

Highway Transportation Management System**Roadside Reader User's Manual****Version: 1.0****23 April 2013****Prepared by:**

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Version Change History

Revision	Paragraph	Explanation
1.0	All	Initial release

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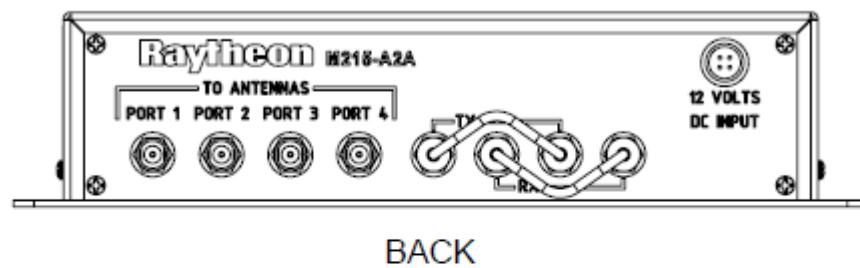
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1 Introduction

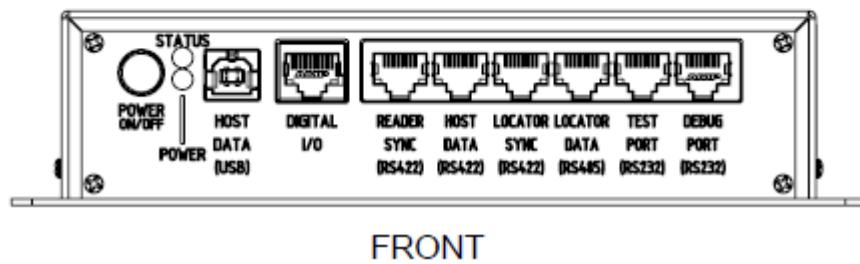
The Reader is part of an automatic vehicle identification system that transmits and receives radio frequency (RF) data to/from transponder-equipped vehicles or assemblies.

The Reader works in conjunction with a host computer system to identify a passing transponder, verify its operating credentials (if applicable), communicate to the driver whether the vehicle is cleared or not (if applicable), and transmit the transponder's data package to the next appropriate station (dependent of the type of system connected to the Reader).

The Reader is a part of the electronic toll collection system that may reside inside a cabinet adjacent to the toll road, or inside a vehicle for mobile operation.



BACK



FRONT

Figure 1.1-1 DSRC Reader Unit

1.1 Safety Considerations

Note: This equipment has been tested and found to comply with the limits for a Class A digital device, pursuant to part 15 of the FCC Rules. These limits are designed to provide reasonable protection against harmful interference when the equipment is operated in a commercial environment. This equipment generates, uses, and can radiate radio frequency energy and, if not installed and used in accordance with the instruction manual, may cause harmful interference to radio communications. Operation of this equipment in a residential area is likely to cause harmful interference in which case the user will be required to correct the interference at his own expense.

To ensure RF exposure safety the installation of the antennas listed in Table 3.1-1 below shall be at least 29.8 cm from personnel.

2 Applicable Documents

The following documents apply to the extent specified herein:

DSRC Reader Description and Operational Procedure Version 3.0

3 Setup and Installation

The unit requires a 12VDC (9-18VDC) source capable of supplying up to 2.5A via a mating power connector (Hirose HR10-73P-4S) shown in Fig 1.1-1. Only antennas which have been approved for use with this Reader (see table 3.1-1) and professionally installed by Raytheon or its designated installer shall be connected to the unit.

Changes or modifications not expressly approved by **Raytheon** could void the user's authority to operate the equipment.

Manufacturer	Model No.	Gain (dBi)
Sirit	ANTENNA-024	15
Transcore	AA3152	14
European Antennas LLC	FPA15-916H/1159	15.4

Table 3.1-1 Approved antennas for Roadside Reader

4 Roadside Reader Operation

4.1 Reader Power Indicator

A green LED on the front panel of the Reader is lit when the Reader is powered ON. A red LED on the front panel briefly lights up when the Reader is first turned on, and will turn off if the Reader is functioning properly.

4.2 Reader Power Switch

A push button switch on the front panel of the Reader is used to power the Reader ON and OFF.

4.3 Startup

To turn on the Roadside Reader, press the power switch on the front panel after verifying that a proper antenna or termination has been connected to the antenna port/s. After booting up the Reader should request a configuration command from the Host computer connected to either the Host Data port or the Test Port. Depending on internal jumper settings either of these ports are active. Refer to Reader Description and Operation Procedure document for specific configuration settings. The Host Data port is an RS-422 interface while the Test Port is an RS-232 interface. Once a valid configuration command is received by the Roadside Reader, it will begin transmitting from any one of four antenna ports and at power levels ranging from 20 to 30 dBm depending on configuration settings. Transmissions occur at approximately 9.8 msec intervals and have durations of approx. 1 msec. There is only one port that will transmit during a 9.8 msec interval.

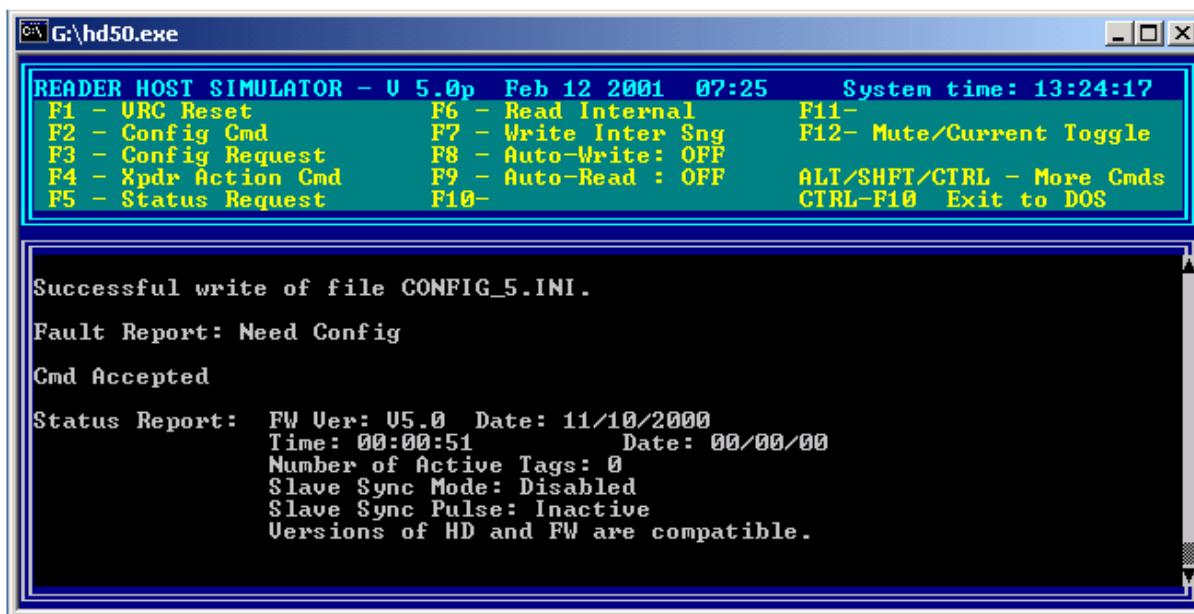


Figure 4.3-1 Roadside Reader Menu Screen

Figure 4.3-1 shows a typical startup dialog between the Host computer and the Roadside Reader

4.4 FCC Two Part Warning: 15.19(a)(3)

"This device complies with Part 15 of the FCC Rules. Operation is subject to the following two conditions: (1) this device may not cause harmful interference, and (2) this device must accept any interference received, including interference that may cause undesired operation."

Appendix A. Acronyms and Definition of Terms

DSRC	Dedicated Short Range Communications
ID	Identification
LED	Light-Emitting Diode
PC	Personal Computer
PDA	Portable Data Assistant
RF	Radio Frequency
VRC	Vehicle-Roadside Communication