SOLAR RELAY

INVERTER CONTROL
with GOODWE

NS/DNS/MS Series

CATCH Power
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IMPORTANT..PLEASE READ

The CATCH Solar Relay works by emulating the energy meter the inverter would normally use.

This means two things are really important.

1. You need to read the inverter manual:

Make sure you understand how to setup the inverter for export control. When you read the manual it will talk about an energy meter or CT…Follow the instructions exactly as they are in the manual. If there are any changes required we will let you know further down in this document.

## 2. Read the CATCH Solar Relay installation manual:

The manual outlines how to setup the CATCH Solar Relay to control loads. It also outlines circuit breaker requirements, how to use the CATCH Configurator App, etc.

Once you have followed step one and two you are ready to proceed….
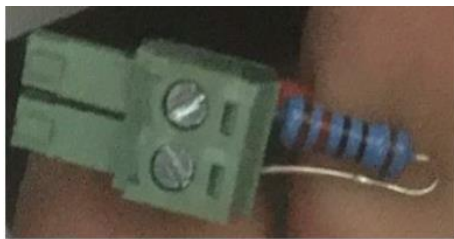
Wiring Instructions

CATCH Solar Relay and the inverter communicate using RS485. Connecting the two pieces of hardware requires a 2 core RS485 cable. When the RS485 cable run is greater than 20m it is recommended to use a 2 core cable designed specifically for RS485 communication, it will typically have a 120 Ohm characteristic impedance. However, for short cable runs any 2 core cable will typically do the job, as long as it is rated for the voltages it will be exposed to. The pink CBUS data cable is ideal for short cable runs.

NS Series
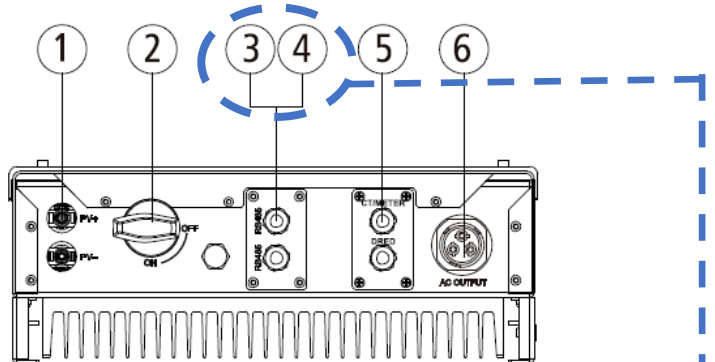
The image above is the bottom of the NS Series inverter.

1. Remove bottom plate number 3 & 4.
2. Pass the RS485 cable through the CT Meter gland.
3. Using the green connectors supplied. Connect the RS485 cable to either pin 1 and 2 **or** pin 5 and 6 as shown
4. Using the green phoenix type connectors supplied, connect the RS485 cable to either pin 1 and 2 or pin 5 and 6 as shown below.
   If there is no 6 pin socket connector supplied with the inverter then use the 2 pin socket that was meant for the CT connection, you do not need the CT, so you can use the connector.

The diagram below shows 2 separate cables, you only need 1, you choose the 1&2 or 5&6 connection points, not both.

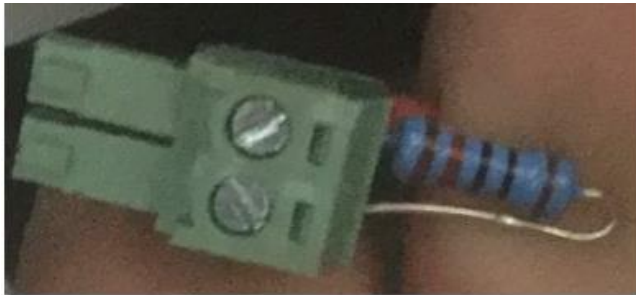| Line	Function
1	RS485+
2	RS485-
3	Reserved
4	Reserved
5	RS485+
6	RS485-

Pin 1 and 2

OR

Pin 5 and 6

Pin 1 (+) is closest to the inverter front cover

Pin 1/Pin 5 => Catch Solar Relay RS485 A
Pin 2/Pin 6 => Catch Solar Relay RS485 B

NS Series..Continued

Add RS485 termination resistor

For the NS/DNS/MS series a 120 Ohm termination resistor needs to be installed at the Solar Relay across RS 485 terminals A & B This is supplied with Catch Solar Relay. On occasions you also need to manually add a second 120 Ohm resistor inside the inverter rs485 connection point. In short cable runs you may get away with not having it, but it may be needed for longer cable runs. A second resistor is not supplied with the inverter.
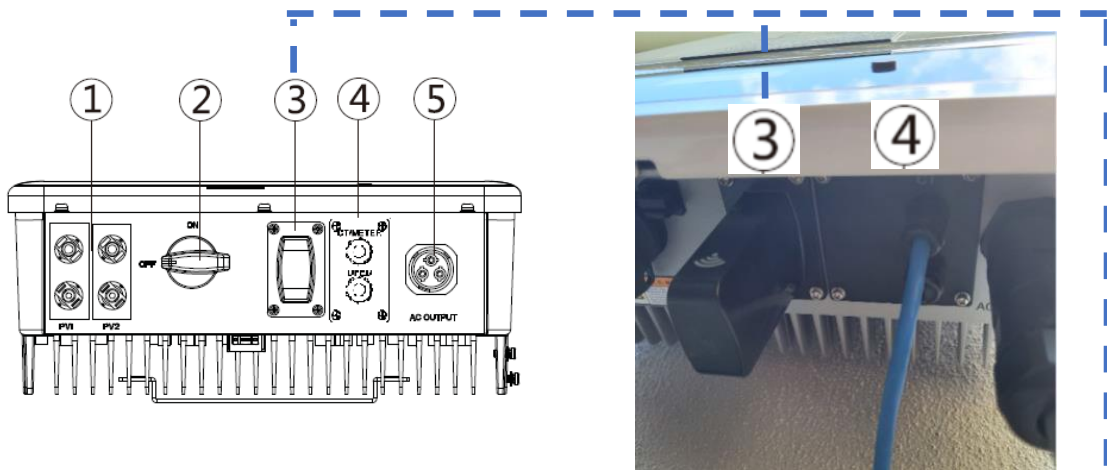
Use the 2 pin phoenix connector meant for CT socket, if 6 pin phoenix is not supplied with inverter
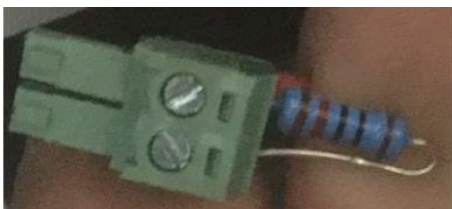
DNS Series

The installation manual of the DNS Series inverter talks about using a CT for export limiting. You will not need to install the CT. The CATCH Solar Relay will be doing the job of the CT.

YOU WILL NOT NEED THE GOODWE CT FOR THIS INSTALLATION

The image above is the bottom of the DNS Series inverter.

1. Remove bottom plate number 3 & 4.
   The RS485 connection point is located behind panel 3, next to the Wifi dongle.
   DO NOT connect to the 6 pin socket behind plate 4.

2. Pass the RS485 cable through the CT Meter gland plate (plate 4) and pass the wire through to the 6pin socket behind plate 3 and next to the WiFi dongle connector.

3. Using the green phoenix type connectors supplied. Connect the RS485 cable to either pin 1 and 2 **or** pin 5 and 6 as shown on the following page. If there is no 6 pin socket connector supplied with the inverter then use the 2 pin socket that was meant for the CT connection, you do not need the CT, so you can use the connector.

Use the 2 pin phoenix connector meant for CT socket, if 6 pin phoenix is not supplied with inverter
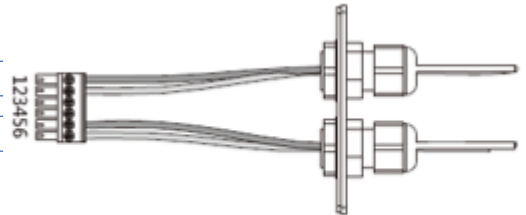
DNS Series..Continued

The diagram below shows 2 separate cables, you only need 1, you choose the 1&2 or 5&6 connection points, not both.

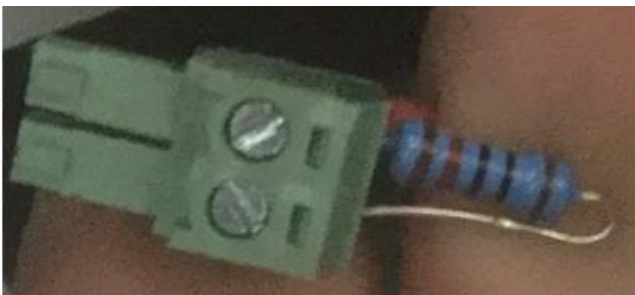| Line	Function
1	RS485+
2	RS485-
3	Reserved
4	Reserved
5	RS485+
6	RS485-

Pin 1 and 2

OR

Pin 5 and 6

Pin 1(+) is closest to the inverter front cover

Pin 1 or Pin 5 => Catch Solar Relay RS485 A
Pin 2 or Pin 6 => Catch Solar Relay RS485 B
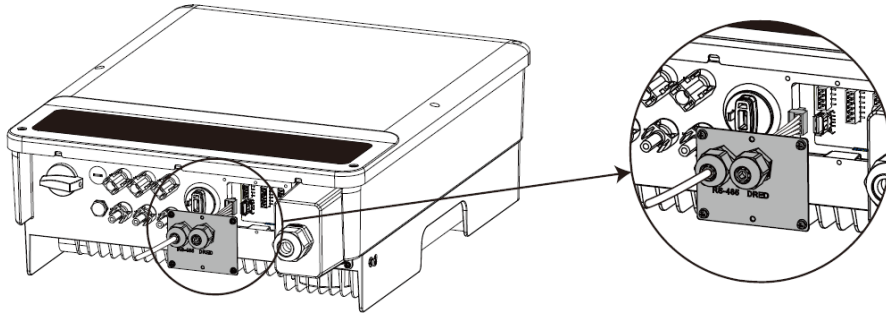
Add RS485 termination resistor

For the NS/DNS/MS series a 120 Ohm termination resistor needs to be installed at the Solar Relay across RS 485 terminals A & B This is supplied with Catch Solar Relay. On occasions you also need to manually add a second 120 Ohm resistor inside the inverter rs485 connection point. In short cable runs you may get away with not having it, but it may be needed for longer cable runs. A second resistor is not supplied with the inverter.

Use the 2 pin phoenix connector meant for CT socket, if 6 pin phoenix is not supplied with inverter

MS Series

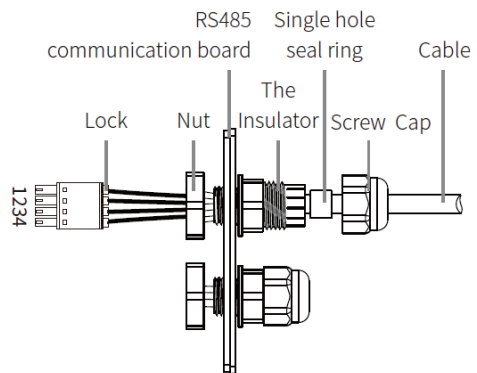**Step 1:** Screw this plate off from inverter.

Step 2:

Put the cable through the plate.

Connect RS485 cable on the 4-pin terminal.

Advise to use cable 16AWG-26AWG.

No.	Function
1	RS485+
2	RS485-
3	RS485+
4	RS485-

Pin 1(+) is closest to the inverter front cover

RS485 communication board · Single hole seal ring · Cable · Lock · Nut · The Insulator · Screw · Cap

1 2 3 4

Pin 1 or Pin 3 => Catch Solar Relay RS485 A
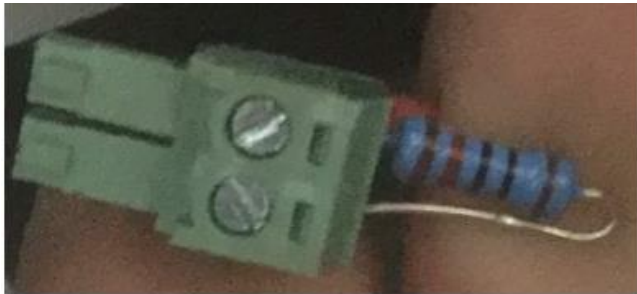Pin 2 or Pin 4 => Catch Solar Relay RS485 B

Step 3: Connect the terminal to the right position onto the inverter and screw the plate.
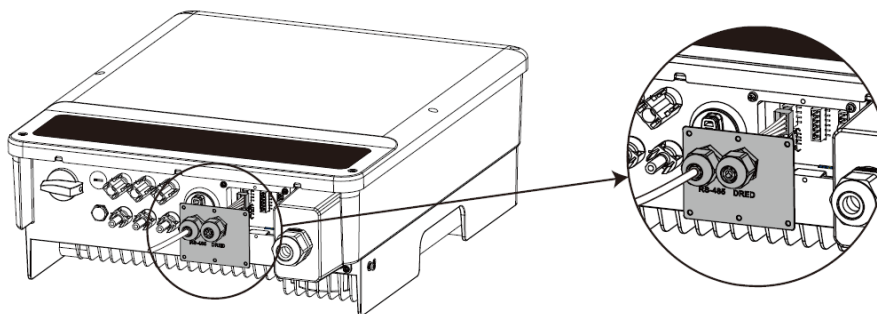
MS Series..Continued

Add RS485 termination resistor

For the NS/DNS/MS series a 120 Ohm termination resistor needs to be installed at the Solar Relay across RS 485 terminals A & B This is supplied with Catch Solar Relay. On occasions you also need to manually add a second 120 Ohm resistor inside the inverter rs485 connection point. In short cable runs you may get away with not having it, but it may be needed for longer cable runs. A second resistor is not supplied with the inverter.

Use the 2 pin phoenix connector meant for CT socket, if 6 pin phoenix is not supplied with inverter

Connecting the RS485 Wires to CATCH Solar Relay
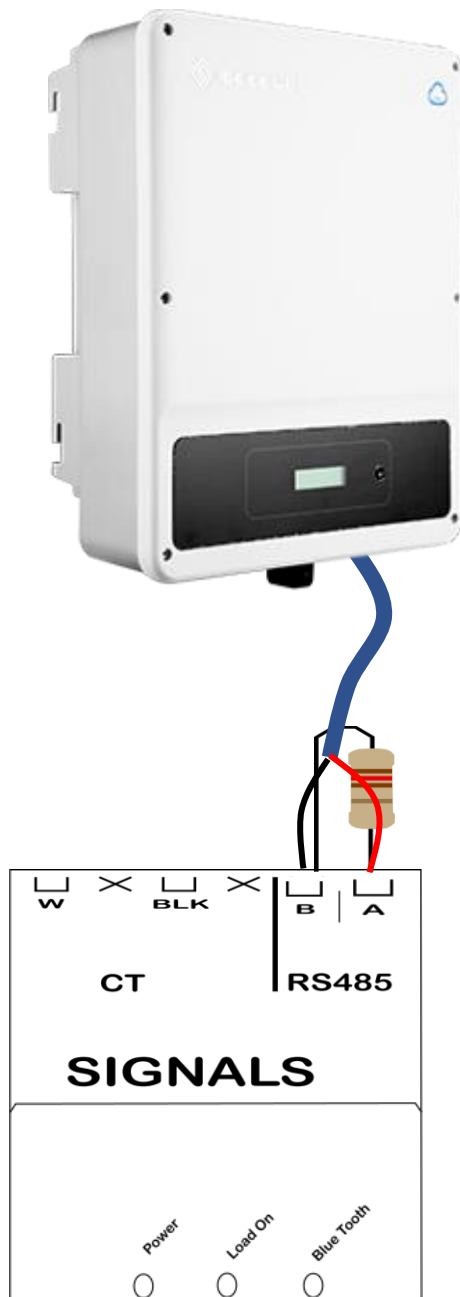
Ensure the data cable is rated for the voltages it will be in close proximity to.
A 120 Ohm terminating resistor may be required at the CATCH Relay terminals as shown in the diagram below if the cable run is longer than 10m.

Inverter Setup

The link below walks you through the process of configuring the GOODWE inverter for export limiting.

https://www.youtube.com/watch?v=dnfvOa1H6w0

Turn Power Limit On/Off

1. Navigate to the `Power Limit OFF` menu option using short presses.

2. Long press on the button until the password screen appears. The default password is `1111`.

3. Use longer 2sec presses to get to the last digit of the password then don't press anything for 10sec. Eventually you will move onto the Power Limit menu option.

4. Short press to change the Power Limit option from off to On.

5. Don't press anything for 10sec. Eventually it will go back to the main screen.

Power limiting is now turned on. The next step is to set the actual export limit.

Set the Power Limit

1. Navigate to the Set `Power Limit` menu option using short presses.

2. Long press on the button until the password screen appears. The default password is `1111`.

3. Use longer 2sec presses to get to the last digit of the password then don't press anything for 10sec. Eventually you will move onto the Power Limit menu option.

4. Use short presses to change the Power Limit digits and 2sec presses to move to the next digit.

5. Don't press anything for 10sec. Eventually it will go back to the main screen.

You have now set the power limit.

Inverter Setup..Continued

The power limit is expressed as a percentage. For example:
If you are configuring a 5kW inverter, and the export limit is 3kW, the export limit should be set to `100*3kW/5kW = 60%`

IMPORTANT!!

RESTART THE INVERTER NOW!!!
- Shutdown the A/C
- Shutdown the DC
- Wait for the screen to go blank.

Power the inverter back up…

The inverter will not connect to the relay unless it has been restarted..

Important GOODWE characteristics to note

- Consumption data does not get sent to the GOODWE monitoring portal. Regardless of whether you are using the CATCH Solar Relay or the GOODWE CT, no consumption data is displayed on the portal. The Goodwe HomeKit is required for this.

- If communications is lost between CATCH Solar Relay and the inverter, the inverter will ignore export limiting and ramp up to full production.

- If there are multiple inverters on site. The Goodwe inverter ignores all export limits until it reaches its own export limit power output.

  As an example, if the site is export limited to 3kW, there is an existing 1.5kW system on site and you are installing a 5 kW system. Typically you will set the Goodwe export limit to 3kW, however this will result in a total possible export of 3kW + 1.5kW. To rectify this problem using the Cluster Export feature of the Solar Relay.

SOLAR RELAY Setup

The screen below is from the CATCH Power Configuration App. The App can be downloaded from Google Play Store or the Apple iStore.
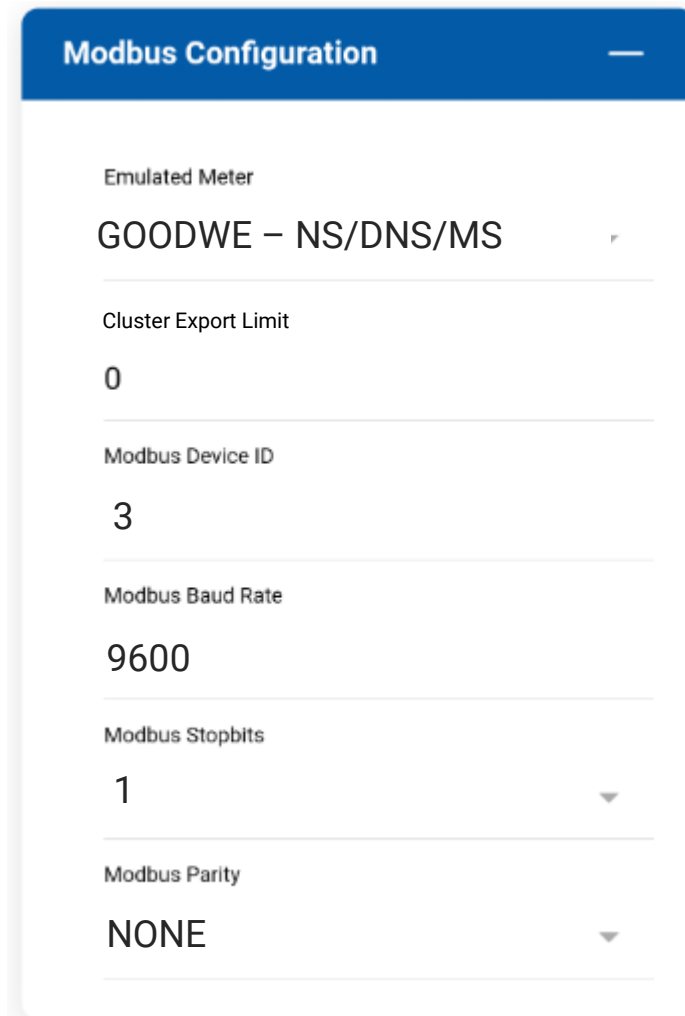

IMPORTANT

DO A FIRMWARE UPGRADE BEFORE YOU BEGIN

We are adding new inverters, and new control features all the time. Your relay firmware is most likely out of date already. Follow the onscreen instructions and perform a firmware update before you continue on

SOLAR RELAY Setup

Navigate to the Configuration screen and expand the Modbus Configuration section. Fill it out using the details below.

Save your changes.

Modbus Configuration

Emulated Meter
GOODWE – NS/DNS/MS

Cluster Export Limit
0

Modbus Device ID
3

Modbus Baud Rate
9600

Modbus Stopbits
1

Modbus Parity
NONE

Checking the status of the RS485 interface

Within the CATCH Power app if you navigate to the bottom of the Live Data screen you will see something similar to the screen below.

The RS485 Status Can be used to confirm correct operation
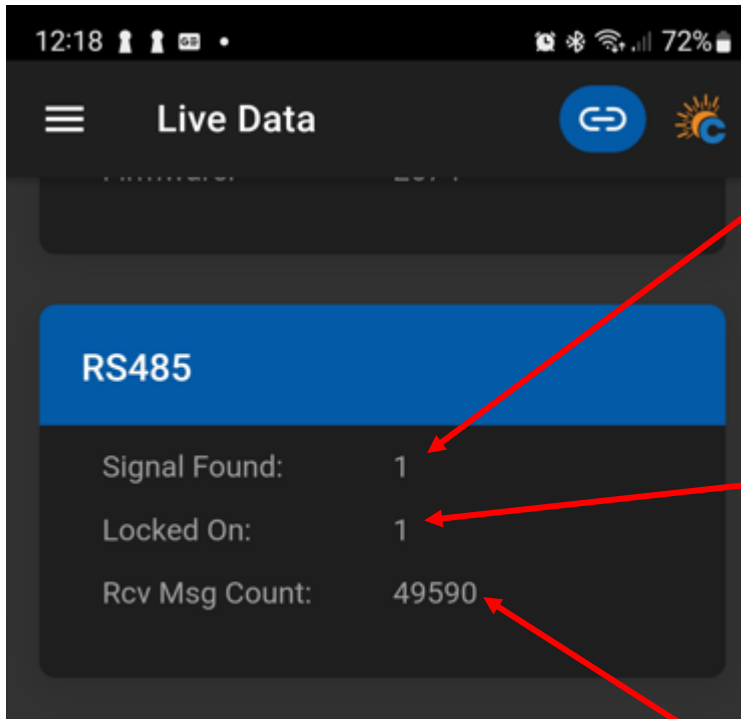
Indicates the inverter is transmitting data on the RS485 cable.

If this is zero it means the inverter is not communicating or there is a break in the cable.

This indicates the inverter and the CATCH Relay are talking the same language.

If this is zero it is likely you have not chosen the correct meter when configuring the relay or the +ve and −ve wires are crossed over.

This number continually counts the number of successful messages. This number will continue to rise if communications the link is good.

1

THE FOLLOWING ONLY NEEDS
TO BE FOLLOWED IF YOU ARE ENABLING
DYNAMIC / FLEXIBLE EXPORTS

RTU Control

DYNAMIC / FLEXIBLE Export Control

NO NATIVE MONITORING
If you choose to use RTU Control for this inverter, the inverter monitoring platform will not work

NO BATTERIES
RTU Control cannot be used on Hybrid inverters that have a battery connected.

1. Log into the inverter using the SolarGo commissioning app

SolarGo
GoodWe Technologies Co., Ltd.
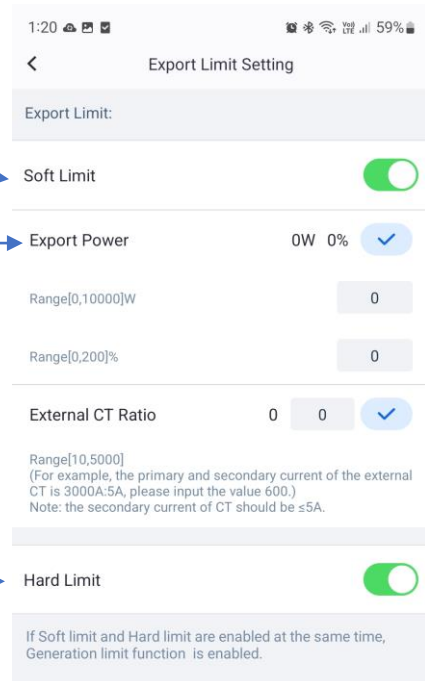
2. Navigate to
Advanced Settings ->Export/Power Limit Settings

3. Setup the inverter as Shown

Soft limit ON

Export limit to ZERO

Hard Limit ON

1:20   59%

<   Export Limit Setting

Export Limit:

Soft Limit   ⬤

Export Power   0W 0% ✓

Range[0,10000]W   0

Range[0,200]%   0

External CT Ratio   0   0   ✓

Range[10,5000]
(For example, the primary and secondary current of the external CT is 3000A:5A, please input the value 600.)
Note: the secondary current of CT should be ≤5A.

Hard Limit   ⬤

If Soft limit and Hard limit are enabled at the same time, Generation limit function is enabled.

SUNSPEC Configuration

GOODWE Does not support
SUNSPEC over modbusTCP

Follow the Configuration steps in the Electricians Guide to register the site for the MONOCLE, and for Dynamic / Flexible Exports