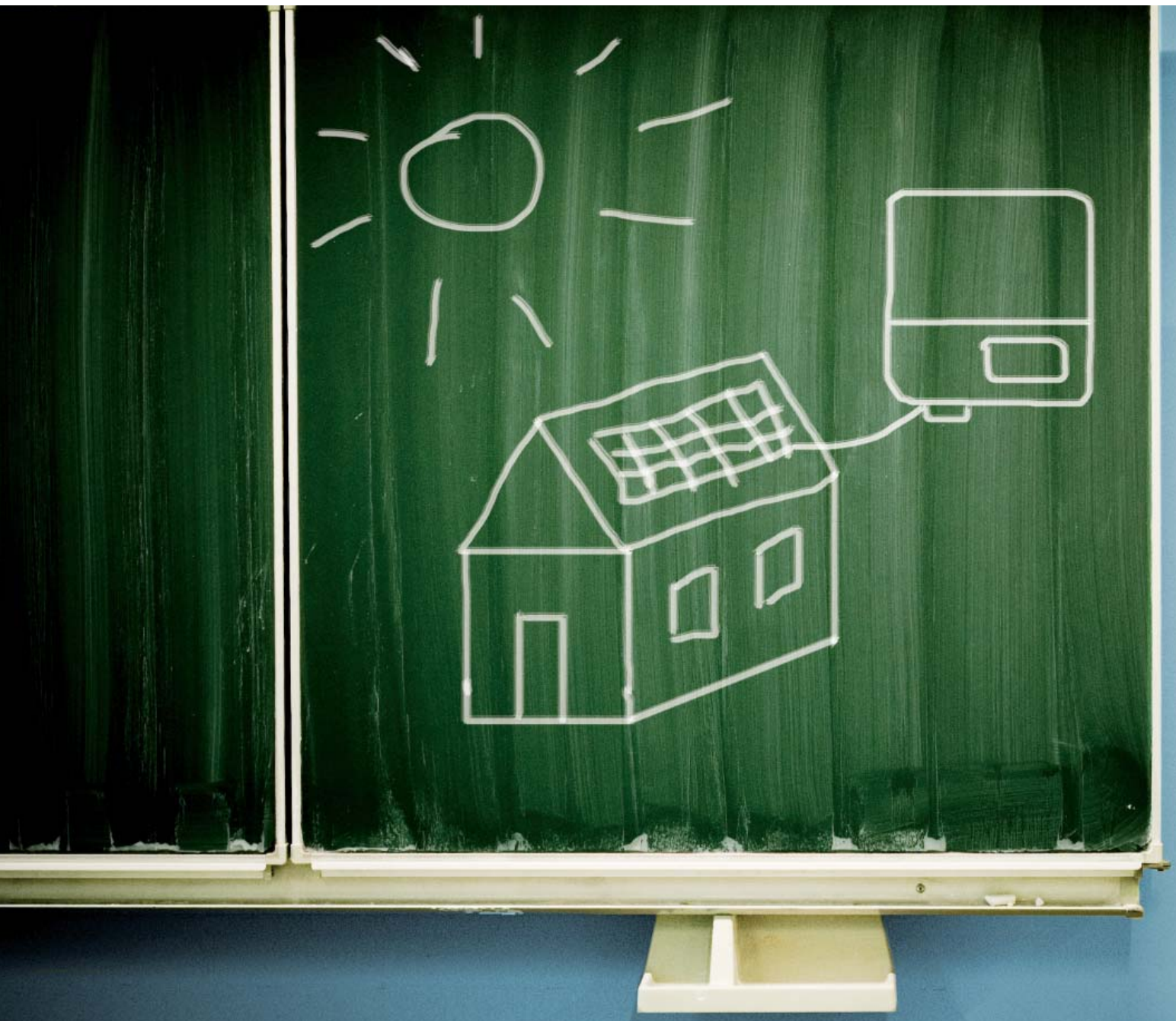


# Solutions for N SSP Guideline



# 1. Data Collection



**SUNNY BOY 3000TL / 4000TL / 5000TL**  
[http://www.SMA-Australia.com.au/en\\_AU/products/solar-inverters/sunny-boy/sunny-boy-3000tl-4000tl-5000tl.html](http://www.SMA-Australia.com.au/en_AU/products/solar-inverters/sunny-boy/sunny-boy-3000tl-4000tl-5000tl.html)



**ACCESSORIES**  
[http://www.SMA-Australia.com.au/en\\_AU/products/accessories.html](http://www.SMA-Australia.com.au/en_AU/products/accessories.html)



References of non SMA Products:  
Order Line for SMA tested energy meters from Landis+Gyr : 1300 252 634

## 1.1 DATA SOURCE

### 1.1.1 Green Data

**I.** The data sources in the NSSP as provided by SMA are the SUNNY BOY solar inverters or WINDY BOY wind turbine inverters (also usable for hydro turbines) with their integrated measurements on AC and DC of the renewable energy systems.

**II.** A communications PC card, Piggy Back, must be installed in the SUNNY BOY inverter, or it can also be purchased with this Piggy Back integrated already. This makes it possible for the inverter to communicate the data to other devices, such as data loggers. For the NSSP, the suggested Piggy Back is the RS485 (can be integrated in the order key from SMA or ordered with the order number "485PB-NR") Accuracy of all measurements is Class 2.

**III.** Installing an external meter to get output data from the renewable energies is not necessary in SMA systems, but generally is also possible.

**IV.** The data of each smaller system installed in a school with multiple systems is possible by integrating the RS485 Piggy Back into each inverter.

**V.** Current PV systems can be integrated into the data collection if a) these systems contain SMA inverters (follow step ii) or b) the protocol has been made compatible with the SMA NET Protokoll.

### 1.1.2 Black Data

**I.** An energy meter for black data collection must have an S0 output, which is a pulsing signal transmitted from the energy meter by using two simple communication wires. Generally, a meter from the public utilities are in place, but due to regulations not accessible. In these cases, the addition of a second energy meter is necessary, which has an S0 output. The function of this data collection is independent from the meter's location (primary source or just one building out of several buildings).

**II.** Multiple metering points can be integrated into an SMA data collection system. There must be one meter at each metering point with an S0 output each, and each meter has to count the energy of all phases. If one meter displays the required 65 % of the overall energy at the metering points, this meter is sufficient. Other meters can be added to display 100 % (optional). Using three phase meters requires that the pulses at the S0 output represent a sum of the counted energy of all three phases. Otherwise, a pulsing output for each phase needs to be available from the meter.

**III.** The overall energy consumption can be consolidated later in the various SMA software solutions, such as FLASHVIEW or SUNNY PORTAL, in order to show data as if it is read from just one measuring point.

**IV.** The number of different meters in one data collection system can be up to 50 units.



#### **SUNNY SENSORBOX**

[http://www.SMA-Australia.com.au/en\\_AU/products/monitoring-systems/sunny-sensorbox.html](http://www.SMA-Australia.com.au/en_AU/products/monitoring-systems/sunny-sensorbox.html)



#### **SUNNY BOY 3300 / 3800**

[http://www.SMA-Australia.com.au/en\\_AU/products/solar-inverters/sunny-boy/sunny-boy-3300-3800.html](http://www.SMA-Australia.com.au/en_AU/products/solar-inverters/sunny-boy/sunny-boy-3300-3800.html)



#### **SUNNY WEBBOX**

[http://www.SMA-Australia.com.au/en\\_AU/products/monitoring-systems/sunny-webbox.html](http://www.SMA-Australia.com.au/en_AU/products/monitoring-systems/sunny-webbox.html)

### **1.1.3 Temperature**

I. SMA offers an ambient temperature sensor, which is operated using the SUNNY SENSORBOX. Through the SUNNY SENSORBOX, the information of the ambient temperature sensor is transformed from an analogue signal to the RS485 signal, just as the RS485 Piggy Back in a SUNNY BOY.

II. The temperature sensor includes mounting materials so that an installation on walls or other objects is possible. The maximum distance between the SUNNY SENSORBOX and the ambient temperature sensor is around 29m.

III. See II.

IV. N/a

## **1.2 DATA TYPES AND ACCURACY**

### **1.2.1 Green Data**

I. The green data is sent out via the RS485 bus by the inverters, equipped with a RS485 Piggy Back. The data output is all the same no matter if it is a SUNNY BOY or a WINDY BOY.

- Energy Output daily
- Energy Output in Total, since installation
- DC power
- DC voltage
- DC current
- AC power
- AC voltage
- AC current
- Frequency

... and many more

II. The data collection interval can be set in the SMA data logger, the SUNNY WEBBOX. The options are 5 minutes, 10 minutes, and 15 minutes.

III. With SMA inverters, no additional meters are necessary for getting the information about the green data.

IV. N/a

V. Getting the data into the SUNNY WEBBOX is independent from the number of phases. Up to 50 units can be monitored at once with a single WEBBOX.

VI. As mentioned in i) many more than just the basic values can be logged. Depending on the technology of the inverter, the number of parameters can vary.



#### **SCHOOLMETERBOX**

[http://www.SMA-Australia.com.au/en\\_AU/products/monitoring-systems/schoolmeterbox.html](http://www.SMA-Australia.com.au/en_AU/products/monitoring-systems/schoolmeterbox.html)

### **1.2.2**

I. Using an energy meter with an S0-output, the SCHOOLMETERBOX translates from the pulse information to the RS485 system so that the energy meter's information can be logged in the SUNNY WEBBOX. The SCHOOLMETERBOX provides

- Energy consumption, daily
- Energy consumption, since installation
- Number of hours in operation
- Calculated maximum height of power
- Number of counted impulses

II. The data collection interval can be set in the SMA data logger, the SUNNY WEBBOX. The options are 5 minutes, 10 minutes and 15 minutes.

III. Energy meters and CT's in general with a Class 1 standard are the common ones in Australia.

IV. N/a



#### **SUNNY SENSORBOX**

[http://www.SMA-Australia.com.au/en\\_AU/products/monitoring-systems/sunny-sensorbox.html](http://www.SMA-Australia.com.au/en_AU/products/monitoring-systems/sunny-sensorbox.html)

### **1.2.3**

I. The temperature measurements are always average values.

II. The temperature sensor has an accuracy of +/- 0.5°C.

III. Using the SUNNY SENSORBOX for the ambient temperature measurement, the SUNNY SENSORBOX includes a module temperature sensor, as well as an integrated insolation measuring device. These sensors are included at no additional cost. A wind speed sensor as well as other optional auxiliary sensors can be connected to the SENSORBOX, as long as the aux sensor provides an analogue output with a voltage range between 0 and 300mV.

## **1.3**

### **1.3.1 Utility Meters**

I. The function of SMA's communication systems for schools is independent from using additional meters or existing meters from the utilities. These meters need to provide an S0-output.

II. See above

III. - IV. N/a

## 2. Data Storage



### SUNNY MINI CENTRAL

[http://www.SMA-Australia.com.au/en\\_AU/products/solar-inverters/sunny-mini-central.html](http://www.SMA-Australia.com.au/en_AU/products/solar-inverters/sunny-mini-central.html)



### SUNNY PORTAL

[http://www.SMA-Australia.com.au/en\\_AU/products/monitoring-systems/sunny-portal.html](http://www.SMA-Australia.com.au/en_AU/products/monitoring-systems/sunny-portal.html)

### 1.3.2 Power Quality Meters

I. - IV. N/a

### 1.3.3 Weather Stations

I. N/a

## 2.1 GENERAL REQUIREMENTS

I. SMA provides both a local and a web based storage possibility: The local storage is the SUNNY WEBBOX, which can – according to the size of the SD card – store data for several years. The web based storage, SUNNY PORTAL, is supported through several web servers located at SMA's headquarters.

II. Depending on the size of a system (number of devices) and the SD card, the SUNNY WEBBOX is able to store the data for up to several years.

III. Once the storage is full, the data will be kept in the FIFO manner

IV. The data can be retrieved in .csv or .xml formats

V. The stored data is always accessible at SUNNY PORTAL as an external storage as well as from the SUNNY WEBBOX as the local storage.

VI. With the SMA monitoring systems, the time stamp is given to the values centrally through the SUNNY WEBBOX. All data arriving at the data logger will be sharing the same time stamping reference.

VII. Sensors give constant values, even if the value is "0". Inverters switch off during night time so there will not be values recoded from the PV system during that time.

VIII. Stored data with SMA products have up to three decimal places, but at least one, no matter which data.

IX. Once the data is stored via SUNNY WEBBOX, as the data logger for the schools systems, or the SUNNY PORTAL, it is accessible instantly. Both can be reached via an FTP server, where the data is easily available (e.g. by using your web browser of your computer). The SUNNY WEBBOX can also send data out automatically to a preselected IP address (FTP server). Using this function, the data is not only available through SUNNY PORTAL on the internet, but also on an FTP server of the school's choice.

X. All stored data is instantly accessible.



#### **SUNNY WEBBOX**

[http://www.SMA-Australia.com.au/en\\_AU/products/monitoring-systems/sunny-webbox.html](http://www.SMA-Australia.com.au/en_AU/products/monitoring-systems/sunny-webbox.html)

## 2.2 DATA STORED "ONSITE"

### 2.2.1 Hardware-based Aggregation and Storage

**I.** The average data used for a system on the SUNNY WEBBOX with an interval of five minutes is approx. 50kB per day. For example, if a 512Mb SD card is used, the time of storage in a SUNNY WEBBOX would be far more than 5 years, but less than 25 years.

**II.** An SD card is used in the SUNNY WEBBOX.

**III.** SUNNY WEBBOX is a pure data logger with web capabilities and does not have batteries or a UPS integrated.

**IV.** The SUNNY WEBBOX is password protected.

**V.** The SUNNY WEBBOX can be reached via FTP with a web browser, local and through the internet.

**VI.** The "FTP push mode" is included in all SUNNY WEBBOXES with FW1.45 and above. A SUNNY WEBBOX performs an update automatically, once it is connected to the internet, but can be updated via the SD card as well. The FTP push function sends out the stored data from the WEBBOX to another location (IP address) on the internet.

### 2.2.2 Software-based Aggregation and Storage

**I.** The PC-based software SUNNY DATA CONTROL and SUNNY EXPLORER are available from SMA, at no cost or free of charge and without limitation of usage.

**II. - III.** N/a

## 2.3 DATA STORED "OFFSITE"

**I.** SUNNY PORTAL is available 24/7. Rights to users can be given as user or administrator. Once the passwords are set, no prior notice of the host (SMA Australia) is necessary.

**II.** All rights can be freely adjusted

**III.** Data, the created web page, as well as the visibility in general of SUNNY PORTAL, is security protected by passwords.

**IV.** SUNNY PORTAL consists of several servers with multiple backup routines in place.



#### **SUNNY PORTAL**

[http://www.SMA-Australia.com.au/en\\_AU/products/monitoring-systems/sunny-portal.html](http://www.SMA-Australia.com.au/en_AU/products/monitoring-systems/sunny-portal.html)

# 3. Data Communication and Transmission



## SUNNY WEBBOX

[http://www.SMA-Australia.com.au/en\\_AU/products/monitoring-systems/sunny-webbox.html](http://www.SMA-Australia.com.au/en_AU/products/monitoring-systems/sunny-webbox.html)

## 2.4 SERVICE AND MAINTENANCE

I. - II. N/a

## 3.1 GENERAL

I. SMA monitoring systems use the SMA NET protocol. This protocol is described in detail and is available on our web page.

II. All tools which are necessary to operate the communication system from SMA are available at no cost from our website.

III. Wireless solutions are possible on the RS485 and LAN side of the systems.

## 3.2 DEVICE COMMUNICATIONS

I. SMA communication systems for the NSSP are based on a hard wired solution. Nevertheless, the integration of wireless solutions in the hard wired system present no problem (see 3.1 III.).

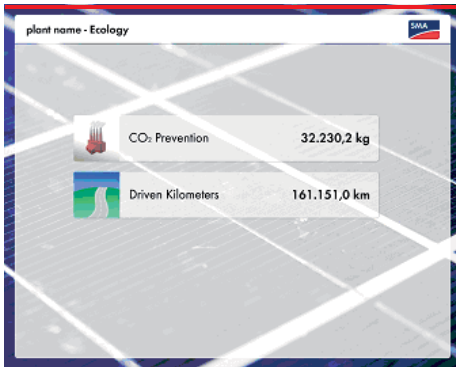
II. N/a

## 3.3 REMOTE COMMUNICATIONS

I. GPRS / 3G! Routers can easily be used with the SUNNY WEBBOX. As long as the router is IP address based, it is just important that a connection to the internet is somehow possible.

II. N/a

# 4. Data Visualisation including Websites



### FLASH VIEW

[http://www.SMA-Australia.com.au/en\\_AU/products/software/flashview.html](http://www.SMA-Australia.com.au/en_AU/products/software/flashview.html)

## 4.1 WEB VISUALISATION

### 4.1.1 General

I. SUNNY WEBBOX and SUNNY PORTAL can be operated by all common web browsers such as IE6, Safari, Firefox, Chrome.

II. SUNNY PORTAL lets you customise your web page freely so that you can include photos, CO<sub>2</sub> calculations, graphs, curves and bars of each single parameter, which are sent to SUNNY PORTAL by the SUNNY WEBBOX.

III. SMA software does not use ActiveX controls. FLASHVIEW 2.21AU allows you to display real time values of your system on a local display.

IV. The kind of parameter, time intervals, comparisons and CO<sub>2</sub> calculations can be freely set up in SUNNY PORTAL. SMA software allows you to compare this to driven kilometers in Australia. Periods of graphs can easily be changed in SUNNY PORTAL.

V. Download from SUNNY PORTAL in .csv can be done manually or automatically with a software routine requesting the data download.

VI. SMA software supports Web 2.0 standards.

### 4.1.2 Internally Hosted Websites

I. The availability of an internally hosted website lies in the responsibility of the system administrator of the school. SUNNY PORTAL graphs and data can be displayed on an internal private website as well.

II. N/a

### 4.1.3 Externally Hosted Websites

I. N/a

II. SUNNY PORTAL is completely free of charge and accessible for everyone.

III. Authorisation for data usage can be given by the administrator of the website on SUNNY PORTAL.

IV. Comparisons of different systems is a feature of SUNNY PORTAL. Another solution would be to integrate the provided link from SUNNY PORTAL into a private website for further comparisons.



### SUNNY PORTAL

[http://www.SMA-Australia.com.au/en\\_AU/products/monitoring-systems/sunny-portal.html](http://www.SMA-Australia.com.au/en_AU/products/monitoring-systems/sunny-portal.html)



**FLASHVIEW**

[http://www.SMA-Australia.com.au/en\\_AU/products/software/flashview.html](http://www.SMA-Australia.com.au/en_AU/products/software/flashview.html)



**FLASHVIEW**

[http://www.SMA-Australia.com.au/en\\_AU/products/software/flashview.html](http://www.SMA-Australia.com.au/en_AU/products/software/flashview.html)

## 4.2 EXTERNAL DISPLAYS AND PUBLIC SCREENS

I. N/a

II. SMA's FLASHVIEW displays real time data of all important values of the green and black data.

III. N/a

IV. N/a

V. N/a

VI. FLASHVIEW shows dynamic slides containing graphs, pictures, values and information such as RSS feeds, where each school can individually display their system on a screen.

VII. N/a

**SMA Solar Technology**

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