

Technical Reference
MR-1824 Proximity Reader
Assuring Maximum Read Range

Change History

Version	Date	Author	Comments
1.0	25 Aug 2004	LHH	First release.
1.1	26 Feb 2005	LHH	Update.
1.2	23 Jun 2009	LHH	General editing.
2.0	13 April 2012	LHH	Re-written; expanded.

AWID recommends the following checks when installing the **MR-1824**, **MR-1824MC** and **MR-1824HiLo** Proximity Readers, to assure that they perform at the published read-range distances (see product sheet “Credentials for Proximity Readers”, page 2).

Isolation (“Green Field”) Test

- Start the testing by running “Basic Tests – Isolation” at the shop or other quiet remote location. This is to give the installer confidence that the reader by itself is operating as rated. This is possible because of the self-testing feature of AWID’s proximity readers. All that you need is (a) the MR-1824... reader, (b) a charged back-up battery, (c) an AWID *clamshell* proximity card that you know reads well on other readers, and (d) a DC voltmeter to check voltage on the black and red wires.
- In absence of a back-up battery, clip the reader’s black and red wires to a truck battery. First, turn off the truck’s engine.
- When you see the reader operating as rated, proceed with other steps for the installation.

Power Supply

- Use an *independent* DC power supply, like AWID’s Part No. PS-121A plug-in module. *Do not connect* the reader’s red wire for positive voltage to the positive DC power terminal on the panel’s reader input port.
- Use a *linear, regulated* DC power supply, rated 12 volts, 1 ampere or more. If necessary to use a switching-type power supply, current rating should be 1.5 amperes or more. Locate a switching power supply 8 feet or more away from the reader.
- Other proximity readers may be connected to this power supply if its current rating is about twice the total reader load.
- Adjust voltage on the reader’s black and red wires to exactly **12.0 volts DC** for best read range. If the reader’s voltage is either higher or lower than 12.0 volts, read range will be shorter. At 5 volts, read range may be reduced by about one-quarter.
- **Voltage drop** between the power supply and the reader should not be more than several tenths of a volt. Higher voltage drop indicates restricted current flow in the reader. Look for a problem in the power supply, cable, wiring junctions, or reader.

Cable and Wiring (for Wiegand Interface)

- If power and data use the **same cable**, cable should be 18 gauge, 6 conductors, stranded, overall-shielded (not twisted pairs).
- If cables are **separate**, use 18 gauge for power, and 22 gauge for data. *All* cables must be overall-shielded.
- If data cable must be **twisted-pair**, run the 2 Wiegand data lines (green and white) in different twisted pairs – for example, green with black, and white with red. This avoids data crosstalk between the wires in long cable runs.
- Tie **all grounds** together – the reader (black), the reader’s power supply (negative), the panel’s “Ground” or “Common” terminal for this reader input port, and even ground or common for the door or gate controller.
- Tie the reader’s **drain** (bare silver) wire to the **shields** of both power and data cables. At the end of the cables nearest the panel and power supply, connect the cables’ shields to true *earth-ground* – not to Ground or Common terminals in the controller box.
- Insulate **unused wires** (orange, violet – perhaps brown, yellow, blue) from each other. They must touch nothing. Probe for cuts in the wires’ insulation, causing shorts.
- Connect just one reader into each reader-input port of the panel. *Do not connect* Wiegand devices in parallel at the ports.

(continued)

Distance from Metal

- For best read range, fasten the non-metal-compensated MR-1824 reader to a **non-metal surface**. Use a plastic box 4 inches deep, or a concrete wall without rebar, or a wallboard wall away from metal studs, or a wood post. Keep the reader 4 inches from a pedestal's mounting flange and from all other metal. Pull the cable straight back away from the reader.
- For best read range, fasten the metal-compensated MR-1824MC to a **metal surface** that is at least as large as the reader (8 inches square) or *larger*. With a given card or tag, best read range for the MR-1824MC may be about one-third less than the MR-1824.
- Do not mount either reader inside a metal housing, enclosure or room. Do not recess the reader in an opening in a metal surface. If you mount the reader directly inside the front cover of a plastic housing, loss of read range is only the thickness of the plastic.

Distance between Readers

- To maintain full read range, MR-1824... readers with 12 volts power must be installed 8 feet apart from each other, or more. At 5 volts, this distance between readers can be reduced.
- If MR-1824... readers must be closer together than 8 feet, place metal sheet, foil or screen between them, to shield their RF fields.
- Keep smaller proximity readers away from MR-1824... readers, to assure good performance. Test the readers before installing.

Credentials

- Use AWID's low-frequency proximity cards, keytags and wafers. Cards or tags from other sources may not be compatible.
- For best read range, use AWID's CS-AWID clamshell cards. Other cards and tags have shorter range (see the product sheet).
- Test the card at another reader to be sure that the card reads at full rated range. Present just a single card to the reader.

Environment

- MR-1824... readers may be installed indoors and outdoors. If they are exposed directly to rain, snow or bright sunlight in a hot environment, mount readers inside protective plastic housings.
- Avoid locations near sources of RF energy – radio transmitters, arc lights, electrical machinery. Use metal shielding if necessary.

Installation Site Test

- Interchange two MR-1824... readers. Does the problem stay at the location or move with the reader?
- Turn off the power to other nearby electrical devices one by one – RF-type vehicle sensors, other proximity readers, intercoms, PCs, RF communications systems, intercom stations, arc-type and fluorescent lights, HVAC motors, etc. Test for improved read range at the MR-1824... reader as each item is powered down.
- Adjust RF-type buried-loop vehicle sensors to the minimum settings that detect vehicles reliably.

Host Access Control System

- To be sure that the host system is reading normally, substitute a different reader that you know works well at the reader input port.

MR-1824HiLo and MR-1824HiLoMC

- The “HiLo” reader sets follow the same instructions to assure maximum read range as the single reader units.

References

- Visit AWID's Website – www.awid.com – for descriptions, specifications, and installation instructions for MR-1824... and all other AWID proximity products. Contact AWID's Technical Support at +1-408-825-1100 (toll-free in the U.S., 800-369-5533).
- Study the product sheet and the Installation Sheet for the MR-1824... reader before starting installation.
- Read AWID's Technical Reference issues for “Proximity Readers - Basic Tests” and “Proximity Readers - Trouble-Shooting”.