Technical Information



System commissioning and setting the active and reactive power setpoints

in systems with PV inverters of the type Sunny Tripower CORE2 and SMA Data Manager M

1 Introduction

This document describes how to commission systems with Sunny Tripower CORE2 PV inverters and a SMA Data Manager M as system manager and to configure it such that the PV inverter can receive and implement the active and reactive power setpoints from the SMA Data Manager M.

The SMA Data Manager can control subordinate inverters and regulate them in combination with an energy meter. In addition, the SMA Data Manager takes over system monitoring and communication with the Sunny Portal powered by ennexOS.

2 Commissioning Procedure

In systems with Sunny Tripower CORE2 and the SMA Data Manager, the SMA Data Manager is the system manager.

The SMA System Manager controls or regulates the Sunny Tripower CORE2 inverters in the system. The prerequisite for this is that all devices in the system are commissioned and configured in accordance with the procedure described here.

Procedure		See
1.	Commission every Sunny Tripower CORE2 PV inverter.	Manual of the inverter
2.	Call up the user interface of each Sunny Tripower CORE2 and log in as the service provider.	Manual of the inverter
3.	Check the firmware version of each Sunny Tripower CORE2. The firmware version must be 1.01.03.R or later. If the Sunny Tripower CORE2 has an earlier firmware version, update the firmware to the latest version.	Manual of the inverter
4.	Set the country data set for each Sunny Tripower CORE2.	Section 3.1, page 3
5.	Enable external control for each Sunny Tripower CORE2.	Section 3.2, page 3
6.	Configure the rate of increase for each Sunny Tripower CORE2.	Section 3.3, page 3
7.	Configure the response time for each Sunny Tripower CORE2.	Section 3.4, page 4
8.	Optional: Configure the behavior for an active power setpoint of 0% for each Sunny Tripower CORE2.	Section 3.5, page 4
9.	Configure the fallback behavior in the absence of a setpoint for each Sunny Tripower CORE2.	Section 3.7, page 5
10.	Commission the SMA Data Manager and start the commissioning wizard. When doing so, activate the Modbus server in the commissioning wizard, record each Sunny Tripower CORE2 as a Modbus SunSpec device, and deactivate the optimized regulation/control function in the configuration of the active power setpoint.	Manual of the SMA Data Manager and commissioning wizard
11.	Configure the query rate for the active and reactive power setpoints via the SMA Data Manager user interface.	Section 4.1, page 7
12.	Deactivate the optimized regulation/control function via the SMA Data Manager user interface.	Section 4.2, page 8

3 Configuration of the Sunny Tripower CORE2

3.1 Configuring the Country Data Set

By default, the inverter is not set to a specific country data set. In order for the inverter to be able to feed in, a country data set must be set. The country data set must be adjusted to the installation site.

i The country data set must be set correctly.

If you select a country data set which is not valid for your country and purpose, it can cause a disturbance in the PV system and lead to problems with the grid operator. When selecting the country data set, you must always observe the locally applicable standards and directives as well as the properties of the PV system (e.g. PV system size, grid-connection point).

- If you are not sure which standards and directives are valid for your country or purpose, contact the grid operator.

Prerequisites:

☐ You are logged into the user interface as the service provider.

Procedure:

1. Click on [**Device monitoring**] in the menu.
2. Select [**Initialization**].
3. Select the desired country data set from the drop-down list **Grid code settings**.
4. Confirm change of the setting with [**Save settings**].

3.2 Enabling external control

Requirements:

☐ You are logged into the user interface as the service provider.

Procedure:

1. Select [**Communication**] in the menu.
2. Select the **MODBUS** submenu.
3. Activate **[Switch]** for local port 502.

3.3 Configuring the rate of increase

Requirements:

☐ You are logged into the user interface of the inverter as service provider.

Procedure:

1. Click on [**Device monitoring**] in the menu.
2. Click on the **[Parameters]** tab.
3. Click on the **Extended Model 2-1 RW** tab.
4. Set the current value of the parameter **ActPowSpeedEna** to **On**.
5. Set the current value of the parameter **ActPowDel** to **6000**.
6. Set the current value of the parameter **ActPowRis** to **6000**.
7. Confirm change of the setting with [**Save settings**].

3.4 Configuring the response time

Requirements:

☐ You are logged into the user interface of the inverter as service provider.

Procedure:

1. Click on [**Device monitoring**] in the menu.
2. Click on the **[Parameters]** tab.
3. Click on the **Extended Model 2-2 RW** tab.
4. Set the current value of the parameter **ReactiveRespEna** to **On**.
5. Set the current value of the parameter **ReActiceResponsTime** to **1**.
6. Confirm change of the setting with [**Save settings**].

3.5 Setting the behavior for an active power setpoint of 0%

By default, the inverter is set such that it attempts to control to 0% when there is an active power setpoint of 0%. This can result in control deviations of 1-2 kW.

To ensure that no more active power is fed in, you can configure the behavior of the inverter such that the inverter disconnects from the utility grid when there is an active power setpoint of 0%.

Requirements:

☐ You are logged into the user interface as the service provider.

☐ The PV inverter must be equipped with at least firmware version 1.01.03.R.

Procedure:

1. Click on [**Device monitoring**] in the menu.
2. Click on the **[Parameters]** tab.
3. Click on the **Extended Model 2-1 RW** tab.
4. For control to 0% with deviations from the regulations: Set the current value of the parameter **WlimitShutdownENA** to **Off**.
5. For disconnection when there is an active power setpoint of 0%: Set the current value of the parameter **WlimitShutdownENA** to **On**.
6. Confirm change of the setting with [**Save settings**].

3.6 Behavior for an active power setpoint of 0%

The inverter behavior depends on the parameter settings **WlimitShutdownENA**:

Parameter	Setting value	Behavior
WlimitShutdownENA	**On**	If 0% active power is specified, the inverter disconnects from the AC grid. If an active power setting > 0% is then made, the inverter switches back to the AC grid and switches to feed-in operation according to its configuration.
	Off	With a 0% active power specification, the inverter regulates its feed-in power to a minimum power of 1-2 kW.

3.7 Setting the fallback behavior in the absence of a setpoint

You must set how the Sunny Tripower CORE2 must behave In the event that communication between the SMA Data Manager and the Sunny Tripower CORE2 fails. Here, you can specify the time in seconds that the inverter waits until the fallback behavior takes effect, and also define a fallback value. A minimum waiting time of 20 seconds must be set for the configuration.

Configure the settings for each Sunny Tripower CORE2 in the system.

Parameters to be set:

Display group	Parameter	Parameter name on the user interface	Default settings	Selection/ range	Explanation
Extended model 2-1 RW	**Preset Power Limit Ratio**	**PreWLimit**	100.0 %	[0.0~100.0] %	Fallback value for active power control to which the inverter will be set when the specified time has expired and the setpoint is still absent. With a configured fallback value of 0%, the inverter regulates its feed-in power to a minimum power of 1-2 kW. No grid disconnection can be configured for the fallback behavior in the absence of active power setpoints.
Extended model 2-1 RW	**Preset Reactive Power Regulation Mode**	**PreVarMod**	off	off / PF / QT / Q(P) / Q(V)	Fallback value for reactive power mode. The values PF, Q(P) and Q(V) refer to the configured characteristic curve functions. The **QT** selection must be set if the fallback behavior for reactive power control is required in accordance with the setting in the **PreVarValue** parameter.

Display group	Parameter	Parameter name on the user interface	Default settings	Selection/ range	Explanation
Extended model 2-1 RW	**Preset Reactive Power Ratio**	**PreVarValue**	0.0	[-100.0~100.0] %	Fallback value for reactive power control to which the inverter will be set when the specified time has expired and the setpoint is still absent.
Extended model 2-1 RW	**Preset Power Factor**	**PrePF**	1,000	[-1,000~-0.800], [0.800~1,000]	Fallback value for cos φ control to which the inverter will be set when the specified time has expired and the setpoint is still absent.

The configuration of the waiting time is used to activate the fallback behavior for the desired power control.

Display group	Parameter	Parameter name on the user interface	Default settings	Selection/ range	Explanation
Ext. controls	**WMaxLimPct_RvrtTms**	**Timeout for active power commands**	0 s	[0~36000]	Time in seconds that the inverter waits until the fallback behavior for active power control takes effect. 0 = no fallback behavior Minimum value for configuration = 20

Display group	Parameter	Parameter name on the user interface	Default settings	Selection/ range	Explanation
Ext. controls	**VArPct_RvrtTms**	**Timeout for reactive power commands**	0 s	[0~36000]	Time in seconds that the inverter waits until the fallback behavior for reactive power control takes effect. 0 = no fallback behavior Minimum value for configuration = 20
Ext. controls	**OutPF-Set_RvrtTms**	**Timeout for cos(phi) commands**	0 s	[0~36000]	Time in seconds that the inverter waits until the fallback behavior for cos φ control takes effect. This function can only be used in conjunction with a 3rd party system controller. Not in connection with an SMA Data Manager. 0 = no fallback behavior Minimum value for configuration = 20 This parameter is reset to the default setting by restarting the inverter.

Requirements:

☐ You are logged into the user interface as the service provider.

Procedure:

1. Click on [**Device monitoring**] in the menu.
2. Click on the **[Parameters]** tab.
3. Depending on the parameter to be set, select the **[Ext. controls]** and **[Extended Model 2-1 RW]** tab.
4. Set the parameters for the fallback behavior as desired.
5. Confirm change of the setting with [**Save settings**].

4 Configuration of the SMA Data Manager

4.1 Configuring the query rate for SMA Data Manager setpoints

Prerequisites:

☐ The user interface of the SMA Data Manager must be open and you must be logged in as **Installer** or **Administrator**.

Procedure:

1. Select the SMA Data Manager in the focus navigation.

2. Select the menu **Configuration**.
3. Select the **Parameters** menu item.
4. Call up the parameter **Call interval for the control** via the search function or navigate to the parameter.
5. Set the value of the parameter to **1 second**.
6. Click on [**Save**].

4.2 Deactivating the optimized regulation/control function in the SMA Data Manager

Prerequisites:

☐ The user interface of the SMA Data Manager must be open and you must be logged in as **Installer** or **Administrator**.

Procedure:

1. Select the SMA Data Manager in the focus navigation.
2. Select the menu **Configuration**.
3. Select the menu item **Grid management service**.
4. For the active and reactive power select **Configuration & activation**.
5. Under Active power, open the configuration wizard for **Operating mode**.
6. Disable the option button **Optimized closed-loop control/open-loop control**.
7. Confirm every step with [**Continue**]
8. Configure any further settings that are necessary.
9. Click on [**Save**].

5 Contact

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