Ixxat®

BY HMS NETWORKS

PCIe/104 CAN Interface

CAN-IB130/230/630/PCIe 104

HMS *Connecting Devices*™

Important User Information

Disclaimer

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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

1 User Guide

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

1.1 Target Audience

This manual addresses trained personnel. Trained personnel are all persons who are familiar with the installation and use of interfaces. 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 *VCI Driver*	HMS

1.3 Document History

Version	Date	Description
2.0	November 2017	Revised and edited in new design, added FD variant
2.1	June 2019	Layout changes

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

→   result 1

→   result 2

Lists are structured as follows:
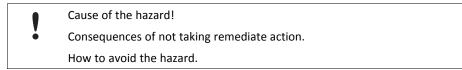
•   item 1

•   item 2

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

```
This font is used to indicate program code and other
kinds of data input/output such as configuration scripts.
```

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.

> ⓘ   *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 and LIN networks. The interfaces can be stacked on top of a host single board computer.

3   Scope of Delivery

Included in the scope of delivery of standard variant:

•   PC CAN interface

•   box header/D-Sub-9 adapter

•   CD with VCI driver and example application

•   Installation Guide *VCI Driver*

•   User Manual *PCIe/104 CAN Interface*

4 Product Description

Common Features

- PCIe/104 interface according to the PCI/104 Express™ and PCIe/104™ specification V2.01

- coupling according to PCI Express Base specification, Revision 1.1

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

- common driver interface for easy exchange of PC interface type

CAN-IB130/PCIe 104

- passive interface

- available with 1 or 2 CAN channels

- 1 channel variant galvanically isolated

CAN-IB230/PCIe 104

- active interface

- available with 2 or 4 CAN channels

- optionally CAN low-speed interface according to ISO 11898-3 with 4 channel variant, high-speed/low-speed switchable via software

- 4 channel variant provides an additional LIN interface

- galvanically isolated

CAN-IB630/PCIe 104

- active interface

- available with 1 or 2 CAN channels

- supports 2 CAN FD, switchable ISO CAN FD, non-ISO CAN FD or CAN2.0A/B

- galvanically isolated

5 Installation

5.1 Installing the Software

For the operation of the interface a driver is needed.

Windows

► Install the VCI driver (see Installation Guide *VCI Driver*).

Linux and Real-Time Operating Systems

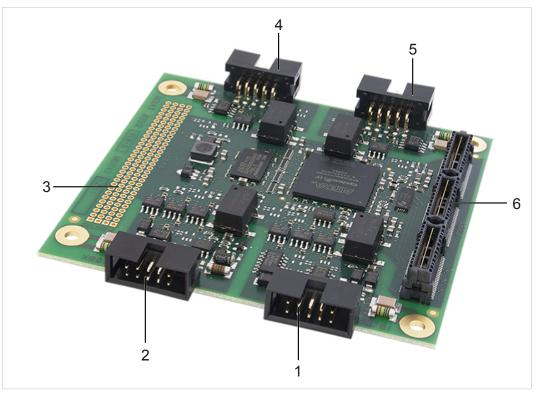► Observe information about supported operating systems and interfaces on www.ixxat.com.

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.

► Determine the corresponding connector on the host single board computer.

► Plug the PCIe connector of the interface in the corresponding connector, without using force.

► Make sure that the interface is securely held on the host single board computer.

→ Hardware installation is complete.

6   Connections

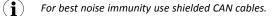## 6.1   Overview

Fig. 1   Connectors

1	Channel 1, CAN high-speed, optional CAN low-speed or CAN FD
2	Channel 2, CAN high-speed, optional LIN or CAN FD
3	PCI/104 Stack-Through connector (optional)
4	Channel 4, CAN high-speed (only available with IB230)
5	Channel 3, CAN high-speed (only available with IB230)
6	PCIe/104 connector

6.2   Fieldbus Connector

Galvanic isolation of the bus coupling is optional. For a not galvanically isolated interface, the CAN ground and PC ground are at the same potential.

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

CAN High-Speed/Low-Speed

CAN high-speed is provided on channel 1 to 4. CAN low-speed is available as an option. If the interface supports CAN low-speed it is possible to switch channel 1 from CAN high-speed to CAN low-speed via software.

CAN FD

CAN FD is only available with the CAN-IB630/PCIe 104.

LIN

The LIN interface is only available with the CAN-IB230/PCIe 104.

If the interface supports LIN, the signals are provided on channel 2. The LIN interface can be operated in Master and in Slave mode, selectable via software. Parallel operation of the LIN and CAN interface is possible.

Pin Allocation of 10 Pin Box Header		
Pin no.	**Signal**	**Comment**
1	CAN-low (low-speed)	Optional, channel 1
2	—	—
3	CAN-low (high-speed/CAN FD)	—
4	CAN-high (high-speed/CAN FD)	—
5	CAN GND	—
6	LIN	Optional, channel 2
7	CAN-high (low-speed)	Optional, channel 1
8	$VBAT_{LIN}$	Optional, channel 2
9, 10	—	—

HMS Industrial Networks offers a box header/D-Sub-9 adapter.

Pin Allocation of D-Sub-9 of the Adapter		
Pin no.	**Signal**	**Comment**
1	CAN-low (low-speed)	Optional, channel 1
2	CAN-low (high-speed/CAN FD)	—
3	CAN GND	—
4	CAN-high (low-speed)	Optional, channel 1
5	—	—
6	—	—
7	CAN-high (high-speed/CAN FD)	—
8	LIN	Optional, channel 2
9	$VBAT_{LIN}$	Optional, channel 2

7 Firmware Update

▶ For information about current version and downloading files and tools see support area on www.ixxat.com.

8 Technical Data

PCIe/104 interface	PCI Express Base Specification Rev. 1.1 PCI/104 Express™ and PCIe/104™ Specification V2.01.
Dimensions	90 x 96 mm (without box header)
Weight	Approx. 60 g
Power supply	Via PCIe/104 socket (3.3/5 VDC)
Operating temperature	-40 °C to +85 °C
Storage temperature	-40 °C to +85 °C
Galvanic isolation	1000 V DC for 1 sek, 800 V DC for 1 min, 700 V AC for 1 sek, 500 V AC for 1 min, 130 V working voltage AC/DC
Relative humidity	10 % to 95 %, no condensation
CAN propagation delay	With galvanic isolation typical 6 ns, max. 10 ns

CAN-IB130/PCIe 104	
CAN high-speed transceiver	TI SN65HDV251
Current consumption	Typ. 3.3 V/190 mA, 5 V/25 mA
CAN baud rates	10 kBit/s up to 1 MBit/s

CAN-IB230/PCIe 104	
CAN high-speed transceiver	TI SN65HDV251
CAN low-speed transceiver	TJA1054
LIN transceiver	TJA1020T
Current consumption	Typ. 3.3 V/350 mA, 5 V/230 mA
CAN baud rates	High-speed: 10 kBit/s up to 1 MBit/s Low-speed: 10 kBit/s to 125 kBit/s

CAN-IB230/PCIe 104	
CAN high-speed transceiver	TI SN65HDV251
CAN FD transceiver	SN65HVD251
Current consumption	Typ. 3.3 V/390 mA
CAN baud rates	High-speed: 10 kBit/s up to 1 MBit/s CAN FD: 250 kBit/s up to 4 MBit/s

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.

A Regulatory Compliance

A.1 EMC Compliance (CE)

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-IB130/PCIe 104, CAN-IB230/PCIe 104
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.

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