PW6K1R1E Input/Output Module

Installation and Configuration Guide

Ordering Information

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Introduction

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In this chapter...

1.1 Overview

The PW6K1R1E reader interface provides a network connected, single door with paired reader, PoE based solution to the OEM integrator for interfacing TTL/ Wiegand/RS-485 type readers to door hardware. The on-board twisted pair Ethernet jack with PoE support enables easy installation.

A maximum of 16 PW6K1R1E downstream boards can be connected to PW6K1ICE controller board.

You can control one physical barrier with PW6K1R1E, using single or paired readers. The first reader port can accommodate a read head that utilizes Wiegand, magnetic stripe, or 2-wire RS-485 electrical signaling standards, one or two wire LED controls, and buzzer control (one wire LED mode only).

The second reader port can accommodate a read head that utilizes Wiegand or magnetic stripe signaling, one or two wire LED controls, and buzzer control (one wire LED mode only).

You can use two form-C relay outputs for door strike control or alarm signaling.The relay contacts are rated at 5A @ 30VAC/DC, dry contact configuration. Four inputs are provided for monitoring the door contacts, exit push buttons, and alarm contacts.

The PW6K1R1E requires power from PoE or local 12VDC. The reader power should be based on peak reader power consumption.

The PW6K1R1E may be mounted in a 3-gang switch box; a mounting plate is supplied with the unit. The PW6K1R1E may be mounted in an enclosure; the supplied mounting plate has mounting holes that match the MR50 mounting footprint. Refer to *Additional Mounting Information* (p. -15) for UL enclosure requirements.

The PW6K1R1E has to be installed on the same subnet as PW6101 (i.e., PW6K1ICE) or PW6000. The encryption between both PW6000 and PW6K1ICE, and, PW6101 and PW6K1ICE, is built-in and automatic.

1.2 General UL-Compliance

A UL-compliant installation requires the following:
- The PW6K1R1E board must be installed within the protected area.
- The PW6K1R1E board is installed for indoor use only.
- The PW6K1R1E board must be installed with a tamper switch mounted to the enclosure cover.
- The fail secure locking mechanism shall only be installed where is is allowed by the local authority having jurisdiction (AHJ), and it shall not impair the operation of panic hardware and emergency egress.

Note: The PW6K1R1E board is not UL Listed for burglary installations.

1.3 Card Readers

The Pro-Watch PW6K1ICE controller and PW6K1R1E input/output board have been tested for use with the following Listed (ALVY) card readers:

Manufacturer	Model	Part Number
HID	ProxPro	HU/5355AGN00
	ProxPro II	HU/5455BGN00
	ProxPro K	HU/5355AGK00
	MiniProx	HU/5365EGP00
	ThinLine II	HU5395CB100
		HU/5395CG100
		HU/5395CK100
Honeywell	OM40	OM40BHONC
		OM40GHONC
	OM41	OM41BHONC
		OM41GHONC
	OM55	OM55BHONB
		OM55GHONB
	OP-10	OP10GENR
		OP10HONR
	OP-30	OP30GENR
		OP30HONR
	OP-40	OP40GENR
		OP40HONR

1.4 Warranty

Honeywell Security Access warrants that the product is free from defects in material and workmanship under normal use and service with proper maintenance for one year from the date of factory shipment.

Honeywell Security Access assumes no responsibility for products damaged by improper handling or installation. This warranty is limited to the repair or replacement of the defective unit.

There are no expressed warranties other than set forth herein. Honeywell Security Access does not make, nor intends, nor does it authorize any agent or representative to make any other warranties, or implied warranties, and expressly excludes and disclaims all implied warranties of merchantability or fitness for a particular purpose.

Returned units are repaired or replaced from a stock of reconditioned units. Returns must be accompanied by a Returned Merchandise Authorization (RMA) number obtained from customer service, and prepaid postage and insurance.

1.5 Liability

You should use the Interface only to control exits from areas where an alternative method for exit is available.

This product is not intended for, nor is rated for operation in life-critical control applications.

Honeywell Security Access is not liable under any circumstances for loss or damage caused by or partially caused by the misapplication or malfunction of the product.

Honeywell Security Access's liability does not extend beyond the purchase price of the product.

1.6 FCC Compliance

This device complies with part 15 of the FCC Rules. Operation is subject to the following two conditions: (1) This device may not cause harmful interference, and (2) this device must accept any interference received, including interference that may cause undesired operation.

PW6K1R1E Wiring and Setup

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In this chapter...

2.1 PW6K1R1E Hardware
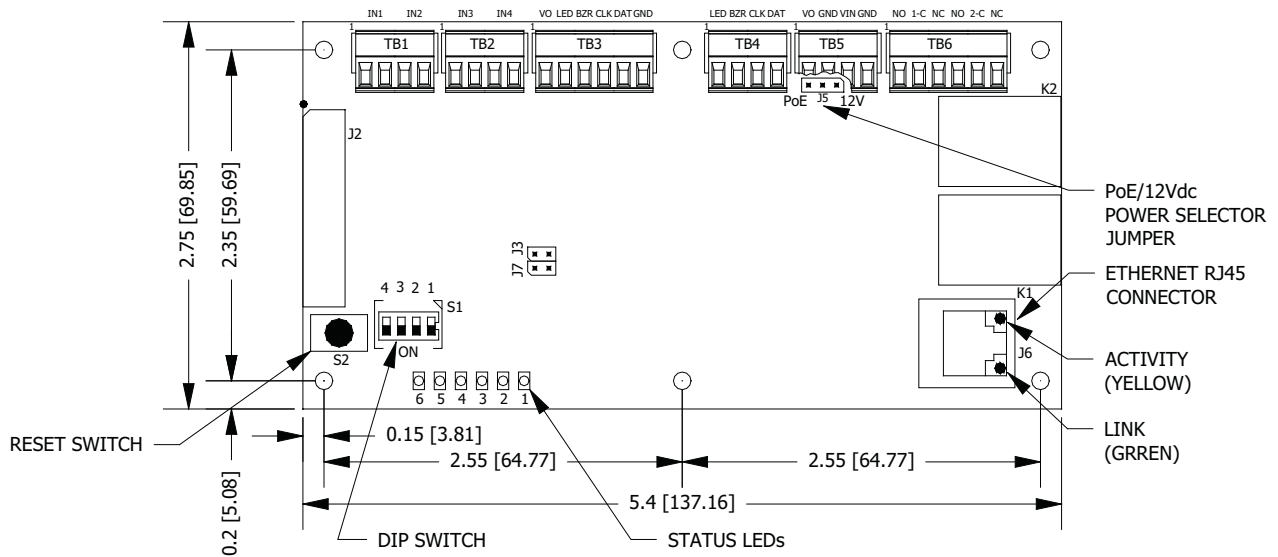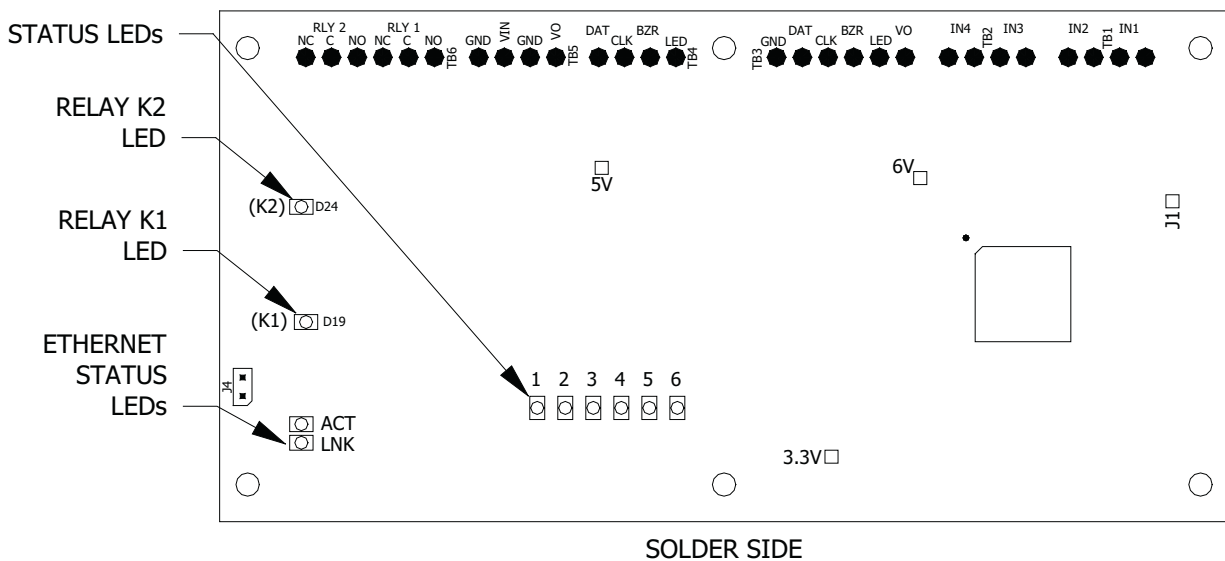
Figure 2-1: PW6K1R1E Control Board

Figure 2-2: PW6K1R1E Control Board Solder Side

2.2 Terminal Connections

Table 1: PW6K1R1E Terminal Connections

Terminal	Acronym	Description
TB1-1	IN1	Input 1
TB1-2	IN1	
TB1-3	IN2	Input 2
TB1-4	IN2	
TB2-1	IN3	Input 3
TB2-2	IN3	
TB2-3	IN4	Input 4
TB2-4	IN4	
TB3-1	VO	Reader 1 Power Output - 12VDC
TB3-2	LED	Reader 1 LED Output
TB3-3	BZR	Reader 1 Buzzer Output
TB3-4	CLK	Reader 1 CLK/Data 1/TR+
TB3-5	DAT	Reader 1 DAT/Data 0/TR-
TB3-6	GND	Reader 1 Ground
TB4-1	LED	Reader 2 LED Output
TB4-2	BZR	Reader 2 Buzzer Output
TB4-3	CLK	Reader 2 CLK/Data 1 Input
TB4-4	DAT	Reader 2 DAT/Data 0 Input
TB5-1	VO	Auxiliary Power Output - 12VDC
TB5-2	GND	Auxiliary Power Output Ground
TB5-3	VIN	Input Power - 12VDC (from local power supply)
TB5-4	GND	Input Power Ground
TB6-1	NO	Relay K1 - Normally Open Contact
TB6-2	1-C	Relay K1 - Common Contact
TB6-3	NC	Relay K1 - Normally Closed Contact
TB6-4	NO	Relay K2 - Normally Open Contact
TB6-5	2-C	Relay K2 - Common Contact
TB6-6	NC	Relay K2 - Normally Closed Contact

2.3 Jumper Configuration
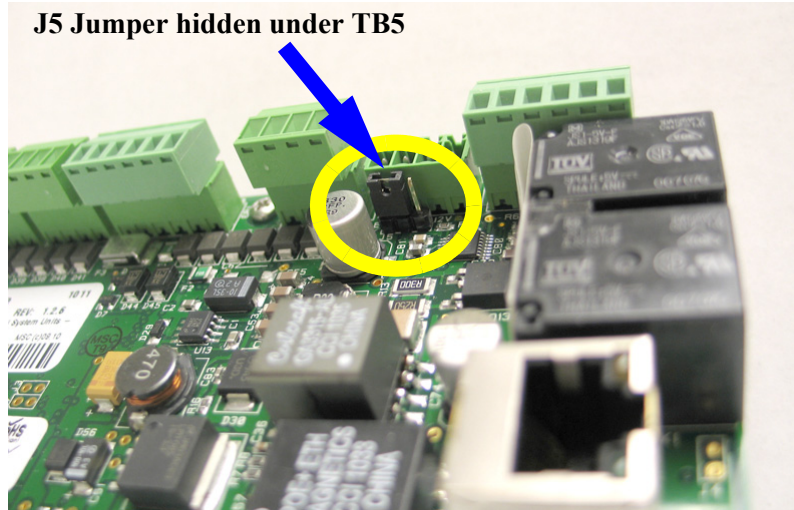
Figure 2-3: J5 Jumper Location

J5 Jumper hidden under TB5

Table 2: Jumper Settings

Jumper	Set at	Description
J1	N/A	Factory Use Only
J2	N/A	Factory Use Only
J3	N/A	Factory Use Only
J4	N/A	Factory Use Only
J5	PoE	PW6K1R1E powered from the Ethernet connection
	12V	PW6K1R1E powered from an external 12VDC power source connected to TB5-3 (VIN), TB5-4 (GND)
J6	N/A	Ethernet connection with PoE support
J7	N/A	Factory Use Only

2.4 DIP Switch Configuration

All S1 switch settings are unassigned and are reserved for future use. Set all switches to the OFF position.

2.5 Input Power

The PW6K1R1E is powered by one of the following two ways (jumper selected):

1. The Ethernet connection using PoE, fully compliant to IEEE 802.3af.

2. Local 12VDC power supply, TB5-3 (VIN), TB5-4 (GND).

2.6 Communication Wiring

The PW6K1ICE communicates with PW6K1R1E through the Ethernet. In the event of communication loss, all readers connected to the PW6K1R1E must be programmed to the "locked" option in the Offline mode menu.

2.7 Reader Wiring

The first reader port supports Wiegand, magnetic stripe, or 2-wire RS-485 electrical interfaces.

The second reader port supports Wiegand or magnetic stripe electrical interfaces.

Power to the first reader is 12VDC and its current is limited to 150mA. The second reader may be powered from the auxiliary power output on TB5-1 and TB5-2.

Readers that require different voltage or have high current requirements should be powered separately. Refer to the manufacturer's specifications for cabling requirements. In the 2-wire LED mode, the Buzzer output is used to drive the second LED. Reader port configuration is set via the host software.

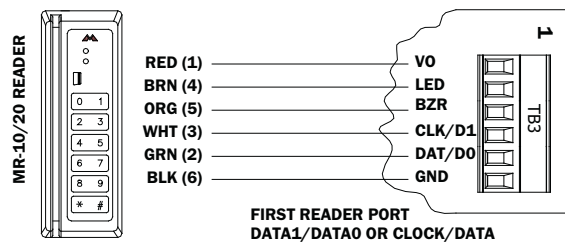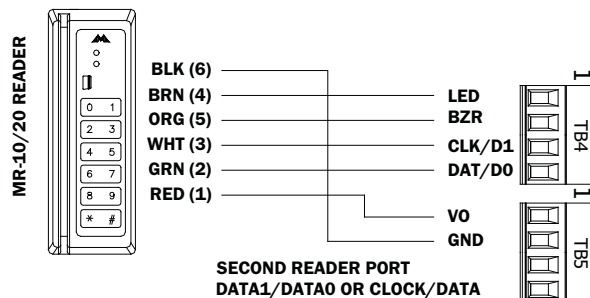*Figure 2-4: First Reader Port Wiring*

Figure 2-5: Second Reader Port Wiring

2.8 Input Circuit Wiring

Typically, these inputs are used to monitor door position, request to exit, or alarm contact. Input circuits can be configured as unsupervised or supervised. When unsupervised, reporting consists of only the open or closed states.

When configured as supervised, the input circuit will report not only open and closed, but also open circuit, shorted, grounded, and foreign voltage.

Note: Grounded and foreign voltage states are not a requirement of UL 294 and therefore not verified by UL.

A supervised input circuit requires two resistors be added to the circuit to facilitate proper reporting.

The standard supervised circuit requires 1K Ohm, 1% resistors and should be located as close to the sensor as possible. Custom end of line (EOL) resistances may be configured via the host software.

The input circuit wiring configurations shown below are supported but may not be typical:

Figure 2-6: Input Circuit Wiring
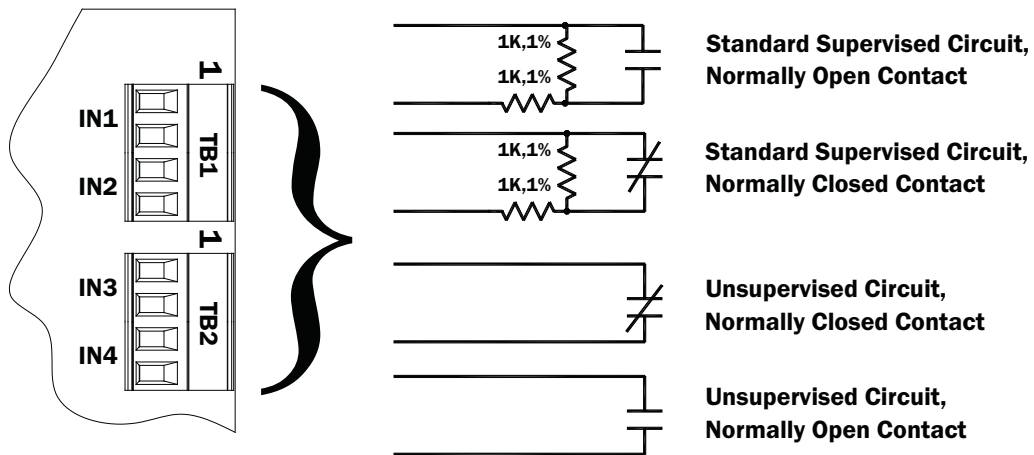
2.9 Relay Circuit Wiring

Two relays are provided for controlling door lock mechanisms or alarm signaling. The relay contacts are rated at 5A @ 30VAC/DC, dry contact configuration.

Each relay has a **Common pole (C), a Normally Open pole (NO)** and a **Normally Closed pole (NC)**.

*   When you are controlling the delivery of power to the door strike, the **Normally Open and Common** poles are used.

• When you are momentarily removing power to unlock the door, as with a mag lock, the **Normally Closed and Common** poles are used.

Check with local building codes for proper egress door installation.

⚠ **Caution:** Door lock mechanisms can generate feedback to the relay circuit which can cause damage and premature failure of the relay. For this reason, it is recommended that you should use either a diode or MOV (metal oxide varistor) to protect the relay. Wire should be of sufficient gauge to avoid voltage loss.

Figure 2-7: Relay Circuit Wiring Diagram
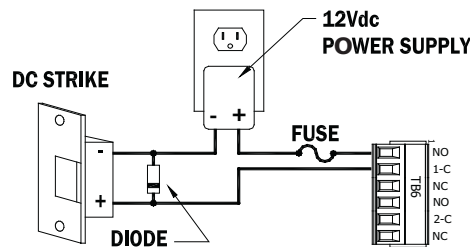
Diode Selection:
• Diode current rating: 1x strike count
• Diode breakdown voltage: 4x strike voltage
• For 12VDC or 24VDC strike, diode 1N4002 (100V/1A) typical
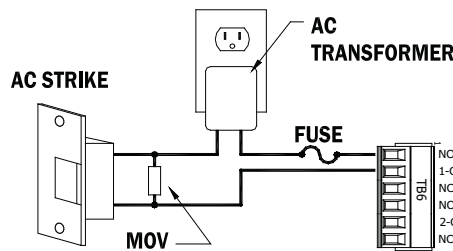
MOV Selection:
• Clamp voltage: 1.5x VAC RMS
• For 24VAC strike, Panasonic ERZ-C07DK470 typical

Note: The initial charge of the battery may take up to 24 hours to be fully charged.

2.10 Status LEDs

At power-up**,** LEDs 2 through 6 are turned ON then OFF in sequence.

After the above sequence has completed successfully, the PW6K1R1E goes to the "waiting for IP address" mode.

LED	DESCRIPTION
1	Off-line: Off-line = 0.2 second ON, 0.8 second OFF
2	Waiting for IP address: 0.5 second ON, 0.5 second OFF
3	Flashes when data is received from either reader
4	Input IN1 Status: OFF = Inactive, ON = Active, Flashing = Trouble

5	Input IN2 Status: OFF = Inactive, ON = Active, Flashing = Trouble
6	Input IN3 Status: OFF = Inactive, ON = Active, Flashing = Trouble

After the PW6K1R1E has received its IP address, the following table describes the LEDs in the normal running mode. If the communication is lost, the PW6K1R1E reverts back to the "waiting for IP address" mode:

LED	DESCRIPTION
1	On-line, encryption disabled = 0.8 second ON, 0.2 second OFF
	On-line, encryption enabled = four pulses, 0.1 second ON, 0.1 second OFF per second
2	Flashes when there is host communication
3	Flashes when data is received from either reader
4	Input IN1 Status: OFF = Inactive, ON = Active, Flashing = Trouble
5	Input IN2 Status: OFF = Inactive, ON = Active, Flashing = Trouble
6	Input IN3 Status: OFF = Inactive, ON = Active, Flashing = Trouble

2.11 Specifications

The interface must be used in low voltage, class 2 circuits only.

The installation of this device must comply with all local fire and electrical codes.

Power Input	• PoE Power Input 12.95W, compliant to IEEE 802.3af
	  - OR -
	  •12VDC 10%, 900mA maximum
	Notes:
	• A +12V power input must be powered by a UL 294/UL 609 Listed power supply with appropriate ratings (12Vdc, 900mA) and the capability to provide adequate standby power.
	• If the PW6K1ICE is powered by Power-Over_Ethernet (POE), it must be powered by a Listed (ALVY) Altronix, Model NetWay1 POE Injector. NetWay1 must be powered by a UL 294/UL 609 Listed power supply with appropriate ratings (24Vac/dc, 1.2A) that is capable of providing adequate standby power.

Power Output	• 12VDC @ 700mA maximum (reader and AUX outputs combined) • Reader (TB3) 12 VDC (10.3 through 12.6) @ 150mA maximum • AUX (TB5) 12 VDC (10.7 through 13.0) @ 700 mA maximum
Output	• Form-C Contacts rated at 5A @ 28VDC
Inputs	• 4 unsupervised/supervised, End of Line resistors • 1k/1k - ohm, 1% 1/4W watt standard

Reader Interface		
	Reader Power:	• 12VDC @ 700mA maximum (reader and AUX outputs combined)
	Reader LED Output	• TTL compatible • High > 3.0V • Low < 0.5V • 5mA source/sink maximum
	Buzzer Output	• Open collector • 5VDC open circuit maximum • 10mA sink maximum
	Reader Data Inputs	• TTL compatible inputs or • 2-wire RS-485
	RS-485 Mode	• 9600 bps • Asynchronous • Half-duplex • 1 start bit • 8 data bits • 1 stop bit • Maximum cable length 4000' (1,200m)
Cable requirements		
	Communication	• Ethernet • Category 5 minimum
	Power	• 18 AWG • 1 twisted pair
	Ethernet	• CAT-5 (minimum)
	RS-485	• 24AWG • 120-ohm impedance • 4,000ft (1,219 m) maximum • Twisted pair(s) with an overall shield
	Alarm Input	• 1 twisted pair per input • 30-ohm maximum loop resistance
	Reader data (TTL)	• 18AWG • 6 conductors • 500-foot (150 m) maximum

	Reader data (RS-485)	• 24AWG
		• 120-ohm impedance
		• Twisted pair with shield
		• 4000-foot (1,219 m) maximum

Environmental		
	Temperature	• -55°C to +85°C, storage
		• -40°C to +75°C, operating
	Humidity	• 10 to 95% RHNC

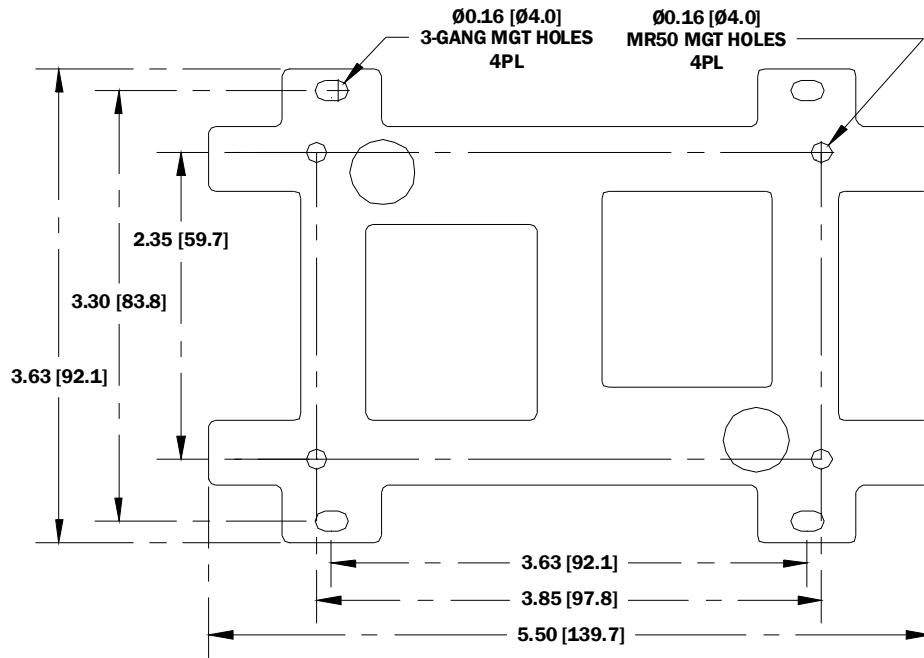| **Mechanical**		
	Dimension	• 5.5" (140mm) W x 2.75" (70mm) L x 0.96" (24mm) H without bracket
		• 5.5" (140mm) W x 3.63" (92mm) L x 1.33" (34mm) H with bracket
	Weight	• 4.2 oz. (120g) without bracket
		• 5.3 oz. (150g) with bracket
Enclosure		
	Box type	• The unit must be installed within a UL 514A/UL 514C Listed (QCIT or QCMZ) 3-gang electrical box.
	Box dimensions	• The minimum dimensions for the electrical box are 2.75 inches by 2.75 inches by 5.8 inches, with a minimum capacity of 44 cubic inches.
	Box spacing	• Minimum spacings must be enforced of at least 1/2 inch between the PWB/components and the enclosure.
	Tamper switch	• For UL applications, a tamper switch must be installed.

2.12 Additional Mounting Information

Sources for the optional items shown below:

- 3-gang stainless steel blank cover: Leviton part number 84033-40. Available from Graybar, part number 88158404.
- Magnetic switch set: G.R.I. part number: 505.

Figure 2-8: Stainless Steel Blank Cover

OPTIONAL BLANK
COVER W/SCREWS

OPTIONAL MAGNETIC
TAMPER SWITCH

PW-6K1R1E WITH INCLUDED
MOUNTING PLATE

OPTIONAL 3-GANG
JUNCTION BOX

FIELD WIRING

TO ETHERNET
NETWORK

Figure 2-9: Mounting Plate Dimensions

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