ZK115M User Manual

GPS Tracker

1. Introduction

The ZK115M is a water-resistant GPS tracker designed for scooter. its built-in GPS receiver has superior sensitivity and fast time to first fix (TTFF). Its LTE allows the ZK10M's location to be monitored in real time or periodically tracked by a backend server or other specified terminals. its built-in 3-axis accelerometer allows motion detection and extends battery life through sophisticated power management algorithms. It has built-in high brightness color indicator and audio broadcast function. System integration is straightforward as complete documentation is provided for the full featured @Track protocol. The @Track protocol supports a wide variety of reports including emergency, low battery and scheduled GPS position.

2. Product Overview

3. Specifications

3.1 General Specifications

Dimensions(L*W*H)	195*37*71(mm)
External Battery Voltage	3.65V
Waterproof	IP65
Operating Temperature	-20℃ ~ +60℃

3.2 Network Specifications

No.	Item	Parameters
1	Antenna	Internal only
2	Frequency	LTE Cat M1: B2/B4/B5/B12/B13/B25/B26/B66/B85 LTE Cat NB2:

		B2/B4/B5/B12/B13/B25/B66/B71/B85 GSM:GSM850/GSM1900
3	GSM Features	GPRS: Max. 107Kbps (DL), Max. 85.6Kbps (UL) EGPRS: Max. 296Kbps (DL), Max. 236.8Kbps (UL)
4	LTE Features	Support LTE Cat.M1 and LTE Cat.NB2 Cat.M1: Max. 588kbps (DL)/1119kbps (UL) Cat.NB2: Max.127kbps (DL)/158.5kbps (UL)
5	Transmit Mode	TCP, UDP, SMS

3.3 GPS Specifications

No.	Item	Parameters
1	Antenna	Internal only
2	Sensitivity	Tracking & Navigation -164 dBm Reacquisition -160 dBm Cold start -148 dBm Hot start -157 dBm
3	Position accuracy (CEP, 50%, 24H Static, -130 dBm, > 6 SVs)	2.5M
4	TTFF(Open Sky)	Cold start: 28s average Auxiliary start : <5s Hot start : 1s average

3.4 BLE Specifications

No.	Item	Parameters
1	Antenna	Internal only
2	Frequency	2.4GHz RF transceiver compatible with Bluetooth low Energy (BLE)
3	Sensitivity	Excellent receiver sensitivity -88dBm
4	Max out RF Power	-7.54 dBm

3.5 NFC Specifications

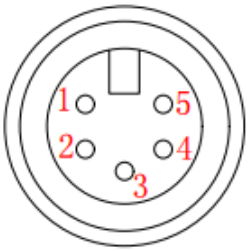
No.	Item	Parameters
1	Antenna	Internal only
2	Frequency	13.56 MHz. Full NFC controller solution

3.6 Other Specifications

No.	Item	Parameters
1	MCU	Core: Cortex – M4 Flash memory: 1024K bytes Ram: 256k bytes Frequency: Up to 100MHz
2	G-Sensor	Model type: 3D accelerometer
		acceleration range: ±2/±4/±8/±16g
3	Timing Report	Report position and status at pre-set intervals
4	Motion Detection	Motion alarm based on internal 3-axis accelerometer
5	Audio Codec	I2S/PCM serial data port 24-bit, 8 to 96 kHz sampling frequency 95 dB signal to noise ratio, -85 dB THD+N 1.25W@8Ω/5V or 1.8W@4Ω/4.2V mono class D speaker driver

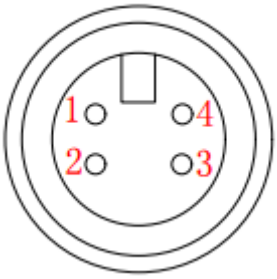
4. Interface Description

4.1 5-pin Connector Interface



Pin No.	Pin Name	Description
1	GND	Power GND (Black)
2	CAN-ON	Control signal output (Blue)
3	CAN-H	CAN Bus H Line (Green)
4	CAN-L	CAN Bus L Line (Yellow)
5	DC IN: 12V	Power+ Input (Red)

4.2 4-Pin Connector Interface



Pin No.	Pin Name	Description
1	OUT_3V	Voltage output pin: 3.0V, 150mA (Red)
2	UART RX	UART debug port (Orange)
3	UART TX	UART debug port (Brown)
4	GND	GND (Gray)

5. User Instructions

5.1 Installing SIM Card

1, Turn off ZK115M.

2, Open ZK115M and insert SIM card as follows.

5.2 Installing ZK115M to the Scooter

Connect the 5-pin interface to the scooter, and then it will be powered on and can communicate with the scooter. ZK115M can report the position and status of the scooter to the backend server and the backend sever can send commands to ZK115M to transfer to scooter to control the behavior of the scooter also.

5.3 Communicating with Backend Server

After installing SIM card and powered on, ZK115M can communicate with the backend server through network, and transfer reports of emergency, Geo-fencing, device status and scheduled GPS position etc. It is easy for service provider to set up their tracking platform based on the functional wireless tracking protocol.

5.4 Debugging

Users can use the 4-pin interface to give commands to the device locally for the purpose of testing and debugging.

6 BLE

6.1 BLE working modeexplanation

ZK115M isinstalled in the SharedScooter and supplied by the main battery of Scooter. With the external power(main battery of Scooter) supplying , the BLE of ZK115M works. Otherwise with the backup battery of ZK115M supplying, BLE stops working.

6.2 BLE instructions

Heartbeat packet uploaded from ZK115M to Server includes 20 bytes dynamic password (BLE Command Password).After successfully connected with the BLE of ZK115M,It is able to send command <AT+BKSCT=BLE Command Password,0$> to unlock Scooter or <AT+BKSCT=BLE Command Password,1$>to lock Scooter by BLE channel.

7 NFC

NFC function can be set enable or disable through command. It need enable before applying NFC function.

7.1 Enable/Disable NFC function

Command to enable NFC：AT+GTVAD=ZK115,0,0,0,**1**,,,,FFFF$ Command to disable NFC：AT+GTVAD=ZK115,0,0,0,**0**,,,,FFFF$

7.2 NFC Instructions

After ZK115M NFC function enabled, it is able to take NFC tool to send command <AT+BKSCT=BLE Command Password,0$>to unlock Scooter or <AT+BKSCT=BLE Command Password,1$> to lock Scooter by NFC channel.

FCC Statement :

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

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.

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 20cm between the radiator& your body.

Note: 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.