KCS TraceME TM-186 / R9A10
GPS / GPRS / LTE-M / NB-IoT module

The TM-186 / R9A10 is a high-end product line member of KCS' advanced TraceME track and trace modules. The TM-186 is targeted for remotely tracing and controlling vehicles, vessels and other powered equipment and machinery.

The TM-186 is equipped with an intelligent RF-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.

Key Features

- National telecom & worldwide satellite (GNSS) coverage
    - LTE Cat M1 / NB-2 / EGPRS
    - GPS   (*)
    - Glonass/GPS/Galileo
- Micro SIM socket
- Low power consumption, down to 100uA.
- Robust aluminum enclosure 90 x 67 x 20mm.
- 4 LEDs for user interaction.
- Excellent Glonass/GPS/Galileo accuracy, external antenna.
- Integrated 2.45GHz. radio for special functions and peripherals.   (*)
    - Long range, over 1 km range, line of sight   (*)
- Onboard sensors:
    - 3D accelerometer up to 16g.
    - Temperature sensor (±0.5°C)
- Wide operating range: -40 ˚C … +85˚C (Excluding optional LiPo battery Cell).
- Multiple watchdog levels for maximum stability.
- 6 to 31VDC power supply

- 6 to 35VDC power supply   (*)
- 5V / 1A power supply for peripherals
- Versatile interfacing:
    - Digital and analog
    - Bluetooth LE   (*)
    - 4x Serial (3V / RS232)
    - CAN bus / OBD-II   (*)
    - RS485   (*)
    - iButton™ / 1-Wire™
    - Cameras
    - LCD Display + keyboard
    - Digital tachograph
    - Passive / active RFID
    - Garmin FMI™
- Event based free configurable module to fit any job; 300+ different events and 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 vessel tracking
- Public transport / Railway industry
- Logistics, M2M
- Security and surveillance
- Remote control and diagnostics
- Anti-theft

Product Summary

The KCS TraceME TM-186 is a full featured next generation track and trace module targeting vehicles, vessels and other powered equipment and machinery.

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.

The TM-186 / R9A10 module is equipped with external power and battery connection and contains full I/O-connectivity and multiple on-board sensors offering easy integration into many applications.

Optional, the module can be extended with many features (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-186 / R9A10 can be equipped with different optional technologies for traceability. It can be fully customized dependent of the application. Please contact sales for more details.

Related products:
- TM-R9B3   Basic version (TM-186 with basic I/O-functionality)

Specifications KCS TraceME TM-186

Data communication (*)

Modem	Quectel BG95-M3 LTE Cat M1 / NB-2, GSM 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

RF Communication (*)

		Without amplifer	With amplifier
Radio chip	Nordic nRF51822 (*)		
Frequency	Worldwide 2.45 GHz. ISM band, 126 channels, GFSK modulation		
Amplifier	RFaxis RFX2401C		
RF Tx Power		0…-20dBm	+20…0dBm
RF Rx Sensitivity	2Mbps	-85 dBm (typical)	-90 dBm (typical)
	1Mbps	-90 dBm (typical)	-93 dBm (typical)
	250Kbps	-96 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 L76 GNSS (Glonass + GPS + Galileo) module, optional L70 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	

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

Electrical

Power supply	External +6…+31VDC
Charging Current (LiPolymer)	450 mA. Observing 0...+45 ˚C safety range for LiPolymer.
Typical Power Consumption	20 mA, GPS full power tracking, open GPRS session
	6 mA, using AlwaysLocate™
	100 uA, GPS/GPRS/sensors power down, 4 inputs and 1 timer active

External Connections

External antenna connectors

GSM/GPRS	External GSM/GPRS antenna (*)
GPS	External GPS antenna (*)

(*) Please contact sales for more details.

Optional RF variant (*)

GSM/GPRS	External GSM/GPRS antenna (*)
GPS	External GPS antenna (*)
RF	External 2.45GHz. antenna (*)

(*) Please contact sales for more details.

External Connections

Front view Power and I/O-connectors

Pin	Signal	Type	Description
1	GND for VCC	GND	Ground for VCC
2	VCC	VCC	+6…+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	I/O	I/O1 (3 Volt)
	RXD4_3V or		- or RXD4 (e.g. Camera1)
	One-Wire™ or		- or One-Wire™
	ADC6		- or analog input (ADC6) range +0.0…+2.5Volt
11	I/O2 or	O	I/O2 (3 Volt)
	TXD4_3V or		TXD4 (e.g. Camera1)
	One-Wire™		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	N/C	-	Reserved
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)
TM-186C			
E	CAN_H / RS485-A	I/O	CANH or RS485-A
F	CAN_L / RS485-B	I/O	CANL or RS485-B
G	GND for CAN / RS485	GND	Ground for CAN / RS-485

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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