Kvaser Mini PCI Express HS v2 User's Guide

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Contents

1 About this manual

This manual is intended for Kvaser Mini PCI Express HS v2 users. This document contains a description of the hardware's properties and general instructions for connecting the device to a computer.

2 Introduction

This section will describe the functions and features of the Kvaser Mini PCI Express HS v2.

2.1 Welcome to Kvaser Mini PCI Express HS v2
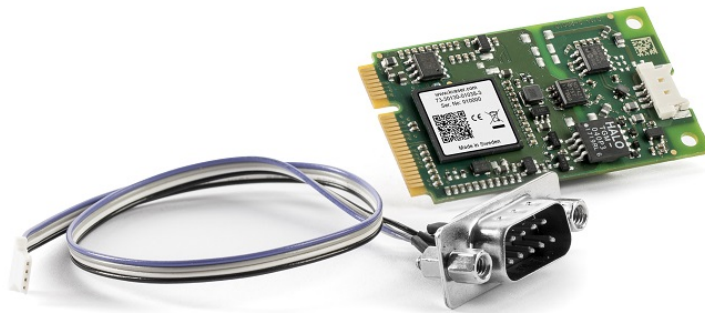
Figure 1: Kvaser Mini PCI Express HS v2

Kvaser Mini PCI Express HS v2 is a small, yet advanced, real time CAN interface that handles transmission and reception of standard and extended CAN messages on the bus with a high time stamp precision. The Kvaser Mini PCI Express HS v2 is compatible with applications that use Kvaser's CANlib.

This guide applies to Kvaser Mini PCI Express HS v2 devices listed in Table 1.

Device	Product Number (EAN)
Kvaser Mini PCI Express HS v2	73-30130-01038-3

Table 1: Kvaser Mini PCI Express HS v2 devices and their product numbers.

2.2 Major features

- Mini PCI Express CAN interface.

- Supports CAN FD, up to 8 Mbit/s (with correct physical layer implementation).

- Quick and easy plug-and-play installation.

- Supports both 11-bit (CAN 2.0A) and 29-bit (CAN 2.0B active) identifiers.

- 100 % compatible with applications written for other Kvaser CAN hardware with Kvaser CANlib.

- High-speed CAN connection (compliant with ISO 11898-2), up to 1 Mbit /s.

- Fully compatible with J1939, CANopen, NMEA 2000 and DeviceNet.

- Supports silent mode for analysis tools – listen to the bus without interfering.

- Simultaneous operation of multiple devices.

2.3 Interface

Kvaser Mini PCI Express HS v2 provides a CAN bus interface through a Mini PCI Express interface.

2.4 Additional software and documentation

The Kvaser CANlib SDK includes everything you need in order to develop software for Kvaser CAN hardware. The SDK contains full documentation and many sample programs, written in C, C++, C#, Delphi, Python and Visual Basic. All Kvaser CAN interface hardware share a common software API. Programs written for 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 Mini PCI Express HS v2 hardware

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

3.1 Hardware installation

The Kvaser Mini PCI Express HS v2 may be inserted in any free Mini PCI Express slot on the host computer. You do need to switch the power off before inserting or removing the device. For the Kvaser Mini PCI Express HS v2 to communicate with the host computer, compatible versions of the Kvaser driver and firmware must be used. The firmware is downloaded and installed directly on the Kvaser Mini PCI Express HS v2. The driver is installed on the host computer.

The latest version of the drivers, `kvaser_drivers_setup.exe`, and firmware can be downloaded from www.kvaser.com/download.

3.2 Mini PCI Express connection

Figure 2: Mini PCI Express connector

The Kvaser Mini PCI Express HS v2 is a Card of type F2 (Full-Mini with bottom side keep outs).

3.3 CAN channels

The Kvaser Mini PCI Express HS v2 has a single CAN Hi-Speed channel in a 4-pin Molex connector (see Figure 3 on Page 8), see Section 4.2, CAN connectors, on Page 9 for pinout information.
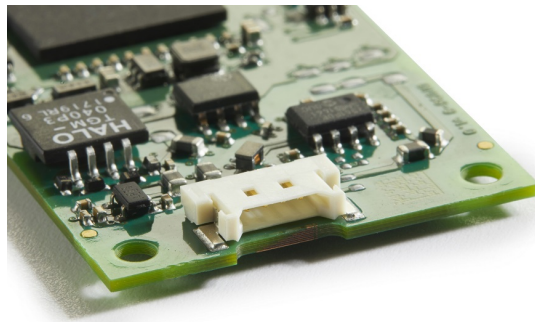
Figure 3: CAN connector on Kvaser Mini PCI Express HS v2

3.4 Power supply

The Kvaser Mini PCI Express HS v2 is only powered using +3.3 V from the Mini PCI Express connector.

3.5 LED Indicators

The Kvaser Mini PCI Express HS v2 has no LED indicators.

3.6 Troubleshooting

Use "Kvaser Device Guide" in the Control Panel to verify that the computer can communicate with the Kvaser Mini PCI Express HS v2. If the firmware version shown is all zeros, there are communication problems.

4 Appendices

In this section you will find technical information about the Kvaser Mini PCI Express HS v2 and its connectors.

4.1 Technical data

In Table 2 below you will find the Kvaser Mini PCI Express HS v2's technical specifications.

CAN Channels	1
CAN Transceivers	MCP2561FD (Compliant with ISO 11898-2)
CAN Controller	Kvaser CAN IP in FPGA
Galvanic isolation	Yes
CAN Bit Rate	50 kbit/s to 1 Mbit/s "Classic CAN"
CAN FD Bit Rate	Up to 8 Mbit/s (with correct physical layer implementation)
Time stamp resolution	1 µs
Max message rate	20000 msg/s per channel
Error Frame Detection	Yes
Error Frame Generation	Yes
Silent mode	Yes
PC interface	Mini PCI Express, type F2 (i.e. full-Mini with bottom side keep outs)
Power consumption	Typically 700 mW idle plus max 150 mW per channel, i.e. max 850 mW for a single channel interface. Only uses 3.3 V.
Hardware configuration	Done by software.
Software requirements	Windows Vista or later. (For other operating systems, contact Kvaser support.)
Dimensions	51 x 30 x 5 mm
Weight	5 g (13 g including cable)
Operating temperature	−40 °C to +85 °C
Storage temperature	−40 °C to +85 °C
Relative humidity	0 % to 85 % (non-condensing.)

Table 2: Technical Specifications.

4.2 CAN connectors

Kvaser Mini PCI Express HS v2 devices that use the 4-pin Molex connector (53780-0470) have the pinning described in Table 3 on Page 10.
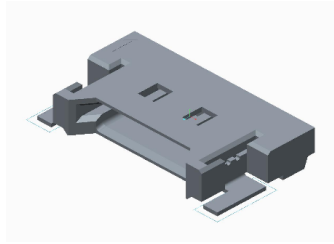
Figure 4: Molex Connector 53780-0470

Molex pin number	D-SUB 9	Function
1	3	GND
2	7	CAN_H
3	2	CAN_L
4	5	Shield

Table 3: Molex pin configuration

4.3 CAN bus termination

Every CAN bus must be terminated with a 120 Ohm resistor at each end of the bus. The Kvaser Mini PCI Express HS v2 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.**

4.4 Updating the firmware

For the Kvaser Mini PCI Express HS v2 to communicate with the host computer, compatible versions of the Kvaser CANlib (including driver) and firmware must be installed.

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

Connect the Kvaser Mini PCI Express HS v2 to your PC and start the update.exe application. A window opens showing the Firmware Update Instructions, read and follow those carefully.

To check the current firmware version, open "Kvaser Device Guide" which can be found in the Control Panel. Select "Kvaser Mini PCI Express HS v2" in the tree view to the left, and click on the channel. The firmware revision information now appears in the right half of the window.

5 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: http://www.kvaser.com/en/kvaser/recycling-policy.html

6 Legal acknowledgements

6.1 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.

6.2 EU Regulatory Compliance

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 Mini PCI Express HS v2

Object of the declaration (identification of apparatus allowing traceability):
Product: Kvaser Mini PCI Express HS v2
Type: 73-30130-01038-3

The object of the declaration described above is in conformity with the relevant Union harmonisation legislation:
Chemical substances (REACH) Regulation (EC) No 1907/2006

Electromagnetic Compatibility (EMC) Directive 2014/30/EU

RoHS recast Directive 2011/65/EU

Waste Electrical & Electronic Equipment (WEEE) Directive 2012/19/EU

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

EN 55022 (2010)	EN 55024 (2010)
EN 61000-6-2 (2005)	EN 61000-6-3 (2007 + A1:2011)
EN 50581 (2012)	EN 50419 (2005)

Signed for and on behalf of:

Mölndal	2018-01-30	
Place of issue	Date of issue	Claes Haglund, Supply Chain and Quality director

NOTE: This equipment has been tested and found to comply with the limits for a Class A digital device, pursuant to Part 15 of the FCC Rules. These limits are designed to provide reasonable protection against harmful interference when the equipment is operated in a commercial environment. This equipment generates, uses, and can radiate radio frequency energy and, if not installed and used in accordance with the instruction manual, may cause harmful interference to radio communications. Operation of this equipment in a residential area is likely to cause harmful interference in which case the user will be required to correct the interference at his/her own expense.

6.3 Patents, Copyrights and Trademarks

All trademarks are the property of their respective owner. Windows is a registered trademark of Microsoft Corporation in the United States and other countries.

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.

7 Document Revision History

Version history for document UG_98204_minipciexpress_hs_v2:

Revision	Date	Changes
1.0	2018-02-15	Initial version
1.1	2018-05-03	Minor textual changes