- 1 -

Solar Elf-SEW4xB

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

User Manual

V 1.5

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 one of TTL/RS232/RS485 for communication**

✧ **Support UART to WiFi data transmission, with a maximum serial port speed of 460800bps**

✧ **Support Solar Of Things energy management platform, web page or APP to monitor energy data**

✧ **Power supply: 5-16VDC**

TABLE OF CONTENTS

FIGURE

TABLE

History

V 1.0 2023-08-14 First Edition

V 1.3 2023-09-13 Update product description

V 1.4 2023-10-23 Update power supply requirement

V 1.5 2024-03-19 Update subtype name

1. PRODUCT OVERVIEW

1.1. Overview

The Solar Elf-SEW4xB 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 Solar Elf-SEW4xB is equipped with rich network protocols and an integrated one of TTL/RS232/RS485 for data transmission, without the need for any driver, making it convenient for traditional serial devices to connect and use. It is compatible with four-color photovoltaic energy management and 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 Elf-SEW4xB Product Technical Parameters

Classification	Parameters
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	PCB Internal Antenna
BLE Interface	
Wireless Standards	BLE5.0
Frequency Range	2.402GHz ~ 2.480GHz

Transmitting Power	Max 15dBm
Receiving Sensitivity	-97dBm
Serial Port	
Number of Port	1
Interface Standard	Solar Elf-SEW40B: RS232 Solar Elf-SEW41B: RS485 Solar Elf-SEW42B: 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
Software	
Collocation Method	APP
Firmware update	Serial port or OTA network upgrade
基本参数	
Size	61mm x 26mm x 17.8mm
Working Temperature	-40～85°
Storage Environment	-45～105°C， 5～95% RH（无凝水）
Input Voltage	5~16VDC
Average Current	<30mA@9V
Average Power Consumption	180mW

1.3. Main Application Areas

The Solar Elf-SEW4xB 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;

2. HARDWARE INTRODUCTION

Solar Elf-SEW4xB is a WiFi+BLE solution for serial device networking, which enables data transmission through routers, making product integration very easy.

2.1. Product Appearance Diagram

The product appearance diagram is as follows.

Figure 1.   Solar Elf-SEW40B/-0 Product Appearance

Figure 2.   Solar Elf-SEW41B/-0 Product Appearance Diagram

Figure 3.   Solar Elf-SEW42B/-0 Product Appearance

2.2. **Solar Elf-SEW4xB Interface Pin Definition**

Figure 4.　RJ45 Pin Label

Table2.　Solar Elf-SEW4xB Pin Description

Pin	Description	Net Name	Signal Type	Comment
1		GPIO17	IO	Reserved
2		GPIO11	IO	Reserved
3		NC		
4	Restore to Factory	Reload	I	The default height is high. Press and hold this key (>4S) and release it to restore the module to its factory settings. GPIO3
5	UART1_TXD	UART1_TXD	IO	Solar Elf-SEW40B：RS232 TX Solar Elf-SEW41B：RS485 A+ Solar Elf-SEW42B：3.3V TTL TX
6	UART1_RXD	UART1_RXD	IO	Solar Elf-SEW40B：RS232 RX Solar Elf-SEW41B：RS485 B- Solar Elf-SEW42B：3.3V TTL RX
7	Power VCC	VCC	Power	5～16VDC
8	Power GND	GND	Power	
9	Green LED Net Status	NET	O	Boot On: Power is OK. 0.3s Off -> 3s On: STA mode connect to router or AP mode being connected by other STA. 0.3s Off ->0.3s On: No Wi-Fi Connection GPIO5
10	Amber LED Data Transfer	COM	O	Off: No data transfer 0.3s Off -> 0.9s On: UART TX Output 0.3s Off -> 0.3s On: UART RX Receive On: UART bidirection. GPIO14

\<Description\>:

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

2.3. **RS232 Interface**

Device RS232 does not support hardware flow control. The physical voltage is about ±7V.

2.4. RS485 Interface

RS485 use two wire links, A(DATA+), B(DATA-). Connect A(+) to A(+), B(-) to B(-) for communication. Suggest to connect GND together when interference is very severe.

The RS485 interface support maximum 32 485 device, device. The cable maximum length is 1200 meters. Need to add 120Ohm terminal resistor for over 300 meters.

2.5. TTL Interface

The serial port of this device has no hardware flow control function, and the physical level is $\pm$ 3.3V TTL

2.6. Internal Antenna

When using a built-in antenna in the product, the following precautions for built-in antennas must be observed:

✓ The antenna should be kept away from metal and should not be placed inside products wrapped in metal;

2.7. Solar Elf-SEW4xB Mechanical Dimensions

The dimensions of different sub models of Solar Elf-SEW4xB are defined as follows (in millimeters).
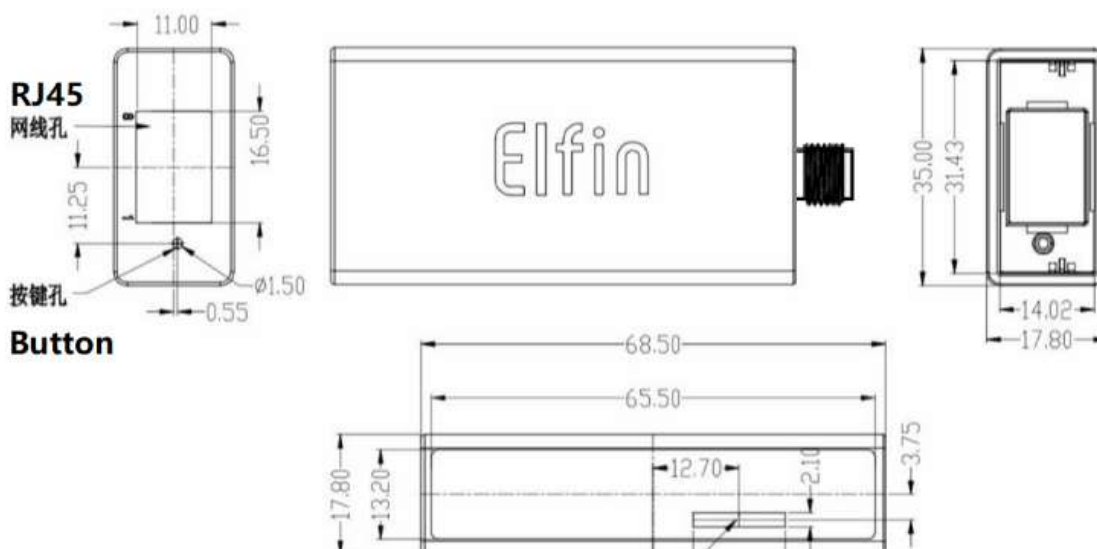

Figure 5.　　Solar Elf-SEW4xB Mechanical Dimensions

2.8. RJ45 8PIN Connector

Figure 6.   RJ45 8PIN Connector

Figure 7.   Solar Elf-SEW40B+8PIN Connector

Figure 8.   Solar Elf-SEW41B+8PIN Connector

Figure 9.   Solar Elf-SEW42B+8PIN Connector

2.9. RJ45 4PIN Connector

Figure 10.   RJ45 4PIN Connector

Figure 11.   Solar Elf-SEW40B+4PIN Connector

Figure 12.   Solar Elf-SEW41B+4PIN Connector

Figure 13.   Solar Elf-SEW42B+4PIN Connector

2.10. RJ45 Conversion cable

Figure 14.　RJ45 Conversion cable

Figure 15.　Solar Elf-SEW40B+RJ45 Conversion cable

2.11. Homemade cable

Customers can make their own RJ45 conversion cable, add 232 DB9 interface, DC power connector, reset button and so on according to the following sequence.
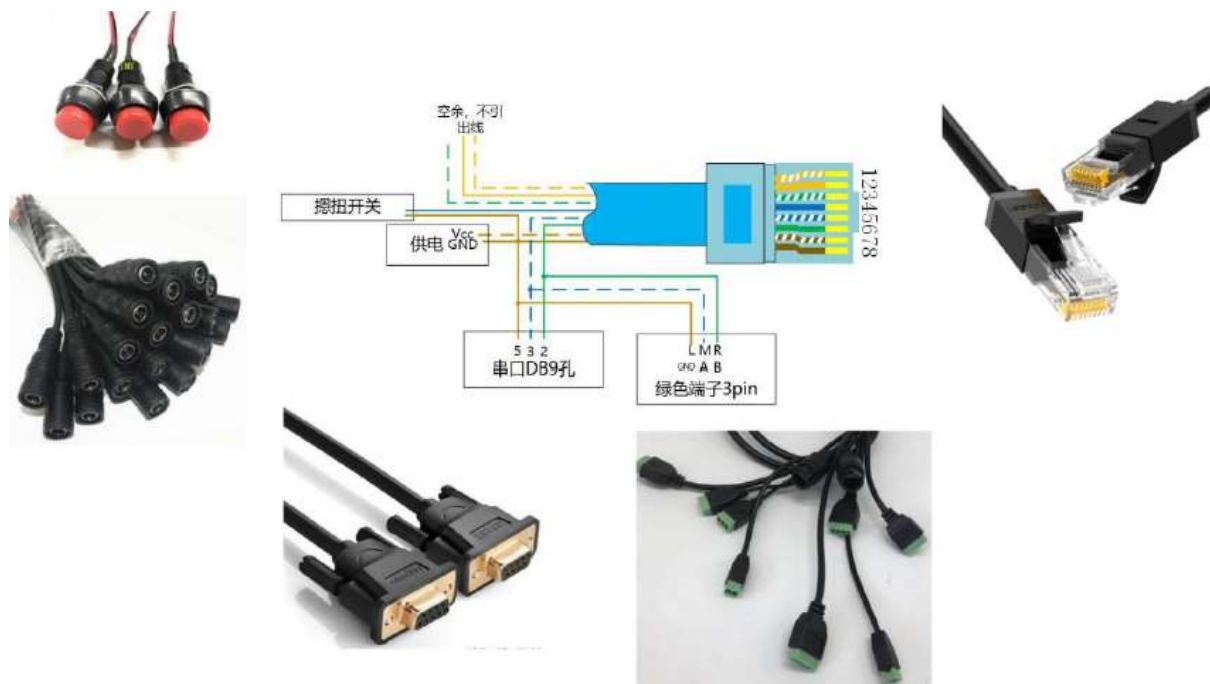
Figure 16.   Cable fabrication diagram

2.12. Fixed Bracket

Figure 17.   Fixed Bracket

2.13. Rail Bracket

Figure 18.   Rail Bracket
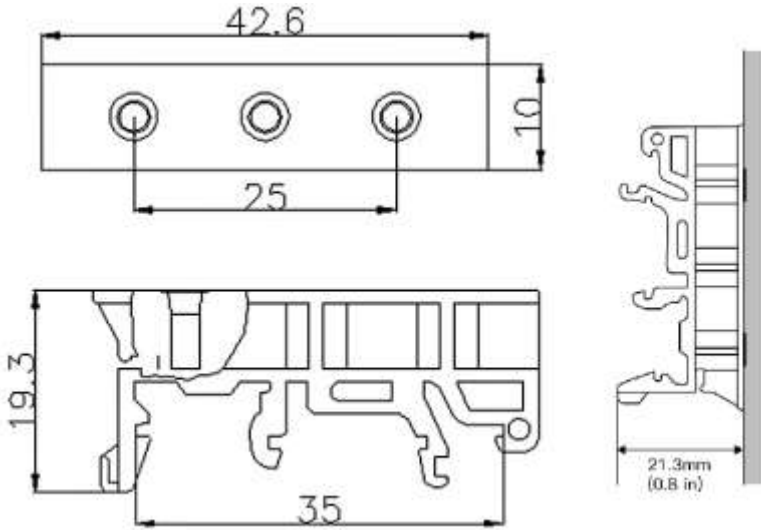
2.14. Bracket

Figure 19.   Bracket Size

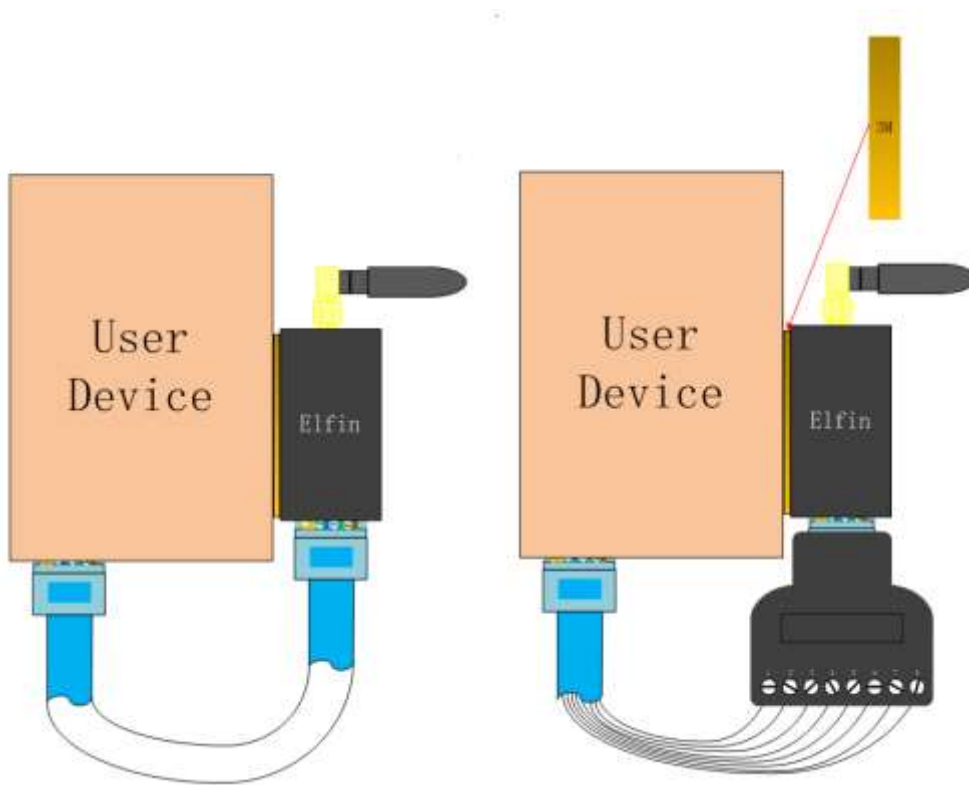Figure 20.   Bracket Install Picture

2.15. Product Installation

Figure 21.　Product Installation

2.16. EVK

EVK indluce one Elfin device, one RJ45 Connector and one screw driver.

Figure 22.　EVK Package

2.17. Product Number

According to customer requirements, Solar Plug RWB1 provides different configuration versions, as follows:

Function / Model	Power Input	Type	Antenna	UART
Solar Elf-SEW40B	5~16VDC	Wi-Fi&BLE	Internal PCB	RS485
Solar Elf-SEW41B	5~16VDC	Wi-Fi&BLE	Internal PCB	RS232
Solar Elf-SEW42B	5~16VDC	Wi-Fi&BLE	Internal PCB	3.3V TTL
Solar Elf-SEW40B-0	5~16VDC	Wi-Fi&BLE	External 1st IPEX	RS485
Solar Elf-SEW41B-0	5~16VDC	Wi-Fi&BLE	External 1st IPEX	RS232
Solar Elf-SEW42B-0	5~16VDC	Wi-Fi&BLE	External 1st IPEX	3.3V TTL

Figure 23.   Solar Elf-SEW4xB Product Number Definition

APPENDIX A: CONTACT INFORMATION