Kvaser Ethercan Light User's Guide



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https://www.kvaser.com

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We believe that the information contained herein was accurate in all respects at the time of printing. Kvaser AB cannot, however, assume any responsibility for errors or omissions in this text. Also note that the information in this document is subject to change without notice and should not be construed as a commitment by Kvaser AB.

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1 About this manual

This manual is intended for Kvaser Ethercan Light users. This manual contains a description of the hardware properties and general instructions for connecting the device to a computer.

2 Introduction

This section will describe the functions and features of the Kvaser Ethercan Light.

2.1 Welcome to Kvaser Ethercan Light



Figure 1: Kvaser Ethercan Light

The Kvaser Ethercan Light is a powerful real time Ethernet to CAN interface. With a time stamp precision of 100 microseconds, the Kvaser Ethercan Light handles transmission and reception of standard and extended CAN messages on the bus. The Kvaser Ethercan Light is compatible with applications that use Kvaser's CANlib.

This guide is applicable to the Kvaser Ethercan Light devices listed in Table 1.

Device	Product Number
Kvaser Ethercan Light HS	73-30130-00713-0

Table 1: Kvaser Ethercan Light device and its EAN number.

Throughout this document, we use the name Kvaser Ethercan Light to mean any

one of the different Kvaser Ethercan Light products listed in Table 1, unless otherwise noted.

2.2 Major features

- Quick and easy plug-and-play installation.
- Supports ISO 11898-1 with both 11-bit and 29-bit CAN identifiers.
- Large on-board RAM buffer for CAN messages.
- 100 % compatible with applications written for Kvaser hardware such as LAPcan, PCIcan, and USBcan with Kvaser CANlib.
- One high-speed CAN connection (compliant with ISO 11898-2), 40 kbit/s up to 1 Mbit/s.
- Fully compatible with J1939, CANopen, NMEA 2000 and DeviceNet.
- Ethernet connection with auto-MDIX using a standard shielded RJ45 socket.
- Built-in Power over Ethernet (PoE), allows the device to receive both data and power over a single Ethernet cable.
- Small, lightweight plastic housing — easy to tuck away (e.g. in a vehicle during a test drive)
- Supports extreme data throughput, quick reaction times and precise time stamping — removing any bottlenecks.

2.3 Additional software and documentation

The Kvaser CANlib SDK includes everything you need in order to develop software applications interacting with Kvaser CAN and LIN hardware. The SDK contains full documentation and many sample programs, written in C, C++, C#, Delphi, Python and Visual Basic. Kvaser CAN and LIN hardware is built around the same common software API. Applications developed using one device type will run without modification on other device types.

The latest versions of documentation, software and drivers can be downloaded for free at www.kvaser.com/download.

3 Kvaser Ethercan Light hardware

In this section you can read more about the CAN channels, power supply and LED indicators.

3.1 Hardware installation

The Kvaser Ethercan Light may be inserted in any free Ethernet socket. If the Ethernet socket does not support Power over Ethernet, power must be supplied on the CAN connector. For the Kvaser Ethercan Light to communicate with the host computer, the correct version of the Kvaser driver and firmware must be installed. The firmware is downloaded and installed directly on the Kvaser Ethercan Light and the driver is installed on the computer.

The delivery package Kvaser Ethercan Light contains:

- Kvaser Ethercan Light.
- Ethercan Factory Reset Device.

3.2 Network connector

The Kvaser Ethercan Light has a standard shielded RJ45 socket (STP) ethernet connector, see Figure 2. Connect the Kvaser Ethercan Light to your network or directly to your host computer for first time configuration. For more information on how to configure the Kvaser Ethercan Light see Section 4, How to use the Kvaser Ethercan Light, on Page 10.

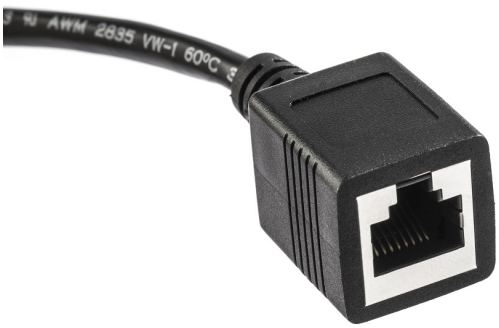

Figure 2: Network connector on the Kvaser Ethercan Light.

3.3 Ethercan Factory Reset Device

The Ethercan Factory Reset Device, see Figure 3 on Page 8, is used to reset the Kvaser Ethercan Light configuration. To perform a factory reset see Section 4.3, Reset device to factory settings, on Page 14.

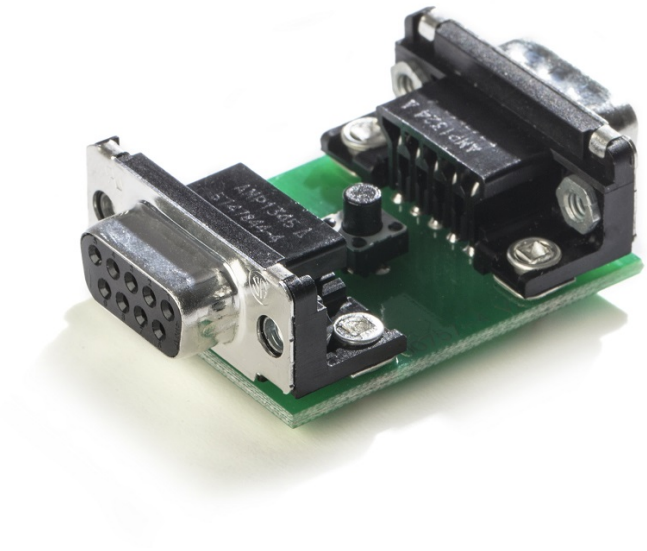

Figure 3: Ethercan Factory Reset Device

3.4 CAN channels

The Kvaser Ethercan Light has one CAN Hi-Speed channel with a 9-pin D-SUB connector. See Section 5.2, CAN connector, on Page 16 for details about the connector.

3.5 Power supply

The Kvaser Ethercan Light is powered either from the Ethernet connector using PoE or from the CAN connector. The Kvaser Ethercan Light is compliant with PoE IEEE 802.3af supporting both Mode A (endspan) and Mode B (midspan).

3.6 LED indicators

The Kvaser Ethercan Light has four LEDs as shown in Figure 4 on Page 9.

LED	General meaning
PWR (Green)	Steady light when unit is powered and working.
CAN (Yellow)	CAN channel status.
ERR (Red)	Indicates different types of errors.
LAN (Yellow)	LAN connection status.
	Fast flashing when waiting for DHCP lease.
	Slow flashing when ready for connection as remote device.
	Steady light when device is connected as a remote device.

Table 2: LEDs on the Kvaser Ethercan Light.

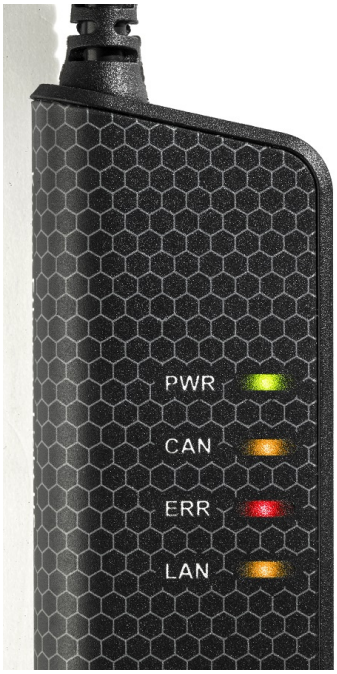

Figure 4: LEDs on the Kvaser Ethercan Light.

The ERROR LED indicator can give more information about the cause of failure, see Table 3 on Page 9.

ERROR LED Signal	Auxiliary Signal	General Meaning
Blink	CAN LED blinks	CAN channel is in error passive mode
Slower blink	CAN LED blinks	CAN channel is bus off
Short flash	-	Error frame detected

Table 3: ERROR LED Indicator Signals

4 How to use the Kvaser Ethercan Light

4.1 Initial setup on network with DHCP

Connect the Kvaser Ethercan Light to the network and start Kvaser Network Device Selector found in Kvaser Device Guide, see Figure 5.

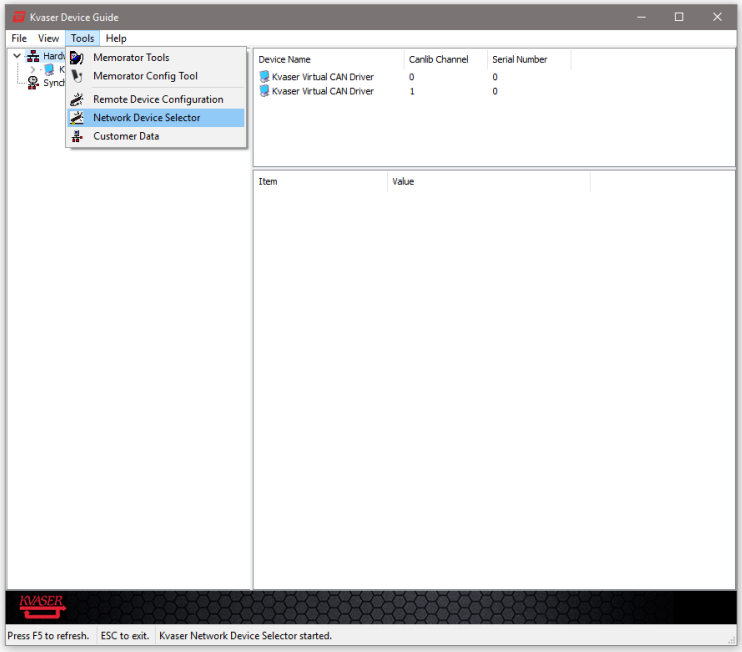

Figure 5: Kvaser Network Device Selector is found in Kvaser Device Guide

The new device will be available in the Kvaser Network Device Selector, see Figure 6 on Page 11.

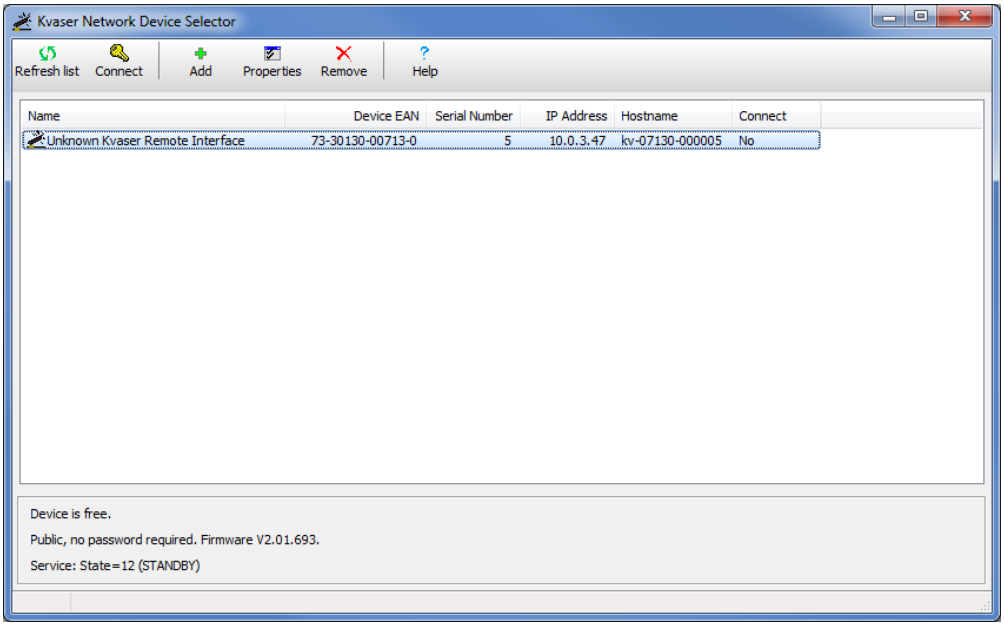

Figure 6: The new device is found in Kvaser Network Device Selector

4.2 Initial setup on network with static IP

The factory setting uses Windows APIPA[1]. To initially configure the Kvaser Ethercan Light for a static IP, connect the device directly to your computer's network connector and the new device will be available in the Kvaser Network Device Selector (using an IP in the range 169.254.0.1 to 169.254.255.254), see Figure 7 on Page 12.

You can now connect to the device by clicking the Connect button, then start Kvaser Remote Device Configuration (found in Kvaser Device Guide) and select your device, see Figure 8 on Page 12.

You will be informed that the parameter area is blank, which is a normal condition for new devices, see Figure 9 on Page 13. The Info tab in the Kvaser Remote Device Configuration tool will then show general information about the device such as MAC address, hostname, and used IP address.

Change the Network Settings to the preferred settings and click OK, see Figure 10 on Page 13.

[1] APIPA (Automatic Private IP Addressing) is a DHCP failover mechanism for local networks. When a DHCP server fails, APIPA allocates IP addresses in the private range 169.254.0.1 to 169.254.255.254.

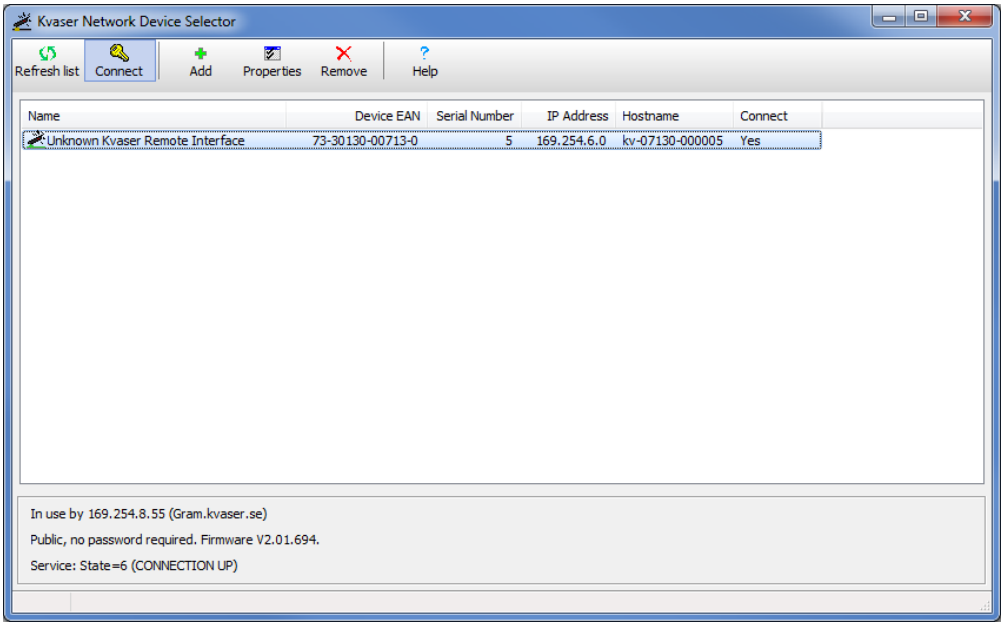

Figure 7: The new device is found in Kvaser Network Device Selector

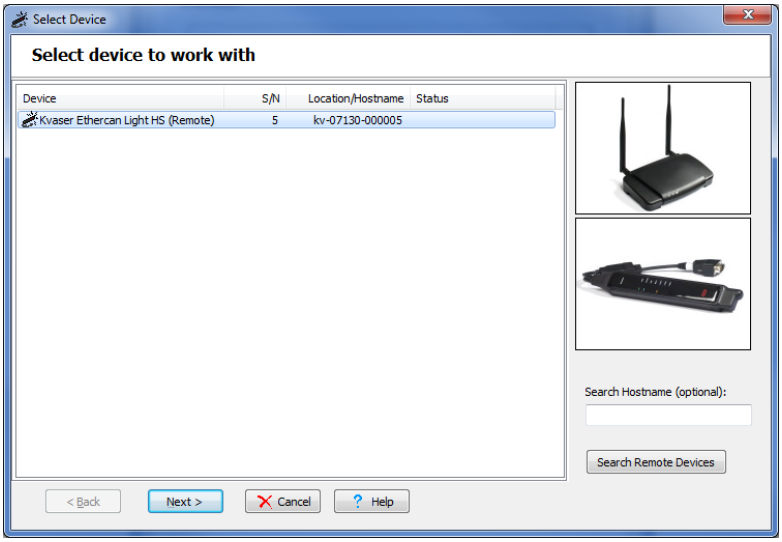

Figure 8: Select device in Kvaser Remote Device Configuration

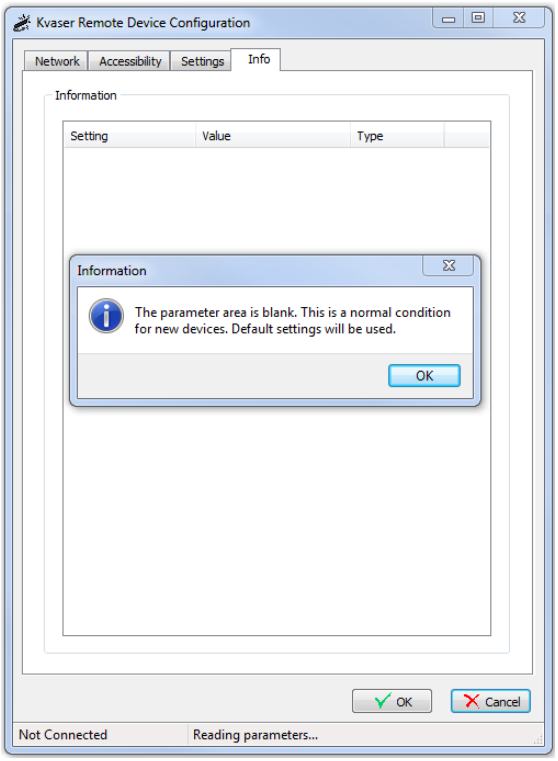

Figure 9: Kvaser Remote Device Configuration starting up

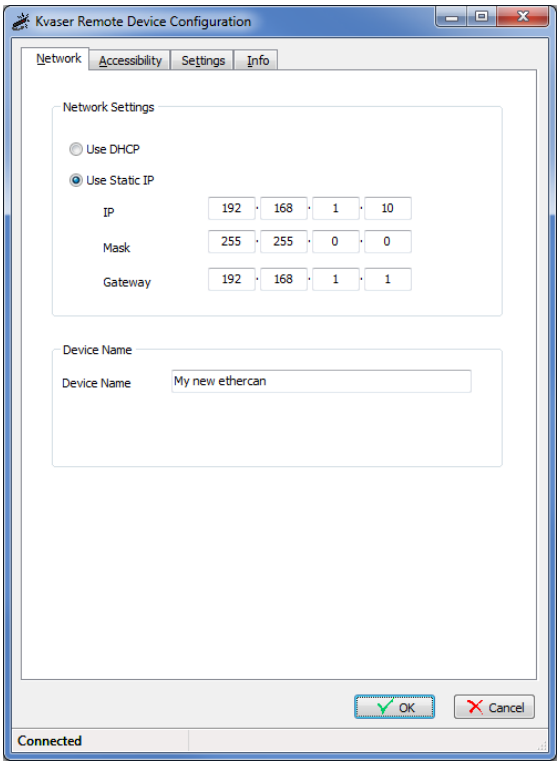

Figure 10: Kvaser Remote Device Configuration network settings

4.3 Reset device to factory settings

To reset the Kvaser Ethercan Light to factory settings using the Ethercan Factory Reset Device, connect the Ethercan Factory Reset Device directly to the CAN connector on the Kvaser Ethercan Light and follow the steps in Section 4.3.1 Factory reset procedure.

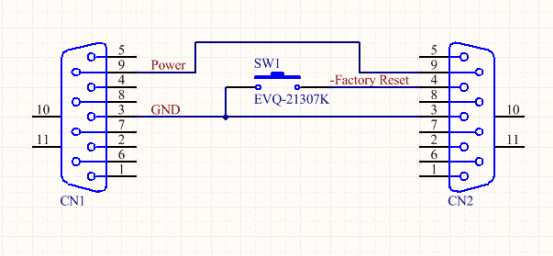

Figure 11: Ethercan Factory Reset Device schematic.

Male D-SUB (CN1)	Function
3	GND
4	Not connected
9	Power supply to the device

Table 4: Ethercan Factory Reset Device pin configuration for Male D-SUB (CN1)

Female D-SUB (CN2)	Function
3	GND
4	Factory Reset. By pushing the button SW1, this pin will be connected to GND.
9	Power supply to the device

Table 5: Ethercan Factory Reset Device pin configuration for Female D-SUB (CN2)



If the Ethercan Factory Reset Device is connected to the Kvaser Ethercan Light it can not be used for normal CAN traffic since CAN high/low are not forwarded within the Ethercan Factory Reset Device.

4.3.1 Factory reset procedure

1. First connect the Ethercan Factory Reset Device to the Kvaser Ethercan Light CAN connector. If the Kvaser Ethercan Light is powered through the CAN connector the Ethercan Factory Reset Device should be placed in between.
2. Press and hold the button on the Ethercan Factory Reset Device (this will connect the Factory reset pin to ground).
3. Apply power to the Kvaser Ethercan Light
4. Let the device boot up and the CAN and ERR LEDs will have a steady light
5. After 5 s the CAN and ERR LEDs start flashing, release the button on the Ethercan Factory Reset Device
6. The Kvaser Ethercan Light will now reboot with factory default settings.

If the button has not been released after 10 s, the device will continue normal operation without reebooting. The CAN and ERR LEDs will now also stop flashing.

4.4 Troubleshooting

Use "Kvaser Device Guide" in the Control Panel to verify that the computer can communicate with the Kvaser Ethercan Light. If the firmware version shown is all zeros, there are communication problems. If the LEDs are not flashing or do not light up at all, check the power supply.

4.4.1 Check your firewall

The default port number used by the Kvaser Ethercan Light is 11416. This port is used for both UDP and TCP and should be open for both incoming and outgoing traffic (both TCP and UDP) on your firewall. The Kvaser Network Device Selector tool might also need authorization from you. Consult your firewall software documentation for how to do this.

5 Appendices

In this section you will find technical information about Kvaser Ethercan Light and the device's connectors.

5.1 Technical data

In Table 6 below you will find the Kvaser Ethercan Light technical specifications.

CAN Channels	1
CAN Transceiver	TJA1051T (Compliant with ISO 11898-2)
CAN Bit Rate	40 kbit/s up to 1 Mbit/s
Time stamp resolution	100 µs
Max message rate	8000 msg/s
Error Frame Detection	Yes
Error Frame Generation	No
Silent mode	No
Kvaser t programming	No
Kvaser CANtegrity	No
Host interface	Ethernet (using Power over Ethernet)
Host OS	Windows (7 or later)[1].
Ethernet interface	Ethernet IEEE 802.3u 100BASE-TX
Ethernet connector	Shielded RJ45 socket STP
Galvanic isolation	Yes
Power Supply	PoE (Power over Ethernet) IEEE 802.3af or CAN +9 V to +35 V DC
Power consumption	Typical 1.2 W
Hardware configuration	Done by software.
Dimensions	35 x 165 x 17 mm for body incl. strain relief
Weight	120 g including cables and connectors.
Operating temperature	−20 °C to +70 °C
Storage temperature	−40 °C to +85 °C
Relative Humidity	0 % to 85 % (non-condensing.)

Table 6: Technical specifications.

5.2 CAN connector

Kvaser Ethercan Light devices that use the 9-pin D-SUB connector (see Figure 12 on Page 17) have the pinning described in Table 7 on Page 17.

[1] For other operating systems, contact Kvaser support.

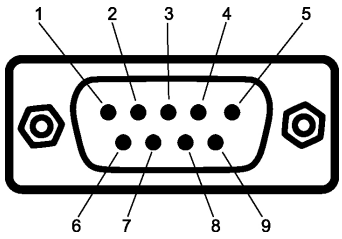

Figure 12: The D-SUB 9 connector pin numbers

D-SUB pin number	Function
1	Not connected
2	CAN_L
3	GND
4	Factory Reset
5	Shield
6	Not connected
7	CAN_H
8	Not connected
9	Power supply to the device

Table 7: Configuration of the 9-pin D-SUB

The Factory Reset input is only used to reset the device to factory settings, see Section 4.3, Reset device to factory settings, on Page 14.

5.3 CAN bus termination

Every CAN bus must be terminated with a 120 Ohm resistor at each end of the bus. The Kvaser Ethercan Light does not contain any CAN bus termination, because their inclusion could cause severe disturbance in a system which is already correctly terminated.

For laboratory or testing use, the exact value of the termination resistors is not always critical. Sometimes a single terminator is sufficient. For production, proper termination is essential. If you see error frames on the bus, you should check the termination.



To save yourself a lot of trouble, always terminate the CAN bus properly.

6 Safety Instructions

6.1 Intended Use

Kvaser interfaces are used to connect computer systems to CAN buses. The Kvaser Ethercan Light is intended for connection to a computer via an available Ethernet socket.

6.2 Usage Warning



WARNING FOR ALL USERS

WARNING! - YOUR USE OF THIS DEVICE MUST BE DONE WITH CAUTION AND A FULL UNDERSTANDING OF THE RISKS!
THIS WARNING IS PRESENTED TO INFORM YOU THAT THE OPERATION OF THIS DEVICE MAY BE DANGEROUS. YOUR ACTIONS CAN INFLUENCE THE BEHAVIOR OF A CAN-BASED DISTRIBUTED EMBEDDED SYSTEM, AND DEPENDING ON THE APPLICATION, THE CONSEQUENCES OF YOUR IMPROPER ACTIONS COULD CAUSE SERIOUS OPERATIONAL MALFUNCTION, LOSS OF INFORMATION, DAMAGE TO EQUIPMENT, AND PHYSICAL INJURY TO YOURSELF AND OTHERS. A POTENTIALLY HAZARDOUS OPERATING CONDITION IS PRESENT WHEN THE FOLLOWING TWO CONDITIONS ARE CONCURRENTLY TRUE: THE PRODUCT IS PHYSICALLY INTERCONNECTED TO A REAL DISTRIBUTED EMBEDDED SYSTEM; AND THE FUNCTIONS AND OPERATIONS OF THE REAL DISTRIBUTED EMBEDDED SYSTEM ARE CONTROLLABLE OR INFLUENCED BY THE USE OF THE CAN NETWORK. A POTENTIALLY HAZARDOUS OPERATING CONDITION MAY RESULT FROM THE ACTIVITY OR NON-ACTIVITY OF SOME DISTRIBUTED EMBEDDED SYSTEM FUNCTIONS AND OPERATIONS, WHICH MAY RESULT IN SERIOUS PHYSICAL HARM OR DEATH OR CAUSE DAMAGE TO EQUIPMENT, DEVICES, OR THE SURROUNDING ENVIRONMENT.
WITH THIS DEVICE, YOU MAY POTENTIALLY:

- CAUSE A CHANGE IN THE OPERATION OF THE SYSTEM, MODULE, DEVICE, CIRCUIT, OR OUTPUT.
- TURN ON OR ACTIVATE A MODULE, DEVICE, CIRCUIT, OUTPUT, OR FUNCTION.
- TURN OFF OR DEACTIVATE A MODULE, DEVICE, CIRCUIT, OUTPUT, OR FUNCTION.
- INHIBIT, TURN OFF, OR DEACTIVATE NORMAL OPERATION.
- MODIFY THE BEHAVIOR OF A DISTRIBUTED PRODUCT.
- ACTIVATE AN UNINTENDED OPERATION.
- PLACE THE SYSTEM, MODULE, DEVICE, CIRCUIT, OR OUTPUT INTO AN UNINTENDED MODE.

ONLY THOSE PERSONS WHO:
(A) ARE PROPERLY TRAINED AND QUALIFIED WITH RESPECT TO THE USE OF THE DEVICE,
(B) UNDERSTAND THE WARNINGS ABOVE, AND
(C) UNDERSTAND HOW THIS DEVICE INTERACTS WITH AND IMPACTS THE FUNCTION AND SAFETY OF OTHER PRODUCTS IN A DISTRIBUTED SYSTEM AND THE APPLICATION FOR WHICH THIS DEVICE WILL BE APPLIED, MAY USE THE DEVICE.
PLEASE NOTE THAT YOU CAN INTEGRATE THIS PRODUCT AS A SUBSYSTEM INTO HIGHER-LEVEL SYSTEMS. IN CASE YOU DO SO, KVASER AB HEREBY DECLARES THAT KVASER AB'S WARRANTY SHALL BE LIMITED TO THE CORRECTION OF DEFECTS, AND KVASER AB HEREBY EXPRESSLY DISCLAIMS ANY LIABILITY OVER AND ABOVE THE REFUNDING OF THE PRICE PAID FOR THIS DEVICE, SINCE KVASER AB DOES NOT HAVE ANY INFLUENCE ON THE IMPLEMENTATIONS OF THE HIGHER-LEVEL SYSTEM, WHICH MAY BE DEFECTIVE.

7 Disposal and Recycling Information



When this product reaches its end of life, please dispose of it according to your local environmental laws and guidelines.

For information about Kvaser's recycling programs, visit:
https://www.kvaser.com/en/kvaser/recycling-policy.html

8 Legal acknowledgements

8.1 EU Regulatory Compliance

KVASER **EU Declaration of Conformity (DoC)**

We

Company Name:	Kvaser AB	City:	Mölndal
Postal address:	Aminogatan 25	Telephone number:	+46 31 886344
Postcode:	431 53	E-mail address:	sales@kvaser.com

declare that the DoC is issued under our sole responsibility and belongs to the following product:

Product: Kvaser Ethercan Light HS

Object of the declaration (identification of apparatus allowing traceability):
Product: Kvaser Ethercan Light HS
Type: 73-30130-00713-0

The object of the declaration described above is in conformity with the relevant Union harmonisation legislation:
Electromagnetic Compatibility (EMC) Directive 2014/30/EU (Art. 6)

RoHS recast Directive 2011/65/EU (Art. 4.1)

The following harmonised standards and technical specifications have been applied
(title, date of standard/specification):

EN 55032 (2015 + A11:2020)

EN 55035 (2017 + A11:2020)

EN IEC 63000 (2018)

Signed for and on behalf of:

Mölndal	2025-01-10	
Place of issue	Date of issue	Kent Lennartsson, Research Manager

8.2 FCC Regulatory Compliance

KVASER

Federal Communications Commission (FCC) Compliance Information Statement

IDENTIFICATION OBJECT:
Product: Kvaser Ethercan Light HS
Type: 73-30130-00713-0

APPLICABLE COMPLIANCE STATEMENTS:
CFR Title 47 Part 15 §15.107, §15.109
This device complies with part 15 of the FCC Rules.
Operation is subject to the following two conditions:
(1) This device may not cause harmful interference, and
(2) this device must accept any interference received,
including interference that may cause undesired operation.

RESPONSIBLE PARTY (IN USA) NAME:
Kvaser Inc.
23881 Via Fabricante, Suite 503
Mission Viejo, CA 92691

Internet contact: support@kvaser.com

8.3 Patents, copyrights and trademarks

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Adobe, the Adobe logo, and Reader are either registered trademarks or trademarks of Adobe Systems Incorporated in the United States and/or other countries.

MagiSync is a trademark of Kvaser AB.

DeviceNet is a trademark of Open DeviceNet Vendor Association, Inc.

NMEA 2000 is the registered trademark of the National Marine Electronics Association, Inc.

For information about Kvaser related CAN patents, see www.kvaser.com/patent.

The products described in this document are protected by U.S. patent 5,696,911.

9 Document Revision History

Version history for document UG_98155_ethercan_light:

Revision	Date	Changes
1.0	2014-04-23	Initial version.
1.1	2015-01-08	Minor update.
1.2	2015-08-11	Minor textual changes.
1.3	2016-02-04	Minor textual changes.
1.4	2017-01-09	Updated compliance text, added link to patents.
2.0	2017-08-25	Updated EU Declaration of Conformity.
2.1	2018-01-29	"Kvaser Device Guide" has replaced "Kvaser Hardware".
2.2	2018-08-28	Minor textual changes.
3.0	2018-10-15	Updated EU Regulatory Compliance.
4.0	2019-02-11	Windows Vista or later supported, minor textual changes.
4.1	2019-08-09	Url protocol updated.
4.2	2020-01-27	Added sdoc.
4.3	2020-08-19	Windows 7 or later supported. Updated content in delivery package.
4.4	2022-04-01	Minor textual changes.
4.5	2023-02-13	Stated in the Technical data table that Kvaser t programming is not supported. Added section about intended use.
4.6	2024-04-25	Updated Kvaser logo and the section for troubleshooting.
4.7	2025-01-10	Updated EU Declaration of Conformity.