AS/NZS 4777.2:2020 Technical Information

SB1.5-1VL-40, SB2.5-1VL-40, SB3.0-1AV-41, SB4.0-1AV-41, SB5.0-1AV-41,
SB6.0-1AV-41, STP3.0-3AV-40, STP4.0-3AV-40, STP5.0-3AV-40, STP6.0-3AV-40
STP8.0-3AV-40, STP10.0-3AV-40, STP 50-41

Version 2.0 | 04/07/2023

Contents

1 Disclaimer 4

2 Scope 5

3 Firmware update 6

3.1 Procedure 7

3.1.1 Required equipment 7

3.1.2 Connection 7

3.1.2.1 Connecting via Wi-Fi 7

3.1.2.2 Connecting via Ethernet 8

3.1.2.3 Updating Firmware 9

4 Commissioning Inverter 11

4.1 Via the SMA 360 App 12

4.2 Via Web Browser 14

4.2.1 Installation Assistant 14

5 Checking of Firmware and Country Settings 15

5.1 Via WebUI 15

6 Export Limiting 17

6.1 Export Limit requirements 17

6.2 Setting up Export Limiting. 18

6.2.1 Export limiting via 360 App/Mobile device/Web Browser 19

7 DRED / DRM 20

7.1 Connection to a DRED 20

7.2 DRM Modes 21

7.3 DRM Labelling 21

8 Earth Fault Alarm 22

8.1 Sunny Portal Remote Alarm Setup 22

1 Disclaimer

Every attempt has been made to make this document complete, accurate and up-to-date. Readers are cautioned, however, that changes to local regulations or product improvements may cause SMA Australia to make changes to this document without advance notice. SMA Australia shall not be responsible for any damages, including indirect, incidental or consequential damages, caused by reliance on the material presented, including, but not limited to, omissions, typographical errors, arithmetical errors or listing errors in the content material.

It is therefore recommended that you always check for the latest version prior to following the instructions in this document.

2 Scope

This document is intended to cover the following SMA models:

Inverter model
SB1.5-1VL-40
SB2.5-1VL-40
SB3.0-1AV-41
SB4.0-1AV-41
SB5.0-1AV-41
SB6.0-1AV-41
STP3.0-3AV-40
STP4.0-3AV-40
STP5.0-3AV-40
STP6.0-3AV-40
STP8.0-3AV-40
STP10.0-3AV-40
STP 50-41

Table 1: *In scope inverters*

As of December 18th, 2021 all inverters installed in Australia must comply with one of the pre-set region setting sets described in AS/NZS 4777.2:2020.

1. Australia A
2. Australia B
3. Australia C

All three regions contain the default Power Quality, Volt-Watt, Volt-Var, Frequency/Voltage Response and grid protection settings. Should you require advice or changes to protection settings please reach out to the SMA technical support for assistance.

The following inverters have not been tested to AS/NZS 4777.2:2020 for multiple phase combinations: SB1.5-1VL-40, SB2.5-1VL-40, SB3.0-1AV-41, SB4.0-1AV-41, SB5.0-1AV-41, SB6.0-1AV-41, STP3.0-3AV-40, STP4.0-3AV-40, STP5.0-3AV-40, STP6.0-3AV-40, STP8.0-3AV-40, STP10.0-3AV-40, STP 50-41

3 Firmware update

NOTE: For installations from December 18, 2021 connect the DC supply only when commissioning the inverter until the inverter has the minimum firmware required.

Please refer to **Table 1** for applicable devices and minimum firmware versions. We recommend using the latest firmware from the website if it is newer than the one listed below.

Inverter model	Minimum firmware
SB1.5-1VL-40 SB2.5-1VL-40	3.11.04.R
SB3.0-1AV-41 SB4.0-1AV-41 SB5.0-1AV-41 SB6.0-1AV-41	4.00.21.R
STP3.0-3AV-40 STP4.0-3AV-40 STP5.0-3AV-40 STP6.0-3AV-40	3.11.02.R
STP8.0-3AV-40 STP10.0-3AV-40	3.11.02.R
STP 50-41	3.14.05.R

Table 2: *Minimum Firmware Requirements*

3.1 Procedure

3.1.1 Required equipment

a. Laptop with WiFi and/or Ethernet port with a Web Browser eg. Chrome, Firefox, Edge.
    i. Internet access onsite is not required if Firmware is downloaded prior to site visit.

3.1.2 Connection

a. Via WiFi connection – refer to **3.1.2.1**
b. Via Ethernet – refer to **3.1.2.2**

3.1.2.1 Connecting via Wi-Fi

a. Search for the WLAN of the inverter.
   The name will follow the format **SMA [serial number]**.

b. Use the device specific **WPA2-PSK password**. The WPA2-PSK password can be found on thr type label on the side of the inverter.

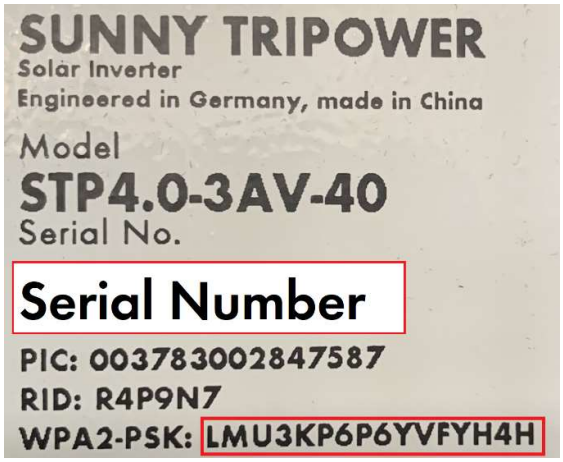


Image 1: *Example of WPA password*

c. Open a web browser and enter in the IP address **192.168.12.3**.

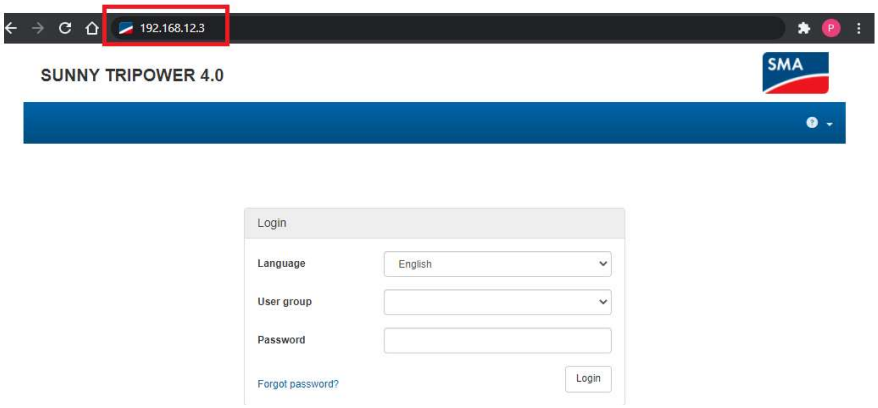


Image 2: *WiFi Login Menu*

d. Refer to **3.1.2.3** to complete the update.

3.1.2.2 Connecting via Ethernet

a. Connect your laptop to the inverters ethernet port.

b. Open a web browser and enter in the IP address **169.254.12.3**.

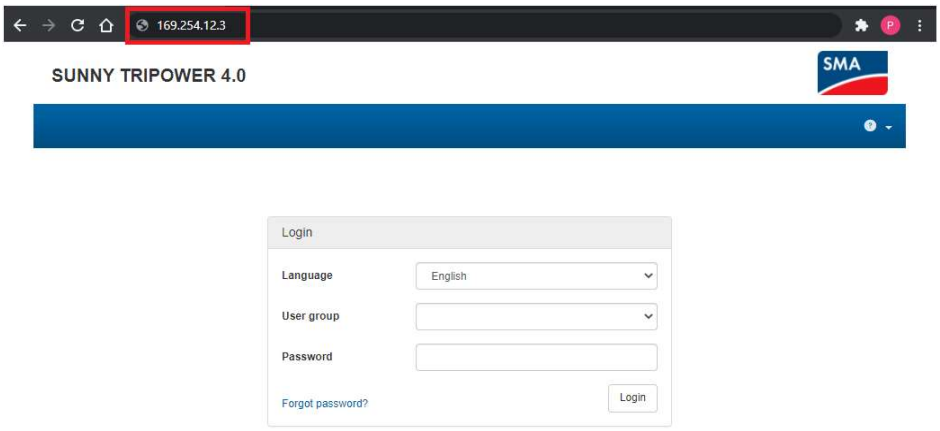


Image 3: *Direct Ethernet Login Menu*

c. Refer to **3.1.2.3** to complete the update.

3.1.2.3 Updating Firmware

a. Select **Installer** as the user group and enter your password.
    i. If this is the first-time logging into the inverter you will need to setup a User and Installer password.
    ii. Please set the **User** password to **Sma12345!**

b. Once logged in as the installer navigate to the **Device Configuration** via the top menu.
    i. Once on the page, click on the setting wheel next to the Device.
    ii. Select **Update firmware.**

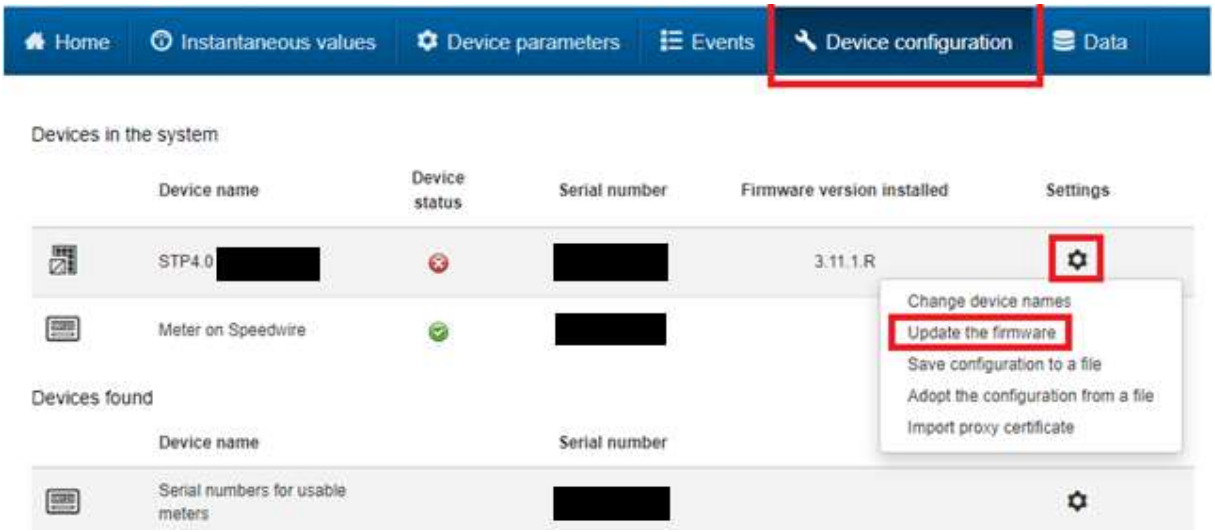


Image 4: *Update the Firmware*

c. Click on **Browse...** locate the appropriate firmware update on your smart device and click **Update firmware**.

Note:

Depending on the firmware, the update process will take some time to complete. During this time, the file will be uploaded from your smart device to the inverter. Once this upload process reaches 100%, the inverter will install the new firmware. During which, you will lose connection between your smart device and the inverter. Wait 5 minutes after losing connection, before reconnecting to the inverter's WebUI.

When the update is complete, you will be able to verify this by navigating to **Events** and finding an entry **Update completed**.

Image 5: *Firmware Update selection*

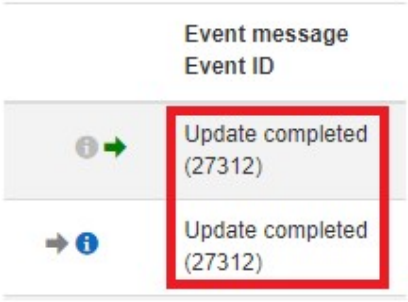


Image 6: *Update completed message*

4 Commissioning Inverter

Commissioning the inverter can be done by either:

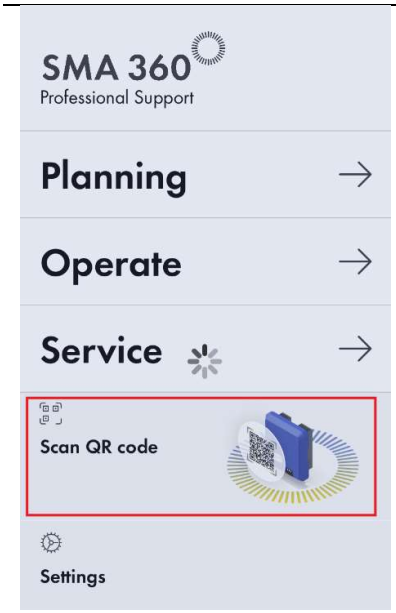
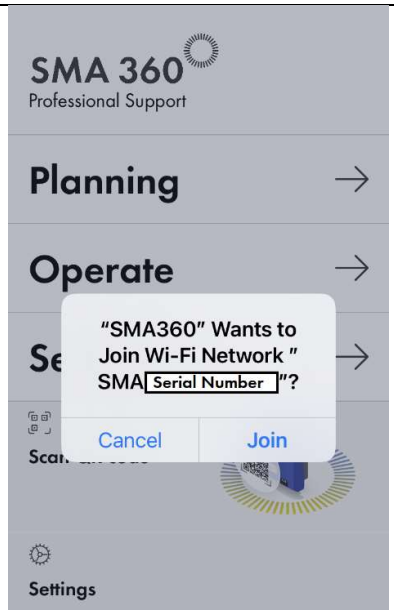
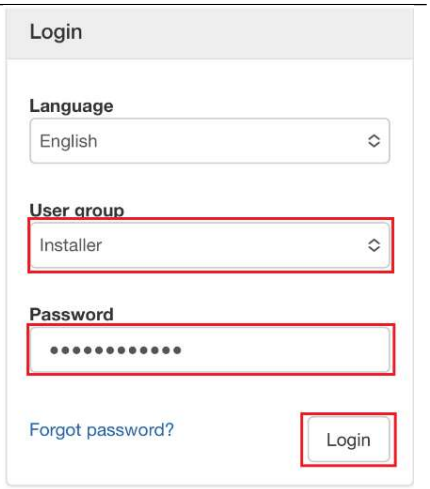
a. SMA 360 App via QR code – available for Android and iOS devices, via respective app stores.
b. Web browser – for all smart devices

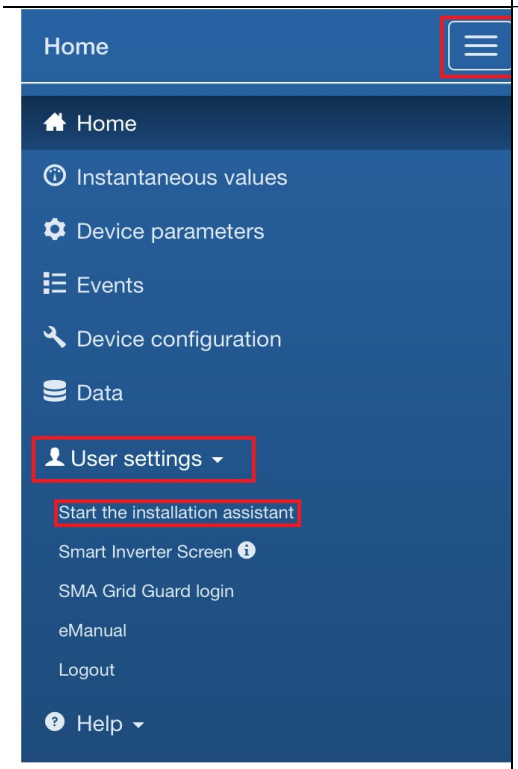
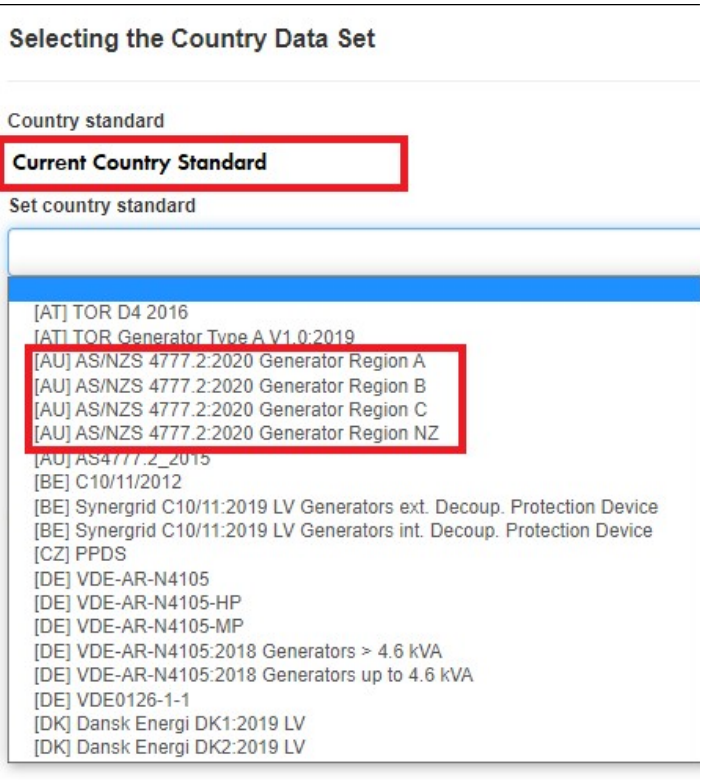
DNSP	Country Standard
Ausgrid Ausnet Citipower Endeavour Energy Energex Ergon Essential Energy Evoenergy Jemena SA Power Networks Ausgrid PowerCor United Energy	[AU] AS/NZS 4777.2:2020 Generator Region A
Western Power	[AU] AS/NZS 4777.2:2020 Generator Region B
Horizon Power TasNetworks	[AU] AS/NZS 4777.2:2020 Generator Region C
New Zealand DNSPs	[AU] AS/NZS 4777.2:2020 Generator Region NZ

4.1 Via the SMA 360 App

a. Open the app and login.
   i. Requires a free SMA Sunny Portal account.
   ii. Internet access required, if you do not have internet access, please refer to section **3.2** for commissioning.

b. Follow steps below to complete commissioning.

Select QR code scanner & scan code at the front of the unit	**Join** SMA network	Login as an **Installer**, for first time connection refer to section **3.1.2.3.a**
		

Navigate to **installation assistant**	Complete **Network** and **Time Setting** then move onto **Country Standard**
	

c. If you require **Export Limiting** refer to **Section 6.1**.
d. Otherwise click on continue until you reach the Summary Page.
e. On the Summary Page make sure the country standard is set correctly, refer to image 7.

Image 7: *Country Standard*

4.2 Via Web Browser

If using a mobile device and not using the SMA 360 app, please refer to section **3.1.2.1** on how to connect to the inverter via Wi-Fi. Then, follow the instructions from "Login as an **Installer**" in section **3.1.b**.

For all other users with a laptop please refer to section **3.1.2** for connection via Wi-Fi or Ethernet.

4.2.1 Installation Assistant

1. To start the installation assistant, navigate to the user settings icon as shown below.

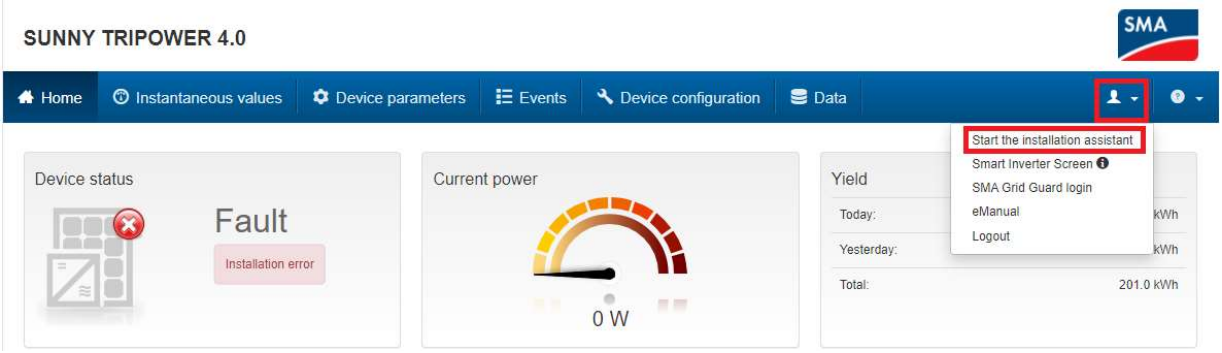


Image 8: *Installation assistant*

2. Complete **Network** and **Time settings** then move onto **Country Standard**.
    a. Select the correct country code from the dropdown list.
    b. Refer to your grid operator for correct settings.

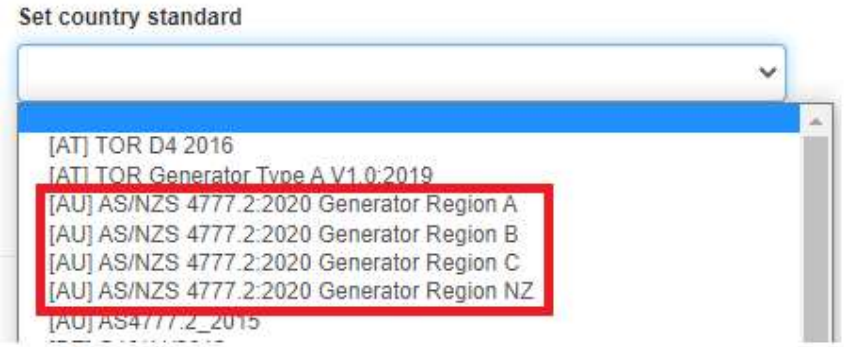


Image 9: *Available Country Standard*

3. If you require **Export Limiting** refer to **Section 6.1**.
4. Otherwise, click on continue until you reach the Summary Page.
5. On the Summary Page make sure the country standard is set correctly, refer to image 7.

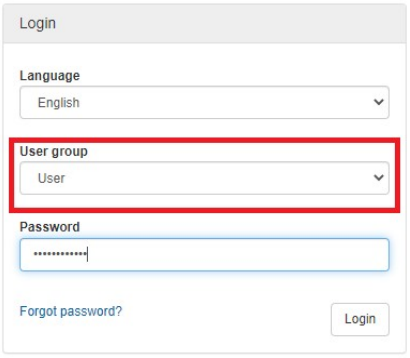
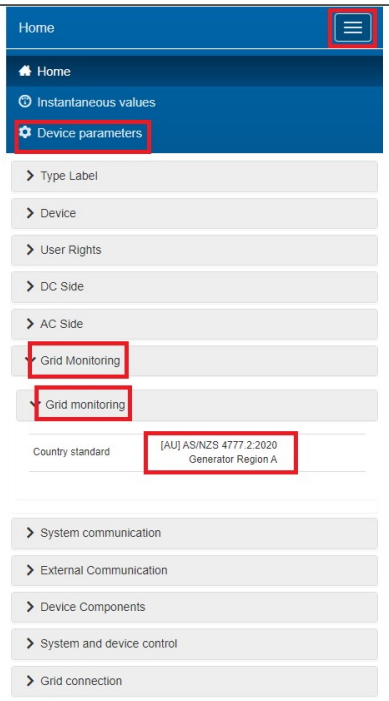
5 Checking of Firmware and Country Settings

To verify that the Firmware and Country Standard are correct, it can be done via the following method.

a. WebUI of the inverter
   i. Via SMA 360 App
   ii. Via Web Browser

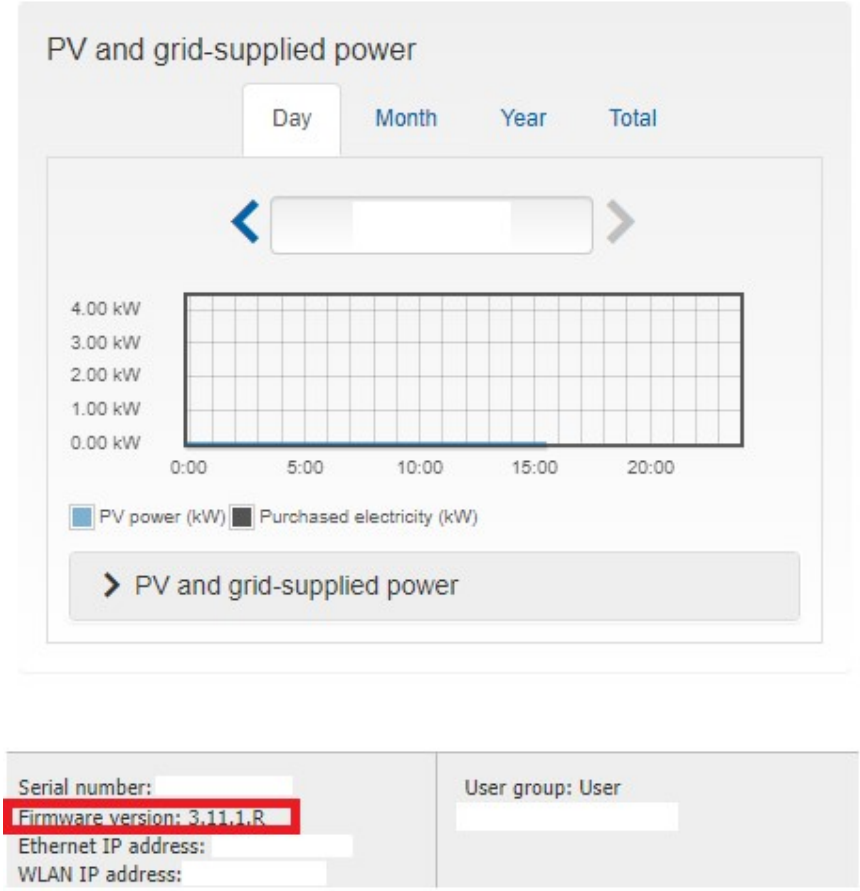
5.1 Via WebUI

Screenshots shown below are using a mobile device, web interface will look slightly different on a laptop/computer screen.

Login to the inverter WebUI as a **User**	**Checking the Country standard**
Refer to section **3.1.2** for web browser connection options or **4.1** for 360 App connection.	Navigate to **Device Parameters > Grid Monitoring > Grid Monitoring > Country standard.**
	

Checking the Firmware

On the **Home** page scroll to the bottom of the screen to find the current firmware.



6 Export Limiting

6.1 Export Limit requirements

Refer to Table 3 and Table 4 on what meters are compatible for export limiting as tested to AS/NZS 4777.2:2020 Section 6.

The Data Manager M is also compatible with 3rd party meters, some devices with predefined modbus profiles are listed in Table 5.

INVERTER	Options for Export Control < 63A		
	SMA Energy Meter	Home Manager 2.0	Data Manager M + Energy Meter
SB 1.5/2.5 VL-40	Max 1 PV inverter*	Max 12 inverters*	NA
SB 3.0 – 6.0 AV-41	Max 1 PV inverter*	Max 12 inverters*	NA
STP 3.0 – 6.0 AV-40	Max 1 PV inverter*	Max 12 inverters*	NA
STP 8.0 – 10.0 AV-40	Max 1 PV inverter*	Max 12 inverters*	Max 49 inverters*
*Test Results for AS/NZS 4777.2:2020 Section 6 will be available on Q3 2023.			

Table 3: *Export Limit Selection Guide*

INVERTER	Options for Export Control >63A		
	Controller	Energy Meter	Max No. of Inverters
CORE1 STP50-41	SMA Data Manager M	Janitza UMG604E*	Max 49 inverters
	SMA Data Manager M	Siemens PAC2200*	Max 49 inverters
	Home Manager 2.0	In-built*	Max 12 inverters
* Maximum 1 energy meter per system. The meter requires compatible current transformers. Any 5A secondary output CT with class 1 accuracy is compatible.			

Table 4*: Export Limit Selection Guide >63A*

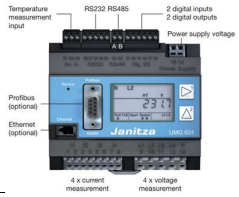
Meter Brand	Model	Communication Method
Janitza	UMG604E 	Modbus TCP/IP
Siemens	PAC2200	Modbus TCP/IP or Modbus RTU depending on meter model.

Table 5: *3rd Party Energy Meter >63A*

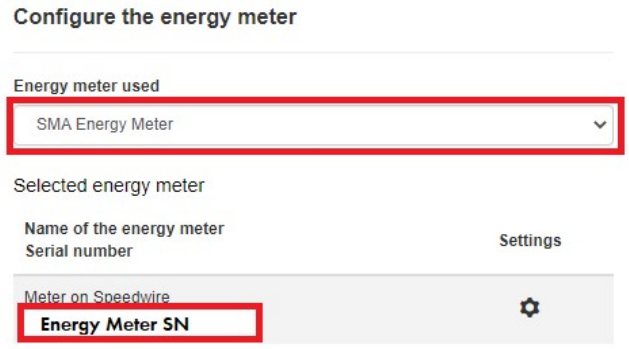
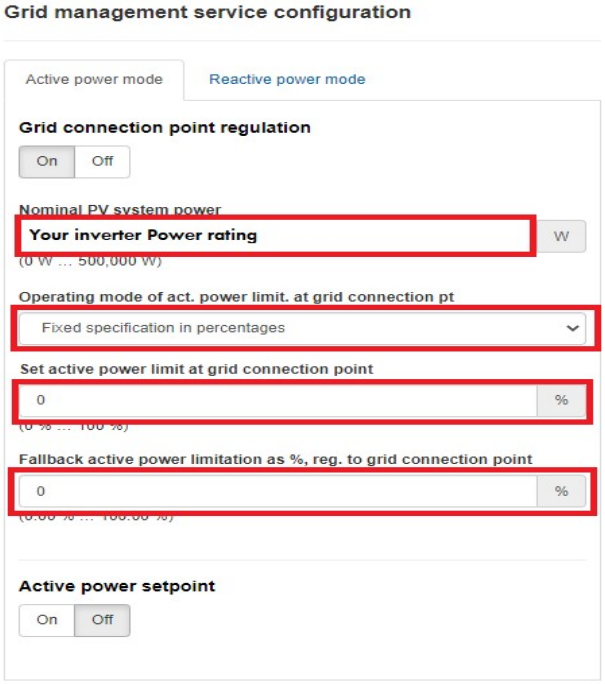
6.2 Setting up Export Limiting.

This section will only go through SMA Energy Meter compliant devices for export limiting. Please refer to supporting documents for Export Limiting via a SMA Home Manager 2.0 or Data Manager M + Energy Meter[1].

6.2.1 Export limiting via 360 App/Mobile device/Web Browser

Make sure you have completed **Section 3.1** prior to continuing.

If working on a laptop the Web Browser will look slightly different, but the parameter names are the same.

Skip RS485 section and move onto Detection of EM	Zero Export Example
	
Make sure that the Serial Number of the Energy Meter is shown in the meter on speedwire section.	Summary of parameters: **Nominal PV System Power** – This is the rating of the inverter, no need to adjust. **Operating mode of act. Power limit. At grid connection point** – this is either % or in Watts of the nominal PV system Power. **Set active power limit at grid connection point** – This is the actual value to set, for our example 0%/0W. **Fallback active power limitation as %....** – This is in case there is a communication issue with the meter. For compliance with AS/NZS 4777.2:2020 Soft Export Limit Requirements, the Fallback active power limitation for the site must be no more than the active power limit at the grid connection point for the site.

7 DRED / DRM

7.1 Connection to a DRED

Inverter connection to a demand response enable device (DRED) is possible with an approved Sunspec modbus Demand Response controller (DRC) such as provided by Future Point systems:

Olivance Powerlink - Olivance

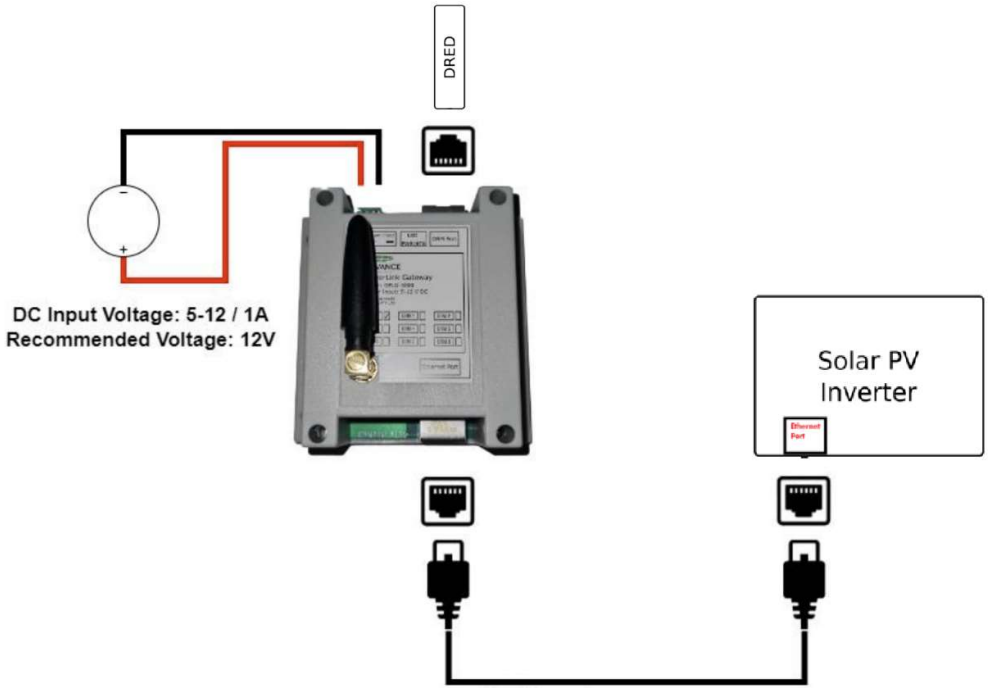


Image 10: *DRC connection, image courtesy of Futurepoint*

The modbus TCP parameter must be enabled on the inverter.

1. Login to the inverter's WebUI as an installer, refer to section **3.1.2** or **4.1** depending on different connection methods.
2. Navigate to **Device Parameters > External Communication > Modbus > TCP server > activated > yes**

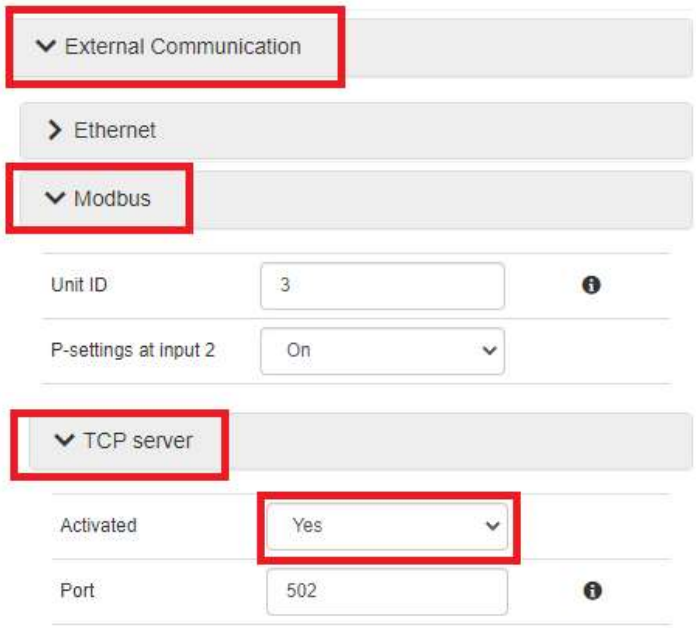


Image 11: *Enabling Modbus*

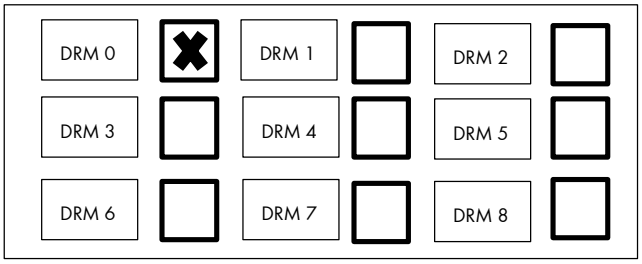
7.2 DRM Modes

Currently DRM0 is the only DRM mode available for the following inverter models:

SB1.5-1VL-40,SB2.5-1VL-40, SB3.0-1AV-41, SB4.0-1AV-41, SB5.0-1AV-41, SB6.0-1AV-41, STP3.0-3AV-40, STP4.0-3AV-40, STP5.0-3AV-40, STP6.0-3AV-40, STP8.0-3AV-40, STP10.0-3AV-40, STP 50-41, STP110-60

7.3 DRM Labelling

The DRC must be labelled with the DRM mode and the RJ45 with the DRM Port.



Example DRM Model Label

Example DRM Port Label

8 Earth Fault Alarm

The inverter detects earth faults by the measurement of insulation resistance between the DC side and ground prior to operation, and residual current during operation. Earth faults (and other faults) trigger the inverter's earth fault alarm. The following is a summary of these alarms.

Inverter model	Visual LED on Inverter	Audible alarm	Remote Alarm
SB1.5-1VL-40 SB2.5-1VL-40	Yes	Yes	Optional via Sunny Portal
SB3.0-1AV-41 SB4.0-1AV-41 SB5.0-1AV-41 SB6.0-1AV-41	Yes	Yes	Optional via Sunny Portal
STP3.0-3AV-40 STP4.0-3AV-40 STP5.0-3AV-40 STP6.0-3AV-40 STP8.0-3AV-40 STP10.0-3AV-40	Yes	Yes	Optional via Sunny Portal
STP50-41	Yes	No	Optional via Sunny Portal

Table 6: *Earth Fault Alarm*

8.1 Sunny Portal Remote Alarm Setup

The inverter's Earth Fault Alarm can be configured once the plant is registered in Sunny Portal. In the event of an earth fault, a report with the corresponding events will be emailed to nominated addresses. A report will then be sent every hour until the earth fault is acknowledged in Sunny Portal or cleared.

For instructions on how to register your plant in Sunny Portal, please refer to the respective Sunny Portal User Manual for your plant:

- Webconnect (no communication devices): User Manual - Webconnect Systems in SUNNY PORTAL (sma.de)

Once your plant is registered in Sunny Portal, continue to set up the Earth Fault Alarm using the following instructions:

1. Login to your Sunny Portal account.

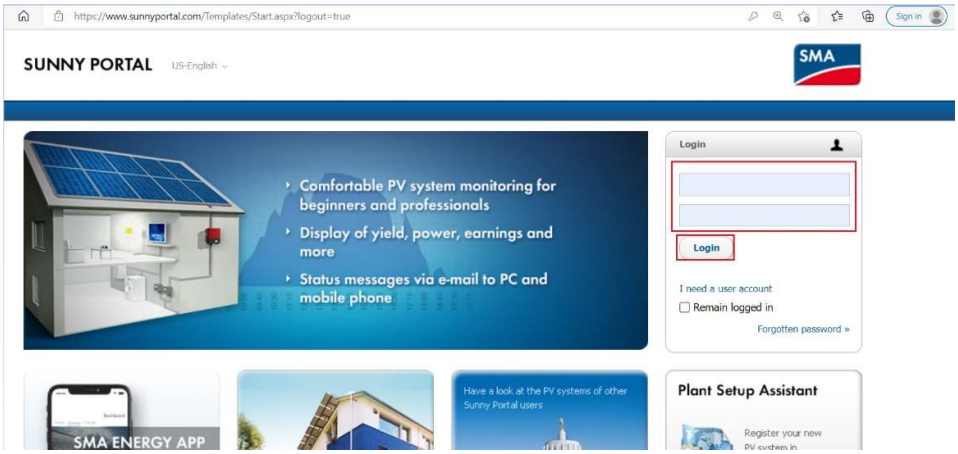


Image 12: *Sunny Portal Login*

2. Expand the **Configuration** tab and select **Report Configuration**.

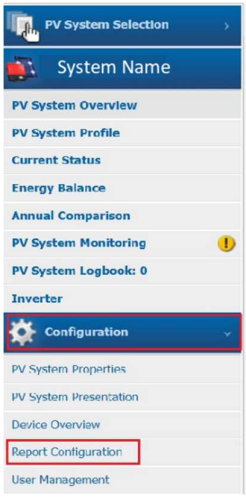


Image 13: *Report Configuration*

3. Expand the drop-down menu at the top of the page and select the option **Event report for errors in accordance with the standard**.

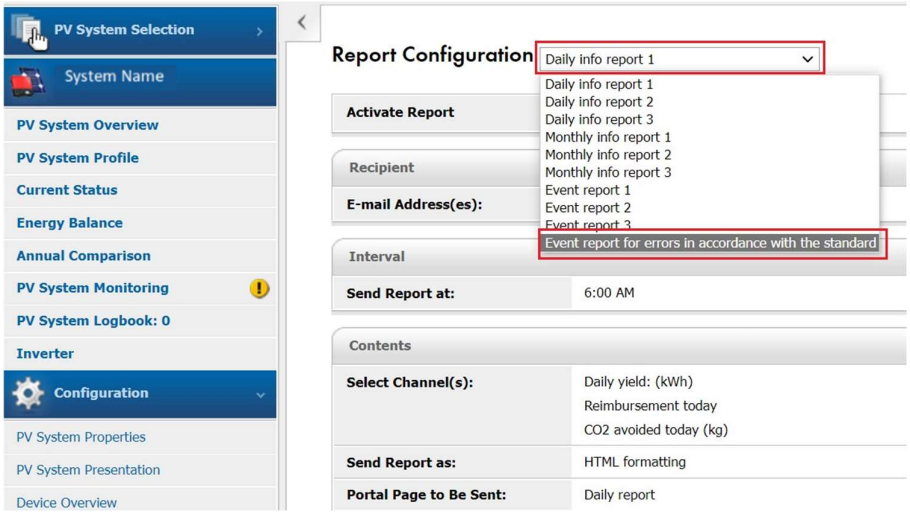


Image 14: *Event Report Selection*

4. Ensure the drop-down menu at the top of the page now reads **Event report for errors in accordance with the standard**. Now click **Edit** at the bottom of the page.

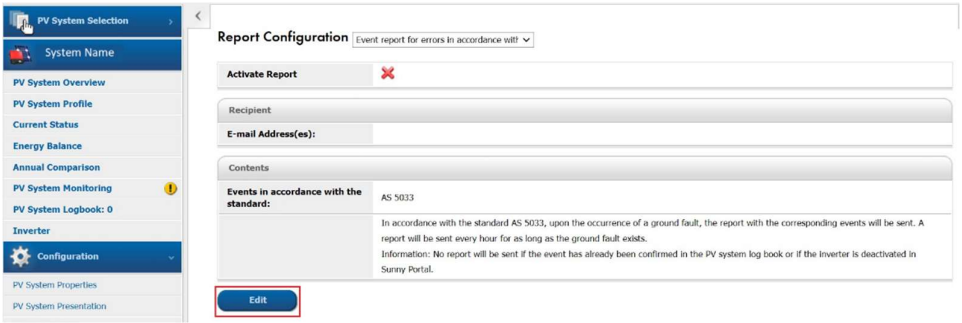


Image 15: *Editing Report function*

5. Next to **Active**, tick the box to activate the report. Under the heading **Recipient**, enter in your email address. Under **Contents**, ensure that **AS 5033** is selected from the drop-down menu. At the bottom of the page, click **Save** once all parameters have been changed.

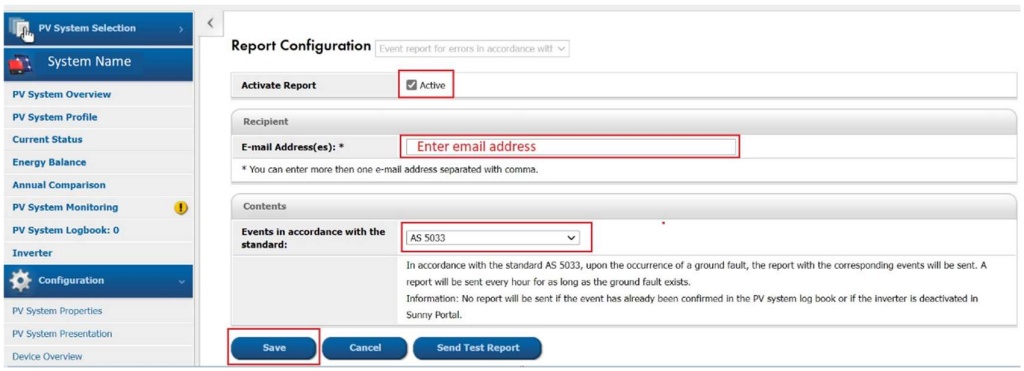


Image 16: *Selecting Earth Fault Alarm*

6. You have now set up the Earth Fault Alarm for your inverter.

This concludes the document, if you have any questions you can reach out to Solaracademy@sma-australia.com.au for pre-sales/installation questions or service@sma-australia.com.au for after sales support.