PoE Reader

User Manual

General Confidential and Proprietary Information

Document Revision History

Revision No.	Date	Description/Changes
1.0	20-Feb-2012	Initial Release
1.1	7-Jun-2017	Changes to include reader IP, subnet mask and default gateway in the software

Safety Instructions

WARNING: These are electrostatic sensitive devices. Proper ESD protection is required when handling bare boards. Do not handle the boards with bare hands.

ESD CAUTION

ESD (electrostatic discharge) sensitive device. Electrostatic charges as high as 4000 V readily accumulate on the human body and test equipment and can discharge without detection. Although this product features proprietary ESD protection circuitry, permanent damage may occur on devices subjected to high energy electrostatic discharges. Therefore, proper ESD precautions are recommended to avoid performance degradation or loss of functionality.

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1. Introduction

The PoE reader and p-link light sticks are used as an efficient script retrieval system in pharmacy operations. The system consists of p-link light stick, a Power over Ethernet (PoE) reader and the pharmacy management software (PMS). Each p–Link light stick will be attached to the materials/medicine bags. When a prescription must be fetched, PMS gives the command to the PoE Reader which in turn communicates with p-link light stick. After getting the command, the p-link light stick which is attached to the prescription bag, starts blinking. The user can identify and retrieve appropriate prescription bags from several identical bags by identifying the corresponding LED blink.

This document gives an overview of the PoE reader, its specifications and the software which can be used to configure the settings of the PoE reader. This document can be used by installers, end users and support staff in configuring the device.

2. System Overview

2.1. PoE Reader

The Active RFID Reader with PoE/Ethernet interface device works in dual mode either as a PoE (Power Over Ethernet) to active RFID device or as Ethernet to active RFID device. The term Power Over Ethernet (PoE) indicates that the Power Supply will be given to the unit through Ethernet cable from the PoE routers. The Ethernet circuitry supports 10/100 Mbps connectivity. If this device is going to be used as an Ethernet device with non-PoE switches, then a separate DC (12V) supply should be given through the DC Jack provided.

Figure 1: PoE Reader with Antenna

The PoE/Ethernet to Active RFID Reader device has a main Processor, which gets the command from the host controller or PC through Ethernet communication. Another Processor is dedicated for RF functionalities. Once the Command has been received by the main controller that will be given to the RF Processor which is turn communicate with RF transceiver to send the command wirelessly to the intended receivers. The PoE device has an RF Front End which amplifies the RF Signal to increase the range up to 100 meters line of sight. The omni-directional RF antenna is small and sleek and complies with FCC part-15 standards.

The PoE/Ethernet to Active RFID Reader device can be programmed either through the mini-USB interface or remotely. It comes with custom software through which the device settings can be created or modified.

An Auto reset circuitry is included in the PoE device to reset the device in case of any software malfunction or in the power supply. This is intended to protect the device from any fatal errors and enables the device to restart smoothly in a shortest possible time without any manual intervention.

The device has three bi-color LEDs. Each LED can glow either in red or green. The first LED is a power LED which glows when the device is powered up either through PoE or through 12V DC. The second LED is to indicate RF transmission. This LED blinks in green every 5 seconds and glows in steady red for 5 seconds when the device transmits the data. The third LED is used to indicate the Ethernet operation. This LED blinks every second indicating the Ethernet stack is running correctly in the PoE Device. A small reset switch is provided at the back panel of the device which is used to reset the device manually. It's a toggle switch which when pressed once will switch off the power supply and switches on when pressed again.

The PoE/Ethernet to Active RFID Reader is easy to install and does not require any on-site maintenance. The device is so robust that becomes fully functional within a short time of 8 to 10 seconds after it's powered ON. The device is built with a rugged ABS plastic enclosure in bone color and comes with a flame rating of UL94-5VA. The device is compact and comes with the following dimensions: 3.00 x 4.00 x 1.38 in.

3. Device Specifications

3.1. PoE Reader

3.1.1. Environmental Specifications

- Operating Temperature -20°C to + 85°C

3.1.2 Physical Specifications

- Dimensions 3.00 x 4.00 x 1.38 in. / 76.20 x 101.60 x 35.05 mm
- Color Bone
- Casing Material ABS Plastic with a flame rating of UL94-5VA

3.1.3 Electrical Specifications

- DC Source 12VDC or PoE (Power Over Ethernet)

3.1.4. RF Specifications

- Operating Frequency 902 to 928 MHz (915.1 MHz default)
- Modulation GFSK
- Sensitivity -116 dBm

- Data Rate 1.2 kbps to 250 kbps (100 kbps default)
- Air Protocol Proprietary-Reindeer Technologies Pvt Ltd
- Range Around 60 meters line of sight
- RF Antenna Omni-directional Whip Antenna of 6 cms long

4. Device Configuration

4.1. System Requirements and Pre-requisites

- Ensure the PC/laptop is running with Windows 7, 8 or 10 operating system.
- Ensure a disk space of at least 50 MB is available to install the application.
- Install the 'PoE Reader Configuration Utility' software from the setup file before configuring the PoE reader.

4.2. PoE Reader

4.2.1. Overview

The PoE device settings can be configured by the user by using a simple custom software. The device can be configured by connecting the device to PC/laptop through a mini-USB cable. The PoE reader will be enumerated as a virtual COM port in the host. The PoE reader configuration utility has been shown in the below figure.

There are two different sections in the configuration software. The 'Reader Settings' section allows the users to define the settings of the reader and the 'Network Settings' allows the users to define the IP address of the reader and assign the IP address of the server and port number.

The configuration parameters for the PoE device are as follows:

Reader Settings

1. **PoE Reader ID**, a unique 4-byte alphanumeric ID to identify the PoE Reader. The default value is RD01.
2. **RF baud rate** indicates the baud rate at which the communication between the PoE reader and p-link light sticks happen. The default value is 100 kbps.

3. **RF Channel** indicates the frequency channel at which the communication between the PoE reader and p-link light sticks happen. The default value is 915.1 MHz.
4. **Power Level** indicates the RF power level at which the commands will be transmitted to p-link light sticks. Power level is directly related to distance so higher the power level, the longer is the distance covered. The default value is +12 dBm.

The other two fields '**No of Sec to Spray**' and '**No of count to spray**' are for internal use and these are not enabled for end users.

Please note the **RF baud rate** and **Channel** in both the PoE Reader and p-link light sticks must match for the RF communication to happen.

The RF baud rate has 5 options starting from 38.4 kbps to 250 kbps with 100 kbps being the default value. The channel has 25 options starting from 915.1 MHz to 919.9 MHz with 915.1 MHz being the default value. The power level has 10 options starting from -30 dBm to +12 dBm with the default value being +12 dBm.

Network Settings

1. **Reader IP Address** allows the users to assign a unique IP address to the PoE reader.
2. **Server IP Address** indicates the IP address of the server to which the PoE Reader is will communicate
3. **Port** indicates the 5-digit port number to which the server is listening
4. **Subnet Mask** allows the user to assign an IP address to the subnet mask
5. **Default Gateway** allows the user to assign an IP address to the default gateway

The user can click 'ctrl+D' as a shortcut to load default values on the screen. Alternately, the user can click the option 'Default Settings' under the 'File' menu or click 'Load Default Settings' button to load the default settings on the screen.

This user manual can be accessed from the software by pressing F1 or by clicking 'User Manual' under 'Help' menu.

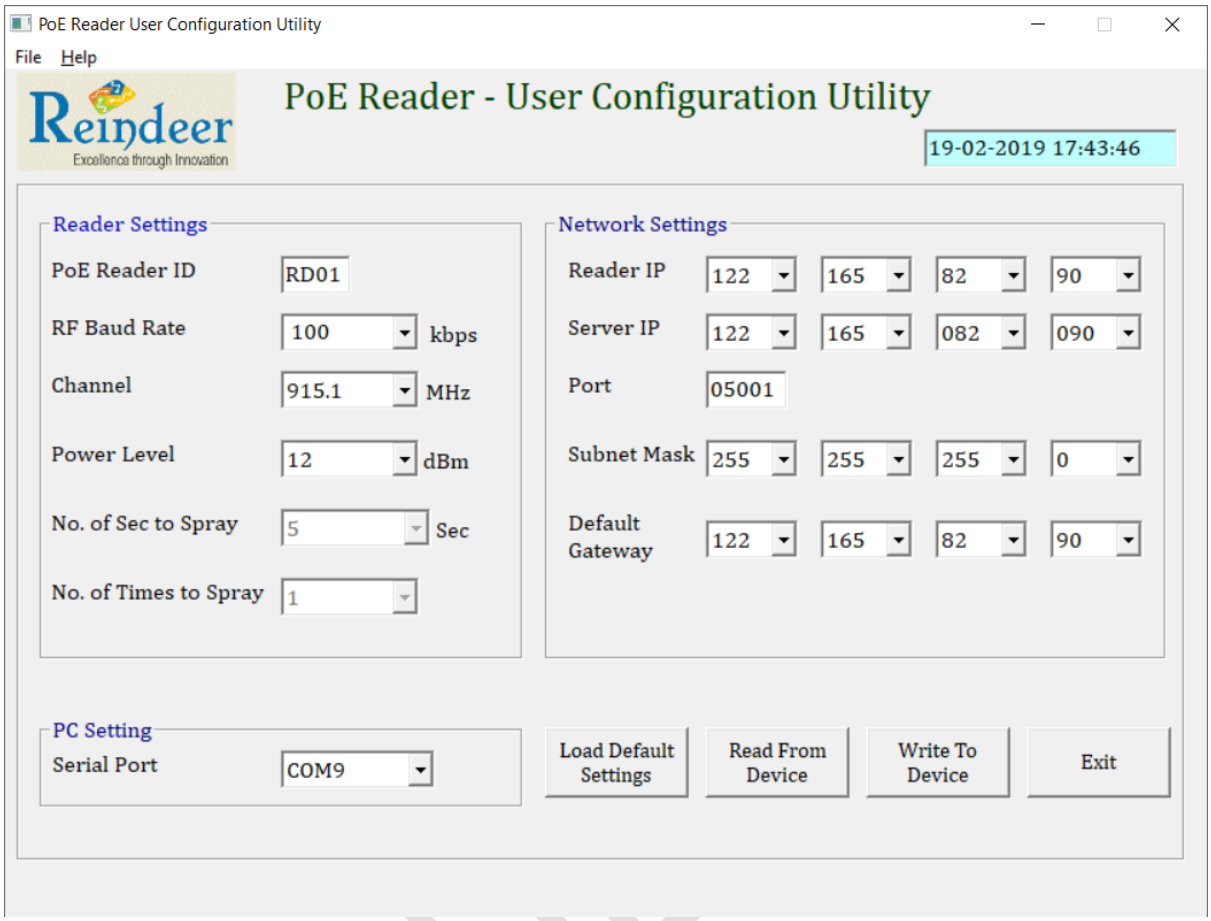

Figure 2: PoE Device Configuration Utility

Operating Instructions:

1. Connect the antenna to the PoE reader and turn ON the power supply to the PoE reader.
2. Open the 'PoE Reader UC' software from the Start Menu or from the shortcut. Connect one end of the mini-USB cable to the PoE reader. Connect the other end of the mini-USB cable to one of the USB ports of the PC/laptop (The software should recognize the serial port to which the PoE reader is connected and populate the COM port automatically).
3. The push buttons 'Write to Device' and 'Read from Device' will be enabled once the connection between the software and the PoE reader is successfully established (Please check the USB cable connection to the reader if the both the push buttons in the software are not enabled).

4. Click the button 'Read from Device' to read the current settings of the PoE reader. This will retrieve and display the settings from the PoE reader and display a message 'Program Read Successful'. The message 'Read from Device failed' will be displayed if the software is unable to read the settings or if there is a connection failure.
5. Press CTL+D or click 'Load Default Settings' button to fill the default values or fill in the values manually in the screen. Ensure all the values are properly entered as all the fields are mandatory. Ensure the RF baud rate and the Channel match with the corresponding values of the p-link light stick.
6. Click 'Write to Device' to write the settings to the PoE reader. An acknowledgement message 'Program Write Successful' will be displayed indicating the settings have been updated successfully. Failure will be marked by the message 'Write to Device Not Successful'. 'Write to Device' can also be invoked by clicking the option 'Write to Device' under the 'File' menu.

4.2.2. Precautions

Please follow the following precautions while programing or using PoE reader.

1. Please install the FTDI drivers for smooth USB communication between the test bench and the software. It can be downloaded from http://www.ftdichip.com/Drivers/VCP.htm. Check the section 'Currently Supported VCP Drivers' and download the drivers for the appropriate OS. Most likely, you may need the drivers for 32-bit OS.
2. Please ensure the RF antenna is well connected before the device is turned ON.
3. Please ensure at least 5 feet distance is maintained between the PoE reader and p-link light stick.

4. Ensure all settings of the p-link are done properly especially the p-link ID, RF Baud Rate and Frequency Channel and match with the PoE reader.
5. Please ensure the Power LED blinks as soon as the PoE or power adapter is connected. Besides, the RF LED should blink on sending any command to p-link and the Ethernet LED should blink once the device is turned ON.

5. Troubleshooting Guide

This section gives some troubleshooting tips which will help the users to diagnose and solve the problem by themselves. These problems may creep in when the user goes to install the system. This section gives the commonly encountered problems with the PoE reader and gives the possible solutions.

No.	Problem	Solution
1	The button 'Read from Device' is not enabled even when the USB cable is connected properly to the PoE reader.	There could be loose connection at the point where the mini-USB cable is connected to the PoE reader. Please check the connection. The push button 'Read from Device' will get enabled if the connection is proper.
2	I get a message 'Write to Device Not Successful' when I click the button 'Write to Device'.	There could be loose connection at the point where the mini-USB cable is connected to the PoE reader. Please check the connection. The device settings should get updated if the connection is proper.
3	When I am trying to open	If the COM port number is greater than 15, then it can

	the COM port in the software utility, it reports Invalid Port.	be changed to another COM port number which is less than 15. To change that, go to My Computer -> Properties ->Device Manager -> Ports. In the Ports right click on 'USB serial port' and then select Properties. And then go to Port Settings Tab. This has been shown in Figure 5. In this form, click 'Advanced' button and then select the COM number with in 15. Figure 6 shows 'Advanced Settings for COM port' for changing the COM number. Even for some COM numbers system shows that as if it is 'in use', it can be selected if it is not representing any device.
4	p-link to PoE Device RF communication is not happening. Though the command is sent from the server and the server got the ACK and CDC packets from PoE Device, p-link doesn't light the LED.	• Ensure that the RF baud rate and channel for the PoE Device and p-link are identical for the communication to happen. • Check whether the sensitivity of p-link is kept as high to get the best range. And if the baud rate is kept higher, then the communication range will come down. • Ensure that the command contains the broadcast ID or the 20-charater ID of the p-link which has to respond for the command.
5	Server to PoE Device Ethernet communication is not happening. Though the server is listening at the configured port, PoE Device can't get connected to the server.	• Check whether the IP address of the server and the port at which it is listening has been given correctly for the PoE Device configuration. • Check whether any firewall in the server is blocking the access to the port number in which it is listening. If so disable the firewall and try. • If a custom-made application is running in the server to listen for the incoming connection, then it is better to run generic TCP/IP utility (like Hercules TCP/IP Utility) to check whether it is the

		device problem or the application problem • Check whether the PoE Ethernet LED is blinking for every 1 second. This indicates that the Ethernet stack is running in the PoE Device.

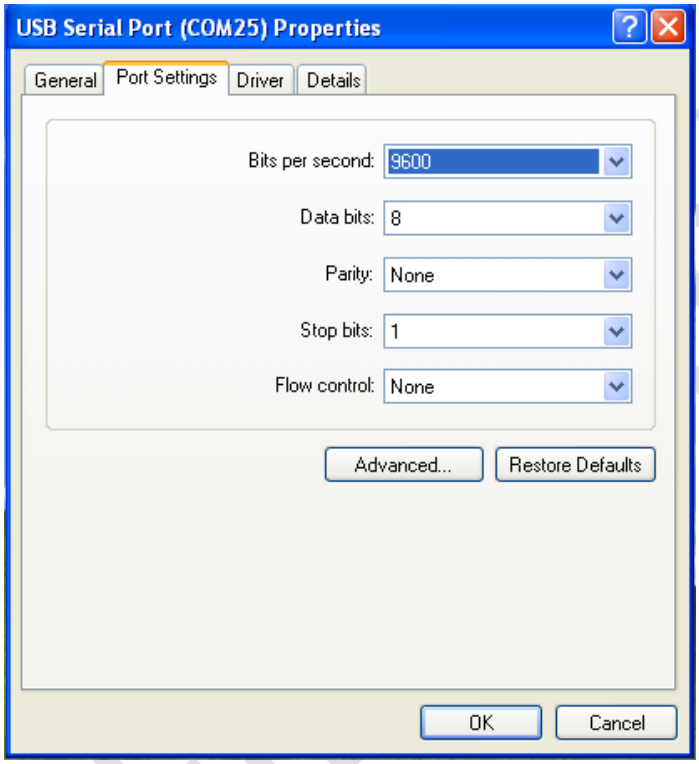

Figure 3: USB Serial Port Settings

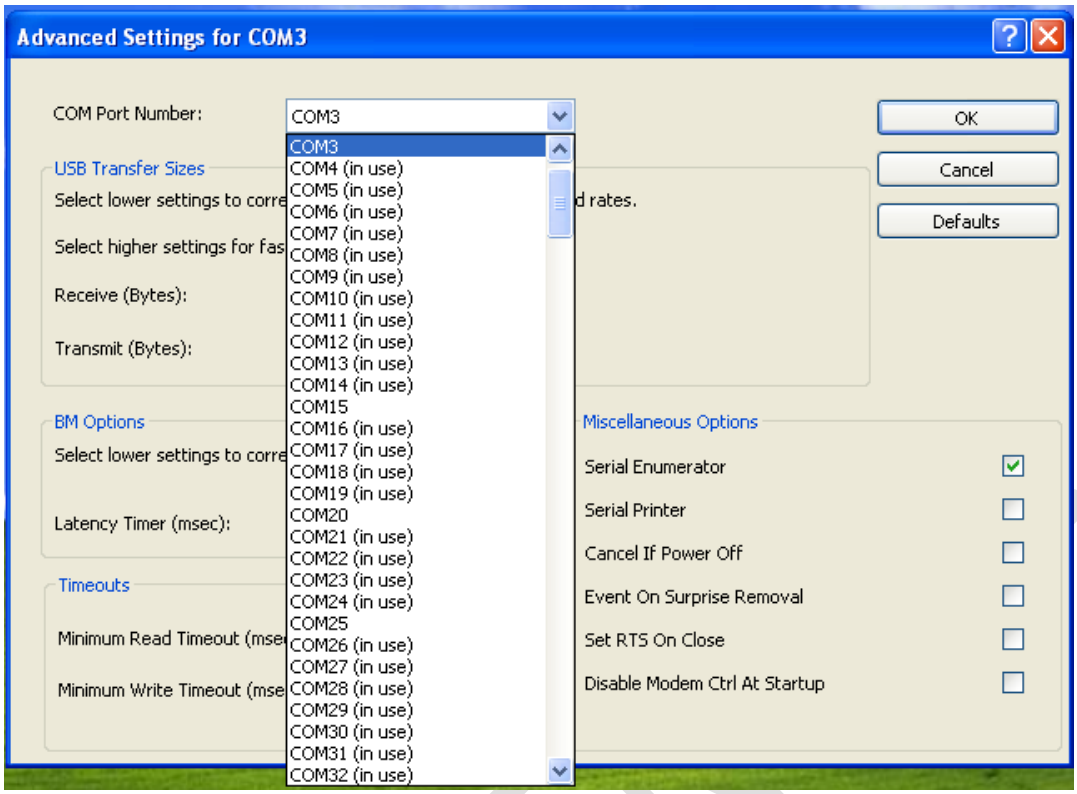

Figure 4: Advanced Settings for COM port

6. Ordering Information

Product part Number	Description
POE_RDR	PoE/Ethernet to RF Device in 902-928 MHz

7. Contact Us

7.1. Technical Support

Reindeer Technologies Pvt. Ltd. has built a solid technical support infrastructure so that you can get answers to your questions when you need them.

Our technical support engineers are available Mon-Fri between 9:00 am and 6:30 pm Indian standard time. The best way to reach a technical support engineer is to send an email to *support@reindeersystems.com*. E-mail support requests are given priority because we can handle them more efficiently than phone support requests.

7.2. Sales Support

Our sales department can be reached via e-mail at *sales@reindeersystems.com* or by phone at +91-44-45022335.

Our sales department is available Mon-Fri between 9:00 am and 6:30 pm.

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