P-500: Sierra Reader

Quick Start Guide

P-500

The P-500 Sierra Reader

The P-500 Sierra Reader is intended for mounting on a flat surface or a standard U.S. single gang electrical box. It can be mounted on metal or non-metal surfaces. The P-500's electronics are housed in a black, weatherproof, shock resistant package. This package is mounted to the installation surface. An attractive, snap-on, black or white front cover hides the electronics package and installation mounting hardware providing an extra level of security.

The P-500 can be used with virtually any manufacturer's access panel because it produces an industry standard Wiegand output. The reader can be configured to work with access panels using either single or dual LED control lines. It is able to read the following Keri Systems' Wiegand cards.

- PSC-1 Standard Light Proximity Cards
- PSM-2 Multi Technology Cards
- PSK-3 Proximity Key Tags

When a card or tag is read, the P-500 immediately responds with a beep and an LED blink. The access panel then handles subsequent LED and beeper responses. The P-500 also features built-in diagnostics: a start-up self test to ensure reader functionality and a data line test to ensure reader/access panel communication.

Specifications

Dimensions
- 4.5 inches High x 3.0 inches Wide x 0.38 inches Deep
- 114 mm High x 76 mm Wide x 10 mm Deep

Operating Voltage
- 5v to 14v DC @ 80 ma nominal

Operating Temperature
- -40 °C to +65 °C (-40 °F to +150 °F)

Cable Specifications [1]
- up to 500 feet using seven conductor, shielded, stranded AWG 24 wire (such as Belden 9537)

Frequency
- 125 KHz excitation
- 62.5 KHz data return (PSK)

Read Range [2]
- up to 7 inches (17.8 cm) off metal
- up to 3 inches (7.6. cm) on metal

LED Indicator
- standard tri-color (Red, Green, Amber)

Audio Tone
- standard

Front Cover Colors
- Black, Off-White

[1] Per Wiegand specification, a minimum gauge of AWG 24 is required for data transfer in a 500-foot run length. However the wire gauge to use should be determined by the current draw requirements of the reader, the length of the cable run, and the voltage being applied to the reader. If the reader is to be operated at +5 VDC, +5 VDC must be available at the reader (long cable runs have a voltage drop across the length of the run due to the resistance in the cable). To ensure +5 VDC is available at the reader a larger gauge of wire (having less resistance) or a separate power supply at the reader may be required.

[2] Read Range is measured in a clean RF and electrical environment using a Keri Systems Standard Light Proximity Card presented parallel to the reader surface. The Read Range will be less for a Key Tag and a Multi Technology Card.

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Mounting Instructions

Three holes need to be drilled to mount the P-500 Reader (see Figure 1). One large hole (7/8") accommodates the beeper and the reader cable. Two small holes (for a #6 screw) are for mounting the electronics package on the mullion or doorframe.

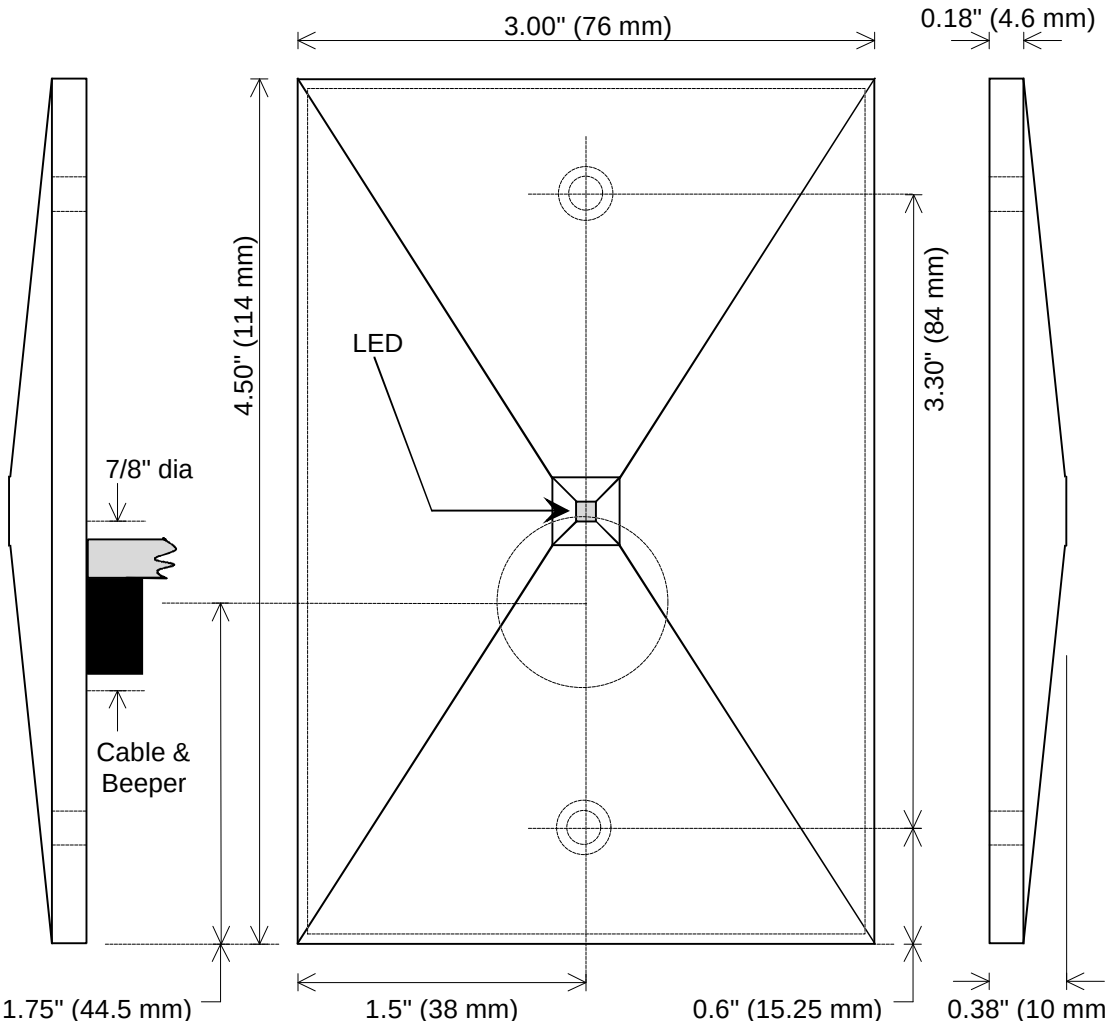

Figure 1 – P-500 Mounting Dimensions

Connections

There are no switches or jumpers to set. The only configuration the P-500 requires is to set the reader for single or dual LED control line operation (explained later in this document). The P-500 Reader can be connected to virtually any access panel that meets Wiegand interface standards. All connections are made through the reader's cable. Please consult Table 1 and Figure 2 for wiring instructions.

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Wire Color	Function
Green	Data 0
Blue	Beeper
Red	Reader Power
Black	Reader Ground
Brown	Second LED Control Line (Green LED)
Orange	Single LED Control Line (Red LED)
White	Data 1

Table 1 – Wiring Connections

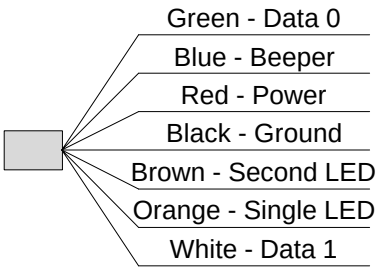

Figure 2 – Wiring Connections

Installation Verification

The following information applies to an installation with an access panel. The access panel controls the actions of the P-500's LED and beeper.

Power

The P-500 is powered by the access panel, so the reader is powered on when the access panel is powered on.

Read Range

To verify the P-500's read range, hold a Keri Systems Wiegand card or tag parallel to the reader, about 1 foot away and slowly bring the Card/Tag in toward the reader. Note the distance when the reader recognizes the card (the reader beeps and the LED flashes). The reader's range will be up to 7 inches (if mounted off a metal surface) or up to 3 inches (if mounted on a metal surface) depending upon the installation conditions, the material on which the reader is mounted, and whether it is a card or a tag being read. Due to the physical size difference between cards and tags, cards provide approximately 50% greater read range than tags.

Refer to the Troubleshooting the Reader Installation section if the reader is not functioning properly.

Switching Between Single or Dual LED Control Line Modes

The P-500 can work with control panels configured to drive either Wiegand single or dual LED control line devices. The reader uses a "control" card to switch between single and dual line LED control modes. The Control Line card must be ordered separately from the supplier. The default setting for the P-500 reader is for dual LED control line operation.

To toggle between modes, simply present the LED Mode control card to the reader. The reader will beep and the LED will flash indicating the control card was recognized and the mode has been changed, but no data is sent to the access panel.

Troubleshooting the Reader Installation

Problem	Probable Cause	Corrective Action
The reader does not recognize a card/tag (no beep, no LED flash).	1. One or more of the reader's wiring connections are incorrect.	• Power down the controller and verify the wiring connections are correct for the reader/access panel combination per the instructions provided in the Connections section on page 2.
	– continued next page –	

Problem	Probable Cause	Corrective Action
	2. The reader is not receiving proper power from the access panel.	• Verify the voltage supplied to the reader is between 5 and 14 VDC.
	3. The reader is mounted too close to a device that radiates electromagnetic interference.	• Devices such as computer monitors radiate electromagnetic interference that affects read range. When possible, relocate either the reader or the device to provide a greater distance between the two.
The reader has a short read range.	1. The access panel is not properly grounded.	• Ensure there is a quality earth ground connection made to the access panel. Refer to the access panel's documentation for specific information regarding the earth ground connection.
	2. The shield wire for the reader's cable has opened somewhere between the reader and the access panel.	• Verify the shield line from the access panel to the reader is one continuous, connected line. Refer to the access panel's installation documentation and verify the shield line is correctly connected to the access panel.
	3. The reader is mounted too close to a device that radiates electromagnetic interference.	• Devices such as computer monitors radiate electromagnetic interference that affects read range. When possible, relocate either the reader or the device to provide a greater distance between the two.
	4. The power supply is generating electromagnetic interference.	• The power supply on the alarm panel should be a regulated linear supply – do not use switching supplies as they are often sources of electromagnetic interference.

Data Line Level Test

The P-500 has an internal data line level test to verify the reader is able to communicate with the access panel. A "control" card is used to trigger the data line level test. Present the card to the reader. The reader beeps and the LED flashes to indicate the card has been read and the test has begun. In this test the reader toggles the Wiegand data lines between high and low states – +5 VDC to 0 VDC. This toggling occurs at a slow rate so that it can be viewed on a DVM.

1. Set the DVM to a range that can safely view +5 VDC.
2. Disconnect the Wiegand Data lines from the access panel.
3. At the access panel, connect the negative lead of the DVM to access panel ground.
4. Connect the positive lead of the DVM to the Wiegand Data 0 line.
5. Monitor the DVM. If the reader is operating correctly, the DVM will toggle between +5 VDC and 0 VDC.
6. Now connect the positive lead of the DVM to the Wiegand Data 1 line.
7. Again monitor the DVM. If the reader is operating correctly, the DVM will toggle between +5 VDC and 0 VDC.
8. Reconnect the Wiegand Data lines to the access panel.