

OptiLink™

INSTALLATION MANUAL



WABCO

REGIONS IN WHICH OPERATION OF THE OPTILINK ECU IS PERMITTED.

- The conditions and requirements for operating WiFi transmitting stations is regulated differently in the various regions. Use of certain channels may be prohibited or operation may not be permitted at all.

You will find a list of the regions in which operation of the OptiLink ECU is permitted as of 10/08/2016 here:
<http://www.wabco.info/i/65>

Please obtain information about whether use is permitted at the time of operation from the respective region or contact your WABCO partner directly.

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1 General information

Purpose of the document

This document describes the installation and start-up of the OptiLink system.
This document is directed toward vehicle manufacturers and workshops.

Copyright and trademark notice

The content, particularly technical information, descriptions and figures, corresponds to the state current at the time of printing and is subject to change without notice.

This document, including all its parts, in particular texts and figures, is protected by copyright. Use outside the statutory or contractual limits require authorisation by the copyright owner. All rights reserved.

Any brand names, even if not indicated as such, are subject to the rules of the trademark and labelling rights.

Symbols used

 Important information, instructions and/or tips that you must always observe.



Reference to information on the internet

- Action step
- ⇒ Consequence of an action
- List

Technical documents



- Open the WABCO INFORM online product catalogue:
<http://inform.wabco-auto.com>
- Search for documents by entering the document number.

The WABCO online product catalogue INFORM provides you with convenient access to the complete technical documentation.

All documents are available in PDF format. Please contact your WABCO partner for printed versions.

Please note that the publications are not always available in all language versions.

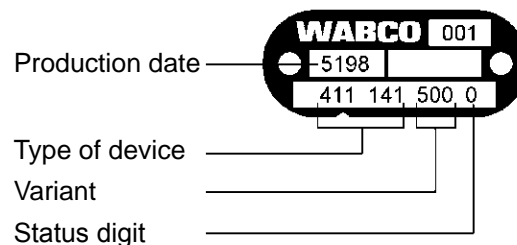
General information

DOCUMENT TITLE	DOCUMENT NUMBER
OptiLink – Installation manual	815 XX0 226 3
OptiLink – User manual	815 XX0 231 3
Diagnosis and test equipment – Product overview	815 XX0 037 3

*Language code XX: 01 = English, 02 = German, 03 = French, 04 = Spanish, 05 = Italian, 06 = Dutch, 07 = Swedish, 08 = Russian, 09 = Polish, 10 = Croatian, 11 = Romanian, 12 = Hungarian, 13 = Portuguese (Portugal), 14 = Turkish, 15 = Czech, 16 = Chinese, 17 = Korean, 18 = Japanese, 19 = Hebrew, 20 = Greek, 21 = Arabic, 24 = Danish, 25 = Lithuanian, 26 = Norwegian, 27 = Slovenian, 28 = Finnish, 29 = Estonian, 30 = Latvian, 31 = Bulgarian, 32 = Slovakian, 34 = Portuguese (Brazil), 98 = multilingual, 99 = non-verbal

Structure of the WABCO product number

WABCO product numbers consist of 10 digits.



0 = New device (complete device); 1 = New device (subassembly)
2 = Repair kit or subassembly; 4 = Component part; 7 = Replacement device;
R = Reman

Choose genuine WABCO parts

Genuine WABCO parts are made of high quality materials and are rigorously tested before they leave our factories. You also have the assurance that the quality of every WABCO product is supported by a powerful customer service network.

As a leading supplier to the industry, WABCO collaborates with the world's leading original equipment manufacturers, and has the experience and capacities required to also satisfy the most stringent production standards. The quality of every genuine WABCO part is supported by:

- Tooling made for serial production
- Regular sub-supplier audits
- Exhaustive end-of-line tests
- Quality standards < 50 PPM

Installing replica parts can cost lives – genuine WABCO parts protect your business.

General information

WABCO additional services

The package you will get with a genuine WABCO part:

- 24-month product warranty
- Overnight delivery
- Technical support from WABCO
- Professional training solutions from the WABCO Academy
- Access to diagnostics tools and support from the WABCO Service Partner network
- Straightforward claims handling
- Confidence that the vehicle manufacturer's rigorous quality standards are met.

WABCO Service Partner

WABCO Service Partners – the network you can rely on. You can access 2000 high quality workshops with more than 6000 specialist mechanics, all trained to WABCO's exacting standards and equipped with our most up-to-the-minute systems diagnostic and support technology.

Your direct contact to WABCO

In addition to our online services, trained members of staff are there to help you at our WABCO Service Partners to directly answer any technical or business-related questions you may have.

Contact us if you need assistance:

- Find the right product
- Diagnosis support
- Training
- System support
- Order management



You can find your WABCO partner here:

<http://www.wabco-auto.com/en/how-to-find-us/contact/>

2 Safety information

Observe all required provisions and instructions:

- Read this publication carefully.
Adhere to all instructions, information and safety information to prevent injury to persons and damage to property.
WABCO will only guarantee the safety, reliability and performance of their products and systems if all the information in this publication is adhered to.
- Always abide by the vehicle manufacturer's specifications and instructions.
- Observe all accident regulations of the respective company as well as regional and national regulations.

Make provisions for a safe work environment:

- Only trained and qualified technicians may carry out work on the vehicle.
- Use personal protective equipment if required (protective goggles, respiratory protection, ear protectors, etc.).
- Pedal actuations can lead to severe injuries if persons are in the vicinity of the vehicle. Make sure that pedals cannot be actuated as follows:
 - Switch the transmission to "neutral" and actuate the park brake.
 - Secure the vehicle with brake wedges.
 - Fasten a visible note to the steering wheel indicating that work is being performed on the vehicle and that the pedals must not be actuated.

Note the following if you are using the TailGUARD function:

- 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.

A void electrostatic charge and uncontrolled discharging (ESD):

Note during construction and building the vehicle:

- 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).

While carrying out repair or welding work on the vehicle, observe the following:

- 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.

Special note when using prefabricated support modules for installations in the vehicle:

Prefabricated support modules are today frequently installed in trailer vehicles as the result of optimised production processes at the trailer vehicle manufacturers. The modulator as well as other possible valves are fastened to these cross-member supports. 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.

Ensuring the electrical conductivity between the support module and the vehicle frame:

- 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.

3 Functional description

The OptiLink app enables monitoring and controlling a trailer vehicle.

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

Given a WiFi connection, the OptiLink app retrieves ongoing information of the trailer vehicle and displays it. For this, the trailer vehicle needs to be provided 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 scope provided of also controlling the trailer vehicle functions per the OptiLink app largely depends on its equipment – for instance, the level of the chassis can only be controlled conditional upon the trailer vehicle having OptiLevel (ECAS or eTASC). The OptiLink app only displays the available functions 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 between the user and the OptiLink ECU can considerably reduce the maximum transmission distance; this relates to the panels of the driver's cabin, for instance.

The transmission and reception quality of the mobile terminal also has a role to play.

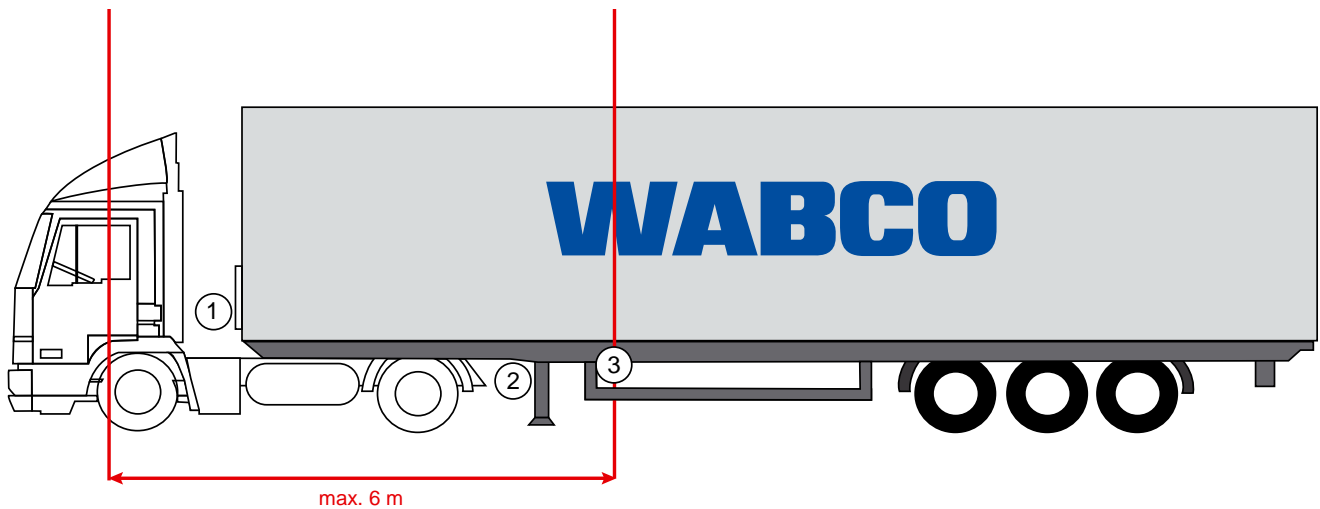
If the connection is lost, the user needs to approach the vehicle for the connection to be resumed.

4 Installation

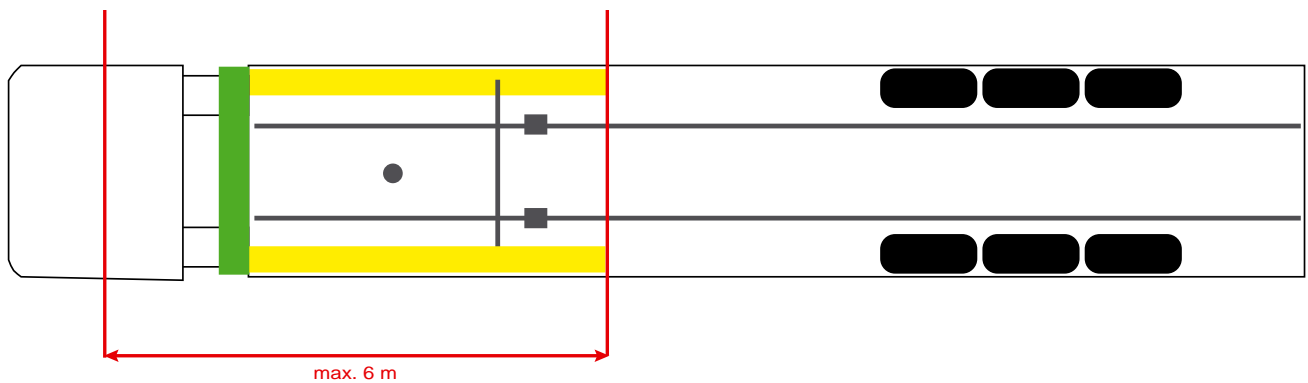
4.1 Installation

! 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.

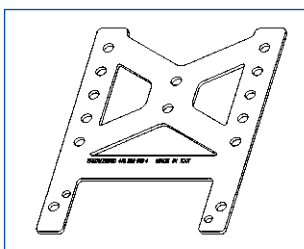
Installation areas



Exemplary figures



Material



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

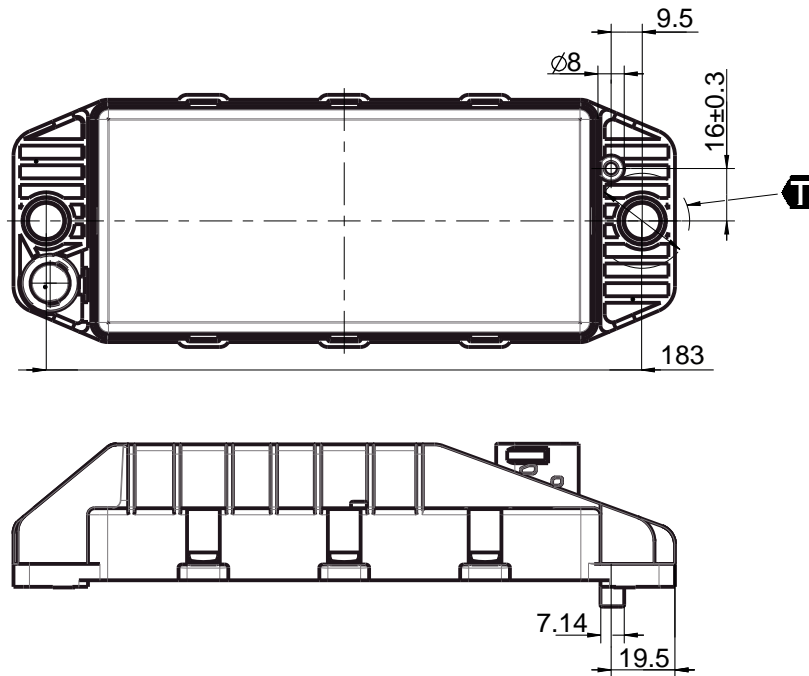
Areas behind the mounting bracket should be free of metal as far as possible.

Screws M8x30 to M10x30 with washers are recommended for mounting.

Installation

Installation note

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



LEGEND



Tightening torque 15 Nm \pm 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.

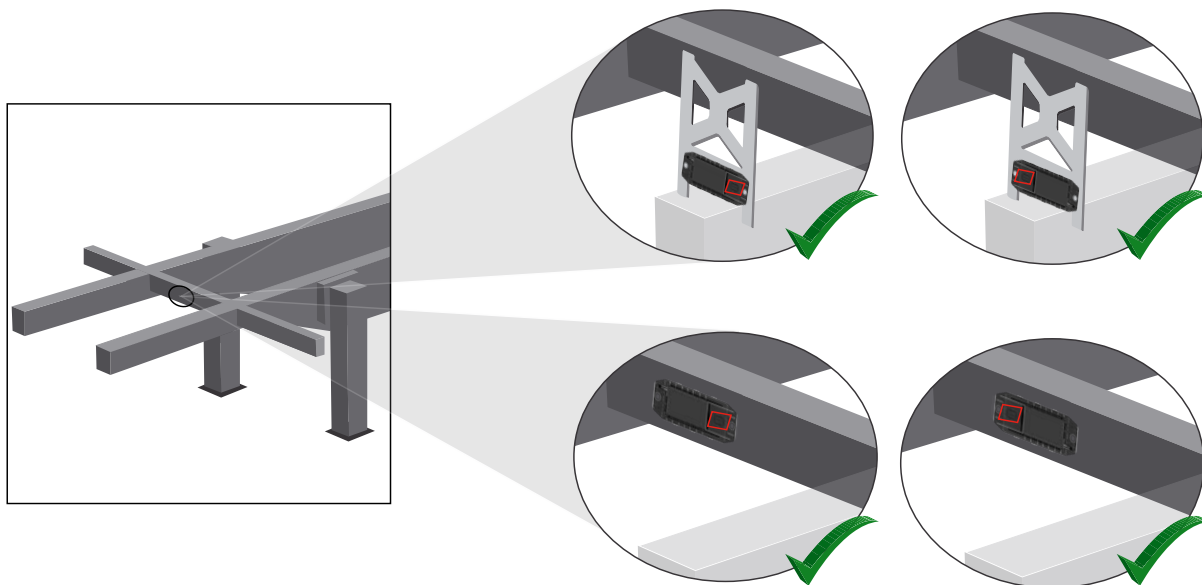


Installation

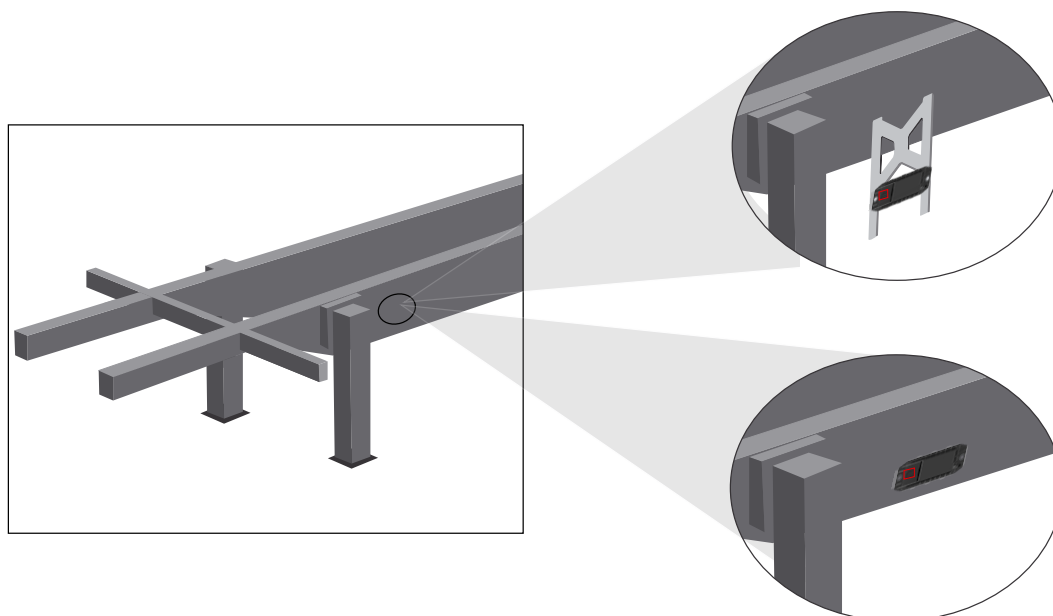
Alternative installation areas

If for construction-related reasons it is not possible to install the ECU at the trailer's front side, the ECU can be installed 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 towards the trailer's rear



General measures for optimisation in the case of poor reception



The WiFi 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 WiFi 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 or distance sleeves) between the ECU rear side and the mounting surface.
- Make sure that no other WiFi / Bluetooth transmission units are installed in the immediate vicinity.

- Use a smartphone to check the optimum signal strength of the OptiLink ECU from different positions and distances. Install a suitable app, such as Wifi 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.

4.2 Electrical connections

4.2.1 Safety information


 **Observe the following safety instructions for handling cables:**

- Water that enters the cable core or cable sleeve can damage electronic control units. Cables with open ends should therefore always be connected in the driver's cabin to ensure that no water can enter. 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 route 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.
- If the cables are too long, do not wind them up but lay them in loops.

 **Observe the following safety instructions to avoid damaging the OptiLink ECU:**

- The ECU must not be opened.
- The contract pins must not be touched.

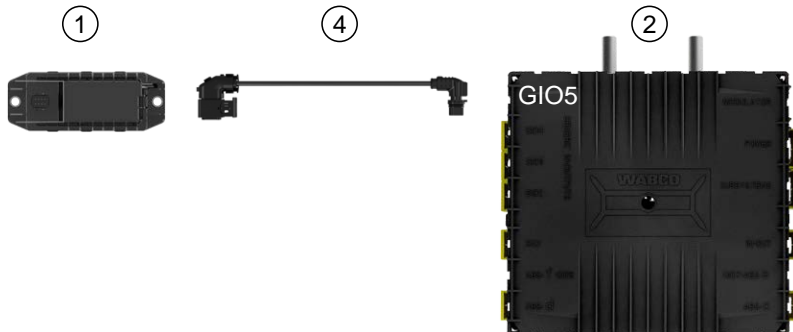
4.3 Technical data

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

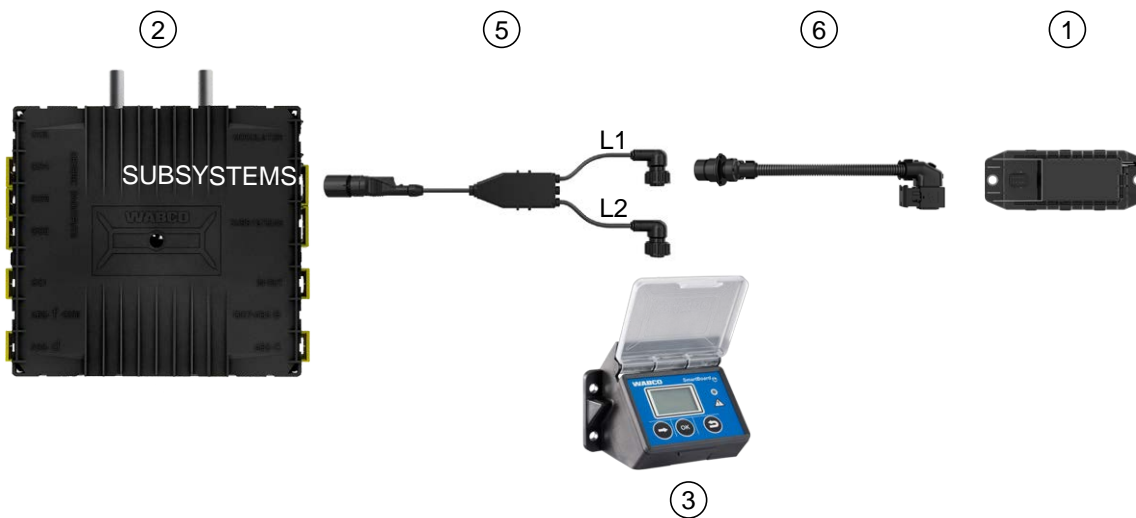
PIN	FUNCTION
1	CAN Low
2	CAN High
3	Reserved
4	Reserved
5	Reserved
6	Alternative supply (8 to 32 VDC, terminal 15)
7	Operating voltage (8 to 32 VDC, terminal 30)
8	Vehicle ground (GND)

4.4 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
5	Cable for SmartBoard and OptiLink	449 916 182 0 (L1 = 0.4 m, L2 = 4 m) 449 916 253 0 (L1 = 6 m, L2 = 6 m)
6	Adapter cable	894 600 001 2

5 Start-up




5.1 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

REQUIREMENTS	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

REQUIREMENTS	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.

5.2 Diagnostic Software

5.2.1 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.am.wabco-auto.com/welcome/>

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.

5.2.2 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.am.wabco-auto.com/home/>

Please contact your WABCO partner if you have any questions.

5.2.3 Parameter setting

- Start the TEBS E diagnostic software.
- Install the current firmware for EBS and for the Electronic Extension Module ▶ Chapter "5.3 Application software", page 21.
- Click on *System => Parameter*.

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

The screenshot shows the 'Standard functions' tab in the TEBS E diagnostic software. On the left, under 'Subsystems', the 'OptiLink (OLink)' checkbox is checked and highlighted with a green circle. On the right, the 'OptiLink' configuration panel is visible. It includes an SSID field with the text 'Wahrn_TFRS_F' and a search field containing '_OptiLink_6006830500'. Below this is a 'Channel' dropdown menu set to '6 (recommended)'. There are two password fields: 'Network password' (unchecked) and 'Trailer data password' (checked), with a 'generate' button next to the latter. At the bottom of the left panel, there are three 'Display' buttons for 'Parameter Brake functions', 'Parameter General functions', and 'Parameter Function modules'.

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.

Channel: Here you have the option to select a channel 1 to 13.

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

! **Network password:** Always assign a password to the network to protect it against unauthorised access.

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

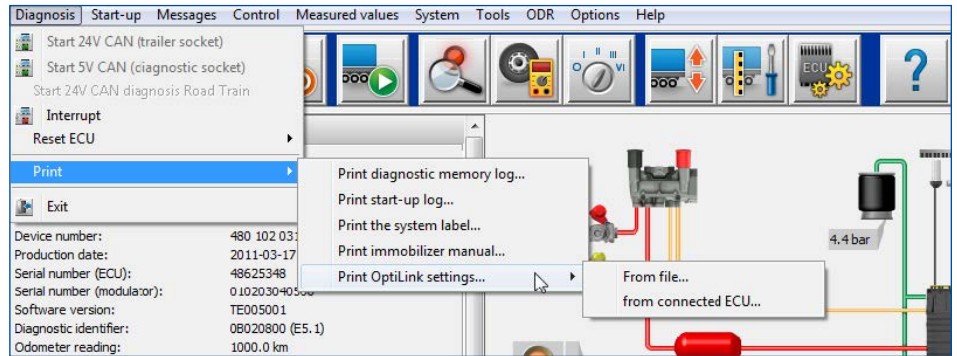
Trailer data password: Enter a password here or let the system generate one for you by pressing the *generate* button. Here you can assign a password to protect access to the data from the Trailer EBS.

! 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.

5.2.4 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

5.3 Application software



You can obtain the corresponding application software (app) for your smartphone in the Google Play Store: <http://www.wabco.info/i/590>

Application software (app): version 1.02 or higher

Trailer EBS Software: from TE005106

Electronic Extension Module software: EX010409

The required files are supplied with the current diagnosis.

5.4 Checking the successful start-up

Requirements:

- mobile device with the Android OS operating system as of version 4.1 (Jelly Bean).
- 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/57>
- Download the app via the following link: <http://www.wabco.info/i/591>
- Install the app.
- Switch on the ignition.
- Launch the app on your mobile device.
- Connect the app with the vehicle as described in the OptiLink user manual.
- As soon as the app signals a successful connection to the vehicle, use the app to operate the trailer functions.

6 Problems and corrective measures

PROBLEM	REMEDIES
Device does not transmit.	<ul style="list-style-type: none">– In the Wi-Fi settings of your 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.	<ul style="list-style-type: none">– 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.	<ul style="list-style-type: none">– 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.



WABCO
a **WORLD** of
DIFFERENCE

WABCO (NYSE: WBC) is a leading global supplier of technologies and services that improve the safety, efficiency and connectivity of commercial vehicles. Founded nearly 150 years ago, WABCO continues to pioneer breakthrough innovations for advanced driver assistance, braking, stability control, suspension, transmission automation and aerodynamics. Partnering with the transportation

industry as it maps a route towards autonomous driving, WABCO also uniquely connects trucks, trailers, drivers, cargo, and fleet operators through telematics, as well as advanced fleet management and mobile solutions. WABCO reported sales of \$2.6 billion in 2015. Headquartered in Brussels, Belgium, WABCO has 12,000 employees in 39 countries. For more information, visit

www.wabco-auto.com