

KCS TraceME TM-178 / R9H7 GPS / GPRS / SMS / RF module



The TM-178 / R9H7 is a budget product line member of KCS' advanced TraceME track and trace modules. The TM-178 is targeted for remotely tracing and controlling vehicles and other powered equipment.

The TM-178 is equipped with an intelligent location based positioning solution, which provides locating the vehicle or object quickly and accurate in scenarios where traditional GPS systems are insufficient. It offers multiple connectivity options and server connections. The module is designed to comply with all approvals for the North American market, and can be used in all countries of the world.

Key Features

- National telecom & worldwide satellite (GNSS) coverage
 - Quad-band GSM/GPRS
 - UMTS/HSPA (*)
 - GPS
 - Glonass/GPS/Galileo (*)
- Very small, only 91 x 40 x 9 mm.
- Lightweight: 30 grams for the fully equipped PCB.
- Micro SIM socket
- BASIC I/O, Serial, analog and digital interfaces
- Ultra low power consumption, down to 12uA.
- 6 to 31VDC power supply
- Excellent GPS accuracy including full-size GPS antenna.
- Integrated 2.45 GHz radio for special functions and peripherals (*)
 - Long range, over 1 km range, line of sight
- LoRa technology (*)
 - 868MHz / 915MHz
 - Up to 60km line of sight at 25mW and with integrated antenna.
- Wi-Fi (*)
- Portable type: Integrated antennas.
 - External micro coax RF antenna. (*)
- Li-ion charger/switcher system seamlessly feeds all parts from external power source or Li-ion battery.
- Onboard sensors:
 - 3D accelerometer (up to 16g)
 - Baro-/Altitude meter(±10cm)(*)
- Wide operating temperature range: -40°... +85°C (without LiPo battery)
- Robust IP67 housing (*)
- Multiple watchdog levels for maximum stability.
- Dual charge protection for voltages and temperature range.
- Event based free configurable module to fit any job; 300+ different events, up to 4,000 geozones.
- Remote maintenance. Both firmware and configuration files can be updated over the air.
- Runs local user scripts via .src files.
- User definable SMS commands.
- Supports integration into third party networks.

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

Applications

- Vehicle and boat tracking
- Object protection and tracking
- Logistics, M2M
- Security and surveillance
- Remote control and diagnostics
- Anti-theft
- Asset monitoring

Product Summary

Equipped with a state-of-the-art GPS receiver, the KCS TraceME TM-178 / R9H7 module provides reliable and accurate navigational data. Advanced location-based positioning (LSB) by proprietary RF enables positioning inside buildings and offers special power saving features for a variety of applications.

The module's positioning coordinates are transmitted by GPRS/SMS and optional 3G, LoRa, Wi-Fi, Bluetooth Smart (BLE) and iBeacon offering easy integration with existing wireless networks and specific custom mobile App's on smartphones and tablets. In areas without network coverage, position-data and events are stored in memory (up to 250,000 positions). As soon as communication is restored, all information can be transmitted.

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, which offers excellent indoor and outdoor tracing with an accuracy up to 1.5 meters.

The full version module (TM-178F) is equipped with different technologies for traceability (e.g. GPS/Glonass*/Galileo*), GPRS/SMS, LoRa, Bluetooth Smart (BLE) and proprietary RF), which can all be combined dependent of the application and local mobile network coverage. User specific low-budget basic versions are available on request.

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

- TM-178F Full version (3G, GPS+Glonass, LoRa, Wi-Fi, Long-range RF)
- TM-178L Light version (Quad-band GSM/GPRS, GPS, LoRa, Long-range RF)
- TM-178B Basic version (Quad-band GSM/GPRS, GPS, Long-range RF)
- (*) Optional, please contact sales for more details


Specifications KCS TraceME TM-178


Data communication

GPRS Modem	Quectel M95 QUAD band, optional UG95(-A or -E) UMTS/HSPA Module, optional UG96 UMTS/HSPA Module, all global certifications and R&TTE directives.	
Power saving	Typical power consumption in sleep mode: 1.3mA @ GSM, DRX = 5 1.2 mA @ GSM, DRX = 9 1.15 mA @ UMTS, DRX=9	
Frequency bands	<ul style="list-style-type: none"> • Quad-band GSM850, GSM900, DCS1800, PCS1900 • Dual-band UMTS850/1900 or UMTS900/2100 • Five-band UMTS800/850/900/1900/2100 • Frequency bands can be set by AT command • Compliant with GSM Phase 2/2+ 	
GSM Class	Small MS	
Transmitting power	<ul style="list-style-type: none"> • Class 4 (2 W) at GSM850 and GSM900 • Class 1 (1 W) at DCS1800 and PCS1900 • Class 3 (250 mW) at UMTS 800/850/900/1900/2100 	
GPRS connectivity	<ul style="list-style-type: none"> • GPRS multi-slot class 12 (default) • GPRS multi-slot class 1~12 (configurable) • GPRS mobile station class B 	


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 Communication

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)	

Wi-Fi	Gainspan GS2100MIE 
Protocol	IEEE 802.11b/g/n
Transmitting power	+15dBm (802.11b), +11dBm (802.11n)
Sensitivity	-95dBm
Data rate	up to 72Mbps

Navigation

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

Operating Temperature Conditions

With Primary Lithium Cell or without LiPo battery	-40°C ... +85°C (discharging only)
With rechargeable LiPo Cell (**)	-20°C ... +60°C (discharging) 0°C ... +45°C (charging)

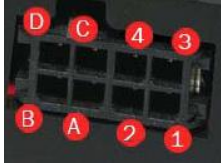
(**) Extended temperature range LiPo batteries available on request.

Electrical

Power supply	Maximum range: +6...+31VDC
Charging Current	Max 450mA. Observing 0...+45°C safety range for LiPolymer. Higher charging currents (for batteries with higher capacity) on request.
Power Consumption	60 µW standby (typical): GPS off, hot start possible. GSM off. Processor monitors timer + acceleration sensor + I/O, watchdog on, brownout detection on.
	Power per fix: < 1.3 mAh, including cold start of GPS, GSM power-up and transmission via GPRS or SMS.
	150 mW tracking: GPS always on, GPRS active, GPRS session open.
	Power consumption depends on amount of GPRS traffic and navigation parameters.

External connections

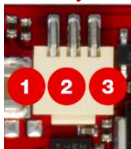
Power and I/O-connector



Pin	Signal	Type	Description
1	GND	GND	Ground for VCC and IO
2	VCC	VCC	+6 to +31VDC charge input and power supply
3	TxD4	O	3V serial Tx4
4	Analog In 3/In 5, Out 3 (*)	I/O	Analog Input #3/#5 (0..35V), Digital output #3 (150mA) (*)
A	RxD4, or analog input 0..1V	I/O	3V serial Rx4, or analog input 0..1V (*)
B	Analog in 1	I/O	Analog Input #1 0..35V, Digital output #1 (150mA)
C	Board Voltage	O	Optional board voltage 5 Volt max 500mA
D	Analog in 2	I/O	Analog input #2 0..35V, open collector output 2 (150mA), TxD2 open collector

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

Battery connector



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

Module revision history

		TM-178/R9H4	TM-178/R9H5	TM-178/R9H7
GSM		Quad band GSM	Quad band GSM Optional: 2-band UMTS Optional: 5-band UMTS	Quad band GSM Optional: 2-band UMTS Optional: 5-band UMTS
RF				LoRa, Wi-Fi, BLE
Sensors		Acceleration	Acceleration	Acceleration, pressure
Battery (Primary or Li-Ion)		Required for transmissions	Optional	Optional
Electrical connections	Pin 3	GND	TxD4, 3V	TxD4, 3V
	Pin 4	Analog In5	Analog In3/In5 + digital Out3 (*)	Analog In3/In5 + digital Out3 (*)
	Pin A	RxD4/TxD4, 3V	RxD4 3V, or analog input 0..1V	RxD4 3V, or analog input 0..1V (*)
	Pin B	Analog In1	Analog In1 + digital Out1	Analog In1 + digital Out1
	Pin C	Not connected	Power output 5V/500mA	Power output 5V/500mA
	Pin D	Digital In2, TxD2 open collector	Analog In2 + Out2, TxD2 open collector	Analog In2 + Out2, TxD2 open collector
Hardware Pulse counter		Combined with In2 (Pin D)	On special request	On special request
Power down mode		± 100uA	± 12uA	± 12uA

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 BV is a LoRa Alliance member since 2016.

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 9001:2015 and ISO 14001:2015.

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 GSM unit and antenna 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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