

## Technical Reference

### **UHF Long-Range Readers – Suppressing Multiple Reads, Etc.**

*In some applications, the host system may not be completely compatible with incoming data from the reader. This memo suggests improvements. These conditions do not indicate a problem with the reader – just the nature of the application.*

#### **A. Data Repetition: To Assure a *Single* Code Transmission for Each Vehicle**

When AWID ships a long-range reader, it is programmed to repeat the code reading 3 times per second, as long as the tag or card remains in the reader's RF field. This may allow multiple code reads to be registered in the host system. The following methods prevent more than one read being stored in the database and being displayed in activity reports.

1. In the access control system's program, enable **timed anti-passback** (APB). Set a time (perhaps 5 seconds) between inputs for a repeated code. Be sure that timed APB actually blocks entry of a repeated code during the set time.
2. Use a **timed relay** to disarm the reader's RF field. Wire the timed relay's normally-closed contacts to break the connection of the reader's yellow wire to the black wire for the time (perhaps 5 seconds) that you set in the relay. The timed relay's operation is triggered by the panel's NO relay contacts when the gate motor operation starts.
3. Change the reader's **repetition rate** from the default 3 reads per second to one of the available slower rates. Download the Long-Range Reader Settings program from AWID's Web site (Note 1). Set a rate that assures that the vehicle carries its tag beyond the reader's RF field before the tag is read a second time. (Note 2.)

#### **B. Data Repetition: To Reduce the Number of Reads for Each Tag**

If the vehicle pauses at a slow gate or door *and* the tag remains in the reader's RF field, multiple reads may be transmitted into the system's controller. To have a smaller number of reads recorded by the system, use these methods.

1. Install the reader far enough\* in front of the gate so that the vehicle carries its tag out of the reader's RF field, as the gate motion begins. The goal is for the driver to **keep the vehicle moving** slowly (up to about 15 miles per hour) through the RF field, toward the gate. (\* . . . but not too far. Watch out for piggybacking by following vehicles.)
2. Change the reader's **repetition rate** from the default 3 reads per second to one of the available slower rates. Download the Long-Range Reader Settings program from AWID's Web site (Note 1). Set a rate that provides the desired smaller number of code reads to the host system for each vehicle. (Note 2.)

#### **C. Data Processing Speed: To Space Out Repeated Inputs**

If the host system can not process incoming code data at the default rate of 3 reads per second, it may be necessary to reduce the rate so that the system can see each input as a complete event, and to display and register each input separately.

1. Change the reader's **repetition rate** from the default 3 reads per second to one of the available slower rates. Download the Long-Range Reader Settings program from AWID's Web site (Note 1). Set a rate that lets the host system see each code input separately, with enough time to process the code correctly. (Note 2.)

#### **D. Data Corruption: To Maintain Clean Data**

The host system may fail to accept input if data from the reader are corrupted. Or the system may accept the corrupted code but fail to grant access. Causes of corrupted data are (a) electrical noise causing extra pulses or damaging valid pulses in the data stream from the reader, and (b) cross-talk in the Wiegand data lines if the cable has twisted-pairs.

A system that counts and displays the number of bits in the incoming code helps to diagnose the problem.

- If the number of bits is correct, and the site code and ID number are consistent but wrong, check the Wiegand data lines (green and white). They may be reversed. (continued)

- If the number of bits in repeated code inputs is consistently wrong (always the same *number* of bits), the tag or card may have a format (number of bits) that is different from the format that is programmed into the system.
- If the number of bits in repeated code inputs is randomly *higher* than the number of bits in the tag's code, a noise source may be injecting pulses in the data stream.
- If the number of bits in repeated code inputs is randomly *lower* than the number of bits in the tag's code, there may be a bad wire junction that intermittently fails to transmit one or more bits in the data stream.

Corrections include ...

1. Use tags and cards with the **correct code format** (number of bits).
2. Program the host system for the **identical code format** with which the tags or cards are encoded.
3. Review **AWID's specifications** for cables, power and data wire connections, drain wire connections (do not ground), grounding metal conduit, and grounding the metal pole or surface to which the reader is fastened, etc. (Note 3.)
4. **Separate the cables** for switching door locks, gate operators, motors, etc. from the long-range reader's cable.

### **E. Data Collision: To Read Each Tag Separately**

AWID's long-range readers read codes from one or two tags at a time. If more than two tags are present, the transmitted codes may collide in the reader. The reader then does not transmit any data to the system. To avoid data collision --

1. Have only **one or two tags** in the reader's RF field at any time. See section F (below) for ways to do this.
2. Do NOT connect **readers in parallel** for data input to the system's controller. Each reader needs its own input port.

### **F. Reading Tags on Several Cars in Line: To Read Only the Closest Tag**

When there is a string of vehicles waiting at a gate, you can read only the tag on the first car by these techniques.

1. Install the reader about a **vehicle-length** in front of the gate, but no more than this.
2. Install the reader about **2 feet higher** than the typical height of vehicle tags. Aim the reader toward the nearest tag.
3. **Tilt the reader** down even more, to shorten the maximum distance at which the reader can read a tag.
4. Use the LRRSettings program (see Note 1) to **reduce the RF field** from the reader. The entire field gets smaller.

### **G. RF Field Overlap: To Separate RF Fields of Two Readers**

If the RF fields of two neighboring readers overlap, their fields can interact with each other. Read range will be reduced. Technical Reference "Preventing RF Field Overlap" offers six suggestions. An easy solution is to reduce the reader's RF field strength. If two readers must be close together, consider using the LR-2000HiLo set with two antennas.

### **H. Tag Cross-Talk: To Assure Tag Reading by a Single Reader**

If two readers are so close that they both read a tag, there are ways to assure that only the correct reader sees the tag. Technical Reference "Preventing Cross-Lane Tag Reading" offers six suggestions. Try reducing the RF field strength.

### **Notes**

1. Path for "**Long-Range Reader Settings**" program on AWID's Web site = [www.awid.com](http://www.awid.com) > Support tab > Downloads > Access Control > Software Tool > LR > LRReaderSettings>
2. For any setting of the **read repetition rate** in the reader, the next tag that is presented to the reader is read immediately, and its code is transmitted to the host system with no delay. Repeated reads for that same tag will be at the programmed read repetition rate.
3. The **specifications** for the DC power supply, cables, wire connections, shield connections, and grounding are in the Material List, the product sheet, and the installation instructions for the long-range UHF reader models.