

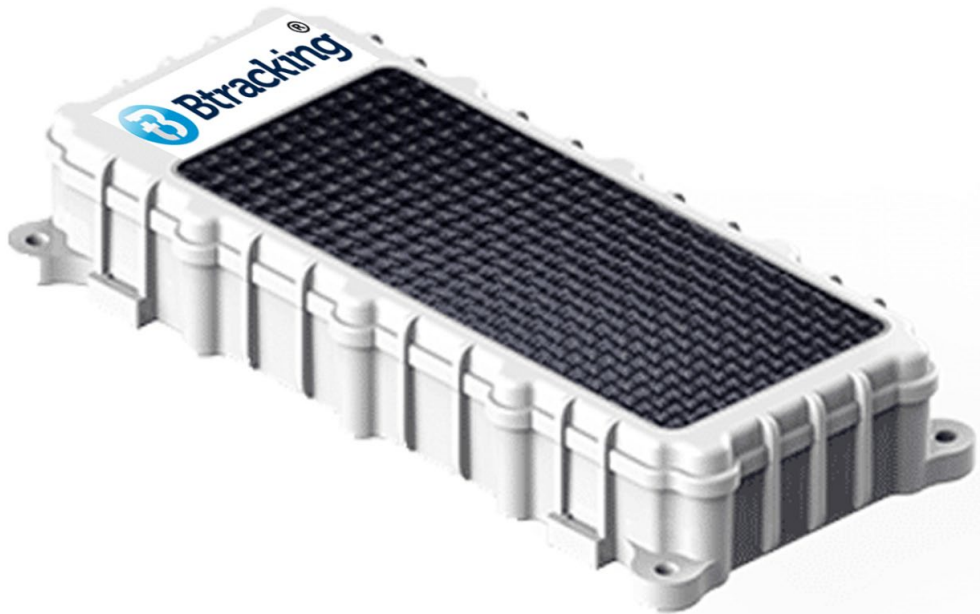


BS120 Solar Powered GPS Tracker

User Manual



1. Quick Reference



BS120 Solar Powered GPS Tracker

Attention

- i. Tracker obtains power through sunlight to extend the battery life.
- ii. Please make sure the device is exposed to direct sunlight every day. This will be very useful to extend the battery life. If the device is not charged for more than three months, it may cause permanent damage to the internal battery.
- iii. Your unit has been fully charged prior to shipment. Please ensure device has a full charge before installation.
- iv. Only when the solar panel output voltage value is 0.3V higher than device battery voltage value, will the solar panel start to charge the battery. Otherwise, the solar charging will stop.
- v. To ensure long battery life, carefully choose the reporting intervals ("TIMER"). Lower reporting rates will maintain the balance between the power consumption and gaining (from solar panel). We recommend to set tracker reporting ≥ 5 mins when ignition/motion on, and ≥ 1 hour when ignition/motion off. We will advise you what the setting are at shipment. These can be changed over the air and from the platform as well. Contact us for assistance if you need to change settings.



Equipment power consumption and solar panel charging current

- i. The normal device power consumption is around 50mAh 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 250mAh (different sunlight illumination, different charging current).



Disclaimer

Before using this device, customers should fully understand their usage scenarios and installation environment. Btracking is not responsible for any loss caused by using the device improperly or at an unsustainable reporting rate.



Intelligent Power Management

To extend the battery life, the tracker has an intelligent power management algorithm. This algorithm allows the tracker to continue to function with a lower reporting rate when the battery is low. Once the battery is recharged, the tracker will report as normal. This function is enabled by default:

- When the battery voltage value $< 3.2V$, tracker will send positions 24 hours no matter if ignition (motion) is on or off. Alarm (event) message will not be affected and are sent immediately regardless of whether the tracker is in this mode.
- When the battery is recharged $\geq 3.4V$, the tracker will report again at its TIMER settings.



Battery Protection

The tracker has a charging threshold to avoid battery overcharge. Only when battery voltage is $\leq 3.95V$, will charging start (once sunlight is available, or the tracker is connected to external power through the cable). Charging stops when battery voltage reaches $4.05V$, or sunlight is unavailable, or tracker is disconnected from external power.

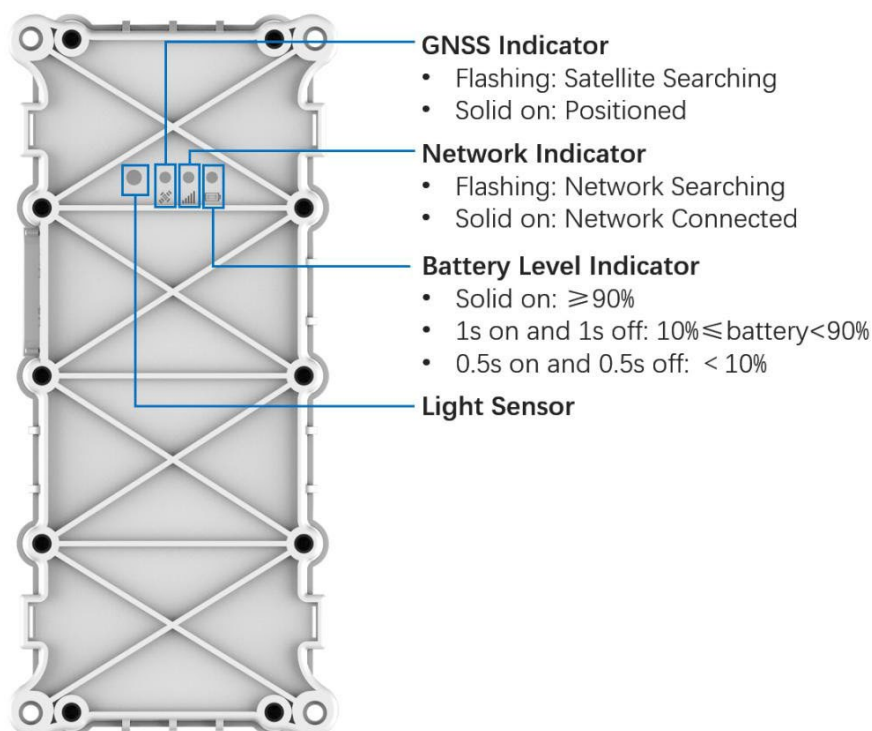
2. Product Specifications

Network Specifications	
Operating Band	LTE FDD Cat 1: B1/B2/B3/B4/B5/B7/B8/B12/B13/B17/B18/B19/ B20/B25/B26/B28/B66 LTE TDD Cat 1:

	B34/B38/B39/B40/B41 GSM: 850/900/1800/1900 MHz
Data Transmission	LTE-FDD:Max.10Mbps (DL), Max.5Mbps (UL) LTE-TDD:Max.8.96Mbps(DL), Max.3.1Mbps (UL) GPRS: Max. 85.6Kbps (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
Horizontal Position Accuracy	Autonomous: < 2 m CEP
TTFF @ -130 dBm with (without) Easy	Cold start: <28s Warm start: <25s Hot start: <1s
Interfaces	
Charging and Data Transmission	Type-C connector
Network, GNSS Antenna	Internal only
LED Indicator	Network, GNSS and Battery
Touch button	For Power On and Off
FOTA	Yes
Light sensor	For Remove Alert
Temperature Sensor	Built-in Temperature sensor
BLE 5.3	Yes
WiFi	2.4 GHz 802.11b (Rx)
Sim Card	Nano Sim Card
Tracker Configuring	TypeC Connector
General Specifications	
Waterproof	IP67
Dimensions	185.4mm*84.7mm*31.3mm (5.56" *2.54" *0.94")
Weight	410g (14.5oz)
Battery	Rechargeable Li-Polymer 7500 mAh/ 3.6V
Standby Time (Without solar charging, 2 hours active tracking per day)	30 minutes reporting: 300 Days 5 minutes reporting: 135 Days

Charging & Data Communication	Type-C cable (Recommend using 5V 1A adaptor, 10 hours charging)
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
BLE Accessory Support	Yes
Scheduled Timing/angle/distance Report	Report position and status at preset intervals
Geo-fence	Support up to 64 internal geo-fence regions
Alarms	Support up to 31 types of alarm (Refer 7. Alarm Configuration)
Industry Certifications	
FCC/CE/RCM/NBTC/TDRA/CITC/Anatel/IP67	

3. LED Indicators



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

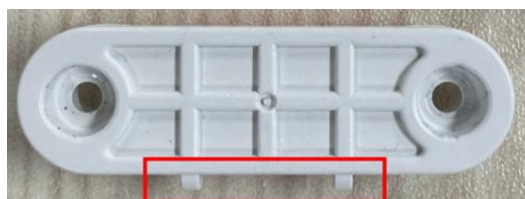


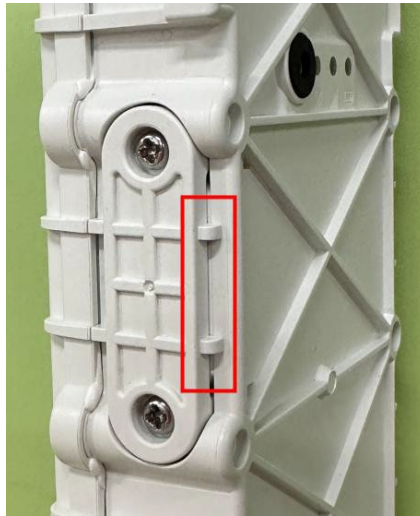
4. USB Charging Port and SIM slot

- 4.1 The SIM card has been installed and is active. Do not remove it.
- 4.2 To charge tracker with a USB cable if needed:
 - 4.2.1 Open the cover (2 screws).
 - 4.2.2 Connect any 5V 1A (cellphone) adaptor through Type-C cable. If drained, it takes about 20-24 hours to fully recharge the battery. You can use other Type-C connectors, but the lower current output will increase charging time.



- 4.2.3 Put the cover back and screw it on tightly (2 screws). It is **EXTREMELY IMPORTANT** that the cover is installed correctly to prevent water from leaking inside, cause damage to the tracker, and void the warranty.
- 4.2.4 Please note the sides of the cover are different. **CAREFULLY** follow the instructions below to ensure the area highlighted in red faces toward the bottom of the tracker, and only then tighten the screws after ensuring that it is fully covered.





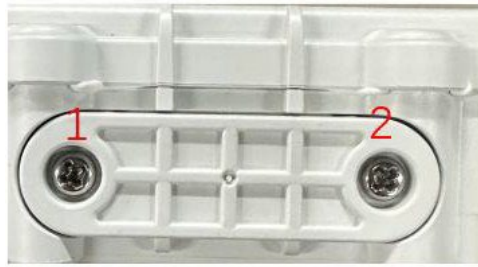
4.2.5 We recommend using a torque screwdriver and a torque rate of 3.5 kgfcm:



Scale to 0

Adjust the torque rate to 3.5 kgfcm

- 4.2.6 Tighten the 2 screws one by one in the sequence shown below with a torque screwdriver.

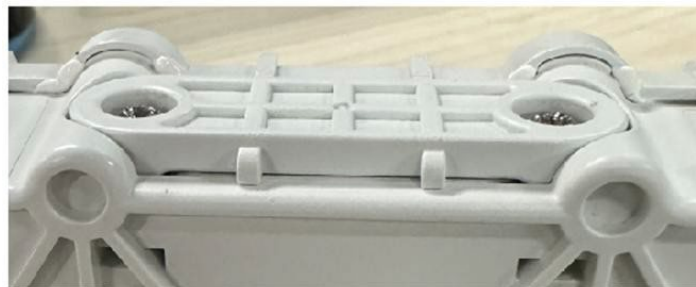


↑
Tighten the screws one by one by following the sequence above

When it reaches the torque rate set, the screwdriver can't move the screw further in. Ensure that each screw torque rate is 3.5 kgfcm



- 4.2.7 As a final check, please ensure the cover/lid is fully covered and screws tightened.



Good

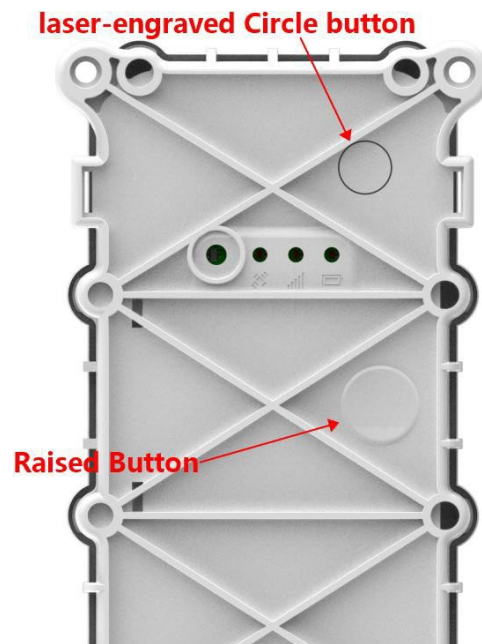
4.3 Tracker Installation

- 4.3.1 Install tracker where it has open access to the sky, away from emission sources and electronics that may cause interference such as sensors, alarms, radios and other communication devices.

5. Tracker Operation

5.1 Power Button Location

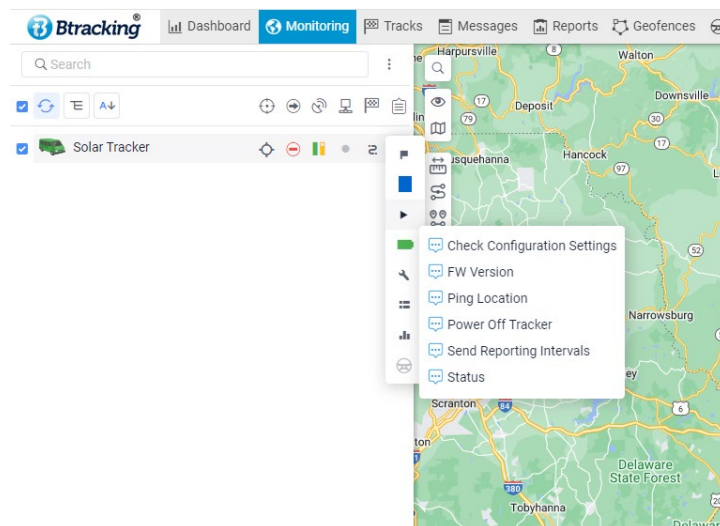
- 5.1.1 **If there is a laser-engraved circle in the upper right corner of the device, the power button is the laser-engraved circle.**
- 5.1.2 Conversely, **if there is no laser-engraved circle on the device, the power button is the raised button.**



5.2 Power On/Off

5.2.1 Power ON: Push the power button on the back of the device for **5 seconds**

5.2.2 Power OFF: There is **no power off button**. To power off the device, send the POWER OFF command from the tracking platform or app. Power off is recommended when the tracker is stored.



5.3 Motion Operations

5.3.1 Hold the tracker and keep the LED indicator side towards the sky. Use normal speed to turn it over 180° (the solar panel side towards the sky) then recover. This is called one-time standard turning. By repeating the standard turning 3 times, the tracker will show GNSS, network and battery status through LED



indicator. It only works when device powered on.

5.4 Battery

- 5.4.1 If battery voltage drops to 3.5V, usually a battery charging is needed to avoid shutdown due to low power. If the battery runs out completely, please charge the tracker for 24 hours. Once the battery is recharged to 3.5V, the device power on again.

5.5 Get Current Position

- 5.5.1 SMS Query (only when the device in working mode and registered on the network)
Device default PIN is 0000. Send a location inquiry SMS command (google,0000#) to the tracker. The location information will be sent back through SMS (the tracker SIM card must support receiving and sending SMS first).

6. Troubleshooting

6.1 Tracker Shows Offline

- 6.1.1 Check the remaining battery power.
- 6.1.2 Check if the device has entered a network blind area.

6.2 Unable to Locate

- 6.2.1 The device may shielded by metallic objects or thick walls.
- 6.2.2 The device may be in an area with no satellite signal coverage such as a parking garage or large building.

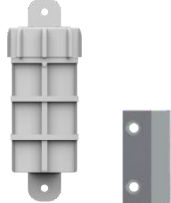
6.3 Position Drift

- 6.3.1 In areas with a poor GNSS signal, such as cities with tall buildings, position drift may occur.

7. Warranty

Btracking offers a lifetime warranty with exceptions, see <https://btracking.com/warranty/> To ensure the battery provides the longest possible life, if the tracker will be unused, try to connect it to external power and recharge the battery for 20 hours every 3 months to extend battery life.

8. Optional Accessories

Product Sku	Description	Photo for Reference
BTH1B	BLE 5.0 Wireless Temperature and Humidity Sensor	
BTDT1B	BLE 5.0 Wireless Door and Temperature Sensor	
TSR1-B	BLE 5.0 Wireless Relay	
BAMMS	Magnet Mount Kit (4 units)	
TA46	Sponge for light sensor	
BAWKF300	BLE 5.1 Key Fob & Panic button	
BTTS	BLE 5.1 IP67 temp&movement&door sensor	
T-hub	BLE 5.1 IO extension hub	

T-one	BLE 5.1 Probe temp or temp&humi sensor extender	
TA45	USB-A (male) to Type-C (male) cable 100cm	

9. FCC Warning

This equipment has been tested and found to comply with the limits for a Class B digital device, pursuant to part 15 of the FCC Rules. These limits are designed to provide reasonable protection against harmful interference in a residential installation. This equipment generates, uses and can radiate radio frequency energy and, if not installed and used in accordance with the instructions, may cause harmful interference to radio communications. However, there is no guarantee that interference will not occur in a particular installation. If this equipment does cause harmful interference to radio or television reception, which can be determined by turning the equipment off and on, the user is encouraged to try to correct the interference by one or more of the following measures:

- Reorient or relocate the receiving antenna.
- Increase the separation between the equipment and receiver.
- Connect the equipment into an outlet on a circuit different from that to which the receiver is connected.
- Consult the dealer or an experienced radio/TV technician for help.

This device complies with Part 15 of the FCC Rules. Operation is subject to the following two conditions:

- (1) this device may not cause harmful interference, and
- (2) this device must accept any interference received, including interference that may cause undesired operation

Caution!

Any changes or modifications not expressly approved by the party responsible for compliance could void the user's authority to operate the equipment.

IMPORTANT NOTICE:

Btracking 340 Route 202 Somers NY 10589-3237 USA
www.btracking.com 866-233-0953 info@btracking.com



FCC Radiation Exposure Statement

This equipment complies with FCC radiation exposure limits set forth for an uncontrolled environment. This equipment should be installed and operated with minimum distance 20 cm between the radiator and your body.

10. ISED Warning

This device complies with Innovation, Science, and Economic Development Canada license-exempt RSS standard(s). Operation is subject to the following two conditions:

- (1) this device may not cause interference, and
- (2) this device must accept any interference, including interference that may cause undesired operation of the device.

Le présent appareil est conforme aux CNR d'Innovation, Sciences et Développement économique Canada applicables aux appareils radio exempts de licence. L'exploitation est autorisée aux deux conditions suivantes:

- (1) l'appareil ne doit pas produire de brouillage, et
- (2) l'utilisateur de l'appareil doit accepter tout brouillage radioélectrique subi, même si le brouillage est susceptible d'en compromettre le fonctionnement.

This device complies with Innovation, Science, and Economic Development Canada license-exempt RSS standard(s). Operation is subject to the following two conditions:

This device complies with RF exposure guidelines, users may request Canadian information on RF exposure and compliance. The minimum distance from body to use the device is 20cm.

Le présent appareil est conforme. Après examen de ce matériel aux normes de conformité ou aux limites d'intensité de champ RF, les utilisateurs peuvent, sur l'exposition aux radiofréquences et la conformité and compliance, d'acquiescer les informations correspondantes. La distance minimale du corps à utiliser le dispositif est de 20cm.