



CAN-PC Interface

CPC-Card

User Manual

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Documentation for CAN-Interface CPC-Card.

Document version: V 2.1

Documentation date: January 17th, 2005.

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Our products are continuously improved. Due to this fact specifications may be changed at any time and without announcement.

WARNING: CPC-Card hardware and software may not be used in applications where damage to life, health or private property may result from failures in or caused by these components.

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Inserting CPC-Card

CPC-Card can be inserted and removed whether the system is on or off in the same manner as inserting and removing a floppy disk.

Insert CPC-Card into the socket until it locks in place. The system may beep in a special way which depends on your host software indicating that CPC-Card has successfully been inserted into the socket.

Removing CPC-Card

Press the ejection button to remove the card. The system may also beep when the card is being ejected.

4.4 Installation

To install CPC-Card your computer needs an empty type II PC-Card expansion socket. 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-Card in the antistatic cover until installing. Just before you remove CPC-Card 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 two cable connectors of CPC-Card only CAN networks with a connector and electrical characteristics complying with CiA DS-102 may be attached.

PC interface and CAN bus are not galvanic decoupled in the standard version of CPC-Card. 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 users manual.

If you are not sure about the installation please contact **EMS Dr. Thomas Wünsche**.

1 Overview

1.1 Attributes

- CAN-Interface for PC-Card slots
- PC-Card type II
- Bus interface according to CiA DS 102 and ISO 11898
- Equipped with 2 CAN controllers Philips SJA1000
- Extended ESD protection of CAN transceivers
- Software for measurement, control, automation
- Windows driver available
- Easy programming due to direct mapping of CAN controller registers into PC memory address range

1.2 General Description

CPC-Card is a CAN interface for PC-Card (former PCMCIA) slots. CPC-Card can be used for mobile applications in laptop computers as well as with PC-Card host adaptors in desktop PCs.

A wide range of application software is available for example TestPoint for development of measurement applications for the MS-Windows environment. LogiCAD for the graphical design of control programs or CAN-Sim for CAN bus analysis.

With CPC-Card and this software each standard PC with PC-Card slots is converted into

an individual system solution. CPC-Card applies the widely used CAN controllers PCA82C200 or SJA 1000 from Philips Semiconductors for the CAN interface and maps these directly into the PC memory range. Due to this feature the porting of software written for other CAN interfaces with the same controller is considerably facilitated. During the development of CPC-Card ease of installation was a major design consideration: CPC-Card is automatically configured by generic enablers, which are part of modern PC-Card software.

1.3 Ordering Information

10-01-210-20	CPC-Card/SJA1000 CAN-PC interface for PC-Card Slot with 2 CAN controllers Philips SJA1000
10-01-216-20	CPC-Card/SJA1000 PinOut CAN-PC interface for PC-Card slot with 2 CAN controllers Philips SJA1000 and connection for external transceivers

Note: the CAN controller type PHILIPS 82C200 used on older boards has been replaced by the successor type PHILIPS SJA1000. These two controllers are designed to be compatible but due to the enhanced capabilities of the SJA1000 the signature for the board with this controller was changed (see table on page 3).

4.2 Resource Management

CPC-Card is automatically configured by generic enablers which are part of modern host software for PC-Card adapters. After the configuration CPC-Card behaves like a plug-in card for the ISA bus.

The allocation of the used resources (IRQ, base address) depends on your host software. In some cases you may have to edit a configuration file. For detailed information please refer to your host software documentation.

4.3 Standard Software

The delivery includes a small monitor application for use with MS Windows operating systems (currently supported: Windows2000, WindowsXP). The application is capable of receiving and sending as well as filtering and logging messages.

In addition, CPC-Card is delivered with a demonstration program as C language source code for DOS. This program shows the access to the control registers and the CAN controllers. Based on this sample software applications can be developed.

4 Operating Instructions

4.1 Pin configuration of CAN connector

CPC-Card is attached to up to two CAN buses by a cable with two DSub-9 connectors (male) conforming to CiA standard DS102.

The pin usage is detailed in the following table:

Pin 1	–	Reserved by CiA
Pin 2	CAN_L	CAN_L bus line (dominant low)
Pin 3	GND	Ground
Pin 4	–	Reserved by CiA
Pin 5	–	Reserved by CiA
Pin 6	GND	Optional ground, internally connected to Pin 3
Pin 7	CAN_H	CAN_H bus line (dominant high)
Pin 8	–	Reserved by CiA (error signal)
Pin 9	–	not connected

Cables with other connectors can be manufactured on request.

2 Programming Interface

CPC-Card uses an area in the memory address range of the PC for access to a set of control registers and the two CAN controllers. For the reception of CAN messages an interrupt channel is available. The configuration registers are described in the following table:

Address offset	Access	Description
0h	Read	Constant 55h for card detection
1h	Read	Constant AAh for card detection
2h	Read	Encoding of occupied memory range in units of 512 Byte
3h	Read	Constant CBh for card detection
4h	Read	Detection of card type: 04h for PCA82C200 05h for SJA1000
6h	Read	Status register
0h	Write	Control register
40h – 5Fh	Read / Write	CAN controller 1/ Basic CAN mode
60h – 7Fh	Read/ Write	CAN controller 2 / Basic CAN mode
100h - 17Fh	Read / Write	CAN controller 1/ PeliCAN mode
180h - 1FFh	Read / Write	CAN controller 2 / PeliCAN mode

The status register contains the actual state of CPC-Card. The bits have the following meaning:

Bit	Indication
0	Hardware reset active at CAN controller
1	High for compatibility reasons

Write access to the control register initiate actions within CPC-Card. The following table shows the transmitted data and the resulting action:

Value	Function
0	Hardware reset of CAN controller. The minimum reset time for the controllers is generated by logic on CPC-Card.

Initialization of the CAN controller and CAN communication are done by accesses to the CAN controller registers. The register description may be taken from the data sheet of the controller.

3 Electrical Characteristics

3.1 Absolute Limiting Values

Any (also temporary) stress in excess of the limiting values may cause permanent damage on CPC-Card.

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	-	0.1	A

* Extended temperature range on demand

** This voltage is measured against the ground potential of the CAN transceiver. Older versions are equipped with PCA82C250 transceivers. In this case lower limits apply.

3.2 Nominal values

Parameter	Min.	Typ.	Max.	Unit
Power supply on Pin B3 of the PC expansion slot	4,75	5	5,25	V
Clock frequency		16		MHz