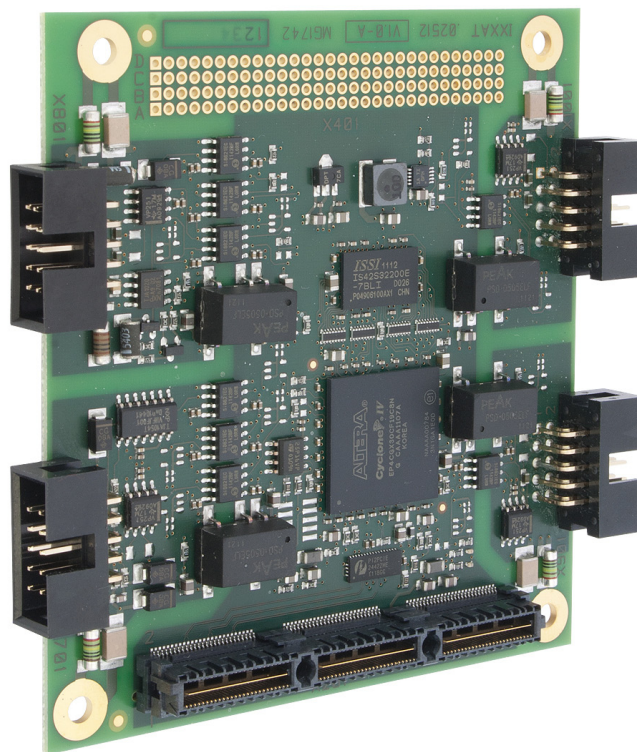


# CAN-IB130/PCIe

# CAN-IB230/PCIe

PCIe/104 CAN Interface



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# 1 Introduction

## 1.1 Overview

The IXXAT CAN-IB130/PCle104 or CAN-IB230/PCle104 are high-quality electronic components developed and manufactured according to the latest technological standards. This manual describes both, the CAN-IB130/PCle104 interface board (passive) and the CAN-IB230/PCle104 interface board (active). In the following both interfaces will be called "CAN interface board".

## 1.2 Features

- PCIe/104 interface according to the PCI/104 Express™ and PCIe/104™ specification V2.01
- Coupling according to the PCI Express Base Specification, Revision 1.1
- Up to four independent CAN channels
- ISO 11898-2 CAN bus coupling (high speed)
- Optionally galvanic decoupled
- Optionally CAN low speed according to ISO 11898-3 on channel 1
- Optionally LIN (only CAN-IB230/PCle104) on channel 2

# 2 Installation

## 2.1 Software installation

A driver is needed for the operation of the CAN interface board. This driver is a component of the VCI (Virtual CAN Interface) V3 for Windows, which you can download free of charge from <http://www.ixxat.com>. Please follow the VCI installation manual to install the VCI V3 CAN driver under Windows. For many interfaces, IXXAT also offers ECI drivers for Linux and real-time operating systems. You can find information about the operating systems and interfaces supported at <http://www.ixxat.com>.

## 2.2 Hardware installation

You should install the software driver before inserting the CAN interface board into the PCIe slot (see previous section). Proper ESD precautions must be practiced before performing the following tasks in sequence:

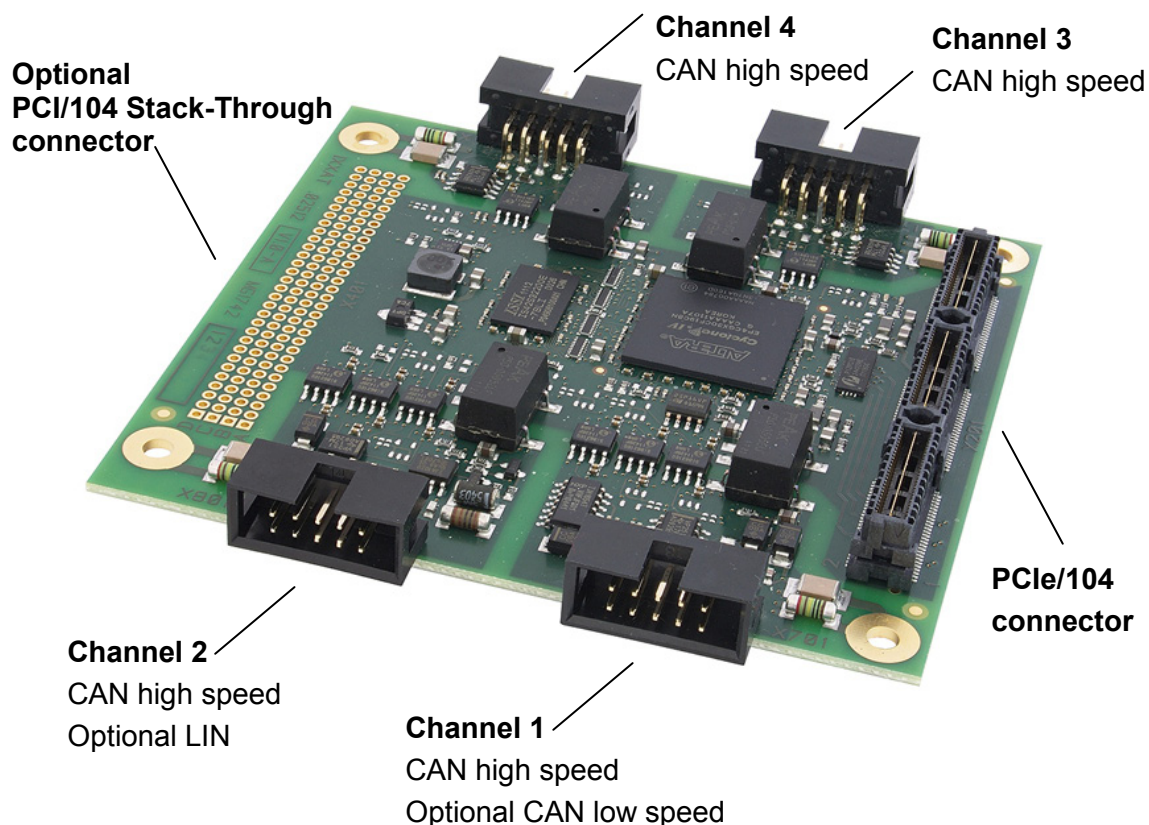
## Connections

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- (1) Turn the PC off and pull the power cord.
- (2) Open the PC according to the instructions of the PC manufacturer and determine a suitable slot. The CAN interface board is designed according to the PC standard and can easily be installed into the corresponding slot. Do not use force when inserting it.
- (3) Be sure the interface is securely held in the PC.
- (4) Close the PC; the hardware installation is now complete.

### 3 Connections

Figure 3-1 shows the position of the connectors which are described following. Please note, depending on the type of CAN interface board used, it may be that some interfaces are not available. A list of available CAN interface board versions can be found on the IXXAT webpage.



**Figure 3-1: Connectors on the CAN interface board**

#### 3.1 PCIe/104 connector

The pin assignment of the PCIe/104 connector was made according to the "PCI/104-Express™ and PCIe/104™ Specification V2.01".

## 3.2 Field bus connection

The field bus connections are available with a galvanic isolation as an option. If the CAN interface board you use doesn't have such a galvanic isolation, CAN ground and PC ground are on the same potential.

### 3.2.1 CAN high speed (ISO 11898-2), channel 1-4

All CAN channels available on the CAN interface board do have an interface according to ISO 11898-2. The pin assignment of the signals ( $CAN_H$  *high speed*,  $CAN_L$  *high speed*, GND) is shown in table 3-1 and 3-2.

### 3.2.2 CAN low speed (ISO 11898-3), channel 1

Some variants of the CAN interface board allow to switch channel 1 via software from ISO 11898-2 to ISO 11898-3 (CAN low speed). If your CAN interface board supports low speed CAN, the signals are provided on channel 1 with a pin assignment according to table 3-1 and 3-2.

### 3.2.3 LIN, channel 2

The LIN interface is only available for the CAN-IB230/PCle104. If your CAN interface board supports LIN the signals are provided on channel 2. The LIN interface can be operated in master and slave mode, selectable via software. At this, the parallel operation of the LIN and CAN interface is possible. The pin assignment of the available LIN signals (LIN,  $VBAT_{LIN}$ , GND) is shown in table 3-1 and 3-2.

### 3.2.4 Pin assignment of the 10 pin box header (channel 1-4)

The pin assignment of the box header is shown in table 3-1.

| Pin No. | Signal                      | Option | Note      |
|---------|-----------------------------|--------|-----------|
| 1       | $CAN_L$ , <i>low speed</i>  | ✓      | Channel 1 |
| 2       | -                           |        |           |
| 3       | $CAN_L$ , <i>high speed</i> |        |           |
| 4       | $CAN_H$ , <i>high speed</i> |        |           |
| 5       | GND                         |        |           |
| 6       | LIN                         | ✓      | Channel 2 |
| 7       | $CAN_H$ , <i>low speed</i>  | ✓      | Channel 1 |
| 8       | $VBAT_{LIN}$                | ✓      | Channel 2 |
| 9, 10   | -                           |        |           |

Table 3-1: Pin assignment of the 10 pin box header

### 3.2.5 Pin assignment of the DSub-9 plug (channel 1-4)

If the special box header/DSub-9 adapter is used, the pin assignment of the DSub-9 plug is shown in table 3-2.

| Pin No. | Signal                               | Option | Note      |
|---------|--------------------------------------|--------|-----------|
| 1       | CAN <sub>L</sub> , <i>low speed</i>  | ✓      | Channel 1 |
| 2       | CAN <sub>L</sub> , <i>high speed</i> |        |           |
| 3       | GND                                  |        |           |
| 4       | CAN <sub>H</sub> , <i>low speed</i>  | ✓      | Channel 1 |
| 5       | -                                    |        |           |
| 6       | -                                    |        |           |
| 7       | CAN <sub>H</sub> , <i>high speed</i> |        |           |
| 8       | LIN                                  | ✓      | Channel 2 |
| 9       | VBAT <sub>LIN</sub>                  | ✓      | Channel 2 |

Table 3-2: Pin assignment of the DSub-9 plug

## 4 Programming the firmware

The active CAN interface board CAN-IB230/PCle104 is always delivered with the latest firmware. If you require a different firmware or if a firmware update is required, you can download the files and tools required from the download area of our Website.

## 5 Support

For more information on our products, FAQ lists and installation tips, please refer to the support area on our homepage (<http://www.ixxat.com>). There you will also find information on current product versions and available updates.

## 6 Returning hardware

If it is necessary to return hardware to us, please download the relevant RMA form from our homepage and follow the instructions on this form.

## 7 Information on EMC

The product is a class A device. If the product is used in office or home environment, radio interference can occur under certain conditions. To ensure faultless operation of the device, the following instructions must be followed due to technical requirements of EMC:



- only use the included accessories
- all cables must be shielded
- the shield of the interfaces must be connected with the device plug and with the plug on the other side

## 8 Appendix

### 8.1 Technical data

|  |   |
|--|---|
| PCIe/104 interface:                        | PCI Express Base Specification Rev. 1.1<br>PCI/104-Express™ & PCIe/104™<br>Specification, Rev. 2.01             |
| CAN transceiver (High Speed):              | TI SN65HVD251   |
| CAN transceiver (Low Speed):               | TJA1054   |
| LIN transceiver:                           | TJA1020T  |
| CAN propagation delay:                     | with galvanic isolation typ. 6 ns, max. 10 ns   |
| CAN baudrates:                             | 10 kBaud – 1 MBaud (High Speed),<br>10 kBaud - 125 kBaud (Low Speed)  |
| Power supply:                              | via PCIe104 socket (3.3 / 5 VDC)  |
| Current consumption<br>(normal operation): | CAN-IB130/PCIe104 typ. 3.3 V / 190 mA,<br>5 V / 25 mA<br>CAN-IB230/PCIe104 typ. 3.3 V / 350 mA,<br>5 V / 230 mA |
| Dimensions:                                | 90 x 96 mm (without box header)   |
| Weight:                                    | approx. 60 g  |
| Operating temperature range:               | -40 °C ... +85 °C   |
| Storage temperature range:                 | -40 °C ... +85 °C   |
| Relative humidity:                         | 10 - 95 %, no condensation  |
| Galvanic isolation:                        | 500 V AC for 1 minute between CAN bus and<br>internal logic   |
| EMC testing according to:                  | DIN EN 55022:2006 + A1:2007 - Class B<br>EN 61000-6-2:2005  |

### 8.2 FCC compliance

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, and
- this device must accept any interference received, including interference that may cause undesired operation

#### **Class A digital device – Instructions**

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 own expense.

### 8.3 EC declaration of conformity

IXXAT Automation declares, that the product:

CAN-IB130/PCle104 with the article numbers: 1.01.0238.xxxxx

CAN-IB230/PCle104 with the article numbers: 1.01.0239.xxxxx

complies with the EU directive 2004/108/EC.

Applied harmonized standards: EN 55022:2006 + A1:2007  
EN 61000-6-2:2005

22.03.2012, Dipl.-Ing. Christian Schlegel, Managing Director



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