



BS110 Asset GPS Tracker

User Manual

1. Quick Reference



Attention

- i. BS110 obtains power through sunlight to extend the battery life.
- ii. Please make sure that the device is exposed to direct sunlight every day. If the device is not charged for more than three months, it may cause permanent damage to the internal battery.
- iii. Give the device a full charge before installation.
- iv. Only when the solar panel output voltage value is 0.3V higher than device battery voltage value, the solar panel will start to charge the battery. Otherwise, solar charging will stop.
- v. To ensure long battery life, be careful to set the reporting intervals. Lower reporting rates will maintain the balance between the power consumption and gaining (from solar panel). We recommend tracker reporting $\geq$ every 5 mins when ignition/motion on, and $\geq$ every 1 hour when ignition/motion off.



Equipment power consumption and solar panel charging current

- i. The normal device power consumption is around 50 mAh when the device is in working mode without sleep.
- ii. The typical charging rate of the solar panel under direct sunlight at noon (in summer) is about 110mAh (different sunlight illumination, different charging current).



Intelligent Power Management

This allows the tracker to work at a lower reporting rate when battery is low. Once the battery is recharged back, the tracker will report as normal. This function is enabled in default:

- When the battery voltage value is down to 3.2V, tracker will send position message at every 24 hours no matter ignition (motion) on or off. Alarm (event) message will not be affected and sent out immediately regardless of whether the tracker is in this mode.
- When the battery is charged back to 3.4V, the device will report at its TIMER setting.

⚠ Battery Protection

The tracker has a charging threshold to avoid the battery overcharge. Only when the battery voltage is $\leq 3.95V$, the battery charging will start once sunlight condition is met or the tracker is connected to external power through magnetic USB cable. The charging will stop when the battery voltage reaches 4.05V or the sunlight condition isn't met or it's disconnected from external power, depending on which comes first.

⚠ Product Specifications

Network Specifications	
Operating Band	LTE FDD Cat M1: B1/B2/B3/B4/B5/B8/B12/B13/B18/B19/B20/B25/ B26/B27/B28/B66/B85 LTE FDD Cat NB2: B1/B2/B3/B4/B5/B8/B12/B13/B18/B19/B20/B25/ B28/B66/B71/B85 GSM/EDGE: 850/900/1800/1900 MHz
Data Transmission	eMTC: Max. 588 (DL), Max. 1119 (UL) NB1: Max. 32Kbps (DL), Max. 70Kbps (UL) NB2: Max. 127 (DL), Max. 158.5 (UL) EDGE: Max. 296Kbps (DL), Max. 236.8Kbps (UL) GPRS: Max. 107Kbps (DL), Max. 85.6Kbps (UL)
GNSS Specifications	
GNSS Chipset	All-In-One GNSS Receiver
GNSS System	GPS + Glonass + Beidou + Galileo + QZSS
Receiver type:	47 tracking / 47 acquisitions- channel GNSS receive
Sensitivity	Acquisition: -147dBm Tracking: -166dBm Reacquisition: -159dBm
Position Accuracy in open sky (CEP-50)	Autonomous: < 2 m CEP
Standalone TTFF	Cold start: <15S/28s Warm start: <25s/2s Hot start: <1s/1s
Interfaces	
Charging and Data Transmission	Type-C connector
Network, GNSS Antenna	Internal only
Indicator LED	Network, GNSS and Battery level
Touch Button	Power On and Off
Light Sensor	Back for Removal Alert

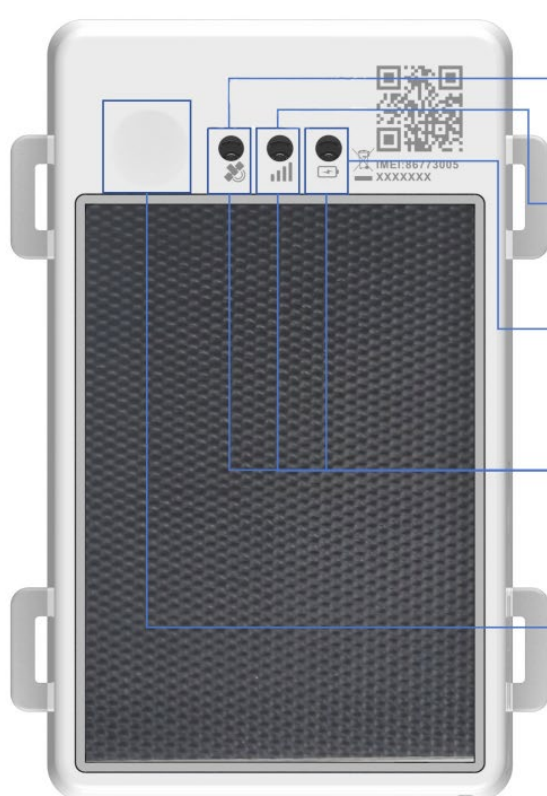
Temperature Sensor	1 temperature sensor
BLE	5.3
General Specifications	
Waterproof	IP67
Dimensions	88mm*60.4mm*30.7mm (3.46" *2.38" *1.21")
Weight	150g (5.3oz)
Battery	Rechargeable Li-Polymer 2500 mAh/ 3.6V
Standby Time (Without considering solar charging 2 hours active tracking per day)	30 minutes reporting: 100 Days 5 minutes reporting: 45 Days
Charging & Data Communication	Type-C cable (A to C and C to C) (Recommend using 5V 1A adaptor, 5 hours charging)
Solar Panel	For charging the tracker battery
Operating Temperature	-30°C ~ +80°C (-22°F ~ 176°F)
Mounting	Magnet/Screw/Double-sided tape
Air Interface Protocol	
Transmit Protocol	TCP, UDP, MQTT, SMS
Data Security & Encryption Option	MD5/ AES128
Scheduled Timing/angle/distance Report	Report position and status at preset intervals
Geofence	Support up to 64 internal geofence regions
Alarms	Support up to 31 types of alarms
Industry Certifications	
FCC, PTCRB, AT&T, US Cellular, T-Mobile	

2. Charging Cable Accessories



USB Type-C Cable (NOT INCLUDED)

3. LED indicators



GNSS Indicator • Solid on: Positioned • 1s on and 1s off: Positioning • 0.5s on and 0.5s off: GPS upgrading
Network Indicator • Solid on: Network connected • 1s on and 1s off: Network searching
Battery Indicator • Solid on: $\geq 90\%$ • 1s on and 1s off: $10\% \leq \text{battery} < 90\%$ • 0.5s on and 0.5s off: $< 10\%$
Three indicators as a whole • Flash alternately: Upgrading MCU • Same Frequency Flashing: BOOT and APP abnormality
Touch Button • Power on • Power off • Status check • (Please refer to '5. Control button work logic')

Note: Indicator lights will go out automatically after the tracker turns on for 70 seconds without connecting to external power via USB cable.

4. Sim and Charging Ports – Open Cover with a Screwdriver

4.1 SIM card (upper slot)

4.1.1 SIM card is enabled and inserted prior to shipping. Do NOT remove it.

4.2 Charging with USB Cable

4.2.1 If it becomes necessary to charge the device quickly, insert a USB Type-C power connector into the USB port. It takes about 2-4 hours to fully charge the battery.



4.3 Tighten Screws

- 4.3.1 It is **VERY IMPORTANT** to tighten the screws to prevent water from leaking inside and damaging the device. Note, the structures on each side of the cover are different. Therefore, follow the below photos, to making sure the curved part of the cover is positioned in the area highlighted in red, and tighten the ensuring it is fully covered.



- 4.3.2 Final check, ensure the cover/lid is fully covered and screws tightened.



4.4 Installation

Away from emission source such as all kinds of sensors, burglar alarm and other communication devices.

5. Power button

Power on (default enable)	● Push button more than 6 seconds, device powers on, all LEDs start to work ● Other method to power on: USB connected.
Status Check (default enable)	When device is in power on status, push button 5 times (each interval less than 1 second), LEDs will work for 100 seconds and indicate GNSS, Network, and Battery status.
Power off (default enable)	Push button 9 times (each interval less than 1 second), the ninth time holding the button for more than 3 seconds, LED lights will be solid on for 3 seconds then device powers off.

6. Quick Trouble Shooting

6.1 Tracker Shows Offline

6.1.1 Check the battery remaining power

6.1.2 Check if the device entered into a network blind area.

6.2 Unable to Locate

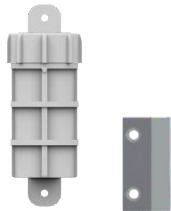
6.2.1 The device may be shielded by metallic objects.

6.2.2 The device may be in an area with no satellite signal coverage.
(Underground, building, etc)

6.3 Position Drift

In an area with poor GNSS signal (such as areas with tall buildings), position drift may happen. When the device moves to an open area, the drift will no longer exist.

7. Optional Accessories

SKU	Description	Photo for Reference
BS110BRK	Bracket (stainless steel) with 2 mounting screws	
BS110MM	2 magnets for bracket with 2 mounting screws (magnet installation does not support removal alert)	
TA63	Double-sided tape for mounting bracket	
BTH1B	BLE 5.0 Wireless Temperature and Humidity Sensor	
BTDT1B	BLE 5.0 Wireless Door and Temperature Sensor	
BTTS	BLE 5.1 IP67 Temp, movement & door sensor	