



LOOK'ET LBS User Manual

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1. Overview

This manual describes the SOC LBS Real-time GPS tracker for using in the fleet management and other location utility.

We call the SOC LBS Real-time GPS tracker as "LOOK'ET", our product name in this document from now on.

Chapter 1 describes the LOOK'ET hardware part and 2,3 describe security and safety.

Chapter 4 describes the stating and testing method.

Chapter 5 describes the specification of LOOK'ET.

1.1. Reference

- [1] SOC LBS USB Driver Installation Guide
- [2] PC Application software Manual [Control Center]
- [3] PC Application software Manual [Diagnostic Monitor]
- [4] PC Application software Manual [Upgrade Server]
- [5] SOC LBS SW Interface

1.2. Hardware overview

LOOK'ET has following hardware block diagram.

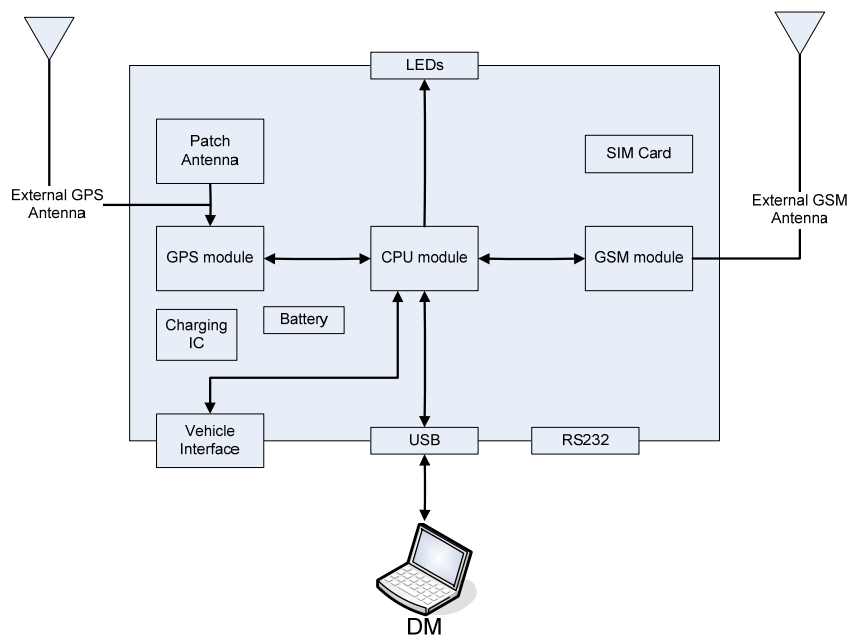


Fig 1. LOOK'ET hardware block diagram

LOOK'ET has following hardware appearance.



Fig 2. LOOK'ET appearance in front view



Fig 3. LOOK'ET appearance in right side view



Fig 4. LOOK'ET appearance in left side view



Fig 5. . LOOK'ET appearance including tray

1.3. Hardware interface description

1.3.1. Vehicle interface

LOOK'ET has 12 port signals to interface with vehicle.

1.3.1.1. Vehicle 12 pin interface pin out

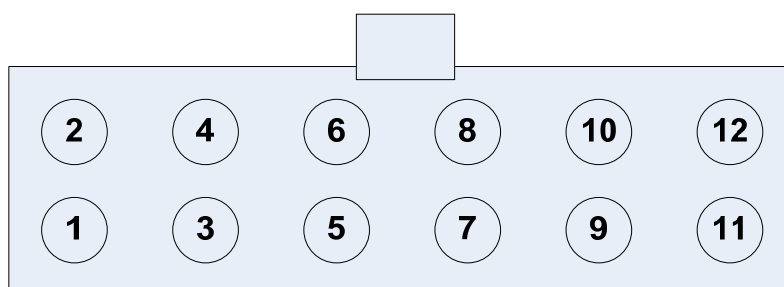


Fig 6. Vehicle 12 pin connector cable part



Fig 7. Vehicle 12 pin connector LOOK'ET part

1.3.1.2. Vehicle 12 pin interface pin & cable description

Number	Pin name	Description	Cable color
1	Digital output 1	General purpose output.500 mA max.@ 10 ~ 33V DC To connect the vehicle, it needs Relay.	Brown
2	Digital output 2	General purpose output.500 mA max.@ 10 ~ 33V DC To connect the vehicle, it needs Relay.	Brown
3	Analog input 1	General purpose analog input. Up to 33 V DC/10 bit resolution	Yellow
4	Analog input 2	General purpose analog input. Up to 33 V DC/10 bit resolution	Yellow
5	Digital input 1	General purpose input. High=10 V ~ 33 V DC, Low=0V	Orange
6	Digital input 2	General purpose input. High=10 V ~ 33 V DC, Low=0V	Orange
7	Digital input 3	General purpose input. High=10 V ~ 33 V DC, Low=0V	Orange
8	IGNITION	General purpose input. High=10 V ~ 33 V DC, Low=0V	Blue
9	CANH	NC.	White
10	CANL	NC.	White
11	VIN	Input power for the unit must be 12/24 volts for the unit to	Red

		operate properly; A direct connection to the vehicle's battery is preferable. The 2A fuse in this cable is to protect the +12/24 volt input to the unit.	
12	GND	Wire to vehicle ground.	Black

Table 1. Vehicle interface pin description table

1.3.2. USB interface

LOOK'ET supports USB 2.0 and mini-USB type connector.

1.3.3. RS232 interface

LOOK'ET supports RS232 to interface with external device like navigation..

Supported signal is RS232Tx,RS232Rx and GND. In normal LBS applications, It does not need to be connected.

1.3.4. External GPS antenna

LOOK'ET has internal GPS patch antenna in itself, but supports external GPS antenna.

1.3.5. External GSM/GPRS antenna

LOOK'ET has two types of GSM/GPRS antenna according to the supported bandwidth.

1.3.6. LEDs

LOOK'ET has three LEDs for indicating operation status.

LED name	Mark	Description
Battery LED		It indicates the battery status. In boot stage after power on, it blinks 4 times with 1 second period indicating boot completion. If the boot stage has some error, it blinks forever. After boot stage, It blinks if the battery voltage level is under 3.6V else on.
GPS LED		It indicates the GPS sync status. This LED is on if the GPS has detected and synced. But GPS does not have synced and is under searching sync, this LED is blinked.
GSM/GPRS LED		It indicates the GSM Tx / Rx status. In boot stage after power on, it blinks 4 times with 1 second period indicating boot completion. If the boot stage has some error, it blinks forever. After boot stage, this LED is on when the GSM Tx or Rx operation is executed. LED is off when LOOK'ET is in Idle mode.

Table 2. LED indications

1.4 LOOK'ET basic operation scheme

LOOK'ET has several stages to debug status and operate in test mode.

User does not have to control this, but it is good to know to when the debugging command is valid.

1) Boot stage

After power on, Boot stage takes 25 seconds to check the flash memory status and user program updating request.

If the user want to upgrade LOOK'ET with the new binary file, it can be done in this time.

2) Application stage

After boot stage, application code will be executed. Application code waits 5 seconds to select the test mode before initialization. If the user does not enter test mode value within 5 seconds, LOOK'ET proceeds the normal operation mode. This test mode is just for the hardware testing so user does not have to enter this. After this, LOOK'ET does initialization and waits in idle mode.

Consequently, user must waits the least 35 seconds after power on.

2. Security

It is important for the efficient and safe operation to read this information before use LOOK'ET.

This chapter contains important information for the safe and reliable use of the LOOK'ET. Please read this chapter carefully before starting to use LOOK'ET.

- (1) Risk of explosion if battery is replaced by incorrect type. dispose of used batteries according to the instructions.
- (2) To minimize the exposure to RF energy, It is recommended to place the antenna more than 20 centimeter from human body.
- (3) Turn your LOOK'ET modem device OFF in health care facilities when any regulations posted in the area instruct you to do so. Hospitals or health care facilities may be using RF monitoring equipment.
- (4) Turn your LOOK'ET device OFF in blasting area when any regulations posted in the area instruct you to do so.
- (5) Turn your LOOK'ET device OFF before boarding any aircraft. Use it on the ground only with crew permission. Do not use it in the air.
- (6) Do not allow children to play with your LOOK'ET device. Children could hurt themselves or be damaged with playing that.
- (7) Turn your LOOK'ET device off when in any area with a potentially explosive atmosphere. Modem or its accessories could generate sparks. Sparks in such areas could cause an explosion or fire resulting in bodily injury or even death.
- (8) The antenna shall be mounted in such a position that no part of the human body will normally rest close to any part of the antenna. It is also recommended to use the equipment not close to medical devices as for example hearing aids and pacemakers.

3. Safety standards

This GSM/GPS modem complies with all applicable RF safety standards.

The embedded GSM/GPRS/GPS modem meets the safety standards for RF receivers and the standards and recommendations for the protection of public exposure to RF electromagnetic energy established by government bodies and professional organizations, such as directives of the European Community, in matters of radio frequency electromagnetic energy.

4. Basic startup and testing

The SOC LBS LOOK'ET has been made to make installation, testing and configuration simple. For vehicle installation and testing for correct working after installation we recommend the installer to use a Notebook or Desktop PC via USB 2.0 interface.

The program for debugging/controlling LOOK'ET is provided in view of both target side and network side. DM(Diagnostic Monitor) is the target side program and CC(Control Center) is network side program for debugging and controlling.

Before the LOOK'ET is installed, we recommend configuring the unit functions and setup using the LOOK'ET DM program including setup configuration. The LOOK'ET has many functions that will allow the unit to operate for different user applications including security and fleet management.

4.1. Needed accessory and programs

LOOK'ET product has many hardware accessories and software programs to operate correctly.

No.	Component name	Quantity	Remarks
1	LOOK'ET body	1 ea.	Hardware.
2	External GPS antenna	1 ea.	Hardware.
3	External GSM/GPRS antenna	1 ea.	Hardware.
4	12 Pin Vehicle interface connector & cable	1 ea.	Hardware.
5	Internal battery	1 ea.	Hardware.
6	USB mini-type connector & cable	1 ea.	Hardware.
7	RS232 connector & cable	Not included.	Hardware.
8	Tray for Fix LOOK'ET	1 ea.	Hardware.
9	USB Driver install file	1 set.	Software.
10	DM(Diagnostic Monitor) Program	1 set.	Software.
11	CC(Control Center) Program	1 set.	Software.
12	UPGS(Update Server) Program	1 set.	Software.

Fig 8. Hardware/Software accessories

4.1.1. Hardware accessories

1) LOOK'ET body



Fig 9. Hardware Accessory : Body

2) External GPS antenna



Fig 10. Hardware Accessory : External GPS antenna

3) External GSM/GPRS antenna



Fig 11. Hardware Accessory : External GSM/GPRS antenna

4) 12 Pin Vehicle interface connector & cable



Fig 12. Hardware Accessory : vehicle 12 pin connector & cable

5) Internal battery



Fig 13. Hardware Accessory : Internal battery

6) USB mini-type connector & cable



Fig 14. Hardware Accessory : USB mini-type connector & cable

7) RS232 connector & cable

None. Not needed.

8) Tray for Fix LOOK'ET



Fig 15. Hardware Accessory : LOOK'ET tray(Cradle)

4.1.2. Software programs

1) USB Driver install file

USB driver installation is needed to connect the LOOK'ET with PC. After completed installing the USB driver, hyper terminal and DM can be used to control and debug the LOOK'ET.

Refer to the document [1] and [3] for detail description to install USB driver and DM.

2) DM(Diagnostic Monitor) Program

LBS_DM.exe, configuration text file and several DLL files are provided by SOC. These files must be copied together in one directory of your DM PC. Just execute LBS_DM.exe to invoke the DM program.

Refer to the document [3] for detail description for DM.

3) CC(Control Center) Program

LBS_CONTROL_CENTER.exe, configuration text file and several DLL files are provided by SOC. These files must be copied together in one directory of your control center PC. Just execute LBS_CONTROL_CENTER.exe to invoke the DM program.

Refer to the document [3] for detail description for CC.

4) UPGS(Update Server) Program

LBS_REMOTE_UPGRADE_SERVER.exe, binary LOOK'ET file and several DLL files are provided by SOC.

Binary LOOK'ET file must be placed in the C:\LBS_FLASH_FILE directory and other exe and DLL files must be copied together in one directory of your upgrade server PC.

Refer to the document [4] for detail description for upgrade server.

4.2. Testing environment & Installation

4.2.1. Testing environment

The testing environment of LOOK'ET is as followings.

Basic period report message, which is occurred by period during ignition on or off, is reported to the control center.

History report & logging message can be checked at DM and control center at any time during GPRS connection is established. Also daily history report can be sent E-mail server or other GPRS server by configuration setting.

Program updating can be executed at DM and Upgrade server. Alarm messages can be transferred to the specified SMS user by configuration setting. To test this basic environment, DM and GPRS capable Control center and upgrade server software will be provided by SOC.

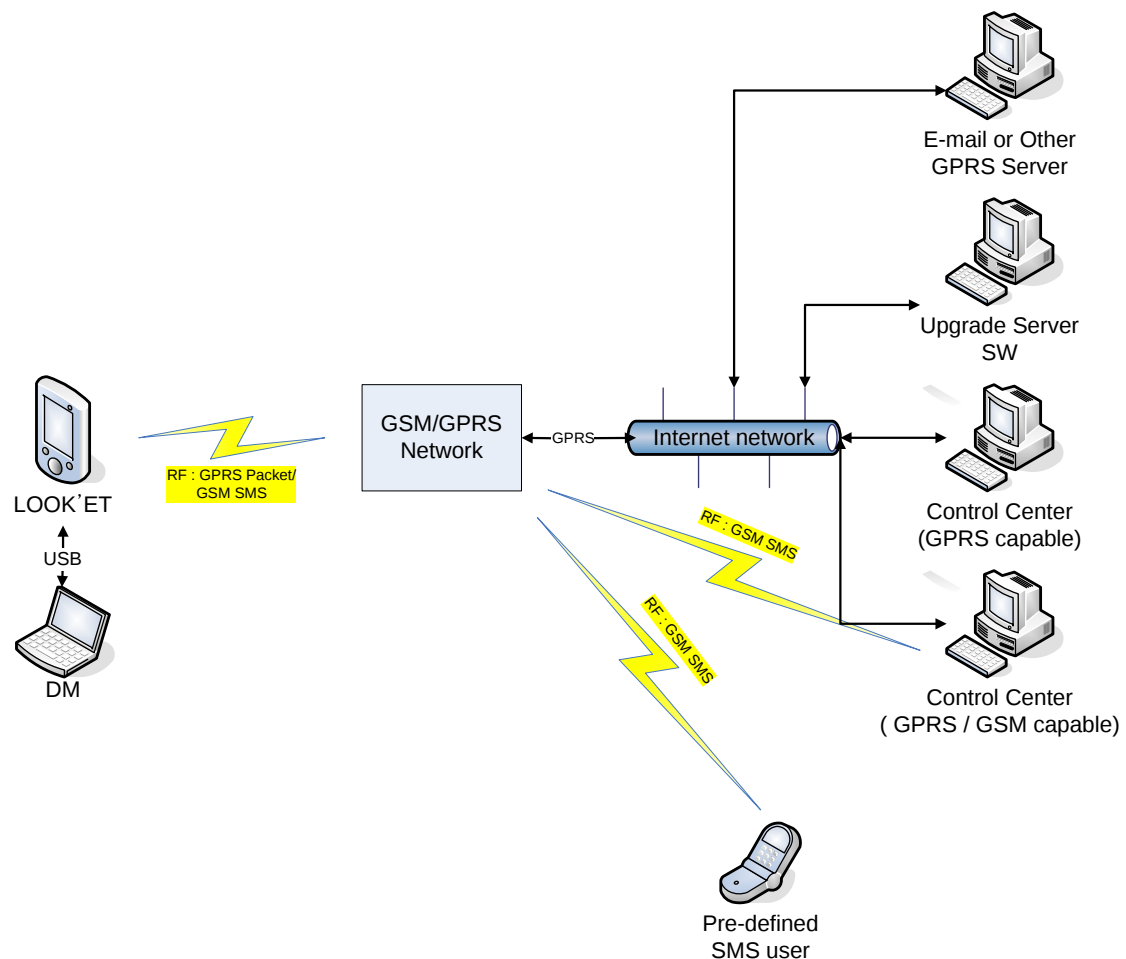


Fig 16. Operation environment

4.2.2. Installation & Usage

4.2.2.1. Component connection

(1) Connect the external GSM antenna and external GPS antenna



(2) Connect the USB connector LOOK'ET and PC.



(3) Connect the 12 pin vehicle interface connector LOOK'ET and Vehicle.



The VIN, GND and IGNITION signals of vehicle interface must be connected to the vehicle. If these signals are not connected with vehicle, use power supply or 12V/24V battery.

(4) Open the rear cover and insert the SIM card.



(5) Insert the Internal battery. Inserting internal battery means the power On.



(6) You can execute "CONNECT" in the DM program.

You can see the processing status.

(7) After about 25 seconds, Boot process is completed, LEDs for GSM and Power will be blinked 4 times.

Then LOOK'ET will process the application code. Application code will initialize its configuration and goes to the idle state. User must wait for 35 seconds to enter debugging or control commands.



4.2.2.2. USB driver installation & test

Refer to the document [1] for detail description.

4.2.2.3. DM installation

Refer to the document [1] for detail description.

4.2.2.4. Configuration setting by DM

Refer to the document [3] for detail description.

4.2.2.5. Confirm the connection with control center

Refer to the document [2] for detail description.

4.2.2.6. Program updating

Program updating using DM is described in the document [3].

Program updating using Upgrade server is described in the document [4].

5. Specification

5.1. Software features

- SMS mode/GPRS mode/SMS+GPRS mode
- Position request via SMS or GPRS
- Auto position logging or reports, based on configurable time or distance interval
- Data logging capacity : up to Max. 1,440 point
- Upload/download settings, locations, and update firmware via GPRS.
- Configurable GEO-fencing
- Configurable 3 digital inputs for alert messaging
- 2 analog inputs for alert messaging
- Configurable 2 digital outputs for remote control of vehicle
- Combination of GSM network based tracking and GPS tracking possible

5.2. Hardware features

- **GSM/GPRS Core**
Siemens MC55 : 900/1800/1900 MHz
Siemens MC56 : 850/1800/1900 MHz
- **GSM/GPRS services**
Data, SMS/ GPRS class B, class 10, TCP IP
- **Physical characteristics**
Dimensions(L x W x H) : 104 x 73 x 29.8 mm
Weight : approx. 160 g (Including internal battery)
- **Temperature range**
Operation: -20°C to +70°C
Storage temperature -40°C to +80°C
- **Power sources**
Input Voltage: 10~32 Volt DC regulated / Max. 2A
Rechargeable & replaceable Li-ion Battery 1800 mAh
- **Interfaces**
12-pin vehicle I/O interface :
USB connector interface
Serial RS232C Interface

- **Antenna**
 - Default GPS patch antenna
 - External GSM/GPRS antenna
 - Optional external boost GPS antenna
- **Indication**
 - 3 LED's for GSM/GPRS and GPS status
- **Certificate**
 - Compliant with the EU RoHS Directive
 - CE, FCC, E-mark

5.3. Technical specification

- **GSM/GPRS modem specification**

Frequency bands	MC55 Tri-band : EGSM 900, DCS 1800, PCS1900 MC56 Tri-band : GSM 850, DCS 1800, PCS 1900 Compliant to GSM Phase 2/2+
GSM class	Small MS
Transmit power	Class 4 (2W) at EGSM900 and GSM850 Class 1 (1W) at DCS1800 and PCS 1900
GPRS connectivity	GPRS multi-slot class 10 GPRS mobile station class B
DATA GPRS	Data up/ downlink transfer: max. 85.6/ 42.8 kbps Coding scheme: CS-1, CS-2, CS-3 and CS-4 Supports the protocols PAP and CHAP commonly used for PPP connections. Support Packet Switched Broadcast Control Channel (PBCCH)
DATA CSD	CSD transmission rates: 2.4, 4.8, 9.6, 14.4 kbps, non-transparent Unstructured Supplementary Services Data (USSD) support
SMS	SMS, MT, MO, CB, Text and PDU mode SMS storage: SIM card and 25 SMS locations in the mobile equipment Support transmission of SMS alternatively over CSD or GPRS. User can choose preferred mode.
TCP/IP stack	Internet services : TCP,UDP,HTTP,FTP,SMTP,POP3
FAX	Group 3 : Class 1, Class 2
SIM interface	Supported SIM card: 3V

Table 3. GSM/GPRS module specification

- **GPS module specification**

General	Receive frequency	1.57542 GHz +/- 1.023 MHz
	GPS datum	WGS-84
	Acquisition Rate	Conventional mode Cold/ Warm/ Hot start < 42/ 38/ 1 sec (95 % typical)
	Accuracy	Position: 10 meters CEP without SA Velocity: 0.1 meters/second, without SA Time: 1 microsecond synchronized to GPS time
	Channel	20-channel GPS

Table 4. GPS module specification

6. History

Document history		
V 0.9	Sep.28, 2007 star4u	Document creation.
V 0.91	Oct.11, 2007 star4u	Added chapter 2(Security) description Added chapter 3(Safety standards) description Added vehicle interface pin out.