OptiLink™

INSTALLATION MANUAL

WABCO

Mobilizing Vehicle Intelligence

Original document:
The German version is the original document.

Translation of the original document:
All non-German language editions are translations of the original document.

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You will find the current edition at:
http://www.wabco.info/i/1296

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1 Abbreviations

Abbreviation	Meaning
ECAS	Electronically Controlled Air Suspension
ECU	Electronic Control Unit
eTASC	Electronic Trailer Air Suspension Control (rotary slide valve with RTR function) and ECAS function
GIO	Generic Input/Output
TEBS	Electronic Braking System for Trailers
Wi-Fi	Wireless Fidelity
WLAN	Wireless Local Area Network

2 Symbols used

NOTICE

The signal word denotes a hazard which, if not avoided, can result in material damage.

Important information, notes and/or tips

Reference to information on the internet

Descriptive text

– Action step

1. Action step 1 (in ascending order)
2. Action step 2 (in ascending order)

   ⇨ Consequence of an action

- Listing
  - Listing

3 Safety information

Requirements and protective measures

- Always follow the vehicle manufacturer's specifications and instructions.
- Follow the company's accident prevention regulations as well as regional and national regulations.
- Follow all warning notes, notices and instructions in this document to avoid personal injury and material damage.
- Follow regional and national road traffic regulations.
- Use protective equipment if required (safety footwear, protective eyewear, respiratory protection, ear defenders, etc.).
- Only trained and qualified technicians may carry out work on the vehicle.
- Make sure the workplace is dry as well as adequately lit and ventilated.

Proper working practice

- Make settings (e.g. the volume on the mobile terminal) before you start driving. For safety reasons OptiLink sometimes does not accept control commands while driving.
- Ensure that the mobile device is fixed or securely stored when driving. Make sure you do the following:
  - Make sure that the view of the traffic is not impaired.
  - Make sure that operating elements are not restricted in their function.
- Only instructed persons who have knowledge of the configured vehicle functions may perform controls with the OptiLink app. Incorrect operation leading, for instance, to vehicle movements can cause injuries to persons and damage to objects in the vicinity.
- Only operate vehicle functions if you have an unobstructed view of the vehicle and persons or objects in the vicinity. Ensure that no-one is put at risk from vehicle movements.
- Train people on how to operate the mobile terminal before you pass it on.
- Switch off the mobile terminal where its use is not permitted.

The OptiLink app can be used to control vehicle functions that can lead to accidents and injuries to third parties in the event of incorrect or unintentional operation:

- Be careful and take precautions if necessary when controlling the vehicle functions.
- Do not leave the mobile terminal unattended while the OptiLink app is active.
- Do not put the mobile terminal in your pocket while the OptiLink app is active, as this could inadvertently trigger vehicle functions. Close the OptiLink app when not in use or at least return to the instrument panel of the OptiLink app.

Improper activities

- Do not operate the mobile terminal (smartphone) when driving. At the steering wheel, always pay full attention to driving. Making telephone calls or operating the OptiLink app at the wheel, even with a hands-free module, can be distracting and lead to accidents.

4 Information about this document

4.1 Target group for this document

This publication is intended for vehicle manufacturers and trained and qualified workshop personnel.

5 Approved regions

The conditions and requirements for operating WLAN transmitting stations is regulated differently in the various regions.

Use of certain channels may be prohibited or operation may not be permitted at all.

Please check with each region to see if use is permitted at the time of operation or contact your WABCO contractor directly.

You will find a list of the regions in which operation of the OptiLink ECU is permitted as of 01/09/2019 here:

Albania	Germany	Montenegro
Australia	Greece	Netherlands
Austria	Greenland	New Zealand
Balearic Islands	Guernsey	Norway
Belgium	Hungary	Poland
Bosnia & Herzegovina	Iceland	Portugal
Bulgaria	Ireland	Romania
Ceuta	Isle of Man	Russia
Croatia	Italy	San Marino
Cyprus	Japan	Slovak Republic
Czech Republic	Jersey	Slovenia
Denmark	Korea, Republic of	Spain
Estonia	Latvia	Sweden
Faroe Islands	Liechtenstein	Switzerland
Finland	Lithuania	Turkey
France	Luxembourg	United Kingdom
Georgia	Malta	Vatican City

6 Functional description

The OptiLink app enables monitoring and controlling a trailer vehicle.

The OptiLink ECU and mobile terminal communicate via WLAN. Additionally an authentication (pairing) is needed for control commands to the trailer vehicle. Authentication (pairing) ensures that control commands are transmitted only to "our own" trailer vehicle.

With an established WLAN connection, the OptiLink app wirelessly retrieves and displays current information about the trailer vehicle. For this, the trailer vehicle needs to be supplied with power. In addition, the towing vehicle needs to have its ignition switched on or the WABCO Trailer EBS needs to be in the standby mode.

The ability to also control trailer functions via the OptiLink app essentially depends on the equipment of the trailer – for example, the chassis level can only be controlled if the trailer has OptiLevel (ECAS or eTASC). The OptiLink app only displays the functions that are available in the trailer vehicle.

The connection quality between the OptiLink app and trailer vehicle depends on the distance between the OptiLink ECU on the trailer and the position of the user with the mobile terminal.

Obstacles located between the user and the OptiLink ECU can significantly reduce the possible distance, e.g. the walls of the driver's cabin.

The transmission and reception quality of the mobile terminal also plays a role.

If the connection is lost, the user needs to approach the vehicle for the connection to be resumed.

7 Installation

7.1 Safety information

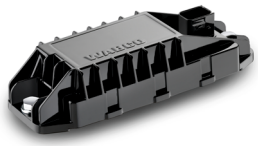
Avoid electrostatic charge and uncontrolled discharging (ESD)

- Prevent potential differences between components (e.g. axles) and the vehicle frame (chassis).
  - Make sure that the resistance between metallic parts of the components and the vehicle frame is less than 10 ohms.
  - Establish an electrically conductive connection between moving or insulated vehicle parts, such as axles, and the frame.
- Prevent potential differences between the towing vehicle and the trailer.
  - Make sure that an electrically conductive connection is made between metal parts in the towing vehicle and the coupled trailer via the coupling (king pin, fifth wheel, claws with pins), even without a cable being connected.
- Use electrically conductive bolted connections when fastening the ECUs to the vehicle frame.
- Run the cable in metallic casing if at all possible (e.g. inside the U-beam) or behind metallic and grounded protective plating to minimise the influence of electro-magnetic fields.
- Avoid the use of plastic materials if they can cause electrostatic charging.
- For electrostatic painting, connect the ground line of the ISO 7638 plug connection (pin 4) to the paint ground (vehicle chassis).
- Disconnect the battery (if installed in the vehicle).
- Disconnect cable connections to devices and components and protect connectors and ports against contamination.
- Always connect the grounding electrode directly with the metal next to the welding point when welding to prevent magnetic fields and current flow via the cable or components.
- Make sure that current is well conducted by removing paint or rust.
- Prevent heat influences on devices and cabling when welding.

Thanks to the optimisation of production processes at trailer manufacturers, prefabricated carrier modules are often installed in trailers nowadays. The modulator and other possible valves are attached to this cross-member. These support modules are often painted, so when they are installed in the vehicle frames, the electrical conductivity between the frame and support module has to be restored.

- Fasten the support module to the vehicle frame with electrically conductive screw joints using self-tapping screws with a conducting surface.
  The resistance between the support module and the frame must be < 10 ohms.

7.2 Technical data

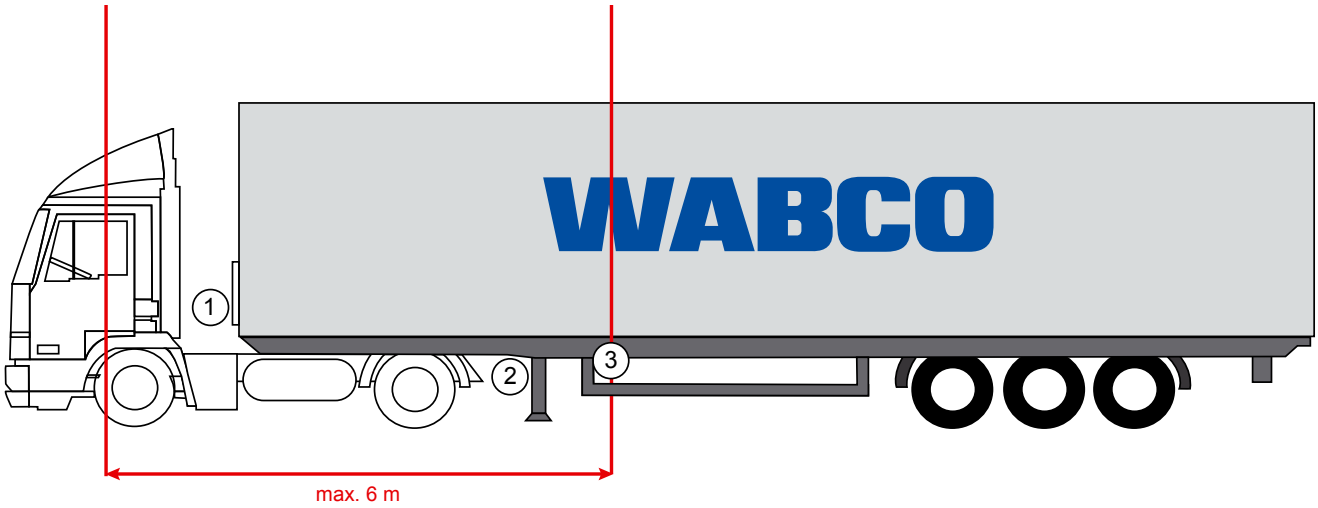
OptiLink ECU	
	
WABCO part number	446 290 700 0
Operating temperature	-40 °C to +85 °C
Voltage	8 to 32 VDC
Complete device with assembled plug connection	IP 6K9K

Pin	Function
1	CAN Low
2	CAN High
3	Reserved
4	Reserved
5	Reserved
6	Alternative supply (8 to 32 VDC, terminal 15)
7	Operating voltage (8 to 32 VDC, terminal 30)
8	Vehicle ground (GND)

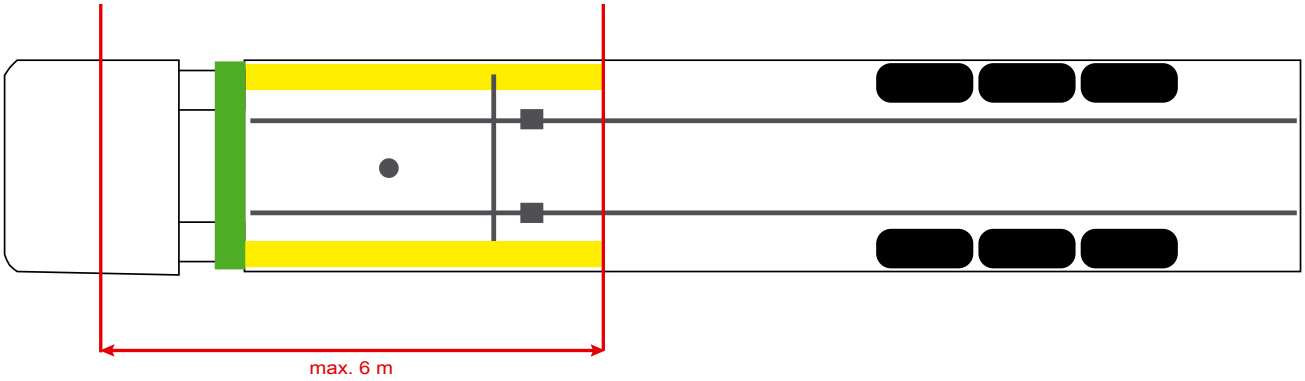
7.3 Installation

- When installing OptiLink, WABCO recommends the installation of at least one other control element (e.g. SmartBoard) so that the vehicle can still be controlled when the connection quality is poor or the telephone has been lost.
- If the TailGUARD function is used, rear outline marker lamps (or additional lamps) must be installed on the trailer or the Trailer Remote Control display and remote control unit must be installed in the towing vehicle.

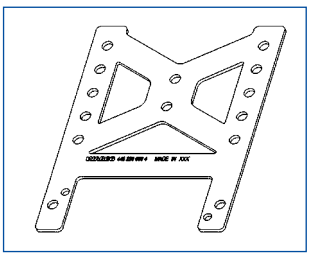
Installation areas



Exemplary figures



Material



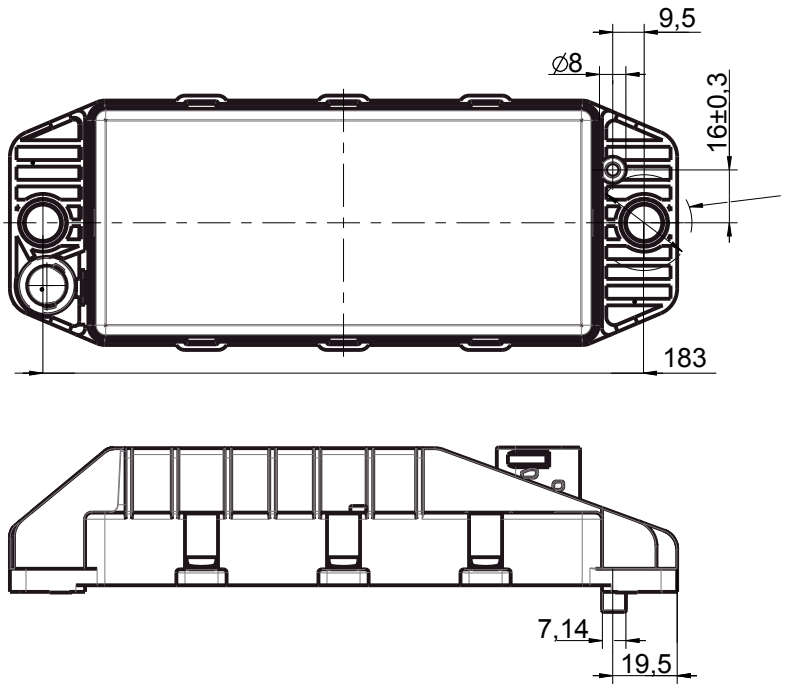
To enable improved reception behind the cross-member, use the mounting bracket (WABCO part number: 446 220 000 4).

Areas behind the mounting bracket should be free of metal as far as possible.

Screws M8x30 to M10x30 with washers are recommended for mounting.

Installation note

Use the dimensioning information below to mark the three bore holes for correct installation:



T	Tightening torque 15 Nm ±1.5

Recommended installation area

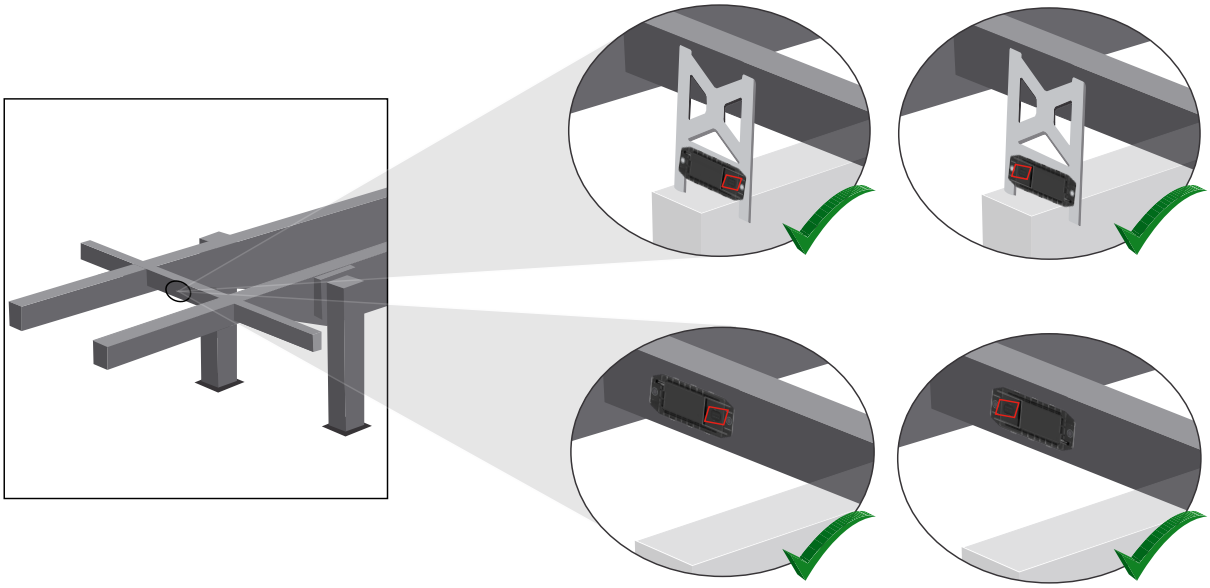
WABCO recommends installing the ECU on the front side of the trailer to ensure the best possible reception in the driver's cabin.

(1) Front side trailer (area marked green): good reception in the driver's cabin and around the vehicle; possibly poorer connection quality directly behind the trailer. The ECU can be optionally installed vertically or horizontally.

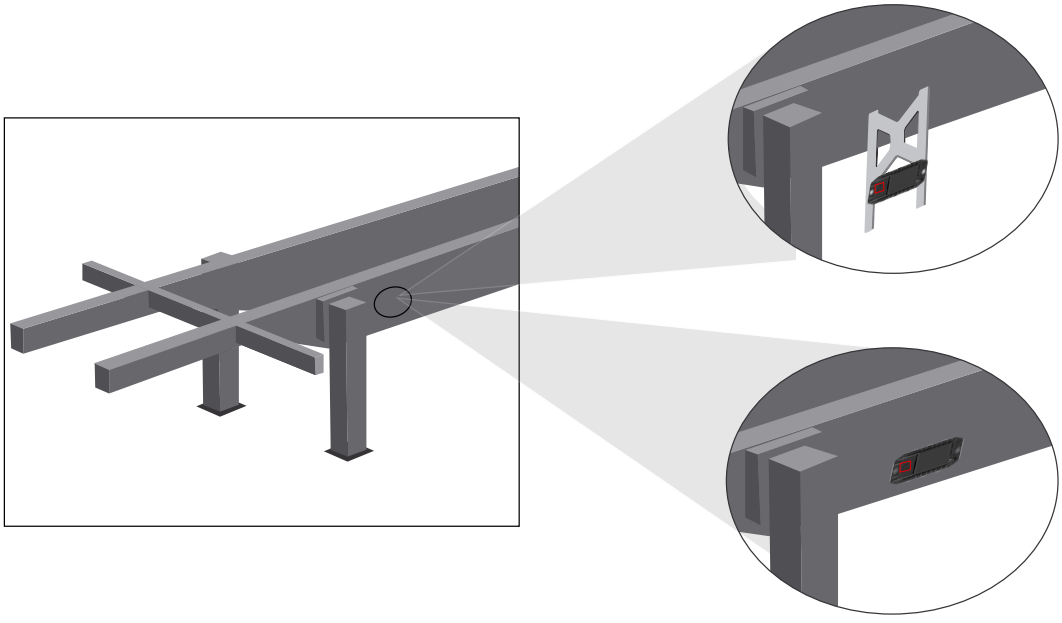
Alternative installation areas

If for construction-related reasons it is not possible to install the ECU at the trailer's front side, you can install the ECU on the cross-member or longitudinal beam as an alternative.

② Cross-member, in front of the supports (in the direction of the driver's cabin), installation position across, connectors optionally left or right



③ Longitudinal beam, installation position across, connectors in driving direction towards the trailer's rear



General measures for optimisation in the case of poor reception

The WLAN connection quality can be impaired by environmental factors, e.g. reflections or damping due to objects in the vicinity.

- A smartphone app for measuring the WLAN field strength can be used to determine the optimum location for installation on the vehicle.
- Metal components in the immediate vicinity of the ECU impair the connection quality.
- Avoid painting the ECU as this reduces the transmission power.
- Changing the mounting direction (in steps of 90°/180°) may improve the signal.
- Generally the reception is better on the side facing away from the connector (see adjacent figure).
- The signal may also be improved by increasing the distance (e.g. plastic plates of distance sleeves) between the ECU rear side and the mounting surface.
- Make sure that no other WLAN / Bluetooth transmission units are installed in the immediate vicinity.

– Use a smartphone to check the optimum WLAN signal strength of the OptiLink ECU from different positions and distances. Install a suitable app, such as Wi-Fi Analyzer, on your smartphone for this purpose.

A poorer connection quality to the OptiLink ECU must always be expected from within vehicles with insulated glazing.

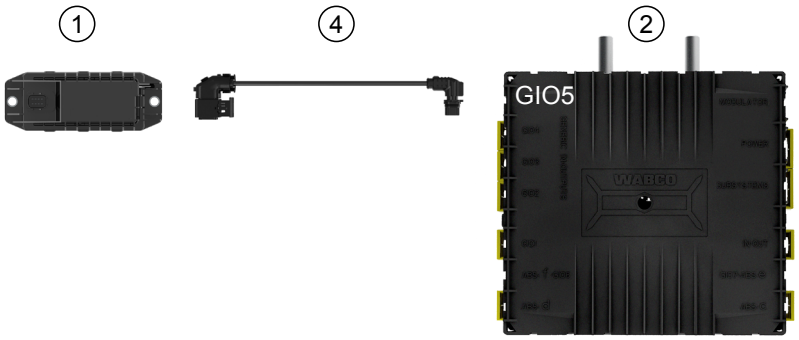
7.4 Electrical connections

7.4.1 Safety information

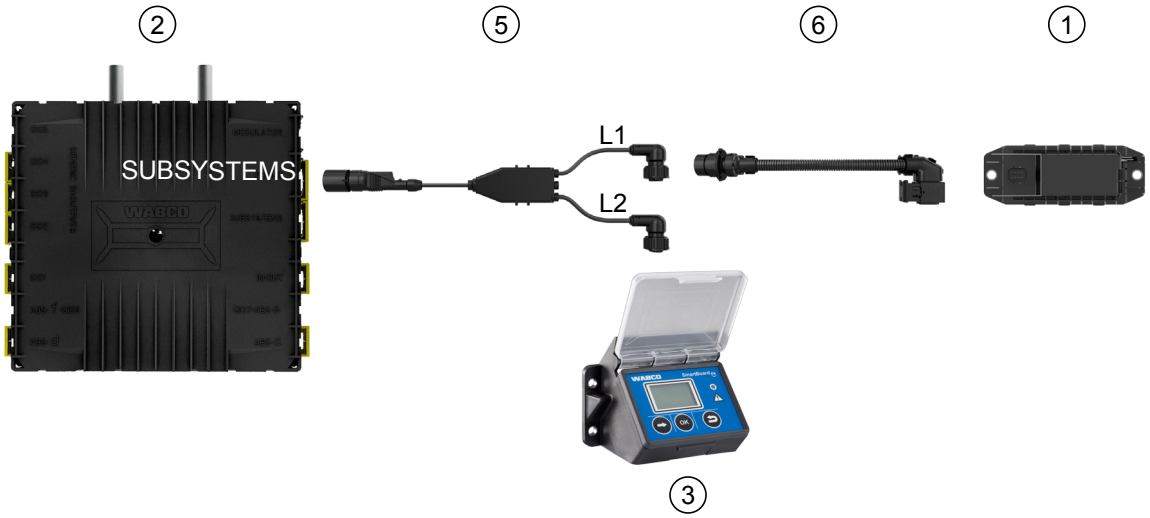
– Always connect cables with open ends in the cab so that no water can penetrate. Where this is not possible, use a suitable cable joint box.
– Plan your installation position so that cables cannot become kinked.
– Fasten the cables and connectors so that the plug connections are not subjected to any tensile stress or lateral forces.
– Never lay cables over sharp edges or in the vicinity of aggressive media (e.g. acids).
– Route the cable to the connections so that water cannot enter the plug-in connector.
– Fasten the cable ties so that the cable is not damaged.
– When using tools, please note the instructions of the cable-tie manufacturer.
– Route long cables in loops.
– Never open the ECU without authorisation.
– Never touch the contact pins.

7.5 Cabling options

Option 1: Connection to the TEBS E Modulator via GIO5

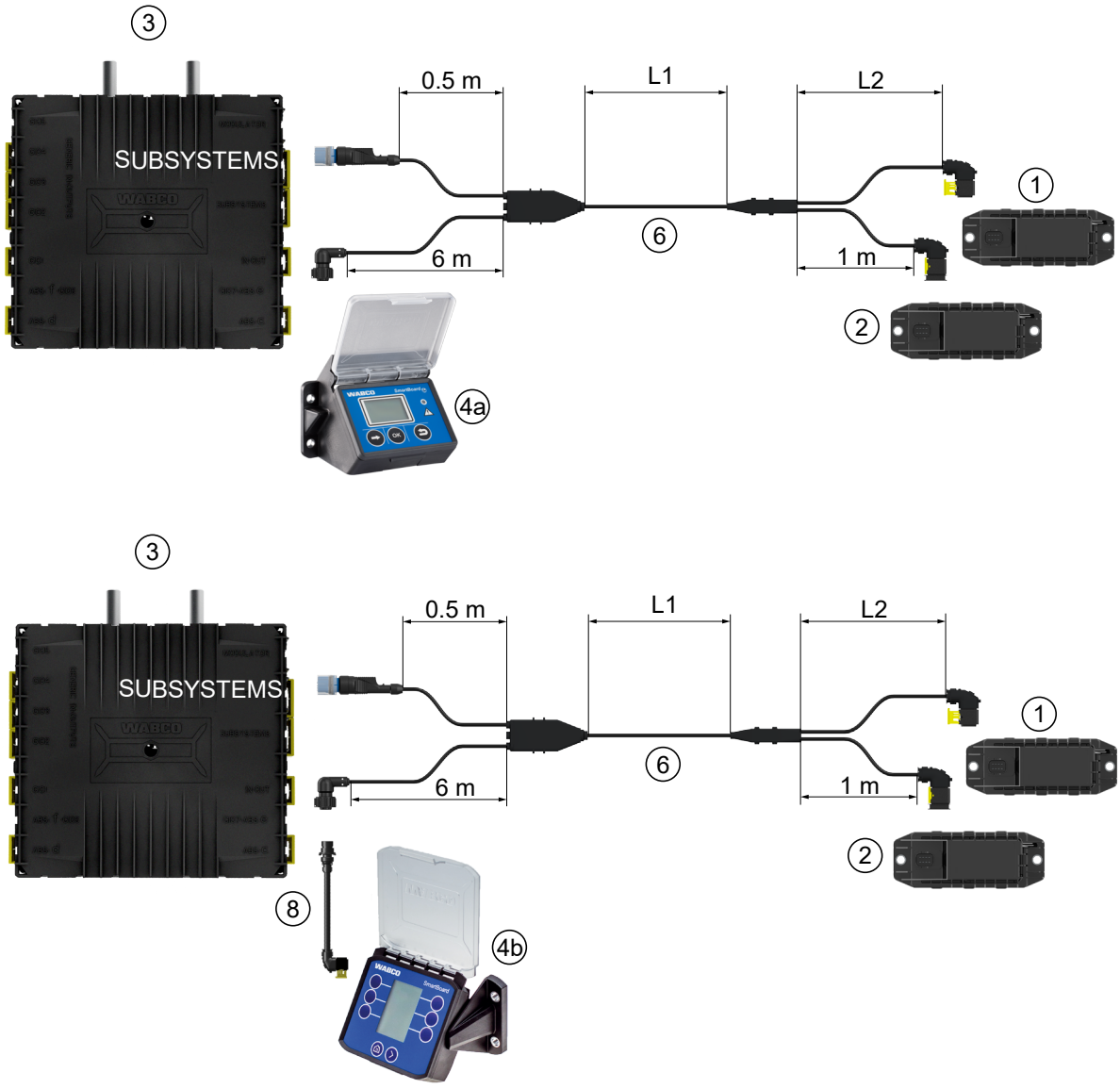


Option 2: Connection to the TEBS E Modulator via SUBSYSTEMS

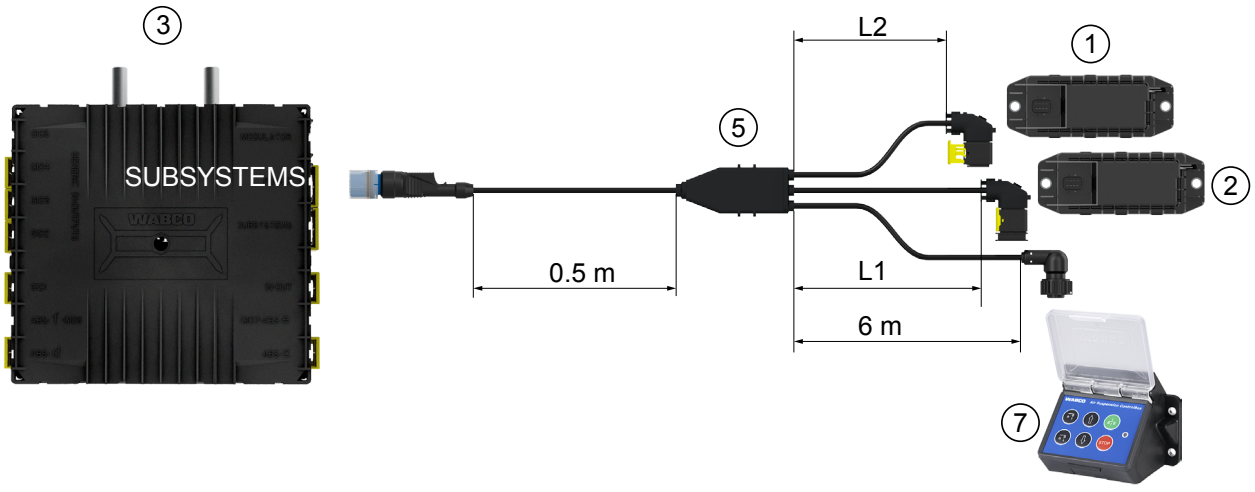


Item	Name	Part number
1	OptiLink ECU	446 290 700 0
2	TEBS E Modulator	480 102 03X 0 (Standard modulator) 480 102 06X 0 (Premium modulator) 480 102 08X 0 (Multi-Voltage modulator)
3	SmartBoard	446 192 11X 0
4	Cable with connector	449 927 XXX 0 Outline drawing: http://www.wabco.info/i/1329
5	Cable for SmartBoard and OptiLink	449 916 XXX 0 The cable is available in different lengths (L1, L2). Outline Drawings: http://www.wabco.info/i/1326
6	Adapter cable	894 600 001 2

Option 3: Connection to the TEBS E Modulator via SUBSYSTEMS



Option 4: Connection to the TEBS E Modulator via SUBSYSTEMS



Item	Name	Part number
1	OptiLink ECU	446 290 700 0
2	OptiTire ECU	446 220 100 0
3	TEBS E Modulator	480 102 03X 0 (Standard modulator) 480 102 06X 0 (Premium modulator) 480 102 08X 0 (Multi-Voltage modulator)
4a 4b	SmartBoard SmartBoard	446 192 11X 0 446 192 21X 0
5	Cable (connects OptiLink-ECU, OptiTire-ECU and ECAS Control Box with TEBS E Modulator)	449 944 XXX 0 The cable is available in different lengths (L1, L2). Outline Drawings: http://www.wabco.info/i/1327
6	Cable (connects OptiLink - ECU, OptiTire-ECU and SmartBoard with TEBS E Modulator)	449 934 XXX 0 The cable is available in different lengths (L1, L2). Outline drawing: http://www.wabco.info/i/1328
7	ECAS control box	446 156 023 0
8	Adapter cable	894 600 074 2

8 Start-up

8.1 Diagnostic hardware

For diagnosis you need the following diagnostic hardware:

Option 1 – diagnosis conforming to ISO 11992 (CAN 24 V); via the 7-pin ISO 7638 CAN connection

Requirement	Diagnostic hardware	
ISO 7638 disconnecting adapter with CAN socket 446 300 360 0 	Diagnostic Interface (DI-2) with USB port (for connection to a PC) 446 301 030 0 	CAN diagnostic cable 446 300 361 0 (5 m) / 446 300 362 0 (20 m) 

Option 2 – diagnosis according to ISO 11898 (CAN 5 V); via an external diagnostic connection

Requirement	Diagnostic hardware	
External diagnostic socket with yellow cap Only TEBS E Modulators (Premium) 449 611 XXX 0 	Diagnostic Interface (DI-2) with USB port (for connection to a PC) 446 301 030 0 	CAN diagnostic cable 446 300 348 0 

– Connect the Diagnostic Interface to the central diagnostic port on the vehicle and the diagnostic PC.

8.2 Diagnostic Software

8.2.1 Ordering and download

The Trailer EBS E Diagnostic Software must be version 5.10 or higher.

Login at myWABCO

– Open the myWABCO website: http://www.wabco.info/i/1367

Help on logging in can be obtained by pressing the *Step-by-step instructions* button.

– If you already have a Diagnostic Software subscription, you can download the desired software via the link *Download Diagnostic Software*.

– If you do not have a Diagnostic Software subscription, click on the link *Order Diagnostic Software*.

Please contact your WABCO partner if you have any questions.

– Install the TEBS E diagnostic software.

8.2.2 Training

Certain functions are protected in the diagnosis. These functions can be activated with a PIN. You obtain the PIN after you have successfully completed the TEBS E Training.

TEBS E Training

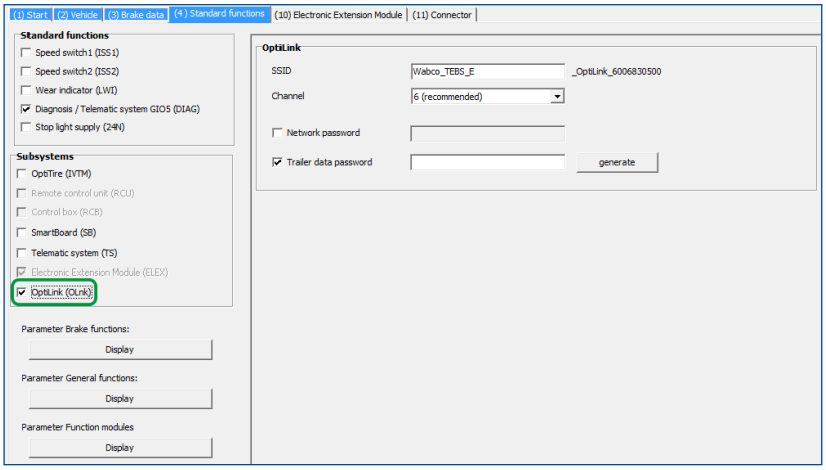
For further information please visit our homepage: http://www.wabco.info/i/1368

Please contact your WABCO partner if you have any questions.

8.2.3 Parameter setting

1. Start the TEBS E diagnostic software.
2. Install the current firmware for EBS and for the Electronic Extension Module.
See chapter "8.3 Application software", page 23.
3. Click on *System => Parameter*.

The function is activated and configured via the tab *(4) Standard functions:*



Subsystems: Make sure that the checkbox for *OptiLink* is activated.

SSID: Here you can enter the name of the commercial vehicle in which OptiLink is installed. If the OptiLink ECU was recognised, the modulator's serial number is displayed behind the search field.

WLAN transmission power: Here you have the option to choose between maximum and reduced transmission power.

If WLAN transmission power is reduced, reception in the driver's cab may be impaired.

According to the current legal situation, the WLAN transmission power must be reduced in some countries. Before start-up, please inform yourself about the current legal situation in which OptiLink is operated and adjust this setting accordingly.

A recommended channel should be used to avoid interferences as much as possible.

Network password:: From TEBS E Diagnostic Software version 5.5 a generic password is predefined: 12345678

Changing the password is recommended.

Only communicate the network password to trusted persons and make sure third parties cannot access it.

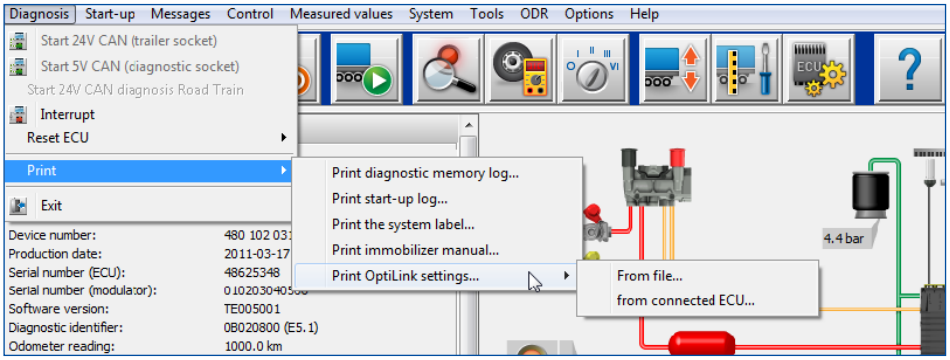
Trailer data password: Enter a password here or let the system generate one for you by pressing the *generate* button. Here you can assign a password to protect access to the data from the Trailer EBS.

The password must consist of at least 8 characters and contain letters as well as numbers. We recommend you generate a unique password for each vehicle.

The settings you have made in the TEBS E diagnostic software are stored in the TEBS E Modulator.

8.2.4 Printing out the OptiLink configuration

– Click on *Diagnosis => Print => Print OptiLink settings.*



WABCO

OptiLink settings 2016-11-01

Vehicle data

Manufacturer
Vehicle type
Vehicle ident. no
Production date

Device data	OptiLink	TEBS-E
WABCO device number	446 290 700 0	480 102 031 0
Serial number	759673905	48625348
Production date	2015-05-22	2011-03-17
Software version	OL010103	TE005001

The following settings are stored for OptiLink

Network SSID	Wabco_TEBS_E_OptiLink_6006830500
Channel	6
Network password	No password has been set
Trailer data password	

8.3 Application software

You can obtain the corresponding application (app) software for your smartphone in the Google Play Store or App Store (Apple).

Application software: at least version 1.02

Trailer EBS Software: from TE005106

Electronic Extension Module software: EX010409

The required files are supplied with the current diagnosis.

8.4 Checking the successful start-up

Requirements

- Mobile device (Smartphone):
  - Operating system Android OS as of version 4.1 (Jelly Bean)
  - Operating system iOS as of version 11
- no diagnostic connection with Trailer EBS active

– Download the description of the app (OptiLink user manual) via the link below and read it carefully: http://www.wabco.info/i/1344

– Download the app via Google Play Store or App Store (Apple).

1. Install the app.
2. Switch on the ignition.
3. Launch the app on your mobile device.
4. Connect the app with the vehicle as described in the OptiLink user manual.
5. As soon as the app signals a successful connection to the vehicle, use the app to operate the trailer functions.

9 Problems and corrective measures

Problem	Remedies
Device does not transmit.	– In the WLAN settings of you smartphone, check if the network name with the keyword "OptiLink" appears exactly as displayed in the diagnosis. – Check if the device is connected to the modulator.
Poor or no reception in the driver's cabin.	– Install the OptiLink ECU closer to the driver's cabin. Make sure that no interfering radio signal sources can impair the transmission.
Poor or no reception at the opposite side of the installation location.	– Use the WABCO mounting bracket (part number: 446 220 000 4) instead of mounting the ECU directly to the member. This improves the reception at the opposite side.

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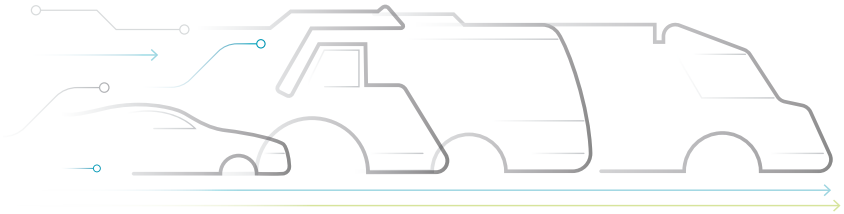

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About WABCO

WABCO (NYSE: WBC) is the world's leading supplier of brake control systems and other advanced technologies to improve the safety, efficiency and connectivity of commercial vehicles. Founded about 150 years ago as Westinghouse Air Brake Company, WABCO is committed to an increasingly autonomous, networked and electrical future for the commercial vehicle industry, true to the motto "Mobilizing Vehicle Intelligence". WABCO continuously drives the development of forward-looking innovations with the aim of setting important technological milestones in the field of autonomous mobility and uses its extensive expertise to integrate complex control and fail-safe systems required for efficient and safe control of vehicle dynamics in every phase of vehicle operation - on the motorway, in the city and in the depot. The world's leading manufacturers of trucks, buses and trailers rely on WABCO's cutting edge technologies. Powered by its vision for accident-free driving and greener transportation solutions, WABCO is also at the forefront of advanced fleet management systems that contribute to commercial fleet efficiency. In 2018, WABCO reported sales of $3.8 billion and has nearly 16,000 employees more than 40 countries. For more information, visit **www.wabco-auto.com**

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