

## GPS/GSM/GPRS tracking device with integrated antenna

### 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
- Quick Installation
- Integrated GPS/GSM antenna
- Reduced size enclosure
- Maintenance-free
- RoHS-compliant



### DESCRIPTION

The **TRAXLOGIX** TRX-400 tracking base unit provides cost-effective, high-performance, fleet management solution for a wide variety of vehicles. The product is designed as a stand-alone unit. Energy is either supplied by the car battery or a rechargeable li-Ion backup battery pack. The product enclosure contains a GPS receiver, a GSM/GPRS engine, and a microcontroller. Installation requires no tools or special skills and takes only a few minutes. GSM and GPS antennas are fully integrated into the enclosure, 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. All **TRAXLOGIX** tracking products are designed to communicate in duplex with a centralized dedicated server through a highly efficient communication protocol.

### APPLICATIONS

The TRX-400 is specially designed for fleet management and asset monitoring of:

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

## HOW IT WORK

The **TRAXLOGIX** TRX-400 tracking base unit 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.

## PRODUCT INSTALLATION

The **TRAXLOGIX** TRX-400 tracking base unit provides a true technical advance over competitive third party AVL systems. Thanks to the GPS and GSM integrated antenna. Installation time is optimized thus reduced to a minimum.

## GPS RECEIVER

Information on the geographic position of the vehicle is provided by a highly sensitive, 50-channel GPS receiver (Ublox) 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 TRX-400 tracking device is available with Ublox or SkyTraq GPS receiver. Assisted GPS (A-GPS) is delivered as standard feature in all TRX-400 tracking devices based on Ublox GPS receiver.

## TEMPERATURE SENSOR

The **TRAXLOGIX** TRX-400 tracking base unit may be ordered with an on-board high accuracy temperature sensor. Additional external temperature sensors (max. 3 sensors per device) may be connected to the temperature sensor input of the device.

## FLOWMETER INPUT

The **TRAXLOGIX** TRX-400 tracking base unit may be ordered with a flowmeter input and integrated digital counter with reset function, allowing to monitor fuel, water or other liquid flow and total consumption.

## GSM-GPRS ENGINE

The **TRAXLOGIX** TRX-400 tracking base unit 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, P TCRB and the FCC. Communication can be achieved using GPRS class 10, SMS, and MMS data transfer. An internal SIM card socket is included in the product enclosure.

## MICROCONTROLLER

The **TRAXLOGIX** TRX-400 tracking base unit 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 product. When the battery pack needs to be recharged, a text message is sent to the communication server, allowing further action to be taken.

## VIBRATION/SHOCK SENSOR

The **TRAXLOGIX** TRX-400 tracking base unit 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** TRX-400 tracking base unit can be configured and re-configured by the communication server after the product has been installed in the vehicle.

## LED INDICATION

The **TRAXLOGIX** TRX-400 tracking base unit provides a visual indication inside the device's enclosure of the product's status and battery condition through a tri-color LED.

## CANBUS INTERFACE

The **TRAXLOGIX** TRX-400 tracking base unit may be ordered with a CANBUS interface circuitry, firmware of the device may be customized in accordance with technical communication specification of the vehicle.

## OBD-II DIAGNOSTIC

The **TRAXLOGIX** TRX-400 tracking base unit may be ordered with a OBD-II interface circuitry, firmware of the device may be customized in accordance with technical communication specification of the vehicle.

## SERIAL PORT INTERFACE

The **TRAXLOGIX** TRX-400 tracking base unit may be ordered with a serial port interface circuitry, firmware of the device may be customized in accordance with technical communication specification of the external accessory that will need to be connected to the TRX-400 device. Serial port interface is available in two versions, with TTL level (0-3V) or RS-232-C compatible level.

## GENERAL PURPOSE I/O

The **TRAXLOGIX** TRX-400 tracking base unit is delivered with general purpose digital and analog I/O's. Dallas I-button 1 wire protocol input with Led indicator output is also available for driver identification as an option.

## ENGINE STOP MODULE

The **TRAXLOGIX** TRX-400 tracking base unit may be ordered with a power interface additional circuitry, this module allows to remotely and safely stop the engine of the vehicle. Ignition is only killed after the positive after key (contact key) has been released for at least 20 seconds. The module integrates two separate ignition power relays. The module is delivered with further options such as horn and blinkers power control, in this case if the engine is killed, the horn and blinkers will be activated when the driver attempt to start the engine by turning the contact key ON. The module may also remotely control the opening and closing of the vehicle's doors.

## AUDIO INTERFACE PORT

The **TRAXLOGIX** TRX-400 tracking base unit may be ordered with an audio interface port. A mobile phone headset can be directly connected to this port allowing the driver of the vehicle to call and receive phone (voice) calls.

## LOG MEMORY

The **TRAXLOGIX** TRX-400 tracking base unit may be ordered with various LOG memory capacity and technology. S-RAM is the cheapest option but stored data may be lost if the car's battery is disconnected and the backup battery is discharged. F-RAM are non volatile memories and data will remain stored if power fails. Memory capacity is available in 256 Kbit S-RAM version and 256, 512, 1024 or 2048 Kbit F-RAM versions.

**MECHANICAL**



## ELECTRICAL CHARACTERISTICS

CHARACTERISTICS	VALUE	UNIT
Nominal Supply Voltage:	10-30VDC	Volt
Power consumption during Communication:	2200 max (During Tx Burst)	mA
Power consumption in Sleep Mode:	65	$\mu$ 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).

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