

CAN-PC Interface CPC-PCI/CC770

User manual (preliminary)



User manual CPC-PCI/CC770

Document version:1.02Documentation date:September 29rd, 2009

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1 Overview

1.1 Attributes

- CAN Interfaces for industrial applications
- Compact size for PCI slots
- CiA DS 102 and ISO 11898 compatible physical layer
- Equipped with one or two CAN controller Bosch CC770
- CAN controller CC770 compatibel to Intel AN82527 CAN controller
- Galvanic decoupling between PC and CAN bus (optional)
- Easy programming based on direct mapping of CAN controller registers into PC memory area

1.2 General Description

CPC-PCI/CC770 is a PCI plug-in card for the CAN bus. Designed for industrial series applications CPC-PCI/CC770 has a robust and cost efficient layout. CPC-PCI/CC770 supports one or two Full-CAN controller of type Bosch CC770.

CPC-PCI/CC770 maps the CAN controller into the PC address space and thus allows access to CAN messages with low latency. Existing software for the supported CAN controller or the compatible Intel type CAN controller AN82527 can easily be adapted. With CPC-PCI/CC770 the CAN communication may be handled either in interrupt controlled or in polled mode.

CPC-PCI/CC770 can optionally be delivered with galvanic decoupling of the CAN bus. The dual channel version has the additional option of galvanic decoupling between the two CAN channels.

1.3 Ordering Information

| 10-05-300-20 | CPC-PCI/CC770S |
|--------------|---|
| | CAN plug-in board with one CAN controller |
| | Bosch CC770 |
| 10-05-301-20 | CPC-PCI/CC770S-GTI |
| | CAN plug-in board with one CAN controller |
| | Bosch CC770, galvanic decoupling |
| 10-05-310-20 | CPC-PCI/CC770D |
| | CAN plug-in board with two CAN controllers |
| | Bosch CC770 |
| 10-05-311-20 | CPC-PCI/CC770D-GTI |
| | CAN plug-in board with two CAN controllers |
| | Bosch CC770, galvanic decoupling |
| 10-05-312-20 | CPC-PCI/CC770D-GTIS |
| | CAN plug-in board with two CAN controller |
| | Bosch CC770, individual galvanic decoupling |
| 10-05-330-20 | CPC-PCI/CC770Q |
| | CAN plug-in board with four CAN controller |
| | Bosch CC770 |
| 10-05-331-20 | CPC-PCI/CC770Q-GTI |
| | CAN plug-in board with four CAN controller |
| | Bosch CC770, galvanic decoupling |
| 10-05-332-20 | CPC-PCI/CC770Q-GTIS |
| | CAN plug-in board with four CAN controller |
| | Bosch CC770, individual galvanic decoupling |

2 Programming Interface

CPC-PCI/CC770 is mapped into the PC memory space with a base address assigned by the PC BIOS. The availability of the CAN controller(s) int the memory area makes the CAN communication direct and provides a low latency time. The card is identified by the following parameters:

| Vendor ID | : 0x10B5 |
|--------------|----------|
| Device ID | : 0x9030 |
| Subvendor ID | : 0x10B5 |
| Subsystem ID | :0x4001 |

CPC-PCI/CC770 incorporates a PLX9030 PCI to local bus bridge. BAR0 of the PCI configuration space register points to the bridge registers, whereas BAR2 plus an offset of 0x400 points to the first CC770 CAN controller. BAR2 plus an offset of 0x600 points to the optional second CC770 CAN controller.

Please contact EMS Dr. Thomas Wünsche for more detailed information about the programming interface of CPC-PCI.

3 Electrical Characteristics

3.1 Absolute Limiting Values

Any (also temporary) stress in excess of the limiting values may cause permanent damage on CPC-PCI/CC770 and connected devices.

| Parameter | Min. | Max. | Unit |
|----------------------------------|------|------|------|
| Storage temperature | -20 | 80 | °C |
| Operating temperature* | 0 | 60 | °C |
| Voltage on the bus connections | -30 | 30 | V |
| Current across ground connection | - | 1 | А |

* Extended temperature range on demand

3.2 Nominal Values

| Parameter | Min. | Тур. | Max. | Unit |
|--|------|------|------|------|
| Power supply on +5V Pins of the PCI expansion slot | 4.75 | 5 | 5.25 | V |
| Voltage on bus pins* | -30 | - | 30 | V |
| CAN controller clock frequency | - | 16 | - | MHz |

* This potential is measured against the ground potential of the related CAN transceiver

4 Operating Instructions

4.1 Pin configuration of CAN connector

The CAN interface connector (D-Sub 9 male) schema complies to CiA Standard DS 102. The pin usage is detailed in the following table:

| Pin | Name | Description |
|-----|-------|--------------------------------|
| 1 | - | Reserved by CiA, not connected |
| 2 | CAN_L | CAN low bus line |
| 3 | GND | CAN Ground |
| 4 | - | Reserved by CiA, not connected |
| 5 | - | Reserved by CiA, not connected |
| 6 | - | Reserved by CiA, not connected |
| 7 | CAN_H | CAN high bus line |
| 8 | - | Reserved by CiA, not connected |
| 9 | - | Reserved by CiA, not connected |

4.2 Configuration

CPC-PCI/CC770 is a Plug and Play interface and therefore does not need a configuration. The base address of the interface within the PC memory and the interrupt used is assigned by the PC BIOS.

4.3 Installation

CPC-PCI/CC770 may be installed in an empty expansion slot on the motherboard of your IBM compatible computer. To avoid damage please pay attention to the following hints:

WARNING: Computer devices and components are sensitive against static discharge. For this reason keep CPC-PCI/CC770 in the antistatic cover until installing. Just before removing CPC-PCI/CC770 from the protection cover touch the metal case of your computer.

Avoid damage by achieving equal potential between all devices on the CAN before plugging the connection.

To the rear side connector of CPC-PCI/CC770 only CAN networks with a connector and elecrical character complying with CiA DS-102 may be attached.

PC interface and CAN bus are not galvanic decoupled in the standard version of CPC-PCI/CC770. Use in systems with diverging ground potential of PC and CAN bus is not permitted in this case.

Besides the instructions mentioned in this manual carefully observe the instructions in your computers user manual.

If you are not sure about the installation please contact **EMS Dr. Thomas Wünsche**. Execute the following steps for installation:

- Disconnect your computer from the power line.
- Open the case of your computer and remove the cover of the expansion slot rear panel.
- Insert CPC-PCI/CC770 carefully into the PCI slot. Therefore take the card at its top corners and shift it down into the slot equally. Push onto the upper side of CPC-PCI/CC770 to achieve correct seat in the slot.

If the card can not be inserted without problems, please don't use extensive force. Remove the card and retry.

• Fix the mounting screw and close the PC housing. Connect the required cables.