APPLIED WIRELESS ID

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Technical Reference

LR-2000 Reader – Application: Big Trucks and Buses

Change History

Version	Date	Author	Comments
1.0	19 May 2011	L. Hickcox	First release.

These suggestions apply equally well to big delivery and utility trucks, tractors of semi-trailer trucks, big buses, forklifts, and off-road construction machines. We offer three alternative plans, which work well to match common conditions of the installation. Start by deciding if the application is to identify trucks, or their drivers and passengers.

A. Reader Over Center of Lane

- The reader may be suspended from the ceiling of the parking structure, or fastened to a beam across the lane near the gate, or supported on a long arm from a side wall or column. The reader should be centered over the lane. A mounting bracket with adjustable head for pan-and-tilt aiming is necessary. (Note 2)
- Height of the reader should be enough to clear the highest truck or trailer or load, but no higher than necessary for safe clearance.
- The tags must be at the center of the trucks, inside or outside the cab (note 3). For selection of suitable tags and cards for all conditions, see note 4. The MT tag, fastened outside the truck, may be above or below the windshield. Use "landscape" orientation of the tags if possible.
- Aim the reader toward the location of tags on the approaching trucks, for example, the center of the windshields. Measure out to the "sweet spot" distance of 15 feet in front of the reader (note 5). The reader will be aimed somewhat downward below horizontal, and straight at the center of the lane.
- Trucks may travel at speed up to about 15 miles per hour in this application, depending on distance from the reader to the gate, time for the gate to open, and other site conditions.

B. Reader High at Side of Lane

- The reader may be installed on either side of the lane. The left side is ideal, so that the driver can visually align the truck with the reader at the side of the lane. The installer may use a pole or post or column near the side of the lane, or a wall or fence, or the ceiling or beam. A mounting bracket with adjustable head for pan-and-tilt aiming is necessary. (Note 2)
- Height of the mounted reader should be enough so that the reader's face and the truck's tags are about parallel to each other at the "sweet spot" distance (about 15 feet). This generally positions the reader higher than the location of tags by 1 or 2 feet – often about 9 feet above the lane surface.
- The tags must be on the front of the truck, near the side on which the reader is mounted. The tags may be inside or outside the cab. For selection of suitable tags and cards, see note 4. "Portrait" orientation of the tags may be best.
- Aim the reader toward the location of tags on the approaching trucks, for example, the trucks' windshield toward the side nearest the reader. Measure out to the "sweet spot" distance of 15 feet in front of the reader (note 5). The reader will be aimed somewhat downward below horizontal, and out into the lane to the tags' position.
- Trucks may travel at speed up to about 15 miles per hour in this application, depending on distance from the reader to the gate, time for the gate to open, and other site conditions.

C. Reader Low at Side of Lane

- The reader may be installed on either side of the lane. The left side is ideal, so that the driver can visually align the truck with the reader at the side of the lane. The installer may use a post or pedestal or stand near the side of the lane, or a wall or fence. A mounting bracket with adjustable head is convenient for pan-and-tilt aiming. But a bracket may not be necessary if the reader and the tags on trucks are mounted at the same height above the lane. (Note 2)
- Height of the mounted reader is typically about 4-1/2 feet above the lane. This is a convenient height for mounting tags on the side of trucks. If the reader is mounted lower, its read range may be reduced.
- Use MT tags only. The tags must be on the side of the trucks facing the reader, usually toward the front end of the truck (fender or door or quarter panel). Use "portrait" orientation of the tags if possible, to assure best reading characteristics. For mounting, MT tags require a flat surface 8 inches high by 1 inch wide.

  In a few reported installations, this type of installation used WS tags mounted by their adhesive on the inside of the vehicles' side windows. The windows must be in a fixed position, and the height of the tags and the reader must match.
- Aim the reader horizontally, straight across the lane, toward the location of tags on the approaching trucks. Most reliable reading occurs when the distance from the reader to the tags is between 4 feet and 10 to 12 feet. In this range the reader's effective RF field has a large circular cross-section – around 4 feet diameter or larger.
- Trucks may travel at speed up to about 10 miles per hour in this application, depending on distance from the tag to the reader, distance from the reader to the gate, time for the gate to open, and other site conditions.

Notes

1. Tag information:
   (a) Plan the tag type and location from the start of the project. Select the tag or card type that suits the application best (note 4).
   (b) Readers read tags equally well in all orientations. The path of the tag as the truck carries it past the reader determines whether "portrait" or "landscape" orientation is better for a particular application.
   (c) A tag should face the reader and be about parallel to it at the "sweet spot" distance (about 15 feet from the reader, at which most tags will read). If this is not possible, choose the tag's orientation so that either long edge of the tag is closest to the reader – but not a short edge of the tag.
   (d) Install the tags on all trucks in about the same location relative to the *reader*.
2. If the reader is installed outdoors *and* is exposed directly to rain and snow, or to bright sunlight in a hot environment, mount the reader inside a protective Lexan housing. Contact AWID for further information.
3. At the reading distance typically 15 feet from reader, tags must face reader and be about parallel to face of reader.
4. See the product sheet and mounting instructions for UHF Credentials.
   (a) Inside the cab – use all tags and cards. . . . Outside the truck – use MT tag only.
   (b) Permanent, secure attachment – use WS, RV and MT tags. (WS and RV tags are destroyed if removed after adhesion.) . . . Mobile, portable applications – use VT, HT and MT tags, and CS and GR cards.
   (c) Hanging inside the cab – use VT and HT tags. . . . Lying on the dashboard or other surface – use MT tags only.
   (d) Hand-held reading – use HT and MT tags, and CS and GR cards. (Hold cards and tags in fingertips, away from hand. Aim card through windshield or out of driver's side window, facing reader.)
   (e) At the center of the vehicle – use WS, RV, HT and MT tags (and possibly VT tag). . . .
   At one side of the front of the vehicle – use WS, VT and MT tags (and possibly HT tag).
5. Most tags and cards will read at the "sweet spot", 15 feet in front of the reader. If the trucks are turning or changing grade as they approach the reader at the "sweet spot", or if the trucks are of different sizes, substitute the LR-2000HiLoMA reader (2 antenna units) in place of the standard LR-2000. Use the LR-2000KIT Installation Kit's test units to assure best aiming.

Reference: Product sheets; installation sheets; "LR-2000 – Effective RF Field" diagram; Technical Reference "Material List".