

Solar Plug-SWB1

RS485/RS232/TTL To Wi-Fi+BLE Collector

User Manual

V 1.1



Product Features

- ✧ Supports WiFi 802.11b/g/n wireless standards
- ✧ Adopting RISC architecture SOC chip, with a maximum frequency of 160MHz, 276KB RAM, 2MB Flash, based on FreeRTOS system
- ✧ Support BLE 5.0 for diagnostic or local Bluetooth debugging and data collection functions
- ✧ Supports RS485/RS232/TTL (one out of three) to WiFi data transmission, with a maximum serial port rate of 460800bps
- ✧ Support Solar Of Things energy management platform, web page or APP to monitor energy data
- ✧ Power supply: 5-36VDC
- ✧ Supports multiple interface styles

TABLE OF CONTENTS

TABLE OF CONTENTS	2
FIGURE	3
TABLE	3
1. PRODUCT OVERVIEW	4
1.1. Overview	4
1.2. Product Parameters	4
1.3. Main Application Areas	5
2. HARDWARE INTRODUCTION	7
2.1. Interface Diagram	7
2.2. Product Appearance Diagram	8
2.3. Solar Plug-SWB1 Interface Pin Definition	9
2.4. Solar Plug-SWB1 Indicator Light And Button Functions	11
2.5. RS485 Interface Description	12
2.6. RS232 Interface Description	12
2.7. Solar Plug-SWB1 Mechanical Dimensions	13
2.7.1. Mechanical Dimensions For Types -06/-15/-22.....	14
2.7.2. Mechanical Dimensions For Types-23/-24/-25.....	15
2.7.3. Mechanical Dimensions For Types-13	16
2.7.4. Mechanical Dimensions For Types-09/-10/-12/-26	17
2.7.5. Mechanical Dimensions For Types-20	18
2.7.6. Mechanical Dimensions For Types-27	19
2.8. Product Number	20
3. NETWORK TOPOLOGY	21
APPENDIX A: CONTACT INFORMATION	22

FIGURE

Figure 1.	Typical Applications	6
Figure 2.	DB9 Interface Style	7
Figure 3.	Red Aircraft Head Interface Style	7
Figure 4.	Green Internal Thread Aviation Head Interface Style	7
Figure 5.	DB9 Interface Default Style And Short Style	8
Figure 6.	RJ45 Interface Style	8
Figure 7.	USB-Type A Interface Style	8
Figure 8.	Solar Plug-SWB1-09 Appearance Diagram	9
Figure 9.	Solar Plug-SWB1-15 Appearance Diagram	9
Figure 10.	Pin Markings Of The Red Aircraft Female Head And DB9	9
Figure 11.	Green Aircraft Female Head And Green Aircraft Female Head Side Pin Markings	10
Figure 12.	Front indicator Light And Reset Button Of The Product	11
Figure 13.	Standard DB9 Female Pin	12
Figure 14.	Standard DB9 Female RS232 Interface	12
Figure 15.	Solar Plug-SWB1-06/-15/-22 Mechanical Dimensions	14
Figure 16.	Solar Plug-SWB1-23/-24/-25 Mechanical Dimensions	15
Figure 17.	Solar Plug-SWB1-13 Mechanical Dimensions	16
Figure 18.	Solar Plug-SWB1-09/-10/-12/-26 Mechanical Dimensions	17
Figure 19.	Solar Plug-SWB1-20 Mechanical Dimensions	18
Figure 20.	Solar Plug-SWB1-27 Mechanical Dimensions	19
Figure 21.	Solar Plug-SWB1 Product Number Definition	20
Figure 22.	Product Application Architecture Diagram	21

TABLE

Table1.	Solar Plug-SWB1 Product Technical Parameters	4
Table2.	Interface Sub Models And Pin Definition Diagram	10
Table3.	Solar Plug-SWB1 Pin Description	11
Table4.	Solar Plug-SWB1 Indicator Light and Key Definition	11

History

V 1.0 2023-04-14 First Edition

V 1.1 2023-08-09 Add interface styles, correct incorrect parameters, and supplement functional definitions such as indicator lights and buttons

1. PRODUCT OVERVIEW

1.1. Overview

The Solar Plug SWB1 acquisition rod adopts a Wi-Fi+BLE data transmission method, which facilitates the collection and monitoring of data from inverters, energy storage devices, and other devices. The protection level is IP65, suitable for harsh outdoor scenarios, and the sub models support different interfaces to adapt to external devices.

Solar Plug SWB1 is equipped with rich network protocols and integrates RS485/RS232/TTL standard data transmission interfaces, without the need for any driver. It is convenient for traditional serial devices to connect and use, and is suitable for Solar Of Things energy management. It is suitable for the photovoltaic energy industry. You can log in to the photovoltaic platform to view the platform's functions in detail.

1.2. Product Parameters

Table1. Solar Plug-SWB1 Product Technical Parameters

Classification	Parameter
System Information	
Processor/Main Frequency	RISC 160MHz
Flash	2MB
RAM	276KB
Operating System	FreeRTOS
Wi-Fi Interface	
Wireless Standards	802.11 b/g/n
Frequency Range	2.412GHz ~ 2.472GHz
Network Mode	STA/AP/STA+AP
Security Type	WEP/WPA-PSK/WPA2-PSK/WPA3-SAE
Encryption	WEP64/WEP128/TKIP/AES
Transmitting Power	802.11b: +17dBm ± 1.5dBm (@11Mbps) 802.11g: +15dBm ± 1.5dBm (@54Mbps) 802.11n: +14dBm ± 1.5dBm (@HT20, MCS7)
Receiving Sensitivity	802.11b: -96dBm (@1Mbps) 802.11b: -89dBm (@11Mbps) 802.11g: -91dBm (@6Mbps) 802.11g: -76dBm (@54Mbps) 802.11n: -91dBm (@MCS0) 802.11n: -73dBm (@MCS7)
Antenna Option	SMA External Antenna
BLE Interface	
Wireless Standards	BLE5.0

Frequency Range	2.402GHz ~ 2.480GHz
Transmitting Power	Max 15dBm
Receiving Sensitivity	-97dBm
Antenna Option	SMA external antenna (Same as Wi-Fi Interface)
Serial Port	
Number of Port	1
Interface Standard	Different sub models support one of RS485/RS232/3.3V TTL
Data Bit	7, 8
Stop Bit	1, 2
Check Bit	None, Even, Odd
Baud Rate	TTL: 1200 bps~460800 bps
Flow Control	No flow control Half duplex (RS485)
Software	
Collocation Method	APP
Firmware update	Serial port or OTA network upgrade
Basic Parameters	
Size	-06/-15/-22/-23/-24/-25 Type: 125mm x 72.37mm x 34.48mm -13 Type: 118mm x 72.37mm x 34.48mm -09/-10/-12/-26 Type: 137.5mm x 47.76mm x 34.53mm -20/-27 Type: 136.5mm x 47.76mm x 34.53mm
Working Temperature	-40 ~ 85°
Storage Environment	-45 ~ 105°C, 5 ~ 95% RH (without condensation)
Protection Level	IP65
Input Voltage	5~36VDC
Average Current	<30mA@9V
Average Power Consumption	180mW

1.3. Main Application Areas

Solar Plug SWB1 connects serial devices to the Internet and transmits serial data in accordance with the TCP/IP protocol.

- Monitoring of photovoltaic solar energy and energy storage;



Figure 1. Typical Applications

2. HARDWARE INTRODUCTION

Solar Plug SWB1 is a Wi Fi+BLE solution for serial device networking, which enables data transmission through routers, making product integration very easy.

2.1. Interface Diagram

Solar Plug SWB1 can use different interface styles to meet different device interface requirements, and currently there are three main interface styles.



Figure 2. DB9 Interface Style



Figure 3. Red Aircraft Head Interface Style



Figure 4. Green Internal Thread Aviation Head Interface Style

The DB9 interface also has a short style, detailed as described in the size diagram.

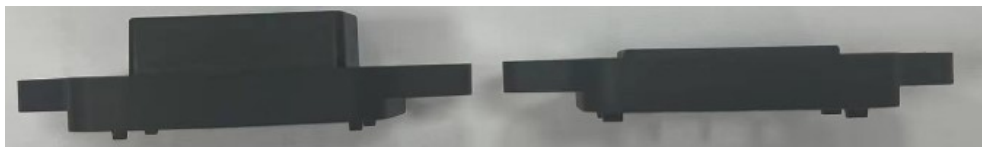


Figure 5. DB9 Interface Default Style And Short Style

If customers have customized interface requirements, they can contact our company for detailed discussion. An example of an extensible interface is as follows.



Figure 6. RJ45 Interface Style



Figure 7. USB-Type A Interface Style

2.2. Product Appearance Diagram

Different interface sub models are defined according to - XX, and the following are the appearance diagrams of two interface styles



Figure 8. Solar Plug-SWB1-09 Appearance Diagram



Figure 9. Solar Plug-SWB1-15 Appearance Diagram

2.3. Solar Plug-SWB1 Interface Pin Definition

The pin markings of the red aircraft female head and DB9 are shown in the following figure.



Figure 10. Pin Markings Of The Red Aircraft Female Head And DB9

The green aircraft female head and DB9's green aircraft carrier head side pin markings are shown in the following figure.



Figure 11. Green Aircraft Female Head And Green Aircraft Female Head Side Pin Markings

Table2. Interface Sub Models And Pin Definition Diagram

Sub Model Code	Interface Form	Serial Port Type	Line Sequence A/T/+	Line Sequence B/R/-	Line Sequence VCC/+	Line Sequence GND/-	Remarks
-06	DB9 Male Head Above	TTL	3Txd	2Rxd	9VCC	5GND	
-15	DB9 Male Head Above	RS232	3TXD	2RXD	9VCC	5GND	
-22	DB9 Male Head Above	RS485	7A	8B	9VCC	5GND	
-23	DB9 Male Head Below	TTL	3Txd	2Rxd	9VCC	5GND	
-24	DB9 Male Head Below	RS232	3TXD	2RXD	9VCC	5GND	
-25	DB9 Male Head Below	RS485	7A	8B	9VCC	5GND	
-13	DB9 Short Male Head Below	RS232	3TXD	2RXD	9VCC	5GND	
-09	4HKT Red Circle Female Head	RS232	2RXD	3TXD	1VCC	4GND	
-10	4HKT Red Circle Female Head	RS232	2TXD	3RXD	1VCC	4GND	
-12	4HKT Red Circle Female Head	RS485	2A	3B	1VCC	4GND	
-26	4HKT Red Circle Female Head	TTL	2Txd	3Rxd	1VCC	4GND	
-20	4HKT Green Female Head Side	RS485	3A	4B	1VCC	2GND	
-27	4HKT Green Female Head	RS485	3A	4B	1VCC	2GND	

Table3. Solar Plug-SWB1 Pin Description

Signal Description	Signal Type	Description
VCC	P	5~36VDC power supply input
GND	P	GND Ground
TXD	O	RS232 level serial port output
RXD-	I	RS232 level serial port input
A	IO	RS485 level A+phase
B	IO	RS485 level B+phase
Txd	O	3.3V TTL level serial port output
Rxd	I	3.3V TTL level serial port input

<Description>:

I — Input; O — Output; Power—Power supply

2.4. Solar Plug-SWB1 Indicator Light And Button Functions

There are 4 LED indicator lights on the front of the product, and there is also a reset button on the side of the antenna.



Figure 12. Front indicator Light And Reset Button Of The Product

Table4. Solar Plug-SWB1 Indicator Light and Key Definition

Pin	Description	Network Name	Signal Type	Note
PWR	Power indicator light	PWR	O	On: Power supply is normal Off: Abnormal power supply
COM	Serial port transmission indicator light	COM	O	Off: No data interaction Off for 0.3 seconds, on for 0.9 seconds: serial port outputs data Off for 0.3 seconds, on for 0.3 seconds: serial port receives data On: Bidirectional sending and receiving.
NET	Network status indicator light	NET	O	Off for 0.3 seconds, on for 3 seconds: Connect to the router in STA mode Off for 0.3 seconds, on for 0.3 seconds: STA is not

Pin	Description	Network Name	Signal Type	Note
				connected to the router
SRV	Server connection indicator light	SRV	O	On: Connected to server Off: Not connected to the server
Reload	Reset Button	Reload	I	The default height is high. Press and hold this key (>4S) and release it to restore the module to its factory settings.
ANT	Antenna interface	ANT		Wi-Fi SMA antenna interface

2.5. RS485 Interface Description

RS485 has outgoing lines A (data+) and B (data-) respectively. When connecting to device RS485, A (+) is connected to A (+), and B (-) is connected to B (-). In severe interference situations, it is recommended to connect GND together.

This product can come with 32 terminals and 485 devices. The maximum communication distance is 1200 meters. The 485 terminal resistance is 120 ohms, and it is generally necessary to use a terminal resistance when wiring over 300 meters. When wiring, A+and B - must be twisted together as a pair of twisted pairs to reduce signal interference.

2.6. RS232 Interface Description

When connecting the RS232 level male of this product to the device female, please use a direct connection (2-2, 3-3, 5-5, 9-9 direct connection). When connecting to the device, the relevant definition is shown in the following figure.

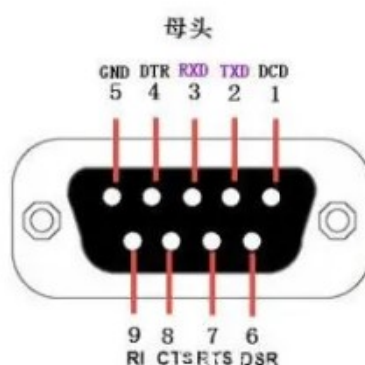


Figure 13. Standard DB9 Female Pin

Figure 14. Standard DB9 Female RS232 Interface

Pin Number	Network Name	Description
2	TXD	Send data
3	RXD	Receive data
5	GND	GND

Pin Number	Network Name	Description
9	RI(VCC)	Power input to this product

2.7. Solar Plug-SWB1 Mechanical Dimensions

The dimensions of different sub models of Solar Plug-SWB1 products are defined as follows (in millimeters).

2.7.1. Mechanical Dimensions For Types -06/-15/-22

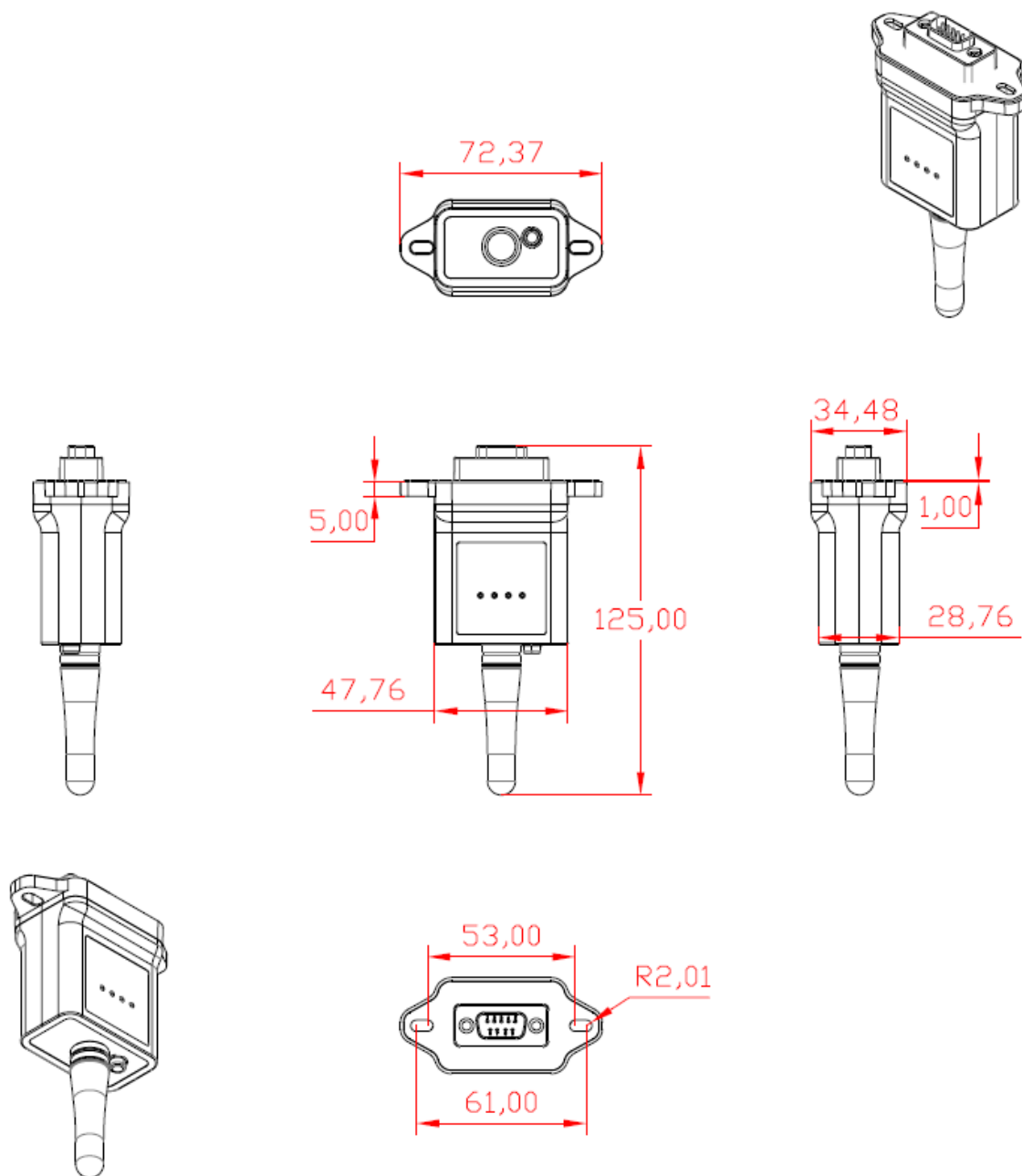


Figure 15. Solar Plug-SWB1-06/-15/-22 Mechanical Dimensions

2.7.2. Mechanical Dimensions For Types-23/-24/-25

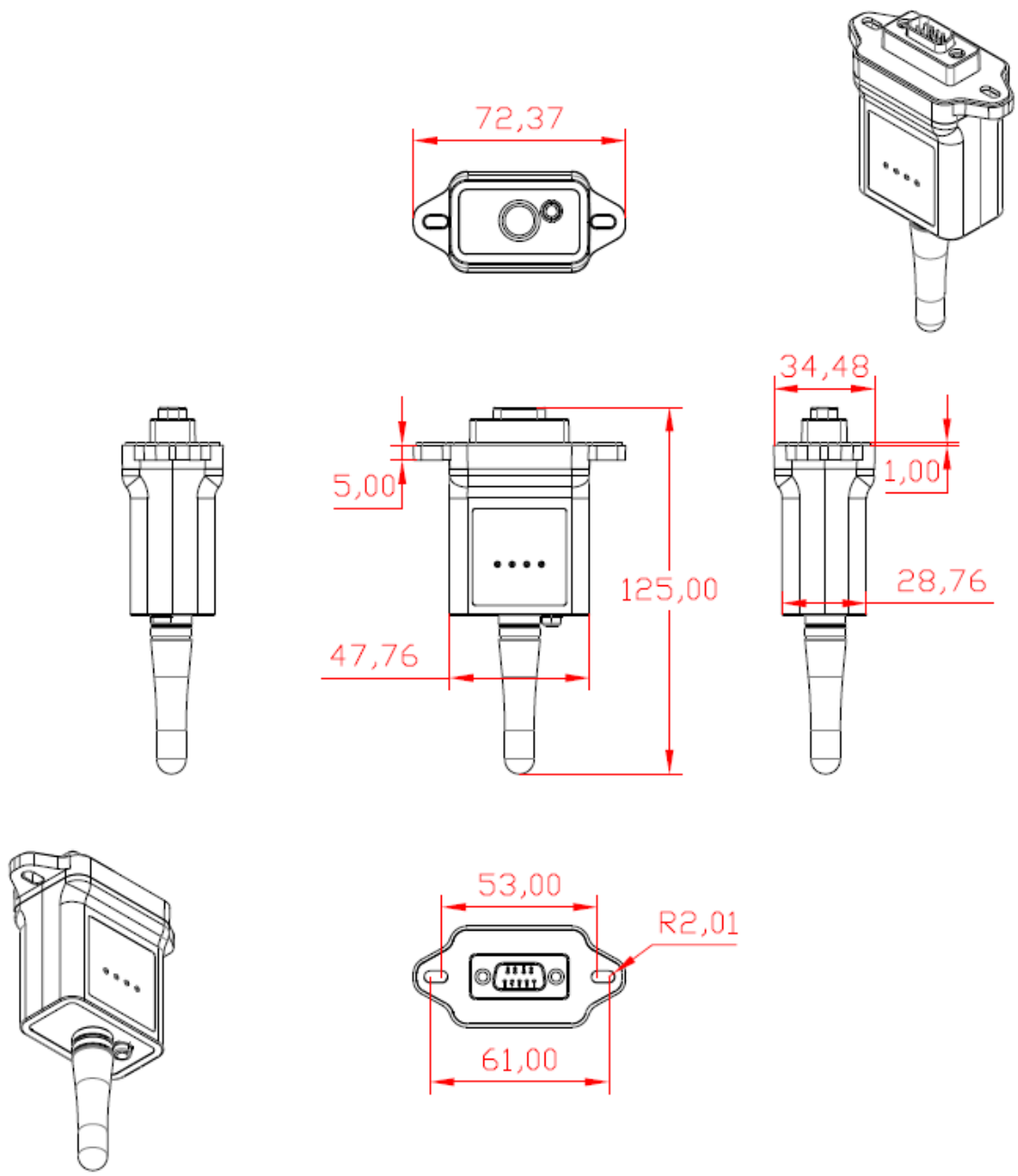


Figure 16. Solar Plug-SWB1-23/-24/-25 Mechanical Dimensions

2.7.3. Mechanical Dimensions For Types-13

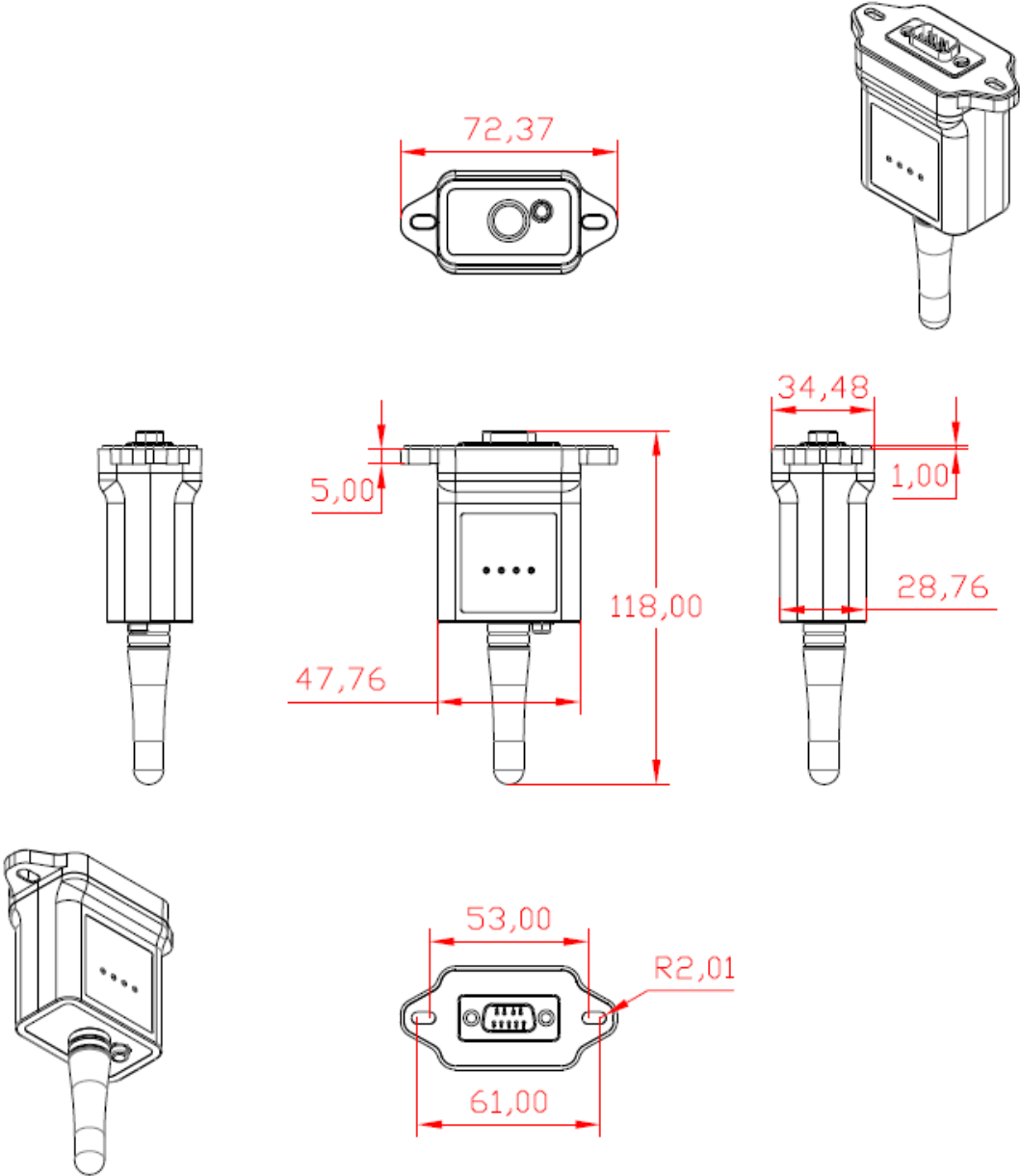


Figure 17. Solar Plug-SWB1-13 Mechanical Dimensions

2.7.4. Mechanical Dimensions For Types-09/-10/-12/-26

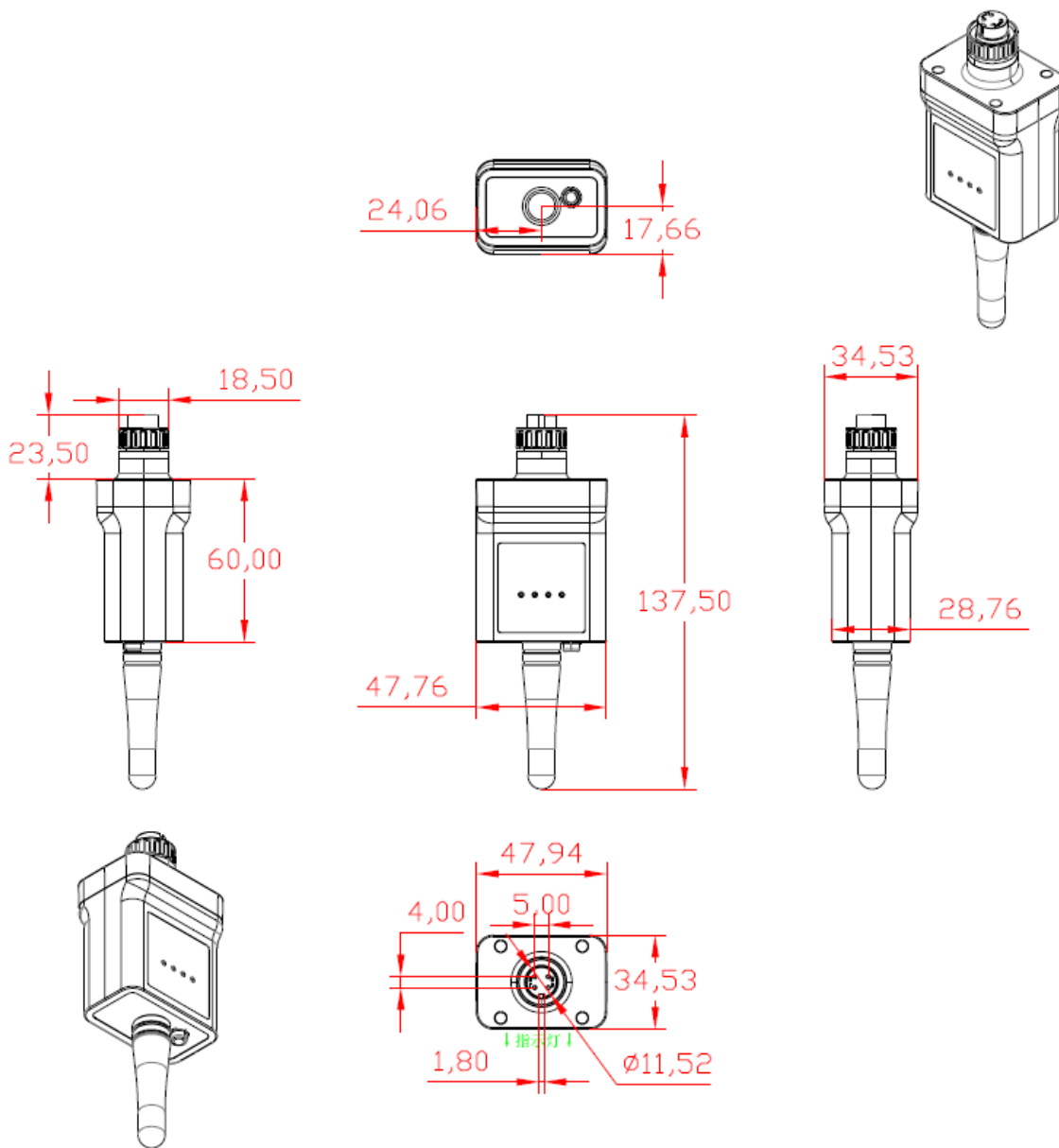


Figure 18. Solar Plug-SWB1-09/-10/-12/-26 Mechanical Dimensions

2.7.5. Mechanical Dimensions For Types-20

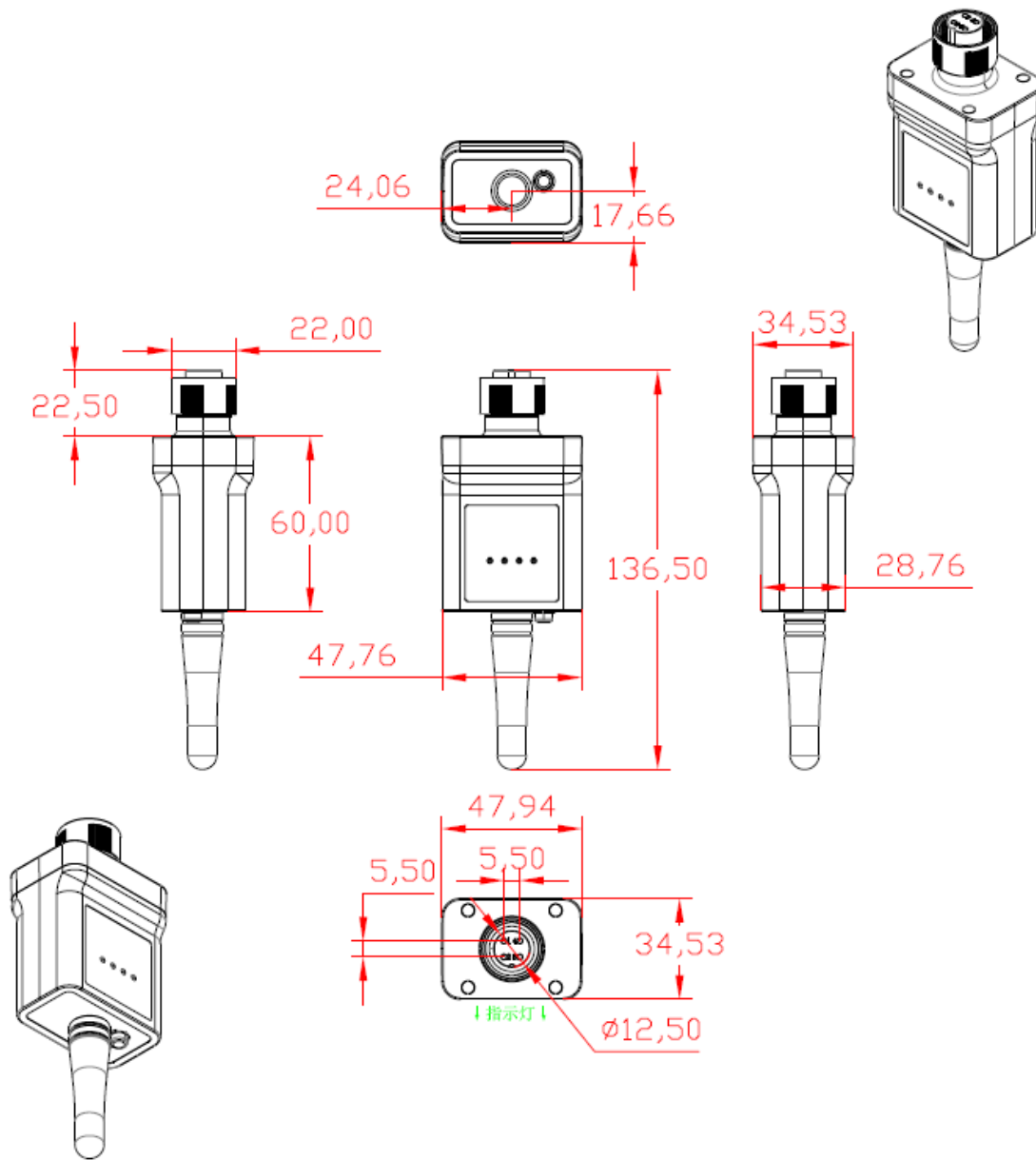


Figure 19. Solar Plug-SWB1-20 Mechanical Dimensions

2.7.6. Mechanical Dimensions For Types-27

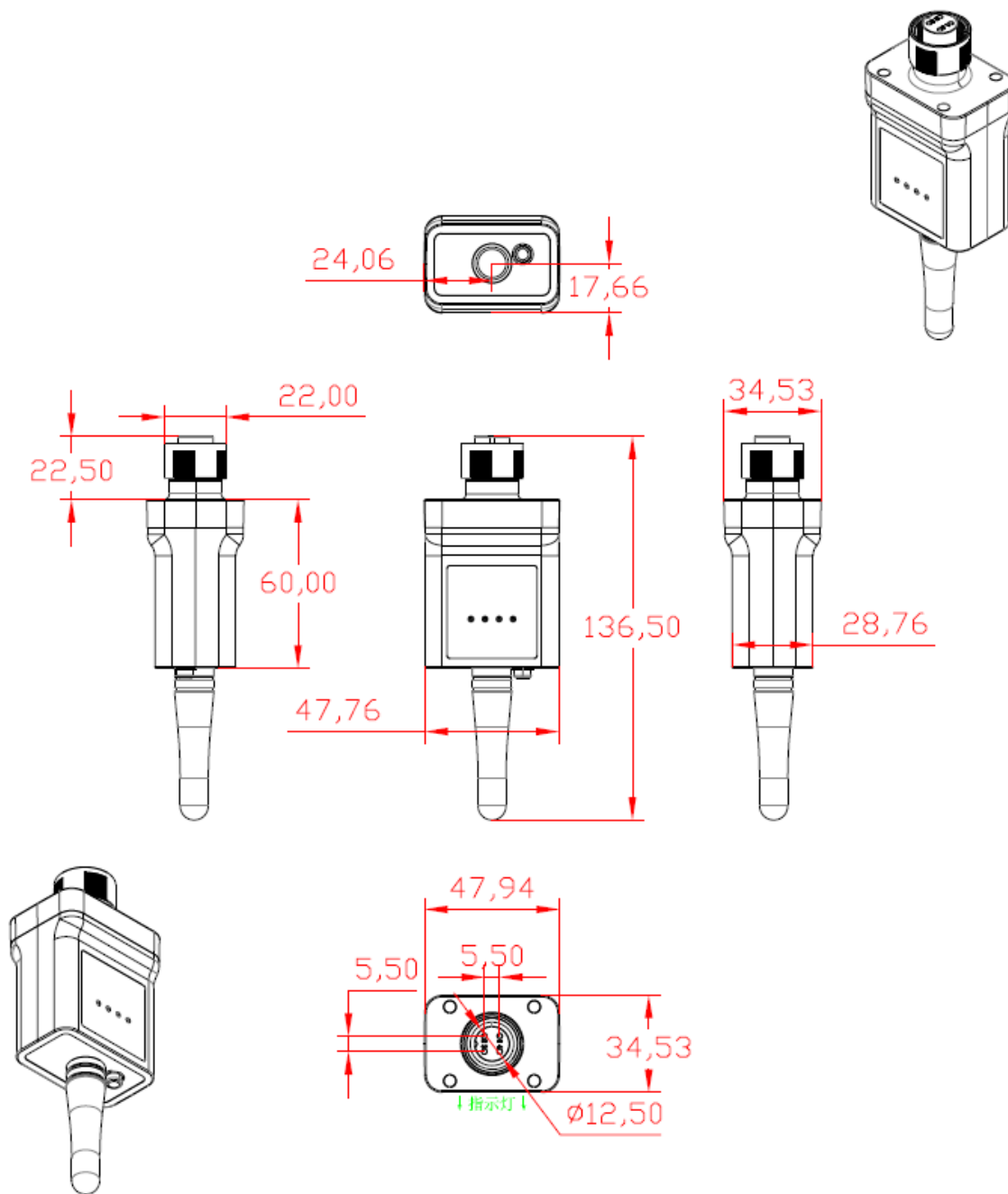


Figure 20. Solar Plug-SWB1-27 Mechanical Dimensions

2.8. Product Number

According to customer requirements, Solar Plug-SWB1 provides different configuration versions, as follows:

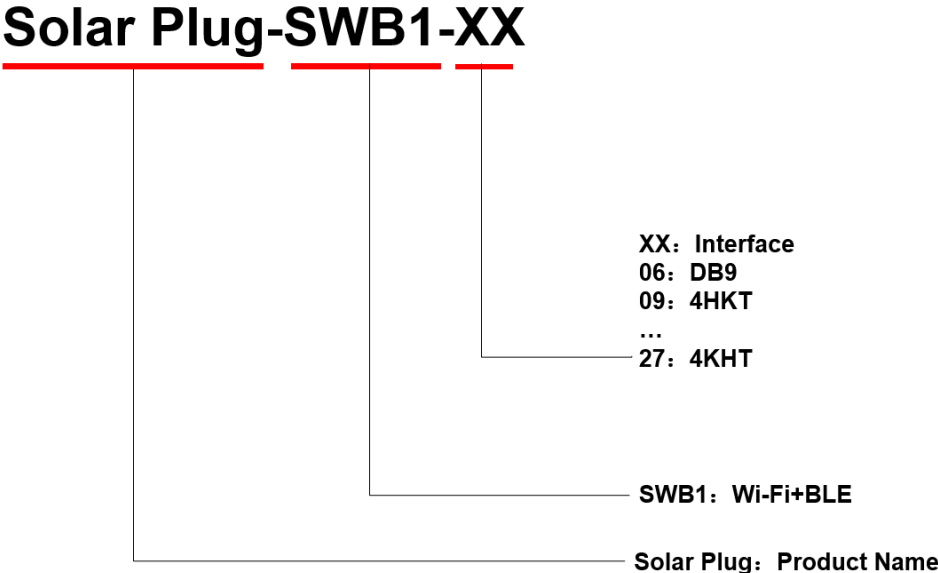


Figure 21. Solar Plug-SWB1 Product Number Definition

3. NETWORK TOPOLOGY

The application architecture of Solar Plug-SWB1 product is shown in the following figure.

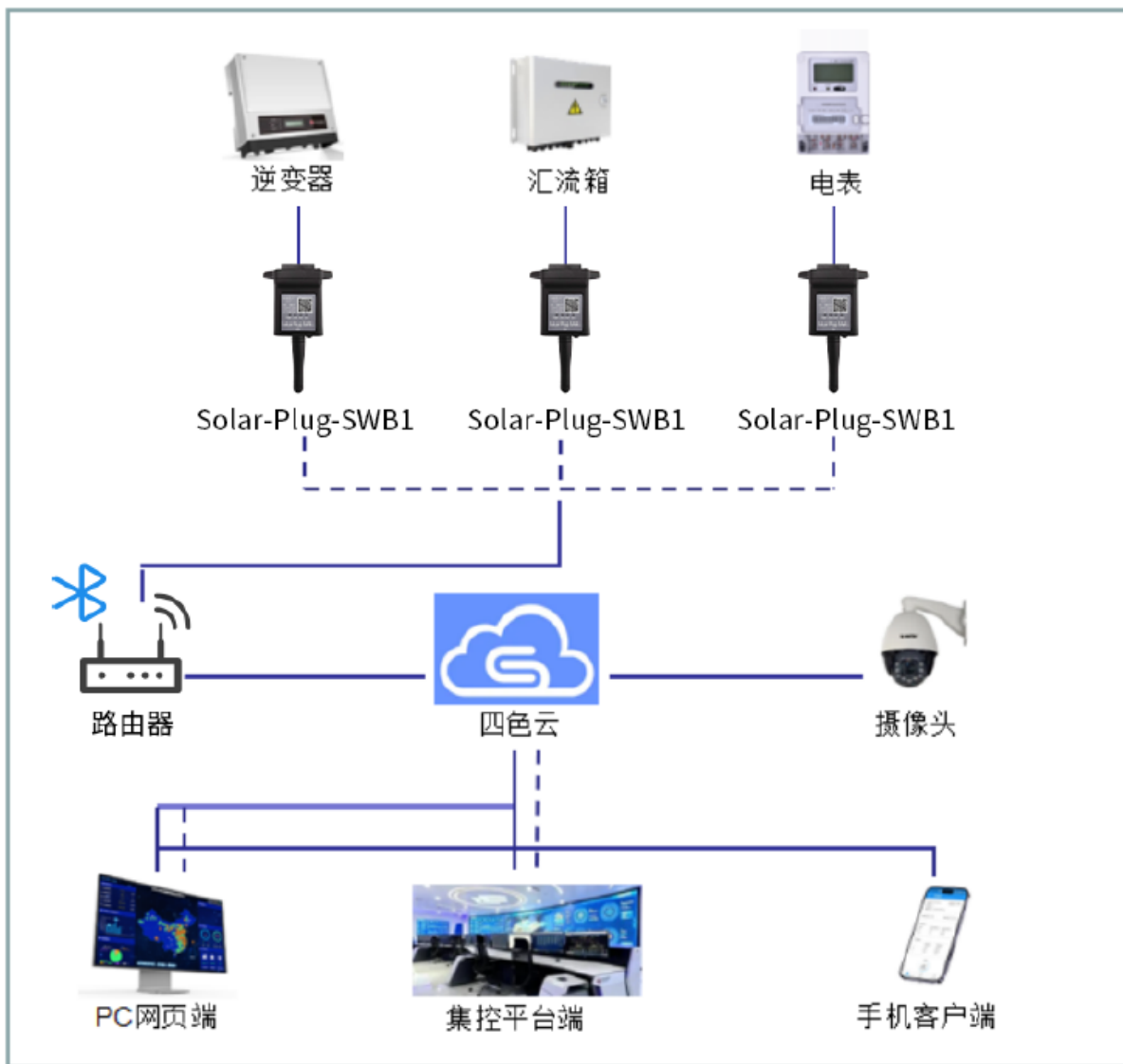


Figure 22. Product Application Architecture Diagram

APPENDIX A: CONTACT INFORMATION

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