

User Manual
sonnenBatterie eco Gen 2

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Dear sonnenBatterie Owner,

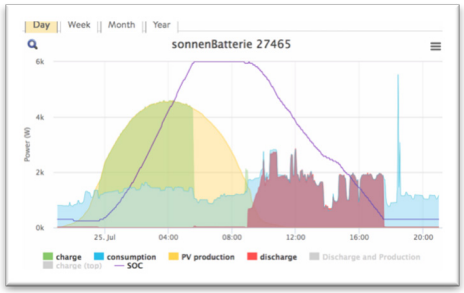
Welcome to the future of energy with your new sonnenBatterie smart energy management system. By adding a sonnenBatterie to your home, you are joining a **growing community of over 18,000 households around the world** who are using clean and reliable energy to power their lives.

Below are instructions on how to virtually access your sonnenBatterie system using the sonnen Web Portal and the sonnenApp. Your login information is:

Serial number	User name	Password *(Please keep your password confidential)*

The sonnenBatterie Web Portal

You can access our internet portal from any web browser. The portal shows the energy produced and consumed by your home and stored in your sonnenBatterie, throughout the day.



1. Go to https://my.sonnen-batterie.com/login
2. Enter the user name and password shown above
3. Use on screen tabs to navigate



The sonnenApp

With the sonnenApp, you can also use a smartphone or tablet to monitor your sonnenBatterie on the go.

1. Download the sonnenApp for Android or Apple
2. Create an account and select “Pair new sonnenBatterie” option
3. Enter the serial number and password above and "Pair now"
4. Use on screen options to navigate

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If you need help or service, contact the company that commissioned your storage system.

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About this manual

This manual describes the operation of the sonnenBatterie eco storage system. Read this manual carefully and keep it near the storage system.

Target audience

This document is intended for the following audience:

- End user of the storage system

Material damage

Attention

Possible material damages are indicated in this document with the warning word “Attention.”

Actions

Actions to be taken are marked with a ►. For example:

► Read this manually thoroughly before operating the storage unit.

Safety

Intended use

Any use of the system other than the intended use can cause serious injury, death, and damage to the product or other assets.

- The storage system must only be used to store electrical power.
- The storage system must only be used with the battery modules provided.
- The storage system is intended for indoor use only.
- The intended use includes knowledge and application of the information in this manual as well as all delivered product documentation.

Failure to comply with the warranty conditions and the information listed in this installation and operating manual will void any warranty claims.

Prohibited uses

Only authorized electrically qualified persons can perform work on electrical parts.

- Do not use the storage system in vehicles.
- Do not use the storage system in wet locations.
- Do not use the storage system in areas at risk of explosion (flour dust, sawdust, etc.).
- Do not expose the storage system to direct sunlight.
- Do not use the storage system in areas where the ammonia content of the air exceeds 20 ppm.
- Do not use the storage system when corrosive gases are present.
- Do not use the storage system higher than 9,842 feet (3,000 meters) above sea-level.
- Do not operate the storage system at temperatures outside of the allowed ambient temperature range of 41°F - 113°F (5°C - 45°C).
- Do not operate the storage system at a humidity higher than 90%.

General safety instructions

- Do not modify the storage system.
- Do not use the storage system if it has been damaged.
- Ensure that all safety systems are in perfect working order.
- Read this manual with care.

General warnings

Despite all of the care that goes into the design of the storage system, fires are still possible. A fire can release substances contained in the battery modules.

In the event of a fire in the storage system or its surroundings:

- Only fire fighters wearing proper protective clothing (including gloves, masks, and breathing apparatus) may enter the room with the burning storage system.
- A fire in the storage system can be extinguished by conventional agents.
- The use of water is advisable to cool the battery modules and thus prevent the thermal runaway of modules that are still intact.

If contents escape:

- Do not enter the room.
- Avoid contact with the escaping electrolyte.
- Contact your fire department.

Pertinent information on battery modules include:

- The battery modules have a rated voltage of 51.2 VDC and are thus in the range of protective extra-low voltage (below 60 VDC).
- The battery modules contain no metallic lithium.

Description and Specifications

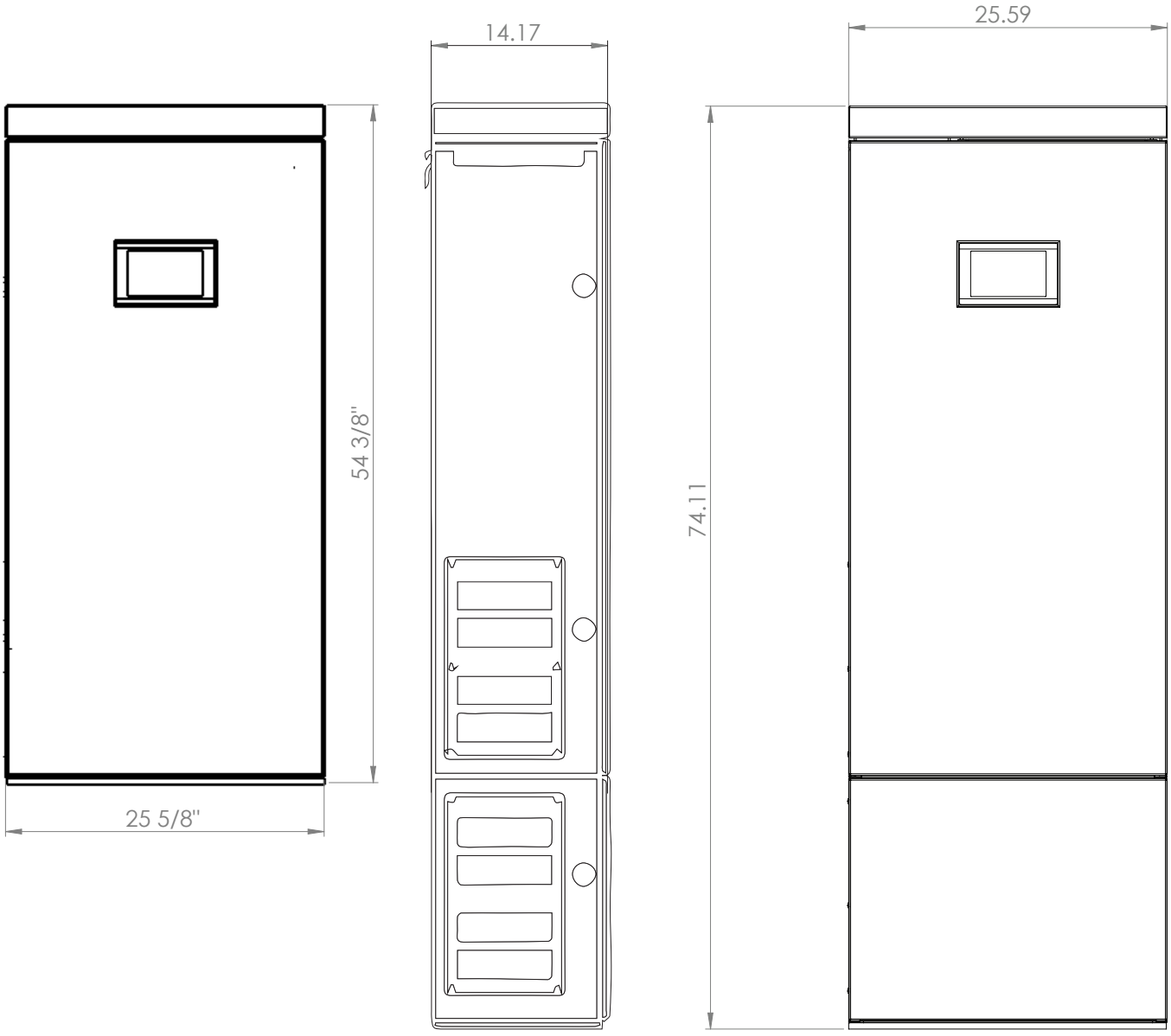
	eco 4	eco 6	eco 8	eco 10	eco 12	eco 14	eco 16
Usable capacity (100% DOD)	4 kWh	6 kWh	8 kWh	10 kWh	12 kWh	14 kWh	16 kWh
Continuous power output (at 25 deg C)	3kW	4kW	4kW	7kW	8 kW	8 kW	8 kW
Dimensions W"/H"/D" (approx.)	26x55x14	26x55x14	26x55x14	26x75x14	26x75x14	26x75x14	26x75x14
Weight (approx.)	377 lbs.	437 lbs.	496 lbs.	622 lbs.	683 lbs.	741 lbs.	800 lbs.
Nominal current		16.7A			33.3A		
Cell chemistry	Lithium iron phosphate ($LiFePo_4$)						
Nominal voltage	120/240VAC						
Device protection	Short circuit, overload, over temperature						
Ambient temperature	41°F - 113°F (5°C - 45°C)						
Maximum Humidity	90%, non-condensing						
Applications	Self-consumption, backup, time of use						
PV integration	AC coupled						

Specifications

Nominal AC current	12.5A	16.67A	16.67A	29.16A	33.33A	33.33A	33.33A
Max power	100 ms – 8.5KVA 5s – 6KVA 30m – 4.5KVA			100 ms – 16.97KVA 5s – 12KVA 30m – 9KVA			

	eco 4	eco 6	eco 8	eco 10	eco 12	eco 14	eco 16
General specifications							
Transfer switch	Automatic, integrated						
Backup capacity	2 kilowatt-hours per battery module, up to 16 kilowatt-hours						
Certifications	UL Recognized Components: Battery modules –UL1973; Inverter – UL1741; ATS – UL1008; AC Breaker – UL489; UL 9540						
Warranty	Inverter, 10 years; battery modules, 10 years or 10,000 cycles; cabinet and components, 1 year						
Inverter efficiency	92.5% CEC weighted, 95.0% peak						
Cooling Method	Forced air						
Noise emission	< 35dBA						
AC Specifications							
AC input rated current	Pass through: 200 amps @ 240VAC Power plant: 33.33 amps @ 240VAC						
AC output voltage	120/240 volts						
Nominal frequency	60 Hz						

Storage System Dimensions

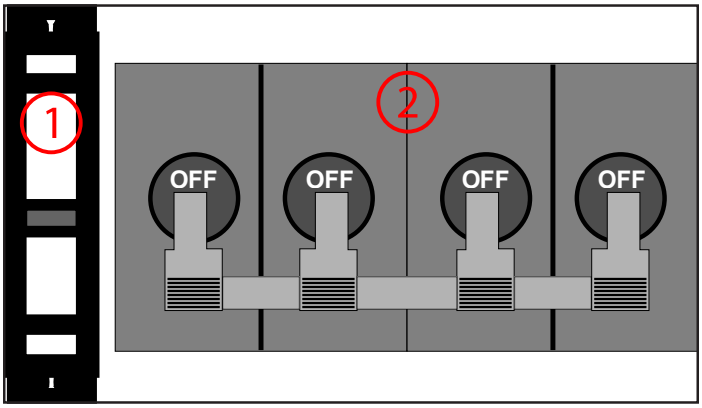


Turning the system on and off

In most cases, you will not need to turn the storage system on or off. If you do need to turn the system on or off, follow the directions below.

Turning the storage system on

The main DC circuit breaker F1 and the switch S1 are located in the interior of the main cabinet.



(1) Switch

(2) Main circuit breaker

Attention

Damage of the storage system by high currents!

High currents can damage components of the storage system if the process is not followed properly.

► Turn on the storage system only according to the steps below.

1. Make sure the battery emergency switch is turned on (if available).
2. Press switch S1 for at least 7 seconds and keep it pressed for the next step.
3. Turn on main circuit breaker F1 of the main cabinet.
4. Release switch S1.

Attention

Damage of the battery cells by deep discharge!

If the storage system is not connected to the utility grid, the battery modules can be damaged by excessive and prolonged discharge.

► Do not leave the storage system disconnected for longer than six months.

Shutting the storage system down

Attention

Damage of system parts by forced disconnect!

If there is no emergency:

► Shut the storage system down.

If there is no emergency, do not turn off the storage system by forcibly removing power, by turning off the DC circuit breaker, or by using the battery emergency switch, as these methods may result in undesirable behavior.

Shut down the storage system

Follow these steps to shut the storage system down properly:

1. Press "Shutdown" button

► Press the grid of six dots in the upper right corner of the screen.

► Press the "Settings" icon.

► Press "Shutdown" button.

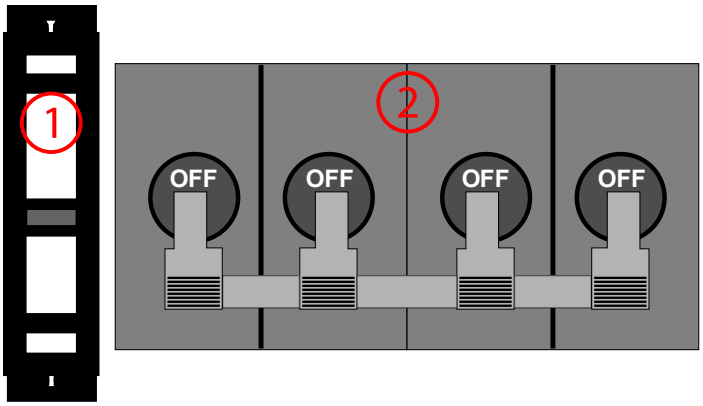
2. Confirm shut-down

► Press "Yes" to confirm shut-down.

The shut down takes approximately 60 seconds.

Emergency switch-off

In case of an emergency, the storage system can be switched off by the main circuit breaker F1 or the external emergency switch (if installed).



- In case of an emergency, switch off the main circuit breaker F1 in the interior of the main cabinet or the external emergency switch (if installed).
- Only switch off the main circuit breaker F1 if it can be reached without danger.

Recycling and certificates

This battery system complies with RoHS and contains none of the following substances: lead, cadmium, mercury, hexavalent chromium, polybrominated biphenyl (PBB) and polybrominated diphenyl ether (PBDE).

- To dispose of the storage system:
  - Do not dispose of the storage system and its battery modules in your household refuse!
  - Contact service or the company that installed your storage system and commission them to disassemble and dispose of the storage system.
  - You can also call Call2Recycle at (877) 723-1297.

Your battery modules will be recycled and disposed of in an environmentally friendly manner.

Maintenance and care

To ensure proper operation, safety, reliability and longevity, you must perform periodic cleaning and function control of the storage system.

Function control

Periodically check if the eclipse on the door is pulsing White or Green (Normal). An error has occurred if the eclipse is a solid or blinking red or blue color.

Care of the storage system

Attention

Risk of damage by improper cleaning utensils!

- Only use cleaning solutions and tools listed in this chapter.
- Do not use high-pressure cleaning equipment.
- Do not use abrasive cleaners.

Cleaning the screen

► If the screen appears dirty, clean it carefully with a damp cloth with a small amount of dish liquid.

Cleaning the enclosure

► If the cabinet appears dirty, clean the exterior with a soft, damp cloth. Do not clean the interior of the cabinet.

Checking the storage unit

► Periodically check the area around storage unit for safety hazards or potential maintenance issues, including debris and chemical vapors that can degrade electrical insulation.

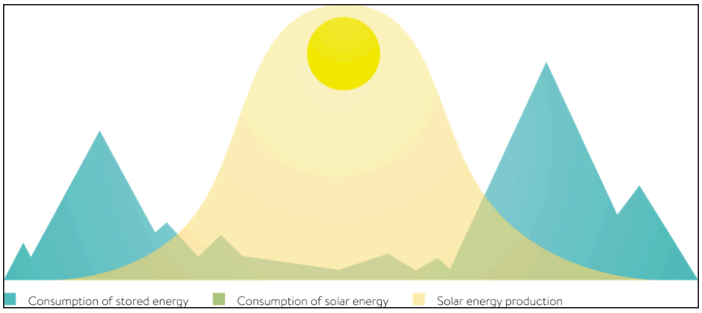
General System Function

Description of use

The sonnenBatterie eco is an intelligent storage system that monitors and controls energy production, consumption, and storage in the house.

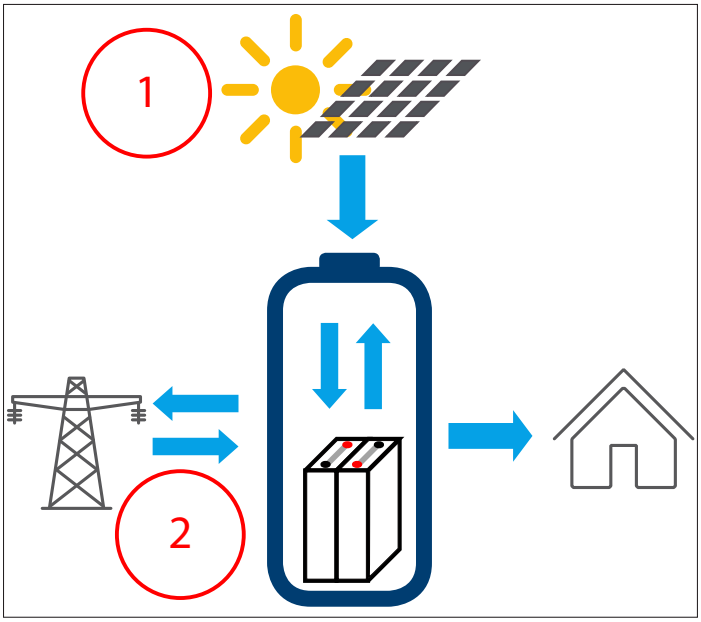
The sonnenBatterie eco can work with existing or newly installed PV systems. The solar inverter and eco storage system connect to the same distribution panel. Solar modules do not connect to the sonnenBatterie directly.

The storage system uses two power meters to monitor solar power production and energy consumption. When production is higher than consumption, such as at midday, the eco stores the excess energy in its lithium iron phosphate (LiFePo4) battery modules. When consumption is higher than production, such as in the evening, the storage system releases the energy. In doing so, the storage system allows you to use solar power at night, reducing your power bill and increasing the value of your investment in renewable energy.



The storage system also acts as a backup power supply, meaning that if the utility grid goes out, your appliances will remain powered.

The illustration below shows how the storage system manages solar power (1) and power from the utility grid (2) to maximize your energy independence and savings on your power bill.



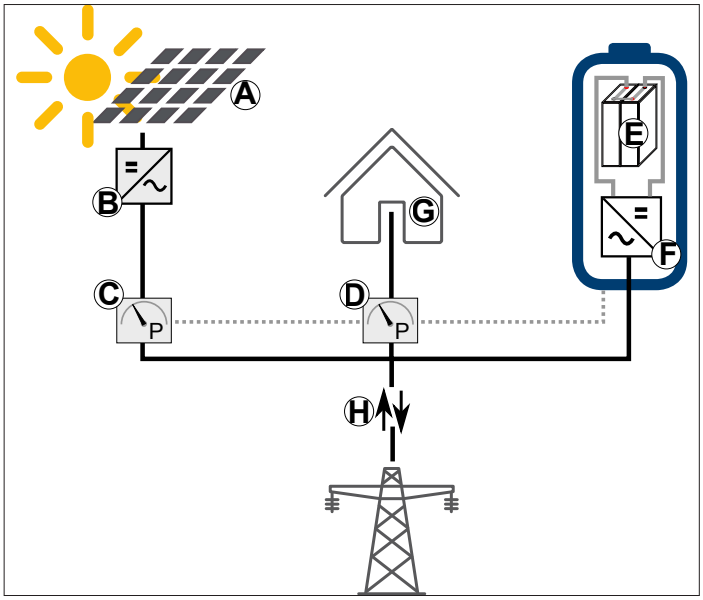
Modes of operation

The sonnenBatterie eco offers three complementary modes of operation: Self-consumption, Backup, and Time of Use. Self-consumption mode ensures that you are using the power you generated even when the utility grid power is available; backup mode makes that self-generated power available in the event of a grid power outage.

In addition, many utility companies are moving to a Time of Use-based rate tariff, in which electricity costs more during high-demand time periods. The sonnenBatterie eco can maximize your cost savings by using your stored battery power during the high-cost part of the day and recharging from solar and optionally with electricity purchased from the grid at the lowest offered rates.

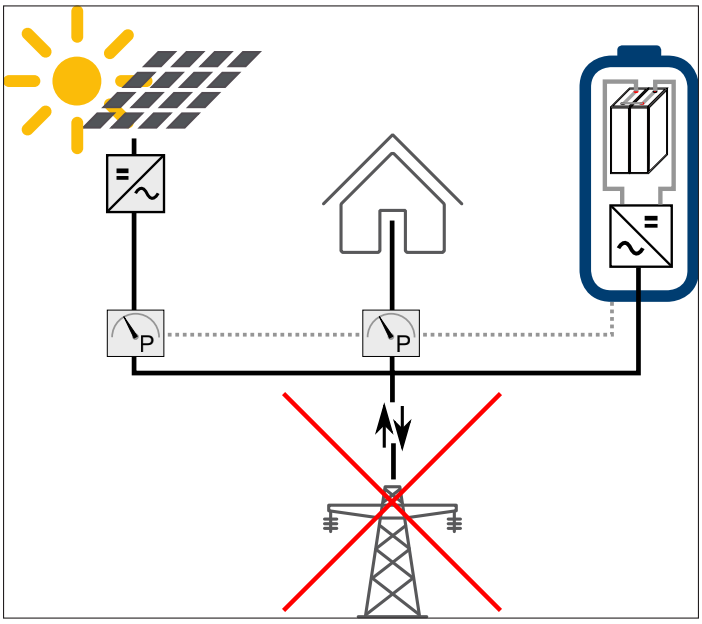
Self-consumption mode

The following images illustrate the interaction between the storage system, the PV system, and the utility grid in self-consumption and backup modes:



The DC power that is generated by the PV array (A) is converted to AC power by means of an inverter (B). The meters (C) and (D) measure the current electrical power in watts. The production meter (C) measures the power production, the consumption meter (D) measures the power consumption in the house. If the production is higher than the consumption, the surplus will be stored in the battery modules (E). The storage system's inverter (F) converts the AC power to DC power while the battery modules (E) are charging. When the production is lower than the consumption, electric power will be released from the battery modules to power the loads. The storage system's inverter (F) converts the DC power of the battery modules (E) to AC power. The utility's power meter (G), measures the power supply and the power fed back to the grid (H) by the PV array (if applicable). The storage system will not discharge its batteries to the grid in normal operation.

Backup mode



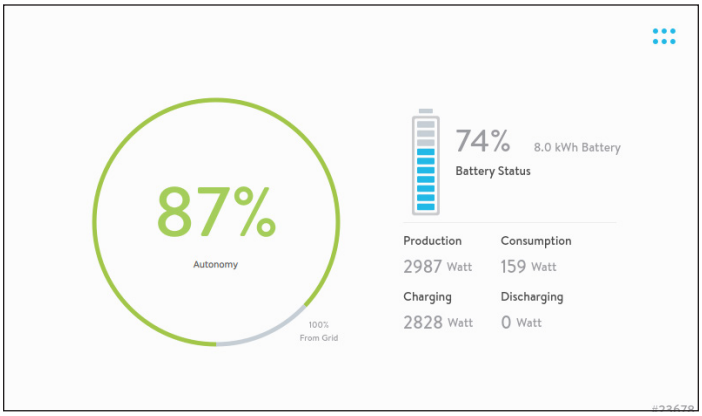
In backup mode, the storage system provides grid-quality power to keep the PV array working when the grid goes down. During the day, the PV array initially powers the household loads fed by the backup sub-panel and uses any excess power to charge the battery modules, depending on production and consumption levels. The house can then be powered at night by the solar energy stored in the battery modules. If there is insufficient PV during the day to cover the loads, the storage unit will discharge its batteries to meet household demand.

In backup mode, the 10-, 12-, 14-, and 16-kilowatt models of the sonnenBatterie eco storage system will automatically isolate the house from the utility grid using a 200A automatic transfer switch. Once the grid comes back online, the storage system will automatically reconnect to the utility grid.

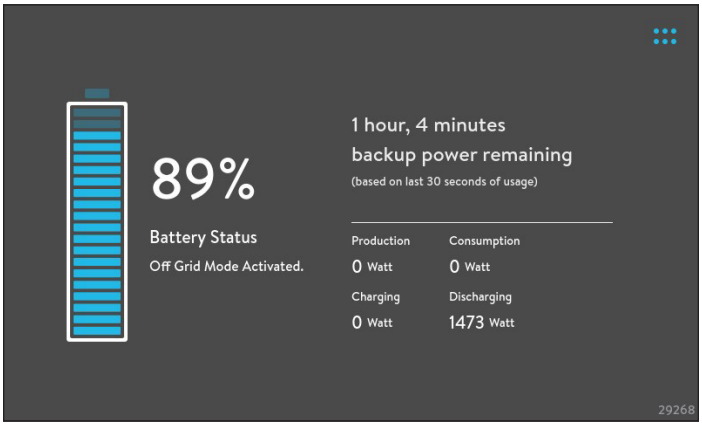
In the event of grid failure, the smart storage system can also turn the PV array off if there are no household loads to be fed and the battery modules become fully charged. If the loads are small and the PV production is high, then this could happen multiple times per day.

System touchscreen interface

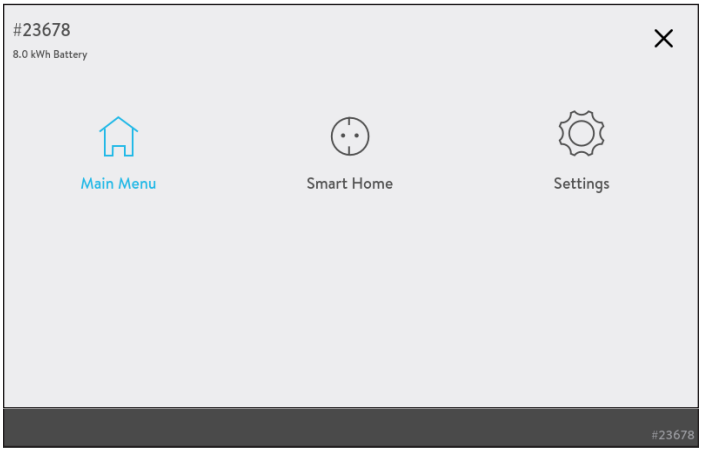
The sonnenBatterie eco is designed to run without user intervention in most cases. The LCD screen on the physical unit has a number of menus to display information and control the unit.



In a normal installation, the screen above will serve as the home screen. This screen displays the unit's state of charge, the home's energy autonomy, production and consumption statistics, and the amount of power that is going into or coming out of the unit.



When the storage unit is in power outage mode, the screen above will be the home screen. This screen displays the unit's state of charge, production and consumption statistics, and the amount of power that is going into or coming out of the unit. The screen will also show an estimated length of backup power remaining (in hours). This estimate is based on energy usage for the last 30 seconds and therefore may change frequently.



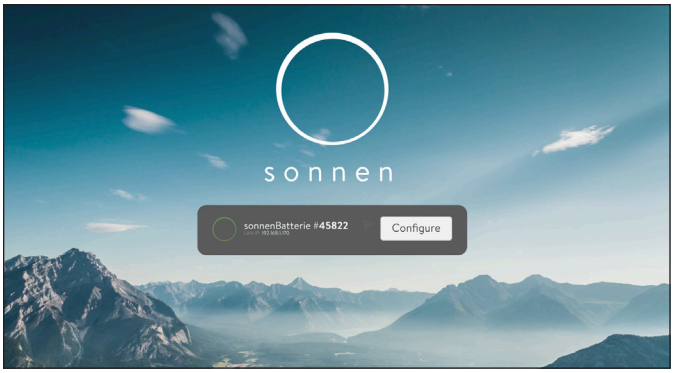
The menu screen, accessed by pressing the grid of six dots in the upper right corner of the screen, allows you to access the Settings screens.



The Settings screen allows you to shut down the unit by pressing the Shutdown button.

sonnen Dashboard interface

- On your local home internet network, go to https://find-my.sonnen-batterie.com. (For easier future access, we recommend you save this to your address or bookmarks bar).
- Once you access this webpage, you will see the following screen. The information on the screen should match your sonnen serial number and local IP address.

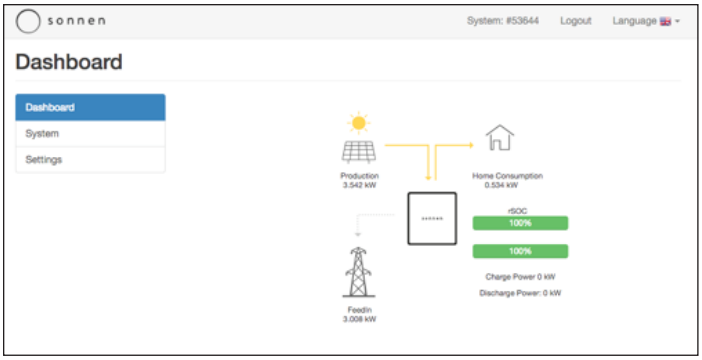


- Click 'Configure' to access the settings menu. After pressing 'Configure,' you will see a login page.
- Select **User** from the drop down menu and enter the password '**Sonnen2016**'.



After logging into the find-my.sonnen-batterie.com page, you will arrive at your sonnenBatterie dashboard. This diagram provides an overview of your sonnenBatterie's state of charge, your home's solar PV production, your home's energy consumption, and the energy drawn from the utility grid.

Sonnen Dashboard



Your sonnenBatterie's current State of Charge, or how much energy is stored in the battery, is represented by the large bars on the right side of the diagram. The upper bar is the real State of Charge, which is always 5% higher than the State of Charge. (This is because there is a built-in buffer of 5% for best practice).

Next, on the top left hand corner labeled 'Production,' is your solar PV production. It is located under the graphic of a sun and PV panel. This number is a real-time measurement of how much energy, in kilowatts, you are generating with your solar PV system.

On the top right, under the graphic of the house is your home's energy consumption. This is a real-time assessment of how much energy the loads in your home are consuming in kilowatts. Finally on the bottom left, under the transmission tower graphic, you can find the amount of energy being purchased from the grid.

Please note, this information is also provided on the status page of the sonnenBatterie App and Web Portal.

There will also be two tabs on the left side. The *System* tab will provide more technical information about the battery, such as the model number, serial number, storage capacity, maximum inverter power, firmware version, IP address, as well as grid and Battery Management System (BMS) information.

The *Settings* tab will allow you to select your sonnenBatterie's operating mode, as described in the 'Operating Mode' section on the next page.

Operating Mode

Under the Settings tab, there are three operating modes to choose from – *Backup Mode*, *Self-consumption Mode*, and *Time of Use Mode*.

Backup Mode

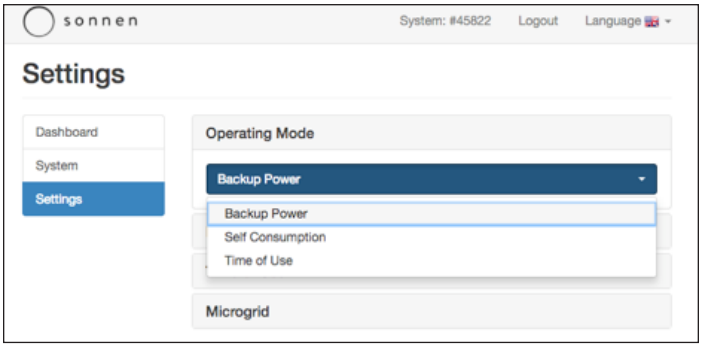
Under this setting, the battery will maintain a higher state of charge and will only discharge power during a grid outage.

Self-consumption Mode

Under this setting, the sonnenBatterie will utilize solar energy to first feed loads and then charge the batteries with the extra energy produced from your solar panels. After solar generation has stopped, the battery will supplement the grid in powering your loads.

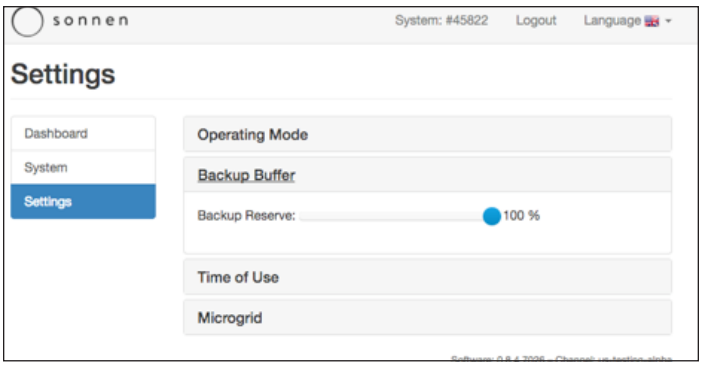
Time of Use Mode

As mentioned in the 'Modes of Operation' section on page 11, this setting is for residents who have utilities which charge Time of Use rates. Under this setting, you can input which times your utility charges higher tariff rates, and the sonnenBatterie will begin discharging power if no solar is available to meet the required loads. Thus, the sonnenBatterie will help you avoid using power during periods with expensive peak tariff rates.



Backup Buffer

In addition to the operating mode, you can also adjust the Backup Buffer setting. This setting indicates how much power the sonnenBatterie will keep in reserve in the event of a power outage. If you are using backup mode, we recommend that you set this to 95%, this way the battery will retain its stored power solely for power outages. If you want to use Self-consumption or Time of Use mode, we recommend setting the buffer no lower than 10%. In this case, the sonnenBatterie will stop discharging power once it has 10% charge remaining (or whichever percentage you set it to), so that in the event of a nighttime grid failure, there is stored energy remaining to restart your home's power.



Time of Use

Under Time of use, you can enter which times your utility charges peak energy rates. Please note, the peak hour start and end times need to be entered in military time.

Under these settings, you can adjust:

- **Grid enabled: No** - The sonnenBatterie will never use the grid for charging
- **Grid enabled: Yes** - The sonnenBatterie will charge from the grid during off-peak hours
- **Peak Hour Start Time** - Enter in military time when your utility begins charging peak energy rates, so the sonnenBatterie will know when to begin powering loads

For example, if the peak time is set from 16:00 to 20:00, the batteries will discharge for 4 hours from 4 p.m. to 8 p.m., stopping at your preset buffer percentage discussed above.

- **Peak Hour End Time** - Enter in military time when your utility stops charging peak energy rates
- **Low Tariff Charge Time** - If your local utility also has a low tariff period, the battery can be set to charge at this designated time as well. You can enter that time here in military time.

Microgrid

This feature is not frequently used and can typically be ignored.

This feature is available in the event of an extended grid failure and there is no solar power available to charge the sonnenBatterie for multiple days. Your sonnenBatterie is designed to preserve the life of its batteries, so once the sonnenBatterie's state of charge, or remaining battery life, drops below 5%, the unit will shut down to conserve power.

However, the sonnenBatterie can be programmed to try to restart and search for a grid or solar to create a microgrid if YES is selected for 'reenable microgrid.' If YES is selected, the sonnenBatterie will look for grid power or a solar connection at three different predetermined times, which you can set here. If the unit fails to establish a connection at time 1, it will attempt to make another connection at time 2, followed by time 3.

Accordingly, for 'User Input Time One' please input which time you would like the sonnenBatterie to look for a grid, enter two additional time periods for 'User Input Time Two' and 'User Input Time Three.'

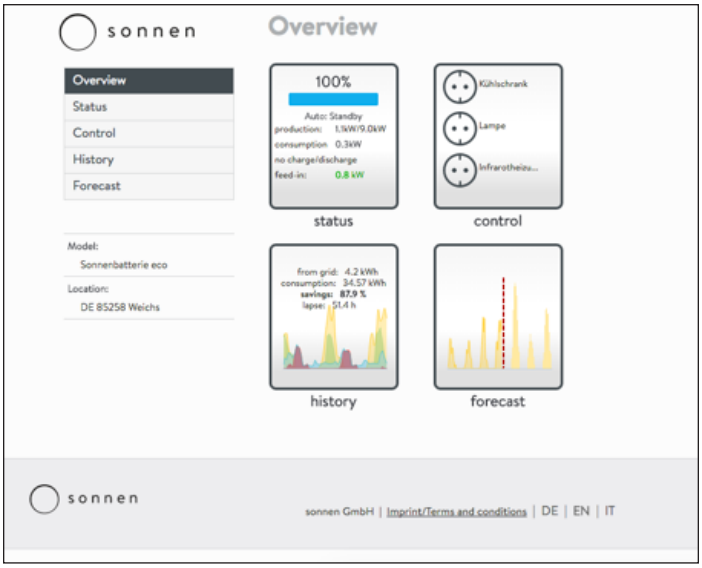
Alternatively, if NO is selected for 'reenable microgrid,' your sonnenBatterie will continue to conserve power extending the life of its batteries.

sonnen App and Web Portal

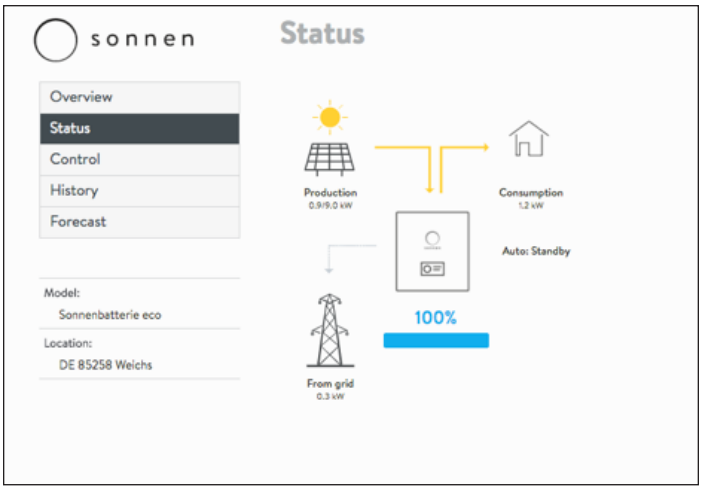
As a homeowner, you can track your home's energy production and consumption through the sonnen App and Web Portal. You can download the App on your smartphone or tablet or go to the Web Portal at my.sonnen-batterie.com/login for access to your sonnenBatterie smart energy storage system. Your serial number and password are provided in the Customer Welcome Letter at the beginning of this manual.

The first screen you will see after logging in is the Overview page. This page provides a quick synopsis of the unit and a summary of the other four tabs, which are located on a menu to the left. Below this left side menu, you will also find the model and location of the unit. At the bottom of the screen is a language control, which allows you to switch between English (EN), German (DE), and Italian (IT).

On the left side menu, you will be presented with four options corresponding with the four panels on the overview page: Status, History, Control, and Forecast. The two most important tabs you will be using are Status and History. Each tab will be covered sequentially in the following sections of this guide.



Status: Tracking Your Energy



The status feature will indicate your sonnenBatterie's current State of Charge, or how much energy is stored in the battery. This information is represented by the large bar and percentage number, directly below the square sonnen graphic in the middle of the diagram.

On the top left hand corner labeled 'Production,' under the graphic of a sun and PV panel, is your solar PV production. This is a real-time measurement of how much energy in kilowatts you are generating with your solar PV system.

On the top right hand corner labeled 'Consumption,' under the graphic of a house, is your home's energy consumption. This is a real-time assessment of how much energy the loads in your home are consuming in kilowatts.

On the bottom left you can find your Grid Feed-in. If this number is positive, it indicates the amount of energy that is being drawn from the grid. However, if this number is negative, it represents the energy that is being fed back into the grid.

History: Understanding your Consumption

The next tab is the History tab. This graph represents a history of your home energy consumption, solar system PV production, sonnenBatterie discharge, and sonnenBatterie State of Charge in real time.

Depending on the mode of operation - Self-consumption, Backup, or Time of Use - the typical unit consumption and discharge should look differently, an example of a battery set to self-consumption is provided in a subsequent section.

Time Settings

For each graph, starting from the top, is the time increment setting. This allows you to change which time increment you would like to view, and will provide you with a view of your home history per day, week, month, or year. You can view previous data outside of this range by using the arrowed tabs at the bottom, which will move to previous days based on the time indicated.

Graph Axes

The y-axis (vertical axis) on the left side of the history graph is the power measured in kilowatts. Therefore, this is the rate at which energy is generated or consumed. The x-axis (horizontal axis) tells you which day is represented by the history graph. The y-axis on the right side of the graph corresponds to the sonnenBatterie State of Charge, which will be covered in the next section.

Graph Color Definitions

The graph itself will indicate when the sonnenBatterie is charging (the area colored in green) and discharging (the area colored in red) as well as your home energy consumption (the area colored in blue) and solar PV production (the area colored in yellow). The purple line represents the State of Charge of the battery, which reflects battery performance and how much energy is remaining on the battery.

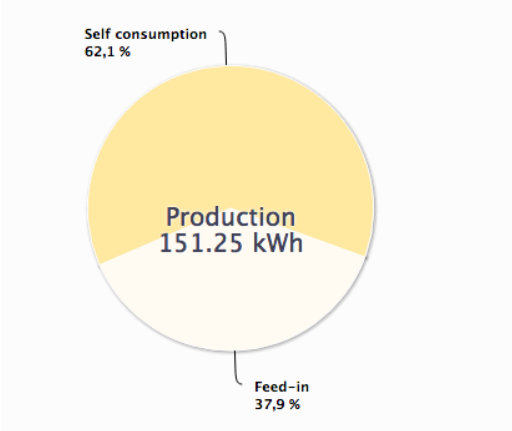
A color guide is also located below the graph. You can click each indicator to view or hide this information from the history graph.

Production Pie Chart

Below the history graph are two pie charts, one labeled ‘Production’ and the other labeled ‘Consumption.’ Example charts are located below.

The Production graph indicates how much energy was produced by your solar system overall, your PV self-consumption, and your grid feed-in.

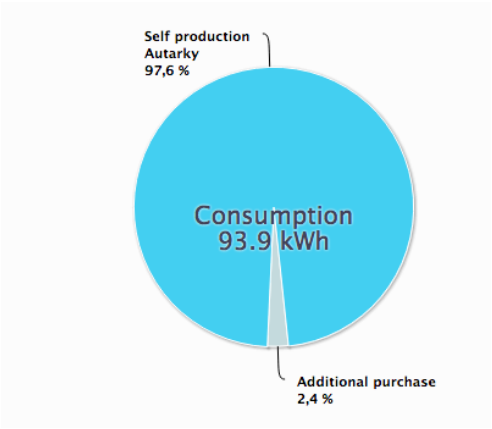
The section labeled ‘Self-consumption’ represents the proportion of your solar energy that was either stored by the sonnenBatterie or consumed in your home. The section labeled 'Feed-in' represents the proportion of solar energy produced that was fed back into the grid.



Consumption Pie Chart

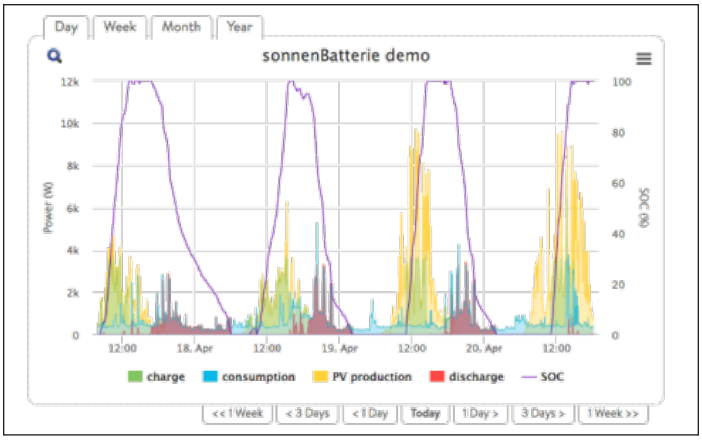
The Consumption graph indicates how much energy was consumed in your home overall, as well as the proportion this energy that was self-produced, or purchased from the grid.

The section labeled 'Self Production Autarky' represents the proportion of home energy consumption that was stored in your sonnenBatterie and produced by your solar system – your solar self-consumption. The section labeled 'Additional purchase' represents the proportion of home energy consumption purchased from the grid.



Self-Consumption Mode Use Case

This section will provide an example of a typical history graph for a sonnenBatterie set to self-consumption mode.



**Note that this view period is set to Week, although it can be set to Day, Week, Month, and Year.*

As a reminder, in this graph, the yellow spikes represent how much PV you are producing, the blue represents your home's energy consumption, and the red represents battery discharge. The purple line that moves up as the battery charges and down as the battery discharges is called the State of Charge. This is like a 'fuel gauge' for the battery.

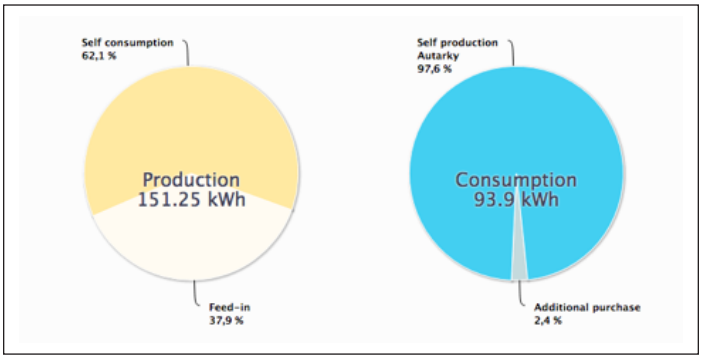
In the weekly graph above, you can see the transition from day to night as the PV production reading rises and falls in daily cycles. Correspondingly, the sonnenBatterie begins to charge during the day, as shown by the green area.

In this example, on the sunnier days, the home solar array produces much more energy than can be stored in the solar battery or consumed by the home. This extra energy would be fed back into the grid or dissipated.

The home energy consumption in blue is relatively constant throughout the day with a large spike in the evening after the sun sets. However, this blue consumption is mainly covered in red, indicating that the sonnenBatterie began discharging once the sun set to cover the energy consumption.

There is a brief period at night when consumption is not covered by the sonnenBatterie or home solar. As a homeowner, this could be fixed by getting a larger storage system, reducing consumption, or shifting load use to the middle of the day when excess solar is being produced.

In addition, the most telling feature that the sonnenBatterie is in self-consumption mode is the daily rise and fall of the unit's State of Charge. The State of Charge rises as the battery charges using solar energy produced throughout the day and falls as the battery discharges to meet home energy use demands.



Underneath this graph are the Production and Consumption pie charts, which show how much of your own energy you are producing and consuming respectively.

In this example, the Production pie chart on the left indicates that the homeowner produced 151.25kWh of energy for that day. Using their sonnenBatterie storage system, they were able to use 62.1% of the energy that they produced with their solar system. The other 37.9% was fed back into the grid.

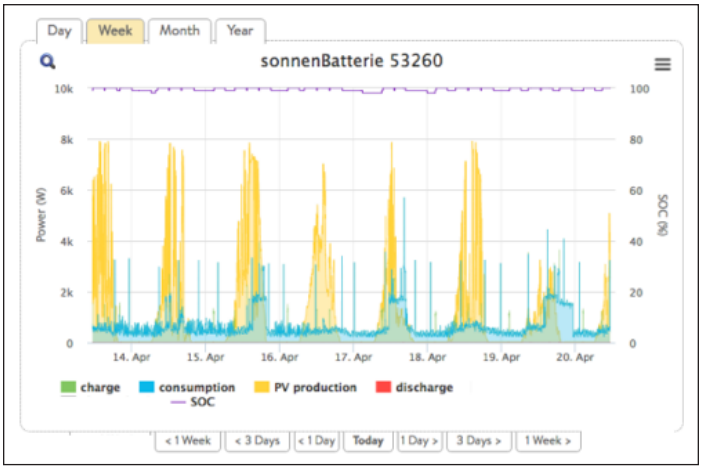
The Consumption chart on the right indicates that the homeowner consumed 93.9kWh of energy that day. It also shows that with the help of their sonnenBatterie, the homeowner produced 93.9% of the energy they used that day with solar power! Only 2.4% of the energy they used had to come from the grid.

Time of Use Mode Use Case

If the sonnenBatterie is set to Time of Use mode, the daily consumption and production cycle will look very similar to the self-consumption cycle, except the sonnenBatterie will only begin discharging at specific times at night to ensure that loads generated during peak energy periods are covered.

Backup Mode Use Case

This section will provide an example of a typical history graph for a sonnenBatterie set to Backup mode.

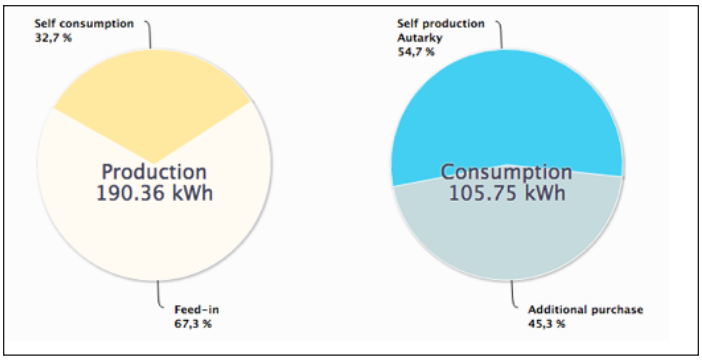


As in self-consumption mode, in this weekly backup mode graph, you can see the transition from day to night as the PV production reading rises and falls in daily cycles. The home consumption is also relatively steady until sunset where energy consumption tends to increase.

In backup mode, the sonnenBatterie does not discharge throughout the day, instead reserving power to restore energy to the home in the event of an outage. Accordingly, the State of Charge, as indicated by the purple line at the top of the graph, stays relatively constant (small fluctuations are normal).

Underneath this graph are the Production and Consumption pie charts, which show how much of your own energy you are producing and consuming. In this example, the Production chart on the left indicates that the homeowner produced 190.36kWh of energy for that day using their home solar system. They were able to consume 32.7% of the energy that they produced with their solar system. The other 67.3% was fed back into the grid.

The Consumption chart on the right indicates that the homeowner consumed 105.75kWh of energy overall that day. It also shows that the homeowner produced 54.7% of the energy they consumed and purchased the remaining 45.3% of the energy they consumed from the utility grid.



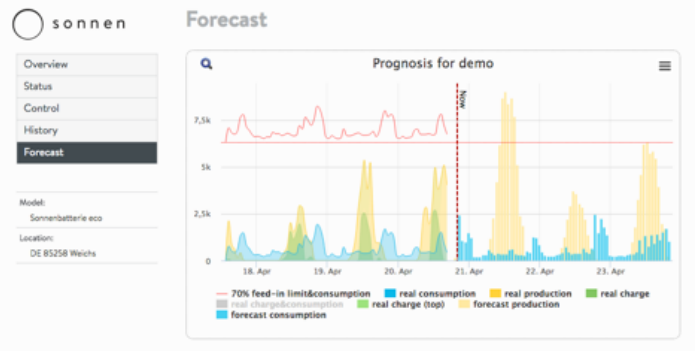
Control

This function is currently under development.

Forecast

The forecast feature predicts what your future solar energy production and home energy consumption will be based on your current energy use.

The graph depicts the previous three days and future three days, with the dotted line representing the current day. The historic home consumption, battery charge, and PV production data are represented as ‘real consumption’, ‘ real charge,’ and ‘real production,’ while the predicted consumption and production are represented as ‘forecast consumption’ and ‘forecast production.’



Glossary

Appliances: Devices that consume power. These may include small appliances, such as a blender, or large ones, such as a water heater.

Autonomy: A measurement of how little you rely on the grid for energy. The more renewable energy you produce and consume, the higher your autonomy.

Backup mode: A mode of operation in which the sonnenBatterie eco provides power stored in its battery modules when the utility grid power is unavailable.

Backup readiness: When the storage system emphasizes backup readiness, it maintains a specified state of charge, such as 90%, in its battery modules to be ready to provide power in the event of an outage.

Battery modules: The energy storage modules in the sonnenBatterie eco.

Capacity: The amount of energy that can be stored in the sonnenBatterie eco, measured in kilowatt-hours.

Consumption: The amount of power being used by appliances.

Deep discharge: Bringing the battery module's charge to such a low level that it damages the battery. For the modules used by the eco, this requires leaving a module at an extremely low level (0%-1%) for weeks or months.

Discharge: When the storage system provides power to your house or building.

Feed-In: When the storage system provides power to the utility grid.

Grid: The power source provided by utility companies, as opposed to self-generated power.

Kilowatt-hour: A measurement of energy equal to one kilowatt delivered for one hour.

Load-shedding: The method of removing power to appliances either to keep the load within power requirements or to maximize battery time.

Microgrid: The grid created by your power generation system, as opposed to the utility grid.

Photovoltaic: A photovoltaic system of solar-power panels.

Production: The power generated by your solar panels.

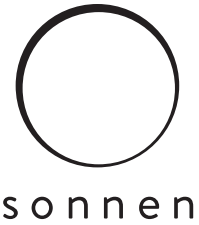
Protected loads panel: A panel providing power to the most important appliances in the house or building, such as a refrigerator, freezer, or heater. This subpanel is isolated from the main service panel by a switch to prevent electrical feedback.

Self-consumption: The method of using solar power to power appliances rather than using grid power.

State of charge: The percentage of charge available in the storage system's battery modules.

Storage system: The sonnenBatterie eco, which combines an inverter, battery modules, and other hardware and proprietary algorithms to make solar power an even more cost-effective power source.

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