TrailerGUARD System Overview

1st Edition

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WABCO
Vehicle Control Systems

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1 System

1.1 Introduction

The term Telematics is a combination of the words "Telecommunication" and "Informatics". Telematics indicates the possibility of processing information and transporting it over a distance at the same time.

Telematics, as an application in the utility vehicle industry and trailer vehicles makes it possible to transport data and information that is sensed in the trailer via a wireless connection on a computer and to process the data there. Normally, the access to the information occurs via an Internet portal.

Utilisation of this information is complex and depends on the business processes of the user. The range of applications for a Trailer Telematics system can be:

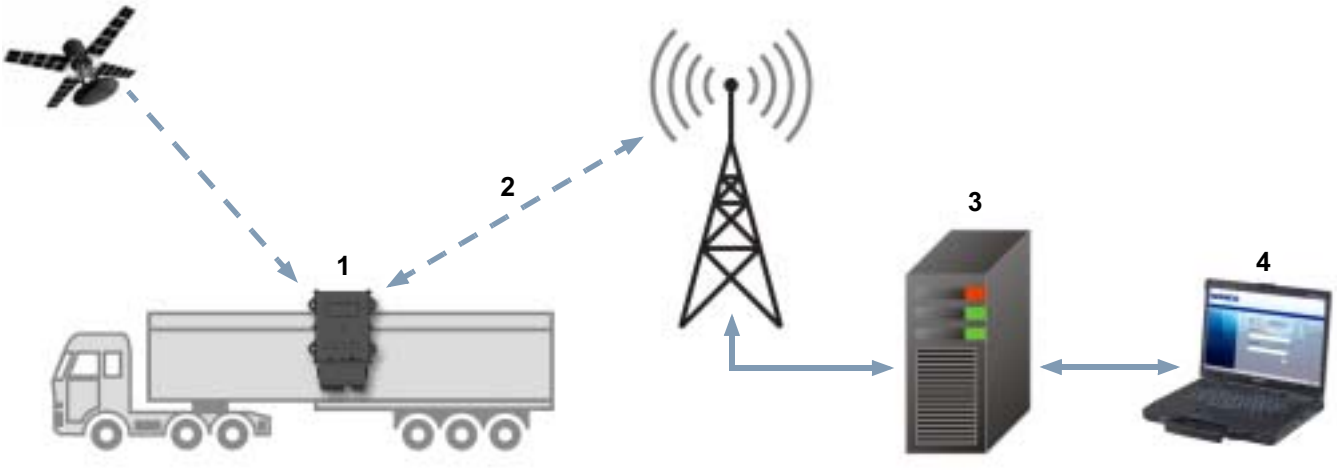
- Location-detection for the trailer.
- Documentation for the condition of goods, such as e.g. the temperature in the trailer.
- Monitoring of the technical characteristics of the trailer, e.g. the tire pressures.

Area of application

The Trailer Telematics System is designed for the European geographics (including Turkey). Operation of TrailerGUARD is only possible in areas with GPS- and mobile reception.

> **!** The area of application for the Trailer Telematics system is mainly dependent on the technical boundary conditions, e.g. the GSM coverage in the respective countries.

1.2 System design



A Telematics system mainly consists of four system components.

- Vehicle hardware (**1**)
- Data transfer (**2**)
- Data management (**3**)
- User interface (**4**)

The data transfer and data management are components that work in the background and are not visible to the user.

Vehicle hardware
Hardware for connecting various sensors and collecting data is installed in the vehicle.

Data transmission
Enables the bidirectional communication between the vehicle and the communication central (Telematics Portal).

Data management
IT architecture for collecting, evaluating and managing the data from the connected vehicle.

User interface
Web-based user interface for the end user for calling up information and communicating with the vehicle.

1.3 Function of system components

The components installed in the vehicle determine which information can be transferred from the TTU.

Component	Information	Description
1 - Trailer Telematic Unit (TTU)	Position	Current position as coordinates, distance and direction to the next larger city
	Date, time	Date and time (GMT) of the individual pieces of information
	Park- and drive-trip	Start- / target-position, Start- / target-time, Duration, Length, Stopped time
2 - TTU battery	Battery voltage Charge status Capacity	Voltage Charge status Available capacity
3 - Door sensor	Door status	Door open / close, Number of door openings / closings during a trip, Door status at the end of a trip
4 - Connect sensor	Connect status	Trailer connected/disconnected

Component	Information	Description
5 - WABCO Trailer EBS (as of version T EBS D1 Premium)	Velocity	Current speed, measured in the trailer EBS, maximum speed during a trip, average speed during a trip,
	Kilometres	Trailer EBS kilometres
	Aggregate load	Aggregate load, maximum and average aggregate load during a trip
	Trips without EBS	Trips without connected EBS plug-in (24 N supply)
6 - IVTM *	Tyre pressure	Up to 6 pressures measured by the IVTM on the wheels and one reserve wheel
7 - BVA *	Brake pad wear status	Status of the brake pad (ok / not ok)
8 - Temperature logger	up to 4 temperature types	Current temperature, minimum, maximum and average temperature during a trip
9 - Cooling device	Status	On / Off
	Messages	Status of the cooling device
	Operating hours	Electrical, diesel
	Setpoint	Up to 3 setpoints, minimum and maximum setpoint during a trip
	Defrost cycle	On / Off
10 - Cooling device battery	Battery voltage	Voltage

* Only possible in combination with WABCO Trailer EBS (as of Generation D1 Premium).

1.4 Configuration / power supply

1.4.1 WABCO Trailer EBS

The power supply via terminal 15/30 through the trailer EBS is provided through the "POWER / EBS" slot of the TTU. This slot is also the interface for the trailer EBS.

Voltage source	5V CAN (Data from T-EBS)
Trailer EBS E	X
Trailer EBS D Premium Trailer EBS D Standard	X –
Vario Compact ABS (VCS I / II)	–
Systems of other manufacturers with 5V CAN interface	X*
Systems by other manufacturers	–

* The data content from systems of other manufacturers may deviate from the data contents of the WABCO Trailer EBS.

The trailer EBS as of generation D1 Premium supplies the TTU with information on the trailer EBS as well as the voltage. The trailer EBS also transfers data from the tire pressure monitoring system IVTM and the brake pad wear indicator BVA to the TTU via the 2nd CAN bus (5V).

Modulators of the Trailer EBS of generation D0 (production date –09/2003, Series No. –75000) do not support the power supply of the TTU can therefore cannot be used for connecting a TTU.

! Information and publications on the trailer EBS can be found in the product catalogue INFORM on the Internet under www.wabco-auto.com

The TTU can also be operated with systems that do not have a 5V CAN interface. The data that is generated by a Trailer EBS modulator (e.g. load and brake-pad wear) will not be sent to the TTU however. The vehicle speed and travel distance are determined by the TTU from the received GPS data.

1.4.2 TTU battery

The TTU battery supplies the TTU with power, if the trailer is disconnected and the TTU is not supplied via terminal 15/30. The TTU battery is charged through the TTU when the power supply is connected.

1.4.3 Refrigerator battery

In addition to or instead of the TTU battery, the battery for the refrigerator can also be used to supply the TTU with power when the ignition is OFF.

! The refrigerator battery is not charged by the TTU. This causes the danger of running down the battery if the refrigerator is not run for longer periods of time.

In order to prevent this discharging, a low-voltage limit can be defined in the Telematics Portal. If this limit is exceeded, the TTU switches away from the refrigerator battery as a power source. Only when there is sufficient voltage available again is the battery used as a power source for the TTU again.

1.4.4 Vehicle electrical system

The vehicle electrical system can be used as another power source:

- Vehicle electrical system (12 V or 24 V) connected to the TTU slot "POWER / EBS"

The TTU can also be connected directly to the vehicle electrical system of a vehicle such as e.g. delivery vehicle or passenger vehicle. Prerequisite for this is a constant supply voltage via Term. 30 (with ignition OFF as well). There is no requirement for using a TTU battery this way.

This configuration is not suitable for a trailer vehicle however, since the constant power supply via Term. 30 is not assured when the trailer vehicle is not connected.

! If the vehicle electrical system is used as a power source, no data is available on the trailer EBS.

2 Components

Overview of components with WABCO part numbers

WABCO part number	Description
446 290 110 0 446 290 150 0 446 290 120 0	TTU Pack (TTU, cable bracket, blind stop) TTU battery pack (battery, fastening screw) TTU Mounting Pack (cable bracket, blind stop)
446 290 231 0 441 044 110 0	Connect sensor, converter Connect sensor, pressure sensor
446 290 261 0 446 290 25 . 0	Magnet Door sensors
	Cable (see chapter 2.3 “Cable”, page 12)

2.1 Trailer Telematic Unit (TTU) 446 290 100 0

The TTU is the central component for Telematics in trailers. It handles the following tasks:

- Collecting and temporarily storing the data from the individual system components and sensors.
- Managing the individual tasks for reading, temporarily storing and transferring the data.
- Bidirectional communication between the Telematics Portal and the vehicle.
- Determining the position using a GPS signal.
- Coordinating the operating modes and the power supply of the LIN sensors.

! The TTU housing is not to be opened.

Operating modes

The TTU can switch operating modes for extending the standby time with disconnected trailers. The TTU chooses the respective operating mode automatically, however, many components may not be available depending on the mode of operation.

Interfaces

The TTU has three interfaces for connecting components and sensors.

Interface	Slot	Description
CAN	1, OPTION 3, POWER / EBS	Interface to trailer EBS or other CAN-capable systems (slot 1) and for diagnosing via CAN (slot 3). Downstream from the trailer EBS are diagnostic port, IVTM and BVA.
LIN	2, BATTERY 4, LIN	Interface to battery, door- and connect-sensor and LIN-based sensors. The individual sensors are connected with Y-distributors.
RS232	1, OPTION	Interface to refrigeration system and to diagnostics. The information of the cooling device is transferred directly via the temperature logger.

Technical data

Protection class:	IP6k9k
Operating voltage:	12V ... 24V
Current consumption at 24V DC:	Min: 5mA Max: 1,350 mA
Operating temperature:	-30°C ... +75°C: Full functionality -40°C ... -30°C, +75°C ... +85°C: no power supply via the TTU battery, possibly limited GSM communication

2.1.1 cable clip

Fig. TTU with opened cable bracket, inserted power- and LIN-cables and blind stops for slot "OPTION"; right: cover (2), bottom part (1)

The cable bracket consists of two components (bottom and cover) and is clipped on the TTU. It is used for:

- Fastening and relieving the stress on the cable and the
- protection of the plug-in connections from direct water and dirt

! The installation and operation of the TTU without a cable bracket is not permitted.

2.1.2 Blind stops

Blind stops close off the unused slots of the TTU. These blind stops are available with the TTU Mounting Pack (446 290 120 0).

Slot	WABCO part number
POWER / EBS	898 020 009 2
LIN	898 020 010 2
OPTION	898 020 011 2

! Moisture that is able to come through a slot that is not closed off on the TTU can lead to damages in the TTU.

2.1.3 TTU battery 446 290 150 0

The TTU battery supplies the TTU with power, if the TTU is not supplied via terminal 15/30. The TTU battery is charged through the TTU when the power supply is connected.

In exclusive battery operation, the TTU can be supplied with voltage for approximately 8 weeks. The duration depends on the application conditions and the installed components and can greatly deviate from this value.

The TTU battery is inserted in the battery compartment of the TTU and screwed tight with a fastening screw on the TTU.

The plug-in connector for the TTU battery is connected to slot 2 "AKKU" of the TTU. The TTU battery indicates the battery voltage, charge status and capacity of the TTU via the LIN interface.

Technical data

Type:	Lithium-Ion-Mangan
Protection class:	IP6k9k
Operating voltage:	7.2V
Capacity:	4,350 … 4,500 mAh

Operating temperature: Power discharge –30°C … +75°C
Charged 0°C … +65°C

In temperature range -30°C ... 0°C, the battery is warmed to >0°C by an integrated heater, to enable charging. Under -30°C, the heater is switched off and charging the battery is no longer possible.

2.2 Sensors

The sensors are connected with the TTU via a LIN bus (Slot 4 "LIN"). A maximum of 4 door sensors and one connect sensor can be connected to the TTU. Starting with the first cable (449 745 005 0), all other sensors are introduced in a Y distributor (894 600 024 0) in the layout.

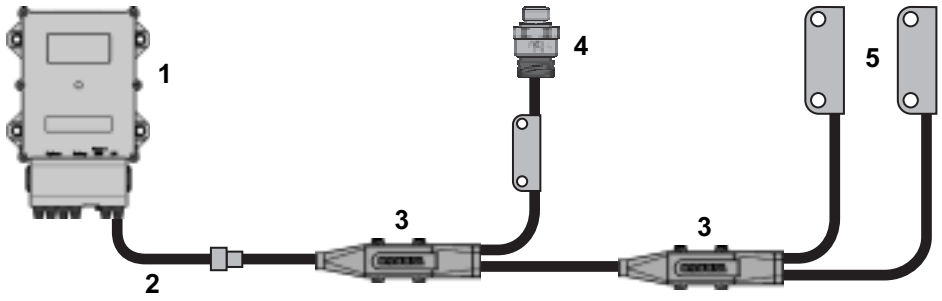


Fig. Connecting the sensors to the TTU

1 TTU
2 Sensor cable (449 745 005 0)
3 Y distributors (894 600 024 0)
4 Connect sensor (pressure sensor with converter)
5 Door sensors

2.2.1 Door sensor

The door sensor is a non-contact switch, consisting of a hall sensor and a magnet. Up to 4 door sensors can be connected to the TTU.

The door sensor detects whether the door is open or closed by means of the magnets and sends the door status and a change of the door status to the TTU. In the Telematics Portal, the status "Door open" is indicated as soon as one of the doors has been opened.

Fig. Door sensor (1) with magnet (2)

The door sensors can also be used for purposes other than sensing the door status, such as e.g. sensing the flap on a tipping trough or a fixture cabinet.

Each door sensor is recognised via its own ID in the LIN bus. Therefore, when using multiple door sensors, different item numbers have to be used. The door sensors must be used in combination with magnet 446 290 261 0.

Name	Cable length	ID	WABCO part number
Magnet	-	-	446 290 261 0
Sensor	0.5 m	1	446 290 251 0
		2	446 290 252 0
		3	446 290 253 0
		4	446 290 254 0
	6 m	1	446 290 255 0
		2	446 290 256 0
		3	446 290 257 0
		4	446 290 258 0
	18 m	1	446 290 259 0
		2	446 290 260 0
		3	446 290 262 0
		4	446 290 263 0

Technical data

Protection class:	IP6k9k
Operating temperature:	–40°C ... +85°C
Switch limit:	21 ± 2 mm

2.2.2 Connect sensor

The connect sensor recognises, by means of the pressure in the supply line (red coupling head), whether the trailer vehicle is connected to a towing vehicle. If pressure is applied, the system recognises that the trailer is connected with a towing vehicle.

The connect sensor consists of two components – the pressure sensor (441 044 110 0), which senses the pressure, and a converter (446 290 231 0) that converts this pressure signal into a LIN bus signal. The connect sensor is connected to the TTU slot "LIN".

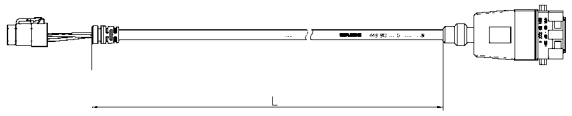
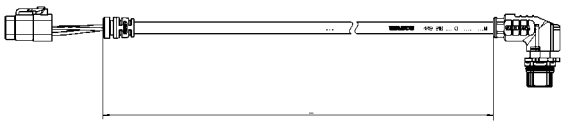
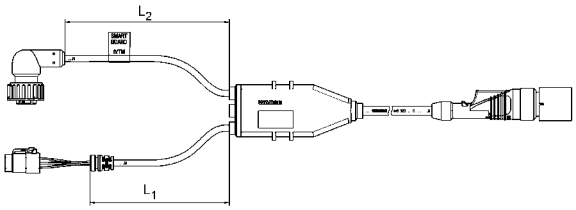
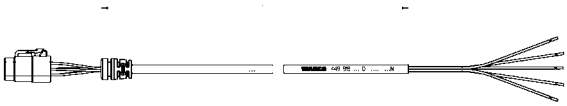
Fig. Connect sensor: Pressure sensor and converter

Technical data

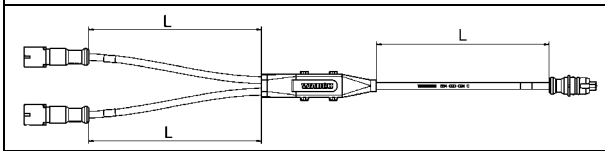
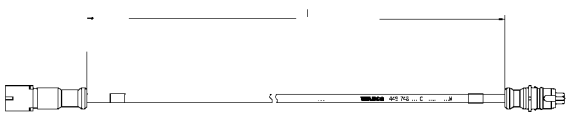
Protection class:	IP6k9k
Operating temperature:	–40°C ... +85°C
Cable length	Pressure switch - Converter: 0.5m Converter - Connecting point: 0.5m
Switch limits:	Connected: 0.9 bar (1.3 V) Disconnected: 0.5 bar (0.9 V)

2.3 Cable

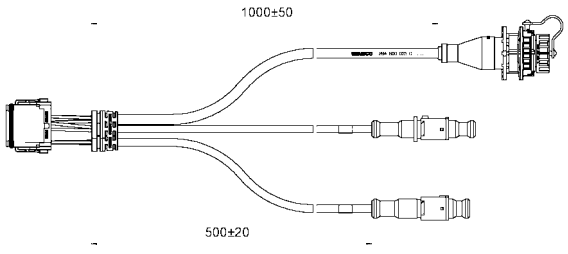
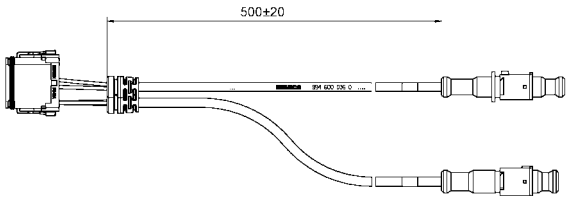
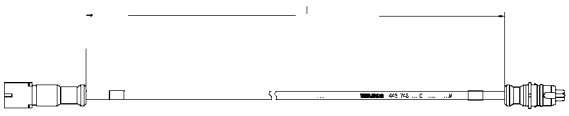
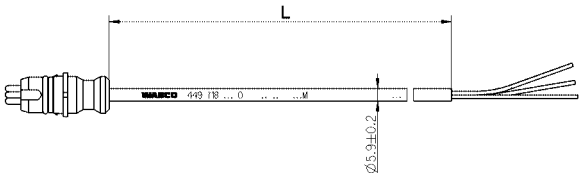
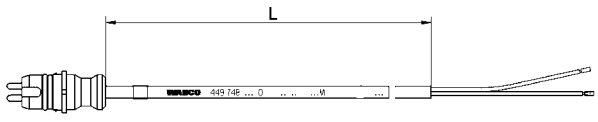
2.3.1 Power cable

Cable	WABCO No	L in m	Cable ends - Design	
	**Trailer EBS D**			
	449 910 005 0	5,0	POWER	IN/OUT 2
	**Trailer EBS E on SUBSYSTEM**			
	449 917 025 0	2,5	POWER	SUBSYSTEM
	449 917 050 0	5,0		
	**Trailer EBS E on GIO 5**			
	449 918 025 0	2,5	POWER	GIO 5
	449 918 050 0	5,0		
	**Trailer EBS E on SUBSYSTEM and IVTM / SmartBoard**			
	449 920 248 0	L_1: 3,0 L_2: 6,0 1,0	POWER	SUBSYSTEM; IVTM / SmartBoard
	**Vehicle electrical system (for inside use only)**			
	449 919 050	5,0	POWER	Open end 1: Red / IGN 2: Green / PWR 3: Brown / GND 4: Black / CAN-H 5: White / CAN-L 6: –

2.3.2 Sensor cable (connect- and door-sensor)

Cable	WABCO No	L in m	Cable ends - Design	
	**Connection sensors**			
	449 745 005 0	0,5	LIN	3-pin socket connector
	**Y distributor**			
	894 600 024 0	0,15	3-pin socket connector	3-pin plug-in connector
	**Extension (red marking)**			
	449 747 060 0	6,0	3-pin socket connector	3-pin plug-in connector

2.3.3 Option- and refrigeration technology cable

Cable	WABCO No	L in m	Cable ends - Design	
	**Temperature logger, refrigerator battery and diagnostics (blue: Temperature logger, yellow: refrigerator battery)**			
	894 600 025 0	0,5 0,5 1,0	OPTION	3-pin plug-in connector; 2-pin plug-in connector; Diagnostic socket with yellow cap
	**Temperature logger and refrigerator battery (blue: Temperature logger, yellow: refrigerator battery)**			
	894 600 036 0	0,5 0,5	OPTION	3-pin plug-in connector; 2-pin plug-in connector
	**Extension Temperature logger (blue marking)**			
	449 746 150 0	15,0	3-pin socket connector	3-pin plug-in connector
	**Connection Temperature logger**			
	449 718 005 0	0,5	3-pin plug-in connector	Open end A: white / Rx B: red / Tx C: Brown / GND
	449 718 020 0	2,0		
	449 718 025 0	2,5		
	449 718 050 0	5,0		
	449 718 150 0	15,0		
	449 718 160 0	16,0		
	**Connection refrigerator battery**			
	449 748 180 0	18,0	2-pin plug-in connector	Open end A: Brown / GND B: Blue / PWR

2.4 Temperature logger, cooling device

> ! The temperature logger, the cooling device and the refrigerator battery are not components of the WABCO product palette. Notes and information on these components are found in the documentation of the manufacturer.

The data of the refrigeration system are normally provided by the temperature logger.

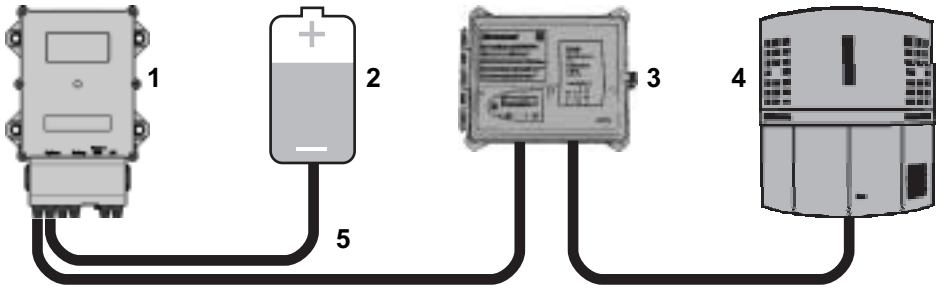


Fig. Layout of the refrigeration interface

1 TTU
2 Refrigerator battery
3 Temperature logger
4 Refrigerator
5 Options-/Refrigeration cable

2.4.1 Temperature logger

The temperature logger is a certified device for recording the temperatures in a refrigeration vehicle. This data is read from a temperature logger by the TTU, since it cannot be accessed directly from the temperature sensors. Up to 4 different temperatures can be processed and transferred.

The temperature logger is connected with the TTU slot OPTION. The Thermo King temperature logger is connected via the interface i-Box to the TTU.

Temperature logger supported by the TTU

Manufacturer	Refrigerator	Temperature logger	Interface	Comment
Thermo King	SLX series SL 400e	Smart Reefer 2	i-Box for Smart-Reefer 2 (40-870)	The i-Box is an interface for connecting to the temperature logger from Thermo King. Software version: > B003
	SL 100 SL 200 SL 300 Spectrum	DAS	i-Box for DAS (40-836)	
Carrier	Vector Maxima	Datacold 500	Not necessary	Software version: < 2.12 / >= 2.17
Euroscan		Euroscan TX1	Not necessary	Version A (29/2000)
ColdChain		Transcan 2/4	Not necessary	UDN-1623-A (23.04.2002)
		Transcan-XL	Not necessary	

Technical data

Connection Temperature logger
Cable lengths: 0.5 m, 2.0 m, 2.5 m, 6.0 m, 15.0 m, 16.0 m
Extension: 15.0 m

2.4.2 Cooling device

In addition to the data from the temperature logger, cooling device data (e.g. setpoints or messages) can also be sent to the TTU. This is only possible however if the temperature logger supports this option and a data line is installed between the cooling device and the temperature logger.

Up to 3 setpoints can be processed and transferred by the TTU.

The following temperature logger supports the transmission of data from the cooling device. The scope of data is different however and depends on the system used.

Manufacturer	Model	Comment
Thermo King	iBox	Transferred data: Shutdown alarms, hours of operation, battery status, fuel level
Carrier	Datacold 500	Software version: < 2.12 / >= 2.17

! Information on the installation of the connection between the cooling device and the temperature logger can be found in the manufacturer's documentation.

3 Telematics Portal and communication

Besides the components in the vehicle, the Telematics system also consists of the data transmission, the data management and the user interface. The data management and user interface are combined in the Telematics Portal. The data transmission occurs in the background and can only be influenced indirectly.

3.1 Telematics Portal

The Telematics Portal is an internet-based application in which the data and information recorded in the vehicle can be displayed and processed. This can be found via internet address

http://www.wabco-telematics.com

. After registering a user name (email address) and a password, the functions can be used. The functions that are available in the Telematics Portal depend on the respective service pack and can vary.

Service pack

- TrailerGUARD BASIC
  Optimises the capacity of your vehicle supported with Track & Trace
- TrailerGUARD ADVANCED
  Optimises capacity and efficiency with Track & Trace and vehicle information
- TrailerGUARD COOLER
  Optimises your refrigerator transport with verification of temperature monitoring

! The individual functions of the Telematics Portal are described in the Online Help of the Telematics Portal.

Besides the functions in the Telematics Portal, a connection can be made to existing software solutions, e.g. a logistic software, with a programming interface (API).

Prerequisites

Hardware

- Internet access with a band width of >1 Mbit/sec
- Desktop PC or Notebook with Windows operating system as of Windows XP
- Screen resolution at least 1024 x 768

Software

- Internet browser: Microsoft Internet Explorer as of Version 6.0
  - Security setting: Activating "Scripting of Java-Applets"
  - Security setting: Add www.wabco-telematics.com as a reliable site
  - Always allow the download of files from www.wabco-telematics.com
- Adobe Acrobat Reader for the display of pdf reports
- Microsoft Excel for the display of Excel Reports

Administration

- Completely set up user access to www.wabco-telematics.com with user name and password (see chapter 4 “Registering and administration”, page 18)

3.2 Communication

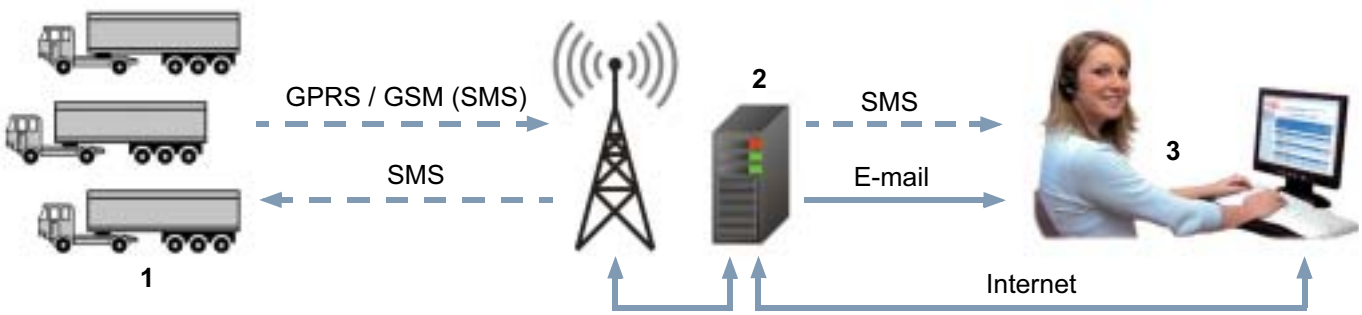


Fig. Communication between vehicle (1), Telematics Portal (2) and the user (3)

The communication between the vehicle and the Telematics Portal occurs in fixed intervals and in the case of a message of the connected sensors or components (event-based) via the mobile phone network.

Between Telematics Portal and the Telematics user, communication occurs via the mobile phone network and the Internet. The communication via email and SMS can be configured freely in the Telematics Portal.

of	to	Communication
Vehicle	Telematics Portal	GPRS / GSM, SMS as emergency communication, if GPRS / GSM is not available
Telematics Portal	Vehicle	SMS
Telematics Portal	User	Internet E-mail SMS
User	Telematics Portal	Internet

! The communication between the vehicle and the Telematics Portal via SMS as emergency communication is an independent service option and is not included in the service pack.

4 Registering and administration

Before starting up a vehicle equipped with WABCO Telematics, the following steps must be performed.

- Register the customer in the Telematics Portal
- Registering the vehicle in the Telematics Portal and storing the vehicle configuration for the End-Of-Line process
- Activate the SIM chip of the TTU in the Telematics Portal

After completing this step, the start-up can be performed on the vehicle.

> ! Waiting times occur because of administrative processes during the registration.

1. Registering the customer	2. Registering the vehicle	3. Activating the SIM chip
		
1. Entering customer data 	1. Vehicle data entry 	1. Entering the SIM chip data 
2. Confirming the customer data and the General Terms and Conditions 	2. Confirming the vehicle data and the General Terms and Conditions 	2. Confirming the activation 
3. Receiving access data 	3. Confirming the registration 	

4.1 Customer registration

Every user is provided with access to the Telematics Portal and can therefore access his/her vehicle and data by means of the registration.

The customer registration occurs on the WABCO homepage in three steps:

- Entering customer data
- Confirmation of the customer data and the General Terms and Conditions
- Confirmation of the registration by WABCO

After a successful customer registration, you will be sent an email with your personal access data. Keep the access data in a safe place and inaccessible to others.

4.2 Vehicle registration

In order to allocate the vehicle to the respective customer and prepare the vehicle configuration for starting up the vehicle, the vehicle must be registered on the Telematics Portal.

The vehicle registration occurs on the WABCO homepage in three steps:

- Vehicle data entry
- Confirmation of the vehicle data and the General Terms and Conditions
- Confirmation of the registration by WABCO

After a successful vehicle registration, you are sent an email with confirmation of the successful registration of the vehicle and a vehicle configuration file in XML format. You will need this file when starting the TTU.

4.3 Activate the SIM chip of the TTU

The SIM chip in the TTU must be activated so that the TTU can communicate with the Telematics Portal via the mobile phone network during the EOL process and during operation.

The activation of the SIM chip is done on the WABCO homepage.

After a successful activation, a confirmation is sent by email to the specified email address.

5 Diagnosis

The diagnosis of TrailerGUARD includes

- the display of installed components and their status
- Start-up of the system
- Display of diagnostic memory
- Display of measurement values such as e.g. voltages, sensor data, temperatures and EBS data

For the diagnosis, you require

- A PC or laptop,
- A diagnostic interface
- A connection cable to the vehicle
- The Diagnostic Software "TrailerGUARD",

5.1 Diagnostic port

The ISO 7638 interface, an existing diagnostics socket of the Trailer EBS with yellow protective cap or the direct diagnostics socket to the TTU can be used as the diagnostic port.

5.1.1 ISO7638 towing vehicle/trailer interface

For diagnosis via the ISO7638 towing vehicle-/trailer interface, an ISO 7638 connection adapter is installed between the coiled flex-cable from the towing vehicle and the ISO 7638 plug-in socket. This interface can only be used if the TTU is connected to WABCO Trailer EBS of generations D Premium or E.

<table>
<tr><th>Diagnostic Interface</th><th>Diagnostic cable</th><th>Connection adapter</th></tr>
<tr><td>446 301 021 0 (serial)
  </td><td>CAN-Converter
446 300 470 0
  </td><td rowspan="2">446 300 360 0
  </td></tr>
<tr><td>446 301 022 / 030 0
(USB)
  </td><td>446 300 361 0 or
446 301 362 0
  </td></tr>
</table>

5.1.2 External diagnostics socket (Trailer EBS E / TTU)

The diagnosis via the external diagnostics socket of the Trailer EBS § is only possible with Premium modulators (5 V CAN bus). In this case, the Trailer EBS serves as a gateway.

A direct interface to the TTU can also be used as another possibility. If the cable 894 600 025 0 is installed in the vehicle and connect to TTU slot 1 "OPTION", this direct diagnostic port is available.

Diagnostic Interface	Diagnostic cable	Connection on the vehicle
446 301 021 0 (serial) 	446 300 348 0 	Diagnostics socket with yellow sealing cap 
446 301 022 / 030 0 (USB) 		

! The Trailer EBS E modulator must be connected via CAN with the TTU.

5.2 Hardware

PC / Laptop
WABCO offers you a workshop-suitable, impact- and contamination-resistant laptop. This "Toughbook" with preinstalled Diagnostic Software can be obtained from WABCO.

The Diagnostic Software will run on all standard PCs with an operating system Microsoft Windows 2000 or higher however.

There are no other special requirements of the hardware. The PC should however have a free USB connector or a free serial connector (COM interface 9-pin) to connect the diagnostic interface.

Diagnostic Interface Set
To set up the diagnosis, the WABCO Diagnostic Interface Set with order number 446 301 030 0 (USB connection) is required. The set contains the Diagnostic Interface and a USB connecting cable to the PC or laptop.

The old Diagnostic Interfaces with serial connection (446 301 021 0) and with USB connection (446 301 022 0) can still be used.

5.3 Diagnostic Software "TrailerGUARD" (246 301 919 0)

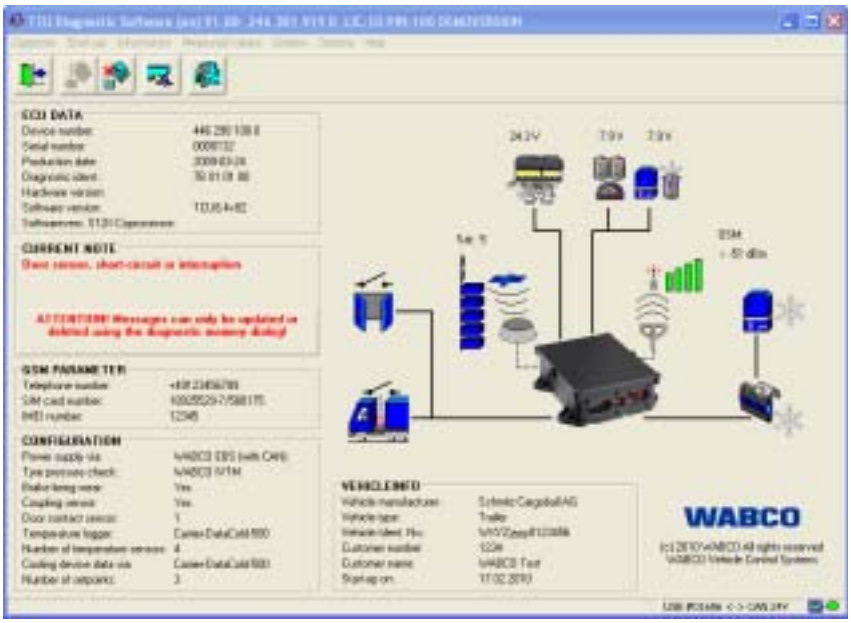


Fig. Start window of the Diagnostic Software "TrailerGUARD"

There are three ways to obtain the Diagnostic Software "TrailerGUARD":

- Offline as a USB stick version
- Online as a single download
- As a part of a WABCO system diagnostics subscription

For the diagnosis of multiple WABCO systems, WABCO offers you four different Diagnostic Software subscriptions via the Internet. These contain numerous diagnostic programs at one very low price.

Click on Website www.wabco-auto.com/sd on the Internet. There, you will find further information and can order the Diagnostic Software in your language and to load onto your PC.

The diagnosis with the Diagnostic Software can be performed by any user. If parameters are to be changed however, authorisation is required (PIN). You can obtain this PIN through the respective training at the WABCO University. More information on WABCO University training courses can be found on the Internet under www.wabco-university.com.