

UHF Long-Range Readers

Support 2 – Preparing to Install

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

While preparing to install AWID's UHF long-range readers and credentials, the steps below will guide the installers.

To start a new project, see AWID's 'Support 1 - Getting Started'. It helps to assure that the correct products are ordered and collected for the client's application.

B. GUIDELINES

1. First thing - Know the client's **goals and desires**. Know what will work, and what needs to be changed.
2. Study the site's **layout**. Make plan drawings. Get architect's prints. Take photographs.
3. Define the **roadway** so that all vehicles follow the same path - one lane wide. Mark the lane if necessary.
4. A vehicle-length between the reader and the gate may allow the **gate to open** before vehicles roll up to the gate.
5. Ideal **vehicle speed** may be 15 miles per hour. This should assure time for reliable reading of all tags.
6. If possible, select a reader location where the vehicles travel in a **straight line** as the tags are read.
7. Know **where to mount** the reader - at the side of the roadway, or above the roadway, or facing turning vehicles.
8. Plan on **reader height** that relates to the physical structure, vehicle types, tag type and location on vehicles.
9. Assure that there is **open space** between the reader and the tags - no fence, bushes, structure to block the UHF.
10. If vehicles will have access to more than one gate, the arrangement of reader and tag locations must be **consistent**.
11. Mount the reader using an **adjustable-head** bracket. The reader must be aimed at the location of tags for reading.
12. At the reading distance, have the **reader and tags aligned** with each other - facing each other, in parallel planes.
13. Watch for conditions that may require the 'HiLo' dual-antenna reader set, or a protective **housing** for readers.
14. Scan the site for **radiation** that might affect reading. Use the Installation Kit's 'ProHunter' RF Signal Detector.

C. GOOD PRACTICES FOR ALL UHF READER INSTALLATIONS

1. Use only overall **shielded cable** (100% rated) for reader's power and data, and for door locks and gate operators.
2. A reader's power and data may share the same cable, or run in separate cables. Use AWID's **cable specifications**.
3. Use a **separate shielded cable** for each reader. This helps to prevent cross-talk in long cable runs.
4. **Never connect** 2 or more readers *in parallel* into the same power wires or data wires of the cable.
5. **Never connect** 2 or more reader cables *in parallel* into the same port on the panel, or into the same power supply.
6. When making **power connections**, connect negative DC *first* and positive DC *last*. Disconnect in reverse order.
7. **Remove DC power** before cutting wires and before making data wire connections. Never bunch-cut hot wires.
8. Feed Wiegand Data-0 and Data-1 wires in different pairs of **twisted-pair cables**, to prevent data crosstalk.
9. UHF readers have no audible or visible indicators. Use the Installation Kit's test unit for **beeper and LED**.
10. UHF readers are **wired differently** from proximity readers with the same Wiegand interface. Use the diagrams!
11. UHF readers must not be grounded or tied together. Let DC power, drains and shields **float**.
12. **Unused wires** must be taped or capped separately at the reader, insulated from ground and from other wires.

D. TOOLS AND SUPPLIES

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

- AWID's **LR-KIT-0-0 Installation Kit** ó a **required** first-time, one-time purchase for every installing company.
- **Back-up battery**, 12 volts, 7.5 ampere-hours, fully charged (to substitute for DC power supply and power cable).
- **Proximity reader** and compatible card (to substitute for the UHF long-range reader and data cable into the panel).
- **Spare tags or cards** from the client's supply for users (with codes programmed into the system).
- Digital **DC meter** with ranges for 20 volts or more, and 5 amperes or more.
- **Camera tripod**, with camera seating pad (1/4ö-20 screw).
- Common **hand tools** and wiring supplies.
- If available ó dual-trace **oscilloscope**, and UHF **spectrum analyzer** with directional and 360-degree antennas.

E. DOCUMENTS FOR REFERENCE

- Quick Installation Guide for the AWID UHF long-range reader model to be installed.
- "Installation & Operation Manual" for the AWID UHF long-range reader model (available on AWID's Web site).
- Technical Reference issues describing special conditions for this application ó 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.

F. TESTING THE INSTALLATION SITE

The LR-KIT-0-0 Installation Kit supplies the means of testing and evaluating the environment into which the UHF long-range reader will be installed. These tests can be run without interface to any access control system or controller.

1. With the ProHunter RF **Signal Detector** from the Kit held in your fingers, scan the area around the planned site for the reader. Watch for indications of spurious RF radiation from a neighboring source. This may be a cell phone tower, communications antenna, another UHF reader, arc-type lighting fixture (including fluorescent), buried loop sensor, or security camera. (Such extraneous radiation may not interfere with the AWID readers.)
2. Set up the Kit's **EVAL** reader. Clip the Kit's Test Unit to the EVAL reader. Clip the Kit's plug-in DC power module, or a back-up battery, to the EVAL reader's wires. To arm the EVAL reader, connect its **yellow** wire to the **black** wire. (A camera tripod is very convenient for supporting the reader during testing, hands-free, up to a height of 6 feet.) See Figure 1 (page 4) for clip connections of **black**, **red**, **orange** and **yellow** wires.
3. Read a single **tag or card** from the Kit, or from the client's supply. Measure how far that tag can be read in front of the EVAL reader. Hold the tag or card as instructed. Have all other UHF tags far behind the EVAL reader to prevent inadvertent reading of other tags.
4. If the tests indicate less than rated **reading distance** for the reader and credential models:
 - (a) Move the EVAL reader around to other locations at the installation site. Find an alternative RF-quiet area.
 - (b) Remove power from all other devices that may generate interfering radiation. Look for improved tag reading.
 - (c) To test the Kit's components without interference, carry the test gear to a remote location free of RF sources.
5. To test-read a **credential in or on a vehicle**, secure a tag temporarily by tape. For a WS-UHF windshield tag, press it inside the windshield glass using a fist-size block of plastic foam. This flattens the WS tag against the glass.
6. Invite the **client** to observe these tests, for confidence in good performance of the products before installation.

G. SHOP-TESTING AWID'S PRODUCTS

When the AWID products arrive, open the packages, account for all items, and know the purpose of each item. Before taking them to the site for installation, use the Installation Kit to see the reader, the tags, the power supply, and other system components working in the friendly environment of your own shop.

1. Hang the **reader** on a wall or shelf, about 6 feet high, with plenty of clear space in front of the reader. If possible, use a driveway or parking lot. A ¼"-20 screw inserted in the reader's back surface is convenient for quick testing.
2. Follow the same procedure as in **Section F**, except substitute the reader that will be installed, in place of the Kit's **EVAL** reader.
3. To see the **reader's data** in an access control system, connect the reader's 3 Wiegand data lines (green, white and blue) to the reader input port on your shop's controller panel. Use the wiring diagram. Observe code inputs for a test tag, with the tag held in your fingertips, far to the side of your body, out to the rated reading distance.
4. Use this procedure to build **confidence** in the operation and performance of the products, and in your own ability to install the products quickly and correctly at the site. Call AWID with questions.

H. CLUES FOR GOOD TESTING

1. **Hold the test tag** or card in your fingertips, at arm's length beside you, with a flat side facing the reader.
2. **Have just one tag** or card in front of the reader. Move all other tags far behind the reader.
3. Start by holding the tag or card close to the reader. Gradually move the tag away from the reader, in front of the reader, moving the tag up and down, back and forth, to **map the extent** of the working field.

I. CHECK LIST

- ___ 1. Assure that the plan meets the **Guidelines** for an effective and satisfying installation.
- ___ 2. Be familiar with the **Good Practices** that lead to good results.
- ___ 3. Collect the **Tools and Supplies** that will be needed in shop-testing and for the installation at the site.
- ___ 4. Be **familiar with the site** where each part of the system will be located, and how the parts will work together.
- ___ 5. **Test AWID's products** at you shop, to know how all items work and how they will be installed at the site.
- ___ 6. Contact AWID's **Technical Support** with questions.

J. AWID'S SUPPORT PEOPLE

Sales Please contact your AWID supplier or the Regional Sales Manager.

Customer Support Please contact AWID's corporate offices ó 408-825-1100, option 3.

Technical Support Please contact AWID's corporate offices ó 408-825-1100, option 1.

K. HOOK-UP DIAGRAMS

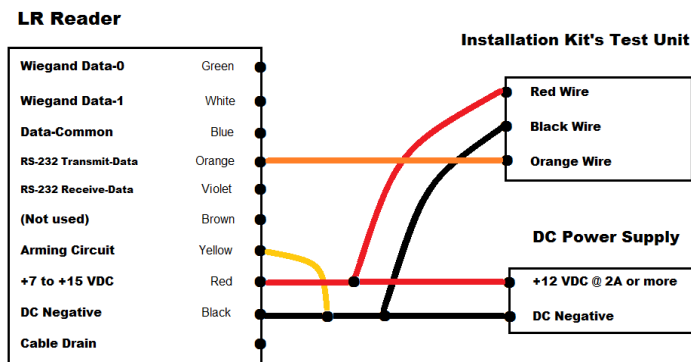


Figure 1. Test Unit Wiring.

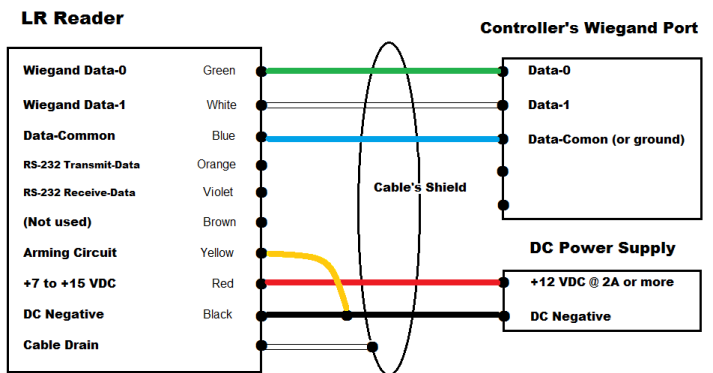


Figure 2. Installation Wiring (Wiegand).

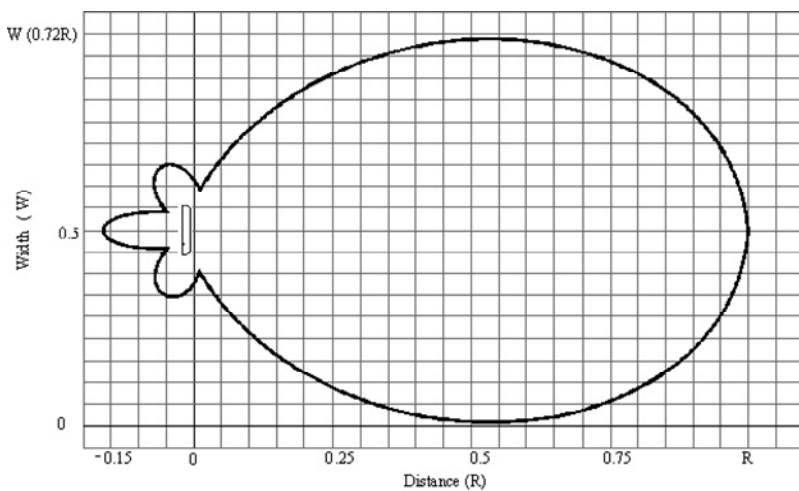


Figure 3. Effective RF Field for UHF Long-Range Readers.