

*EXHIBIT E*  
SYSTEM MANUAL

# Thin Line II Reader Installation Manual

## Installation Requirements

The following instructions will explain the installation procedure for the Thin Line II Reader. The instructions include these sections:

### Mounting Instructions

### Connecting the Reader to the Host

### Testing & Operation of the Thin Line II Reader

#### Parts List (Included)

Parts List (Included)	Quantity
1) Thin Line II	1
2) #6-32 x 1" self tapping, Type T or 23	2
3) Installation Sheet	1

#### Parts Recommended (not Included)

1) Wire Splice	9
2) Grommet	1
3) DC Power Supply 4.75 to 16VDC, 50mA	1
4) Cable, 10 conductor, 22 AWG	

## Mounting Instructions

1. Determine an appropriate mounting position for the Reader.

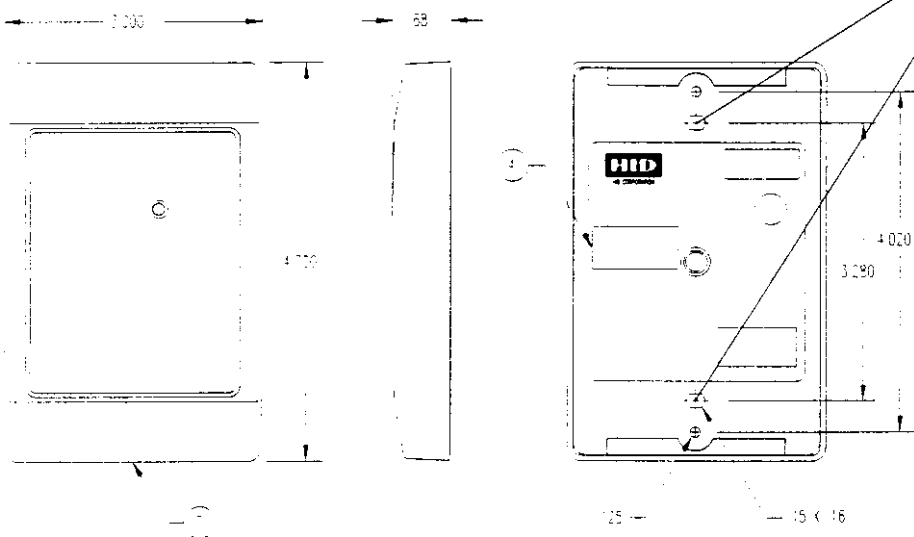


Figure 1

2. Drill two 7/64th (.109) Inch holes for mounting the Reader to the surface.

3. Drill a 3/8 to 1.0 Inch hole for the cable. If you are mounting on metal place a grommet around the edge of the hole.

4. Route the interface cable from the Reader and/or power supply to the Host. **Linear type power supply is recommended.**

**Check all electrical codes for proper cable installation**

**Mount the Reader with the screws provided when mounting onto metal mullions or junction boxes. On other materials use appropriate fasteners.**

## Connecting the Reader to the Host

The Thin Line II is available with an 18" Pigtail with a 10 conductor cable and a 10 conductor terminal strip.

- Pigtail** - Prepare the new cable by cutting the cable jacket back 1-1/4" and strip the wires 1/4".
- Splice the cable and the pigtail together and seal the splice if the Thin Line will be an outdoor unit. **Trim and cover all conductors that are not used.**
- Terminal Strip** - Loosen the terminal strip screws until the top of the screw is flush with the back surface of the Reader. **Be careful not turn them further; they are not captive and will fall out.**
- Prepare the new cable by cutting the cable jacket back 1-1/4 inches and strip the wire 1/4". **Twist the ends of the wires to eliminate stray strands.**
- Form each wire into a hook and install each wire by wrapping it around the screw.

## Important Product Specifications

### Power Requirements

> Power supply	Linear type recommended
> Operating Voltage Range (+DC)	4.75VDC -16.0VDC
> Absolute Maximum (+DC non-operating)	18.0VDC
> Maximum Average Current 5V/12V	40mA/50mA
> Peak Current 5V/12V (maximum)	60mA/120mA
> Peak Current 5V/12V (typical non-metallic mounting)	50mA/100mA
> Peak Current 5V/12V (typical mounted on metal)	60mA/120mA

### Operating Parameters

Maximum Cable Distance to Host	500 feet (152 meters)
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Connect the Reader to the Host according to this wiring diagram and the Host installation guide.

The legend for wiring is color coded according to the "Wiegand Standard" for the recommended cable.

The numbering for the terminals is shown on the back label and in Figure 2

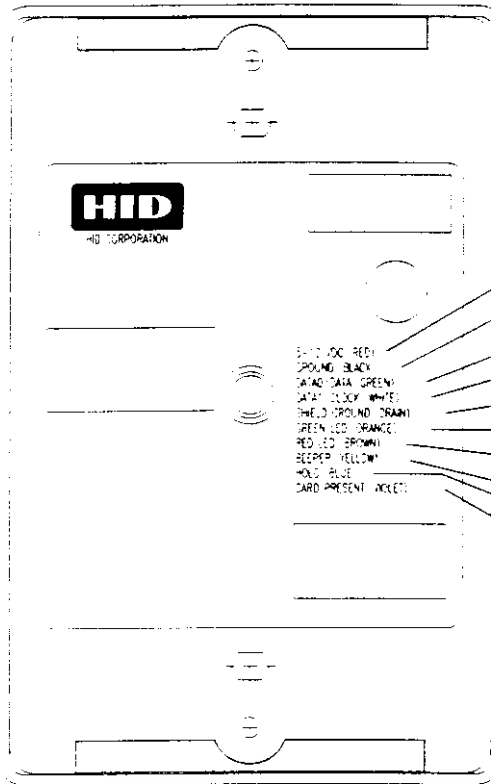


Figure 2

Color	Wiegand	Clock & Data
Red	+DC	+DC
Black	Ground	Ground
Green	Data 0	Data
White	Data 1	Clock
Drain	Shield Ground	Shield Ground
Orange	*Green LED	*Green LED
Brown	*Red LED	*Red LED
Yellow	*Beeper	*Beeper
Blue	*Hold	*Hold
Violet	---	Card Present

\* These connections are OPTIONAL.

All other connections are required.

**Marking the wires will make future maintenance easier.**

## Cable Notes

- 1) When using a separate power supply for the Thin Line II, the power supply and Host should have a common ground (voltage reference).
- 2) If the Host is controlling the beeper, Hold, or the LEDs are configured for the dual LED mode, additional conductors will be required. The recommended cables are Alpha 1295C, 1296C, 1297C, 1298C and 1299C that are five, six, seven, eight and nine conductors respectively. Larger wire gauges are acceptable. The wire is to be stranded with an overall shield, either foil or braided.
- 3) The Cable shield should be connected to the Shield Ground on Reader TB1- E, and left floating at the panel or power supply end of the cable. This configuration is the best for shielding the reader cable from external interference and reducing the likelihood of the Reader causing interference.

## Testing & Operation of the Thin Line II Reader

After wiring the Reader and power supply, the Reader is ready to be tested.

1. Power up the Reader and the LED and Beeper will flash and beep 3 times in a sequence of two short delays and one long delay. This indicates that the micro-controller unit is working properly.
2. Present an ID card to the Reader and the LED should momentarily turn green, indicating a read of the card.
3. If the Reader LED is controlled by the Host refer to the Host description of the LED operation.

### NOTES:

THE ABOVE ARE RECOMMENDED INSTALLATION PROCEDURES. ALL LOCAL, STATE AND NATIONAL ELECTRICAL CODES TAKE PRECEDENCE.

# MiniProx Reader Installation Manual

## Installation Requirements

The following instructions will explain the installation procedure for the MiniProx Reader. The instructions include these sections:

**Mounting Instructions (hazardous & nonhazardous)**

**Connecting the Reader to the Host**

**Testing & Operation of the MiniProx Reader**

Part	Quantity
1) MiniProx	1
2) 7/64" x 1/2" x 1/2" Screws	2
3) 1/2" x 1/2" x 1/2" Screws	2
4) 1/2" x 1/2" x 1/2" Screws	2
5) 1/2" x 1/2" x 1/2" Screws	2
Parts Recommended (not included)	
1) 1/2" x 1/2" x 1/2" Screws	2
2) Grommet	1
3) 1/2" x 1/2" x 1/2" Screws	2
4) 1/2" x 1/2" x 1/2" Screws	2
5) Cable, 10 conductor, 22 AWG	1

## Mounting Instructions

1. Determine an appropriate mounting position for the Reader.

Tolerances .xx = +/- .03"  
.xxx = +/- .010"

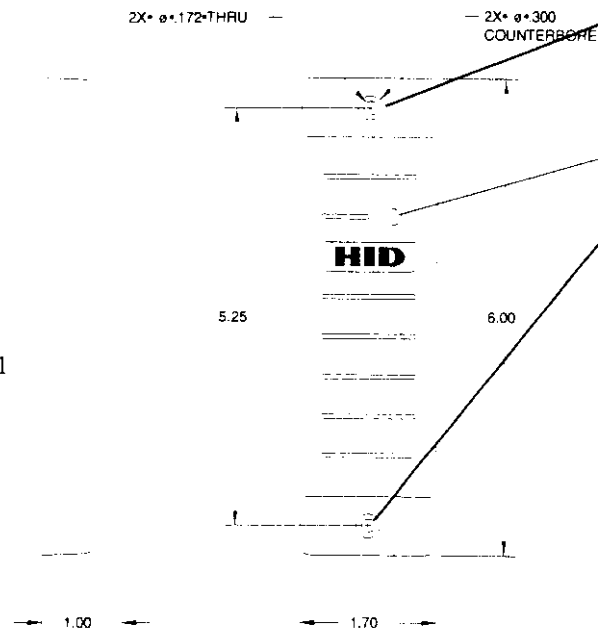


Figure 1

2. Drill two 7/64th (.109) Inch holes for mounting the Reader to the surface.

3. Drill a 3/8 to 1.0 Inch hole for the cable. If you are mounting on metal place a grommet around the edge of the hole.

4. Route the interface cable from the Reader and/or power supply to the Host. **Linear type power supply is recommended.**

**Check all electrical codes for proper cable installation**

**Mount the Reader with the screws provided when mounting onto metal mullions or junction boxes. On other materials use appropriate fasteners.**

## Connecting the Reader to the Host

The MiniProx is available with an 18" Pigtail with a 10 conductor cable and a 10 conductor terminal strip.

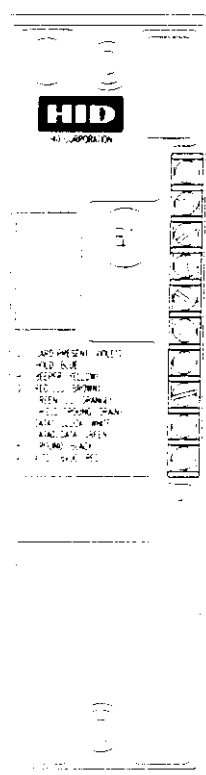
- a. **Pigtail** - Prepare the new cable by cutting the cable jacket back 1-1/4" and strip the wires 1/4".
- b. Splice the cable and the pigtail together and seal the splice if the Thin Line will be an outdoor unit. Trim and cover all conductors that are not used.
- c. **Terminal Strip** - Loosen the terminal strip screws until the top of the screw is flush with the back surface of the Reader. **Be careful not turn them further; they are not captive and will fall out.**

- d. Prepare the new cable by cutting the cable jacket back 1-1/4 inches and strip the wire 1/4". **Twist the ends of the wires to eliminate stray strands.**
- e. Form each wire into a hook and install each wire by wrapping it around the screw.

Connect the Reader to the Host according to this wiring diagram and the Host installation guide.

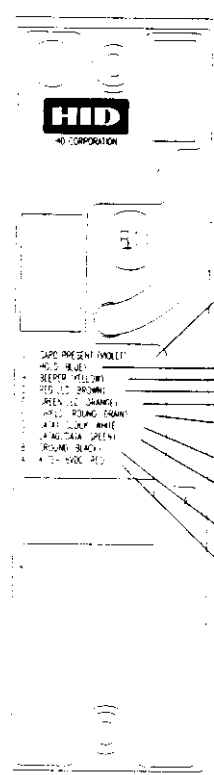
The legend for wiring is color coded according to the "Wiegand Standard" for the recommended cable.

The numbering for the terminals is shown on the back label and in Figure 2



Terminal Strip

Figure 2



Pigtail

Color	Wiegand	Clock & Data
Violet	---	Card Present
Blue	*Hold	*Hold
Yellow	*Beeper	*Beeper
Brown	*Red LED	*Red LED
Orange	*Green LED	*Green LED
Drain	Shield Ground	Shield Ground
White	Data 1	Clock
Green	Data 0	Data
Black	Ground	Ground
Red	+DC	+DC

\* These connections are OPTIONAL.  
All other connections are required.

**Marking the wires will make future maintenance easier.**

## Cable Notes

- 1) When using a separate power supply for the Reader, the power supply and Host should have a common ground (voltage reference).
- 2) If the Host is controlling the beeper, Hold, or the LEDs are configured for the dual LED mode, additional conductors will be required. The recommended cables are Alpha 1295C, 1296C, 1297C, 1298C and 1299C that are five, six, seven, eight and nine conductors respectively. Larger wire gauges are acceptable. The wire is to be stranded with an overall shield, either foil or braided.
- 3) The Cable shield should be connected to the Shield Ground on Reader TB1- E, and left floating at the panel or power supply end of the cable. This configuration is the best for shielding the reader cable from external interference and reducing the likelihood of the Reader causing interference.

## Testing & Operation of the MultiProx Reader

After wiring the Reader and power supply, the Reader is ready to be tested.

1. Power up the Reader and the LED and Beeper will flash and beep 3 times in a sequence of two short delays and one long delay. This indicates that the micro-controller unit is working properly.
2. Present an ID card to the Reader and the LED should momentarily turn green, indicating a read of the card.
3. If the Reader LED is controlled by the Host refer to the Host description of the LED operation.

### NOTES:

THE ABOVE ARE RECOMMENDED INSTALLATION PROCEDURES. ALL LOCAL, STATE AND NATIONAL ELECTRICAL CODES TAKE PRECEDENCE.

## Installation Procedure: (hazardous unit)

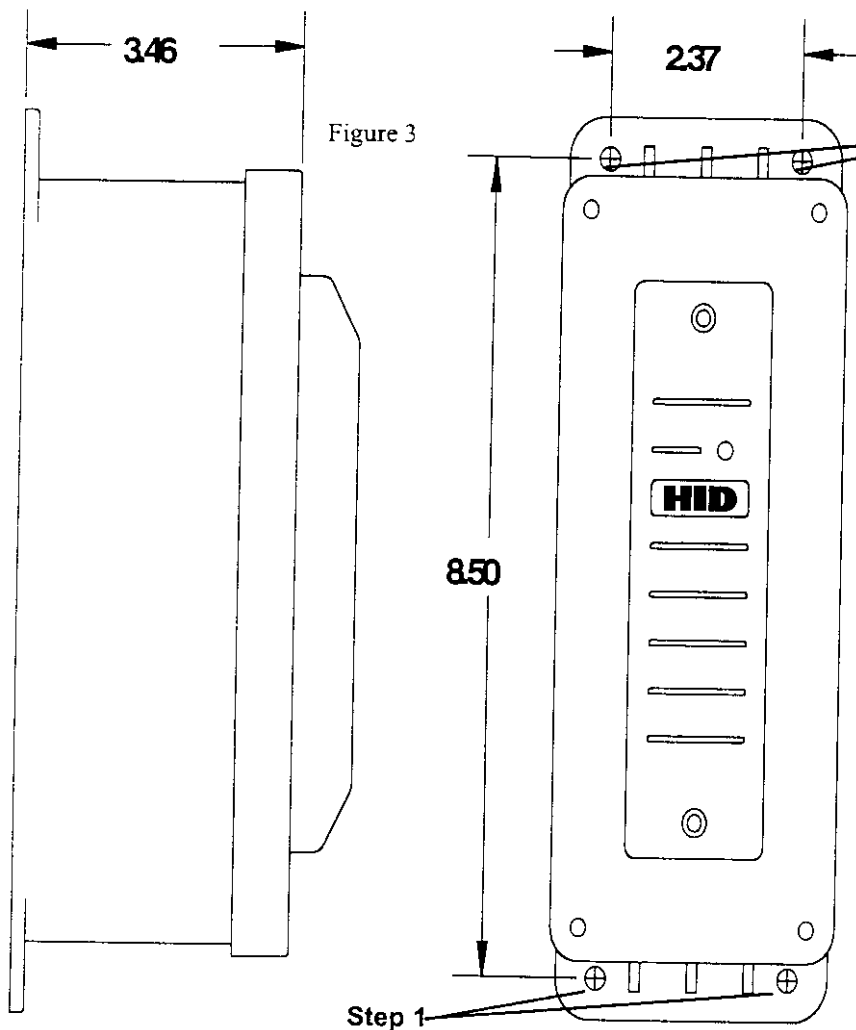


Figure 3

1. Determine an appropriate location for the junction box.

Attach the junction box to the mounting surface using the 4 holes shown in figure 3.

**Mount the junction box cover to the junction box and mount the Reader to the cover with the provided screws.**

2. Route conduit and cable to the junction box **per National Electric Code Article 720-2.**

Provide enough cable length to allow wiring of the Reader assembly outside of the junction box.

Route wiring from junction box through the center hole of the junction box cover.

3. Loosen the terminal strip screws until there is sufficient room to wrap a wire around the screw post.

Prepare the cable by cutting the cable jacket back 1-1/4 inches and strip the wires 1/4".

Twist the ends of the wires to eliminate stray strands.

4. Connect the Reader & the Host together. Refer to Figure 2 (nonhazardous installation section).

**Testing and operation are the same for this unit.**

### Important Product Specifications

#### **Power Requirements**

> Power supply	Linear type recommended	
> Operating Voltage Range (+DC)		4.75VDC -16.0VDC
> Absolute Maximum (+DC non-operating)		18.0VDC
> Maximum Average Current 5V/12V		40mA/50mA
> Peak Current 5V/12V (maximum)		60mA/120mA
> Peak Current 5V/12V (typical non-metallic mounting)		50mA/100mA
> Peak Current 5V/12V (typical mounted on metal)		60mA/120mA

#### **Operating Parameters**

Maximum Cable Distance to Host 500 feet (152 meters)