# Kvaser Edge 4xCAN, Type WL420S 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 Edge 4xCAN, Type WL420S users. This document contains a description of the hardware's properties.

# 2 Introduction

This section will describe the functions and features of the Kvaser Edge 4xCAN, Type WL420S.

## 2.1 Welcome to Kvaser Edge 4xCAN, Type WL420S

Figure 1: Kvaser Edge 4xCAN, Type WL420S

Kvaser Edge 4xCAN, Type WL420S is a powerful, ruggedized, and compact data logger and computer with galvanically isolated channels. It is designed for use in data logging and processing missions at the edge.

This guide applies to Kvaser Edge 4xCAN, Type WL420S devices using at least firmware version listed in Table 1 on Page 6. For minimum compatible firmware version of Kvaser Edge 4xCAN, Type WL420S see Table 2 on Page 13.

| Device | Product Number | Firmware |
|---|---|---|
| Kvaser Edge 4xCAN, Type WL420S | 73-30130-01758-0 | v1.1.0 |

Table 1: Firmware version needed to support all functionality present in this guide.

## 2.2 Major features

- Designed for effortless execution of data logging and processing missions at the edge
- Powerful embedded ARM-based Linux computer with ”Secure Element”, NXP SE051C2 facilitating CRA compliance with target software applications.
- Four fully featured, time-synchronized, individually galvanically isolated CAN-FD channels utilizing Kvaser CAN-IP implemented in FPGA.
- WiFi6 and Gigabit Ethernet Interface enables remote connectivity.
- Ruggedized housing with IP67 ingress protection.
- Wired interfaces for durable flexible connections.
- Inertial measurement units.
- Galvanic Isolated GPIO interfaces enables trigger-based logging.
- Separate galvanic isolated power supply with support of activation by ignition signal.
- High-capacity battery ensures safe shutdown and supports intermediate operation.
- Multi-GNSS (Global Navigation Satellite System) support (GPS, Galileo, GLONASS) for enhanced positioning accuracy and reliability.

# 3 Kvaser Edge 4xCAN, Type WL420S hardware

In this section you can read more about the User Interface, activation signal, digital I/O, GPS connection, IMU and CAN channels of Kvaser Edge 4xCAN, Type WL420S.

## 3.1 Hardware installation

The Kvaser Edge 4xCAN, Type WL420S may be mounted using M4 screws. Either secure the device with four screws through the two long sides of the housing, see Figure 2 and Figure 3 on Page 9, or use two screws on the back to mount it on a wall, see Figure 4 on Page 9 and Figure 5 on Page 10.

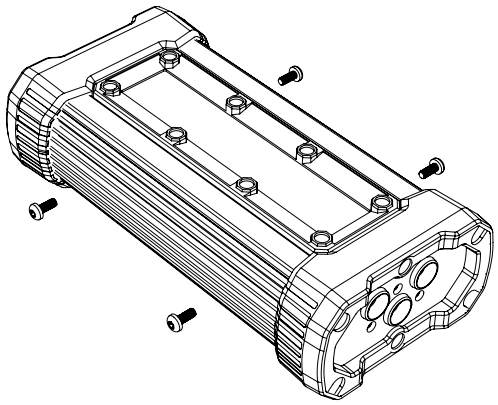

Figure 2: Mounting on the sides of the Kvaser Edge 4xCAN, Type WL420S.

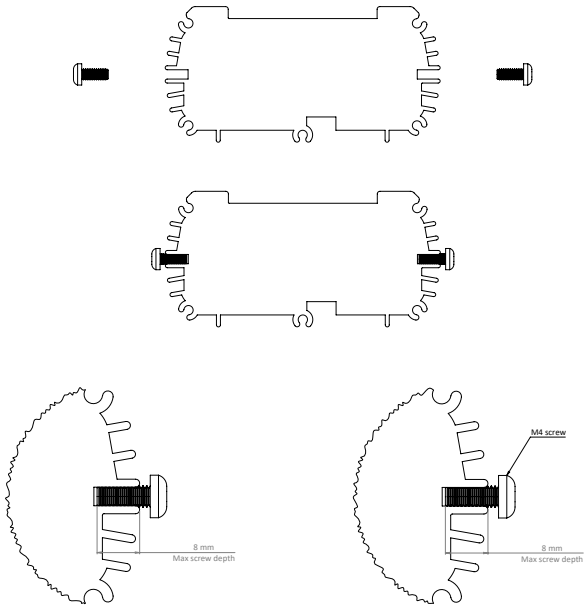


Figure 3: Mounting on the sides of the Kvaser Edge 4xCAN, Type WL420S, as seen from the edge.

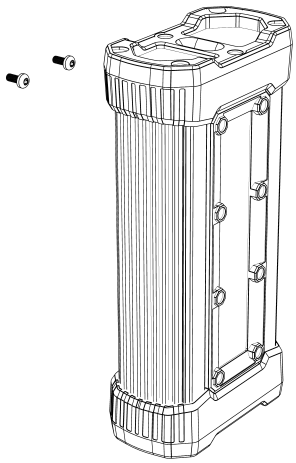

Figure 4: Mounting on the back of the Kvaser Edge 4xCAN, Type WL420S.

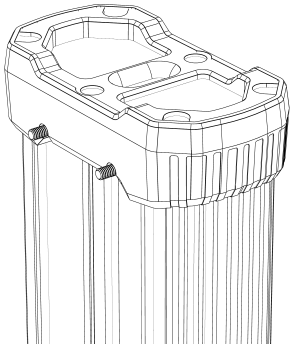

Figure 5: Mounting on the back of the Kvaser Edge 4xCAN, Type WL420S, as seen when mounted on a wall.

## 3.2 USB connection

When connecting the Kvaser Edge 4xCAN, Type WL420S to a computer via USB, it is recommended to limit the extension cable to maximum 1.0 m for optimal signal integrity and margin. Use only high-quality, fully compliant USB Type-C cables rated for USB 3.2 Gen 1 or higher. Avoid low-quality or uncertified cables, as excess insertion loss and impedance discontinuities may degrade performance.

## 3.3 User interface

The Kvaser Edge 4xCAN, Type WL420S has nine LEDs and two buttons. One LED is used for indicating power, the other LEDs and buttons are user managed. For more information about the LED indicators and buttons, please refer to https://kvaser.com/keos-webhelp/latest/hw_spec/.

## 3.4 Activation signal

The activation signal enables the primary DC/DC converter. When this signal is low, the unit will remain off even if the power supply is present. Once KEOS has fully booted, the activation signal can be disconnected from the DC/DC converter. In this state, the activation signal no longer affects the power supply.

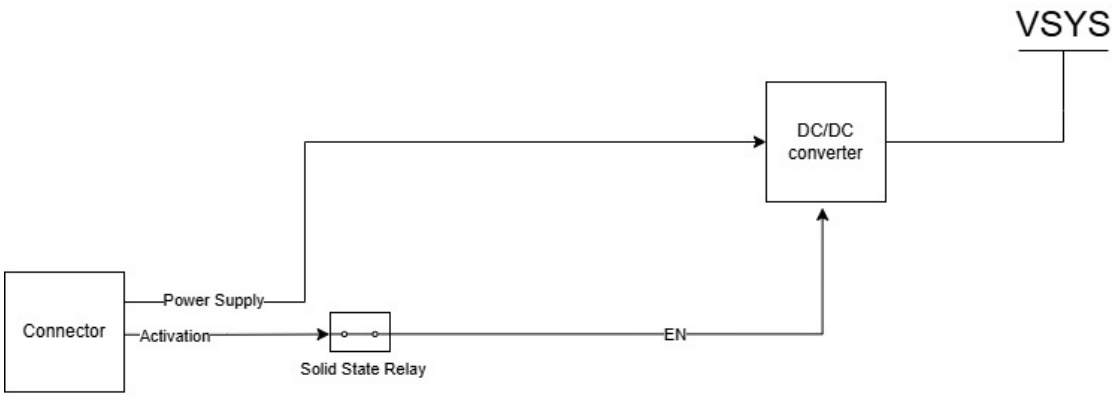


Figure 6: Activation signal on the Kvaser Edge 4xCAN, Type WL420S.

## 3.5 Digital I/O

The Kvaser Edge 4xCAN, Type WL420S provides an isolated external trigger output with a voltage range of 0 V to 5 V. It can sink up to 50 mA and includes built-in short-circuit protection. The output is protected against short circuits to both ground and 24 V.

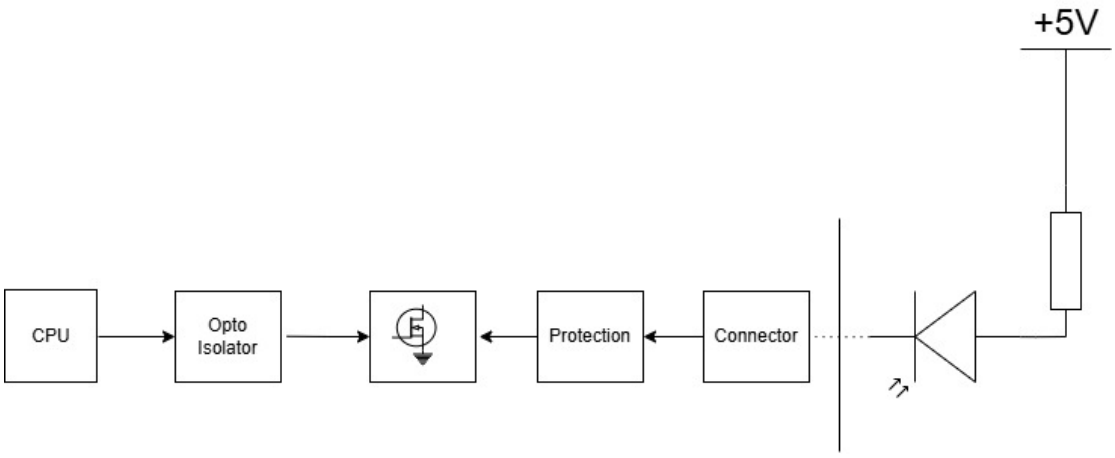


Figure 7: External trigger output on the Kvaser Edge 4xCAN, Type WL420S.

The Kvaser Edge 4xCAN, Type WL420S features two isolated trigger inputs.

- When configured for a falling edge, the trigger is activated when the external trigger input is connected to ground.
- When configured for a rising edge, the trigger is activated when the external trigger input is disconnected from ground.

The input voltage range is 0 V to 5 V, and both inputs are protected against short circuits to 24 V.

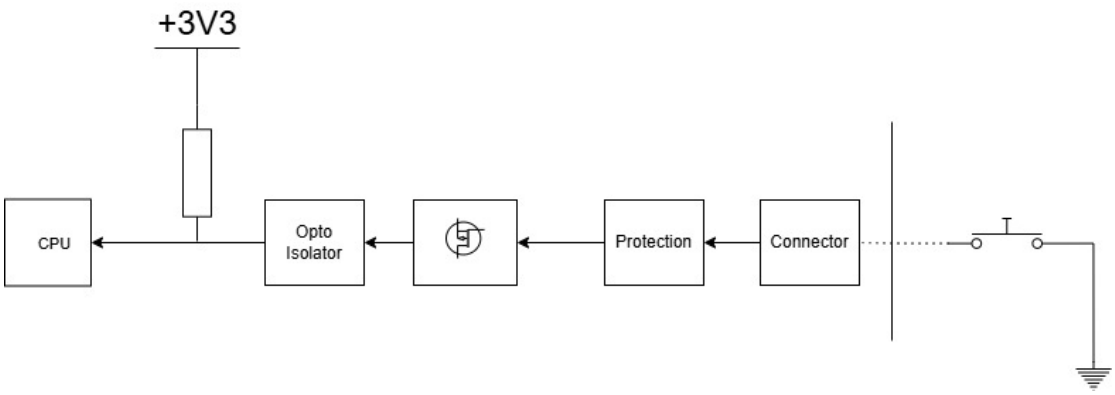


Figure 8: Trigger inputs on the Kvaser Edge 4xCAN, Type WL420S.

## 3.6 GPS connection

The Kvaser Edge 4xCAN, Type WL420S uses an external active antenna, connected via a Fakra connector. The antenna is powered through the RF pin.

Antenna Specifications:

- Female Fakra SMD socket connector (Code C)
- DC power input: 3.2 V
- Cable impedance: 50 Ω
- Gain: approximately 15 dB to 20 dB
- Supports L1/L5 frequency bands

## 3.7 IMU

The Kvaser Edge 4xCAN, Type WL420S contains a 6-axis IMU (Inertial Measurement Unit) with an accelerometer and a gyroscope.

Available sampling frequencies for the accelerometer are 12.5, 26, 52, 104, 208, 416 and 833 Hz.

Available sampling frequencies for the gyroscope are 12.5, 26, 52, 104, 208, 416 and 833 Hz.

## 3.8 Updating the firmware

For information about how to update the firmware of Kvaser Edge 4xCAN, Type WL420S, please refer to https://kvaser.com/keos-webhelp/latest/.

The absolute minimum firmware version needed in order to use Kvaser Edge 4xCAN, Type WL420S are listed in Table 2 on Page 13.

| Device | Min. Firmware Version |
|---|---|
| Kvaser Edge 4xCAN, Type WL420S | v1.1.0 |

Table 2: Minimum compatible firmware version of Kvaser Edge 4xCAN, Type WL420S.

## 3.9 Technical data

In Table 3 below you will find the Kvaser Edge 4xCAN, Type WL420S's technical specifications.

| | |
|---|---|
| Battery | Lithium-ion 18650 |
| Battery capacity | 10 Wh |
| Bluetooth | Supporting mode BLE 5.3 |
| CAN | 4 x CANFD SIC Galvanic Isolated, HD26 |
| CAN FD bitrate | Up to 8 Mbit/s |
| Ethernet | 2x Gigabit Ethernet 1000BASE-T, RJ45 Socket |
| GPIO | 2x Digital Input<br>1x Digital Output |
| Housing | Aluminum housing with plastic protective caps, approx. 200 x 110 x 58 mm, IP67 |
| IMU*Acceleration sensitivity*<br>*Angular rate sensitivity* | 6-axis (accelerometer + gyroscope)<br>*+-2g range 0.061 mg/LSB (Typical)*<br>*+-125 dps range 4.375 mdps/LSB (Typical)* |
| Ingress Protection: Housing | IP67 |
| Operating temperature | –40 °C to 50 °C ambient. (If handheld use is not a requirement, the device can operate at ambient temperatures up to 70 °C.) |
| Operating system | Kvaser Edge OS (KEOS), a Linux-based OS |
| Positioning | Multi-GNSS (GPS, Galileo, GLONASS) with external active antenna via FAKRA connector (Key Code-C) |
| Power activiation | Galvanic Isolated |
| Power consumption | Up to 15 W in active mode.<br>Standby mode, down to 200mW |
| Power Supply | 9 - 36 V, DC Galvanic Isolated |
| Processor | i.MX8 with NPU, Multicore processing Quad Cortex®-A53 up to 1.6 GHz |
| RAM | 2 GB DDR |
| Regulatory Compliance | CE, FCC |
| Status display | 8 Multicolor and user configurable LEDs, 1 Power LED and 2 user defined buttons |
| Storage | 256 GB eMMC (embedded MultiMediaCard) |
| USB | USB 3.1 Host, Type-C (PD 400 mA) |
| Weight | 850 g, cables excluded |
| WiFi | WiFi6 IEEE 802.11ax, Dual band, 2x2 MIMO (5GHz), Antenna Diversity, Integrated antennas |
| Relative humidity | 0 % to 85 % (non-condensing.) |

Table 3: Technical Specifications.

## 3.10 CAN Connectors

Kvaser Edge 4xCAN, Type WL420S has a 26-pin HD D-SUB connector with four CAN channels. A Kvaser Edge Cable HD26-5xDB9 (https://kvaser.com/product/kvaser-edge-cable-hd26-5xdb9/) can be used to connect to the four separate 9-pin D-SUB connectors representing each CAN channel and a fifth 9-pin D-SUB connector for power supply and trigger handling.

The pinouts for the 26-pin HD D-SUB connector are shown in Figure 9 and the pinout functions are described in Table 4.

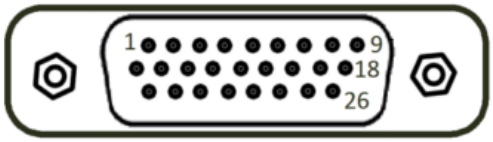


Figure 9: HD 26-pin D-SUB pinout.

| HD D-SUB | Function |
|---|---|
| 19 | EXT_GND |
| 1 | TRIG IN 1 |
| 11 | TRIG IN 2 |
| 6 | TRIG OUT |
| 8 | ACTIVATION |
| 10 | EXT_POW |
| 20 | GND 1 |
| 2 | CANL 1 |
| 12 | CANH 1 |
| 21 | GND 2 |
| 3 | CANL 2 |
| 13 | CANH 2 |
| 22 | GND 3 |
| 4 | CANL 3 |
| 14 | CANH 3 |
| 23 | GND 4 |
| 5 | CANL 4 |
| 15 | CANH 4 |
| 16 | RESERVED |
| Shell | SHIELD |

Table 4: Pin configuration of the 26-pin HD D-SUB

## 3.11 CAN bus termination

Every CAN bus must be terminated with a 120 Ohm resistor at each end of the bus. The Kvaser Edge 4xCAN, Type WL420S 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.**

# 4 Troubleshooting

Please refer to https://kvaser.com/keos-webhelp/latest/ for troubleshooting information.

# 5 Safety Instructions

## 5.1 Intended Use

The Kvaser Edge 4xCAN, Type WL420S is a laboratory equipment used to connect a computer system to CAN buses. It is intended for connection to a computer via the USB port, Ethernet port or via WiFi.

## 5.2 Usage Warning

CAUTION: THE SURFACE OF THIS DEVICE MAY BECOME HOT IF IT IS EXPOSED TO FOR EXAMPLE RADIATION FROM THE SUN.

## 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.

THIS PRODUCT CONTAINS A RECHARGEABLE LI-ION BATTERY THAT MUST BE DISPOSED OF PROPERLY. IT MAY EXPLODE IF DAMAGED OR DISPOSED OF IN FIRE. DO NOT SHORT CIRCUIT.

THE OPERATING TEMPERATURE IS SET BY THE PRIMARY INTENDED USE CASE, AS LABORATORY EQUIPMENT WHERE THE OPERATING MODE CAN BE HANDHELD THE OPERATING TEMPERATURE IS –40 °C TO 50 °C AMBIENT. IF HANDHELD USE CAN BE EXCLUDED, THE HIGHER OPERATING TEMPERATURE CAN BE UP TO 70 °C.

# 6 Disposal and Recycling Information

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

Dispose of batteries 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

# 7 Legal acknowledgements

## 7.1 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 Edge 4xCAN, Type WL420S |

**Object of the declaration** (identification of apparatus allowing traceability):
Product: Kvaser Edge 4xCAN, Type WL420S
Type: 73-30130-01758-0

**The object of the declaration described above is in conformity with the relevant Union harmonisation legislation:**
Radio Equipment Directive (RED) 2014/53/EU (Art. 3.1a, 3.1b and 3.2)

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 301 489-1 (2019-11 (2.2.3))

EN 301 489-17 (2024-09 (3.3.1))

EN 55035 (2017 + A11:2020)

EN 61326-1 (2021)

EN 61010-1 (2010 + A1:2019)

EN IEC 63000 (2018)

**Signed for and on behalf of:**

| Mölndal | 2026-05-07 | |
|---|---|---|
| Place of issue | Date of issue | Kent Lennartsson, Research Manager |

## 7.2 FCC Regulatory Compliance

KVASER

Federal Communications Commission (FCC) Compliance Information Statement

**IDENTIFICATION OBJECT:**
Product: Kvaser Edge 4xCAN, Type WL420S
Type: 73-30130-01758-0

**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

## 7.3 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.

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.

# 8 Document Revision History

Version history for document UG_98408_kvaser_edge_4xcan_type_wl420s:

| Revision | Date | Changes |
|---|---|---|
| 1.0 | 2026-05-07 | Initial version. |