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TOPAZ

ACURT2 and ACURT4

Hardware Installation Guide

REVISION STATUS

DescriptionDate Revised

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IKE Keypad Installation Section Added	
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Update Figures 1-1 and 1-2	
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Added Figure Figure 2-12 Multi-Drop RS485 from panel connected to the LAN/WAN.	
Added Windows XP Professional support.	
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Modified Figures 1-1 and 1-2, RREs no longer supported.	
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Additional technical information add to "Installing Dial-up Modem" on page 5-9
New section on "Installing Server External Modem" on page 5-11

Rev - G.6

March 16, 2004

Correction to Figure 5-3 page 5-11 form 16 panels to 15 maximum panels.

Rev - G.7

June 21, 2004

Replaced Altronix AL300ULM Power Supply/Charger with AL400UL3 page 5-13.

Preface

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Microsoft Windows 2000, XP, and Internet Explorer	Microsoft Corporation
HID	HID Corporation
B&B	B&B Electronics Manufacturing Company
Altronix	Altronix

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and with the equipment sold by GE Security or its predecessors. Permission to relocate the equipment must be obtained by contacting GE Security in Garden Grove, California. However, certain fees may be in effect.

Modems

The Part 68 rules require the following or the equivalent information be provided to the end user of equipment containing a pre-approved modem module.

Type of Service

The TOPAZ System operates on a GE Security ACURT field panels and is designed to use a standard device telephone lines. It connects to the telephone line by means of a standard jack called the USOC RJ-11C (or USOC FJ45S.) Connection to the telephone company provided coin service (central office implemented systems) is prohibited. Connection to party line services is subject to state tariffs.

Telephone Company Procedures

The goal of the telephone company is to provide you with the best service it can. In order to do this, it may occasionally be necessary for them to make changes in their equipment, operations, or procedures. These changes might affect your service or the operation of your equipment, the telephone company will give notice, in writing, to allow you to make any changes necessary to maintain uninterrupted service.

In certain circumstances, it may be necessary for the telephone company to request information from you concerning what equipment you have connected to your telephone line. Upon request from the telephone company, provide the FCC registration number and the ringer equivalence number (REN); both of these items are listed on the equipment label. The sum of all the RENs on your telephone line should be less than five in order to assure proper service from the telephone company. In some cases, five may not be usable on a given line.

Radio Frequency

This equipment generates, uses, and can radiate radio frequency energy and if not installed and used in accordance with the instructions manual, may cause interference to radio communications. It has been tested and found to comply with the limits for a Class-A computing device pursuant to Subpart J of Part 15 of FCC Rules, which are designed to provide reasonable protection against such interference when operated in a commercial environment. Operation of this equipment in a residential area is likely to cause interference; in which case the owners will be required to take whatever measures may be required to correct the interference at their own expense.

NOTE: The use of shielded communication interface cables with this equipment is required.

FCC Registration

This equipment complies with the requirements in Part 15 of the FCC Rules for a Class-A computing device. Operation of this equipment in residential area may cause unacceptable interference to radio and TV reception requiring the operator to take whatever steps are necessary to correct the interference.

UL Standards

The following has been determined by Underwriters Laboratories to be compatible with the ACURT2/ACURT4.

- GE Security Remote Input Modules (RIM)
- GE Security Remote Relay Modules (RRM)
- GE Security Remote Module Enclosure with power supply (REN and REND)
- GE Security Keypads (K-10, K-10L, K-10P, K-10LP, K11)
- HID ProxPro Model 5355 with and without keypad
- HID ProxPoint Model 6005
- HID MiniProx Model 5365
- HID MiniProx Model 5375
- GE Security Magstripe Extender

NOTE: Any reader or keypads other than the ones listed are not to be used on a UL listed system.

UL / CUL Specifications

TOPAZ Software Revision 1.44

In order to comply with UL 1076 and/or UL 294 the following items must be adhered to, if not, the installation site will be in violation of the UL requirements.

The ACU panel must be powered by an Altronix AL400UL3 Power Supply. This must be located in the same room as the panel and no more than 25 feet from the unit. See Figure I-1:.

The DC input rating on the ACURT2/ACURT4 is +24VDC +-4V @ 750ma. max. with all outputs at maximum load.

Combined Auxiliary Power rating for all 4 readers on the ACURT4 must not exceed a maximum of 900Ma.

Only UL listed equipment may be connected to the GE Security system. This includes external power supplies, motion detector, door contacts, enclosures, etc.

All RRM and RIM modules must be installed in the room with panel and no more than 25 feet from the unit.

The End-Of-Line resistor must be located within the alarm zone sensor enclosure.

Shielded cables must be used for all communication and readhead runs.

The use of the dial up modem or any other network connection on the ACURT2/ACURT4 must not be used for UL Certified Installations.

All Receiving equipment must meet the following Conditions:

The Central Supervising Station Equipment shall have the following minimum system configuration: 400 Mhz Pentium II with 512 KB Cache, 128 megabytes of RAM, 6 Gigabytes hard drive and 2 megabytes video memory, Windows 2000 or XP Professional. (This is the minimum system requirements. However, a 1.2 Ghz Pentium IV with 512 megabytes of Ram is recommended.) *Data processing equipment and office appliance and business equipment used as central supervisory station equipment shall comply with;*

The Standard for Office Appliance and Business Equipment, UL 114;

The Standard for Information-Processing and Business Equipment, UL 478; or

The Standard for Information Technology Equipment, UL 1950.

Line transient protection complying with the Standard for Transient Voltage Surge Suppressors, UL 1449, with a maximum marked rating of 330V shall be used.

Signal line transient protection complying with the Standard for Protectors for Data Communications and Fire Alarm Circuits, UL 497B, with a maximum marked rating of 50 V shall be used.

Communication circuits and network components connected to the telecommunications network shall be protected by secondary protectors for communication circuits. These protectors shall comply with the Standard for Secondary Protectors For Communications Circuits, UL 497A. These protectors shall be used only in the protected side of the telecommunications network.

Equipment shall be installed in a temperature controlled environment. A temperature controlled environment is defined as one that can be maintained between 13 – 35 C (55 – 95 F) by the HVAC system. Twenty-four hours of standby power shall be provided for the HVAC system. The standby power system for the HVAC system may be supplied by an engine driven generator alone. A standby battery is not required to be used.

All receiving equipment shall be completely duplicated with provision for switchover to the backup system within 30 seconds. The backup system shall be fully operational within 6 minutes of the loss of the primary system. This allows 30 seconds for the backup system to be fully energized and connected to necessary communication lines and other devices, followed by 5-1/2 minutes for the system to boot up, conduct memory tests, file system check, security verifications and prepare for full system operation. The backup computer shall have the capabilities of the primary, such as memory, speed and the like.

Failure of the main computer system, hard disk, and alarm monitor shall result in switchover to the backup system and shall be indicated by an audible or obvious visual indication.

A fault tolerant system may be used in lieu of complete duplication of the system if every component in the fault tolerant system, including the software and the power supply, is duplicated.

In addition to the main power supply and secondary power supply that are required to be provided at the central supervisory station, the system shall be provided with an uninterruptible power supply (UPS) with sufficient capacity to operate the computer equipment for a minimum of 15 minutes. If more than 15 minutes is required for the secondary power supply to supply the UPS input power, the UPS shall be capable of providing input power for at least that amount of time.

The UPS shall comply with the Standard for Uninterruptible Power Supply Equipment, UL 1778, or the Standard for Fire Protective Signaling Devices, UL 1481.

In order to perform maintenance and repair service, a means for disconnecting the input to the UPS while maintaining continuity of power to the automation system shall be provided

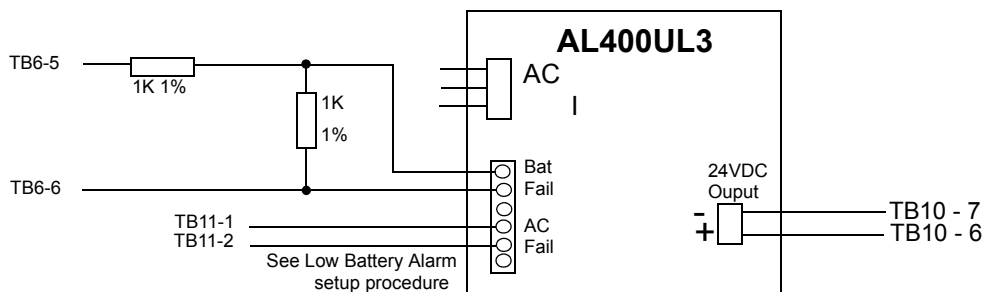


Figure I-1: Wiring Diagram for Altronix AL400UL3

For Canadian Certification installations, the model Brownsville or Easton 2 Computer must be used with this system and the installation must follow the Canadian Electrical Code, Part 1.

Low Battery Alarm Setup

- 1) From Topaz main screen go to **Hardware** then **Alarm Point** tab.
- 2) Click **Clear** then enter **Alarm Name**: *Low Battery Panel #*.
- 3) Select **Field Panel** (this procedure must be done for each ACURT panel).
- 4) Select **Security Area**,
- 5) Select **Alarm Category**
- 6) Select **Alarm Instruction**
- 7) Select **Active**.
- 8) Select Input Number **22**
- 9) Select Priority **5**.
- 10) Uncheck **User ACK Required** and **Alarm Can Be Masked**.
- 11) Set **Alarm Reporting Delay** to "0" and enter the **Description**.
- 12) Click **Save**.

NFPA Standard

National Fire Protection Association
1 Batterymarch Park
Quincy, MA 02269
617-770-3000
www.nfpa.org

NFPA 70 Article 250, NEC

If Problems Arise

If any of your telephone equipment is not operating, you should immediately remove it from your telephone line, as it may cause harm to the telephone network. If the telephone company notes a problem, they may temporarily discontinue service. When practical, they will notify you in advance of this disconnection. If advanced notice is not feasible, you will be notified as soon as possible. When you are notified, you will be given the opportunity to correct the problem and informed of your right to file a complaint with the FCC. Contact your telephone company if you have any questions about your phone line. In the event repairs are ever needed on the GE Security ACURT field panel they should be performed by GE Security technicians or an authorized representative.

Returning Procedure

Contact the distributor where the product was purchased for return policy and procedures.

Contact Us

GE Interlogix Address

Correspondence should be sent to the following address:

GE Interlogix
12345 SW Leveton Drive
Tualatin, OR 97062
USA
800-547-2556

Electronic Email Addresses

Customer Service	800-648-7422	domestic_sales@ge-interlogix.com
Technical Support	800-648-7424	tech_support@ge-interlogix.com
Applications Engineering	714-890-0083	App.ilx.infographics@ge.com
Sales	800-648-7422	domestic_sales@ge-interlogix.com
Training	800-547-2556	domestic_sales@ge-interlogix.com

Web Site

www.GE-Interlogix.com

Introduction

FOR YOUR SAFETY

The following **WARNINGS:** and **CAUTIONS:** appear here for your safety. They are general in nature and do not pertain to specific procedural steps. There are, however, additional safety precautions that do pertain to specific procedural steps. These precautions appear at the point in the installation and/or maintenance procedures where a hazard is most likely to be encountered.

BE SURE to read and follow all personal safety **WARNINGS** and equipment **CAUTIONS** appearing in this document PRIOR to beginning ACURT installation.

**WARNING:**

Be sure to observe battery manufacturer's instructions:

Danger Explosive Gases

- Can cause blindness or severe injury.
- Use in a well-ventilated area away from open flame, cigarettes, sparks, and other sources of ignition.
- Shield eyes and face when working around battery.
- Do not make direct contact between the positive and negative terminals.
- Do not puncture, disassemble or incinerate battery.
- Dispose of in accordance with environmental regulations.

Poison - Contains lead compounds and corrosive acid

- Contains sulfuric acid and can cause severe burns. In the event of contact flush with water and obtain immediate medical attention.

Keep out of reach of Children**Charge in accordance with manufacturer's instructions****WARNING:**

The ACURT components described in this manual contain electrical shock hazard potential. Only qualified personnel should perform installation and maintenance. Use the appropriate procedures to remove power before proceeding with servicing.

**WARNING:**

Make certain that the AC power source circuit breaker(s) is OFF BEFORE proceeding. Failure to heed this **WARNING:** can cause damage to unit(s).

**WARNING:**

Do not use the ACURT Controller, Remote Input Module (RIM) or Remote Relay Module (RRM) to switch any voltage above 30 volts. Failure to heed this **WARNING:** can cause death, personal injury or damage to unit(s).

**CAUTION:**

Prior to handling ACURT System components, be sure to follow the two rules below to avoid damaging the ICs by static electricity.

1. Handle all static-sensitive components at a static safeguarded work area.
2. Transport all static-sensitive components in static-shield containers or packages.

**CAUTION:**

The ACURT controllers must have separate conduit run to each enclosure. Only cables/wires that begin or terminate in the enclosure should run into the enclosure. DO NOT use the enclosure(s) as "pull-boxes" for any foreign wiring. The enclosures should be arranged for separate conduit runs.

NOTICE: FIRE SAFETY NOTICE**WARNING:**

NEVER connect any card reader devices or locks onto doors, gates or barriers that may be fire exits without first consulting and getting approval of applicable local officials. Use of push buttons to exit may be illegal. Single action exit may be required. Obtain proper permits and approvals in writing before installation.

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Chapter 1

ACURT2 and ACURT4 Networked Controller

Overview

This section provides technical information on models ACURT2 and ACURT4. These intelligent networked devices provide access control, alarm monitoring and output control. The ACURT4 provides support for four (4) Wiegand output card readers and/or keypads, while the ACURT2 provides support for two (2) Wiegand output card readers and/or keypads. ACURT2 and ACURT4 models provide one (1) host serial port for connections to a server computer using either RS-485 or RS-232 communications and one (1) 10-BaseT Ethernet port.

Each controller consists of a printed circuit board (PCB) assembly with optional battery backup. The processor is a 90 MHz Motorola 5307 Coldfire with 8 Mbytes of RAM memory. Additional program memory consists of 4 Mbytes FLASH ROM.

Communication to external devices is a polled serial protocol up to 4000 feet (1220 meters) for Remote Electronics Modules, such as inputs (RIM modules) or outputs (RRM modules).

Twelve (12) Grade A supervised inputs on the ACURT4 or six (6) Grade-A supervised inputs on the ACURT2 are available for alarm monitoring. These supervised inputs are for exit push buttons and door contacts for the card readers, and for auxiliary monitor points.

Each model is also equipped with a low battery detection alarm and two (2) unsupervised alarms (AC power fail and cabinet tamper). Eight (8) Form-C relays are provided on the ACURT4 and four (4) for the ACURT2 for strike activation and/or remote control. All relay contacts are rated for 30 VDC at 2 amperes. DO NOT switch any voltages over 30 volts.

DIP Switches are used to set the device's communication baud rate and a rotary switch is used to set the device address. DIP Switches are also used to terminate alarm inputs and host communications ports.

General Specifications

Characteristic	Specifications
DIMENSIONS	
HEIGHT	16.25 in (41.28 cm)
WIDTH	16.375 in (41.59 cm)
DEPTH	4.125 in (10.48 cm)
WEIGHT	
WITH BATTERIES	19 lb. (8.6 kg)
WITHOUT BATTERIES	16 lb. (7.3 kg)
ENVIRONMENTAL	
MAXIMUM TEMPERATURE	+150°F (+65°C)
MINIMUM TEMPERATURE	+32°F (0°C)
HUMIDITY	0 to 95% Relative (non-condensing)
INPUT POWER VOLTAGE	24 VAC, 40 VA
DC STANDBY BATTERY BACKUP	4-Hour Backup

Table 1-1: General Specifications ACU2RT2 and ACU2RT4 Networked Intelligent Controller

ACURT2 Block Diagram

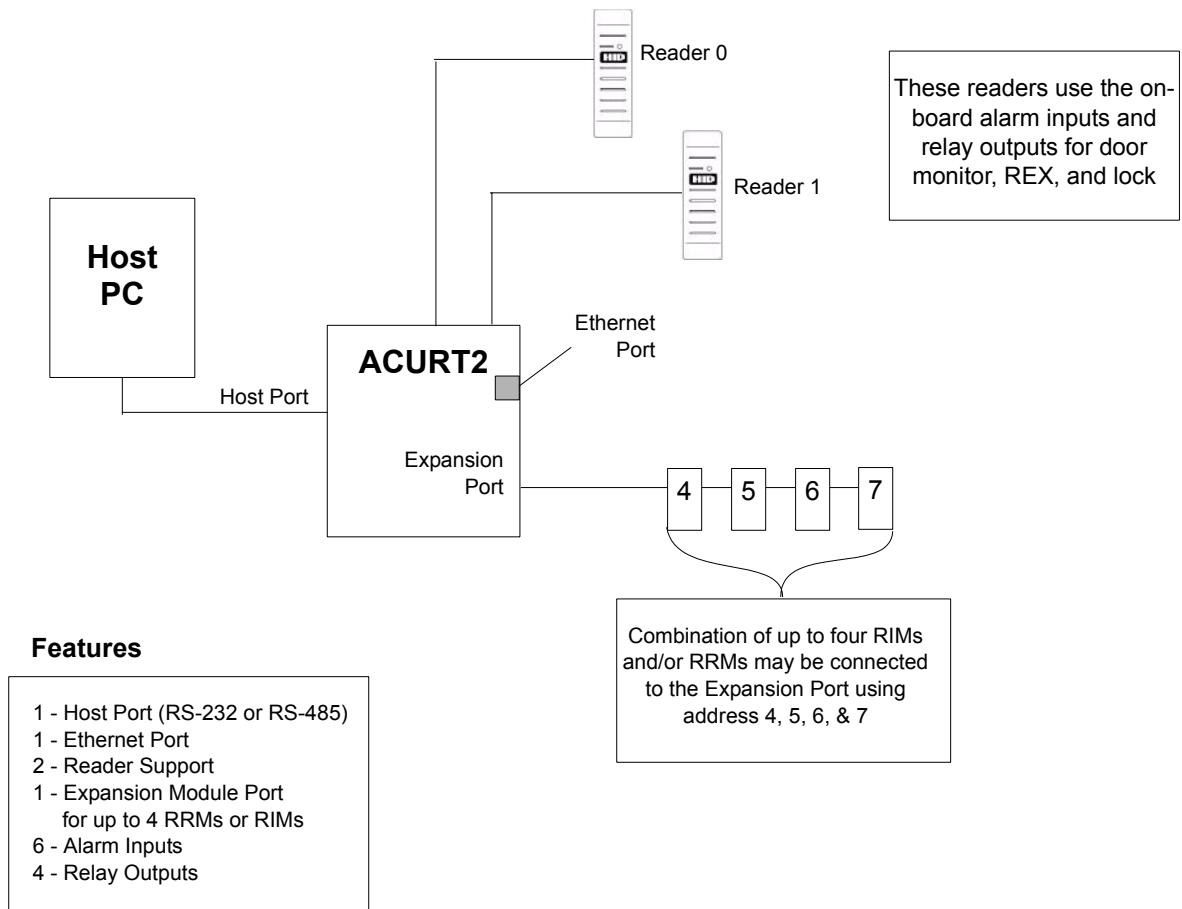


Figure 1-1: ACURT2 Block Diagram

ACURT4 Block Diagram

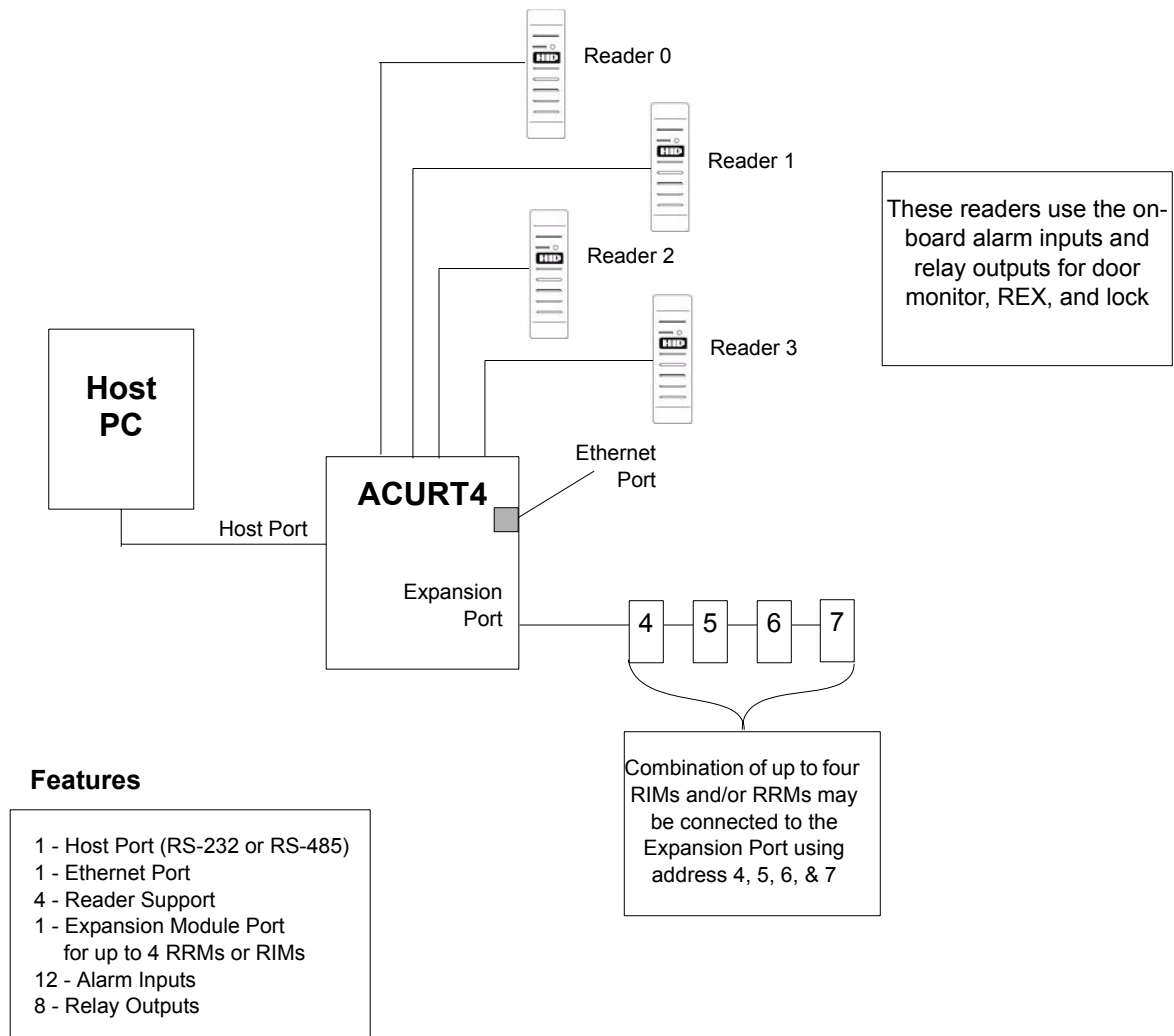


Figure 1-2: ACURT2 Block Diagram

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Chapter 2

Installing the ACURT2 and ACURT4

Running the Wire and Cable

The procedure for running the wire and cable is described in the following paragraphs.

NOTES:

1. In running wire and cable, be sure to observe and follow applicable building codes.
2. The dry relay contacts are rated at 2 amps at 30 AC/DC volts.
3. All wires should be stranded.
4. The maximum length of the wiring between the farthest Remote Module (RIM, or RRM) and the ACURT controller is 4000 feet (1220 meters) provided the remote module is locally powered.
5. Guard against lightning damage.
6. All bare Shields should be taped or protected against accidental shorting against electronic components.

RS-485 Communications

RS-485 is a differential voltage communication circuit. The impedance is 120 ohms. End-of-line terminators are required on both ends of the communications path. Multi-drop configurations are allowed with a maximum length of 4000 feet. **Off the RS-485 cable, stubs can be dropped, but the length of any stub should not be longer than 10 feet.** Stubs can connect to ACURT controllers or remote modules (RIM or RRM). Stubs must not be terminated. **We strongly recommend star configurations be avoided.** (See figure Figure 2-1)

The ACURT2 and ACURT4 controllers are switch selectable for RS-485 termination on each host and expansion module port.

The GE Security's ACURT2 / ACURT4 requires a RS-485 terminator at the NCIC-5 RS-485 converter. See Figure Figure 2-10 and Figure 2-11.

The Remote Modules (RIM, or RRM) do not have built-in terminators, so the farthest unit from the ACURT must have an external terminator (part number 124-824). See Figure 2-2

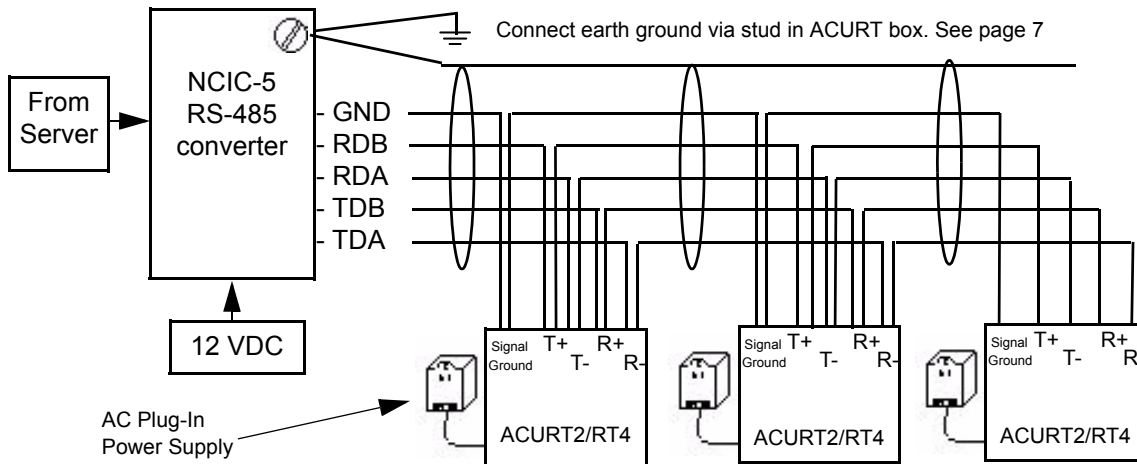


Figure 2-1 RS-485 Communication Wiring for ACURT2 and ACURT4

NOTE: Shield refers to the over all braided shield, GND refers to the shield drain wire. Transmit should use one twisted pair and receive should use the other twisted pair.

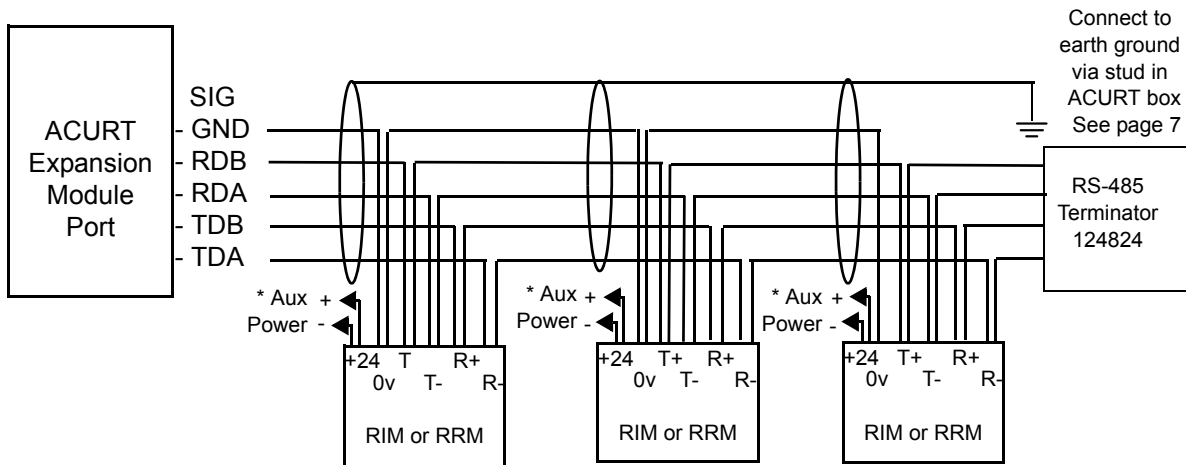


Figure 2-2 RS-485 Communication Wiring for Remote Modules

NOTES:

1. If Auxiliary power is not provided locally, another pair of wires will be required to each RIM / RRM.
2. Shield refers to the over all braided shield, GND refers to the shield drain wire. Transmit should use one twisted pair and receive should use the other twisted pair.

Pulling Wire and Cable

Pull the wiring to the remote module from the ACURT controller.

All the wires except the strike pair may be run as one cable. The cable should have low-capacitance twisted pairs and a shield. Attach pigtail to shield and connect to chassis ground. The following Belden cable numbers (or equivalent) are suggested:

Belden No. 9842-24 AWG for 1000 feet (305 meters) maximum distance

Pull a single pair of wires from the enclosure to the electric door strike. The following Belden cable number (or equivalent) is suggested:

Belden No. 9409-18 AWG

Pull the wires to the enclosure from each alarm zone sensor, door contact and exit push button. The following Belden cable number (or equivalent) is suggested:

Belden No. 9407-22 AWG

Pull the wires to the enclosure from passive exit device if the device requires power, otherwise use cable listed above. The following Belden cable number (or equivalent) is suggested:

Belden No. 8741-22 AWG

Grounding Connections

It is important to connect each ACU panel on the communication loop individually to earth ground, not to chassis or electrical ground. Grounding is imperative for proper data communications between panels and to ensure full functionality of the lighting and transient voltage protection devices. Voltage protection devices are designed into all ACU panels and will channel most transient surges to ground if the panel is properly connected to earth ground. If the panels are not properly connected to ground, the surge suppression devices may not function and data communications may be erratic.

For proper grounding all ACUs should be connected to earth ground, not to chassis or electrical ground. Cold water pipes or a grounding rod usually make a good earth ground. The grounding wire should be as heavy as possible with as short and straight a run as possible. Avoid sharp bends in the wire because a large power surge might arc across the bend.

Recommended Grounding Sources

- Cold Water Earth Ground
- Building Ground
- Electrical Ground

The GE Security system should use a consolidated earth ground, in which the public utilities and the security system ground rods are bonded together. A consolidated earth ground eliminates the problem of step voltage blowout, in which measurable voltage potential exists between earth ground rods, resulting in a current flow path and damage to the system during a lightning strike.

It is recommended that 12 AWG wire be used to connect the earth ground in the shortest and straightest path possible. Avoid sharp turns and use a minimum radius of eight inches (203 mm) for bends. Ground wires should be run separate from other wires and be routed toward the earth. Use of eight-foot (2.4 m) copper clad ground rod is recommended.

Alarm Zone Sensor Wiring

Pull twisted pair of wire (Belden 9407-22 AWG or equivalent) from each alarm zone sensor to the assigned input terminals on the ACURT controller or Remote Module (RIM). (See Terminal Block Tables in each section for alarm zone terminations.) End-of-line (EOL) resistor for the SECURE state is 1000 ohms. The EOL (End-Of-Line) resistor must be located within the alarm zone sensor enclosure, otherwise the alarm zone circuit will be considered unsupervised.

When 1000 ohms terminators are used, the sensors can be either normally closed contacts or normally open contacts providing the SECURE or inactive state is 1000 ohms. See Figure Figure 2-3. (Note: A normally open exit-push-button is wired the same as a normally closed alarm). See Figure Figure 2-3.

Zone Input State	Sensor Circuit in Ohms Normally Closed	Sensor Circuit in Ohms Normally Open
Secure	1000	1000
Active	2000	500
Open	> 50000	> 50000
Short	< 50	< 50

Table 2-1: Alarm State Resistance

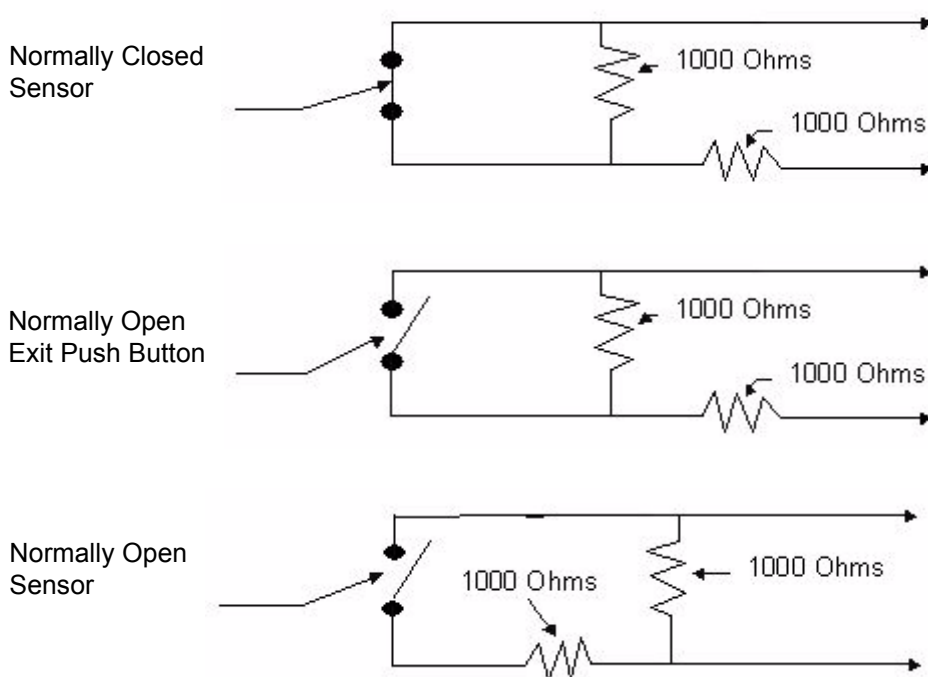


Figure 2-3 Zone Sensor with 1000-Ohm Resistors

Wiring a RTE1000 Request-to-Exit PIR Sensor (Optional)

The RTE1000 is a common motion detector used for request-to-exit and can be found at your local alarm supplier.

The following tables show wiring and switch settings for the RTE1000.

TB	TRE1000 Terminal Block Description	ACURT Reader Terminal Block The PIR is Controlling
+	12 VDC (45 mA) or 24 VDC (60 mA) See Warning below	+12 VDC
-	Power Ground	0 Volts
CC	No Connection	No Connection
C	Connect to REX (Request To Exit)	Z1+
OC		Z1-
C	Optional Alarm panel Shunt (TCE)	
OC		
XOD	No Connection	No Connection

Table 2-2: RTE1000 Connections to ACURT Reader

TM1	TM2	Description Relay Timer
ON	ON	5 Seconds
OFF	ON	30 Seconds
ON	OFF	75 Seconds
OFF	OFF	120 Seconds
TCE ON		Timer cancel feature for Monitor Relay output active.
TCE OFF		Timer cancel feature for Monitor Relay output inactive. Output can be used as a signal output.

Table 2-3: RTE1000 Switch S1 Settings for Relay Timer



WARNING:

If **12 VDC** source is used to power the RTE1000, leave 24 Volt jumper (J4) in place. If **24 VDC** source is used to power the RTE1000, **remove** 24 Volt jumper (J4).

Lock Relay

Lock power can be routed through the Lock Relay to provide power when locked or power when unlocked. These contacts are rated at 1 A at 30 VDC.

Monitor Relay (Optional)

Connect across contact wiring to alarm control. If door monitor is used without alarm system, connect closed circuit contact switch to the monitor relay terminals.

If door position monitoring is not required, turn OFF TCE switch and monitor relay output becomes standard timed relay.

NOTE: Do not exceed 24 mA through monitor relay contacts.

XOD

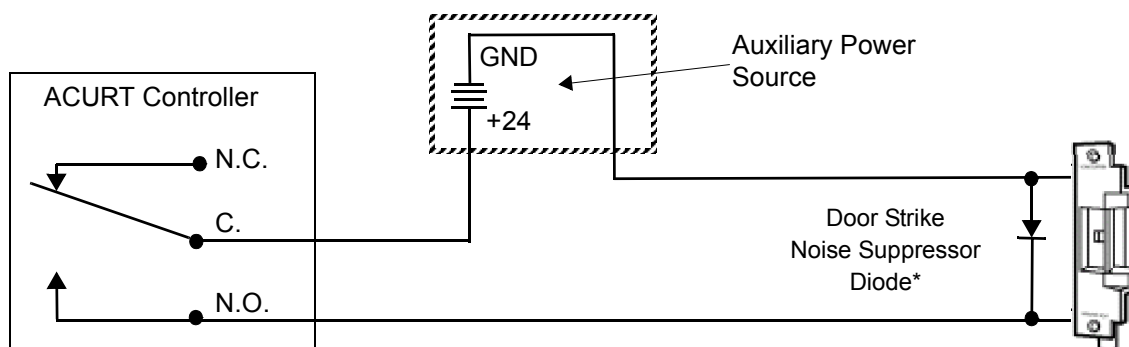
Connect through Remote Push Button, Key Lock, Key Pad or Card Reader to provide negative (ground) input to XOD to start timer.

NOTE: For additional installation details see the installation instructions shipped with the RTE1000.

Door Strike Power Wiring

Figure Figure 2-4 shows door strike power wiring for the ACURT. See the terminal block connection table for the relay terminals. **Always use a spike suppression diode on DC door strikes.** The noise suppressor diode is a 1N4933 or use the optional noise suppressor unit part number 122610 as shown in Figure 2-5. Use Belden cable #9409 (1 pair 18 AWG unshielded) or equivalent. The dry relay contacts for the strike power are rated at 2 amps at 30 AC/DC volts maximum.

Auxiliary power source is required to power door locks.



*Install Noise Suppressor Diode as close to the door strike as possible.

Figure 2-4 Door Strike Wiring for ACURT with Supplied Diode

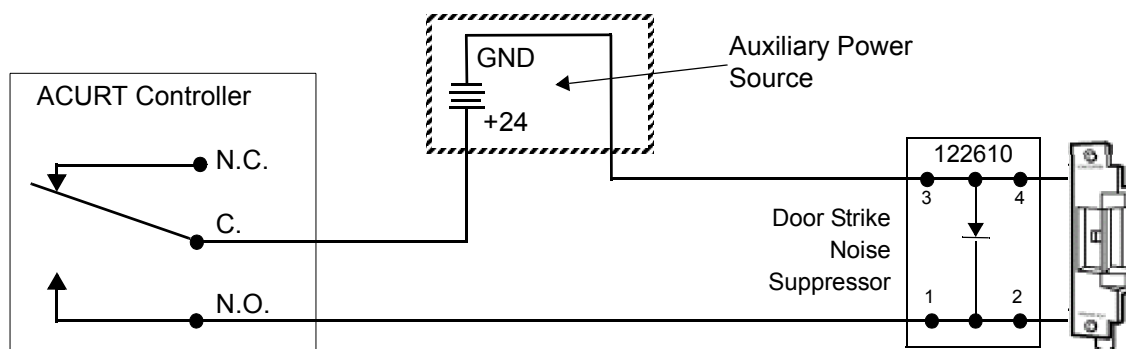


Figure 2-5 Door Strike Wiring for ACURT with Optional Door Strike Noise Suppressor #122610

Magnetic Lock Power Wiring

Figure Figure 2-6 shows magnetic lock power wiring for the ACURT. See the terminal block connection table for the relay terminals. Use Belden cable #9409 (1 pair 18 AWG unshielded) or equivalent. The dry relay contacts for the lock power are rated at 2 amps at 30 DC volts maximum. .

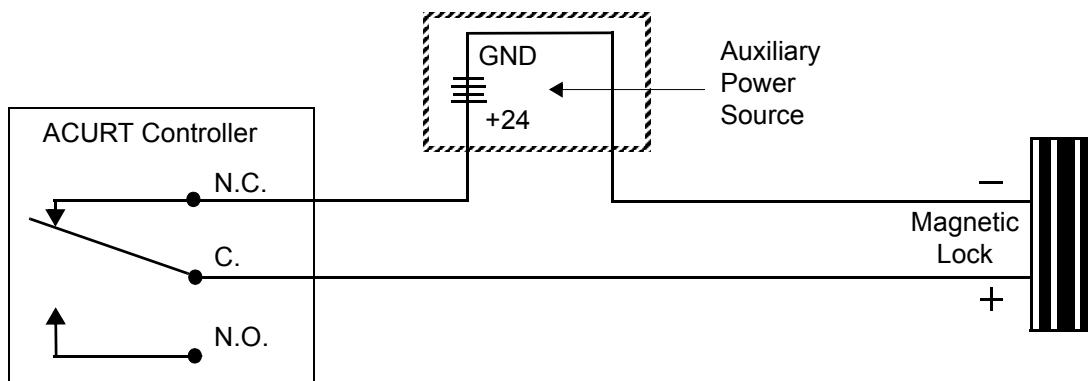


Figure 2-6 Door Lock Wiring for ACURT with Supplied Diode

NOTE: Do Not install a diode for noise suppression on magnetic type locks. Locks like Securitron's Magnalocks already have internal inductive kickback protection, so addition of a reverse diode is pointless. A diode would recirculate current flow through the magnet coil and thereby considerably slows release of the lock.



WARNING:

Door Locks must be install according to building and life safety codes for the location in which the installation is taking place!

ACURT2 and ACURT4 Enclosure Layout

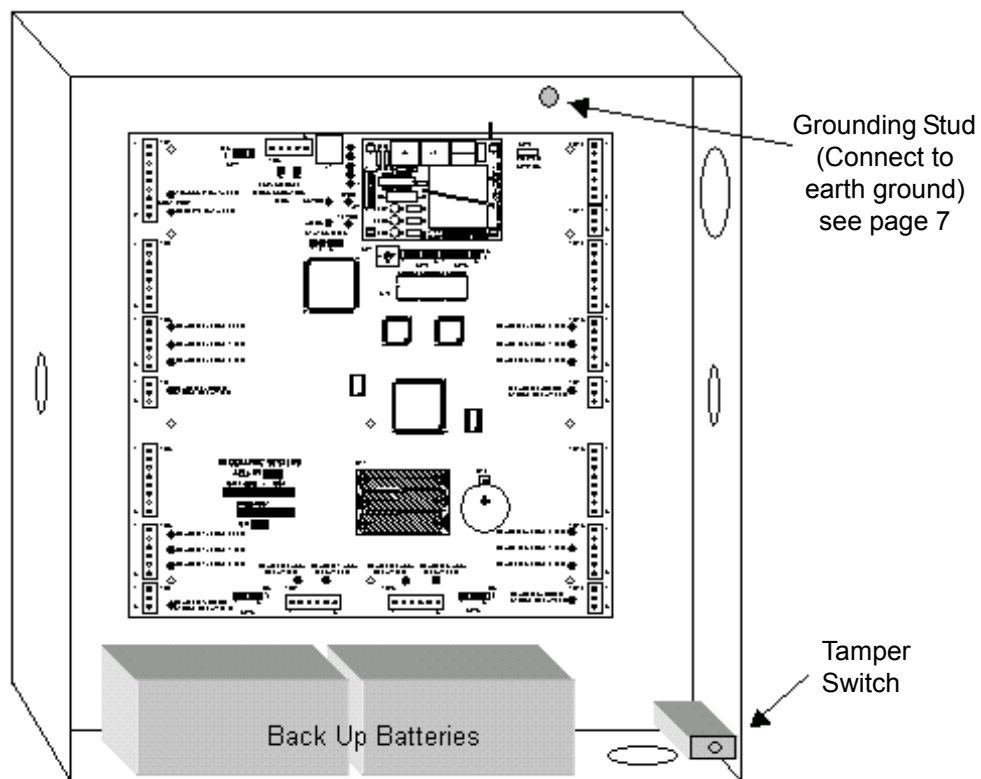


Figure 2-7 Components Mounted Inside the ACURT Controller Enclosure

ACURT2 and ACURT4 Component Layout

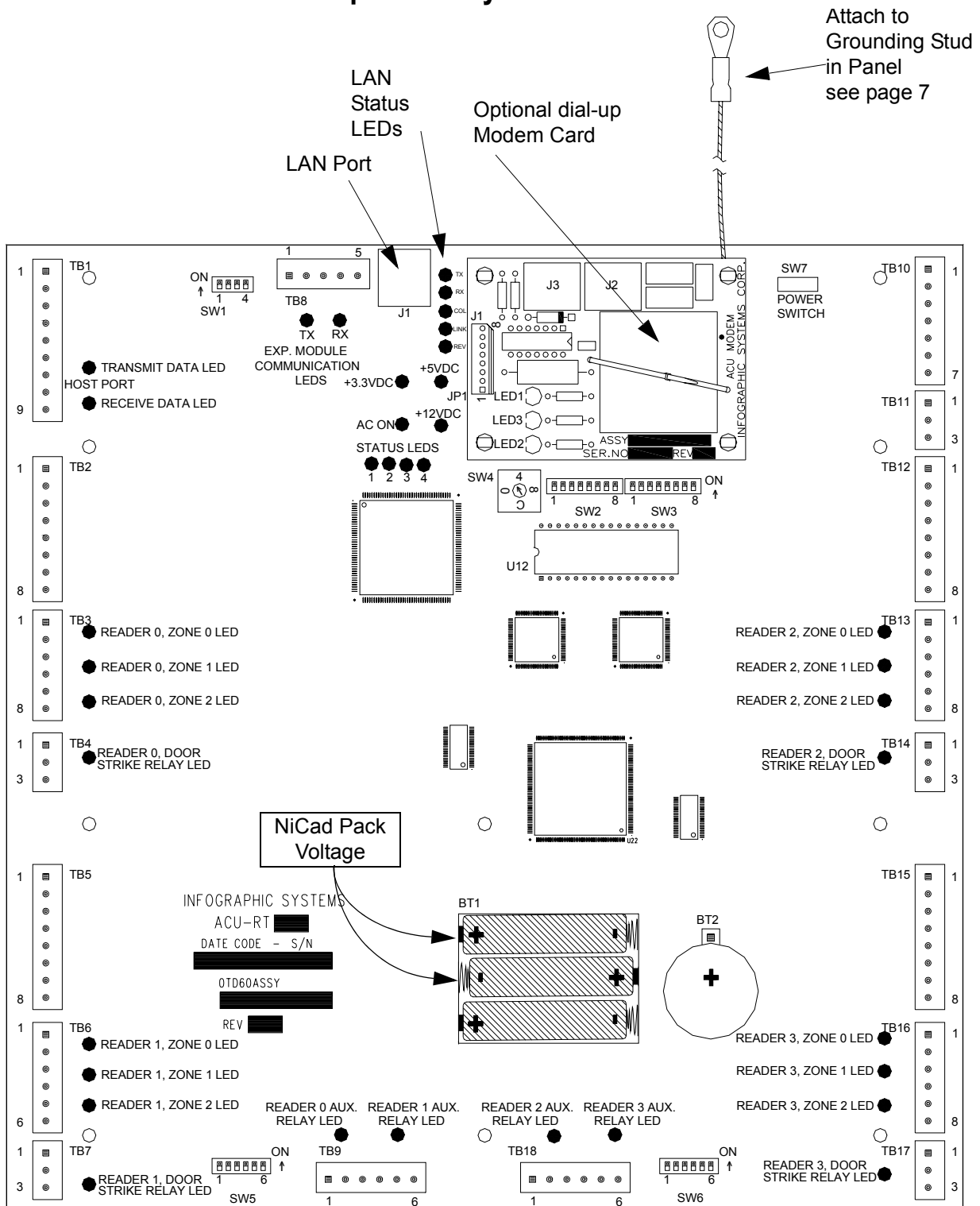


Figure 2-8 ACURT2 and ACURT4 Component Layout

Terminal Connector Pin Numbers

Tables Table 2-5: through Table 2-14: show cable types and connections to terminal blocks TB1 through TB18. Explanations of the table column headings are as follows:

1	2	3	4	5
TB#	Pin#	Term. Strip ID	Description	Maximum Distance and Belden or Equivalent Cable No.

Table 2-4: Table Header Descriptions

1. Identifies the terminal block number on the ACURT2 and ACURT4 circuit board.
2. Identifies the pin number of the applicable terminal block.
3. Identifies the abbreviation of the terminal on the printed template.
4. Identifies the description of the terminal.
5. Identifies the cable number, the maximum distance when applicable.

Connections for Terminal Block 1 (ACURT2 and ACURT4)

Host Communication Port

TB#	Pin#	Term. Strip ID	Description	Maximum Distance and Belden or Equivalent Cable No.
1	1	SIG GND	Host Port Signal Ground	9608-24 (3 conductor) AWG, 50 feet 9609-24 (4 conductor) AWG, 50 feet
1	2	TXD	Host Port RS-232 Transmit Data	
1	3	RXD	Host Port RS-232 Receive Data	
1	4	RTS	Host Port RS-232 RTS	
1	5	CTS	Host Port RS-232 CTS	
1	6	TX+	Host Port RS-485 Transmit Data (+)	9842-24 AWG / 9368-18 AWG 4000 feet (1220 meters) maximum
1	7	TX-	Host Port RS-485 Transmit Data (-)	
1	8	RX+	Host Port RS-485 Receive Data (+)	
1	9	RX-	Host Port RS-485 Receive Data (-)	

Table 2-5: Terminal Block TB1 Pin Number Identification

Connections for Terminal Block 2, 3, and 4 (ACURT2 and ACURT4)

Reader 0 Connections

TB#	Pin #	Term. Strip ID	Description	Maximum Distance Belden or Equivalent Cable No.
2	1	+12 VDC	Fused 12 VDC Output	9514-22 AWG
2	2	+5 VDC	Fused 5 VDC Output	
2	3	0 V	0 Volts	
2	4	DATA 0	Reader Data 0 (Green)	
2	5	DATA 1	Reader Data 1 (White)	
2	6	RED LED	Red LED	
2	7	GREEN LED	Green LED	
2	8	BUZZER	Buzzer	
3	1	Z0+	Normally Closed Door Contact	9407-22 AWG / 9409-18 AWG 1000 feet (305 meters) / 4000 feet (1220 meters)
3	2	Z0-		
3	3	Z1+	Normally Open Request-to-Exit Contact	9407-22 AWG / 9409-18 AWG 1000 feet (305 meters) / 4000 feet (1220 meters)
3	4	Z1-		
3	5	Z2+	Normally Closed Spare Input	9407-22 AWG / 9409-18 AWG 1000 feet (305 meters) / 4000 feet (1220 meters)
3	6	Z2-		
4	1	NC	Door Strike Relay Normally Closed	9409-18 AWG (See Warning)
4	2	C	Door Strike Relay Common	
4	3	NO	Door Strike Relay Normally Open	

Table 2-6: Terminal Block TB2, 3, and 4 Pin Number Identification

**WARNING:**

DO NOT switch any voltage over 30 VDC on these relays.

Connections for Terminal Block 5, 6, and 7 (ACURT2 and ACURT4)

Reader 1 Connections

TB#	Pin #	Term. Strip ID	Description	Maximum Distance Belden or Equivalent Cable No.
5	1	+12 VDC	Fused 12 VDC Output	9514-22 AWG
5	2	+5 VDC	Fused 5 VDC Output	
5	3	0 V	0 Volts	
5	4	DATA 0	Reader Data 0 (Green)	
5	5	DATA 1	Reader Data 1 (White)	
5	6	RED LED	Red LED	
5	7	GREEN LED	Green LED	
5	8	BUZZER	Buzzer	
6	1	Z0+	Normally Closed Door Contact	9407-22 AWG at 1000 feet (305 meters)
6	2	Z0-		9409-18 AWG at 4000 feet (1220 meters)
6	3	Z1+	Normally Open Request-to-Exit Contact	9407-22 AWG at 1000 feet (305 meters)
6	4	Z1-		9409-18 AWG at 4000 feet (1220 meters)
6	5	Z2+	Normally Closed Spare Input	9407-22 AWG at 1000 feet (305 meters)
6	6	Z2-		9409-18 AWG at 4000 feet (1220 meters)
7	1	NC	Door Strike Relay Normally Closed	9409-18 AWG (See Warning)
7	2	C	Door Strike Relay Common	
7	3	NO	Door Strike Relay Normally Open	

Table 2-7: Terminal Block TB5, 6, and 7 Pin Number Identification

**WARNING:**

The plug in AC power supply can only be use to power one ACURT board.

Connections for Terminal Block 8 (ACURT2 and ACURT4)

Expansion Module Communication Port RS-485 Connections

Pin No.	Term. Strip ID	Description	Maximum Distance Belden or Equivalent Cable No.
1	SIG GND	Signal Ground	9842-24 AWG 4000 feet (1220 meters) maximum
2	TX+	Transmit +	
3	TX-	Transmit -	
4	RX+	Receive +	
5	RX-	Receive -	

Table 2-8: Terminal Block TB8 Pin Number Identification

Connections for Terminal Block 9 (ACURT2 and ACURT4)

Reader 0 and 1 Auxiliary Relay Connections

Pin No.	Term. Strip ID	Description	Maximum Distance Belden or Equivalent Cable No.
1	NC	Reader 0 Aux Relay Normally Closed	9409-18 AWG See WARNING
2	C	Reader 0 Aux Relay Common	
3	NO	Reader 0 Aux Relay Normally Open	
4	NC	Reader 1 Aux Relay Normally Closed	9409-18 AWG See WARNING
5	C	Reader 1 Aux Relay Common	
6	NO	Reader 1 Aux Relay Normally Open	

Table 2-9: Terminal Block TB9 Pin Number Identification

Connections for Terminal Block 10 (ACURT2 and ACURT4)

Power Connections

Pin No.	Term. Strip ID	Description
1	24 VAC INPUT	24 VAC Input 40 Volt Amps (from plug in transformer)
2	24 VAC INPUT	
3	Frame Ground	Frame Ground (connected to cabinet stud)
4	0 V	Ground
5	0 V	Ground
6	Battery 24 V+	UPS Batteries Positive
7	Battery 24 V-	UPS Batteries Negative

Table 2-10: Terminal Block TB10 Pin Number Identification



WARNING:

The ACURT board requires 24 AC power. The plug in AC power supply can only be use to power one ACURT board.

Connections for Terminal Block 11 (ACURT2 and ACURT4)

Cabinet Tamper Connections

Pin No.	Term. Strip ID	Description	Maximum Distance Belden or Equivalent Cable No.
1	ACPF	AC Power Fault Input	24 Gauge
2	0 V	Power Fault & Tamper Input Common	Not Applicable – Factory Wired
3	CTSW	Cabinet Tamper Switch	24 Gauge

Table 2-11: Terminal Block TB11 Pin Number Identification

Connections for Terminal Block 12, 13, and 14 (ACURT4 Only)

Reader 2 Connections

TB#	Pin #	Term. Strip ID	Description	Maximum Distance Belden or Equivalent Cable No.
12	1	+12 VDC	Fused 12 VDC Output	9514-22 AWG
12	2	+5 VDC	Fused 5 VDC Output	
12	3	0 V	0 Volts	
12	4	DATA 0	Reader Data 0 (Green)	
12	5	DATA 1	Reader Data 1 (White)	
12	6	RED LED	Red LED	
12	7	GREEN LED	Green LED	
12	8	BUZZER	Buzzer	
13	1	Z0+	Normally Closed Door Contact	9407-22 AWG at 1000 feet (305 meters)
13	2	Z0-		9409-18 AWG at 4000 feet (1220 meters)
13	3	Z1+	Normally Open Request To Exit Contact	9407-22 AWG at 1000 feet (305 meters)
13	4	Z1-		9409-18 AWG at 4000 feet (1220 meters)
13	5	Z2+	Normally Closed Spare Input	9407-22 AWG at 1000 feet (305 meters)
13	6	Z2-		9409-18 AWG at 4000 feet (1220 meters)
14	1	NC	Door Strike Relay Normally Closed	9409-18 AWG See WARNING
14	2	C	Door Strike Relay Common	
14	3	NO	Door Strike Relay Normally Open	

Table 2-12: Terminal Block TB12, 13, and 14, Pin Number Identification

Connections for Terminal Block 15, 16, and 17 (ACURT4 Only)

Reader 3 Connections

TB#	Pin #	Term. Strip ID	Description	Maximum Distance Belden or Equivalent Cable No.
15	1	+12 VDC	Fused 12 VDC Output	9514-22 AWG
15	2	+5 VDC	Fused 5 VDC Output	
15	3	0V	0 Volts	
15	4	DATA 0	Reader Data 0 (Green)	
15	5	DATA 1	Reader Data 1 (White)	
15	6	RED LED	Red LED	
15	7	GREEN LED	Green LED	
15	8	BUZZER	Buzzer	
16	1	Z0+	Normally Closed Door Contact	9407-22 AWG at 1000 feet (305 meters)
16	2	Z0-		9409-18 AWG at 4000 feet (1220 meters)
16	3	Z1+	Normally Open Request-to-Exit Contact	9407-22 AWG at 1000 feet (305 meters)
16	4	Z1-		9409-18 AWG at 4000 feet (1220 meters)
16	5	Z2+	Normally Closed Spare Input	9407-22 AWG at 1000 feet (305 meters)
16	6	Z2-		9409-18 AWG at 4000 feet (1220 meters)
17	1	NC	Door Strike Relay Normally Closed	9409-18 AWG See WARNING
17	2	C	Door Strike Relay Common	
17	3	NO	Door Strike Relay Normally Open	

Table 2-13: Terminal Block TB15, 16, and 17, Pin Number Identification

Connections for Terminal Block 18 (ACURT4 Only)

Reader 2 and 3 Auxiliary Relay Connections (ACURT4 Only)

Pin No.	Term. Strip ID	Description	Maximum Distance Belden or Equivalent Cable No.
1	NC	Reader 0 Aux Relay Normally Closed	9409-18 AWG See WARNING
2	C	Reader 0 Aux Relay Common	
3	NO	Reader 0 Aux Relay Normally Open	
4	NC	Reader 1 Aux Relay Normally Closed	9409-18 AWG See WARNING
5	C	Reader 1 Aux Relay Common	
6	NO	Reader 1 Aux Relay Normally Open	

Table 2-14: Terminal Block TB18 Pin Number Identification

Relay Numbering for ACURT2 and ACURT4

Relay Numbers for Readers

Reader Number	ACURT2 Relay Number	ACURT4 Relay Number
Reader 0 Door Strike Relay	16	16
Reader 0 Aux Relay	17	17
Reader 1 Door Strike Relay	18	18
Reader 1 Aux Relay	19	19
Reader 2 Door Strike Relay	Not Available	20
Reader 2 Aux Relay		21
Reader 3 Door Strike Relay	Not Available	22
Reader 3 Aux Relay		23

Table 2-15: Relay Numbers for ACURT2 and ACURT4 Readers

Relay Numbers for RIM Remote Input Module

Relay Numbers	Expansion Port Address 4	Expansion Port Address 5	Expansion Port Address 6	Expansion Port Address 7
K1	32	34	36	38
K2	33	35	37	39

Table 2-16: Relay Numbers for RIM Remote Input Module

Relay Numbers for RRM Remote Relay Module

Relay Numbers	Expansion Port Address 4	Expansion Port Address 5	Expansion Port Address 6	Expansion Port Address 7
K1	112	128	144	160
K2	113	129	145	161
K3	114	130	146	162
K4	115	131	147	163
K5	116	132	148	164
K6	117	133	149	165
K7	118	134	150	166
K8	119	135	151	167
K9	120	136	152	168
K10	121	137	153	169
K11	122	138	154	170
K12	123	139	155	171
K13	124	140	156	172
K14	125	141	157	173
K15	126	142	158	174
K16	127	143	159	175

Table 2-17: Relay 128 Numbers for RRM Remote Relay Module

Alarm Numbering for ACURT2 and ACURT4

Alarm Numbers for Readers

Reader Number	Relays		Physical Alarm Zones			Logical Alarm Zones				
	Strike	AUX	Zone 0 D.C.	Zone 1 REX	Zone 2 SPARE	Lock Monitor	F.O.	H.O.	R.T.	OFFL
0	16	17	16	17	18	48	64	65	66	67
1	18	19	20	21	22	50	68	69	70	71
2 *	20	21	24	25	26	52	72	73	74	75
3 *	22	23	28	29	30	54	76	77	78	79

Lock Monitor / Bond Sensor = If used must be connected to Z2.

F.O. = Forced Open, H.O. = Held Open, R.T. = Reader Enclosure Tamper, OFFL = Reader Off Line, D.C. = Door Contact, REX = Request to Exit.

Table 2-18: Physical to Logical Zone Numbering

* Readers 2 and 3 are available on ACURT4 only.

Alarm Numbers for RIM Remote Input Module

Zone Input	Expansion Port Address 4	Expansion Port Address 5	Expansion Port Address 6	Expansion Port Address 7
IN1	128	144	160	176
IN2	129	145	161	177
IN3	130	146	162	178
IN4	131	147	163	179
IN5	132	148	164	180
IN6	133	149	165	181
IN7	134	150	166	182
IN8	135	151	167	183
IN9	136	152	168	184
IN10	137	153	169	185
IN11	138	154	170	186
IN12	139	155	171	187
IN13	140	156	172	188
IN14	141	157	173	189
IN15	142	158	174	190
IN16	143	159	175	191
IN17	96	100	104	108
IN18	97	101	105	109
IN19	98	102	106	110
RIM Off-line	99	103	107	111

Table 2-19: RIM Alarm Numbers for GE Security's TOPAZ

Alarm Numbers for RRM Remote Relay Module

Zone Number	Expansion Port Address 4	Expansion Port Address 5	Expansion Port Address 6	Expansion Port Address 7
I1	97	101	105	109
I2	98	102	106	110
RRM Off-line	99	103	107	111

Table 2-20: RRM Alarm Numbers

Wiring the Host Communications

Connecting RS-232C Interface to ACURT2 and ACURT4 Controllers

The RS-232 interface is a simple communications interface used between computers or modems and ACURT2 or ACURT4 controllers. The maximum overall length of the wires from the host computer to the ACURT2 or ACURT4 controller is 50 feet (15 meters). Only one device per RS-232 path is supported.

Provide a single pair shielded cable (two wires and shield) minimum from the host computer's serial port to the ACURT2 or ACURT4 controller. Tables Table 2-21: and Table 2-22: show the cable connections. The shield attaches to chassis ground.

9-pin male connector

DB-9 DTE Pin Numbers	ACURT2 and ACURT4 Controller	Description
2	TXD (TB1-2)	Transmit Data
3	RXD (TB1-3)	Receive Data
5	SIG GND (TB1-1)	Signal Ground

Table 2-21: PC (9-pin) to ACURT2 or ACURT4 (RS-232)

25-pin male connector

DB-25 DTE Pin Numbers	ACURT2 and ACURT4 Controller	Description
2	RXD (TB1-3)	Receive Data
3	TXD (TB1-2)	Transmit Data
7	SIG GND (TB1-1)	Signal Ground

Table 2-22: PC (25-pin) to ACURT2 and ACURT4 (RS-232)

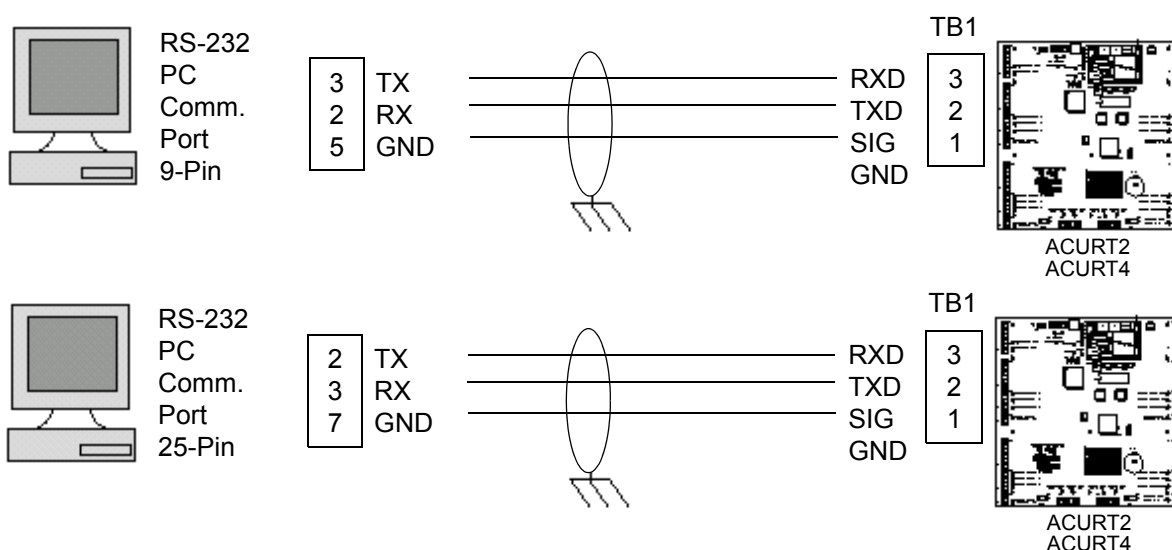


Figure 2-9 Typical RS-232C Interface Wiring from PC to ACURT2 or ACURT4 Controller

Connecting RS-485 Converter to the ACURT2 or ACURT4

Provide a two-pair shielded cable (Belden 9842 or equivalent required) between the server's communication port to the ACURT2 or ACURT4 controller.

RS-485 communications must be used if the server is more than 50 feet (15 meters) from an ACURT controller, or if there are multiple controllers.

Use the supplied RS-232C-to-RS-485 converter with the six-foot DB9 to DB25 cable to make this connection.

Installing the NCIC-5 RS-485 Converter

Configure the ACURT2 or ACURT4 controller for RS-485 communication and wire the units as shown in Figure Figure 2-10. An RS-485 terminator must be installed at the RS-485 (NCIC-5) converter as well as the farthest ACURT2 or ACURT4 device on the communication line. The maximum overall length of this cable (from RS-485 converter to the last ACURT2 or ACURT4 controller) is 4000 feet (1220 meters) using Belden 9842 or equivalent cable. Beyond this distance a modem must be used. For Dial up to the ACU panels, **a Robotics Sportster external modem must be used at the host computer.**

RS-485 Converter	RS-485 Terminator	ACURT2 and ACURT4 Controller	Description
FR. GND			Shield
RD(B)	RD+	TX+ (TB1-6)	Transmit Data (+)
RD(A)	RD2	TX- (TB1-7)	Transmit Data (-)
TD(B)	TD+	RX+ (TB1-8)	Receive Data (+)
TD(A)	TD2	RX- (TB1-9)	Receive Data (-)
+12VDC			+12 Volt
GND		SIG GND (TB1-1)	Power Supply Common

Table 2-23: Model NCIC-5 RS-485 Converter to ACURT2 or ACURT4

Jumpers on NCIC-5

Echo = ON

Control = No Jumper

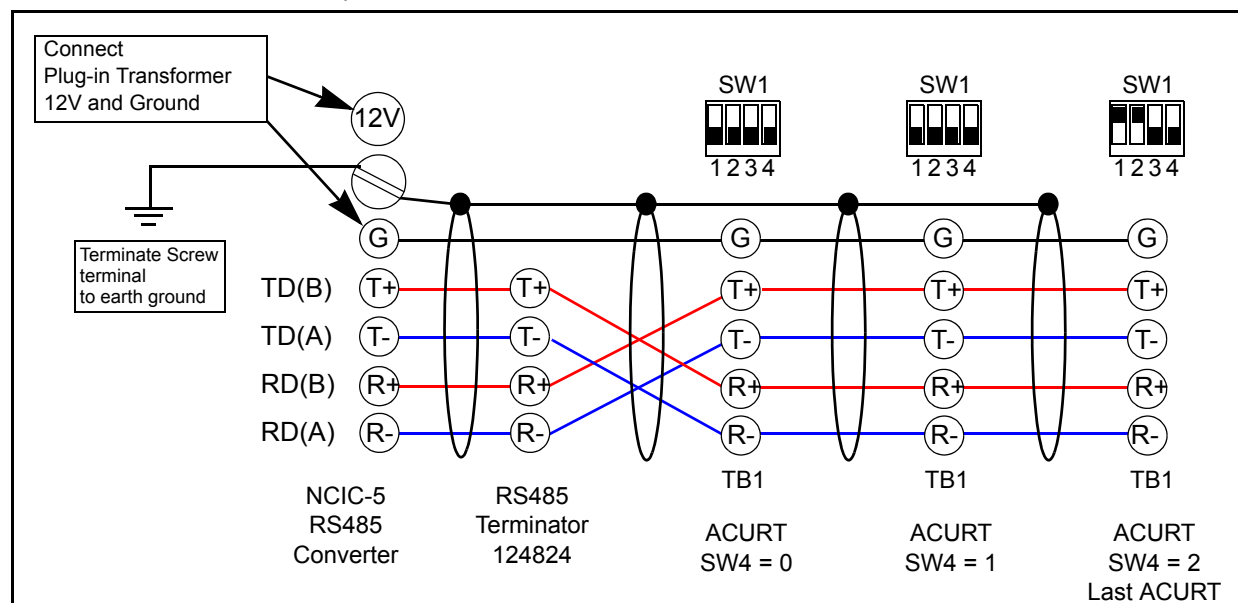


Figure 2-10 RS485 Communication wiring for Multiple ACURT's with NCIC-5 RS485 Converter

SW2 - Set to 9600 Baud - Dip Switches 1,2,3 On (All ACURT's)

SW3 - All ACURT's set Dip Switch 7 On

NCIC Jumper Settings: Echo = On, Control = No Jumper

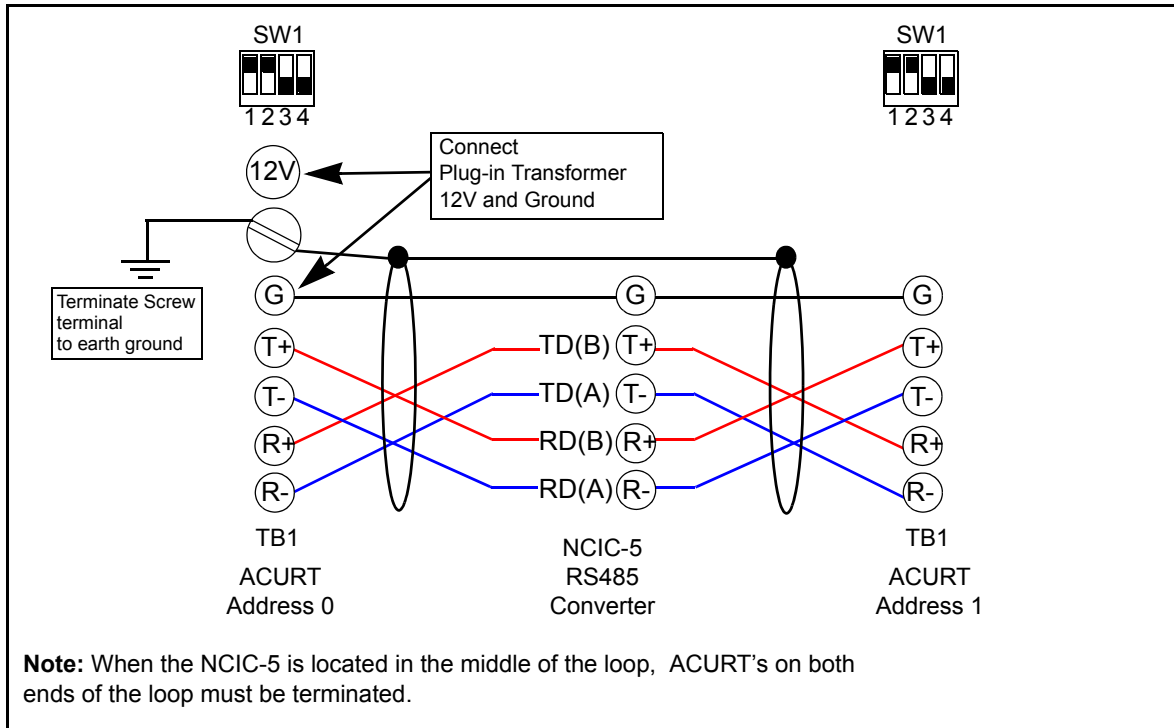


Figure 2-11 RS485 wiring for ACURT's with NCIC-5 RS485 Converter in Middle of Loop

NOTE: Shield refers to the over all braided shield, GND refers to the shield drain wire. Transmit should use one twisted pair and receive should use the other twisted pair.

With the server in the middle RS-485 communication going out in two directions, the RS-485 converter does not need to be terminated like in the example shown in Figure Figure 2-10 where the server is at one end. However, the last ACURT at both ends of the RS-485 line must be terminated with SW1 DIP switches S1 and S2 ON.

Wiring a NCIC-5 RS-485 Converter to the Server

If you do not have the 6-foot cable covered above you may wire the RS-485 converter as shown below

DB-9 Pin Numbers Male	RS-485 Converter NCIC-5 25-Pin Female
2	3
3	2
5	7

Table 2-24: Connecting DB-9 RS-485 Converter

The model NCIC-5 RS-485 converter can be plugged into the communication port via the supplied DB9 to DB25 six-foot cable.

Multi-dropping RS-485 from a LAN Connected ACU2RT

You may still multi-drop any ACURT panel from an ACURT connected to the LAN via RS-485 up to a maximum of 4,000 feet to the last ACURT from the LAN connected ACU2RT. See the wiring diagram below and the wiring table that follows.

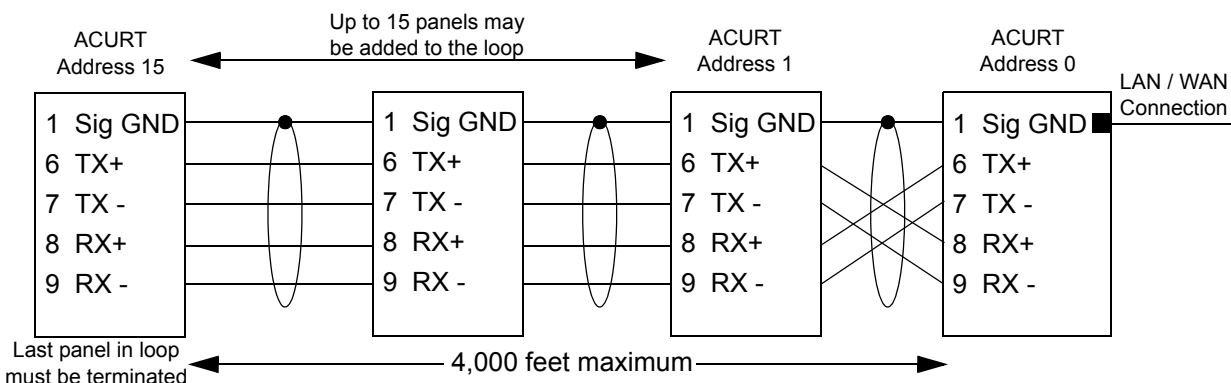


Figure 2-12 Multi-Drop RS-485 Wiring from a LAN Connected ACURT.

NOTE:

1. SW3 DIP switch 1 must be ON to enable the LAN connection.
2. Use SW1 to terminate the last ACURT panel in the RS484 loop.

DIP Switch Settings for ACURT2 and ACURT4

The locations of the various DIP switches on the ACURT2 and ACURT4 are shown in Figure Figure 2-8. Tables Table 2-25: through Table 2-30: describe how each DIP switch (SW1- SW7) is set. The rotary switch (SW4) described in Table Table 2-25: provides sixteen addresses 0 to 15 (0 to 'F' hexadecimal) for ACURT addressing.

NOTE: Switches SW2, SW3 and SW4 are read only at power-up and are ignored thereafter. When switch settings are changed, power **MUST** be turned OFF then turned ON **AFTER** the settings are changed. You can use SW7 to cycle power on the board.

DIP switch SW1 Communication Port Termination

To be switched on to terminate communications line when panel is last on the RS-485 loop.

Switch SW1	Description
S1	ON = Host TX Line Terminated
S2	ON = Host RX Line Terminated
S3	ON = Expansion Module Port TX Line Terminated
S4	ON = Expansion Module Port RX Line Terminated

Table 2-25: Switch SW1 Settings on the ACURT2 and ACURT4

DIP Switch SW2 Settings Baud Rate, Dial-up, Parity, and Com Type

Switch SW2	Switch Setting			Function
	S1	S2	S3	Host Communication Baud Rate
	OFF	OFF	OFF	19200
S1	ON	OFF	OFF	38400
	OFF	ON	OFF	57600
through	ON	ON	OFF	1200
	OFF	OFF	ON	115200
S3	ON	OFF	ON	2400
	OFF	ON	ON	4800
	ON*	ON*	ON*	9600
S4	OFF*			DES Encryption Enabled
S5	ON			Dial-Up Host Communications
	OFF*			Dedicated Host Communications
S6	ON			Use 5-wire RS-232 using RTS & CTS
	OFF*			Use RS-485 or 3-wire RS-232
S7	OFF*			Spare - Set OFF
S8	ON			Host Communication uses No Parity (modem)
	OFF*			Host Communication uses Even Parity

Table 2-26: DIP Switch SW2 Settings on the ACURT2 and ACURT4 Controller

* Denotes default setting.

DIP Switch SW3 Settings

Switch SW3	Description
S1	ON = LAN Enabled
S2	ON = Allow LAN IP Parameters Update
S3	ON = Default LAN IP Parameter
S4	ON = Triple DES Encryption Enabled
S5	ON = Spare – Leave OFF
S6	ON = Magnetic Stripe Cards
S7	ON = Battery Backed Up RAM *
S8	ON = Disable Watch Dog Timer

Table 2-27: DIP Switch SW3 Settings on the ACURT2 and ACURT4 Controller

* Denotes default setting.

Dip Switch SW4 (rotary switch) Settings ACURT Panel Addressing

Switch SW4	Description
0	ACURT field Panel # 0
1	ACURT field Panel # 1
2	ACURT field Panel # 2
3	ACURT field Panel # 3
4	ACURT field Panel # 4
5	ACURT field Panel # 5
6	ACURT field Panel # 6
7	ACURT field Panel # 7
8	ACURT field Panel # 8
9	ACURT field Panel # 9
A	ACURT field Panel # 10
B	ACURT field Panel # 11
C	ACURT field Panel # 12
D	ACURT field Panel # 13
E	ACURT field Panel # 14
F	ACURT field Panel # 15

Table 2-28: Rotary Switch SW4 Settings on the ACURT2 and ACURT4

DIP Switch SW5 and SW6 Settings Alarm Zone Termination for Readers.

Switch SW5	ON Position = Terminated – No Input Device Present OFF Position = Not Terminated – Zone In Use With End Of Line Resistor
S1	Terminates Zone Input Reader 0 Zone 0 with a 1k-ohm resistor
S2	Terminates Zone Input Reader 0 Zone 1 with a 1k-ohm resistor *
S3	Terminates Zone Input Reader 0 Zone 2 with a 1k-ohm resistor
S4	Terminates Zone Input Reader 1 Zone 0 with a 1k-ohm resistor
S5	Terminates Zone Input Reader 1 Zone 1 with a 1k-ohm resistor *
S6	Terminates Zone Input Reader 1 Zone 2 with a 1k-ohm resistor
Switch SW6	
S1	Terminates Zone Input Reader 2 Zone 0 with a 1k-ohm resistor
S2	Terminates Zone Input Reader 2 Zone 1 with a 1k-ohm resistor *
S3	Terminates Zone Input Reader 2 Zone 2 with a 1k-ohm resistor
S4	Terminates Zone Input Reader 3 Zone 0 with a 1k-ohm resistor
S5	Terminates Zone Input Reader 3 Zone 1 with a 1k-ohm resistor *
S6	Terminates Zone Input Reader 3 Zone 2 with a 1k-ohm resistor

Table 2-29: DIP Switch SW6 Settings Alarm Termination for Readers

* If exit push button is not connected, (reader zone 1), then another 1000 ohm resistor must be installed across the zone input.

DIP Switch SW7 Power Switch

Switch SW7	Description
Slide Switch	Turns on Boards Power Supply

Table 2-30: Switch SW7 Power Switch on the ACURT2 and ACURT4

Status LEDs on the ACURT2 and ACURT4

ACU Power-Up Self-test

The ACURT2 and ACURT4 should always be tested after installing any module. The power-up self-test indicators are for both the ACURT2 and ACURT4 controller. The LEDs will light as follows: at power-up, all ON, at hardware reset, all OFF.

Status LED	Description
1	ON indicating power-up
2	ON indicating successful RAM test
3	ON indicating successful PROM test
4	ON indicating initialization complete (1 second)

Table 2-31: Power-Up LED Status

ACURT Online Status

The normal operating indicators for the ACURT Controllers are indicated by LEDs 1 – 4. The LEDs on the ACURT Controller's PCB will light as follows:

Status LED	Description
1	Flashes at a 1 Hz rate
2	ON while transmitting to the Remote Modules
3	Two seconds OFF, then blinks once if Reader 0 is online, followed by blinking twice if Reader 1 is online, etc.
4	ON if zone voltage reference is ever out of range (indicates board or power supply failure)

Table 2-32: ACURT Online Status LEDs

LAN LED Status

Status LED	Description
TX	ON Transmitting
RX	ON Receiving
COL	ON Collision
Link	ON Cable connected
Rev	ON Cable reversed

Table 2-33: LAN LED Status

Host Port LED Status

Status LED	Description
Transmit Data	ON transmitting data to host computer
Receive Data	ON Receiving data from host computer

Table 2-34: Host Port LED Status

Reader Zones LED Status

Status LED	Description
Reader 0-3 Zone 0,1, & 2	OFF - Secure
	ON - Active Alarm
	Fast Flashing - Trouble (open or short, etc.)
	Slow Flashing - Masked

Table 2-35: Reader Zone LED Status

Relay and Door Strike LED Status

Status LED	Description
All Relays	ON Relay is energized

Table 2-36: Relay and Door Strike LED Status

Clearing the Memory on the ACURT2 and ACURT4

To clear memory, first power off the ACURT2 and ACURT4. Set the *even* switches (positions 2, 4, 6, & 8) on DIP switch SW2 to **ON** and the *odd* switches (positions 1, 3, 5, & 7) to **OFF**. Set the polling address of the Rotary Switch SW4 to **F**. Apply power to the ACURT2 or ACURT4. LEDs 1-4 will blink together indicating that the operation is complete. Turn power off and reset switches SW2 and SW4 to the desired settings.

Chapter 3

Reader Installation

GE Security's TOPAZ system comes standard with either one (1) set of two (2), or one (1) set of four (4) of the following standard readers.

Standard Readers:

- HID ProxPoint Plus 6005
- HID MiniProx 5365

Optional Readers and Keypads:

- HID ProxPro (with Keypad) 5355
- HID MaxiProx 5375 Long Range
- GE Security K11L Keypad
- GE Security IKE Keypad

This section covers the installation and wiring for the standard and optional readers/keypads for the GE Security TOPAZ system.

If the reader you are installing is not covered in this manual or you need additional information, please refer to the documentation that was shipped with the reader.

Refer to tables 2-6, 2-7, and 2-9 for reader 0 and 1 connections and tables 2-12 through 2-14 for readers 2 and 3 connections, available only on the ACURT4 controller.

NOTE: The GE Security IKE Keypad is a stand-a-lone keypad and will communicate via RS-485 on the ACURT Expansion Port. All other readers and keypads must be connected to one of the ACURT reader ports.

Reader Installation Direct Connection

The following readers can only be connected to the ACURT Reader Ports.

See the installation sheets packaged with the reader for specifications and other reader information.

Wiring HID ProxPoint Plus 6005 to the ACURT2 and ACURT4

Refer to tables 2-6, 2-7, and 2-9 for reader 0 and 1 connections and tables 2-12 through 2-14 for readers 2 and 3 connections, available only on the ACURT4 controller.

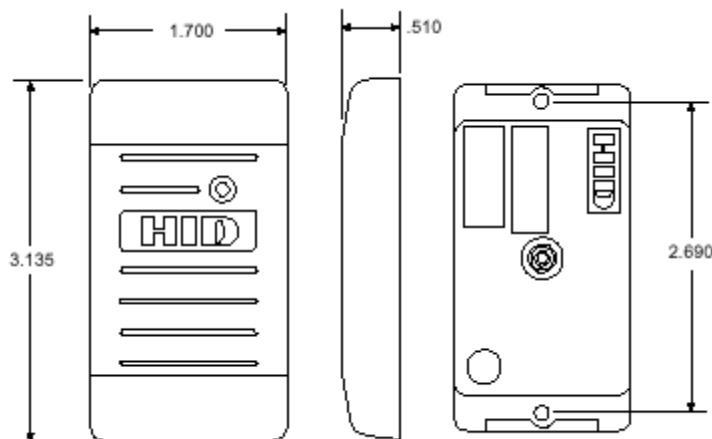


Figure 3-1: HID ProxPoint Plus 6005

Reader Wire Color	Description	Connection to ACURT2 TB2 or TB5 Reader 0 or Reader 1		Connection to ACURT4 TB12 or TB15 Reader 2 or Reader 3	
Red	+12 Volts	Pin 1	+12 VDC	Pin 1	+12 VDC
Black	Ground	Pin 3	0V	Pin 3	0V
Green	Data 0	Pin 4	Data 0	Pin 4	Data 0
White	Data 1	Pin 5	Data 1	Pin 5	Data 1
Shield	Shield Ground	Pin 3	0V	Pin 3	0V
Orange	Green LED	Pin 7	Green LED	Pin 7	Green LED
Brown	Red LED	Pin 6	Red LED	Pin 6	Red LED
Yellow	Beeper	Pin 8	Buzzer	Pin 8	Buzzer
Blue	Data Hold	No Connection		No Connection	
Violet	Card Present	No Connection		No Connection	

Table 3-1: Wiring HID ProxPoint Reader to the ACURT

The reader can be installed up to a maximum cable distance of 500 feet (152 meters) from the ACURT2 or ACURT4 using Belden cable #9514 or equivalent (4 pairs) 22 AWG, over-all foil shield.

HID ProxPoint Plus 6005 Point to Point Wiring

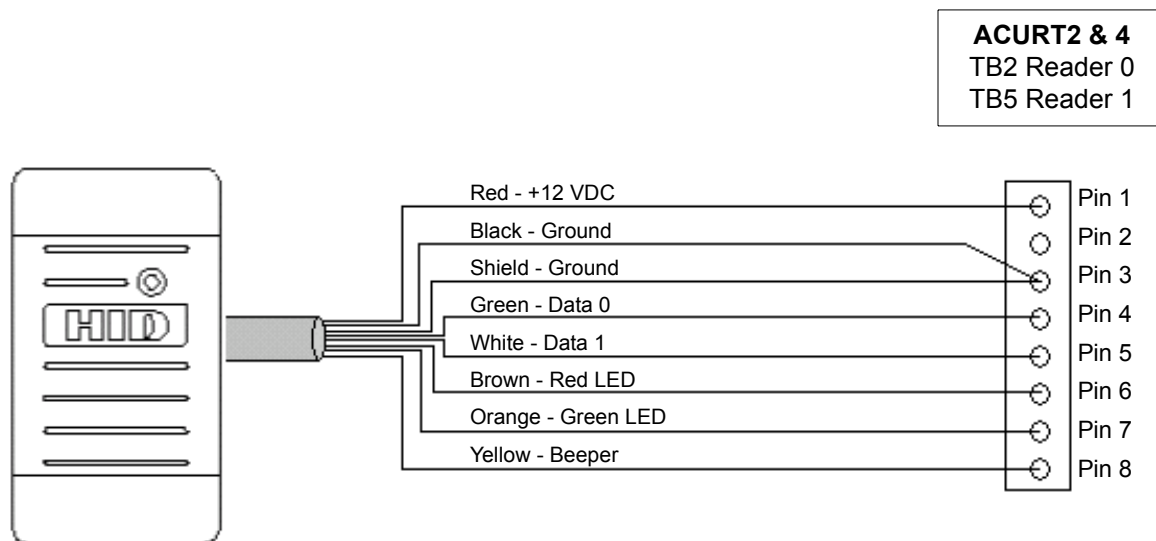


Figure 3-2: HID ProxPoint Plus 6005 Point to Point Wiring (ACURT2 and 4)

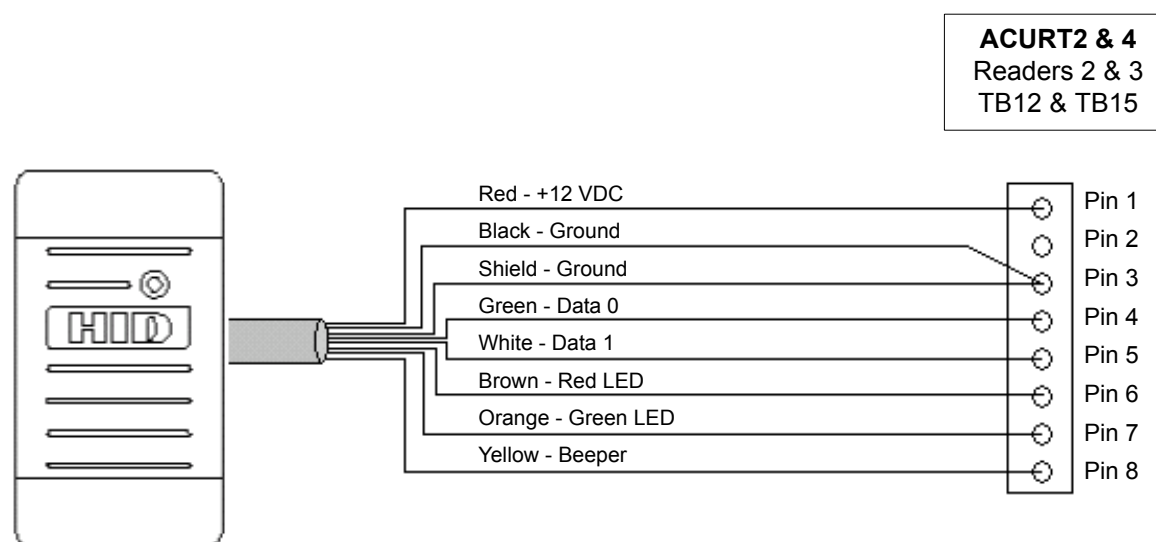


Figure 3-3: HID ProxPoint Plus 6005 Point to Point Wiring (ACURT4 Only)

Wiring HID MiniProx Model 5365 Reader to the ACURT

See the installation sheets packaged with the reader for specifications and other reader information.

Refer to tables 2-6, 2-7 and 2-9 for reader 0 and 1 connections and tables 2-12 through 2-14 for readers 2 and 3 connections, only available on the ACURT4 controller.

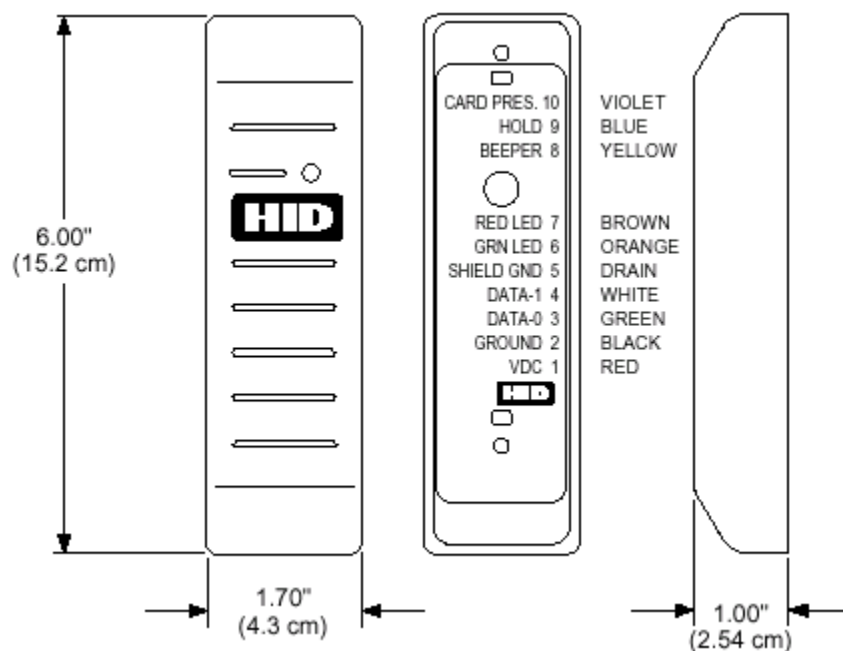


Figure 3-4: HID MiniProx 5365

Reader Wire Color	Description	Connection to ACURT2 TB2 or TB5 Reader 0 or Reader 1		Connection to ACURT4 TB12 or TB15 Reader 2 or Reader 3	
Red	+12 Volts	Pin 1	+12 VDC	Pin 1	+12 VDC
Black	Ground	Pin 3	0V	Pin 3	0V
Green	Data 0	Pin 4	Data 0	Pin 4	Data 0
White	Data 1	Pin 5	Data 1	Pin 5	Data 1
Shield	Shield Gnd	Pin 3	Ground	Pin 3	Ground
Orange	Green LED	Pin 7	Green LED	Pin 7	Green LED
Brown	Red LED	Pin 6	Red LED	Pin 6	Red LED
Yellow	Beeper	Pin 8	Buzzer	Pin 8	Buzzer
Blue	Data Hold	No Connection		No Connection	
Violet	Card Present	No Connection		No Connection	

Table 3-2: Wiring HID MiniProx Model 5365 Reader to the ACURT

The reader can be installed up to a maximum cable distance of 500 feet (152 meters) from the ACURT2 or ACURT4 using Belden cable #9514 or equivalent (4 pairs) 22 AWG, over-all foil shield.

HID MiniProx Model 5365 Point to Point Wiring

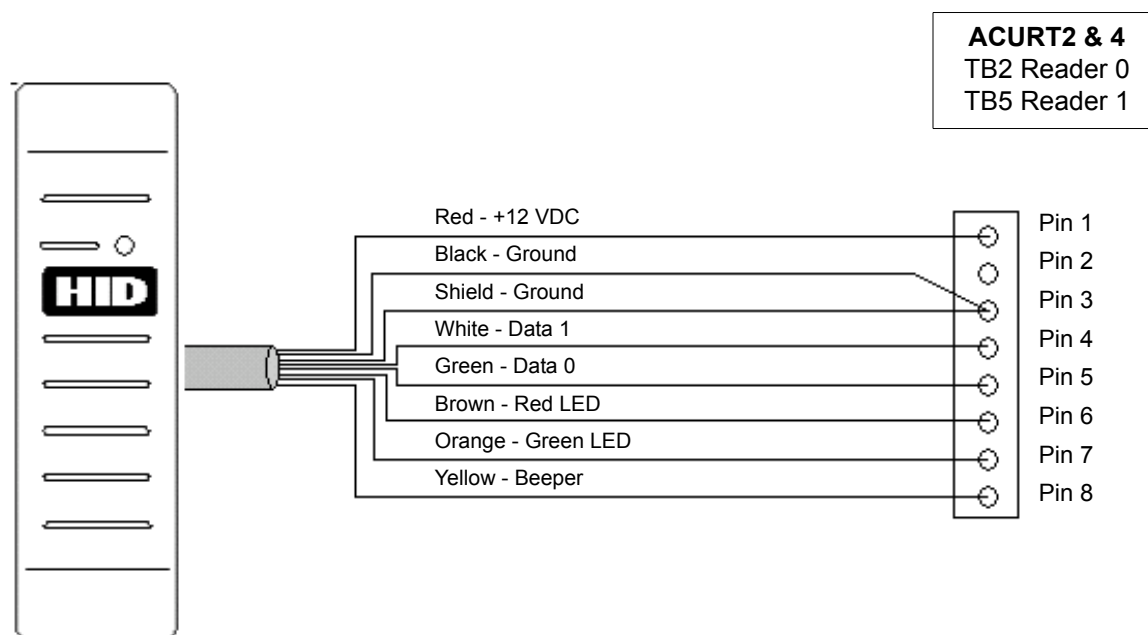


Figure 3-5: HID MiniProx Model 5365 Point to Point Wiring (ACURT2 and 4)

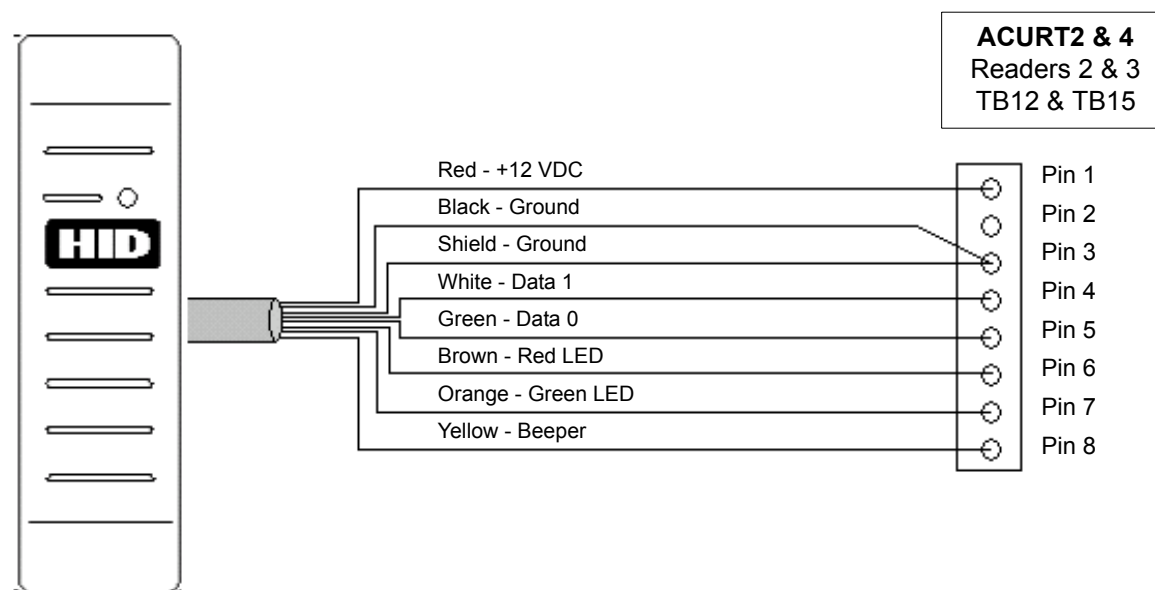


Figure 3-6: HID MiniProx Model 5365 Point to Point Wiring (ACURT4 Only)

Wiring Optional HID ProxPro Model 5355 Reader to the ACURT

See the installation sheets packaged with the reader for specifications and other reader information. Refer to tables 2-6, 2-7, and 2-9 for reader 0 and 1 connections and tables 2-12 through 2-14 for readers 2 and 3 connections, only available on the ACURT4 controller.

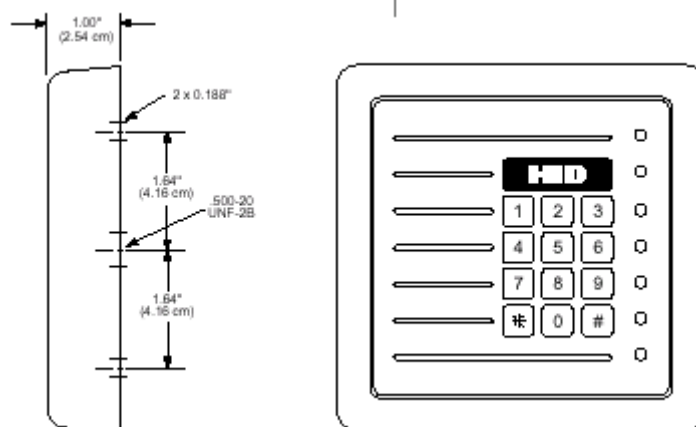


Figure 3-7: HID ProxPro 5355

Reader TB1	Description	Connection to ACURT2 TB2 or TB5 Reader 0 or Reader 1		Connection to ACURT4 TB12 or TB15 Reader 2 or Reader 3	
1	+12 Volts DC	Pin 1	+12 VDC	Pin 1	+12 VDC
2	Ground	Pin 3	0V	Pin 3	0V
3	Data 0	Pin 4	Data 0	Pin 4	Data 0
4	Data 1	Pin 5	Data 1	Pin 5	Data 1
5	Return	No Connection		No Connection	
6	Green LED	Pin 7	Green LED	Pin 7	Green LED
7	Red LED	Pin 6	Red LED	Pin 6	Red LED
8	Beeper	Pin 8	Buzzer	Pin 8	Buzzer
9	Hold/Card Present	No Connection		No Connection	
10	Tamper Common	No Connection		No Connection	
11	Tamper Select	No Connection		No Connection	

Table 3-3: Wiring HID ProxPro Model 5355 Reader to the ACURT

The reader can be installed up to a maximum cable distance of 500 feet (152 meters) from the ACURT2 or ACURT4 using Belden cable #9514 or equivalent (4 pairs) 22 AWG, over-all foil shield.

DIP Switch **SW1** should be set as listed below.

SW 1	ON	OFF	Function Description
1	X		Hardware Identity
2	X		Beeper Control
3		X	Green LED Control
4	X		Keypad
5	X		Single/Dual LED Control
6	X		Wiegand Data 1 Bias
7	X		
8	X		Not Used

Table 3-4: DIP Switch SW1 Settings

P1 jumper 1 and 2 when mounted on a metallic surface other wise jumper 2 and 3.

P2 jumper should be on 2 and 3.

Wiring Optional HID MaxiProx Model 5375 Long Range Reader

See the installation sheets packaged with the reader for specifications and other reader information. Refer to tables 2-6, 2-7, and 2-9 for reader 0 and 1 connections and tables 2-12 through 2-14 for readers 2 and 3 connections, only available on the ACURT4 controller.

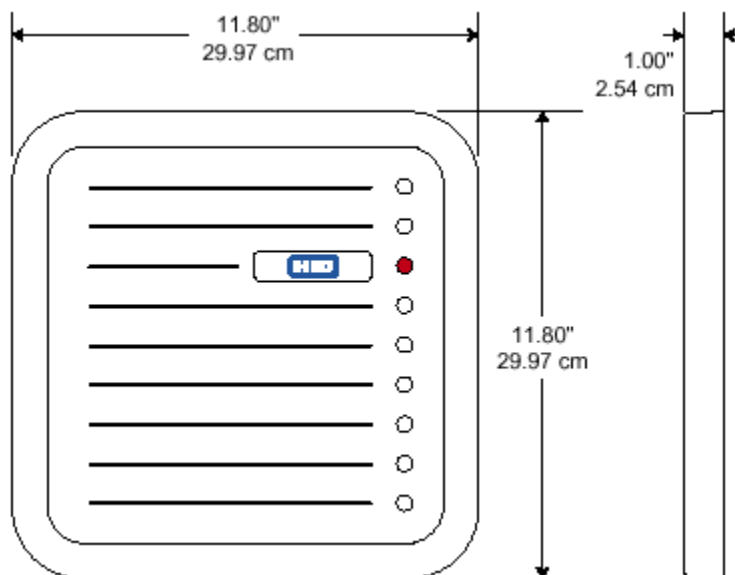


Figure 3-8: HID MaxiProx 5375 Long Range Reader

5375 Reader TB1	Description	Connection to ACURT2 TB2 or TB5 Reader 0 or Reader 1		Connection to ACURT4 TB12 or TB15 Reader 2 or Reader 3	
1	+24 Volts	24 VDC (2-Amp minimum) Aux power required		24 VDC (2-Amp minimum) Aux power required	
2	Shield Do not connect at reader	Pin 3	Ground	Pin 3	Ground
3	Ground	Pin 3	Ground	Pin 3	Ground

Table 3-5: Wiring HID MaxiProx Model 5375 Reader TB1 to the ACURT

5375 Reader TB1	Description	Connection to ACURT2 TB3 or TB6 Reader 0 or Reader 1		Connection to ACURT4 TB13 or TB16 Reader 2 or Reader 3	
4	Tamper	Pin 5	Z2 spare input	Pin 5	Z2 spare input
5	Tamper	Pin 6		Pin 6	

Table 3-6: Wiring HID MaxiProx Model 5375 Reader TB1 Tamper to the ACURT

5375 Reader TB 2	Description	Connection to ACURT2 TB2 or TB5 Reader 0 or Reader 1		Connection to ACURT4 TB12 or TB15 Reader 2 or Reader 3	
1	Data 0	Pin 4	Data 0	Pin 4	Data 0
2	Data 1	Pin 5	Data 1	Pin 5	Data 1
4	Green LED	Pin 7	Green LED	Pin 7	Green LED
5	Red LED	Pin 6	Red LED	Pin 6	Red LED
6	Beeper	Pin 8	Buzzer	Pin 8	Buzzer
3, 7, 8, & 9	Not Used				

Table 3-7: Wiring HID MaxiProx Model 5375 Reader TB2 to the ACURT

The reader can be installed up to a maximum cable distance of 500 feet (152 meters) from the ACURT2 or ACURT4.

DIP Switch **SW1** should be set as listed below.

SW 1	ON	OFF	Function Description
1	X		Wiegand Data Mode
2	X		Wiegand Data Mode
3	X		Wiegand Data Mode
4	X		Beep on Valid Card Read
5		X	Flash Green After Valid Card Read
6	X		External Dual LED control
7		X	Not Used
8		X	Not Used

Table 3-8: DIP Switch SW1 Factory Defaults

DIP Switch **SW 2** should be set as listed below.

SW 2	ON	OFF	Function Description
1	X		Leave as shown; not used.
2		X	
3		X	
4		X	
5		X	
6		X	
7		X	
8		X	

Table 3-9: DIP Switch SW2 Settings

DIP Switch **SW 5** should be set as listed below.

SW 5	ON	OFF	Function Description
1	X		Wiegand Data 0 Non-Isolated Output
2	X		Wiegand Data 1 Non-Isolated Output
3	X		Leave as shown; not used.
4		X	
5		X	
6		X	
7		X	
8		X	

Table 3-10: DIP Switch SW 5 Settings

Jumper Pins on 5375 Reader

Pin Jumper No.	Function	Position	Comment
P1	Tamper NC	2 & 3	Closed circuit tamper; tamper use optional; must run alarm wire to Z2
P2	DC Voltage	No Jumper	Factory default +24 VDC
P3	Interface jumpers (Wiegand Format)	1 & 2	Used with Dip switches SW1 & SW5; See mode chart below
P4		1 & 2	

Table 3-11: Jumper Pin settings

NOTES:

1. Factory default is no jumper on P2. The reader uses 24 VDC in this configuration.
2. Use a quality 24 VDC **linear type power** supply; the minimum current requirement is 2 Amperes per 5375 reader. See page 5 of 20, #9 of the Parts List in the HID installation manual.
3. The ground of the reader and the ground of the power supply must be common. Do this by connecting 0V (negative) of the **linear power supply** to TB2-3 or TB5-3 of the ACURT2 or TB12-3 or TB15-3 of the ACURT4.
4. Use of a tamper switch is optional; if one is used, it is not internal and requires a wired alarm zone.
5. Pins 3 and 4 jumpers are use in conjunction with the settings on SW 1 and SW 5 to provide a Wiegand format output. See Mode Chart table below.
6. The HID installation manual 5375-901 that comes with the 5375 reader should be used as an additional guide.

Mode Chart

Mode	SW1 - 1	SW1 - 2	SW1 - 3	SW5 - 3	SW5 - 4	SW5 - 5	P3 & P4 Jumpers
Wiegand	ON	ON	ON	NA	NA	NA	1 & 2

Table 3-12: 5375 Reader Switch Settings For Wiegand Mode

Wiring Optional K11L Keypad to the ACURT2 and ACURT4



Figure 3-9: GE Security K11L Keypad

Refer to tables 2-6, 2-7, and 2-9 for reader 0 and 1 connections and tables 2-12 through 2-14 for readers 2 and 3 connections, only available on the ACURT4 controller.

The keypad can be installed up to a maximum cable distance of 500 feet (152 meters) from the ACURT2 or ACURT4 using Belden cable #9514 or equivalent (4 pairs) 22 AWG, over-all foil shield.

J1 on K11L	Description	Connection to ACURT2 TB2 or TB5 Reader 0 or Reader 1		Connection to ACURT4 TB12 or TB15 Reader 2 or Reader 3	
Pin 1	0V	Pin 3	0V	Pin 3	0V
Pin 2	Data 1	Pin 5	Data 1	Pin 5	Data 1
Pin 3	Data 0	Pin 4	Data 0	Pin 4	Data 0
Pin 4	+5V	Pin 2	+5 VDC	Pin 2	+5 VDC
Pin 5	Green LED	Pin 7	Green LED	Pin 7	Green LED
Pin 6	Yellow LED	No Connection		No Connection	
Pin 7	Red LED	Pin 6	Red LED	Pin 6	Red LED
Pin 8	Buzzer	Pin 8	Buzzer	Pin 8	Buzzer

Table 3-13: Wiring GE Security K11L Keypad to the ACURT

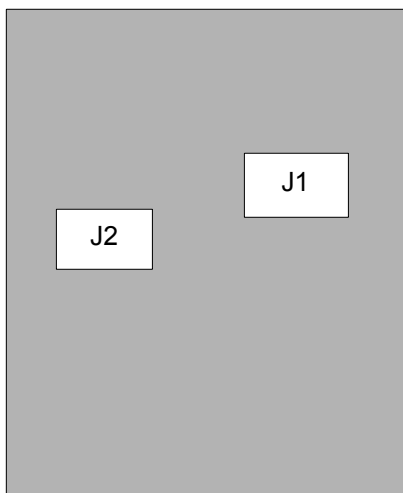


Figure 3-10: Rear View of the K11 Keypad.

Jumper Configuration For Reader Support

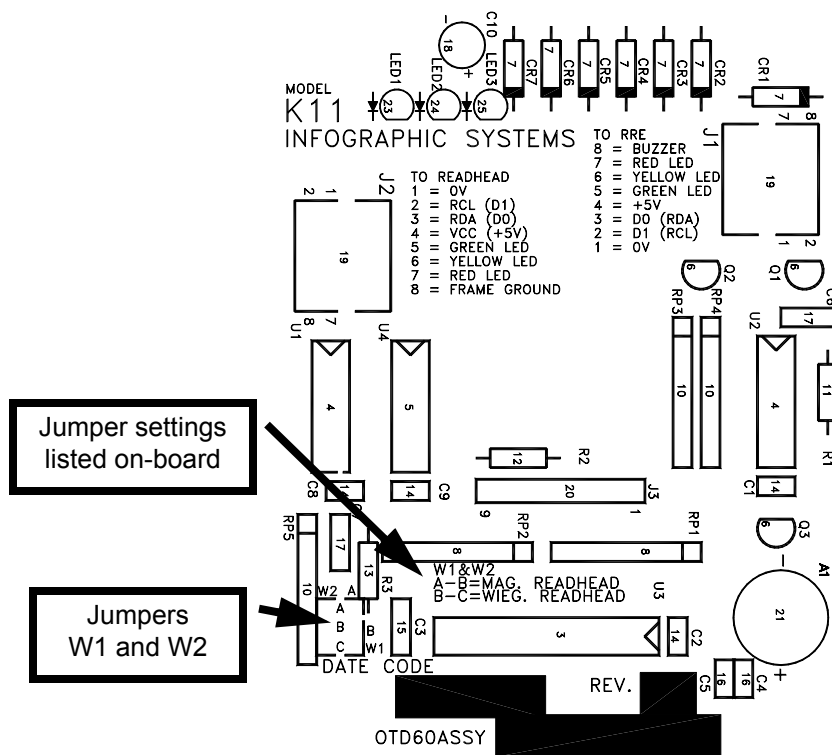


Figure 3-11: K11L Board Only with Jumper Locations

Jumpers W1 and W2 must be set to position B-C for Wiegand (typical) or A-B for magnetic stripe.

Chapter 4

RIM Optional Remote Input Module

The Remote Input Module (RIM) provides the interface from the ACURT controller and additional alarm sensors. The RIM consists of the electronic circuit board, and the screw terminal connector board, connected together by a ribbon cable. The RIM can be installed in its own tampered enclosure.

Each RIM provides 16 supervised inputs, 3 unsupervised inputs, and 2 relay outputs (dry contact relays (SPDT) Single Pole Double Throw).

The Remote Input Module connects to the expansion port on the ACURT. The ACURT2 and ACURT4 expansion port can support four (4) remote modules (RIM, RRM).

NOTE: The Remote Input Module requires optional 24 VDC ($\pm 15\%$) power supply.

Each of the 16 alarm inputs is supervised as 4-states: Alarm, Secure, Open, and Short.

A pair of 1 K ohm resistors, at the sensor end of each alarm circuit, ensures that the line resistance is typically 1 K ohm when the alarm is in the secure state.

Zone Input State	Sensor Circuit in Ohms Normally Closed	Sensor Circuit in Ohms Normally Open
Secure	1000	1000
Active	2000	500
Open	> 50000	> 50000
Short	< 50	< 50

Table 4-1: Alarm Zone Resistance Value



WARNING:

Do not use the ACURT controller, Remote Input Module (RIM) or Remote Relay Module (RRM) to switch any voltage above 30 volts. Failure to heed this WARNING: can cause death, personal injury, or damage to unit(s).

RIM Circuit Board

RIM Component Location

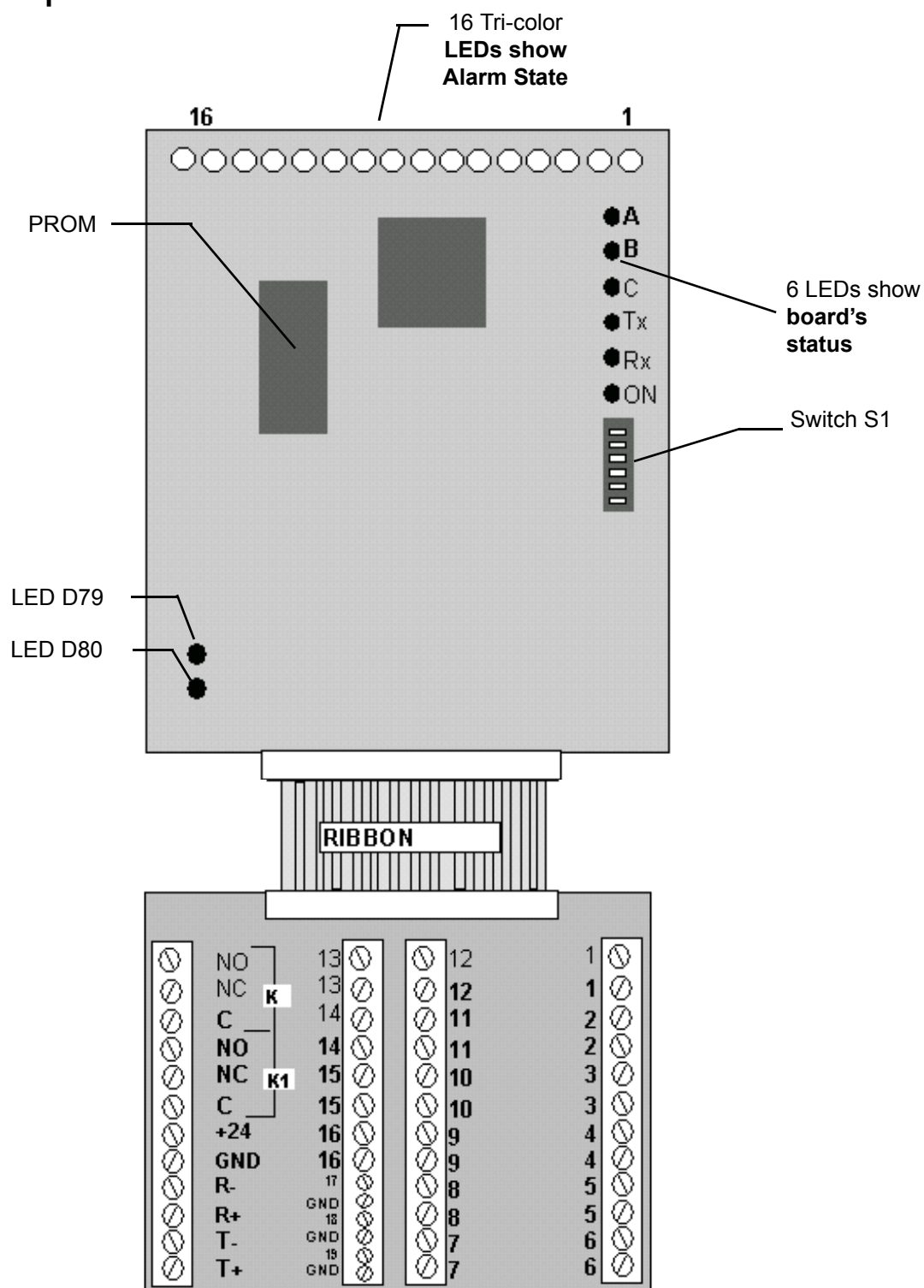


Figure 4-1: Location of Components on the RIM

Terminal Block Connector Pin Numbers on the RIM

Tables 4-2 through 4-7 show RIM terminal block wiring connections. Refer to Table 2-5 for applicable ACURT controller connections and cable identifications.

RIM Connections for Expansion Port

Pin No.	Term. Strip	Description	(Filled in by Installer) Connected to:	Cable Color (Filled in by Installer)
1	K2 N.O.	Aux Relay 2 Normally Open		
2	K2 N.C.	Aux Relay 2 Normally Closed		
3	K2 C.	Aux Relay 2 Common		
4	K1 N.O.	Aux Relay 1 Normally Open		
5	K1 N.C.	Aux Relay 1 Normally Closed		
6	K1 C.	Aux Relay 1 Common		
7	+24V	+ 24 VDC In	Aux Power	
8	GND	0 V	Aux Power	
9	R-	From ACURT TX (-)	ACURT TB8-3	
10	R+	From ACURT TX (+)	ACURT TB8-2	
11	T-	To ACURT RX (-)	ACURT TB8-5	
12	T+	To ACURT RX (+)	ACURT TB8-4	

Table 4-2: RIM Wiring Connections for Expansion Port 1

- For cable from the RIM to ACURT, the Belden cable numbers suggested:
No. 9842-24 AWG for 4000 feet (1220 meters) maximum distance.
- Install one RS-485 terminator on each expansion port.
- Install RS-485 terminator on the farthest expansion module.

NOTE: Remote Modules should be multi-dropped with no more than a 10-foot stub.



WARNING:

The Remote Input Module required optional DC power supply. DO NOT use the plug in power supply to power this board.

RIM Connections for TB1 - TB3

Zones Inputs 1-6

Pin No.	Term. Strip	Description	(Filled in by Installer) Connected to:	Cable Color (Filled in by Installer)
1	IN1	Zone Input 1		
2	IN1	Zone Input 1		
3	IN2	Zone Input 2		
4	IN2	Zone Input 2		
5	IN3	Zone Input 3		
6	IN3	Zone Input 3		
7	IN4	Zone Input 4		
8	IN4	Zone Input 4		
9	IN5	Zone Input 5		
10	IN5	Zone Input 5		
11	IN6	Zone Input 6		
12	IN6	Zone Input 6		

Table 4-3: RIM Wiring Connections for TB1 - TB3

NOTE: Refer to Figure 2-3 for wiring and terminating the field device to the RIM input.

RIM Wiring Connections for TB4 - TB7

Zone Inputs 7-12

Pin No.	Term. Strip	Description	(Filled in by Installer) Connected to:	Cable Color (Filled in by Installer)
1	IN12	Zone Input 12		
2	IN12	Zone Input 12		
3	IN11	Zone Input 11		
4	IN11	Zone Input 11		
5	IN10	Zone Input 10		
6	IN10	Zone Input 10		
7	IN9	Zone Input 9		
8	IN9	Zone Input 9		
9	IN8	Zone Input 8		
10	IN8	Zone Input 8		
11	IN7	Zone Input 7		
12	IN7	Zone Input 7		

Table 4-4: RIM Wiring Connections for TB4 - TB7

Zone Input Resistance States

Zone Input State	Sensor Circuit in Ohms Normally Closed	Sensor Circuit in Ohms Normally Open
Secure	1000	1000
Active	2000	500
Open	> 50000	> 50000
Short	< 50	< 50

Table 4-5: Input Zone Status By Resistance

NOTE: Refer to Figure 2-3 for wiring and terminating the field device to the RIM input.

LEDs for Alarm Zone Status

LEDs 1 - 16	Status of 16 Alarm points	Green - Secure
		Red - Active
		Yellow - Trouble (open or short, etc.)

Table 4-6: Alarm Zone Status LED indicators.

RIM Connections for TB8 - TB10

Zone Inputs 13-19

Pin No.	Term. Strip	Description	(Filled in by Installer) Connected to:	Cable Color (Filled in by Installer)
1	IN13	Zone Input 13		
2	IN13	Zone Input 13		
3	IN14	Zone Input 14		
4	IN14	Zone Input 14		
5	IN15	Zone Input 15		
6	IN15	Zone Input 15		
7	IN16	Zone Input 16		
8	IN16	Zone Input 16		
9	IN17	Unsupervised Zone Input 17		
10	GND	Ground		
11	IN18	Unsupervised Zone Input 18		
12	GND	Ground		
13	IN19	Unsupervised Zone Input 19		
14	GND	Ground		

Table 4-7: RIM Wiring Connections for TB8 - TB10

NOTE: Refer to Figure 2-3 for wiring and terminating the field device to the RIM input.

Setting the DIP Switches on the RIM

The 6-position DIP Switch (S1) located on the RIM (Figure 4-1) should be set according to Table 4-8.

NOTE: The switches are read at power-up and will be ignored thereafter. If it is necessary to change a setting, power **MUST** be cycled OFF then, **AFTER** the settings are changed, back ON.

Switch Number			Description
SW-1	SW-2		Module address:
Off	Off		Address 4
On	Off		Address 5
Off	On		Address 6
On	On		Address 7
SW-4			Alarm latching:
On			Enables latching, IN18 toggles to reset latched status
Off			Disables latching
SW-3	SW-5	SW-6	Zone Termination:
Off	Off	Off	1 Kohm = secure / 500 or 2 Kohm = alarm
On	Off	Off	200 ohms = secure / 10K = alarm
Off	On	Off	1 Kohm = secure / 3 Kohm = alarm / 5 or 7 Kohm = tamper
On	On	Off	Special Customer Configuration
Off	Off	On	Special Customer Configuration

Table 4-8: RIM DIP Switch Settings

LEDs Normal Operation on the RIM

The LEDs on the Remote Input Module will light as follows:

LED	Description
A	ON steady when board is Online
B	Heart beat 1 flash per second
C	Flashing when board is Off-line
Tx	Flashing when transmitting data to ACURT
Rx	Flashing when receiving data from ACURT
ON	ON when power is applied
D79	ON when relay 2 is energized
D80	ON when relay 1 is energized
LEDs 1 - 16	Status of 16 Alarm points Green - Secure Red - Active Yellow - Trouble (open or short, etc.)

Table 4-9: RIM Normal LED Status

Alarm Numbers for RIM Remote Input Module

Zone Input	Expansion Port Address 4	Expansion Port Address 5	Expansion Port Address 6	Expansion Port Address 7
IN1	128	144	160	176
IN2	129	145	161	177
IN3	130	146	162	178
IN4	131	147	163	179
IN5	132	148	164	180
IN6	133	149	165	181
IN7	134	150	166	182
IN8	135	151	167	183
IN9	136	152	168	184
IN10	137	153	169	185
IN11	138	154	170	186
IN12	139	155	171	187
IN13	140	156	172	188
IN14	141	157	173	189
IN15	142	158	174	190
IN16	143	159	175	191
IN17	96	100	104	108
IN18	97	101	105	109
IN19	98	102	106	110
RIM Off-line	99	103	107	111

Table 4-10: RIM Alarm Numbers for GE Security's TOPAZ

Relay Numbers for RIM Remote Input Module

Relay Number	Expansion Port Address 4	Expansion Port Address 5	Expansion Port Address 6	Expansion Port Address 7
K1	32	34	36	38
K2	33	35	37	39

Table 4-11: RIM Relay Numbers

Field Testing The RIM

Field Wiring Test

After making all connections and prior to connecting the ribbon cable to the RIM, the following tests should be made. Connections should already be completed at the ACURT and external power supply.

Test points and expected voltages

From	To	Voltage	Tolerance
GND	+24V	+ 24 VDC	3.5 VDC
T+	T-	+ 4.0 VDC *	0.5 VDC
R+	R-	+ 2.5 VDC *	0.5 VDC
+24V	Bldg. Gnd.	24 VDC	3.5 VDC
GND	Bldg. Gnd.	0 VDC	0.5 VDC
T+	Bldg. Gnd.	Less than 6.0 VDC	N/A
T-	Bldg. Gnd.	Less than 6.0 VDC	N/A
R+	Bldg. Gnd.	Less than 6.0 VDC	N/A
R-	Bldg. Gnd.	Less than 6.0 VDC	N/A

Table 4-12: RIM Test Points and Voltages

- After the first reader is connected, these voltages will modulate due to data on the line.

Most digital voltmeters should indicate about 2.0 VDC.

Power-Up Self Test

The Remote Input Module should always be tested after installation. The indicators for the RIM are the red LEDs located on the component board. See Figure 4-1 for the locations of LEDs. The LEDs will light as shown in Table 4-13.

LED	Description
A	ON at power-up
B	ON when successful RAM test is finished
C	ON when successful PROM test and initialization completed
ON	ON when power is applied
LEDs 1 - 16	All green, then all yellow, then all red

Table 4-13: Power-up LED Indicators on the RIM

Replacing The RIM

This procedure enables the user to replace the RIM.

**WARNING:**

Be sure to remove all power from the RIM to avoid personal injury or damage to the unit.

1. Remove all power from the RIM (from auxiliary power source).
2. Open RIM cover to access the wiring.

**CAUTION:**

The printed circuit boards or modules contain static-susceptible devices. Prior to handling them, be sure to follow the two rules below to avoid damaging these devices by static electricity:

1. Handle all static-sensitive components at a static-safeguarded work area.
 2. Transport all static-sensitive components in static-shield containers or packages.
-
3. Note the orientation and disconnect the ribbon cable on the RIM.
 4. Note the positions of the DIP switches (Figure 4-1). Set the switch settings on the replacement PCB to the required positions.
 5. Note the revision level of PROM U3 located on the RIM. See Figure 4-1. The revision letter should be the same or higher.
 6. Release the board from the standoffs by squeezing the pit of the standoff with a pair of needle nose pliers, then pull (gently) the RIM circuit board from each of the snap-in standoffs and remove the circuit board.
 7. Position the replacement circuit board on the snap-in standoffs until the circuit board firmly rests in place on the standoffs.
 8. Reconnect the ribbon cable removed in step 3 and set DIP switches.
 9. Perform "Power-up Self-Test on the RIM" and "Normal Operation Test on the RIM" found in Section 8 of this manual.

RIM Parts Replacement

133560	RIM Termination Board, Printed Circuit Board Assembly
133558	RIM Electronic board, Printed Circuit Board Assembly
133561-02	RIM Cable from Terminal Board to Electronics Board

Table 4-14: Parts Replacement Chart for RIM

RRM Optional Remote Relay Module

The Remote Relay Module (RRM) provides eight (8) single pole double throw (SPDT) and eight (8) double pole double throw (DPDT) dry contact relays.

Each relay is rated 2 Amps at 30 VDC.

Three LEDs provide heartbeat feedback and online status. Nineteen hardware controlled LEDs provide communication, power, and relay status.

Two unsupervised inputs are available for power fault and cabinet tamper.

The Remote Relay Module connects to the expansion port on the ACURT. The ACURT expansion port can support four (4) remote modules (RIM, RRM).

NOTE: The Remote Relay Module requires optional 24 VDC ($\pm 15\%$) power supply.

WARNING:



Do not use the ACURT controller, Remote Input Module (RIM) or Remote Relay Module (RRM) to switch any voltage above 30 volts. Failure to heed this WARNING can cause death, personal injury, or damage to unit(s).

RRM Circuit Board

RRM Component Location

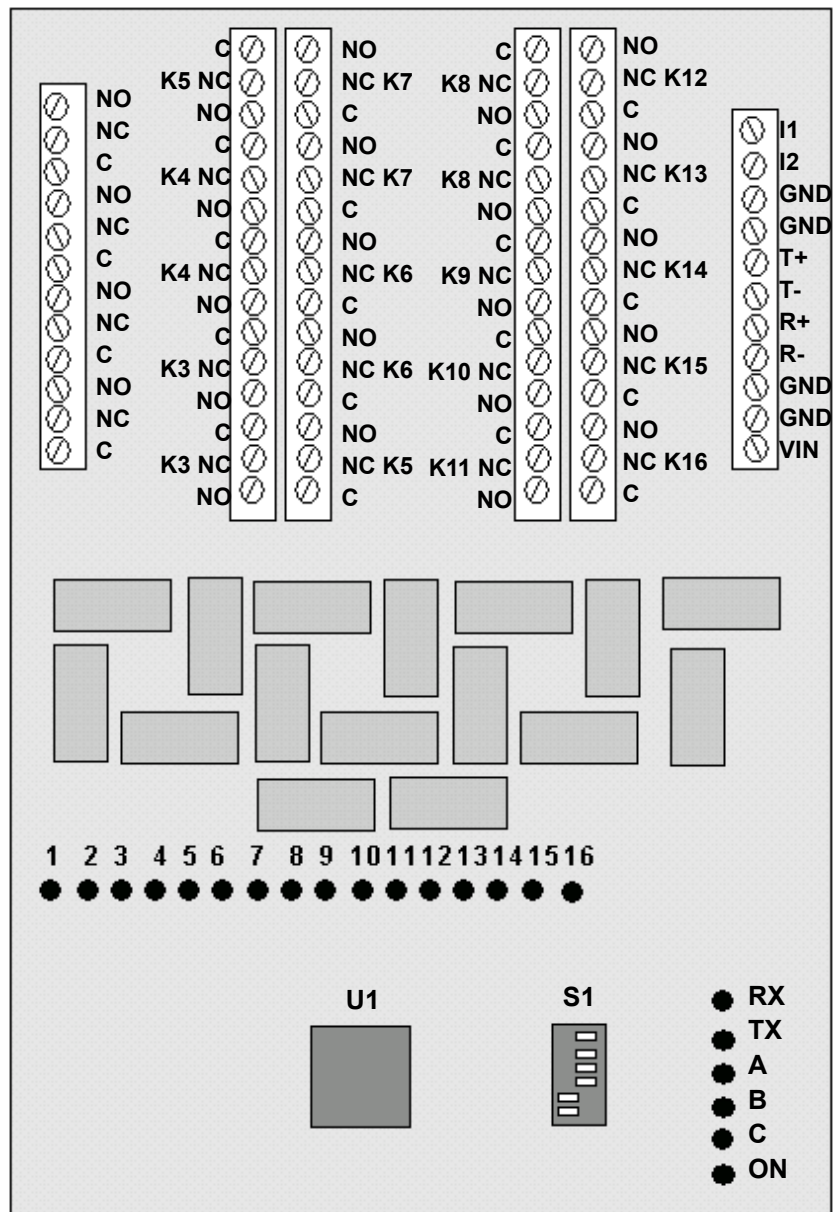


Figure 4-2: Locations of Components on the RRM

RRM Terminal Block Connector Pin Numbers

Tables 4-15 through 4-21 show RRM terminal block wiring connections. Refer to Table 2-5 for applicable ACURT controller connections and cable identifications.

RRM Connections for Expansion port 1

Term. Strip	Description	Connected to:	Cable Color (Filled in by Installer)
I1	Unsupervised alarm 1		
I2	Unsupervised alarm 2		
GND	Alarm common ground		
GND	Alarm common ground		
T+	Transmit +	ACURT TB8-4	
T-	Transmit -	ACURT TB8-5	
R+	Receive +	ACURT TB8-2	
R-	Receive -	ACURT TB8-3	
GND	Signal ground	ACURT TB8-1	
GND	Ground	Aux power	
VIN	+ 24 VDC In	Aux power	

Table 4-15: RRM Wiring Connections for Expansion port 1

NOTES:

- ACURT2 controller has one (1) expansion port and the ACURT4 has two (2) expansion ports. Four (4) expansion modules Remote Relay Modules (RRM) and Remote Input Modules (RIM) may be multi-dropped on each port.
- Belden cable numbers suggested:
 1. No. 9824-24 AWG for 4000 feet (1220 meters) maximum distance.
- Install one RS-484 terminator on each expansion port.
- Install RS-485 terminator on the farthest ACURT expansion cable.

Remote Modules should be multi-dropped with no more than a 10-foot stub.



WARNING:

The Remote Relay Module required optional DC power supply. DO NOT use the plug in power supply to power this board.

RRM Normal LED Operation

LED	Description
A	ON steady when board is on-line
B	Heart beat 1 flash per second
C	Flashing when board is off-line
Tx	Flashing when transmitting data to ACURT
Rx	Flashing when receiving data from ACURT
ON	ON when power is applied
LEDs 1 - 16	One LED per relay LED is ON when relay is energized

Table 4-16: RRM Normal LED Operation

RRM Connections for Relays 1 & 2

Term. Strip	Description	Connected to: (Filled in by Installer)	Cable Color (Filled in by Installer)
K2 NO	Relay 2 Normally Open		
K2 NC	Relay 2 Normally Closed		
K2 C	Relay 2 Common		
K2 NO	Relay 2 Normally Open		
K2 NC	Relay 2 Normally Closed		
K2 C	Relay 2 Common		
K1 NO	Relay 1 Normally Open		
K1 NC	Relay 1 Normally Closed		
K1 C	Relay 1 Common		
K1 NO	Relay 1 Normally Open		
K1 NC	Relay 1 Normally Closed		
K1 C	Relay 1 Common		

Table 4-17: RRM Wiring Connections for Relays 1 & 2

NOTE: Relay 1-7 on the RRM is DPDT (double pole double throw) and both poles are available.

RRM Connections for Relays 3 - 5

Term. Strip	Description	Connected to: (Filled in by Installer)	Cable Color (Filled in by Installer)
K5 C	Relay 5 Common		
K5 NC	Relay 5 Normally Closed		
K5 NO	Relay 5 Normally Open		
K4 C	Relay 4 Common		
K4 NC	Relay 4 Normally Closed		
K4 NO	Relay 4 Normally Open		
K4 C	Relay 4 Common		
K4 NC	Relay 4 Normally Closed		
K4 NO	Relay 4 Normally Open		
K3 C	Relay 3 Common		
K3 NC	Relay 3 Normally Closed		
K3 NO	Relay 3 Normally Open		
K3 C	Relay 3 Common		
K3 NC	Relay 3 Normally Closed		
K3 NO	Relay 3 Normally Open		

Table 4-18: RRM Wiring Connections for Relays 3 - 5

NOTE: Relay 1-7 on the RRM is DPDT (double pole double throw) and both poles are available.

RRM Connections for Relays 5-7

Term. Strip	Description	Connected to: (Filled in by Installer)	Cable Color (Filled in by Installer)
K7 NO	Relay 7 Normally Open		
K7 NC	Relay 7 Normally Closed		
K7 C	Relay 7 Common		
K7 NO	Relay 7 Normally Open		
K7 NC	Relay 2 Normally Closed		
K7 C	Relay 7 Common		
K6 NO	Relay 6 Normally Open		
K6 NC	Relay 6 Normally Closed		
K6 C	Relay 6 Common		
K6 NO	Relay 6 Normally Open		
K6 NC	Relay 6 Normally Closed		
K6 C	Relay 6 Common		
K5 NO	Relay 5 Normally Open		
K5 NC	Relay 5 Normally Closed		
K5 C	Relay 5 Common		

Table 4-19: RRM Wiring Connections for Relays 5-7

NOTE: Relay 1-7 on the RRM is DPDT (double pole double throw) and both poles are available.

RRM Connections for Relays 8-11

Term. Strip	Description	Connected to: (Filled in by Installer)	Cable Color (Filled in by Installer)
K8 C	Relay 8 Common		
K8 NC	Relay 8 Normally Closed		
K8 NO	Relay 8 Normally Open		
K8 C	Relay 8 Common		
K8 NC	Relay 8 Normally Closed		
K8 NO	Relay 8 Normally Open		
K9 C	Relay 9 Common		
K9 NC	Relay 9 Normally Closed		
K9 NO	Relay 9 Normally Open		
K10 C	Relay 10 Common		
K10 NC	Relay 10 Normally Closed		
K10 NO	Relay 10 Normally Open		
K11 C	Relay 11 Common		
K11 NC	Relay 11 Normally Closed		
K11 NO	Relay 11 Normally Open		

Table 4-20: RRM Wiring Connections for Relays 8-11

RRM Connections for Relays 12-16

Term. Strip	Description	Connected to: (Filled in by Installer)	Cable Color (Filled in by Installer)
K12 NO	Relay 12 Normally Open		
K12 NC	Relay 12 Normally Closed		
K12 C	Relay 12 Common		
K13 NO	Relay 13 Normally Open		
K13 NC	Relay 13 Normally Closed		
K13 C	Relay 13 Common		
K14 NO	Relay 14 Normally Open		
K14 NC	Relay 14 Normally Closed		
K14 C	Relay 14 Common		
K15 NO	Relay 15 Normally Open		
K15 NC	Relay 15 Normally Closed		
K15 C	Relay 15 Common		
K16 NO	Relay 16 Normally Open		
K16 NC	Relay 16 Normally Closed		
K16 C	Relay 16 Common		

Table 4-21: RRM Wiring Connections for Relays 12-16

RRM Setting the DIP Switches

The 6-position DIP Switch (S1) located on the RRM (Figure 4-2) should be set according to Table 4-22.

NOTE: The switches are read at power-up and will be ignored thereafter. If it is necessary to change a setting, power **MUST** be cycled OFF then, **AFTER** the settings are changed, back ON.

Switches 1,2 - Communication	1 = OFF 2 = OFF Address 4 1 = ON 2 = OFF Address 5 1 = OFF 2 = ON Address 6 1 = ON 2 = ON Address 7
Switch 3	Spare
Switch 4	Spare
Switch 5	Spare
Switch 6	Spare

Table 4-22: RRM DIP Switch Settings

Relay Numbers for RRM Remote Relay Module

Relay Numbers	Expansion Port Address 4	Expansion Port Address 5	Expansion Port Address 6	Expansion Port Address 7
K1	112	128	144	160
K2	113	129	145	161
K3	114	130	146	162
K4	115	131	147	163
K5	116	132	148	164
K6	117	133	149	165
K7	118	134	150	166
K8	119	135	151	167
K9	120	136	152	168
K10	121	137	153	169
K11	122	138	154	170
K12	123	139	155	171
K13	124	140	156	172
K14	125	141	157	173
K15	126	142	158	174
K16	127	143	159	175

Table 4-23: Relay 128 Numbers for RRM Remote Relay Module

Alarm Numbers for RRM Remote Relay Module

Zone Number	Expansion Port Address 4	Expansion Port Address 5	Expansion Port Address 6	Expansion Port Address 7
I1	97	101	105	109
I2	98	102	106	110
RRM Off-line	99	103	107	111

Table 4-24: RRM Alarm Numbers

Field Testing The RRM

RRM Field Wiring Test

After making all connections and prior to connecting the ribbon cable to the RRM, the following tests should be made. Connections should already be completed at the ACURT and external power supply.

Test points and expected voltages

Test points and expected voltages

From	To	Voltage	Tolerance
GND	VIN	+ 24 VDC	3.5 VDC
T+	T-	+ 4.0 VDC *	0.5 VDC
R+	R-	+ 2.5 VDC *	0.5 VDC
+24V	Bldg. Gnd.	24 VDC	3.5 VDC
GND	Bldg. Gnd.	0 VDC	0.5 VDC
T+	Bldg. Gnd.	Less than 6.0 VDC	N/A
T-	Bldg. Gnd.	Less than 6.0 VDC	N/A
R+	Bldg. Gnd.	Less than 6.0 VDC	N/A
R-	Bldg. Gnd.	Less than 6.0 VDC	N/A

Table 4-25: RRM Test Points and Voltages

- After the first reader is connected these voltages will modulate due to data on the line.

Most digital voltmeters should indicate about 2.0 VDC.

Power-Up Self-Test on the RRM

The Remote Relay Module should always be tested after installation. The indicators for the RRM are the red LEDs located on the component board. The LEDs will light as follows:

LED	Description
A	ON at power-up
B	ON when successful RAM test is finished
C	ON when successful PROM test and initialization is completed
ON	ON when power is applied

Table 4-26: Power-up LED Indicators on the RRM

After all three LEDs have lit, LED B will flash at a 1 Hz rate.

Normal Operation Test on the RRM

The operation and status LEDs will light as follows:

LED	Description
A	ON steady when board is on-line with the ACURT controller
B	Heart beat 1 flash per second
C	Flashing when board is off-Line
Tx	Flashing when transmitting data to ACURT
Rx	Flashing when receiving data from ACURT
ON	ON when power is applied
LEDs 1 - 16	One LED per relay LED is ON when relay is energized

Table 4-27: Normal LED Indicators on the RRM

Replacing The RRM

This procedure enables the user to replace the RRM.

**WARNING:**

Be sure to remove all power from the RRM to avoid personal injury or damage to the unit.

1. Remove all power from the RRM (from the ACURT controller or other auxiliary power source).
2. Open RRM cover to access the wiring.

**CAUTION:**

The printed circuit boards or modules contain static-susceptible devices. Prior to handling them, be sure to follow the two rules below to avoid damaging these devices by static electricity:

1. Handle all static-sensitive components at a static-safeguarded work area.
2. Transport all static-sensitive components in static-shield containers or packages.
3. Tag and note the orientation of the 6 terminal connectors then disconnect the terminal connectors on the RRM.
4. Note the positions of the DIP switches (Figure 4-2). Set the switch settings on the replacement PCB to the required positions.
5. Note the revision level of PROM U1 located on the RRM (Figure 4-2). The revision letter should be the same or higher.
6. Release the board from the standoffs by squeezing the pit of the standoff with a pair of needle nose pliers, then pull (gently) the RRM circuit board from each of the snap-in standoffs and remove the circuit board.
7. Position the replacement circuit board on the snap-in standoffs until the circuit board firmly rests in place on the standoffs.
8. Reconnect the terminal connectors removed in step 3.
9. Perform "Power-up Self-Test on the RRM" and "Normal Operation Test on the RRM" found on the previous page.

RRM Parts Replacement

133563	RRM Printed Circuit Board Assembly
--------	------------------------------------

Table 4-28: Parts Replacement Chart for RRM

Elevator Control Relay Interface

Overview

The Elevator Control Software (ECS) is an enhancement that allows TOPAZ to manage floor access. This feature is turned on in the Field Panel configuration page. TOPAZ associates cab and floor numbers with a security area and relay.

Once a field panel is configured for the elevator control function it can only be used for elevator control. The relays on an elevator control field panel are always in the activated (on) state. A valid access will deactivate the relay(s) for the authorized floor(s) on the cab being used.

The Elevator Control Software (ECS) can support up to all 32 readers configured as elevator cabs even if the cabs are in different buildings. Elevator cabs used in conjunction with this feature should be equipped with card readers, which may or may not have keypads. Two (2) elevator cabs are supported on the ACURT2 and four (4) cabs on the ACURT4 field panels.

ECS controls access to different floors for each badge holder using security area(s)/group and time schedules per card per floor. The software verifies that the cardholder has access to the cab and floor combination. If access is allowed the system will send a momentary relay deactivation command to the elevator control panel.

Configuring the Elevator Control is a five-step process:

1. Install the specific hardware that supports elevator control. Install card readers in the elevator cabs and connect the control relays as the interface to the elevator control panel.
2. Define the field panel configuration used with the elevator cabs. You can configure any reader on an Elevator ACURT2 or ACURT4 as an elevator cab reader. There is no special elevator configuration needed in the Reader Setup.

NOTE: Once an ACURT is configured for Elevator Control is can only be used for Elevator Control.

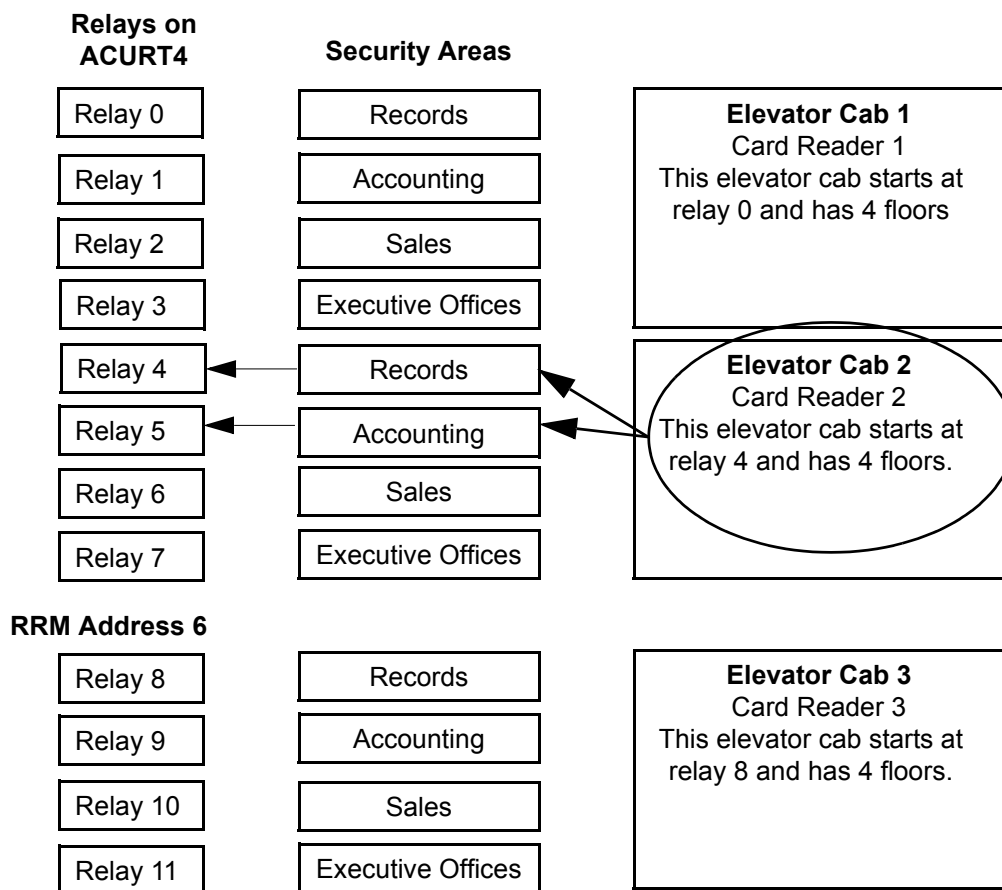
3. Configure a Security Area for each floor that the elevator cab(s) will control access to.
4. Define the elevator cabs and floors accessible by the cab. Up to 40 floors can be configured by adding two (2) RRM's (address 6 and 7) to the ACURT4. For more information on this step, see "Elevator Floor Definition" below.
5. Setup and configure the Elevator Control itself.

Elevator Floor Definition

The ACURT2 field panel has 4 onboard relays and the ACURT4 has 8 onboard relays. The ACURT2 and ACURT4 can have two (2) RRM's added for a maximum of 36 or 40 relays maximum for elevator control. The relay numbering will be different depending on which ACURT is used, see the relay numbering chart on the next page.

The example below is using an ACURT4 with one RRM (addressed #6). There are 3 Elevator Cabs controlling 4 floors each. Each relay would be given a security area for access authorization. Each elevator cab must have its own reader. When a card is read in Elevator Cab 2 and the user has access to areas "Records" and "Accounting" then only relays 4 and 5 would operate.

NOTE: Only RRM's addressed 6 and 7 can be used for an ACURT that is configured for elevator control.



Elevator Relay Numbering

Relay Numbering for Elevator Control		
	ACURT2	ACURT4
Onboard ACURT	0 – 3	0 – 7
RRM Address 6	4 – 19	8 – 23
RRM Address 7	20 - 35	24 - 39

Table 4-29: Parts Replacement Chart for RRM

Standard Elevator Wiring

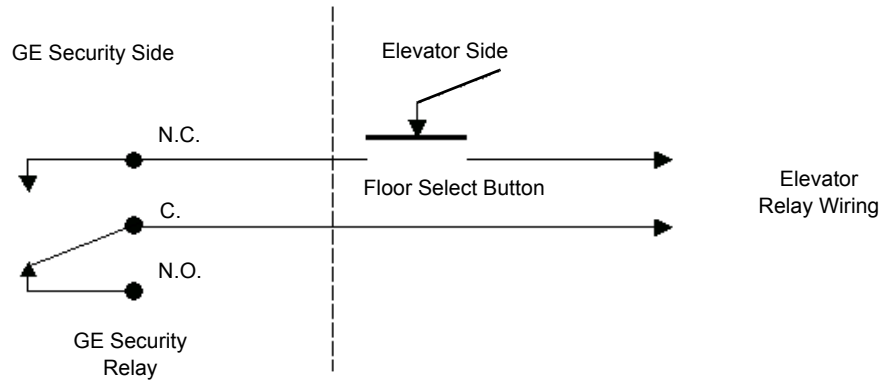


Figure 4-3: Elevator Control Relay Interface

NOTE: When an ACURT is used for elevator control, all of its relays are set to energize when not selected. If the ACURT were to fail, all floors will be enabled (Fail Safe).

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Chapter 5

Setting TCP/IP Address for ACURT2 / ACURT4

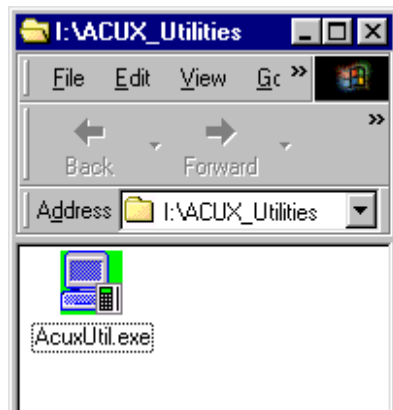
Setting IP Address

If the installation requires UL Listing, Network connections cannot be used.

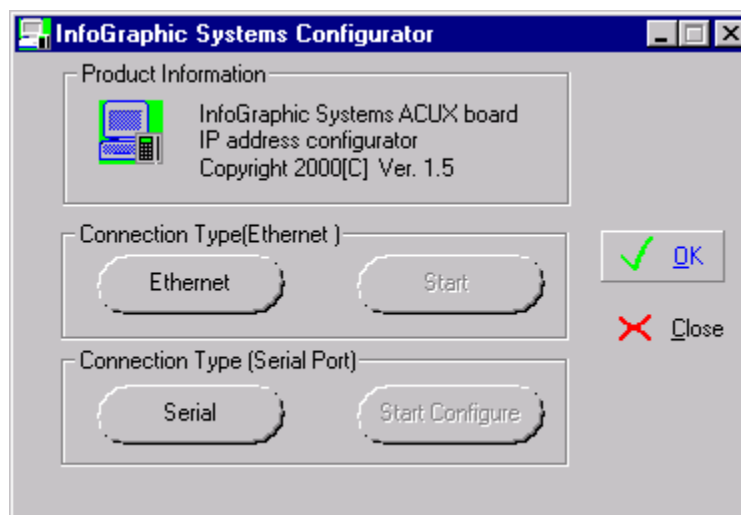
One of the simplest ways to set the IP address on the ACURT2 or ACURT4 is with a laptop computer in the field running the AcuxUtil.exe program.

If using the default IP address (SW3 switch 3 on) attach and configure only one ACURT at a time.

To set up the TCP/IP address for an ACURT field panel start by locating the **AcuxUtil.exe** file on the CD and start the utility by double-clicking on it's icon.



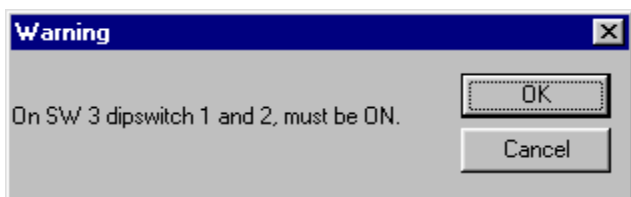
After starting the utility the following screen is displayed.



Set IP Address Through Ethernet

Before continuing make sure your PC has a network card installed with TCP/IP enabled. The IP address must be able to communicate to the ACURT. In other words, the first three sets of numbers of the computer's IP address must match the first three sets of numbers of the ACURT IP address. The default IP address of the ACURT is 192.168.0.132

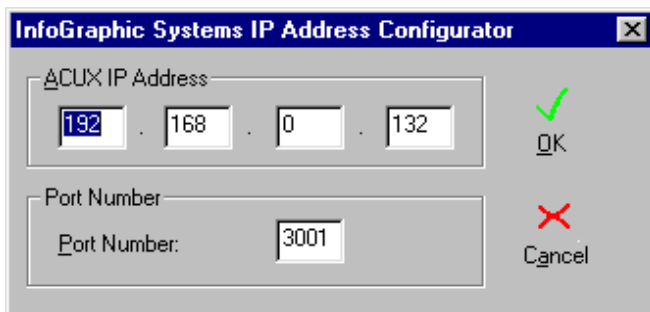
1. Click the **Ethernet** button.



2. Make sure that SW3 DIP switches 1 and 2 are ON before continuing.

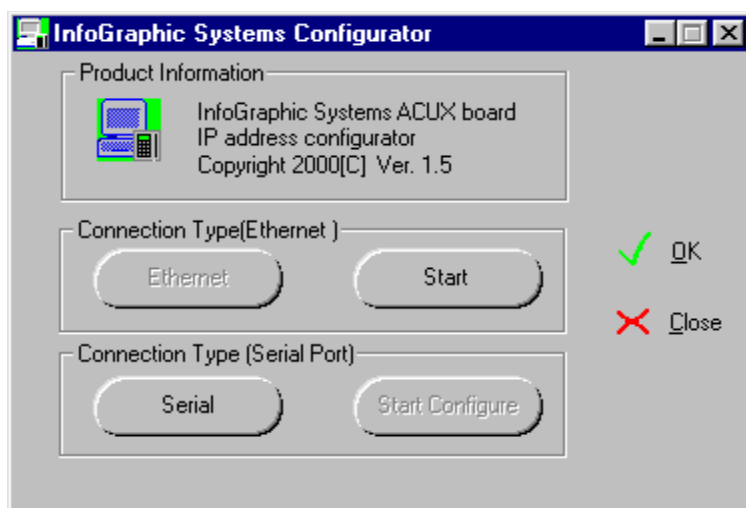
NOTE: If you change switch settings, you must restart the ACU by powering down and back up.

3. You must also know the IP address of the ACURT before continuing. If you do not know the current IP address for the ACURT, turn SW3 switch 3 ON to use the default IP address of 192.168.0.132.
4. Power must be cycled on the ACURT for the switches to be read.
5. After the switches are set properly, click **OK**.

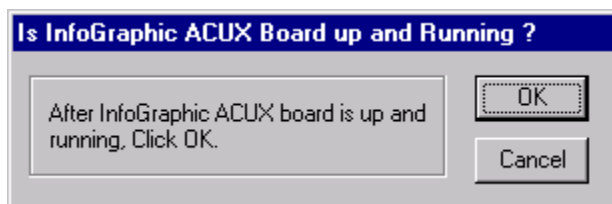


The IP Address of the ACURT has been set at the factory to a default of 192.168.0.132.

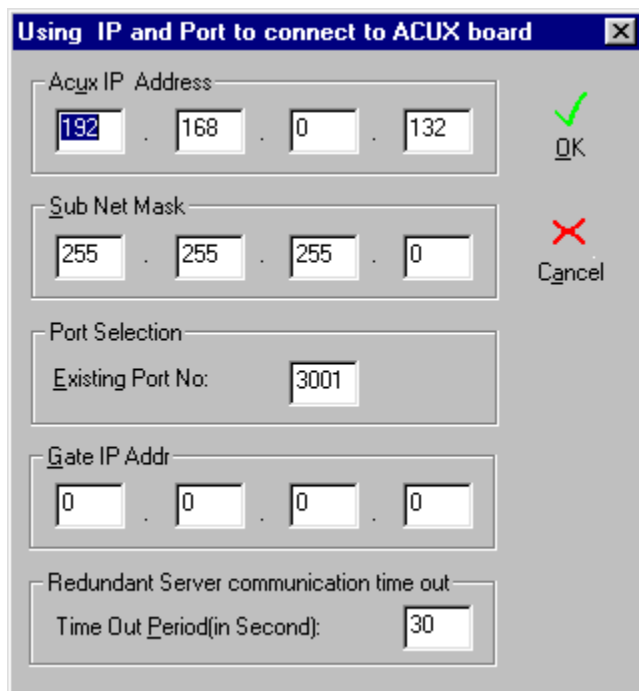
6. Enter the **IP address** for the ACURT
7. The **Port Number** will be left at the default 3001 unless you have multiple servers on your system. If using multiple servers change the last three digits (3000 plus the LAN number) of the Port Number to reflect the server number. For server number two the Port Number would be 3002.
8. Click **OK** to continue.



9. Click **Start** button to start the configuration of the IP Address.



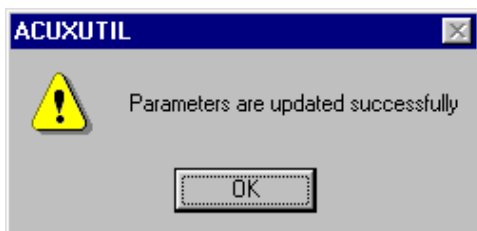
10. Make sure SW3 DIP Switches 1 and 2 are turned ON at the ACURT and click **OK**.



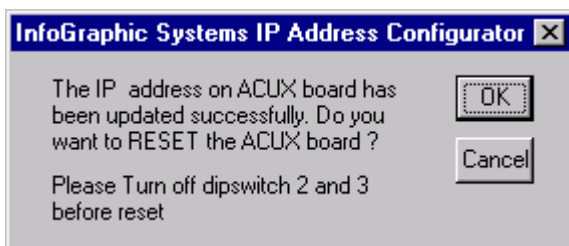
The addresses for this screen must be obtained from your MIS department.

11. Enter the new **ACURT IP Address**, **Sub Net Mask**, **Gate IP Address**, (Gateway or Router).

12. The **Existing Port No.** will be left at its default 3001 unless you have multi servers on your system. Change the last three digit of the Port No. to reflect the server number (3000 plus the LAN number). For server number two the Port No. would be 3002.
13. The **Time Out Period** is used for redundant systems only. The default is 30 Sec.
14. Click **OK** to continue.



15. The ACURT was updated successfully.
16. Click **OK** to continue.



17. Before continuing, make sure DIP switches 2 and 3 at the ACURT are turned OFF.
18. Click **OK** to continue and reset the ACURT.



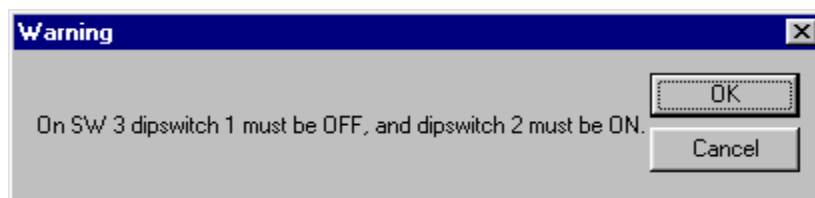
The ACURT has been updated with the new IP address.

19. Click **OK** to complete the setup.

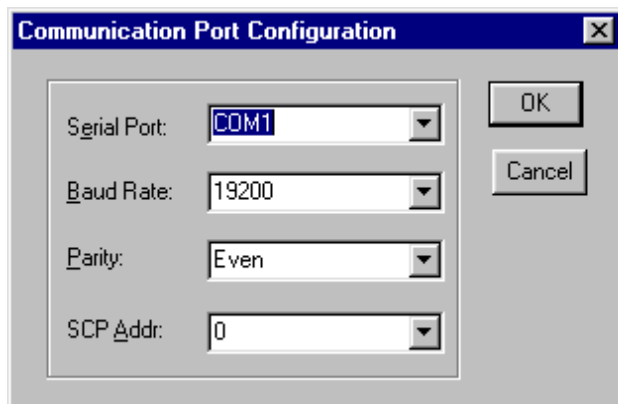
Set IP Address Through Serial Connection

The ACURT must be able to connect to the computer and power to the ACURT must be turned on.

1. Click the **Serial** button.



2. Turn SW3 DIP switch 1 OFF and 2 ON at the ACURT.
3. Power must be cycled on the ACURT for the switches to be read.
4. Click **OK** to continue.

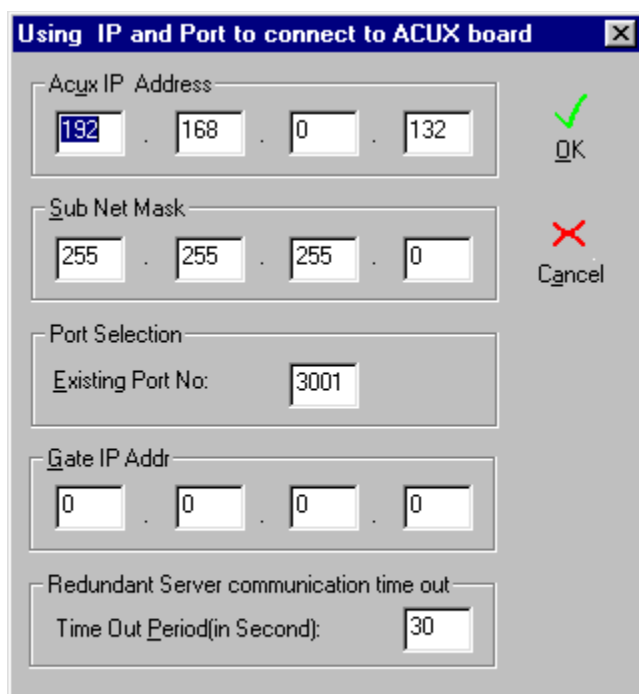


5. Select the Communication port that the ACURT is connected to.
6. Select the Baud Rate that the ACURT set to communicate at.
7. Parity should be left at Even.
8. The SCP Address is the communication address the ACURT is set at with SW4.
9. Click **OK**.

If the ACURT is not communicating the following message will appear.



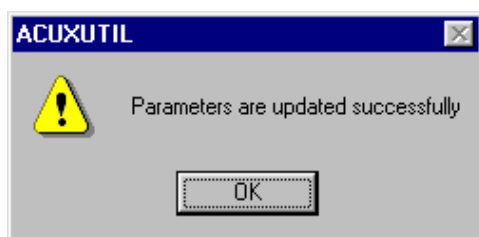
10. Click **OK** and check your Serial connection and try again.



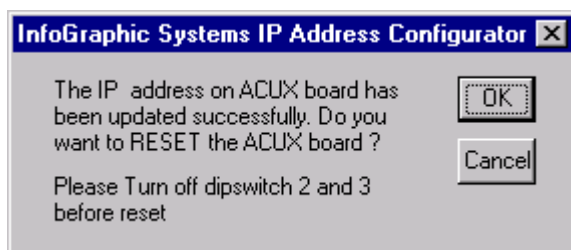
A dialog box titled "Using IP and Port to connect to ACUX board" with a close button (X) in the top right corner. It contains several input fields and buttons. The "Acux IP Address" section has four input boxes with values 192, 168, 0, and 132, followed by a green checkmark and an "OK" button. The "Sub Net Mask" section has four input boxes with values 255, 255, 255, and 0, followed by a red X and a "Cancel" button. The "Port Selection" section has a label "Existing Port No:" and an input box with the value 3001. The "Gate IP Addr" section has four input boxes, all with the value 0. The "Redundant Server communication time out" section has a label "Time Out Period(in Second):" and an input box with the value 30.

The addresses for this screen must be obtained from your MIS department. The IP Address of the ACURT has been set at the factory to 192.168.0.X. The X number is different for each ACURT.

11. Enter the new **ACURT IP Address**, **Sub Net Mask**, **Gate IP Address**, (Gateway or Router).
12. The **Existing Port No.** will be left at its default 3001 unless you have multi servers on your system. Change the last three digit of the Port No. to reflect the server number (3000 plus the LAN number). For server number two the Port No. would be 3002.
13. The **Time Out Period** is used for redundant systems only. The default is 30 Sec.
14. Click **OK** to continue.

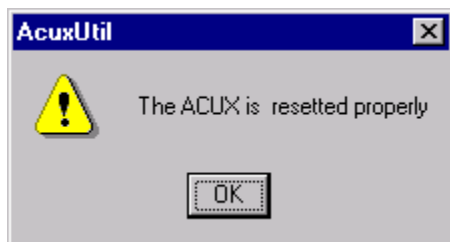


15. The ACURT was update successfully.
16. Click **OK** to continue.



17. Before continuing, make sure DIP switches 2 and 3 at the ACURT are turned OFF.

18. Click **OK** to continue and reset the ACURT.



The ACURT has been updated with the new IP address.

19. Click **OK** to continue.

Installing UPS Batteries



WARNING:

Be sure to observe battery manufacturer's instructions:

Danger Explosive Gases

Can cause blindness or severe injury.

Use in a well ventilated area away from open flame, cigarettes, sparks, and other sources of ignition.

Shield eyes and face when working around battery.

Do not make direct contact between the positive and negative terminals.

Do not puncture, disassemble, or incinerate batteries.

Dispose of in accordance with environmental regulations.

Poison - contains lead compounds and corrosive acid.

Contains sulfuric acid which can cause severe burns. In the event of contact, flush with water and obtain immediate medical attention.

Keep out of reach of children.

Charge in accordance with manufacturer's instructions.



WARNING:

Make certain that the AC power source circuit breaker(s) is OFF before proceeding.

Failure to heed this WARNING can cause death, personal injury, or damage to unit(s).



CAUTION:

To avoid an electrical short, do not let the contacts on the batteries touch any part of the enclosure or mounting plate.

Installing and Connecting

The UPS battery installation and wiring connection to the assembly is made as follows:

1. Place the two 12 VDC rechargeable batteries in the bottom of the cabinet.
2. Connect the battery cables (AFTER all other wiring is connected) to the battery to TB10 terminal 6 (Battery, 24V+) and terminal 7 (Battery, 24V-).
3. The operating voltage of the batteries will be approximately 27.5 VDC. When the battery voltage drops to 24 VDC the ACURT will generate an AC Fail alarm and when the voltage level drops to 21 VDC it will generate a Low Battery alarm.

NOTE: If the ACURT is to be powered from a 27.5 VDC UPS, connect the output of the power source to the battery connection on the ACURT, TB10-6(+), and TB10-7(-). The 24 VAC plug in transformer and internal ACURT UPS batteries are no longer required.

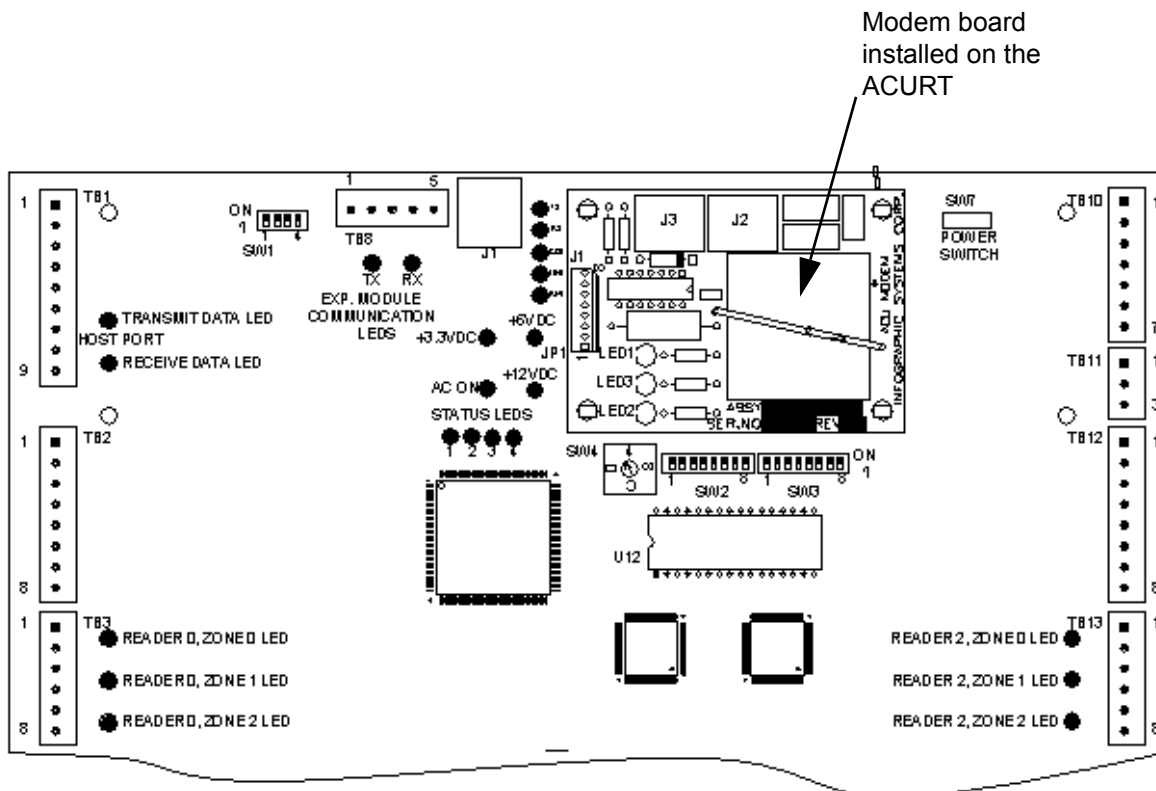
Dial-up Modem (Optional)

Installing Dial-up Modem

If the installation requires UL Listing, the Dial-up modem cannot be used.

The Dial-up modem allows the TOPAZ server to communicate over standard dial phone lines to the ACURT2 and ACURT4 when LAN or direct connections with RS-232 and RS-485 are not available.

The modem board mounts on the ACURT board near the top by plugging the J1 connector on the modem board into the PJ1 connector on the ACURT board, as shown below.



Connecting the Dial-up Modem

After installing the modem board connect the frame ground wire to the grounding lug in the cabinet just above the board. See Figure 2-8.

Connect the modem to a standard dial type telephone line by plugging the phone line's RJ45 connector into J3. A telephone instrument for testing can be connected to J2.

NOTE: DO NOT use PBX or Key Switch type phone lines.

SW2 on the ACURT2 or ACURT4 should be set as follows: **1,2,3, 5,** and **8** set to **"ON"**.

The Topaz systems administrator will need to know the ACURT2 or ACURT4 Controller's Serial Number.

Component Layout

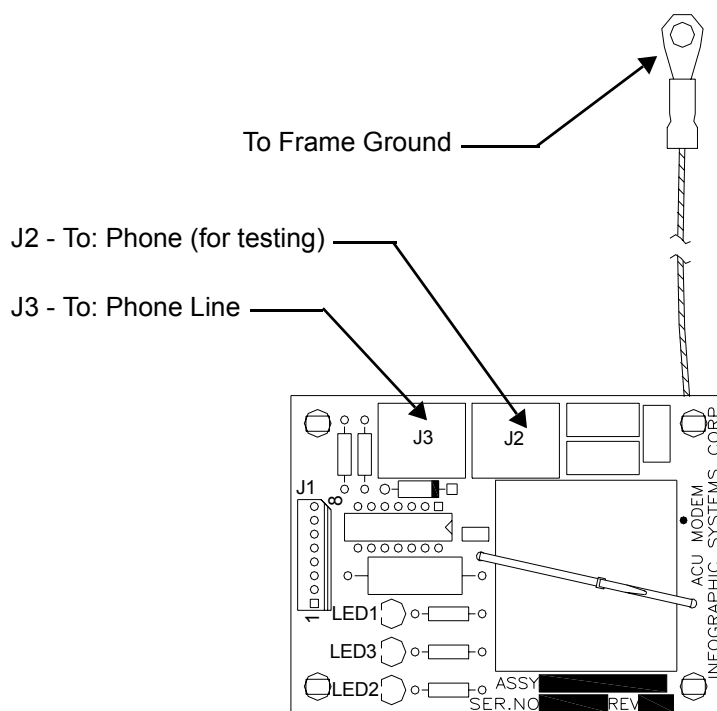


Figure 5-2: Component Layout of the Dial-up Modem Board

LEDs on Modem Board

The LEDs will show the modem status and help in trouble shooting the modem.

LED's on Modem	Description
LED1	Power - Lights when modem is "powered".
LED2	Ring Detect - Lights when the modem has called.
LED3	Carrier Detect - Lights when the Modem has established communication with the host modem.

Table 5-1: Dial-up Modem LED Indicators.

Connecting (MDD) Multi-Drop Dial-Up Panels

The dial-up ACURT panel may have up to 14 additional ACURT panels multi-dropped to its RS485 port as shown below. The additional panels must be configured in Topaz software as dial-up panels with the same phone number as the ACURT panel with the dial-up modem card installed.

NOTE: DO NOT use PBX or Key Switch type phone lines.

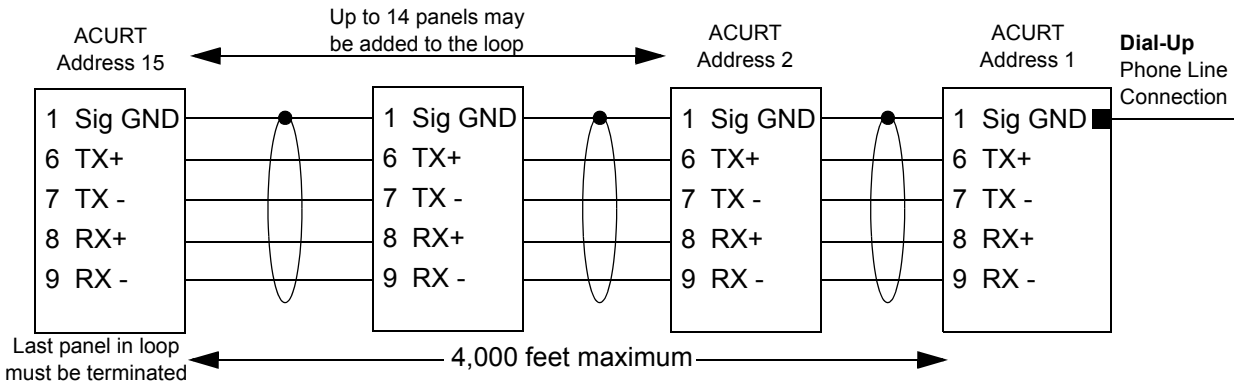


Figure 5-3: RS485 Port Wiring For Multi-Drop Dial-Up Panels

In the above configuration the panel with the dial-up modem installed must be set as address “1” and each additional panel on the RS485 port must be addressed starting with “2” then “3” and so on up to address 15.

Modem Board Replacement

Make sure that power is removed from the ACURT before removing the modem board. Disconnect the phone line(s) from the modem. While squeezing the tip the standoff, protruding through the board with a pair of needle nose pliers, gently lift the modem board off of the plastic standoffs. Unplug the board from the ACURT.

While aligning the new board with the J1 and JP1 connectors, gently snap the board on to the plastic standoffs. Plug the phone line back into J3. If there was a telephone instrument (for testing) connected, plug it back into J2.

Installing Server External Modem

When using Dial-up communications to an ACURT field panel you must install an external modem at the server. The Topaz Software will **ONLY** support the (USR) US Robotics 33.6 faxmodem or the 56K V.90 faxmodem, Sportster modem models 0701 (005686-03) or 0459 (00083907).

Model information located on the back of the modem near the FCC logo sticker, there are some numbers, model #0459 and Sportster 0083907 (the current model is 000839-09 from the USR web site). The 56K V.90 faxmodem can also be used. The number on the back is model #0701 Sportster 005686-03 (USR5686E from the web site).

NOTE: DO NOT use internal modem cards or external modems without dipswitches.

Information on these modems may be found at the US Robotics web site, www.usr.com. Click on **U.S./Canada (English)**, then click **Search Site** tab at the top of the page, then type **sportster 005686-03** or **sportster 00568** into the search field.

External Modem Setup

The switches on the back of the modem must be configured with switches 5 and 6 set to the UP position, all others should be in the down position as shown to the right.



NOTE: You will NOT need to install the modem or drivers in Windows.

When you power up the external modem LEDs AA, TR, and CS should be illuminated, all other should be off.

Software Setup

After installing the modem make sure dial-up panels are configured in the Topaz server software as SCP Dial-Up, set to 9600 baud, No parity and Active.

From Control and Service Functions, you must setup the modem. Choose Initialize - Test Modem and Serial Port and say Go. The modem LEDs SD and RD should blink several time. This sends the correct AT commands necessary for the modem to work correctly.

NOTE: It is recommended you use a minimum of two dial-up ports/modems for data and alarms. As the system grows or as the alarm load increases, it may be necessary to use more Server modems to handle the traffic.

The Topaz systems administrator will also need to know the ACURT2 or ACURT4 Controller's Serial Number.

Troubleshooting

Be sure the external dial-up modem at the server is connected correctly.

Check the dial-up modem board in the ACURT to make sure it is firmly install on the pins J1 and no pins are bent over.

Make sure the ACURT modem board is properly grounded.

You may have to clear memory on the ACURT board.

NOTE: Be aware this action will leave the ACURT without any configuration.

Altronix Power Supply Charger (Optional)

The Altronix AL400UL3 is a recommended additional power source. It is a multi-output access control power supply/charger that is specifically designed for use with access control systems and accessories. The AL400UL3 converts a 115 VAC 50/60Hz input into three individually regulated 12 VDC or 24 VDC power limited outputs. Each output will supply power to the RIM, RRM, magnetic locks, electric strikes, magnetic door holders, etc. These outputs will operate in both fail-safe and fail-secure modes for door locks.

With the optional batteries installed (required for UL listed installations), will back up power to the connected remote devices including RIM and RRM panels.

NOTE: On UL certified installations, batteries are required.

Panel Layout

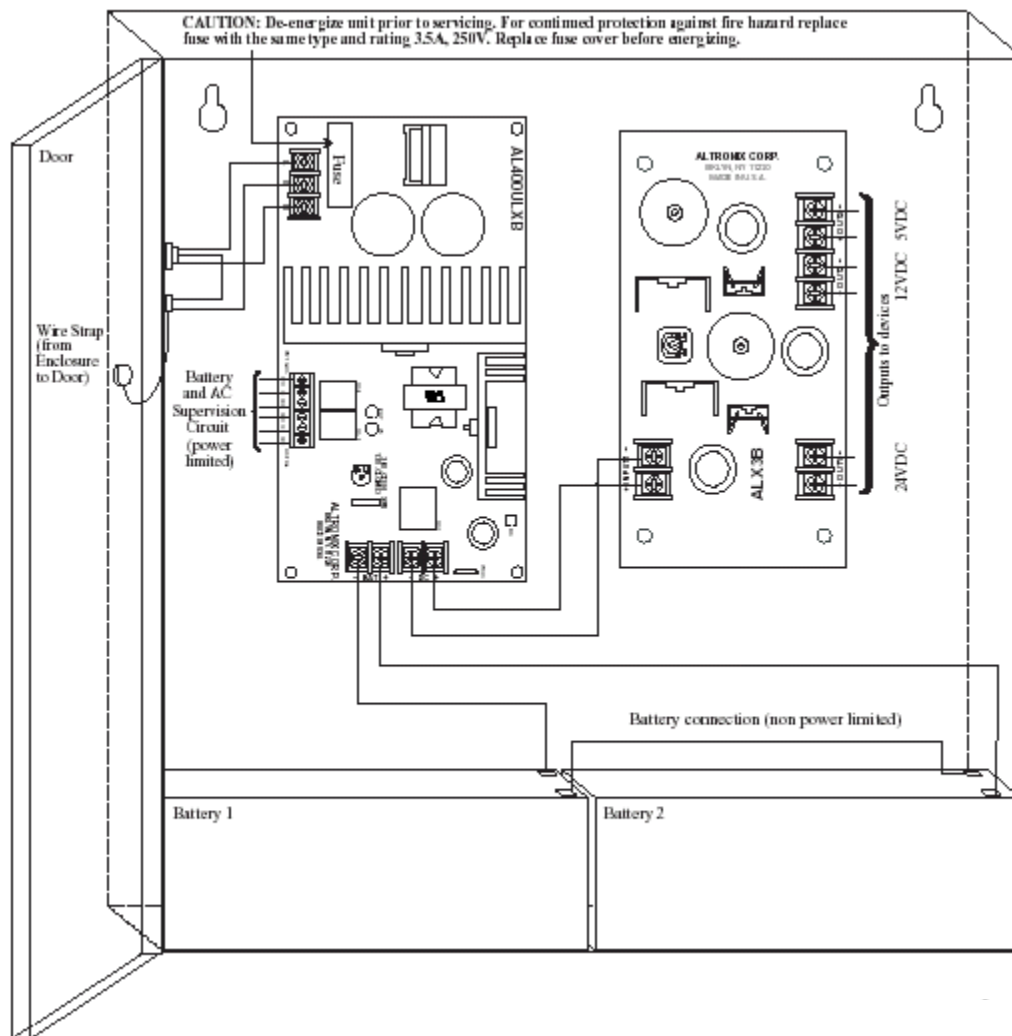


Figure 5-1: Altronix AL400UL3 Power Supply/Charger Cabinet layout

Enclosure Dimension

13.5"H x 13"W x 3.25"Ds

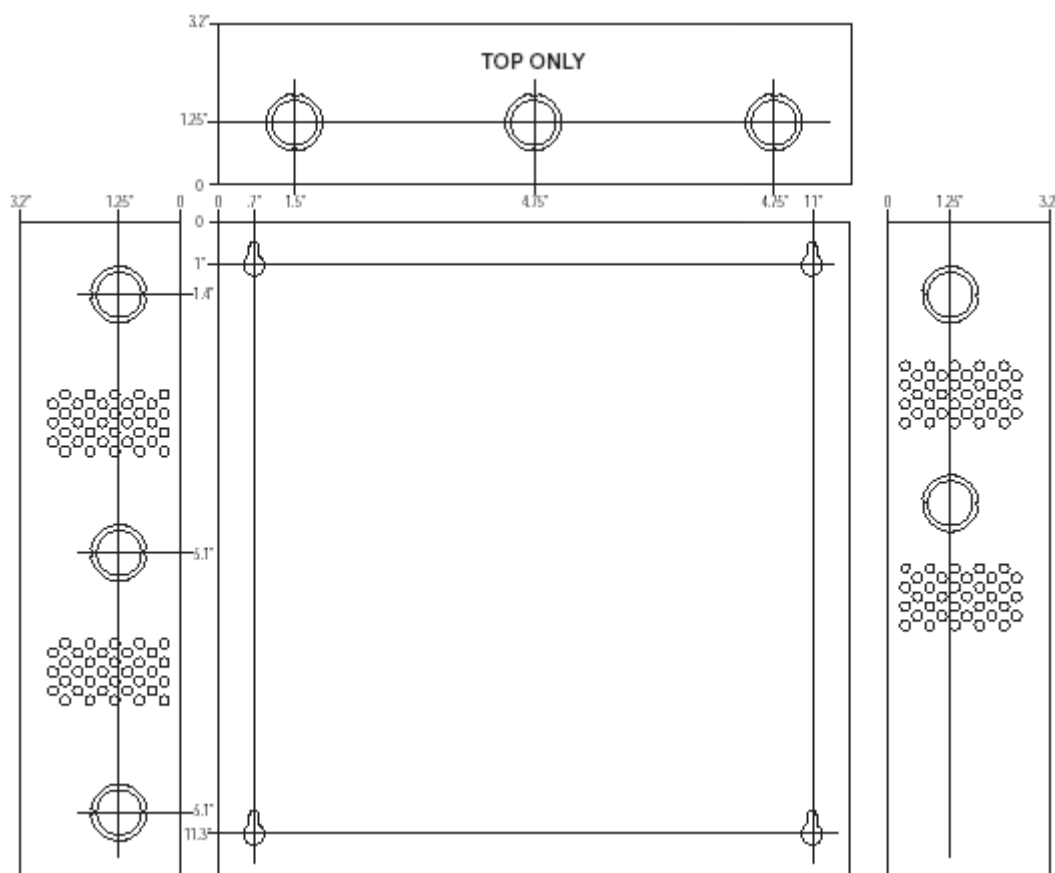


Figure 5-4: Altronix AL400UL3 Power Supply/Charger Enclosure Dimensions

Altronix Specifications

- NFPA 72 compliant.
- All outputs are Class 2 rated.
- Input 115VAC 50/60Hz, 1.45 amps.
- 1.75 amps continuous supply current at 5VDC.
- 1.75 amps continuous supply current at 12VDC.
- 1.5 amps continuous supply current at 24VDC.
- Filtered and electronically regulated outputs.
- 51 mV p/p output ripple.
- Maximum charge current .7 amp.
- Built-in charger for sealed lead acid or gel type batteries.
- Automatic switch over to stand-by battery when AC fails.
- Zero voltage drop when switching over to battery backup.
- Thermal and short circuit protection with auto reset.
- DC output LED indicators.
- AC fail supervision (form "C" contact rated 1amp @28VDC).
- Battery fail and battery presence supervision (form "C" contact rated 1amp @ 28VDC).
- Power supply is complete with enclosure, cam lock, and battery leads.
- Enclosure accommodates up to two (2) 7AH batteries.
- Enclosure dimensions: 13.5"H x 13"W x 3.25"D

NOTE: Before installing, refer to the datasheet packed with the AL400UL3 for latest information and specifications for the Altronix AL400UL3.

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