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PROFESSIONAL FLEET MANAGEMENT
EQUIPMENT & SOFTWARE

2016



ABOUT

Corporate group TechnoKom specializes in radio systems engineering and integration and has more than 23 years of experience in this field. The team of highly skilled developers, including engineers and programmers, was created in 1993 in Chelyabinsk and was originally based at the Radio Technical Systems Department of the South Ural State University.

Eventually a small production company developed into a concern of companies united by a common purpose which formed the corporate group TechnoKom.

Over the years company's specialists accumulated extensive practical knowledge in design and production of various electronic devices and systems. TechnoKom-Technology, a member of the corporate group TechnoKom, has one

of the most technologically advanced production facilities for serial assembly of electronic boards in Russia. In 2009 the company successfully launched its own fully automated full-cycle SMD production line.

Today the entire process from designing to final product is carried out in Chelyabinsk on the basis of the cutting edge European and Japanese equipment. The high quality of electronic assembly is confirmed by both domestic and foreign experts.

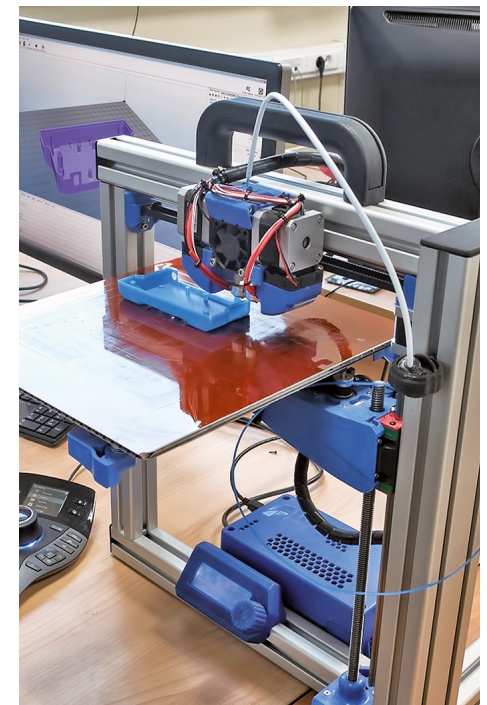


DEVELOPMENT

Product development starts with the needs analysis of our customers and dealers. The research team continually monitors the market, researches for new technologies and components, sets the standards for new products and ensures compliance with the current legislation. Constant technical support of the world leading manufacturers and suppliers of components ensures state of the art engineering solutions. All this gives us an edge and helps to make sure that we are one step ahead of our competitors.

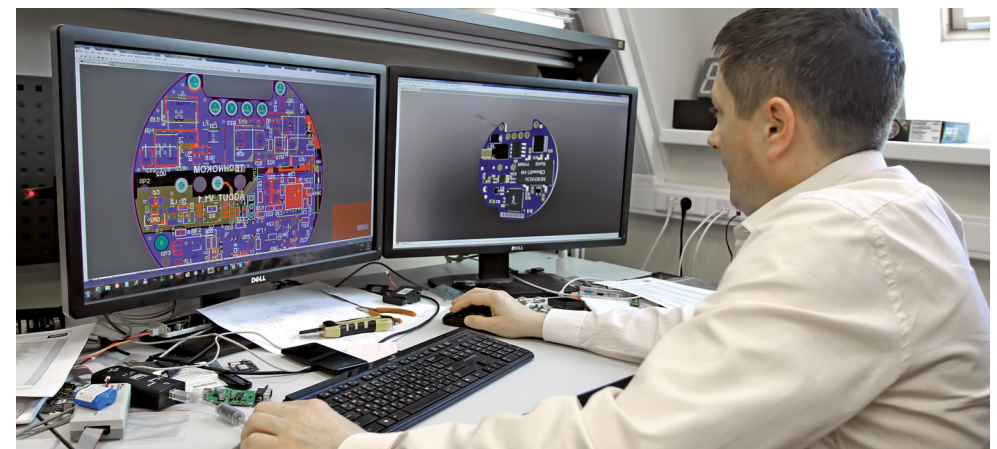
The next stage of development is conducted by the design-engineering department. This team deals with the immediate development of products and the circuit design. A team of professional design engineers implements the requirements of the research phase, extends products' functionality, introduces new technologies and components into the system and cuts off dead-end solutions. Development is conducted on the basis of the latest hardware and software. The team uses a wide range of measuring and testing equipment from the leading manufacturers.

Extensive use of 3D printing technology and 3D-prototyping during the development of cases and PCBs allows us to check the design elements quickly and make changes to the product well before the start of batch production. To assess the behavior of devices



and components in real and extreme conditions we use a climatic chamber, which allows us to conduct temperature-cycle testing of samples and simulate the required climatic zones, change of seasons and the critical heating and cooling.

During the development of almost any electronic device we simultaneously work in three directions: on the design of its hardware, its firmware and software.





MANUFACTURE

Once the unit has been designed and tested, it goes into production. Professional engineers supervise and optimize the manufacturing process for all stages of the production.

The production starts with the application of solder paste to PCB using screen and stencil printer integrated in the production line.

The next step is provided with **MYDATA** automatic and precision high-speed chip mounters. Optimal task assignment between mounters provides dramatic performance increase of production line. Due to careful timing, PCBs are delivered from one mounter into the next mounter without interruption of operating process for a moment.

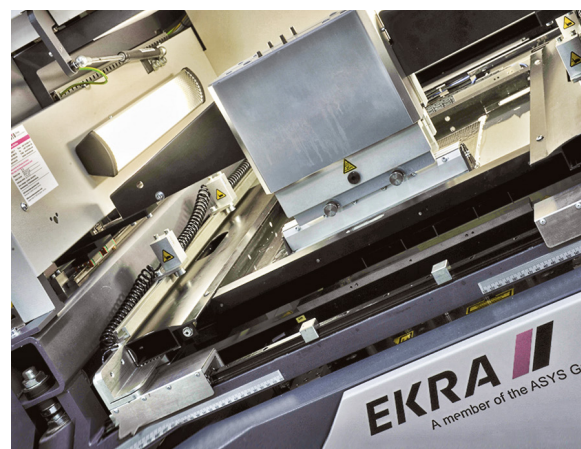
TechnoKom is one of the first manufacturers in Russia using Vapour Phase Soldering Technology in production. Nowadays it is the most innovative and advanced technology, which is used for soldering. In our production we use the **ASSCON VP1000** vapour phase

soldering system. Due to this fact the optimum temperature is ensured at all component positions, excluding over- and underheatings, which is typical for conventional soldering systems. Application of vapour phase soldering system provides fault-free soldering of complex components and PCBs.

Automated conveyor connecting all units of the production line together is responsible for automatic waiting queue and delivery of printed boards from one unit to others. The assembling quality control is the essential part of our production.

Application of automated optical inspection machine by **NORDSON** reliably minimizes the risk of manufacturing defect. When any fault or unreliable joint is captured it is shown on the display of the computer, as well as the fault is reported to an operator. In complex conditions, we use **XT V 160** electronics X-ray inspection machine, which allows to look inside the PCB and its components.

The last step – multiphase PCB test using hi-tech equipment is guaranty of the high quality of our products.



Today the corporate group TechnoKom is a recognized leader in the design and manufacture of GPS /GLONASS satellite tracking systems and monitoring of vehicles and personnel in the Russian Federation.

Our product has a wide range of applications and can be installed on cars and trains, planes and ships, agricultural and construction equipment. More than six hundred thousand navigation system controllers AutoGRAPH are operating at this very second on various Russian and foreign enterprises.

Our range of on-board controllers covers almost all areas of application and allows you to optimally and efficiently solve a wide variety of tasks for transport control and management.

AutoGRAPH FLEET MANAGEMENT SOLUTION

We deliver a wide range of fleet management devices providing our customers with a choice of optimal solution for their special tasks. AutoGRAPH fleet management devices are capable of data transmission across different wireless network at your option.



More than six hundred thousand AutoGRAPH devices are operating at this very second on various Russian and foreign enterprises. Our range of fleet management devices provides solutions for a great number of tasks. Possibility for optional extension of AutoGRAPH device functionality gives a great opportunity to select the most optimal solution specially for your application.

Excellent quality and reliability of AutoGRAPH devices are generally recognized by our customers in Russia and abroad. With AutoGRAPH system your fleet management will be propelled to completely next level.

AutoGRAPH IP54 PROTECTION RATING CASE

The optional high protection rating case allows AutoGRAPH on-board devices to operate continuously even in extreme environments. All modifications of AutoGRAPH on-board devices supplied in the protective case have been successfully tested in certification centers proving high-reliable operation.



AUTOGRAPH FLEET MANAGEMENT TRACKERS OVERVIEW

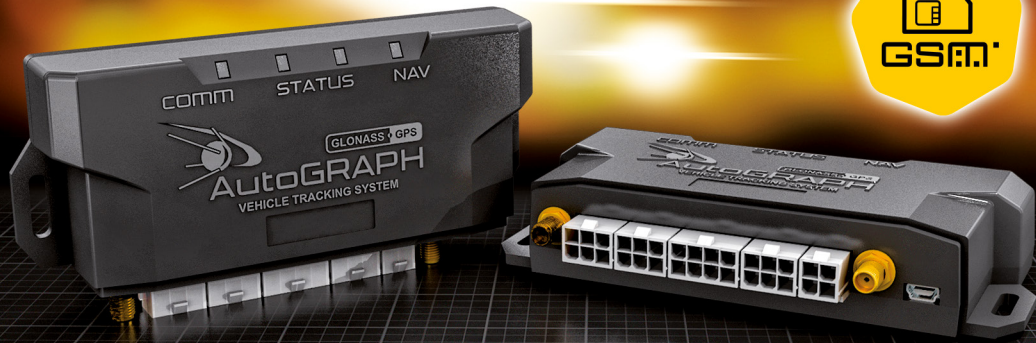
DESCRIPTION / DEVICE	SL	GSM	GSM+	GSM+ WiFi	WiFi
NAVIGATION					
Supported GNSS	GLONASS + GPS / GALILEO / Beidou				
GLONASS/GPS antenna	External (SMA)	External (SMA)	External (SMA)	External (SMA)	External (SMA)
COMMUNICATION					
GSM/GPRS	850/900/1800/1900	850/900/1800/1900	850/900/1800/1900	850/900/1800/1900	---
3G UMTS ¹	---	Yes	Yes	Yes	---
Wi-Fi	---	---	---	Wi-Fi 802.11 b/g/n	Wi-Fi 802.11 b/g/n
GSM/Wi-Fi antenna	External (SMA)	External (SMA)	External (SMA)	External (SMA)	External (SMA)
BASIC CHARACTERISTICS					
Internal accelerometer / motion sensor	Yes	Yes	Yes	Yes	Yes
Internal non-volatile memory, records	> 270.000	> 270.000	> 270.000	> 270.000	> 270.000
Additional memory (MicroSD/eMMC)	---	Yes	Yes	Yes	Yes
Bluetooth Smart	---	Yes	Yes	Yes	Yes
Digital inputs	2	6	6	6	6
Digital outputs	1	2	2	2	2
Digital high-impedance inputs	1	---	1	1	1
Configurable (analogue-digital) inputs	---	2	2	2	2
RPM input	---	---	1	1	1
RS-485 (TIA / EIA-485-A) bus	1	2	2	2	2
CAN (SAE J1939 / FMS) bus	1	1	2	2	2
1-Wire bus	---	1	1	1	1
RS-232 bus	---	1	1	1	1
Voice communication (GSM)	---	---	Yes	Yes	---
Protective case (IP54) ¹	---	Yes	Yes	Yes	Yes
External backup power input	---	Yes	Yes	Yes	Yes
Backup battery charger	---	---	Yes	Yes	Yes
Power consumption ²	50	70	80	80	80

¹ Optional. ² The value is given for the data recording mode.

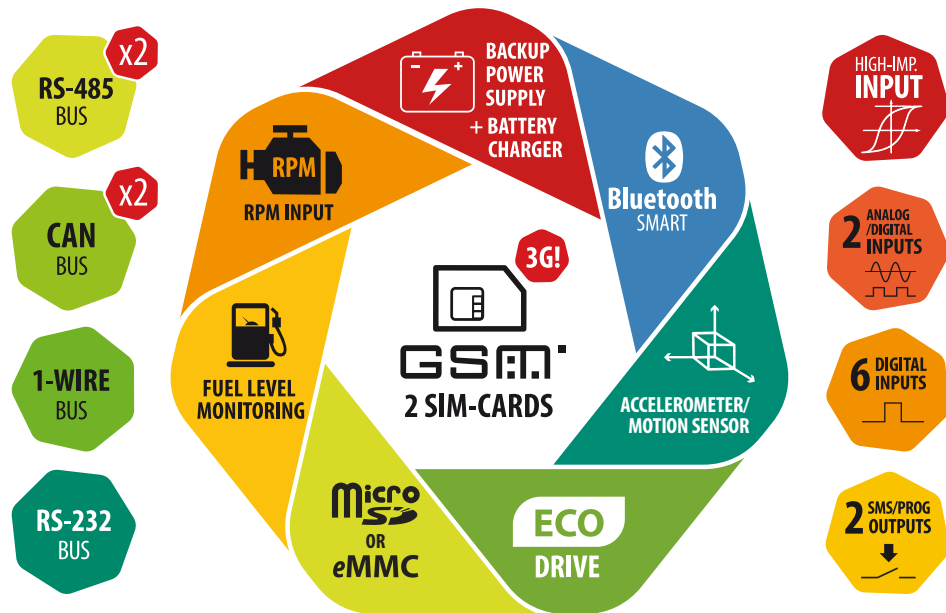
Power consumption in other operating modes is given in technical specification for each AutoGRAPH device.

AutoGRAPH-GSM/GSM+

FLEET MANAGEMENT
SOLUTION



THE MOST COMMON TRACKING DEVICE IN RUSSIA AND ABROAD



The features provided on the diagram are applied to the extended modification of AutoGRAPH-GSM device.
Differences between standard and extended models are given on the following table.

TECHNICAL SPECIFICATION

NAVIGATION & COMMUNICATION

- | | |
|------------------------|--|
| GNSS receiver | <ul style="list-style-type: none"> • uBlox MAX-M8Q, 72 channels • GLONASS + GPS / GALILEO / Beidou • A-GNSS, D-GPS • Cold start: 26 s¹ • Accuracy: 2 m¹ (CEP) • External antenna (SMA) |
| GSM module | <ul style="list-style-type: none"> • 3G UMTS² / GSM (GPRS / SMS) 850 / 900 / 1800 / 1900 MHz • 2 x SIM • External antenna (SMA) |
| Bluetooth Smart | <ul style="list-style-type: none"> • Yes • Effective range: up to 10 m |

INTERFACES

	AutoGRAPH-GSM+	AutoGRAPH-GSM
Serial buses	<ul style="list-style-type: none"> • 2 x RS-485 (TIA / EIA-485-A) • 2 x CAN (SAE J1939 / FMS) • 1 x RS-232 • 1 x 1-Wire • 1 x USB 2.0 • 1 RPM input (RPM counting) 	<ul style="list-style-type: none"> • 2 x RS-485 (TIA / EIA-485-A) • 1 x CAN (SAE J1939 / FMS) • 1 x RS-232 • 1 x 1-Wire • 1 x USB 2.0
Inputs / Outputs	<ul style="list-style-type: none"> • 4 active low digital inputs • 2 active high digital inputs • 2 configurable (analogue/digital) inputs • 2 digital outputs • 1 high-impedance active high input 	<ul style="list-style-type: none"> • 4 active low digital inputs • 2 active high digital inputs • 2 configurable (analog/digital) inputs • 2 digital outputs
Voice communication (GSM)	<ul style="list-style-type: none"> • Microphone input • Internal loudspeaker amplifier 	

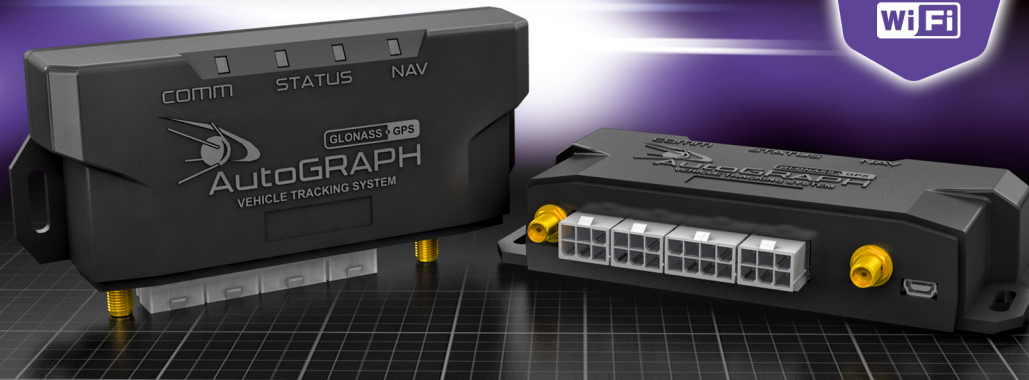
BASIC CHARACTERISTICS

	AutoGRAPH-GSM+	AutoGRAPH-GSM
Memory	<ul style="list-style-type: none"> • FLASH (up to 270.000 records) • eMMC 	<ul style="list-style-type: none"> • FLASH (up to 270.000 records) • MicroSD (up to 32 GB)
Sensors	<ul style="list-style-type: none"> • Internal 3-axis accelerometer • Motion sensor 	<ul style="list-style-type: none"> • Internal 3-axis accelerometer • Motion sensor
External backup power input	<ul style="list-style-type: none"> • 12 VDC 	<ul style="list-style-type: none"> • 12/24 VDC
External backup battery (not supplied)	<ul style="list-style-type: none"> • Lead-acid • Internal battery charger • Charging time: 30 hours 	
Electrical	<ul style="list-style-type: none"> • Operating voltage: 10...60 V • Power consumption³ <ul style="list-style-type: none"> - recording state: 80 mA - data transferring state: 320 mA 	<ul style="list-style-type: none"> • Operating voltage: 10...60 V • Power consumption³ <ul style="list-style-type: none"> - recording state: 70 mA - data transferring state: 300 mA
Environmental	<ul style="list-style-type: none"> • Operating temperature: -40...+85 °C • Optional protective case: IP54 	<ul style="list-style-type: none"> • Operating temperature: -40...+85 °C • Optional protective case: IP54
Dimensions	<ul style="list-style-type: none"> • Standard case: 138 x 67 x 27 mm, 110 g • Protective case: 138 x 92 x 27 mm, 150 g 	
Average life time	<ul style="list-style-type: none"> • 10 years 	

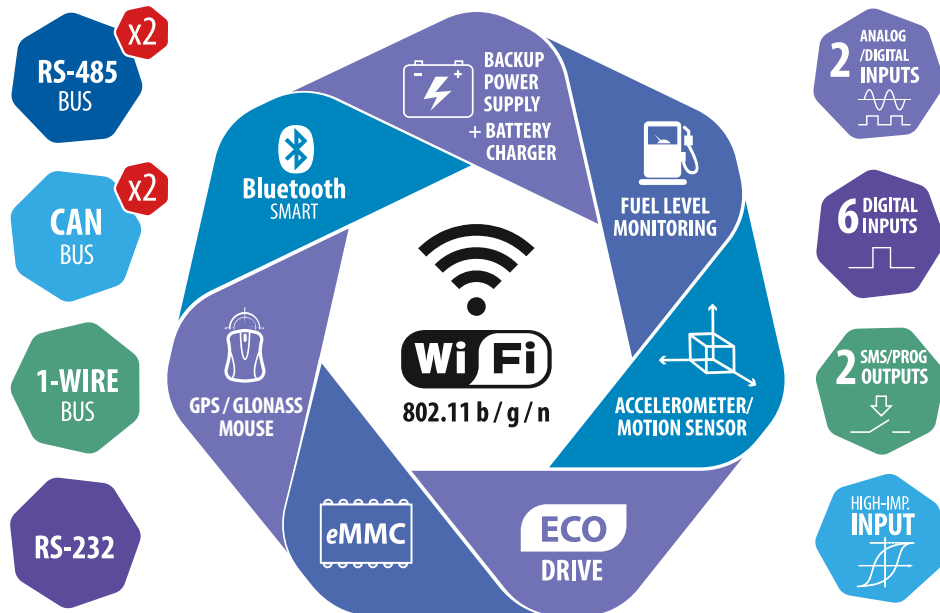
¹ With nominal GNSS signal levels -130 dBm.

² Optional. ³ At 12 VDC, 22 °C.





VEHICLE TRACKING EVEN OUT OF GSM AREA



GLONASS + GPS

WWT
World Wide Tracking

UTSYSTEM
Universal Tracking System



TECHNICAL SPECIFICATION

NAVIGATION & COMMUNICATION

GNSS receiver	<ul style="list-style-type: none"> • uBlox MAX-M8Q, 72 channels • GLONASS + GPS / GALILEO / Beidou • A-GNSS, D-GPS • Cold start: 26 s¹ • Accuracy: 2 m¹ (CEP) • External antenna (SMA)
Wi-Fi module	<ul style="list-style-type: none"> • 802.11 b / g / n, WEP, WPA, WPA2 Personal and Enterprise • Output Power: 17.0 dBm • Sensitivity: -94.7 dBm • External antenna (SMA)
Bluetooth Smart	<ul style="list-style-type: none"> • Yes • Effective range: up to 10 m

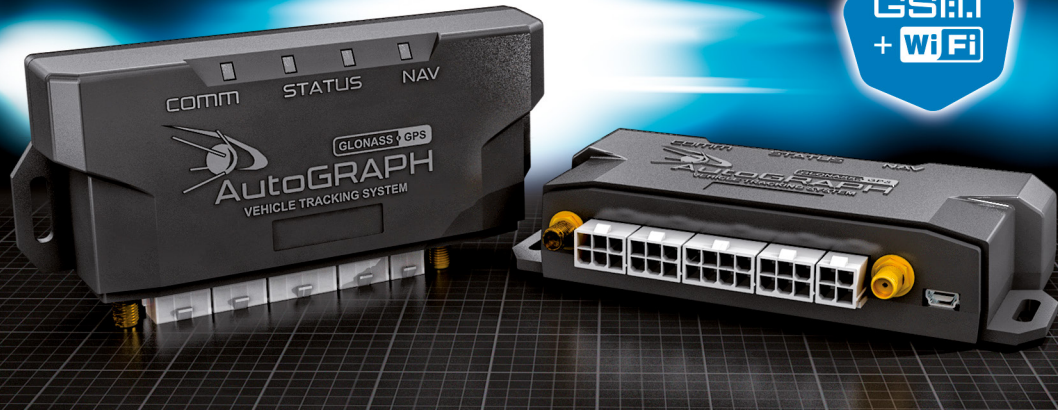
INTERFACES

Serial buses	<ul style="list-style-type: none"> • 2 x RS-485 (TIA / EIA-485-A) • 2 x CAN (SAE J1939 / FMS) • 1 x RS-232 • 1 x 1-Wire • 1 x USB 2.0 • 1 RPM input (RPM counting)
Inputs / outputs	<ul style="list-style-type: none"> • 4 active low digital inputs • 2 active high digital inputs • 2 configurable (analogue/digital) inputs • 2 digital outputs • 1 high-impedance active high input

BASIC CHARACTERISTICS

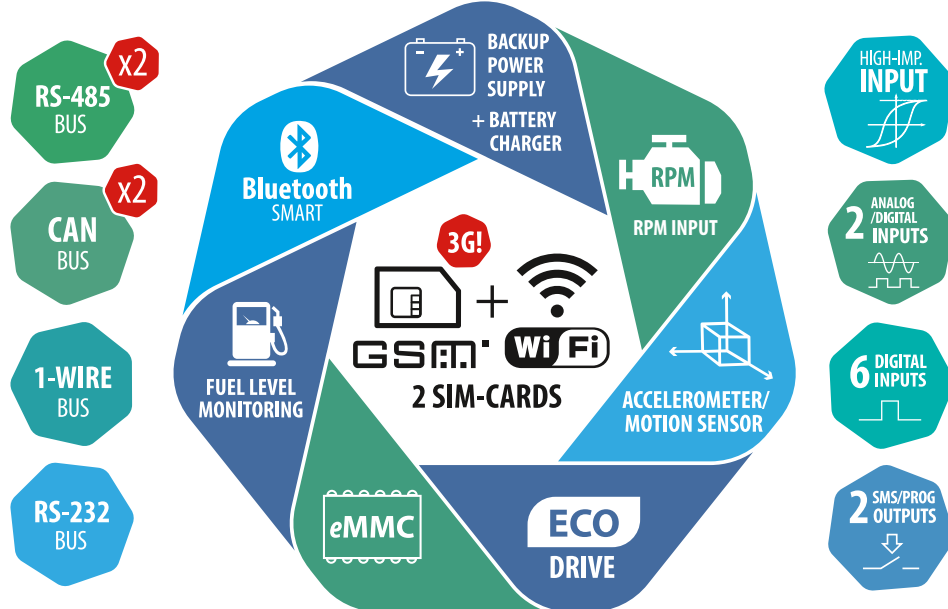
Memory	<ul style="list-style-type: none"> • FLASH (up to 270.000 records) • eMMC
Sensors	<ul style="list-style-type: none"> • Internal 3-axis accelerometer • Motion sensor
External backup power input	<ul style="list-style-type: none"> • 12 VDC
External backup battery (not supplied)	<ul style="list-style-type: none"> • Lead-acid • Internal battery charger • Charging time: 30 hours
Electrical	<ul style="list-style-type: none"> • Operating voltage: 10...60 V • Power consumption² - recording state: 80 mA - data transferring state: 300 mA
Environmental	<ul style="list-style-type: none"> • Operating temperature: -40...+85 °C • Optional protective case: IP54
Dimensions	<ul style="list-style-type: none"> • Standard case: 138 x 67 x 27 mm, 110 g • Protective case: 138 x 92 x 27 mm, 150 g
Average life time	<ul style="list-style-type: none"> • 10 years

¹ With nominal GNSS signal levels -130 dBm. ² At 12 VDC, 22 °C.



GSM
+ WiFi

EXTREMELY POWERFUL SOLUTION FOR FLEET MANAGEMENT



GLONASS GPS

WWT
World Wide Tracking

UTSYSTEM
Universal Tracking System

ERC

TECHNICAL SPECIFICATION

NAVIGATION & COMMUNICATION

GNSS receiver	<ul style="list-style-type: none"> • uBlox MAX-M8Q, 72 channels • GLONASS + GPS / GALILEO / Beidou • A-GNSS, D-GPS • Cold start: 26 s¹ • Accuracy: 2 m¹ (CEP) • External antenna (SMA)
GSM module	<ul style="list-style-type: none"> • 3G UMTS² / GSM (GPRS/SMS) 850 / 900 / 1800 / 1900 MHz • 2 x SIM • External antenna (SMA)³
Wi-Fi module	<ul style="list-style-type: none"> • 802.11 b / g / n, WEP, WPA, WPA2 Personal and Enterprise • Output Power: 17.0 dBm • Sensitivity: -94.7 dBm • External antenna (SMA)³
Bluetooth Smart	<ul style="list-style-type: none"> • Yes • Effective range: up to 10 m

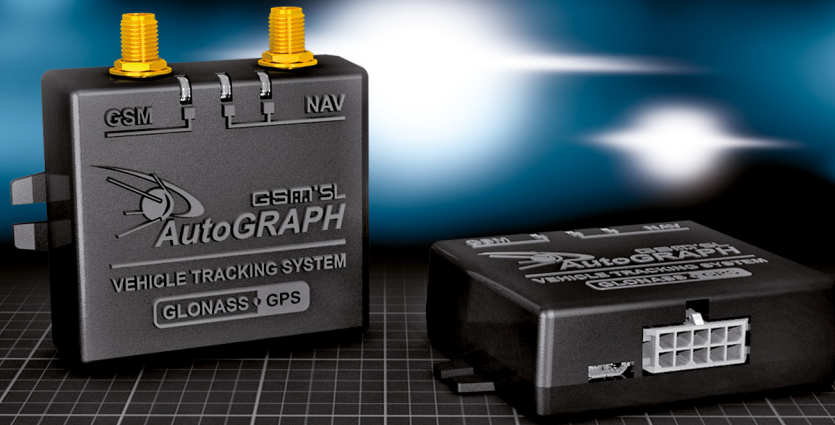
INTERFACES

Serial buses	<ul style="list-style-type: none"> • 2 x RS-485 (TIA / EIA-485-A) • 2 x CAN (SAE J1939 / FMS) • 1 x RS-232 • 1 x 1-Wire • 1 x USB 2.0 • 1 RPM input (RPM counting)
Inputs / outputs	<ul style="list-style-type: none"> • 4 active low digital inputs • 2 active high digital inputs • 2 configurable (analogue/digital) inputs • 2 digital outputs • 1 high-impedance active high input

BASIC CHARACTERISTICS

Memory	<ul style="list-style-type: none"> • FLASH (up to 270.000 records) • eMMC
Sensors	<ul style="list-style-type: none"> • Internal 3-axis accelerometer • Motion sensor
External backup power input	<ul style="list-style-type: none"> • 12 VDC
External backup battery (not supplied)	<ul style="list-style-type: none"> • Lead-acid • Internal battery charger • Charging time: 30 hours
Electrical	<ul style="list-style-type: none"> • Operating voltage: 10...60 V • Power consumption⁴ - recording state: 80 mA - data transferring state: 300 mA
Environmental	<ul style="list-style-type: none"> • Operating temperature: -40...+85 °C • Optional protective case: IP54
Dimensions	<ul style="list-style-type: none"> • Standard case: 138 x 67 x 27 mm, 110 g • Protective case: 138 x 92 x 27 mm, 150 g
Average life time	<ul style="list-style-type: none"> • 10 years

¹ With nominal GNSS signal levels -130 dBm. ² Optional. ³ The tracker is supplied with combined GSM/Wi-Fi antenna. ⁴ At 12 VDC, 22 °C.



ULTRA SMALL SIZE WITH A GREAT SET OF ADVANCED FEATURES



TECHNICAL SPECIFICATION

NAVIGATION & COMMUNICATION

- | | |
|----------------------|--|
| GNSS receiver | <ul style="list-style-type: none"> • uBlox MAX-M8Q • GLONASS + GPS / GALILEO / Beidou • 72 channels • A-GNSS, D-GPS • Cold start: 26 s¹ • Accuracy: 2.0 m¹ (CEP) • External antenna (SMA) |
| GSM module | <ul style="list-style-type: none"> • GSM (GPRS / SMS) 850 / 900 / 1800 / 1900 MHz • 2 x SIM • External antenna (SMA) |

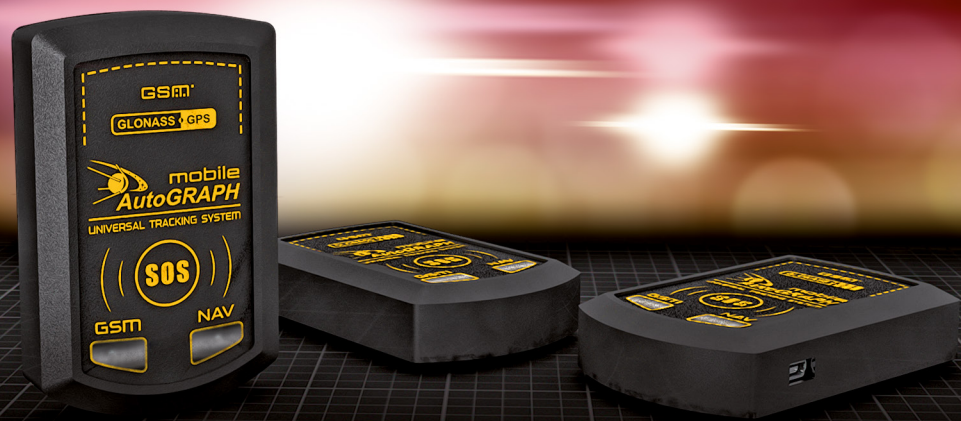
INTERFACES

- | | |
|-------------------------|---|
| Serial buses | <ul style="list-style-type: none"> • 1 x RS-485 (TIA / EIA-485-A) • 1 x CAN (SAE J1939 / FMS) • 1 x USB 2.0 |
| Inputs / Outputs | <ul style="list-style-type: none"> • 2 x digital inputs: 1 x active low, 1 x active high • 1 x high-impedance active high input • 1 x digital output |

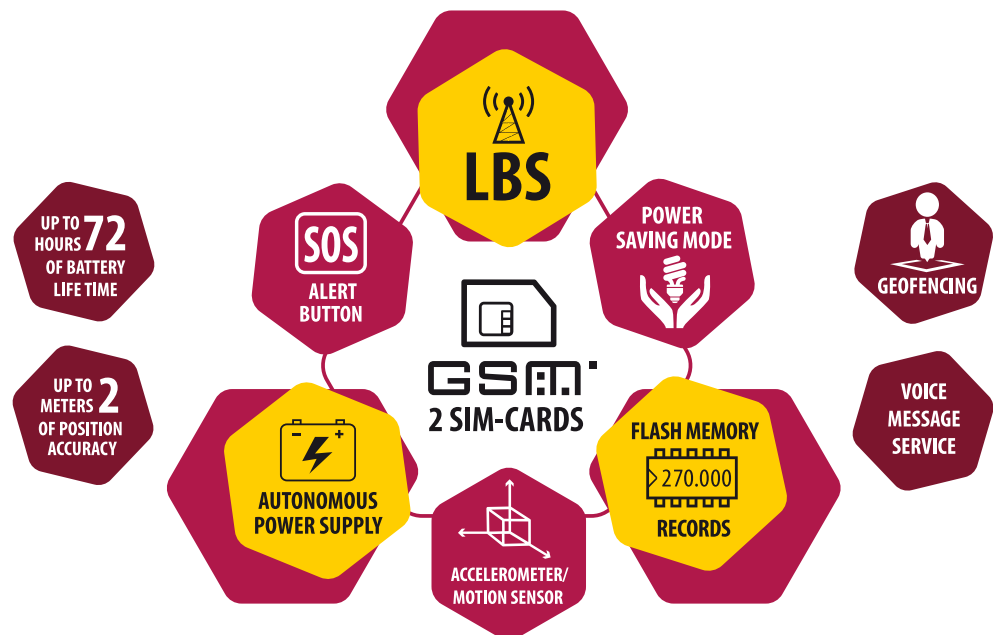
BASIC CHARACTERISTICS

- | | |
|--------------------------|---|
| Memory | • FLASH (up to 270.000 records) |
| Sensors | • Internal 3-axis accelerometer • Motion sensor |
| Electrical | <ul style="list-style-type: none"> • Operating voltage: 10...60 V • Power consumption (at 12 VDC, 22 °C) <ul style="list-style-type: none"> - recording state: 50 mA - data transferring state: 200 mA |
| Environmental | • Operating temperature: -40...+85 °C |
| Dimensions | • 65 x 50 x 20 mm, 50 g |
| Average life time | • 10 years |

¹ With nominal GNSS signal levels -130 dBm.



RELIABLE SOLUTION FOR PERSONAL TRACKING



NAVIGATION & COMMUNICATION

Locating • GNSS, LBS

GNSS receiver • uBlox MAX-M8Q
• GLONASS + GPS / GALILEO / Beidou
• 72 channels
• A-GNSS, D-GPS
• Cold start: 26 s¹
• Accuracy: 2.0 m¹ (CEP)
• Internal antenna

GSM module • GSM (GPRS / SMS) 850 / 900 / 1800 / 1900 MHz
• 2 x SIM
• Internal antenna

BASIC CHARACTERISTICS

Memory • FLASH (up to 270.000 records)

Connection to PC • USB 2.0

Sensors • Internal 3-axis accelerometer • Motion sensor

Battery • Li-Ion, 3.7 V, 1800 mAh
• Charging via USB or power adapter
• Charging time: approx. 160 min
• Operating / Charging voltage: 5 V

Features • Alert button (Voice message / SMS)
• Power saving mode

Environmental • Operating temperature:
- connected to battery: -20...+45 °C
- connected to external power: -40...+85 °C
• Charging temperature: 0...+45 °C

Dimensions • 92 x 58 x 22 mm, 90 g

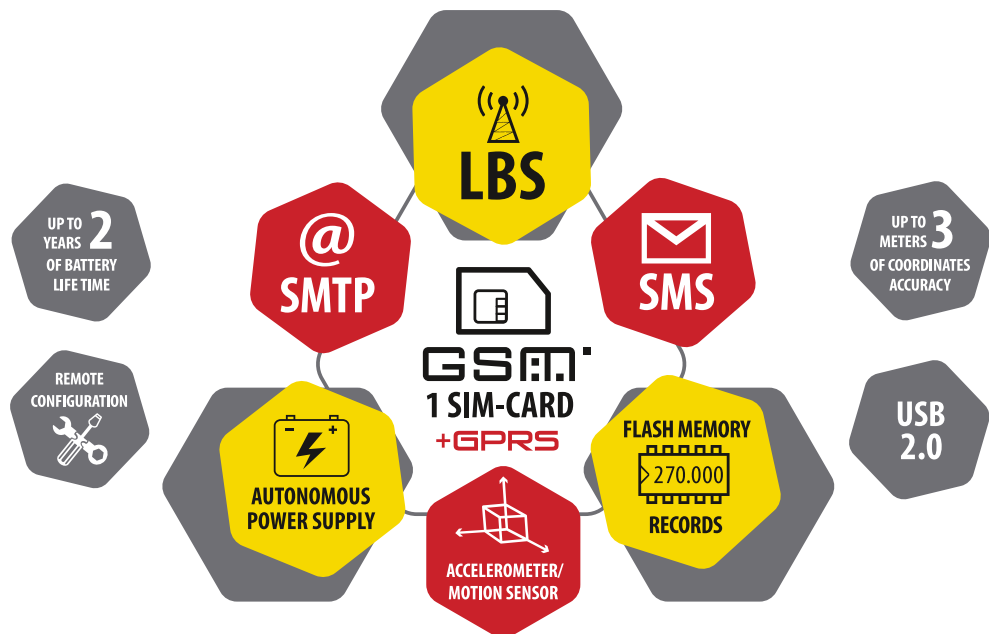
Average life time² • 10 years

¹ With nominal GNSS signal levels -130 dBm.

² Does not apply to the battery.



AUTONOMOUS NAVIGATION AND SEARCHING SYSTEM



TECHNICAL SPECIFICATION

NAVIGATION & COMMUNICATION

Locating	• GNSS, LBS
Communication	• SMS / SMTP / GPRS
GNSS receiver	<ul style="list-style-type: none"> • uBlox MAX-M8Q • GLONASS + GPS / GALILEO / Beidou • 72 channels • A-GNSS, D-GPS • Cold start: 26 s¹ • Accuracy: 2.0 m¹ (CEP) • Internal antenna
GSM module	<ul style="list-style-type: none"> • GSM (GPRS / SMS) 850 / 900 / 1800 / 1900 MHz • 1 x SIM • Internal antenna

BASIC CHARACTERISTICS

Memory	• FLASH (up to 270.000 records)
Connection to PC	• USB 2.0
Sensors	• Internal 3-axis accelerometer • Motion sensor
Battery	<ul style="list-style-type: none"> • Li-MnO₂, 6.0 V, 1550 mAh • Battery life time: up to 2 years²
Environmental	• Operating temperature: -40...+85 °C
Dimensions	• 75 x 48 x 21 mm, 80 g
Average life time³	• 10 years

¹ With nominal GNSS signal levels -130 dBm.

² Under normal use, battery life time amounts up to 2 years. Battery capacity is enough to send 1200 messages with coordinates (Email, SMS and data to server).

³ Does not apply to the battery.

AutoGRAPH-NAVIGATOR

TELEMATICS
TABLET



ALL-IN-ONE SOLUTION: DRIVER ASSISTANT,
FLEET MANAGEMENT, NAVIGATION



WWT
World Wide Tracking

UTSYSTEM
Universal Tracking System

TECHNICAL SPECIFICATION

NAVIGATION & COMMUNICATION

- GNSS receiver**
 - uBlox MAX-M8Q
 - GLONASS + GPS / GALILEO / Beidou
 - 72 channels, A-GNSS, D-GPS
 - Cold start: 26 s¹
 - Accuracy: 2.0 m¹ (CEP)
 - Internal antenna
- GSM module**
 - 3G UMTS² / GSM (GPRS/SMS) 850 / 900 / 1800 / 1900 MHz
 - 2 x SIM
 - Internal antenna
- Wireless²**
 - Wi-Fi (802.11 b/g/n)
 - Bluetooth (Smart)

PERFORMANCE

- Processor**
 - ARM Cortex-A8 Core
 - AM3354, 1GHz
- Memory**
 - RAM: 512 MB
 - External: MicroSD (up to 32 GB)
- Display**
 - 7 inch, 800 x 480
 - TFT, touchscreen
- OS**
 - Microsoft Windows Embedded Compact 7.0

INTERFACES AND FEATURES

- Interfaces**
 - 1 x RS-485 (TIA / EIA-485-A)
 - 1 x CAN (SAE J1939 / FMS)
 - 1 x RS-232
 - 1 x 1-Wire
 - 1 x USB 2.0
- Sensors**
 - Internal 3-axis accelerometer • Motion sensor
- Voice communication (GSM)**
 - Internal microphone
 - Internal loudspeaker amplifier
 - Phone book

- Smart features**
 - Vehicle tracking and fuel control (LLS)
 - Routing service and task management
 - Different modes: Navigation, Auto-information
 - Loading files from server: maps, routes, tasks
 - Message handling
 - Remote firmware update
 - Supporting internet, vector, raster maps

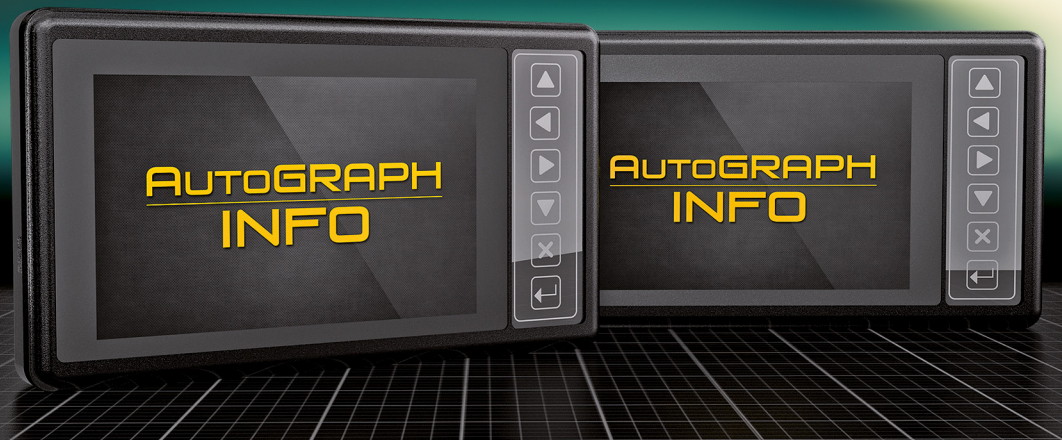
POWER SUPPLY

- Electrical**
 - Operating voltage: 10...60 V
 - Power consumption (at 12 VDC, 22 °C) 700 mA
- Internal backup battery**
 - Li-Polymer, 4.2 V
 - 1500-4500 mAh
 - ~1 hours of autonomous operation

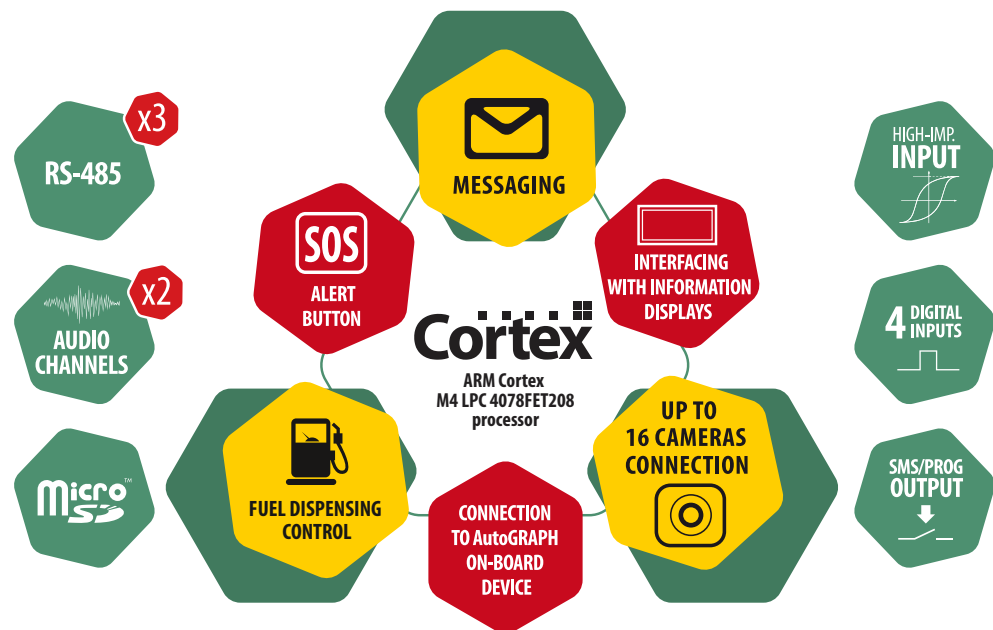
OTHER CHARACTERISTICS

- Environmental**
 - Operating temperature³: -40...+85 °C
- Dimensions**
 - 205 x 115 x 14 mm, 500 g
- Average life time³**
 - 7 years

¹ With nominal GNSS signal levels -130dBm. ² Optional. ³ Does not apply to the battery.



EASY AND SMART DRIVER ASSISTANT



PERFORMANCE

- | | |
|------------------|---|
| Processor | • ARM Cortex M4
LPC 4088FET208 |
| Memory | • FLASH
• MicroSD (up to 32 GB) |
| Display | • 5 inch, 800 x 480
• TFT, touchscreen |

INTERFACES AND FEATURES

- | | |
|-------------------------|--|
| Serial buses | • 3 x RS-485
• 1 x USB 2.0 |
| Inputs / Outputs | • 4 x Digital inputs
• 1 x High-impedance input
• 1 x Digital output |
| Audio | • 2 x audio outputs
• 6 W/output |
| Smart features | • Connection to AutoGRAPH on-board device
• Messaging
• Auto announcement of public stops
• Vehicle operation display
• Driver identification by iButton keys
• Fuel level control
• Axle load control
• Connection to fueller
• Connection of up to 16 photo cameras
• Alert signal transmission
• Connection of information displays
• Data loading from server |

OTHER CHARACTERISTICS

- | | |
|--------------------------|--|
| Electrical | • Operating voltage: DC 10...60 V
• Power consumption (at 12 VDC, 22 °C)
- normal mode: 250 mA
- playback mode: 1880 mA |
| Environmental | • Operating temperature: -40...+85 °C |
| Dimensions | • 160 x 96 x 37 mm, 270 g |
| Average life time | • 10 year |

AutoGRAPH-INFO-MINI

INFORMATIONAL
DISPLAYS



MULTIFUNCTIONAL VEHICLE OPERATION DISPLAY



WWT
World Wide Tracking

UTSYSTEM
Universal Tracking System

TECHNICAL SPECIFICATION

PERFORMANCE

Processor • ARM Cortex M4
LPC 4088FET208

Memory • FLASH

Display • 128 x 64 pixels

INTERFACES AND FEATURES

Serial buses • 1 x RS-485
• 1 x USB 2.0

Inputs / Outputs • 1 x Digital input (active low)
• 1 x Digital output

Smart features • Connection to AutoGRAPH on-board device
• Messaging
• Fuel level control
• Axle load control
• Connection to fueller
• Vehicle operation display

BACIS CHARACTERISTICS

Real-time clock • Yes

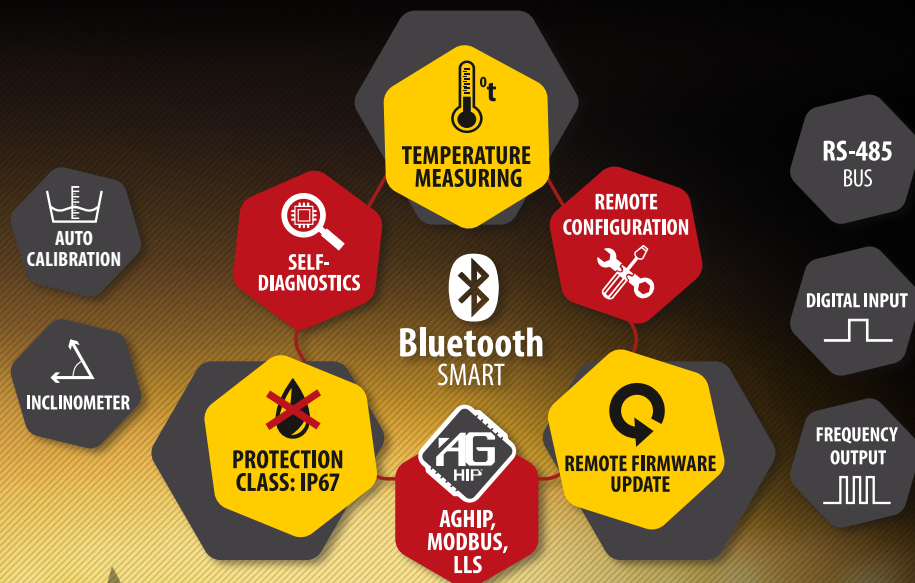
Electrical • Operating voltage: 10...60 V
• Power consumption (at 12 B, 22 °C): 50 mA

Environmental • Operating temperature: -40...+85 °C

Dimensions • 105 x 57 x 18 mm, 90 g

Average life time • 10 year

TKLS FUEL LEVEL SENSOR: SMART. EFFICIENT. RELIABLE



We offer simple and still smart solution for fuel control designed by our engineers with the benefit of our long-term experience in fleet management solution development. At the core of TKLS fuel level sensor are long-term reliability, guaranteed accuracy of measurement in different conditions, high performance and high quality. All these features become its great advantages.

BASIC CHARACTERISTICS

Interfaces	<ul style="list-style-type: none"> 1 x RS-485 (TIA / EIA-485-A) 1 x Frequency output 1 x Digital input 1 x Analogue output (on request)
Communication protocols (RS-485)	<ul style="list-style-type: none"> AGHIP (AutoGRAPH Hardware Interface Protocol), LLS, Modbus
Bluetooth Smart	<ul style="list-style-type: none"> Yes
Sensors	<ul style="list-style-type: none"> Internal 3-axis accelerometer / Inclinator
Smart features	<ul style="list-style-type: none"> Self-diagnostics, Logging Remote configuration: Bluetooth (Smart), RS-485 Remote firmware update Auto calibration

FREQUENCY OUTPUT

Output type	<ul style="list-style-type: none"> Open collector
Output frequency range	<ul style="list-style-type: none"> 100...3000 Hz
Maximum load current	<ul style="list-style-type: none"> 200 mA

MEASURING CHARACTERISTICS

Operational liquids	<ul style="list-style-type: none"> Gasoline, fuel oil
Fuel level measuring	<ul style="list-style-type: none"> Accuracy: $\leq 1\%$ Resolution: 12 bit (0...4095)
Temperature measuring	<ul style="list-style-type: none"> Measuring range: $-40...+85\text{ }^{\circ}\text{C}$ Accuracy: $\pm 1\text{ }^{\circ}\text{C}$

OPERATIONAL CONDITIONS

Electrical	<ul style="list-style-type: none"> Operating voltage: 7...60 V Power consumption (at 12 V, 22 °C): 30 mA Galvanic isolation: internal, up to 2500 V_{RMS} (UL 1577)
Environmental	<ul style="list-style-type: none"> Operating temperature: $-40...+85\text{ }^{\circ}\text{C}$ Case protection class: IP67 Cable protection: PVC Coated Interlock Stainless Steel Flexible Conduit

OTHERS

Dimensions	<ul style="list-style-type: none"> Probe length: 750 / 1000 / 1500 / 2000 / 2500 / 3000 mm
Mounting type	<ul style="list-style-type: none"> SAE 5
Average life time	<ul style="list-style-type: none"> 10 years



Also we offer extra equipment and accessories to program and configure easily TKLS sensor, broaden its features and simplify the sensor mounting and demounting.

TKLS-PROG PROGRAMMING TOOL

TKLS-Prog is designed to convert USB interface to RS-485 one in order for programming, data reading and configuring TKLS fuel level sensor.

Interfaces	<ul style="list-style-type: none">• 1 x USB 2.0: connection to a PC• 1 x RS-485 (TIA / EIA-485-A): connection to an external device
Electrical	<ul style="list-style-type: none">• Power type: USB• DC output (for external device): 12 ± 2 V, 200 mA
Operating temperature	<ul style="list-style-type: none">• -40...+85 °C
Dimensions	<ul style="list-style-type: none">• 30 x 25 x 13 mm• Cable length: 195 mm
Average life time	<ul style="list-style-type: none">• 10 years



TKLS-PROG-BLUETOOTH PROGRAMMING TOOL

TKLS-Prog-Bluetooth is designed for wireless programming, data reading and configuring TKLS fuel level sensor.

Interfaces	<ul style="list-style-type: none">• 1 x USB 2.0: connection to a PC• Bluetooth Smart: connection to an external device
Electrical	<ul style="list-style-type: none">• Power type: USB
Operating temperature	<ul style="list-style-type: none">• -40...+85 °C
Dimensions	<ul style="list-style-type: none">• 70 x 25 x 8 mm
Average life time	<ul style="list-style-type: none">• 10 year



FREQUENCY-TO-ANALOGUE CONVERTER

Frequency-to-analogue converter is designed to operate with TKLS fuel level sensor and convert frequency output signal to analogue one.

Inputs / Outputs	<ul style="list-style-type: none">• 1 x frequency input• 1 x analogue input• Output type: open collector
Analogue output maximum voltage	<ul style="list-style-type: none">• 8 ± 0.1 V
Analogue output resistance	<ul style="list-style-type: none">• 1 kOhm
Operating voltage	<ul style="list-style-type: none">• 10...36 V
Operating temperature	<ul style="list-style-type: none">• -40...+85 °C



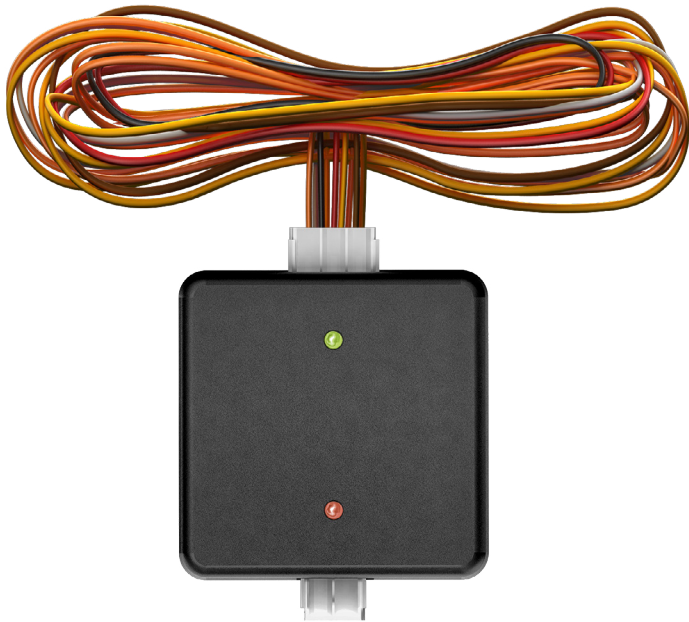
ACCESSORIES FOR TKLS SENSOR

- Mounting kit (fasteners, plastic cover, seal gasket, end cap, fuse, plastic seal)¹
- FAST 330 plastic seal of the plastic cover
- TWIST-M rotary seal
- End cap of measuring probes
- Plastic cover
- Seal gasket for a rectangular tank
- Seal gasket for a cylindrical tank
- Fuel tank repair plug

¹ Supplied with TKLS sensor.



AutoGRAPH PERIPHERALS



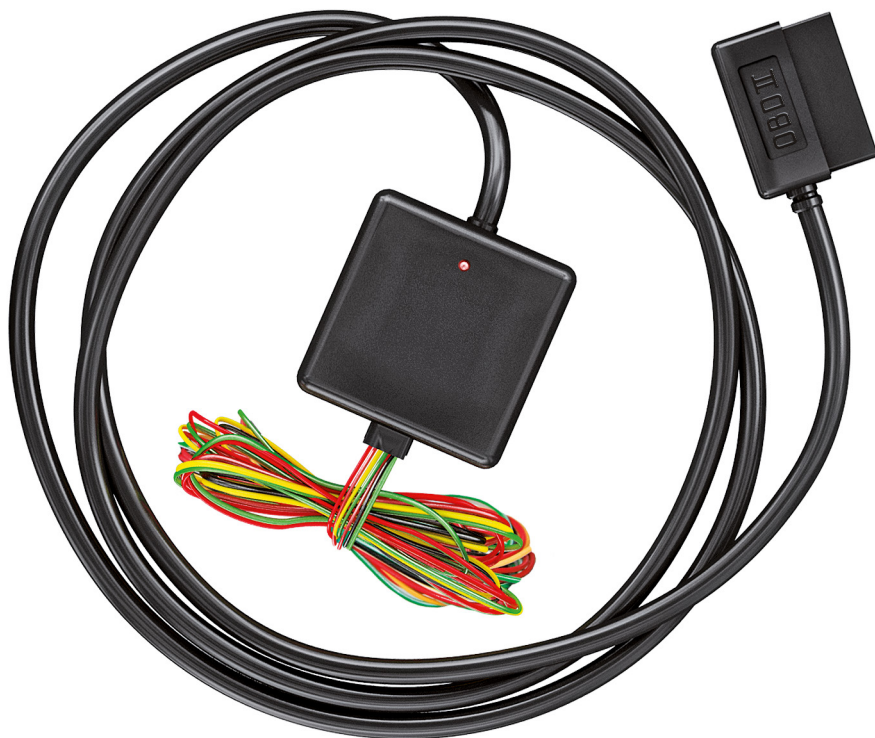
UNIVERSAL INTERFACE CONVERTER

With the Universal converter, we offer the complete solution to monitor tire pressure using Pressure Pro and TPMS systems

BASIC CHARACTERISTICS

Supported protocols ¹	<ul style="list-style-type: none">• Pressure Pro, TPMS 6-13, TPMS 4(6)-09 and etc.
Interfaces	<ul style="list-style-type: none">• Input interfaces: RS-485 (TIA / EIA-485-A), RS-232• Output interface: RS-485 (TIA / EIA-485-A)
Inputs / Outputs	<ul style="list-style-type: none">• 1 x digital input
Electrical	<ul style="list-style-type: none">• Operating voltage: 10...60 V• Consumption (at 12 V, 22 °C): 40 mA
Operating temperature	<ul style="list-style-type: none">• -40...+85 °C
Dimensions	<ul style="list-style-type: none">• 50 x 50 x 20 mm
Average life time	<ul style="list-style-type: none">• 10 years

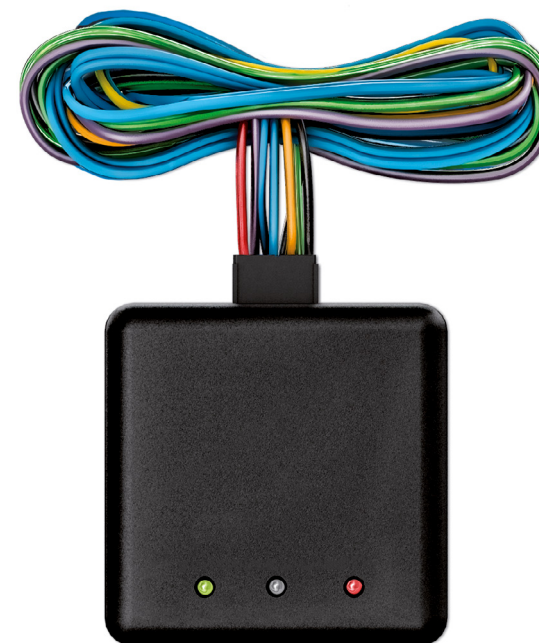
¹ The list of supported protocols and devices is continuously being extended. To get the full list, contact the manufacturer.



TK-OBD2LOG ADAPTER

BASIC CHARACTERISTICS

Supported OBD-II standards	<ul style="list-style-type: none"> • ISO 15765-4 (CAN) • ISO 14230-4 (Keyword Protocol 2000) • ISO 9141-2 • SAE J1850 VPW • SAE J1850 PWM
Connection to external device	<ul style="list-style-type: none"> • CAN (SAE J1939)
Electrical	<ul style="list-style-type: none"> • Operating voltage: 10...60 V • Power consumption (at 12 VDC, 22 °C): 80 mA
Operating temperature	<ul style="list-style-type: none"> • -40...+85 °C
Dimensions	<ul style="list-style-type: none"> • 50 x 50 x 20 mm



TK-CANLOG ADAPTER

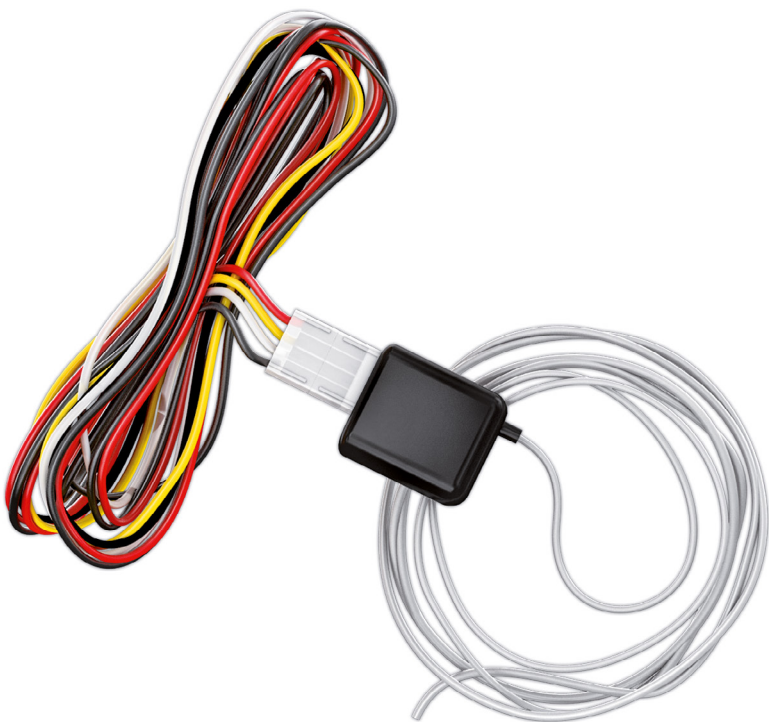
BASIC CHARACTERISTICS

Supported machinery	<ul style="list-style-type: none"> • Building machinery • Agricultural machinery • Harvesting machinery • Lorry / light vehicle • Motor-buses
Interfaces	<ul style="list-style-type: none"> • 1 x RS-232 • 2 x CAN
Electrical	<ul style="list-style-type: none"> • Operating voltage: 10...60 V • Power consumption (at 12 VDC, 22 °C): 40 mA
Operating temperature	<ul style="list-style-type: none"> • -40...+85 °C
Dimensions	<ul style="list-style-type: none"> • 50 x 50 x 20 mm
Average life time	<ul style="list-style-type: none"> • 10 years



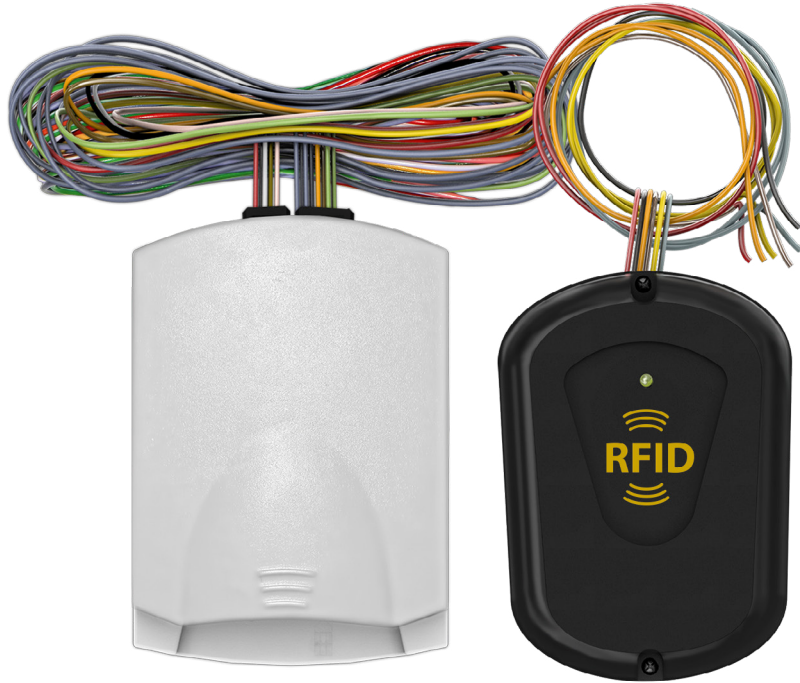
TEMPERATURE SENSORS

BASIC CHARACTERISTICS		
	Pulse Output Sensor	1-Wire Sensor
Output interfaces	<ul style="list-style-type: none">Digital output (periodic counter)Type: open collector	<ul style="list-style-type: none">1-Wire
Temperature measuring	<ul style="list-style-type: none">Range: -55...+125 °CAccuracy: 0.5 °C	<ul style="list-style-type: none">Range: -55...+125 °CAccuracy: 0.5 °C
Operating voltage	<ul style="list-style-type: none">10...40 V	<ul style="list-style-type: none">10...40 V
Operating temperature	<ul style="list-style-type: none">-40...+85 °C	<ul style="list-style-type: none">-40...+85 °C
Distance to sensitive element	<ul style="list-style-type: none">5...15 m	<ul style="list-style-type: none">5...15 m
Dimensions	<ul style="list-style-type: none">30 x 25 x 13 mm	<ul style="list-style-type: none">30 x 25 x 13 mm
Average life time	<ul style="list-style-type: none">10 years	<ul style="list-style-type: none">10 years



RPM SENSOR

BASIC CHARACTERISTICS	
Outputs	<ul style="list-style-type: none">Type: open-collector1 x digital output: engine indicating1 x digital output: output frequency divider (by 10)
Electrical	<ul style="list-style-type: none">Operating voltage: 7.5...40 V
Operating temperature	<ul style="list-style-type: none">-40...+85 °C
Dimensions	<ul style="list-style-type: none">31 x 26 x 12 mmCable length: 1.2 m
Average life time	<ul style="list-style-type: none">10 years



AutoGRAPH-CardReaders

BASIC CHARACTERISTICS

	CardReader-Smart	CardReader-Light
Supported cards	• RFID (EM-Marlin), Smart Card	• RFID (EM-Marlin)
Interfaces	• 1 x RS-485 (TIA / EIA-485-A) • 1 x 1-Wire • 1 x USB 2.0	• 1 x RS-485 (TIA / EIA-485-A)
Inputs / Outputs	• 4 x programmable digital outputs • 2 x preset digital outputs • 2 x digital inputs	• 1 x programmable digital output • 1 x digital input
Operating voltage	• 10...60 V	• 10...60 V
Operating temperature	• -40...+85 °C	• 40...+85 °C
Dimensions	• 118 x 83 x 29 mm, 110 g	• 94 x 65 x 18 mm, 150 g
Average life time	• 10 years	• 10 years

AutoGRAPH DISPATCH SOFTWARE

AutoGRAPH 
DESKTOP SOFTWARE **PRO**

AutoGRAPH 
MOBILE APPLICATION **MOBILE**

AutoGRAPH 
WEB PLATFORM **WEB**

TOTALLY FREE!

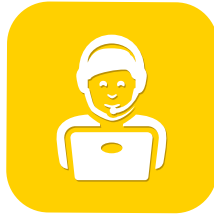


- High-scaled multi-platform and multi-lingual professional AVL and fleet management software
- Flexible accommodation to consumer's purposes, absolutely configurable and extendable module system
- Wide opportunities for analytics, powerful report system, report constructor
- Integration with report systems and management systems of the company, open API for extensions plugins
- Total control of motion parameters, operation, condition of sensors and data buses of monitoring objects

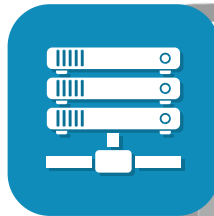
FEATURES AND BENEFITS



- Real-Time Fleet Tracking
- Trips History Playback
- Group Tracking
- Object's Cursor & Track Coloring
- MultiLevel Assets Hierarchy
- Flexible Trips Splitting
- MultiTrack Feature
- Static and Moving Control Points Support
- GeoFences and Landmarks
- Vehicle Status Tracking
- Trip Parameters Control



- Route Optimization
- Job Schedule Board
- Maintenance Reminders
- Dispatching
- Fleet, Driver & Team Management



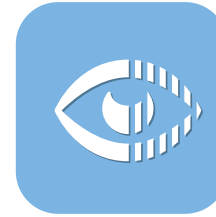
Hosted Software

- No problem with supporting your own server
- Comes with all needed features in a very short time
- Free Desktop, Web, iOS and Android Applications

GPS tracking business without big investments
Manage and charge your users for service

Server Software

- Build your own GPS tracking server
- No monthly fees for software
- Unlimited number of users and devices
- Free Desktop, Web, iOS and Android Applications



- Enterprise KPI Dashboard
- Powerful and Flexible Reports System
- Automated and Scheduled Reports
- TimeLine View
- Powerful Charts and Diagrams Constructor



- Role-based Users Hierarchy
- Multi Languages & Time Zones Support
- Open and Extensive API for Integration
- Fully Customizable Interface
- Flexible Module System
- Multimonitor Configuration Support
- Unlimited Number of Workplaces



- Powerful Fuel Management
- Refueling and Fuel Draining Detection



- Multi-Map Tile View
- Vector, Raster and Internet Maps Support
- Powerful MultiGIS Engine
- Live Fleet Map Website Integration



- Custom Virtual Sensors Support
- CAN bus data reading
- User Definable Fields and Parameters
- Passengers Counting
- Treated Area Control
- Small Aircraft Special Features
- Discrete, Analog and Digital Sensors Support



- Driver ID and Automatic Driver Assignment
- 2-Way Messaging