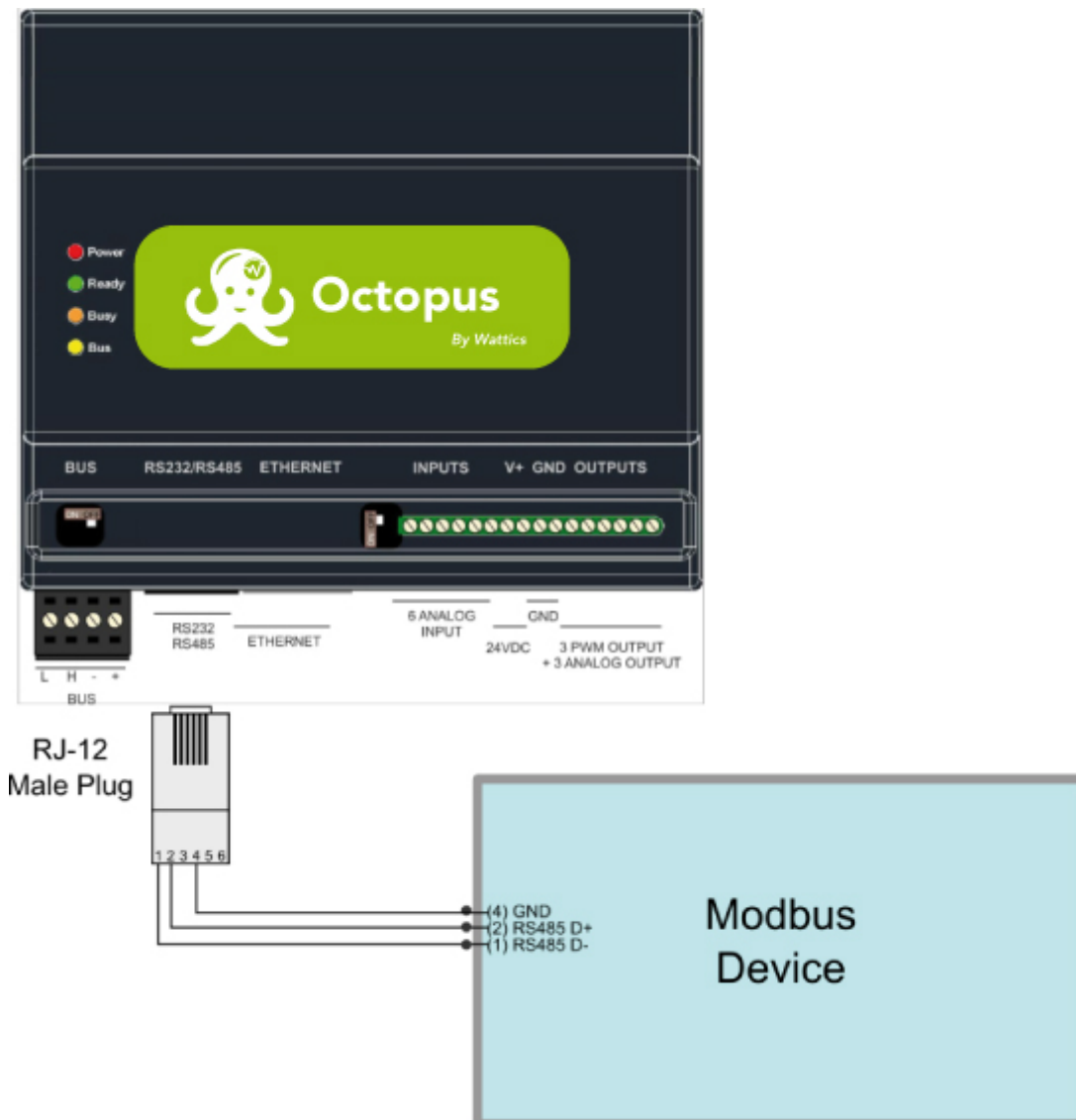


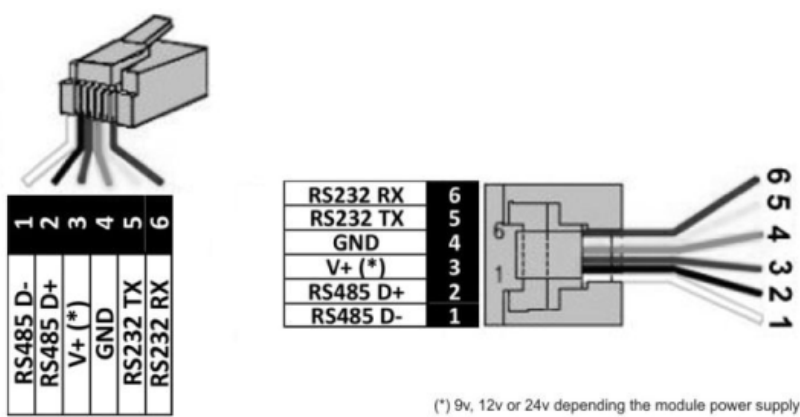
This post outlines the wiring steps for connecting RS485 Modbus devices (e.g. Modbus meter) to the Wattics Octopus. Before you start please make sure you have all material available:

- Modbus device (e.g. Modbus meter)
- Octopus Gateway unit
- RJ12 interface cable, to connect the Modbus device to Octopus Gateway unit



## RS485 (Modbus) pinout

The Octopus Gateway unit has a RJ12 Connection available for Modbus RTU (RS485) communication. The 6P6C modular connection provides serial communication over RS232 or RS485 for external devices.



**IMPORTANT** when using the RS485 connector provided by Wattics:

- RS485 D+ = Yellow wire
- RS485 D - = Blue wire
- GND/Shield = Red wire



Modbus devices typically use A, B and S terminals for RS485 connections:

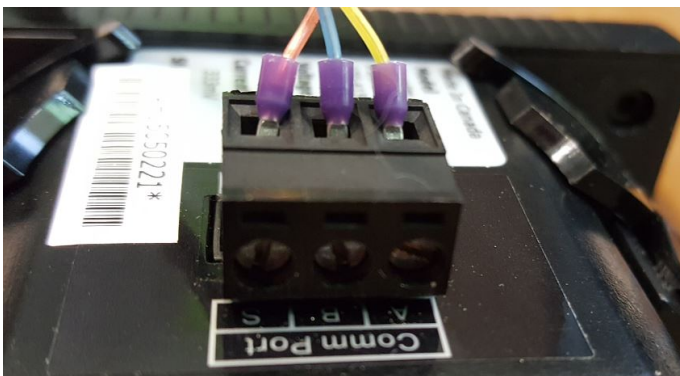
- A is generally the differential signal +
- B is generally the differential signal -
- S is generally connected to the shield of the twisted pair cables

It is important you check first that A, B and S are used as above, some Modbus devices like the Carlo Gavazzi EM21 meters use A for - and B for +.

Once you have confirmed the A, B and S wiring on the meter you can connect your Wattics RS485 connector as follows:

- Yellow wire = A
- Blue wire = B
- Red wire = S

We recommend that you cut or isolate the other wires as wire number 3 supplies 24V.

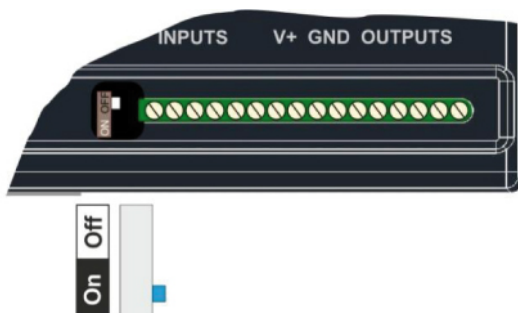


### Verifications

#### RS485 bus resistance

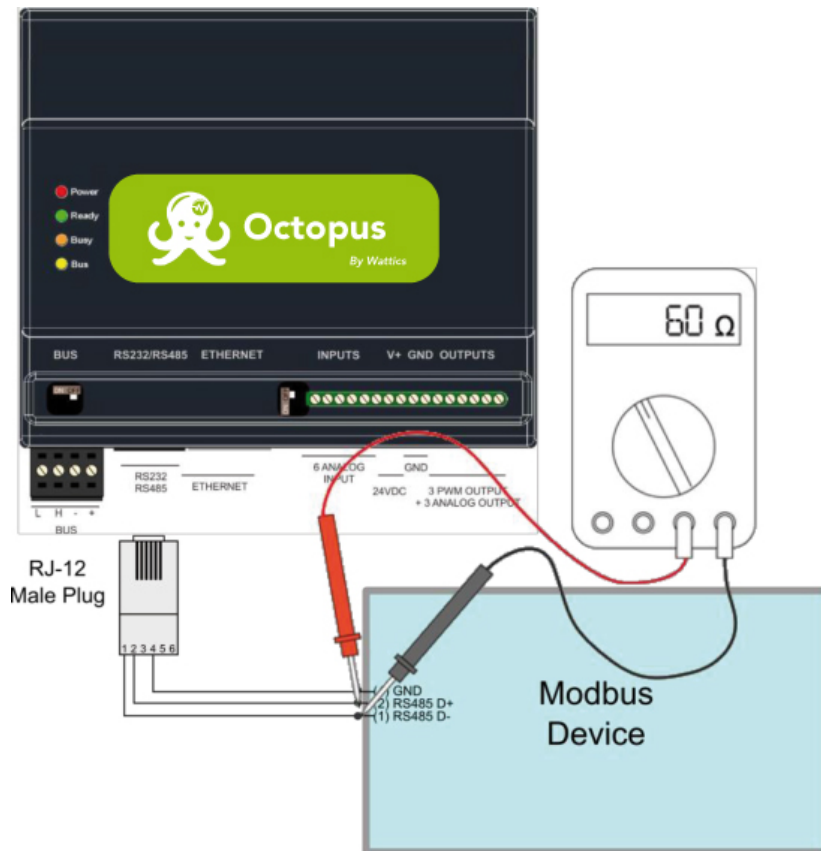
For daisy chain or long distance installations, it is very important that wiring is done with twisted cable that provides maximum noise immunity. It is also possible use an unshielded cable, while reducing network speed.

To obtain a transmission line as possible immune to the noise, a good practice is to place resistors at both ends of the line, to keep the line impedance balanced. We recommend that the RS485 cable is terminated at each end with a 120 ohm resistor for daisy chain or long distance installations. Check the value of the Octopus Gateway unit RS485 Bus resistance (120 ohm expected). If the measured value is different from the desired value, turn on the resistor switch to guarantee 120 ohms.



### Connections

1. Check the connections from the Modbus device to the (Data+) and (Data -) of the Gateway unit.
2. With the cable connected to both devices and both power sources off, check the value of the resistance between the two terminals. The measured value must be between 50 and 60 ohms.



### Modbus configuration

You must finally configure your Modbus device to communicate with the Octopus.

For each Modbus RTU device (RS485 wiring), you need to set:

- Modbus address (make sure each meter has a unique Modbus address)
- Baud rate (19200 recommended and 9600 for long daisy chains)
- Data parity (None recommended)
- Number of bits (1 recommended)
- Number of stop bits (1 recommended)

For each Modbus TCP device (LAN connection), you need to know:

- IP address (make sure each meter has a unique IP address)
- Modbus address (make sure each meter at a given IP address has a unique Modbus address)

Make sure that the Octopus and Modbus slave devices are connected within the same IP range.

You may contact us at [support@wattics.com](mailto:support@wattics.com) for any wiring clarification.