TOPFLYtech KnightX 100 Asset GPS Tracker User Manual

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TOPFLYtech KnightX 100 Asset GPS Tracker

USER MANUAL

Thanks for your purchasing of the high-quality GPS tracker from TOPFLYtech. Please read this user manual carefully before installation and operation. Information in this manual is the property of TOPFLYtech. Changes to the specifications and features in this manual may be made by TOPFLYtech without prior notice. No part of this manual could be reproduced, copied, translated, transmitted, or published in any form or by any means without TOPFLYtech's prior written permission.

KnightX 100

The tracker is using GNSS & LTE & WiFi & BLE scan technologies and could collect device coordinates then transfer them via LTE network to the server. It provides customer with cost-effective, efficient and safety management. It has been widely used in commercial transportation, company vehicle fleet management, intelligent transportation, logistics, car rental, engineering machinery, marine transportation, and other segments.

1. Quick Reference

KnightX 100

Attention

Disclaimer

Before using this device, customers should fully understand their usage scenarios and installation environment. TOPFLYtech will not be responsible for any lost caused by using the device in a wrong scenario or reporting rate. It is highly recommended that customers should contact TOPFLYtech before deployment. We are glad to give suggestions.

Intelligent Power Management

To extend the battery life, we designed an intelligent power management algorithm. This algorithm allows the tracker working under a lower reporting rate when battery is low. Once the battery is charged back, the tracker will report as normal. This function is enabled in default. Customer can disable it by command. The detail working logic is:

- When the battery voltage value is down to 3.4V, 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 3.5V, the device will report at its TIMER setting.

FOTA (firmware over the air) Notification

TOPFLYtech is committed to providing clients with the best user experience. We are offering automatic firmware update feature for every device. This feature allows devices always having the latest version firmware. It can save clients the time and effort of updating firmware manually.

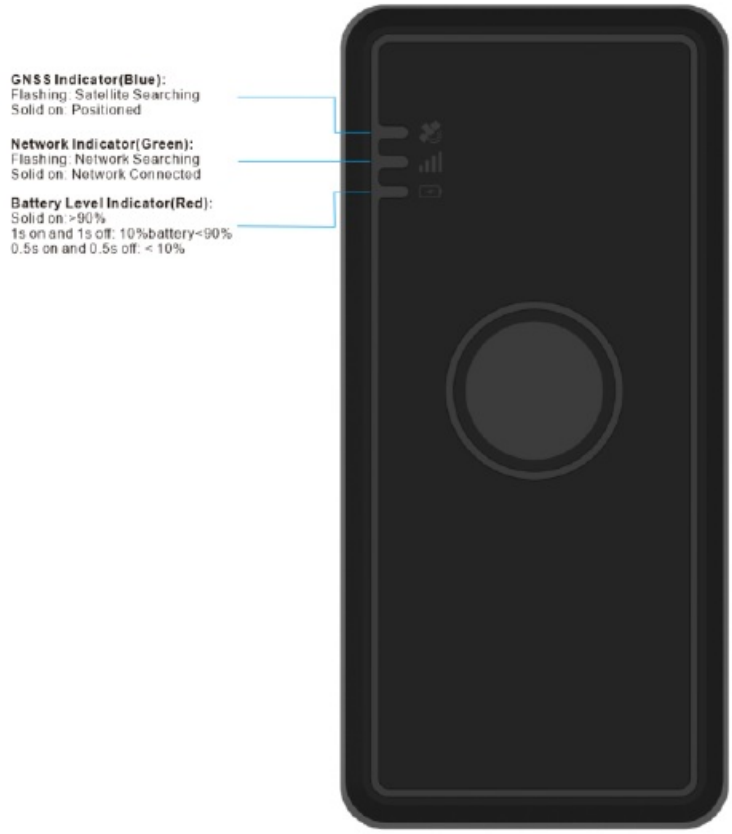
Please note that this feature is enabled in default. If you want to turn it off, please contact with TOPFLYtech. If this feature is disabled, the fw update only can be done by sending upgrade command manually.

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	
GPS Chipset	All-In-One GNSS Receiver
Parallel GNSS	GPS + Glonass + Beidou + Galileo +QZSS
Receiver type:	47 tracking / 47 acquisitions – channel GNSS receiver
Sensitivity	Acquisition: -147 dBm Reacquisition: -159 dBm Tracking: -166 dBm
Horizontal Position Accuracy	Autonomous: < 1.5 m CEP
TTFF @ -130 dBm with (without) EPO	Cold Start: < 15s (30s) Warm Start: < 2s (25s) Hot Start: < 2s (2s)
Interfaces	
GNSS	Internal
Indicator LED	Network and GNSS and Power
FOTA	Yes (Only support BLE 1M)
Temperature Sensor	1 temperature sensor (Internal)
External Sensor	Optional (more details please check with sales)
BLE 5.1	Yes
WiFi	2.4 GHz 802.11b (Rx)
Sim Card	Nano Sim Card
Tracker Configuring	USB Type-C Connector
Panic Button	Support
General Specifications	
Ingress Protection Rating	IP67
Dimensions	91.8mm*43.5mm*29.2mm (”3.61 *1.71” *1.14”)
Weight	165g (5.82oz)
Battery	Lithium-ion 6400mAh/ 3.7V
Charging Voltage	5V DC
Operating Temperature	-20℃ ~ +80℃ (-4°F ~ 176°F)

Storage Temperature	-40℃ ~ +85℃ (-40°F ~ 185°F)
Air Interface Protocol	
Transmit Protocol	TCP, UDP, MQTT, SMS
Protocol Check & Encryption Support	MD5/ AES128
BLE Accessory Support	Yes
Scheduled Timing/angle/distance Report	Report position and status at preset intervals
Low Power Alarm	Report when backup battery is low
Data Roaming Control	Avoid additional data consumption

3. LED indicator and SIM card Slot



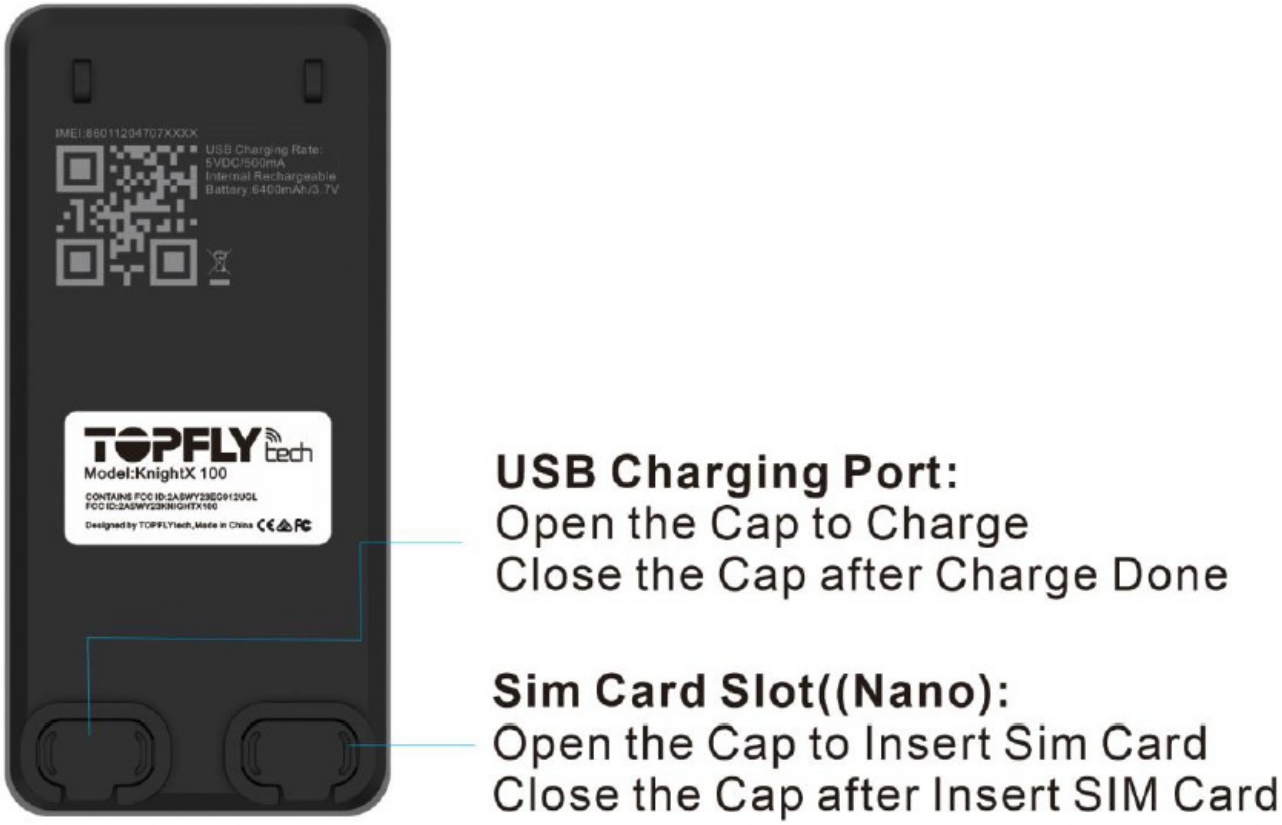
4. Installation Guide

4.1 SIM Card Pre-Installation Note

4.1.1 SIM card data service should be enabled.
4.1.2 If SIM card is locked via PIN, please unlock it first.
4.1.3 Ensure there is sufficient balance in the SIM card.

4.2 SIM card installation

4.2.1 Open the rubber stopper on the side
4.2.2 Insert the SIM card by following the direction icon on the tracker cover
4.2.3 Give a little push to the SIM card. When there is a “click” sound, it stands for the SIM card has been successfully inserted



4.3 Control button work logic

Power on (default enable)	Hold on the button more than 6 seconds, device will vibration 1 seconds and all LEDs start to work
Device health status check (default enable)	When device is in power on status, click the button 5 times in a row (each interval is less than 1 second), device's LEDs will work 100 seconds and indicate GNSS status: if disable GPS, it will not on, if enable GPS, solid on, get GNSS signal, 1 second on and 1 second off, searching GNSS signal . Network status: solid on, get network signal, 1 second on and 1 second off, searching network. Battery status: solid on battery level ≥90%, 1 second on and 1 second off 90% > battery level ≥10%, 0.5 second on and 0.5 second off 10%>battery level .
Power off (default enable)	Click the button 9 times in a row (each interval is less than 1 second), the ninth times keep press the button more than 3 seconds, device will vibration then power off. Notes: Between 120 seconds after shutting down, the button cannot be awakened and work.
Panic (default disable)	When device power on and hold on the button more than 6 seconds, LEDs and vibration work as the morse code for panic Aert is sent out: Device will vibration and LEDs solid on 9 seconds then LEDs off.
	Alert is sent out: LEDs will go off and no vibration if time over 100 seconds.

4.4 Installation

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

5. Quick Trouble Shooting

5.1 Unable to Connect to the Tracking Platform

5.1.1 Check the APN and IP settings.
5.1.2 Check the SIM card whether support specific network and the data service whether is enabled.
5.1.3 Make sure there is no limitation or already added server IP to the IP whitelist when using a M2M SIM card.
5.1.4 Check the remaining balance or network signal of the SIM card.

5.2 Tracker Shows Offline

5.2.1 Check the external power voltage to see whether the tracker is disconnected from external power.
5.2.2 Check whether the vehicle entered network blind area.
5.2.3 Check the balance of tracker SIM card.
5.2.4 If the connection lost happens on the last several days of the month, check whether the network service is terminated by carrier because of exceeding the max data usage volume.

5.3 Location Drift

In an area with poor GNSS signal (like the areas with lots of high buildings), location drift may happen. When

move to open area, the drift will no longer exists.

5.4 No Command Reply
5.4.1 Check the command format. Make sure it's correct.
5.4.2 Vehicle may be in network blind area.
5.4.3 Ensure the SIM card is properly inserted.

6. Tracker Operation

6.1 The battery

6.1.1 Recommend connecting the device to a 5V 1A (cellphone) adaptor
6.1.2 Customer also can connect the tracker to other USB connectors. But lower current output will cause longer charging time.
6.1.3 When the battery voltage value drops to 3.3V, usually a battery charging is needed to avoid unexpected shutdown due to low power. If the battery runs out completely, please keep the tracker charging for 24 hours first. Only when the battery is charged to 3.4V, the device will power on again.

6.2 Get Current Position

6.2.1 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).

6.2.2 Platform Query
Connect your tracker to the tracking platform then check the real-time position online. (Additional tracking service charge may happen. Contact with your service provider to get more details)

7. Alarm Configuration

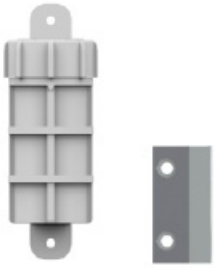
7.1 Alarm sent through network
7.1.1 alarm_set,0000,a,b,0,0,#
7.1.2 0000 is device default PIN
7.1.3 a=alarm code, value from 1 to 31

Alarm Code	Description	Alarm Code	Description
6	Low battery (Vs alarm 7)	7	Battery recover
12	USB cable connected (VS alarm 13)	16	Start moving (VS alar m 17)
17	Stop moving		

8. Warranty and Stock

The standard warranty period is 12 months starting from the date of purchasing. If the tracker will be stored for a long time, please connect it to the external power and recharge the internal battery (10 hours) every 6 months. It will be helpful to the internal battery life.

9. Optional Accessories List

TSTH1-B	BLE 5.0 Wireless Temperature & Humidity Sensor	
TSDT1-B	BLE 5.0 Wireless Door & Temperature Sensor	
TSR1-B	BLE 5.0 Wireless Relay	
TA20	External TPS Set (BLE)	
TA22	Internal TPS Set (BLE)	
T-button	BLE 5.1 Key Fob & Panic button	
T-sense	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 sens or extender	

10. 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:

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.

11. ISEDC Warning

This device complies with Innovation, Science, and Economic Development Canada licence-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.

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

Product Specifications

- **Network Specifications:**
  - **Operating Band:**
  - **Data Transmission:**
- **GNSS Specifications:**
  - **GPS Chipset:**
  - **Parallel GNSS Receiver type:**
  - **Sensitivity:**
  - **Horizontal Position Accuracy:**
  - **TTFF @ -130 dBm with (without) EPO:**
- **Interfaces:**
  - **GNSS Indicator LED**
  - **FOTA**
  - **Temperature Sensor**
  - **External Sensor**
  - **BLE 5.1**
  - **WiFi**
  - **Sim Card**
  - **Tracker Configuring**
  - **Panic Button**
- **General Specifications:**
  - **Ingress Protection Rating**
  - **Dimensions**
  - **Weight**

Frequently Asked Questions (FAQ)

Q: Can I disable the intelligent power management feature?

A: Yes, customers can disable the intelligent power management feature by sending a specific command to the tracker.

Q: How can I update the firmware manually if the FOTA feature is disabled?

A: If the FOTA feature is disabled, firmware updates can be done by sending an upgrade command manually to the tracker.

Documents / Resources

	TOPFLYtech KnightX 100 Asset GPS Tracker [pdf] User Manual KnightX 100 Asset GPS Tracker, KnightX 100, Asset GPS Tracker, GPS Tracker, Tracker

References

- User Manual