APPLIED WIRELESS ID

MPR-5005 125kHz Reader

Installation & Operation Manual - 041326

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AWID

382 Routes 59, Section 292

Monsey, NY 10952

FCC COMPLIANCE

This equipment has been tested and found to be in compliance with the limits for FCC Part 15, Class A digital device. 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 instruction manual, may cause harmful interference with 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.

The users are prohibited from making any change or modification to this product, any modification to this product shall void the user's authority to operate under FCC Part 15 Subpart A Section 15.21 regulations.

"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."

CAUTION:

Reader should be positioned so that personnel in the area for prolonged periods may safely remain at least 23 cm (9 in) in an uncontrolled environment from the reader's surface. Observe FCC OET Bulletin 56 "Hazards of radio frequency and electromagnetic fields" and Bulletin 65 "Human exposure to radio frequency electromagnetic fields."

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NOTE: READ AND USE THIS MANUAL.

NOTE: ONLY A TRAINED PROFESSIONAL SHOULD INSTALL READER. FAILURE TO FOLLOW THE INSTALLATION GUIDE MAY RESULT IN POOR PERFORMANCE OR EVEN CAUSE PERMANENT DAMAGE TO THE READER, THUS VOIDS THE PRODUCT WARRANTY.

1.0 INTRODUCTION

AWID's MPR-5005 reader is a Radio Frequency IDentification (RFID) reader operating at 125kHz with Ethernet or RS-232 I/O interface. It has an internal power converter, allowing it to work with a wide range of supply inputs without affecting its performance.

The MPR-5005 readers are delivered with the following components and accessories:

- Antenna: MPR-5007 (single antenna) or MPR-5011A/B (dual antenna)
- Power supply: Input = 110 VAC ~ 240VAC, 50~60Hz. Output: 12 VDC, 1 A
- RF Cables: Two 6-foot cables are included with MPR-5011A/B antenna. RF cable is connected to the MPR-5007 Antenna.

To control the MPR-5005 reader you will need the following:

- PC running Windows 98 or higher, one RJ45 Ethernet or one RS-232 serial port.

1.1 THEORY OF OPPERATION

AWID MPR-5005 Reader design for communicating with Atmel AT24RF08 chip transponder (TAG HPPN 0960-2349) in working frequency at 125KHz.

MPR-5005 RFID reader use small loop low frequency antenna, matched inductance is 220uH. Reader provides all controls and RF energy to activate the transponder. Two different antenna configurations can be connected to the readers BNC connector. The reader checks the received transponder (tag) and responds to an end-user computer via Ethernet (LAN) or RS232 communication.

MPR-5007 is the single antenna solution for the MPR-5005 reader. The MPR-5007 antenna measures 25.5” x 21.5” x 0.75” and is shielded from EM interferences to increase performance of the reader system. Antenna housing is made from molded Polystyrene (PS) and is connected to the reader via BNC coaxial cable. Read range is typically 20-inches ± 0.5”.

MPR-5011A and MPR-5011B are a paired antenna solution for the MPR-5005 reader. The antennas measure 20” x 10” x 1.5” and is shielded from EM interferences to increase performance of the reader system. Antenna backing is made from Type 1 PVC, and the top cover is molded Polystyrene (PS). The antenna pair is connected to the reader via coaxial cable with BNC ends. The dual antennas are placed opposite each other to achieve a read range of 32”. Polarity is important for these antennas; the AWID top covers must be facing each other.

2.0 SPECIFICATIONS

Part Number	Mfr part # MPR-5005	
Power Supply	12.0 VDC, 450mA, regulated	
Carrier Frequency	125 kHz +/-3.125 kHz	
Reference Clock Frequency	16 MHz	
Date Rate	7.81kbps(Receive), 1.95kbps(Transmit)	
Memory	16 kByte FLASH for Firmware 512 bits EEPROM for Configuration 1 kByte RAM for Data	
RF output	RF Power = 1.9W, 125khz	
Data Storage	96bits ID Codes, 128bits page	
Communications Interface	LAN, RS232	
Data Transmission	Miller Decoding(Receive), Manchester Encoding(Transmit)	
Modulation	ASK	
Reader Antenna Size	MPR-5007: 648mm x 546mm x 25.4mm MPR-5011A/B: 508mm x 254mm x 37mm	
Antenna Base material	ABS/PVC	
Antenna Tuning Range	220 uH+/-11uH	
Connectors	BNC, DB9, RJ45	
Reader Enclosure	255 mm x 215 mm x 65 mm	
Regulatory	FCC, CE	
Operating temperature	0^{o}C to + 40^{o}C	
Storage temperature	– 35^{o}C to + 85^{o}C	
Weight	1590 grams	

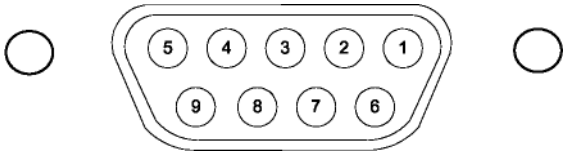
2.1 ANTENNA SPECIFICATIONS

MPR-5007
Dimensions: 25.5” x 21.5” x 0.75”
Material: Polystyrene (PS), Chi Mei Corporation

MPR-5011A/B
Dimensions: 20” x 10” x 1.5”
Material: Top Cover: Polystyrene (PS), Chi Mei Corporation
Bottom Cover: PVC, Simona

2.2 INPUT AND OUTPUT INTERFACES

RS232 Connector Pin Assignment



Pin	Function
1	
2	RS232 Tx
3	RS232 Rx
4	
5	Ground

- Please refer to document *MPR-5005 RS232 Interface* for command listings.

TCP/IP Interface

- Please refer to Document *MPR-5005 TCP/IP Interface* for command listings.

3.0 INSTALLATION & OPERATION GUIDELINES

3.1 PARTS LIST

- MPR-5005 125kHz RFID Reader
- MPR-5007 Single Antenna. 6-foot length BNC RF cable connected.
- MPR-5011A Dual Antenna, paired with MPR-5011B Antenna
- MPR-5011B Dual Antenna, paired with MPR-5011A Antenna
- Two 6-foot long BNC RF cables for connecting Dual Antennas
- 12V power supply

Additional equipment needed

- Crossover Ethernet cable
- Optional RS232 Serial cable
- Computer running Windows 98 or higher, and capable of running test software

MPR-5007 Antenna

MPR-5011A/B Antenna with cables

3.2 INSTALLATION

3.2.1 Site location

The professional installer should select a suitable indoor location for set-up of the reader, antennas, and PC. An AC mains socket should be available to plug in the readers 12V supply.
Antennas should not be mounted on metal, or mounted within close proximity of devices generating large amounts of electro-magnetic interference i.e. electric motors.

3.2.2 Reader Location

Position reader, RF cables, power cables, and communication cables, so all can easily reached the proper connections on the reader. The reader should be mounted on a flat surface, horizontal or vertical, by placing bolts or screws through predrilled holes near the corners of the reader.

3.2.3 Antenna Connections

The MPR-5005 reader can be connected with one of two antenna configurations: Single antenna (MPR-5007) or dual antenna (MPR-5011A + MPR-5011B). Both have BNC RF connectors.

MPR-5007 Single Antenna: Plug RF connector from antenna into the RF connector on the reader.

MPR-5011A/B Dual Antenna: Connect the two antennas together via one 6-foot RF cable. Labels on each antenna direct connection route. Connect the antenna pair to the reader by using the additional 6-foot RF cable, once again, following labels on antennas.

3.3 OPERATION

1. Connect antenna(s) to reader

2. Connect reader to PC via crossover Ethernet cable

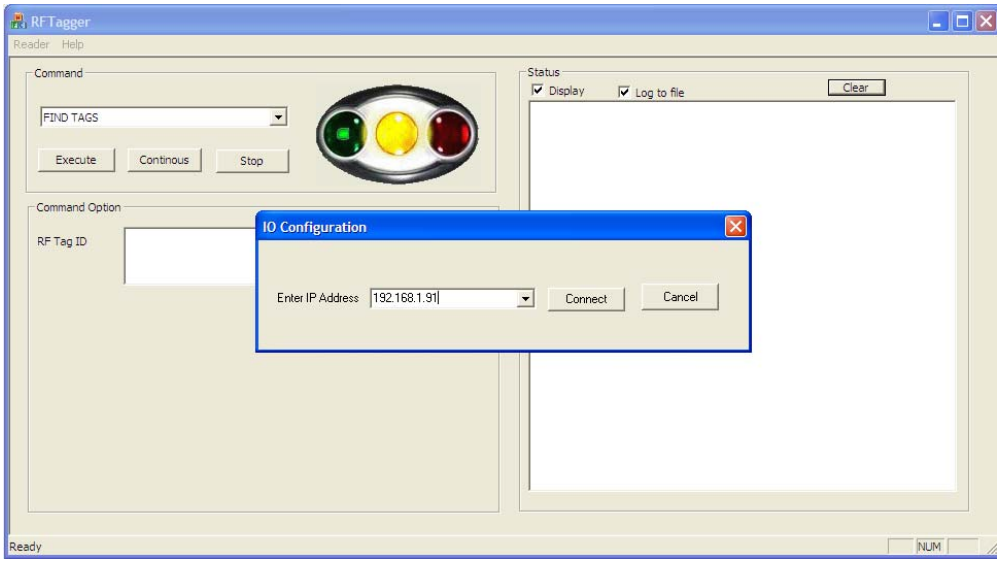
3. Set PC's local IP address to 192.168.1.26, Mask to 255.255.255.0 (Default). Leave additional options blank. Reboot will be required for PC's running Windows 2000 or earlier.
To find Network Connections: Control Panel / Network Connections / LAN > Properties. Pop-up window, select *TCP/IP* > Properties > select *Use the fallowing IP Address* > Set IP Address.

4. Power on reader (Plug power supply into wall and 12V jack into reader)

5. Wait approximately 1 minute for reader to initialize

6. Run RFTagger.exe on PC. *RFTagger is HP proprietary user interface software.*

7. Connect to reader. In the *Reader* menu, select *Set IP*. A box will pop-up asking for the readers IP address. Enter the correct reader IP address (default 192.168.1.91) and click *connect*. Connection to the reader will be verified by displaying the units' firmware version in the *Status* text box.
Note: The PC's local IP address must be fixed. AWID suggests local IP address of 192.168.1.26, mask set to default (255.255.255.0)



8. The reader can now interrogate RFID tags. To verify tag-reading capability, select *FIND TAGS* from the drop-down menu in the *Command* box and click *Continuous*. When a tag enters the read-field, its data will be displayed in the *Status* text box.

4 SOFTWARE

The other options in the drop-down list in the *Command* box give the user full-functionality of the RFID Tag. The tag has different blocks, and pages of memory that can be read, and written to.

These other options are as follows:

- FIND TAGS
- READ BLOCK
- READ PAGE
- WRITE PAGE
- WRITE READ PAGE
- READ BYTES
- WRITE BYTES
- WRITE READ BYTES

With each command, the user can choose to execute the command once or in a continuous mode.