



SOLAR RELAY

INVERTER CONTROL
with
FRONIUS SYMO / GEN 24



CATCH Power
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Installation Overview

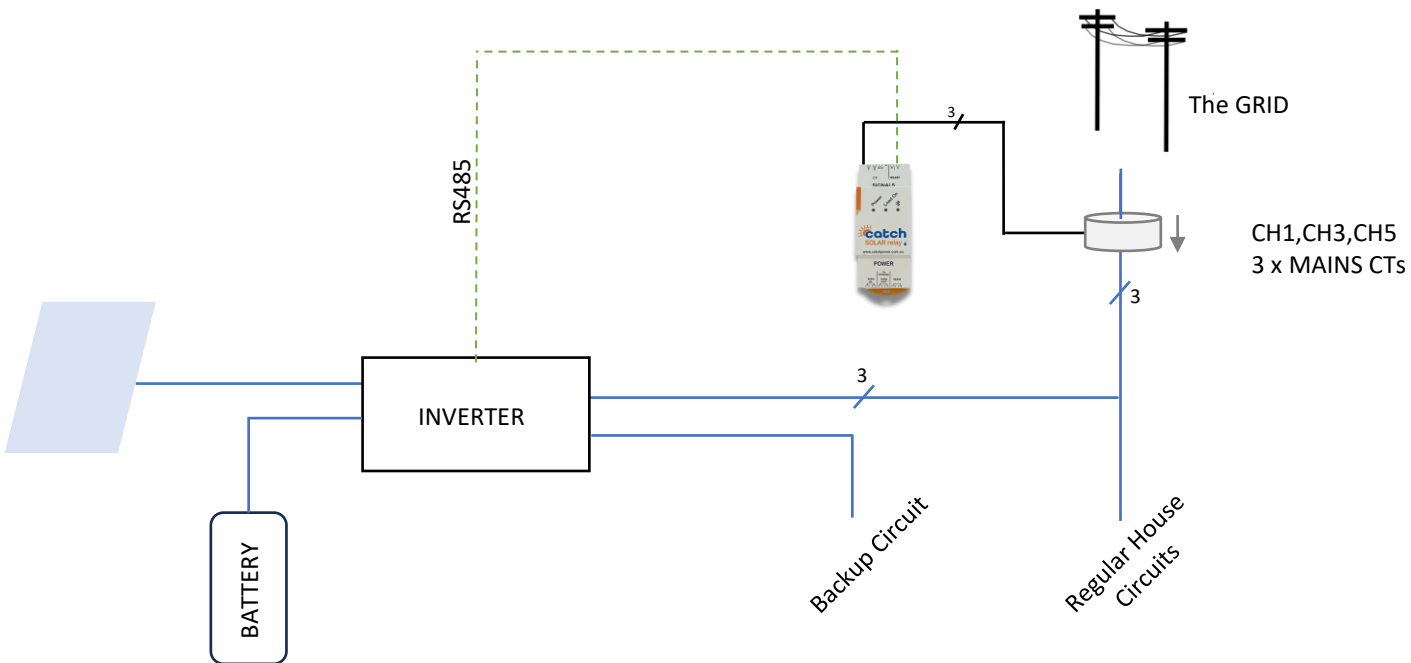
1. Install the Fronius Inverter as per the Fronius Installation Guide.
2. Install the CATCH Control as per the CATCH Electricians Guide.
3. Adjust the CATCH CT wiring as show in this document.
4. Connect the RS485 bus between the CATCH Control and the inverter as shown in this document.
5. Run the CATCH 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 Solar CTs. 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 CT2,CT4, CT6 to monitor another consumption circuit make sure you specify the channel purpose as OTHER during the commissioning process.



CT1, CT3, CT5 to go around the MAINS

IMPORTANT



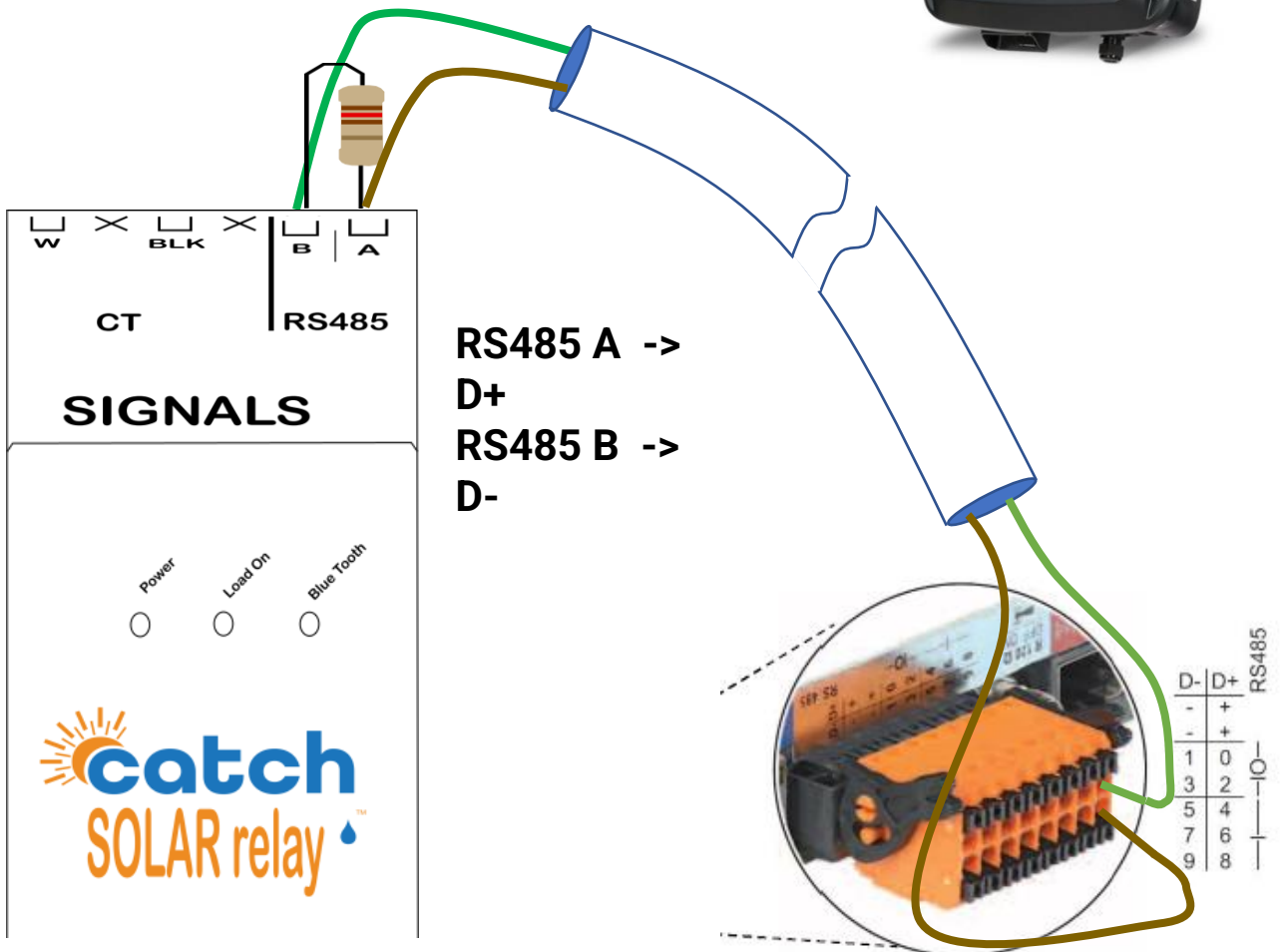
This guide discusses the specific wiring and configuration need to implement inverter control. Ensure the installation guide for both products is also followed.

Connecting the RS485 – FRONIUS SYMO

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.



IMPORTANT



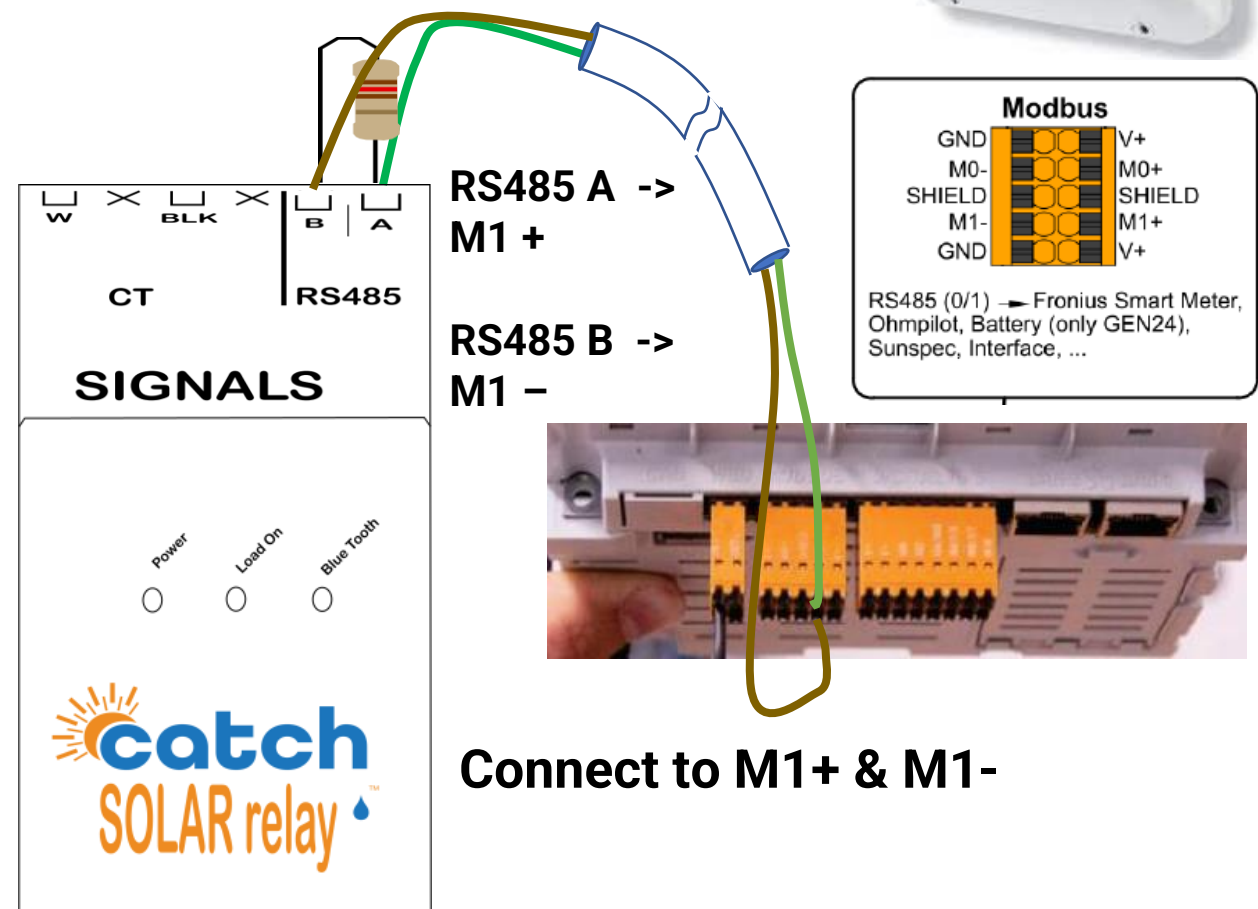
This guide discusses the specific wiring and configuration need to implement inverter control. Ensure the installation guide for both products is also followed.

Connecting the RS485 – FRONIUS GEN 24

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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.

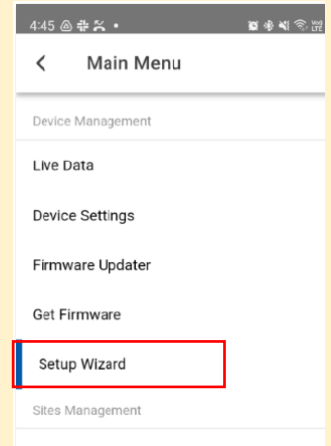


CATCH Commissioning Wizard

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

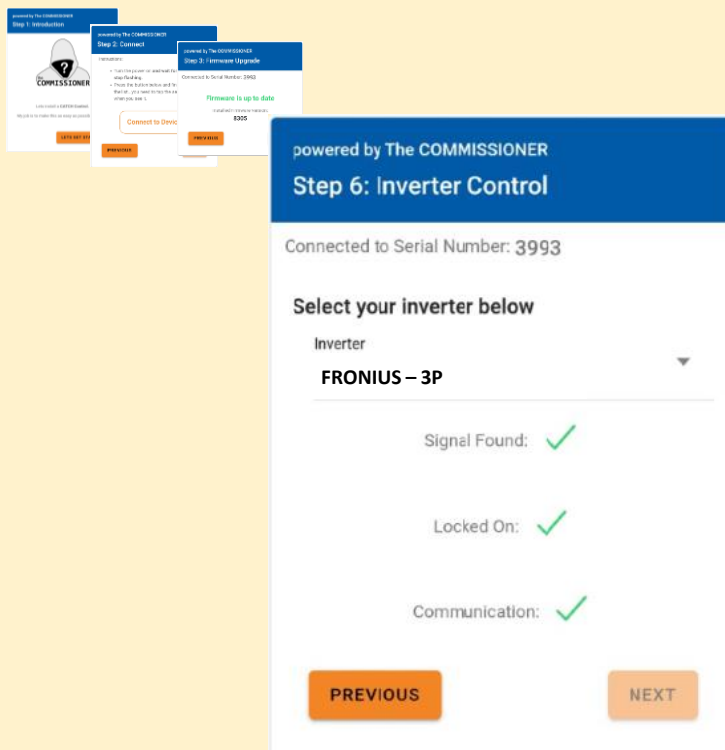


2. Follow the Commissioner step by Step.



Step 6: Inverter Control

If you are installing a 3 Phase inverter choose **FRONIUS – 3P**



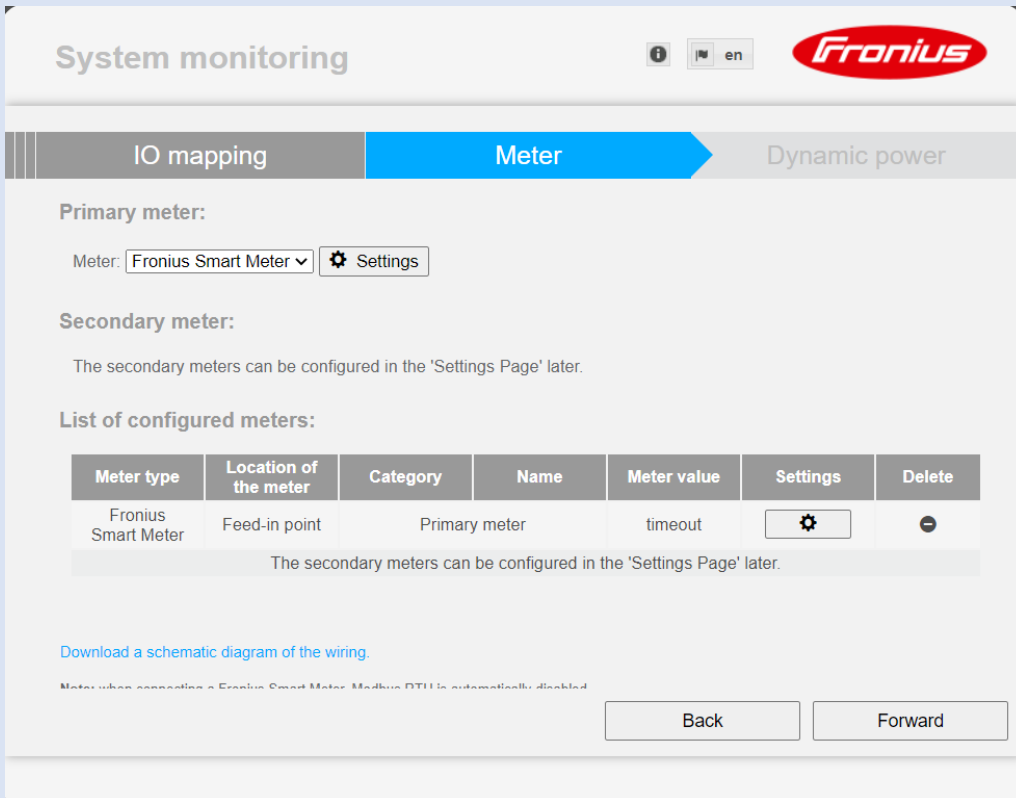
Choose: **FRONIUS – 3P**

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.



The screenshot shows the 'System monitoring' web interface for a Fronius inverter. The 'Meter' tab is selected, and the 'Primary meter' is configured as a 'Fronius Smart Meter'. The 'Secondary meter' section indicates that secondary meters can be configured in the 'Settings Page' later. A table lists the configured meters, showing one 'Fronius Smart Meter' at the 'Feed-in point' location, categorized as a 'Primary meter' with a 'timeout' value. The table includes columns for Meter type, Location of the meter, Category, Name, Meter value, Settings, and Delete. Below the table, there is a link to download a schematic diagram of the wiring and a note that the Meter when connecting a Fronius Smart Meter Modbus DTU is automatically disabled. At the bottom, there are 'Back' and 'Forward' buttons.

System monitoring en 

IO mapping **Meter** Dynamic power

Primary meter:

Meter: Fronius Smart Meter Settings

Secondary meter:

The secondary meters can be configured in the 'Settings Page' later.

List of configured meters:

Meter type	Location of the meter	Category	Name	Meter value	Settings	Delete
Fronius Smart Meter	Feed-in point	Primary meter		timeout	Settings	Delete


The secondary meters can be configured in the 'Settings Page' later.

[Download a schematic diagram of the wiring.](#)

Meter when connecting a Fronius Smart Meter Modbus DTU is automatically disabled.

Back Forward

Inverter Setup – PRIMO - METER

System monitoring en 

IO mapping Meter **Dynamic power**

Dynamic power reduction

Power limit: No limit limit for entire system

total DC power of the system: Wp

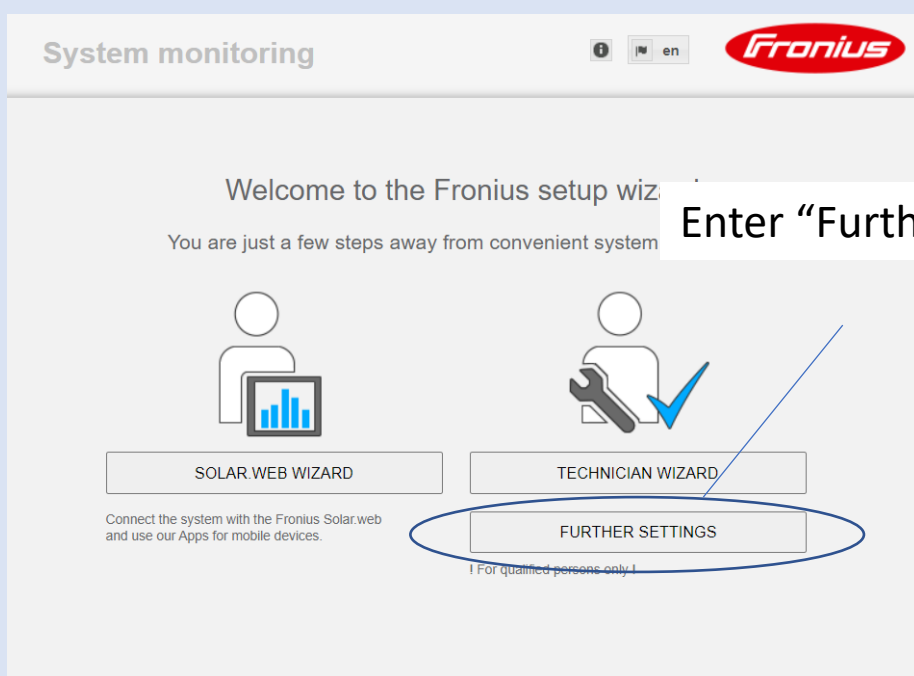
Maximum grid feed-in power: %

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

Back Forward

Change these to suite your requirements

Inverter Setup – PRIMO - Meter



Inverter Setup – PRIMO - METER

1. Click On the Meter Tab

2. Click On “Settings”

System monitoring en

Settings

Meter settings

Primary meter:
Meter: **Fronius Smart Meter** **Settings**

Secondary meter:
Meter: **None selected** **Add**

List of configured meters:

Meter type	Location of the meter	Category	Name	Meter value	Settings	Delete
Fronius Smart Meter	Feed-in point	Primary meter		searching		

[Download a schematic diagram of the wiring.](#)

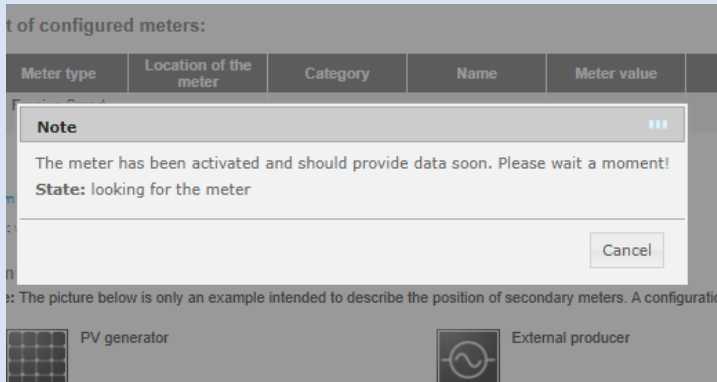
Note: when connecting a Fronius Smart Meter, Modbus RTU is automatically disabled.

Configuration positions

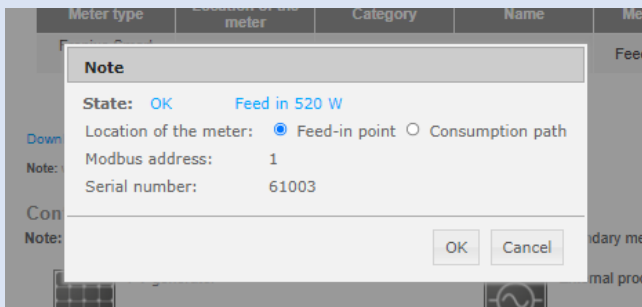
Note: The picture below is only an example intended to describe the position of secondary meters. A configuration is not possible here.

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

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

✓ ✕

IO control

unlocked	Input pattern	Active power	Power factor cosφ	DNO output	excluded inverter(s)	
	1 2 3 4 5 6 7 8					
<input type="checkbox"/>	■ ■ ■ ■ ■ ■ ■ ■	<input checked="" type="checkbox"/> 100 %	<input type="checkbox"/> 1 <input type="radio"/> ind <input checked="" type="radio"/> cap	<input checked="" type="checkbox"/>	<input type="text"/>	<input type="button" value="−"/>
<input type="checkbox"/>	■ ■ ■ ■ ■ ■ ■ ■	<input checked="" type="checkbox"/> 60 %	<input type="checkbox"/> 1 <input type="radio"/> ind <input checked="" type="radio"/> cap	<input checked="" type="checkbox"/>	<input type="text"/>	<input type="button" value="−"/>
<input type="checkbox"/>	■ ■ ■ ■ ■ ■ ■ ■	<input checked="" type="checkbox"/> 30 %	<input type="checkbox"/> 1 <input type="radio"/> ind <input checked="" type="radio"/> cap	<input checked="" type="checkbox"/>	<input type="text"/>	<input type="button" value="−"/>
<input type="checkbox"/>	■ ■ ■ ■ ■ ■ ■ ■	<input checked="" type="checkbox"/> 0 %	<input type="checkbox"/> 1 <input type="radio"/> ind <input checked="" type="radio"/> cap	<input checked="" type="checkbox"/>	<input type="text"/>	<input type="button" value="−"/>
<input type="checkbox"/>	■ ■ ■ ■ ■ ■ ■ ■	<input type="checkbox"/> %	<input type="checkbox"/> <input type="radio"/> ind <input type="radio"/> cap	<input type="checkbox"/>	<input type="text"/>	<input type="button" value="+"/>

... 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

Export Limit Protection (Hard Limit Trip)

Export Limiting Control (Soft Limit)
Maximum Grid Feed-In Power W

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

total DC power of the system

Export Limit Protection (Hard Limit Trip)

Export Limiting Control (Soft Limit)
Maximum Grid Feed-In Power 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

Catch Power **Fronius**

Settings

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

Network interface

Go to Network.

Connection mode

- Internet via WLAN
- Internet via LAN
- Local Network via Access-Point

LAN Settings

Get address: static dynamic

Host name:

IP address:

Subnet mask:

Gateway:

DNS server:

WLAN Settings

Available networks

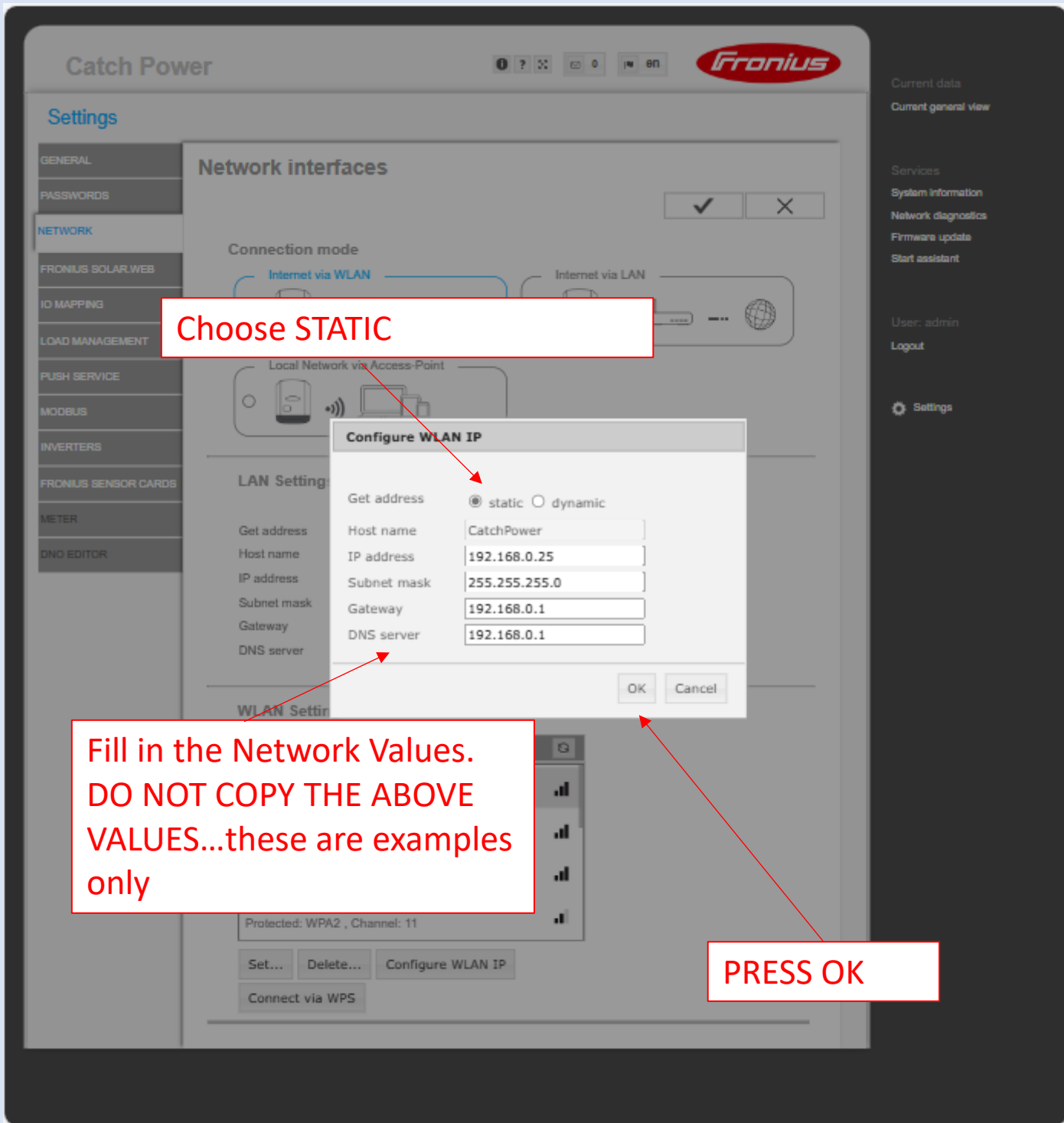
- Glen Solar**
Connected, Protected: WPA2, Channel: 11
- NETGEAR65
Protected: WPA2, Channel: 11
- ALD081124050708
Protected: WPA2, Channel: 2
- Solar-WiFi233W0237
Protected: WPA2, Channel: 11

Set... Delete... **Configure WLAN IP**

Connect via WPS

Current data
Current general view
Services
System information
Network diagnostics
Firmware update
Start assistant
User: admin
Logout
Settings

Inverter Setup - PRIMO – Set a static IP



The screenshot shows the 'Settings' menu of a Fronius inverter. The 'NETWORK' section is selected, and the 'Configure WLAN IP' dialog box is open. The dialog box has the following fields:

Field	Value
Get address	<input checked="" type="radio"/> static <input type="radio"/> dynamic
Host name	CatchPower
IP address	192.168.0.25
Subnet mask	255.255.255.0
Gateway	192.168.0.1
DNS server	192.168.0.1

Annotations on the screenshot include:

- A red box with the text "Choose STATIC" pointing to the "static" radio button in the "Get address" field.
- A red box with the text "Fill in the Network Values. DO NOT COPY THE ABOVE VALUES...these are examples only" pointing to the input fields for IP address, Subnet mask, Gateway, and DNS server.
- A red box with the text "PRESS OK" pointing to the "OK" button at the bottom right of the dialog box.

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

String control address offset

Sunspec Model Type float int + SF

Demo mode

Inverter control via Modbus

Restrict the control

FILL OUT THE VALUES EXACTLY AS
THEY ARE ABOVE

- Control priorities:
1. Control
 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.

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

Then Click the Tick to save the changes

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



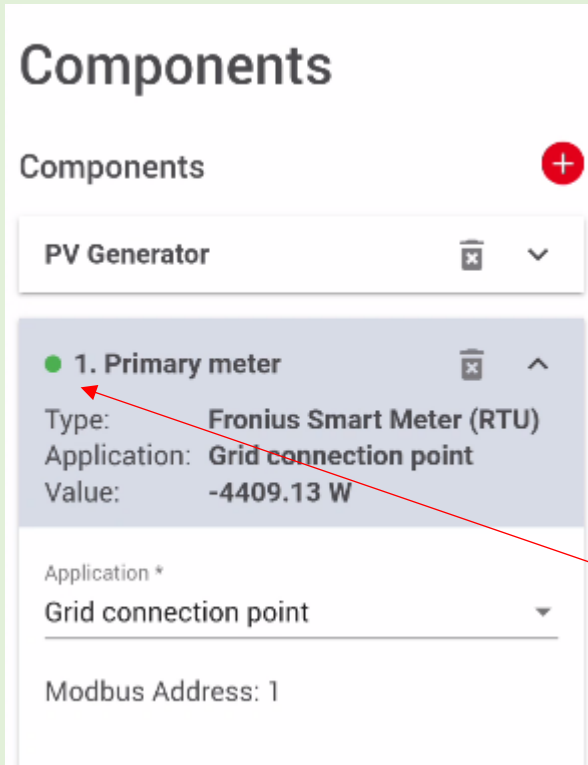
1. Controlling via Modbus
2. IO control
3. Dynamic power reduction

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"

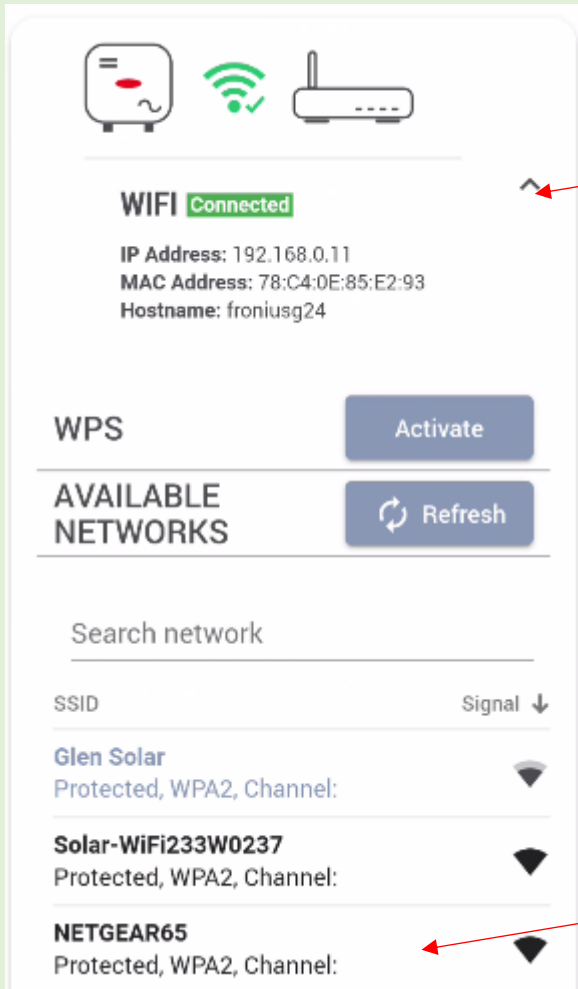
Application should be set to **Grid Connection Point**

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**



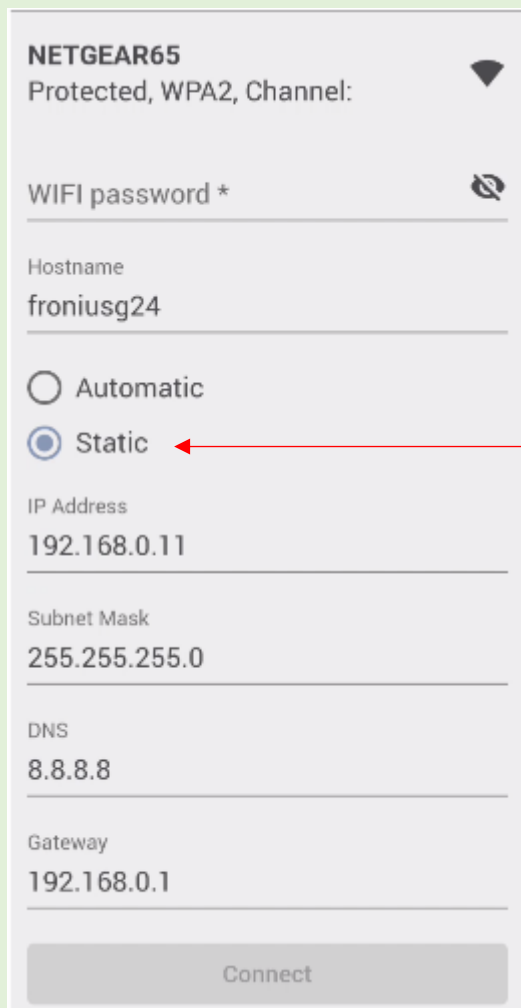
Expand the WiFi if the inverter is on the WiFi network, or expand the ETHERNET of the inverter is hardwired

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 *

Hostname
froniusg24

Automatic
 Static

IP Address
192.168.0.11

Subnet Mask
255.255.255.0

DNS
8.8.8.8

Gateway
192.168.0.1

Connect

Fill in the WiFi password

Choose STATIC

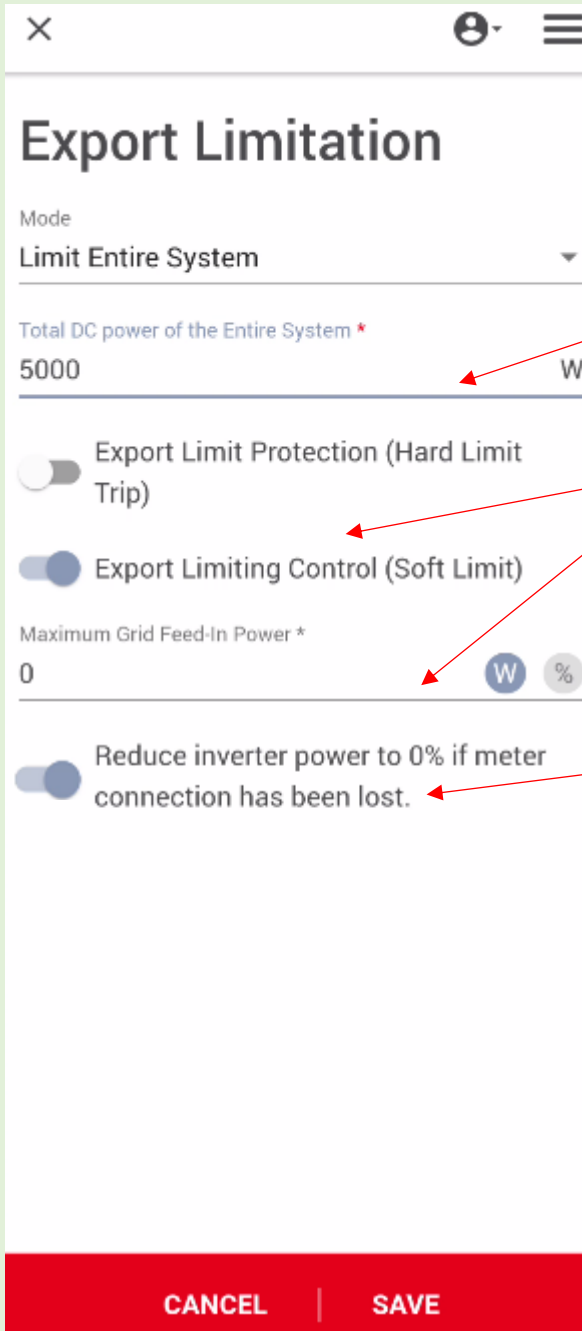
Specify the network details.

**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.

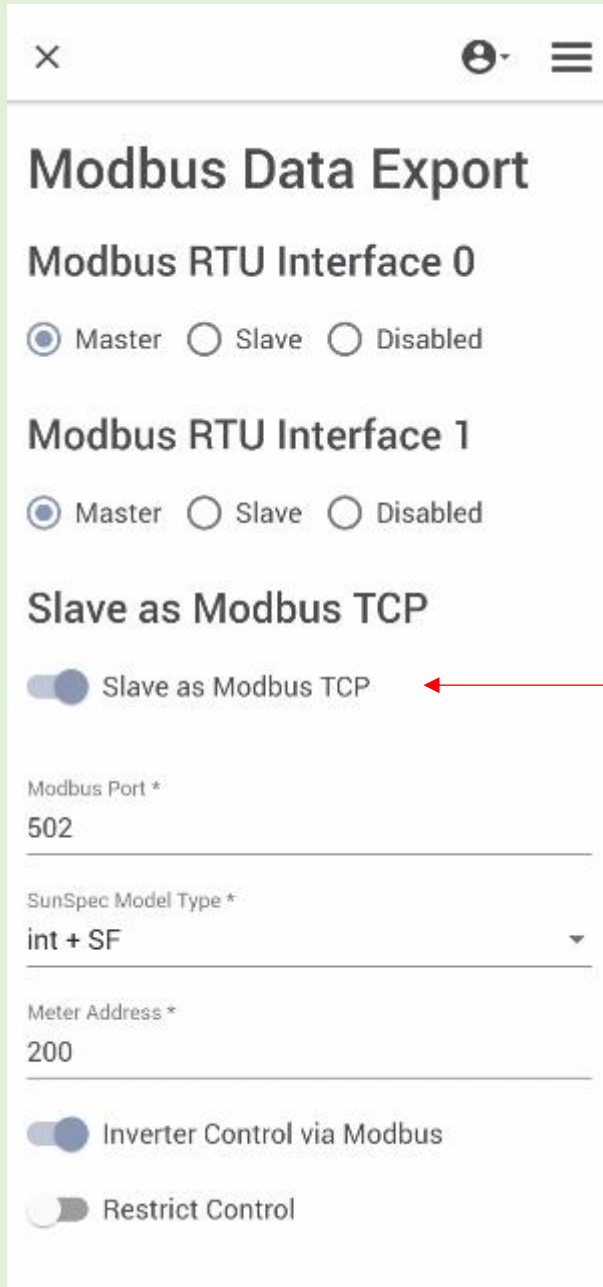
Turn on the Soft Limit, and set the export limit to ZERO

Turn this on

Inverter Setup - GEN24 – MODBUS/TCP

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

Navigate to **Communications** -> **Modbus**



Modbus Data Export

Modbus RTU Interface 0

Master Slave Disabled

Modbus RTU Interface 1

Master Slave Disabled

Slave as Modbus TCP

Slave as Modbus TCP

Modbus Port *

502

SunSpec Model Type *

int + SF

Meter Address *

200

Inverter Control via Modbus

Restrict Control

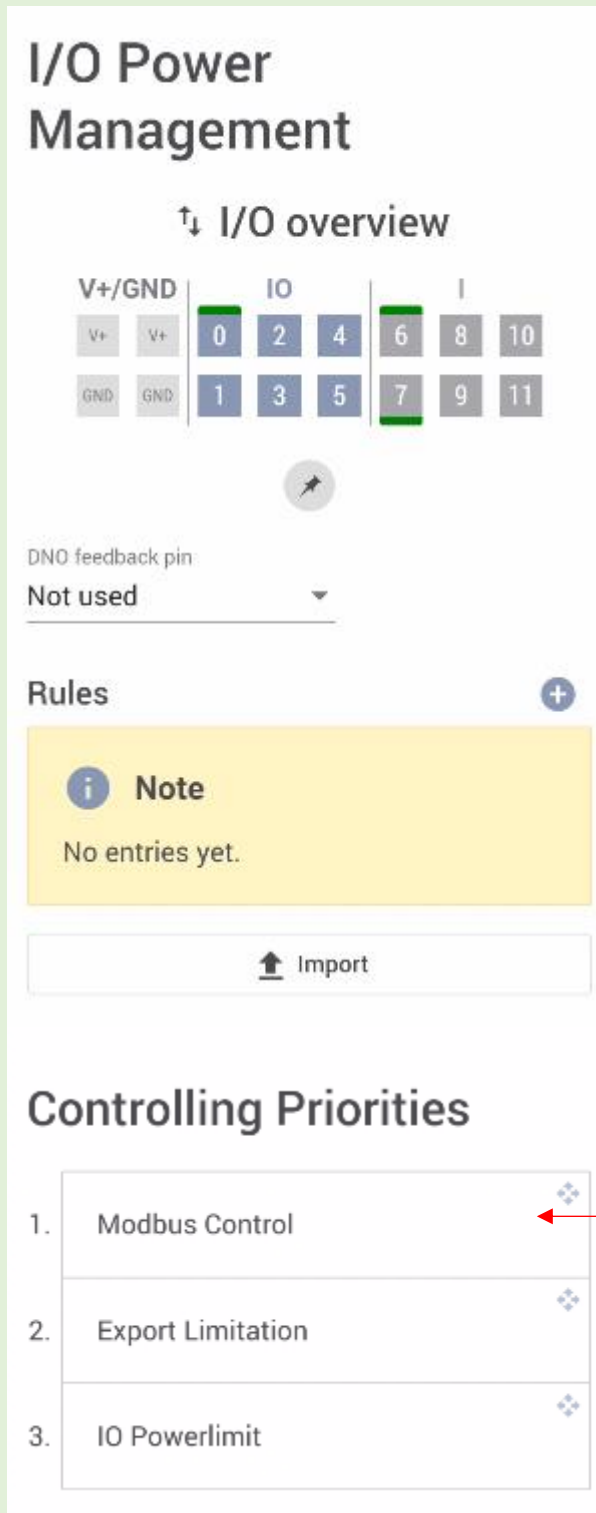
Turn on Modbus TCP

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

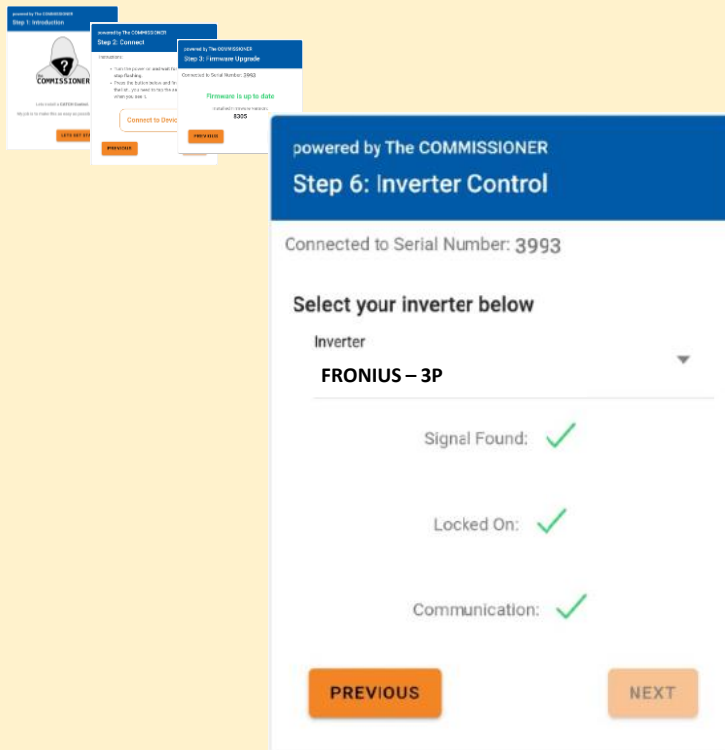
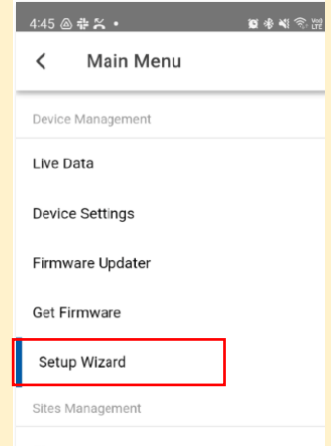
Now go back to the CATCH Configurator and restart the wizard.

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 – 3P**

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



CATCH Control Setup

Step 7: Channel Setup

You will need to make sure the channels are assigned the way you installed them. If you followed the CT Arrangement above then the assignment will be:

MAINS: CH1, CH3, CH4

OTHER: CH2, CH4, CH6

The CT Channel readings appear below. The wizard will attempt to check the CT's for any errors, but it is not perfect. You may get a red cross when things are correct. If you are sure you are right you can move on.

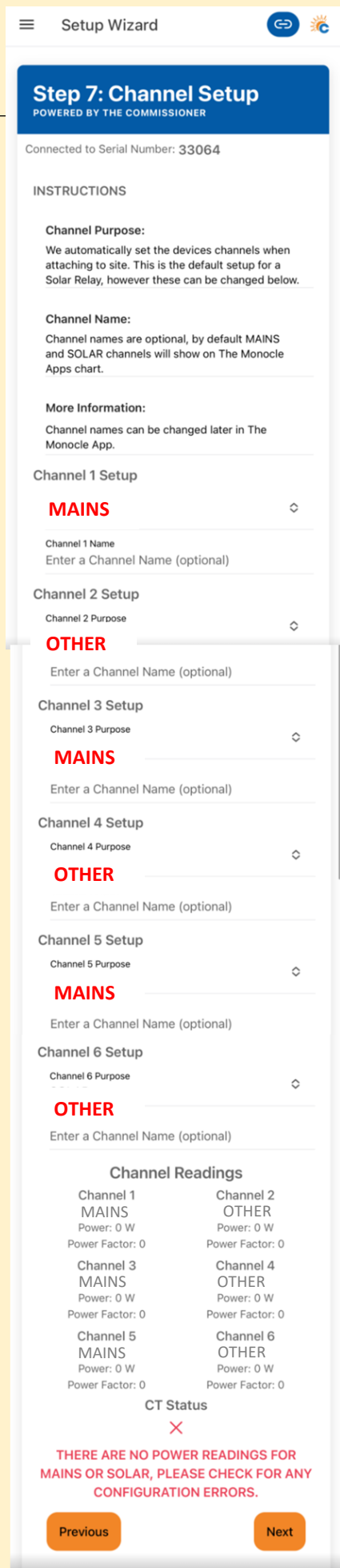
Things to Check yourself:

Bad Connection:

If there is a bad connection on one or both CT wires you will get either ZERO or VERY HIGH readings for Amps.

Lower power factor:

This typically means the CT is on the wrong phase and needs to be moved. This is only true if you have power above 500W. When there is little to no power, power factor will be low (almost zero), and this is normal. But if you have power above 500W and low power factor this is an indicator you have the CT on the wrong phase. You can either remap it in the configurator setup or physically move the CT.





CATCH Control Setup

Step 7: Channel Setup..continued

Things to Check yourself:

Incorrect Direction:

If the CT arrow is not pointing in the right direction your power numbers will be in the wrong direction.

With CATCH Control we show exporting power as a negative number and importing power as a positive number.

Pay special attention to the sign of the power numbers of each CT. The best way to check is to follow the procedure below:

1. Shut down all Solar and Battery systems.

All MAINS ct's should show a POSITIVE power number.

CATCH Commissioning Wizard

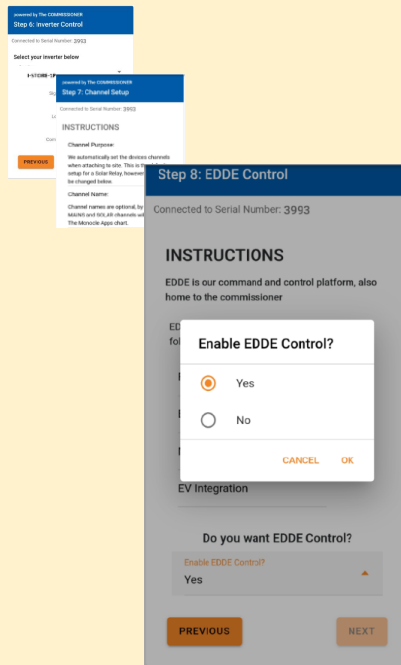
Now go back to the CATCH Configurator and restart the wizard.

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

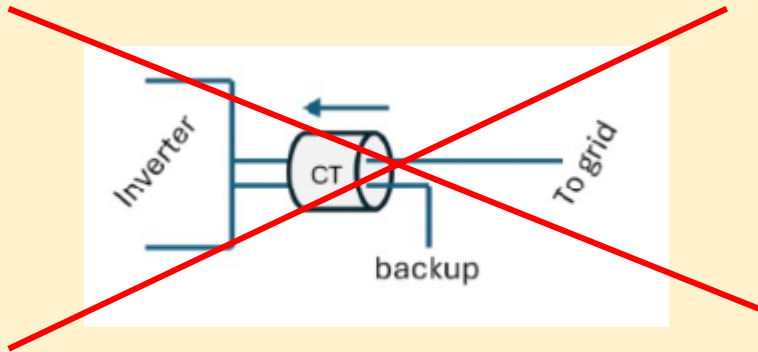


CATCH Commissioning Wizard

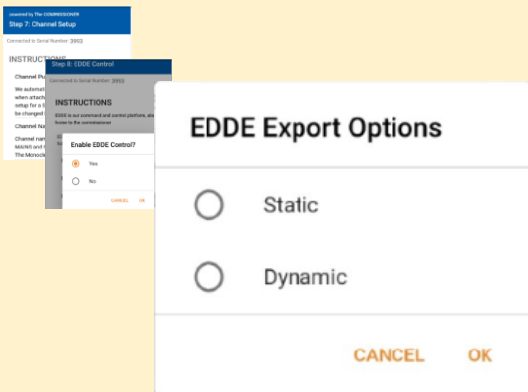
Step 9: EDDE Export Control

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.

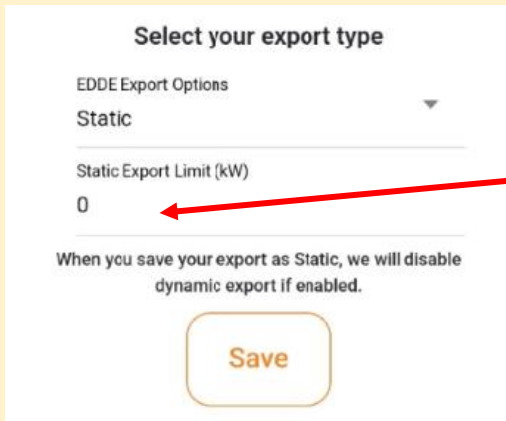
Dynamic: When you put the connection application in you would have nominated for the dynamic connection. The DNSP will adjust the export limit based on daily requirements.

You will need the NMI to complete the dynamic connection setup.

CATCH Commissioning Wizard

Step 9: EDDE Export Control..Continued

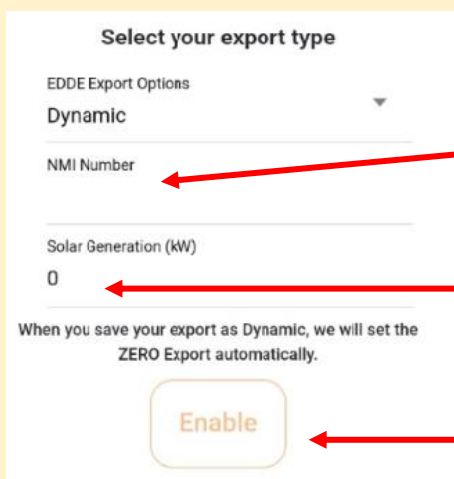
Static Export Configuration:



The screenshot shows a form titled "Select your export type". It has a dropdown menu for "EDDE Export Options" set to "Static". Below it is a text input field for "Static Export Limit (kW)" containing the number "0". A red arrow points from the explanatory text to this field. At the bottom, there is a "Save" button. A note below the input field states: "When you save your export as Static, we will disable dynamic export if enabled."

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

Dynamic Export Configuration:



The screenshot shows a form titled "Select your export type". It has a dropdown menu for "EDDE Export Options" set to "Dynamic". Below it is a text input field for "NMI Number". A red arrow points from the explanatory text to this field. Below that is a text input field for "Solar Generation (kW)" containing the number "0". A red arrow points from the explanatory text to this field. At the bottom, there is an "Enable" button. A note below the input fields states: "When you save your export as Dynamic, we will set the ZERO Export automatically."

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**.

powered by The COMMISSIONER
Step 10: Save Configuration

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

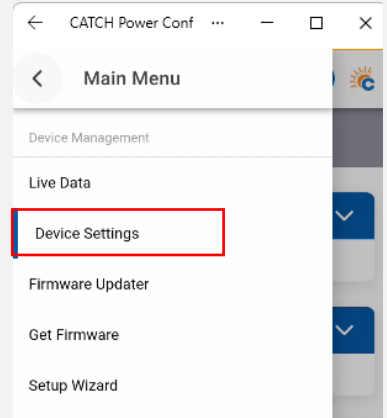
PREVIOUS

SAVE

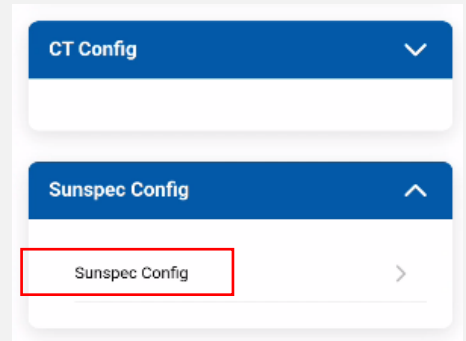
CATCH Configurator SUNSPEC SCAN

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.

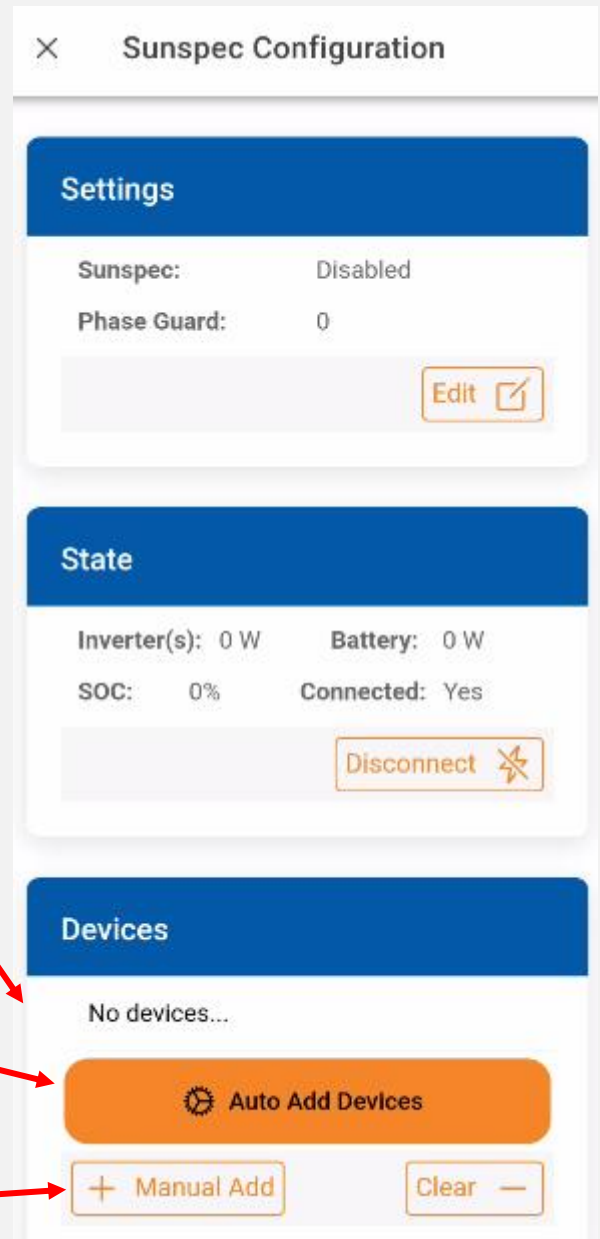
When you first come into the SUNSPEC screen all of the values are zero

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.



The screenshot shows the 'Sunspec Configuration' window with three main sections: Settings, State, and Devices. The Settings section shows 'Sunspec: Disabled' and 'Phase Guard: 0' with an 'Edit' button. The State section shows 'Inverter(s): 0 W', 'Battery: 0 W', 'SOC: 0%', and 'Connected: Yes' with a 'Disconnect' button. The Devices section shows 'No devices...' and buttons for 'Auto Add Devices', '+ Manual Add', and 'Clear -'. Red arrows point from the explanatory text to these specific elements.

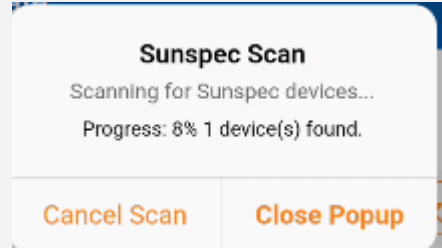
Section	Parameter	Value
Settings	Sunspec	Disabled
	Phase Guard	0
State	Inverter(s)	0 W
	Battery	0 W
	SOC	0%
	Connected	Yes
Devices	Current Count	No devices...

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 – MANUAL ADD

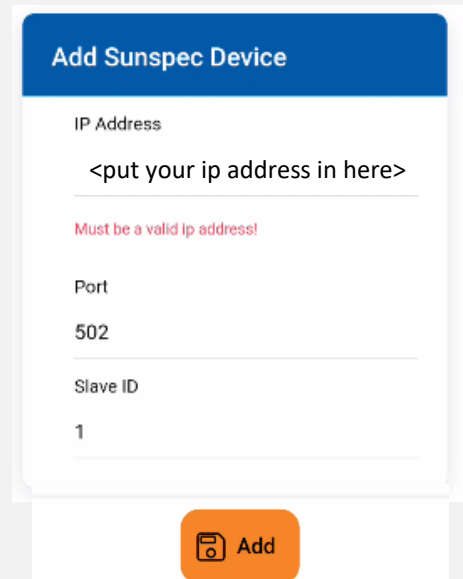
If you setup the inverter with a static IP address this is where you put the ip address in.

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.

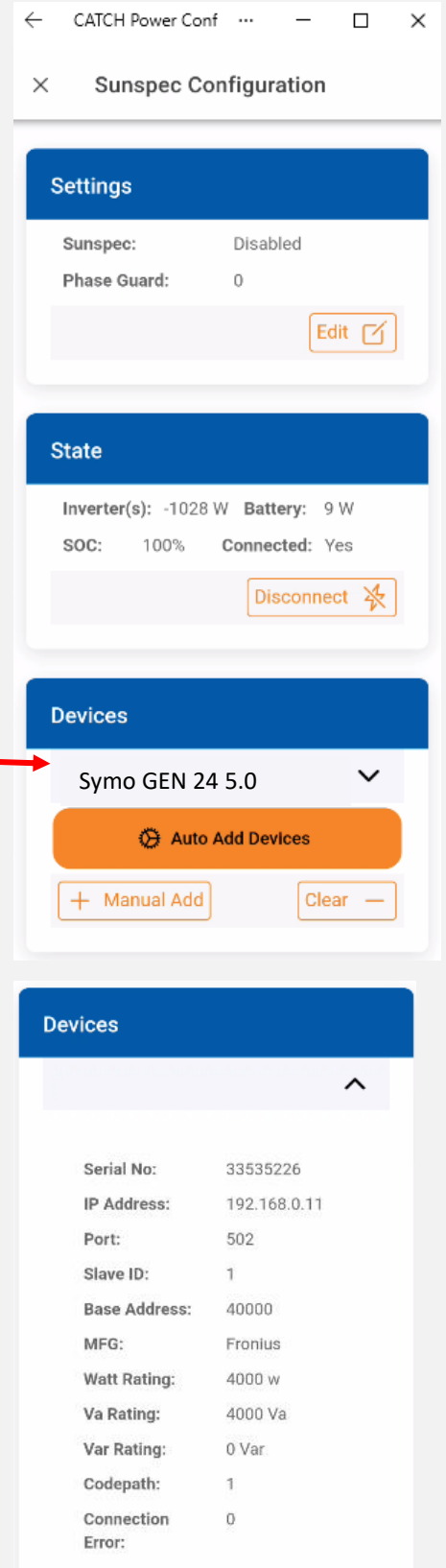


CATCH Configurator SUNSPEC SCAN

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

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

Click here to expand and the device should look like below



The screenshot shows the 'Sunspec Configuration' window in the CATCH Power Conf application. It is divided into several sections:

- Settings:** Shows 'Sunspec: Disabled' and 'Phase Guard: 0'. There is an 'Edit' button with a pencil icon.
- State:** Shows 'Inverter(s): -1028 W', 'Battery: 9 W', 'SOC: 100%', and 'Connected: Yes'. There is a 'Disconnect' button with a lightning bolt icon.
- Devices:** Shows a list with one device: 'Symo GEN 24 5.0'. Below the list are buttons for 'Auto Add Devices', '+ Manual Add', and 'Clear -'.
- Expanded Device View:** A red arrow points to the 'Symo GEN 24 5.0' device, which is expanded to show detailed information:

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.