KCS TraceME GPS / GPRS Module Rev9
TM-185/TM-R9B2/R9A8

The KCS TraceME GPRS/GPS Modules enable you to remotely track & trace a variety of objects, e.g. cars, trucks, containers or ships. Its small, lightweight aluminum design makes it easy to install and together with the extended position logging, it's ideal for use in fleet management, anti-theft and M2M applications.
The numerous I/O's allow monitoring and control of a range of external hardware, like cameras and iButtons™

Key Features

- Extremely small and lightweight, ruggedized aluminum enclosure
- Wide operating temperature range
- Quad-band for worldwide coverage, optional 3.75G
- Ultra low power consumption
- Optional internal Li-ion battery
- Excellent GPS accuracy
- Multiple watchdog levels for maximum stability
- Versatile interfacing: Digital+Analog, Serial (3V / RS232), iButton/1-Wire™, Cameras, LCD display+keypad, Sensors, Digital Tachograph, passive/active RFID, Garmin™ displays, etc.
- 5V/1A power supply for peripherals
- Remote configurable to fit any job
- Configuration can be both Server and Event driven, 300+ different events
- Field upgradeable firmware via GPRS
- Supports backup server configuration
- User definable SMS commands
- Standalone scripting language
- Distance measurement for trip / ODO
- Long term investment, hardware and software compatible since 2004
- 1 year full warranty

Applications

- Object Protection
- Fleet management
- Public transport /Railway industry
- Logistics
- M2M
- Security and surveillance

- Remote control and diagnostics
- Vehicle immobilisation

Product Summary

Equipped with a state-of-the-art Sirf-IV GPS receiver, the KCS TraceME Module provides reliable and accurate navigational data.
All communication is handled rapidly and effectively by a GPRS/GSM modem (QUAD band version) through a GPRS network. In areas without network coverage, position-data and events are stored in memory (up to 500,000 positions). As soon as communication is restored, all information can be transmitted.
A unique feature is the user-configuration menu, which controls events like sending position-information and switching of external hardware.
All of the necessary server-side scripts to process and store data from the TraceME 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 many partner companies.

About KCS BV

KCS BV, founded in The Netherlands in 1984, develops and manufactures electronics in-house for industrial applications, medical purposes, broadcasting solutions, etc. Since 1999 KCS is ISO 9001:2000 registered.

Support

Support available at www.trace.me or contact one of highly trained TraceME resellers worldwide.

Specifications KCS TraceME Rev9-Basic

Data Communication

Modem	Quectel M95 QUAD band 850/900/1800/1900 GPRS	
RF Power	Class 4 (2W) @ 850 / 900 MHz Class 1 (1W) @ 1800 /1900 MHz	
Sensitivity	850/900 MHz GPRS	-108.5 dBm
	1800/1900 MHz GPRS	-108.5 dBm
Data	GPRS	Class 8 + 10 + 12
	Coding schemes	CS1 to CS4
SMS	Point-to-Point mobile originated & mobile terminated	
	Cell Broadcast	

Navigation

GPS module	Quectel L30 SIRFstarIV
Power supply	Supply voltage 1.71 – 1.89V typical 1.8V
Power consumption (excluding antenna current)	Acquisition 40mA @ -130dBm Tracking 36 mA @ - 130 dBm
Receiver type	GPS L1 1575.42MHz C/A Code 48 search channels
Sensitivity (with active GPS antenna)	Cold start (autonomous) – 148 dBm Reacquisition – 160 dBm Hot start – 160 dBm Tracking – 163 dBm Navigation – 160 dBm

Physical

Outside Dimensions	Size	90x67 mm (excluding antenna connectors)
	Height	20 mm
	Weight	Approx. 110 grams (without battery)
Connections	GPRS/GSM	SMA or micro-coax
	GPS	SMA or micro-coax
	Power/IO	Molex 43045-0412 (4 pins) + 43045-2412 (24 pins) or Molex 43045-0812 (8 pins) Optional: Amp 2029030-3 (3 pins for CAN/RS-485)

Electrical

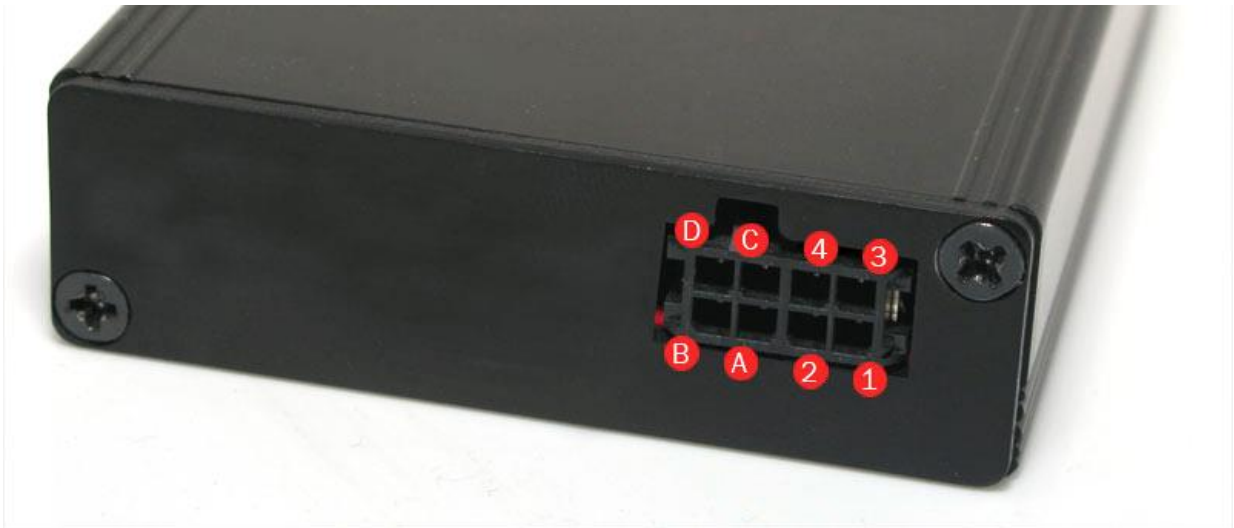| Operating Voltage	• External +6...+31VDC	
Power Consumption	• <5 mW standby • 300 mW tracking , full power. Approx. 9 W peak during data transmission • Power consumption depends on amount of GPRS traffic and navigation parameters	
External Connections (Basic version)	Serial Communication (3V combined RxD / TxD)	One-Wire / iButton™ Generic serial
	Input / Output	2x combined open collector output + digital+analog in, max 31V 1x digital+analog in, max 31V 1x 3V digital in/out, overlaps serial
	Peripheral power supply	Board Voltage out (3.5 ... 4.2 Volt), max 250 mA
External Connections (Full I/O version)	Serial Communication (dual 3V, dual RS232)	One-Wire/ iButton™ / Cameras / LCD / generic RS232
	Input / Output	5x digital+analog in, max 31V 4x digital out, open collector with 'self-healing' fuse 2x 3 Volt in/out, overlaps serial
	Power supply	3.3V controlled by module, 150 mA max Board Voltage out (5 Volt), max 1000 mA

Environmental

Units with Li-Ion battery (excluding TM185 series) need a minimum battery charge for full functionality.

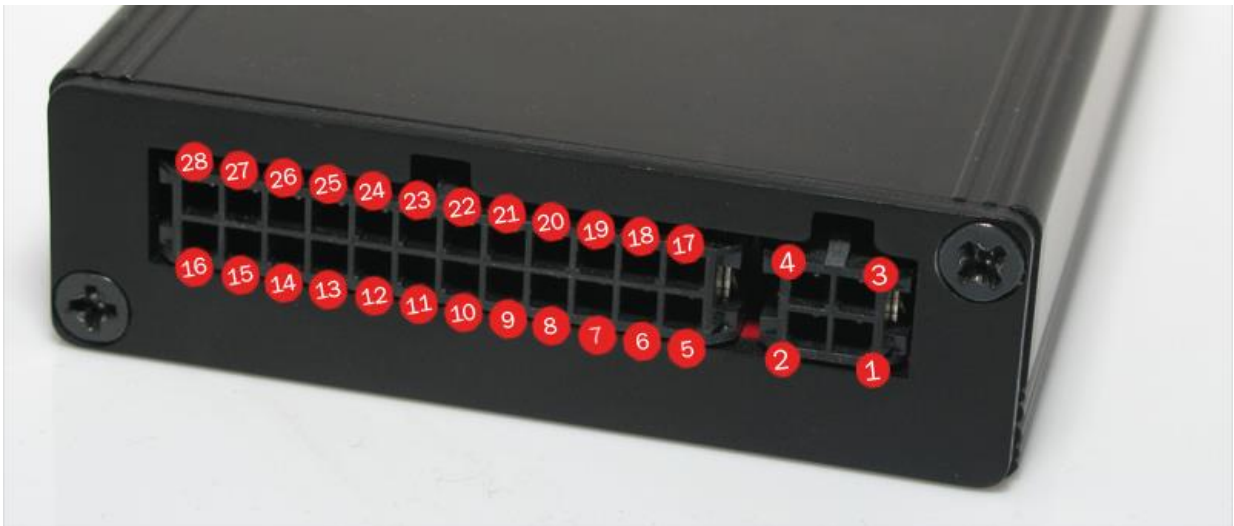| Enclosure	Aluminum with black anodised finish. Black ABS front lid.
Operating Temperature	With Li-Ion battery: -20ºC to +60ºC (-4ºF to +140ºF) non-condensing Li-Ion battery cannot charge outside 0ºC to 45ºC.
Storage Temperature	Without Li-Ion battery: -40ºC to +85ºC (-40ºF to +185ºF) non-condensing With Li-Ion battery: -20ºC to +60ºC (-4ºF to +140ºF) non-condensing

External Hardware

1-Wire™	Sensor count	Max. 30
	Cable type	2 wire, 3 wire for temperature
	Temperature	DS18B20 / DS18S20 / DS1822
	ID (input)	DS2411
	iButton	Any for ID only
Camera (with full I/O version)	Sensor	OmniVision™
	Resolution	Up to 640 x 480 Colour
	Format	JPEG
	Colour Depth	16 bits
	Lens	f4.0 mm / F 2.2 (Other lens types on request)

Front view Power and I/O-Connectors

Front view Power and I/O-Connectors (full I/O)

External Connections KCS TraceME (Full I/O)

Pin	Signal	Type	Description
1*	GND for VCC	GND	Ground for VCC
2*	VCC	VCC	+5...+31VDC or VCC Charge input
3*	GND for I/O	GND	Ground for I/O
4*	Digital/Analog_In5	I	Digital/Analog Input 5 (0..31V)
5	TXD1_3V	O	3 Volt serial transmit port 1
6	RXD1_3V	I	3 Volt serial receive port 1, hardware pulse counter
7	TXD2_RS232	O	RS232 serial transmit port 2
8	TXD2_3V	O	3 Volt serial transmit port 2
9	GND for I/O	GND	Ground for I/O
10	I/O1 or RXD4_3V or One-Wire™ or ADC6	I/O	I/O1 (3 Volt) - or RXD4 (e.g. Camera1) - or One-Wire™ - or analog input (ADC6) range +0.0...+1.0Volt
11	I/O2 or TXD4_3V or One-Wire™	O	I/O2 (3 Volt) TXD4 (e.g. Camera1) Note: Connect pins 10-11 for One-Wire™ operation
12	Digital_Out1	O	Open Collector max. 31V /160 mA, protected via Polyswitch fuse
13	Digital_Out2	O	Open Collector max. 31V /160 mA, protected via Polyswitch fuse
14	GND for I/O	GND	Ground for I/O
15	Digital_Out3	O	Open Collector max. 31V /160 mA, protected via Polyswitch fuse
16	Digital_Out4	O	Open Collector max. 31V /160 mA, protected via Polyswitch fuse
17	TXD3_RS232	O	RS232 serial transmit port 3
18	TXD3_3V	O	3 Volt serial transmit output 3
19	RXD3_RS232	I	RS232 receive input 3
20	RXD2_RS232	I	RS232 receive input 2
21	VCC_3V3	VCC	External Supply 3.3V switchable by module
22	VCC_5V	VCC	External Supply, 5V+-5%, 1 Amp max.
23	N/C	-	Reserved
24	Digital/Analog_In1	I	Digital/Analog Input 1 (0..31V)
25	Digital/Analog_In2	I	Digital/Analog Input 2 (0..31V)
26	N/C	-	Reserved
27	Digital/Analog_In3	I	Digital/Analog Input 3 (0..31V)
28	Digital/Analog_In4	I	Digital/Analog Input 4 (0..31V)

A	Serial in/out	I/O	3V serial transmit/receive1, iButton, Input IN3
B	Digital OUT1 + IN1	I/O	- Digital/Analog Input 1 (0..31V) - Open Collector max. 31V /160 mA, protected via Polyswitch fuse - or hardware pulse counter**
C	Board voltage	O	Max 250mA
D	Digital OUT2 + IN2	I/O	- Digital/Analog Input 2 (0..31V) - Open Collector max. 31V /160 mA - protected via Polyswitch fuse

* Pins 1-2-3-4 are identical for Full I/O and Basic version.

** The internal hardware pulse counter is combined with input 1. It has an internal pull-up making the input measure a voltage close to 3 Volt when nothing is connected. Since default settings determine a voltage like that to be digitally active, the input may always seem active unless you:
- do not keep the input floating.
- use a switch level of 4Volt or higher in the settings.
- disable the hardware pulse counter in the settings which also disables the internal pull-up.

External Connections KCS TraceME (Full I/O)

	Rev9 (TM-185)	Rev9-Basic (TM-R9B2)
Introduction date	Nov-2010	Nov-2010
Outside Dimensions	100 x 67 x 20 mm Aluminum housing, ABS front lid	100 x 67 x 20 mm Aluminum housing, ABS front lid

GPRS/SMS

	Rev9 (TM-185)	Rev9-Basic (TM-R9B2)
QUADBAND 850/900/1800/1900 Mhz	✓	✓
Antenna connection	SMA / micro-coax	SMA / micro-coax
GPRS antenna included	-	✓

GPS

	Rev9 (TM-185)	Rev9-Basic (TM-R9B2)
Tracking sensitivity / channels	-161 dBm / 65 ch	-161 dBm / 65 ch
Antenna sensing circuitry	✓	✓
Antenna connection	SMA / micro-coax	SMA / micro-coax
GPS antenna included	-	✓

Power

	Rev9 (TM-185)	Rev9-Basic (TM-R9B2)
Internal Backup battery	Li-Ion / Li-Polymer 1100 mAh (optional)	Li-Ion / Li-Polymer 560mAh (optional)
Average tracking power (GPS full power, GPRS connected)	300 mW	300 mW
Minimum power consumption	<5 mW at 6..31V	<5 mW at 6..31V
Power cable + fuse included	-	✓

IN/OUT

	Rev9 (TM-185)	Rev9-Basic (TM-R9B2)
Connector	4 + 24 pins, 3 pins for CAN-bus/RS-485	8 pins, optional 4 + 24 pins
Digital / Analog Inputs	5	3 (combined IO1+IO2, IN5) *
Digital outputs (max. 31 Volt)	4	2 (combined IO1+IO2)
Camera interface	4	-
RS-232 connections	2 RXD + 2 TXD	-
3V serial connections	2 RXD + 2 TXD	1 combined RXD-TXD or IN3
1-Wire / iButton™ interface	✓	iButton only

Miscellaneous

	Rev9 (TM-185)	Rev9-Basic (TM-R9B2)
Internal 3 axis acceleration / G-force sensor	optional	optional
CAN-bus support (2.0B, up to 1 MBit)	optional	-
RS-485 support	Optional (Q1/2011)	-
Internal Vibration sensor on Li-Ion version	✓	✓
Maximum items in log	55,000 / 500,000+ (optional)	6,000
Minimum Order Quantity	25	500

* Rev9-Basic has two pins that can function as both Input and Output (IO1+IO2) and one input-only pin (IN5). These 3 pins are all 0..31V capable. IN3 has a default range of 0..3V, but can be externally adapted to a 0..31V range.

Final notes, Certification and Disclaimer

We certify that Kolff Computer Supplies BV, Dordrecht, The Netherlands does not make any hardware or IMEI modifications to the Quectel M95 devices as used in the TraceME track&trace device. All software modifications are restricted to official firmware upgrades as provided by Quectel Wireless Solution Co.,Ltd.

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.

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