



Connection & Settings  
of  
SEVEN Sensors to  
Huawei Smartloggers



## 1. Introduction

This document is prepared for Huawei Smartlogger 1000, 1000A, 2000 & 3000A users. The steps are explained below to connect SEVEN Sensor Box to Huawei Smartlogger.

The following meteorological data can be provided by SEVEN Sensor Box. The communication is provided via RS485 with Modbus RTU protocol.

1. 3S-IS, Irradiance Sensor (W/m<sup>2</sup>)
2. 3S-MT-PT1000, Module Temperature Sensor (°C)
3. 3S-AT-PT1000, Ambient Temperature Sensor (°C)
4. 3S-WS-PLS, Wind Speed Sensor (m/s)
5. 3S-WD, Wind Direction Sensor (°)

- SEVEN has the right to make modifications without notice.


## 2. Cable Connection


Connect the green wire (RS485 A / Data (+)) of the output cable of the Sensor Box to COM3 (+) port of the Smartlogger and connect the yellow wire (RS485 B / Data (-)) of the output cable of the Sensor Box to COM3 (-) port of the Smartlogger. Another free port also can be selected for connection (COM1/COM2) for the same purpose.

White and brown wires of the output cable of the Sensor Box power up the Sensor Box as shown in Table 1.

<b>Brown</b>	<b>Power (+)</b>
<b>White</b>	<b>Power (-)</b>
<b>Green</b>	<b>RS485 A / Data (+)</b>
<b>Yellow</b>	<b>RS485 B / Data (-)</b>

Table 1: Communication and Power Cable Color Coding

 A cable with magnetic field protection can be used as communication and power cable between the sensor and the datalogger. Please don't use CAT 6 cable.

 SEVEN sensors are supplied with a voltage of 12-30 VDC. The recommended voltage value is 24 VDC. A high quality power supply must be used for the sensor supply. If the datalogger has 12 VDC or 24 VDC output, it can be used as a power source.

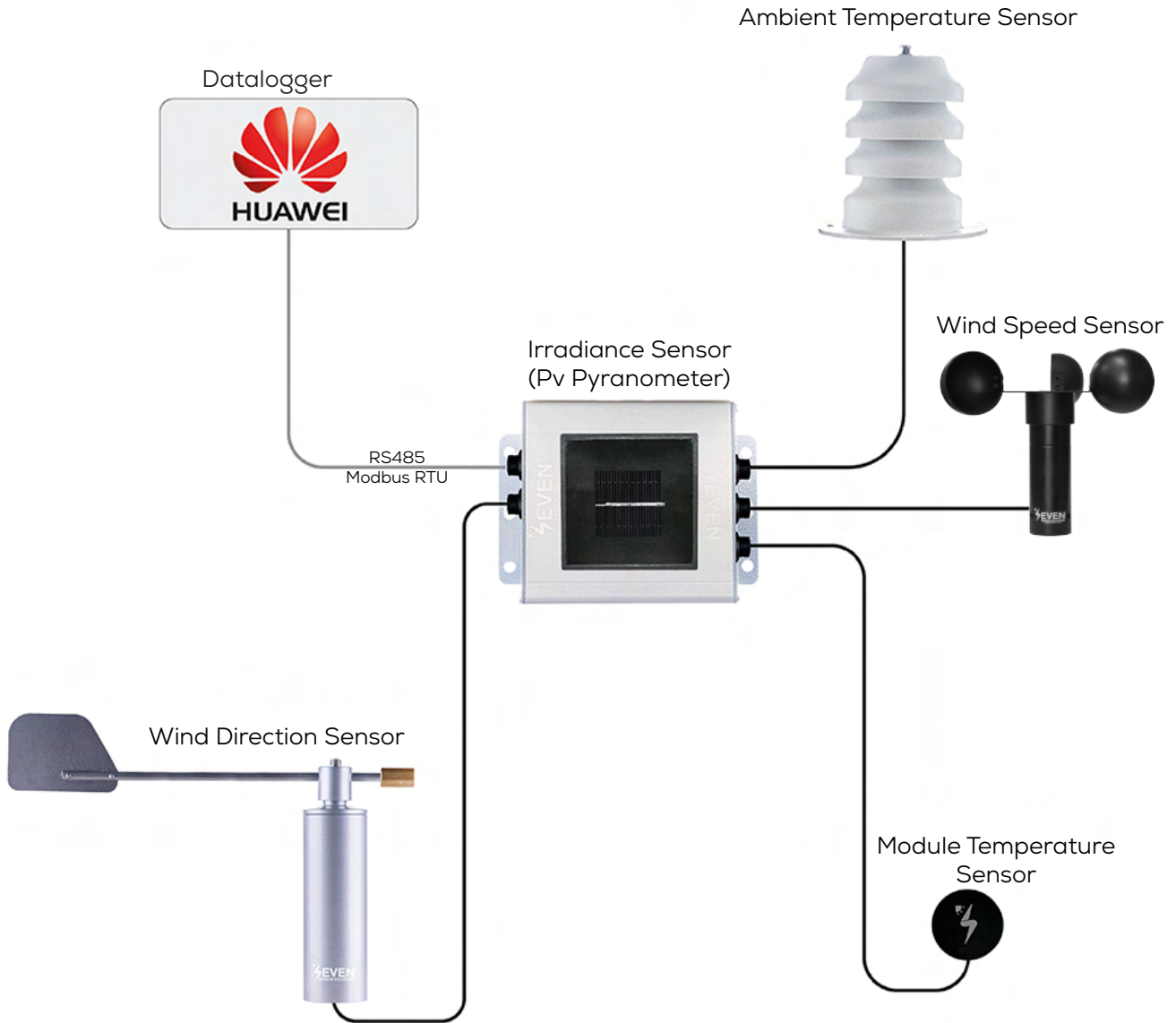


Figure 1: Huawei Weather Station

### 3. Settings

SEVEN Sensor Box will not be automatically detected by Smartlogger. Therefore, the settings shall be proceeded manually.

To log in to the Smartlogger user interface (Enspire), you need to log in to the same network as Smartlogger. Enter the Smartlogger IP address in your computer's browser.

**Step 1 :** To log in to the Enspire interface, choose User Name as Advanced User, enter your password and click on the "Log In" button.

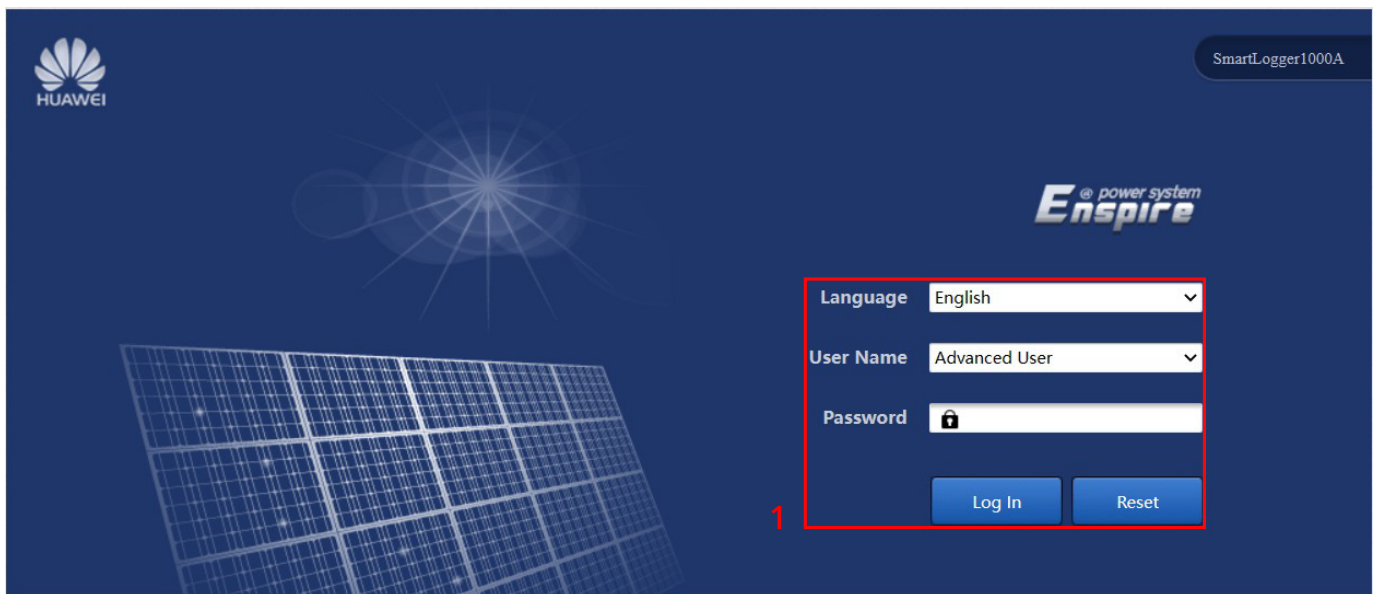


Figure 2: Enspire Interface Home Page

Follow the steps below to configure communication parameters.

**Step 2, 3 and 4 :** Settings → Comm. Param. → RS485

**Step 5 :** Choose communication parameters of device.

*Factory default settings for SEVEN Sensor Box:*

- Address: 1
- Baudrate: 9600
- Parity: None
- Stop Bit: 1

**Step 6 :** Click on “Submit” button.

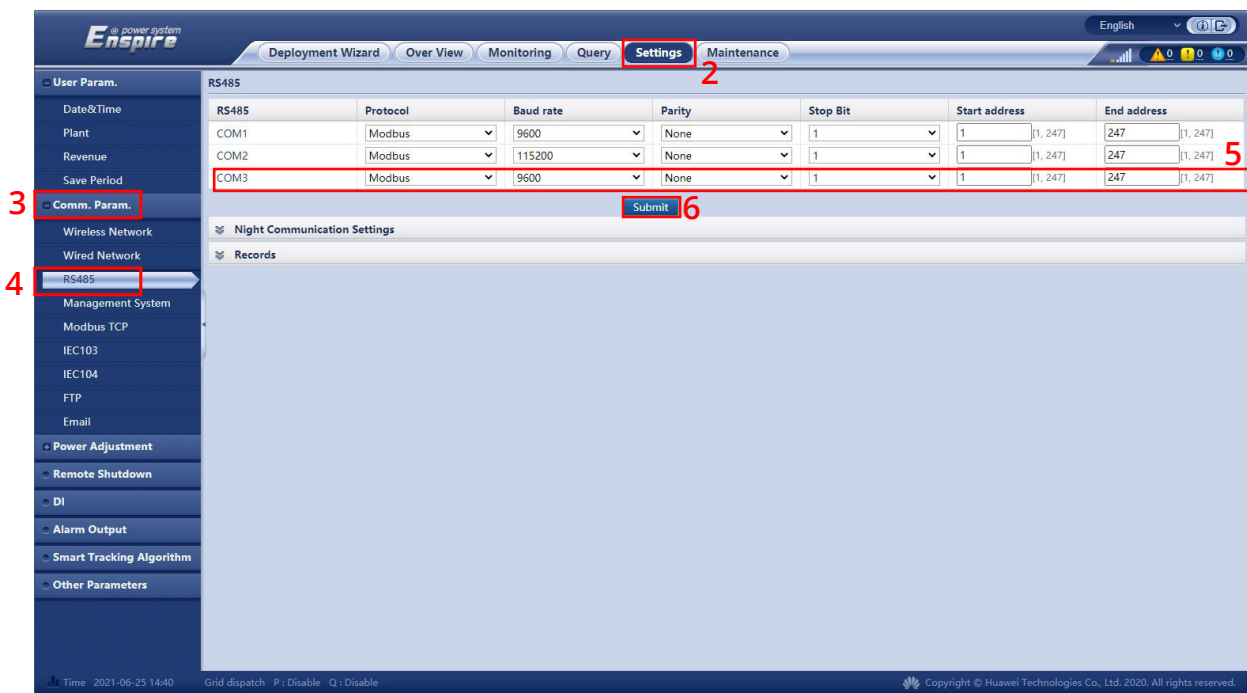


Figure 3: RS485 Settings

Follow the steps below to add a new EMI device (SEVEN Sensor Box):

**Step 7, 8 and 10 :** Maintenance → Device Management → Connect Device → Add Devices

**Step 11 :** Select Device Type as EMI, Connection mode as Modbus RTU, and Port number as COM3 (or any other, where you connect your Sensor Box to). Then enter the Address of sensor.



ID of SEVEN Sensor Box is 1 as factory default. If this value is changed by the user please enter the new value.

**Step 12 :** Click on “Add Devices” button.

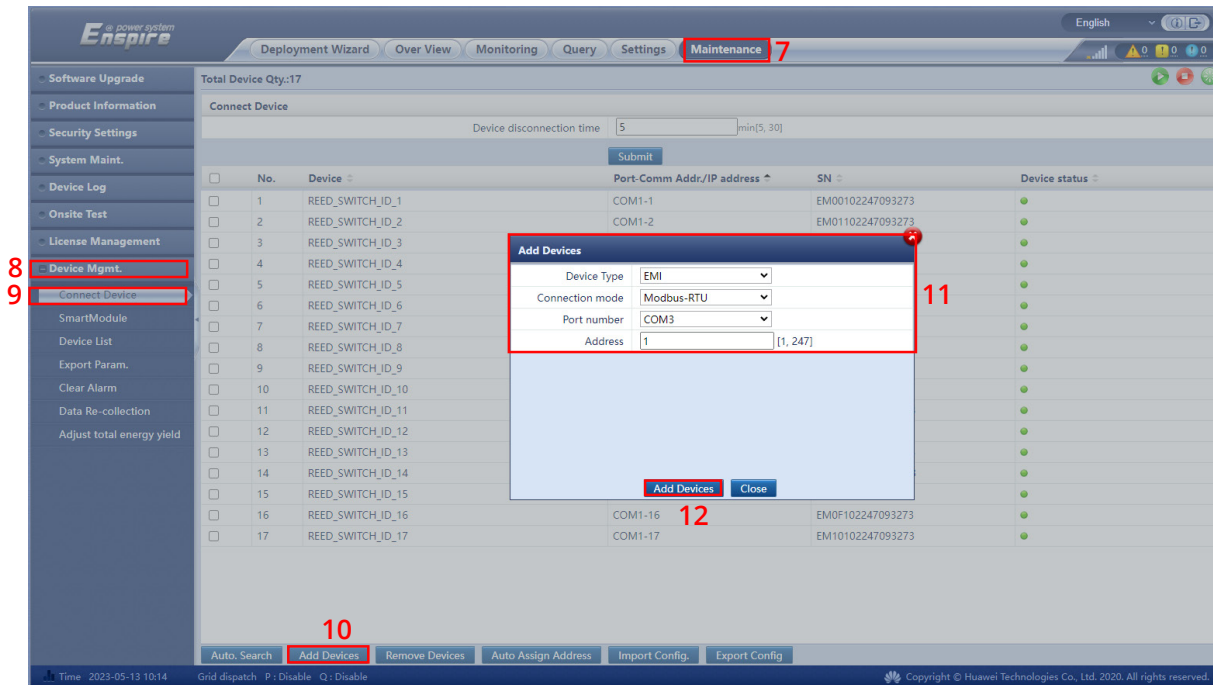


Figure 4: COM Port Settings

After completing the adding device process, follow the steps below for configuration settings.

**Step 13, 14 and 15 :** Monitoring → EMI (SEVEN Sensor) → Running Param.

**Step 16, 17 and 18 :** Default EMI settings should be changed according to SEVEN Sensor Box as shown in Figure 5. Modbus RTU register addresses (signal address) are given in Table 2.

**Step 19 :** Click on “Submit” button.



While the register addresses are entered on Enspire, you must only enter the used sensors register addresses. You must enter 65535 in the signal address section for non measured values.

No.	Signal Name	Signal address	Gain	Offset	Unit
1	Daily irradiation amount	65535	10		MJ/m <sup>2</sup>
2	Daily irradiation amount 2	65535	10		MJ/m <sup>2</sup>
3	Total Irradiance	12	10		W/m <sup>2</sup>
4	Total Irradiance 2	65535	10		W/m <sup>2</sup>
5	Ambient temperature	29	10	0.0	degC
6	PV module temperature	21	10	0.0	degC
7	Wind speed	53	10		m/s
8	Wind direction	52	10		
9	Custom 1	65535	10		
10	Custom 2	65535	10		

Figure 5: Seven Sensor Box Settings

Step 20 : After completing all settings on Enspire, open "Running Info" to see the data.

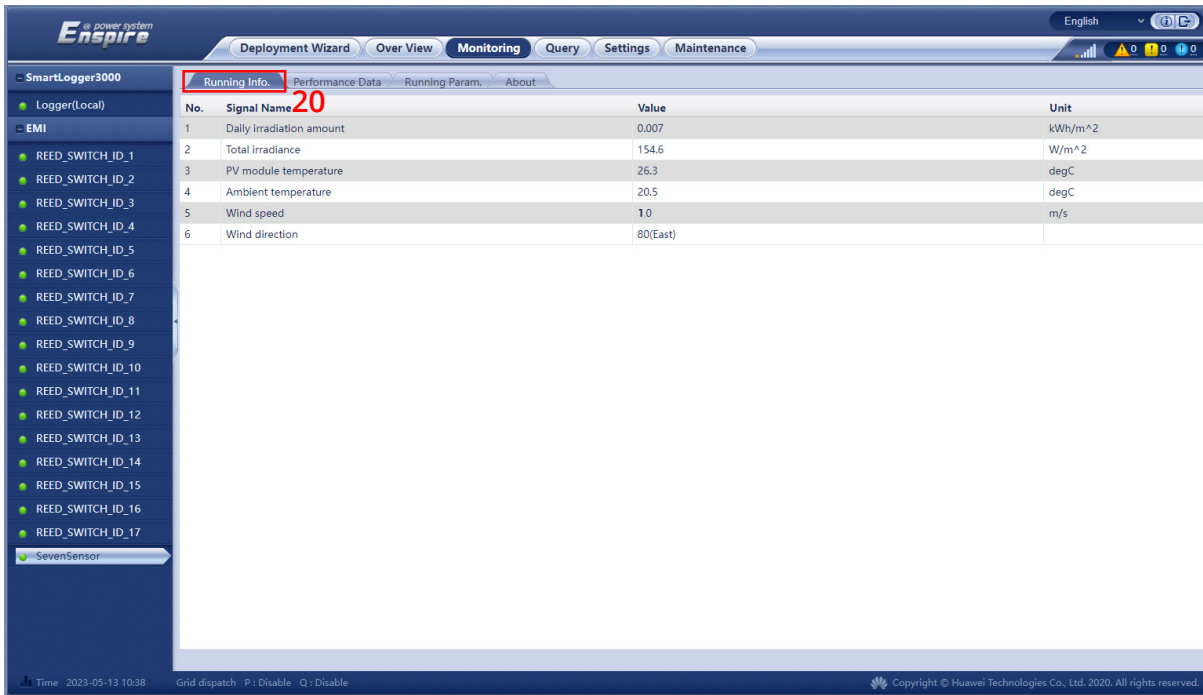


Figure 6: Data Monitoring

### 3. Monitoring System

After completing all the string settings on NetEco or Fusion Solar, Total Irradiance and Performance Ratio will appear on the main screen.



Figure 7: NetEco Monitoring System



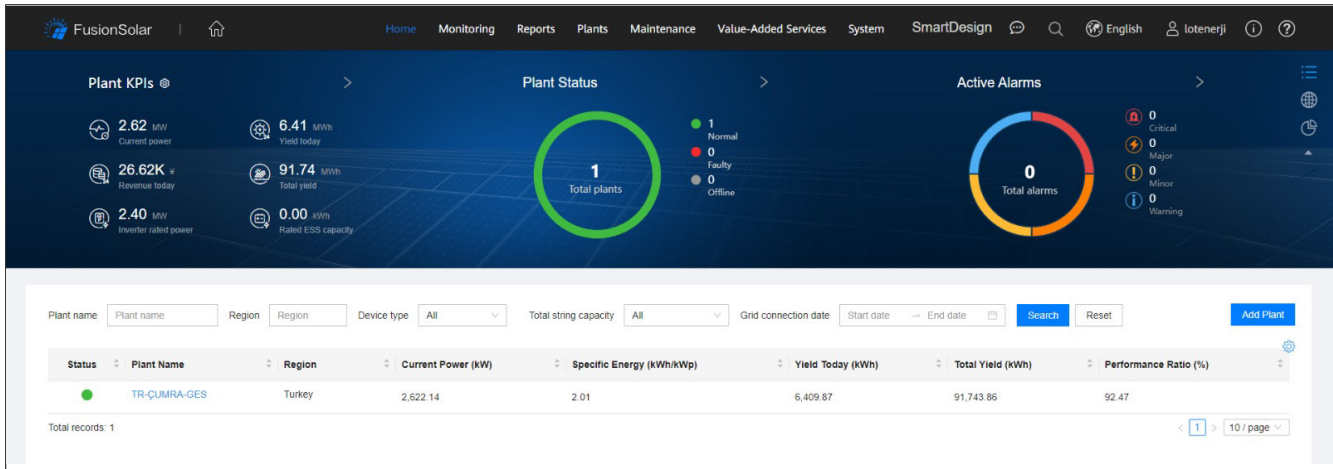


Figure 8: Fusion Solar Monitoring System

## Modbus RTU Specifications

### Supported Bus Protocol

**BaudRate:** 3800, 9600, 19200, 38400

**Parity:** None, Even, Odd

**Stop Bit:** 1, 2 (only at no parity)

**Factory Default:** 9600 Baud, 8N1, Address: 1

**Transmission mode:** MODBUS RTU

**Supported function codes:** 0x04: Read Input Register

### Register Map:

The following Modbus data can be read individually or in blocks.

ID-Dec.	ID-Hex	Value	Data Type
53	0x35	Wind Speed, 0...6000, 1/100 m/s	US
12	0x0C	Temperature Compensated Irradiance Value, 0...1600 in 0.1 W/m <sup>2</sup>	US
15	0x0F	Cell Temperature, -400 ... +850 [range -40 ... +85°C] in 0.1°C	S
21	0x15	External Temperature 1, -400 ... +850 [range -40 ... +85°C] in 0.1°C	S
29	0x1D	External Temperature 2, -400 ... +850 [range -40 ... +85°C] in 0.1°C	S
33	0x21	Relative Humidity, 0...100 [%] in 1%	US
52	0x34	Wind Direction, 0...359 in 1°	US

Table 2: Modbus Map

**Contact Informations:**

Please feel free to contact our technical team if you face any difficulties during settings.

**Can GÜNDÜZ**

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