

Application :Rental cars, insurance cars, trucks, buses Wireless Fleet management Solution Innovator GSM/GPRS/GPS Tracker

User Manuel

BK-600







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1. Product Overview



Bk600 is an eMTC NB CatM1 Asset GPS Tracker with 20000Mah battery, it has built in G-sensor, motion sensor, light sensor. It's ideally suitable for Asset tracking market.

1.1 Highlights

- No wired needed, easy for installation
- Built in G-sensor
- Temperature monitor
- Built-in large-capacity disposable lithium-ion battery, with ultra-low



- self-discharge rate and extremely wide temperature adaptability.
- Battery can be last for 10 years based on reports one GPS position every day
- Ultra low consumption, decrease to 15uA below when in sleep mode
- Strong magnetic and screws installation
- Support tamper proof alarm
- ♦ Multiple position mode: GPS, Wifi, AGPS, LBS
- ♦ Jamming detection
- ♦ IP67 waterproof
- Regular mode, clock mode, track mode

1.2 Function

- Position and monitor
- ◆ GPS/Wifi/LBS (Need map database support)
- ♦ Temperature monitor
- ♦ AGPS Positioning
- Different tracking modes
- ♦ Motion alarm
- Removal alarm
- ♦ History data storage

1.3 Specification

Dhysical	Dimension	154X82X30mm (L*W*H)	
Fliysical	Weight	445±5g	
	Communication module	Quectel BG95	
Cellular	Frequency	Working frequency: Cat M1: LTE- FDD B1/B2/B3/B4/B5/B8/B12/B13/B14/B18/B 19/B20/B25/B26*/B27/B28/B66/B85 • Cat NB2: LTE- FDD B1/B2/B3/B4/B5/B8/B12/B13/B18/B19/B 20/B25/B26*/B28/B66/B71/B85 • EGPRS: 850/900/1800/1900MHz	



		protocol: Embedded TCP/IP stack		
		Sensitivity: -107dBm@850/900MHz		
		-106dBm@1800/1900MHz		
		Output power: Class 4 (2W)@850/900MHz		
		Class 1 (1W)@1800/1900MHz		
		GPRS data: GPRS Class 10, Mobile Station Class		
		В		
		Channels: 50		
		Sensitivity: -147dBm		
CDS		Position accuracy:5-10m		
UP5		Accuracy: 5m CEP		
		Cold start: <27s		
		Hot start: <1s		
Processor	Processor STM32G070CB			
Motion sensor		DA260		
Wifi position		Wifi 4.0		
Bluetooth		Bluetooth 5.0		
		Disposable Lithium-ion battery and (3.6V,		
	D. //	20000mAh)		
	Battery	and ultra-low discharge rate: less than 1%, store		
		one year below 25°C		
		Average working current <100mA: Power save		
Power	Power consumption	current <15uA:		
	GSM antenna	Internal High Gain		
	GPS antenna	Internal High Gain		
	SIM	Microsim		
		2 status LEDs, Green: GPS, Red: Celluar(Inside		
	Indicator	enclosure)		
	Working Temperature	-20°C ~ +70°C		
Environmental	Humidity	5% ~ 95% (no fog)		
Parameter	Ingress Protection Rating	IP67		

2.Product Functions



2.1Woking mode priority

The default upload interval is one-day one ping, the data packets information includes GPS status, longitude and latitude, cellular signal Strength, satellite numbers, battery level etc, there are multiple track modes available from the device, below is the explanation for work mode priorities:

- Track mode>Warehouse >Timely upload=Clock mode=Week mode= Motion and static mode;
- The work mode which is equal can be replaced by each other, as the last configuration will prevail

2.2 Tracking mode

Mode	SMS Command	
	ZZ,A,T1,T2# or MODE,1,T1,T2#;	A: 1- Enter in track mode, 0- Exit
	For example:	track mode;
	ZZ,300,60# (MODE,300,60#)	T1:upload interval ,unit:seconds;value
Set Track mode	indicates enter into track mode,	range 30-300 seconds;
Set Hack mode	upload data each 300 seconds, track	T2:Track duration
	duration time is 60 mins	time,Unit:minutes,value range 5-
	ZZ,0# or MODE,0# indicates exit	57600 minutes;
	track mode	
Exit track mode	ZZ,0# or MODE,0#	

Note:

Under track mode, GPS position is on priority, and acquire LBS and WIFI data each 30 seconds Device enters into power save mode if the device is in static status in 5 minutes, GPS is switched off, but it will keep communication with backend and upload data according to the pee-configured intervals

Under track mode, if the SIM card is loosen, or network register failure or server failure, device will switch off communication and position 30 minutes , however if the removal alarm triggered, it will resume to normal mode

GPS will wake up if vibration happens

2.3 Warehouse mode

Configuration SM	S Command	
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Set storage mode	STORAGE,T# For example: STORAGE,2880# indicates enter into storage mode, upload data each 2880 minutes	T: Upload interval Unit: Minutes Value range: 2880- 43200minutes (2-30 days)
Exit storage mode	STORAGE,0#	

Note:

Under warehouse mode, if light sensor triggered, device will exit warehouse mode Under warehouse mode, if other work mode has been set, device will exit warehouse mode Under warehouse mode, device can't be wake up by vibration

2.4 Fixed upload mode (Recommended)

Configuration	SMS Command	
	HX,T# or MODE,0,T#	T: Upload interval
Sat fixed unload made	For example	Unit: Minutes
Set fixed upload filode	HX,1440# or MODE,0,1440# indicates	Value range: 5-43200minutes
	upload each 1400 minutes (24 hours)	(2-30 days)
Exit storage mode	STORAGE,0#	
Note:		
Default setting is wake	up each 1440 minutes	
Fixed upload mode can'	t be wake up by vibration	

2.5 Clock mode

Configuration	SMS Command	
Set clock mode	WAKEUP,t1[,t2[,t3[,t4]]]#or MODE,4,N,T1,T2TN# For example MODE,4,3,0800,1400,2100##	T1-TN is time point, format is HHMM, for example 0800 indicates 08:00
Delete clock mode and return to fix upload	WAKEUP,#	
Note: Time interval between each two clocks should be no less than 5 minutes Clock mode can't be wake up by vibration		

2.6 Week mode

Configuration	SMS Command	



	-	
	MODE,3,T1,T2#	T1=1:Monday, T1=137
	For example	indicates Monday, Wednesday
Set week mode	MODE,3,246,09:00# indicates	and Sunday
	wake up at 9:00am at Tuesday,	T2 indicates wake up point ,
	Thursday and Saturday	format is HH:MM
Note:		

Note:

Clock mode can't be wake up by vibration

2.7 Motion and static mode 1

Configuration	SMS Command	
Set motion and static mode	MODE,6,T1,T2,A# or MS, T1,T2[,A]# For example: MODE,6,60,300,1#:Indicates upload interval in motion status is 60 minutes, upload interval in static status is 300 minutes, motion alarm on	T1:Upload interval in motion status, value 5-43200 minutes T2: Upload interval in static status, value 5-43200 minutes or set clock mode, format (HH:MM) A: 1:Motion Alarm on, 0:Motion Alarm off

Note:

Device can't be wake up by vibration while in motion mode

Device can be wake up by vibration while in static mode

After wake up, there should be 3 seconds vibration in 6 seconds, device will turn on cellular module and upload position data, otherwise it would enter into sleep mode again and maintain the previous configuration parameters

2.8 Motion and static mode 2

Configuration	SMS Command	
		T1:Upload interval in motion
	MODE,8,T1,T2,A,B#	status, value 1-5 minutes
	For example:	T2: Upload interval in static
	MODE,6,60,300,1# Indicates	status, value 5-43200 minutes
Set motion and static mode	upload interval in motion status is 60	or set clock mode, format
	minutes, upload interval in static	(HH:MM)
	status is 300 minutes, motion alarm	A:1-Exit tracking when
	on	statics, 0-Continous tracking
		B:1:Motion Alarm on,



0:Motion Alarm off

Note:

If motion is detected after waking up, enter the tracking mode, the return interval is T1, and the duration is 57600 minutes:

B=1 and the device is awakened by vibration, and the vibration alarm will be reported after going online;

After wake up, there should be 3 seconds vibration in 6 seconds, device will turn on cellular module and upload position data, otherwise it would enter into sleep mode again and maintain the previous configuration parameters

2.9 Report positioning data

Reported data content: time, date, location, network type, network signal, GPS satellite number, base station information, WIFI information, battery power, on-board temperature, SIM card ICCID, device status, current working mode;

2.10 Position Priority

2.10.1 GPS>WIFI>LBS

Turn on the GPS module immediately after the device wakes up, and report the position after GPS positioning or timeout; 2.10.2WIFI>GPS>LBS

Search for WIFI hotspots immediately after the device wakes up. When the number of hotspots>=2, the GPS module will not be turned on;

2.10.3: WIFI>LBS, GPS OFF

The GPS module is not turned on after the device wakes up. When the number of hotspots>=2, the positioning package will be reported immediately; **2.10.4: GPS>WIFI, LBS OFF**

Turn on the GPS module immediately after the device wakes up, and report the positioning package after GPS positioning or timeout; 2.10.5: WIFI> GPS, LBS OFF

Search for WIFI hotspots immediately after the device wakes up. When the number of hotspots>=2, the GPS module will not be turned on;

2.11 AGPS

When the device successfully registers on network, AGPS is available to speed up the position speed and improve the position accuracy

2.12 Blind Compensation and Delete function

♦ Command: BLIND, A# A=1: OFF; A=0: ON



Clear command:CLR,BLIND#

The blind zone data can store up to 128 items; the blind zone data read is first-in first-out;

2.13 Early sleep mode

In order to reduce the waste of power, the device will not continue to work and directly enter the sleep state under those abnormal status:

- \diamond \Box The device does not recognize the SIM card;
- \diamond \Box Abnormal communication module automatically resets 6 times continuously;
- \diamond \Box The whole machine is reset 6 times continuously;
- \Rightarrow \Box Failed to connect to the server (single IP 3 times, dual IP 2 times each);
- ♦ □After connecting to the server, I did not receive a response after sending data three times in a row;
- \diamond \Box VCC voltage is lower than 2.9V;
- ☆ □After VCC is lower than 2.7V or 6Second is continuously reset, if the return interval is less than 60 minutes, the sleep time will be changed to 60 minutes forcibly;

2.14 Low Voltage Shutdown

Device will immediately enter the low-power mode and will not wake up;

- \diamond VCC voltage is lower than 2.7V;
- ♦ VCC voltage is lower than 2.9V and the device has been continuously reset 6 times and the power is <=2%;</p>

2.15 Set standby time

♦ Command: STANDBYTIME,T#

T:Standby time, Unit: Year, Support 3, 5, 8, 10; Default 10years **2.16 Online timeout**

Normally the maximum working time of each wake-up of the device is 15 minutes.

2.17 Network and Bands lock

♦ Command: SEARCH, P[; BandNBiot; BandCAT-M1]#

P:Network priority
P=1 Lock GSM
P=2 Nbiot Priority, CAT-M Second, GSM final
P=3 CAT-M Priority, GSM Second, NB OFF, Defaulted
P=4 Lock CAT-M
P=5 Nbiot Priority, GSM Second, CAT-M OFF
P=6 CAT-M Priority, NB Second, GSM OFF
P=7 Nbiot Priority, CAT-M Second, GSM OFF
BandNBiot: Nbiot Bands;ALL-Bands, Multiple bands are separated by half-width

commas, for example:B1,B3,B5



BandCAT-M1: CAT-M1 Bands; ALL-Bands, Multiple bands are separated by half-width commas, for example: B1, B3, B5

When set this parameter, please restart the device to make executed.

2.18 APN Adaptive

- ☆ If the built-in APN of the device is empty, or the set APN is CMNET, it will adapt to the APN according to the first 5 digits of the IMSI;
- \diamond If the APN is another value, the set APN is used, and no longer self-adaptation;
- ♦ APN can be deleted, Command: CLEAR, APN#
- **2.19 IBEACON**

Command: IBEACON,uuid,major,minor,rssi#

UUID:32 bytes,Composed of 0-9, A-F, a-f, default: 0000ffa06da44e50a375bade13be6daa

major: Ibeacon group code, default 1, value range 0-65535

minor: ibeancon code, default 0, value range 0-65535

rssi: Signal strength at a distance of 1M, default -59, value range 0-255

The device is equipped with Bluetooth chip, and it sends ibeacon BLE information regularly after power on, and the distance can be checked through the Apple beacon APP;

3.Alarm Functions

3.1 Removal alarm

- ♦ Command: FALL, A#
- \Rightarrow A=3 Turn on the removal alarm, and only report data once, as defaulted.
- \Rightarrow A=2 Turn on the removal alarm, tracking for 15 minutes, once every 300 seconds
- \Rightarrow A=1 Turn off the removal alarm function
- \Rightarrow A=0 Turn on the removal alarm function, tracking for 60 minutes, once every 60 seconds



3.2 Vibration alarm

The motion is in static mode and the vibration alarm is turned on, and the vibration alarm will be reported following the positioning after being awakened by vibration;

3.3 GPS receiver failure alarm

When the GPS module is turned on, there is no GPS data output for 90 seconds, and the GPS receiver failure alarm will be reported

3.4 WIFI failure alarm

After powering on the WIFI twice in a row, the serial port did not report any information, and followed the positioning package to report a WIFI failure alarm;

3.5 G-sensor failure alarm

Gsensor I2C initialization failed, will report the vibration sensor failure with positioning.

3.6 Collision Alarm

♦ Command: COLLISION, A# Value Range 0-8000mg

When the acceleration change value exceeds A, the device immediately wakes up and reports a collision alarm;