

RS485-RF Transceiver User Manual

Introduction

The RS485-RF Transceiver acts as a bridge to eliminate the need for physical wiring between RS485 nodes. By acting as a transparent wireless link, it integrates seamlessly into existing or new RS485 networks.

The device is capable of communicating in both half-duplex and full-duplex modes. Each device has a programmable address, and once two devices with matching addresses have bonded then data will be sent transparently between them. The transceivers can be used over both short and long distances.

Power Configurations

The RS485-RF device can be configured to support multiple different power supply options:

AC Supply

The AC supply configuration allows the device to be powered using an 85-264VAC connection via the J16 terminal block. Please see label A in Figure 1. Note that J3 can be used as a 5V output when used in the AC supply configuration.

9-36VDC Supply

The 9-36VDC supply configuration allows the device to be powered using a 9-36VDC connection via the J1 terminal block. Please see label B in Figure 1.

5V Supply

The 5VDC supply configuration allows the device to be powered using a 5VDC connection via the J3 terminal block. Please see label C in Figure 1. The device can also optionally be powered via USB (label D in Figure 1).

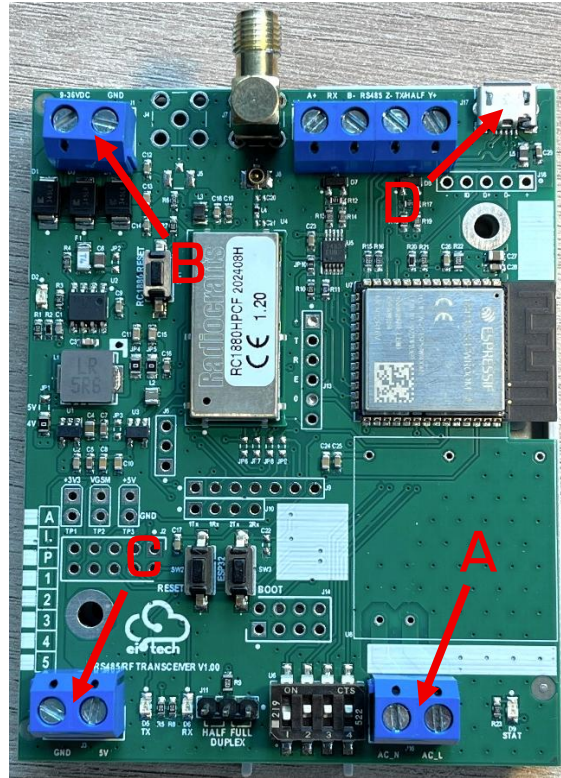


Figure 1: Power supply connections for the RS485-RF transceiver

Note: The device must be ordered with a specific power supply configuration in mind.

RS485 Communication Mode

The RS485-RF device has the capability to communicate in either half-duplex or full-duplex mode. The mode is selected on the device using a jumper on the J11 header, selecting either half or duplex mode, as shown by the silkscreen. Please see Figure 2 below, which demonstrates the device in full-duplex mode and Figure 3 below, which demonstrates the device in half-duplex mode.

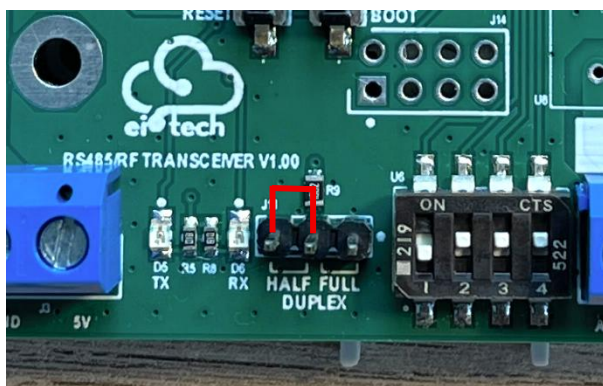


Figure 3: Half-duplex mode

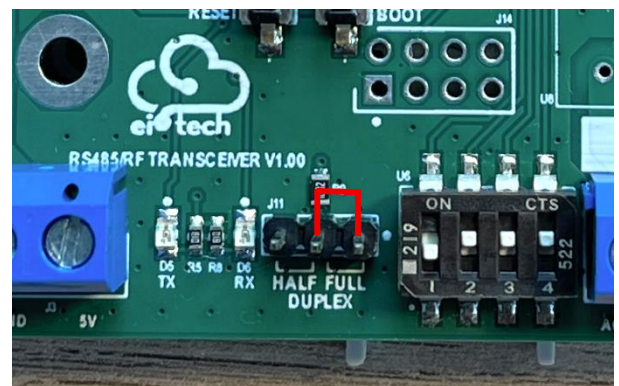


Figure 2: Full-duplex mode

The device can be added to a RS485 wired network by connecting the J12 and J15 terminal blocks to the RS485 network. Note that only J15 is used when the device is in the

half-duplex mode. Please refer to the section labelled RS485 Wiring Guide for the RS485 wiring requirements.

RS485 Wiring Guide

Please refer to the section titled RS485 Communication Mode to determine how either half or full duplex mode is selected.

Half-Duplex Wiring Guide

In half-duplex mode, the device must be connected to the RS485 bus via the J15 terminal block. The port silkscreen labelled as “Z-” is the negative bus connection and the port labelled “Y+” is the positive bus connection. The port connections can be seen Figure 4.

Full-Duplex Wiring Guide

In full-duplex mode, the device must be connected to the RS485 bus via the J12 and J15 terminal blocks. J12 is the receive path, labelled as “RX”, and J15 is the transmit path, labelled as “TX”. The port labels, “B-” and “A+”, are the negative and positive receive paths respectively. The port labels, “Z-” and “Y+”, are the negative and positive transmit paths respectively. The port connections can be seen in Figure 4.

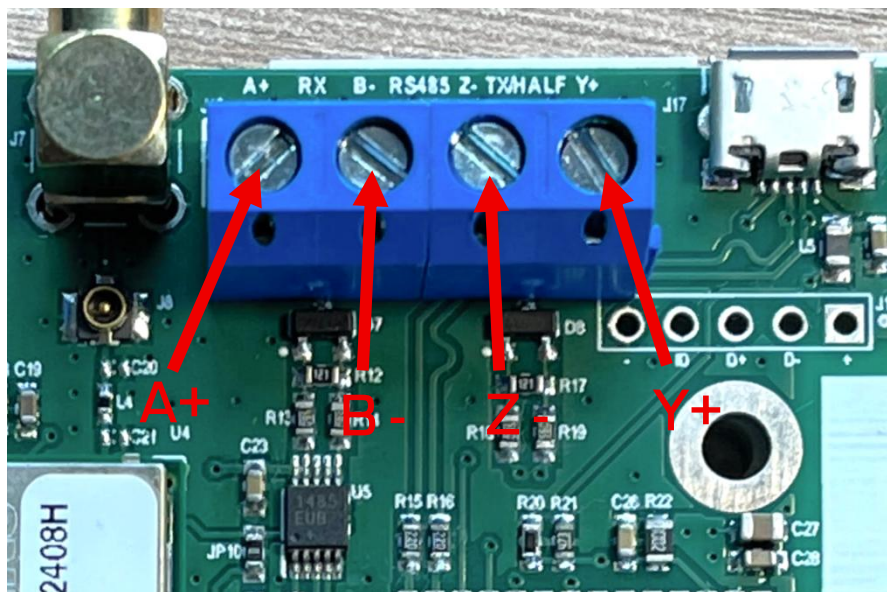


Figure 4: RS485 wiring guide

Note: Both the transmit and receive paths have a 120Ω termination resistor present. These can be removed on request.

RF Programmable Address

The RS485-RF device has a programmable address that is set via the dip switch with the U6 designator on the PCB. This allows for 16 unique addresses. Each device will only pair and accept RF packets from other RS485-RF devices with a matching address. Please see Figure 5 which demonstrates a device address of 8.

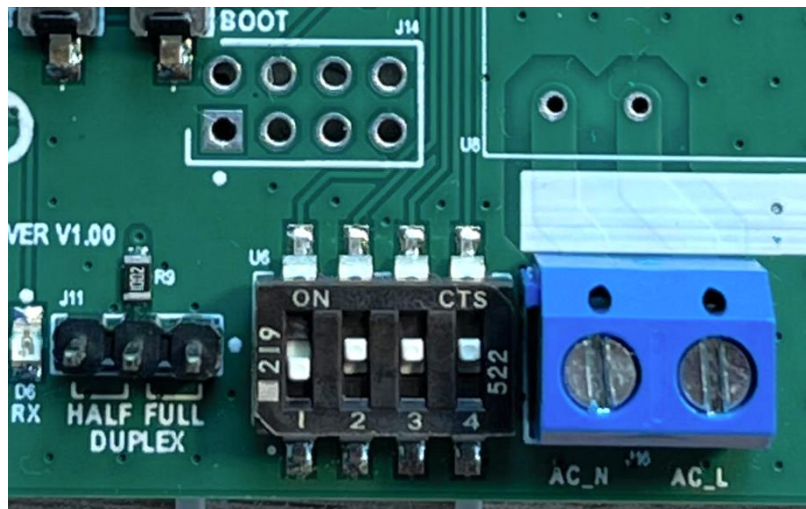


Figure 5: Programmable address – showing address value of 8

LED Flashing Routines

The LED flashing routine of the “STAT” LED will change depending on the RF paired status of the device.

Device is paired

This will result in the following flashing routine:

- 100ms ON
- 900ms OFF

Device not paired

This will result in the following flashing routine

- 100ms ON
- 150ms OFF

Mounting

Device is designed to be mounted in a DIN rail enclosure measuring 71.2mm x 98mm x 58mm (L x B x H). Alternatively, the PCB can be mounted in a custom enclosure.

Customisation

The RS485 device has been designed with the option to add both GSM functionality and/or a user display on request. Please enquire regarding these options if they are required.