

OABR2Ethernet

Media Converter

User Manual



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Introduction

Intended use

OABR2Ethernet is an automotive media converter between OPEN Alliance BroadR-Reach® (OABR) and standard Ethernet 100BASE-T. The device is primarily designed to convert Ethernet signals between a car's ECU on one side and a PC or datalogger on the other.

You may only operate the converter within the scope of the technical specifications provided in this user manual. Additionally, the use in hazardous areas is not allowed.

The converter meets the requirements of the EMC Directive of the European Union if the connecting cable supplied is used. The interface connection lines may be extended up to a maximum of 30 m, the voltage supply line, with sufficient cross section, up to 3 m.

You can find the declaration of conformity at the end of this user manual. Exact names of the compliant product variants are available on request.

Delivery contents

- OABR2Ethernet Media Converter
- connection cable (optional)
- user manual
- XORAYASuite
- USB driver

Check to ensure that the delivery is complete and all hardware components are in sound condition. If the delivery is incomplete or supplied components are damaged, contact X2E immediately. Do not use damaged components.

General safety instructions

The OABR2Ethernet Media Converter is only intended for use by qualified personnel. Read the user manual and especially this chapter thoroughly before operating.



CAUTION

Electric shock due to damaged components

Damages to the converter or the connection cable can result in electric shock.

- ▶ Check all components regularly for damages.
- ▶ Only connect the converter if all components are undamaged.



CAUTION

Device damage due to vibrations, dirt or liquids

Excessive vibrations, dirt or liquids may result in malfunction or destruction of the converter.

- ▶ Avoid exposing the converter to excessive vibrations, dirt or liquids.
- ▶ Keep the converter clean, especially plugs and sockets to ensure a reliable contact.
- ▶ Never open the converter.



CAUTION

Device damage due to electrostatic discharge

Electronic components can be destroyed by electrostatic discharge.

- ▶ Avoid touching connectors and connector pins.
 - ▶ Ground yourself before carrying the converter in your hands.
 - ▶ Operate the converter in an ESD-compliant environment.
-

Product overview

Identification

The identification plate is located on the bottom side of the OABR2Ethernet Media Converter.



It contains information about:

- Typ device type
- Rev hardware revision
- S/N serial number
- DMF date of manufacture

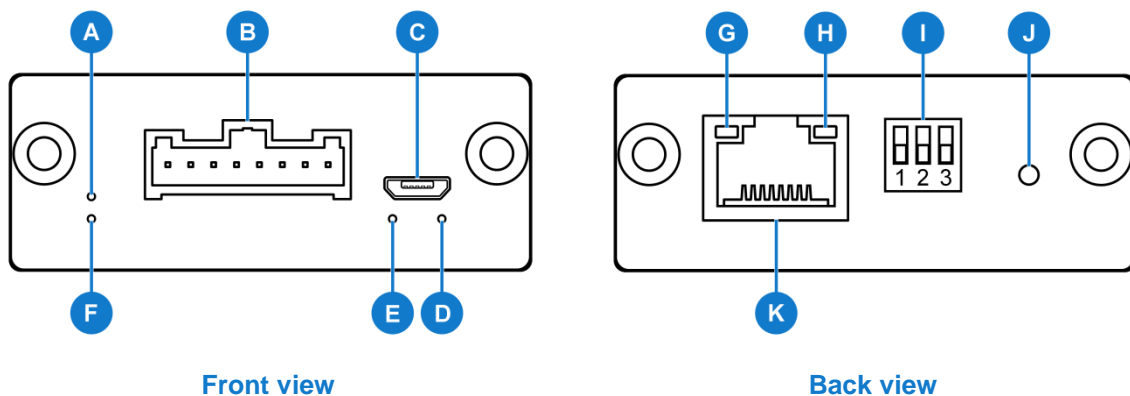
Functions described in this user manual correspond to the OABR2Ethernet Media Converter at the following development stage:

- hardware revision 1.01
- firmware version 04.00.05
- XORAYASuite version 03.06.00.15

Connections and controls

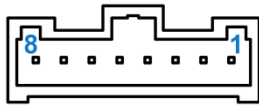
The front side contains LEDs, the service interface and the combined connection for power, OABR and CAN.

The Ethernet interface and control elements are located on the back side.



Link LED for OABR (A)

Colour	Meaning
green	link established
yellow	USB bootloader mode

Connection for power, OABR and CAN (B)

Pin	Function
1	CAN_H
2	CAN_L
5	KL30(Ubatt)
6	KL31(GND)
7	OABR_N
8	OABR_P

Service interface (C)

Use the Micro USB interface to change the configuration and to update the firmware. For further information, refer to the chapter *Configuration and firmware update*.

General status LED (D)

Colour	Meaning
blue	converter in initialisation phase
green	converter ready
red	error
off	USB bootloader mode

LED for CAN (E)

Colour	Meaning
blue	interface in initialisation phase
green	interface ready
green (blinking)	activity on this interface

Activity LED for OABR (F)

Colour	Meaning
green	interface ready
green (blinking)	activity on this interface
yellow	USB bootloader mode

Activity LED for Ethernet (G)

Colour	Meaning
yellow (blinking)	activity on this interface

Link LED for Ethernet (H)

Colour	Meaning
green	connection established

DIP switches (I)

No	Function
1	switch the OABR interface between master (up) or slave (down)
2	switch the OABR interface between full-out (up) and half-out (down)
3	activate (up) or deactivate (down) sleep/wake mode via CAN

Reset button (J)

This button is used to:

- restart the converter
- switch the converter into USB bootloader mode (further information in the chapter *Connect converter*)

Ethernet interface (K)

Connection for a standard Ethernet cable.

Installation

Mounting



CAUTION

Device damage due to overheating

Overheating may result in malfunction or destruction of the converter.

- ▶ Do not operate the converter outside the specified temperature range.
 - ▶ Do not operate the converter in the vicinity of heat sources.
 - ▶ Ensure adequate air circulation.
 - ▶ Do not cover the converter with other objects.
-

- ▶ Mount the converter in such a way that it does not pose a hazard at any time.

Connecting



DANGER

Electric shock due to improper connection

Introducing the 4-mm plugs of the supplied connection cable into low-voltage sockets can be fatal.

- ▶ Never introduce the 4-mm plug into low-voltage sockets.
-



CAUTION

Device damage due to wrong power supply

A wrong power supply can result in damage or destruction of the converter.

- ▶ Only connect the converter to power supplies that correspond to the technical specifications.
 - ▶ Pay attention to the correct polarity when connecting.
-



Disconnect service interface during standard operating mode

Make sure that the service interface **(C)** is disconnected in standard operating mode. Pull the plug if necessary and connect it again before changing the configuration or updating the firmware.

The following instructions refer to the connection cable provided by X2E. If you use other cables, connect accordingly.

- ▶ Plug the connection cable into the socket **(B)**.
- ▶ Connect the cable labelled **OABR** to the ECU or any other OABR device.
- ▶ To use the sleep/wake mode, connect the cable labelled **CAN** to a CAN bus.
- ▶ Plug a standard Ethernet cable into the socket **(K)**.
- ▶ Connect the Ethernet cable to a PC, switch or datalogger.



Requirements for the DC power supply

The DC power supply must provide a continuous current of 150 mA. Use a regulated power supply or the vehicle battery and pay attention to the required voltage and current levels.

- ▶ Connect the black cable labelled **KL31(GND)** to 0 V or ground.
- ▶ Connect the red cable labelled **KL30(Ubatt)** to a DC power supply in the specified range.
- ▶ Ensure that all connectors are firmly attached.
- ▶ Turn on the power supply.

The converter indicates its readiness by green illumination of the general status LED **(D)**. As soon as data is received at the OABR or the Ethernet interface, the data is converted accordingly and sent in the opposite direction.



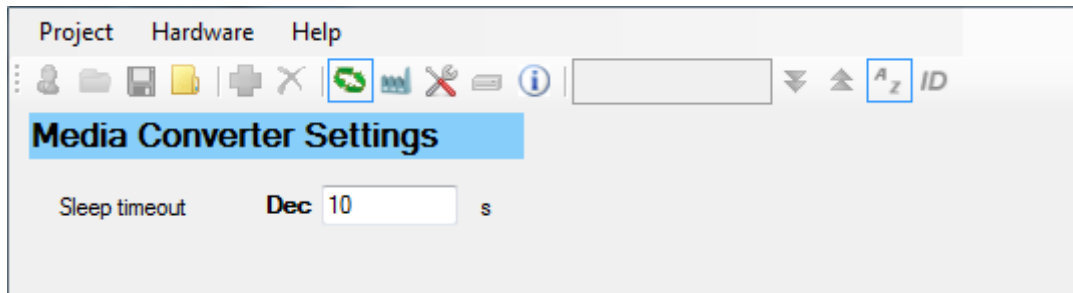
Energy management

The OABR2Ethernet Media Converter features an intelligent energy management that reduces the current consumption depending on a connected CAN bus.

To activate the sleep/wake mode, DIP switch **(I)** No 3 needs to be *ON* (= top position).

If there is no activity on the CAN bus within a configurable number of seconds (see chapter *Configuration and firmware update*), the converter switches into sleep mode. If there is activity again, it wakes up back to standard operating mode.

Configuration and firmware update



In addition to the general converter configuration with DIP switches **(I)**, it is possible to change the following value with the tool *Gateway configuration*, part of X2E's XORAYASuite:

- time in seconds without CAN activity that puts the converter into sleep mode (requirement: DIP switch No 3 is in top position)

Install XORAYASuite

The XORAYASuite is a collection of programs to configure and control XORAYA dataloggers and additional devices like the OABR2Ethernet Media Converter.

Supported operating systems:

- Microsoft® Windows® 7 (32 Bit or 64 Bit)
- Microsoft® Windows® 8 (32 Bit or 64 Bit)
- Microsoft® Windows® 10 (32 Bit or 64 Bit)

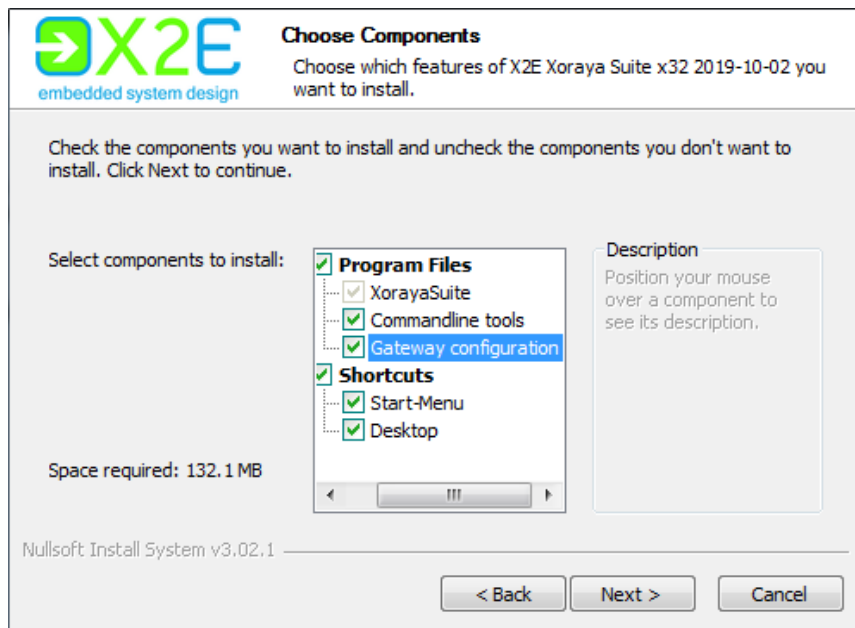
Hardware requirements:

- Processor speed: at least 1 GHz
- RAM: at least 2 GB
- Hard disk space: approx. 130 MB available


Software requirements:

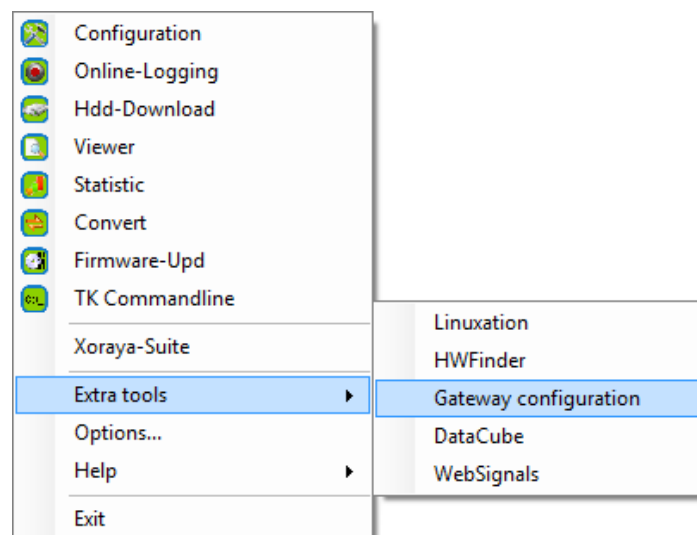
- Microsoft® .NET Framework Version 4.5 or higher

- Start the XorayaSuite installation wizard and follow the instructions.
- Make sure that the component *Gateway configuration* is installed.



Start Gateway configuration


- ▶ Start the XorayaSuite.
- ▶ Click  in the Windows notification area.
- ▶ Select Extra tools > Gateway configuration.





Connect converter

- ▶ Make sure that the correct USB driver is installed.
- ▶ Deactivate sleep mode (DIP switch **(I)** No 3 is in down position).
- ▶ Connect the converter to the power supply (see chapter *Connecting*).
- ▶ Turn on the power supply.
- ▶ Connect the converter via service interface **(C)** to your PC.
- ▶ Press the reset button **(J)** with a pointed object.



The converter indicates USB bootloader mode by turning off the general status LED **(D)**. Additionally, the LEDs **(A)** and **(F)** turn on yellow.

- ▶ Click  to connect to the converter.

An established connection is indicated by a blue border around the icon: 

- ▶ Click  to get information about the connected converter (firmware version, current configuration, etc.).

Change configuration

- ▶ Click  to load the current configuration from the converter.
- ▶ Set the **Sleep timeout** (at least 2 s, accuracy $\pm 20\%$).
- ▶ Click  to transfer the configuration onto the converter.




Complete configuration properly

Do not abort the process and do not disconnect the USB cable prematurely. Otherwise, the converter stays in USB bootloader mode and it is not converting data.

After the successful transfer, the converter switches back into standard mode, which is indicated by green illumination of the general status LED **(D)**.

- ▶ Pull the USB cable from the converter.

Update firmware

- ▶ Click  .
- ▶ Navigate to the directory that contains the firmware file and select the **File name**.
(Never change the file names of the provided firmware archive.)
- ▶ Click **Open**.

The firmware is being updated.



Complete firmware update properly


Do not abort the process and do not disconnect the USB cable prematurely. Otherwise, the converter stays in USB bootloader mode and it is not converting data.

After the successful transfer, the converter switches back into standard mode, which is indicated by green illumination of the general status LED **(D)**.

- ▶ Pull the USB cable from the converter.

Disconnect converter

Manual disconnection of the converter is only necessary if you did not transfer a configuration or update the firmware after connecting.

- ▶ Click  to disconnect the converter.
- ▶ Pull the USB cable from the converter.
- ▶ Press the reset button **(J)** to switch back into standard mode.

Cleaning

**CAUTION****Device damage due to entering liquids**

Entering liquids may result in malfunction or destruction of the converter.

- ▶ Disconnect the converter from the power supply before cleaning.
 - ▶ Make sure that no liquids enter the converter.
-

- ▶ Clean the converter with a damp, soft cloth as needed.

Repair

**CAUTION****Device damage from opening the device**

Unauthorised opening may result in malfunction or destruction of the converter.

- ▶ Never open the converter.
 - ▶ Maintenance and repair must be carried out by X2E personnel only.
-

- ▶ In case of malfunctions or damages, please contact X2E via e-mail to get information about returning the converter: xoraya-return@x2e.de

Disposal



Within the European Union, the disposal of electrical devices is determined by national rules that are based on the directive 2012/19/EU of the European Parliament and of the Council on waste electrical and electronic equipment (WEEE). Accordingly, electrical and electronic equipment may not be disposed of in household waste.

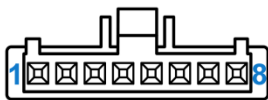
Outside the European Union, please contact your local authority so as to comply with the correct method of disposal for electrical devices.

Appendix

Technical specifications

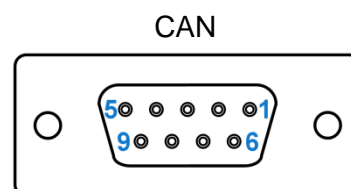
Dimensions (H x W x D)	21 mm x 56 mm x 104 mm
Supply voltage	5 V to 28 V
Current consumption	max 150 mA (at 12 V)
Current consumption (standby)	max 23 mA (at 12 V)
Data rate	100 Mbit/s guaranteed
Temperature range	-40 °C to +65 °C

Pin assignments of the connection cable

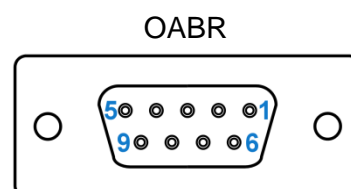


Pin	Function
1	CAN_H
2	CAN_L
5	KL30(Ubatt)
6	KL31(GND)
7	OABR_N
8	OABR_P

Pin	Function
2	CAN_L
7	CAN_H



Pin	Function
2	OABR_N
7	OABR_P



Colour	Function
red	KL30(Ubatt)
black	KL31(GND)

Ubatt/GND



EC Declaration of Conformity



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Declares the conformity for the product

Product name:

OABR2Ethernet - Media Converter

According to the following requirements:

EMC Directive 2014/30/EU

OF THE EUROPEAN PARLIAMENT AND OF THE COUNCIL

of 26 February 2014 on the harmonisation of the laws of the Member States relating to electromagnetic compatibility and repealing Directive 2004/108/EC.

The following standards have been applied:

EN 55011:2009 + A1:2010

EN 61326-1:2013

EN 61000-4-2:2009

EN 61000-4-3:2006 + A1:2008 + A2:2010

EN 61000-4-4:2012

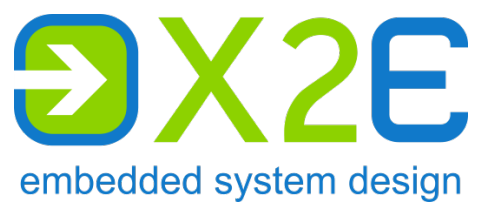
EN 61000-4-5:2014

EN 61000-4-6:2014

EN 61010-1:2010


Signature: / Position in company:


Place and date:



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