



ISO9001

S21

High Precision Positioning Terminal Product
Manual

July, 2023

www.xbteek.com

Revision History

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

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Lead in

This document indicates the main features of the S12, the terminal product of high precision positioning.

This document aims to indicate the hardware interface, electrical characteristics, mechanical specifications, and other related information of the S21, the terminal product of high precision positioning. With the help of this document, the hardware design guide book and application manual of Simple, can S21 be quickly used in the wireless communication field.

1. Product Overview

S21, a type of 4G high-precision mobile positioning terminal, integrates 4G wireless communication technology and GPS/BDS satellite navigation and positioning technology, and adopts self-developed Beidou differential positioning technology to ensure the accuracy of various environments.

The device, built-in sensor, has the intelligent power-saving and warning-up to work function. It has the functions of GPS/ Beidou positioning, low power alarm, AGNSS fast positioning, status detection, remote FOTA firmware upgrade, remote configuration and real-time monitoring. With the global positioning service platform, can achieve real-time positioning data acquisition, tracking and positioning functions.

- Real-time positioning: In the outdoor, can help the terminal get positioning data through GNSS; achieve the centimeter-level high precision outdoor positioning based on the CORS sever.
- Accelerometer: built in 3-axis acceleration sensor, integrate accurate acceleration algorithm, acquire real-time equipment movement status;
- Low power alarm: the equipment can give device prompt or system reminder according to the preset power.
- Integrated positioning: support to expand indoor UWB+ outdoor RTK integrated positioning.
- Flexible way of wear: support to handheld, wear on the helmet/ on the chest or arms.

2. Main Performance

2.1 GNSS Specifications

Features	Instructions	
Tracking frequency points	BDS: B1I, B2a GPS: L1, L5 Galileo: E1, E5a QZSS: L1, L5	
Data update rate	1- 10Hz	
First positioning time	Cold start	< 30 s
	Initialization time	< 5 s (typical value)

Fixed value convergence time	≤10s	
Sensitivity	Tracking	-165dBm
	Recapture	-160dBm
	Capture sensitivity	-148dBm
Horizontal accuracy	1cm + 1ppm	
Time accuracy	2cm + 1ppm	
Output protocol	NMEA 0183 RTCM 3. X	

2.2 4G LTE Specifications

Features	Instructions
Supportable bands	LTE-FDD: B1/B3/B5/B8 LTE-TDD: B34/B38/B39/B40/B41
Transmit power	LTE-TDD: Class3(23dBm+1/-3dB) LTE-FDD: Class3(23dBm + / - 2dB)
Power supply	VBAT 3.3V ~ 4.3V, typical value 3.8V
LTE Characteristics	<ul style="list-style-type: none"> • Support non-CA CAT1 maximally, support VOLTE • Support 1.4 to 20MHz RF bandwidth • LTE-FDD: Max.uplink rate 5Mbps, Max. downlink rate 10Mbps • LTE-TDD: Uplink and downlink configuration 2, Max. uplink rate of 2Mbps, Max downlink rate of 8Mbps • LTE-TDD: Uplink and downlink configuration 1, Max. uplink rate of 4Mbps, Max. downlink rate of 6Mbps
Network Protocol Characteristics	Have supported TCP/UDP/FTP/HTTP/MQTT/SMS
USIM card interface	Support USIM/SIM card: 1.8V and 3V
USB port	<ul style="list-style-type: none"> • Compatible with USB 2.0 (slave mode only), data transfer rate up to 480Mbps • Used for AT instruction, data transfer, software debugging, software upgrade • USB virtual serial port driver: Supports the USB driver under Windows 7/8.1/10, Linux 2.6.x/3.x/4.1, Android 4.x/5.x/6.x/7.x and other operating systems

3. Hardware Parameters

3.1 Electrical Characteristics

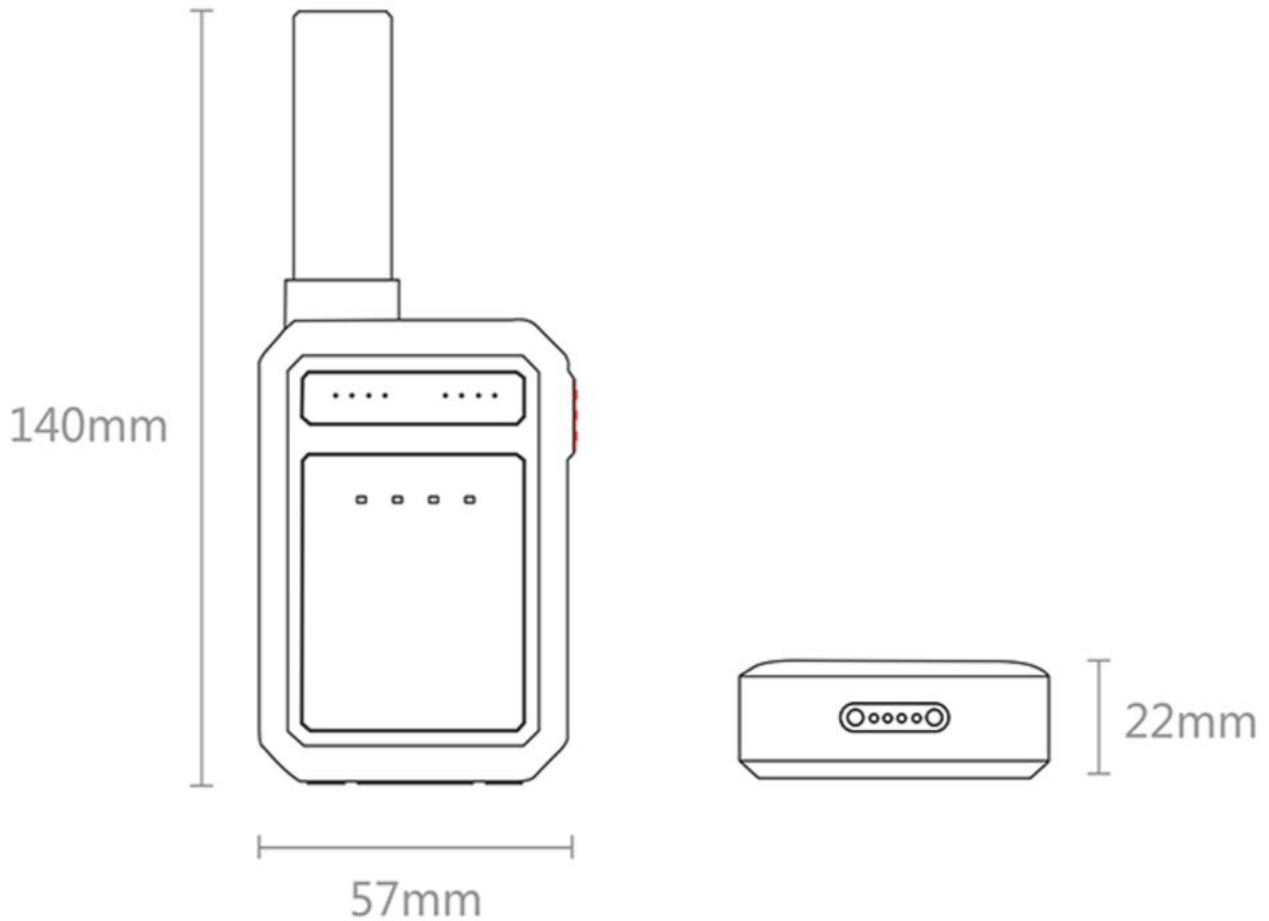
Parameters	Instructions
Charging voltage Current	DC 5V/500mA
Operating voltage Current	3.7V-4.2V/ average 90mA
Sleep voltage Current	3.7V/ less than 100uA
Built-in battery capacity	2500mAh (3.7V polymer battery)
Battery run time	12 hours+

3.2 Operating Conditions

Parameters	Instructions
Operating temperature range	-20°C -75 °C
Storage temperature range	-30 ° C - 80 ° C
Operating humidity range	10%-85% RH non-condensation

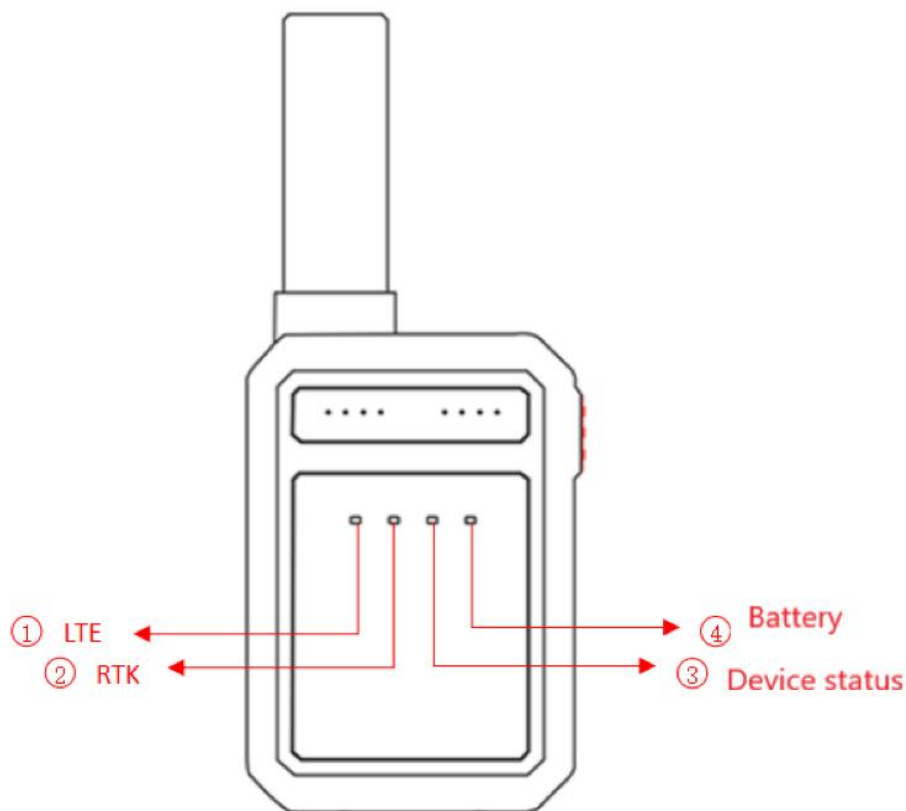
4. Appearance

4.1 Appearance Specifications



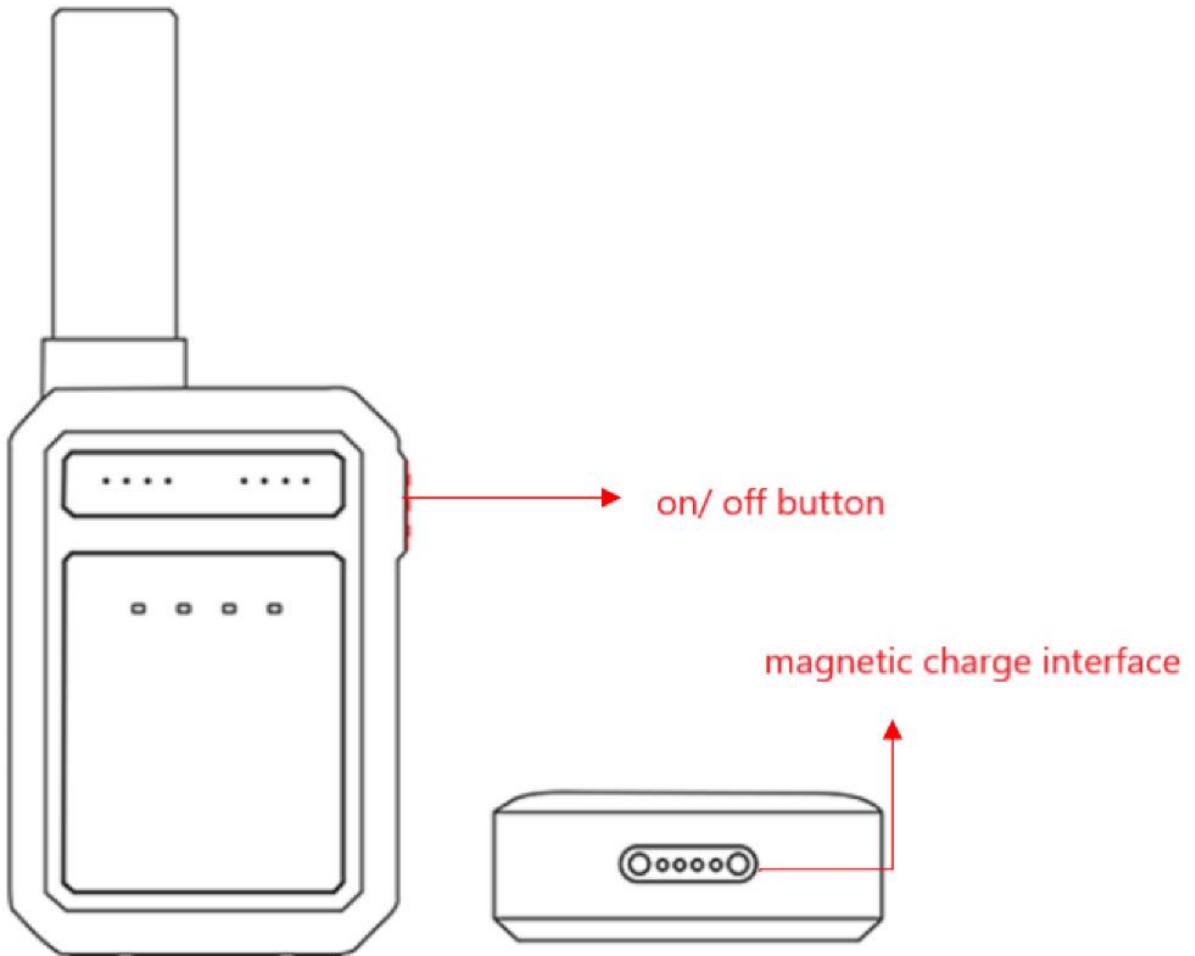
Parameters	Dimensions
The host machine	57 (L) *22mm (W) *140mm (H)
GNSS antenna specifications	19mm (L) *19mm (W) *50mm (H)
Housing material	ABS plastic
The weight of the host	About 120g

4.2 Indicated Lights



NO.	Function	Status	Description
1	4G/ LTE network status indicator	Flash once every five seconds	The user platform, connected with network, is normal
		Quick flash twice in 1 second	The user server, connected with network, is abnormal
2	GNSS/RTK indicator	Flash 1 time in 5 seconds	GPS has located
		Flash twice in 1 second	GPS has not located
3	Device status indicator	Keeping on	Device on
		Off	Device off
4	Battery indicator	Flash 1 time in 5 seconds	The battery continues to work normally
		Flash twice in 1 second	Low battery

4.3 Interface Instructions



Interface	Function	Description
Magnetic charger interface	Charging	Charging interface Magnetic contact, output positioning data, debugging device interface
Switch button	on/off button	Long press the on/off button

5. Units of the Products

Name	Specifications	Quantity
The host S21		1
Magnetic charging cable		1

Shenzhen Simple Technology Electronics Co., LTD.



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