User Manual

ST4950

Suntech International Ltd.

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Disclaimer

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Warning

Our customers are required to be aware that connecting the wire inputs can be hazardous to both of the installer and your vehicle’s electrical system(s) if not done by an experienced installer. This document assumes you are aware of the inherent dangers of working in installing the device on the vehicle(s) and the machinery.

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.

1. Introduction

The ST4950 is a asset tracker for a vehicle. It is designed to collect location data through GPS technology and interact remotely with its server by using GPRS/HSPA technology.

In order to make the vehicle tracking system work, device should be configured and installed properly on a vehicle whose geographical position and/or state is desired to be remotely monitored and/or controlled.

Please note that this Operation Manual is for the standard model. In case specific requirements are incorporated into this Manual, such a manual applies only for the case.

For overall operation including installation, in addition to the 'Device Manual', users should refer to other documents such as Parameter Manual, Commands Manual, Reporting Manual and so on.

2. Overview

Main function of device installed on a vehicle is to report vehicle location and status to its monitoring server at predefined interval and to deliver command coming from the server for activating any appliance connected to the device.

2-1. Operation modes

The device works in one of the two (2) operation modes below.

- Parking mode:
  - ✓ This mode is operational when 'MOTION' is OFF for duration longer than the pre-defined time or 'motion sensor' is disabled.
- Driving mode:

- ✓ This mode starts when 'MOTION' is ON for duration longer than the pre-defined time.

2-2. Reports sent by device

There are 2 types of report/response sent by device to the server as follows:

- ✓ Status Report
- ✓ Alerts Report

2-3. Parameter change

Parameters which have already been set on the device can be changed via GPRS/HSPA or via SMS or via RS232 connected with PC if a user needs to do so. Some controlling functions can also be implemented in the same way.

2-4. Features

Key features of the ST4950 device are as follows:

- Unifed Protocol

- ✓ Support standard report format fixed to all models.
- ✓ Customer can select only the data they want from the data included in the report, so that they can configure their own report format.

- Power Saving

- ✓ The device can save power consumption of the battery according to options. (motion sensor and tracking time)

- LED Indicators

- ✓ The LEDs indicate GPRS/HSPA and GPS status. It is helpful to check what error(s) and why such an error has occurred.
  Please refer to Chapter 3-1

- Maintenance server support

- ✓ Upgrading Firmware by Over The Air (Firmware OTA)

- Alerting Battery Low & Shutdown

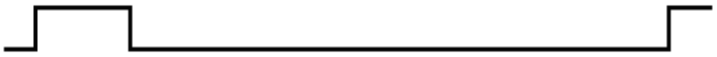
Device sends an alert or will be shutdown when a battery voltage is lower than pre-defined.

3. DETAILED DESCRIPTION

3-1. Indication with Two(2) LEDs

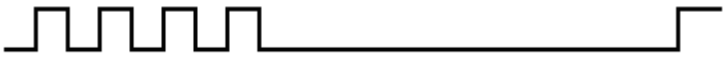
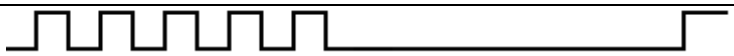
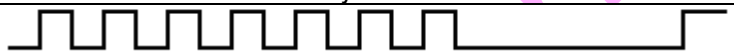
RED LED indicates GPS status and blue LED indicates GPRS/HSPA status.

3-1-1. Red LED for GPS

GPS	Blink Count	Meaning
Normal	1	
No Fix	2	 **<Probable Situations>** 1. If power is on, GPS chipset tries to find position for some minutes. 2. If device has weak connectivity with GPS network or if it has no GPS signal position. 3. If GPS connectivity with a device is weak.
GPS Chipset Error GPS Antenna Error	4	 **<Probable Situations>** 1. If GPS antenna is disconnected. 2. If GPS antenna or socket of GPS antenna is broken. 3. If device is broken.

3-1-2. Blue LED for GPRS/HSPA

GPRS/HSPA	Blink Count	Meaning
Normal	1	
Server Com. Error	2	 **< Probable Situations >** 1. If the server or network parameter is wrong. 2. If the server is closed. 3. If there is a temporary network barrier.
GPRS/HSPA Com. Error	3	 **<Probable Situations >** 1.If network parameter is wrong. 2. If SIM is blocked and it is impossible to use GPRS/HSPA session. 3. If there is a temporary network barrier. 4. If device receives weak GPRS/HSPA signal. 5. If GPRS/HSPA connectivity with a device is weak.

No Network	4	 **< Probable Causes>** 1. If GPRS/HSPA antenna is disconnected. 2. If GPRS/HSPA antenna or socket of GPRS/HSPA antenna is broken. 3. If the device is broken.
SIM PIN Locked	5	 **<Probable Situation >** 1. If SIM PIN is enabled.
Cannot Attach NW	6	 **< Probable Situations>** 1. If device receives weak GPRS/HSPA signal. 2.If GPRS/HSPA connectivity with a device is weak.
No SIM	7	 **< Probable Situations >** 1. If there is no SIM or if SIM is not inserted properly. 2. If SIM or SIM socket is broken.
SIM PUK Locked	8	 <Probable Situation > 1. If SIM PUK is enabled.

3-2. Power Saving

Device turns off GPS and GPRS/HSPA part except for time to send report. All communication with the server is impossible and it cannot receive any SMS messages. If GPRS/HSPA wake up for sending report, will be respond to message received.

3-3. Turn On/Off

- Turn ON

If you put a magnet on sensor position for more than 2 seconds, the device will be turned on. Then Red and blue LEDs blink together twice. When the power is on, Red LED will be light for 3 seconds.

- Turn OFF

If you put a magnet on sensor position for more than 2 seconds when device turned on, the device will be turned off. Then Red LED only blink six(6) times. When the power is off, Red LED will be blink once a second.

3-4. Storage of Reports un-sent

Device has maximum storage capacity of the un-sent reports in such cases as follows:

- 2,000 reports (**),

Note (**):

Due to bad report-routing environment, device could not make a real-time based reporting. For example, the reporting router does neither run properly, is nor connected properly. In such a situation there might be a report which has consequently failed to arrive in the server successfully after making several attempts to send the report to the server. In that case, the device stores such a report for a while until such environment (e.g. GPRS/HSPA network) gets back to normal to enable the device to try to send the report to the server again.

When 'reports' start being accumulated, max 2000 reports can be hold in the buffer storage of the device. If those 'reports' are triggered out to the server, the oldest report is erased first and a new report is buffered if the buffer is completely full of those reports. And then, a new status report enters (FIFO: First In First Out as a sequential system).

REVISIONS

Rev. No.	Date	Modifications were made on:	Writer
Rev. 1.00	2020-04-22	Draft a manual	B.C JEON

- End of the Document –

Caution

FCC Part 15.19

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.

L'émetteur/récepteur exempt de licence contenu dans le présent appareil est conforme aux CNR d'Innovation, Sciences et Développement économique Canada applicables aux appareils radio exempts de licence.

L'exploitation est autorisée aux deux conditions suivantes :

(1) L'appareil ne doit pas produire de brouillage;

(2) L'appareil doit accepter tout brouillage radioélectrique subi, même si le brouillage est susceptible d'en compromettre le fonctionnement.

FCC Part 15.21

Any changes or modifications (including the antennas) to this device that are not expressly approved by the manufacturer may void the user's authority to operate the equipment.

FCC RF Radiation Exposure Statement:

[EN] FCC and IC RF Radiation Exposure Statement: This equipment complies with FCC and IC RF Radiation exposure limits set forth for an uncontrolled environment. This device and its antenna must not be co-located or operating in conjunction with any other antenna or transmitter. This equipment should be installed and operated with a minimum distance of 20 cm between the radiator and your body.

[FR]RF du FCC et IC d'exposition aux radiations: Cet équipement est conforme à l'exposition de FCC et IC rayonnements RF limites é-tablies pour un environnement non contrôlé. L'antenne pour ce transmetteur ne doit pas être même endroit avec d'autres émetteur sauf conformément à FCC et IC procédures de produits Multi-émetteur.

Cet équipement doit être installé et utilisé avec une distance minimale de 20 cm entre le radiateur et votre corps.