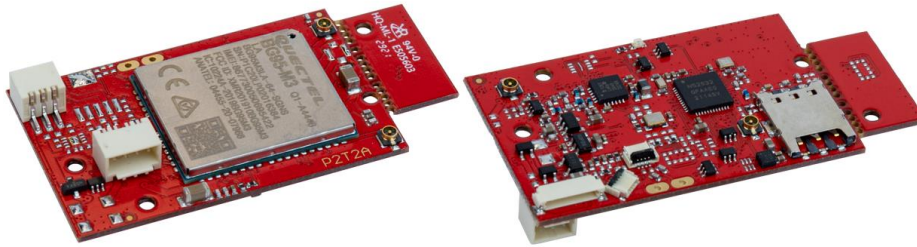# KCS TraceME TM-2206 / P2T2A
LTE-M / NB-IoT / LoRa / RF-module

KCS' TraceME TM-2206/P2T2A is a full-featured next generation IoT and tracking module.

The optional features, compact form factor, great positioning performance and low power consumption makes the TM-2206 the best choice for a wide range of M2M/IoT applications, such as smart waste management, security and asset management.

Key Features

- Excellent national telecom coverage (*)
  - LTE Cat M1 / NB-1 / EGPRS
  - LTE Cat M1 / NB-2 / EGPRS
- External antenna
- Nano SIM socket
- SIM-on-chip (*)
- Optional GNSS coverage, external antenna (*)
- LoRa® technology, EU-868MHz (*)
  - External micro coax antenna
- Integrated 2.45GHz. radio for special (*) functions and peripherals.
  - Short range, up to 30m
  - External micro coax antenna
- NFC for special functions and peripherals. (*)
- Optional sensors: (*)
  - 3D accelerometer (up to 16g)
  - Distance sensor (up to 4m)
  - Temperature sensor (±0.5°C)

- Very small, only 54.5 x 27.4mm
  - Optional 44.5 x 27.44 (*)
- Lightweight: 8.4 grams for a fully equipped PCB, (excl. battery)
- 5VDC power supply
- 8 – 14VDC power supply (*)
- Standby battery lifespan up to 10 years.
- 1 LED for user interaction (*)
- Extension connector, I2C interfacing
  - Optional external I2C OLED display, NFC/RFID-reader. (*)
- Wide operating range: -30˚C … +85˚C (depending on options)
- 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/patched over the air).
- Supports integration into third party networks.

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

Applications

- Smart waste management for smart cities.
- Object protection, up to 10 years of standby on a single lithium battery.
- Remote control and diagnostics.

Product Summary

The KCS TraceME TM-2206 is a full featured next generation LoRa-based IoT tracking module with fully customized functionality.

The module can be equipped with different optional features: LTE Cat-M1 / NB-IoT modem, GNSS, NFC, LoRa, Bluetooth Smart (BLE) and proprietary RF, acceleration-, temperature- and distance sensor (up to 4m) and external I2C sensor interfacing). The module can be fully customized dependent of the application.

The module provides reliable, optimized connectivity and coverage for the next generation 4G LTE Cat-M1 and NB-IoT networks and offers seamless fall back to 2G networks. In areas without network coverage, position-data and events are stored in memory. As soon as communication is restored, all information can be transmitted.

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.

Ordering information

The KCS TraceME TM-2206 can be equipped with different optional technologies for traceability. It can be fully customized dependent of the application. Please contact sales for more details.

Enclosure (*)

The picture above is an example of the 'proximity sensor enclosure'.

Battery (*)

The module can be used with a non-rechargeable battery, or rechargeable LiPo battery. Depending on the application, different battery types and capacities might be required, which can be provided separately.

Specifications KCS TraceME TM-2206

Data communication (*)

GPRS Modem	Quectel BG95-M3 LTE Cat M1 / NB-1, GSM Module, optional BG95-M2 LTE Cat M1 / NB-2 Module optional BG96 LTE Cat M1 / NB-1 Module, all global certifications and R&TTE directives.
Frequency bands	GSM/GPRS: 850/900/1800/1900 MHz LTE: B1-5, 8, 12, 13, 14 (Cat M1) 18, 19, 20, 25, 26, 27 (Cat M1), 28

LoRa	Semtech SX1261 transceiver
Frequency	EU 868 MHz.
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 custom 2.4 GHz. protocol
Transmitting power	up to +4 dBm
Sensitivity	-96 dBm (BLE)

Navigation (*)

GNSS	Quectel BG95/BG96 GNSS (GPS + (Glonass or Galileo))

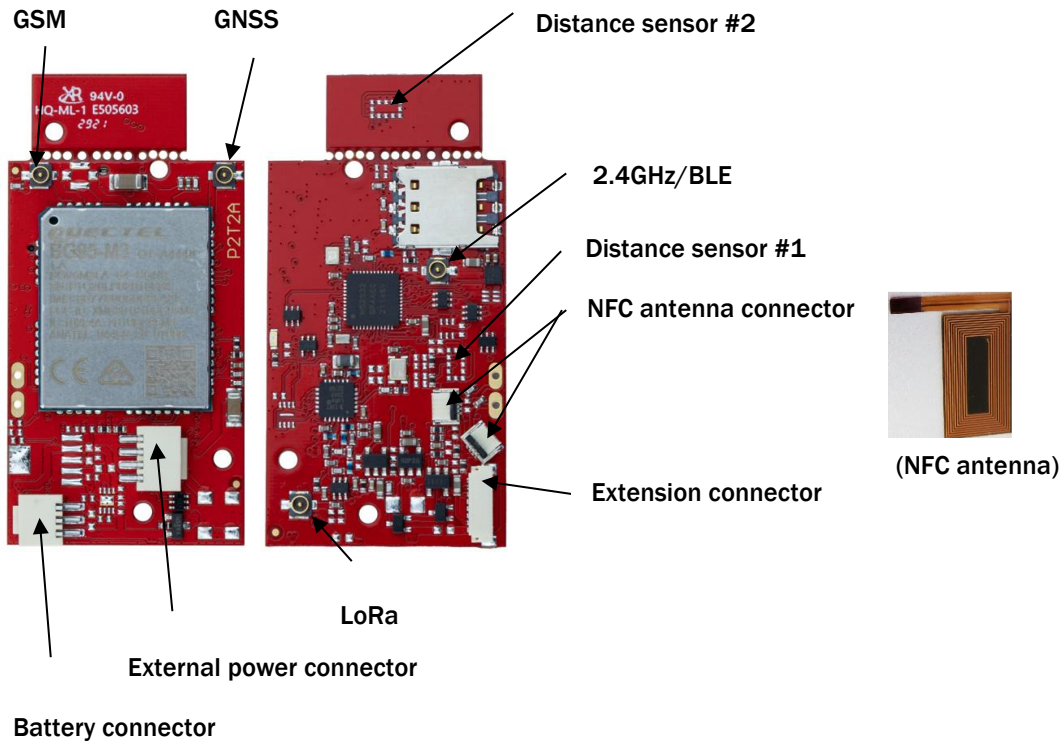(*) Optional, please contact sales for more details.

Operating Temperature Conditions

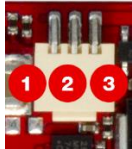| With rechargeable LiPo cell	-20°C … +60°C (discharging) 0°C … +45°C (charging)

Electrical

Power supply	Maximum range: +5VDC ±5% Optional: +8…+14VDC
Charging Current	Max 450mA. Observing 0...+45°C safety range for LiPolymer.
Power Consumption	10 µA standby (typical): Processor monitors timer + acceleration sensor + I/O, watchdog on, brownout detection on.
	Power consumption depends on amount of GPRS traffic and navigation parameters.

External Connections

GSM

GNSS

Distance sensor #2

2.4GHz/BLE

Distance sensor #1

NFC antenna connector

Extension connector

(NFC antenna)

LoRa

External power connector

Battery connector

Battery connector

Pin	Description
1	Temperature sensor
2	Ground
3	3.4 - 4.5V Battery (+) connection

Connector manufacturer:	Molex
Description:	1.50mm pitch Pico-SPOX pcb header, 3 circuits
Partnumber PCB connector:	874380343
Mates with cable connector:	874390300
Partnumber crimp serie:	87421

External power connector

Pin	Description
1	Power (+8V to +14VDC), optional +5VDC
2	Ground
3	Internal use only
4	Internal use only

Connector manufacturer: Molex
Description: 1.50mm pitch Pico-SPOX pcb header, 4 circuits
Partnumber PCB connector: 874380443
Mates with cable connector: 874390400
Partnumber crimp serie: 87421

Extension connector

Pin	Signal	Type	Description
1	VCC	VCC	+4.5 … +5.5 VDC Charge input, max 600mA
2	PWR-OUT	O	+2.8VDC power output for external I2C sensors
3	Serial IN	I	Serial input or digital input (2..31V for active high) ~ 50k pulldown
4	Serial OUT	O	Serial or digital output, open collector (max 31V/10mA/100mW)
5	I/O-1	I/O	Digital I/O (0…+3V)
6	SCL	O	I2C clock
7	SDA	O	I2C data
8	GND	GND	GND for charge and I/O

Connector manufacturer: JST
Partnumber PCB connector: SM08B-SURS-TF(LF)(SN)
Partnumber cable connector: 08SUR-32S
Partnumber crimp contact: SSUH-003T-P0.15

Onboard sensors

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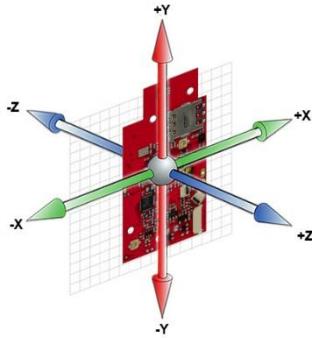
The module contains a 3D accelerometer (up to 16g), which can be used for a variety of custom specific (M2M) applications. Accelerometers are useful for measuring movement, speed, g-forces and vibration of the object. The accelerometer and advanced embedded firmware enables a very low-power battery solution.

Temperature sensor (*)

The module contains a temperature sensor (±0.5°C), which can be used for example to monitor and control any temperature sensitive equipment.

Distance sensor (*)

The module contains an optional advanced distance sensor (VL53L1x) , providing accurate distance measurement. The maximum range is 4m and the receiver field-of-view is programmable from 15 to 27 degrees. It can be used for advanced position detection applications. An optional IR lens is available to withstand ambient light performance influences.

Note: Distance sensor #1 **or** #2 can be equipped.
If #1 is used, the PCB size can be made smaller (44.5 x 27.4mm)

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

Sales

Contact us by email: Trade@trace.me

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