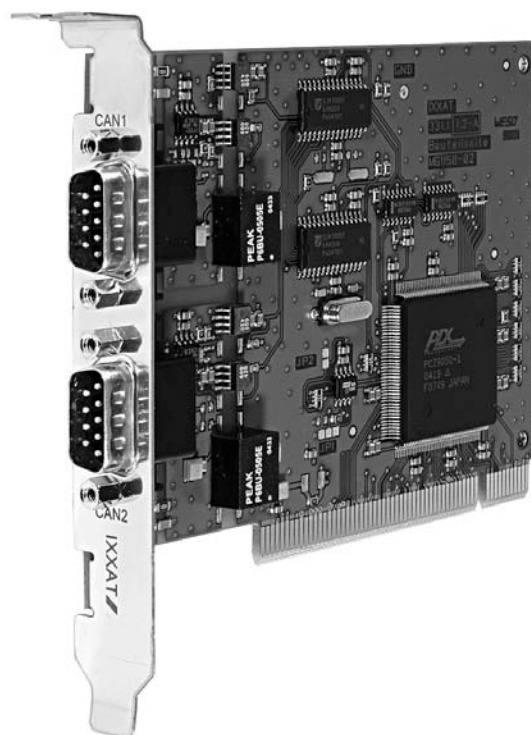# PC-I 04/PCI

Passive PC/CAN Interface

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Support

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Further international support contacts can be found on our webpage www.ixxat.com

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1 Introduction

1.1 Overview

Congratulations on your purchase of the IXXAT-PC-CAN-interface PC-I 04/PCI, a high-quality electronic component developed and manufactured according to the latest technological standards.

This handbook is intended to familiarize you with your interface, also referred to in the following as PC-I 04/PCI. Please read this handbook before beginning with the installation.

1.2 Features

The most important technical features are as follows:

- Constructed as PCI-plug-in card
- 32 bit memory-mapped access (1024 bytes are required in the memory address space for the CAN-controllers and 128 bytes each in the I/O address space and in the memory address space for the local configuration register)
- Basic address and interrupt via plug'n'play PCI-Bios
- One or two CAN-lines with Philips SJA1000 with 16 MHz clock
- CAN-bus connection in accordance with ISO 11898-2 high speed (as an option galvanically isolated)
- Bus connection carried out separately for each CAN-controller
- Pin assignment according to CiA/DS-102

1.3 Support

For more information on our products, FAQ lists and installation tips, please refer to the support section of our website (http://www.ixxat.de), which also contains information on current product versions and available updates.

If you have any further questions after studying the information on our website and the manuals, please contact our support department. The support section on our website contains the relevant forms for your support request. In order to facilitate our support work and enable a fast response, please provide precise information on the individual points and describe your question or problem in detail.

If you would prefer to contact our support department by phone, please also send a support request via our website first, so that our support department has the relevant information available.

1.4 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. In the case of repairs, please also describe the problem or fault in detail on the RMA form. This will enable us to carry out the repair quickly.
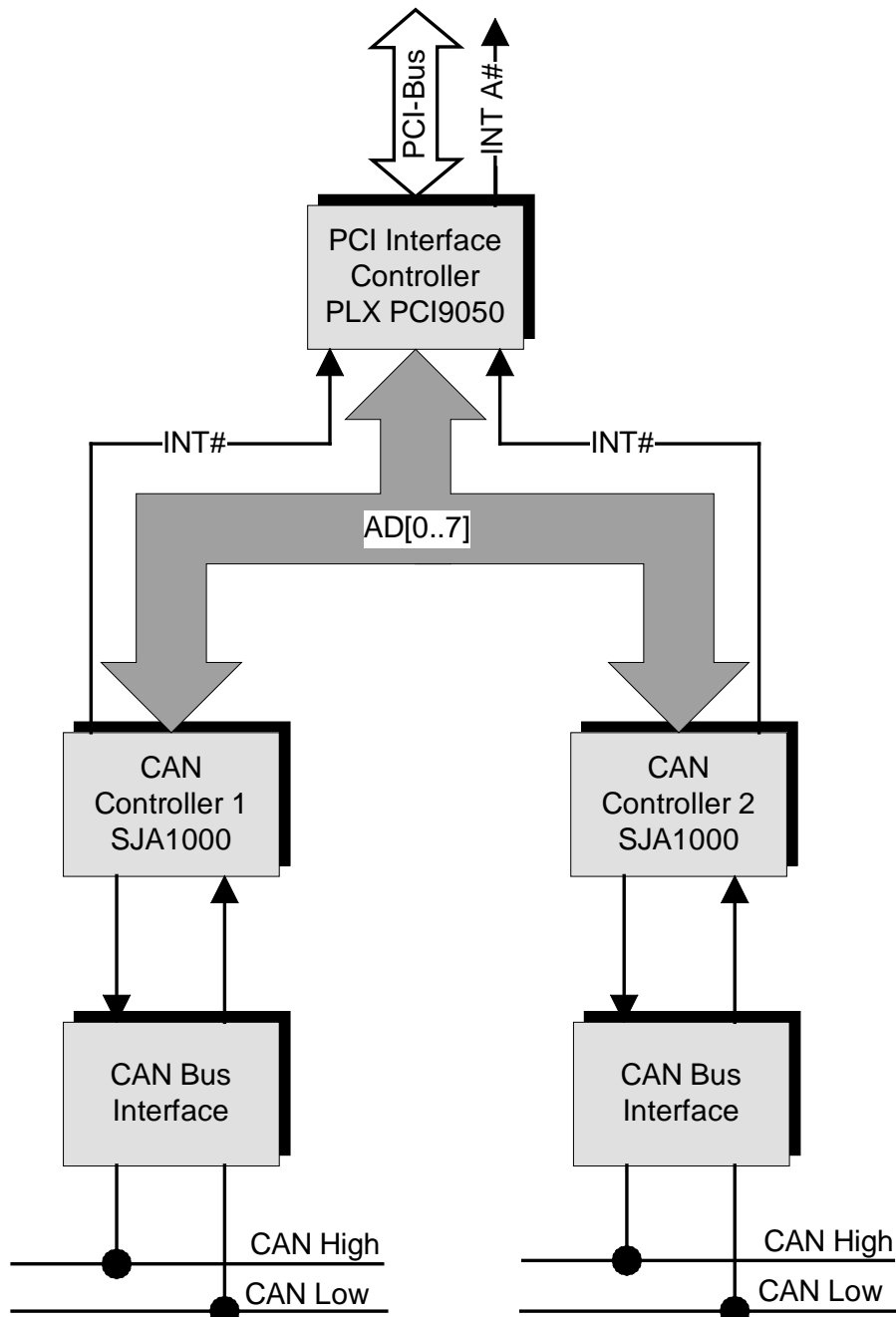
1.5 Block diagram

Fig. 1-1: Block diagram PC-I 04/PCI interface

2 Installation

2.1 Software installation

A driver is required in order to operate the interface.
For the installation of the CAN driver VCI, please read the VCI installation handbook.

2.2 Hardware-Installation

Before you plug the PC-I 04/PCI into the PCI slot, you should install the software driver (see section 2.1).

For all work on the PC and interface, you must be statically discharged. Work must be carried out on an earthed, anti-static work mat.

Take the following steps in sequence:

(1) Switch the PC off and disconnect the mains plug.

(2) Open the PC according to the instructions of the PC manufacturer and find a suitable place to plug in.
The interface is designed according to the PC-standard and can easily be built into the computer. Do not use force when plugging in.

(3) Make sure the interface sits tightly in the PC.

(4) Close the PC; the hardware installation is now complete.

3 Configuration

3.1 Settings on the interface

Figure 3-1 shows the position of the plugs, figure 3-2 the jumpers on the interface.
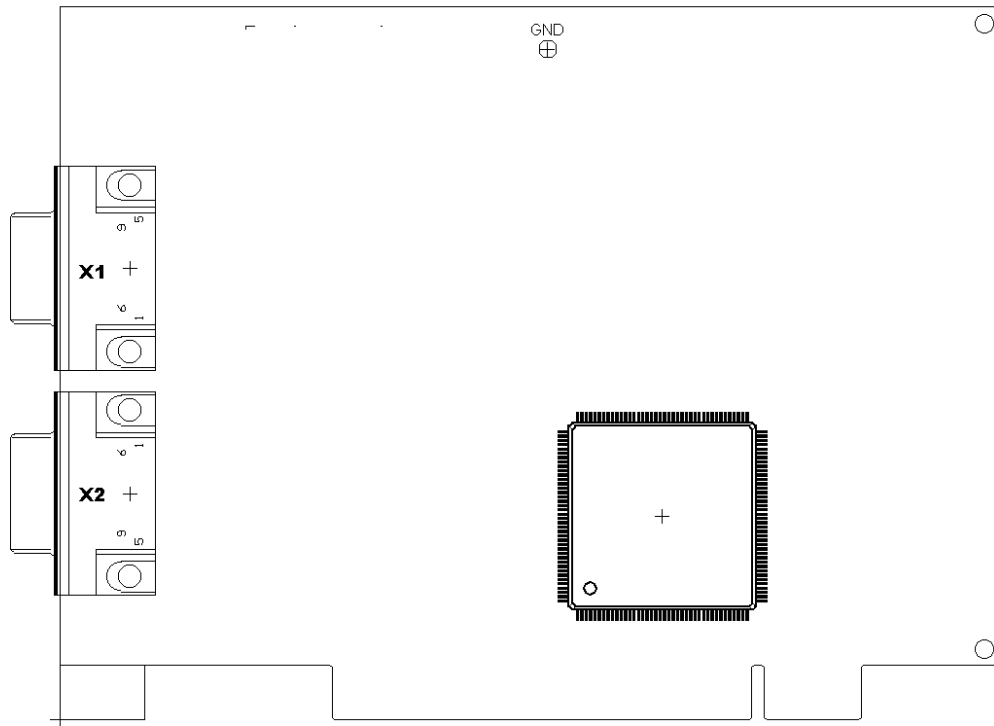

Fig. 3-1: PC-I 04/PCI interface – components side
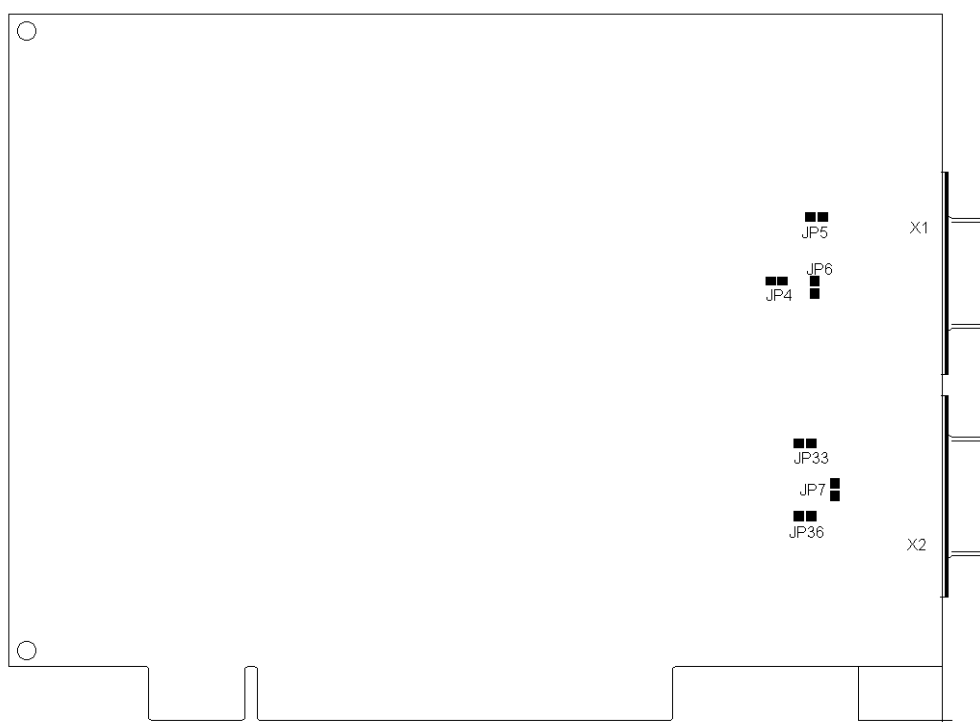
Fig. 3-2: PC-I 04/PCI interface – solder side

3.1.1 Power supply via CAN-plugs

With the solder jumpers JP4, JP5, JP33 and JP36, VCC (5 V) or GND can be connected to the CAN-plugs of the two CAN-lines. For this, the jumpers given in the following table are to be connected. The solder jumpers are on the solder side of the PC-I04/PCI.

Plug (X1, X2) Pin – Signal	Default setting	CAN-line 1	CAN-line 2
6 - GND	open	JP5	JP33
9 - VCC	open	JP4	JP36

Attention: This voltage may be loaded with maximum 100 mA.

With galvanically isolated bus connections, the signals GND and VCC are also galvanically isolated from the power supply of the PC.

3.1.2 Connection to ground for measuring purposes

There is a connection on the PC-I 04/PCI for a ground pin. The abbreviation GND is marked on the board next to the drill hole.

3.2 Design of the CAN-plugs

Two isolated high-speed bus attachments according to ISO 11898-2 can be mounted on the interface.

The signals of the first bus connection are connected to the 9-pin Sub-D-plug X1.

If the second bus connection is printed, the signals for the CAN-bus of the second bus connection are connected to the header X2.

3.2.1 Connecting the bus

Signals of the **1st bus connection** on the 9-pin Sub-D plug X1:

Pin no. X1	Signal name
1	
2	CAN Low
3	GND
4	
5	
6	GND (JP5)
7	CAN High
8	
9	VCC (JP4)
-	

Signals of the **2nd bus connection** on the 9-pin Sub-D plug X2:

Pin no. X2	Signal name
1	
2	CAN Low
3	GND
4	
5	
6	GND (JP33)
7	CAN High
8	
9	VCC (JP36)
-	

With galvanically isolated bus connections, the signals GND and VCC are also galvanically isolated from the power supply of the PC.

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3.3 Bus terminator

On the PC-I04/PCI there are bus terminator resistors for the two bus connections. The bus terminator for the first bus connection is connected via the solder jumper JP6 and for the second bus connection with JP7. Bus termination is with a 120 Ohm resistor between CAN Low and CAN High.

On delivery, the bus connections are not active.

Alternatively bus termination can also be made externally with the IXXAT accessory "SubD9 connector with CAN bus terminator resistor" (order number 1.04.0075.03000).

4 Architecture

4.1 PC-side memory allocation

The CAN-controllers are displayed directly in the memory range of the PC.

Reset CAN2	03FFh
	0300h
2.CAN-Controller	
	0200h
Reset CAN1	
	0100h
1.CAN-Controller	
	0000h (Basisadresse)

Fig. 4-1: PC-side memory allocation

4.1.1 Access to CAN-controllers

There can be up to two CAN-controllers of the type Philips SJA1000 on the interface.

The first CAN-controller is displayed in the range from 0000h to 00FFh, the second CAN-controller in the range of 0200h to 02FFh from the basic address of the card. When accessing the corresponding memory range, the CAN-controller is selected automatically. The basic address is allocated by the PCI plug-and-play BIOS.

The exact register description of the SJA1000 can be found in the corresponding Philips data sheets (web-addresses in Appendix).

The Output Control Register of the CAN-controllers must be loaded with the value DEh or 5Eh.

4.1.2 Resetting the CAN-controllers from the PC

By writing a random value to an address of the reset range (0100h to 01FFh for the first CAN-controller and 0300h to 03FFh for the second CAN-controller), a hardware reset is carried out on the corresponding CAN-controller.

4.2 Triggering an interrupt on the PC

The CAN-controllers can trigger an interrupt on the PC. Both CAN-controllers share one interrupt (INTA# of the PCI-interface).

The PCI plug-and-play BIOS allocates an interrupt to the card (IRQ3..IRQ15).

4.3 Interrupt handling

The card is transparent, which means that the interrupt signal on the PCI-bus (INTA#) is active when a CAN-controller issues an interrupt signal and it remains active until the signal on the CAN-controller is reset by an interrupt acknowledge by the PC. The PCI-bus interface chip PLX PCI9050-1 does not appear here.

It should be noted that the PCI-bus interrupt in the PCI-specification is defined as level-triggered.

Appendix

Appendix A

Technical data

The following data refer to the version of the PC-I04/PCI with two Philips SJA1000 CAN-controllers and two galvanically isolated bus connections.

Dimensions:	95 x 125 mm (without slot plate)
	16 mm overall height
Weight:	approx. 100 g
Operating temperature range:	-20 .. +70 °C
Power supply:	5V DC ± 5%
Current consumption:	typically 300 mA
	max. 600 mA
Relative humidity	10 – 95 %, non-condensing
CAN-controllers:	Philips SJA1000
CAN transceiver:	Texas Instruments SN65HVD251
	or Philips PCA 82C251
ESD protection CAN-bus:	12kV (Human Body Model)
Max. number CAN-bus nodes:	120
Galv. isolation bus connection:	1000 V DC between CAN1, CAN2 and internal logic
Signal delay due to galv. isolation:	typically 50 ns

Appendix B

Sources of data sheets

CAN-controller Philips SJA1000:
www.philips-semiconductors.com

CAN-transceiver Texas Instruments SN65HVD251:
www.ti.com

PCI-bus interface chip PLX PCI9050-1:
www.plxtech.com

Appendix B

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Declaration of conformity

IXXAT Automation declares that the product: PC-I 04/PCI

with the article numbers: 1.01.0057.10100
                             1.01.0057.10200
                             1.01.0057.11110
                             1.01.0057.11220

do comply with the EC directives 2004/108/EC.

Applied harmonized standards in particular:
                             EN 55022:2006 + A1:2007
                             EN 55024:1998 + A1:2001 + A2:2003

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

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