

External level shifter

User Manual



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Introduction

Intended use

The External level shifter is an automotive voltage converter for serial signals between a car's head unit and a PC or datalogger. It can also be used for other devices where a conversion of serial signals from 3.3 V to RS232-compatible levels and vice versa is needed.

The External level shifter must not be used in living areas. Its use is strictly limited to industrial environments.

You may only operate the External level shifter within the scope of the technical specifications provided in this user manual.

The External level shifter meets the requirements of the EMC Directive of the European Union if the optionally available connecting cable is used. The connection lines may be extended up to a maximum of 30 m provided that they are shielded like the connection cable from X2E.

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

- External level shifter
- connection cable (optional)
- user manual

Check to ensure that the delivery is complete and all parts 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 External level shifter 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 External level shifter or the connection cable can result in electric shock.

- ▶ Check all components regularly for damages.
- ▶ Only connect the External level shifter 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 External level shifter.

- ▶ Avoid exposing the External level shifter to these influences.
- ▶ Keep the External level shifter clean, especially plugs and sockets to ensure a reliable contact.
- ▶ Never open the External level shifter.



CAUTION

Device damage due to electrostatic discharge

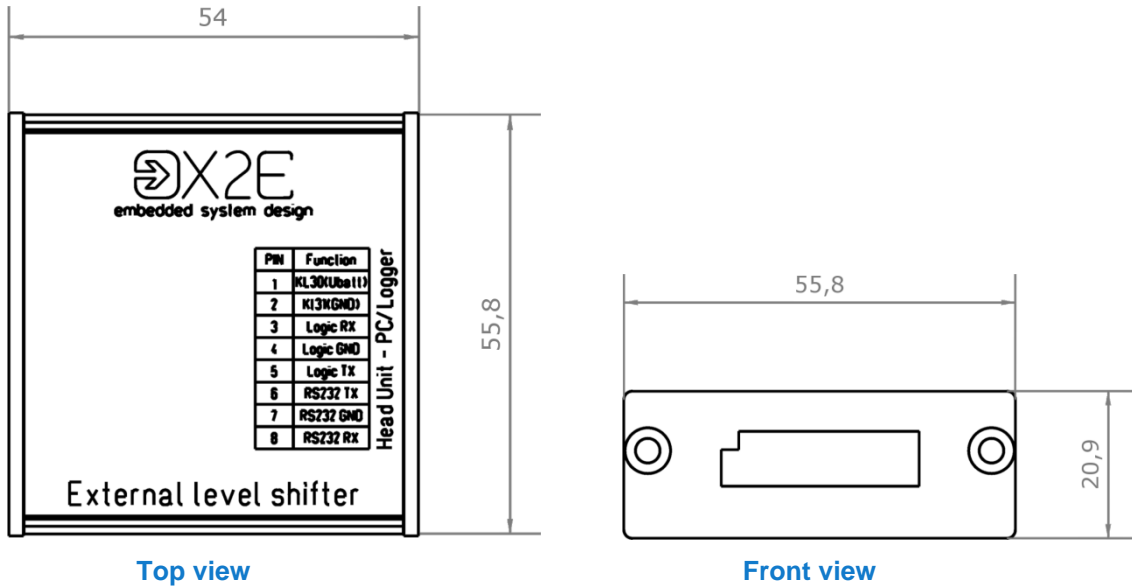
Electronic components can be destroyed by electrostatic discharge.

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

Product overview

Dimensions

Unit: mm



Connection

Pin	Function	Description
1	KL30(Ubatt)	Plus pole of the car battery or alternative power supply (Recommendation: use a 400 mA pre-fuse)
2	KL31(GND)	Minus pole of the car battery or ground
3	Logic RX	Receiver signal to Head Unit
4	Logic GND	Ground signal from Head Unit
5	Logic TX	Transmitter signal from Head Unit
6	RS232 TX	Transmitter signal from PC/Logger
7	RS232 GND	Ground signal from PC/Logger
8	RS232 RX	Receiver signal to PC/Logger

Technical specifications

Dimensions (H x W x D)		20.9 mm x 55.8 mm x 54 mm	
Data rate		min 115 kBit/s	
Temperature range		-40 °C to +85 °C	
Current consumption (standby)		max 300 µA	
Current consumption		max 50 mA	
		Min	Max
V_{KL30}	Supply voltage	4.7 V	28.0 V
Logic interface		Min	Max
V_{IL}	Input voltage for Low		0.8 V
V_{IH}	Input voltage for High	2.0 V	
V_{oL}	Output voltage for Low		0.4 V
V_{oH}	Output voltage for High		2.7 V
RS232 interface		Min	Max
V_{IL}	Input voltage for Low	-25.0 V	0.8 V
V_{IH}	Input voltage for High	2.0 V	25.0 V
V_{oL}	Output voltage for Low	-5.0 V	-5.4 V
V_{oH}	Output voltage for High	5.0 V	5.4 V

Commissioning

**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 plugs into low-voltage sockets.
-

**CAUTION****Device damage due to wrong power supply**

A wrong power supply can result in damage or destruction of the External level shifter.

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

**CAUTION****Device damage due to overheating**

Overheating may result in malfunction or destruction of the External level shifter.

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

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



Additionally, we recommend the use of a **400 mA pre-fuse** as a means of protection against overload to exclude damages to the device or the cable.

Connect:

- ▶ the 8-pin connector to the External level shifter
- ▶ the cable labelled **HeadUnit** to the car's head unit
- ▶ the cable labelled **PC/Logger** to the PC or the datalogger
- ▶ the black cable labelled **KL31(GND)** to the minus pole of the car battery or ground
- ▶ the red cable labelled **KL30(Ubatt)** to the plus pole of the car battery or the alternative power supply

The External level shifter is ready and converts the received signals to the desired levels.



If the External level shifter does not receive a valid RS232 TX signal on pin 6, pin 8 for the RS232 RX signal is automatically deactivated.

Cleaning



CAUTION

Device damage due to entering liquids

Entering liquids may result in malfunction or destruction of the External level shifter.

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

- ▶ Clean the External level shifter 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 External level shifter.

- ▶ Never open the External level shifter.
 - ▶ 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 External level shifter: 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.

EC Declaration of Conformity



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Declares the conformity for the product

External level shifter

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

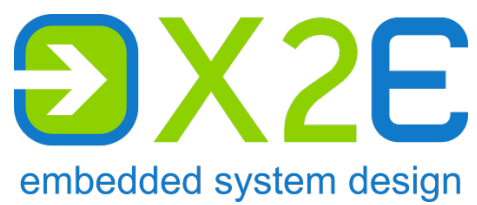
EN 61000-4-6:2014

EN 61010-1:2010

The respective conformal product variations are listed under: Y:\dokumentation\emv\Messungen_CE_Vergabe\BB-UART-Levelshifter-0100-000003 (CE)\Prüfprotokoll und Konformitätserklärung\External-level-shifter-Variationen.xlsx


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