METRATEC

Quickstart Guide PulsarLR

Version: 1.1

Date: November 2024

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1. Introduction

The PulsarLR is a modern UHF RFID reader with integrated Linux module. The device has a number of communication options to connect it to almost any type of host. This document describes the first steps to setup the reader, configure it and read a UHF RFID transponder.

Figure 1. PulsarLR Connectivity Side

2. Setup

2.1. Power Supply

The first step is to connect the reader with a suitable power supply. Here you have to options:

a) Power the device via Power-over-Ethernet (PoE). Just plug in an Ethernet cable which is connected to a PoE switch (Class 0 - 12.8W power delivery) and the device will turn on.

b) Use a normal 24V supply to power the device. Metratec offers a suitable power supply as accessory but you can use any other PSU that is able to supply a clean 24V / 1A.

Just connecting a USB cable to the reader is NOT enough to power the device.

After connection a power supply, the reader will start automatically, shown by the red "Power" LED and the blinking four LEDs on the top of the reader. Once the device has bootet, only the green "RUN" LED will be active and blinking slowly. Now the device is ready for operation.

2.2. Antenna Connection

To work properly, the reader has to have at least one antenna connected. The four antenna ports on the reader are 50 Ohm antenna ports with R-TNC connector. You can use any UHF RFID antenna at 868 MHz (for ETSI operations in Europe) or 902-928 MHz (for FCC/ISED operations in the US and Canada). Metratec offers a number of suitable antennas as accessory.

Figure 2. Antenna Side

The reader will check the antenna ports before activating the power. If no antennas are connected, you will get an error message. You don't have to connect the first antenna to the first port. Any combination is okay. The order of the antenna ports matches the order written next to the LEDs on top of the device.

2.3. Communication Configuration

There are four main ways to communicate with the PulsarLR: Ethernet, USB-C, RS232 and RS485. The two serial ports are on the orange connector at the connectivity side of the reader next to the USB host port marked "Serial".

Figure 3. Connectivity Side

2.3.1. Ethernet

The most common connectivity option used is probably Ethernet TCP/IP. To use this, connect the reader to the same network as your host device (PC, etc.). Then you need to find the IP address of the device. From factory, the reader uses DHCP to get an address. If no DHCP server is present in the network it will select a link-local address in the 169.xxx.xxx.xxx IP range.

To connect, you can directly enter the hostname (as printed on the device label) into your browser. By default this will be something like https://PLR-XXXXXX.local with XXXXXX as a 6-digit code. Alternatively, you can have a look in your DHCP server logs for a device with a hostname of PLR-XXXXXX.

The reader uses mDNS/Avahi/Bonjour to advertise its service in the local network. So if you have an Avahi scanner, you can find the device there

as well including its IP.

2.3.2. USB-C

You can also connect to the device via the USB-C port. On you host device, this will open a virtual serial / COM port. Use a terminal tool like metraTerm2 to connect and directly send AT commands (see below for details).

2.3.3. Serial Interfaces

The 6 pin orange adapter marked "serial" contains a legacy RS-232 as well as a RS-485 serial port. The pin description is the following:

Table 1. Serial Interface Pin Description

Pin	Description
X1.1	RS232 Rx
X1.2	RS485 A
X1.3	RS232 Tx
X1.4	RS485 B
X1.5	GND
X1.6	GND

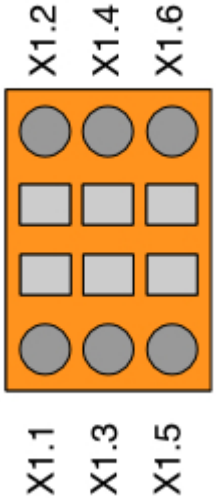

Figure 4. Serial Interface Pins

2.3.4. Wifi via external Wifi Stick on USB-A Port

The USB Host (Type A) connector can be used to add external components. Here, you can connect a USB-Wifi-Stick to the reader to communicate via Wifi. Please note that currently only the Ezurio (formerly Laird Connectivity) Sterling-LWB5+ USB-Wifi-Sticks will work (Ezurio article no. 450-00137). Ask your distributor or Metratec support for more information on supporting other models or manufacturers.

Figure 5. Laird USB Wifi Stick

2.4. General Purpose Inputs/Outputs

Besides standard communication interfaces the PulsarLR also has a 2 optically isolated inputs and 4 24V outputs that can be used to interface with photo cells, movement sensors and light stacks to react to outside events and signal its own internal state. This is situated on the antenna port side of the product.

The input pins are optically isolated 24 V DC inputs as common in automation technology in general. Up to 25 mA are needed to set the input to "high".

The output pins are 24 V high side switch DC outputs with a maximum current of 250 mA per pin. These can be used to directly power e.g. signal towers. In total a maximum current of 1000 mA for all pins is allowed. Outputs are equipped with internal overcurrent and overtemperature shutdown.

The pins X2.1 and X2.2 are connected directly to the power supply input, i.e. the applied voltage is 24 V DC. This can be used for power supply of e.g. sensors, etc. The power of these pins is only limited by the power of the power supply used.

The pin description is the following:

Table 2. GPIO Pin Description

Pin	Description
X2.1	GND
X2.2	24V DC Out
X2.3	Out 1 -
X2.4	Out 1
X2.5	Out 2 -
X2.6	Out 2
X2.7	Out 3 -
X2.8	Out 3

Pin	Description
X2.9	Out 4 -
X2.10	Out 4
X2.11	In 1 -
X2.12	In 1
X2.13	In 2 -
X2.14	In 2
X2.15	GND
X2.16	24V DC Out

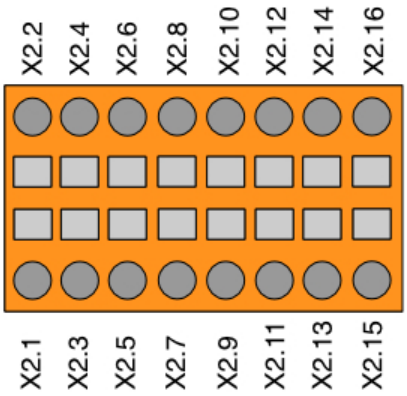

Figure 6. GPIO Interface

3. Software

The final step to reading a transponder is using the right software to control the reader. With the PulsarLR, you have three options: a) Use the integrated web interface b) Use the Reader Control 3 software c) Control the reader directly with AT commands

The details depend on the kind of communication interface you are using and will be explained in the next sub-chapters.

3.1. Using the Web GUI

The reader has an integrated web interface that can be used to configure the device and even use all RFID functions. Just go the IP address of the reader or the host name in your browser (see previous chapter). At the first time, there will be a warning due to teh self-signed HTTPS certificate. Click that away and you will see the login to the web interface. The default password is "admin" - please change that after login to something more secure. If you want, you can also add your own certificate (eg. a wildcard certificate for your domain) to make things more secure.

On the website, you can also change the IP from DHCP to static and give the device any IP you like. You can also control the device via the web interface for some first tests.

3.2. Using Reader Control 3

If you use Windows or MacOS, you can also download the Reader Control 3 demo tool from the Metratec website. This has a similar interface to the web GUI. It can be used with a Ethernet connection via TCP but also via USB-C and RS232/RS485.

The advantage of the Reader Control 3 is that the tool will scan the network for Metratec devices (when connected via Ethernet) and show you the reader without you having to find out the IP first.

3.3. Using AT commands

You can also use a terminal tool (eg. Metraterm2, which can also be downloaded from the Metratec website) and directly send AT commands to the reader to control it. If you use Ethernet, you need to connect to TCP port 10.001. For USB and the serial connections, just open the (virtual) serial port and send commands according to the AT UHF Command Guide.

3.4. Programming your own software

While probably not the first step, you can also integrate the PulsarLR into your own software by using one of the free SDKs we provide for Java, .NET and Python. These can be found on our website and also on Github (https://github.com/metratec) where the full code is open-source.

4. Version History

The following table shows the different version of this file.

Table 3. Version History

Version	Change	by	Date
1.0	Initial version	KD	24.11.2023
1.1	Expanded connectivity	KD	29.11.2024

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