

# Device Control - Connection and Configuration Guide, Europe & APAC

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## Introduction

### Overview

The SolarEdge Smart Energy Management solutions allow increasing the self-consumption of a site. One method used for this purpose is controlling the usage (consumption) of loads using home automation Device Control products.

These products divert power to a load according to pre-configured schedules, using the following modes:

- **Schedule** - The device diverts power to the load during the configured time-slots, using excess PV power or, if none is available, using grid power.
- **Smart Save** - The device begins diverting power to the device once there is excess PV power, even prior to the configured time-slots, to maximize self-consumption and minimize consumption from the grid during the scheduled time-slot.

You can re-configure the schedules at any time and manually switch devices on and off.

You can configure the devices locally through the SolarEdge inverter or remotely, via the SolarEdge monitoring app.

Device Control can be used together with the export limitation application. For details on export limitation, refer to [http://www.solaredge.com/sites/default/files/feed-in\\_limitation\\_application\\_note.pdf](http://www.solaredge.com/sites/default/files/feed-in_limitation_application_note.pdf).

This document describes how to connect and configure Device Control products in StorEdge systems, and describes how to connect a Device Control system to the SolarEdge monitoring portal.



#### NOTE

Device Control requires inverter CPU version 3.19xx and above. If an upgrade is required the latest version can be downloaded [here](#); for upgrade instructions refer to the following application note: [http://www.solaredge.com/sites/default/files/upgrading\\_an\\_inverter\\_using\\_micro\\_sd\\_card.pdf](http://www.solaredge.com/sites/default/files/upgrading_an_inverter_using_micro_sd_card.pdf).

## System Components

A Device Control system includes the following components:

- **Device Control products**, one or several of each:
  - **Immersion Heater Controller** - Automatically divert excess PV power to provide free hot water & highly cost effective energy storage
  - **Plug-In Socket with Metering** - Wireless plug for controlling electrical loads, typically home appliances, pool pumps, etc.
  - **Switch with Metering** - Wireless relay for controlling electrical loads, typically home appliances, pool pumps, etc.
  - **Dry Contact Switch (without metering)** - Wireless switch for controlling loads using an external control interface, such as smart grid-ready supported heat pumps
- **Device Control ZigBee Module** - Device Control network manager, installed in the inverter; one module can manage up to 10 device control products
- **SolarEdge Modbus Meter and Current Transformers (CTs)** – the meter is used by the inverter for import/export or consumption readings, and manages Device Control network accordingly; the meter readings are displayed in the SolarEdge monitoring portal



**NOTE**

It is recommended to connect the meter to the inverter which is connected to the monitoring portal.

- **Optional: RS485 Expansion Kit** – the kit is used for multi-inverter systems, and provides an additional RS485 port within the inverter

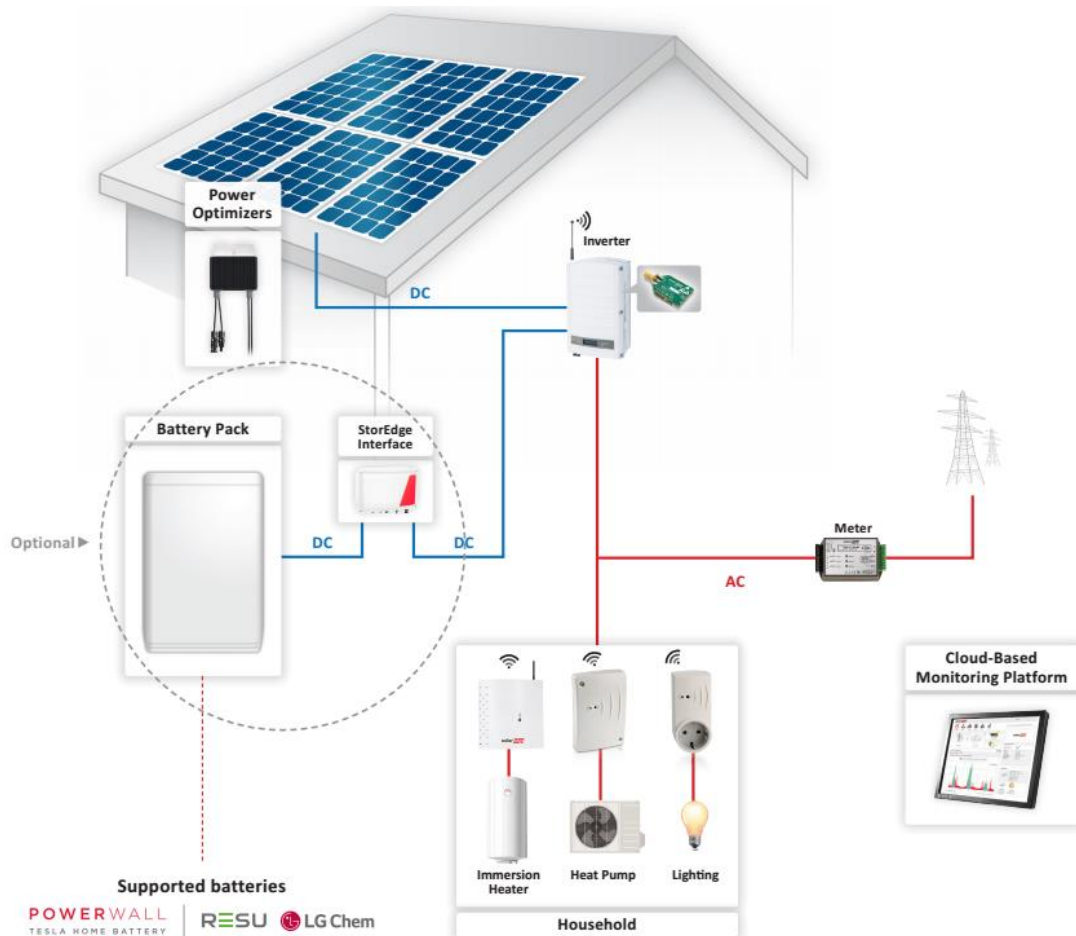


Figure 1: Device Control - system overview

## System Configurations

The configuration described in this document are the following:

Configuration	Description	Page
<b>Device Control with StorEdge (without Backup)</b>	Device Control products can be installed in a StorEdge system, further increasing the self-consumption of the site.	3
<b>Device Control with StorEdge (with Backup)</b>		5
<b>Connection to Monitoring Portal, Single Inverter</b>	How to connect a Device Control single inverter system (with or without StorEdge) to the SolarEdge monitoring portal	7
<b>Connection to Monitoring Portal, Multiple Inverters</b>	How to connect a Device Control multiple inverter system (with or without StorEdge) to the SolarEdge monitoring portal	8

## Related Documentation

For detailed installation and configuration instructions of the system components, refer to the following installation guides:

- **Immersion Heater Controller:** <http://www.solaredge.com/sites/default/files/se-device-control-immersion-heater-controller-installation-guide.pdf>
- **Plug-In Socket with Metering:** <http://www.solaredge.com/sites/default/files/se-device-control-plugin-socket-installation-guide.pdf>
- **Switch with Metering:** <http://www.solaredge.com/sites/default/files/se-device-control-switch-installation-guide.pdf>
- **Dry Contact Switch:** <http://www.solaredge.com/sites/default/files/se-device-control-dry-contact-switch-installation-guide.pdf>
- **Device Control ZigBee Module:** <http://www.solaredge.com/sites/default/files/se-device-control-zigbee-module-installation-guide.pdf>
- **Modbus Meter:** <http://www.solaredge.us/files/pdfs/solaredge-meter-installation-guide.pdf>
- **RS485 Expansion Kit:** [http://www.solaredge.com/files/pdfs/RS485\\_expansion\\_kit\\_installation\\_guide.pdf](http://www.solaredge.com/files/pdfs/RS485_expansion_kit_installation_guide.pdf)

For details on installation and configuration of additional related products and features, refer to:

- **Export Limitation:** [http://www.solaredge.com/sites/default/files/feed-in\\_limitation\\_application\\_note.pdf](http://www.solaredge.com/sites/default/files/feed-in_limitation_application_note.pdf)
- **StorEdge Interface Installation Guide:** [http://www.solaredge.com/sites/default/files/storedge\\_interface\\_installation\\_guide.pdf](http://www.solaredge.com/sites/default/files/storedge_interface_installation_guide.pdf)
- **StorEdge Inverter Installation Guide:** [http://www.solaredge.com/sites/default/files/storedge\\_backup\\_installation\\_guide.pdf](http://www.solaredge.com/sites/default/files/storedge_backup_installation_guide.pdf)
- **StorEdge Solution Applications Connection and Configuration Guide:** [http://www.solaredge.com/sites/default/files/storedge\\_applications\\_connection\\_and\\_configuration\\_guide.pdf](http://www.solaredge.com/sites/default/files/storedge_applications_connection_and_configuration_guide.pdf)
- **GSM Installation Guide:** [http://www.solaredge.com/sites/default/files/cellular\\_gsm\\_installation\\_guide.pdf](http://www.solaredge.com/sites/default/files/cellular_gsm_installation_guide.pdf)

## System Configuration Options

### Device Control with StorEdge (without Backup)

Device Control products can be installed in a StorEdge system, further increasing the self-consumption of the site. In such a case, excess PV power is used first for Device Control and only then for StorEdge (i.e. battery charge).

The Device Control ZigBee Module can be installed in any inverter with an available ZigBee/Wi-Fi connector (i.e. in any inverter where the connector is not used for ZigBee/Wi-Fi communications to the monitoring portal).

#### ► **Configure the System:**

- 1** Configure the StorEdge system as described in the StorEdge guides: [http://www.solaredge.com/sites/default/files/storedge\\_interface\\_installation\\_guide.pdf](http://www.solaredge.com/sites/default/files/storedge_interface_installation_guide.pdf) and [http://www.solaredge.com/sites/default/files/storedge\\_applications\\_connection\\_and\\_configuration\\_guide.pdf](http://www.solaredge.com/sites/default/files/storedge_applications_connection_and_configuration_guide.pdf)
- 2** Configure the Device Control system as described in the product installation guides. Refer to *Related Documentation* above.

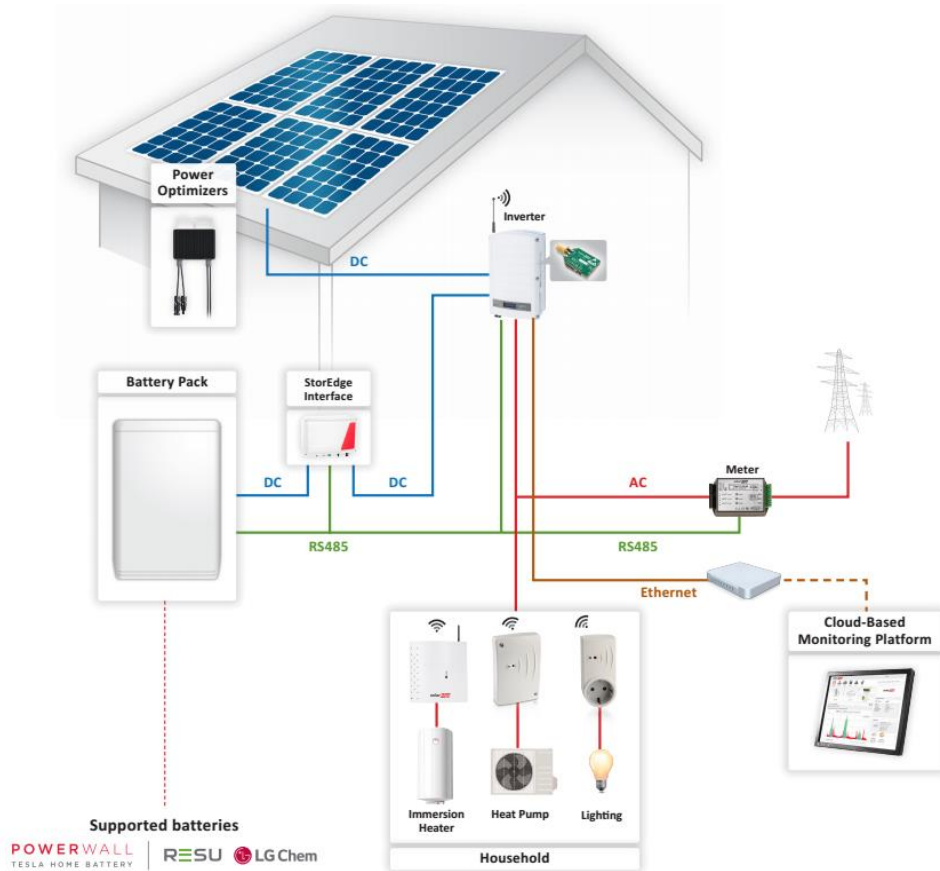


Figure 2: Device Control with StorEdge (without Backup), single inverter

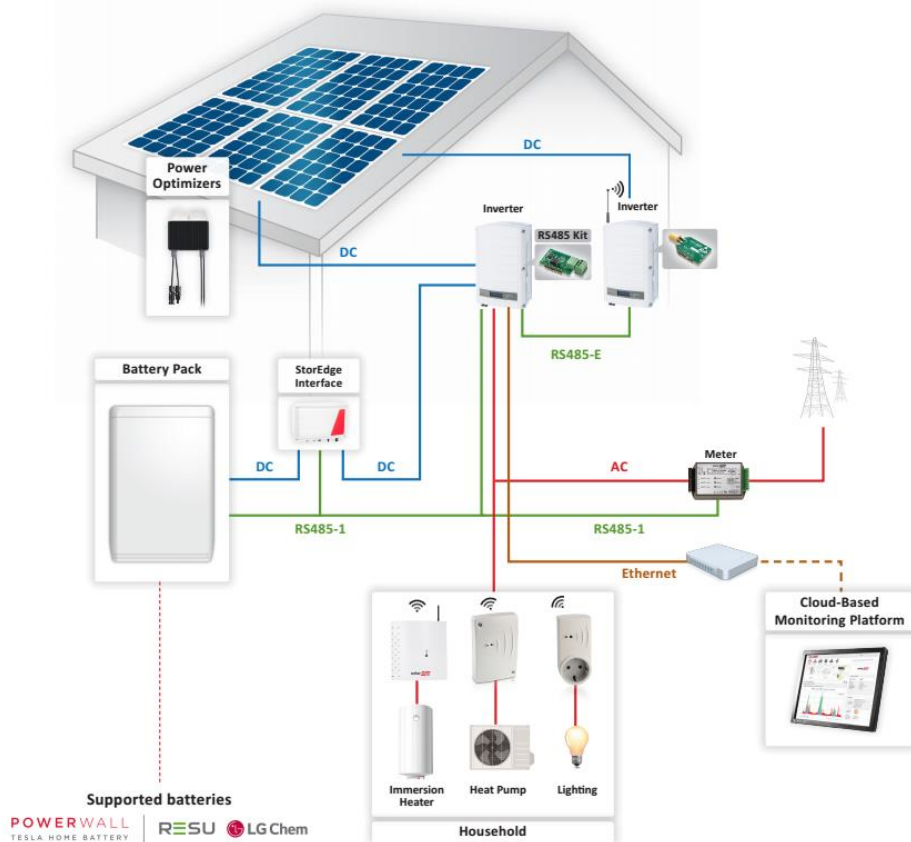


Figure 3: Device Control with StorEdge (without Backup), multiple inverters

## Device Control with StorEdge (with Backup)

Device Control products can be installed in a StorEdge system, further increasing the self-consumption of the site. In such a case, excess PV power is used first for Device Control and only then for StorEdge (i.e. battery charge).

The Device Control ZigBee Module can be installed in any inverter with an available ZigBee/Wi-Fi connector.



**NOTE**

When the system is in backup mode, Device Control is automatically set to mode **Manual** → **OFF**; the mode can be changed as described in the Device Control product installation guides.

► **Configure the System:**

- 1 Configure the StorEdge system as described in the StorEdge Solution with Backup installation guide: [http://www.solaredge.com/sites/default/files/storedge\\_backup\\_installation\\_guide.pdf](http://www.solaredge.com/sites/default/files/storedge_backup_installation_guide.pdf)
- 2 Configure the Device Control system as described in the product installation guides. Refer *Related Documentation* on page 3.

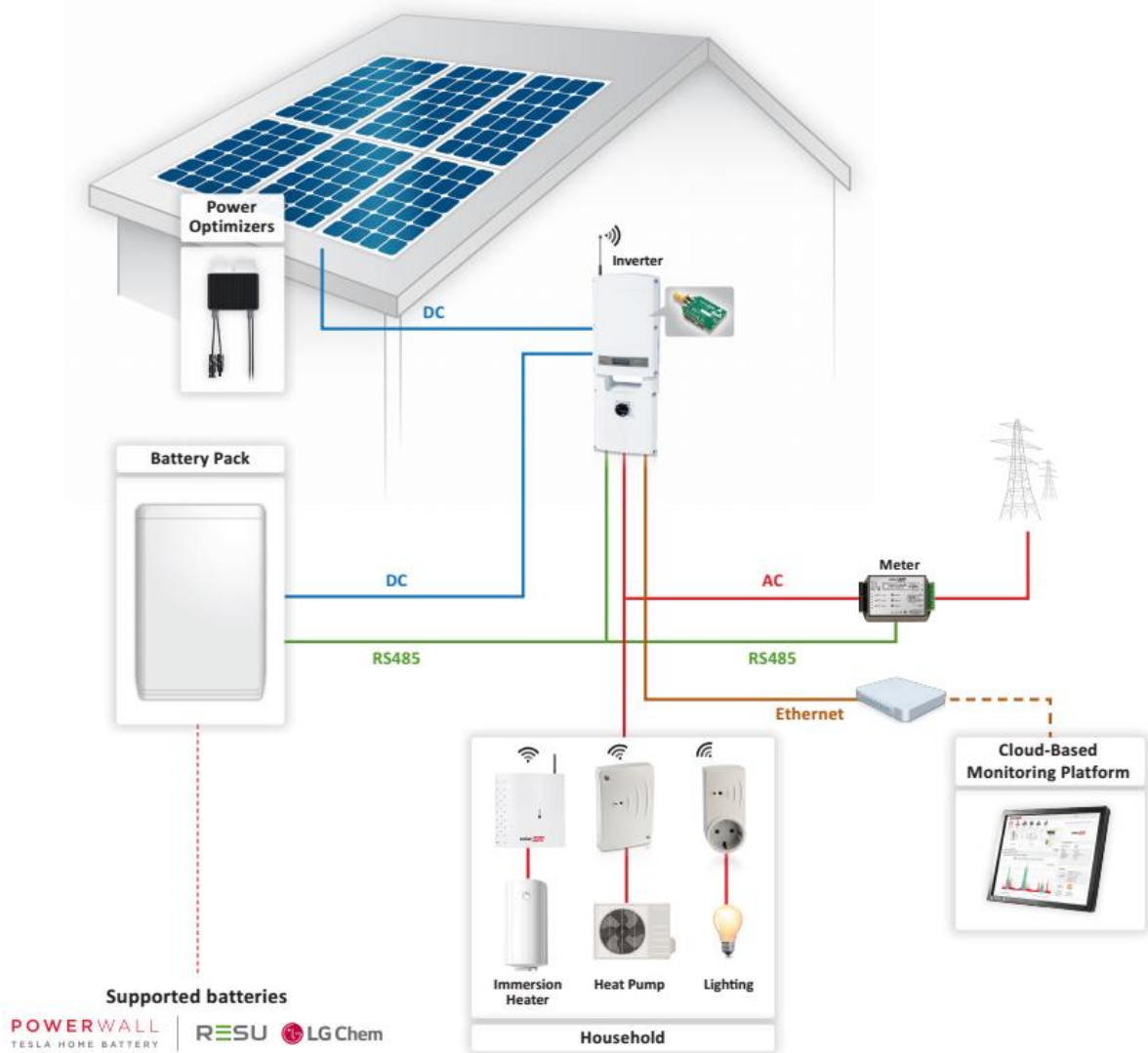


Figure 4: Device Control with StorEdge (with Backup), Single Inverter

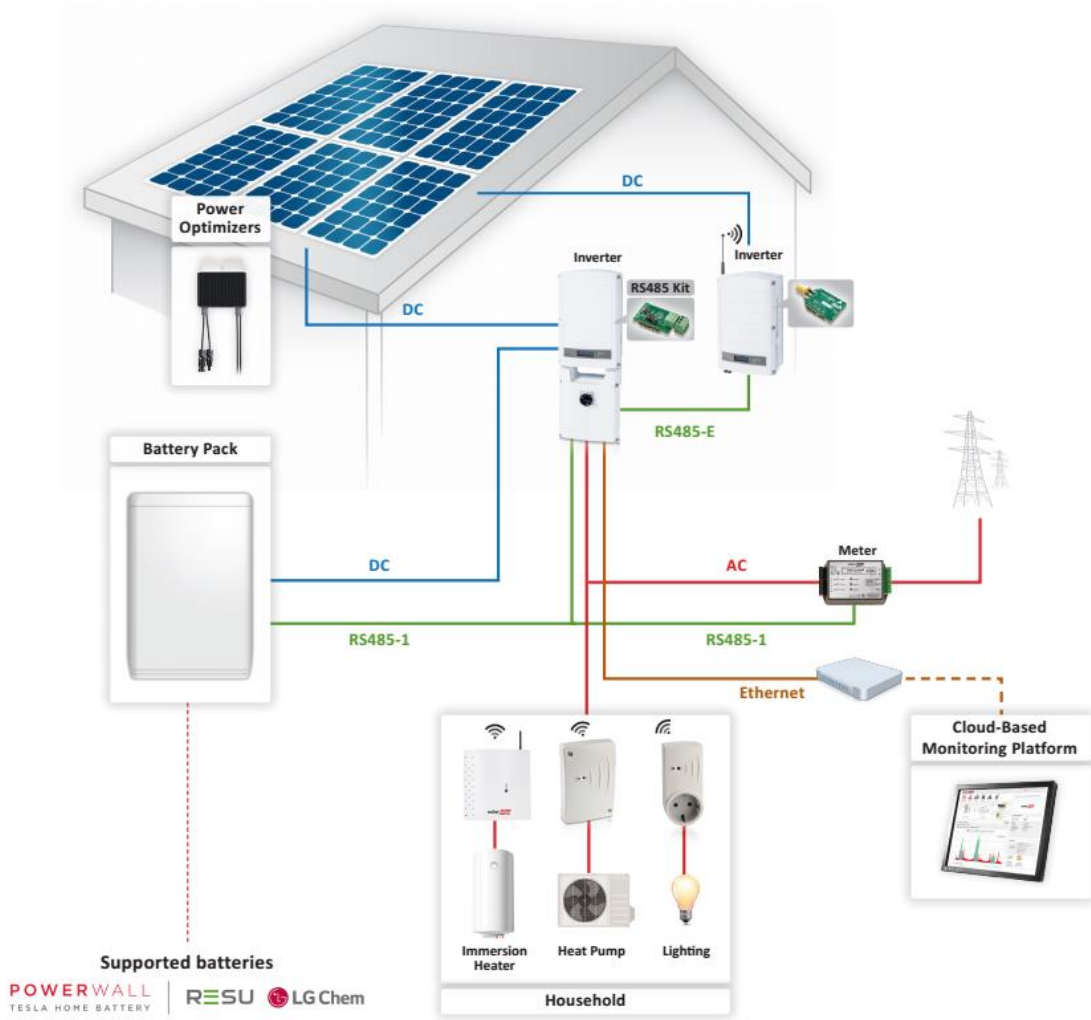


Figure 5: Device Control with StorEdge (with Backup), Multiple Inverters



## Connection to Monitoring Portal, Single Inverter

In a single inverter Device Control system the Device Control ZigBee Module occupies the inverter’s ZigBee/Wi-Fi connector. Therefore, the inverter should be connected to the SolarEdge monitoring portal with Ethernet (LAN). No communication configuration is needed – the inverter default communication mode is LAN.

Alternately, the inverter may be connected using the GSM Cellular Modem. This option requires a SIM card with a 1GB data plan that should be purchased from a cellular provider. If using GSM, configure the communications as described in the GSM installation guide: [http://www.solaredge.com/sites/default/files/cellular\\_gsm\\_installation\\_guide.pdf](http://www.solaredge.com/sites/default/files/cellular_gsm_installation_guide.pdf).

**NOTE**  
 The Device Control ZigBee Module cannot be used for communication to the monitoring portal.

**NOTE**  
 To use the GSM Cellular Modem install an inverter with a built-in GSM modem or purchase a GSM upgrade kit (for inverters with CPU V3.xxxx and above).

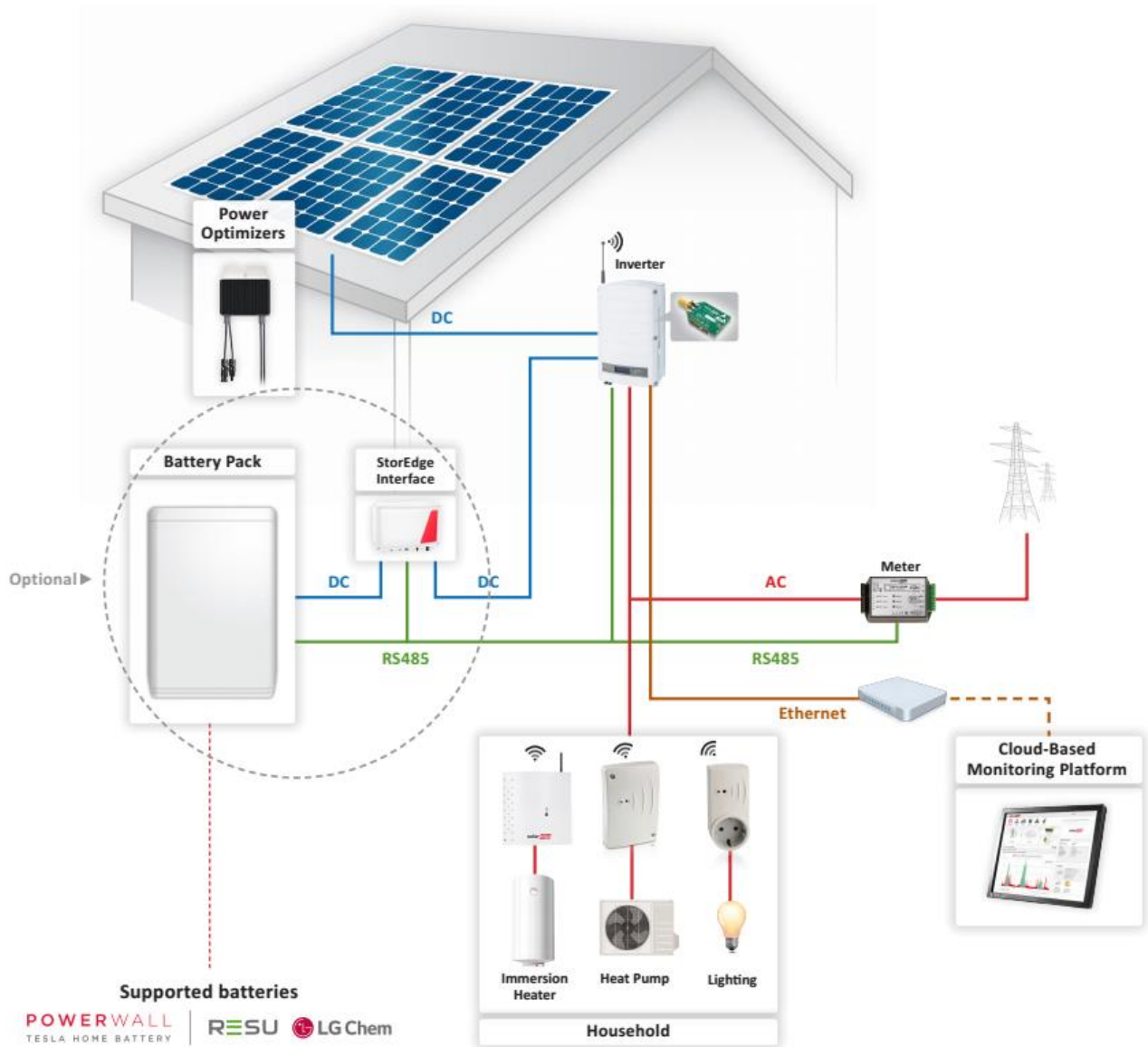


Figure 6: Connection to Monitoring Portal, Single Inverter

## Connection to Monitoring Portal, Multiple Inverters

In a multiple inverter Device Control system, the inverters are connected on an RS485 bus. Since the meter (and the battery in a StorEdge system) is connected to one of the inverters' RS485 connectors (RS485-1), an RS485 Expansion Kit is installed in this inverter and is used to connect the inverter RS485 bus (RS485-E).

The Device Control ZigBee Module can be installed in any inverter with an available ZigBee/Wi-Fi connector.

Since the RS485 Expansion Kit occupies one inverter's ZigBee/Wi-Fi connector and the Device Control ZigBee module occupies a second inverter's ZigBee/Wi-Fi connector, the RS485-E master should be connected to the SolarEdge monitoring portal with Ethernet (LAN). No communication configuration is needed – the inverter default communication mode is LAN.

Alternately, the inverter may be connected using the GSM Cellular Modem. This option requires a SIM card with a 1GB data plan that should be purchased from a cellular provider.



### NOTE

The Device Control ZigBee Module cannot be used for communication to the monitoring portal.

### ► System Configuration – Communication to Monitoring Portal:

Configure the inverter RS485 bus and the server communications from the RS485-E master.

- 1 Configure RS485 communication:
  - a. Select **Communication** → RS485-E Conf.
  - b. Select **Protocol** → Master
  - c. Select **Slave Detect**. Verify that the inverter reports the correct number of slaves (the number of connected devices).
- 2 Configure communications from the RS485-E master:
  - If using Ethernet, no communication configuration is needed – the inverter default communication mode is LAN
  - If using GSM, configure the communications as described in the GSM installation guide: [http://www.solaredge.com/sites/default/files/cellular\\_gsm\\_installation\\_guide.pdf](http://www.solaredge.com/sites/default/files/cellular_gsm_installation_guide.pdf)

### ► System Configuration – Meter (and Battery):

Configure the meter and optionally the battery from the RS485-1 master.

- 1 Configure the meter:
  - a. Select **Communication** → RS485-1 Conf → **Device Type** → **Multi-devices**. A list of devices is displayed.
  - b. Select **Meter 2**. The meter configuration screen is displayed.
  - c. Configure the meter:
    - Select **Device Type** → Revenue Meter
    - Set the CT value that appears on the CT label: **CT Rating** → <xxxxA> (use the up/down arrows to set each character, press Enter to set the character and move to the next one, long press on Enter to set the value)
    - Select **Meter Func.** and select the function according to the meter CT(s) location:
      - **Export + Import**: meter CT(s) at grid connection point (as shown in the diagram above)
      - **Consumption**: meter CT(s) at load consumption point
- 2 In a StorEdge system, configure the battery as described in the relevant StorEdge guide.

### ► System Configuration – Device Control:

Configure the Device Control system from the inverter with the Device Control ZigBee Module.

- 1 Configure the Device Control ZigBee Module as described in its installation guide: <http://www.solaredge.com/sites/default/files/se-device-control-zigbee-module-installation-guide.pdf>
- 2 Configure Device Control as described in the product installation guides. Refer to *Related Documentation* on page 3.



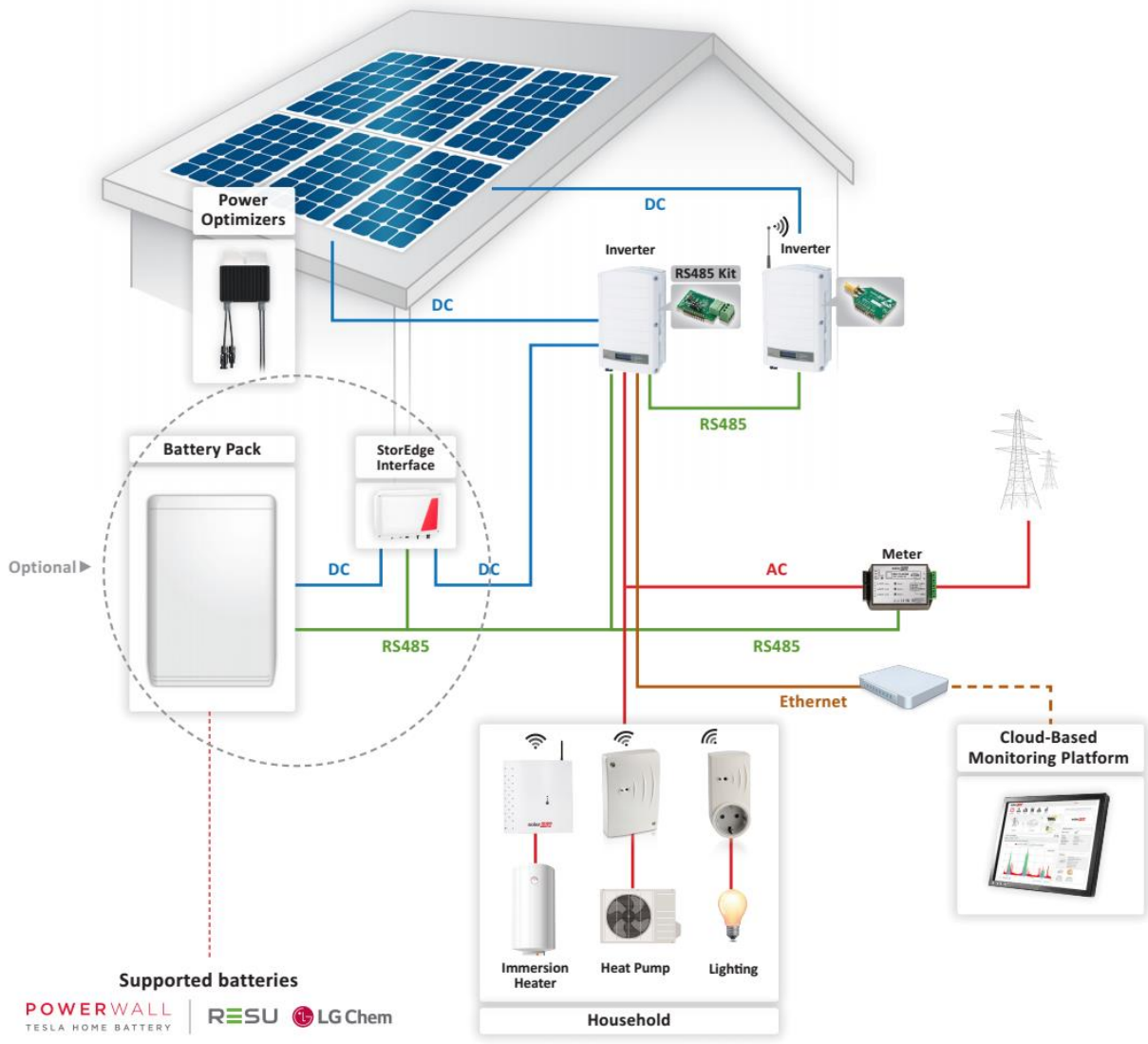


Figure 7: Connection to Monitoring Portal, Multiple Inverters