1. **Configure the RED-485**

   (1) Required items
   - Windows PC
   - Richards Electric Network Parameter Utility (NPU)
   - USB Type C Cable

   (2) Download the NPU from the RED-485 product page
   https://www.richards.iccdesigns.com/red485

   (3) Extract and run the NPU software

   (4) Connect a USB cable between the PC and the RED-485 to power and configure the device

   (5) Load the corresponding Device Update File (DUF) for your inverter onto the RED-485:

   (a) Click File->Update Device…

   (b) Navigate to the NPU's "Device Update Files" directory

   (c) Select the DUF file

   (d) Click the Open button

   (e) The NPU will update and reboot the device

   (6) Select the desired protocol and configure the device's network settings for your network

   (7) Click the Submit button to apply the settings and reboot the RED-485
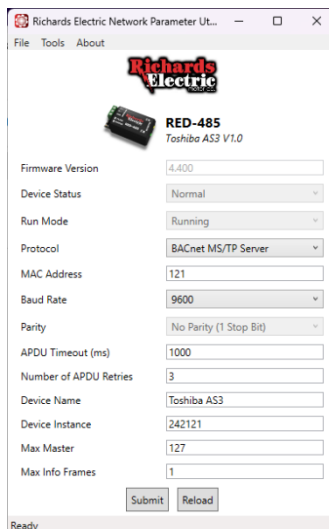
2. **Install the RED-485**

   (1) Power off the inverter

   (2) Wire the RS-485 network cable to the RED-485's Network port

Table 1: RED-485 Network Port

Terminal	Network Connection
D +	RS-485 Positive (Non-Inverting) Data Signal
D −	RS-485 Negative (Inverting) Data Signal
GND*	RS-485 0V Ground Reference

* GND is common with the inverter's signal ground and CC terminal

(3) Connect a standard, straight-through Cat5 cable (or similar, e.g. Cat5e, Cat6, Cat6a, etc.) to the inverter's RS-485 port and ensure the port is configured for 2-wire mode, if applicable

Table 2: Inverter RS-485 Port

Inverter Type	RS-485 Port	Inverter 2-Wire Setting
AS3	RS485 communication connector 2	F829 = 0 (2-wire)
S15	RS485 communication connector	
NC3	RS485 communication connector	
9-Series	RS485 4-wire communication connector	SW200 = ON
AS1	RS485 2-wire communication connector	
7-Series	CNU1	JP1, JP2 = HALF (Old Control PCB) SW5 = HALF (New Control PCB) F821 = 0 (2-wire)

(4) Connect the other end of the Cat5 cable to the RED-485's Inverter port, which will also provide power to the device

(5) Power on the inverter and confirm the communication parameters for the RS-485 port listed in Table 2 above are set to their default values shown in Table 3

Table 3: Inverter Default Communication Settings

Parameter	Value
Baud Rate	19200 (9600 for 7-Series)
Parity	Even Parity
Inverter Number	0

(6) Power cycle the inverter for any setting changes to take effect

3. RS-485 Electrical Specifications

Isolated .... No
Unit Loads .... 1/8 Unit Load
Maximum Devices...................... 256
Internal Biasing Resistors........... None
Internal EOL Termination........... None
Failsafe Receiver .... Full-failsafe (open, shorted, terminated and undriven)
Differential Output Max............. 5.0V (no load)
Differential Output Min .... 2.4V (terminated and fully loaded)

4. 3 Year Warranty
The RED-485 is covered by a three-year warranty. Products that are damaged or modified are not covered under warranty.

5. Additional RED-485 documentation, software, and other resources can be found on the RED-485 product page at:

https://www.richards.iccdesigns.com/red485