

GPS/GSM/GPRS tracking module for protection against theft and carjacking

FEATURES

- Quad-band GSM/GPRS engine
- Built-in GPS and GPRS antenna
- SuperSense GPS sensitivity
- Assisted GPS ready
- Ultra-low power consumption
- Multi-polygon driving area
- High performance communication Protocol
- Multiple cell-ID geofencing
- Field configurable
- Compact design
- Maintenance-free
- RoHS-compliant



DESCRIPTION

The **TRAXLOGIX** OEM -110 tracking base printed circuit board (module) provides cost-effective, high-performance, passive protection against theft and carjacking for a wide variety of vehicles. Energy can be externally supplied by a non-rechargeable lithium/thionyl chloride battery pack, ensuring a life expectancy for the battery of up to four years. The module pcb contains a GPS receiver, a GSM/GPRS engine, and a microcontroller. Implementation of the module onto the customer motherboard pcb can be easily made using three standard plastic standoffs. GSM and GPS antennas are fully integrated into the module, reducing installation time even more. Using a full-featured duplex communication protocol, the product becomes a versatile communicative platform, allowing field setup programming, geofencing configuration, and real-time vehicle tracking. The GPS time to first fix can be greatly reduced by using the assisted GPS commands. these products are designed to communicate in duplex with a centralized dedicated server through a highly efficient communication protocol.

APPLICATIONS

The OEM -110 is specially designed for a quick and easy implementation into existing and new customers designed products for :

- Cars
- Trucks
- Industrial vehicles
- Boats
- Personal watercraft
- Motorbikes
- Trailers
- Motor home
- and much more

HOW IT WORK

The **TRAXLOGIX** OEM-110 tracking module contains real-time clock circuitry. After installation, the communication server configures the product to wake up the GSM regularly. Depending on the product's configuration setup, the product will stay attached to the GSM network for a pre-defined period of time. If no text message is received, the product will be forced back to sleep (and is thus disconnected from the GSM network for a certain period of time). When the sleeping period has expired, the real-time clock will wake up the product again, and so on. Should the vehicle be stolen, the server will send an sms over the GSM network. As soon as the product exits sleep mode and reconnects to the GSM network, the sms will be caught by the product. At this stage, the product is in alarm mode and permanently connected to the network, awaiting further sms requests from the communication server. Another way to put the product in alarm mode is through a GPRS connection. Using FTP, the server stores an alarm message in a predefined server directory. Each time the product connects to the GPRS network, a file-presence check is executed to see whether an alarm file can be detected. Working this way saves energy, extending battery life to up to four years using a 3.6V 6500 mA/h non-rechargeable lithium/thionyl chloride single cell.

CONNECTORS

If the module need to be connected to the customer motherboard, a single 30 pole 0.5mm pitch FPC cable will provide all the power supply lines and basic extensions. If general purposes and audio I/O's are required, access is provided through the uses of another 20 pole 0.5mm pitch FPC cable.

GPS RECEIVER

Information on the geographic position of the module is provided by a highly sensitive, 16-channel GPS receiver coupled with a passive ceramic patch antenna. SuperSense technology allows enhanced indoor tracking, thanks to the high sensitivity of the receiver. Time to first fix can also be seriously reduced if needed. In this case, an approximate position is first estimated using geofencing through the cell-IDs of the GSM network. The data are then sent to a dedicated server. A data file is formatted and resent to the GPS receiver of the product. The GPS receiver is always disconnected until the vehicle has been declared stolen, reducing power consumption to a minimum.



GSM-GPRS ENGINE

The **TRAXLOGIX** OEM-110 tracking module contains a quad-band GSM/GPRS engine covering the following frequencies : 850, 900, 1800, and 1900 Mhz. The module has been approved by the FTA, GCF, PTCRB and the FCC. Communication can be achieved using GPRS class 10, SMS, and MMS data transfer. An internal SIM card socket is included on the module.

MICROCONTROLLER

The **TRAXLOGIX** OEM-110 tracking module uses a 64-pin high-performance, 8-bit flash microcontroller. Program memory space can be increased for additional software source code if required for custom applications.

MULTI-POLYGON AREA

The multi-polygon area function provides the ability to check whether the vehicle is in a pre-defined geographical area. Up to 16 areas, each containing up to 16 position points, can be stored in the nonvolatile memory of the product. The position of the vehicle can be ascertained using GPS or GSM cell ID. If the position is located outside one of the predefined areas, an sms is sent to the communication server, allowing further action to be taken. Every time the product is awakened, the analysis will be performed. The software embedded in the microcontroller will automatically calculate the position by creating a virtual diagonal between two position points.

BATTERY MONITORING

The battery's condition is permanently monitored by the module. When the battery needs to be replaced, a text message is sent to the communication server, allowing further action to be taken.

VIBRATION/SHOCK SENSOR

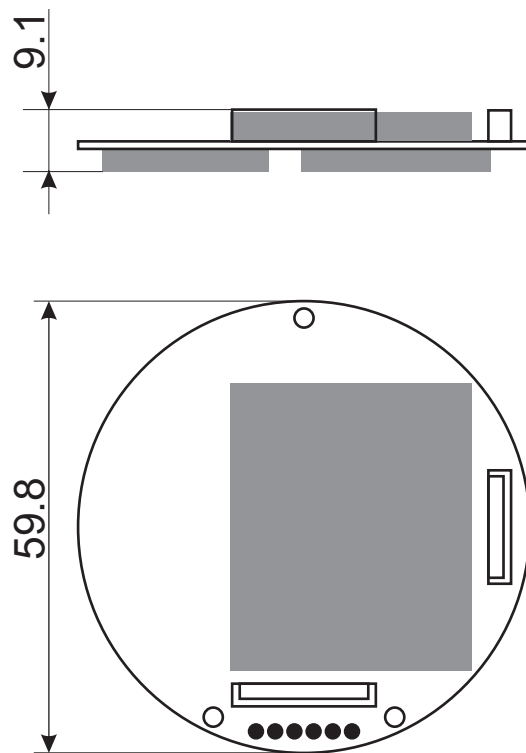
The **TRAXLOGIX** OEM-110 tracking module includes a vibration/shock sensor. If the product will not be used and will not move for a long period of time, the communication server can disable it. When the vehicle is physically moved, the sensor will wake up the product and send an alert sms message to the communication server, allowing further action to be taken.

FIELD CONFIGURATION

The **TRAXLOGIX** OEM-110 tracking module can be configured and re-configured by the communication server after the product has been installed in the vehicle.

LED INDICATION

The **TRAXLOGIX** OEM-110 tracking module provides a visual indication of the product's status and battery condition through a tri-color LED.



All dimensions are in millimeters

ELECTRICAL CHARACTERISTICS

CHARACTERISTICS	VALUE	UNIT
Nominal Supply Voltage:	3.6	Volt
Power consumption during Communication:	2200 max (During Tx Burst)	mA
Power consumption in Sleep Mode:	65	μ A
Power consumption in Standby Mode	4.7 (Connected to GSM network)	mA

ENVIRONMENTAL CHARACTERISTICS

CHARACTERISTICS	VALUE	UNIT
Storage temperature range:	-20 to +85	$^{\circ}$ C
Normal operating temperature range:	-10 to +55 (see NOTE1)	$^{\circ}$ C
Extended operating temperature range:	-20 to +70 (see NOTE2)	$^{\circ}$ C
Long damp heat operating conditions:	Tested at +60 $^{\circ}$ C,95% RH,500 hours	
Short damp heat storage & transportation conditions:	Tested at +40 $^{\circ}$ C,95% RH,90 hours	

NOTE1: Inside this normal range, the GSM engine inside the Product guarantee full compliance with GSM standards. Certification tests reports applies to the GSM engine operating in this interval.

NOTE 2: Inside this extended range, the operability is guaranteed. However, there is not a full certification test report in this range. Practically, TRAXLOGIX performs non regression tests in this range in order to ensure that the GSM engine inside the Product can attach to the network and handle a data transfer. Some performances may remain under the normal GSM expectation (sensitivity reception level 1 or 2 dB lower, TX emitting power slightly weaker).

FPC 30 POLE CONNECTOR I/O CHARACTERISTICS

PIN NBR	PIN TYPE	BUFFER TYPE	VOLTAGE MIN	VOLTAGE MAX	CURRENT MAX	PULL U/D ON PCB	DESCRIPTION OF LINES
1	-	-	-	-	-	-	SIM card VCC
2	-	-	-	-	-	-	SIM card RST
3	-	-	-	-	-	-	SIM card CLK
4	-	-	-	-	-	-	SIM card DATA
5	O	TTL	0.1	2.8	3.0 mA	100K Vss	GSM engine green led output
6	O	TTL	0.1	2.8	3.0 mA	100K Vss	GSM engine red led output
7	O	TTL	0.1	2.8	2.5 mA	100K Vdd	GSM engine - UART - ring indicator
8	I	TTL	0.1	2.8	-	100K Vdd	GSM engine - UART - receive data
9	O	TTL	0.1	2.8	2.5 mA	100K Vdd	GSM engine - UART - transmit data
10	O	TTL	0.1	2.8	2.5 mA	100K Vdd	GSM engine - UART - clear to send
11	I	TTL	0.1	2.8	-	100K Vdd	GSM engine - UART - request to send
12	PWR	-	3.6	4.2*	2.2 A pk	-	Power supply Vdd
13	PWR	-	3.6	4.2*	2.2 A pk	-	Power supply Vdd
14	PWR	-	3.6	4.2*	2.2 A pk	-	Power supply Vdd
15	PWR	-	0.0	0.0	2.2 A pk	-	Power supply Gnd
16	PWR	-	0.0	0.0	2.2 A pk	-	Power supply Gnd
17	PWR	-	0.0	0.0	2.2 A pk	-	Power supply Gnd
18	O	TTL	0.1	2.8	2.5 mA	100K Vdd	GSM engine - UART - data set ready
19	O	TTL	0.1	2.8	2.5 mA	100K Vdd	GSM engine - UART - data carrier detect
20	I	TTL	0.1	2.8	-	100K Vdd	GSM engine - UART - data terminal ready
21	I	TTL	0.1	3.0	-	100K Vdd	GPS receiver boot mode
22	O	TTL	0.1	3.0	2.5 mA	100K Vdd	GPS receiver - UART - transmit data
23	I	TTL	0.1	3.0	-	100K Vdd	GPS receiver - UART - receive data
24	I/O	ST	0.1	5.5	3.0 mA	-	μP ICSP - PGD line
25	I	ST	0.1	5.5	-	-	μP ICSP - PGC line
26	I	TTL	0.1	3.0	-	-	Master clear input
27	O	TTL	0.1	3.0	3.0 mA	100K Vss	μP green led output
28	O	TTL	0.1	3.0	3.0 mA	100K Vss	μP red led output
29	PWR	-	2.95	3.05	10 mA	-	Regulated +3V output
30	O	TTL	0.1	3.0	1mA	-	RTC 32 Khz output

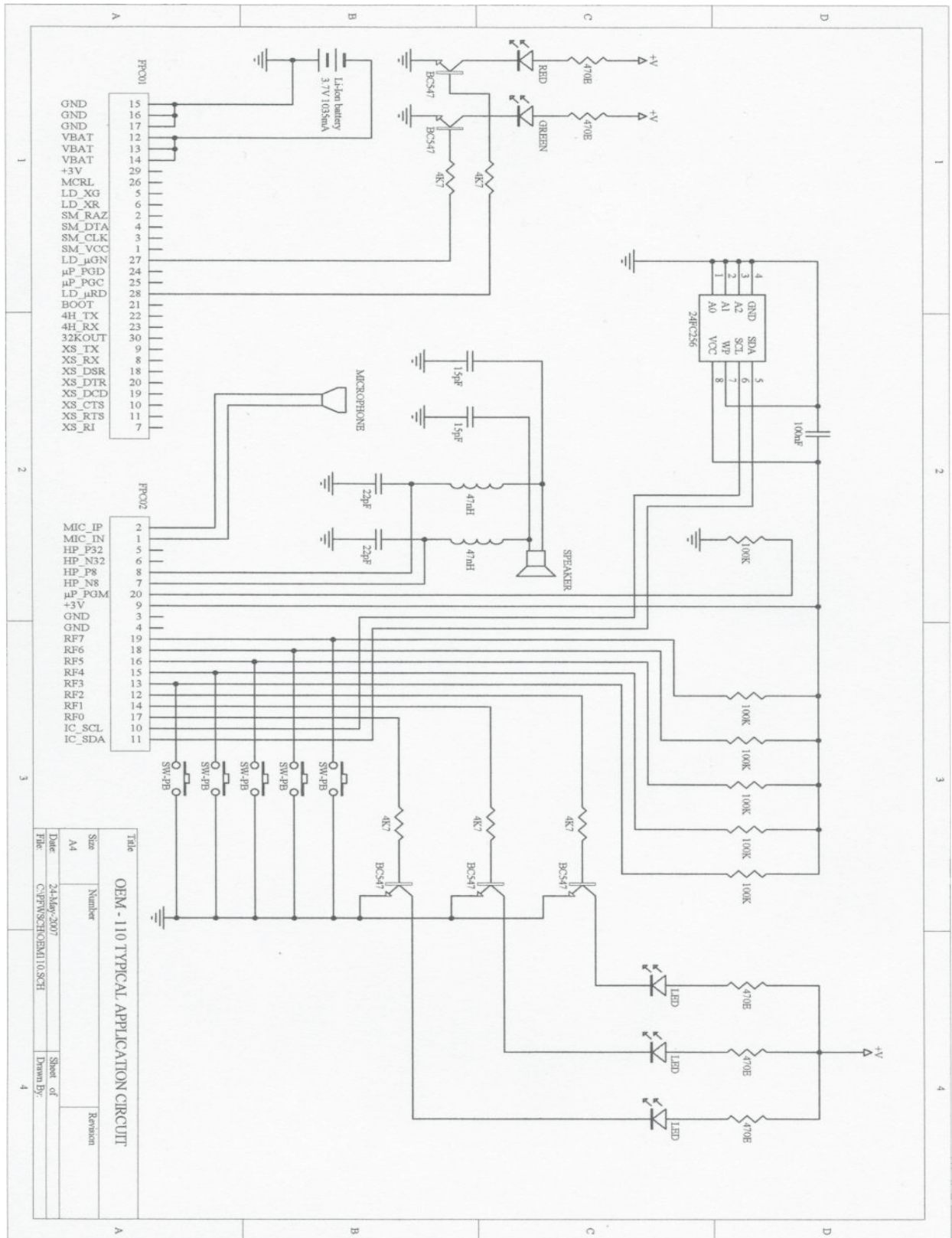
FPC 20 POLE CONNECTOR I/O CHARACTERISTICS

PIN NBR	PIN TYPE	BUFFER TYPE	VOLTAGE MIN	VOLTAGE MAX	CURRENT MAX	PULL U/D ON PCB	DESCRIPTION OF LINES
1	I	AN	-	-	-	-	Micro positive input
2	I	AN	-	-	-	-	Micro negative input
3	PWR	-	0.0	0.0	2.2 A pk	-	Gnd
4	PWR	-	0.0	0.0	2.2 A pk	-	Gnd
5	O	AN	-	-	-	-	Speaker 32 ohms positive output
6	O	AN	-	-	-	-	Speaker 32 ohms negative output
7	O	AN	-	-	-	-	Speaker 8 ohms negative output
8	O	AN	-	-	-	-	Speaker 8 ohms positive output
9	O	-	2.95	3.05	10 mA	-	Regulated +3V output
10	O	TTL	0.1	3.0	3.0 mA	22K Vdd	I ² C SCL line
11	I/O	TTL	0.1	3.0	3.0 mA	22K Vdd	I ² C SDA line
12	I/O	ST	0.1	3.0	3.0 mA	RQE	General purpose port I/O bit 2
13	I/O	ST	0.1	3.0	3.0 mA	RQE	General purpose port I/O bit 3
14	I/O	ST	0.1	3.0	3.0 mA	RQE	General purpose port I/O bit 1
15	I/O	ST	0.1	3.0	3.0 mA	RQE	General purpose port I/O bit 4
16	I/O	ST	0.1	3.0	3.0 mA	RQE	General purpose port I/O bit 5
17	I/O	ST	0.1	3.0	3.0 mA	RQE	General purpose port I/O bit 0
18	I/O	ST	0.1	3.0	3.0 mA	RQE	General purpose port I/O bit 6
19	I/O	ST	0.1	3.0	3.0 mA	RQE	General purpose port I/O bit 7
20	I	TTL	0.1	3.0	3.0 mA	RQE	μP ICSP - PGM line

* = 4.2V allowed during Li-Ion battery charge process

RQE = An external pull-up or pull-down resistor is required

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Title		Revision	
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