



ROHS, ISO9001

S8P

High Precision Positioning Terminal Product
Manual

April, 2023

Revision History

Ver. NO.	Version	Date
V.1	New	April, 2023

Disclaimer

This document only indicates the information of the products of Shenzhen Simple Technology Electronics Co., LTD without any transfer purposes, including has no transfer any patent, trademark, Copyright or ownership right or any rights or licenses under Company or any third party by implication, estoppel or other ways. We (Shenzhen Simple Technology Electronics Co., LTD) accepts no liability other than those stated in the terms and conditions of Sale of its products. Furthermore, regarding the sale and use of its products, Simple makes no any kinds of express or implied warranties including fitness for a particular purpose, marketability or liability for infringement of any patent, copyright or other intellectual property rights. If the connection or operation is not in accordance with the manual requirements, the company is exempt from liability. Simple perhaps make modifications to product specifications and descriptions at any time without prior notice. The products of our company may contain certain design defects or errors, which will be included in the corrigendum upon discovery, and may result in differences between the product and the published specifications. An updated erratum is available upon request.

Catalogue

Lead in	3
1. Product Overview	4
2. Main Performance	5
3. Electrical parameters	8
3.1 Electrical maximum.....	8
3.2 Working Conditions.....	8
4. Dimensions	9
5. Interface and transmission	10
6. Model Description of S8P Series	11
7. Units of the Product	12
8. Precautions	12

Lead in

This document indicates the main features of the S8P, the terminal product of high precision with all frequency band and all satellites positioning and orientation function.

This document aims to indicate the hardware interface, electrical characteristics, mechanical specifications, and other related information of the S8P, the high precision positioning terminal. With the help of this document, the hardware design guide book and application manual of Simple, hope can our dear customers quickly apply the S8P high precision positioning terminal to the field of wireless communication.

1. Product Overview

S8P, the high-precision positioning terminal adopts the intelligent integration positioning solution of BDS, GPS and GLONASS, and adopts the Beidou differential positioning and IMU integrated positioning technology to ensure the accuracy under various comprehensive road conditions. Integrate the high-dynamic and high-gain GNSS antenna technology, that under the no odometer signal, no speed pulse signal, no limiting the installation direction condition, it can achieve real-time, high-precision, and three-dimensional positioning, three-dimensional velocity measurement, three-dimensional attitude measurement, and proceed with differential positioning calculating and IMU technology positioning. It can effectively locate in areas with weak or no satellite signals such as urban business districts, jungles, under viaduct, tunnels, underground parking lots, airports, etc., even can provide high positioning of accurate and available for vehicle users.

- all frequency band and all satellites positioning
- centimeter-level positioning accuracy
- 4G_CAT1 wireless communication
- high-performance IMU
- Strong installation adaptability
- 100M Ethernet port wired communication

All frequency band and all satellites positioning

S8P high-precision positioning terminal adopts the intelligent integration positioning and orientation solution of BDS/GPS/GLONASS all-constellation and all-band RTK satellites.

Data communication

Support 4G full netcom, access to CORS network to obtain differential data and return the data to server, to ensure bidirectional communication between vehicle terminal and server. Background data management.

High performance IMU

S8L, high precision positioning terminal with built-in high performance IMU, provides customers with IMU original data, as the algorithm basis.

Strong installation adaptability (Easy to install)

There is no special requirement for the installation angle of the product, and the ideal positioning effect can be achieved by just keeping it to lie horizontally. The adaptive algorithm can automatically identify

Focus on Precise Space-time, Assist in Smart Service Worldwide

and filter the installation error angle.

100M Ethernet port wired communication

Support standard Ethernet wired communication, the highest rate up to 10/100Mbps. It can also ensure bidirectional communication between the vehicle terminal and the server. The data managed by the back- stage.

2. Main Performance

Basic information		
Channel		1408
Name	Function description	Specifications
Satellites	all satellites	BDS/GPS/GLONASS/Galileo/QZSS
Signals	main antenna	GPS: L1C/A, L2C, L2P*,L5
		BDS-2: B1I, B2I, B3I
		BDS-3: B1I, B3I, B2I
		GLONASS: G1, G2
		Galileo: E1, E5a,E5b
		QZSS: L1C/A, L2,L5
	secondary antenna	GPS: L1C/A, L2C, L2P*
		BDS-2: B1I,B2I, B3I
		BDS-3: B1I, B3I, B2I

		GLONASS: G1, G2
		Galileo: E1, E5b
		QZSS: L1C/A, L2C
SIM card		NANO small card
Communication frequency band	4G full Network	LTE-FDD: B1/B3/B5/B8
		LTE-TDD: B34/B38/B39/B40/B41
Network Protocol	TCP/IP/UDP/FTP/HTTP/HTTPS/MQTT/SMS	
Performance Index		
First positioning time	cold start	< 30s
	hot start (using RTC)	< 1s
Measurement accuracy	pseudo-range accuracy	≤ 10cm
	carrier phase accuracy	≤ 1mm
Precision	timing accuracy	20ns
	orientation accuracy	0.1 degrees /1m baseline
	positioning accuracy of single-point positioning	horizontal :1.5m; vertical :2.5m
	DGPS	horizontal: 0.4m +1 ppm; vertical: 0.8m +1 ppm
	RTK	horizontal: 0.8cm + 1ppm; vertical: 1.5cm +1 ppm
	speed measurement accuracy	≤ 0.03 m/s (PDOP ≤4)
Data rate	positioning, orientating 20Hz	

		20Hz original observed value
Transmit power	<ul style="list-style-type: none"> • LTE-TDD Class3(23dBm+1/-3dB) • LTE-FDD: Class3(23dBm±2dB) 	
LTE features	<ul style="list-style-type: none"> • non-CA CAT1 is maximally supported • Support VOLTE and 1.4 to 20MHz RF bandwidth • LTE-FDD: maximum uplink rate 5Mbps , maximum downlink rate 10Mbps • LTE-TDD: uplink and downlink configuration 2, maximum uplink rate 2Mbps, maximum downlink rate 8Mbps • LTE-TDD: uplink and downlink configuration 1, maximum uplink rate 4Mbps, maximum downlink rate 6Mbps 	
Ethernet Interface	WLAN/WLAN*1 10/100Mbps, automatic adaptive Ethernet interface	
Differential data	RTCM 3. X	
Data format	NMEA-0183, Unicore	
Environmental Index		
Operating temperature		-35°C~+70°C
Limit operating temperature		-40°C~+85°C
Humidity		95% non-condensation
Physical characteristics		
Size		110 * 66 * 33.3 mm
Weight		

[1] Test conditions: Support SBAS and QZSS

[2] Test conditions: the number of available satellites is more than 6, and the signal strength of all satellites is not less than -130dBm

[2] Test conditions: CEP_{50%}, the number of satellites is more than 8, 24-hour static positioning, and the signal strength of all satellites is not less than -130dBm

[3] Test condition: 50%@30m/s

[4] Test conditions: LNA test with good performance for external use

3. Electrical parameters

3.1 Electrical maximum

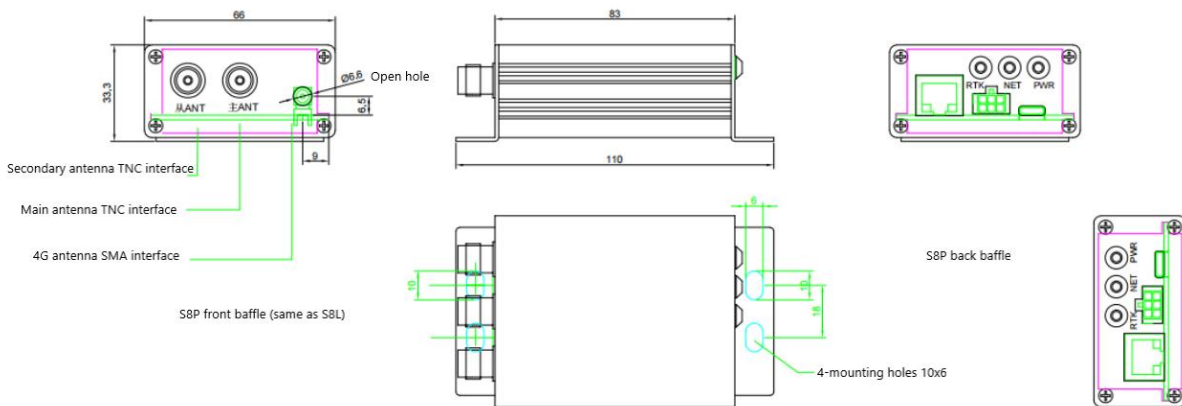
Parameters	Symbols	Minimum value	Maximum value	unit
Type-C interface power supply voltage	VBUS		5	V
Vehicle power supply voltage (VCC)	Vcc	9	28	V
IO voltage	VTTL	-0.5	3.6	V
Maximum acceptable ESD level (contact)	VESD(HBM)		2000	V
Storage temperature		- 40	+ 85	°C

3.2 Working Conditions

Parameters	Symbols	Minimum value	Typical value	Maximum value	Units
Type-C interface power supply voltage	VBUS			5	V
Vcc peak current	Ipeak			3	A
Vehicle power supply voltage (VCC)	Vcc	9V	12/24	28	V
Vcc peak current	Ipeak			3	A
Operating temperature		- 30	25	+ 80	°C
Humidity				95	%

4. Dimensions

Parameters	Minimum value	Typical value	Maximum value	Units
Shell length		110		millimeter
Housing width	-	66	-	millimeter
Housing height	-	33.3	-	millimeter
Exposed cable length (customizable)		customizable		meter



ANT1: main antenna interface;
 ANT2: secondary antenna interface;
 4G: 4G antenna interface
 RTK: RTK status indicator;
 NET: network communication status indicator;
 PWR: power status indicator
 MX3.0-6P power supply and data output port

Figure 4-1 S8P structure

5. Interface and transmission

S8P, high-precision positioning terminal, provides many kinds of peripheral interface and transmission mode, the interfaces including vehicle mode power interface, Type-C interface, 10/100M Ethernet interface.

S8P high precision positioning terminal can use the following modes to transmit high precision positioning data.

1. For network transmission, the JT808 is standard protocol by default.
2. MX3.0-6P interface, vehicle interface output high-precision positioning data

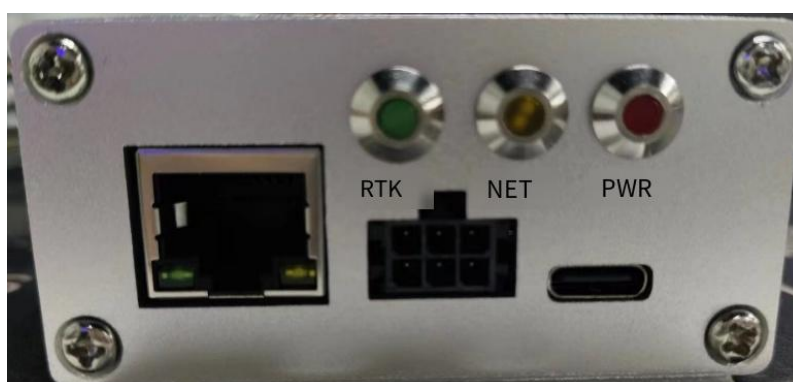


Figure 4-1 S8P interface

Interface	Interface location	Interface function	Description
LED status indicator	LED- Yellow	Network status indicator	Found the network: Flash slowly, about once every 5s. Network abnormal: Quick flash
	LED- Green	GNSS positioning indicator	Complete positioning: Flash slowly, about once every 5s; positioning abnormal: Quick flash
	LED- Red	Power indicator	Power on: flash slowly, once every 5s.
MX3.0-6p	Top Left	* External power input positive	Connect to the positive of the vehicle power
	Bottom left	*ACC input end	Connect vehicle ACC
	Nakagami	GND	Ground wire
	Bottom and middle	*NC	Reserved for digital input or output
	Top right	RS232-RXD	Serial input, default 115200 8-N-1, support PC tool or use

	Bottom right	RS232-TXD	MCU parameter to control Serial output, default 115200 8-N-1 log output or NMEA0183 protocol
10/100M Ethernet interface	10/100M Ethernet interface	10/100M Ethernet wired communication interface	WLAN/WLAN*1 10/100Mbps, self adaptive Ethernet interface, default gateway IP: 192.168.14.1; Server IP:192.168.14.168
Type-C	Type-C	Debugging interface/power supply interface	Used for CAT1: AT instruction, data transmission, software debugging, software upgrade/equipment 5V power supply



Figure 4-2 Terminal S8P antenna interface

Interface	Interface position	Interface function	Description
LTE ANT	LTE ANT	External 4G antenna	External 4G antenna, SMA interface
Main antenna	Main ANT	External GNSS antenna	External GNSS antenna, TNC interface
Secondary antenna	Secondary ANT	External GNSS antenna	External GNSS antenna, TNC interface

6. Model Description of S8P Series

S8P series, high-precision positioning terminal, are divided into several types according to different performance.

Focus on Precise Space-time, Assist in Smart Service Worldwide

The specific description as below:

Main Model	Types and Instructions
S8P	P: without battery, support Ethernet interface type
	PL: without battery, support 4G_CAT1 wireless communication + Ethernet interfaces

7. Units of the Product

Names	Specifications	quantity
S8P High precision positioning terminal		1
GNSS antenna		2
4G antenna		1

8. Precautions

1. Do not operate with power on/connected.
2. Insert the SIM card, consist with PCBA printed direction and position.
3. The dynamic vehicle test required to fix the device (horizontally).
4. The module is electrostatic sensitive product. The RF circuit on the module contains electrostatic sensitive components, please pay attention to do ESD protection during welding, installation, and transportation. Do not touch the module pins directly, otherwise the module may be damaged.



ESD CAUTION

Shenzhen Simple Technology Electronics Co., LTD.



Focus on Precise Space-time, Assist in Smart Service Worldwide

Address: 23rd Floor, Xinlikang Building, QianHai Nanshan
District, Shenzhen City, Guangdong Province

Website: <https://xbteek.com>