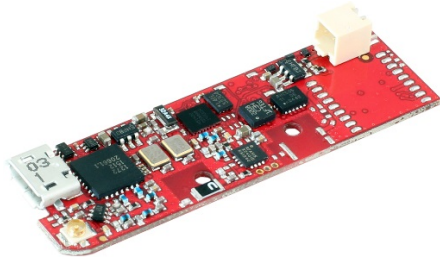


KCS TraceME TM-900 / N1C1 GPS/RF-module / OEM-version



The TM-900 / N1C1 is a budget product line member of KCS' advanced TraceME track and trace modules. The TM-900 is targeted for remotely tracking and tracing a variety of objects, even livestock, and for personal use.

The TM-900 offers excellent long range RF coverage and is equipped with a low-power GPS receiver.

The module is equipped with multiple on-board sensors, low-level I/O-connectivity and a solar (*) rechargeable integrated battery. It offers accurate location based position data to be connected to any existing worldwide server application.

Key Features

- Excellent satellite coverage
 - GPS
 - Glonass/GPS (*)
- Very small, only 49.6 x 15mm
- Lightweight: 3.4 grams for a fully equipped PCB
- Standby battery lifespan of more than 10 years.
- OEM version
- Excellent GPS accuracy, internal antenna.
- Integrated 2.45GHz. radio for special functions and peripherals.
 - Short range, up to 30m (*)
 - Long range, over 1 km range, line of sight
- LoRa™ technology, up to 10km, line of sight
- Excellent indoor and outdoor performance with accuracy up to 1.5m
- 3 LEDs for user interaction.
- 1 switch for user interaction.
- Onboard sensors:
 - Temperature sensor ($\pm 0.5^{\circ}\text{C}$)
 - 3D accelerometer (up to 16g)
 - Humidity sensor (*) ($\pm 2\% \text{RH}$)
- Wide operating range: $-20^{\circ}\text{C} \dots +85^{\circ}\text{C}$
- Multiple watchdog levels for maximum stability.
- Solar cell powered (*)
- Versatile interfacing:
 - Digital I/O
 - Serial, 3V
 - iButton™ / 1-Wire™
- Buzzer
- Event based free configurable module to fit any job.
- Remote maintenance. 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, up to 10 years of standby on a single lithium AAA-battery.
- Logistics, M2M
- Animal tracking, asset monitoring
- Security and surveillance
- Remote control and diagnostics
- Anti-theft

Product Summary

Equipped with a state-of-the-art GPS receiver, the KCS TraceME TM-900 / N1C1 module provides reliable and accurate navigational data.

The full version module (TM-900F) is equipped with different technologies for traceability (e.g. GPS/Glonass, LoRa™, Bluetooth LE, ANT/ANT+ and proprietary RF), which can all be combined dependent of the application. The low-budget basic version module (TM-900B) is equipped without GPS while still offering the highly intelligent traceability functionality.

The combined LoRa™ and 2.4GHz. RF technologies offers tracing of the module over a wide area up to 10km. The rough tracing from 10km down to 300 meters is done by LoRa™, while the short-range tracing is done by the proprietary RF-technique. This technique offers excellent indoor and outdoor tracing with an accuracy up to 1.5 meters. Traditional national telecom costs are avoided because of the absence of GPRS/SMS.

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.

Multiple on-board sensors (temperature, humidity (*) and acceleration) as well as buzzer, LEDs, I/O-functionality and pushbutton enable the integration of TraceME into a variety of custom specific (M2M) applications. With a minimal size of 49.6 x 15 mm, weight of only 3.4 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.

All of the necessary server-side scripts to process and store data from these units are available, free of charge. 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-900F Full version (Long-range RF, optional Solar-charger)
- TM-900B Basic version (TM-900F without: GPS, Buzzer, Solar-charger)
- (*) Optional, please contact sales for more details

Specifications KCS TraceME TM-900

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 nRF81422 (BLE only) optional nRF51422 (BLE/ANT)
Frequency	2.45 GHz.
Protocol	BLE 4.0, ANT and custom 2.4 GHz. protocol
Transmitting power	up to +20 dBm (with on-board amplifier)
Sensitivity	-93 dBm (BLE), -90 dBm (ANT)

Navigation (*)

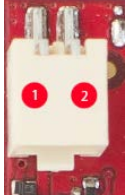
GPS Receiver	Quectel L70 GPS module, optional L76 GNSS (Glonass + GPS) module	
Frequency	GPS L1 1575.42 MHz. C/A Code, 48 search channels Glonass L1 1598.0625 ~ 1605.375 C/A Code	
Sensitivity	Acquisition	-148 dBm (typical)
	Reacquisition	-160 dBm (typical)
	Tracking	-165 dBm (typical)
Horizontal Position Accuracy	<2.5 m CEP	

Electrical

Power supply	Default: Internal non-rechargeable Lithium AAA primary cell (+3.7V/650mAh), or: External +5VDC ±10% (micro USB-connector) Optional: Rechargeable Lithium battery Optional: Solar cell 5V + rechargeable Lithium battery
Typical power consumption	2mA GPS low power tracking
	100mA BLE/LoRa™ transmission
	13 uA standby, sensors, timer and I/O active, no transmissions

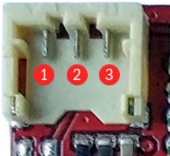
External Connections

Power connector



Pin	Description
1	3.4 - 4.2V Non-rechargeable battery (+) connection
2	Ground

Power connector (*)



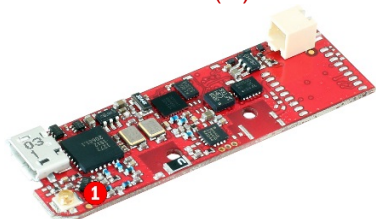
Pin	Description
1	3.4 - 4.2V Rechargeable battery (+) connection
2	Ground
3	Temperature sensor / Optional: Solar cell 5V

Micro-USB



Pin	Signal	Type	Description
1	USB VCC	VCC	+4.5 ... +5.5 VDC Charge input, max 600mA
2	Serial IN	I	Serial input or digital input (2..31V for active high) ~ 50k pulldown
3	Serial OUT	O	Serial or digital output, open collector (max 31V/10mA/100mW)
4	NC	-	Not Connected
5	GND	GND	GND for charge and I/O

External antenna (**)

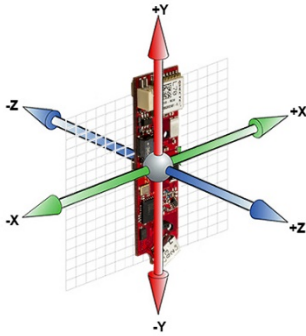


Pin	Description
1	ISM-antenna

(**) Please contact sales for more details.

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 ($\pm 0.5^{\circ}\text{C}$), which can be used for example to monitor and control any temperature sensitive equipment.

Humidity sensor (*)

The module contains an optional humidity sensor ($\pm 2\% \text{RH}$), which can be used to monitor and control any object in an environmental sensitive infrastructure, for example goods stored in a unmanned warehouse.

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.

Support

Visit our support page at: www.trace.me

Sales

Contact us by email: Trade@trace.me

Final notes & certification

We certify that Kolff Computer Supplies BV, Dordrecht, The Netherlands does not make any hardware or IMEI modifications to the QUECTEL devices as used in the TraceME track & trace device. All software modifications are restricted to official firmware upgrades as provided by Quectel Wireless Solutions Co., Ltd..

KCS is ISO 9001:2008 and ISO 14001 certified since 1999.

WARNING:

- The device should be turned off in vicinity of petrol pumps, chemical, flammable or hazardous environments where ignition of flammable atmospheres is possible.
- The module and antennas shall be operated at a distance greater than 20 cm from the human body.
- The device is to be operated in accordance with the user instructions or manufactured recommendations.

Disclaimer

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