

Technical Note – Storing and Sending SolarEdge Device Data

Version History

- Version 1.3, October 2022 – Data usage table updated to include Three Phase Inverter with Synergy Technology
- Version 1.2, December 2020

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Introduction

The SolarEdge inverter stores performance data of the inverter and of connected devices and sends it to the SolarEdge monitoring platform. The data is stored for a certain retention time; if there is no connection to the monitoring portal for a period longer than the retention time, the data is erased. This document details how much data can be stored and for how long, and how much data is transmitted to the monitoring platform.

Storing Data

Inverters with CPU Version 3.xxxx or 4.xxxx

Retention time [days, approximate]: $\frac{Memory}{\sum DeviceUsage_n * DeviceNum_n}$

where:

- Memory: 2.87 MB (2.87 * 1024 * 1024 Byte)
- DeviceNum_n: number of devices of type n
- DeviceUsage_n: memory usage of device type n, according to the following table, in which:
 - High bandwidth: for systems communicating with anything other than cellular low bandwidth connection
 - Low bandwidth: for systems communicating with cellular low bandwidth connection

Device Type	Bytes per Day, High Bandwidth	Bytes per Day, Low Bandwidth
Single Phase Inverter	46080	10032
Three Phase Inverter	58176	10800
Power Optimizer	3024	1008
Export/Import Meter	57024	19008
Consumption Meter	76032	25344
StorEdge Battery	37440	12480
Device Control Product ¹	21312	7104

- Erasing data: new data will overwrite old data
- Example: Single phase inverter with 20 optimizers, using Ethernet communications:

$$\begin{aligned} & \frac{2.87 \text{ MB}}{(46080 \text{ Bytes} + 3024 \text{ Bytes} * 20)} \\ &= \frac{2.87 * 1024 * 1024}{106560} \\ &= 28 \text{ days} \end{aligned}$$

¹ The SolarEdge data plan cannot be used for monitoring Device Control products; if using a non-SolarEdge data plan use this value to calculate the required data plan size

Inverters with CPU Version 1.xxxx or 2.xxxx

The SolarEdge inverter stores data for a period of time that is relative to the number of devices connected to it.

- Retention time [days, approximate]:
 - Inverters with CPU version 1.xxxx / 2.xxxx lower than 2.0400: 250/# of optimizers
 - Inverters with CPU version 2.0400 and higher: 530/# of optimizers
- Erasing data:
 - Inverters with CPU version 1.xxxx: data is not erased but no new data can be stored
 - Inverters with CPU version 2.xxxx: new data overwrites old data

Examples:

Examples: Number of Optimizers	Retention Time CPU version 1.xxxx / 2.xxxx lower than 2.0400	Retention Time, CPU version 2.0400 and higher
12	20 days	44 days
24	10 days	22 days
50	5 days	10 days

Control and Communication Gateway (CCG) with CPU Version 3.xxxx

In a system with a CCG, the data of devices connected to the CCG is stored in the CCG and not in the inverter.

Retention time [days, approximate]: $\frac{Memory}{\sum DeviceUsage_n * DeviceNum_n}$

where:

- Memory: 2.87MB (2.87 * 1024 * 1024 Byte)
- DeviceNumn: number of devices of type n
- DeviceUsagen: memory usage of device type n, according to the following table, where:
 - High bandwidth: for systems communicating with anything other than cellular low bandwidth connection
 - Low bandwidth: for systems communicating with cellular low bandwidth connection

Device Type	Bytes per Day, High Bandwidth	Bytes per Day, Low Bandwidth
Production Meter	19008	6336
Export/Import Meter	57024	19008
Consumption Meter	76032	25344
Environmental Sensors (for any number of sensors)	21888	7296
Device Control Product	21312	7104

- Erasing data: new data will overwrite old data
- Example: CCG with 3 sensors and one consumption meter, using Ethernet communications:

$$\begin{aligned}
 & 2.87 \text{ MB} / (21888 \text{ Bytes} + 76032 \text{ Bytes}) \\
 & = 2.87 * 1024 * 1024 / 97920 \\
 & = 30 \text{ days}
 \end{aligned}$$

Control and Communication Gateway (CCG) with CPU Version 1.xxxx or 2.xxxx

- Retention time [days, approximate]: 50
- Erasing data:
 - Inverters with CPU version 1.xxxx: data is not erased but no new data can be stored
 - Inverters with CPU version 2.xxxx: new data will override old data

Examples:

Number of Optimizers	Retention Time, CPU version 1.xxxx / 2.xxxx lower than 2.0400	Retention Time, CPU version 2.0400 and higher
12	20 days	44 days
24	10 days	22 days
50	5 days	10 days

Sending Data

Data Sampling and Upload Options

A SolarEdge system is connected to the SolarEdge monitoring platform using one of the following communication options:

- Ethernet (LAN)
- ZigBee communication
- Wi-Fi
- Cellular GSM/CDMA

Communications are performed using one of two bandwidth modes:

- High bandwidth: used by all communication options other than cellular low bandwidth connection
- Low bandwidth: used by cellular low bandwidth communication options; in this mode only the inverter in which the modem is installed, along with the devices connected to it, is monitored

Once a connection with the monitoring platform is established, data is automatically sent at the following upload rate:

Bandwidth Mode	Data Sampling Rate	Data Upload Rate
High	5 min	Continuous
Low	15 min	Every 4 hours

The inverter receives confirmation that the data was properly received and then erases the data. Data is not erased unless confirmation is received from the portal.



NOTE

When a system is communicating in low bandwidth mode, communications will be initiated in the following cases even if 4 hours have not elapsed since the last communication:

- Immediately after optimizer pairing; connection will remain for 1 hour
- StorEdge system operating in backup mode and battery SOE (state of energy) at 100%, 80%, 60%, 50%, 40%, 30%, 20%, 10% and 5% ; inverter, battery and meter data will be sent (optimizer data will not be sent in such communications).
- Earth fault error in Australia (to comply with regulation requiring immediate notification); no monitoring data will be sent in such communication

Data Usage

The following table details the monthly data usage for each device type, assuming the system is operating 12 hours/day:

Device Type	MB per Month, High Bandwidth	MB per Month, Low Bandwidth
Single Phase Inverter	5.86	0.49
Three Phase Inverter	6.14	0.51
Three Phase Inverter with Synergy Technology	13	2
Power Optimizer	0.1	0.045
Export/Import Meter	2.15	0.86
Consumption Meter	3	1.15
StorEdge Battery	3	1.15
CCG (including Sensors)/Firefighter Gateway	3.2	0.47
Device Control Product	1.15	0.33
Inverter Firmware Upgrade	26	26
StorEdge Battery Firmware Upgrade	2	2
CCG Firmware Upgrade	1.5	1.5

Overhead: when using the SolarEdge Cellular GSM modem, TCP overheads (not accounted for in the table above) should be taken into account.

Examples:

- System with 2 inverters, 20 optimizers per inverter, and 1 export meter, using high bandwidth communications and allowing for 1 inverter upgrade a month (overhead not included):
 Data Usage = $2 * 5.86 \text{ MB} + 2 * 20 * 0.1 \text{ MB} + 2.15 \text{ MB} + 2 * 26 \text{ MB} = \sim 70 \text{ MB}$
- System with 1 inverters, 20 optimizers and 1 export meter, using low bandwidth cellular communications and allowing for 1 inverter upgrade a month (overhead not included):
 Data Usage = $0.49 \text{ MB} + 20 * 0.045 \text{ MB} + 0.86 \text{ MB} + 26 \text{ MB} = \sim 28.25 \text{ MB}$

Safety Symbols Information

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



WARNING

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



CAUTION!

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



NOTE

Denotes additional information about the current subject.



IMPORTANT SAFETY FEATURE

Denotes information about safety issues.

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



NOTE

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

Support Contact Information

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



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

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

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