

UHF Long-Range Readers

Support 3 – Installing

These notes are for AWID's LR-2000, LR-2200 and LR-3000 reader models, and their 'HiLo' variations.

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A. PURPOSE

AWID offers these suggestions to assure quick and successful installation of the UHF long-range readers and credentials.

Before starting a new project, see AWID's 'Support 1 - Getting Started'.

To prepare for the installation, see 'Support 2 - Preparing to Install'.

If there are operating or performance concerns, see 'Support 4 - Trouble-Shooting'.

B. TOOLS AND SUPPLIES

For installing and trouble-shooting the AWID UHF readers, the following tools and devices are always *very* useful.

- **Installation Kit** (Model LR-KIT-0-0) is a **required** first-time, one-time purchase for every installing company.
- **Back-up battery**, 12 volts, 7.5 ampere-hours, full charge (substitutes for DC power supply and cable).
- **Tags or cards** from the client's supply for users (with codes programmed into the system).
- **DC meter**, digital, with ranges for 20 volts or more, and 5 amperes or more.
- **Hand tools** and wiring supplies (common van supplies).

C. REFERENCE DOCUMENTS

- Quick Installation Guide for the AWID UHF long-range reader model to be installed.
- 'Installation & Operation Manual' for UHF long-range reader model (available on AWID's Web site).
- Technical Reference issues describing special applications of installing the reader inside a protective housing, tags on big trucks or forklifts, and others. See Technical References in AWID's Web site.
- Instructions for the UHF tags and cards.
- Quick Installation Guide and product sheet for the LR-KIT-0-0 Installation Kit.

D. GUIDELINES

1. Review the **Support memos** for 01 Getting Started and 02 Preparing to Install. Look at every item.
2. To preserve the reader's Warranty, keep it assembled. **Do not remove** the screws. **Do not drill** holes anywhere.
3. Be sure that the **height and location** of the reader matches the roadway, the vehicles, the tags and their locations.
4. Check on **consistency** for all readers and tags – readers on same side of roadway, tags in same position in cars.
5. Have a means of adjusting the reader's **aiming**, except when the reader is aimed straight across the lane at tags.
6. Use a polycarbonate **enclosure** to protect the reader from direct rain or snow, or from bright sunlight when hot.
7. Assure that there is **open space** (no posts or structure or trees or shrubs) between the reader and the tags or cards.
8. At the reader area, avoid sources of **RF** – fluorescent lamps, arc-lights, radio transmitters, other UHF readers.
9. Locate the DC power supply 12 feet **or more** from the reader, to reduce RF transmission into the reader.
10. Using 18 gauge power cable and 22 gauge data cable, reader may be up to **500 feet** from power supply and panel.

E. STRATEGY

1. **Test products to be installed:** Before going to the site, test each product on your bench for complete confidence in perfect performance.
2. **Test installed products:** Test the long-range reader at each stage in the installation – before and after interface to the host system.
3. **Keep everything accessible:** Do not tighten fasteners or seal wiring junctions until the system is tested and works completely. Then – wrap up the job.
4. **Solve problems:** SEE 0Support 40 of this series for an effective trouble-shooting procedure to identify and cure problems in the installation.

F. MOUNTING THE READER – SINGLE ANTENNA UNIT

1. Remove the long-range **reader** from its carton. Cut off and discard the white in-line connector from the cable.
2. Insert ¼–20 **screws** through the slots of the mounting bracket's adjustable head, into the reader's 2 capture nuts.
3. If there is no adjustable bracket, use an **adapter** plate, or drill holes through the mounting surface, for ¼ screws.
4. If a protective **enclosure** for the reader is required, ask for AWID's Technical Reference on mounting the reader.
5. Run the reader's **cable** to the cable junction. Use conduit and boxes. Keep wire tie points accessible for testing.

G. MOUNTING THE READER – DUAL ANTENNA UNITS (“HiLo”)

1. Review the items in **Section E**. They apply to the 0HiLo reader set as well.
2. Install each reader unit on its own **mounting bracket**, and inside its own protective **enclosure** (if needed).
3. Run the 6 foot **mini-coax cable** between the two antenna units. Tighten and seal the brass connectors if exposed.

H. INITIAL READER TESTING

This Section uses AWID's LR-KIT-0-0 Installation Kit, its instructions sheet, and the test wiring in Figure 1.

1. Strip the reader's **black**, **red**, **orange** and **yellow** wires.
2. Clip the Kit's Test Unit (**black**, **orange** and **red** wires) to the wires with the same colors on the reader.
3. Apply DC power (usually nominal 12 volts) to the **black** and **red** wires. A back-up battery (7.5 A-hr) is ideal.
4. To arm the reader (so it generates RF), clip its **yellow** wire to the **black** wires.
5. Measure the voltage on the reader's **black** and **red** wires. It should be within 0.4 volts of the no-load voltage.
6. Hold the Kit's ProHunter RF Signal Detector in front of the reader. Measure the distance for steady chirps.
7. If the ProHunter chirps to 60 feet or more, hold the Kit's sample tags and cards in front of the reader in fingertips.
8. If the Test Unit beeps, and its LED changes color, to the rated distance, the initial tests are successful.

See Figure 1. Test Unit Wiring (page 5).

I. WIRE CONNECTIONS AT THE READER

This Section refers to Figure 2 for the reader's permanent wire connections.

1. If the reader is to be armed continuously, permanently connect the **yellow** wire to the **black** wire at the reader. If the reader's arming is controlled by external relay contacts, connect **yellow** to **black** through those contacts.
2. Connect the 3 Wiegand data wires (green, white and blue) from the reader to the panel's reader input port. Select the terminal for the blue Data-Common wire carefully. It may be labeled Ground or Common.
3. Connect the drain of the reader's cable to shields of data and power cables. Let them float. *Do not ground them.*
4. Connect the reader's **black** and **red** wires to the DC power's negative & positive terminals. *Do not ground them.*
5. Separately insulate the unused **violet** and **brown** wires. Keep the **orange** wire available to connect the Test Unit.

See Figure 2. Installation Wiring (page 5).

J. INTERFACE AND PROGRAMMING

1. Look for data input at the controller panel while reading a tag or card. Use the panel's LED indicator, relay, etc.
2. Program the host system for the reader type, the code format (number of bits), and the credential's site code.
3. Enter the assigned credential's ID numbers into the database, along with the user's identification data.
4. Program the host system for door or gate numbers, time zones, priority levels, anti-passback, and other features.
5. Look for input of events on the host system's events monitor and reports.

K. INSTALLING CREDENTIALS

Instructions for all tag and card types are in AWID's Installation Instructions & Credentials for LR-2000 í and Manual.

1. Be certain that the correct credential type has been selected for the user's application and desired characteristics.
2. Test the location for the tags on a few vehicles, using tape, before applying tags to all vehicles.
3. To test a new WS tag: Keep the tag's adhesive covered. Press the tag inside the windshield at several positions, using a plastic foam block. When a good position is identified, expose the adhesive and press the tag on the glass.
4. Either portrait or landscape orientation of the tag may be best on a particular vehicle. Try both for best result.
5. If properties of a few cars interfere with tag performance, use AWID's Technical Reference Alternatives í.

L. ALIGNING READER AND CREDENTIALS

- RFID credentials (tags and cards) work best when they are aligned with the reader, and parallel to the reader.
- When the credentials are at the planned reading distance from the reader ó
 1. Aim the reader so that it is facing directly the location of credentials on vehicles.
 2. Locate the credentials on vehicles so that they are aligned with the reader ó face-to-face with the reader.
 3. Have clear line-of-sight between the credentials and the reader.
- This usually means that the reader will be higher than the tags, and aimed downward somewhat.
- In the øHiLoø dual-antenna set, the two units may be close together, facing each other, or any other configuration.

M. SYSTEM TESTING

- Do **tags** on all vehicles, or held by all people, read correctly and promptly and consistently?
- Does the **gate** operate without delay when a valid credential is presented to the reader?
- Does the systemø **event monitor** display the proper information? Do events reports present correct activity?

N. CHECK LIST

- ___ 1. Test the reader at the shop **before it is installed**, for confidence in its performance before you take it to the site.
- ___ 2. Test the reader when it is **fastened to its mounting**, before you wire it into the system.
- ___ 3. Test the reader when it is **wired into the system** and programmed for the application software.
- ___ 4. Test the reader when **tags are attached** to the vehicles.
- ___ 5. Watch for **full operation** of the gate. Watch for correct **display** of code data and reports of events.
- ___ 6. Prepare **instructions** for the systemø manager or end users: How to attach tags. How to drive past the reader.
- ___ 7. If a **problem** develops, SEE øSupport 4 ó Trouble-Shootingø.

O. AWID'S SUPPORT PEOPLE

Sales	Please contact your AWID supplier or the Regional Sales Manager.
Customer Support	Please contact AWIDø corporate offices ó 408-825-1100, option 3.
Technical Support	Please contact AWIDø corporate offices ó 408-825-1100, option 1.

P. HOOK-UP DIAGRAMS

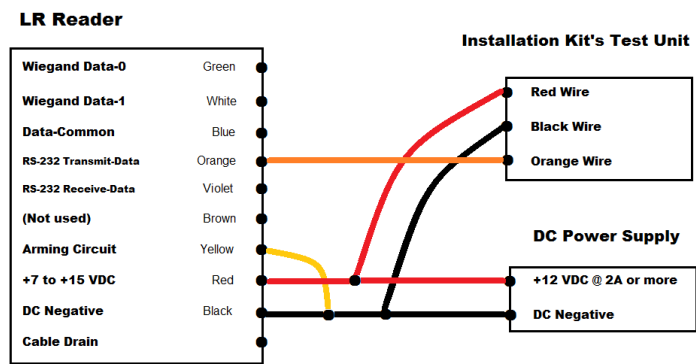


Figure 1. Test Unit Wiring.

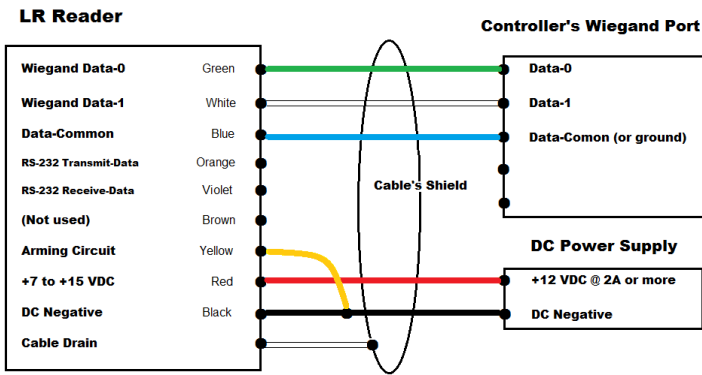


Figure 2. Installation Wiring (Wiegand).

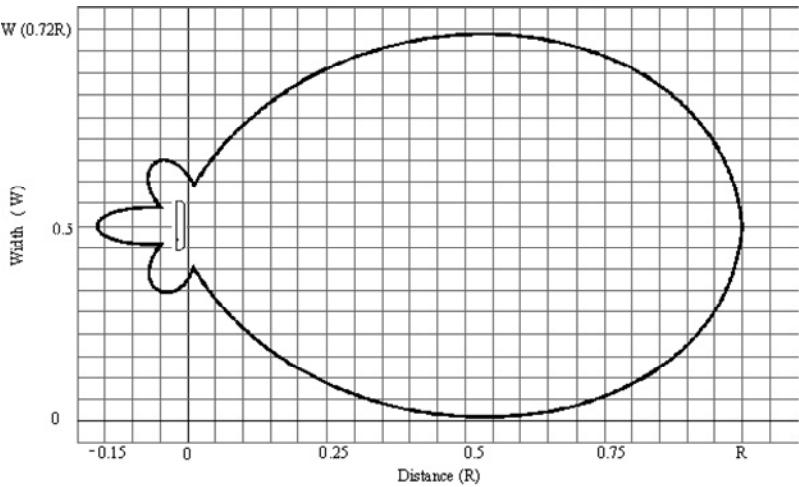


Figure 3. Effective RF Field for UHF Long-Range Readers.