



ORC-HAGW

(Information for advanced partners)

Product Variations

ORC-HAGW

Series 1

RS485 Modbus / ORC-NET only

Ethernet – NO



ORC-HAGW-2

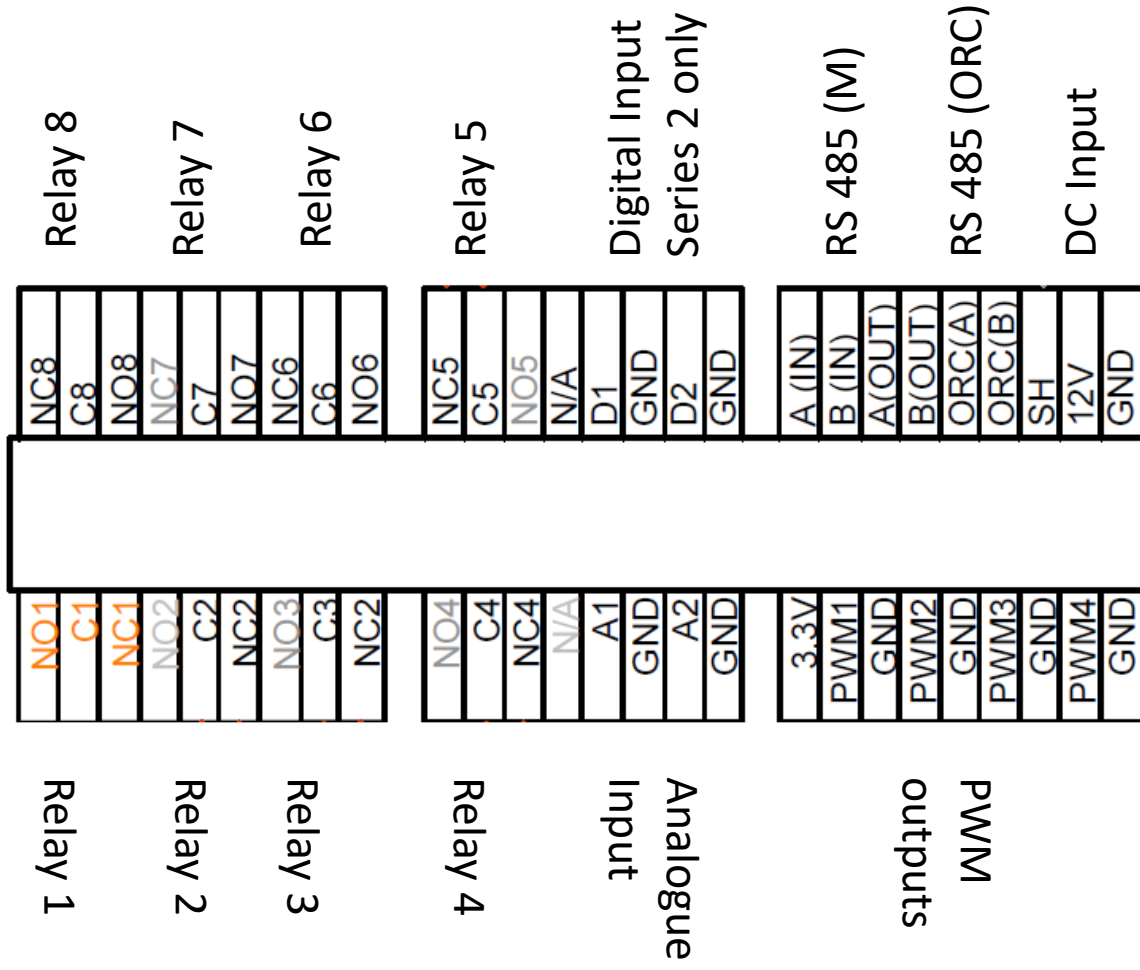
Series 2

RS485 Modbus / ORC-NET / others

Ethernet – 10Mb (optional card required)



Connections



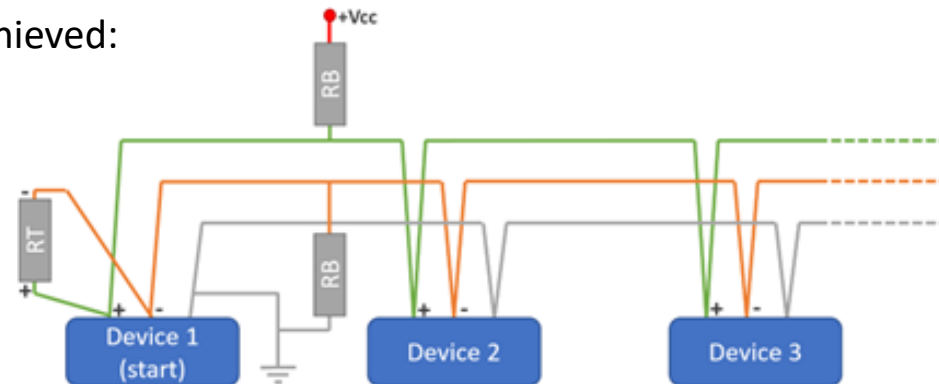
Why BIAS resistors

With RS485 networks, there are periods of time when no driver is actively driving the bus. On a Master-Slave network this would correspond to potential times when the Master is not transmitting and the slaves have finished responding to any command. This state is also called "tri-state mode".

During this time, the termination resistors collapse the differential bus voltage to 0V, which is an undefined input level for many RS485 receivers. Faced with this undefined input, a receiver might output the wrong logic state or worse yet, it might oscillate. The oscillation may be interpreted as an endless stream of message start bits, causing the controller to waste valuable bandwidth trying to service these phantom messages. Fail-safe bus biasing is one way to alleviate this problem.

The objective of biasing is to make sure that the RS485 line remains in a known, non-fluctuating state when no devices are transmitting. Biasing the entire network requires a single pair of resistors: a pull-up resistor to VCC to the "+" signal line, and a pull-down resistor to ground attached to the "-" signal line.

See the schematic here below which explains how biasing is achieved:



The "RB" going between "-" and "earth" is the "pull-down" resistor, the "RB" going between "+" and "+Vcc" is the "pull-up" resistor.

Example of different installations / firmware

Orcomm Generic (non site specific) firmware has been engineered to work across multiple designs and environments.

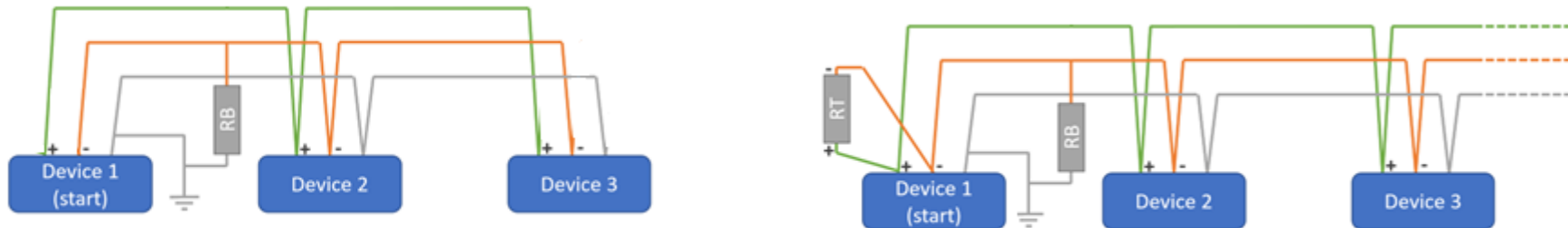
A "pull down" resistors are recommended across any RS485 communication.

This will enhance the BUS stability across the RS485. EOL resistors depends on the cabling and connected devices.

If the installation has minimal devices and short distances then no EOL 120 ohm would be required.

NOTE: Pull-down resistor are installed from ground to the "-" signal line (B).

See the schematic here below which explains how biasing is achieved:

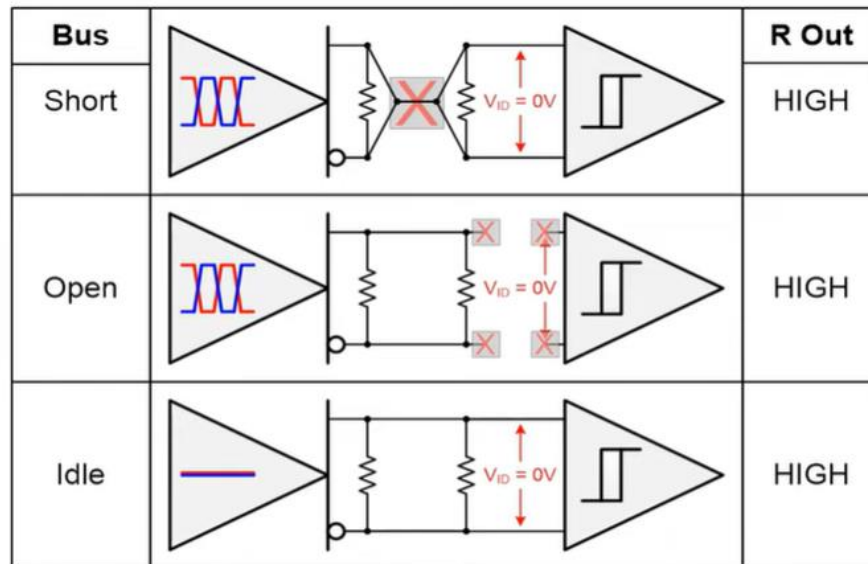


The "RB" going between "-" and "earth" is the "pull-down" resistor, the **RT** is required on larger installations.

Other useful notes.

EIA-485 compliant receivers must have $V_{IT+} < +200\text{mV}$ and $V_{IT-} < -200\text{mV}$.

Offset receiver input thresholds



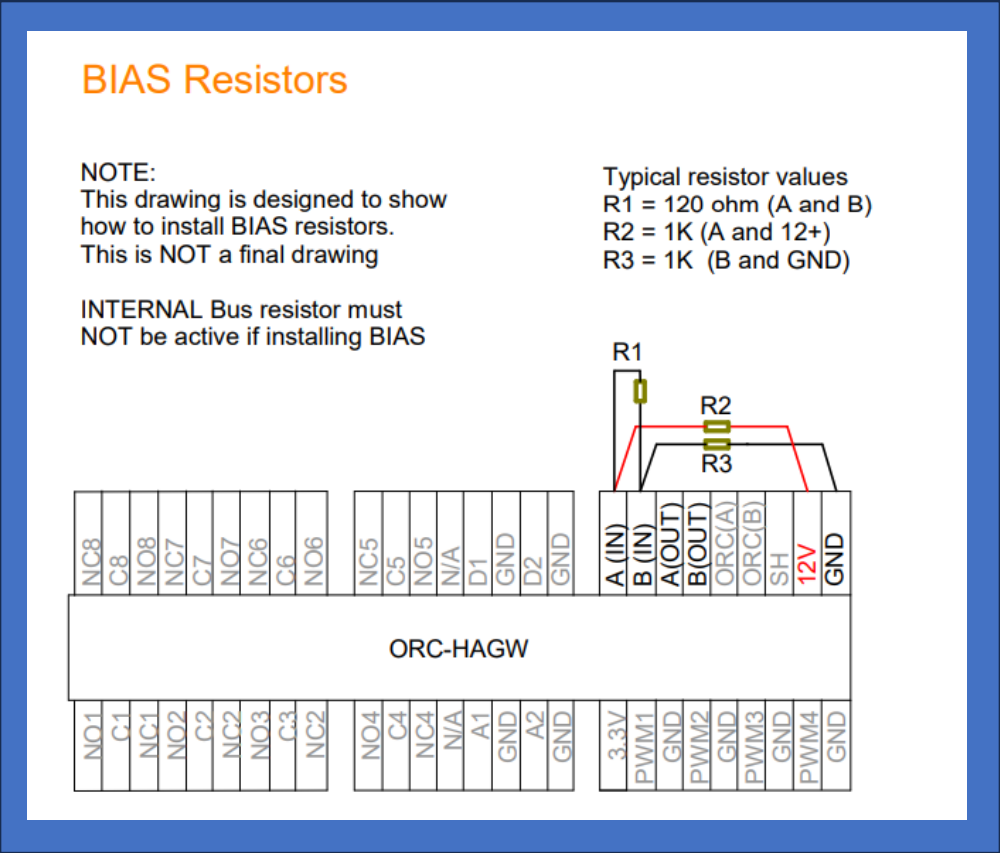
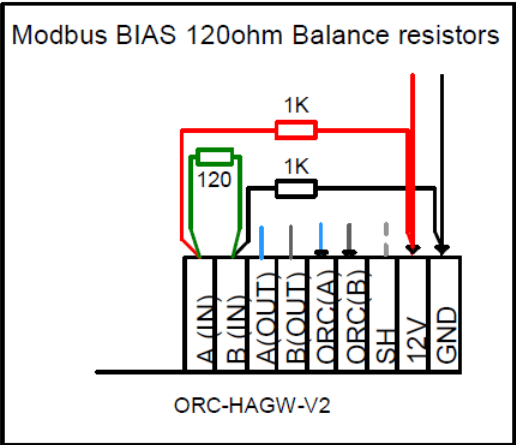
Modern transceivers have $V_{IT+} \leq 0\text{V}$ to ensure that the receiver outputs a failsafe HIGH during bus short, open, and idle events.

Example of Drawing / Schematics / Key

Note:

Depending on installation BIAS resistors may vary in value. This is why it is not installed internally within the HAGW.

An oscilloscope can show the bus quality and ensure peak to peak minimum of 100mV across A and B



Other connections and inputs

