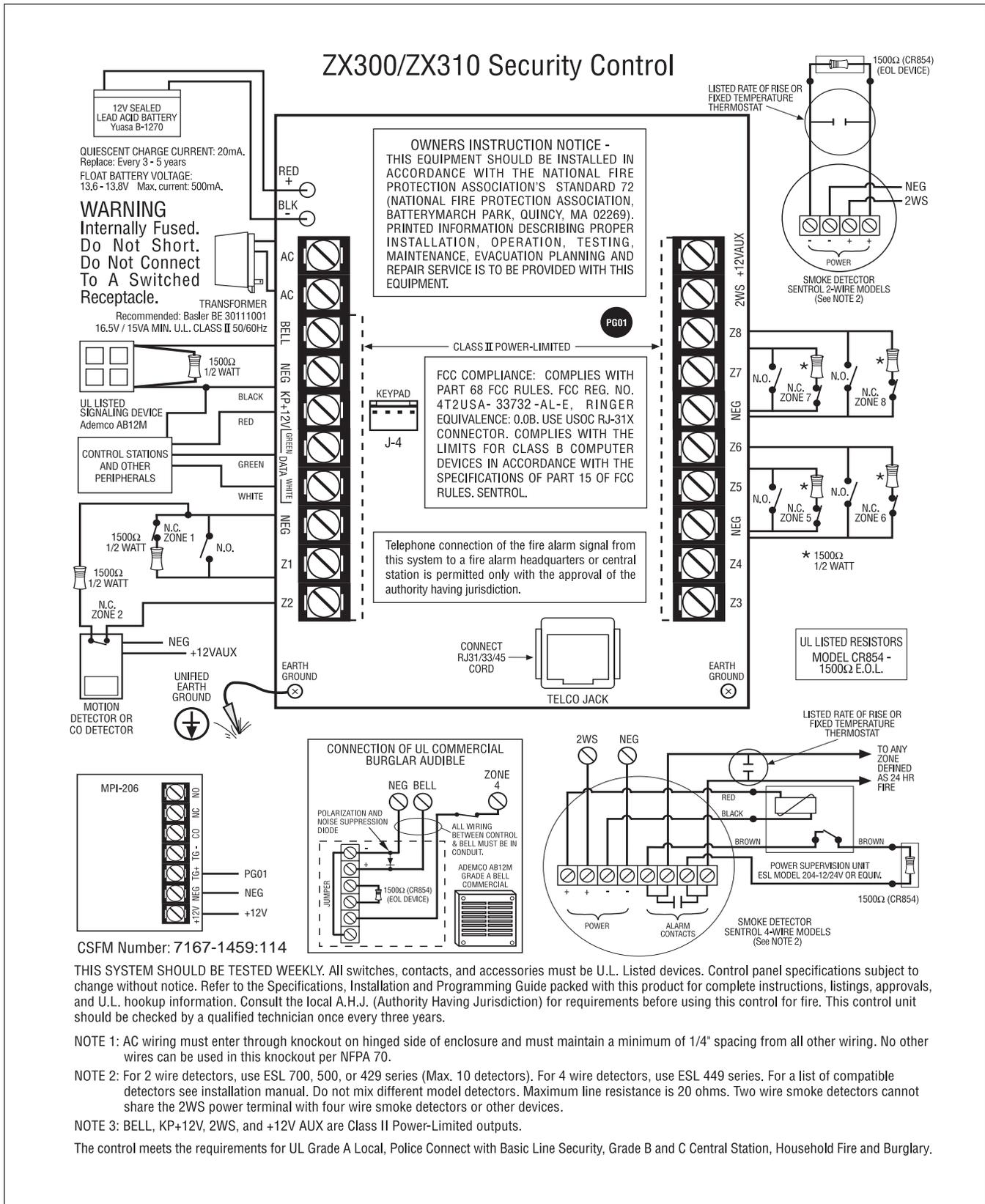


FIGURE 1 Suggested UL Household Burglar Alarm and/or Fire (ff) Alarm Hookup

Control Board Terminal Descriptions

TERMINAL	FUNCTION	DESCRIPTION
AC	AC Input	Connect a 16.5 VAC 15 VA UL Class II transformer minimum using 18 gauge minimum 2 conductor wire. Do not exceed 50 feet.
BELL	Supervised Bell Output (power-limited)	(+)12 VDC. Combined alarm current should not exceed 1.0 amps. Overcurrent protected at 1.35 amps (PTC2). A 1500 Ohm EOL resistor (CR854) must be connected between the Bell and Neg terminals; otherwise a bell output fault will occur.
NEG	Common Negative	BLACK WIRE - (-)12 VDC. Negative connection for Control Stations, ODM, RF receiver, zone expander, motion detectors, bell output, and other devices.
KP+12V	Keypad Power (power-limited)	RED WIRE - (+)12 VDC 500 mA continuous power connection for Control Stations, ODM, zone expander, and RF Gateway. Overcurrent protected at 1.35 amps (PTC1). CAUTION: Use the KP+12V and the +12V AUX terminals when calculating total current drain.
GREEN DATA	Local Data Bus In	GREEN WIRE - Connection for Control Stations, zone expander, ODM and RF receiver. Use 22 gauge wire up to 1000 ft. Use 18 gauge wire up to 2000 ft.
WHITE DATA	Local Data Bus Out	WHITE WIRE - Connection for Control Stations, zone expander, ODM and RF receiver. Use 22 gauge wire up to 1000 ft. Use 18 gauge wire up to 2000 ft.
NEG Zone 1 Zone 2 Zone 3 Zone 4 NEG Zone 5 Zone 6 NEG Zone 7 Zone 8	Zone Inputs	Each loop requires a 1500 Ohm end-of-line resistor (P/N CR854). 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.
2WS	Two-Wire Smoke Terminal	Current limited 100 mA terminal. Connection for two-wire/four-wire smoke detectors, glass break detectors, and devices requiring resettable power. The maximum series loop resistance for a two-wire smoke loop is 20 ohms. The maximum Alarm Impedance is 500 ohms.
+12V AUX	Auxiliary Power (power-limited)	(+)12 VDC 500 mA continuous power. Overcurrent protected at 1.35 amps (PTC1). Used for powering motion detectors, CO detectors, and other accessories. CAUTION: Use the KP+12V and the +12V AUX terminals when calculating total current drain.

Zone Wiring

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

A Class 'B' zone must be supervised with a 1500 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 zone and uses the zone voltage levels in Table 1 to determine whether the zone is normal, open, or shorted. The operation of a zone is programmable (see Programming Record Book). **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.**

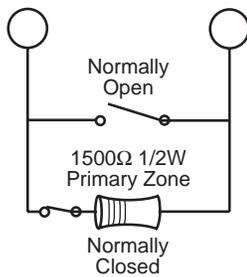


Figure 2 Zone Wiring

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 zone and the zone will have either a short or an open condition. See Programming Record Book for programming an unsupervised zone. Fire zones may not be installed as unsupervised. Only Burglar defined zones may be wired non-supervised.

NOTE

For UL Listed systems, EOL Supervision is required.

ZXEX08 Zone Expander Module

This module provides an additional 8 zones (zones 9-16) for the ZX300/ZX310 control. These zones are wired the same as the 8 on-board zones and the JP1 jumper must be in place.

Mount the module in a ZX310 enclosure as shown in the ZXEX08 insert using the screws and stand-offs provided. For mounting with the ZX300 or in a remote location, use a suitable enclosure, like the EB1511.

Connect the module to the ZX300/ZX310 local data bus using either the "quick connection" or the data bus terminals on the module. The "Active" LED flashes to indicate the module is communicating with the control.

CONDITION	NOMINAL LOOP RESISTANCE	VOLTAGE READING
Zone Open	Infinite Ohms	9.75 - 13.85 V
Zone Normal	1500 Ohms	2.82 - 9.74 V
Zone Shorted	0 Ohms	0.00 - 2.81 V

Table 1 Zone Troubleshooting Chart

Wireless Devices

The ZX300/ZX310 provides an option for including Wireless (or RF) Devices. The RF Devices may consist of RF Zone Devices (Universals, Door Contacts, Glassbreaks, PIRs and Smoke Detectors) and RF User Devices (Handhelds). These RF Devices require that an RF Gateway be attached to the system. The ZX300/ZX310 is compatible with either a model 4710 or 4720 RF Gateway which are UL listed for household fire and burglary and commercial fire. If a 4720 RF Gateway is used, it must be set to address '1'. Refer to the RF Gateway instructions for address selection.

- 4710 RF Gateway - provides up to 8 RF Zone Devices and up to 8 RF User Devices. It can only provide for zones 9-16.
- 4720 RF Gateway - provides up to 16 RF Zone Devices and up to 8 RF User Devices. It can provide for zones 1-16.

Mount the RF Gateway as described in the RF Gateway instructions. Wire the local data bus to the terminals: +12V - RED; DATA A - GREEN; DATA B - WHITE; NEG - BLACK. Set Address switch. Reinstall the cover.

See Installer Level Programming - Programming RF Data Into the RF Gateway. An RF User Device must be mapped to a valid user passcode by programming.

The RF Gateway and RF Zone Devices should be temporarily mounted in their desired locations until they have been tested with the Control Panel. These devices may need to be re-oriented or moved to achieve optimal reception. After testing has been completed, they should be permanently mounted.

To test the Received Signal Strength of each RF Zone Device, use Test 6 - RF Signal Strength Test. From the Control Station press the "8" key, followed by the Installer Code (9632) and then press the "6" key. Next press the RF Zone Device Number (1-16). The Control Station will display and sound the Re-

ceived Signal Strength of the last transmission sent by the RF Zone Device. See results below:

Strong Signal (5 Control Station beeps): a strong or high level RF signal was measured by the receiver for that location of the transmitter. This is a good location for the transmitter and receiver.

Acceptable (3 Control Station beeps): a normal or acceptable level of RF signal was measured by the receiver for that location of the transmitter. This is a good location for the transmitter and receiver.

Low Signal (1 Control Station beep): a low or not acceptable level of RF signal was measured by the receiver for that location of the transmitter. Make multiple test transmissions, making sure that obstructions between the transmitter and receiver are normal but minimized (hands away from units, metal ladders away from receiver, etc.) during these tests. The transmitter and/or receiver will need to be relocated to obtain ACCEPTABLE level readings.

No Signal (1 long Control Station beep): no RF signal or an extremely low RF signal was measured by the receiver for that location of the transmitter. Bring the transmitter to the RF Gateway and activate the transmitter. The red LED on the RF Gateway should blink. If it does not, then the transmitter is not working. If the red LED does blink, but the signal strength is still NO SIGNAL, then a programming error exists. Check the programming of the zone in the RF Gateway. If the signal strength is STRONG or ACCEPTABLE, then the transmitter and/or receiver will need to be relocated to obtain ACCEPTABLE level readings. Be sure to power down the control to clear out all signal strength levels before testing the transmitter at its new location.

After testing has been completed, the RF Gateway and RF Zone Devices should be permanently mounted.

NOTE

Series 4000 RF Gateways and transmitters which are not UL labeled are not allowed in UL Certificated installations.

Control Station Addressing and Supervision

All LCD Control Stations are shipped from the factory as Control Station #1 (#3 for Icon Control Stations) and supervised. They may be set to other addresses and to unsupervised as described below.

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 3.

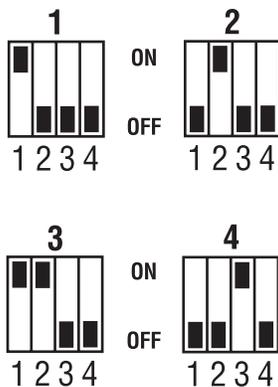


Figure 3 Control Station DIP Switch Settings

ICON Control Stations

These Control Stations have two jumpers on the circuit board to set the address and supervision. To change the address of Control Station #3 to Control Station #4, remove JP2 (see Figure 4). To change a Control Station to unsupervised, remove JP1 (see Figure 4).

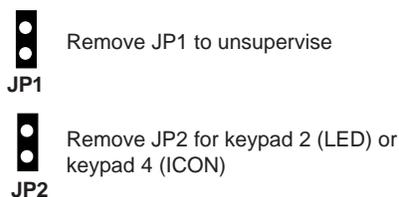


Figure 4 LED & ICON Control Station Jumpers

LED Control Stations

These Control Stations have two jumpers on the circuit board to set the address and supervision. To change the address of Control Station #1 to Control Station #2, remove JP2 (see Figure 4). To change a Control Station to unsupervised, remove JP1 (see Figure 4).

Supervised and Unsupervised Control Stations

A supervised Control Station is reported as missing when the system fails to get any response from it.

If more than one supervised Control Station is set to a particular address, then none of those Control Stations will function properly. Only one supervised Control Station may be used at an 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. Multiple unsupervised Control Stations may be used at any address. When unsupervised SSD, LCD, and VFD Control Stations are used, they **must be** set to address 3 or 4. By adding additional power supplies, like the HCP12SULC, Control Stations may be added up to a total of 18 bus devices on the system.

For UL listed systems, unsupervised Control Stations are **not** allowed.

If an unsupervised Control Station is set to the same address as a supervised Control Station, then the unsupervised Control Station will not function. **Do not mix a supervised Control Station with unsupervised Control Stations at the same address.**

Control Station Troubleshooting

If a Control Station is incorrectly wired, it will not accept key-stroke entries. The following symptoms may appear:

SYMPTOM	CONDITION
No Control Station display or LEDs	Black or Red Wire removed or cut
No response from key presses	Green Wire removed or cut Two supervised Control Stations at the same address
LEDs flash and may display "No Communication From Control" code	White Wire removed or cut Green/White Wires reversed Green & White Wires shorted together

The nominal voltage at the control (with a single Control Station connected) should measure as follows:

TERMINAL	VOLTAGE
from Common Negative to GRN DATA	~ 9.3 VDC
from Common Negative to WHT DATA	~ 10.7 VDC
from Common Negative to KP+12V	~13.8 VDC

12 VDC Outputs

The control is supplied with one keypad power output, one auxiliary power output, one bell output, and one programmable (PGO1) low current output. (See Figure 1). The low current output on the control can supply 10 mA @ 3VDC.

Additional outputs can be added with the ZXODM Output Driver Module. The module receives its data from the local data bus and provides ten additional programmable outputs. The ODM outputs provide +12 VDC on activation and must be limited to 40 mA of current draw.

The ODM comes defaulted from the factory as ODM1. You may use multiple ODMs provided that power restrictions are followed. All ODMs must be addressed as ODM1 and they all will provide identical outputs. Connect the ODM to the control as shown in Figure 5. Use the twelve (12) wire cable provided with the ODM for the outputs as shown.

Output conditions can be programmed as one of many conditions. Refer to the Programming Record Book for programming information and restrictions.

J3 CONNECTIONS	
OUTPUT	WIRE COLOR
1	Tan
2	Pink
3	Gray
4	Violet
5	Yellow
6	Orange
7	Blue
8	Dk Brown
9	Green
10	White
NEG	Black
12V*	Red

DATA BUS CONNECTION	
RED	Connect to Control KP+12V
GREEN	Connect to Control GREEN
WHITE	Connect to Control WHITE
BLACK	Connect to Control NEG

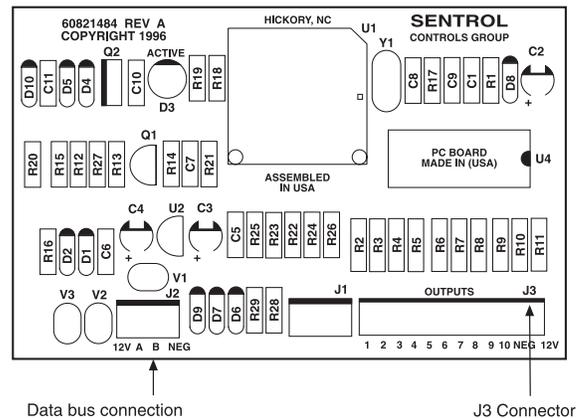


Figure 5 ZXODM Wiring Diagram

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.

12 VDC OUTPUTS

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 6 shows a wiring example for a relay to ODM 1 Output 2. Figure 7 shows a wiring example of ODM 1 Output 1 to trigger an LED.

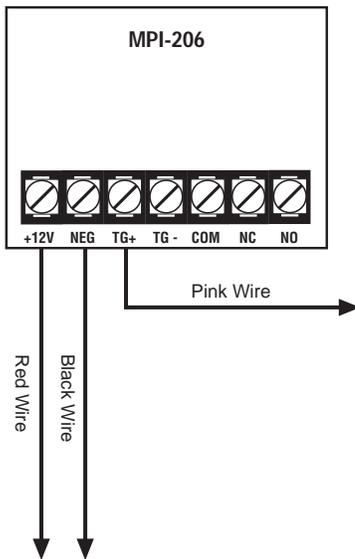


Figure 6 Output Connected to a Relay

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.

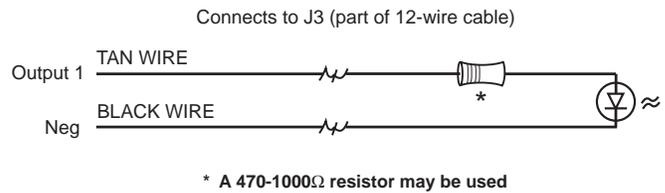


Figure 7 Output Connected to an LED

NOTE

The LED and current limiting resistor shown in Figure 7 are not supplied.

Operating the System

Powering Up The Control

The control comes from the manufacturer with a factory set (default) program. The factory default code for user passcode No. 1 is "1234". This passcode is authorized to perform all user level functions. The default setting for the installer passcode is "9632". The installer passcode performs the installer level functions. For purposes of discussion, the installer and the end user are both considered system users, but have different levels of authorization (see the Programming Record Book).

When a Control Station is powered-up, it briefly displays a test pattern followed by its data bus address. The Control Station will then begin displaying information from the control panel. During the first fifteen seconds after power-up, the control panel will instruct the Control Station to display the panel's software revision and flash the AWAY, STAY and NIGHT LEDs.

If the system is armed when it is powered up, violations from all the Burglar zones are ignored for three minutes. This allows all armed PIRs to stabilize without causing false alarms.

Testing

The ZX300/ZX310 provides the following testing capabilities: Walk Test, Battery Test, Bell Test, Communicator Test, Keypad Test and RF Signal Strength Test. Refer to the appropriate User Guide for instructions on performing these tests. Always ensure that a Walk Test (and an RF Signal Strength Test when applicable) is performed on a new installation.

Installer Arming and Disarming

The installer passcode may be used to arm the system. It may be used to disarm, but only if the system was armed by the installer passcode. It may be used to silence alarms and to silence trouble conditions. When it is used to silence a Burglar alarm, it will not disarm or cancel the alarm unless the sys-

tem was armed by the installer passcode. For a detailed description of arming and disarming procedures, see the appropriate User Guide.

Trouble Conditions

The possible trouble conditions are:

AC Power Failure	Fire Trouble
Low Battery	Silenced Fire Alarm
Memory Error	Zone Missing
Communication Failure	RF Point Not Reporting
Missing Keypad	Smoke Trouble
RF Jamming	RF Point Tamper
Bell Fault	RF Point Low Battery
Telco Line Fault	RF User Device Low Battery
Zone Trouble	

If RF Jamming is detected for at least 90 seconds, then all RF Burglar zones will be faulted.

Clearing Trouble Messages

Most trouble conditions are cleared automatically when the condition that initiated the trouble is restored or is eliminated. Three trouble conditions (Memory Error, Smoke Trouble and Missing Keypad) may be cleared manually by pressing and holding the Clear key for three seconds (until two beeps are heard). This action is also required to turn off the Duress output after it has been activated and to cause an "Installer Off Premises" event. A Bell Silenced trouble condition can only be cleared by performing a smoke reset operation.

Installer On Premises

The first time that an Installer level passcode is used to perform a function, an "Installer On Premises" event is logged to be reported. Before leaving the premises, press and hold the CLEAR key for three seconds and an "Installer Off Premises" event will be logged to be reported.

Programming the Control

Introduction

The control may be programmed locally from any SSD, LCD, VFD, or ICON control station. Programming with an LED Control Station is not supported.

Local Programming

There are two levels of Control Station programming: User level and Installer level.

User Level

User level programming provides the ability to add, change, or delete user passcodes. A user passcode with authority level 1 is required to access the user level programming. See the appropriate User Guide for more information regarding user level programming.

Installer Level

Installer level programming allows total customization of the control's operating features. The installer passcode (User 9) is required to access installer level programming. Anyone attempting installer level programming should be familiar with the contents of this publication prior to programming the control panel.

NOTE

If the installer code is lost or forgotten, it may be impossible to program the control locally.

Programming Zone Names

Zone names may be programmed on LCD and VFD Control Stations without going into Installer Level Programming. To program zone names:

1. Press the CLEAR and ENTER keys simultaneously. The control station prompts you to enter the zone number you wish to program/change.
2. Enter a number corresponding to the Zone ID and press Enter. Once a valid Zone ID is selected, the control displays the Zone ID and the current Zone Name with the cursor on the first character. Press the key associated with each character. Each keypress changes the display to the next character listed for that key. A maximum of 10 characters, including spaces, may be used for each zone name.

The following table lists the characters available for the Zone name.

Key	Characters
#1	0 1 2 3 4 5 6 7 8 9 ; : < = > ? @
#2	A B C
#3	D E F
#4	G H I
#5	J K L
#6	M N O
#7	P Q R S
#8	T U V
#9	W X Y Z [¥] ^ _
#0	space ! " # \$ % & ' () * + , - . /
Left Panic	moves the cursor left one position
Right Panic	moves the cursor right one position

3. If the ENTER or CLEAR key is pressed and no changes have been made, the control station returns to the Zone ID prompt. If the CLEAR key is pressed and changes have been made, all changes are cleared and the control station displays the original Zone Name. To save changes to the Zone Name, press the ENTER key. The control station returns to the Zone ID prompt. Press the CLEAR key to return to Ready mode.

Installer Level Programming

Menu Options

This section will describe Installer Level Programming as performed locally from a Control Station. For upload/download capabilities, please contact Technical Support at 800.800.2027.

To enter Installer Level Programming, press the PROGRAM (9) key and enter the installer passcode (default = 9632). The Control Station will then prompt you to select a programming option from 1 to 9 where:

- 1 = RESERVED FOR FUTURE USE
- 2 = RESERVED FOR FUTURE USE
- 3 = PROGRAM FUNCTION MAP
- 4 = RESERVED FOR FUTURE USE
- 5 = PROGRAM USER CODES
- 6 = RESTORE FACTORY DEFAULTS
- 7 = SET HOURS UNTIL NEXT COMM TEST
- 8 = RESERVED FOR FUTURE USE
- 9 = PROGRAM RF DATA

Program Function Map

Press the '9' key and enter the installer passcode to enter programming mode. Press the '3' key to enter Program Function Map mode. The Control Station will prompt you for a location to be programmed. See the Programming Record Book for location numbers, definitions, and valid entries for the locations. From this mode, you may program the entire Function Map except for User Codes. (See Installer Level Programming - Program User Codes).

From the LOCATION prompt, enter digits for the desired location number. The digits entered will be displayed. If more than three digits are entered, the first digit entered will be discarded. If you make a mistake, you may press the CLEAR key to clear out the location and start over. When the desired location number is displayed, press the ENTER key. The Control Station will then display the current value programmed at that location.

Entering a New Value at a Location

While the Control Station is displaying the value at a location, you can enter digits to change the value at that location. The new value is displayed as you enter the digits. Other keys work as follows:

- ENTER
 - if pressed after new digits are entered, the displayed value is stored at the current location.
 - if pressed with no new digits entered, then it will go to the next location.
- Right Panic Key
 - if pressed, it will go back one location and ignore any digits entered.
- CLEAR
 - if pressed after new digits are entered, the new digits will be erased and the original value will be re-displayed at the location.
 - if pressed with no new digits entered, then it will return to the LOCATION prompt.
- OFF CANCEL
 - if pressed, momentarily displays the present location number (SSD Control Station).

NOTE

When you press the ENTER key to store the new value, the system will store the value as entered. It is the responsibility of the programmer to enter a value within the specified range. If the value entered is out of the range, then undesirable operation may occur.

Programming the Account Code and Telephone Number Digits

When the location being programmed is an account code or telephone number digit the value will be displayed as an "H" followed by a single digit. The "H" indicates that this location is a Hexadecimal field. The valid entries for these locations are "0" through "F", where A - F correspond to 10 - 15 respectively.

To program a digit, enter digits as normal. To enter an A - F, enter a '1' followed by a '0' through '5'.

As in programming normal fields, if too many digits are entered, the first digit entered will be discarded. The ENTER, OFF CANCEL, Right Panic, and CLEAR keys will work the same as described above.

Additional Programming Notes

To exit out of Edit Function Map mode and return the Control Station to the idle state, press the CLEAR key from the LOCATION prompt. (You may need to press the CLEAR key several times to get to the LOCATION prompt). When the installer passcode is used for the first time, an "Installer on Premises" event is logged to be reported. Before leaving, the CLEAR key must be pressed and held for 3 seconds to log an "Installer off Premises" event to be reported.

When programming the value at the last programming location, the Control Station will return to the LOCATION prompt if the ENTER key is pressed.

Program User Codes

The installer passcode has the authority to edit user passcodes locally. The control may be programmed with up to 8 user passcodes and the installer passcode (USER 9). See the Programming Record Book for instructions on setting the authority level for the 8 user passcodes. To program or change a user or installer passcode:

1. Press the '9' key and enter the installer passcode to enter programming mode.
2. Press the '5' key to Program User Codes. The Control Station will prompt you to enter the User ID of the passcode that you wish to program/change.

3. Enter the ID number then press the ENTER key.
4. Enter the new four-digit passcode. The Control Station will beep twice and return to the User ID prompt.
5. Enter a new ID number or press the CLEAR key to return to the Ready mode.

To view an existing passcode, press the ENTER key after each digit is displayed. If the new passcode being entered is a duplicate of an existing one, the Control Station will sound an error tone and return to the first digit location so that you may try again.

If you wish to make a User passcode inoperable, enter "0,0,0,0" as the new four-digit passcode.

Restore Factory Defaults

This function provides a means to completely wipe out the panel's memory and restore it to a factory default state. If successfully completed, the panel will:

- default the entire Function Map (including User Passcodes and Zone Names)
- clear the Event Log
- clear all alarm, trouble and armed conditions
- not affect RF Data in the RF Gateway

Press the '9' key and enter the installer passcode to enter programming mode. Press the '6' key to enter Restore Factory Defaults mode. The Control Station will prompt you to re-enter the installer passcode for verification.

TO DEFAULT PANEL
ENTER PASSCODE

If it is entered correctly, the Control Station will go into a locked out state for a few seconds and then may display the No Communication condition before displaying the panel revision and returning to the Ready mode.

Hours Until Next Comm Test

The scheduling of Automatic Communications Tests requires programming the number of “Days Between Comm Tests”. If “Days Between Comm Tests” is zero, then no automatic comm tests will occur. Otherwise, a comm test will occur on an interval determined by the “Days Between Comm Tests”.

The time that an auto comm test occurs will be the same time on each comm test day. That time is automatically set via a random number whenever the system is powered-up. The time can also be adjusted by setting the “Hours Until Next Comm Test”.

Press the ‘9’ key and enter the installer passcode to enter programming mode. Press the ‘7’ key to set the Hours Until Next Comm Test. The Control Station will display zero (0).

Enter a number between 1 and 255. If a mistake is made, press the CLEAR key to start over. If a number greater than 255 is entered, the first digit entered will be discarded. When the desired number of hours is displayed, press the ENTER key. The Control Station will return to idle. To exit out of this function without setting the number of hours, press the CLEAR key.

Program RF Data

In order for an RF Zone Device or RF User Device to be received by the RF Gateway, the address of the RF Device must be programmed into the RF Gateway. The ZX300/ZX310 can support up to 16 RF Zones and 8 RF User Devices. The RF Zones are programmed into the RF Gateway as devices 1-16 corresponding to zones 1-16. The RF User Devices are programmed into the RF Gateway as devices 17-24 in any order (there is no correlation between these devices and the Control Panel’s configuration data). The 4710 RF Gateway is restricted to devices 9-16 for zones 9-16 and devices 17-24 for eight RF User Devices.

Programming RF Zone Devices Into the RF Gateway

Press the ‘9’ key and enter the installer passcode to enter programming mode. Press the ‘9’ key to Program RF Data. The Control Station prompts you to select an RF Device to program.

Enter 1 thru 16 to select an RF Zone and press ENTER. The Control Station displays the eight digits that are currently programmed in the RF Gateway for that zone. The digits are displayed one at a time. For each digit, you may program a new value by pressing a digit key. The Control Station will automatically move to the next digit. To move to the next digit without changing the current digit, press the ENTER key.

The first digit to enter is the Supervision setting where:

- 0 = Unsupervised
- 1 = Reserved
- 2 = Reserved
- 3 = 4 Hours
- 4 = 24 Hours

The next seven digits to enter come directly off of a label on the RF Device.

If you make a mistake while entering the eight digits, press the CLEAR key and the Control Station returns to the first digit.

After the last digit is entered, the data is sent to the RF Gateway and is confirmed and the Control Station returns to the RF Device selection prompt. If the data is successfully loaded into the RF Gateway, the Control Station beeps twice. If the RF Gateway does not respond, the Control Station sounds an error tone and briefly displays an error message. Check the data bus connections to the RF Gateway. If the 8 digit number entered for the RF Zone is already stored in the RF Gateway for another zone, the Control Station sounds an error tone and briefly displays a message indicating the duplicate zone.

From the RF Device prompt, select another RF Zone Device or press the CLEAR key to exit.

Programming RF User Devices Into the RF Gateway

Press the '9' key and enter the installer passcode to enter programming mode. Press the '9' key to Program RF Data. The Control Station prompts you to select an RF Device to program.

Enter 17 thru 24 to select an RF User Device and press ENTER. The Control Station displays the eight digits that are currently programmed in the RF Gateway for that device. The digits are displayed one at a time. For each digit, you may program a new value by pressing a digit key. The Control Stations will automatically move to the next digit. To move to the next digit without changing the current digit, press the ENTER key.

Enter '1' for the first digit.

The second digit to enter defines the operation of the key(s) on the RF User Device, where:

SEC DIGIT	KEY A	KEY B	KEY C	KEY D
1	AWAY	STAY	NIGHT	OFF/CANCEL
2	AWAY	STAY	ACCESS	OFF/CANCEL
3	AWAY	STAY	PANIC/HOLDUP	OFF/CANCEL
4	AWAY	STAY	AUX/MED	OFF/CANCEL
5	AWAY	STAY	NOT USED	OFF/CANCEL
6	AWAY	PANIC/HOLDUP	NOT USED	OFF/CANCEL
7	STAY	PANIC/HOLDUP	NOT USED	OFF/CANCEL
8	STAY	PANIC/HOLDUP	AUX/MED	OFF/CANCEL
9	AWAY	NOT USED	NOT USED	OFF/CANCEL

The next six digits to enter come directly off of a label on the RF User Device.

If you make a mistake while entering the eight digits, press the CLEAR key and the Control Station returns to the first digit.

After the last digit is entered, the data is sent to the RF Gateway and is confirmed and the Control Station returns to the RF Device selection prompt. If the data is successfully loaded into the RF Gateway, the Control Station beeps twice. If the RF Gateway does not respond, the Control Station sounds an error tone and briefly displays an error message.

Check the data bus connections to the RF Gateway. If the 8 digit number entered for the RF User Device is already stored in the RF Gateway for another device, the Control Station sounds an error tone and briefly displays a message indicating the duplicate device.

From the RF Device prompt, select another RF User Device or press the CLEAR key to exit.

Programming RF Devices Into the Control Panel

After the RF Devices have been programmed into the RF Gateway, they must also be programmed in the Control Panel. The programming options for the Control Panel's Function Map are described in the Programming Record Book. When RF Devices are used in an installation, be sure to consider the following:

For an RF Zone Device, the zone data must be programmed for the selected zone. The Zone Type and Zone Attributes locations are programmed as usual. The Zone Supervision must be programmed to 7 (wireless zone).

For an RF User Device, a user passcode must be created (see Installer Level Programming - Program User Codes) that consists of the last four digits of the RF Device's address. An appropriate authority level must also be programmed for that user.

NOTE

Once all the above steps are performed, the Control Station may sound a Trouble tone. The Control Station will display "Trouble-RF Point Not Reporting" for each RF Zone. These conditions are cleared as a proper transmission is received from each wireless Zone Device.

If the Trouble condition does not clear, then there is an error in the programming of the Gateway or control or the RF Gateway is not responding to the RF signal from the sensor.

Specifications And Features

ZX300/ZX310 Control Board

- Eight (8) two-wire zones, each supervised with a 1500 Ohm end-of-line resistor. Expandable to 16 two-wire zones with ZXEX08 zone expander.
- Two-wire smoke detector zone on control (can be used in place of zone 8).
- Three (3) Control Station activated panic zones.
- Nominal current drain for control board only 50 mA.
- Watchdog microprocessor monitoring.
- Superior six (6) stage lightning/transient protection.
- One assignable high current alarm output. (Supervised Bell Output).
- One assignable low current output (10 mA @ 3 VDC).
- Expandable to eleven (11) low current outputs via an output driver module.
- 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 or four-wire smoke zones available.
- Keypad Programmable.
- Loop response time: 320 msec (general purpose hardwired zones), 1600 msec (two-wire smoke zone).

Power Supply

- Fully regulated 13.8 volt 900 mA supply available with a 16.5 VAC 35 VA transformer.
- Optional 16.5V 25 VA transformer provides 500 mA power.
- Reverse polarity protection on battery inputs.
- Float charging circuit: 13.8 volts DC.

Recommended Batteries

(supplied separately)

- 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 17.2Ah sealed lead acid. Use one (1) battery to meet CSFM requirement of 24 hours of standby at 450 mA.

Recommended Transformers

(supplied separately)

- UL Listed Class II plug-in; 16.5 VAC 15 VA secondary; 120 V 60 Hz primary connected to 24-hour unswitched outlet.
- Optional UL Listed Class II plug-in 16.5 VAC 25 VA secondary, 120 V 60 Hz primary connected to 24-hour unswitched outlet.
- For UL Commercial Burglary, the transformer to be used is a 16.5 VAC 35 VA UL Class II Basler BE 116220.

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: ZX310 (ZX300 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 67% break, 33% make).
- Ringer equivalence: 0.0B.
- Transmission formats include: Contact ID, SIA Level 1, Pager.

- Reports to most major Central Station receivers.
- Primary phone number can have up to 20 digits.
- Secondary phone number can have up to 20 digits.
- Pager phone number can have up to 20 digits.
- Reporting capabilities: two 6-digit account numbers, reporting 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 with 16-digit programmable message and 2-digit coded messages.
- 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 18 Control Stations.

ZXICON Control Station

- Two seven-segment display digits.
- Plain English icons.
- Addressable as Control Station #3 or #4. Jumper change makes Control Station unsupervised.
- Nominal current drain: 50mA.
- Size: 5.0"H x 4.5"W x 1.0"D (127 mm x 114.3 mm x 25.4 mm).

ZXLCD Control Station

- Backlit display.
- Two lines x 16 characters LCD display.
- Addressable with DIP switches, supervised/unsupervised.
- Plain English display.
- Nominal current drain: 20mA - 110mA.
- Up to four (4) 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

- Twelve (12) LEDs annunciate general purpose zones 1 through 12.
- Ready, trouble, and fire alarm LEDs.
- Addressable as Control Station #1 or #2. Jumper change makes Control Station unsupervised.
- Nominal current drain: 23mA - 31mA.
- Size: 5.0"H x 4.5"W x 1.0"D (127 mm x 114.3 mm x 25.4 mm).

ZXLED8 Control Station

- Eight (8) LEDs annunciate zones 1 through 8.
- Ready and trouble LEDs.
- Addressable at Control Station #1 or #2. Jumper change makes Control Station unsupervised.
- Nominal current drain: 23mA - 31mA.
- 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 and trouble LEDs.
- Up to four (4) supervised Control Stations per system.
- Addressable with DIP switches, supervised/unsupervised.
- Nominal current drain: 23mA - 116mA.
- Size: 5.0"H x 4.5"W x 1.0"D (127 mm x 114.3 mm x 25.4 mm).

ZXVFD Control Station

- Two lines x 16 characters VFD display.
- Addressable with DIP switches, supervised/unsupervised.
- Plain English display.
- Nominal current drain: 20mA - 170mA.
- Up to four (4) 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).

Optional Accessories

- ZXEX08 Zone expander module expands the control to 8 additional zones.
Nominal current drain :11mA
- ZXODM: Output Driver Module: Provides ten (10) fully programmable 40 mA + 12 VDC outputs.
Nominal current drain: 10 - 13 mA with no outputs connected.
- ZX310 - ZX300 Control Board mounted in EX1414 enclosure. (The ZX310 assembly is required for UL Commercial Burglary applications).
- F2600 Transformer Enclosure: Ensures that the AC plug-in transformer remains securely fixed to the AC wall outlet
- T-1625 Transformer: UL Listed Class II plug-in 16.5 VAC 25 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.
- 4710 RF Gateway (8 RF Zone Devices, 8 RF User Devices). Nominal Current Drain: 80 mA.
- 4720 RF Gateway (16 RF Zone Devices, 8 RF User Devices). Nominal Current Drain: 80 mA.
- 4110 Universal Transmitter and battery.
- 4545 Shatter Pro Glassbreak Detector with Transmitter and batteries.
- 4655 Sharpshooter PIR with Transmitter and battery.
- 4004 Four Button Wireless Key Transmitter and Battery.
- 4310S, ST, SLT Wireless Smoke Detectors (UL 217) with Transmitter and Battery.
- 4330S, ST, SLT, SLTM Wireless Smoke Detectors (UL 268) with Transmitter and Battery.
- 4113 Three Point Universal Transmitter and Battery.
- 4010 Single Button Panic Transmitter and Battery.
- 4011 Dual Button Panic/Medical Transmitter and Battery.
- ZXLCDD1 LCD Keypad Demonstrator.
- ZXICOND1 ICON Keypad Demonstrator.
- TC1100 Tamper Enclosure.

Output Provisions

- Low Current Trigger Outputs: One output on main board (10 mA), expandable to 11 with ZXODM Output Driver Module (40 mA each).
- Maximum combined continuous current drain at KP+12V, 2WS, +12V AUX and PGO1 is 0.6 amps with 16.5 VAC 35 VA transformer.
- Current Limits: The current at Bell Output is limited to 1.35 amps (PTC2). The 12V Auxiliary current is limited by PTC2 to 2.5 amps. Reverse battery protection is limited to 2.5 amps (PTC3).

List Of Compatible Accessories

ESL Two-Wire Smoke Detectors

429 AT, C, CT, CRT, CST: Standby Current: 70 µA max. (Max. of 10 detectors per zone)

521 B, BXT, CRXT: Standby Current: 70 µA max. (Max. 10 detectors per zone)

711U, 712U, 713-5U, 713-6U: Standby Current: 70 µA max. (Max. 10 detectors per zone)

721U, 721UT, 721UD, 722U, 722UD: Standby Current: 70 µA max. (Max. 10 detectors per zone)

731U, 732U: Standby Current: 70 µA max. (Max. 10 detectors per zone)

ESL Four-Wire Smoke Detectors

445 AT: Standby Current: 500µA @ 6 V; 1.5 mA @ 15 V

445 C, CR, CRT, CS, CSH, CST, CSR, CSRT: Standby Current: 40 µA @ 12 V; 100 µA @ 24 V

449 CTE: Standby Current: 10 mA max.

449 C, CT, CRT, CST, CSRT, CSRH, CSST: 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

(Max. 6 detectors per zone)

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:

<u>Manufacturer</u>	<u>Model Number</u>
Ademco	685
Fire Burglary Instruments	CP-220
Osborne-Hoffman	Quick Alert II
Sur-Gard	MLR2-DG
Silent Knight	9000

SIA and Contact ID Formats

This section cross-references many of the reporting options and equivalent codes sent by Sentrol-manufactured controls when transmitting in the SIA and Contact ID (CID) formats.

Simplified example of data sent in SIA format:

XXXXXX EE CCC

XXXXXX = 6-digit hexadecimal subscriber #

EE = Event data code

CCC = Zone, sensor, or user ID

Simplified example of data sent in CID format:

SSSS 18 Q XYZ AA CCC

SSSS = 4-digit hexadecimal subscriber #

18 = CID que for automation systems

Q = Event qualifier; 1 = new event or opening; 3 = new restore or closing; 6 = previously reported event

XYZ = Event code (3 decimal digits)

AA = Area number (00 for all events)

CCC = Zone, sensor, or user # (3 decimal digits)

EVENT TYPE	CID CODE	SIA CODE	EVENT SOURCE
Zone Fire Alarm	1110	FA	Zone (1 - 16)
Zone Burglar Alarm	1130	BA	Zone (1 - 16)
Zone Holdup Alarm	1120	HA	Zone (1 - 16)
Zone Auxiliary Alarm	1100	MA	Zone (1 - 16)
Zone CO Detect Alarm	1162	GA	Zone (1 - 16)
Left Key Fire Alarm	1115	FA	500 + Keypad (1 - 4)
Center Key or RF Device Holdup Alarm	1120	HA	500 + Keypad (1 - 4)
Right Key or RF Device Auxiliary Alarm	1100	MA	500 + Keypad (1 - 4)
Duress	1121	PA	USER (1 - 8)
Burglar Alarm Cancelled	3406	BC	User (1 - 9) or Keyswitch (11 - 26)
Recent Closing	3459	CR	Quick (0), User (1 - 9), or Keyswitch (11 - 26)
User On Premises	1458	JP	User (1 - 8)
Exit Alarm	1374	EA	Zone (1 - 16)
Zone CCM Alarm	1150	UA	Zone (1 - 16)
Zone Swinger Trouble	1377	BD	Zone (1 - 16)
Zone Fire Trouble	1373	FT	Zone (1 - 16)
Zone Other Trouble	1370	UT	Zone (1 - 16)
Zone No Response on Bus	1333	ET	Zone (1 - 16)
RF Point Not Reporting	1381	US	Zone (1 - 16)
Smoke Detector Maintenance	1393	YX	Zone (1 - 16)
RF Sensor Tamper	1383	TA	Zone (1 - 16)
RF Point Low Battery	1384	XT	Zone (1 - 16)
Zone Fire Bypass	1571	FB	Zone (1 - 16)
Zone Burglar Bypass	1573	BB	Zone (1 - 16)
Zone 24-Hour Bypass	1572	UB	Zone (1 - 16)
Zone Other Bypass	1570	UB	Zone (1 - 16)
Zone Fire Alarm Restore	3110	FR	Zone (1 - 16)
Zone Burglar Alarm Restore	3130	BR	Zone (1 - 16)
Zone Holdup Alarm Restore	3120	HR	Zone (1 - 16)
Zone Auxiliary Alarm Restore	3100	MR	Zone (1 - 16)
Zone CO Detect Alarm Restore	3162	GR	Zone (1 - 16)
Zone CCM Alarm Restore	3150	UR	Zone (1 - 16)

SIA AND CONTACT ID FORMATS

EVENT TYPE	CID CODE	SIA CODE	EVENT SOURCE
Zone Swinger Trouble Restore	3377	BE	Zone (1 - 16)
Zone Fire Trouble Restore	3373	FJ	Zone (1 - 16)
Zone Other Trouble Restore	3370	UJ	Zone (1 - 16)
Zone No Response Restore	3333	ER	Zone (1 - 16)
RF Point Reporting Again	3381	UR	Zone (1 - 16)
Smoke Detector Clean	3393	YZ	Zone (1 - 16)
RF Sensor Tamper Restore	3383	TR	Zone (1 - 16)
RF Point Low Battery Restore	3384	XR	Zone (1 - 16)
Zone Fire Bypass Restore	3571	FU	Zone (1 - 16)
Zone Burglar Bypass Restore	3573	BU	Zone (1 - 16)
Zone 24-Hour Bypass Restore	3572	UU	Zone (1 - 16)
Zone Other Bypass Restore	3570	UU	Zone (1 - 16)
User AWAY Arm	3401	CL	User (1 - 9)
User Other Arm	3456	CG	User (1 - 9)
Quick Arm	3408	CL	No Data
Keyswitch Arm	3409	CS	Keyswitch (11 - 26)
User Disarm	1401	OP	User (1 - 9)
Keyswitch Disarm	1409	OS	Keyswitch (11 - 26)
Walk Test Mode Begin	1607	TS	User (1 - 9)
Installer On Premises	1466	LB	No Data
Keypad Missing	1330	ET	500 + Keypad (1 - 4)
AC Failure	1301	AT	No Data
Panel Low Battery	1302	YT	No Data
Bell Fault	1321	YA	No Data
RF Jamming	1344	XQ	No Data
RF User Device Low Battery	1384	XT	User (1 - 8)
Memory Error	1303	YF	No Data
Walk Test Mode End	3607	TE	User (1 - 9)
Installer Off Premises	3466	LX	No Data
Keypad Missing Restore	3330	ER	500 + Keypad (1 - 4)
AC Restore	3301	AR	No Data
Panel Low Battery Restore	3302	YR	No Data
Bell Restore	3321	YH	No Data
RF Channel Clear	3344	XH	No Data
Failed to Communicate Restore	3354	YK	No Data
Auto-Comm Test (Not Normal)	1608	RY	No Data
Auto-Communicator Test	1602	RP	No Data
Remote Program End	3412	RS	No Data
Remote Program Aborted	1412	RU	No Data
Manual Communicator Test	1601	RX	No Data

Agency Requirements

Underwriters Laboratories (UL) Notes In This Manual

- Key “0” (Access) - The control has not been investigated to UL 294 Access Control System requirements.
- Unsupervised Burglary Zones - UL does not permit the use of unsupervised zones.
- For UL Commercial Burglary, minimum transformer should be 16.5 VAC 35 VA.

UL Notes About Program Functions

- Entrance Delay Time (1 and 2) - Maximum of 45 seconds.
- AWAY Exit Delay Time - Maximum of 60 seconds.
- Burglar Alarm Cutoff Time - 4 minutes minimum for household BA/FA and 15 minutes for commercial burglar alarm and police station connected burglar alarm system.
- Fire Cutoff Time - Minimum of 4 minutes for residential fire.
- Communicator Enable - Police station connected burglar alarm installations: The communicator must be enabled.
- Days Between Comm. Tests - Commercial installations: automatic test performed every 24 hours.
- Time Between Dial Attempts - UL certified accounts: no more than 45 seconds between attempts.
- Dial Type - Will not be programmed for foreign pulse.
- Dial Attempts Before Shutdown - Five dial attempts minimum, ten dial attempts maximum.
- Double Press Arming/Press & Hold Arming - These functions will be disabled. Four digit passcodes will be used.

- Enable Force Arming - This function will be disabled.
- Enable Bypassing - This function will be disabled.
- Burglar Alarm Output - Will be programmed to STEADY.
- Fire Alarm Output - Will be programmed to TEMPORAL.
- Burglar Loop Audible Lockout - This function will be disabled.
- Enable Bell Test Upon Arming - This function will be enabled for Grade A Local Central Station Connected installations.
- Enable Keypad Sounder for BA Zones - The system will have an audible alarm output upon alarm.

UL Notes About Zone Planning

- Burglar Loops - Will be defined as Alarm on Open/Alarm on Short.
- Fire, Holdup, CO Detectors, and Auxiliary Emergency Zones - Will not be defined as bypassable.
- Special Functions/Alarms - Burglar zones will have an audible output.
- Medical Emergency - At least one Control Station will be used as part of the system.

UL Notes About RF Devices

For UL Burglary installations with wireless devices, an output programmed as “RF Annunciator” is required and an audible device must be connected to it. After a trouble condition is silenced with an OFF + passcode, this output will pulse 3 times at 4 hour intervals if a wireless device has a low battery or a wireless point has been tampered.

UL and ULC Listings

APPLICATION	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
Central Station Burglar Alarm Unit	UL 1610
California State Fire Marshal	7167-1459:114
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 2 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.

Application	Listing	Max. Continuous Current Drain (mA) w/ 7 AH Battery	Minimum Battery Standby Time In Hours	Control Stations	Smoke Detector ESL 429 & 700 series, System Sensors 1400 & 2400 series	Auxiliary Equipment Required
Household Burglary	UL1023	400	4	4	N/A	UL listed signaling device
Household Fire	CSFM	400	24	4	Required	UL listed signaling device
Household Burglary/ Fire Combination	UL 1023 UL 985	400	4 24	4	Required	UL listed signaling device
Central Station Burglary (Grade C)	UL 1610 UL 1635	400	4	4	N/A	TC 1100 Tamper Resistant cover with a ZX310
Central Station Burglary (Grade B)	UL 1610 UL 1635	400	4	4	N/A	TC 1100 Tamper Resistant cover with a ZX310 and a UL Listed audible device (AB12M recommended)
Local Burglary (Grade A)	UL 609	400	4	4	N/A	TC 1100 Tamper Resistant cover with a ZX310 and a UL Listed audible device (AB12M recommended)
Police Station Burglary Connection (Grade A)	UL 365	400	4	4	N/A	TC 1100 Tamper Resistant cover with a ZX310 and a UL Listed audible device (AB12M recommended)

Maximum combined continuous current drain (standby) refers to terminals KP+12V, 2WS SWNEG, +12V AUX, and PGO1. Under alarm conditions, the combined output current drain should not exceed 950 mA with 16.5 VAC 35 VA transformer. For 24 hr standby, UL Household Fire & CSFM, two 7 Ah batteries are required.

Table 3 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 100½F. (37.8½C.)

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.

Consult smoke detector specifications and local and national codes for coverage descriptions.

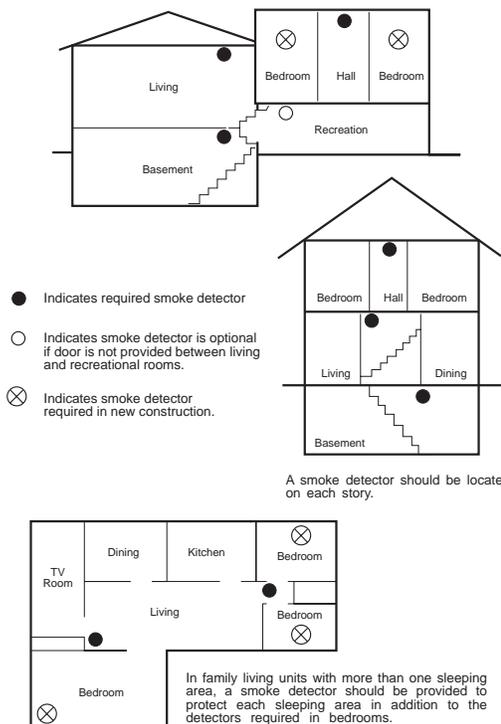
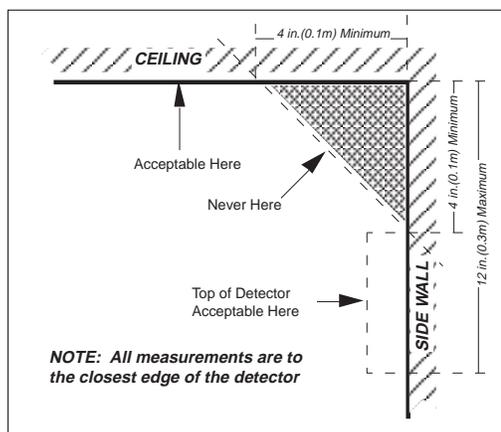


FIGURE 8 Smoke Detector Placement

CO Detector Locations

Selecting a suitable location is critical to the operation of CO detectors. You should install an detector in every bedroom and on each level of a dwelling. At a minimum, one detector should be placed outside the sleeping areas. See Figure 9.

Use the following guidelines to select a suitable location for the installation of CO detectors:

- Mount detectors on a ceiling or wall at least 5 feet up from the floor.
- Mount detectors at least 5 feet from outside doors and windows.
- Mount at least 5 feet from open flame appliances such as furnaces, stoves, and fireplaces.
- Mount at least 5 feet from any cooking appliance.
- For sloped, gabled, or peaked ceilings, locate the detector 3 feet from the highest point.
- Locate in a suitable environment as follows:
 - Temperature between 40 degrees F and 100 degrees F.
 - Humidity between 15 and 90% non-condensing.
- Locate away from air conditioners, heating registers, and any other ventilation source that may interfere with CO gas entering the detector.
- Do not mount where furniture or draperies may obstruct the airflow.
- Mount detectors on a firm permanent surface.

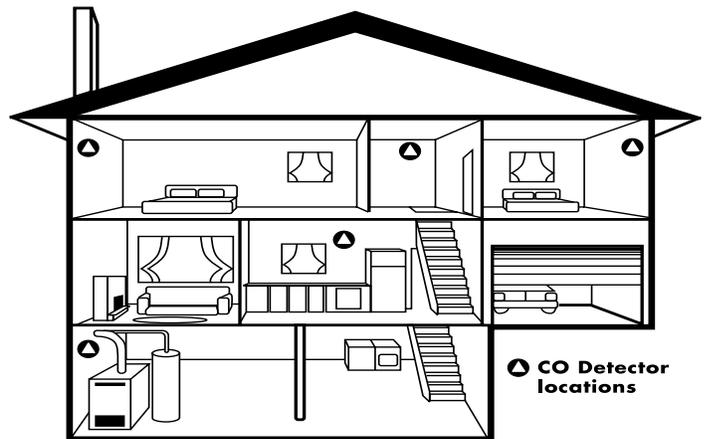


FIGURE 9 CO Detector Placement

FCC Compliance

Part 68 Notification

This equipment complies with Part 68 of the Federal Communications Commissions (FCC) rules. All connections to the telephone network must be made through standard telephone company plugs and jacks, RJ-31X or equivalent, in such a manner as to allow for easy and immediate disconnection of the equipment. If the connecting cord is unplugged from the jack there shall be no interference to the telephone equipment still connected to the telephone network.

The FCC registration number and Ringer Equivalence Number (REN) can be found printed on the wiring connection label located inside the Control Box Enclosure. If requested, provide this information to your telephone company. The REN is useful to determine the quantity of devices that may be connected to your telephone line and still have all of those devices ring when your number is called. In most, but not all areas, the sum of the RENs of all devices should not exceed five (5.0).

In the unlikely event that the equipment should ever fail to operate properly, it should be disconnected from the telephone jack to determine if the problem is with the telephone network or with the equipment. If a problem is found with the equipment, leave disconnected until it is repaired or replaced.

In the unlikely event that the equipment should ever cause harm to the telephone network, the telephone company may temporarily discontinue your service. If possible, they will notify you in advance. However, if advance notice isn't practical, the telephone company may temporarily discontinue service without prior notification. In the case of temporary discontinuance, the telephone company shall promptly notify the telephone subscriber who will be given the opportunity to correct the situation. The customer also has the right to bring a complaint to the FCC if he feels the disconnection is not warranted.

Your telephone company may make changes in its facilities, equipment, operations, or procedures that could affect the proper operation of your equipment. If they do, you will be given advance notice so as to give you an opportunity to maintain uninterrupted service.

You should notify the telephone company if this equipment is removed from the premises and the telephone jack is no longer needed.

Part 15 Notification

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

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

CAUTION: Changes or modifications not expressly approved by the manufacturer could void the user's authority to operate the equipment.

Canadian Notice

The Canadian Department of Communications label identifies certified equipment. This certification means that the equipment meets certain telecommunications network protective, operational and safety requirements. The Department does not guarantee the equipment will operate to the user's satisfaction. Before installing this equipment, users should ensure that it is permissible to be connected to the facilities of the local telecommunications com-

pany. The equipment must also be installed using an acceptable method of connection. In some cases, the company's inside wiring associated with a single line individual service may be extended by means of a certified connector assembly (telephone extension cord). The customer should be aware that compliance with the above conditions may not prevent degradation of service in some situations. Repairs to certified equipment should be made by an authorized Canadian maintenance facility designated by the supplier. Any repairs or alterations made by the user to this equipment, or equipment malfunctions, may give the telecommunications company cause to request the user to disconnect the equipment. Users should ensure for their own protection that the electrical ground connections of the power utility, telephone lines and internal metallic water pipe system, if present, are connected together. This precaution may be particularly important in rural areas.

CAUTION: Users should not attempt to make such connections themselves, but should contact the appropriate electric inspection authority, or electrician, as appropriate.

The LOAD NUMBER (LN) assigned to each terminal device denotes the percentage of the total load to be connected to a telephone loop which is used by the device, to prevent overloading. The termination on a loop may consist of any combination of devices subject only to the requirement that the total of the Load Numbers of all the devices does not exceed 100. The LOAD NUMBER for the system is 2.

This equipment is a Class B Digital apparatus which complies with the radio interference regulations, CRC c. 1374.

Limitations

The ZX300/ZX310 is part of a system designed to warn against unauthorized entry or of other situations. However, it is not a guarantee of protection against the occurrence of those events. Any alarm system is subject to compromise or failure to warn for various reasons. Unauthorized access can be gained through unprotected points or by disarming or bypassing protected points. Sensing devices are power driven and will not operate without power. Telephone lines over which alarm signals are transmitted may be out of service or rendered inoperable by an intruder. Smoke detectors have limitations and cannot detect all types of fires, or sense smoke which is out of the effective range of the detector.

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ff **SPECIAL NOTE** referencing use of the word "Fire" in this manual.

Use of this control for fire detection and/or annunciation may not be permitted by certain states, counties, municipalities, or local jurisdiction. It is the responsibility of the installing alarm company to check with their local AHJ (Authority Having Jurisdiction) or State Fire Marshal's office prior to using this control for fire detection.

This Product is Listed by
UNDERWRITERS LABORATORIES INC.
and Bears the Mark:



See Page 26 for listing information



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