Application Note – Viewing and Setting Inverter Grid Protection Values

Version History

- Version 1.4, March 2023: Addition of "Vgrid Max 5" and "Vgrid Min 5" protection settings
- Version 1.3: January 2019: Update of compatible CPU versions
- Version 1.2: November 2018: New section on how to view and set grid protection values using SetApp
- Version 1.1, October 2018: New section on how to view and set grid protection values using the Monitoring Platform

Contents

Introduction

This document describes how to view and set grid protection values via SetApp, via the inverter display and via the Monitoring Platform.

⚠️ **WARNING!**

Setting the grid protection values is prohibited unless explicitly approved by the grid operator. This feature is offered to you as a convenience, and SolarEdge disclaims all responsibility for any implications of modifying the grid values of the inverter. SolarEdge will in no event be liable to you, any customer or any third party in connection with these changes.

Viewing and Modifying Grid Protection Settings using SetApp

You can use SetApp to view or modify grid protection values, or restore defaults.

→ **To access the grid protection settings:**

1. From the SetApp main menu, select **Maintenance >> Grid Protection**. A pop-up message box requires you to enter a password in order to modify the grid protection settings. Contact your SolarEdge support representative to obtain this password.

2. Enter the password and tap on the **Agree** button. The Grid Protection page appears as shown in the figure below:

Grid Protection
Vgrid Max.
Vgrid Min.
Fgrid Max.
Fgrid Min.
Grid Monitoring Time (GRM)

3.   Select one of the following settings for viewing and modification:

Setting	Description
Vgrid Max.	Maximum acceptable grid voltage for the installed inverters. When selecting Vgrid Max. rows 1 to 4: • V - maximum voltage [V] • ms - trip time, in milliseconds. The trip time indicates the time after which the inverter should disconnect from the grid if the grid voltage is out of range. The row "Vgrid Max 5" is a special protection setting that tracks the running mean value of the grid voltage measurements. The time (in milliseconds) defines the time window over which the measurements are averaged. If the averaged value exceeds the voltage threshold, the inverter shall trip in less than 100 milliseconds. Tap on the **Edit** button to modify the thresholds.
Vgrid Min.	Minimum acceptable grid voltage for the installed inverters. When selecting Vgrid Min. rows 1 to 4: • V - minimum voltage [V] • ms - trip time, in milliseconds. The trip time indicates the time after which the inverter should disconnect from the grid if the grid voltage is out of range. The row "Vgrid Min 5" is a special protection setting that tracks the running mean value of the grid voltage measurements. The time (in milliseconds) defines the time window over which the measurements are averaged. If the averaged value is less than the voltage threshold, the inverter shall trip in less than 100 milliseconds. Tap on the **Edit** button to modify the thresholds.
Fgrid Max.	Maximum acceptable grid frequency for the installed inverters. • F - maximum frequency [Hz] • ms - trip time, in milliseconds. The trip time indicates the time after which the inverter should disconnect from the grid if the grid frequency is out of range. Tap on the **Edit** button to modify the thresholds.
Fgrid Min.	Minimum acceptable grid frequency for the installed inverters. • F - minimum frequency [Hz] • ms - trip time, in milliseconds. The trip time indicates the time after which the inverter should disconnect from the grid if the grid frequency is out of range. Tap on the **Edit** button to modify the thresholds.
Grid Monitoring Time (GRM)	The required number of milliseconds during which the voltage and frequency return to the threshold range before the inverter can reconnect to the grid.

4.   Tap on the **Done** button to save the modified settings.

Viewing and Modifying Grid Protection Settings using the Inverter Display

You can use the inverter display to view and set grid protection values.

> **NOTE**
>
> It is highly recommended to ensure that all the inverters at the site have CPU version 3.22xx or 3.24xx and above (but not version 4.x.xxx). For inverters with CPU version 4.x.xxx, refer to the SetApp use guidelines in the previous section). If required, upgrade the CPU software. To check the CPU version, see the section: *Checking an Inverter Communication Board Firmware (CPU) Version*.

Checking an Inverter Communication Board Firmware (CPU) Version

→ **To check a communication board firmware (CPU) version:**

1. Short-press the LCD light button until the following screen is displayed:

```
I D : # # # # # # # #   # #
D S P 1 / 2 : x . x x x x / x . x x x x
C P U : 0 0 0 3 . 1 6 0 0
C o u n t r y : X X X X X
```

2. Check the CPU version number. If required, upgrade the inverter software as described in the application note:
   Software Upgrade using SD/MicroSD Card

Viewing and Modifying Grid Protection Settings

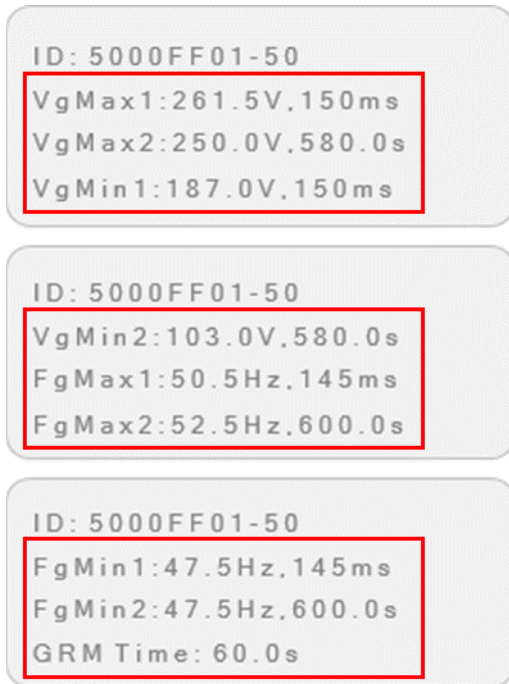→ **To view grid protection values via the inverter display:**

1. Enter Setup mode: Press and hold down the LCD light button located at the bottom of the inverter, and release after 5 seconds; the various inverter menu screens are displayed.

2. Short-press the LCD light button to toggle between the menu screens.

3. Long press to select **Maintenance -> Grid Protection**

```
D a t e   a n d   T i m e
R e s e t   C o u n t e r s
F a c t o r y   R e s e t
S W   U p g r a d e   S D - C a r d
A F C I   < E n >
M a n u a l   A F C I   T e s t
D i a g n o s t i c s
O p t i m i z e r   C o n f .
G r i d   P r o t e c t i o n
E x I t
```

The Grid Protection menu is displayed:

```
V i e w
S e t
```

4. Select **View**. A list showing the inverter's grid protection values is displayed. Each press on the external LCD light button rotates the parameters displayed on the screen in sequence, as shown in the example below:

```
ID: 5000FF01-50
VgMax1:261.5V.150ms
VgMax2:250.0V.580.0s
VgMin1:187.0V.150ms
```

```
ID: 5000FF01-50
VgMin2:103.0V.580.0s
FgMax1:50.5Hz.145ms
FgMax2:52.5Hz.600.0s
```

```
ID: 5000FF01-50
FgMin1:47.5Hz.145ms
FgMin2:47.5Hz.600.0s
GRM Time: 60.0s
```

The grid protection parameters are described in the table below:

Setting	Description
ID	The inverter serial number, which appears as a header in the sequential screens.
Vg<min, max> <1, 2>	The minimum and maximum grid voltage thresholds (in volts) and the trip time in milliseconds or seconds. The trip time indicates the time after which the inverter should disconnect from the grid if the grid voltage is out of range.
Fg<min, max> <1, 2>	The minimum and maximum grid frequency thresholds (in Hz) and the trip time in milliseconds or seconds. The trip time indicates the time after which the inverter should disconnect from the grid if the grid frequency is out of range.
GRM Time	Grid monitoring time - the duration (in seconds) that the grid voltage and frequency must be within the above-defined ranges before the inverter can reconnect to the grid. For example, if the GRM time is set to 60 seconds, the inverter checks that the grid is within the voltage and frequency ranges for 60 seconds before reconnecting to the grid.

→ **To set grid protection values via the SolarEdge inverter display:**

Setting the values requires entering a password, using the internal user buttons. This procedure involves opening the inverter cover.

1. Contact your SolarEdge support representative to obtain this password.

2. Open the inverter cover as described in your SolarEdge Inverter's Installation Guide.

⚠ WARNING!
ELECTRICAL SHOCK HAZARD. Do not touch uninsulated wires when the inverter cover is removed.

3. Enter Setup mode as described in your SolarEdge Inverter's Installation Guide.

4. Select **Maintenance -> Grid Protection ->Set.** A screen requiring a password is displayed:

```
Please enter
Password
```

5. Enter the password provided by your SolarEdge support representative. The grid protection value setting menu is displayed:

```
VgMax1<261V,150ms>
VgMax2 <250V,580s>
VgMin1<187V,150ms>
VgMin1 <103V,580s>
FgMax1<50Hz,145ms>
FgMax2 <100Hz,600s>
FgMin1<47Hz,145ms>
```

6. Select one of the entries, for example, "VgMax1". A screen showing the grid protection value and the Hold Time (trip time) is displayed:

```
VgMax1 <261.5V>
Hold Time <150ms>
```

7. Set the required values. For example:

- ◤ VgMax1: 372.45V

- ◤ Hold Time : 1.12 seconds

```
VgMax1
[V]
372.45
```

```
VgMax1
[ms]
1120
```

Viewing and Modifying Grid Protection Settings using the Monitoring Platform

You can set grid protection values, or restore defaults.

This feature is available via the Monitoring Platform for the supported inverter CPU versions listed below, when the inverter country setting is set to one of the supported countries. To enable this feature for your account, contact your SolarEdge support representative.

- For inverters with LED display: 3.22xx or 3.24xx and above.
- For inverters with SetApp: 4.45.xxx and above.

If all inverters at the site do not have the required CPU version, the feature will be disabled. If at least one of the inverters at the site has the required CPU version, the feature will be enabled and grid settings will be saved in the supported inverters.

Accessing Grid Protection Settings

→ **To access the grid protection settings:**

1. Log in to the monitoring platform (monitoring.solaredge.com) using your user name and password.

2. In the main window in the **Site Name** column click the required site name.


3. Click on the ⚙ Admin icon and then click on **Grid Settings**. The Dashboard view appears.

Setting Grid Protection Values

→ **To set grid protection values:**

1. Access the Grid Settings tab.

2. Select **Apply custom grid settings.** The Grid Protection Values table appears. The values displayed in the table are the current grid protection values that were retrieved from all inverters on site.

Application Note - Viewing and Setting Inverter Grid Protection Values
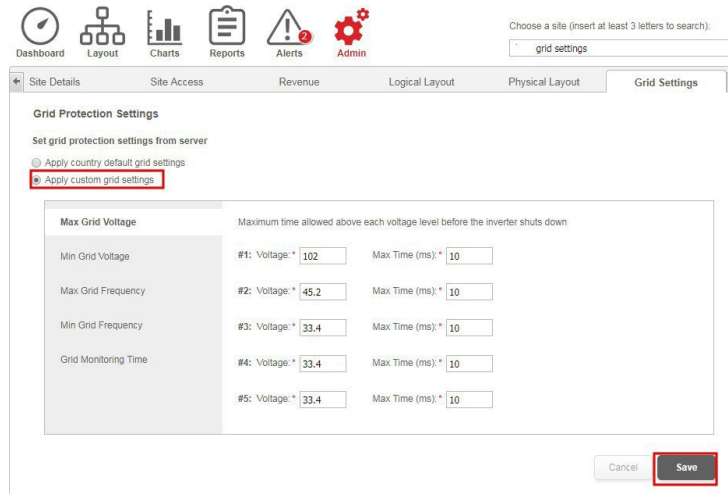
3. Set the required grid protection values then click **Save:**
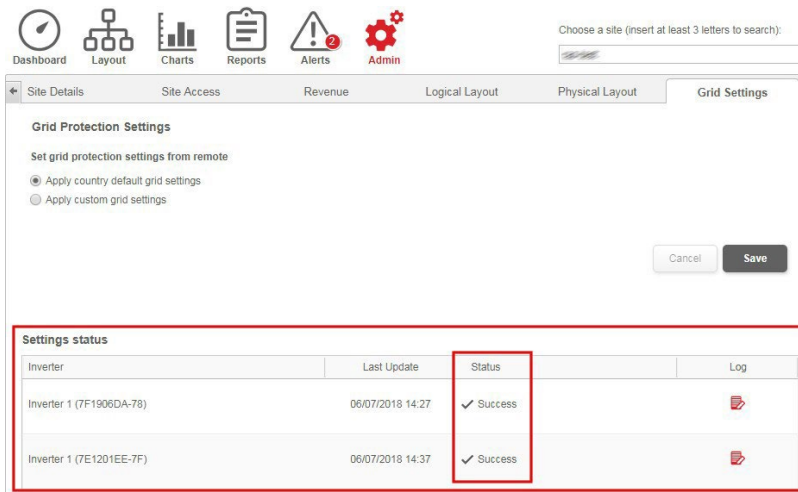
    ◾ Voltage - between 0-400 Volt, 0.1V accuracy

    ◾ Frequency - 40-70Hz, 0.01Hz accuracy

    ◾ Time - 10-600000 milliseconds

    > **NOTE**
    > If required, click **Cancel** to return to the previously set grid protection values.

4. A confirmation message appears. Click **Yes.** The **Settings Status** table appears.

5. Check the **Status** column in the Inverter **Settings Status** table to ensure the change was successful for all inverters at the site. The status types are:

    ◾ **Success** - grid settings were successfully applied.

    ◾ **Pending** - grid settings update is in process.

    ◾ **Failed** - grid settings were not applied. Click **Retry,** and if the operation fails again, contact your SolarEdge support representative.

    ◾ **No communication** - no communication between the inverter and the Monitoring Platform.

    ◾ **Not Supported** - the inverter CPU version is 3.23xx or lower than 3.22xx, to enable this feature for this inverter upgrade its CPU version. For more information, see the section: *Checking an Inverter Communication Board Firmware (CPU) Version*.

Restoring Default Grid Protection Values

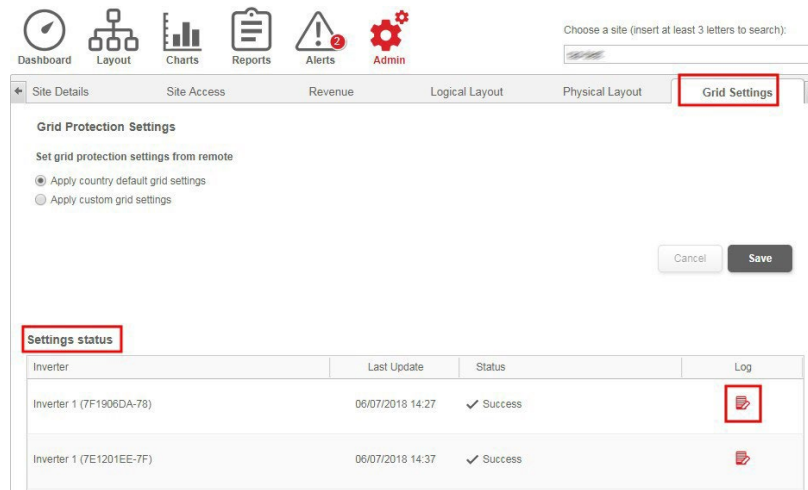→ **To restore default grid protection values:**

1. Access the Grid Settings tab.

2. If no changes were made (locally or remotely), the default country settings are used. If changes were made, you can restore country default grid settings by selecting **Apply country default grid settings** and clicking **Save.**

Viewing Event Logs

In the event log, you can view whether grid protection values are default or custom, as well as the grid protection value status.

→ **To view an event log:**

1. In the **Grid Settings** tab, in the **Settings status** table click the Log icon 📝 of the inverter which settings log you want to view. The Settings log appears.

Safety Symbols Information

The following safety symbols are used in this document. Familiarize yourself with the symbols and their meaning before installing or operating the system.

⚠️ **WARNING**

Denotes a hazard. It calls attention to a procedure that, if not correctly performed or adhered to, could result in **injury or loss of life**. Do not proceed beyond a warning note until the indicated conditions are fully understood and met.

△ **CAUTION!**

Denotes a hazard. It calls attention to a procedure that, if not correctly performed or adhered to, could result in **damage or destruction of the product**. Do not proceed beyond a caution sign until the indicated conditions are fully understood and met.

💬 **NOTE**

Denotes additional information about the current subject.

🔍 **IMPORTANT SAFETY FEATURE**

Denotes information about safety issues.

Disposal requirements under the Waste Electrical and Electronic Equipment (WEEE) regulations:

🗑️ **NOTE**

Discard this product according to local regulations or send it back to SolarEdge.

Support Contact Information

If you are having technical problems concerning SolarEdge products, please contact us:

https://www.solaredge.com/service/support

Before contacting SolarEdge, make sure to have the following information at hand:

- The model and serial number of the product in question.
- The error indicated on the LEDs, the SetApp mobile application, the LCD screen, or on the monitoring platform, if there is such an indication.
- System configuration information, including the type and number of modules connected and the number and length of strings.
- The method of communications with the SolarEdge server, if the site is connected.
- The product's software version as it appears in the ID status screen.

To view YouTube videos for installing, wiring, and commissioning SolarEdge Inverters please click the links or scan the following QR codes:

For more information on Installation:
https://youtu.be/pjuo7KjRHXc

For more information on Wiring:
https://youtu.be/o_EgCnL_r38

For more information on Commissioning:
https://youtu.be/_JoiC4_H8sk