

MS Series Reader Quick Reference

This Quick Reference is designed for the experienced installer as a basic reference while installing MS Readers to ensure all connections are made properly. For detailed information on installing an MS Series Reader, see the [MS-3000 Quick Start Guide](#) (P/N 01815-001), [MS-4000 Quick Start Guide](#) (P/N 01815-004), [MS-5000 Quick Start Guide](#) (P/N 01815-002), [MS-7000 Quick Start Guide](#) (P/N 01826-001), [MS-9000 Quick Start Guide](#) (P/N 01827-001).

1.0 Cable Requirements

1.1 MS-3000, MS-4000, and MS-5000

- up to 500 feet using six conductor, shielded, stranded AWG 24 wire (such as Belden 9536)

1.2 MS-7000

- up to 250 feet using six conductor, shielded, stranded AWG 24 wire
- up to 500 feet using six conductor, shielded, stranded AWG 20 wire

1.3 MS-9000

- up to 100 feet using six conductor, shielded, stranded AWG 24 wire
- up to 250 feet using six conductor, shielded, stranded AWG 22 wire
- up to 500 feet using six conductor, shielded, stranded AWG 18 wire

2.0 Grounding

Shield (Drain) continuity must run from the reader to the access panel. Shield (Drain) and reader ground must be tied together at the access panel and connect to an earth ground in one place.

3.0 Power

A reader may be powered by the access panel, so the reader is powered on when the access panel is powered on. However the best case is to power the readers by a separate linear power supply. When powered, verify the voltage at the reader meets the reader's requirements (refer to Table 1 on page 3). When the reader is powered on, its beeper beeps in the following pattern: 3 short beeps, 1 long beep.

4.0 Operating Voltage

- MS-3000, MS-4000 operate using between 5v to 14v DC @ 50 mA¹
- MS-5000 operates using between 5v to 14v DC @ 100 mA¹
- MS-7000 operates using between 11v to 14v DC @ 200 mA¹
- MS-9000 operates using between 12v to 24v DC @ 200 mA

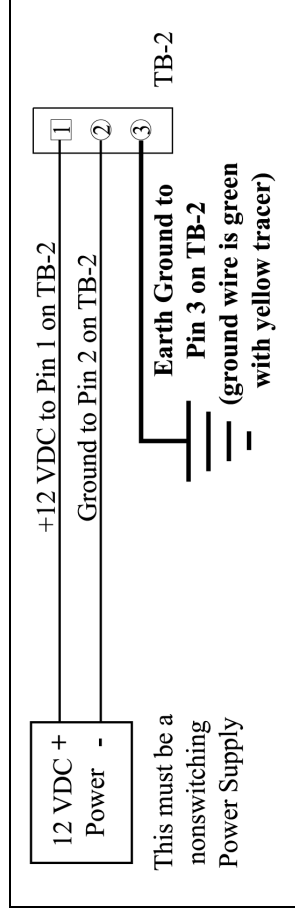


Figure 1: Earth Ground and Power Connections

1. For best results, Keri recommends using 12 VDC on the MS-3000, MS-4000, MS-5000, and MS-7000 readers.

5.2 Connecting to the Design 5 PXL-100 – TB2

| Pin # | Function | MS-4000 Wire Color | All Other MS Readers Wire Color |
|-------|---------------|--------------------|---------------------------------|
| 14 | Green LED | – | Brown |
| 15 | Beeper | – | Green |
| 16 | Reader Power | Red | Red |
| 17 | Reader Ground | Black | Black |
| 17 | Shield | Silver | Silver |
| 18 | Antenna | Blue | Blue |
| 19 | Red LED | – | White |

5.3 Connecting to the Design 5 PXL-100 – TB3

| Pin # | Function | MS-4000 Wire Color | All Other MS Readers Wire Color |
|-------|---------------|--------------------|---------------------------------|
| 20 | Green LED | – | Brown |
| 21 | Beeper | – | Green |
| 22 | Reader Power | Red | Red |
| 23 | Reader Ground | Black | Black |
| 23 | Shield | Silver | Silver |
| 24 | Antenna | Blue | Blue |
| 25 | Red LED | – | White |

5.4 Connecting to the IntelliProx – TBI

| Pin # | Function | MS-4000 Wire Color | All Other MS Readers Wire Color |
|-------|----------------|--------------------|---------------------------------|
| 1 | Reader Antenna | Blue | Blue |
| 2 | Beeper | – | Green |
| 3 | Green LED | – | Brown |
| 4 | Red LED | – | White |
| 5 | Reader Power | Red | Red |
| 6 | Reader Ground | Black | Black |
| 6 | Shield | Silver | Silver |

6.0 Read Range²

| | MS-3000 | MS-4000 | MS-5000 | MS-7000 | MS-9000 |
|-------|---------|---------|---------|---------|------------------------------|
| Cards | 4 in. | 1 in. | 6 in. | 14 in. | 12 VDC 14.5 in. |
| Tags | 2 in. | 1 in. | 3 in. | 7 in. | 24 VDC 4.5 in. 9.5 in. |

2. Read range may vary from what is shown depending upon the installation conditions, the material on which the reader is mounted, and the age of the card or tag.

Figure 2: PXL-250 Connection to 24VDC Power (used with MS-9000)

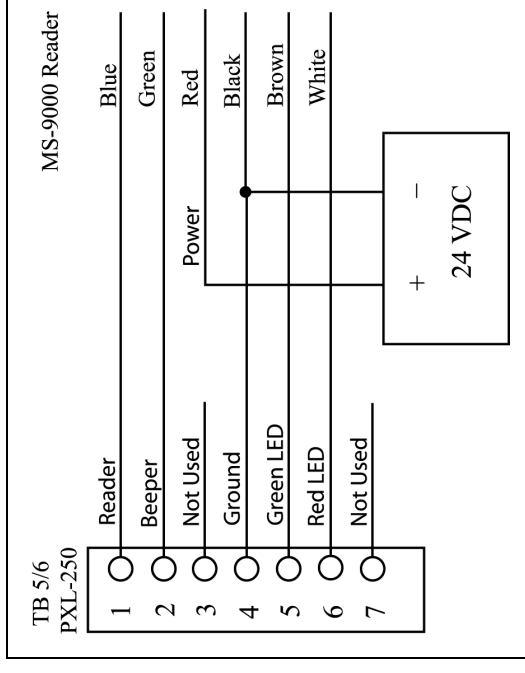
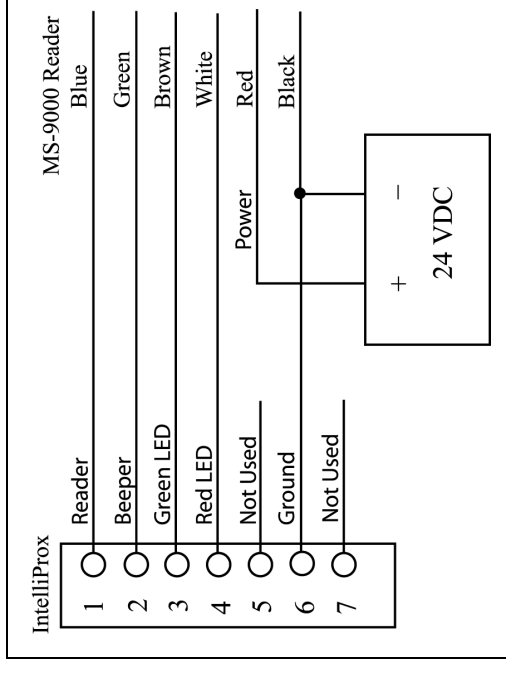


Figure 3: IntelliProx Connection to 24 VDC Power (used with MS-9000)



5.0 Reader Wiring

5.1 Connecting to the PXL-250 – TB5 or TB6

| Pin # | Function | MS-4000 Wire Color | All Other MS Readers Wire Color |
|-------|----------------|--------------------|---------------------------------|
| 1 | Reader Antenna | Blue | Blue |
| 2 | Beeper | – | Green |
| 3 | Reader Power | Red | Red |
| 4 | Reader Ground | Black | Black |
| 4 | Shield | Silver | Silver |
| 5 | Green LED | – | Brown |
| 6 | Red LED | – | White |
| 7 | no connection | – | – |

7.0 Reader Configuration

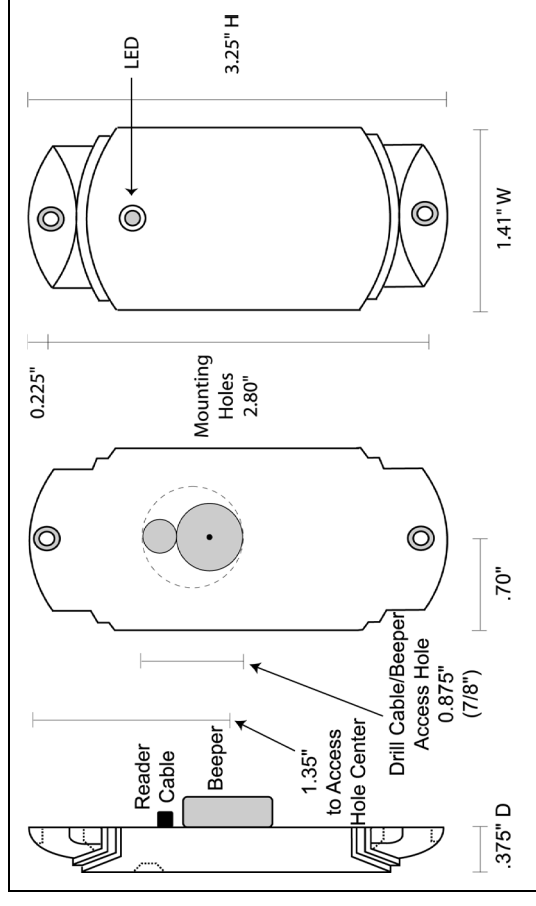


Figure 3: Reader Configuration

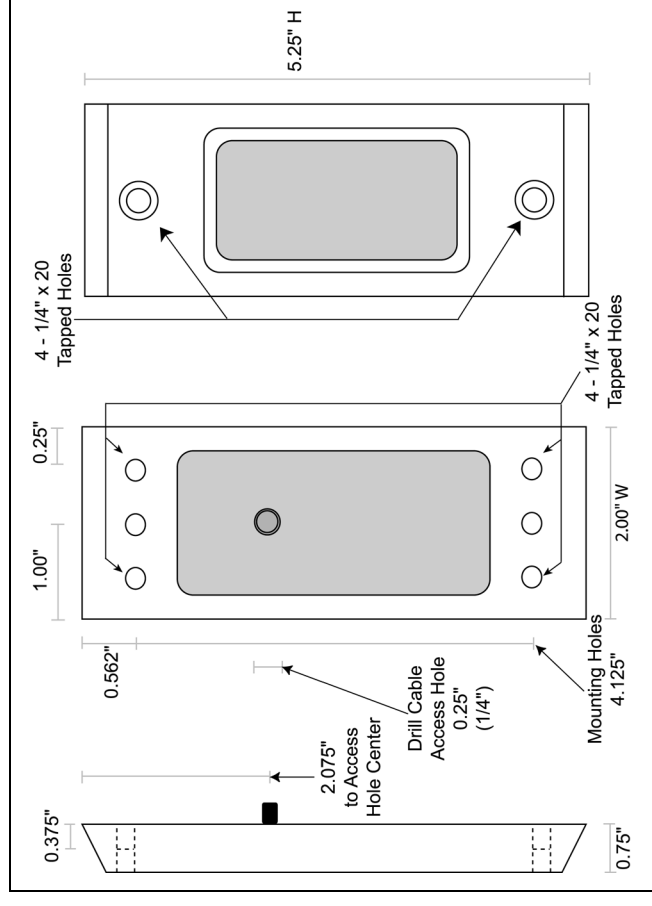


Figure 4: MS-3000 Dimensions

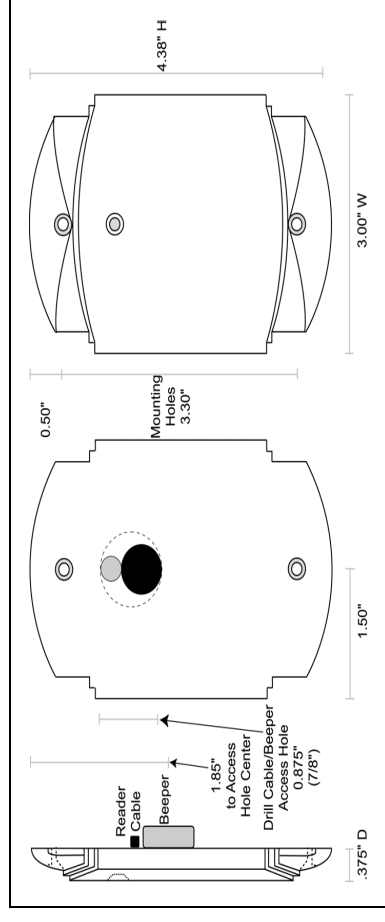


Figure 5: MS-4000 Dimensions

8.0 Troubleshooting the Reader Installation

| Problem | Probable Cause | Corrective Action |
|---|---|---|
| The reader does not recognize a card/tag. | <ol style="list-style-type: none"> One or more of the reader's wiring connections are incorrect. The reader is not receiving proper power from the controller. The reader is mounted too close to a device that radiates electromagnetic interference. A jumper is not set correctly on the controller. | <ul style="list-style-type: none"> Power down the controller and verify the wiring connections are correct. Verify the voltage supplied to the reader is correct per the <u>Operating Voltage</u> section on page 1. 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. For a PXL-250: Verify there is a jumper across pins 1 and 2 of JP4 (refer to the Technical Reference manual for more information - Keri P/N 01836-001). For a PXL-100: If the controllers are using TAP™ software, verify JP1 on the controller and the jumper on the Receiver card are installed across both jumper pins. If the controllers are using Doors™ software, verify JP1 on the controller and the Receiver card are not installed across both pins (typically the jumper will be installed onto one of the pins to keep it available). For an IntelliProx: Verify there is not a jumper across pins 1 and 2 of JP1 (typically the jumper can be installed onto one of the pins to keep it available). |
| | <ol style="list-style-type: none"> You are using an incorrect type of card. The reader is unable to read the card. The reader's controller is not properly grounded. | <ul style="list-style-type: none"> Make sure you are using an access card that is compatible with the reader. Verify there is nothing that can interfere between the reader and the access card. Ensure there is a quality earth ground connection made to the controller. Refer to the controller's documentation for specific information regarding the earth ground connection. |
| The reader has a short read range. | <ol style="list-style-type: none"> The shield wire for the reader's cable has opened somewhere between the reader and the controller. The reader is mounted too close to a metallic object (only MS-5000, MS-7000, or MS-9000). The reader is mounted too close to a device that radiates electromagnetic interference. The controller is mounted too close to a device that radiates electromagnetic interference. The reader is powered by a switching power supply. | <ul style="list-style-type: none"> Verify the shield line from the controller to the reader is one continuous, connected line. Refer to the controller's installation documentation and verify the shield line is correctly connected to the controller. Remove the reader from its mounting surface and ensure there is no metal on the mounting surface within 1 inch of the reader. 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. Devices such as computer monitors radiate electromagnetic interference that affects read range. When possible, relocate either the controller or the device to provide a greater distance between the two. Switching power supplies are EMI sources. Change to a linear, regulated power supply. |

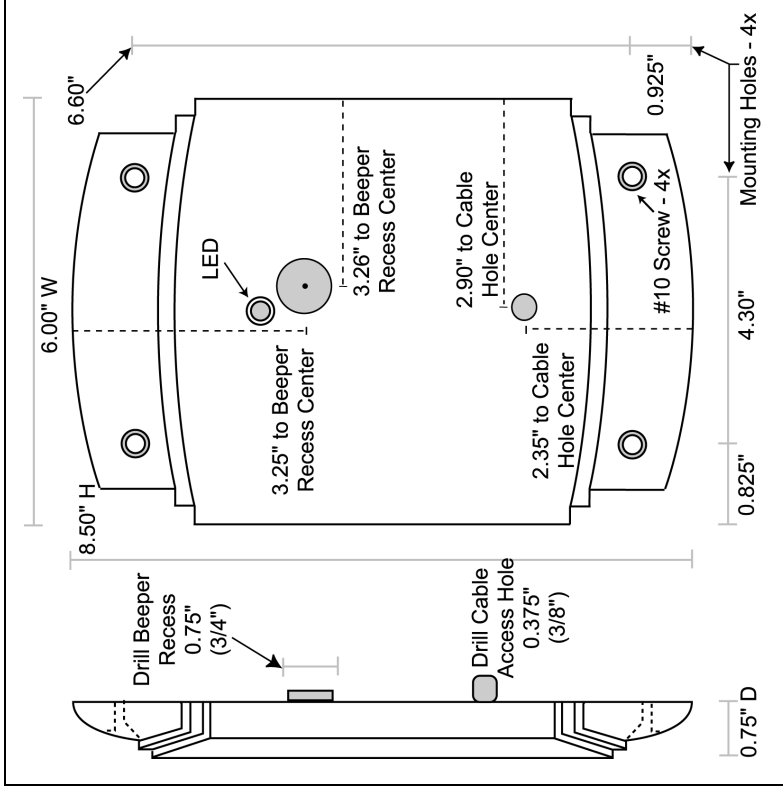


Figure 7: MS-7000 Dimensions

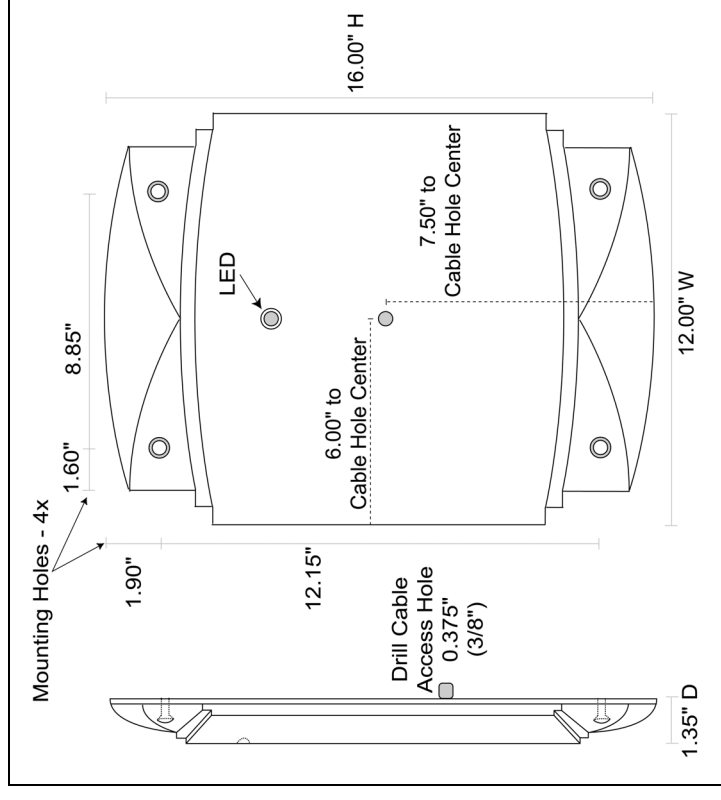


Figure 9: MS-9000 Dimensions