

**Protege 16 Zone Input Expander  
Installation Manual**

**ICT**Protege®.

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# 1 Introduction

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Thank you for purchasing the PRT-ZX16-PCB Protege Zone Input Expander by Integrated Control Technology. The Protege System is an advanced technology security system designed to provide integration with building automation, apartment complex control and HVAC in one flexible package. Communication is over a proprietary high speed protocol across an encrypted local area network and AES Encrypted Proprietary RS-485 module network. Using modular-based hardware design, system installers have the flexibility to accommodate any installation whether it's small, large, residential or commercial.

The Zone Expander extends the number of zone inputs on the system by 16 and the number of PGM outputs by 4 (including 2 monitored bell control outputs).

Flexible module network architecture allows large numbers of modules to be connected to the RS-485 Module Network. Up to 250 modules can be connected to the Protege System in any combination to the network up to a distance of 900M (3000ft). Communication beyond this distance requires the use of a RS-485 Network Extender

Locking a network prevents the removal, substitution or addition of modules to the module network effectively preventing any tampering with the system.

The current features of the Zone Expander include:

- Secure Encrypted RS-485 Module Communications
- 16 Zone Inputs
- 2 Monitored Bell Control PGM Outputs (High Current)
- 2 Open Collector PGM Outputs (50mA)
- 2.5A Switching Power Supply
- Intelligent Battery Charge and Monitoring
- Online and Remote upgradable firmware

When receiving this product, you should find the kit contains the items listed below. If you do not have the correct contents, please contact your distributor immediately.

- Zone Expander Printed Circuit Board
- 6 Plastic Mounting Standoffs
- 36 1K Ohm Resistors
- Red/Black Backup Battery Wires

For more information on the PRT-ZX16-PCB Protege Zone Input Expander and other Integrated Control Technology products please visit the ICT website (<http://www.ict.co>).

## 1.1 Document Conventions

This document uses the following conventions:



Important warnings or cautionary messages to prevent equipment damage, data loss, or other similar conditions



Notes with additional information such as an explanation, a comment, or a clarification about the subject



Tips containing practical information that may help you solve a problem or describing actions that may save you time



Information relating to UL and ULC compliance



Bold text enclosed in brackets is used to show a section number or address of a programmable option or information on programming shortcut sequences

## 2 Installation Requirements

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This equipment is to be installed in accordance with:

- The Product installation instructions
- UL 681 - Installation and Classification of Burglar and Holdup Systems
- UL 827 - Central-Station Alarm Services
- CAN/ULC-S301, Central and Monitoring Station Burglar Alarm Systems
- CAN/ULC-S302, Installation and Classification of Burglar Alarm Systems for Financial and Commercial Premises, Safes and Vaults
- CAN/ULC-S561, Installation and Services for Fire Signal Receiving Centres and Systems
- The National Electrical Code, ANSI/NFPA 70
- The Canadian Electrical Code, Part I, CSA C22.1
- The Local Authority Having Jurisdiction (AHJ)

# 3 Installation

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## 3.1 Location and Mounting

The Zone Expander is available as a PCB Only (Printed Circuit Board) or complete unit supplied with a metal cabinet. We recommend that the cabinet is used wherever possible as this provides the best mounting and installation solution as well as the required cable entry and termination space.

When installing the Zone Expander ensure that there is adequate clearance around all sides of the enclosure and air flow to the vents of the enclosure are not restricted.

We recommend the Zone Expander is installed in a location that will facilitate easy access for wiring. We also recommend that the Zone Expander is installed in electrical rooms, communication equipment rooms, closets or in an accessible area of the ceiling.

1. Insert the plastic stand-offs in to the locations to mount the PCB board.
2. Calculate the location and position of the enclosure and mark the holes for the keyhole points in the top left and right locations. This will allow you to screw in the screws and then hang the box on them adjusting the location to suit.
3. Ensure a solid fixing point and screw in the two screws. Before tightening the top screws insert the tamper bracket in the slot provided on the right side of the enclosure.
4. Fix the enclosure securely using the remaining mounting holes on the bottom left, right and centre of the enclosure.
5. Insert the PCB in to the enclosure and mount using the plastic standoffs inserted during step one.



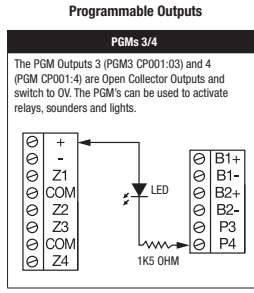
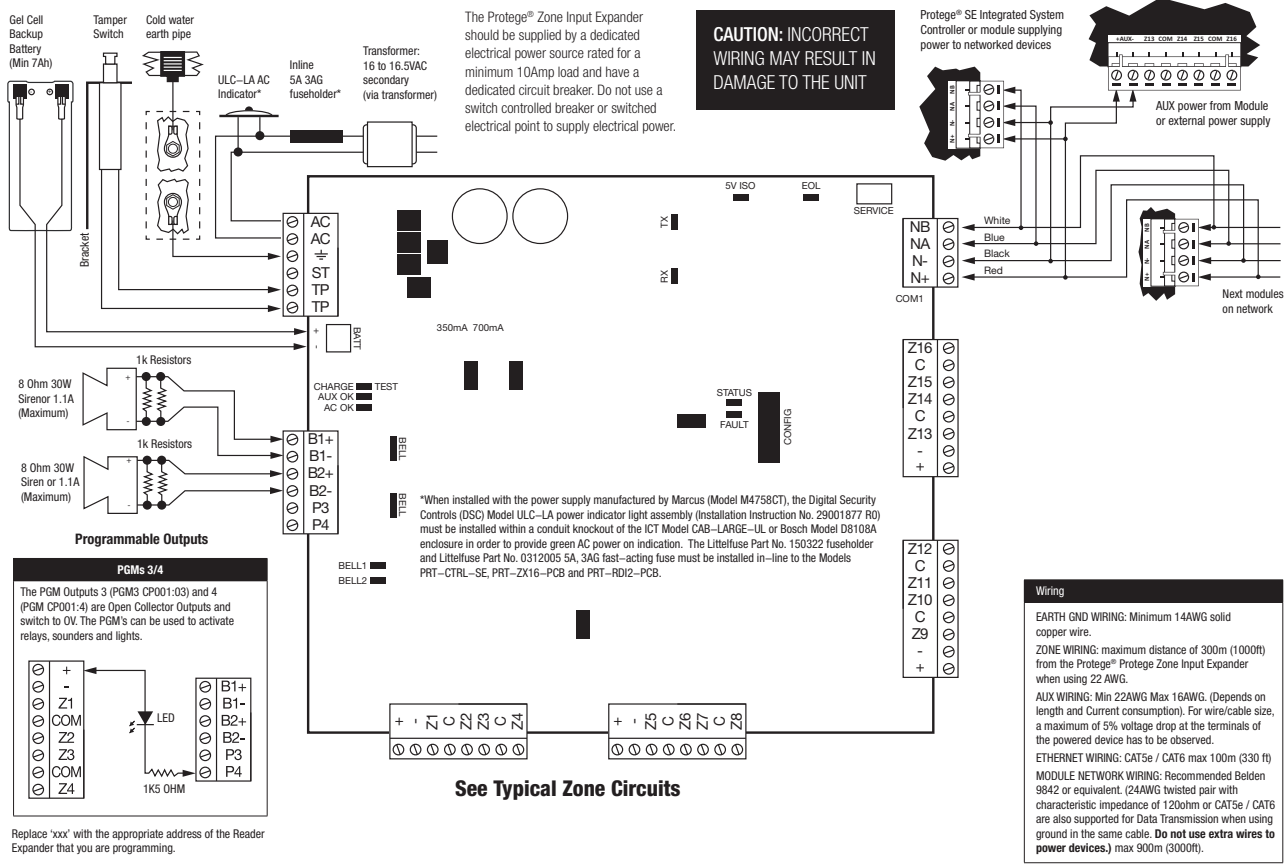
Install the enclosure when the circuit board is NOT installed on the plastic stand-offs. This will reduce the risk of damage caused by debris during the installation process.

## 3.2 UL/ULC Installation Cabinet Options

UL/ULC Central Station Fire Monitoring, Central Station Alarm Installations

Cabinet Model	Manufacturer	UL/ULC Installation Listings
D8108A	Bosch	UL1610, UL1635, ULC-S304, ULC-S559

# 3.3 Wiring Diagram



**Wiring**

EARTH GND WIRING: Minimum 14AWG solid copper wire.

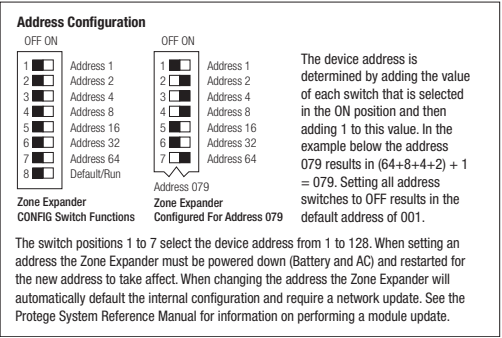
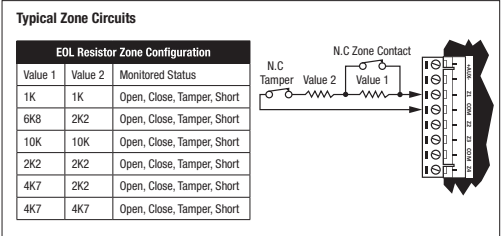
ZONE WIRING: maximum distance of 300m (1000ft) from the Protege® Protege Zone Input Expander when using 22 AWG.

AUX WIRING: Min 22AWG Max 16AWG. (Depends on length and Current consumption). For wire/cable size, a maximum of 5% voltage drop at the terminals of the powered device has to be observed.

ETHERNET WIRING: CAT5e / CAT6 max 100m (330 ft)

MODULE NETWORK WIRING: Recommended Belden 9842 or equivalent. (24AWG twisted pair with characteristic impedance of 120ohm or CAT5e / CAT6 are also supported for Data Transmission when using ground in the same cable. **Do not use extra wires to power devices**.) max 900m (3000ft).

LED	Description	
Status	Slow Flash: Module operating normally	
Status	Fast Flash: Module attempting registration with Controller	
Fault	Slow Flash: Module is in boot mode awaiting firmware update	
	Module is in error state. Error code is displayed by flashing the Status indicator ON and OFF rapidly with a 1.5 second between each display cycle	
	<b>Number of Flashes</b>	<b>Error Description</b>
	1	Unknown Error Code
	2	Firmware Version
	3	Address Too High
	4	Address in Use
	5	Controller Secured
6	Serial Number Fault	
7	Locked Device	
For further details, please refer to the Error Code Display section in the Installation Manual.		
Charge / Test	Varying Intensity: Battery is being charged, indicator's intensity shows charging current	
	ON: Battery test in progress	
AUX	OFF: Auxiliary supply is normal	
AC	ON: Valid AC input is provided	
5V ISO	ON: Valid power supply is provided	
BELL1 / BELL2	ON: BELL is ON	
Network RX / TX	Fast Flash: Data packet transmitted/received	
	OFF: No data packet transmitted/received	



- Mounting**
1. Insert the plastic standoffs into the locations to mount the PCB board.
  2. Calculate the location and position of the cabinet enclosure and mark the holes for the keyhole points in the top left and right locations. This will enable you to fasten the screws and then hang the box on them adjusting the location to suit.
  3. Ensure a solid fixing point and fasten the two screws. Before tightening the top screws, insert the tamper bracket in the slot provided on the right side of the cabinet enclosure.
  4. Fix the cabinet enclosure securely using the remaining mounting holes on the bottom left, right and centre of the cabinet enclosure.
  5. Insert the PCB into the cabinet enclosure and mount using the plastic standoffs inserted during step 1.



## 3.4 Wiring

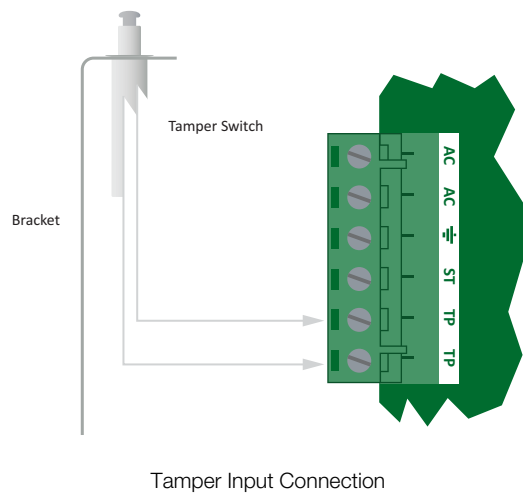


**CAUTION:** Incorrect wiring may result in damage to the unit.

- All output circuits comply with the requirements for inherent power limitation and are Class 2 except the battery wires and AC wires which are not power limited.
- A minimum of 1/4" (6.35mm) physical separation must be respected between power limited and non power limited wiring (Battery Wires and AC Wires).
- Do not route any wiring over circuit board. Maintain at least 25.4mm (1") separation.
- The connection to the mains supply must be made as per local authorities rules and regulations.

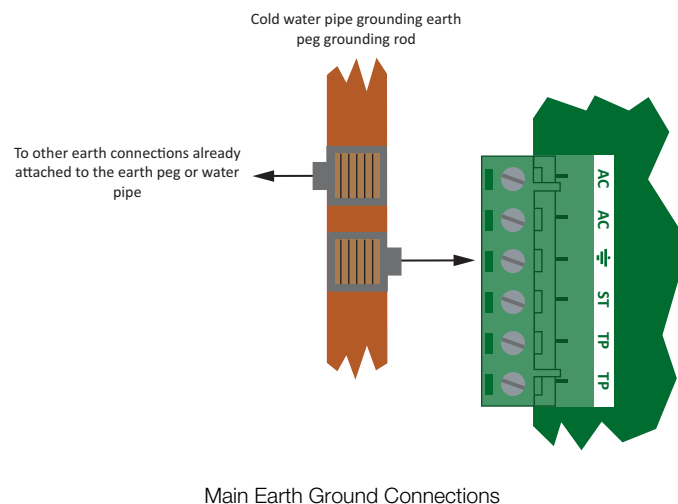
## 3.5 Cabinet Tamper Switch

The enclosure tamper input signals to the monitoring station or remote computer that the Zone Expander enclosure has been opened. The tamper input switch shall be mounted into the steel bracket provided and connected to the tamper connection terminals as shown in the diagram below. The tamper input opens and closes trouble zone ZXxxx:01 on the Zone Expander.



## 3.6 Earth Ground Connection

The Zone Expander has a connection for earth ground. For best results a cold water pipe should be used with a pipe wiring clamp. If a cold water pipe is not available, connect to a suitable ground connection in the installation. A minimum 14AWG solid copper wire shall be used from the Zone Expander's earth connection point to the clamp on the cold water pipe. If other earth clamps are present at the same connection point connect the clamp below the existing units.



## 3.7 AC Power

The Protege Controller shall be supplied by a dedicated electrical power source rated for a minimum 10Amp load and have a dedicated circuit breaker. Do not use a switch controlled breaker or a switched electrical point to supply electrical power. Connect the primary (120VAC) of a 16 to 16.5 VAC, 60Hz, 40VA or 100VA transformer (refer to the table below) to the electrical circuit and run the secondary (16 to 16.5VAC) to the AC Input on the Controller terminals.



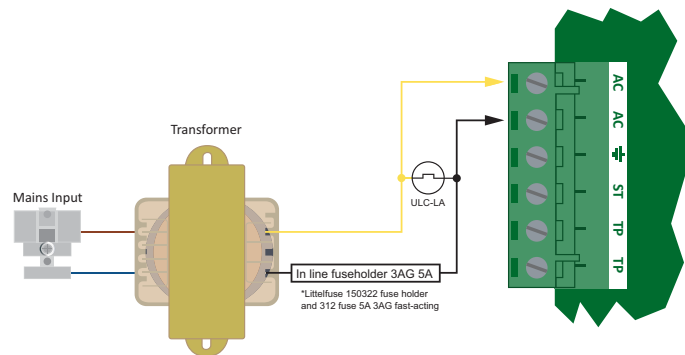
The following table outlines the transformers that shall be used in order to comply with UL and ULC installation standards.

When installed with the power supply manufactured by Marcus, Model M4758CT:

- the Digital Security Controls (DSC) Model ULC-LA power indicator light assembly (Installation Instruction No. 29001877 R0) must be installed within a conduit knockout of either the ICT Model CAB-LARGE-UL or Bosch Model D8108A enclosure in order to provide green AC power on indication.
- the Littelfuse Part No. 150322 fuseholder and Littelfuse Part No. 0312005 5A, 3AG fast-acting fuse must be installed in-line to the Models PRT-CTRL-SE, PRT-ZX16-PCB, and PRT-RDI2-PCB.

For ULC Central Station Fire Monitoring installations, a hardwired connection type transformer is required. Check with the local authority.

Transformer	Manufacturer	Transformer Type	Specification
TRI-PIT 1640C	Solex	PLUG IN Transformer	16.5VAC 40VA
NE-TP4016L	National Electronics	PLUG IN Transformer	16.5VAC 40VA
GF-4016L	GFX	PLUG IN Transformer	16.5VAC 40VA
M4758CT	MARCUS	HARDWIRE Transformer (requires Class 1 120VAC input)	16VAC 100VA



AC Power Connection

Specific regional regulations may allow the transformer to be mounted inside the cabinet enclosure. In this case wire the electrical circuit to the electrical termination point inside the cabinet enclosure and the secondary wires of the transformer to the AC Input on the Zone Expander. The earth wire shall be routed to the V- terminal on the Zone Expander when using an internal transformer.



### Warning:

- This installation should be made by qualified service personnel and should conform to all local codes and in accordance with the National Electrical Codes (NEC US) or the Canadian Electrical Codes (CEC Canada).
- Termination of wiring to the Zone Expander while power is applied or the battery is connected may cause serious damage to the Zone Expander and will VOID ALL WARRANTIES OR GUARANTEES. Power the unit only after all wiring, configuration and jumper settings are completed.
- Extra care must be taken when wiring the AC inputs. Improper connection will cause permanent damage to the Zone Expander.

## 3.8 Battery Backup

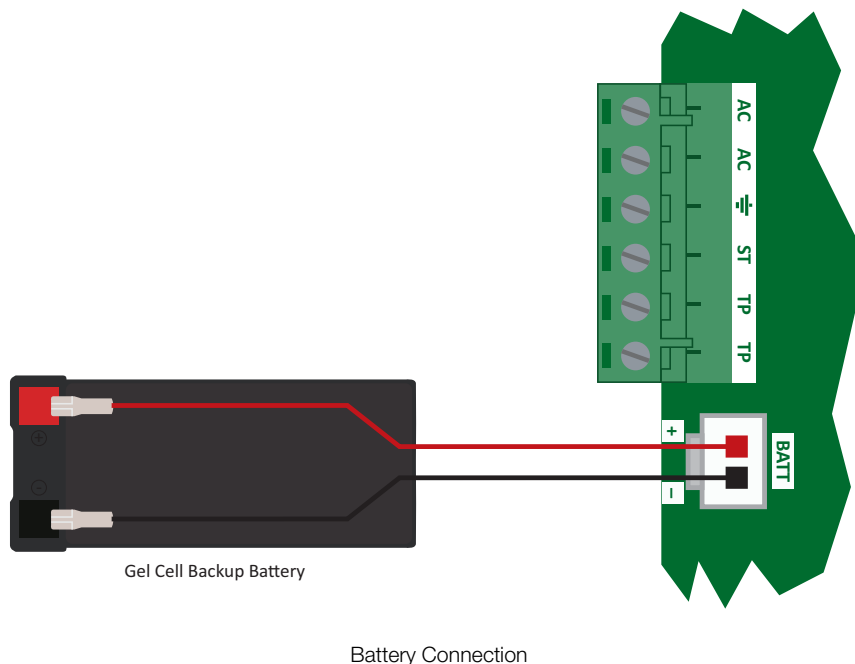
It is recommended that a minimum of a 7Ah battery is used as the main battery backup. From the accessory bag provided, connect the battery housing connector to the battery connector on the Controller. Connect the spade terminals to the battery as shown in the diagram below. Connection of the battery in reverse will not damage the Controller but will cause the electronic battery fuse (5A fast blow) to open. Prolonged reverse connection can cause damage to the Controller.



Please refer to the section Maximum Total Output Current : UL and ULC Installations for specific requirements on complying with UL and ULC installation standards.

Servicing of the battery circuit and replacement of lithium battery must be done by a trained technician.

Follow battery manufacturer instructions for installation, testing and maintenance.



Battery Connection

The battery test procedure uses a special algorithm to prevent deep discharge and increase battery endurance. A dynamic battery test is performed every ten minutes (default) when AC power is present. A battery trouble zone alarm will be generated if the battery is either disconnected or shows poor capacity. Battery fault conditions will activate the battery trouble zone.

If AC is not present, the Controller will monitor the battery for a low voltage level and will activate the battery trouble zone. The next dynamic battery test will occur 30 minutes after AC power has been restored. This delay allows the battery to achieve optimal charging during the first 30 minutes that power has been restored to the unit. Once the first test is completed the dynamic testing will return to the programmed value (default 10 minutes).

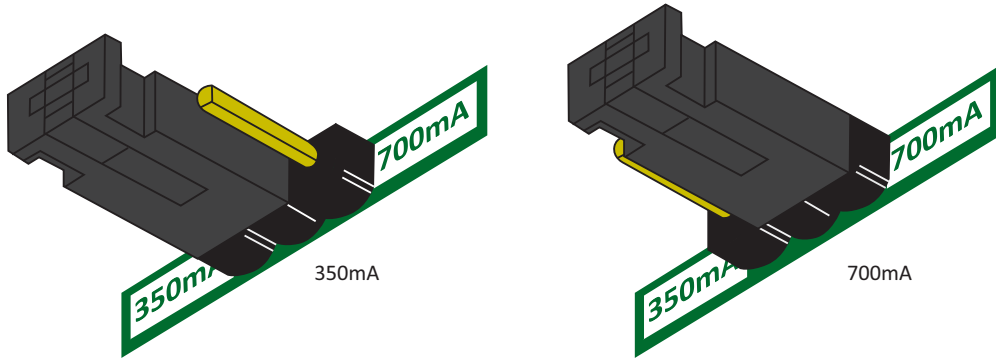
When power is first applied to the Controller, a dynamic battery test will be performed after 30 seconds. This allows the status and condition of the battery to be detected. On completion of this first test, the default testing period of 10 minutes will be resumed. This is a programmable setting in the Controller panel options. The test period can be changed as required by setting the battery test time in the Controller Configuration Menu.



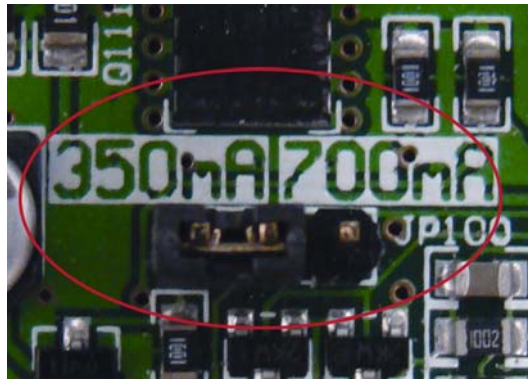
**Warning:** Only attach standard lead acid batteries. Do not connect the battery wires or battery housing connector of the Controller to any other ancillary device (siren, lock or mag clamp etc). Connection may cause erroneous faults or serious damage to the Controller and will VOID ALL WARRANTIES OR GUARANTEES.

### 3.9 Battery Charge Current Setting

To configure the Zone Expander manually for the charge current, select the appropriate battery current limit setting using the jumpers as shown below.



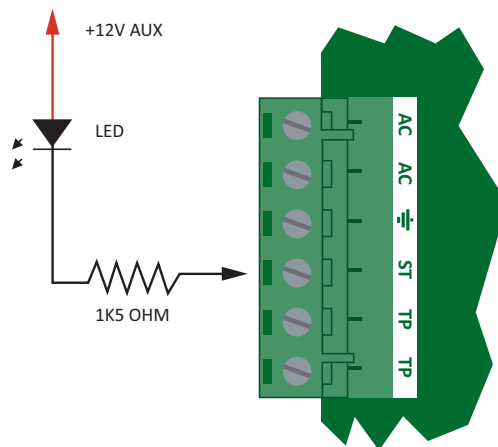
Battery Charge Jumper



Jumper Location

### 3.10 Status Indicator

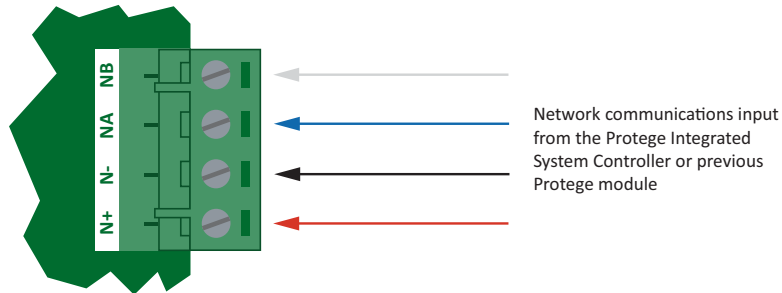
The status output will activate according to the status indicator on the Protege Zone Expander and can be used to provide signalling or indication of the Zone Expander status outside the enclosure. The following diagram shows the connection of an LED indicator to the status output.



External Status LED Connection

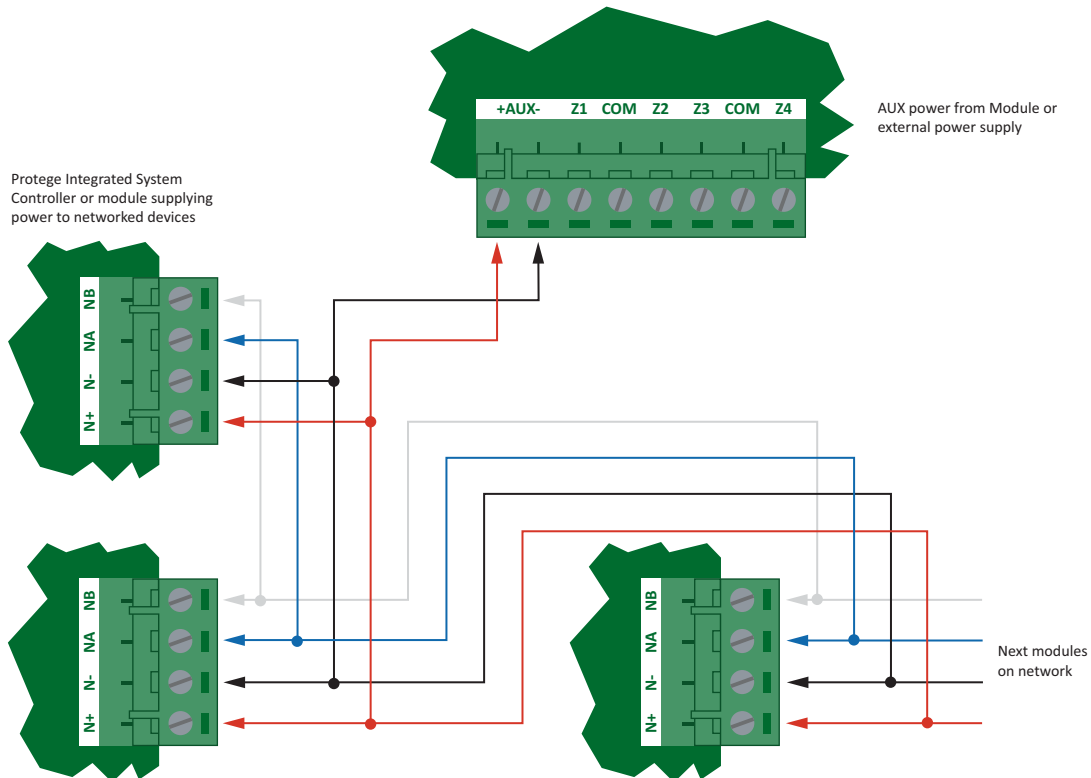
## 3.11 Encrypted Module Network

The Protege Zone Expander incorporates technically advanced encrypted RS-485 communications technology. The isolated communications interface offers full galvanic isolation to prevent ground loop noise and cross phase ground differential. The communication offers superior interference immunity. Connection of the communications should be performed according to the following diagram.



Standard Communication Connection

Always connect the Protege Zone Expander's NA and NB terminals to the NA and NB terminals of the expansion devices and keypads. The N+ and N- must go to a 12V power supply source as shown below.



Network Power Connection

The above diagram shows a power connection taken from the auxiliary power outputs on the Zone Expander's zone terminals.

This connection is suitable for smaller systems provided that the:

- Maximum total output current,
- AUX DC output current,
- B1/B2 DC output current, and
- Total combined current

are ALL lower or equal to the values outlined in the Technical Specifications section. If these currents are exceeded, a separate power supply shall be used.



If an external power supply is required, a UL 603 listed power-limited power supply must be used to comply with UL installation standards, and a CAN/ULC-S318 listed power-limited power supply must be used to comply with ULC installation standards.



**Warning:** The 12V N+ and N- Communication Input must be supplied from only one point. Connections from more than one 12V supply may cause failure or damage to the units supplying power.

The recommended module network wiring specifications are:

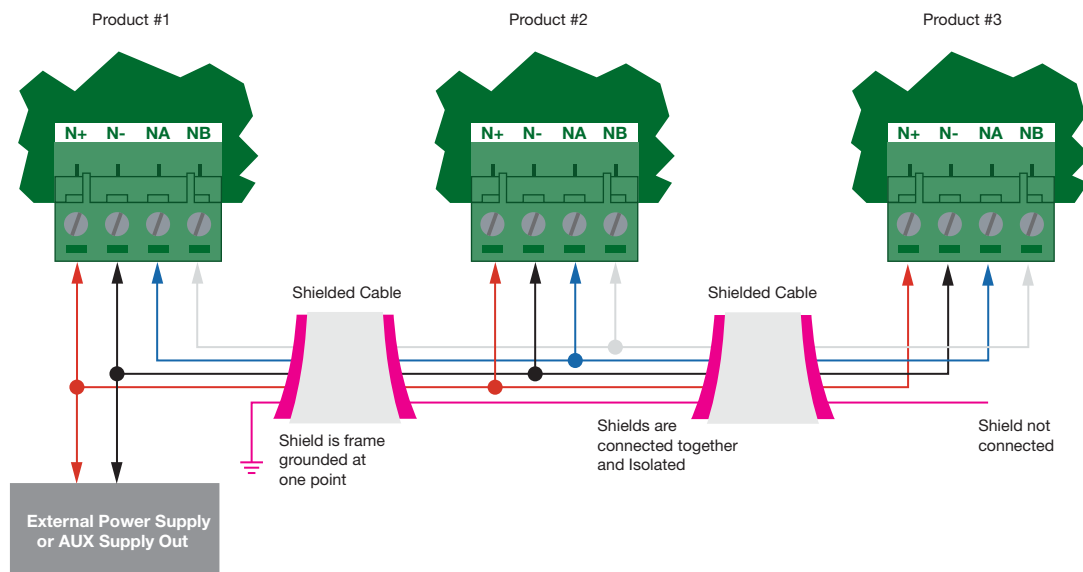
- CAT5e / CAT6 are also supported for data transmission when using ground in the same cable.
- 24AWG twisted pair with characteristic impedance of 120ohm
- Belden 9842 or equivalent.
- Maximum total length of cable is max 900m (3000ft)



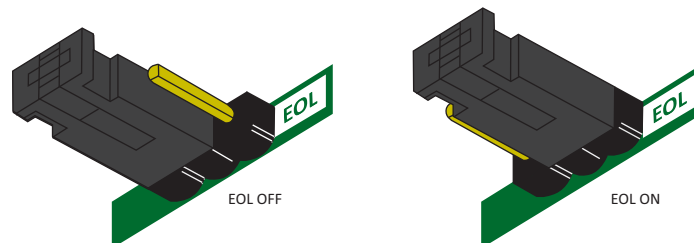
**Warning:** Unused wires in the cable must not be used to carry power to other devices.

## Shielded Cables

- Shielded cables can be used in noisy environments (with RF and electromagnetic interference).
- If a shielded cable is used, the shield must be connected at only one end of the cable. DO NOT connect a shield at both ends. Refer to the following diagram for the recommended shield connection.



Recommended Shield Connection



EOL Jumper



The EOL (End Of Line) jumper setting must be set in the on position for the first and last expansion device only.

# 4 Zone Inputs

The Zone Expander has 16 Zone Inputs. The zone expander also monitors 16 trouble zones used to report trouble conditions. A trouble zone is in most cases not physically connected with a device, rather it is related within the system. For example, a module communication fault causes a trouble zone to open as a result of the communication failure.

## 4.1 Zone Inputs

The Protege Zone Expander can monitor the state of up to 16 zone inputs such as magnetic contacts, motion detectors and temperature sensors. Devices connected to these zones can be installed to a maximum distance of 300m (1000ft) from the Zone Expander when using 22 AWG. The Zone Expander supports normally opened and normally closed configurations with or without EOL resistors on a per zone configuration setting.

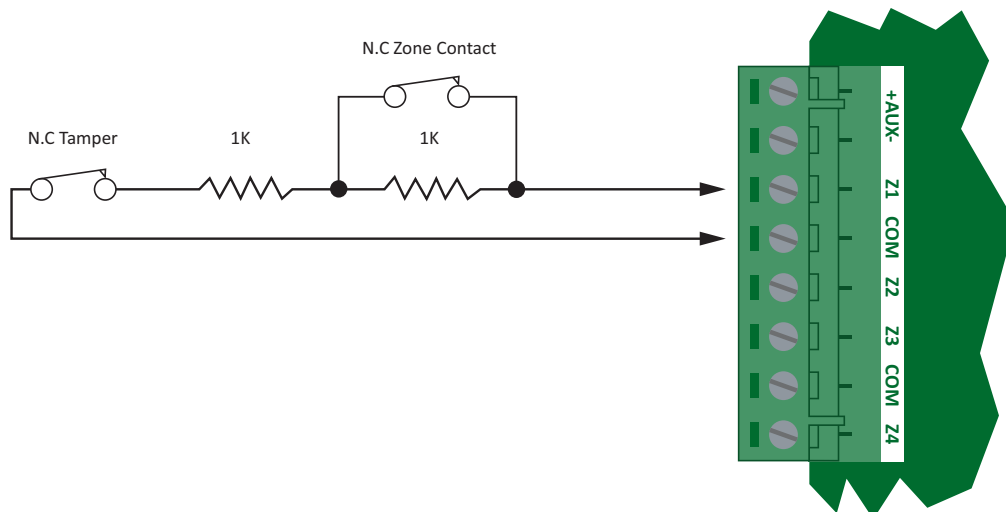


- Magnetic contacts should be listed to UL 634 to comply with UL installation standards and ULC/ORD-C634 to comply with ULC installation standards.
- Motion detectors and temperature sensors should be listed to UL 639 to comply with UL installation standards and ULC-S306 to comply with ULC installation standards.
- The PRT-ZX16-PCB has been evaluated for UL 1610, UL 1635, CAN/ULC-S304 and CAN/ULC-S559.

Zones can be programmed from the Protege LCD Keypad (PRT-KLCD) or using the Protege System Management Suite (PRT-SMGT). ZX001:01 to ZX001:16 represent Zone 1 to Zone 16 on the Protege Zone Expander (Substitute the module address for the appropriate address being programmed).

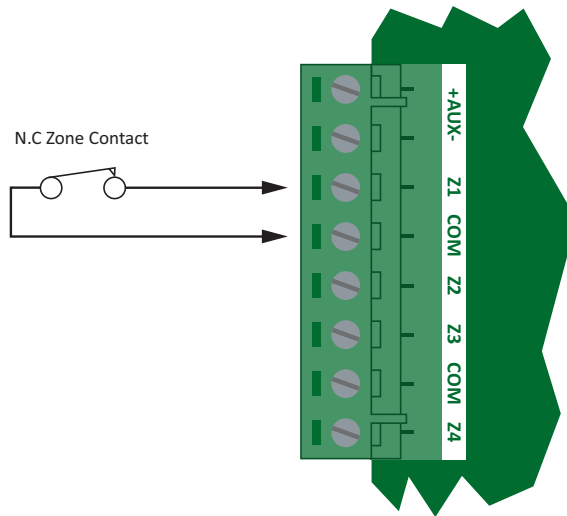
When using a zone with the EOL resistor configuration, the controller generates an alarm condition when the state of a zone changes and generates a tamper alarm condition when a wire fault (short circuit) or a cut wire (tampered) in the line occurs.

When using the EOL resistor configuration, the EOL resistor option must be turned on for the zone(s) so that the tamper and short states can be monitored (refer to Zones Section in the Protege Reference Manual).



EOL Resistor Zone Configuration

Each zone input can use a different input configuration. To program a large number of zones, with a single configuration type, use the Multiple Selection feature in the Protege System Management Suite application. When using the No Resistor configuration, the Controller only monitors the opened and closed state of the connected input device generating the (OPEN) Alarm and (CLOSED) Sealed conditions.



Normally Closed Zone Configuration No Resistors

## 4.2 Resistor Value Options

When using the EOL resistor configuration, the EOL resistor option must be configured based on the site requirements. Note that not all resistor options are supported on all Protege field modules. (Refer to Zones Section in the Protege Reference Manual).

Value 1	Value 2	Monitored Status
1K	-	Open, Closed
<5K7	-	Open, Closed
No Resistors	-	Open, Closed
1K	1K	Open, Closed, Tamper, Short
6K8	2K2	Open, Closed, Tamper, Short
10K	10K	Open, Closed, Tamper, Short
2K2	2K2	Open, Closed, Tamper, Short
4K7	2K2	Open, Closed, Tamper, Short
4K7	4K7	Open, Closed, Tamper, Short



## 4.3 Trouble Zone Inputs

Each zone expander can monitor up to 16 trouble zones. Trouble zones are used to monitor the status of the zone expander and in most cases are not physically connected to an external zone. For example, trouble zone ZX001:05 is used to monitor bell PGM output 1 for a tamper condition and will generate an alarm state if the bell is removed or tampered.

The following table details the trouble zones that are configured in the system and the trouble type and group that they activate.

Zone Number	Description	Type	Group
ZXxxx:01	Module Tamper	System Tamper	System
ZXxxx:02	AC failure	Power Fault	General
ZXxxx:03	Low Battery	Power Fault	General
ZXxxx:04	Aux Failure	Power Fault	General
ZXxxx:05	Lock Failure	Power Fault	General
ZXxxx:06	Bell 1 Tamper	System Tamper	System
ZXxxx:07	Bell 2 Tamper	System Tamper	System
ZXxxx:08	Bell 1 Over Current	Power Fault	General
ZXxxx:09	Bell 2 Over Current	Power Fault	General
ZXxxx:10	Reserved	None	None
ZXxxx:11	Reserved	None	None
ZXxxx:12	Reserved	None	None
ZXxxx:13	Reserved	None	None
ZXxxx:14	Reserved	None	None
ZXxxx:15	Reserved	None	None
ZXxxx:16	Module Offline	Module Offline	System

Replace 'xxx' with the appropriate address of the Zone Expander that you are programming.

# 5 Programmable Outputs

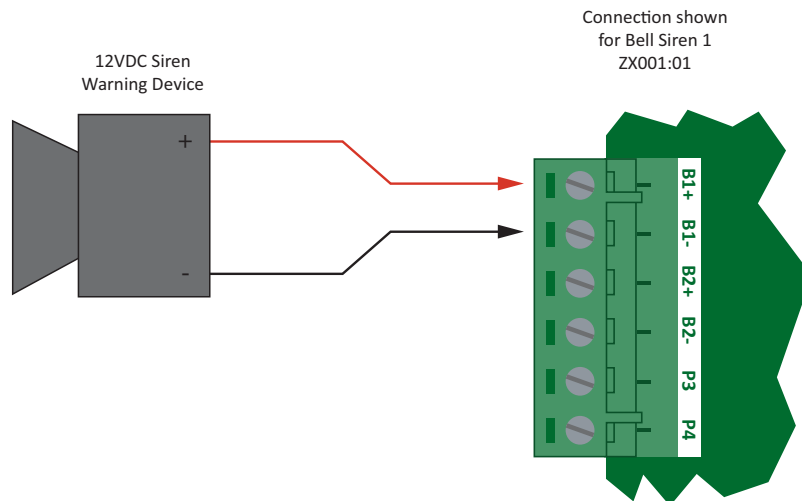
The Zone Expander has 4 Programmable Outputs (PGMs). The PGMs are used to activate the Bell Sirens, Lighting Control and Relay Accessory Products.

## 5.1 Bell PGM Outputs (1 and 2)

The + and - terminals of Bell1 (PGM1 ZX001:01) and Bell2 (PGM2 ZX001:02) are used to power bells, sirens, or any devices that require a steady voltage output. The Bell Outputs supply 12VDC upon alarm and support one 30-watt siren. The Bell Output uses an electronically fused circuit and automatically shuts down under fault conditions.



Not investigated by UL/ULC for Local Burglary applications.



Bell Output PGM1/2 Connection (PGM 1 Shown)

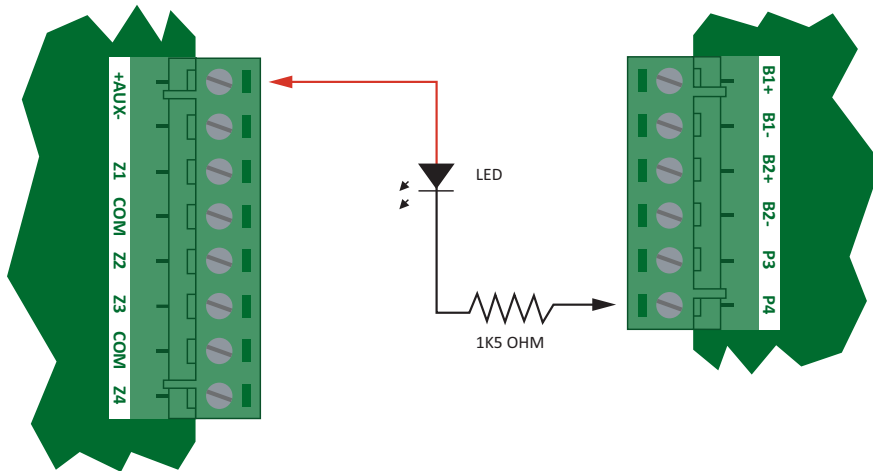
If the load on the bell terminals returns to normal, the Protege Zone Expander reinstates power to the bell terminals on the next transition of the output.



- When the Bell Output is not used, the appropriate trouble zone will be activated (refer to the section on Trouble Zones). This can be avoided by connecting a 1K resistor (provided in the accessory bag) across the Bell Output. If the bell is not being used for another function, and the trouble zone is not programmed in the system, a resistor is not required.
- Connecting a Piezo Siren may result in a dull noise being emitted. This is caused by residual current from the monitoring circuit. To prevent this occurring, connect 2 1K resistors in parallel.

## 5.2 Standard PGM Outputs (3 and 4)

The PGM outputs 3 and 4 on the Zone Expander are open collector outputs and switch to a ground connection.



Open Collector PGM 3/4 Connection



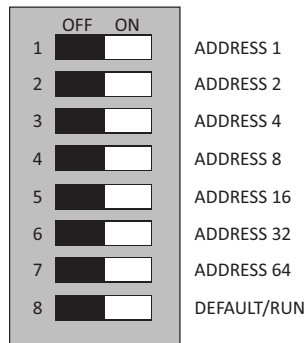
**Warning:** The PGM outputs 3 and 4 can switch to a maximum capacity of 50mA each, exceeding this amount will damage the PGM output.

# 6 Configuration Switch

The addressing of the Zone Expander allows up to 128 devices to be connected to the system controller. The 'CONFIG' configuration DIP switch allows each Zone Expander to have a unique address.

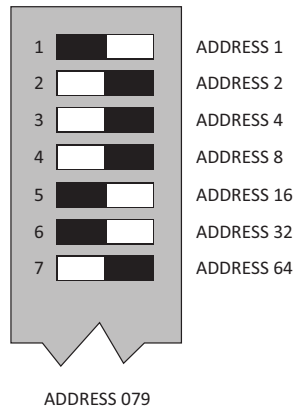
## 6.1 Address Configuration

The switch positions 1 to 7 select the device address from 1 to 128. When setting an address the Zone Expander must be powered down (Battery and AC) and restarted for the new address to take affect. When changing the address the Zone Expander will automatically default the internal configuration and require a network update. See the Protege System Reference Manual for information on performing a module update.



Zone Expander CONFIG Switch Functions

The device address is determined by adding the value of each switch that is selected in the ON position and then adding 1 to this value. In the example below the address 079 results in  $(64+8+4+2) + 1 = 079$ . Setting all address switches to OFF results in the default address of 001.



Zone Expander Configured For Address 079

# 7 Status Indication

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The Zone Expander includes comprehensive diagnostic indicators that can aid the installer in diagnosing faults and conditions. In some cases, an indicator may have multiple meanings depending on the status indicator display at the time.

## 7.1 Status Indicator

The Status Indicator is located in the centre of the PCB and indicates the status of the Protege Zone Expander. If the Protege Zone Expander is operating normally the LED will indicate this by **FLASHING** at 1 second intervals. **FLASHING** rapidly at 250ms intervals indicates that the Zone Expander is attempting to register with the system controller, or that communication has failed and the Zone Expander is retrying the request.



When the fault indicator is ON the status indicator will show an error code. Refer to the section on Error Code Display (see page 23) for more information.

## 7.2 Fault Indicator

The fault indicator LED is identified by the text 'FAULT' and is located in the centre of the PCB. When the fault indicator is **FLASHING** the Zone Expander is operating in firmware update mode, or there is no firmware loaded. The fault indicator when **ON** indicates that an error has occurred while trying to register with the system controller. The status indicator will flash a number of times indicating an error code. Refer to the section on Error Code Display (see page 23) for more information.

## 7.3 Charge/Test Indicator

The charge and test indicator serves two functions; it will indicate that a Battery Test is in progress, and that Battery Charging is being performed. When AC is present the battery charging current will be indicated by a varying intensity level on this indicator. This indicator will be **ON** when a battery test is in progress by illuminating brightly for 30 seconds every 10 minutes.

This indicator is identified by the text **CHARGE/TEST**. This indicator does not function when AC is not present. For more information, refer to the section on Battery Backup.

## 7.4 Auxiliary OK Indicator

Auxiliary voltage is supplied to the AUX+ outputs through the auxiliary fuse. If auxiliary supply is normal the the **AUX OK** indicator will be illuminated. If the auxiliary fuse is damaged, the indicator will be off.

## 7.5 AC OK Indicator

When a valid AC input is provided, the **AC OK** indicator will illuminate. When the AC is disconnected or has failed, the indicator will be off.

## 7.6 5V Isolated Power Indicator

The Zone Expander communicates using an isolated RS-485 interface for optimal performance and this requires an isolated supply on the N+ and N- terminals. When a valid power supply is available the '5V ISO' indicator will be **ON** for the interface. The '5V ISO' indication is located at the top of the network isolated interface.

## 7.7 Bell 1/Bell 2 Indicators

The Bell 1 and Bell 2 indicators will show the status of the Bell Output and the over current or circuit fault conditions.

**ON** Bell is **ON**.

**TWO FLASHES** Bell is **ON**, the circuit is in Over Current Protection or the fuse has blown.

**THREE FLASHES** Bell is **OFF**, the circuit to the locking device is cut, damaged or tampered.

## 7.8 Network RX/TX Indicator

The Network Receive and Transmit Data indicators are located on the top right side of the PCB beside the network communication interface. The indicator shows when the Protege Zone Expander is transmitting and receiving information from the module communications interface and is identified by the text 'RX' and 'TX'. When the indicator is **ON** data is being transmitted or received.

# 8 Error Code Indication

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When the Zone Expander attempts to register or communicate with the system controller a registration error can be generated indicating that it was not successful.

## 8.1 Error Code Display

The following table is only valid if the FAULT indicator is **ON** and the STATUS indicator is **FLASHING GREEN**.

If the fault indicator is **FLASHING** the Zone Expander requires a firmware update or is currently in firmware update mode.

The status indicator will **FLASH GREEN** with the error code number. The error code number is shown with a 250ms **ON** and **OFF** period (duty cycle) with a delay of 1.5 seconds between each display cycle.

Flash	Error Description
1	Unknown Error Code The error code returned by the system controller could not be understood by the Zone Expander. Contact Integrated Control Technology.
2	Firmware Version The firmware version on the Zone Expander is not compatible with the system controller. To clear this error, update the module using the module update application.
3	Address Too High The Zone Expander address is above the maximum number of Zone Expanders available on the system controller. To clear this error change the address to one within the range set on the system controller, restart the Zone Expander by disconnecting the power.
4	Address In Use The Address is already in use by another Zone Expander. To clear this error set the address to one that is currently not occupied by a Zone Expander. Use the view network status command to list the attached devices, or the network update command to refresh the registered device list.
5	Controller Secured Registration Not Allowed Controller is not accepting any module registrations. To allow module registrations use the network secure command to change the secure setting to not secured.
6	Serial Number Fault The serial number in the device is not valid. Return the unit to the distributor for replacement.
7	Locked Device The Zone Expander or system controller is a locked device and cannot communicate on the network. Return the unit to the distributor for replacement.

## 9 Technical Specifications

The following specifications are important and vital to the correct operation of the PRT-ZX16-PCB Protege Zone Expander. Failure to adhere to the specifications will result in any warranty or guarantee that was provided becoming null and void.

Integrated Control Technology continually strives to increase the performance of its products. As a result these specifications may change without notice. We recommend consulting the ICT website (<http://www.ict.co>) for the latest documentation and product information.

Operating Voltage	16 to 16.5VAC secondary (via transformer)
Operating AC Input Current	3.3A @ 16VAC when Total Combined Current = 2.5A 2.2A @ 16.5VAC when Total Combined Current = 1.7A
Operating Current	120mA (Maximum)
Total Combined Current	1.7A (Max) using a 37/40VA transformer 2.5A (Max) using a 60VA or greater transformer Electronically limited at 2.5A
AUX DC Outputs	11.0V-12.3V, 700mA (Typical) Electronic Shutdown at 1.1A
B1/B2 DC Outputs (Continuous)	11.0V-12.3V, 8 Ohm 30W Siren or 1.1A (Maximum)
B1/B2 DC Outputs (Inrush)	1500mA (1.5A)
Battery Charging	350mA/700mA
Battery Low	11.2VDC
Battery Restore	12.5VDC
Electronic Disconnection	9.4VDC
Communication (Serial)	1 Isolated RS-485 Communication Interface Port 12VDC @ 28mA. (Input)
Zone Inputs (System Zones)	16 High Security Monitored Zone Inputs
Trouble Zones	16
Tamper Input	Dedicated Hardware Tamper Input
PGM Outputs	2 50mA (Max) Open Collector Output general functions
Status Output	1 50mA (Max) Open Collector Output
Operating Temperature	0°-50°C (32° - 122°F)
Storage Temperature	-10°- 85°C (14° - 185°F)
Humidity	0%-93% non-condensing, indoor use only (relative humidity)
Dimensions (L x W x H)	183mm X 162mm (7.2" X 6.4")
Weight	233g (8.21oz)



**Warning:** The total combined current must not exceed a maximum of 1.7A if a 37/40VA transformer is used, or a maximum of 2.5A if a 60VA or greater transformer is used. The transformer can be damaged if the total combined current exceeds its capability. The total combined current is the sum of the operating current, charging current, DC Output (AUX) and Bell/Siren (B1 and B2) Outputs. Please refer to the following Current and Validations Examples for more details.



It is important that the unit is installed in a dry cool location that is not affected by humidity. Do not locate the unit in air conditioning or a boiler room that can exceed the temperature or humidity specifications.





The isolated communications interface on the Protege Zone Expander uses full galvanic isolation to prevent ground loop noise and cross phase ground differential. This is a very important feature of the product family and the correct connection of power to this isolated section will ensure the correct operation of the communications network. Failure to apply power to the communication interface will prevent the operation of the communication interface.

## 9.1 Current and Validation Example

The example shown below refers to the specifications needed to help ensure the correct installation of the Protege Zone Expander. Specifications have to be validated to ensure that individual maximum currents and total combined current are not exceeded

### Using a 40VA Transformer

#### External Devices Connected to Panel

8 x EDGE PIR Motion Detectors (Z1 to Z8) connected on AUX1 Outputs

1 x 30W Siren (1.1A Maximum @ 13.8VDC)

#### Current Consumption

Total Combined Current Available	1.7A (1700mA)
Operating Current	120mA (Maximum)
Battery Charging	350mA (Standard Current Charging)
DC Output (AUX1)	8 x EDGE PIR Motion Detectors @ 15mA each (Total 120mA)
Siren on B1 Output	1.1A (1100mA)
Total Consumption	1.69A (1690mA)

#### Validation

Is the total DC Output (AUX1) current less or equal to 0.7A (700mA)?	Yes, it is 120mA	<input checked="" type="checkbox"/>
Is B1 current output less or equal to 1.1A (1100mA)?	Yes, it is 1.1A (1100mA)	<input checked="" type="checkbox"/>
Is the total combined current less or equal to 1.7A (1700mA)?	Yes, it is 1.69A (1690mA)	<input checked="" type="checkbox"/>

## 9.2 Maximum Total Output Current : UL and ULC Installations

The following table describes the maximum total output current available for standby operation using an external VRLA battery in order to comply with UL and ULC standby requirements.

Application	Maximum Total Output Current Available	Charging Jumper Setting	Transformer	Battery Rating
CAN/ULC-S304 24hr backup	100mA	700mA	40VA/100VA	1 x 12VDC, 7Ah
	400mA	700mA	40VA/100VA	2 x 12VDC, 7Ah = 14Ah
CAN/ULC-S559 24hr backup	100mA	700mA	100VA	1 x 12VDC, 7Ah
	400mA	700mA	100VA	2 x 12VDC, 7Ah = 14Ah
UL 1610, UL 1635 24hr backup	100mA	700mA	40VA/100VA	1 x 12VDC, 7Ah
	400mA	700mA	40VA/100VA	2 x 12VDC, 7Ah = 14Ah
UL 1610, UL 1635 72hr backup	60mA	350mA or 700mA	40VA/100VA	2 x 12VDC, 7Ah = 14Ah



The Maximum Total Output Current Available is the **maximum** current that can be supplied to the AUX1/AUX2 DC Outputs and B1/B2 DC Outputs. These are the maximum current values to ensure compliancy with the standby requirements.

## 9.3 Current and Validation (UL Installation) Example 1

Using a 40VA Transformer and 7Ah Battery

UL1610, UL1635, and CAN/ULC-S304 (24 hr standby capacity)

### External Devices Connected to Panel

6 x PIR Motion Detectors @ 15mA each (Total 90mA)

### Standby Current Consumption

Total Output Current Available	100mA
DC Output (AUX)	6 x PIR Motion Detectors @ 15mA each (Total 90mA)
Total Output Current Consumption	90mA

### Current Consumption

Total Combined Current Available	1.7A (1700mA)
Operating Current	120mA (Maximum)
Battery Charging	700mA (High Current Charging)
DC Output (AUX)	6 x PIR Motion Detectors @ 15mA each (Total 90mA)
Total Consumption	0.9A (900mA)

Validation		
In order to comply with UL1610 , UL1635 and ULC-S304 24h standby requirements, is the Total Output Current less or equal to 100mA?	Yes, it is 90mA	<input checked="" type="checkbox"/>
Is the DC Output (AUX) current less or equal to 1.0A (1000mA)?	Yes, it is 90mA	<input checked="" type="checkbox"/>
Is the total combined current less or equal to 1.7A (1700mA)?	Yes, it is 0.91A (910mA)	<input checked="" type="checkbox"/>

## 9.4 Current and Validation (UL Installation) Example 2

### Using a 100VA Transformer and 14Ah Battery

#### UL1610, UL1635 and CAN/ULC-S304 (24hr standby capacity)

External Devices Connected to Panel
16 x PIR Motion Detectors @ 15mA each (Total 240mA)
1 x 30W Siren (1.1A (1100mA) @ 13.8VDC)

Standby Current Consumption	
Total Output Current Available	2A (2000mA)
DC Output (AUX)	16 x PIR Motion Detectors @ 15mA each (Total 240mA)
Total Output Current Consumption	0.24A (240mA)

Current Consumption	
Total Combined Current Available	2.5A (2500mA)
Operating Current	120mA (Maximum)
Battery Charging	700mA (High Current Charging)
DC Output (AUX)	16 x PIR Motion Detectors @ 15mA each (Total 240mA)
B1 Output	1 x 30W Siren (1.1A (1100mA) @ 13.8VDC)
Total Consumption	2.16A (2160mA)

Validation		
In order to comply with UL1610 , UL1635 and ULC-S304 24h standby requirements, is the Total Output Current less or equal to 400mA?	Yes, it is 240mA	<input checked="" type="checkbox"/>
Is the DC Output current (AUX) less or equal to 0.7A (700mA)?	Yes, it is 240mA	<input checked="" type="checkbox"/>
Is B1 current output less or equal to 1.1A (1100mA)?	Yes, it is 1.1A (1100mA)	<input checked="" type="checkbox"/>
Is the total combined current less or equal to 2.5A (2500mA)?	Yes, it is 2.16A (2160mA)	<input checked="" type="checkbox"/>

# 10 New Zealand and Australia

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## General Product Statement

The RCM compliance label indicates that the supplier of the device asserts that it complies with all applicable standards.



# 11 European Standards

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## CE Statement

Conforms to European Union (EU) Low Voltage Directive (LVD) 2014/35/EC, Electro-Magnetic Compatibility (EMC) Directive 2014/30/EU and RoHS Recast (RoHS2) Directive: 2011/65/EU.

The CE mark indicates that this product complies with the European requirements for safety, health, environmental and customer protection.



### Information on Disposal for Users of Waste Electrical & Electronic Equipment

This symbol on the product(s) and / or accompanying documents means that used electrical and electronic products should not be mixed with general household waste. For proper treatment, recovery and recycling, please take this product(s) to designated collection points where it will be accepted free of charge.

Alternatively, in some countries you may be able to return your products to your local retailer upon purchase of an equivalent new product.

Disposing of this product correctly will help save valuable resources and prevent any potential negative effects on human health and the environment, which could otherwise arise from inappropriate waste handling.

Please contact your local authority for further details of your nearest designated collection point.

Penalties may be applicable for incorrect disposal of this waste, in accordance with your national legislation.

### For business users in the European Union

If you wish to discard electrical and electronic equipment, please contact your dealer or supplier for further information.

### Information on Disposal in other Countries outside the European Union

This symbol is only valid in the European Union. If you wish to discard this product please contact your local authorities or dealer and ask for the correct method of disposal.

## EN50131 Standards

This component was tested by the accredited testing laboratory No. 1172 of the company TESTALARM Praha s.r.o. and met the requirements and conditions for full compliance with EN50131 series of standards for equipment classification;

### Security Grade 3

### Environmental Class II

Equipment Class: Fixed

EN 50131-1:2006, EN 50131-3:2009, EN 50131-6:2008

**Recognition class 2** (for readers without a keypad)

**Recognition class 3** (for readers with a keypad)

### Access class B

EN 50133-1:1998

ICT enclosure all products, CAB-JMB-NOT, has been tested and certified to EN50131. By design, the ICT enclosure for all products, CAB-FBY-NOT, complies with the EN50131 standards. Tamper protection against removal of the cover as well as removal from mounting is provided by tamper switch.

### Warning:

Enclosures supplied by 3rd parties may not be EN50131-compliant, and should not be claimed as such.

## EN 50131

In order to comply with EN 50131-1 the following points should be noted:

Ensure for Grade 3 compliant systems, the minimum PIN length is set for 6 digits.

To comply with EN 50131-1 Engineer access must first be authorized by a user, therefore Installer codes will only be accepted when the system is unset. If additional restriction is required then Engineer access may be time limited to the first 30 seconds after the system is unset.

Reporting delay –Violation off the entry path during the entry delay countdown will trigger a warning alarm. The warning alarm should not cause a main alarm signal and is not reported at this time. It can be signaled locally, visually and or by internal siren type. If the zone is not disarmed within 30 seconds, the entry delay has expired or another instant is violated, the main alarm will be triggered and reported.

To comply with EN 50131-1 neither Internals Only on Part Set Zone Alarm nor Internals Only on Part Set Tamper Alarm should be selected.

To comply with EN 50131-1 Single Button Setting should not be selected.

To comply with EN 50131-1 only one battery can be connected and monitored per system. If more capacity is required a single larger battery **must** be used.

### Anti Masking

To comply with EN 50131-1 Grade 3 for Anti Masking, detectors with a separate or independent mask signal should be used and the mask output should be connected to another input zone.

I.e. Use 2 input zones per detector. One zone input for alarm/tamper and one zone input for masking.

To comply with EN 50131-1:

- do not fit more than 10 unpowered detectors per zone,
- do not fit more than one non-latching powered detector per zone,
- do not mix unpowered detectors and non-latching powered detectors on a zone.

To comply with EN 50131-1 the Entry Timer should not be programmed to more than 45 seconds.

To comply with EN 50131-1 the Bell Cut-Off Time should be programmed between 02 and 15 minutes.

EN 50131-1 requires that detector activation LEDs shall only be enabled during Walk Test. This is most conveniently achieved by using detectors with a Remote LED Disable input.

To comply with EN 50131: Only one battery can be connected and monitored per system. If more capacity is required, a single, larger battery must be used.

# 12 UL and ULC Installation Requirements



Only UL / ULC listed compatible products are intended to be connected to a UL / ULC listed control system.

## 12.1 Central Station Signal Receiver Compatibility List

- IP Receiver via Ethernet Port : Integrated Control Technology ArmorIP Internet Monitoring Receiver. Serial interface to be used with SIMS II version 1.3x central station automation system software and compatible receiving equipment as indicted in the SIMS II Appendix E UL Supplement.
- CID Receiver via Onboard Modem: Any UL and ULC listed receiver that uses the Contact ID protocol.

## 12.2 ULC Compliance Requirements

### CAN/ULC-S304-06

- **Auto Arming**

Control units that support auto arming shall provide an audible signal throughout the protected area not less than 10 min prior to the auto arming taking place. The control unit shall allow authorized users to cancel the auto arming sequence and transmit such cancelation to the signal receiving center with the identification of the authorized user that canceled the action.

The following options must be enabled in the Protege System when using the Auto Arming feature. When the defer warning time is programmed to 10 minutes, the PGM group will be activated 10 minutes before the system performs the Auto Arming in the associated Area.

- The **Defer PGM or PGM Group** must be programmed. Please refer to the section Defer PGM or PGM Group in the Protege System Controller Reference Manual (227-4045-500) for programming instructions. For details on modifying the Defer PGM or PGM Group, refer to the section PGM and PGM Group Entry in the Protege System Controller Reference Manual (227-4045-500).
- The **Defer Warning Time** must be programmed to not less than 10 minutes. Please refer to the section Defer Arming Warning Time in the Protege System Controller Reference Manual (227-4045-500).
- The **Defer Automatic Arming** arming option must be enabled. Please refer to the section Area Special Options in the Protege System Controller Reference Manual (227-4045-500)

- **Double EOL Zone Configuration**

Only double EOL Zone Configuration shall be used. Please refer to the section Inputs of this manual and the section Zone Special Options in the Protege System Controller Reference Manual (227-4045-500).

- **Multiplex System and Poll Time**

The PRT-CTRL-SE is compatible with the Integrated Control Technology ArmorIP Internet Monitoring Receiver. Poll Time must be set to 40 seconds and the Grace Time must be set to 20 seconds.

In the Protege System, the reporting service must be configured to 40 seconds. The following options are required for the service selected as Report IP type:

- The **Enable Poll Events** option must be enabled. Please refer to option 5 in the section Reporting Options in the Protege System Controller Reference Manual (227-4045-500)
- The **Poll Time** must be programmed to 40 seconds. Please refer to the Poll Time section in the Protege System Controller Reference Manual (227-4045-500)

- **Central Station Signal Receiver**

The common equipment of each signal receiving center control unit shall be limited to 1000 alarm systems.

- **Number of attempts**

In the event of unsuccessful communication, a digital alarm communicator transmitter shall make a minimum of 5 and a maximum of 10 attempts. Where the maximum number of attempts to complete the sequence is reached, an indication of the failure shall be made at the premises.

In the Protege System, the reporting service selected as Contact ID must have the number of attempts programmed to 5 attempts. The following options are required:

- The **Dialing Attempts** option must be programmed. Please refer to the section Dialing Attempts in the Protege System Controller Reference Manual (227-4045-500)

- **Check-In Time**

DACT communication channel check-in time is not to exceed 24 hrs.

Trouble Zone Service Test Report

- Test report time must be programmed. Please refer to the section Miscellaneous Options in the Protege System Controller Reference Manual (227-4045-500)
- The Panel Option 5 (Option 5 - Generate Trouble Zone Test Report Restore) must be enabled. Please refer to the section Panel Options Generate Trouble Zone Test Report Restore in the Protege System Controller Reference Manual (227-4045-500)
- The Panel Option 2 (Option 2 - Generate Test Report by Time of Day) must be enable. Please refer to the section Panel Options in the Protege System Controller Reference Manual (227-4045-500)

- **Primary Communication Channel**

The first attempt to send a status change signal shall utilize the primary communication channel.

The Report IP and Contact ID services must be programmed and enabled within the Protege System, and the CID service must be set as the backup service. The following options are required:

- The **Contact ID Reporting Service** must be enabled and the **Service Mode** must be configured to start with the operating system.

Refer to the section Contact ID Reporting Service in the Protege System Controller Reference Manual (227-4045-500)

- The **Report IP Service** must be enabled as the primary communication channel and the **Service Mode** must be configured to start with the operating system. The **Reporting Protocol** must be set to ArmorIP, and the **Backup Service** must be configured to use the Contact ID Service.

Refer to the section Report IP Service in the Protege System Controller Reference Manual (227-4045-500).

- All ULC S304 P3 applications must transmit signals simultaneously over both the Contact ID Reporting Service and the Report IP Service. This will occur automatically with the above programming.

- **Status Change Signal**

An attempt to send a status change signal shall utilize both primary and secondary communication channels.

- **Local Annunciation if Signal Reporting Failure**

Failure of the primary communication channel or secondary communication channel shall result in a trouble signal being transmitted to the signal receiving center within 240 seconds of the detection of the fault.

Failure of either communication channel shall be annunciated locally within 180 seconds of the fault.

The following options must be enabled in the Protege System:

- The **Monitor Phone Service** must be enabled, and the **Telephone Line Monitoring** option (Miscellaneous option 1) must be selected. Refer to the section Monitor Phone Service in the Protege System Controller Reference Manual (227-4045-500)
- The area **Trouble Area** must be armed. Refer to the section Regular Arming in the Protege System Controller Reference Manual (227-4045-500)

- **Network and Domain Access**

Neither the subscriber control unit nor the signal receiving center receiver shall be susceptible to security breaches in general-purpose operating systems.

Network access policies should be set to restrict unauthorized network access and "spoofing" or "denial of service" attacks.

- **Ethernet Connections**

All Ethernet network connections shall be installed within the same room as the equipment.

- **Encryption**



For active communications channel security, encryption shall be enabled at all times.

The ArmorIP-E (UDP) protocol must be used and the Encryption Type must be set to AES-256.

The following options must be enabled for the the Report IP service in the Protege System.

- The **Reporting Protocol** must be set to ArmorIP (UDP) Encrypted. The AES key must be set as specified by monitoring station.

Refer to the section Report IP Service in the Protege System Controller Reference Manual (227-4045-500).

- **Server Configuration**

Where a server is employed for control over network addressing, encryption or re-transmission, such shall be designed to remain in the "on state" at all times.

Communicators are not suitable for active communication channel security and medium or high risk applications unless such can be "on line" at all times, have a minimum 128 bit encryption scheme, have encryption enabled, network and domain security implemented.

Network access policies shall be set to restrict unauthorized network access and "spoofing" or "denial of service" attacks.

- **Internet Service Provider (ISP)**

The Internet Service Provider (ISP) providing service shall meet the following requirements:

- redundant servers/systems
- back-up power
- routers with firewalls enabled and
- methods to identify and protect against "Denial of Service" attacks (i.e. via "spoofing")

- **Information Technology Equipment, Products or Components of Products**

Products or components of products, which perform communications functions only, shall comply with the requirements applicable to communications equipment as specified in CAN/CSA-C22.2 No. 60950-1, Information Technology Equipment Safety - Part 1: General Requirements. Where network interfaces, such as the following, are internal to the subscriber control unit or receiver, compliance to CAN/CSA-C22.2 No. 60950-1 is adequate. Such components include, but are not limited to:

- A) Hubs;
- B) Routers;
- C) Network interface devices;
- D) Third party communications service providers;
- E) Digital subscriber line (DSL) modems; and
- F) Cable modems.

- **BELL / SIREN**

Bell / Siren for 30 min standby requirements shall comply with CAN/ULC-S303.

- **Backup Power Requirements**

Power for network equipment such as hubs, switchers, routers, servers, modems, etc., shall be backed up or powered by an un-interruptable power supply (UPS), stand-by battery or the control unit, capable of facilitating 24 h standby, compliant with Clauses 16.1.2 and 16.4.1 of CAN/ULC-S304-06.

For communications equipment employed at the protected premises or signal receiving centre and intended to facilitate packet switched communications, as defined in CAN/ULC-S304, 24 h back-up power is required.

- **Compromise Attempt Events**

ArmorIP automatically detects the reception of any invalid packet on the programmed port as a potential system **compromise attempt**. Each compromise attempt sends a notification to the receiver, and logs a Compromise Attempt event in the Events Tab.

The event is sent with the following details:

- **Account Code** as defined in the Account settings on the Ademco 685 tab of the Preferences Menu
- **Event Code** 0x163
- **Group Code** as defined in the Details settings on the Ademco 685 tab of the Preferences Menu
- **Point Code** as defined in the Details settings on the Ademco 685 tab of the Preferences Menu

Refer to the section Ademco 685 in the ArmorIP Internet Monitoring Application User's Manual (227-5500-000).

For UL and ULC installations the Central Station Receiving software must have the Contact ID details as specified, programmed for the **Compromise Attempt** event.

- **Telephone Lightning Surge Protector**

Telephone lightning surge protector manufactured by L-com Inc (Model HGLN-D1-DT) shall be connected inline to the telephone dialer T1i and R1i. Refer to the PRT-CTRL-SE wiring diagram of this manual.

- **Hardwire Transformer Marcus M4758CT**

When installed with the power supply manufactured by Marcus, Model M4758CT:

- The Digital Security Controls (DSC) Model ULC-LA power indicator light assembly (Installation Instruction No. 29001877 R0) must be installed within a conduit knockout of either the ICT Model CAB-LARGE-UL or Bosch Model D8108A enclosure in order to provide green AC power on indication.
- The Littelfuse Part No. 150322 fuseholder and Littelfuse Part No. 0312005 5A, 3AG fast-acting fuse must be installed in-line to the Models PRT-CTRL-SE, PRT-ZX16-PCB, and PRT-RDI2-PCB.

## CAN/ULC-S559-04

- **Signal Reporting**

Any fault of an active communication system shall be annunciated and recorded at the signal receiving center within 180 s of the occurrence of the fault.

The Report IP and Contact ID services must be programmed and enabled within the Protege System. The following options are required:

- The **Contact ID Reporting Service** must be enabled and the **Service Mode** must be configured to start with the operating system.

Refer to the section Contact ID Reporting Service in the Protege System Controller Reference Manual (227-4045-500)

- The **Report IP Service** must be enabled as the primary communication channel, the **Service Mode** must be configured to start with the operating system, and the **Reporting Protocol** must be set to ArmorIP.

Refer to the section Report IP Service in the Protege System Controller Reference Manual (227-4045-500).

- All ULC S559 applications must transmit signals simultaneously over both the Contact ID Reporting Service and the Report IP Service. This will occur automatically with the above programming.
- The area **Trouble Area** must be armed. Refer to the section Regular Arming in the Protege System Controller Reference Manual (227-4045-500)

In the ArmorIP Internet Monitoring Software the **Poll Time** must be set to 40 seconds and the **Grace Time** must be set to 20 seconds. Please refer to the section Poll/Grace Time in the ArmorIP Internet Monitoring Application User Manual (227-5500-000).

- **Central Station Signal Receiver**

The maximum number of signal transmitting units connected to any transmission channel shall conform to the manufacturer's recommendations. The ArmorIP Receiver supports up to 10000 simultaneous connections.

Please refer to the section Internet Connections Requirements in the ArmorIP Receiver Installation Manual (227-5510-000) for further details.

- **Number of attempts**

In the event of unsuccessful communication, a digital alarm communicator transmitter shall make a minimum of 5 and a maximum of 10 attempts. Where the maximum number of attempts to complete the sequence is reached, an indication of the failure shall be made at the premises.

In the Protege System, the reporting service selected as Contact ID must have the number of attempts programmed to 5 attempts. The following options are required:

- The **Dialing Attempts** option must be programmed. Please refer to the section Dialing Attempts in the Protege System Controller Reference Manual (227-4045-500)

- **Check-In Time**

DACT communication channel check-in time is not to exceed 24 hrs.

#### Trouble Zone Service Test Report

- Test report time must be programmed. Please refer to the section Miscellaneous Options in the Protege System Controller Reference Manual (227-4045-500)
- The Panel Option 5 (Option 5 - Generate Trouble Zone Test Report Restore) must be enabled. Please refer to the section Panel Options Generate Trouble Zone Test Report Restore in the Protege System Controller Reference Manual (227-4045-500)
- The Panel Option 2 (Option 2 - Generate Test Report by Time of Day) must be enable. Please refer to the section Panel Options in the Protege System Controller Reference Manual (227-4045-500)

- **Ethernet Connections**

All Ethernet network connections shall be installed within the same room as the equipment.

- **Telephone Lightning Surge Protector**

Telephone lightning surge protector manufactured by L-com Inc (Model HGLN-D1-DT) shall be connected inline to the telephone dialer T1i and R1i. Refer to the PRT-CTRL-SE wiring diagram of this manual.

- **Hardwire Transformer Marcus M4758CT**

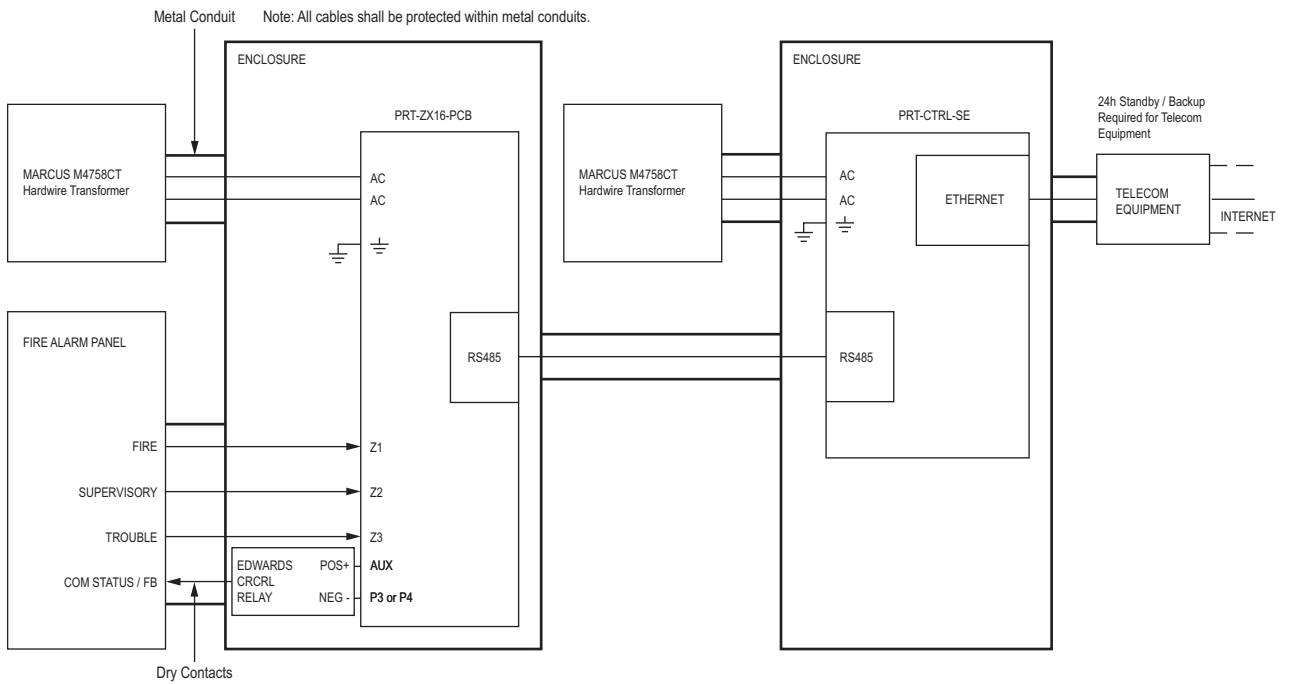
When installed with the power supply manufactured by Marcus, Model M4758CT:

- The Digital Security Controls (DSC) Model ULC-LA power indicator light assembly (Installation Instruction No. 29001877 R0) must be installed within a conduit knockout of either the ICT Model CAB-LARGE-UL or Bosch Model D8108A enclosure in order to provide green AC power on indication.
- The Littelfuse Part No. 150322 fuseholder and Littelfuse Part No. 0312005 5A, 3AG fast-acting fuse must be installed in-line to the Models PRT-CTRL-SE, PRT-ZX16-PCB, and PRT-RDI2-PCB.

- **Fire Zones**

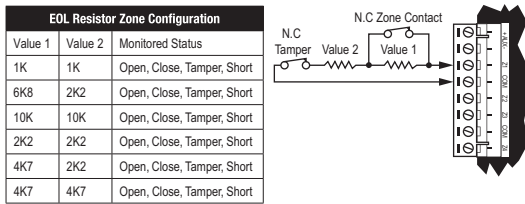
Fires zones shall be separated from burglar zones through area partitioning.

CAN/ULC-S559  
PRT-ZX16-PCB  
ACTIVE COMMUNICATION



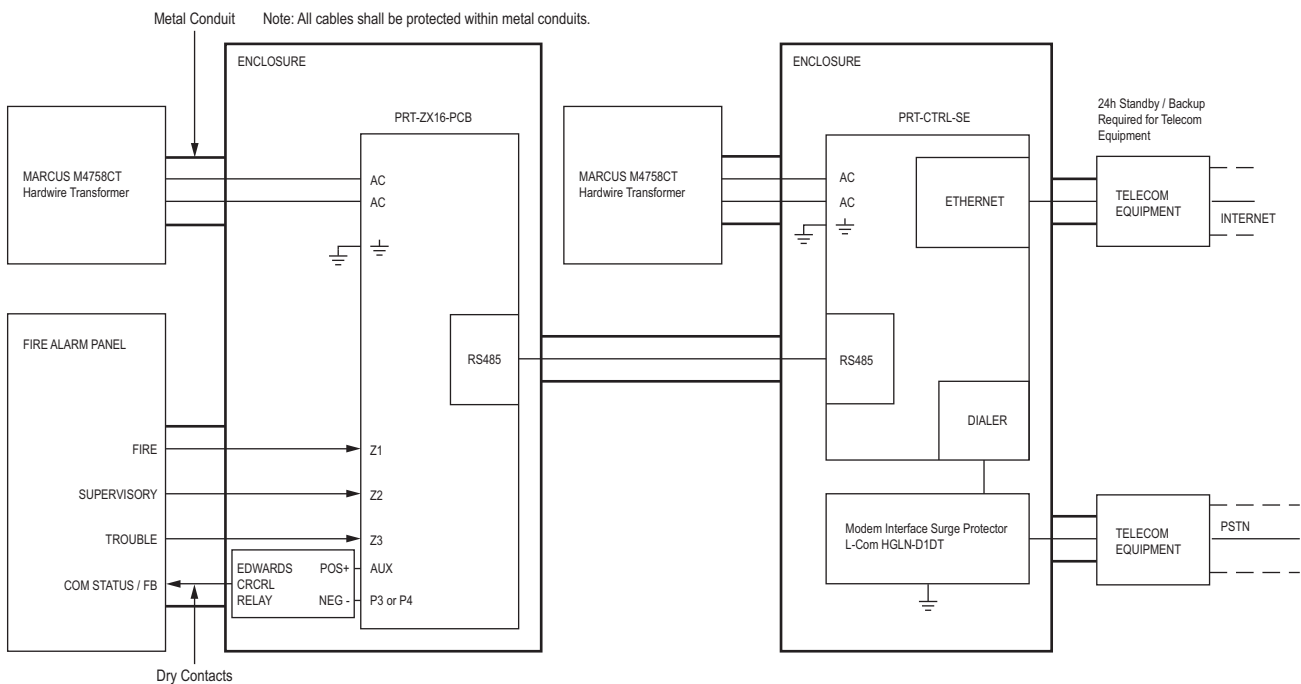
- \* If installation requires Fire Alarm Panel local supervision, a ULC S527 listed relay module (such as the EDWARDS CRCRL RELAY) must be used to trigger input zone on fire alarm control panel. The relay module must be able to meet supervision requirements of the input zone or be mounted within 18m of the fire alarm control unit in conduit.
- \* Fire zones shall be separated from burglar zones through area partitioning.
- \* Fire zones Z1-Z3 shall be used exclusively for fire monitoring and cannot be programmed to activate bell outputs (B1/B2)

Typical Zone Circuits



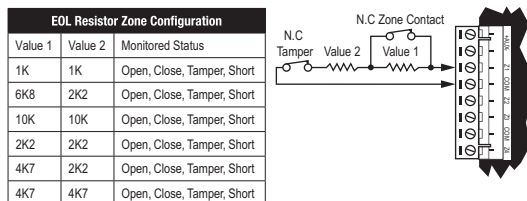
\* EOL resistor must be installed at the Fire Alarm Control Panel Output.

CAN/ULC-S559  
PRT-ZX16-PCB  
PASSIVE COMMUNICATION



- \* If installation requires Fire Alarm Panel local supervision, a ULC S527 listed relay module (such as the EDWARDS CRCRL RELAY) must be used to trigger input zone on fire alarm control panel. The relay module must be able to meet supervision requirements of the input zone or be mounted within 18m of the fire alarm control unit in conduit.
- \* Fire zones shall be separated from burglar zones through area partitioning.
- \* Fire zones Z1-Z3 shall be used exclusively for fire monitoring and cannot be programmed to activate bell outputs (B1/B2)

Typical Zone Circuits



\* EOL resistor must be installed at the Fire Alarm Control Panel Output.

• **Fire Zone Inputs and Outputs**

Fire Zone inputs must be programmed as follow:

- FACP Fire Alarm Signal zone type must be programmed as Fire
- Supervisory Trouble Signal zone type must be programmed as 24 Hr Silent
- Trouble Signal zone type must be programmed as 24 Hr Silent

Please refer to the section **Zone Type Alarm Options** in the Protege System Controller Reference Manual (227-4045-500)

- All fire zone inputs must be placed into an area and this area must be armed. Please refer to the section **Area** in the Protege System Controller Reference Manual (227-4045-500)
- **COM Status**  
FACP system with a COM STATUS input must have this input connected to the P3 or P4 output of the panel and the selected output must be programmed as the Report OK PGM in the Contact ID Service. Please refer to section **Report OK PGM Option** in the Protege System Controller Reference Manual (227-4045-500).
- Fire zones Z1-Z3 shall be used exclusively for fire monitoring and cannot be programmed to activate bell outputs (B1/B2).

## 12.3 UL Compliance Requirements

### UL1610

- A local alarm sounding device, alarm housing, and control unit shall comply with the mercantile requirements in the Standard for Police Station Connected Burglar Alarm Units and Systems, UL365.
- Exit and entry delay must not exceed 60 seconds. To program the entry and exit delay time, please refer to the section *Area* in the Protege System Controller Reference Manual (227-4045-500).
- All Ethernet network connections shall be installed within the same room as the equipment.
- Signals between the premises control unit and the receiving equipment, when not carried by wireless means, shall be protected by the following method:
  - Onboard modem telco connection must be dedicated to the PRT-CTRL-SE.
  - Ethernet connection to the Internet Service Provider (ISP) with a fixed IP Address must be dedicated to the PRT-CTRL-SE.
- To comply with the dual signal line transmission system requirement, both transmission lines (onboard modem and IP reporting) must be enabled. Signals shall be sent simultaneously to both, Report IP Service and Contact ID Reporting Service.

The Report IP and Contact ID services must be programmed and enabled within the Protege System. The following options are required:

- The **Contact ID Reporting Service** must be enabled and the **Service Mode** must be configured to start with the operating system.  
Refer to the section *Contact ID Reporting Service* in the Protege System Controller Reference Manual (227-4045-500)
- The **Report IP Service** must be enabled as the primary communication channel, the **Service Mode** must be configured to start with the operating system, and the **Reporting Protocol** must be set to ArmorIP.  
Refer to the section *Report IP Service* in the Protege System Controller Reference Manual (227-4045-500).
- When more than one means of signal transmission is used, loss of communication with the receiving system shall be annunciated at the receiver within 200 seconds. If a fault is detected on any of the signal transmission means, at least one of the signal transmission channels shall send a signal to the central-station to report the fault within 200 seconds.

The Report IP and Contact ID services must be programmed and enabled within the Protege System.

The PRT-CTRL-SE is compatible with the Integrated Control Technology ArmorIP Internet Monitoring Receiver. Poll Time must be set to 40 seconds and the Grace Time must be set to 20 seconds.

In the Protege System, the reporting service must be configured to 40 seconds. The following options are required for the service selected as Report IP type:

- The **Enable Poll Events** option must be enabled. Please refer to option 5 in the section *Reporting Options* in the Protege System Controller Reference Manual (227-4045-500)
- The **Poll Time** must be programmed to 40 seconds. Please refer to the *Poll Time* section in the Protege System Controller Reference Manual (227-4045-500)
- The **Contact ID Reporting Service** must be enabled and the **Service Mode** must be configured to start with the operating system.  
Refer to the section *Contact ID Reporting Service* in the Protege System Controller Reference Manual (227-4045-500)
- The **Report IP Service** must be enabled as the primary communication channel, the **Service Mode** must be configured to start with the operating system, and the **Reporting Protocol** must be set to ArmorIP.  
Refer to the section *Report IP Service* in the Protege System Controller Reference Manual (227-4045-500).
- The **Trouble Zone Area** must be armed in 24h mode. Refer to the section *24HR Enabling* in the Protege System Controller Reference Manual (227-4045-500).

In the event of unsuccessful communication, a digital alarm communicator transmitter shall make a minimum of 5 and a maximum of 10 attempts. Where the maximum number of attempts to complete the sequence is reached, an indication of the failure shall be made at the premises.

In the Protege System, the reporting service selected as Contact ID must have the number of attempts programmed to 5 attempts. The following options are required:

- The **Dialing Attempts** option must be programmed. Please refer to the section Dialing Attempts in the Protege System Controller Reference Manual (227-4045-500)
- DACT communication channel check-in time is not to exceed 24 hrs.

Trouble Zone Service Test Report

- Test report time must be programmed. Please refer to the section Miscellaneous Options in the Protege System Controller Reference Manual (227-4045-500)
- The Panel Option 5 (Option 5 - Generate Trouble Zone Test Report Restore) must be enabled. Please refer to the section Panel Options Generate Trouble Zone Test Report Restore in the Protege System Controller Reference Manual (227-4045-500)
- The Panel Option 2 (Option 2 - Generate Test Report by Time of Day) must be enable. Please refer to the section Panel Options in the Protege System Controller Reference Manual (227-4045-500)
- ArmorIP automatically detects the reception of any invalid packet on the programmed port as a potential system **compromise attempt**. Each compromise attempt sends a notification to the receiver, and logs a Compromise Attempt event in the Events Tab.

The event is sent with the following details:

- **Account Code** as defined in the Account settings on the Ademco 685 tab of the Preferences Menu
- **Event Code** 0x163
- **Group Code** as defined in the Details settings on the Ademco 685 tab of the Preferences Menu
- **Point Code** as defined in the Details settings on the Ademco 685 tab of the Preferences Menu

Refer to the section Ademco 685 in the ArmorIP Internet Monitoring Application User's Manual (227-5500-000).

For UL and ULC installations the Central Station Receiving software must have the Contact ID details as specified, programmed for the **Compromise Attempt** event.

- The telephone lightning surge protector manufactured by L-com Inc (Model HGLN-D1-DT) shall be connected inline to the telephone dialer T1i and R1i of the PRT-CTRL-SE. Refer to the wiring diagram of the PRT-CTRL-SE Installation Manual (227-4045-001).
- When installed with the power supply manufactured by Marcus, Model M4758CT:
  - The Digital Security Controls (DSC) Model ULC-LA power indicator light assembly (Installation Instruction No. 29001877 R0) must be installed within a conduit knockout of either the ICT Model CAB-LARGE-UL or Bosch Model D8108A enclosure in order to provide green AC power on indication.
  - The Littelfuse Part No. 150322 fuseholder and Littelfuse Part No. 0312005 5A, 3AG fast-acting fuse must be installed in-line to the Models PRT-CTRL-SE, PRT-ZX16-PCB, and PRT-RDI2-PCB.

# 13 FCC Compliance Statements

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## FCC PART 15, WARNINGS: INFORMATION TO USER

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 in a residential installation. This equipment generates, uses and can radiate radio frequency energy and, if not installed and used in accordance with the instructions, 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:

- Re-orient 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.
- Changes or modifications not authorized by the party responsible for compliance could void the user's authority to operate this product.

This device complies with Part 15 of the FCC rules.

Operation is subject to the following two conditions:

- This device may not cause harmful interference.
- This device must accept any interference received, including interference that may cause undesired operation.

NOTE: THE GRANTEE IS NOT RESPONSIBLE FOR ANY CHANGES OR MODIFICATIONS NOT EXPRESSLY APPROVED BY THE PARTY RESPONSIBLE FOR COMPLIANCE. SUCH MODIFICATIONS COULD VOID THE USER'S AUTHORITY TO OPERATE THE EQUIPMENT.



# 14 Industry Canada Statement

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This class B digital apparatus complies with Canadian ICES-003.

Cet appareil numérique de la classe B est conforme à la norme NMB-003 du Canada.

# 15 Ordering Information

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Please use the following product codes when placing an order for the Protege 16 Zone Input Expander.

- PRT-ZX16-PCB - Protege 16 Zone Input Expander (PCB Only)

Includes Accessory Bag

Manuals and additional literature are available on the ICT Website (<http://www.ict.co>).

## 16 Warranty

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Integrated Control Technology (ICT) warrants its products to be free from defects in materials and workmanship under normal use for a period of two years. Except as specifically stated herein, all express or implied warranties whatsoever, statutory or otherwise, including without limitation, any implied warranty of merchantability and fitness for a particular purpose, are expressly excluded. ICT does not install or connect the products and because the products may be used in conjunction with products not manufactured by ICT, ICT cannot guarantee the performance of the security system. ICT's obligation and liability under this warranty is expressly limited to repairing or replacing, at ICT's option, any product not meeting the specifications. In no event shall ICT be liable to the buyer or any other person for any loss or damages whether direct or indirect or consequential or incidental, including without limitation, any damages for lost profits, stolen goods, or claims by any other party caused by defective goods or otherwise arising from the improper, incorrect or otherwise faulty installation or use of the merchandise sold.

# 17 Contact

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Integrated Control Technology welcomes all feedback.

Please visit our website (<http://www.ict.co>) or use the contact information below.

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Designers & manufacturers of integrated electronic access control, security and automation products.

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227-4050-001 : UL 06 March 2013

[www.ict.co](http://www.ict.co)

