Ixxat®
BY HMS NETWORKS

PC CAN Interface

CAN-IB640/PCIe

USER MANUAL

4.01.0245.20000 1.2 en-US   ENGLISH

HMS Connecting Devices™
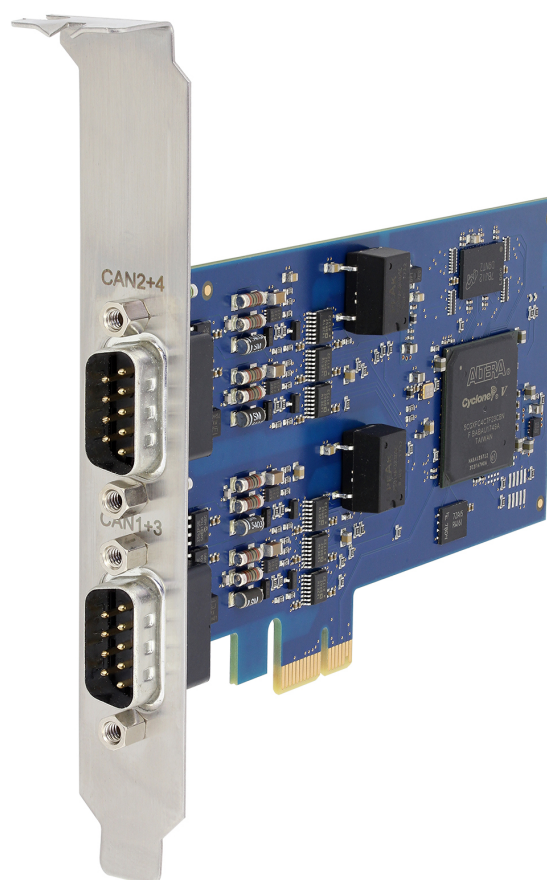
Important User Information

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The data, examples and illustrations found in this document are included for illustrative purposes and are only intended to help improve understanding of the functionality and handling of the product. In view of the wide range of possible applications of the product, and because of the many variables and requirements associated with any particular implementation, HMS Industrial Networks cannot assume responsibility or liability for actual use based on the data, examples or illustrations included in this document nor for any damages incurred during installation of the product. Those responsible for the use of the product must acquire sufficient knowledge in order to ensure that the product is used correctly in their specific application and that the application meets all performance and safety requirements including any applicable laws, regulations, codes and standards. Further, HMS Industrial Networks will under no circumstances assume liability or responsibility for any problems that may arise as a result from the use of undocumented features or functional side effects found outside the documented scope of the product. The effects caused by any direct or indirect use of such aspects of the product are undefined and may include e.g. compatibility issues and stability issues.

Table of Contents

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1 User Guide

Please read the manual carefully. Make sure you fully understand the manual before using the product.

1.1 Target Group

This manual addresses trained personnel who are familiar with CAN, CAN FD and LIN technology and the applicable standards. Only ESD trained staff is authorized to install the interface. The contents of the manual must be made available to any person authorized to use or operate the product.

1.2 Related Documents

Document	Author
Installation Guide of the driver	HMS

1.3 Document History

Version	Date	Description
1.0	August 2018	First release
1.1	December 2018	Added information about LIN
1.2	June 2019	Layout changes, new disclaimer

1.4 Trademark Information

Ixxat° is a registered trademark of HMS Industrial Networks. All other trademarks mentioned in this document are the property of their respective holders.

1.5 Conventions

Instructions and results are structured as follows:

▶ instruction 1

▶ instruction 2

$\rightarrow$ result 1

$\rightarrow$ result 2

Lists are structured as follows:

• item 1

• item 2

Bold typeface indicates interactive parts such as connectors and switches on the hardware, or menus and buttons in a graphical user interface.

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This font is used to indicate program code and other
kinds of data input/output such as configuration scripts.
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This is a cross-reference within this document: *Conventions, p. 4*

This is an external link (URL): www.hms-networks.com

Safety advice is structured as follows:

!	Cause of the hazard!
	Consequences of not taking remediate action.
	How to avoid the hazard.

Safety signs and signalwords are used dependent on the level of the hazard.

i	*This is additional information which may facilitate installation and/or operation.*

!	This instruction must be followed to avoid a risk of reduced functionality and/or damage to the equipment, or to avoid a network security risk.

⚠	**Caution**
	This instruction must be followed to avoid a risk of personal injury.

⚠	**WARNING**
	This instruction must be followed to avoid a risk of death or serious injury.

2   Safety Instructions

2.1   Information on EMC

> **!** Risk of interference to radio and television if used in office or home environment!
>
> Use exclusively included accessories. Use exclusively shielded cables.
>
> Make sure that the shield of the interface is connected with the device plug and the plug on the other side.

2.2   General Safety Instructions

- ▶ Protect product from moisture and humidity.

- ▶ Protect product from too high or too low temperature (see *Technical Data, p. 10*).

- ▶ Protect product from fire.

- ▶ Do not paint the product.

- ▶ Do not modify or disassemble the product. Service must be carried out by HMS Industrial Networks.

- ▶ Store products in dry and dust-free place.

2.3   Intended Use

The interfaces are used to connect computer systems to CAN, CAN FD and LIN networks. They are intended for the installation in computer systems with closed housings.

3   Scope of Delivery

Included in the scope of delivery of standard variant:

- • PC CAN interface

- • CD with driver, driver installation guide and example application

- • User Manual *PC CAN Interface CAN-IB640/PCIe*

4 Product Description

The CAN-IB640/PCIe provides up to four CAN or CAN-FD channel and simultaneously four LIN channels via two D-Sub 9 connectors.

Features

- supports CAN-FD (ISO and non-ISO) and CAN 2.0A/B

- ISO 11898-2 CAN bus coupling (high-speed)

- up to 4 CAN/CAN FD channels (switchable)

- 4 LIN channels

- all fieldbusses accessible via 2 D-Sub 9 connectors

- single Lane (x1) PCI Express CAN Interface

- PCI Express connector compliant with the specification *PCI Express Card Electromechanical Specification version 1.1* , operation in any PCI Express slot (x1, x4, x8, x16) possible

- active interface

- galvanically isolated

5 Installation

5.1 Installing the Software

For the operation of the interface a driver is needed. The kind of driver to be used depends on the operating system.

► Observe information about supported operating systems, interfaces and drivers on www.ixxat.com.

► Install the driver (see Installation Guide of the driver).

5.2 Installing the Hardware

!	Risk of ESD damages caused by improper handling!
	Use ESD protective measures to avoid equipment damage.

► Make sure that the driver is installed.

► Turn off the computer.

► Pull the power cord.

► Open the computer case according to the instructions of the computer manufacturer.

► Determine the corresponding slot.

► Plug the PCI/PCIe connector in the corresponding slot, without using force.

► Make sure that the interface is securely held in the computer.

► Close the computer case.

→ Hardware installation is complete.
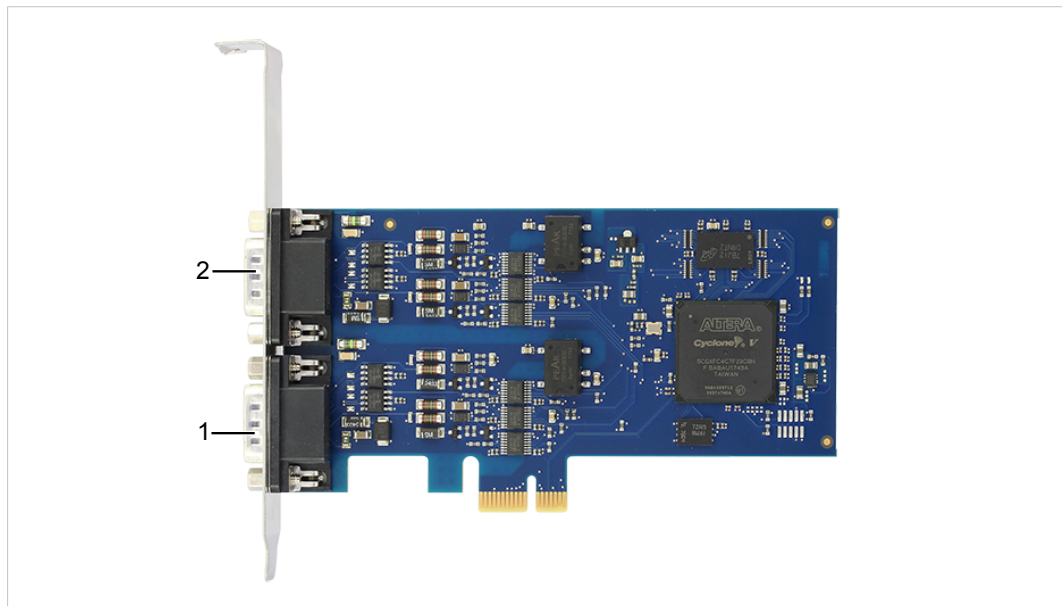
6   Connections

6.1   Overview

Fig. 1   Connectors

1	CAN 1/3, LIN 1/3
2	CAN 2/4, LIN 2/4

6.2   CAN Bus

The bus coupling is galvanically isolated. The shield of the CAN connector is connected to CAN ground through a 1 MΩ resistor and a 10 nF capacitor. The shields of the CAN connectors are connected directly together.

> ⓘ   *For best noise immunity use shielded CAN cables.*

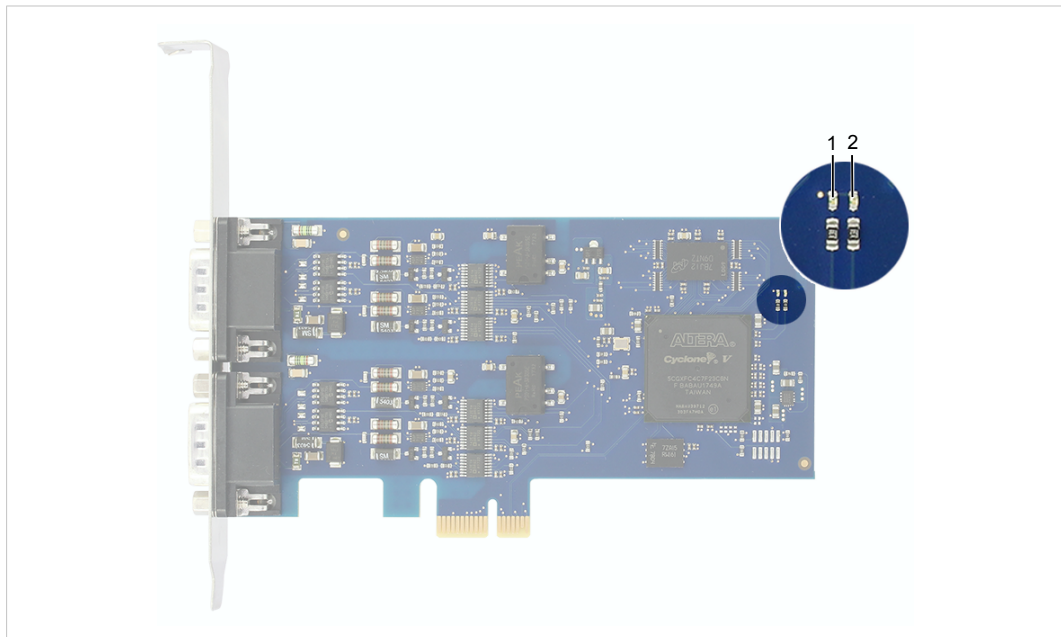| **Pin Allocation D-Sub 9 Connectors**		
Pin no.	**CAN 1/3**	**CAN 2/4**
1	CAN 3 low (high-speed)	CAN 4 low (high-speed)
2	CAN 1 low (high-speed)	CAN 2 low (high-speed)
3	GND	GND
4	CAN 3 high (high-speed)	CAN 4 high (low-speed)
5	GND	GND
6	LIN 3	LIN 4
7	CAN 1 high (high-speed)	CAN 2 high (high-speed)
8	LIN 1	LIN 2
9	$VBAT_{LIN1/3}$ (5.5 V to 30 V)	$VBAT_{LIN2/4}$ (5.5 V to 30 V)

7   Operation

Fig. 2   LEDs

1	Red LED
2	Green LED

The LEDs shows the current boot up state and the state of the firmware start.

Boot up State after Start or Restart of Computer	
LED	**Description**
Red flashing	Interface in boot manager, information about hardware can be read with the device manager, ready to start the application
Red	Error in boot up sequence, hardware issues. Contact HMS support.

Firmware State after Start of the Application	
LED	**Description**
Green flashing	Application firmware active
Green	High prior task uses CPU time or firmware crashed. Contact HMS support.
Red	Issues with initializing the hardware. Contact HMS support.

8   Technical Data

PC interface	PCI Express Base Specification, Rev 1.1, single lane port (x1)
CAN transceiver	MCP2562FDT-ESW
LIN transceiver	MCP2003B-E/MC
LIN bus voltage	-18 V to +50 V (short-circuit protected)
$VBAT_{LIN}$	5.5 V to 30 V
Operating temperature range	0 °C to +70 °C
Storage temperature range	-40 °C to +85 °C
Galvanic isolation	1 kV for 1 second
Relative humidity	10 % to 90 %, no condensation
CAN propagation delay	With galvanic isolation typical 6 ns, max. 10 ns
CAN/CAN FD bit rates	CAN: 10 kbit/s to 1 Mbit/s CAN FD Arbitration Phase: up to 1 Mbit/s CAN FD Data Phase: up to 8 Mbit/s
LIN bit rates	Up to 20 kbit/s
Dimension	64 x 127 mm
Weight	Approx. 69 g
Power supply	Via PCIe socket (3.3 V DC)
Current consumption	Typ. 500 mA

9 Support/Return Hardware

Observe the following information in the support area on www.ixxat.com:

- information about products
- FAQ lists
- installation notes
- updated product versions
- updates

9.1 Support

► For problems or support with the product request support at www.ixxat.com/support.

► If required use support phone contacts on www.ixxat.com.

9.2 Return Hardware

► Fill in the form for warranty claims and repair on www.ixxat.com/support/product-returns.

► Print out the Product Return Number (PRN resp. RMA).

► Pack product in a physically- and ESD-safe way, use original packaging if possible.

► Enclose PRN number.

► Observe further notes on www.ixxat.com.

► Return hardware.

10 Disposal

► Dispose of product according to national laws and regulations.

► Observe further notes about disposal of products on www.ixxat.com.

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A   Regulatory Compliance

A.1   EMC Compliance (CE)

$$C\!\in$$

The product is in compliance with the Electromagnetic Compatibility Directive. More information and the Declaration of Conformity is found at www.ixxat.com.

A.2   FCC Compliance Statement

This device complies with Part 15 of the FCC Rules. Operation is subject to the following two conditions:

▶   This device may not cause harmful interference.

▶   This device must accept any interference received, including interference that may cause undesired operation.

Product name	CAN-IB640/PCIe
Responsible party	HMS Industrial Networks Inc
Address	35 E. Wacker Dr, Suite 1700 Chicago , IL 60601
Phone	+1 312 829 0601

> ⚠   Any changes or modifications not expressly approved by HMS Industrial Networks could void the user's authority to operate the equipment.

> ⚠   This equipment has been tested and found to comply with the limits for a Class B digital device, pursuant to Part 15 of the FCC rules. These limits are designed to provide reasonable protection against harmful interference in a residential installation. This equipment generates, uses and can radiate radio frequency energy and, if not installed and used in accordance with the instructions, may cause harmful interference to radio communications. However, there is no guarantee that interference will not occur in a particular installation. If this equipment does cause harmful interference to radio or television reception, which can be determined by turning the equipment off and on, the user is encouraged to try to correct the interference by one or more of the following measures:
>
> Reorient or relocate the receiving antenna.
>
> Increase the separation between the equipment and the receiver.
>
> Connect the equipment into an outlet on a circuit different from that to which the receiver is connected.
>
> Consult the dealer or an experienced radio/TV technician for help.

A.3   Disposal and recycling

You must dispose of this product properly according to local laws and regulations. Because this product contains electronic components, it must be disposed of separately from household waste. When this product reaches its end of life, contact local authorities to learn about disposal and recycling options, or simply drop it off at your local HMS office or return it to HMS.

For more information, see www.hms-networks.com.