



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 3.65V, 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 3.75V, 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	FDD: B1/B2/B3/B4/B5/B8/B12/B13/B18/B19/B20/B25/B28 TDD: B39 (Cat M1 only) EGPRS: 850/900/1800/1900MHz
Certification	FCC: B2/B4/B5/B12/B13/B25
	(Cat M and NB-IoT)
Data Transmission	eMTC: Max. 300Kbps (DL), Max. 375Kbps (UL) NB1: Max. 32Kbps (DL), Max. 70Kbps (UL) EDGE: Max. 296Kbps (DL), Max. 236.8Kbps (UL) GPRS: Max. 107Kbps (DL), Max. 85.6Kbps (UL)
GNSS Specifications	
GNSS Chipset	Qualcomm Gen 8C GNSS receiver
GNSS System	GPS+Glonass+Galileo+Beidou
Receiver type:	33 tracking / 99 acquisitions- channel GNSS receiver
Sensitivity	Cold start: -149 dBm Tracking: -163 dBm
Position Accuracy in open sky (CEP-50)	< 2m
Standalone TTFF	Cold start: < 29s Warm start: < 27s Hot start: < 1s
Interfaces	
Charging and Data Transmission	4 Pin port with magnet
Network, GNSS Antenna	Internal only
Indicator LED	Network, GNSS and Battery level
FOTA	Yes
Physical Power Switch	1
Light Sensor	2 light sensors (front and back)
Temperature Sensor	1 temperature sensor
General Specifications	
Waterproof	IP67
Dimensions	69.3mm*143mm*24.8mm (2.73" *5.63" *0.98")
Weight	225g (7.94oz)
Battery	Rechargeable Li-Polymer 4800 mAh/ 3.7V

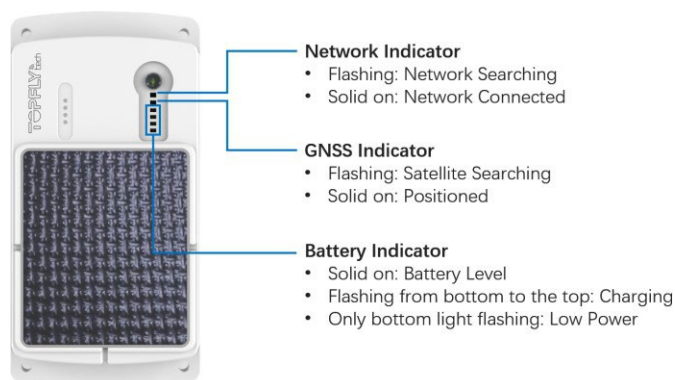
Standby Time (Without considering solar charging 2 hours active tracking per day)	10 minutes reporting: 170 days 5 minutes reporting: 90 Days 1 minute reporting: 35 Days
Charging & Data Communication	Magnetic USB cable (Recommend using 5V 1A adaptor, 10 hours charging)
Solar Panel	For charging the tracker battery
Operating Temperature	-20°C ~ +80°C (-4°F ~ 176°F)
Mounting	Magnet/Screw
Air Interface Protocol	
Transmit Protocol	TCP, UDP, MQTT, SMS
Data Security & Encryption Option	MD5/ AES256
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	
CE, RCM, IC, FCC, PTCRB, AT&T, US Cellular, T-Mobile(pending), Verizon(pending)	

2. Standard Accessories



USB Cable

3. LED indicators



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

4. Enclosure & Operation

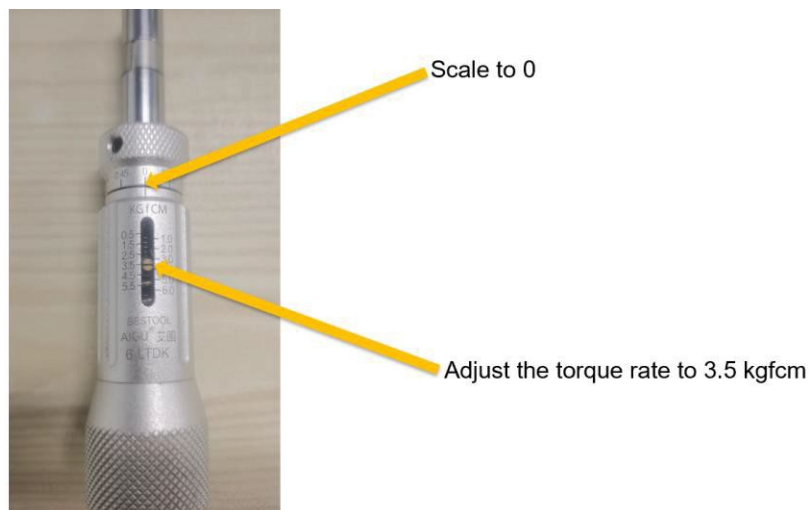
4.1 Power On/Off Switch

- 4.1.1 Tracker has an internal on/off switch (blue circle below, to the right of the sim card). We normally ship with it in the "On" position. If the device will be stored for some time you may wish to open the enclosure and turn the switch to "Off". HOWEVER we recommend turning power on/off using the Motion Controlled Operations, see 3.4.3 below.

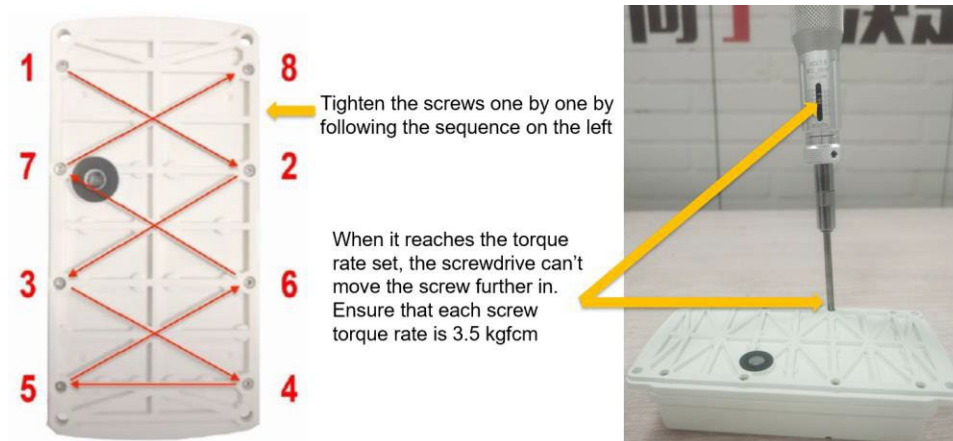


4.2 Replace Enclosure Cover

- 4.2.1 It is **VERY IMPORTANT** to fix each screw on the rear side to prevent water from leaking inside and cause damage to device.
- 4.2.2 Screw fixing guide below.



4.2.3 Please follow below sequence to fix the screws from **1-8** using Torx screwdriver.



4.2.4 Final check, please ensure the cover/lid are fully covered and screws tightened.



4.3 Installation

4.3.1 On top or side of trailers/container away from electronic interference and vehicle emissions.

4.4 Motion Operations

Device uses motion to detect different operations. Hold the tracker and keep the brand label side towards the sky. Use normal speed to turn it over 180° (the brand label side towards the ground) then recover. This can be called one-time standard turning. By repeating the standard turning different times, the tracker will execute different operations:

4.4.1 Check battery status

- (1) Only works with physical power switch at on position
- (2) Repeat the standard turning 3 times

4.4.2 Check GNSS and network status

- (1) Only works with physical power switch at on position

(2) Repeat the standard turning 4 times

4.4.3 Motion controlled power on or off

- (1) Only works with physical power switch at on position.
- (2) Motion controlled power off: Repeat the standard turning 7 times. The tracker will power off. Customer can repeat other motion operation to verify.
- (3) Motion controlled power on: after power off, repeat the standard turning 7 times, then all the LED will be flashing. The tracker will power on.

4.5 Battery

- 4.5.1 If not used for an extended period, connect device to a 5V 1A (cellphone) adaptor through magnet USB cable for 10 hours charging to make sure battery is fully charged.
- 4.5.2 Can charge tracker with other USB connectors but lower current output will cause a longer charging time.
- 4.5.3 When battery voltage value drops to 3.5V, usually battery charging is needed to avoid unexpected shutdown due to low power. If the battery runs out completely, only when the battery is charged to 3.5V will the device power on again.