ST730

Product Description

- SigFox IOT Device -

Suntech International Ltd.

The ST730 is a battery-powered mini tracker utilizing GPS, WiFi and Sigfox technology. With its holder, it is a waterproof (IP66 compliant) hard-cased device to be used for various purposed like an assent tracker or a personal tracker. It works autonomously with its built-in battery.

In addition to 3-axis acceleration sensor, the ST730 have various functionalities such as ultra-low power consumption algorithms and motion checking.

Features;

1. Power On/Off button

    The device can be powered up or down by pressing the On/Off button for at least 2 seconds.
    At power up the device will:
    - Flash 1 time all the LEDs

    - Show the battery status using the battery LED. This status will only show in the first minute after power-up.
    - Send a "power up" message.

    - In case the GPS is configured as a location source, it will start the GPS acquisition. After the GPS fix, the GPS will go into deep sleep mode. There is also a GPS acquisition timeout, after this timeout the GPS will also enter deep sleep.

    At power down:
    - Flash twice all the LEDs

    During operation, if the button is pressed for less than 2 seconds, it will show the battery status using the battery LED.

2. Tracking

    The device will send a tracking message at a defined interval. The customer can configure

what time interval and the local location source. The location source can be GPS, Wifi or both.

In the case of GPS as the location source, the device will turn on or wake-up the GPS receiver 30 seconds before sending the message. If the time interval is greater than 1 (?) hour the GPS will be turned on 1 minute before. This is done to keep the message transmissions at regular intervals and increase the probability to get a GPS fix.

In case of the Wifi as location source, the device will scan for wifi access points 5 seconds before the transmission.

In case of both sources are configured, the device will try to get a GPS fix (using the same rules) and it will only try the wifi location source if 5 seconds before the transmission it was not able to get a GPS fix.

3. SOS button

When the device is ON and if this button is pressed, it will trigger the device to send immediately a "SOS" message. It will also turn on the GPS. If it is able to get a fix within the timeout period it will send a location message. If it is not able to get a fix it will try to scan for Wifi access points. If it finds, it send a location message. If it cannot get GPS or Wifi information it does not send any messages.

4. Sensors
   - Accelerometer
   - Hall/Magnetic
   - Temperature

5. Geo fence

The device will monitor the location based on the GPS receiver and check if the device is inside or outside the circular fence. A circular fence is defined as a GPS coordinate and a radius in meters. There is a limit of 10 (TBD) circular fences.

In order to save power, the customer can configure the time interval between the GPS acquisition. At the specified time the device will wake-up the GPS receiver and keep it on until there is a fix or a timeout is reached.

The check can also be configured to be triggered by the accelerometer or hall sensors. In this case the check is done every time the accelerometer or hall sensors are triggered.

The device will keep in non-volatile memory the status of the fences (if it is inside or outside) while the device is On.

At power-up the device will turn the GPS on and will set the fences reference at the first GPS fix. This will be used to trigger the fences status change thereafter.

6. Wifi fence

    The device will monitor the available wifi access points and check if the configured access point mac address or the SSID are in reach.

    The customer can configure up to 10 (TBD) wifi fences. The fence is defined by the MAC address or SSID name of the access point,   if the event should be triggered in the presence or absence of that access point and the time to consider the presence/absence of the access point.

    The consumer can configure the time interval to check for the access points. The check can also be triggered by the accelerometer or hall sensors

7. Settings

    The device can be configured by using the Synctrak software or by RF. The RF possible configurations are limited and (TBD)

8. Battery

    The battery status can be checked at power up, when the device will show it for 1 minute using the battery LED, and if the device is ON by pressing the On/Off button for less than 2 seconds.
    The code of the LED is:
    -   between 100% and 80%, the LED flashes 5 times

    -   between 80% and 60%, the LED flashes 4 times

    -   between 60% and 40%, the LED flashes 3 times

    -   between 40% and 20%, the LED flashes 2 times

    -   below 20%, the LED flashes 1 times

    A "Low battery" message can be configured to be sent when the battery level reaches at a specified level.
    Also an "External power connected" and an "External power disconnected" can be configured.

9. Location sources

    There 3 location sources available:
    -   GPS – the device has an internal GPS receiver that is able to calculate the geographic coordinates using both the GPS and Glonass constellations.

- Wifi – the device will scan the available wifi hotspots and send the MAC address of the strongest one to the server. In the server side, the customer can use this information to find the location of hotspot (using google maps service, for example). The wifi location is well suited for indoor application and locations that have the presence of several wifi hotspots.

- LBS – depending on the technology and service plan, the customer can get an estimated location based on the strength of the received communication. The source will give more precise estimations in areas with better RF coverage

10. Firmware update

The device can be updated using the following methods:

- USB – the FW can be updated by using the USB port and a specific update software

- Wifi (TBD) – the customer can configure a wifi network and the required access information (user and password). When the device finds that network, it will try to connect and contact an update server. According to the information send, the server will determine if there is any available FW update. If there is, it will start the download. This feature will only be available, if the battery level is above a TBD threshold.

Charging Accessary

Charger adaptor

Charger cable
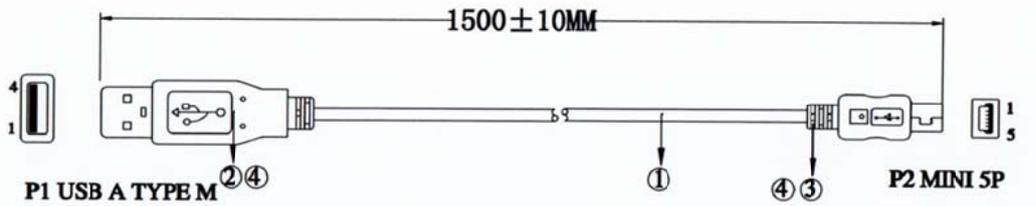
GENERAL & GPRS SPECIFICATION

Battery	Rechargeable 4.2V, Li-ion polymer 1500mAh
Motion Detection	Built-in 3-axis Acceleration sensor
Standby time Deep sleep	***with 1,500mA/h Li-ion battery** Report once a day ?
Power Consumption Operating Current Sleep Current	Sigfox : 17 mA in Rx mode 200mA in Tx mode @ 22.5dBm WiFi : 12mA in active mode GPS : 40mA in active mode 15uA
SigFox Frequency	**902.1375 MHz – 904.6625 MHz**
SigFox Output Power	RCZ2/4 22dBm
WiFi Network	WI-FI B/G/N Support(Optional) 2.4GHz only
Temperature Range	-20°C ~ +60°C
User Interface	Power Button , SOS Button Charger Adaptor, Charger Cable
AT Command	
LED Indicator	Sigfox, GPS, Wifi, Charging status

PC Sync Track	USB cable
Dimension	75 x 50.5 x 22.5 mm 88.3 x 55.9 x 35.6 with magnetic holder
Weight	?g(without holder) ?g (with magnetic holder)
Approval	ANATEL, CE, FCC, RoHS, Sigfox certificate

GPS RECEIVER SPECIFICATION

Receiver Type	56-channel U-Blox 7 engine GPS&QZSS L1 C/A, SBAS : WAAS, EGNOS, MASA,
Update Rate	10Hz
Accuracy [1]	Position 2.5m CEP SBAS 2.0m CEP
Acquisition [2]	Cold starts 29s 12s (AssistNow Autonomous) Aided start <1s Hot start <1s
Supply Voltage	Single voltage supply : 1.4V or 3.0V
Sensitivity [3]	Tracking -162dBm Reacquisition -160dBm Cold start -148dBm
Back-up Supply	Voltage range : 2.5V to 3.6V
Antenna type	Patch Antenna

* 1) All SV @ –130 dBm
* 2) Dependent on aiding data connection speed and latency

* 3)   Demonstrated with a good active antenna

INSTALLATION, CONFIGURATION AND PROTOCOL

Most important point is to install the unit horizontally in order to have the top cover to see the sky

For the details of product handlings / installations, please refer to the attached pictures.

Note 1 : Configuration or Parameter setting should be done before installation.

Configuration :   Refer to separate document and software tool for configuration.

Protocol : Refer to separate document for the standard protocol

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.

CAUTION : 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 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 cm between the radiator and your body. This transmitter must not be co-located or operating in conjunction with any other antenna or transmitter.

This device complies with Industry Canada's licence-exempt RSSs. 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.
Information
Le présent appareil est conforme aux CNR d'Industrie Canada applicable aux appareils radio exempts
de licence.
L'exploitation est autorisée aux deux conditions suivantes :
(1) l'appareil ne doit pas produire de brouillage, et
(2) l'utilisateur de l'appareil doit accepter tout brouillage radioélectrique subi, même
si le brouillage est susceptible d'en compromettre le fonctionnement.
Cet équipement est conforme aux limites d'exposition aux rayonnements énoncées pour un
environnement non contrôlé et respecte les règles les radioélectriques (RF) de la FCC lignes
directrices d'exposition et d'exposition aux frequencies radioélectriques (RF) CNR-102 de l'IC. Cet
équipement émet une énergie RF très faible qui est considérée conforme sans évaluation du débit
d'absorption spécifique (DAS).