KCS TraceME TM-202 / R9C5
GPS / GPRS / LTE-M / NB-IoT module

The KCS GPRS/GPS range of modules enables you to remotely track & trace people, animals and a variety of objects, e.g. cars, trucks, containers, (motor)cycles, lawnmowers, vessels, etc.

KCS TraceME TM-202 / R9C5 is targeted for personal use, or any other application that needs a small size with extremely long battery life. It offers multiple connectivity options and server connections.

Key Features

- National telecom & worldwide satellite (GNSS) coverage
    - Quad-band GSM/GPRS
    - UMTS/HSPA   (*)
    - LTE Cat M1 / NB-1 / EGPRS   (*)
    - LTE Cat M1 / NB-2 / EGPRS   (*)
    - GPS
    - Glonass/GPS/Galileo   (*)
- Very small, only 46 x 21 x 6.5 mm.
- Lightweight: 7 grams for the fully equipped PCB, 5 grams for a suitable 250mAh rechargeable battery.
- Micro SIM socket
- SIM on chip   (*)
- Ultra low power consumption, down to 3uA.
- Standby battery lifespan of more than 10 years.
- Excellent GPS accuracy (onboard antenna), A-GPS options.
- Integrated 2.45 GHz radio for special functions and peripherals.
    - Short range, up to 30m
    - Long range, over 1 km range, line of sight   (*)

- Onboard sensors:
    - 3D accelerometer up to 16g.
    - Humidity/Temp. sensor   (*)
- Wide operating range: -20 ˚C … +85˚C (using Primary Lithium Cell).
- Serial, analog and digital interfaces
- 3 pushbuttons, 3 leds for user interaction.
- 20 pin extension header.
- Multiple watchdog levels for maximum stability.
- Dual charge protection for voltages and temperature range.
- Remote configurable to fit any job (both firmware and configuration files can be updated over the air).
- Configuration can be both Server and Event driven, 300+ different events, up to 4,000 geozones.
- Runs local user scripts via .src files.
- Supports multi server configuration.
- User definable SMS commands.
- Audio with microphone and embedded class AB speaker amplifier.   (*)

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

Applications

- Vehicle and vessel tracking
- Object protection, up to 10 years of standby on a single Lithium 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-202 / R9C5 module provides reliable and accurate navigational data can be equipped with a 2G, 3G or LTE-M/NB-IoT modem.

The module provides reliable, optimized connectivity and coverage for the next generation LTE-M 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 (up to 120,000 positions). As soon as communication is restored, all information can be transmitted.

Optional, the module can be extended with many features (3G or LTE-M/NB-IoT modem, GPS/Glonass/Galileo, 2.45GHz. radio, Bluetooth LE, iBeacon™) providing easy integration with existing wireless networks. This functionality extension upgrades the module into an intelligent location based positioning solution (LBS) for indoor and outdoor anti-theft applications. A sophisticated 'listen before talk' algorithm makes it practically impossible to locate the module which secures the valuable vehicle or object.

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

The KCS TraceME TM-202 / R9C5 can be equipped with different optional technologies for traceability. It can be fully customized dependent of the application. Please contact sales for more details.

Specifications KCS TraceME TM-202

Data communication

GPRS Modem	Quectel M95 QUAD band,
	  optional UG95(-A or -E) UMTS/HSPA Module,
	  optional BG95 LTE Cat M1 / NB-2 Module
	all global certifications and R&TTE directives.

Frequency bands	GSM/GPRS: 850/900/1800/1900 MHz UMTS: 800/850/900/1900/2100 MHz LTE: B1-5, 8, 12, 13,18, 19, 20, 25, 28

RF Communication

		Without amplifer	With amplifier
Radio chip	Nordic nRF24L01+		
Frequency	Worldwide 2.45 GHz. ISM band, 126 channels, GFSK modulation		
Amplifier	RFaxis RFX2401C		
		Without amplifer	With amplifier
RF Tx Power		0, -6, -12, -18 dBm	+20, +14, +8, +2 dBm
RF Rx Sensitivity	2Mbps	-82 dBm (typical)	-90 dBm (typical)
	1Mbps	-85 dBm (typical)	-93 dBm (typical)
	250Kbps	-94 dBm (typical)	-102 dBm (typical)
Ultra low power		13 uA average current use, at 1 RX/TX per second	90 uA average current use, at 1 RX/TX per second, +20 dBm Tx.

Navigation

GPS Receiver	Quectel L70 GPS module, optional L76 GNSS (Glonass + GPS + Galileo) 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	5 VDC ± 10%. Max power consumption via micro-USB: 600 mA
Charging Current (LiPolymer)	450 mA. Observing 0...+45 ˚C safety range for LiPolymer.
Typical Power Consumption	30 mA, GPS full power tracking, open GPRS session
	6 mA, using AlwaysLocate™
	3 uA, GPS/GPRS/sensors power down, 4 inputs and 1 timer active

External connections

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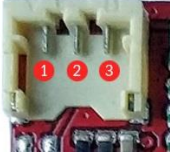
Pin	Description
1	3.4 - 4.2V Rechargeable battery (+) connection
2	Ground
3	Temperature sensor / Optional: Solar cell 5V

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	Optional	I/O	Optional: Analog input (0..+1.2V) or digital I/O
5	GND	GND	GND for charge and I/O

Audio (*)
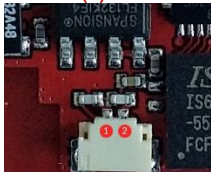
Pin	Signal	Type	Description
1	N	Speaker output	Class AB, max 800 mW, negative speaker output
2	P	Speaker output	Class AB, max 800 mW, positive speaker output

20 pins extension header
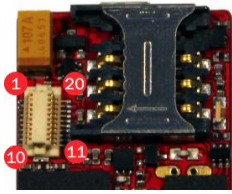
Pin	Description	Description	Pin
1	3.4 - 4.5V Board Voltage (direct battery connection, not switched)*	3.4 - 4.5V Board Voltage (switched)	20
2	general IO / TxD 4 open collector , max 30V @ 5mA	3.4 - 4.5V Board Voltage (switched)	19
3	general IO / RxD 4 , logic 0 if 0-0.4 V, logic 1 if 2..30V	Battery temperature sensor*	18
4	Red LED / general IO*	Analog IN 1 (0..1V or 0..30mV, firmware dependant)	17
5	Ground	Ground	16
6	general IO / TxD 5 (2V8 level)	Ground	15
7	general IO / RxD 5 (2V8 level)	4.5 - 5.5V input (parallel to USB power)	14
8	Ground	4.5 - 5.5V input (parallel to USB power)	13
9	Ground	Ground	12
10	reserved, do not connect	reserved, do not connect	11

* Yellow marked pins available from PCB version R9C4 and up, do not connect for older versions.
  Maximum current per pin: 300mA

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

Sales

Contact us by email: Trade@trace.me

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