APPLIED WIRELESS ID

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# Technical Reference
# Long-Range UHF Readers
# Pre-Installation Testing – Evaluating Site Conditions

*This memo contains a rigorous (but not difficult) approach for testing the installation of an access control system, using AWID's long-range UHF readers. The procedure starts* before *the products are brought to the site. This applies to the LR-2000, LR-2200, LR-3000 and LR-911 reader models.*

## 1. Testing the "EVAL" Reader – Away from the Site

Products: LR-2000KIT Installation Kit. Backup battery (12 volts, 7.5 ampere-hours, fully charged).

Purpose: Know how to set up a reader and test unit for product performance tests.

Procedure: (a) Find a location that has no spurious background radiation – perhaps your own shop, or inside a truck. Use the RF-SD "ProHunter" signal detector (in the Kit) to identify a place where the ProHunter has no "chirping" or LED flashing. **TIPS**: Be sure that all UHF readers have their power off when testing for background radiation. Avoid sources of RF like arc-lamp and fluorescent lighting, radio transmitters, pre-collision warning systems on cars, etc.

(b) Stand the LR-2000EVAL reader (from the Kit) so that there is clear space (20 feet or more) in front of it. Connect the backup battery and the SP-6820-LR test unit to the reader's spring clips, using the wiring diagram in the Kit's laminated instructions. **TIPS**: Use a camera tripod to support the reader, adjusted to full height. The ¼"-20 screw in the camera pad matches the long-range reader. **OPTION**: If necessary, use the PS-123.3A plug-in DC power module from the Installation Kit. The *battery* provides continuous and clean DC, with plenty of current, and power for 8 hours.

(c) Holding one of the 7 test tags and cards from the Kit, observe that the reader reads these credentials at 20 feet or more. **TIPS**: Have just one tag near the reader at any time. Place all other tags 30 feet behind the reader. When testing the windshield tag, use the WS-UHF tag that is adhered to the small piece of windshield glass. Or press a loose WS-UHF tag against the windshield glass, using a block of plastic foam to flatten the tag against the glass.

## 2. Testing the Reader to be Installed – Away from the Site

Products: Long-range reader that will be installed. LR-2000KIT Installation Kit. Backup battery.

Purpose: Know that the reader that will be installed at the site performs to ratings. Steps #1 and #2 are *vital* to set a benchmark for performance of the products – to give full confidence that the AWID products are working normally.

Procedure: (a) In the set-up for Step #1, substitute the reader that will be installed at the site, in place of the EVAL reader from the Kit.

(b) Observe that the reader to be installed reads the Kit's 7 credentials at 20 feet or more. See **TIPS** in Step #1 (c).

(c) If any of these tests fail, contact AWID's Technical Support, to identify and correct the problem.

## 3. Checking the Site for Spurious Background Radiation

Products: LR-2000KIT Installation Kit. Backup battery.

Purpose: Know whether there is radiation from other sources at the site that might interfere with the long-range reader's performance.

Procedure: (a) At the installation site, repeat the ProHunter test of Step #1(a). Walk around the area and watch for "hot spots" and "dead spots" of RF. If possible, select a location for the long-range reader that has no RF indicated on the ProHunter. **TIP**: Detecting spurious RF does not necessarily lead to interference with the long-range reader. The reader may work perfectly well in the presence of most RF from neighboring sources.

(b) Repeat this test using all 7 of the Kit's tags and cards – one at a time). If the read ranges for different credentials are widely different (for example, a 2-to-1 ratio), there may be external RF that will affect the read range of these credentials.

## 4. Testing the Reader to be Installed – At the Site

Products: Long-range reader that will be installed. LR-2000KIT Installation Kit. Backup battery.

Purpose: Know that the reader that will be installed performs at the site to published ratings.

Procedure: (a) Repeat the set-up and connections from Step #2, using the reader that will be installed and the power supply and the test unit from the Kit. **OPTION**: Use the DC power module from the Kit, instead of the battery.

(b) Observe this reader reading the Kit's tags and cards, held in fingertips, at 20 feet or more.

(c) Map the field in which the hand-held tags are read, indicated by the test unit's beep and LED flashing. Reproduce the Effective RF Field diagram with maximum range "R" = 25-30 feet, and maximum width "W" at 1/2 "R" = about 12 feet.

## 5. Mounting the Reader

Products: Long-range reader to install. LR-MB Mounting Bracket. Protective housing. LR-2000KIT Installation Kit.

Purpose: Know that the reader performs as well when it is fastened physically at the site.

Procedure: (a) Fasten the reader to its mounting bracket, using the reader's protective housing when it is required.

(b) Repeat the performance tests, observing reading distance and RF field size when the reader is on its mounting.

## 6. Connecting the Power Supply

Products: DC power supply for this reader. Mounted reader (and housing). LR-2000KIT Installation Kit. Power cable.

Purpose: Know that the reader performs as well when the installation's power supply is used to power the reader.

Procedure: (a) Select a location for the power supply. Install the power supply 12 feet of cable length *and* 12 feet of physical distance ***or more*** away from the reader, to avoid RF feedback (conduction or radiation) from the power supply to the reader. **SEE** Technical Reference "Planning, Material List" or Manual for specifications on power supply and cable.

(b) If the power supply is near the control panel, the cable for power and data may be combined. If the power supply is at a remote location or closer to the reader, separate cables may be better. *Both cables must be overall-shielded.*

## 7. Connecting the Data Lines

Products: Mounted and powered reader. Data cable. Compatible tag or card.

Purpose: Know that the reader communicates data to the host system.

Procedure: (a) **SEE** Technical Reference "Planning, Material List" or Manual for cable specifications and connections.

(b) Observe the means provided by the host system to know that there was data input to the panel. This may be an LED on the board, or a message on the system's PC display, or even a beep.

## 8. Programming a Test Tag's Code

Products: Complete system. Test tag or card.

Purpose: Know that the installer's test tag grants access or registers correct tag data in the system.

Procedure: (a) The Installation Kit's tags and cards use the 26-bit-STD industry-standard format. In the system, select a reader input for this format, and program the facility or site code (usually 001) as printed on that tag or card, and the ID number (perhaps 00001).

(b) Look for the system's indication of correct code reading and programming. This may be the "Access granted" message, or display of the credentials code on the screen, or triggering the panel's relay contacts for gate motor operation or door unlocking.

## 9. Programming a User's Tag

Products: Complete system. Customer's test tag or card.

Purpose: Know that the users' credentials grant access or register correct data in the system.

Procedure: In the system, select a reader input for the code format that AWID programmed into those tags or cards. This is usually 26-bit-STD, the industry-standard format. Program the facility or site code for the users' series of credentials, and the range of ID numbers. ID numbers are usually sequentially numbered and stacked as shipped.

## 10. Attaching a User's Tag to a Vehicle

Products: Complete system. Customer's supply of tags or cards.

Purpose: Know that the system can have the full range of codes entered in the system, and that each tag reads correctly.

Procedure: **SEE** Instructions sheet, Manual, or Technical Reference issues for instructions on attaching or holding the credentials.

## References:

- "Installation & Operation Manual" for the long-range UHF reader model.
- Product sheets for the reader model and compatible credentials.
- Technical Reference issues for AWID's products. See especially "Planning, Material List" for the reader model.
- Instructions for the credentials used with this reader model.
- Diagram for "Effective RF Field" from these long-range readers.

All of these documents are available on AWID's Web site, www.awid.com. On the home page, click on the tab "Support", then use the path Downloads > Access Control > type of documents > "UHF Products" > document by model number for "Readers, UHF" or "Credentials, UHF"