Personal / Asset Tracker

ST940

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.

1. Introduction

ST940:　 Personal / Asset Tracking Device

The ST940 is a waterproof (IP65 compliant) hard-cased ultra-mini tracking device for various usages such as asset tracker and personal trackers.

Without any efforts for connecting wires, the ST940 works autonomously with its built-in battery. If users want to track an object with the ST940, all they have to do is just simply put it into the box or the carry bag where the object is contained. And then, users can track the locations of such an object and receive an alert if the object enters or leaves a pre-defined zone.

This non-wiring device is so small that it can be hidden after being placed.　 So, the waterproof ST940 is suitable for covert tracking even in rainy weather conditions. The ST940 is ideal for tracking various objects such as people, vehicles (especially small vehicles or motorcycles), boats and valuable fixed/moving assets like expensive merchandises, computers, smart phones, electronic products, machinery and so on.

In addition to 3-axis acceleration sensor, the ST940 has various functionalities such as low-power consumption

algorithms and motion checking.

*In case the ST940 is placed inside a metal container, it may not work.

- **Position of the IMEI label**

    the center of the back cover.

-

2. Key Features

- **New technology and the latest GPS Chipset**
- **GSM Quad band support 850/900/1800/1900 Mhz band width**
- **SMS/GPRS communications**
- **Report when the battery is in a low status**
- **Periodic reporting in real time**
- **Built-in motion detector for alarming**
- **Waterproof in compliance with IP65**
- **Baby's palm-sized versatile mini tracker**
- **Fixed asset tracking in real time with Standby Current with less than 8uA.**

- **RF Exposure**

    This device complies with FCC/CE RF exposure guidelines set forth for an uncontrolled environment.

    For body worn operation, this device has been tested and meets the RF exposure guidelines for use with an accessory that contains no metal and the positions the handset a minimum of 0.5 cm from the body. Use of other enhancements may not ensure compliance with RF exposure guidelines.

● **2-1. GSM/GPRS Specifications**

Item	Description
Battery	Rechargeable 3.7V, Li-ion Battery- 1500mAh
Motion Detection	Built-in 3-axis Acceleration sensor
Standby time Deep Sleep Sleep on network	*with 1,500mA/h Li-ion battery less than 8uA Report once a day: 400days 3 minute reporting: 99 hours 5 minute reporting: 139 hours 10 minute reporting: 200 hours 30 minute reporting: 284 hours *only at a good GPS and GPRS signals*
Frequency/ Sensitivity	GSM 850 / EGSM 900MHz -104dBm DCS1800 / PCS1900MHz -102dBm
Temperature Range	**-20°C ~ +55°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
AT Command	GSM 07.07 , 07.05
LED Indicator	GPRS, GPS, Charging status
GPRS	Multi-slot Class 12 Support all 4 coding schemes (CS-1, CS-2, CS-3 and CS-4)
'SyncTrack' for PC	Mini USB cable
Dimensions	50.5(W) x 75(L) x 22.5(T) mm 55.9(W) x 88.3(L) x 35.6(T) mm (with cradle)
Weight	88g, 200g (with cradle)
Approval	CE, FCC, RoHS

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
Accuracy[1]	Position 2.5m CEP SBAS 2.0m CEP
Acquisition[2]	TCXO Cold starts 26s 1s (AssistNow Autonomous) Aided start<1s Hot start<1s
Sensitivity[3]	Tracking -162dBm Reacquisition -160dBm Cold start -148dBm
Back-up Supply	Voltage range : 2.5V to 3.6V
Antenna type	Patch Antenna
Operating Temperature	-20 ~+ 55℃

*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.

2-3. Operational Features

Item	Description
Configuration	either by SMS or PC
Parameter Change	either by SMS or GPRS
Command /Control	either by SMS or GPRS
Reporting	either by GPRS or SMS (as a back-up)
GPRS Communication	TCP, SMS, (UDP is optionally available.)
GPRS Connection	either always connected or upon needed
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	Cyclic location reporting with interval adjustable making possible only when command comes
Back-up Reporting	possible (Dual IP reporting or Backup SMS reporting)
Power down	Sleep on network (less than 2.8mA) Deep sleep on no network (less than 8uA):
How to upgrade Firmware	by OTA (Over The Air) or pc tool.

3. Accessories

The ST940 has two accessories:

- Wall Charger, and
- USB Cable (for charging and setting)

4. How to insert SIM card by step

There are 5 steps in inserting a SIM card onto the ST940 as shown below in the pictures.

Step 1.: Please, unscrew SIM cover.   *Step 2.: Please, insert SIM #1.*

Step 3: Please, insert SIM #2.   *Step 4.: Please, insert SIM #3*

Step 5.: Please, make an assembly with the SIM cover.

5. Charging battery

1. Open the cover to the multifunction jack on the side of the device.

2. Plug the small end of the travel adapter into the device.

3. Plug the large end of the travel adapter into a power outlet.

4. When charging is finished, unplug the travel adapter from the power outlet.

5. Remove the travel adapter from the device.

It is highly recommended that the rechargeable battery should be charged completely before using the device. Connect the ST940 to its charger cable supplied by Suntech and charge it for 5 hours.

< Charging Status indicated on the battery LED >

- Red blinking twice: under 10% of the full capacitance
- Red blinking: under 30% of the full capacitance
- Orange blinking: 30% to 80%
- Green blinking: Almost Full
- Green lighting: Completed charging in full

<Status of Charging Mode indicated on the battery LED>

As soon as the charger is connected with the device which has been turned off, the GPS LED will be turned on and continue

The battery does not charge properly or sometimes your device turns itself off while charging

• Disconnect the device from the charger, remove and reinstall the battery, and try charging again.

• If the battery no longer charges completely, dispose of the old battery properly and replace it with a new battery.

<Charging Error>

When an error occurs while the battery is being charged. The red LED and the green LED blink by turns. In this case, please disconnect the charger cable and try to do charging again by reconnecting the cable. If this error occurs continuously, please replace the battery or contact Suntech.

6.   Appearance

7. How to operate

The ST940, 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.
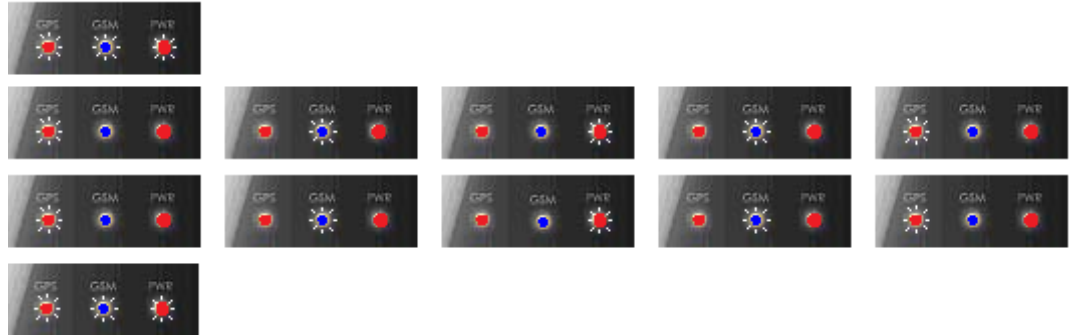
 Users are required to set the reporting timing of the device at an interval with more than 10 minutes in order to save the endurance time of the battery.

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.
Blue LED	**GSM network 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 electricity. If you turn on 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 GSM network connectivity.
	• Server communication Error : 2 times
	• GPRS Communication Error : 3 times
	• No GSM (= not connected with the GSM network): 4 times.
	• SIM PIN Locked : 5 times
	• Impossible to connect with the GSM 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 its SIM. .

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 electricity. If you turn on 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 Charging Battery** The red LED continues to be in the status of 'Turn On' while the device is being connected with the battery charger.
Battery LED (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 capacitance - Red LED blinks. → under 30% of the full capacitance - Orange LED blinks. → 30% to 80% - Green LED blinks. → Almost charged completely - 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 is completed.

8. Commands

This *chapter* explains how command is made and sent to the device from its the server.

Before using the device, you should set the network and the periodic reporting parameters via SMS or 'data cable' at first.

After this, you can send any command(s) via SMS or 'data cable' or GPRS (only when connected).

How to set 'Network Parameters'

● The table below shows how user can set GPRS parameters, Server information and PIN Lock code.

Field	Marks	Value	Meaning

HDR	"ST940"	Model Name
COMMAND	"NETWORK	Command Type
DEV_ID	9 char.	9 digits ID of device. It is a part of IMEI.
AUTH	'0' /'1''/2'	GPRS authentication
		0 : Disable (PAP)
		1 : Enable (CHAP)
		2 : Automatic GPRS set.
		In this case, parameters for APN, USER_ID and
		USER_PWD field should remain empty.
		*PAP : Password Authentication Protocol
		*CHAP : Challenge Handshake Authentication Protocol
APN	String	Access Point Name
USER_ID	String	ID for GPRS Access
USER_PWD	String	Password for GPRS Access
SEVER_IP	String	Server IP Address
SEVER_PORT	String	Server Port
SMS_NO	String	Phone number through which device sends SMS report.
		This can be used for backup in an area where GPRS condition is not good. Alternatively, it can be used as main reporting method when IP and Port are empty. If you do not use this, it should remain empty.
		If some phone numbers have been registered on 'SMS_NO' and they are set properly, only SMS messages of which phone numbers were registered can be accepted as command. The SMS of which phone numbers have not been pre-set, those SMS messages coming from those phone numbers are disregarded.
		"SMS_NO" has to be set with a number more than 7 digits.
PIN_NO	String	PIN Number to release PIN lock if it is enabled
RX_GPRS_CMD	'0' / '1'	Receive command via GPRS
		'0' : Disable (When server doesn't send command via GPRS)
		'1' : Enable

B_SERVER_IP	String	Backup Server IP Address
B_SERVER_PORT	String	Backup Server Port

<Example>

[command]

ST940;NETWORK;123456789;1;internet;suntech;1234;111.111.111.111;8800;111.111.111.111;8801;1234;0

[response]

ST940;RES;NETWORK;123456789;1;internet;suntech;1234;111.111.111.111;8800;111.111.111.111;8801;1234;0

<Notes>

If the SIM does not require User ID and Password, these fields should be empty.

If RX_GPRS_CMD is enabled, the device should keep connection with the server though GPRS so that the device can receive a command from the server.

Sometimes, the device may send 'alive reports' to keep this connection because the network provider may disconnect the GPRS connection if there is no communication for such a time-period. Also, the device may send 'alive reports' to re-connect with the server while the device is disconnected with the server.

How to set 'Additional Parameters'

● The following table shows how to set protocol types for GPRS such as TCP and UDP with device port No.

Field	Marks	Value	Meaning
HDR	"ST940"		Model Name
COMMAND	"ADP"		Command Type
DEV_ID	9 char.		9 digits ID of device. It is a part of IMEI.
SVR_TYPE	'T' / 'U'		Server Protocol Type T : TCP U : UDP
B_SVR_TYPE	'T' / 'U'		Backup Server Protocol Type T : TCP U : UDP
UDP_ACK	'0' ~ '3'		ACK from Server when UPD is used. 0 : No use 1 : ACK when the server receives reports except 'alive-report'. 2 : ACK when the server receives reports except 'STT' and

		'alive report'.
		3 : ACK when the server receives 'emergency report'.
		Command response does not need ACK.
DEV_PORT	String	Device's port for receiving command from UDP server.
		It can be used only when UDP server is used.
		If '0' or empty, the device would use port 9000.
		If not zero, the device can receive commands with port DEV_PORT.

<Example>

[command] ST940;ADP;123456789;T;T;0;8051

[response]ST940;RES;ADP;123456789;T;T;0;8051

<ACK in case of UDP>

UDP is a protocol which does not check if the data has been transmitted successfully. So, the device checks completion of sending with ACK (ST910ACK;111111) depending on UDP_ACK type.

ACK is sent by the server when the data is received.

If the ACK is not sent for more than 2 minutes after sending, the device recognizes that the data has not reached the server and sends the data again.

How to set 'Geo-fence Parameters'

● The following table shows how to set ID, position and enable state of the circular geo-fence.

Field	Marks	Value	Meaning
HDR	"ST940"		Model Name.
COMMAND	"CGF"		Command Type.
DEV_ID	9 char.		9 digits ID of device. It is a part of IMEI.
GEO_ID	'1'~'200'		Geo-fence ID.
ACTIVE	'0' or '1'		enable (1) or disable (0)
LAT	String		Central latitude of circular area.
LON	String		Central longitude of circular area.
RADIUS	String		Radius of circular area.(Unit : Km)
IN			Alert indicating that vehicle enters the circular area. Enable (1) or disable (0)
OUT			Alert indicating that vehicle gets out from the circular area. Enable (1) or disable (0)

<Example>

[command]

ST940;CGF;123456789;1;36.923548;127.309570;29;1;1

[response]

ST940;RES;CGF;123456789;1;1;36.923548;127.309570;29;1;1

How to set 'Report Parameters'

● The following table shows how to set intervals of location report, alert and how to set sensor value to sense if any motion is made.

Field	Marks	Value	Meaning
HDR	"ST940"		Model Name
COMMAND	"REPORT"		Command Type
DEV_ID	9 char.		9 digits ID of device. It is a part of IMEI.
PARKING_INTRV	String	Second	Sending interval of location report while Parking Range : 0 to 86400 If zero, the device doesn't send location report periodically.
DRIVING_INTRV	String	Second	Sending interval of location report while Driving Range : 0 to 6400 If zero, the device doesn't send location report periodically.
EMERG_INTERVAL	String	Second	Sending interval of alert about carrying out. Range : 0 to 180 If zero, checking of carrying is disabled.
EMERG_NUM	String		Number of sending Emergency report until the device receives Server ACK
CARRY_THRES	String		Threshold value of the sensor to check if movement of the object is made Range: 0.0 to 2.0; However, we recommend the value, 0.05.
RPT_TYPE_SEL	'0' or '1'		0 : RPT_TYPE(See "3. Reports" Chapter.) is a string. 1 : RPT_TYPE(See "3. Reports" Chapter.) is a number.
DISTANCE_SEL	'0' or '1'		0: Accumulation of distance is off. 1: Accumulation of distance is on.
DEEP SLEEP	'0' or '1'		0 : Disable 1 : Enable

<Example>

[command] ST940;REPORT; 123456789;180;60;60;3;0.5;0;0

[response] ST940;RES;REPORT; 123456789;180;60;60;3;0.5;0;0

<Notes>

1. Driving or Parking is decided by Motion Sensor. If CARRY_THRES is equal to zero, it cannot recognize Driving.

2. To use the 'DEEP SLEEP' option, 'PARKING_INTRV' should be one hour or more than one hour.

3. If "DEEP SLEEP" option is enabled, 'Distance enable' option cannot be used and the report of distance will be always '0'.

4. The device can be used to do tracking for a fixed asset. In this case, the following table shows how long the endurance time of the battery lasts.

Deep Sleep	PARKING_INTR V [Hour]	CARRY_THRES	LIFE TIME [DAY]
ENABLE	1	0	16
ENABLE	3	0	48
ENABLE	6	0	96
ENABLE	12	0	189
ENABLE	24	0	400

Off (Power off)

● The following table shows how to make a command for power off remotely for a time period of the "the minutes" predefined.

Field	Marks	Value	Meaning
HDR	"ST940"		Model Name
COMMAND	"OFF"		Command Type
DEV_ID	9 char.		9 digits ID of device. It is a part of IMEI.
OFF_TIME	String	minutes	Up to 9999

It is a command which is needed to save battery power when the device is in a safe area and has no plan of moving for a time period of 'OFF_TIME'.

When the device receives this command, it turns the power off and on after OFF_TIME minutes pass.

During the time period of 'power off', the device cannot send either any reports or alert. It cannot receive any commands, either.

This action is exactly same as power handling by pressing the key.

Instead of this command, you can turn off the power by pressing the key and turn on the power by pressing the key after OFF_TIME minutes.

Caution: Please eliminate the 'data cable' after you set 'OFF COMMAND' in 'SyncTrack' program.

<Example>
[command] ST940;OFF;123456789;480
[response] ST940;RES;OFF;123456789;480

How to set 'Function Parameters'

● The following table shows how to make a command to enable or disable the functions:

Field	Marks	Value	Meaning
HDR	"ST940"		Model Name
COMMAND	"FUNCTION"		Command Type
DEV_ID	9 char.		9 digits ID of device. It is a part of IMEI.
CARRY	0 / 1		If 1, Emergency by Carry is enabled.
TURN_OFF	0 / 1		0 : This is the only one way how to turn off the device, if you set the parameter with '0'. 1 : If you set the device to '1', you can turn off the device only

by using the 'power key'.

<Example>

[command] ST940;FUNCTION;123456789;0

[response] ST940;RES;FUNCTION;123456789;0;1

Erase Reports

● The following table shows how to make a command to erase all the reports which have been stored.

Field	Marks	Value	Meaning
HDR	"ST940"		Model Name
COMMAND	"ERASER"		Command Type
DEV_ID	9 char.		9 digits ID of device. It is a part of IMEI.

<Example>

[command] ST940;ERASER;123456789

[response] ST940;RES;ERASER;123456789

Find(Location poll)

● The following table shows how to make command in order to get the current position of the device.

Field	Marks	Value	Meaning
HDR	"ST940"		Model Name
COMMAND	"FIND"		Command Type
DEV_ID	9 char.		9 digits ID of device. It is a part of IMEI.

When the device receives this command, it responds with location report.

<Example>

[command] ST940;FIND;123456789

[response]ST940;Location;123456789;20140810;17:05:30;+37.478519;+126.886819;072.450;121.35;1;3.95;1;1
;0001

<Note>

If the command is sent through RS232, the device responds with "RS910;RES;FIND;xxxxxx" and sends location
string through GPRS or SMS.

ACK (Server Acknowledgement about Alert)

● The following table shows how to make a command in order to stop sending alert.

Field	Marks	Value	Meaning
HDR	"ST940"		Model Name
COMMAND	"ACK"		Command Type
DEV_ID	9 char.		9 digits ID of device. It is a part of IMEI.

When the device receives this command while it is sending alerts, it stops sending alert.

<Example>

[command] ST940;ACK;123456789

[response] ST940;RES;ACK;123456789

Preset

● The following table shows how to make a command to read all of the parameters:

Field	Marks	Value	Meaning
HDR	"ST940"		Model Name
COMMAND	"PRESET"		Command Type
DEV_ID	9 char.		9 digits ID of device. It is a part of IMEI.

<Example>

[command] ST940;PRESET;123456789

[response]

ST940;RES;PRESET;123456789;NETWORK;internet;suntech;1234;111.111.111.111;8800;;1234;1;201.16.225.1
17;7210;ADP;T;T;0;7210;REPORT;120;0;30;3;0.10;FUNCTION;1;0

InitDist

● The following table shows how to initialize the movement distance which has been accumulated so far.

Field	Marks	Value	Meaning
HDR	"ST940"		Model Name
COMMAND	"InitDist"		Command Type
DEV_ID	6 char.		6 digits ID of device. It is a part of IMEI.

<Example>

[command] ST940;InitDist;123456789

[response] ST940;RES; InitDist;123456789

ResetMsgNo

● The following table shows how to initialize the message numbers of the reports:

Field	Marks	Value	Meaning
HDR	"ST940"		Model Name
COMMAND	"ResetMsgNo"		Command Type
DEV_ID	9 char.		9 digits ID of device. It is a part of IMEI.

<Example>

[command] ST940;ResetMsgNo;123456789

[response] ST940;RES;ResetMsgNo;123456789

Location Query using Smart-Phone

● If you are smart phone user, you can easily find the location on the google map in real time.

Just send one of the following messages via your smart phone:

"Where are you", "whereareyou", "Where r u", "whereru"

And then, the google map address will respond to your smart phone. You can see the current location just opening that address on the web browser.

InitCircleGeo

● The following table shows how to initialize all of the geo-fence parameters.

Field	Marks	Value	Meaning
HDR	"ST940"		Model Name
COMMAND	"InitCircleGeo"		Command Type
DEV_ID	9 char.		9 digits ID of device. It is a part of IMEI.

<Example>

[command] ST940;InitCircleGeo;123456789

[response] ST940;RES;InitCircleGeo;123456789

TurnOff

● Definition: Command for target power off .

Field	Marks	Value	Meaning
HDR	"ST940"		Model Name
COMMAND	"TurnOff"		Command Type
DEV_ID	9 char.		9 digits ID of device. It is parts of IMEI.

<Example>

[command] ST940;TurnOff;123456789

[response] ST940;RES;TurnOff;123456789

9. Reports

This *Chapter* explains how device makes a report and sends it to its server.

Location Report

Field	Marks	Meaning
HDR	"ST940"	Model Name
RPT_TYPE	"Location"	Report Type or "0001"
DEV_ID	9 char.	9 digits ID of device. It is a part of IMEI.
SW_VER	3 char	Software version.
DATE	String	YYYYMMDD
TIME	String	HH:MM:SS, 24 hours format, UTC
CELL	String	Cell ID(4digits hex) + Location Code ID(4 digits hex) + Serving Cell BSIC(2 digits decimal)
LAT	String	Latitude in degree
LON	String	Longitude in degree
SPEED	String	Speed over the ground in Km/h
COURSE	String	Track angle in degrees
FIX	'0' or '1'	0: GPS is not fixed 1: GPS is fixed
DISTANCE	String	Moving distance value (Unit : m)
BATTERY_VOLT	String	Voltage of Battery in percentage (%)
IMMEDIATE	Digit	0: Report is sent from the memory 1: Report is sent on-line
MODE	Digit	0: Idle Mode 1: Active Mode
MSG_NO	String	Message number. After 9999, message number initialized to zero.

<Example>

If RPT_TYPE_SEL is '0'

ST940;Location;123456789;001;20140810;17:05:30;0310000100;+37.478519;+126.886819;072.450;121.35;1;80;95;1;1;0001

If RPT_TYPE_SEL is '1'

ST940;0001;123456789;001;20140810;17:05:30;0310000100;+37.478519;+126.886819;072.450;121.35;1;80;95;1;1;0001

Emergency Report

Field	Marks	Meaning
HDR	"ST940"	Model Name
RPT_TYPE	"Emergency"	Report Type or "0002"
DEV_ID	9 char.	9 digits ID of device. It is a part of IMEI.
SW_VER	3 char	Software version.
DATE	String	YYYYMMDD
TIME	String	HH:MM:SS, 24 hours format, UTC
CELL	String	Cell ID(4digits hex) + Location Code ID(4 digits hex) + Serving Cell BSIC(2 digits decimal)
LAT	String	Latitude in degree
LON	String	Longitude in degree
SPEED	String	Speed over the ground in Km/hour
COURSE	String	Track angle in degrees
FIX	'0' or '1'	0: GPS is not fixed 1: GPS is fixed
DISTANCE	String	Moving distance value (Value: meter)
MODE	Digit	1: Emergency by Carry 2: Emergency by Panic

<Example>

If RPT_TYPE_SEL is '0'

ST940;Emergency;123456789;001;20140810;17:05:30;0310000100;+37.478519;+126.886819;072.450;121.35;
1;80;1

If RPT_TYPE_SEL is '1'

ST940;0002;123456789;001;20140810;17:05:30;0310000100;+37.478519;+126.886819;072.450;121.35;1;80;1

<Notes>

When the device checks that the motion sensor value exceeds over than 'CARRY_THRED', it can recognize such a movement of the object on which the device is put. By doing this, the device this alert to its server.

Alert when battery level is low

Field	Marks	Meaning
HDR	"ST940"	Model Name
RPT_TYPE	"Low Battery"	Report Type or "0003"
DEV_ID	9 char.	9 digits ID of device. It is a part of IMEI.

<Example>

If RPT_TYPE_SEL is '0'

ST940;Low Battery;123456789

If RPT_TYPE_SEL is '1'

ST940;0003;123456789

<Note>

When this message is send, please charge the device immediately.

Alive Report

Field	Marks	Meaning
HDR	"ST940"	Model Name
RPT_TYPE	"Alive"	Report Type or "0004"
DEV_ID	9 char.	9 digits ID of device. It is a part of IMEI.

<Example>

If RPT_TYPE_SEL is '0'

ST940;Alive;123456789

If RPT_TYPE_SEL is '1'

ST940;0004;123456789

<Note>

"Alive Report" is sent by device to connect again with the server when connection with the server is broken.

Alert Report

Field	Marks	Meaning
HDR	"ST940"	Model Name
RPT_TYPE	"Alert"	Report Type or "0005"
DEV_ID	9 char.	9 digits ID of device. It is a part of IMEI.
SW_VER	3 char	Software version.
DATE	String	YYYYMMDD
TIME	String	HH:MM:SS, 24 hours format, UTC
LAT	String	Latitude in degree
LON	String	Longitude in degree
SPEED	String	Speed over the ground in Km/hour
COURSE	String	Track angle in degrees
FIX	'0' or '1'	0: GPS is not fixed 1: GPS is fixed
MODE	String	5: The vehicle went out from the geo-fence that has following ID. 6: The vehicle entered into the geo-fence that has following ID.

<Example>

If RPT_TYPE_SEL is '0'

ST940;Alert;123456789;001;20140810;17:05:30;+37.478519;+126.886819;072.450;121.35;1;501

If RPT_TYPE_SEL is '1'

ST940;005;123456789;001;20140810;17:05:30;+37.478519;+126.886819;072.450;121.35;1;501

Revision History

Rev. No.	Date	Contents of Revision		Author
1.00	11 August 2014	Initial writing		SE Park

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