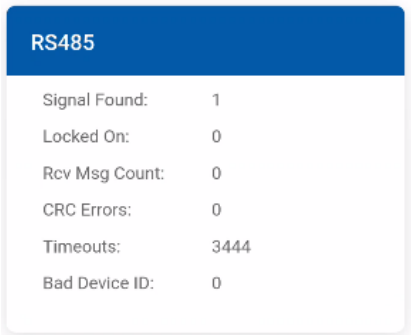
RS485 TroubleShooting

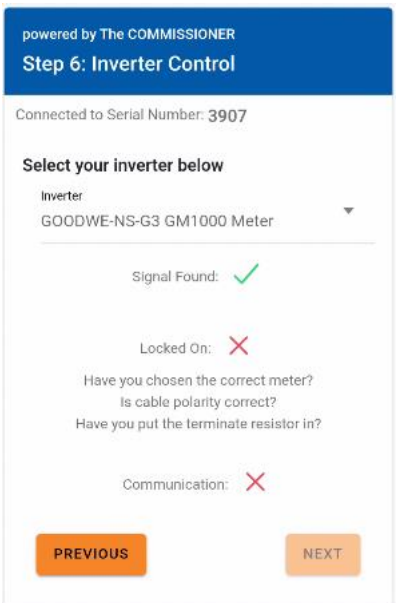
Purpose:
This is an electricians guide to fixing RS485 Communications issues.

How to tell if you have a problem:
Using the CATCH Configurator you can identify if there is an RS485 problem two ways.



Configurator -> Live Data
A Good RS485 connection that is correctly setup will have **Locked On** = 1.

This is an example of a bad setup, or a bad connection.



Configurator -> Wizard
You should have all green ticks.

This is an example of a bad setup, or a bad connection.

RS485 TroubleShooting

SO… YOU HAVE A PROBLEM:

It will be one of 3 things.

- Not plugged into the correct inverter port
- A Bad Electrical connection.
- Not setup correctly.

NOT PLUGGED INTO THE CORRECT PORT

The easiest way to check this is to re-read the instructions and be very sure you have it right…However if you are still not sure then set your multi-meter onto **Volts – DC** and put your multimeter probes onto the inverter terminals.

You should see one of two things.

- A fixed voltage in the order of 3.0 – 5.0V. This indicates an idle RS485 wire..ie you are on an RS485 terminal but its not transmitting.

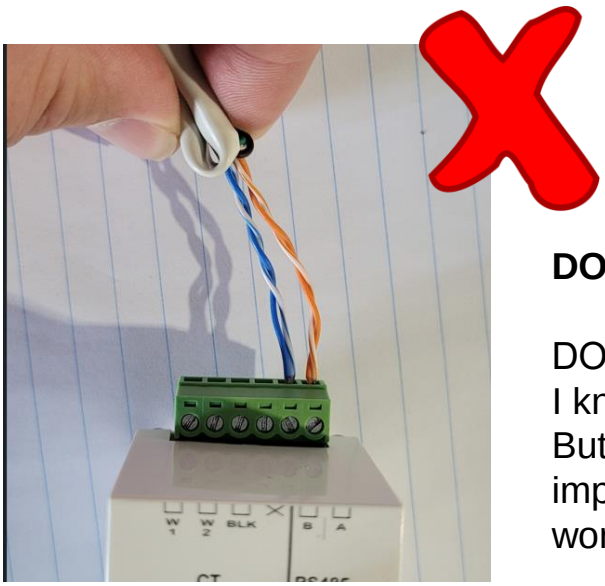
- A voltage that is jumping all over the place. The voltage will be small but it will be jumping around. This indicates an RS485 bus where the inverter is tranmitting a signal.

RS485 TroubleShooting

A BAD ELECTRICAL CONNECTION

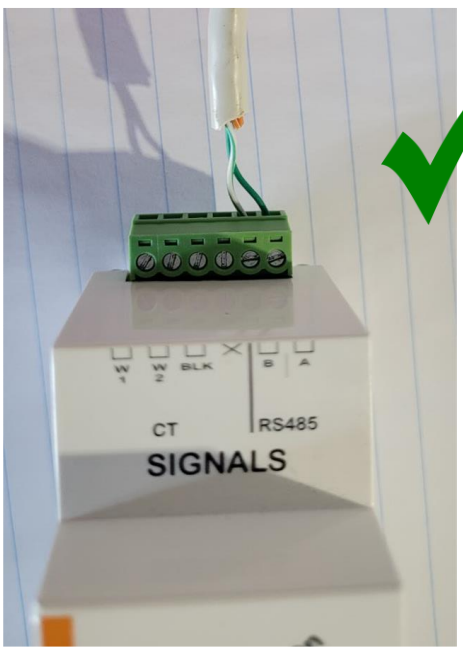
The first piece of advice is don't disconnect everything…unless you really need to. By connecting/disconnecting you are moving the goal posts. Use your meter to work out if there is a connection issue.

Firstly about the wiring. Most people will use CAT6 cable for RS485 runs, and that is perfectly OK, but there are a couple of things to note.



DO NOT DO THIS!!

DON'T USE TWO PAIRS LIKE THIS
I know more seems like it should be better. But you change the characteristic impedance of the cable and things wont work.



THIS IS CORRECT

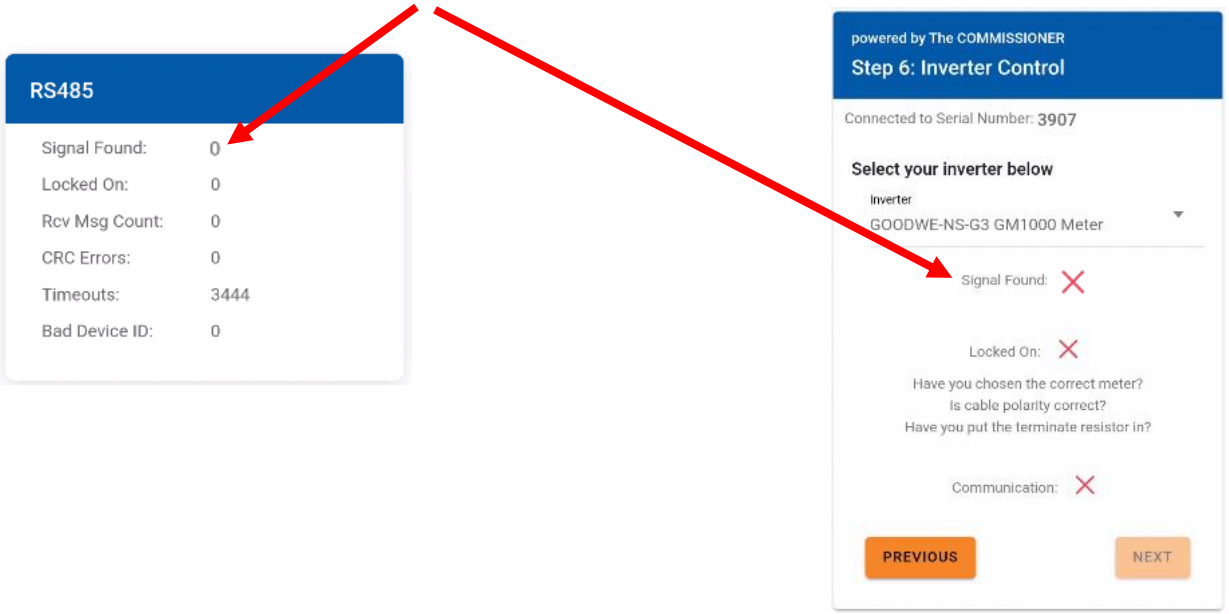
Just use a single Pair. Leave the others

RS485 TroubleShooting

A BAD ELECTRICAL CONNECTION

open the catch Configurator and go to the live data page or go to step 6 of the commissioning wizard. If there is no signal found you have a connection problem.

If you have confirmed you are plugged into the right slot on the inverter, this Indicates a bad connection



RS485 TroubleShooting

A BAD ELECTRICAL CONNECTION

open the catch Configurator and go to the live data page or go to step 6 of the commissioning wizard. If there is no signal found you have a connection problem.

1. Put your multimeter on volts DC and put your probes on the Catch Control A/B terminal screws.

   If you measure a constant voltage in the range of 3-5V the connection is good but the inverter is not transmitting. There is a problem in the inverter setup.

   If you read no voltage (or something very small) then you have a connection problem.

1. take the multimeter over to the inverter and measure at the rs485 connection point at the inverter. If you are measuring a voltage here you now know the issue is either a connection or a broken wire.

RS485 TroubleShooting

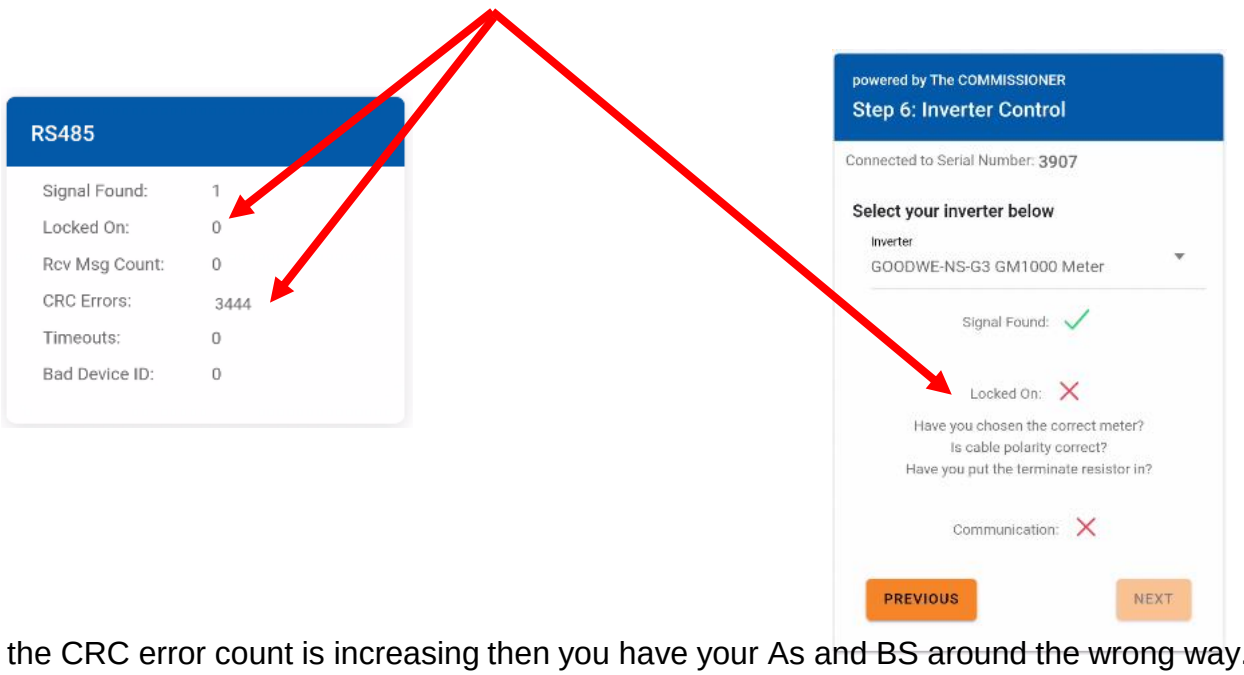
INCORRECT SETUP

Open the Configurator app and go to the rs485 info on the Live Data page.

You should now see signal found.

if the locked on is not equal to 1 there is still a problem.

Signal has now been found, But has not locked on. CRC numbers climbing indicates a polarity problem.



if the CRC error count is increasing then you have your As and BS around the wrong way. Swap the wires over and the CRC errors should stop.

If the CRC count is not growing you have not chosen the correct meter type in the configurator. Go to device settings and choose the correct meter. It could also mean the polarity is incorrect. Which means you need to swap the A & B wires.

Once you have changed the meter shutdown the inverter by shutting down the A/C and isolating all DC sources. wait for the inverter to shutdown. Then perform a restart.

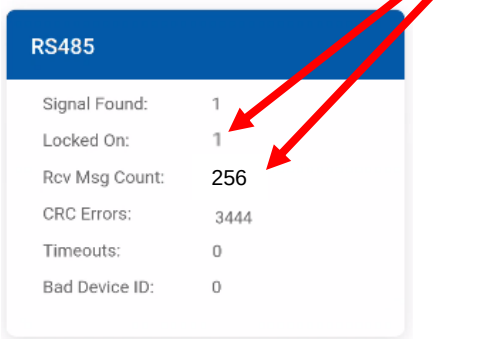
Rs485 Should now be working. You can tell by checking the locked on field in the RS485 summary, or by getting 3 green ticks in the commissioning wizard.

Another potential issue may be the device id is incorrect. This is less likely but possible. Each inverter is different so you will need to consult the inverter manufacturers instructions to check the modbus rtu device ID.

RS485 TroubleShooting

CORRECT SETUP

If you made it to here the setup is now correct. The screens below show you what a correct setup looks like



Locked on should stay at 1, and the Rcv Msg Count should be climbing.
The other fields can have non zero values and that is OK. As long as the CRC Errors is not climbing. Timeouts and Bad Device ID may be increasing, and that does not indicate a problem.