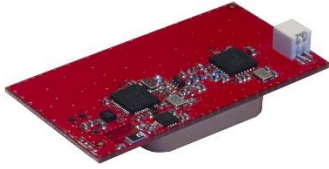


### KCS TraceME TM-2000 / P1A3 LoRa/Rf-module



The TM-2000 / P1A3 is a mid-range product line member of KCS' advanced TraceME track and trace modules. The TM-2000 is a cost-efficient, yet solid solution optimized for mass-production. It is targeted for remotely tracking and tracing a variety of objects.

The module is equipped with a non-rechargeable integrated battery. It offers accurate location based position data to be connected to any existing worldwide server application.

### Key Features

- LoRa® technology
  - 868MHz. / 915MHz. (\*)
  - Up to 60km line of sight at 25mW and with integrated antenna.
- Integrated 2.45GHz. radio for special functions and peripherals. (\*)
  - Long range, over 1 km range, line of sight
- Excellent indoor and outdoor performance with accuracy up to 1.5m
- Very small, only 50 x 26mm
- Lightweight: 17 grams for a fully equipped PCB
- Standby battery lifespan of more than 15 years.
- Onboard sensors:
  - 3D accelerometer (up to 16g)
  - temperature sensor
- 1 LED for user interaction. (\*)
- Wide operating range: -30°C ... +85°C
- Multiple watchdog levels for maximum stability.
- Event based free configurable module to fit any job.
- Remote configurable to fit any job (both firmware and configuration files can be updated over the air).
- Supports integration into third party networks.

(\*) Optional, please contact sales for more details.

### Applications

- Object protection, more than 15 years of standby on a single lithium AA-battery.
- Logistics, M2M
- Remote control and diagnostics
- Anti-theft

## Product Summary

The KCS TraceME TM-2000 is a mid-range, cost-efficient LoRa-based track and trace module with basic functionality. The combined LoRa and 2.4GHz. RF technologies offers an intelligent traceability functionality. An intelligent 'Listen before talk' algorithm makes it practically impossible to locate the module which secures the valuable vehicle or asset. It enables stolen object recovery and thereby offers insurance premiums reduction possibilities.

With RF beacon support and RF triangulation, an indoor geolocation accuracy up to 1.5 meters can be reached. In LoRa based networks the outdoor geolocation accuracy of static devices is typically 50 meters and can be further improved up to 1.5 meters by on-site RF localization.

With a minimal size of 50 x 26 mm, weight of only 17 grams and a battery lifespan of more than 15 years, the module offers endless OEM integration possibilities.

The functionality of the module can be remotely programmed to fit any job. From basic/general functionality to advanced/low-level application specific detailed functionality.

All of the necessary server-side scripts to process and store data from these units are available for registered distributors and resellers. If you do not want to host data and maps yourself, you can use the hosting services of one of our partner companies.

(\*) Optional, please contact sales for more details.

## Ordering information

- TM-2000 Basic version (LoRa and 2.45GHz. RF)
- (\*) Optional, please contact sales for more details.

### Enclosure (\*)



The picture above is an example of an available enclosure.


### Battery




Depending on the application, different battery types and capacities might be required, which can be provided separately.

## Specifications KCS TraceME TM-2000

### Data communication

LoRa	Semtech SX1272 transceiver
Frequency	868/915 MHz. (*)
Protocol	LoRaWAN 1.0.1 and custom LoRa protocol 
Transmitting power	up to +20 dBm
Sensitivity	-137 dBm

RF 2.4GHz.	Nordic nRF51822 
Frequency	2.45 GHz.
Protocol	BLE 4.0 and custom 2.4 GHz. protocol
Transmitting power	up to +20 dBm (with on-board amplifier)
Sensitivity	-93 dBm (BLE)

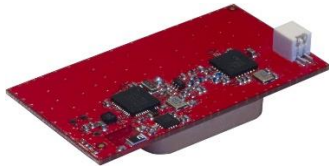
### Electrical

Power supply	Internal non-rechargeable Lithium battery
Typical power consumption	100mA BLE/LoRa transmission
	8uA standby, sensors, timer active, no transmissions

### Recommended environmental conditions

Operating Temperature	-30°C to +85°C (OEM) -20°C to +70°C (key fob housing)
Humidity	10% to 90%
Altitude	up to 2000 meters

## External Connections



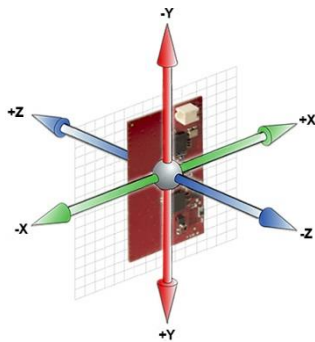
### Battery connector



Pin	Description
1	2.8 - 3.6V Non-rechargeable battery (+) connection
2	Ground

## Onboard sensors

### 3D accelerometer



The module contains a 3D accelerometer (up to 16g), which can be used for a variety of custom specific (M2M) applications. Accelerometers are useful for measuring movement, speed, g-forces and vibration of the object. The accelerometer and advanced embedded firmware enables a very low-power battery solution.

### Temperature sensor

The module contains a temperature sensor, which can be used for example to monitor and control any temperature sensitive equipment.

## About KCS BV

KCS BV, founded in The Netherlands in 1984, develops and manufactures electronics in-house for industrial applications, medical purposes, broad-casting solutions, etc.

KCS is ISO 9001:2015 and ISO 14001:2015 certified.



KCS is a LoRa Alliance member since 2016.

## Support

Visit our support page at: [www.trace.me](http://www.trace.me)

## Sales

Contact us by email: [Trade@trace.me](mailto:Trade@trace.me)

## Disclaimer

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