Application Note

SolarEdge ONE Controller: Guide for Residential Commissioning and Third-Party Integrations

Version 1.8

March 2026

MAN-01-01231-1.8

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About

This Application Note explains how to commission the SolarEdge ONE Controller for Residential use, and explains how selected third-party devices integrate into the SolarEdge Home ecosystem.

Revision history

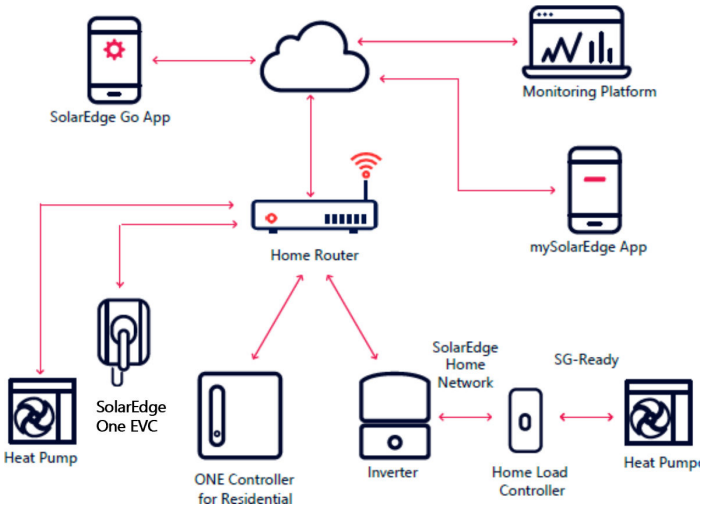
Version	Date	Description
1.8	March 2026	Added NIBE, Bosch and Buderus Heat Pumps
1.7	July 2025	Added network configuration and security table
1.6	March 2025	General updates
1.5	February 2025	Added table: Supported vendors in beta testing

Overview

SolarEdge ONE is an energy optimization system, that automatically manages the home's power in real-time to maximize savings and extend backup duration. SolarEdge ONE integrates with selected third-party devices using the SolarEdge ONE Controller or the SolarEdge Home Load Controller. This allows the customer to build a scalable system that integrates with third-party devices to monitor, manage, and expand your solar ecosystem as needed.

How it works

This diagram displays the interfaces among the devices in the SolarEdge ecosystem.



SolarEdge ONE Controller

This section provides an overview of the ONE Controller for Residential use and describes how to commission the ONE Controller.

The ONE Controller integrates selected third-party products into the SolarEdge ecosystem by connecting to the home router via the Local Area Network (LAN). The home router links the ONE Controller to the Inverter, Heat Pump, and SolarEdge servers. It communicates with the integrated third-party devices through the home router using the EEBUS, enabling continuous communication among the devices, even without connectivity to the SolarEdge Cloud.

SolarEdge Home Load Controller

The SolarEdge Home Load Controller is designed to connect most air-to-water Heat Pumps to the SolarEdge Home ecosystem using an SG Ready interface. For details about the SG Ready heat pump regulations, refer to: https://www.waermepumpe.de/fileadmin/user_upload/bwp_service/SG_ready/2020_SG-ready_Regularien_2.0_final.pdf.

The Load Controller is connected to the inverter through the SolarEdge Home Network. The Load Controller connects directly to the Heat Pump´s SG-Ready interface. It is designed to manage and control the different modes of operations. For details about commissioning Heat Pumps with the Home Load Controller, refer to the Heat Pump Control with SolarEdge Home Load Controller Application Note

Supported functionalities

The following table displays the supported functionalities for Heat Pumps, in combination with the ONE Controller or the Load Controller.

Controlled Device	Connection Method	Description
Air-Water Heat Pump (HP)	ONE Controller (EEBUS)* [1]	• Heat Pump control via mySolarEdge • See Heat Pump power consumption • Heat your Hot Water tank and buffer tank with **Excess Solar.**
	Load Controller (SG-Ready)	• Activate the Heat Pump automatically when the Heat Pump has Excess Solar available. • Ability to set two different set points for Excess Solar operation. • Increase your battery life during power outage by automatically turning the Heat Pump OFF when configured as a **Nonessential** device.

[1]Only available with Heat Pumps, refer to Supported Vendors [3].

Supported vendors

Supported vendors - available

Device	Company	Model
Heat Pump	Vaillant	All Heat Pumps from 2018 that support EEBUS. Before commissioning a Vaillant Heat Pump, install the following equipment: • Vaillant Heat Pump that supports EEBUS (all models from 2018) • Vaillant Communication Gateway VR921 or VR940F • Vaillant Wall Thermostat VRC700 or VRC720
Heat Pump	NIBE	• S1155 / S1156 (S-series) • S1255 / S1256 (S-series) • S735 / S735C (S-series) • SMO S40 /SMO S50 (S-series) • VVM S320 / S325 (S-series) • VVM S330 (S-series) • VVM S500 (S-series) • SVM S332 (S-series)

Device	Company	Model
Heat Pump	Bosch	• Compress 5800i AW • Compress 6800i AW • All power classes
Heat Pump	Buderus	• Logatherm WLW 186i • Logatherm WLW 176i • All power classes

Supported use cases

This section explains which devices can be combined and used for one installation. Only a single ONE Controller is used for each site.

Heat Pumps

Possible Heat Pump combinations:

- One Heat pump with EEBUS connection
- One Heat pump with SG-Ready control using the SolarEdge Load Controller (the ONE Controller is not required)

Commission the ONE Controller

Before you begin to commission the ONE Controller

- Mount and set up the ONE Controller.

> **NOTE**
>
> Place the ONE Controller on a stable, flat surface or mount it on the wall. For details see, https://knowledge-center.solaredge.com/sites/kc/files/se-one-controller-for-residential-quick-installation-guide-eu.pdf.

- Download SolarEdge Go to your mobile device.
- Ensure you have inverter firmware V.4.22 or higher.
- To connect the ONE Controller to the home router via Wi-Fi, ensure you know the network credentials.
- Verify that SolarEdge Go has access to the relevant site.

To commission the ONE Controller

This section explains how to commission the ONE Controller with the SolarEdge Go mobile application.

1. Turn the ONE Controller ON and wait until the Power LED is solid green.
2. Open SolarEdge Go.
3. Go to **Manage** > relevant site > > **Add Device** > **ONE Controller** and tap **Next**.

> **NOTE**
>
> You can also use the following path: **Manage** > relevant site > **Actions** > **+ Add Device** and tap **ONE Controller**.

4. Scan the QR code on the bottom of ONE Controller or enter the serial number.
5. Select the connection mode to the local network:
   a. Ethernet

      Or

   b. Wi-Fi
      i. Tap **Connect with Wi-Fi**.
      ii. Select the network, enter the password, and tap Connect.
6. After the ONE Controller is connected, tap **Done**.

After commissioning is complete, the ONE Controller displays a solid Local LED confirming connectivity, and appears under the device inventory for the relevant site. You are ready to integrate third-party devices.

LEDs ONE Controller status

The following LED indications describe the status of the ONE Controller.

Name	Symbol	Indication
Cloud		• Solid: Connected to the inverter • Blinking: Internet connection available, attempting to connect to SolarEdge Cloud • Off: No connection to the internet

Name	Symbol	Indication
Local		• Solid: Connection to the inverter and all devices • Blinking: Lost communication between ONE Controller and the inverter or the third-party device • Off: No paired device
Power		• Solid: Normal operation • Blinking: Booting or updating • Off: No power

Troubleshoot

If you are unable to successfully commission the ONE Controller, check the following problems, according to the notification received by SolarEdge Go app:

Problem	Troubleshoot
Unable to scan QR code	Manually enter serial number for the ONE Controller.
Incorrect Wi-Fi password	Verify you are using the correct SN of the local residential network.
No internet access on Wi-Fi connection	Verify the internet connectivity of the home router.
One Controller is already installed	There is already a commissioned ONE controller on the site. Multiple ONE controller devices are not necessary on a site.
No inverter on site	A leader inverter is necessary for commissioning. If you only have one inverter, ensure it is configured as a leader.
Incompatible inverter	The inverter's firmware needs to be upgraded. The current firmware version is not compatible with commissioning the ONE Controller.
No Access from SolarEdge server to the ONE Controller	Ensure the ONE Controller is ON and connected to the internet.
No connection with SolarEdge server	There is a connection between the SolarEdge server and the Inverter or the ONE Controller. Ensure the site has access to the internet.
The ONE Controller cannot communicate with the inverters	Ensure the inverter and the ONE Controller are both ON and connected to the same local network. Ensure that the selected site for commissioning in Solar Edge Go is the same one where the ONE Controller was installed.

Commission Heat Pumps

This section explains how to commission supported third-party Heat pumps using the SolarEdge ONE Controller.

NOTE

To maximize energy management savings, we recommend the following:

- Homeowners should define the preferred schedule for their hot water.
- The most effective strategy for homeowners is to determine the amount of hot water needed during the early morning and/or evening hours. This allows the SolarEdge ONE energy management system to heat the hot water tank using only excess solar power.
  - The hot water temperature is set to 48 degrees Celsius and is required daily from 17:00 to 22:00.
  - During the day, the Hot Water Tank remains at a lower temperature, the ONE Energy Management System ensures it reaches the desired temperature at the desired time, using as much Excess Solar as possible.

Required equipment for installing Heat Pumps

Before commissioning Heat Pumps, install the following equipment:

- SolarEdge residential PV system
- SolarEdge One Controller

The following are Heat Pump vendors and models:

Vaillant

- Vaillant Heat Pump that support EEBUS (all models from 2018)
- Vaillant Communication Gateway VR921 or VR940F
- Vaillant Wall Thermostat VRC700 or VRC720

NIBE

- NIBE S1155 / S1156 (S-series)
- NIBE S1255 / S1256 (S-series)
- NIBE S735 / S735C (S-series)
- NIBE SMO S40 /SMO S50 (S-series)
- NIBE VVM S320 / S325 (S-series)
- NIBE VVM S330 (S-series)

- NIBE VVM S500 (S-series)
- NIBE SVM S332 (S-series)

Bosch

- Bosch Compress 5800i AW
- Bosch Compress 6800i AW
- All power classes

Buderus

- Buderus Logatherm WLW 186i
- Buderus Logatherm WLW 176i
- All power classes

Before you begin commissioning Heat Pumps

Before commissioning Heat Pumps, ensure:

- The Heat Pump Communication Gateway is connected to the heat pump and to the same internet network as the ONE Controller and a SolarEdge Inverter through the home router.
- The SolarEdge Go application is downloaded on your mobile device

Commission Heat Pumps in SolarEdge Go

To pair a heat pump to the ONE Controller:

1. Open SolarEdge Go, go to **Manage** and select the relevant site.
2. Go to **Equipment** > **Local Controller > Connected** to verify the ONE Controller has been added and connected to the system.
3. From the **Action** tab, go to **+Add Device** and select the Heat Pump.
4. After the Heat Pump is found, tap **Add Device**

To enable EEBUS and add SolarEdge ONE controller as trusted device, run the following on your heat pump:

1. Tap **Settings**.
2. Enable EEBUS.

NOTE

In some cases the EEBUS settings may appear within a sub-menu.

3. Select SolarEdge ONE Controller from the **Available devices** list and tap **Continue**.
4. Compare the displayed SKI number with the ONE controller SKI number and tap **Trust**.

After the Heat Pump and the ONE Controller are connected, the Heat Pump appears in the Device list and is available in mySolarEdge

Once approved in the Heat Pump App, the connection can take a few minutes.

Network Configuration and Security

Exposed Network Services and Ports

The following table lists the network services and associated ports exposed by the device. This information may be required for configuring network access, firewall rules, securing services, and troubleshooting.

Port number	Service/ Protocol	Description	Required for operation	Recommendation
53	TCP	DNS	Yes	Required for DNS
68	UDP	DHCP	Yes	Required for DHCP
1234	UDP	chronyd	Yes	Required for time synchronization
5353	UDP	mDNS	Yes	Required for mDNS
8000	TCP	EEbus	Yes	Required for working with heat pumps
8989	TCP	EEbus	Yes	Required for working with heat pumps
8889	TCP	Local Service (NM)	No	Used for local service communication
22222	TCP	Device debugging	Yes	Required for remote debugging
48484	TCP	Device Monitor	Yes	Required for device monitoring
61665	TCP	Local Service (HMI)	No	Used for local service communication