



COMPANY BROCHURE

Products - Custom Solutions - Services

ABOUT VARI-TRAC

We are a talented group of entrepreneurs and engineers with groundbreaking Sensor ideas designed that contribute towards a better tomorrow. We provide smart solutions for companies of all sizes and pride ourselves on our unparalleled, dedicated service. At VARI-TRAC, we believe that the right understanding and technological edge can lead our customers towards a successful and more productive future.

Our blend of Building Block Standard Products, Custom Adaptations & Bespoke Solutions enables VARI-TRAC to deliver unparalleled technical solutions.

Follow us on  

Product Short Form

VARI-TRAC offer a range of Standard Products that complement our Customised Solutions and Service offering.

Our agile design process enables a complete range of asset tracking solutions that covers a broad range of industries and applications.

Product Highlights Include

- GPS
- LoRa
- Bluetooth 4.0
- Bluetooth 5.0
- Quad Band GPS
- Quad Band GPRS
- Micro SIM
- Micro SDHC
- Digital I/O
- 3 Axis Gyro

Applications - include Logistics, Automotive, Industrial, Agricultural, Governmental, Civil, Maritime, Defence & Domestic.....



VARI-TRAC Telemetry Range	TAG-TRAC	TELE-TRAC	SAT-TRAC	SAFE-TRAC	SENSOR-TRAC	SECURE-TRAC	TRAIL-TRAC	LEVEL-TRAC
Hardware								
3-axis Accelerometer	✓	✓	✓	✓	✓	✓	✓	✓
3-axis Gyro	✓	✓	-	✓	✓	✓	✓	✓
Analogue I/O	-	✓	-	✓	✓	✓	✓	✓
Bluetooth 4.0 / 5.0	✓	✓	✓	✓	✓	✓	✓	✓
CAN Bus 2.0b	✓	✓	-	✓	✓	✓	✓	✓
Data Encryption	✓	✓	✓	✓	✓	✓	✓	✓
Digital I/O	✓	✓	-	✓	✓	✓	✓	✓
Electronic Compass	✓	✓	-	✓	✓	✓	✓	-
Emergency button	✓	-	-	-	-	-	-	-
GPS Tracking	✓	✓	✓	✓	✓	✓	✓	✓
Humidity Sensor	-	-	-	-	✓	-	-	-
Intrinsically safe IP-67 case	-	-	-	✓	-	-	-	-
Light Sensor (optical)	-	-	-	-	✓	-	✓	-
Lock Mechanism for cable	-	-	-	-	-	✓	-	-
Lock Mechanism for case	-	-	-	-	-	✓	-	-
Locking Activation System	-	-	-	-	-	✓	-	-
LoRa Transceiver	✓	✓	-	✓	✓	✓	✓	-
Microphone (overt and covert)	-	✓	-	-	✓	-	-	-
Micro-SDHC Card	-	✓	-	✓	✓	✓	✓	-
Micro-SIM	-	✓	-	✓	✓	✓	✓	✓
Over-the-air Firmware Update	-	✓	✓	✓	✓	✓	✓	✓
Proximity Sensor	-	-	-	-	✓	-	✓	-
Quad Band GSM/GPRS	-	✓	-	✓	✓	✓	✓	✓
Security hardened IP-67 case	-	-	-	-	-	✓	-	-
Shock Sensor	-	-	-	-	✓	-	✓	✓
Speaker output (overt and covert)	-	✓	-	-	-	-	-	-
Temperature Sensor	✓	✓	✓	✓	✓	✓	✓	✓
Tilt Sensor	-	-	-	-	✓	-	✓	✓
Wide Range Temperature Sensor	-	-	-	-	✓	-	-	-

TELE-TRAC Family & Product Information

TELE - TRAC

With multiple GSM, Bluetooth & LoRa communications this affordable, low power tracking and telemetry product that helps you keep an eye on your business. A very adaptable product that supports a range of applications that includes industrial, military & Oil & Gas. Coming in at half the size of a smart phone with extremely long battery powered operation, this IP67 device with highly accurate sensor functions allows the end user to adapt the product to most applications. With full two-way communications the system can not only monitor its location and associated sensors but allow remote control of other Input/Outputs.

LEVEL-TRAC

This device is a member of the **TELE-TRAC** family and allows the user to monitor the volumes in a tank to high levels of accuracy in both a static and dynamic environment. This low powered device lasts for years in the field and can work in most liquid and solid mediums including, oil, water, acids, alkaline, grains, sands/aggregates & granular food stuffs. It's on board GSM/Bluetooth/LoRa communications allows for both local area and national monitoring.

SENSOR-TRAC

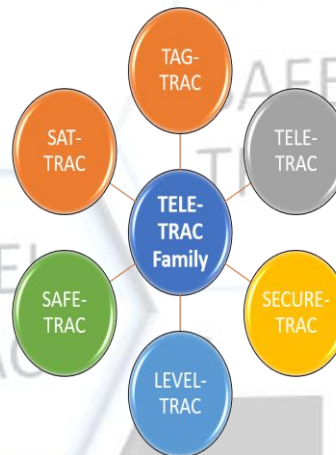
This device is a member of the **TELE-TRAC** family and allows for multiple sensor inputs to be collected. By using its high performance onboard micro-processor, it can intelligently monitor and react to variance outside of pre-determined parameters. These parameters are set remotely over the air or against pre-programmed criteria including time/amplitude or location.

SAT-TRAC

This device adds a new dimension to the **TELE-TRAC** product range and brings affordable & low power tracking via satellite from any global location. Being adaptable to any end use it combines with TELE-TRAC to deliver real time monitoring and control. Cost of data transmission is minimised using predefined canned messages. It can be linked with both TAG-TRAC & TELE-TRAC to create simple answers to a complex scenario.

TRAIL-TRAC

TRAIL-TRAC is focused on the transport industry and allows for pro-active vehicle management, including the ability to stop a vehicle from starting and stopping a vehicle whilst in transit. The system is designed & certified Home Office approvals. Versions with video & audio capture and real time transmission are also available. Driver RFID & Cargo tagging are also available.



TAG - TRAC

With no monthly communication fees this very small and portable device, fully enclosed and water proofed to IP67 with allow for digital Input/Outputs to be delivered using its highly accurate sensor functions. With its built-in industry leading over the air data security and firmware updates this non-GSM licence free radio communication device is the perfect monitoring and control solution in a campus / small area (1sq KM) environment. When integrated with **TELE-TRAC** information can be relayed via a singular GSM network to enable distant remote visibility.

SAFE - TRAC & SECURE-TRAC

These are derivatives of the **TELE-TRAC** device. **SAFE-TRAC** is designed in accordance with ATECS and allows the system to be installed in highly regulated areas, for example chemical plants, refineries and volatile transportation of hazardous substances.

SECURE-TRAC uses a cable based locking system which, if cut puts the unit into an alarm mode. This can be used in any security sensitive application and can also be used as confirmation that a load/lock has not been tampered with. The device is capable of operating within a curtain wall environment as well a static remote location. The cable locking mechanism maybe unlocked in agreed Geo-Fence locations (for customs purposes) all other unlocking is managed remotely by a Secure Operating Centre.

LoRa Technology Overview

LoRa is a Low Power radio specification intended for wireless battery-operated Telemetry in regional, national or global network. LoRa is a worldwide, license free band operating in the 868MHz and 902MHz bands which are available to users as defined by both ETSI and CEPT. LoRa's target key requirements of customers such as secure bi-directional communication, mobility and localization services. This standard will provide seamless interoperability among smart devices in our TAG-TRAC and TELE-TRAC range without the need of complex local installations and gives back the freedom to the users enabling the role out of a monitoring and communications service without the ongoing subscription costs charged by a mobile carrier.

LoRa's network architecture is well defined and allows for low bit rate data to be transmitted and received at ranges more than 10 miles LOS (Line of sight and subject to elevation and congestion)

All communication is generally bi-directional, although both TAG-TRAC/TELE-TRAC support operation such as multicast enabling software upgrade over the air or other mass distribution messages to reduce the on-air communication time.

Communication between end-devices and gateways is spread out on different frequency channels and data rates. The selection of the data rate is a trade-off between communication range and message duration. Due to the spread spectrum technology, communications with different data rates do not interfere with each other and create a set of "virtual" channels increasing the capacity of the gateway. LoRa data rates range from 0.3 kbps to 50 kbps.

To maximize both battery life of the Tag and overall network capacity, the LoRa network server manages the data rate and RF output for each end-device individually by means of an adaptive data rate (ADR) scheme.

National wide networks targeting critical infrastructures, confidential personal data or critical functions or where there is a need for secure communication has been solved by multiple layers of encryption:

Unique Network key (EUI64) and ensure security on network level
Unique Application key (EUI64) ensure end to end security on application level
Device specific key (EUI128)
nearly continuously open receive windows, only closed when transmitting. Class C

- **Very small and portable**
- **Extremely long-time battery powered operation**
- **Miniature Omnidirectional GPS antenna giving unparalleled reception of GPS signal**
- **Free-fall detection**
- **Dead reckoning navigation**
- **E-Call capable out of the box**

TELE-TRAC Specifications - DATA SHEET

General

- Micro-SDHC Card Configurable 8 – 32 GB Long Life ~11 months – collecting location & sensor data every 60 sec and reporting every 4 hours.
- Optional IP67 rated wiring harness for vehicle and external sensor integration Over-the-Air configuration and firmware update

Global Positioning

- Location Technology 72 channel GPS (with SBAS) Receiver Type GPS L1C/A, SBAS L1C/A, QZSS L1C/A, GLONASS L1OF, GALILEO E1B/C2, BeiDou B1 SBAS Type WAAS, EGNOS, MSAS, QZSS
- Location Accuracy <2.5m Autonomous, 2.0m SBAS Velocity Accuracy 0.1 m/s Heading Accuracy 0.5 degrees
- Tracking Sensitivity -166 dBm Acquisition Sensitivity Hot Start: -156 dBm, 1 sec TTFF Cold Start: -148 dBm, 30 sec TTFF, 3 sec aided Max Update Rate 18 Hz

Sensors

- 3-axis Accelerometer 2/4/8 G, Free fall detection 3-axis Gyro +/-250, +/-500, +/-2000 dps full scale Electronic Compass Full Range: ± 1000 µT Temperature Sensor -40° – 85° C

I/O

- CAN Bus 2.0b (ISO 11898-2/5) J1939 (FMS readout ready) Digital & Analog I/O 4 Digital inputs, 4 Digital outputs ADC – 2x 12bit max 1 MSps inputs DAC – 2x 12bit max 0.5 MSps outputs

Battery Type

- 3.7 VDC Lithium Ion (1150 mAh) Power/Data Connector Custom ip67 connector and charging/programming dock

Communications

- Cellular GSM/GPRS 850/900/1800/1900 MHz
- Available Protocols TCP, UDP, FTP, HTTP
- Output Power 850/900 (Class 4) – 2W 1800/1900 (Class 1) – 1W

SIM Form Factor Micro-SIM

Bluetooth Radio

- Type 4.0 LE single mode Frequency 2.402 - 2.480 GHz Max Transmit Power +4 dBm Receive Sensitivity -91 dBm

Low Power ISM Radio

- Type ISM band Custom over-the-air protocol Frequency 915 MHz Max Transmit Power 20 dBm Receive Sensitivity -97 to -148 dBm Max Range 2-5 km urban, ~15 km rural

Environmental Temperature

- -40° to +85° C (storage & operating)
- Humidity 95%RH @ 50° C non-condensing
- Shock and Vibration MIL STD 810E Method 514.4, Category10 IP 67 Dust tight
- Submersible to 1m for 30 minutes
- Altitude Max 15,000 m
- Chemical Impervious to diesel fuels and related chemicals.
- Will not degrade with direct sunlight and sea-spray.

Physical Dimensions

- 55 mm(L) x 35 mm(W) x 10 mm(H) Weight 65 grams Certifications Radio CE, FCC – in process

RoHS Compliant

TAG-TRAC Specification DATA SHEET

- **Microcontroller**
 - CPU ARM Cortex M0 @25 MHz
 - Global Positioning Location Technology 72 channel GPS Receiver Type GPS, QZSS, GLONASS, GALILEO, BeiDou SBAS Type WAAS, EGNOS, MSAS, QZSS
 - Location Accuracy <2.5m Autonomous, 2.0m SBAS Tracking Sensitivity -166 dBm Max Update Rate 18 Hz
- **Sensors**
 - 3-axis Accelerometer 2/4/8 G
 - Free fall detection Electronic
 - Compass Full Range: $\pm 1000 \mu T$
 - Temperature Sensor -55°C - +85°C
- **I/O**
 - Digital I/O 2 Digital inputs
 - 2 Digital outputs
- **Storage**
 - Memory Micro SD Up to 32 GB Micro SD card
- **Battery Type**
 - Lithium Power/Data Connector
 - Custom ip67 connector and charging/programming dock
- **Communications**
 - LORA™ RF Radio Type
 - Modulations ISM band transceiver FSK, GFSK, MSK, GMSK, LoRa, OOK
 - Frequency 433/915 MHz
 - Max Transmit Power 20 dBm (not EIRP)
 - Receive Sensitivity -97 to -148 dBm
 - Max Range 2-5 km urban, 15+ km rural
- **Environmental Temperature**
 - -40° to +85° C (operating) Shock and Vibration MIL STD 810E Method 514.4, Category10 IP 67 Dust tight, Submersible to 1m for 30 minutes Altitude Max 15,000 m

- **Chemical**
 - Impervious to diesel fuels and related chemicals.
 - Will not degrade with direct sunlight and sea-spray.
- **Physical Dimensions**
 - 45 mm(L) x 35 mm(W) x 10 mm(H) Weight 32 grams
- **Certifications**
 - CE FCC – in process
- **RoHS Compliant**
 - General Long Life ~12 months – collecting location data every 30 min & sensor data every 1 min and reporting every 3 hours.

SENSOR
TRAC

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