

## KCS TraceME TM-2016 / P3B2 LoRa-based asset management module



The TM-2016 / P3B2 is a product line member of KCS' advanced TraceME track and trace modules. It is designed for tracking and tracing a variety of IoT assets, targeting industrial, smart cities, transportation and logistics.

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
  - EU-868MHz.
  - 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.
- BLE 4.0 (\*)
- NFC for special functions and peripherals.
- Wi-Fi sniffing
- Indoor and outdoor performance with accuracy up to 5m
- Very small, only 50 x 26mm
- Lightweight: 23 grams for a fully equipped PCB, incl. battery.
- Standby battery lifespan of more than 10 years.
- Optional sensors: (\*)
  - 3D accelerometer (up to 16g)
  - Temperature sensor ( $\pm 0.5^{\circ}\text{C}$ )
- 1 LED for user interaction. (\*)
- IP68 rated enclosure (\*)
- Tamper contact (\*)
- Wide operating range:  $-20^{\circ}\text{C}$  ...  $+60^{\circ}\text{C}$   
Extended temperature on request.
- 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 10 years of standby on a single lithium battery.
- Indoor and outdoor asset management
- Logistics, bicycle tracking

## Product Summary

The KCS TraceME TM-2016 is a LoRa-based track and trace module with basic functionality.

The combined LoRa + Wi-Fi 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 asset. It enables stolen object recovery and thereby offers insurance premiums reduction possibilities.

The combined LoRa and Wi-Fi passive scanning functionality provides an indoor geolocation accuracy up to 5 meters. The module is able to discover the Wi-Fi b/g/n access points available in the vicinity of the device, and extract MAC addressing allowing to geolocate the device. The geolocation accuracy can be further improved by enabling 1-way beacon RF transmission, measuring the RF signal strength.

The TM-2016 contains an optional flexible tamper contact. By using the original enclosure, the tamper contact will stick out of the resin. The enclosure and tamper contact are being glued to the asset. When the enclosure is (fraudly) removed from the protected asset, the tamper contact will be ripped apart, resulting in a tamper alert.

With a minimal size of 50 x 26 mm, weight of only 23 grams and a battery lifespan of more than 10 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

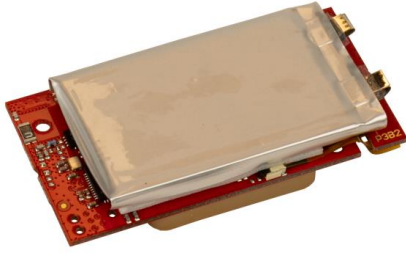
- TM-2016 Basic version (LoRa, Wi-Fi sniffing, NFC and proprietary 2.45GHz. RF)
- (\*) Optional, please contact sales for more details.

### Enclosure (\*)



The picture above is an example of an available enclosure.

## Battery



The module is equipped with a non-rechargeable battery.


- Rated voltage 3.0 Volt
- Nominal capacity 700 mAh
- Typical weight 7 gram
- Operating temperature -20 °C ~ +60 °C  
Extended temperature range on request.
- Storage temperature -5°C ~ +30 °C

## Typical power usage

Depending upon settings, the module can work up to 10 years on a full battery.

## Specifications KCS TraceME TM-2016

### Data communication

LoRa	Semtech LR1110 transceiver
Frequency	EU-868MHz.
Protocol	LoRaWAN 1.0.2 and custom LoRa protocol 
Transmitting power	up to +15 dBm
Sensitivity	-137 dBm

RF 2.4GHz.	Nordic nRF52832
Frequency	2.45 GHz.
Protocol	BLE 4.0 (*) and proprietary 2.4 GHz. protocol
Transmitting power	up to +20 dBm (with on-board amplifier)
Sensitivity	-96 dBm (BLE)

### Electrical

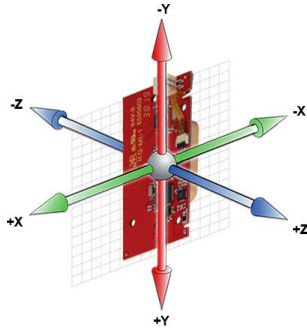
Power supply	Internal non-rechargeable Lithium battery, 700mAh
Typical power consumption	2.4GHz peak current: 100mA
	LoRa peak current: 50mA
	3.5uA standby, timer and watchdogs active, no transmissions

### Recommended environmental conditions

Operating Temperature	-20°C to +60°C (OEM) Extended temperature on request.
Humidity	10% to 90% (OEM) IP68 (module fully encapsulated in enclosure)
Altitude	up to 2000 meters

## Onboard sensors

### 3D accelerometer (\*)



The module contains an optional 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 an optional 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.



## LoRa Alliance Member™

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)

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