

Connection & Settings Instructions for 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/m²)
- 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 (°)

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 ເ	up the Sensor Box as shown in Table 1.
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Brown	Power (+)
White	Power (-)
Green	RS485 A / Data (+)
Yellow	RS485 B / Data (-)

Table 1: Communication and Power Cable Color Coding

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

SE bio

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.

SEVEN has the right to make modifications on this documentation without notice.





Figure 1: Huawei Weather Station

The sensor model can be different as per the customer's request.

If your sensor model sensor model is 3S-2IS, 3S-3IS, 3S-4IS or 3S-CWS, enter each orientation's module number to the configuration tool to monitor total effective irradiance and total effective module temperature before configurating in Huawei Monitoring System.



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 connected your Sensor Box to). Then, enter the Address of sensor.





In case more than one device is connected to the port you have connected the sensor to, device ID's must be different while baudrate and parity values must be the same. You can change the device ID via SEVEN configuration tool.

Step 12: Click on "Add Devices" button.

	otal De	vice Qty.:1	17				0
Product Information	Conne	ct Device					
Security Settings			Device disconnection time	5 min[5,	30]		
System Maint.				Submit			
Device Log		No.	Device 🕀	Port-Comm Addr./IP address	SN C		Device status
Onsite Test		1	REED_SWITCH_ID_1	COM1-1	EM00102247093275		•
Jusice Test		2	REED_SWITCH_ID_2	COM1-2	EM01102247093273		•
License Management		3	REED_SWITCH_ID_3 Add Devices			·	٠
Device Mgmt.		4	REED_SWITCH_ID_4	Type FMI Y			•
Connect Device		5	REED_SWITCH_ID_5	node Modbus-RTU Y	•	11	Θ
SmartModule		6	REED_SWITCH_ID_6	nber COM3 Y	•		Θ
Device List		7	REED_SWITCH_ID_7	iress 1	1 2471		•
Export Param		8	REED_SWITCH_ID_8				0
Class Alassa		9	REED_SWITCH_ID_9				e de la companya de l
		10	REED_SWITCH_ID_10				
Data Re-collection		11					
Adjust total energy yield		12	DEED SWITCH ID 12				
		14	REED_SWITCH_ID_14				
		15	REED SWITCH ID 15	Add Devices Close			
		16	REED SWITCH ID 16	COM1-16 12	EM0E102247093273		
		17	REED SWITCH ID 17	COM1-17	EM10102247093273		0

Figure 4: COM Port Settings

Rev.1.0



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 adresses (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.

E nspire		Deployment Wizard Over View Monit	oring Qu	ery Settings Main	tenance)	_	Englist	× (6)
SmartLogger3000	Runn	ning Info. Performance Data Running Param.	About						
Logger(Local)	Environ	mental Monitoring Instrument 15							
= EMI			EMI model	Other		v	116		
REED SWITCH ID 1		Synchronize Enviro	onment Data	Disable		×			
REED_SWITCH_ID_2		Threshold of fast synchronization of	wind speeds	18.0			15.0, 30.0] m/s		
REED SWITCH ID 3		1	Master/Slave	slave mode		*			
REED SWITCH ID 4		Read fi	unction code	Read input register 04H		*			
REED SWITCH ID 5		Data rep	orting mode	Integer		*			
REED SWITCH ID 6		W	ord ordering	Big endian		~			
REED SWITCH ID 7	·		Read mode	Single read		*	<u> </u>		
REED SWITCH ID 8	No.	Signal Name	Signal addre	55	140	Gain		Offset	Unit
REED SWITCH ID 9	1	Daily irradiation amount	65535		١ð	10	~		MJ/m^2
REED SWITCH ID 10	2	Daily irradiation amount 2	65535			10	~		MJ/m^2
REFD SWITCH ID 11	3	lotal irradiance	12			10	¥		W/m^2
REED SWITCH ID 12	4	Iotal Irradiance 2	00000			10	Ť		W/m^2
REED SWITCH ID 13	6	PV module temperature	23]		10	÷	0.0	degC
REED_SWITCH_ID_14	7	Wind speed	53			10	÷	0.0	m/s
REED_SWITCH_ID_15	8	Wind direction	52			10	~		114.5
REED_SWITCH_ID_15	9	Custom 1	65535	65535		10	v		
REED_SWITCH_ID_17	10	Custom 2	65535			10	~		
SevenSensor	1/		u.	Submit 10					
	14			<u></u>					
Time 2023-05-13 10:26	Grid dispat	ch P : Disable Q : Disable				👋 Copyright ©	Huawei T	echnologies Co., Ltd. 20	20. All rights reserved.

Figure 5: Seven Sensor Box Settings

*The Modbus Map can be different as per the software version of the sensor.



Fe power system				English 🗸 🚯 🕞
Enspire		Deployment Wizard Over View Monit	oring Query Settings Maintenance	
SmartLogger3000	V R	unning Info. Performance Data 🖉 Running Param.	About	
Logger(Local)	No.	Signal Name 20	Value	Unit
= EMI	1	Daily irradiation amount	0.007	kWh/m^2
REED SWITCH ID 1	2	Total irradiance	154.6	W/m^2
REED SWITCH ID 2	3	PV module temperature	26.3	degC
	4	Ambient temperature	20.5	degC
	5	Wind speed	10	m/s
REED_SWITCH_ID_4	6	Wind direction	80(East)	
REED_SWITCH_ID_5				
REED_SWITCH_ID_6				
REED_SWITCH_ID_7				
REED_SWITCH_ID_8				
REED_SWITCH_ID_9				
REED SWITCH ID 10				
REED SWITCH ID 11				
REED SWITCH ID 12				
REED SWITCH ID 13				
REED_SWITCH_ID_15				
REED_SWITCH_ID_16				
REED_SWITCH_ID_17				
SevenSensor				
I Time 2023-05-13 10:38	Grid dis	patch P : Disable Q : Disable	والا	Copyright © Huawei Technologies Co., Ltd. 2020. All rights reserv

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

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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, 06000, 1/100 m/s	US
12	0x0C	Temperature Compensated Irradiance Value, 01600 in 0.1 W/m ²	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, 0100 [%] in 1%	US
52	0x34	Wind Direction, 0359 in 1°	US

Table 2: Modbus Map*

*This Modbus Map is valid for Software 8 and newer versions.

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Contact Informations:

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

Can GÜNDÜZ

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