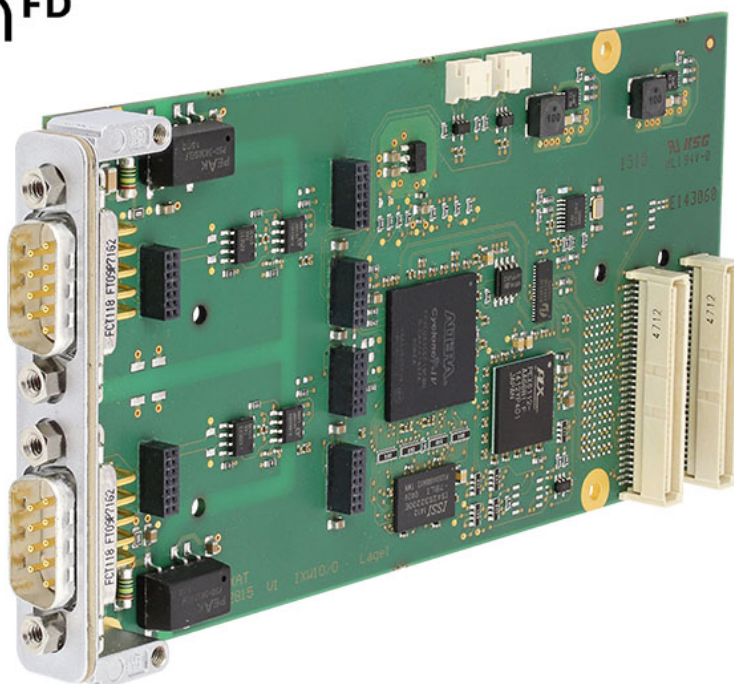


PC CAN Interface

CAN-IB Series PMC

USER MANUAL

4.01.0310.20000 1.4 en-US ENGLISH



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 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 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.

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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, LIN, 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
User Manual <i>Expansions for CAN-IB Series for PCI/PClexpress</i>	HMS
Installation Guide <i>VCI Driver</i>	HMS

1.3 Document History

Version	Date	Description
1.0	September 2016	First release
1.1	October 2017	Added CAN-FD variants, related documents, target group and intended use
1.2	June 2019	Layout changes, new disclaimer
1.3	November 2019	Removed obsolete XMC variants
1.4	March 2021	Added bit rates
1.5	December 2021	Added CAN controller clock frequency for CAN FD interfaces, UK conformity, removed VCI CD

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. 13](#)).
- ▶ 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 on carrier cards for use in computer systems with closed housings.

3 Scope of Delivery

Included in the scope of delivery:

- PC CAN interface
- Installation Guide *VCI Driver*
- User Manual *PC CAN Interface*

Drivers for Windows, Linux and real-time operating systems, including programming examples, CAN bus monitor and software design guides are available on www.ixxat.com/support.

4 Features

Common Features

- active board with 32 bit microcontroller
- LIN optional
- CAN low-speed (ISO 11898-3) optional
- galvanically isolated
- common driver interface for easy exchange of PC interface type
- PMC according to Draft Standard Physical and Environmental Layers for PCI Mezzanine Cards: PMC; P1386.1/ Draft 2.4

CAN-IB410/PMC

- up to 4 CAN channels (high-/low-speed optional switchable)
- expandable via fieldbus expansion and MultiCAN expansion

CAN-IB810/PMC

- 2 CAN/CAN-FD channels (high-/low-speed optional switchable)
- expandable via fieldbus expansion

5 Installation

5.1 Installing the Software

For the operation of the interface a driver is needed.

Windows



The VCI driver is constantly improved and expanded! Check if a newer version is available on www.ixxat.com/driver-windows.

- ▶ Download the latest VCI driver from www.ixxat.com/driver-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/driver-linux and www.ixxat.com/driver-real-time.

5.2 Installing the Hardware



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

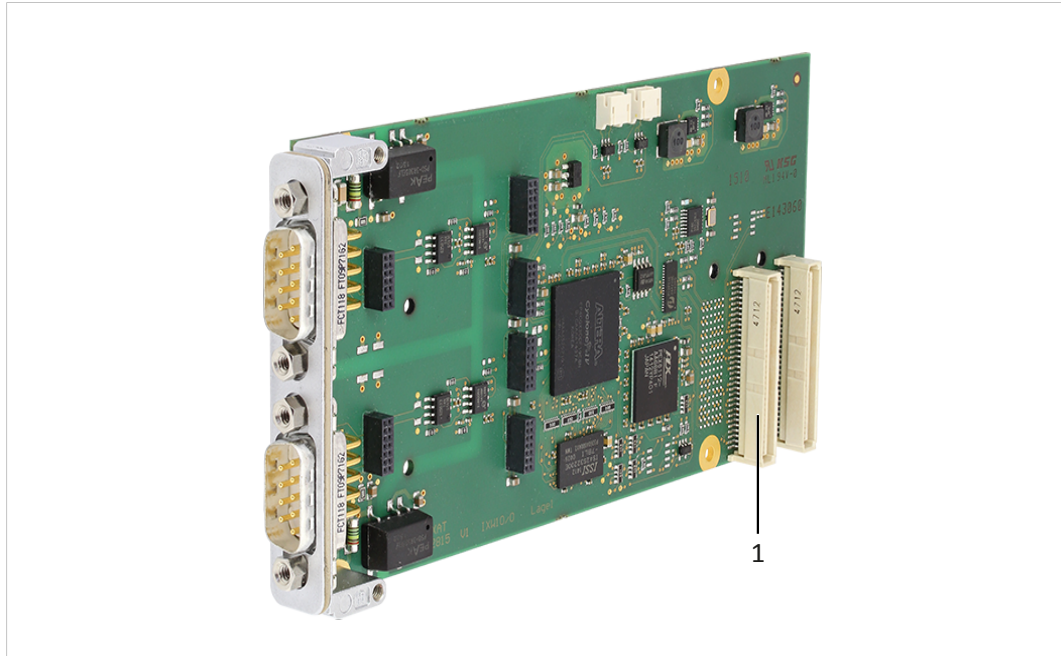


Fig. 1 PC connectors

1	PCI connector (PMC)
---	---------------------

- ▶ Make sure that power is off.
- ▶ Plug the PCI connector (1) in the corresponding slot of the carrier card.
- ▶ Make sure, that the interface is securely held on the carrier card.
- ▶ Install the carrier card in the computer according to instructions of the manufacturer of the carrier card.

6 Connections

6.1 Overview

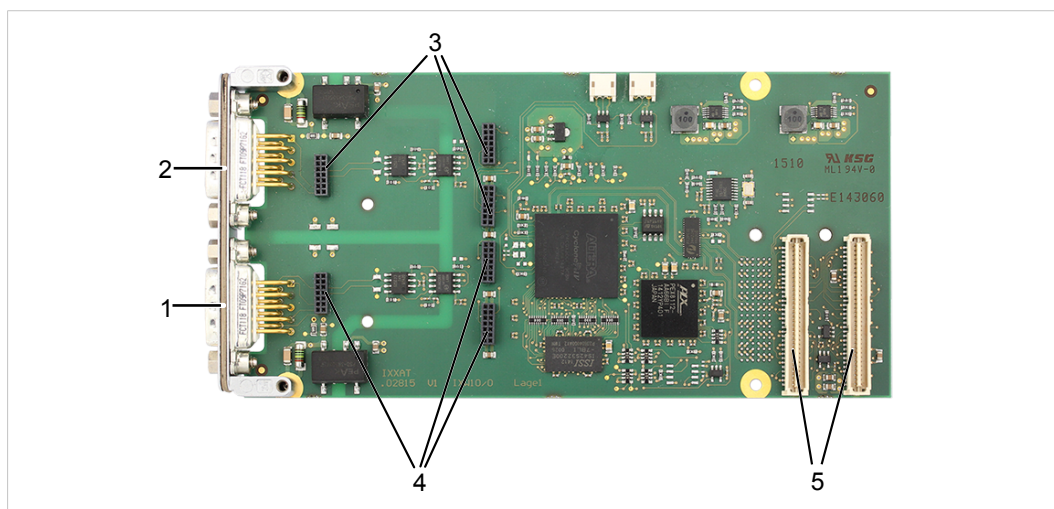


Fig. 2 Connections

1	CAN 2
2	CAN 1
3	Fieldbus expansion connector channel 1 (option)
4	Fieldbus expansion connector channel 2
5	PCI connector (PMC)

6.2 CAN Bus

The bus coupling can optionally be galvanically isolated. With galvanic isolation 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 a not galvanically isolated interface, the CAN ground and PC ground are at the same potential.



For best noise immunity use shielded CAN cables.

Pin Allocation D-Sub-9 Connector

Pin no.	Signal	Additional signals using a fieldbus expansion
1	—	CAN low (low-speed)
2	CAN low (high-speed/CAN FD)	—
3	CAN GND	—
4	—	CAN high (low-speed)
5	—	—
6	—	—
7	CAN high (high-speed/CAN FD)	—
8	—	LIN
9	—	VBAT _{LIN} (8-18 V DC)

6.3 Expansions

The fieldbus expansion connectors can be used to extend each CAN circuit with fieldbus expansions for additional fieldbuses (exclusively galvanically isolated interfaces). The signals of the additional fieldbuses are applied to the corresponding CAN connector.

7 Expansions

7.1 Fieldbus Expansion

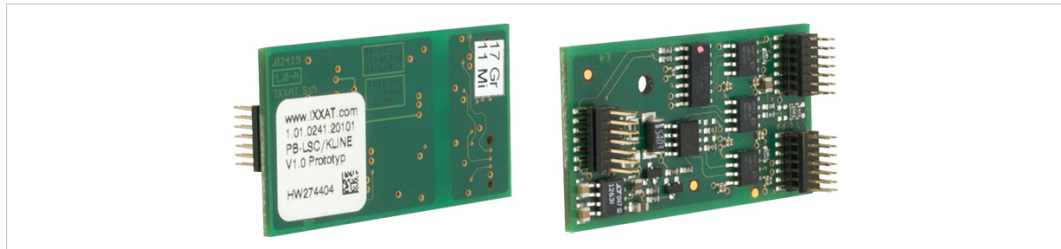


Fig. 3 Fieldbus expansion

If there is a low-speed CAN transceiver on the fieldbus expansion, it is possible to switch via software between the high-speed CAN transceiver on the interface and the low-speed CAN transceiver on the fieldbus expansion. The signals of the fieldbus expansions are connected to the appropriate D-Sub-9 connector.

Simultaneous operation of low-speed CAN and LIN is also possible.



Use fieldbus expansions exclusively in conjunction with galvanically isolated CAN channels.

7.1.1 Installation

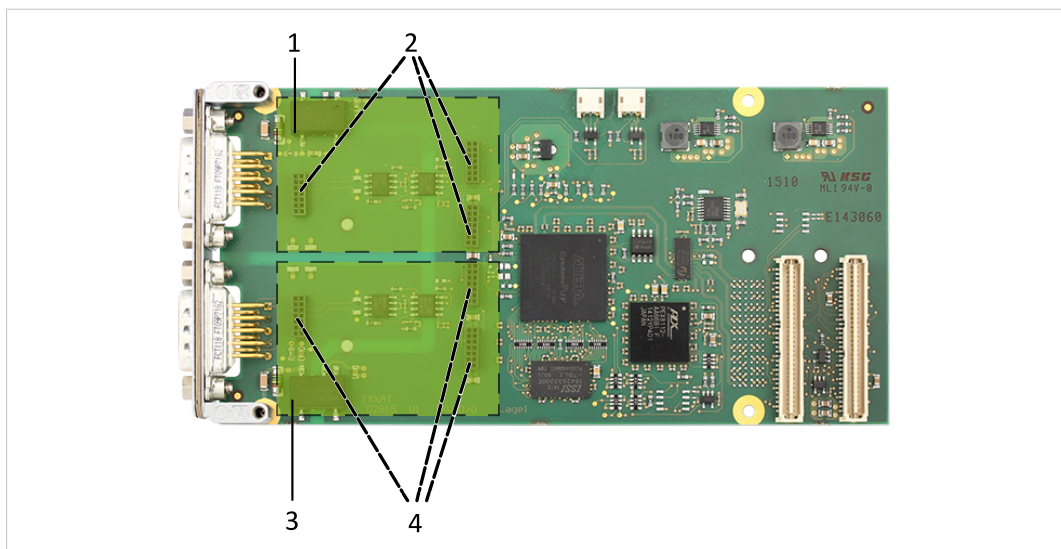


Fig. 4 CAN interface with fieldbus expansions

1	Fieldbus expansion channel 1
2	Fieldbus expansion connector channel 1
3	Fieldbus expansion channel 2
4	Fieldbus expansion connector channel 2

- ▶ Plug the expansion in the corresponding expansion connector.
- ▶ Make sure that the expansion is properly inserted in the socket.
 - Interface detects installed expansions automatically.
- ▶ If the expansion is not detected automatically, check if the expansion is properly inserted.
- ▶ Observe product description and further information on www.ixxat.com.

7.2 MultiCAN Expansion



The use of a MultiCAN expansion is exclusively possible with CAN-IB410/PMC. CAN-IB810/PMC does not support a MultiCAN expansion. The use of fieldbus expansions is not possible if a MultiCAN expansion is used.

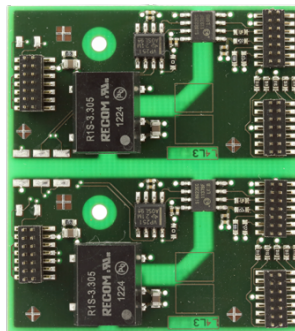


Fig. 5 MultiCAN expansion

With using a MultiCAN expansion the number of available CAN high-speed channels on a D-Sub-9 connector of a specific CAN interface is doubled and the number of required computer slots is halved.

The expansion redirects the channel CAN 3 to the D-Sub-9 connector of CAN 1 and channel CAN 4 to D-Sub-9 connector of CAN 2. The galvanic isolation of CAN channels remains.

7.2.1 Installation



Observe different pin allocation of D-Sub-9 connector when using the MultiCAN expansion.

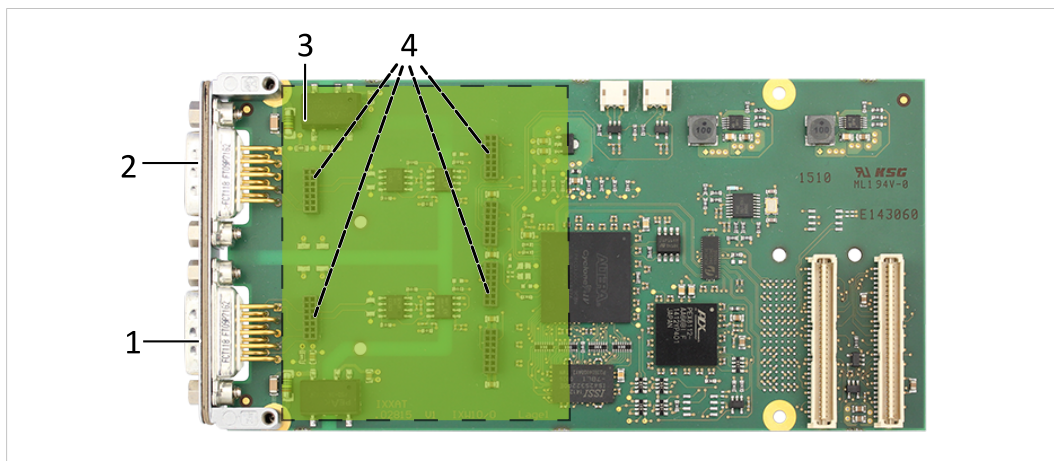


Fig. 6 CAN interface with MultiCAN-PB expansion

1	CAN 2/4
2	CAN 1/3
3	MultiCAN-PB
4	Fieldbus expansion connectors

- Install the expansion (see [Installation, p. 10](#)).
- Observe different pin allocation of D-Sub-9 connector.

Pin Allocation Using MultiCAN-PB

Pin No.	Signal CAN 1/3	Signal 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 ₁	GND ₂
4	CAN ₃ high (high-speed)	CAN ₄ high (high-speed)
5	GND ₃	GND ₄
6	-	-
7	CAN ₁ high (high-speed)	CAN ₂ high (high-speed)
8	-	-
9	-	-

8 Technical Data

PC address range	Plug & Play
Interrupts	Plug & Play
Microcontroller	32 bit microcontroller
Dimension	Approx. 74 x 149 mm
Operating temperature	-20 °C to +70 °C
Galvanic isolation	1 kV for 1 second
CAN interface CAN-IB410/PMC	2 CAN interfaces; CAN 2.0 A/B; D-Sub-9 plug according to CiA 303-1, optional CAN low-speed, optional 4 CAN interfaces via MultiCAN expansion
CAN interface CAN-IB810/PMC	2 CAN/CAN-FD interfaces; CAN 2.0 A/B; D-Sub-9 plug according to CiA 303-1, optional CAN low-speed
LIN interface	Optional up to 2 LIN (ISO 9141) interfaces; D-Sub-9 plug
PC bus interface	PMC
CAN bit rates	8 kbit/s to 1 Mbit/s (high-speed) 10 kbit/s to 125 kbit/s (low-speed)
CAN FD bit rates (CAN-IB810/PMC)	Arbitration rate: up to 1000 kbit/s, data rate: up to 8000 kbit/s (verified by testing) User defined bit rates are possible. Depending on the operating conditions (cable length, settings made, remote stations, etc.) the maximum data might not be reached or exceeded.
CAN controller/clock frequency (CAN-IB810/PMC)	IFI CAN_FD IP/80 MHz
Power supply	3.3 V DC, 650 mA typ.

9 Support/Return Hardware

9.1 Support

- ▶ To contact support, go to www.ixxat.com/technical-support/contact-technical-support.
- ▶ Scroll down and click button **mysupport.hms.se** to register a support case.

9.2 Return Hardware

- ▶ On www.ixxat.com/support/product-returns click button **Portal** to access the support portal.
- ▶ In the support portal select **Submit Product Return (RMA)**.
- ▶ Read the information and click **Create RMA Case**.
- ▶ Register a support account and sign in.
- ▶ Fill in the form for warranty claims and repair.
- ▶ 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 EMC Compliance (UKCA)



The product is in compliance with the Electromagnetic Compatibility Regulations 2016. The Declaration of Conformity is available at www.ixxat.com

A.3 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-IB810/PMC, CAN-IB410/PMC
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.4 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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