SOLAR RELAY

INVERTER CONTROL
with
FRONIUS PRIMO / GEN 24

CATCH Power
A trademark of Project H Pty Ltd
180 Dumaresq Street
Glen Innes
NSW   2370
Australia
Ph: **+64 2** 5700 5717
W: www.Catchpower.com.au
E: sales@catchpower.com.au

Installation Overview

1. Install the Fronius Inverter as per the Fronius Installation Guide.

2. Install the CATCH Control as per the CATCH Electricians Guide.

3. Adjust the CATCH CT wiring as show in this document.

4. Connect the RS485 bus between the CATCH Control and the inverter as shown in this document.

5. Run the CATCH Commissioner wizard up to Step 6.

6. Complete the FRONIUS Commissioning as per Fronius install guide.

7. Setup the Fronius Inverter with a STATIC IP Address.

8. Turn on and configure modbus/TCP in the Fronius Inverter as outlined in this document.

9. Finish the CATCH Commissioner wizard.

10. Perform a SUNSPEC Scan in the CATCH Configurator to connect the CATCH Control to the Fronius inverter over the local network.

CATCH CT Arrangement

For Fronius installations it is not necessary to install the second CT (W2). We will extract the solar production data from the SUNSPEC connection we make with the inverter.

You can use this CT to monitor another circuit if necessary.

If you do decide to use W2 to monitor another consumption circuit make sure you specify the channel purpose as OTHER during the commissioning process.
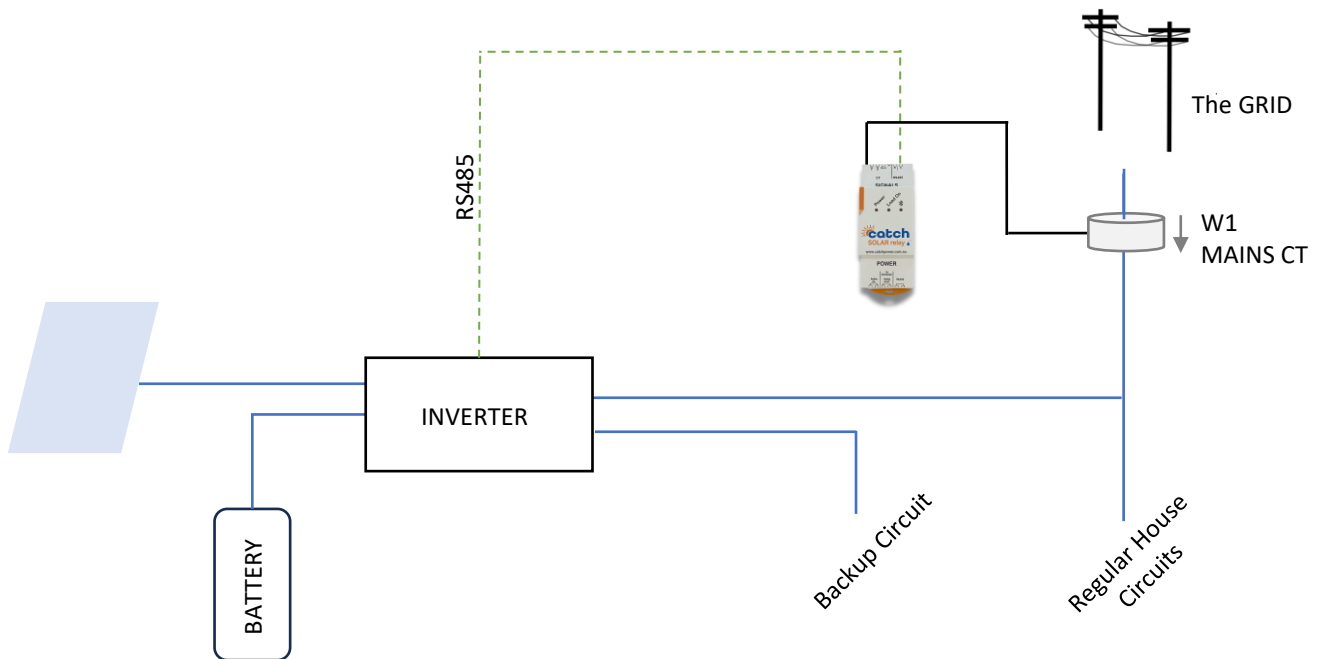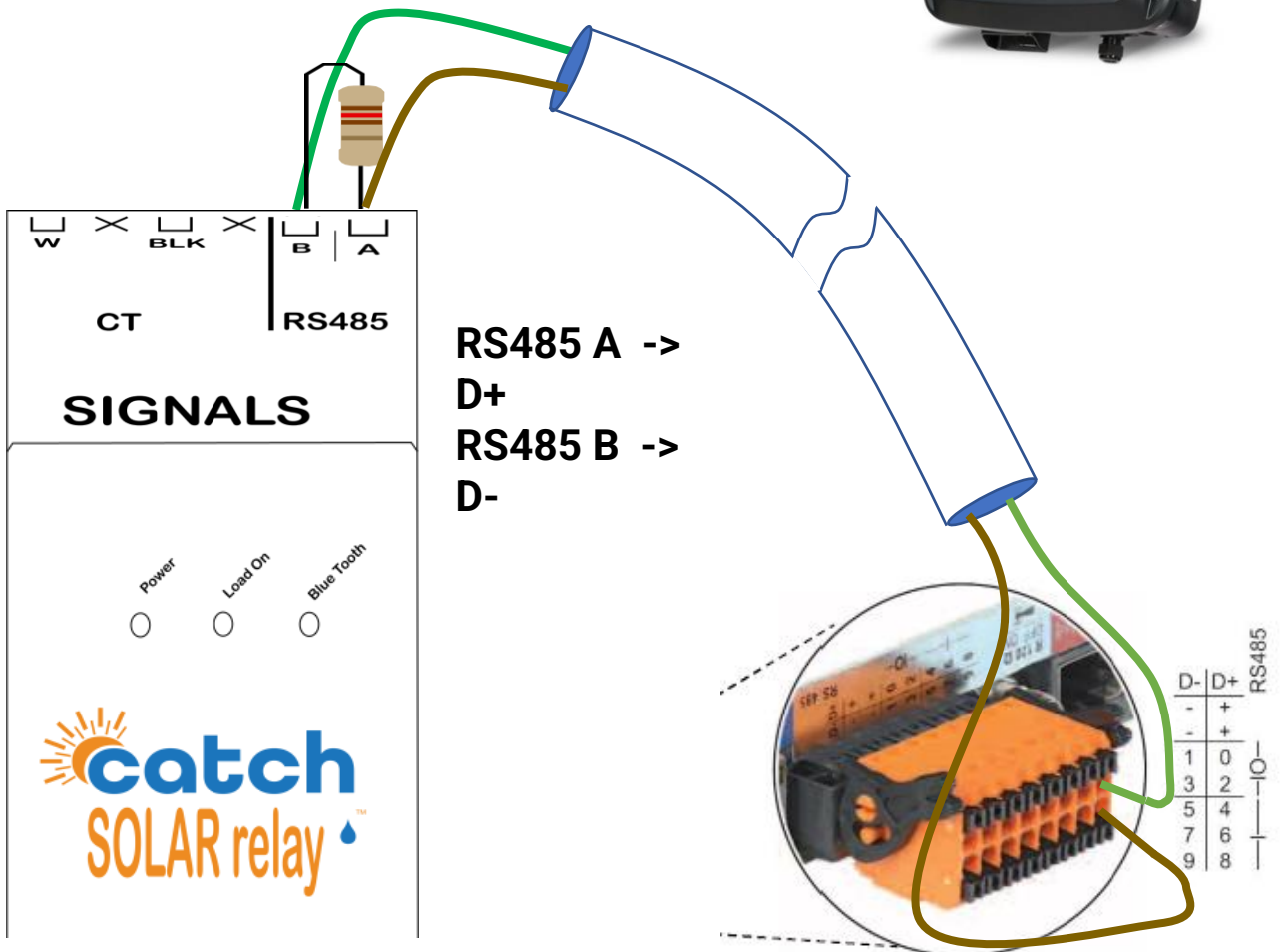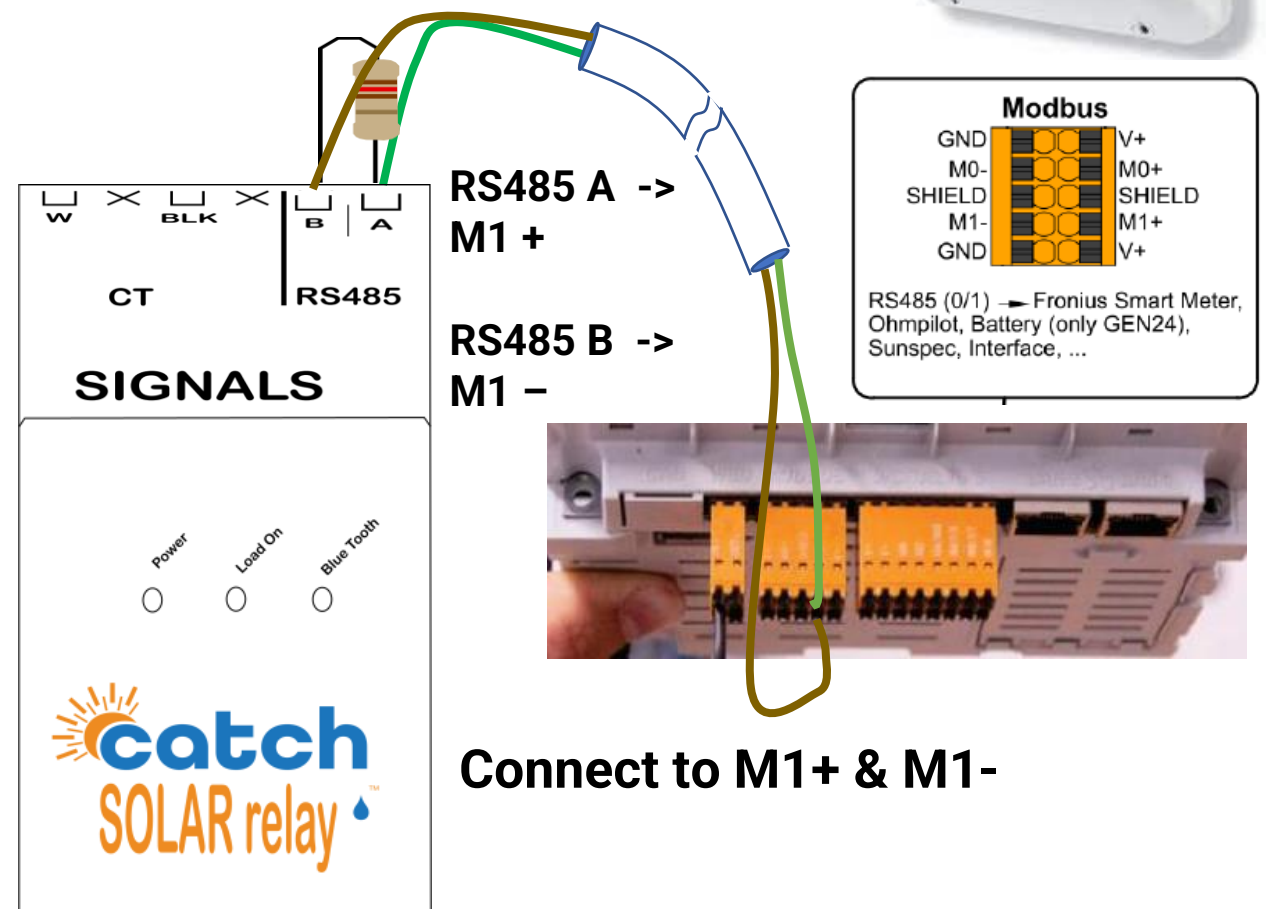
This guide discusses the specific wiring and configuration need to implement inverter control. Ensure the installation guide for both products is also followed.

Connecting the RS485 – FRONIUS PRIMO

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.

Connect the RS485 Cable to the Fronius Data Manager 2 as shown.

RS485 A -> D+

RS485 B -> D-

This guide discusses the specific wiring and configuration need to implement inverter control. Ensure the installation guide for both products is also followed.

Connecting the RS485 – FRONIUS GEN 24

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.

Connect the RS485 Cable to the Fronius Data Manager 2 as shown.

RS485 A -> M1 +

RS485 B -> M1 −

Modbus

GND — V+
M0- — M0+
SHIELD — SHIELD
M1- — M1+
GND — V+

RS485 (0/1) → Fronius Smart Meter, Ohmpilot, Battery (only GEN24), Sunspec, Interface, ...

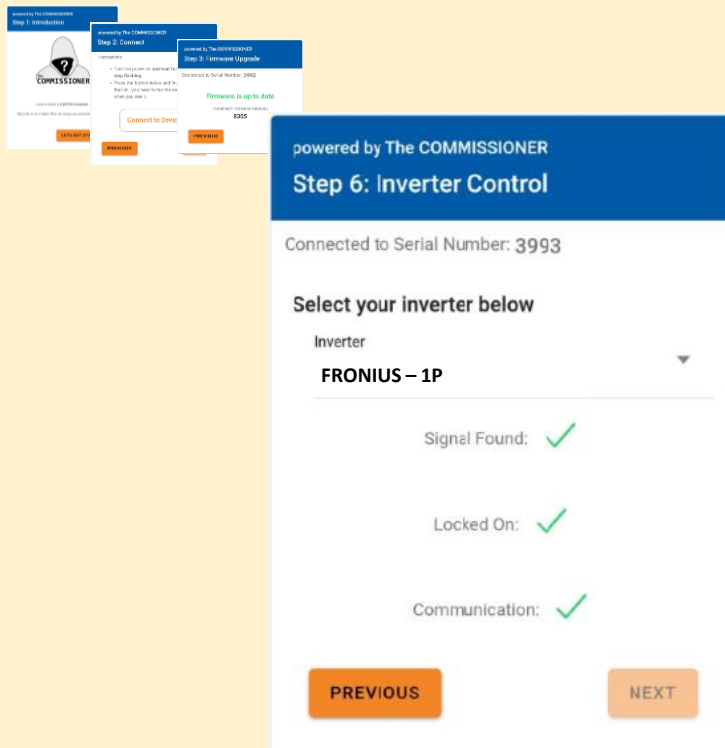**Connect to M1+ & M1-**

CATCH Commissioning Wizard

1. Log into the CATCH Configurator and run the Commissioner.

2. Follow the Commissioner step by Step.
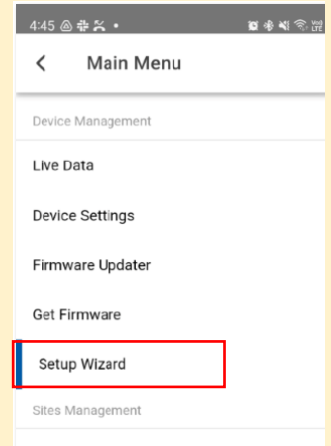
Step 6: Inverter Control
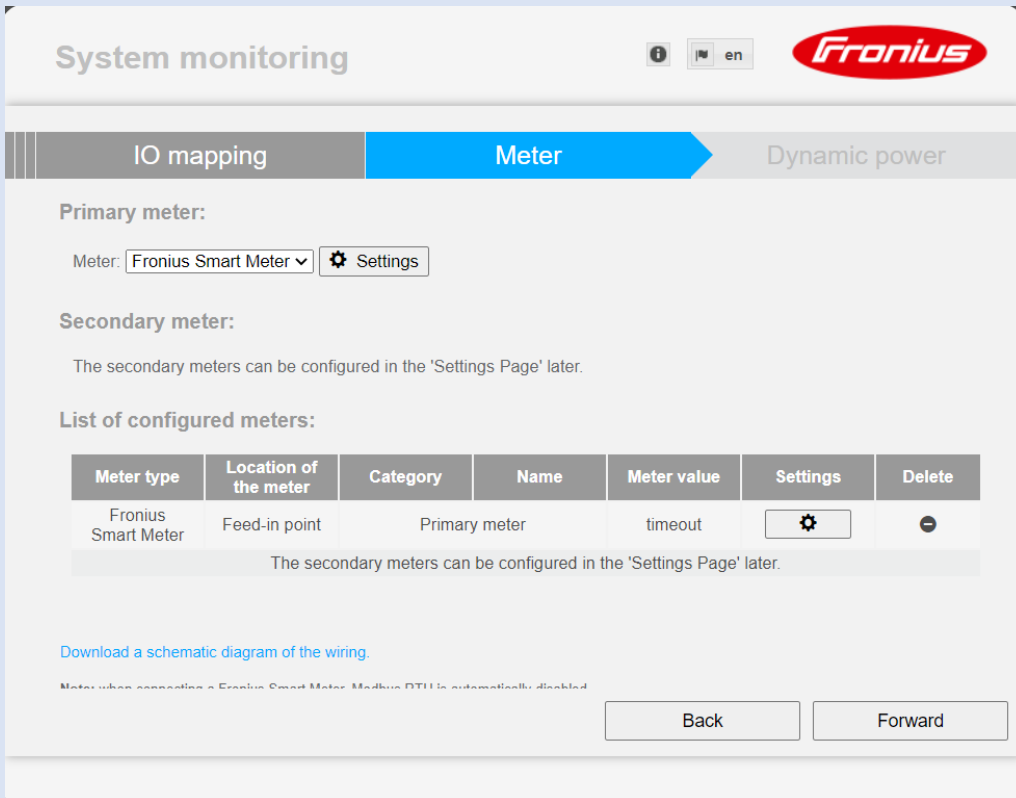If you are installing a 3 Phase inverter choose **FRONIUS – 3P** as the meter. Otherwise **Fronius – 1P**

Choose: **FRONIUS – 1P**
or **FRONIUS – 3P**
if you are are installing a 3Phase inverter.

You will need to get All GREEN ticks before you can continue, but that wont happen until you commission the FRONIUS inverter, which is what we are going to do next.

Inverter Setup – PRIMO - METER

Setup the Inverter for export control exactly the same way you do with a regular Fronius Smart Meter.

1. Connect to the Web Configuration UI (http://192.168.250.181) and run the Technical Wizard.

2. When you get to the Meter setup enter the details as shown below.

Inverter Setup – PRIMO - METER

Change these to suite your requirements

Inverter Setup – PRIMO - Meter

Enter "Further Settings"
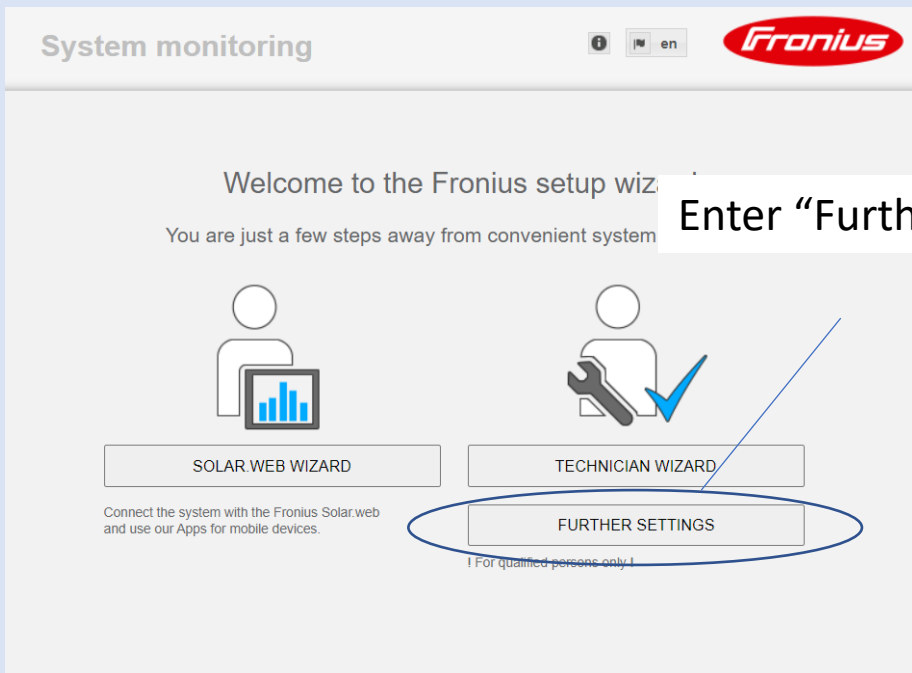
Inverter Setup – PRIMO - METER

1. Click On the Meter Tab

2. Click On "Settings"

Inverter Setup – PRIMO - METER

A message will appear as shown below. This will happen until the inverter has connected to the meter.
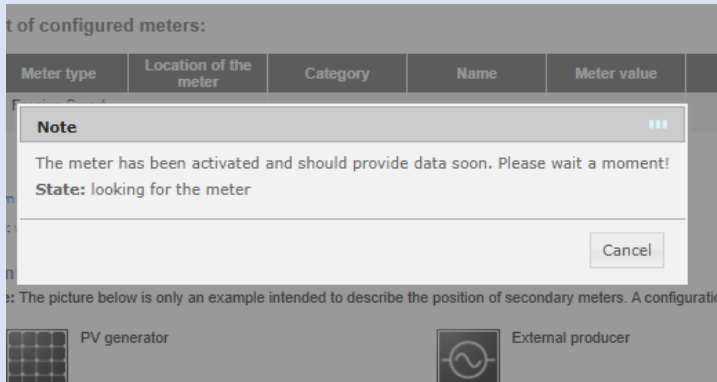
Once the inverter has successfully connected to the Solar Relay you will see this message.
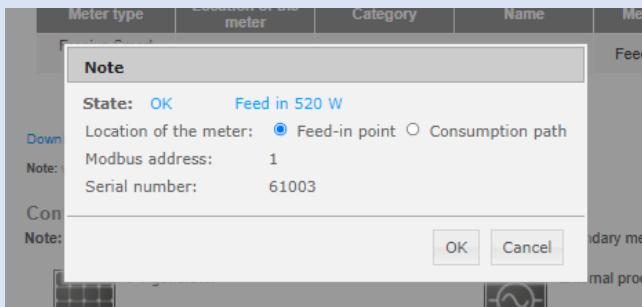
Inverter Setup – PRIMO – ZERO EXPORT LIMIT

Settings

| GENERAL |
| PASSWORDS |
| NETWORK |
| FRONIUS SOLAR.WEB |
| IO MAPPING |
| LOAD MANAGEMENT |
| PUSH SERVICE |
| MODBUS |
| INVERTERS |
| FRONIUS SENSOR CARDS |
| METER |
| DNO EDITOR |

DNO editor Catch Power, on 13/11/2024, 11:27:34 am

IO control

unlocked	Input pattern 1 2 3 4 5 6 7 8	Active power	Power factor cosφ	DNO output	excluded inverter(s)	
☐	■■■■■■■■	☑ 100 %	☐ 1 ○ ind ◉ cap	☑		⊖
☐	■■■■■■■■	☑ 60 %	☐ 1 ○ ind ◉ cap	☑		⊖
☐	■■■■■■■■	☑ 30 %	☐ 1 ○ ind ◉ cap	☑		⊖
☐	■■■■■■■■	☑ 0 %	☐ 1 ○ ind ◉ cap	☑		⊖
☐	■■■■■■■■	☐ %	☐ ○ ind ○ cap	☐		⊕

■ ... not applicable   ▨ ... not considered   ☐ ... pin open   ▦ ... pin closed

Dynamic power reduction

Export Limitation ○ No Limit ◉ Limit Entire System ○ Limit per Phase (not for single-phase devices)

total DC power of the system [5000]

☐ Export Limit Protection (Hard Limit Trip)

☑ Export Limiting Control (Soft Limit)
  Maximum Grid Feed-In Power [0] [W ▾]

☑ Reduce inverter power to 0% if meter connection has been lost

total DC power of the system [5000]
☐ Export Limit Protection (Hard Limit Trip)
☑ Export Limiting Control (Soft Limit)
  Maximum Grid Feed-In Power [0] [W ▾]

☑ Reduce inverter power to 0% if meter connection has been lost.

Limit Entire System
Total solar on premises
Set the Export limit to ZERO

Reduce Power to zero when meter is lost

Inverter Setup - PRIMO – Set a static IP

Go to Network.

Highlight your WiFi Access Point

Press Here

Inverter Setup - PRIMO – Set a static IP

Choose STATIC

Fill in the Network Values.
DO NOT COPY THE ABOVE
VALUES...these are examples
only

PRESS OK

Inverter Setup - PRIMO – MODBUS/TCP

Go to MODBUS.

Settings

- GENERAL
- PASSWORDS
- NETWORK
- FRONIUS SOLAR.WEB
- IO MAPPING
- LOAD MANAGEMENT
- PUSH SERVICE
- MODBUS
- INVERTERS
- FRONIUS SENSOR CARDS
- METER
- DNO EDITOR

Modbus

Data export via Modbus	○ off ◉ tcp ○ rtu	
Modbus port	502	
String control address offset	101	
Sunspec Model Type	○ float ◉ int + SF	
Demo mode	☐	
Inverter control via Modbus	☑	
Restrict the control	☐	

FILL OUT THE VALUES EXACTLY AS THEY ARE ABOVE

C...

1. ...
2. IO control
3. Dynamic power reduction

2 ... medium priority
3 ... lowest priority

Note: a change of control priorities is possible only in the DNO editor with the service password.

Inverter Setup - PRIMO – MODBUS/TCP

Go to DNO Editor.

Settings

- GENERAL
- PASSWORDS
- NETWORK
- FRONIUS SOLAR.WEB
- IO MAPPING
- LOAD MANAGEMENT
- PUSH SERVICE
- MODBUS
- INVERTERS
- FRONIUS SENSOR CARDS
- METER
- DNO EDITOR

DNO editor — Catch Power, on 06/11/2024, 2:13:54 pm

IO control

unlocked	Input pattern	Active power	Power factor cosφ	DNO output	excluded inverter(s)	
☐	■■■■■■■■	☑ 100 %	☐ 1 ○ ind ◉ cap	☑		⊖
☐	■■■■■■■■	☑ 60 %	☐ 1 ○ ind ◉ cap	☑		⊖
☐	■■■■■■■■	☑ 30 %	☐ 1 ○ ind ◉ cap	☑		⊖

Set the Control Priority so that
1.Control via Modbus is at the top.

Then Click the Tick to save the changes

AUS

Reactive power consumption (-Qrel) for DRM 7 ___ 0 %

Controlling priorities

1. Controlling via Modbus
2. IO control
3. Dynamic power reduction

Legend:
1 ... highest priority
2 ... medium priority
3 ... lowest priority

Cloud Control

Allow cloud control for grid/utility compliance purposes ☑

Note: If cloud control is enabled, authorized operators (e.g. network operator/energy supplier) can change the output power of the inverter if required. Cloud control commands always take precedence over local control commands. Connection to internet is required.

Controlling priorities

1. Controlling via Modbus
2. IO control
3. Dynamic power reduction

Legend:
1 ... highest priority
2 ... medium priority
3 ... lowest priority

Inverter Setup - GEN24 – METER

The setup is detailed using the Fronius **SOLAR.Start** phone APP

Navigate to **Device Configuration** -> **Components**
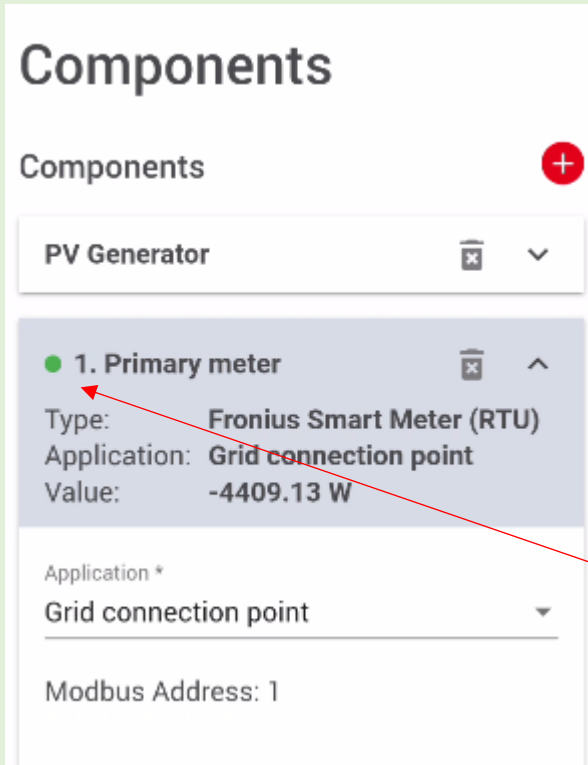
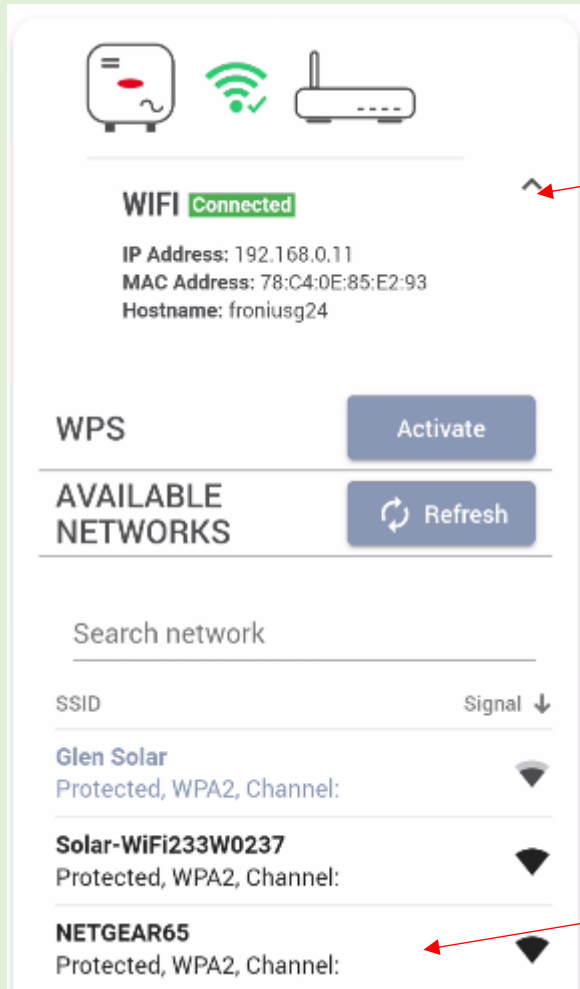If the meter has not already been added. Press the red + and Choose "Power Meter"

Application should be set to **Grid Connection Point**

A green Circle indicates the meter is communicating

Inverter Setup - GEN24 – STATIC IP

The setup is detailed using the Fronius **SOLAR.Start** phone APP

Navigate to **Communications** -> **Network**

WIFI **Connected**

IP Address: 192.168.0.11
MAC Address: 78:C4:0E:85:E2:93
Hostname: froniusg24

WPS — Activate

AVAILABLE NETWORKS — Refresh

Search network

SSID — Signal ↓

Glen Solar
Protected, WPA2, Channel:

Solar-WiFi233W0237
Protected, WPA2, Channel:
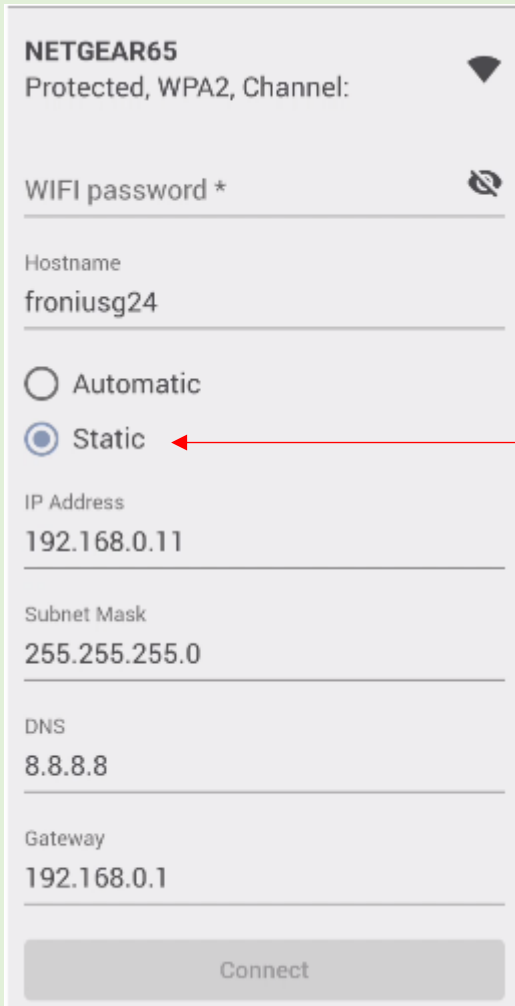
NETGEAR65
Protected, WPA2, Channel:

Expand the WiFi if the inverter is on the WiFi network, or expand the ETHERNET of the inverter is hardwired

Click on the WiFi Network that you want to set the static IP for. If you are already connected you will need to disconnect from the network first, then reconnect.

Inverter Setup - GEN24 – STATIC IP

The setup is detailed using the Fronius **SOLAR.Start** phone APP

Navigate to **Communications** -> **Network**

NETGEAR65
Protected, WPA2, Channel:

WIFI password *

→ Fill in the WiFi password

Hostname
froniusg24

○ Automatic
◉ Static ← Choose STATIC

IP Address
192.168.0.11

Subnet Mask
255.255.255.0

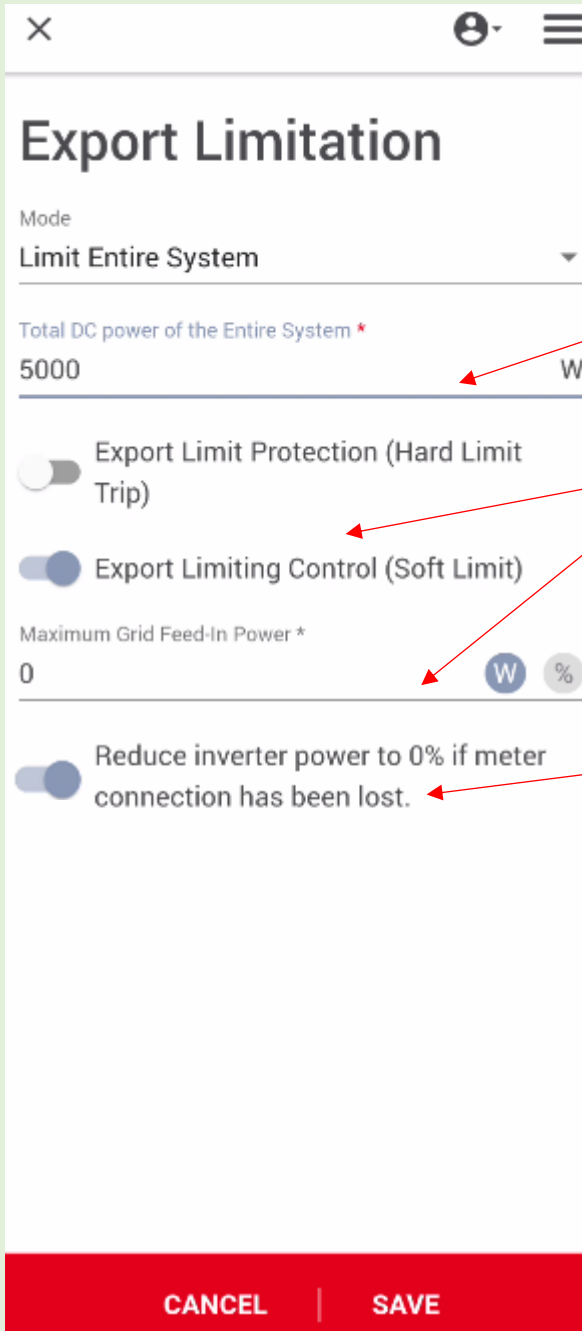DNS
8.8.8.8

Gateway
192.168.0.1

Connect

Specify the network details.

**DO NOT USE THE VALUES YOU SEE HERE
These are examples ONLY.**

Inverter Setup - GEN24 – SET EXPORT TO ZERO

The setup is detailed using the Fronius **SOLAR.Start** phone APP

Navigate to **Safety and Grid Regulations** -> **Export Limitation**
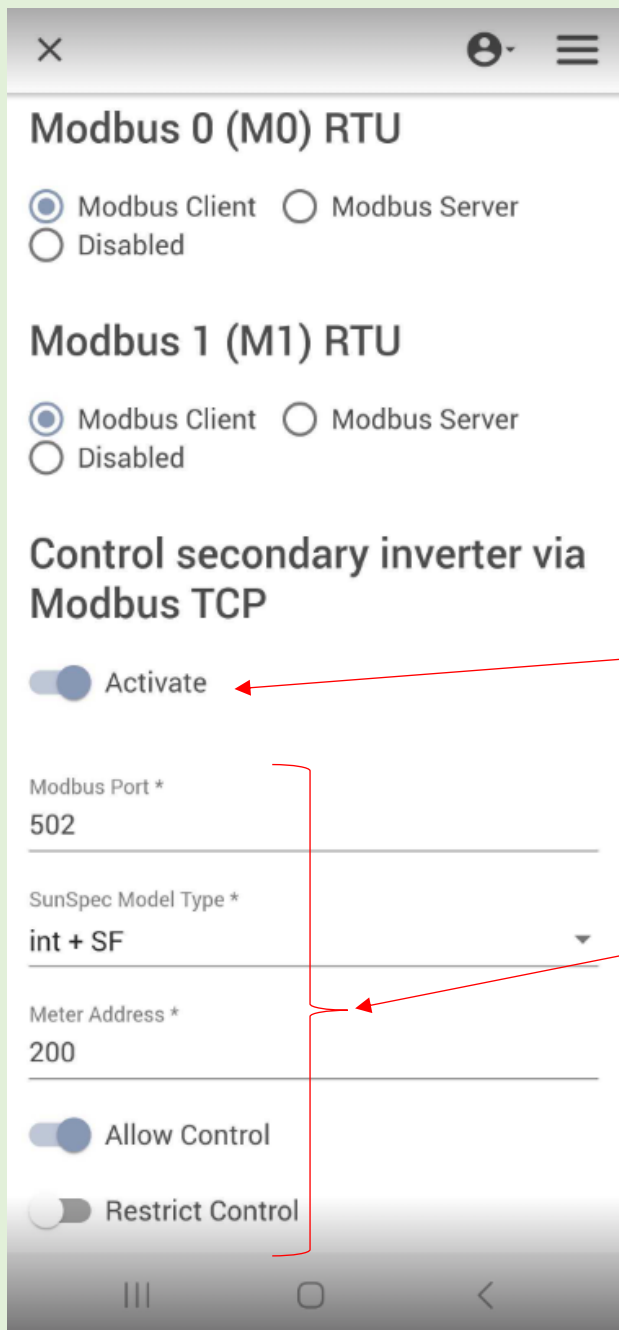

Put in the total size of ALL solar on site.

Turn on the Soft Limit, and set the export limit to ZERO

Turn this on

Inverter Setup - GEN24 – MODBUS/TCP

The setup is detailed using the Fronius **SOLAR.Start** phone APP
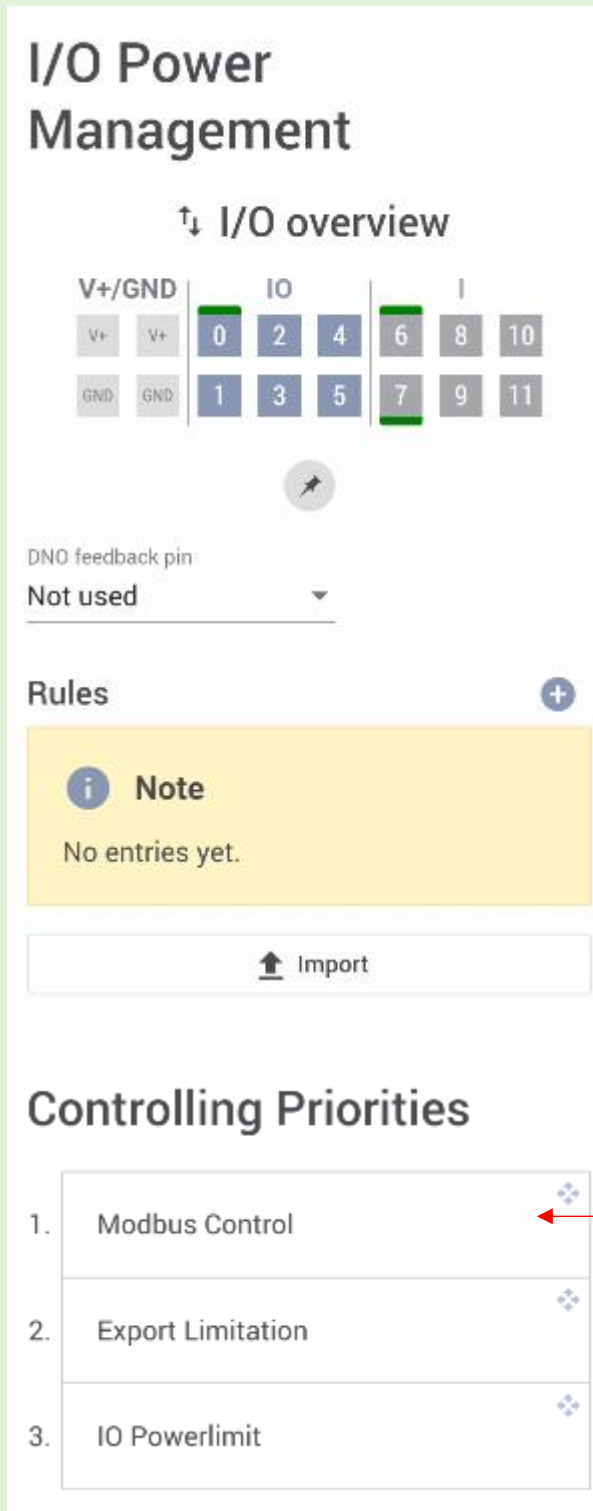
Navigate to **Communications** -> **Modbus**

Turn on Modbus TCP

These values need to be exactly as you see here.

Inverter Setup - GEN24 – MODBUS/TCP

The setup is detailed using the Fronius **SOLAR.Start** phone APP

Navigate to **Safety and Grid Regulations** -> **I/O Power Management**

Make MODBUS Control the top priority
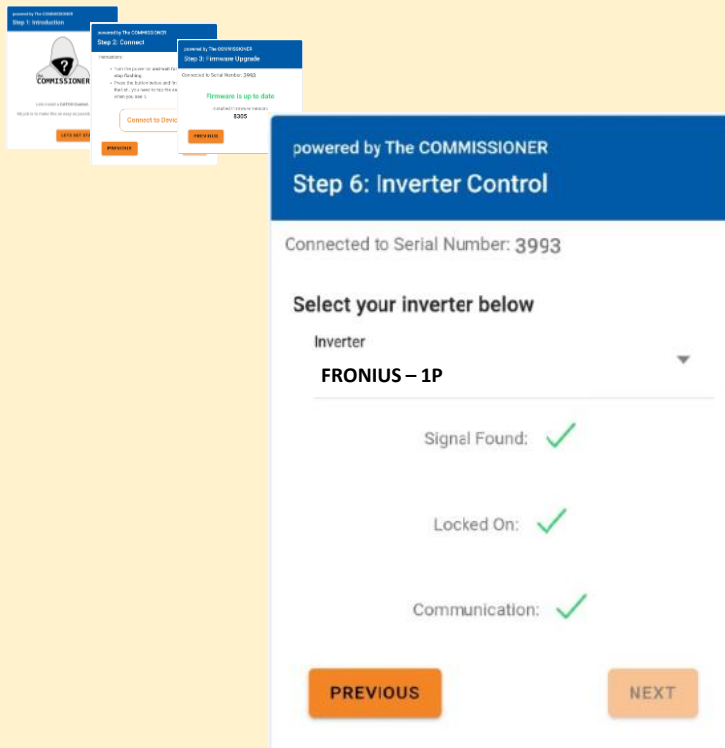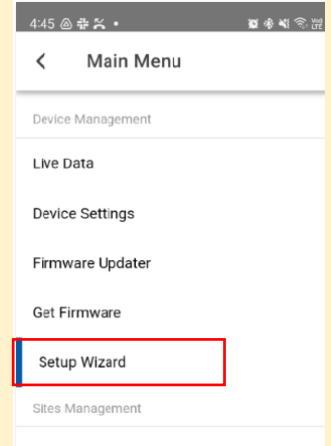
CATCH Commissioning Wizard

Now go back to the CATCH Configurator and restart the wizard.

1. Log into the CATCH Configurator and run the Commissioner.

2. Follow the Commissioner step by Step.

Step 6: Inverter Control
This should already be set to FRONIUS, when you get 3 green ticks you can continue the commissioning process

Choose: **FRONIUS – 1P**
or **FRONIUS – 3P**
if you are are installing a 3Phase inverter.

You will need to get All **GREEN** ticks before you can continue.
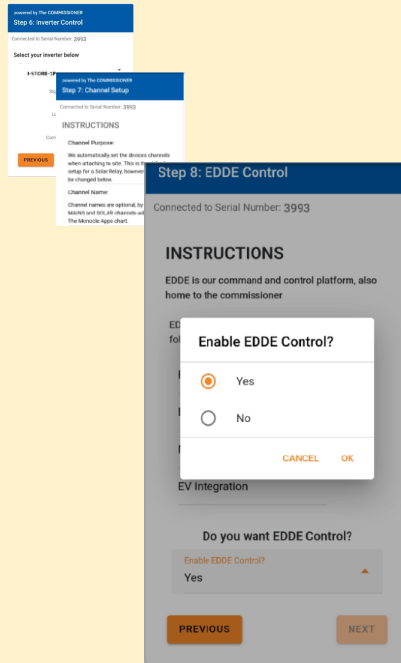
CATCH Commissioning Wizard

Now go back to the CATCH Configurator and restart the wizard.

Step 8: EDDE Control
choose if you want EDDE Control enabled.

You will need EDDE Control to be YES if you want any of the following features.

- Flexible Exports
- Inverter Control
- Market based pricing control such as AMBER curtailment
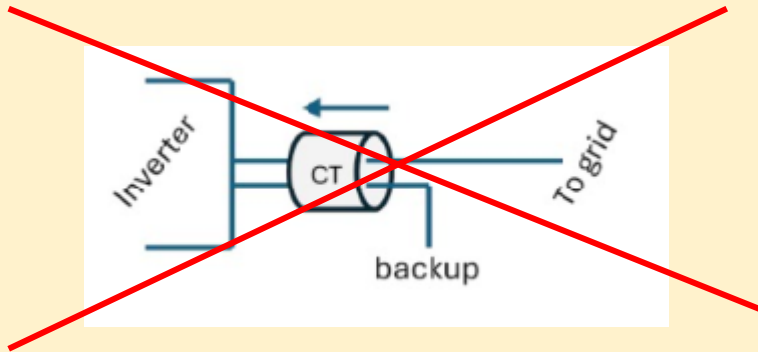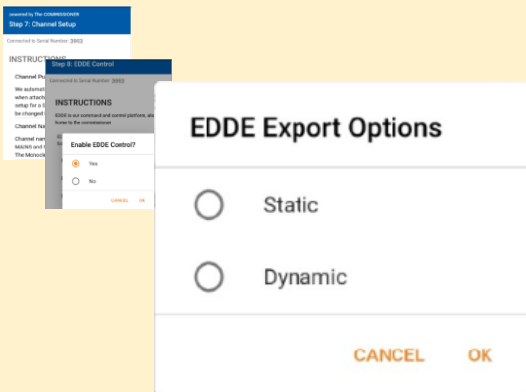- EV Integration

Step 9: EDDE Export Control
If you choose YES for EDDE Control we will take care of the site export limit, not the inverter.

IGNORE THE INSTRUCTIONS ABOUT THE SOLAR CT…YOU DO NOT NEED TO DO THIS.

Tell us how the export limit is to be managed.

Static: Is when the DNSP tells you there is a fixed export limit. Example the connection application might say the site is limited to 5kW. This is a static export limit.
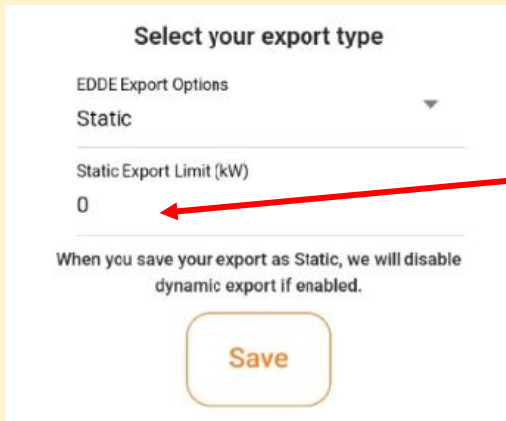
Dynamic: When you put the connection application in you would have nominated for the dynamic connection. The DNSP will adjust the export limit based on daily requirements.
You will need the NMI to complete the dynamic connection setup.

CATCH Commissioning Wizard
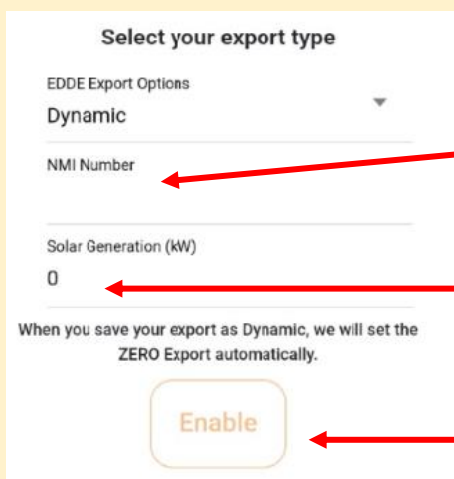
Step 9: EDDE Export Control..Continued

Static Export Configuration:

Fill out the export limit. For example if the site has a 5kw export limit type in 5000 for the export limit and press **SAVE**

Dynamic Export Configuration:

Enter the customers NMI. This can be a 10 or 11 digit NMI.

Tells us the total amount of solar on site. Including any old systems.

Press Enable.

CATCH Commissioning Wizard

2. Follow the Commissioner step by Step.

Step 9: EDDE Export Control..Continued

Dynamic Export Configuration - Continued:

Once you have filled out the required information and pressed save the follow appears and shows you how the registration for dynamic exports is progressing... You want to see all green ticks for everything to be working.

The indicators below are updated every 30sec. You need to get green ticks on all items below in order for Dynamic exporting to be operational.

Inverter Control Scheme: MIXED

✗ **Registered with CATCH CSIP-AUS**

This indicates all the criteria have been met for us to register this site, as a Dynamic Export site. We require Dynamic Exports to be enable and a valid NMI to be supplied.

✗ **Registered with SA Power Networks**

LFDI: N/A

This indicates the NMI has been accepted by the DNSP system. The LFDI is the unique identifier used by CATCH and the DNSP to identify this site. You can copy the LFDI by pressing the copy icon to the right.

✗ **Measurement Data has been sent.**

Last Measurement sent: 1/1/70 10:00 AM

Measurement data has been successfully sent from this site to the DNSP.

✗ **Received Active Controls**

Default Export(W): N/A

Active Export(W): N/A

Last Control Received: 1/1/70 10:00 AM

Indicates we have successfully received some active export controls from the DNSP.

Errors
no errors

CATCH Commissioning Wizard

Step 10: Save Configuration

The final step is to review the configuration, and Press **SAVE**.

Connected to Serial Number: 3993

Summary

Device Information
Device Name: 3993-SRWe/CATCH
Serial Number: 3993
Firmware Version: 8305
Wifi State: Connected
Server State: Connected

Inverter Control
Inverter: Growatt MIN 2500-6000 TL-X

Signal: ✓

Locked: ✓

Communication: ✓

Export Control
Export Type: None

Live Data
Channel 1

Live Data
Channel 1
Name:
Purpose: MAINS
Power: 3.76 kW
Power Factor: -0.94
Volts: 248.9 V
Amps: 16 A
Freq: 49.94 Hz
VA: 4 kVA
VAR: 1357 var
Imported: 55.2 kWh
Exported: -114.0 kWh

Channel 2
Name: Growatt AC
Purpose: OTHER
Power: 590 W
Power Factor: 0.73
Amps: 3.2 A
VA: 0.8 kVA
VAR: 1357 var
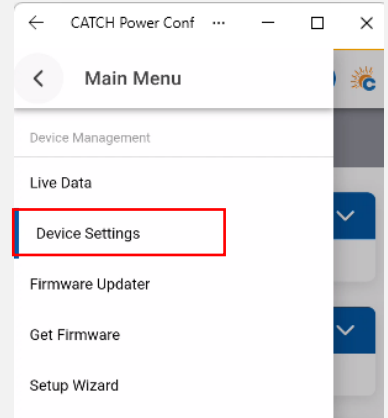Imported: 49.0 kWh
Exported: -0.3 kWh

PREVIOUS   SAVE

CATCH Configurator SUNSPEC SCAN

At this stage most of the CATCH Control is setup. You need to run a SUNSPEC scan in order to find the inverter on the network. We get the solar and battery data from the inverter via the local network.

Go to device Settings

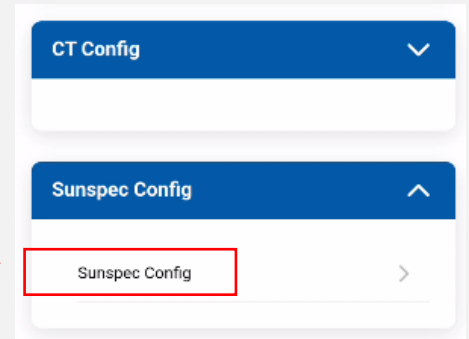Scroll down until you get to the Sunspec Config and click on the Menu Item

CATCH Configurator SUNSPEC SCAN

At this stage most of the CATCH Control is setup. You need to run a SUNSPEC scan in order to find the inverter on the network. We get the battery data from the inverter via the local network.
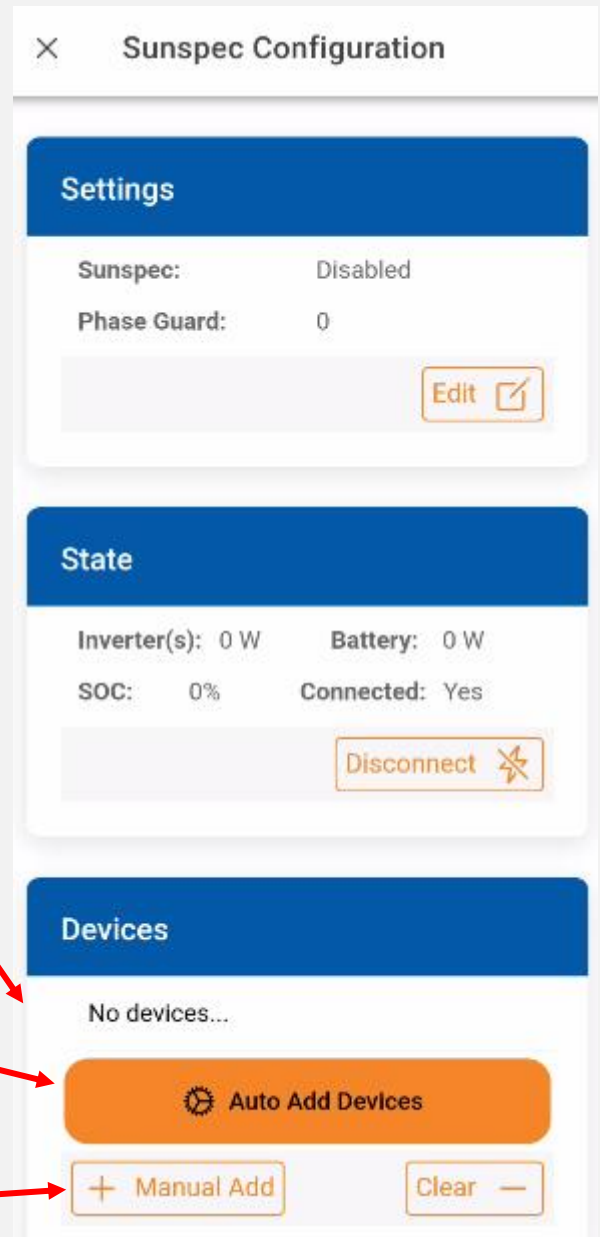
When you first come into the SUNSPEC screen all of the values are zero

and the devices screen says no devices..

You can connect to the Sungrow inverter by either AUTO SCANNING. Auto scanning can take several minutes to complete.

 Or

if you know the IP Address you can manually add the inverter.

CATCH Configurator SUNSPEC SCAN

SUNSPEC - AUTO SCAN

A pop-up box displays and shows you the progress of the scan. As inverters are found you will notice the "device(s) found" increasing.

You can cancel the scan any time once your inverter is found.

Sunspec Scan
Scanning for Sunspec devices...
Progress: 8% 1 device(s) found.

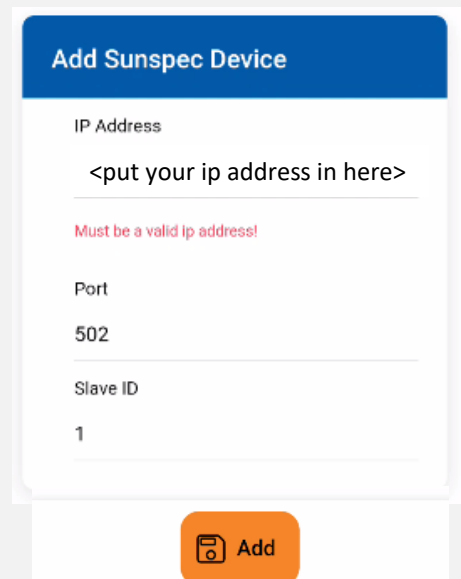Cancel Scan   **Close Popup**
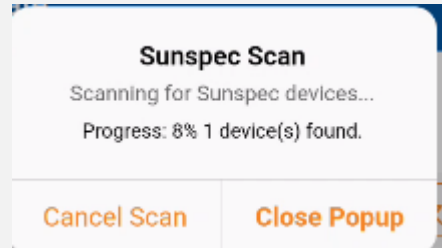
SUNSPEC – MANUAL ADD

If you setup the inverter with a static IP address this is where you put the ip address in.

Make sure to set
- Port: 502
- Slave ID: 1

The press the **ADD** button.

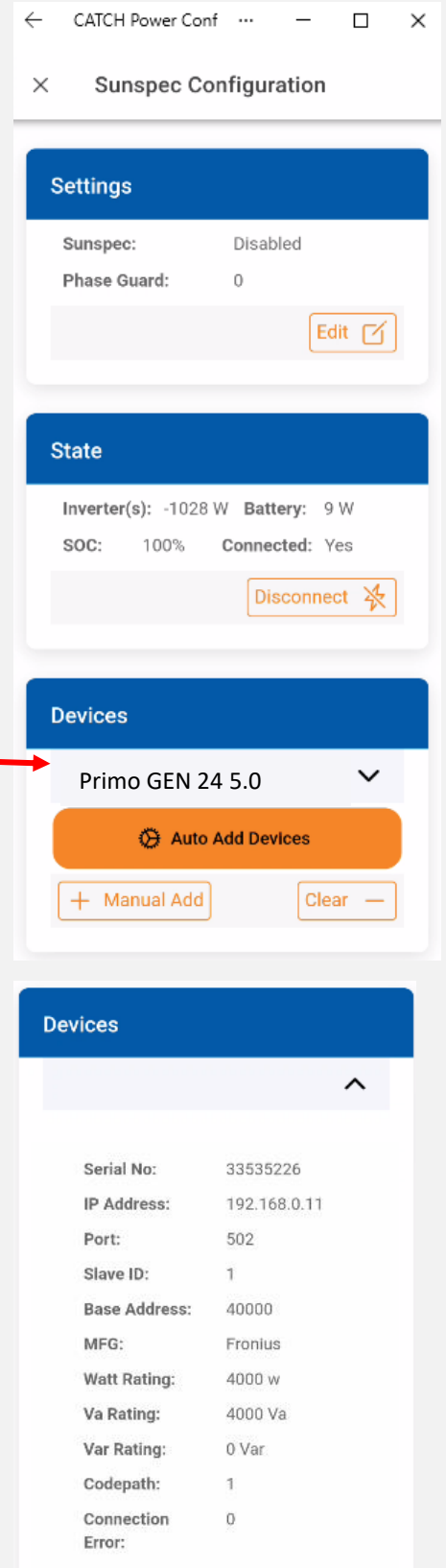All going well you will get a message saying 1 device(s) added.

Add Sunspec Device

IP Address

<put your ip address in here>

Must be a valid ip address!

Port

502

Slave ID

1

Add

CATCH Configurator SUNSPEC SCAN

If the Sunspec device has been successfully added the Sunspec screen should like like this.

Inverter output, Battery SoC and Battery W should all have values

Click here to expand and the device should like below

Sunspec Configuration

Settings

Sunspec:	Disabled
Phase Guard:	0

Edit ☑

State

Inverter(s):	-1028 W	Battery:	9 W
SOC:	100%	Connected:	Yes

Disconnect ⚡

Devices

Primo GEN 24 5.0 ⌄

⚙ Auto Add Devices

+ Manual Add   Clear —

Devices

∧

Serial No:	33535226
IP Address:	192.168.0.11
Port:	502
Slave ID:	1
Base Address:	40000
MFG:	Fronius
Watt Rating:	4000 w
Va Rating:	4000 Va
Var Rating:	0 Var
Codepath:	1
Connection Error:	0

CATCH Configurator SUNSPEC SCAN

MULTIPLE INVERTERS:

You have just been through the process of installing a single Fronius inverter. You can however connect up to 6 Fronius inverters using one CATCH Control. To do this just repeat the inverter configuration steps for each inverter, and using the MANUAL ADD in the sunspec Configuration to connect to the inverters.