RDR-7018BN-NEO

Installation & Operation Manual - 041486

FCC Compliance Statement

This device complies with part 15 of the FCC Rules. Operation is subject to the condition that this device does not cause harmful interference.

Non-modification Warning Statement

Any changes or modifications to this device not expressly approved by the party responsible for compliance could void the user's authority to operate this equipment.

RF Exposure Warning Statement

This equipment complies with FCC radiation exposure limits set forth for an uncontrolled environment and meets the FCC radio frequency (RF) Exposure Guidelines. This equipment should be installed and operated keeping the radiator at least 90cm or more away from person's body.

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NOTE: READ AND USE THIS MANUAL

FAILURE TO FOLLOW THE INSTALLATION (SET UP) GUIDE MAY RESULT IN POOR PERFORMANCE OR EVEN CAUSE PERMANENT DAMAGE TO THE READER, THUS VOIDS THE PRODUCT WARRANTY.

1. INTRODUCTION

RDR-7018BN-NEO is a long-range (35 to 50 feet) Radio Frequency Identification (RFID) reader with TCP/IP interface and general purpose digital I/O (GP I/O - four (4) input four (4) outputs) that works with most leading passive UHF passive tags. This reader comes with a unique combination of long read range, small size, and low power consumption. Its primary applications are toll collection, asset management and tracking, and fleet management applications.

In order to control the RDR-7018BN-NEO reader you will need the following:

- Computer with Network connection
- Host software (demo software or your own custom software).
- RFID Tags (EPC Class 1 Gen 2, ISO Type B, etc)

1.1. SPECIAL FEATURES

- Multi-Protocol: ISO-18000-6 Type B/C, EPC Class 1 Gen 2
- Thin passive tags with long-range performance
- High performance linear polarized antenna
- Splash proof design for indoor or outdoor applications
- UV stabilized housing

2. SPECIFICATIONS

Input voltage	DC 12V
Input current	2.5A Max
Protocol language	ISO 18000-6 Type B/C, EPC Class 1 Gen 2
Read range	Depends on type & size of labels used
Output power	Up to 3 Watts into 12.4 dBi antenna
Transmit frequency	902-928 MHz
Receiver frequency	902-928 MHz (Amplitude Modulated)
Operating temperature range	-20° C to +50° C (-4° F to 122° F)
Color	White
Output data formats	TCP/IP, Ethernet, RS-232
GP I/O Input	4-input, 4-output
GP I/O Connector	10-pin MIL connector
Dimension	18.67x18.67x2.04” (47.4x47.4x5.2cm)
Weight	4lb (1.8kg)
Protection Class	IP 67

2.1. INPUT AND OUTPUT INTERFACES & CONNECTOR PIN ASSIGNMENT

(See Appendix section 6.1 for the interfaces)

2.1.1. Ethernet connector (RJ45)

Pin #	Function description	Pin #	Function description
1	TX+	5	Spare+
2	TX-	6	RX-
3	RX+	7	Spare-
4	Spare+	8	Spare-

2.1.2. General Purpose Input/Output

Pin #	Function description	Pin #	Function description
1	Input 1	6	Output Common
2	Input 2	7	Output 4
3	Input 3	8	Output 3
4	Input 4	9	Output 2
5	Input Common	10	Output 1

The four general-purpose inputs that use photo diodes are used to accept TTL input commands. Each input requires 15 mA and 5V to activate. The four outputs are solid-state relays, with 0.03 uA off-state leakage current and the ability to sink 120 mA at a breakdown voltage of 400V DC. All outputs are protected with reverse clamping diodes, and ready to drive inductive loads. The floating arrangement eliminates any ground loop considerations.

See Appendix 6.2 for wiring diagram of a sample application.

2.2. MEASURING READ DISTANCE

Make sure you know the tag types. For instance, EPC tags must be pre-programmed to be read. For certain readers and tags, user must also be mindful of the tag's orientation and the reader's antenna orientation, what mounting surface the tags are designed for and how the tags are supposed to be mounted. Any departure from its intended purpose will drastically affect the reader's ability to energize the tag and its read range.

When measuring the reader's read range, make sure that the tag is properly oriented to the reader antenna, and for optimum performance, be sure the operator's finger is not within three (3) inches of the tag's antenna surface.

3. INSTALLATION PROCEDURE

This section provides installation and operation information for RDR-7018BN-NEO readers.

3.1. PARTS LIST

Verify that all items listed below are present before starting the installation.

1) RDR-7018BN-NEO reader Qty=1
2) Documentation and demo SW Qty=1
3) 12 VDC wall plug power supply unit Qty=1
4) RJ-45 Cable Qty=1

3.2. PREPARATION FOR INSTALLATION

3.2.1. Bench Top Verification

It is always a good idea to verify system operation before committing to a full-scale installation. The following are the necessary steps to test reader's operation in a static environment[1].

- Connect reader to network with a RJ-45 cable at TCP/IP port
- Power up computer
- Load the and launch the demo program on installation PC. Try *Connect* after filling in the IP address of reader and then some commands once connected.
- Connect the RJ-45 cable between the reader and connector labeled "Out" on the PIPS48-0.3A, connect from Ethernet Hub/Switch to where "In" is labeled. Plug in power
- Place the RFID tags on the exact same locations as the final configuration
- Measure tag's read distance and confirm that read distance is correct.

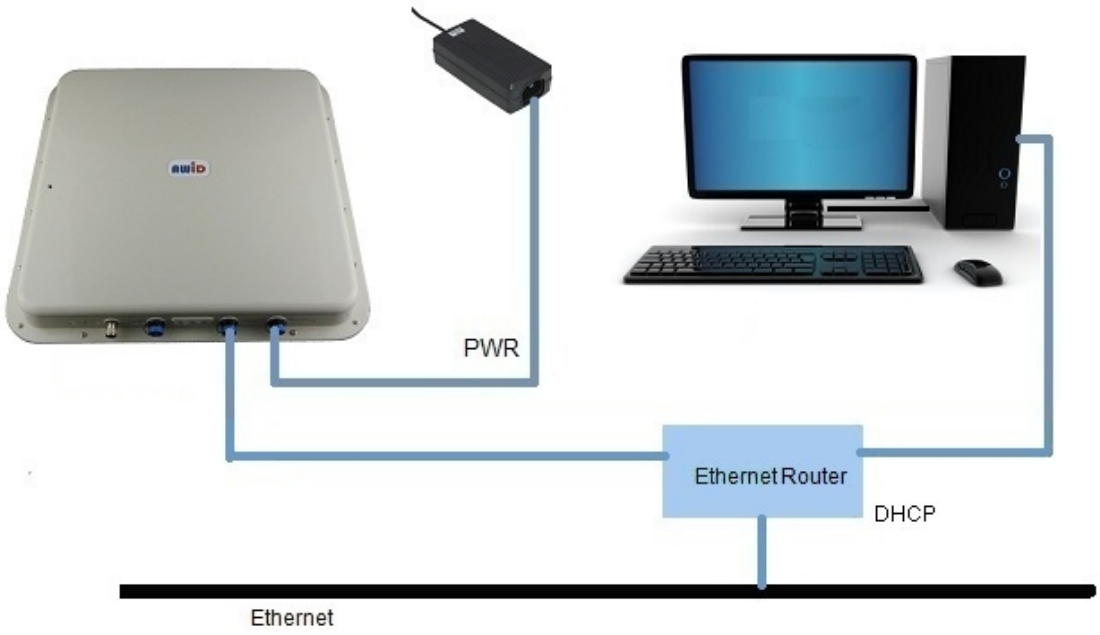


Figure 1 RDR-7018BN-NEO Setup in LAN

[1] Be warned that some fluorescent lighting may cause interference thereby degrades reader performance.

3.3. INSTALLATION STEPS

- Check to ensure that all connections are secure. Make sure all wires through the cable clamps are anchored properly; avoid dangling wires that may become a safety hazard.
- Mount the Reader/Antenna using the eight screw posts to fasten to reader on the desired mounting surface. In cases where the reader aiming is critical, please order the antenna-mounting bracket that provides pan/tilt adjustment for the reader.

4. Notes on Software Programming and System Operation

4.1. SET UP AND SYSTEM OPERATION

4.1.1. Setting Up RDR-7018BN-NEO

Power up with the 12-V power supply unit, connect to network through the Ethernet port with RJ-45 cable.

4.1.2. Running a Custom Software Application or the Demo Program

If Demo Program is not used, it is expected user will launch a custom software application to send commands defined in the Communication Protocol and/or the supporting SDK to the reader.

4.1.3. Operating Modes

Applications can be developed to support typical operating modes for RDR-7018BN-NEO readers as listed below.

Mixed Mode
This mode assumes the user is aware of the types of protocol in use, and furthermore, the user made a determined effort to operate the reader in a mixed protocol mode. In this mode, the user can decide how many and which specific protocols to be selected. Once Mix Protocol Mode is selected, the reader will routinely cycle through each protocol, dwell long enough for the reader to wait for a response and then move onto the next protocol. It should be noted that in a mixed protocol mode, the tag must have sufficient time to respond to the reader, and therefore, it can only be used on applications with specific speed restrictions.

Single Protocol Mode
Single protocol is the normal mode of operation, where the protocol type is known and many tags are expected to pass through the readers.

4.2. USERS NOTE

For System Integrators and/or Software Developers
System Integrators and/or Software developers should get familiar with the MPR Communication Protocol (Reference I) specifications and/or the supporting SDK for developing applications that control MPR network readers.

For Custom System Users
For custom system user, please refer to your host software user guide for information regarding system and software operations

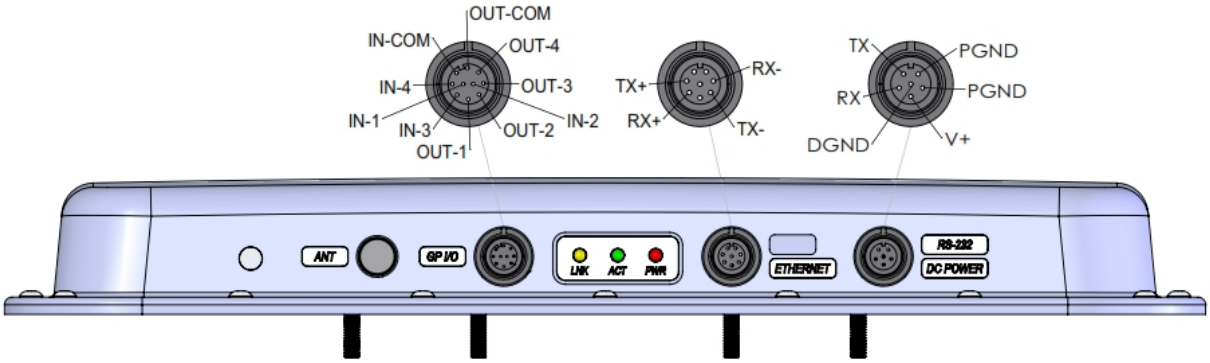
For Demo Software Users
If you are using the demo program which is .NET based with easy-to-follow GUI operations, simply fill in the IP address of RDR-7018BN-NEO installed then click “Connect” should get you started.

5. Reference

I. *Neology MPR Communication Protocol* – Doc# 041487

6. Appendix

6.1. RDR-7018BN-NEO GPIO AND CONNECTOR ASSIGNMENT



6.2. SAMPLE WIRING DIAGRAM FOR GP I/O