APPLIED WIRELESS ID

Applied Wireless Identifications Group, Inc.
18300 Sutter Blvd., Morgan Hill, CA 95037 • Voice 1-408-825-1100 • Fax 1-408-782-7402 • www.awid.com

Technical Reference

WS-_ Windshield Tags for UHF Readers

Testing for Good Location in Vehicles

The WS-UHF-0-0 and WS-1216-0-0 tags generate their full read range only when they are permanently attached by their adhesive to windshield glass inside the vehicles. When they are held in air by the fingertips, they may read only 3 feet from the reader. But when they are properly applied to windshield glass, the WS tag's reading distance increases to about 15 feet for LR-2000 readers, and to about 8 feet for LR-911 readers. This memo describes tests for best reading.

A. Testing Tag by Hand

When you hold a WS-_ tag by hand (a) to test the tag or reader, or (b) to self-enroll the code into a system –

1. Squeeze the tag between your thumb and forefinger at the edge of the protective plastic sheet that covers the tag's adhesive. Keep your hand behind or to the side of the tag.
2. Hold the tag close to the reader, parallel to the reader's face, with the tag's plastic sheet facing the reader.
3. Have a clear line-of-sight between the tag and the reader.

B. Finding Good Tag Location Inside Windshields

To select the best location for WS-_ windshield tags inside vehicles, we must consider all of these factors – the model of the long-range reader, its location, its method of mounting, its aiming, the types and sizes of vehicles, characteristics of the windshields, and features of the vehicles.

When a good tag location on the windshield is identified for a typical vehicle, the tags in *all other* vehicles of that type will usually read well in the same location. A few high-priced cars may require you to identify their ideal tag location.

To test the performance of a new WS-_ tag in various locations inside a windshield, before the tag is attached by its adhesive to the glass –

1. Use the SP-6820-LR **test unit** from the Installation Kit. Clip its wires to the reader's black, orange and red wires.
2. Move the **vehicle** to be tested so that its windshield is about 15 feet (5 meters) in front of the reader. Aim the reader at the windshield.
3. Use a block of flexible **plastic foam** that can be held by hand (3 or 4 inches thick, flat on one side).
4. Hold the **WS-_ tag** with its removable plastic sheet still covering the tag's adhesive, inside the windshield. Place the plastic sheet against the windshield glass, facing the reader.
5. With the plastic foam block, **press the tag** flat against the windshield. Keep your fingers away from the tag.
6. Observe the test unit on the reader. It indicates each read of the tag by a short **beep and LED** color change.
7. To find the best tag location, move the tag to **different locations** inside the windshield. Try both **portrait and landscape** orientation of the tag.
8. When you find the best location, peel the plastic sheet from the tag without bending the tag. **Attach the tag** by its adhesive to the glass. Use your fingers or the heel of your hand to press the tag flat against the glass. Do not press hard directly over the tag's integrated circuit.

Steps 4-7 take just a few seconds. This is a valuable procedure for the few vehicles at a typical installation that may block the tags' RF code transmission to the reader. (See References, page 2, for Technical Reference, "RF Blocking".)

C. Attaching Tag to Other Material

To develop full rated read range with the WS-_ windshield tags, they must be attached by their own adhesive only to windshield glass. When attached to any other material (for example, Plexiglas), or if held in fingers, the reading distance will be greatly reduced. The WS-_ tags must be permanently adhered to windshield glass to make use of the dielectric constant of windshield glass, which becomes a parameter in the tags' circuits.

D. Trouble-Shooting the System

Common reading distance for all AWID tags and cards for long-range readers is 15 feet (5 meters). If you measure considerably less than 15 feet, there are other system factors to check. (Contact AWID's Technical Support.) Check on –

- Power supply – rating; dedicated to this one reader; not grounded.
- Cable specifications – always shielded; proper gauge.
- Wire connections – 7 wires connected; 3 unused wires insulated separately.
- Draining – all cable shields tied together, but *not* grounded anywhere.
- Presence of another UHF reader (use AWID's "HiLo" reader set for 2 readers close together).
- RF interference from another UHF source, for example, fluorescent light close to the reader.
- Presence of more than one tag in the reader's effective RF field.

E. Installation Kit

AWID offers Installation Kits for the long-range readers. The Kit is a required first-time, one-time purchase for every installing company. For the LR-2000 reader, use LR-2000KIT-0-0. For the LR-911 reader, use LR-911KIT-0-0. The Kit contains the SP-6820-LR clip-on test unit, a set of compatible encoded tags, a plug-in DC power module, and other items.

Notes

1. WS-_ tags can be adhered just once to the windshield. If a tag is pulled from the glass, it will no longer read.

References

- Technical Reference: "Long-Range Readers – Questions for **System Planning**"
- Product sheet: "**Credentials** for UHF Readers LR-2000 & UA-612"
- Installation Instructions: "**Credentials** for LR-2000 Long-Range Reader"
- Installation Instructions: "**Credentials** for LR-911 Long-Range Readers"
- Product Sheet: "LR-2000KIT UHF **Installation Kit**"
- Quick Installation Guide: "LR-2000KIT **Installation Kit**"
- Quick Installation Guide: "LR-911KIT **Installation Kit**"
- Technical Reference: "Tags for Long-Range Readers – **RF Blocking** by Vehicle Features"
- Diagram: "Long-Range Readers – Effective **RF Field** with UHF Tags"