trakm8

INTEGRATORS AND DEVELOPERS
PRODUCT CATALOGUE

‣THE TRAKM8 STORY

SECTION CONTENTS

TRAKM8 OVERVIEW

Trakm8 is an industry leader in the global telematics market place operating in over 30 countries with more than 200,000 units deployed worldwide.

Trakm8 designs, develops and manufactures telematics hardware and management tools for use by global telematics service providers that integrate Trakm8's products within their own services.

Trakm8 also operates within the UK as a telematics service provider contracting with the customer to provide an end to end solution. The experience gained through providing end user solutions benefits our global integrator customers because we understand the challenges faced in providing robust solutions that generate demonstrable Return On Investment (ROI) for your clients.

TRAKM8 TIMELINE

2001 – Trakm8 brand established
2002 – Launched T2002, the first successful GPS & GPRS telematics Box
2005 – 91% growth from previous year. Admitted to AIM
– T4 hardware launched
2006 – Independently rated Europe's No 1 Aftermarket Telematics Vendor
– Solo hardware launched
2007 – Over 90,000 units deployed in 25 countries with an RMA rate of less than 2%
– T6 and T6 Lite hardware platform launched
– Acquisition of PJsoft, to secure IPR
– Launch of Trakm8 SWIFT
2010 – T8 Hardware launched
2012 – T8 Mini launched
– 30,000 vehicles using Trakm8 SWIFT worldwide
– Trakm8 launch fuel saving solution, eco^N and hardware
– More than 200,000 devices deployed globally with RMA failure rate below 1%
– Trakm8 s.r.o expand and opens new office in Prague

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▸ OUR BUSINESS

Manufactured in-house

Development capability

Firmware creation and configuration

trakm8
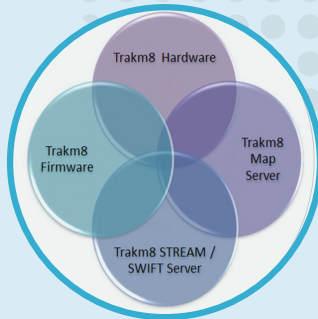
Engineering systems

Present in 30 countries worldwide

Data integration
- TEDS
- Fuel Systems
- CANbus Systems

Server solutions

▶ **PRODUCTS - T8**

FEATURES

- Integrated GSM antenna
- Application implementation support
- uBlox GPS technology
- 25 way connector
- E-Marking, CE, FCC, PTCRB
- 12 / 24 Volt Operation
- Full CANbus vehicle connectivity
- Enhanced vehicle connectivity
- RFID expansion option
- Digital and Analogue Input/Outputs
- RS232 Serial ports
- Tri axis accelerometer
- Optional internal battery options
- Tachograph connectivity

BENEFITS

- Industry leading GPS performance
- Standard interfaces
- Compliant to worldwide legislation
- Approved for vehicles
- One box solution - no third party equipment required
- Compatible with EOBD-II, FMS and K-Line vehicle protocols
- Monitor drivers, assets and load temperatures
- Monitor peripheral equipment
- Binary pass through mode for third party data transmission
- Monitor harsh braking, acceleration and cornering
- Enhanced security
- Identify drivers from Tachograph cards

▶ **Application areas include**

Transport & Logistics
Security & Surveillance
Insurance / Rental Cars
Vans & Trucks
Company Car Management
Private/Business Miles
Taxi & Bus Fleets

TECHNICAL SPECIFICATIONS

GPS Receiver: uBlox NEO-6 50 Channel (1 million effective correlators) -160dBm tracking sensitivity <1 second Time-To-First Fix for hot and aided starts 2.5m CEP accuracy -147dBm acquisition sensitivity

Modem: uBlox LEON-G100 (Quad Band GSM/GPRS) GSM 850 MHz, EGSM 900 MHz, DCS 1800 MHz and PCS 1900 MHz Class 10

GSM Antenna: Internal

GPS Antenna: External Active Type (3VDC)

Supply Voltage: 6 – 30V

Current draw: Running: 45 mA Avg. (peak <600mA) @12V Sleep: <2mA @12V Deep Sleep: <300uA @12V

Protection: Over voltage & reverse power connection

Battery (optional): 3.7V/1500mAh Li-ION type Integrated battery charger with protection circuit

Memory (RAM/FLASH): 512KB / 16MB

Micro SD Card: Supports 512MB to 2GB cards (optional)

Serial ports: 2 x RS232 (all standard baud rates)

1-Wire: Integrated support for Driver ID reader & temperature sensors

Ignition input: Dedicated voltage sensing ignition input

Digital I/O: 5 x configurable inputs and outputs

Digital outputs: 2 x configurable as a 1 Amp switch to ground power drives, overload & short circuit protected or as a digital input

Analogue inputs: 3 x configurable as a 0-30 VDC voltage sense (12 bit resolution) input or as a digital input.

Voltage monitoring: Internal battery state & supply voltage

Accelerometer: Internal 3 axis sensor

Trembler: Internal mechanical tremble sensor

Vehicle interface: CANbus 2.0A

Vehicle protocols: J1939 (trucks & heavy duty) OBDII (cars & LCV) J1708 Other proprietary"

LED Indicators: 3 internal LED's indicating GSM/GPS/CANbus/OBD & application status 2 dedicated external LED drive outputs (can be used to directly drive buzzers)

RFID Receiver option: Internal proprietary 433MHz receiver, typical range 10m

Dimensions: 132 x 108 x 28 mm (excluding connector) Weight - 180g

Environment: Operational temperature is -40°C to +85°C (no battery) and -20°C to +60°C (with battery) Protection - IP54

▸ PRODUCTS - T8 MINI

TECHNICAL SPECIFICATIONS

GPS Receiver: SiRFstarIV 48 Channel <2.5m CEP autonomous

Sensitivity: -163dbm (tracking) -148dbm (acquisition - Cold)

GSM/GPRS Modem: Sagem HiLo NC V2 Quad-band - 850/900/1800/1900 MHZ GPRS - Multi-slot Class 10

µ– Controller: STM32 CortexM3 32-bit RISC, SRAM - 2.5 Mbit, Flash - 4.5Mbit

Power: Input voltage - 8 - 30 VDC

Current draw : Operational - 45mA (typ live tracking) Sleep Mode - 500mA (max) Standby - 200uA (Max) Power Alarm - External power fail

Battery: Li-ion or Li-ion Polymer - 3.7V Capacity - 1,700mAh Battery Alarm - low battery voltage protection - reverse polarity protection, over voltage protection, internal self resetting fuse

Dimensions: 95.0 x 65.0 x 30.0mm 3.7" x 2.6" x 1.2" Weight - 160g/ 6.5oz

Environment: Operational Temperature. -40°C to +85°C (no battery) and - 20°C to +60°C (with battery) Protection - IP67

Sensors: Tremble detector - Mechanical MEMS Accelerometer (±2/8g) - Tri-axis

Input/Output: Digital inputs (0-30v) = 3 Digital outputs (500mA) = 2 Analog inputs (0-30v 12 bit) = 2 Serial Data (RS232) = 1 Dallas interface = 1 Connectors - M12, 8 pin, male

Communications: Internet Protocol via GRPS UDP/IP - User data protocol TCP/IP - Transmission control protocol SMS - Short message service

FEATURES

- Simple 8 pin connection to the vehicle
- IP67 rated enclosure
- Tri axis accelerometer
- Integrated GPS and GSM antenna
- Application implementation support
- SiRFstarIV GPS technology
- E-Marking, CE, FCC
- 12 / 24 Volt Operation
- Digital and Analogue Input/Outputs
- RS232 Serial port
- Extremely low power usage
- Compact dimensions

BENEFITS

- Quick and easy installation
- Suitable for mounting externally
- Small and compact size
- Accurate driver behaviour monitoring to reduce fuel costs
- One box solution
- Short lead time
- Industry leading GPS performance
- Compliant to worldwide legislation
- Suitable for all vehicles types
- Monitoring peripheral equipment
- Binary pass through mode for third party data transmission
- Monitor unpowered assets

▸ Application areas include

Transport & Logistics
Security & Surveillance
Insurance / Rental Cars
Trailer Tracking
Motor Homes & Caravans
Plant Farm Machinery
Boats

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▸ PRODUCTS - DRIVER IN VEHICLE FEEDBACK

Mechanical	
Dimensions	137 x 33 x 18mm
Weight	56g - Lightbar 147g Lightbar and Lead

Environment	
Operating Temp	-40 to +85 C

Power	
Input Voltage	8-30 VDC
Current Draw	@12VDC
Operational	64mA
Sleep Mode	200uA
Protection	Reverse polarity protection Over voltage protection

Communications	
RS232	8,N,1
Baud Rate	57600

Input/Output	
2 Button Inputs	
Dallas Reader	Supports standard ROM code tags - FLASH programmable tags
Light Level Output	Dim level adjustable in 8 steps plus an auto level using the light sensor
Speaker Output	75dB/10cm
Speaker Volume	Adjustable in 5 steps
Speaker Tone	Adjustable dependant on warning level

Electrical Interface	
D Type 9 Way Male	PIN 2 - Receive
	PIN 3 - Transmit
	PIN 5 - Ground
Power Connections	Flying Leads
	Red - Positive Power
	Black - Ground

Aggressive driving wastes fuel, pollutes the atmosphere, causes excessive wear and tear and substantially increases your chances of being involved in a road traffic accident.

Common sense tells us that driving in a calmer more careful manner will have a huge impact in all of these areas considerably reducing total fleet running costs.

Implementing a methodology for ensuring a calm and careful driving style across your fleet can be difficult. Trakm8 has designed a range of products for encouraging safe and fuel efficient driving.

Via the telematics unit, Trakm8 is able to monitor and provide direct visual and audible warnings to the driver on:

• Braking/acceleration/cornering
• Over revving
• Time spent in the green band
• Cruise control operation
• True engine idle
• Speeding

FEATURES

• 15 x Red/Amber/Green LED Array
• Buzzer with variable volume
• Dallas Driver Identification
• Business/Private mileage buttons
• Rebrand option
• Connects via RS232
• Compatible with T8
• Auto dimming at night
• CE Marked
• Display screen can be customised and configured as required when a minimum quantity is ordered.

BENEFITS

• Provide visual and audible driver feedback
• Configurable over the air
• Report by driver
• Record accurate mileages
• Simple to install
• Auto dimming
• Conforms to European standards
• Improved fuel usage
• Corporate responsibility

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▸ PRODUCTS - RFID

ASSET MANAGEMENT AND TEMPERATURE TAGS

The T8 is available with an RFID receiver expansion board option. The receiver includes an antenna design that has been extensively redeveloped for substantially enhanced performance. The internal RFID option allows the use of the following tags:

Asset Tag
• Tag transmits an RFID message containing the tags unique identity every 10 seconds
• Small ergonomic enclosure
• Easily carried in a pocket or attached to an asset
• Magnetic loop antenna ensures operation in close proximity to the human body
• Low power consumption Typical tag life is 36 months when transmitting at 10-second intervals (Low power)
• Tag enclosure sealed to a minimum of IP67
• Tag can be bespoke programmed as customer specific

Movement Tag
• Transmits ID every 3 seconds to the T8 when triggered
• Only transmits if tag moved or trembled (15 minute window)
• Allows increased security if tag is in range of the vehicle but dormant

Temperature Tag
• Transmits an RFID message containing various temperature information every 60 seconds
• Unique identification number
• Small size
• Low power consumption. Typical tag life is 36 months when transmitting at a 60 second interval
• Food grade plastic enclosures sealed to a minimum of IP67
• Designed to meet EN12830 standard

Temperature reporting has Gating control options
• Gate control on ignition (e.g. report temperatures and boundary alerts on ignition ONLY)
• Gate control on Input (e.g. report only when Cooling Compressor active)
• Gating control linked to sleep control (i.e. Wake up and report Temperature on gate trigger)

TOUGH TAG ENCLOSURE

All Trakm8 RFID tags have the same physical size and a tough tag enclosure is available to house the tag when used in extreme environments.
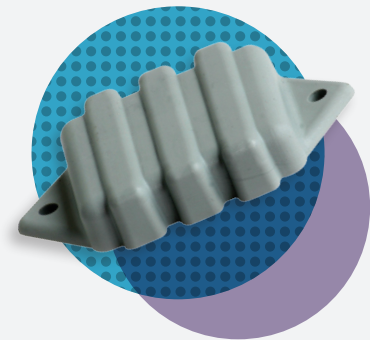
▶ PRODUCTS - ACCESSORIES

DRIVER IDENTIFICATION

1. Dallas Driver Identification
- Dallas receiver connects to the telematics unit via a plug and play connector
- Buzzer option
- Immobilisation options
- Different colour tags available

2. Tachograph Driver Identification
- Connects via a dedicated interface to digital Tachograph
- Multiple manufacturers supported (Siemens VDO/DTCO1381 Stoneridge SE5000)
- Provides driver ID and working/ time states

3. RFID Identification
- Requires RFID daughter board to be fitted within the main T8 Unit
- Active RFID technology - Automatically recognises the driver without presentation of the tag.
- Minimum 3 year battery life
- Immobilisation options

BUSINESS/ PRIVATE AND PANIC BUTTONS

4. Discreet in cab push button typically used for the driver to indicate whether they are on a business or private journey. As an additional feature by pressing and holding the button a panic alert can be generated.
- Single LED to correspond to journey type
- Panic button connects to telematics unit via a plug and play connector
- Button can also be used to deploy other functions or recordings

INPUT AND OUTPUT OPTIONS

In cab vehicle Seat Pressure Pads
These pads are fitted covertly under the seat fabric. The pads are connected to the T8 unit and register when a passenger or driver is seated inside the vehicle. The T8 supports 3 pressure pads at one time.

Immobilisation - Automotive Relays
The T8 has two dedicated outputs that can be connected to automotive relays and the vehicles' starter motor or crank circuitry. This potentially allows the T8 device to immobilise the vehicle in the event of a theft or security breach. The immobilisation feature is often used in conjunction with the driver identification feature. Therefore the driver must present a valid ID tag (RFID or Dallas) before the vehicle can be started.

Power Take Off (PTO)
Power takeoff (PTO) is a method used for describing devices that provide power to drive additional items such as pumps or machinery drive shafts. They can also be found on industrial and marine engines and are very common in heavy goods vehicles containing heavy lifting equipment. The Trakm8 range of hardware devices can be easily wired to monitor PTO operation via a digital input, on some vehicle types the PTO status is mandated on the CANbus, and can be monitored without requiring additional wiring.

Other wired inputs
Other 3rd party peripheral equipment can be monitored using either dedicated inputs or serial data processing to deliver operational data for tasks such as sweeping, road dousing, gritting salt, gulley cleansing and measuring vehicle weight.

Fuel Tank Monitoring
HGV tank fuel monitoring sensors for accurate fuel usage.

Diagnostics Products
The T8 has extensive diagnostic capability when connected to the vehicle CANbus and is capable of monitoring.

CANbus Diagnostic Tool
Robust, self-contained, hand-held EOBD fault code reader. Reads and clears fault codes, live data, and contains a comprehensive fault code library.

▸ PRODUCTS - CONFIGURATION

ALL OF THE FIRMWARE FUNCTIONS ARE CONFIGURABLE VIA THE WEB BASED CONFIGURATION MANAGER

Trakm8's Configuration Manager is a dynamic web based tool that allows units to be managed, configured and firmware upgraded all in one easy to use package.

The Configuration Manager allows users to develop their own unit configurations and firmware products to ensure units deliver the information required.

The Configuration Manager gives complete flexibility when configuring units. The T8 and T8 Mini can be configured remotely over the air, or via connection to a computer. The Configuration Manager can configure one unit or hundreds at a time. The Trakm8 OBU firmware has a new concept - it has a communications intelligent boot loader for over the air upgrading and new feature deployment.

• Support shipping of generic vanilla product
• Provides a more streamlined production process
• Allows for an easier product sign off process

• Gives better management and support of:
• Deployed product upgrades
• Main firmware
• Configurations
• Signoff and upgrade OTA (Over the Air)

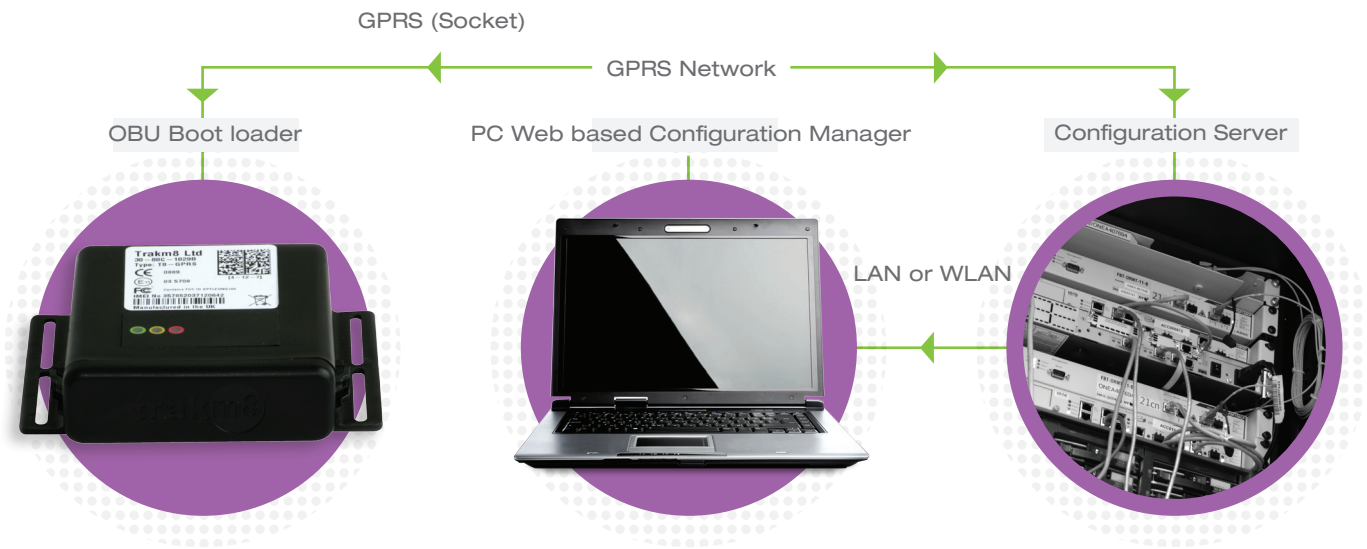This has been achieved by the development of four specific tools
• A Configuration Server for over the air configuration
• Web based tool to setup and manage this process
• Com2IP Serial Tool for direct programming
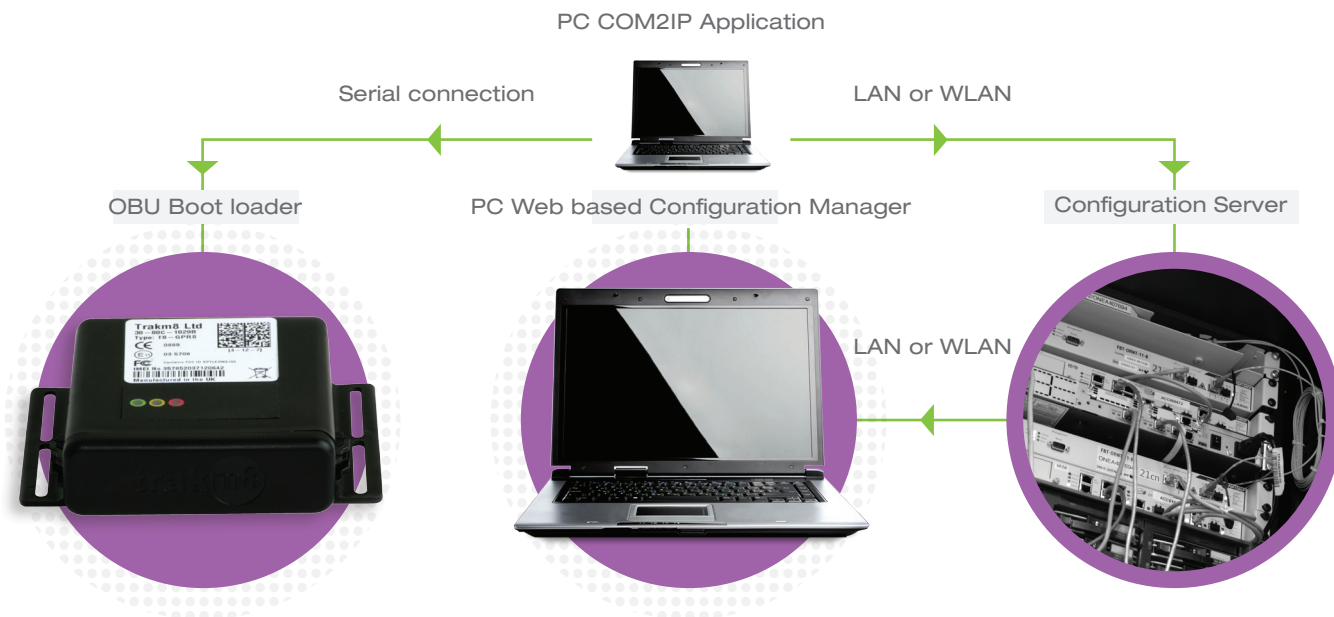• Communications intelligent bootloader

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▸ PRODUCTS - CONFIGURATION

OVER THE AIR CONFIGURATION

GPRS (Socket)

GPRS Network

OBU Boot loader   PC Web based Configuration Manager   Configuration Server

LAN or WLAN

COM2IP CONFIGURATION

PC COM2IP Application

Serial connection   LAN or WLAN

OBU Boot loader   PC Web based Configuration Manager   Configuration Server

LAN or WLAN

Process   Step 1 Define a Product using the configuration manager
Product consists of any one or all of the following:
• Firmware • Expansion Firmware • Configuration
Step 2 Allocate Product to unit or groups of units
Step 3 Upgrade over air or connect unit using COM2IP application

PRODUCTS - TEDS INTEGRATION PROTOCOL

Trakm8's own messaging protocol has been developed ensuring data is sent from units to servers quickly and efficiently. TEDS ensures the right data is sent securely to servers by compacting it. Compacting data into a smaller size not only saves time but also reduces data costs. Trakm8 can assist customers to integrate TEDS into their own servers to allow that benefit to be achieved in-house.

TEDS is Trakm8's own form of communication between units and servers
• Condensed data
• Comprehensive range of data information packets
• Optional end to end acknowledgement to guarantee data delivery

Benefits
• Data can be sent as single events with their relevant data or buffered into multiple events if the units are out of GPRS coverage
• Reduced data charges
• Secure using end to end AcKing
• Reduced data transfer time
• Quick out of coverage buffer transfer
• Supported by Trakm8 engineers messaging structure is flexible and expandable with 72 event types generated by vehicle application
• Journey Start
• Journey Periodic
• Journey Idle Start
• Journey Idle End
• Journey End
• Data can be sent as single or multi events in a condensed format

Special TEDS names pace messaging delivers data in standard ASCII format to provide a wide range of journey summary data as well as bespoke CANbus and driver behaviour features. This simple format allows Trakm8 and its customers to develop new features from concept to deployment in a short timescale.

Tools
• Developer code - Source code allows first integration process
• Event generator (TEDS tool) - Allows integrators to test their integration Event decoder (TEDS tool) - Allows integrators to view packet content

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▸ENGINEERING SERVICES - SUPPORT

KEY TASKS OF THE APPLICATION ENGINEERING SUPPORT TEAM

Trakm8 employs a team of dedicated product specialists, designated "The Application Engineering Team". This team's sole function is to deliver products to Trakm8 customers. The solutions our customers require are constantly changing, but below are examples of the work our application engineering team undertake

Trakm8 Extensible Data Source
The Applications Engineering Team are available to all Trakm8 customers from day 1 to aid with the initial integration process. This will ensure that the TEDS integration process is carried out quickly and efficiently. New customers can see data from the Trakm8 hardware products reporting into their server within a matter of hours.

- Guidance and support with TEDS integration process

- Integrating Trakm8 equipment with third party software, hardware and customer applications

- Customer training

- Firmware and Configuration Management

- Field support for major projects and new installations

- Vehicle surveys and installation method statements

- Site visits to reverse engineer new CANbus protocols on previously unknown vehicle types.

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ENGINEERING SERVICES - BESPOKE PROJECTS

Trakm8 comes with many years' experience and an in depth knowledge of both hardware and software development.

Customers bespoke and increasingly complex solutions can be developed to provide a level of support tailored to meet your specific needs.

Examples of this include the development of cutting edge hardware, integrating our hardware with your own solution. Rebranding of our existing innovative software or totally bespoke, flexible solutions can be created to meet your requirements.

Trakm8 SWIFT Task Planning and optimised scheduling creates an efficient transport plan
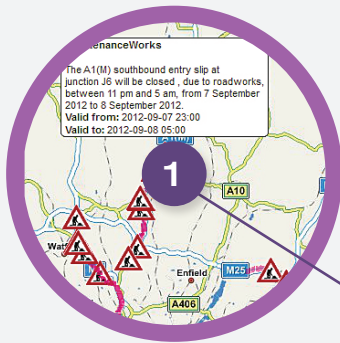
Journey Time Estimation creates a network model. Build in driver hours Jeopardy direct from tacho
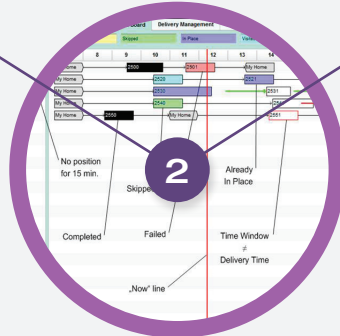
Optimised Sat Nav

Vehicle Systems
- CANbus
- Tyre pressures
- Axle weight
- Temperature
- RFID
- Tachograph

Databases
- Oracle
- MySQL
- MS SQL

ERP/CRM
- SAP
- Sage
- ADP
- Microsoft Dynamics
- Scheduling Systems

Terminals
- Motorola
- Garmin
- Windows Mobile
- Micronet
- Blackberry

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▸SOLUTIONS

1. Trakm8 Dynamics
Trakm8 Dynamics monitors in real time fleet deliveries against a predefined delivery schedule. Deliveries that are in jeopardy can be easily identified and your customers can receive delivery alerts.
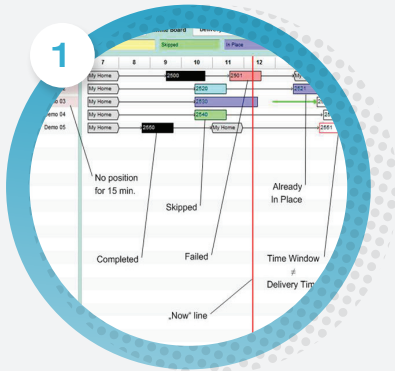
2. Trakm8 Secure
Trakm8 Secure has many features that can give real peace of mind in terms of company asset security and also provide accurate records of usage and exact whereabouts. Trakm8 Secure offers a solution to help prevent misuse of company assets, deter theft and aid recovery of the asset if stolen.

3. eco
Ideally suited for the larger fleets who have large fuel bills, you can measure your fleet's performance and reduce your fuel cost and CO2 emissions. Generate real time feedback for the driver via our in cab lightbar whilst the telematics unit measures factors which contribute to uneconomical driving such as over revving, excessive speeding, cornering, harsh braking and idling.
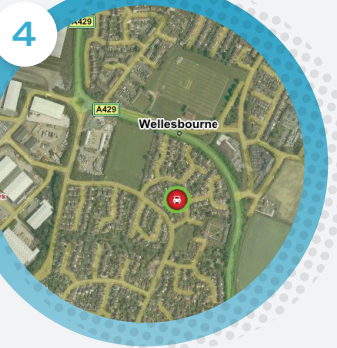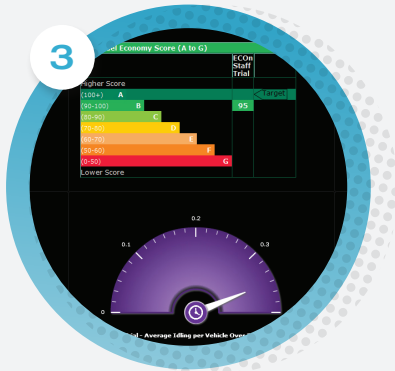
4. Trakm8 SWIFT Advanced
Ideally suited for midsized fleets, packed with all the essential fleet reports and a faster vehicle positioning update rate of 1 minute. Aerial photography is available with the option of CANbus connectivity and driver ID.

5. Trakm8 SWIFT Classic
A web based track and trace solution where you can see your vehicles in real time and have additional hardware features such as business/ private buttons and a panic button. You can also generate points of interest and run reports on vehicle activity, route replays all with a 2 minute update rate.
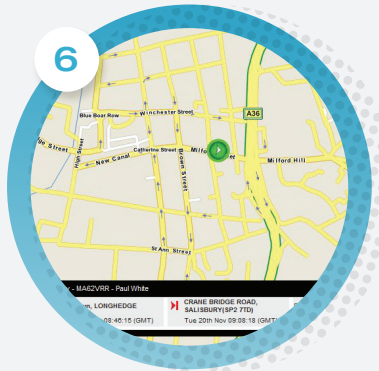
6. Trakm8 PRIME
A web based track and trace solution where you can see where your vehicles are at any point in time. Simple reports can be run to see your vehicles activity for a selected period of time.

▸ TRAKM8 SOLUTION - SERVERS

Trakm8 software is delivered online through the internet, it is a 'Cloud based' application or 'Software as a Service' (SaaS) architecture – which runs on distant computers securely within the Internet cloud. This provides cost-effective, flexible and secure alternative to traditional in-house approaches. The key advantages of SaaS / Cloud based solutions is that they provide minimal risk with no long term customer commitment and subscription based pay monthly cost models which provides immediate scalability; Improved mobility with remote access via any web browser; enhanced security with multiple trusted secure data centres with redundancy and automatic failover designed into the application architecture; improved performance with consistent service, expert UK based support and guaranteed service levels. Most importantly the solution is simple to purchase and use because there are no applications to install; it is all internet based and delivered through your web browser.

Some of our larger multi-national customers choose a private-cloud approach. This entails installing and hosting the Trakm8 SaaS Cloud architecture within a customer's own datacentre infrastructure. Clearly a much more expensive alternative, but it provides the benefits of a fully managed private-cloud solution within a dedicated customer data centre.

Trakm8 uses dual data centres which are geographically separated with multiple points of presence, real-time data replication and failover. The data centres have sophisticated security, surveillance, power and environmental systems which are monitored 24/7 and meet or exceed industry best practice.

The Trakm8 application architecture consists of several layers, an application layer, an information (database) layer and a network layer; Collectively these layers are called Trakm8 STREAM. The application layer provides the business logic for our telematics services such as Trakm8 SWIFT which is the fleet management vehicle tracking system. Trakm8 Dynamics which is the logistics service which provides CRM/ERP integration, electronic proof of delivery ePOD and ETA monitoring. The network layer provides our wireless communications infrastructure which is required to maintain communication with the thousands of remote assets over the mobile phone network.

Trakm8 can also provide direct customer integration in the form of web services and XML data feeds for importing and synchronising customer data which can include fleet makeup, user hierarchy, transactional data such as orders, delivery requirements and proof of delivery as well as location and tachometer data.

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