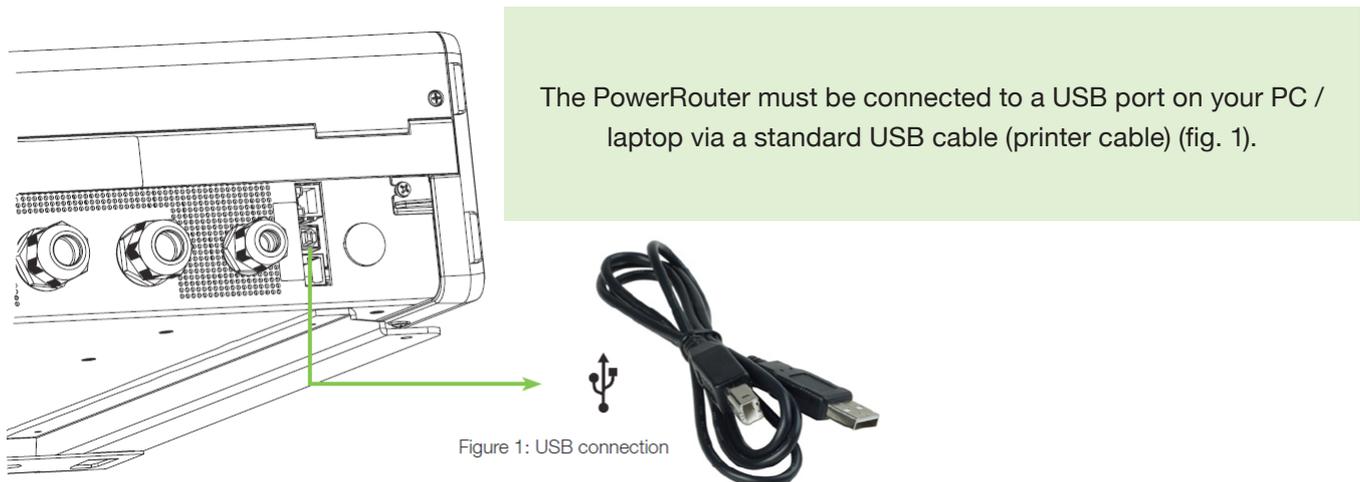

PowerRouter application guideline

Software installation tool - version 3.4

Before operating the PowerRouter, you may initialize the PowerRouter by using the PowerRouter software installation tool. The PowerRouter software installation tool helps you to initialize the PowerRouter but also allows you to make advanced settings and update the PowerRouter firmware, if applicable.

To help you properly install the PowerRouter via the installation tool, we have compiled this helpful application guideline. This guideline explains the options and guides you through the procedures for using the installation tool. Following these steps will ensure proper installation and allow you to quickly and easily connect the PowerRouter with the correct settings.



Prior to start-up

Before you can use the installation tool you must install the software installation tool on your computer. You may download the installation tool from the website: www.PowerRouter.com (you will need your login details for this website). The software installation tool can be used to configure PowerRouters with firmware version 4.0 and higher. If a PowerRouter with an older firmware version is detected, the installation tool will only allow you to update the PowerRouter. The installation tool already includes the latest available firmware version so no additional downloads are required.

System requirements

The installation tool is compatible with the following operating systems:

Operating systems:

- > Windows XP (service pack 3)
- > Windows Vista
- > Windows 7

Minimum requirements for processor and other hardware:

- > Pentium III 800 MHz or equivalent
- > 128 MB RAM
- > 200 MB free hard disk space
- > Resolution of 1024 x 768 pixels

1 Installation - basic settings

To install the installation tool, start the «setup_installtool.exe» file which you have to download from the PowerRouter site and follow the instructions.

Note: You can click the “?” icon in the upper-right corner at any time for help

1.1 Select language

When you start the installation tool the first time, you will be asked to set your language. Select your preferred language and continue.



Figure 2: Select language

1.2 Detect PowerRouter

You can configure a new system using the installation wizard. The wizard automatically detects whether you are connected to a new PowerRouter system. The wizard guides you through the minimal required settings to get your PowerRouter operational.

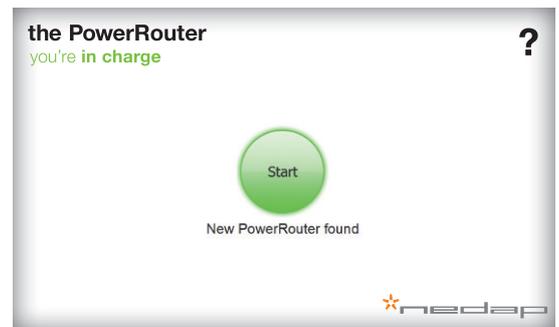


Figure 3: Detect PowerRouter

1.3 Select scenario

This step indicates the pre configured scenario of the installed PowerRouter. This allows you to verify if you have the correct PowerRouter installed. There are 3 scenarios:

1. “Feed-in” scenario
2. “Backup” scenario
3. “Self-use scenario

Note: The scenario may only be changed for specific systems.

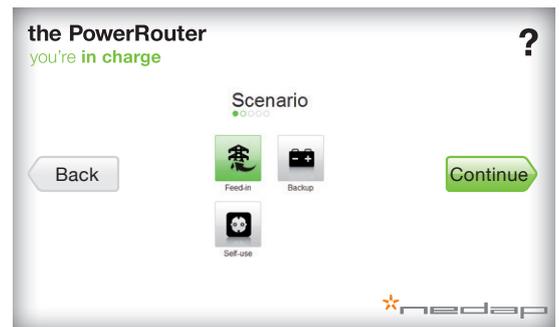


Figure 4: Scenario

1.4 Select country

Select the country in which the system will be installed. Country-specific grid validation settings will be programmed automatically, such as:

Anti-Islanding – Frequency and voltage connect and disconnect values

Active power regulation – Reactive power and power increase curves

1.5 Select display text & language

Configure the status parameters to be shown on the four lines of the system display and the language of the display. The values which are shown are the actual system display settings. Select the status parameter to be shown on each line of the display via the dropdown menu.

1.6 Select battery

Select and configure the connected battery. Select “not configured” if you are installing a system with no batteries connected at the moment. When you install a battery, enter capacity/max DOD (depth of discharge) and DOD self-use.

Capacity (C10)

Enter the capacity in Ah/C10. When no C10 rating (capacity value of the battery discharged in 10 hours) is available, use the rating which is closest to C10. The capacity can be found on the battery itself or on the battery specification sheet.

Maximum depth of discharge (DOD) - backup

Enter the maximum depth of discharge allowed during a grid failure. This defines the percentage of the battery capacity that is used for backup purposes. For backup it is common to use as much of the available battery capacity as possible, to increase the available backup time. Deeply discharging a battery on a frequent basis reduces its service life considerably. So if the installation location is subject to frequent grid failures it is suggested that you configure a lower maximum depth of discharge to increase the battery service life (default is 100%).

Max depth of discharge (DOD) - self-use

Select the percentage of daily discharge of the battery to increase self-consumption of your generated energy. The battery will be discharged to this percentage on a daily basis. For lead-acid batteries a maximum depth of discharge of 50% is advised. A lower percentage will increase the service life of the batteries. When all the basic settings have been made, press “Install”. The configuration will be written to the PowerRouter and the system will reset to activate the configuration.

Caution: When battery settings are changed via the basic settings screen, custom settings will be lost.

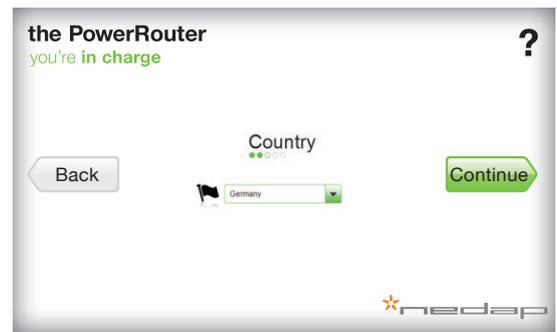


Figure 5: Country setting

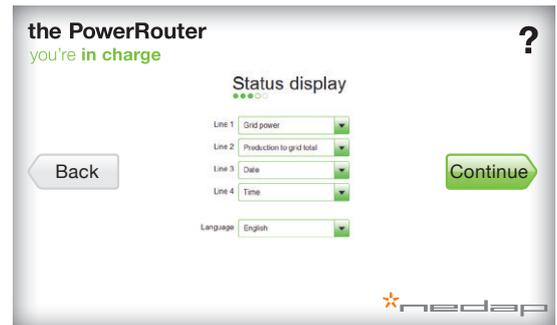


Figure 6: Parameters display

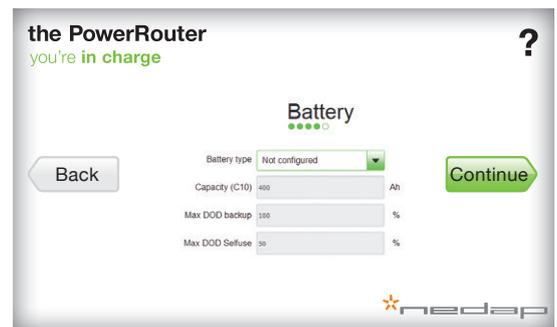


Figure 7: Battery selection

2 Dashboard

The main panel of the installation tool is a dashboard that provides you information about the current status of the PowerRouter. Advanced settings can be made via the drop-down menu that opens when you hover over the word “Advanced” in the upper-right corner.

Hover over the icons and a mouse-over status panel will appear with additional information as explained below:



Grid

- > Module status: shows the status of the AC module in the system. Only intended for diagnostics during service.
- > Grid voltage: shows the current grid voltage.
- > Frequency: shows the current grid frequency.
- > Grid Power: shows the output power of the grid module.
- > 5 latest grid disconnection events



Solar

- > Module status: shows the status of the system’s internal solar module. Only intended for diagnostics during service.
- > Voltage and current of each solar string at this moment.



Local out

- > Module status: shows the status of the system’s AC module. Only intended for diagnostics during service.
- > Voltage island mode: shows the current local out voltage.
- > Frequency: shows the local out frequency.
- > Local power: shows the actual load on local out.



Battery

- > Module status: shows the status of the system’s internal battery module. Only intended for diagnostics during service.
- > Battery type: shows battery type.
- > Autonomy time: shows autonomy time at the current rate of power consumption.
- > State of charge: shows the current battery charge level, in %.
- > Voltage: shows battery voltage.
- > Current: shows battery current (Negative values are charging, positive values are discharging).
- > Pack Temperature: shows reading from battery temperature sensor (should be mounted at positive battery clamp).



Internet

- > MAC address: shows the system’s MAC address.
- > IP address: shows the system’s IP address.
- > Primary DNS: shows the system’s Primary DNS.
- > Secondary DNS: shows the system’s Secondary DNS.
- > Gateway: shows the system’s Gateway.
- > Status: shows the actual status of the internet connection with the PowerRouter.

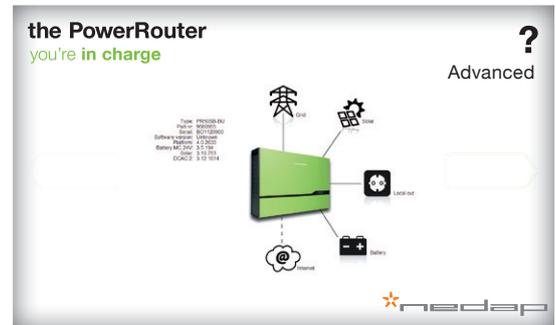


Figure 8: Dashboard

Advanced settings

Via the advanced menu you can:

- I. Change the system configuration via “Settings”
- II. Restart the installation wizard via “Reinstall”
- III. Reset “Factory settings”
- IV. “Check for updates” (installation tool and firmware)
- V. “Update firmware”
- VI. “Create report” of the system configuration
- VII. Change the “Language” of the installation tool

I. Settings

It is possible to configure each system feature in order to optimize the installation. Settings that have been changed are marked with an orange star. Changed settings are only applied to the system after pressing “install and reset”. This will write the changed settings to the system and reset it to activate the new configuration.

Display - configuring the system display



Backlight

When auto mode is selected the display will switch off after it has not been used for two minutes. When always on is selected the display will never switch off.



Display

Configure the status parameters to be shown on the four lines of the system display and the language of the display. Values shown are the actual system display settings. Select the status parameter to be shown on each line of the display via the dropdown menu.



Language

Select the system language. The menu and display interface will be set to the language you choose here. You will not set any country settings. The display language can be set to:

- > English
- > Dutch
- > German
- > French
- > Italian

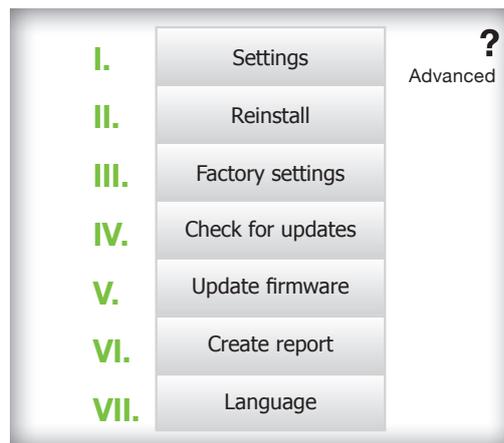


Figure 9: Advanced menu

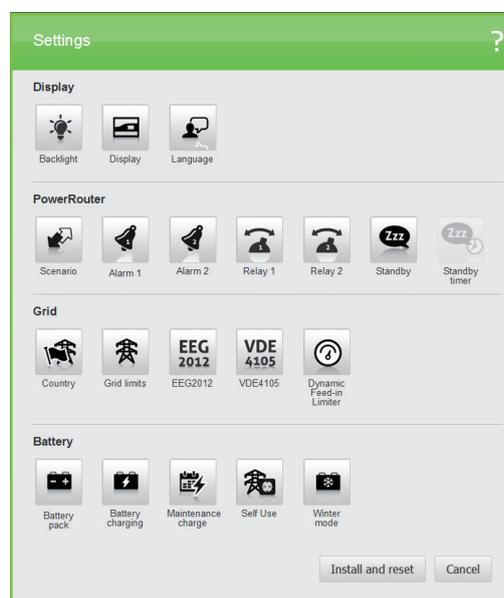


Figure 10: Settings

PowerRouter - configuring general system settings



Scenario

The scenario defines the intended use of the system. Only for specific systems it is possible to change the scenario.

- > In the “Feed-in” scenario the system will feed all its energy back to the grid.
- > In the “Backup” scenario the system will first charge the batteries. The surplus will be sent to the grid.
- > In the “Self-use” scenario the system will first send the available energy, both battery and solar, to the grid load. Surplus solar energy will first be used to charge the battery then be sent to the grid.



Alarm 1 / 2

Generates an alarm notification. This notification can be assigned to a user-selectable relay. These alarms are based on selected system conditions. To assign the alarm to a user-selectable relay, please configure relay K201 or K202 via a separate configuration option. The following system conditions are available:

None

Alarm is not used (default).

Grid voltage

Set trip level to activate the alarm based on the actual grid voltage.

- > Activate trip limit: when the grid voltage is outside this range, the alarm will be activated.
- > Deactivate trip limit: when the grid voltage is inside this range, the alarm will be deactivated.
- > Activation delay: delay time in seconds before the alarm will be activated (between 0 and 100 seconds).
- > Deactivation delay: delay time in seconds before the alarm will be deactivated (between 0 and 100 seconds).
- > Maximum active time: maximum time in minutes that the alarm can be activated (between 0 – 720 minutes).
- > Minimum active time: minimum time in minutes that the alarm can be activated (between 0 – 720 minutes).

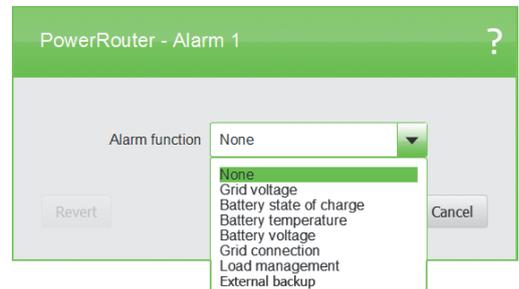


Figure 11: Alarm 1 / 2

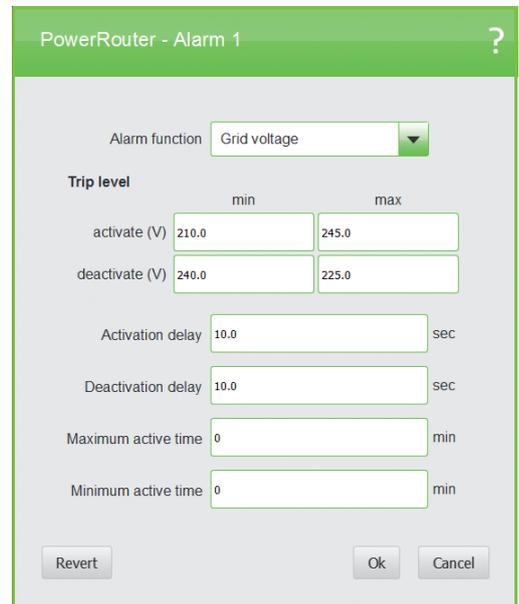


Figure 12: Grid voltage

Battery state of charge

Set trip level to activate the relay based on the actual battery state of charge (SOC):

- > Activate alarm if SOC is below a given percent.
- > Deactivate if SOC is above a given percent.
- > Activation delay: delay time in seconds before the alarm will be activated (between 0 and 100 seconds).
- > Deactivation delay: delay time in seconds before the alarm will be deactivated (between 0 and 100 seconds).
- > Maximum active time: maximum time in minutes that the alarm can be activated (between 0 – 720 minutes).
- > Minimum active time: minimum time in minutes that the alarm can be activated (between 0 – 720 minutes).

Battery temperature

Set trip level to activate the relay based on the actual battery temperature:

- > Alarm temperature: set a value between 45 and 60 degrees Celsius above which the alarm will be activated.
- > Safe temperature: set a value between 30 and 50 degrees Celsius under which the alarm will be deactivated.
- > Activation delay: delay time in seconds before the alarm will be activated (between 0 and 100 seconds).
- > Deactivation delay: delay time in seconds before the alarm will be deactivated (between 0 and 100 seconds).
- > Maximum active time: maximum time in minutes that the alarm can be activated (between 0 – 720 minutes).
- > Minimum active time: minimum time in minutes that the alarm can be activated (between 0 – 720 minutes).

Battery voltage

Set trip level to activate the relay based on the actual battery voltage:

- > Low voltage: set the low voltage under which the alarm will be activated.
- > Safe voltage: set the alarm deactivation voltage over which the alarm will be deactivated.
- > Activation delay: delay time in seconds before the alarm will be activated (between 0 and 100 seconds).
- > Deactivation delay: delay time in seconds before the alarm will be deactivated (between 0 and 100 seconds).
- > Maximum active time: maximum time in minutes that the alarm can be activated (between 0 – 720 minutes).
- > Minimum active time: minimum time in minutes that the alarm can be activated (between 0 – 720 minutes).

The screenshot shows the 'PowerRouter - Alarm 1' configuration window. The 'Alarm function' is set to 'Battery state of charge'. The 'Activate if SOC <' is set to 40%. The 'Deactivate if SOC >' is set to 80%. The 'Activation delay' is 10.0 sec. The 'Deactivation delay' is 10.0 sec. The 'Maximum active time' is 0 min. The 'Minimum active time' is 0 min. There are 'Revert', 'Ok', and 'Cancel' buttons at the bottom.

Figure 13: Battery state of charge

The screenshot shows the 'PowerRouter - Alarm 1' configuration window. The 'Alarm function' is set to 'Battery temperature'. The 'Alarm temperature' is 50.0 °C. The 'Safe temperature' is 45.0 °C. The 'Activation delay' is 10.0 sec. The 'Deactivation delay' is 10.0 sec. The 'Maximum active time' is 0 min. The 'Minimum active time' is 0 min. There are 'Revert', 'Ok', and 'Cancel' buttons at the bottom.

Figure 14: Battery temperature

The screenshot shows the 'PowerRouter - Alarm 1' configuration window. The 'Alarm function' is set to 'Battery voltage'. The 'Low voltage alarm' is 22.0 V. The 'Safe voltage' is 24.0 V. The 'Activation delay' is 10.0 sec. The 'Deactivation delay' is 10.0 sec. The 'Maximum active time' is 0 min. The 'Minimum active time' is 0 min. There are 'Revert', 'Ok', and 'Cancel' buttons at the bottom.

Figure 15: Battery voltage

Grid connection

This setting will trip the relay in the event of a grid failure:

- > Alarm on: choose the alarm to be activated when grid connected or disconnected.
- > Activation delay: delay time in seconds before the alarm will be activated (between 0 and 100 seconds).
- > Deactivation delay: delay time in seconds before the alarm will be deactivated (between 0 and 100 seconds).
- > Maximum active time: maximum time in minutes that the alarm can be activated (between 0 – 720 minutes).
- > Minimum active time: minimum time in minutes that the alarm can be activated (between 0 – 720 minutes).

Load management

Select conditions to switch on or off additional loads:

- > Connected load: define how much power is connected as additional load to be switched on, in watts.
- > Activate on load support: activates if the percentage of the defined power of the load is available as an energy surplus.
- > Deactivate on load support: deactivates if the available surplus is below a coverage of a % set between 20 and 200%.
- > Activation delay: delay time in seconds before the alarm will be activated (between 0 and 100 seconds).
- > Deactivation delay: delay time in seconds before the alarm will be deactivated (between 0 and 100 seconds).
- > Maximum active time: maximum time in minutes that the alarm can be activated (between 0 – 720 minutes).
- > Minimum active time: minimum time in minutes that the alarm can be activated (between 0 – 720 minutes).

To use the load management application this alarm must be linked to an external user-selectable relay.

PowerRouter - Alarm 2

Alarm function: Grid connection

Alarm on: When grid connected

Activation delay: 10.0 sec

Deactivation delay: 10.0 sec

Maximum active time: 0 min

Minimum active time: 0 min

Revert Ok Cancel

Figure 16: Grid connection

PowerRouter - Alarm 1

Alarm function: Load management

Connected load: 500 W

Activate on load support: 100 %

Deactivate on load support: 20 %

Activation delay: 10.0 sec

Deactivation delay: 10.0 sec

Maximum active time: 0 min

Minimum active time: 0 min

Revert Ok Cancel

Figure 17: Load management

External backup

Use this alarm for triggering the external backup relay. This external relay is used to switch loads to the local out when the grid connection fails.

- > Activation delay: delay time in seconds before the alarm will be activated (between 0 and 100 seconds).
- > Deactivation delay: delay time in seconds before the alarm will be deactivated. (between 0 and 100 seconds).
- > Maximum active time: maximum time in minutes that the alarm can be activated (between 0 – 720 minutes).
- > Minimum active time: minimum time in minutes that the alarm can be activated (between 0 – 720 minutes).

To use the external backup application this alarm must be linked to an external user-selectable relay.



Relay K201/K202

When you have set alarm 1/2, you can then set the two user-selectable relays (K201 and K202).

- > Alarm: select alarm to activate this user-selectable relay.
- > Set relay signal type
- > Normal (default): user-selectable relay is activated when switched on.
- > Pulse: activates the user-selectable relay for a defined duration of between 1 and 10 seconds when switched on, for example a start signal or a short ringing signal.



Standby

When “standby allowed” is activated, the system will go into standby mode when there is no solar power or battery power available. In standby mode, the system consumes a minimum amount of energy. Local out will also be without power in standby, and no emergency power is available.



Standby timer

When “standby timer” is enabled, you can set a time interval during which the system is forced to remain in standby. Example: The load during the night is very low, so the dissipation in the system is high compared to the load that is compensated. In that case you force the system into standby during that period.

Note: If a grid failure occurs while the system is in standby, the system will switch to backup operation.

Figure 18: External backup

Figure 19: Relay K201/K202

Grid - configuring grid related settings



Country

Select the country in which the system will be installed. Country-specific grid validation settings will be programmed automatically, such as:

- Anti-Islanding – Frequency and voltage connect and disconnect values
- Active power regulation – Reactive power and power increase curves



Grid limits

When enabled, country specific settings can be overruled. This is only allowed with specific permission from the energy contractor.

Italy only: When the country is set to Italy, the grid frequency limits can be set to locally controlled tight or loose limits (.S2 and .S3). These limits are set by selecting custom limits with local control enabled.



EEG 2012*

When enabled, the system complies with the EEG2012 regulations (in Germany) by limiting its grid output power to 70% of nominal power by default. The limitation can be optimized by entering the installed solar power capacity. The system will then limit its AC output to 70% of the installed solar power capacity.

For the German Battery Subsidy KfW, you should enter 60% limit of grid power in order to be compliant with the subsidy rules.



Active Power Regulation**

Here you can change the reactive power settings as required by your local utility company, when deviating from the standard reactive power curve.

*Note: This setting is only applicable when the PowerRouter is installed in Germany.

**Note: This setting is only applicable when the PowerRouter is installed in Germany or Italy.

Figure 20: Country

Figure 21: Grid limits

Figure 22: EEG2012

Figure 23: Active Power Regulation



Dynamic feed-in limiter

Set the max. output power to the grid. With the external grid sensor is connected, the power is limited at the point of feed-in, otherwise it is limited to the output power of the inverter.

Grid current sensor

Set the configuration of the grid current sensor. If the sensor is not installed, then the Enable sensor checkbox should be disabled.

In some rare occasions the automatic sensor detection is not working properly, for example when multiple solar inverter are installed. When you are sure that the sensor is installed properly, then the Enable sensor detection could be deselected. It is advised to try at least one time the sensor detection allowing the PowerRouter to display the correct settings of the Sensor type, Sensor phase and sensor direction.

Note: When the sensor detection is disabled and the sensor is installed incorrectly, this will cause problems for the PowerRouter and could result in problems with the operation of the system. Ultimately it could result in no self use at all.

Grid current limiter

Set the maximum current to the grid from 0-25A. This is a static value and can be disabled to allow maximum current. For example, if your PowerRouter is installed with a 16A fuse, then you can limit the current to 16A.

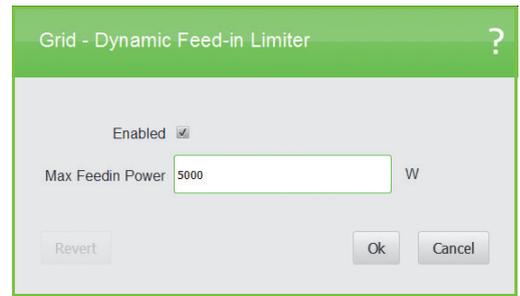


Figure 24: Dynamic feed-in limiter

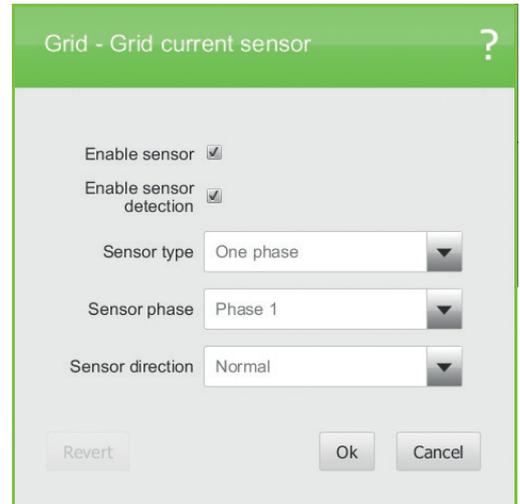


Figure 25: Grid sensor



Figure 26: Grid current limit

Battery - configuring battery specific settings

Note: Check the final page of this document for the Nedap recommended battery settings



Battery pack

Select and configure the connected battery. Select not configured if you are installing a system without batteries. When you install a battery, enter the capacity/max DOD.

- > Capacity (C10): Enter the capacity in Ah/C10. When no C10 rating is available, take the rating which is closest to C10. The capacity can be found on the battery itself or on the battery specification sheet (capacity value of the battery discharged in 10 hours).
- > Maximum depth of discharge (DOD): Enter the maximum depth of discharge allowed during a grid failure. This defines the percentage of the battery capacity that is used for backup purposes. For backup it is common to use as much of the available battery capacity as possible, to increase the available backup time. Deeply discharging a battery on a frequent basis reduces its service life considerably. So if the installation location is subject to frequent grid failures it is suggested that you configure a lower maximum depth of discharge to increase the battery service life (default is 100%).

Note: Connecting the batteries in series does not increase the number of Ah! The Ah of the individual batteries may only be added together when the batteries are connected in parallel.

A screenshot of a software window titled "Battery - Battery pack" with a question mark icon in the top right corner. The window contains three input fields: "Battery type" is a dropdown menu showing "24 V lead acid"; "Capacity (C10)" is a text box containing "400" with "Ah" to its right; "Max DOD backup" is a text box containing "100" with "%" to its right. At the bottom of the window are three buttons: "Revert", "Ok", and "Cancel".

Figure 27: Battery pack



Charge mode

The three-stage charging mode is the default setting and is recommended for most operations. The battery is charged in three stages, which is a quick method of charging (when solar power is available we want the system to store it rather than feed it into the grid). The three stages are:

1. Bulk stage – charges the battery to 70-80% of its capacity at maximum charging current and with increasing voltage.
2. Absorption stage – charges the battery to 85-90% of its capacity at the absorption voltage.
3. Float stage – tops off the charge to 100% of the battery capacity, with low current and float voltage.

The current and voltage values you should enter here can be found on the battery data sheet. For proper operation it is essential that these values are set correctly. Incorrect settings can damage the batteries!

Bulk and absorption voltages are identical and are shown in the installation tool as “Absorption”.

At fixed float, the batteries are charged with a constant voltage. This can be used in a backup application where batteries may be charged over a long period of time.



Maintenance

During every charge/discharge cycle the SOC value (state of charge) of a battery becomes less accurate. For good battery management the system needs to calibrate 100% SOC with the batteries fully charged on a regular basis. To optimize their service life, batteries should also be protected against operation that prevents them from becoming fully charged. During maintenance charge the system will give priority to charging the batteries with the solar power, and it can take a maximum three days to fully charge the batteries. When an SOC of 100% is reached the system will go in normal mode again. During winter mode, maintenance charging will be performed. The default and recommended setting is once every three weeks.

Note: This option is only available in a “self use” scenario.

Figure 28: Charge mode

Figure 29: Maintenance



Self-use

With this setting you can set specify battery settings for self-use optimization.

- > Max. depth of discharge. to the default setting is 50%; this value is preferable for daily use. The battery will not be discharged beyond 50%. The number of charging cycles that lead batteries can undergo before reaching the end of their service life decreases with the depth of discharge. 50% is recommended as a default value, depending of the exact type of battery.
- > Support backup: if the local out is not used, you can disable this function. In that case the system will go to standby if the grid is down and the batteries are fully charged.
- > Limit battery to maximum discharge power: With the battery power limiter enabled, the system will not use the battery to feed peak loads. This provides extra protection for the battery.

Using a lower battery power for self-use compensation increases the lifetime of the batteries, because the batteries are not discharged as quickly. It also improves the self-use consumption percentage, since at lower discharge powers more energy can be extracted from the battery.

If the maximum discharge power is set too low, not all the available battery energy is used. In an ideal situation the maximum allowed depth of discharge should be reached at the end of the night.

When batteries are discharged at high power levels, voltage drops can occur. These can result in under-voltage errors and potentially damage the battery. Such voltage drops can be prevented by limiting the discharge power.



Winter mode

With the winter mode enabled, batteries will not be used during wintertime. This period can be defined by setting a start date and an end date. During the winter the solar power available is so limited that your batteries will most likely never become fully charged or are not used at all. Accordingly, batteries will be run at lower SOC levels or will remain discharged for weeks between the maintenance charging cycles. Not using the batteries during the winter will protect them against damage and will increase their service life. The maintenance charge mode remains active in order to keep the batteries fully charged.

Note: These options are only available in a "self use" scenario.

The screenshot shows a window titled "Battery - Self Use" with a question mark icon in the top right. The window contains the following settings:

- Max depth of discharge: 50 %
- Support backup:
- Limit battery:
- Max discharge power: 5000 W

At the bottom, there are three buttons: "Revert", "Ok", and "Cancel".

Figure 30: Self-use

The screenshot shows a window titled "Battery - Winter mode" with a question mark icon in the top right. The window contains the following settings:

- Enabled:
- Start date: 1 December
- End date: 1 February

At the bottom, there are three buttons: "Revert", "Ok", and "Cancel".

Figure 31: Winter mode

II. Reinstall

With this setting you can reinstall the PowerRouter system. Please be aware of the fact that when you reinstall the system you will lose the basic settings you already have entered. If you want to cancel the reinstallation, press “Cancel” in the upper-right corner of this tool.

Caution: It is recommended to only use this option for new installations.

III. Factory settings

This setting will put the factory settings to the hardware of the PowerRouter. This option is only to be used in case of a change of an internal component by a specially trained operator. This option will not affect any settings of the PowerRouter. Only hardware will be set to the basic factory settings in order work compatibly with the specific system.

IV. Check for updates

Check if there are updates available for your system. These updates include new versions of the system firmware, if available.

- > This action requires an Internet connection.
- > With this option the firmware will only be loaded into the tool.

V. Update firmware

This option allows you to update the firmware of the connected system. If a newer firmware version is available for your system, this will be indicated. You will be asked to confirm, and then the update will begin. A complete update can take up to 15 minutes depending on which modules will be updated. During this period the system will not be operational.

The installation tool already includes the latest firmware versions, so no internet connection is required to perform a system update. The following conditions must be met before starting an update:

- > The PowerRouter must be properly connected to the grid.
- > A battery must be connected to the battery module.

If these conditions are not met, starting an update will result in an incomplete update. In that case the system becomes unusable until the entire update is completed.

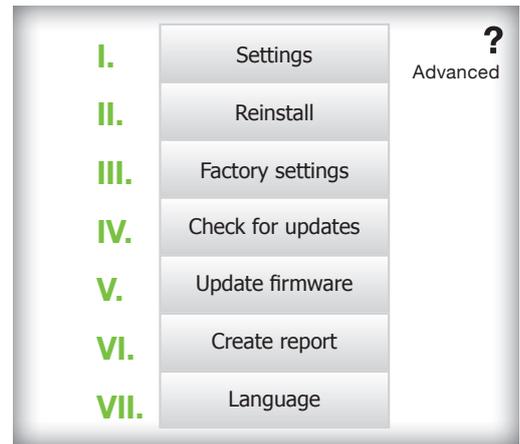


Figure 32: Advanced menu



Figure 33: Factory settings



Figure 34: Check for updates



Figure 35: Update firmware

VI.

Create Report

Create a .pdf report of the PowerRouter settings.

The “Installation description” screen should be filled in by the installer with actual information about the client, the installed solar panels, the installed batteries, the self use sensor and the installer. If these fields are left blank, they will be shown as blanks on the report.

This document can be used to:

- > Show that the system is correctly set as requested by the local energy company or rules
- > Have a record of your customer with the settings made in case of a future service issue
- > To communicate with a business partner or Nedap in case of service issues
- > For internal configuration control

For only Italian systems, the report will show the results of the most recently performed self test.

The report will also show all of the current configurations for the system on which the report is performed.

VII.

Language

Change the language of the installation tool.

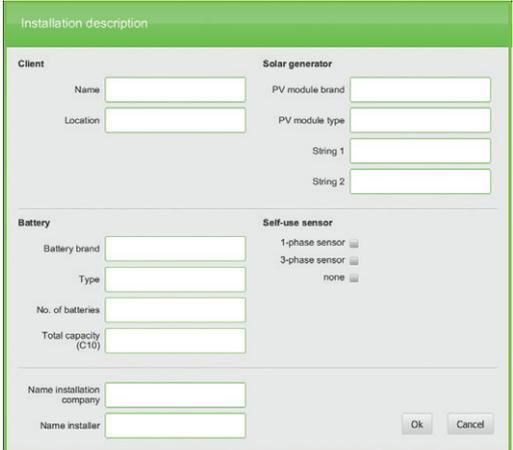


Figure 36: Create report

Once all the settings are completed, the PowerRouter is ready to function properly and ready for use.

Supplement: Battery settings for the most common used battery types

Energys PowerSafe SBS

www.energys-emea.com

Battery type	Number of batteries	Battery pack size (C10 Ah)	Maximum charge current	Bulk voltage	Float voltage
SBS 190F	2x	190 Ah	47 A	28,8 V	27,5 V
	4x*	380 Ah	95 A		
* 2 batteries in series and 2 parallel strings					

HOPPECKE OPzV bloc Solar.power

www.hoppecke.com

Battery type	Number of batteries	Battery pack size (C10 Ah)	Maximum charge current	Bulk voltage	Float voltage
6V 4 OPzV 250	4x	205 Ah	41 A	28,8 V	27,0 V
6V 5 OPzV 300	4x	250 Ah	50 A		
6V 6 OPzV 370	4x	308 Ah	61 A		

BAE Secura PVV BLOCK Solar

www.bae-berlin.de

Battery type	Number of batteries	Battery pack size (C10 Ah)	Maximum charge current	Bulk voltage	Float voltage
6V 4 PVV 280	4x	229 Ah	45 A	28,2 V	27,0 V
6V 5 PVV 350	4x	286 Ah	57 A		
6V 6 PVV 420	4x	344 Ah	68 A		