



Doc. Title
ST4940B User Manual

Concerning:
Features and how to configure ST4940B

Rev.
1.00

Date (dd-mm-yy)
30-10-18

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Asset Tracker

ST4940B

User Manual

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Document Amendments


When it comes to the firmware version column with specific firmware number, any amendment(s) on the comments column should be made on this relevant firmware version (and the versions thereafter). Before applying any changes made in this protocol, you are required to make sure that you have upgraded the firmware suitable for the specified version.

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Revision History

Rev. No.	Date	Contents of Revision	FirmwareNumber reflecting the latest revision	Author
1.00	30 Oct. 2018	Initial writing	302	YS Kim

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1. Introduction

ST4940B: Asset Tracking Device




The ST4940B is a multi-purpose tracking device useful for varied applications such as trailer or container management, vehicle/motorcycle tracking or any kind of valuable asset tracking.

The ST4940B supports 4G networks and has a water resistant (IP67 compliant) rugged, hard-case Fixed type.

Designed to minimize power consumption efficiently, the device incorporates a large battery suitable for longer-term usage between charges and can also be connected directly to an external power source.

*In case the ST4940B is placed inside a metal container, it may not work.


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2. Key Features


- New technology and the latest GPS Chipset
- SMS communications
- Report when the battery is in a low status
- Periodic reporting in real time
- Built-in motion detector for alarming
- ST4940B with its Cradle→Waterproof in compliance with IP66
- ST4940B without its Cradle → Waterproof in compliance with IP65
- Baby's palm-sized versatile mini tracker
- Fixed asset tracking in real time with Standby Current →less than 10uA.

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2-1. H/W Specifications

Item	Description
Battery	Rechargeable 3.7V, Li-ion Battery- 18200mAh
Motion Detection	Built-in 3-axis Acceleration sensor
Item	Description
Motion Detection	Built-in 3-axis Acceleration sensor
Frequency	B2/B4/B12/B13 @LTE M1 850/900/1800/1900MHz
Temperature Range	-20°C ~ +60°C *Caution ! Please pay a careful attention that the vehicle shall NOT be left under direct sunlight for long time in hot weather. There is a risk of battery explosion at hot temperature.
User Interface	Power Button, SOS Button, Charger Adaptor, Charger & Setting Cable
LED Indicator	LTE M1, GPS, Charging status
'SyncTrak' for PC	Micro USB cable
Dimensions	156(W) x 88(L) x 56(T) mm
Weight	545g,
Approval	FCC

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2-2. GPS Specifications

Item	Description
Receiver Type	56-channel U-blox7 engine GPS & QZSS L1 C/A, GLONASS L1OF, Galileo* E1B/L1, Compass* ready SBAS: WAAS, EGNOS, MSAS
Update Rate	10Hz
Accuracy¹⁾	Position 2.5m CEP SBAS 2.0m CEP
Acquisition²⁾	TCXO Cold starts 26s 1s (Assist Now Autonomous) Aided start<1s Hot start<1s
Sensitivity³⁾	Tracking -162dBm Reacquisition -160dBm Cold start -148dBm
Back-up Supply	Voltage range : 2.5V to 3.6V
Antenna type	Patch Antenna
Operating Temperature	-20 ~+80℃

*1) All SV @ -130 dBm


*2) It depends on aiding data connection speed and latency

*3) The 3 figures were measured with a good active antenna.

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2-3. Operational Features

Item	Description
Configuration	either by SMS or PC
Parameter Change	either by SMS
Command /Control	either by SMS
Reporting	either by SMS (as a back-up)
Basic Data reported	NMEA location, Speed, Course, GPS signal status Message No., Accumulated moving (travelling) distance
Data Storage	up to 2,000 locations in case of transmission failure or cost issue
Reporting	Possible to make a cyclic location report at an adjustable interval only when command comes
Back-up Reporting	possible (Dual IP reporting or Backup SMS reporting)
Power down	Sleep on network (less than 4mA) Deep sleep on no network (less than 10uA):
How to upgrade Firmware	by OTA (Over-The-Air) or PC tool.

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3. Appearance



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4. How to operate

The ST4940B, a multifunctional battery-powered mini GPS tracker, is ideal for tracking personnel, valuable assets like merchandises that are delivered by putting it onto an object.

While tracking, it reports location information about the object at a predefined interval and alerts if it detects motion of the object. Because it is powered by battery, its user should charge the battery fully prior to using and should turn it off when tracking is finished.

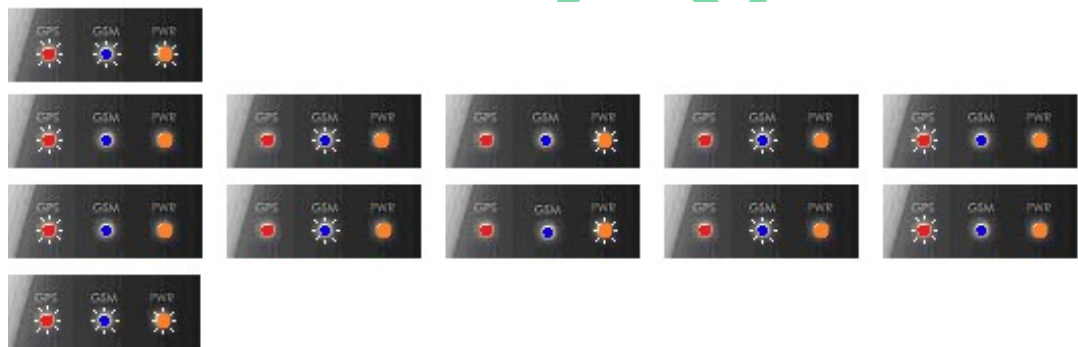
Users are required to set the reporting timing of the device at an interval with more than 10 minutes in order to save the endurance time of the battery.

Power

Turn On

If you press POWER button for more than 3 seconds, the device will be turned on.

When the power is on, LEDs blink as below.



Turn Off

If you press the POWER button till all of the LEDs are turned on, the device goes to shutdown.

After the power is turned off, no LED blinks or lightens.



** If you use an ST4940B device model which is powered by the External Battery, this function does **NOT** work.*

Charging Mode

Turn On

As soon as a device in a status of power off is connected with a charger, only charging the device starts being processed. GPS LED is on. The battery indicator continuously blinks.



If you press 'power button' of the device for more than 2 seconds in a mode of charging, the device will turn to be in a mode of normal operation.

Device might be in an operational mode using its built-in battery. While this device is being charged and if you press the 'power button' of this device for more than 2 seconds, the mode of the device will change to a charging a mode.

Red LED

GPS status indicator

Right after the device is turned on, the red LED starts to blink as below. Five (5) minutes after the red LED starts to blink, it is turned off automatically to save battery. If you press the power button again, the red LED will be on just for short time, for some seconds, to show you the current status of the GPS connectivity.

- Fixed : 1 time
- No fixed: 2 times.
- GPS error: 4 times.

Exclusive Mode of Battery Charging

The red LED continues to be in the status of 'On' while the device is being connected to the battery charger.



**Blue& Red
LEDs
(2 colors)**

Operating Status indicator

Right after the device is turned on, the blue LED starts to blink as below. Five (5) minutes after the blue LED starts to blink, it is turned off automatically to save battery. If you press the power button again, the blue LED will be on just for short time, for some seconds, to show you the current status of the network connectivity.

- Network OK: 1 time
- Server communication Error : 2 times
- SIM PIN Locked : 5 times
- Impossible to connect with the network : 6 times
- No SIM Error (= an error when SIM is not available) : 7 times

In addition to the status described above, the blue LED continues to blink either if the device has an error of SIM Locking or if it does not have a SIM.

If you press 'power button' of device shortly, the Red LED indicates the operation status of the device by showing number of blinking as below.

- 1 time of blinking means → status of Power Off
- 2 times of blinking mean → status of hibernation
- 3 times of blinking mean → status of Power Off and battery discharged. It means that it is time to charge the battery


**Battery
LEDs
(3 colors)**

Battery indicator

Normally, it blinks shortly to indicate the battery level for user as described below.

- Red LED blinks twice shortly. → under 10% of the full capacity
- Red LED blinks. → under 30% of the full capacity.
- Orange LED blinks. → 30% to 80%
- Green LED blinks. → Almost charged
- Green LED is on. → Charging has been completed.

During the charging time, the battery LED blinks continuously. But, the battery LED is turned on when charging the battery is completed.

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Protocol Watchdog

If the PDP connection keeps going invalid status for a while about 40 minutes up to 1 hour, then the device will be reboot and recover the data communication in case that the problem was not caused by the network side.

- The End of the document -

Caution

Modifications not expressly approved by the party responsible for compliance could void the user's authority to operate the equipment.

IMPORTANT NOTE:

FCC RF Radiation Exposure Statement:

This equipment complies with FCC RF radiation exposure limits set forth for an uncontrolled environment. This equipment should be installed and operated with a minimum distance of 20 centimeters between the radiator and your body. This transmitter must not be co-located or operating in conjunction with any other antenna or transmitter.

FCC Compliance Information : 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

- Don't use USB Connect. USB Connect is only use for production.
- This product is fixed to the vehicle.
- Backup battery is used when the vehicle power is off.