

# **PcNetBoard V2.0**

*for BCAN protocol*



**i+ME** Company  
of the ACTIA group  
**ACTIA**  
Systems, Support & More

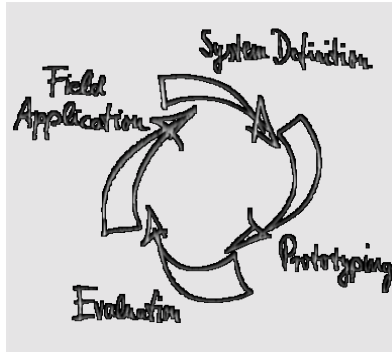


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Welcome to **I+ME** ACTIA !

Before acquainting you with your new **I+ME** Hardware we would first like to thank you for purchasing our product. We are extremely pleased that you have chosen to place your trust in **I+ME** ACTIA and will do our best to satisfy whatever needs you may have. The following is a brief explanation highlighting our background, areas of expertise and general product lines. This products and the list of our world-wide branch offices show that you have found a competent partner in **I+ME** ACTIA.

Since its foundation in 1986, **I+ME** ACTIA has made quite a name for itself. Our employees are dedicated to producing high-quality solutions in the field bus and multiplexed systems sectors. The knowledge of our experts allows to develop a spectrum of products which have been used in the automotive field as well as in general industrial environments. Our products can be used in all phases of system development: system definition, prototyping, evaluation and field application.



**I+ME** *Informatik und MikroElektronik*

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Whether your professional background is into industry-process-control or development and test tools, we offer six product groups to fulfill your sophisticated needs. Tried and tested under the most severe conditions the automotive industry has to offer, our products have proved themselves again and again. Our six products groups are:

### 1 CAN System Test & Design Tools



diagnosis and tests.

Support of various user application phases: Learning, prototyping, testing and evaluation of networked systems. Comfortable Real-Time simulation of message transfer characteristics in CAN networks. Tools for mobile

### 2 CAN PC Interfaces



applications under DOS/Windows according to Real-Time requirements is supported

Easy interfacing between PCs, Laptops, notebooks and networks with automotive fieldbus – protocols. Available for all PC standard interfaces such as ISA-slot, PCI, backplane, RS232, Centronics and PCMCIA. Development of

### 3 CAN Industrial I/O



NiPC is an intelligent hardware concept for sensor / actuator interfacing. A modular architecture allows the flexible change target micro controllers for process control.

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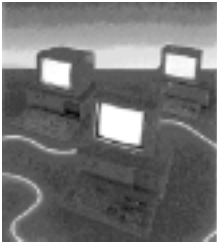
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#### 4 CAN System Application Software



Enabling Real-Time system modeling, testing of networked systems as well as application support. Offering basic services for network communication which is applicable for various processors and programming languages. Facilitating the application interface for distributed industrial process control according to the CAL standard by CiA. Support of Windows 3.1, Windows 95 & NT.

#### 5 CAN System Know How



Promoting the understanding of various network protocols in practice. Understanding of CAN networks with CAL in practice. Developing HW/SW solutions for customer specific problems. We offer CAN / CAL workshops and in-house seminars to enable CAN users to benefit from I+ME ACTIA's extensive knowledge.

#### 6 Automotive Diagnostics



Assistance during the development phases. Diagnostic tools for quality control in production lines as well as after sales diagnostic, control and servicing tools are provided to manufacturers, suppliers and dealers of the car industry by I+ME ACTIA.

If you have any questions concerning our products or you look for specific solutions within our product groups,

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don't hesitate to call us and benefit from I+ME's extensive knowledge - your need is our desire.

Our merger with the french corporation ACTIA in 1995 allowed us to become a powerful supplier for the European automotive industry. ACTIA products include diagnostic systems for automotive service and maintenance as well as development and production of high-quality on-board electronics. joining forces with ACTIA has enabled I+ME to better service it's international customers not only in Europe, but throughout the world.

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# Manual

## PcNetBoard II

### Content

<b>Content</b> .....	<b>viii</b>
<b>1 Introduction</b> .....	<b>1-1</b>
1.1 Your I+ME PcNetBoard II .....	1-2
1.2 System Requirements .....	1-4
1.3 Delivery Contents standart .....	1-4
1.4 Supplementary Support .....	1-4
1.5 Technical Specifications .....	1-5
<b>2 Installation</b> .....	<b>2-1</b>
2.1 Overview .....	2-2
2.2 Installing the Hardware .....	2-3
2.3 Installing the Software .....	2-5
2.3.1 Installation under WinNT .....	2-5
2.3.2 Modify configuration under WinNT .....	2-6
2.3.3 Deinstalling under WinNT .....	2-6
2.3.4 Installing under Win9x .....	2-7
<b>3 Hardware</b> .....	<b>3-2</b>
3.1 Functional description .....	3-3
3.2 CAN-Controller .....	3-4
3.3 Physical Interface .....	3-5
3.4 Connector .....	3-6
<b>4 Troubleshooting &amp; Techn. Support...</b>	<b>4-1</b>
4.1 What to do if you have problems .....	4-2
4.1.1 Solutions for all parts ... ..	4-3
4.1.2 Solutions for PCMCIA .....	4-4
4.1.3 Non-Supported PCMCIA Drives .....	4-5
4.1.4 Solutions for NetPorty II .....	4-6
<b>5 Glossary</b> .....	<b>5-1</b>
<b>6 Literature</b> .....	<b>6-1</b>

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External documentation:

- A LevelX\_API**
- B LevelX Demos**
- C PcCANControl**

Administration of document

General document version      1.03

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Your I+ME *PcNetBoard II*. Overview, System Requirements, Delivery Contents, and Specifications.

## **1 Introduction**

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## 1.1 Your I+ME PcNetBoard II

The PcNetBoard is a universal PC interface card for running and developing bCAN network application. By allowing direct access to the protocol chip via normal main memory addresses. The PcNetBoard uses all powerful tools and compilers available on a PC. With the help of LevelX, it easy to write our application which runs with Windows 95 and Windows NT 4.0.

Due to the babyboard technique, the physical interface may be changed; this gives the user the necessary flexibility even in terms of hardware.

All these features open the possibility for many applications. One of them is the PcCANControl delivered with the board.

PcCANControl allows to generate messages into an operational network system and to trace received messages on PC screen.

The PcNetBoard is available for various network protocols such as eCAN, BasicCAN and many more. In conjunction with the boards there are various physical transceiver babyboards available featuring the different physical busline needs.

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I+ME ACTIA is always eager to full fill the needs of our customers. If problems should occur, please refer to **Troubleshooting**. If the problem persists, then feel free to contact our after-sales support hotline using the following number:

## **After-sales service**

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D-38106 Braunschweig  
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## 1.2 System Requirements

PC requirements:

- standard PC with ISA slot.
- Pentium 166 for using PcCANControl comfortably.

## 1.3 Delivery Contents standart

Your *PcNetBoard II* delivery package includes:  
(Order code: 0040.00.99.01)



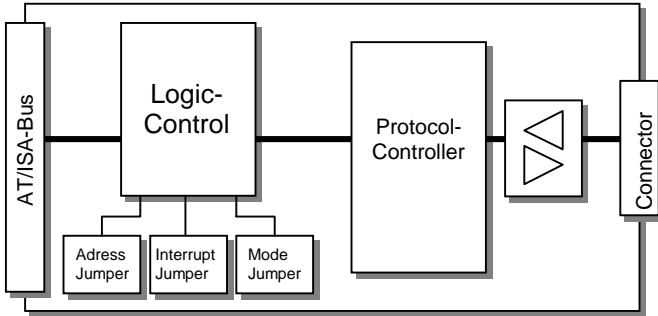
- 1 *PcNetBoard II*
- 1 System user manual as file (hardware/software)
- LevelX software driver for design of 32 bit Windows applications (Windows '9x and Windows NT), including sample programs.
- PCCANControl for Windows '9x and Windows NT version

## 1.4 Supplementary Support

- ChipSetup software
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## 1.5 Technical Specifications



### General Characteristics of PcNetBoard II

CAN-Controller	bCAN Philips 82C200
Physical Interface	CAN: according to ISO 11898 (PCA 82C251)
Temperature Range	0° .. + 70 °C
Connector	9pin sub-min-D CAN according to I+ME ACTIA pinning
Dimensions	135 mm x 110 mm
Jumpers	Memory Adr. (C000h-D800h) I/O Adr. (280h-2B0h) Interrupt (IRQ 3-6) Operation mode (I/O or Memory)
Power Supply	via PC ISA-slot energy consumption 120 mA without TxBB

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Installing your *PcNetBoard II*. Step by step installation procedures for hardware and software.

## **2 Installation**

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## 2.1 Overview

This chapter gives detailed information about installing the *PcNetBoard II* hardware and about the necessary software drivers which make *PcNetBoard II* access possible.

The *PcNetBoard II* is delivered with access driver and applications for Windows 95 and Windows NT. To get your *PcNetBoard II* operational follow the installation guide lines.

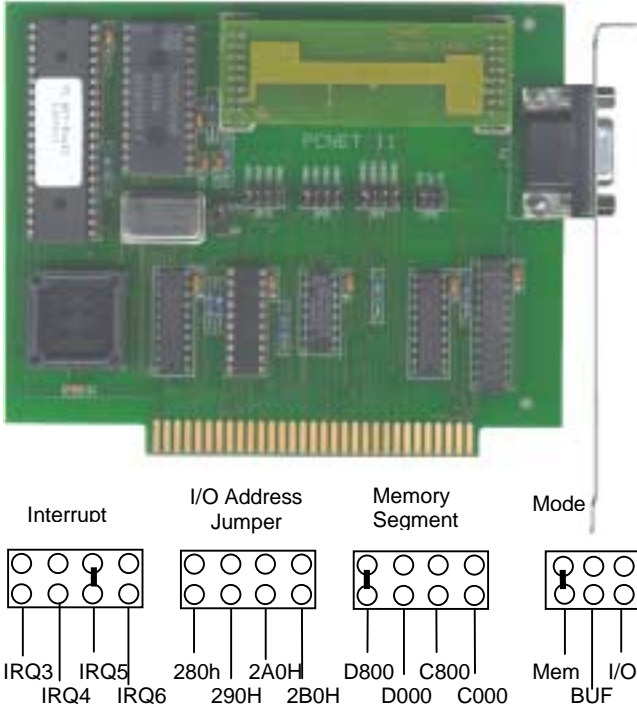
If the *PcNetBoard II* should be used with DOS or Windows 3.x get in contact with the I+ME ACTIA support.

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## 2.2 Installing the Hardware

To install the hardware you should install the *PcNetBoard II* in one free ISA-slot of your PC. First find out which interrupt and I/O are available on the system. The free IRQ, I/O's and Memory must be set by jumpers on the *PcNetBoard II*.



Make sure that the right interrupts are used in the systems configuration and the BIOS settings.



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If all settings are done *PcNetBoard II* is operational and the next step is the software installation.

If your PC also includes PCI slots, make sure, that the resources which should be assigned to the *PcNetBoard II* are not used by any Plug & Play feature.

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## 2.3 Installing the Software

### 2.3.1 Installation under WinNT

#### Driver installation:

- 1 Insert the CD. The setup programm will start automatic, if not please start the program "START.EXE" in root path.
- 2 Go to "Software Installation"
- 3 Choose your operating system, **is important**.
- 4 Choose your hardware component at the selection box then press "Start Installation". If the file is started (\*.com file), follow the steps on the screen. If necessary type in the password, found on cover.
- 5 If password is correct software will be installed successful.
- 6 Installation complete.

#### Application installation:

- 1 Insert the CD. The setup programm will start automatic, if not please start the program "START.EXE" in root path.
  - 2 Go to "Software Installation"
  - 3 Choose your operating system.
  - 4 Choose PcCANControl component at the selection box then press "Start Installation". If the file is started (\*.com file), follow the steps on the screen. If necessary type in the password, found on cover.
  - 5 Installation complete.
-

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### 2.3.2 Modify configuration under WinNT



If you will change the settings of the board, you configure the settings on board new. After done this you should start the program:

**“LevelX ... .. Driver Configuration”.**

You found it under...

START/SETTINGS/CONTROLPANEL/ SOFTWARE  
(START/EINSTELLUNGEN/SYSTEMSTEUERUNG/SOFTWARE)

### 2.3.3 Deinstalling under WinNT

Remember if the software should be deinstalled, please use normal Windows deinstallation service. You found it under...

START/SETTINGS/CONTROLPANEL/ SOFTWARE  
(START/EINSTELLUNGEN/SYSTEMSTEUERUNG/SOFTWARE)

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### 2.3.4 Installing under Win9x

#### Driver installation:

- 1 Insert the CD. The setup programm will start automatic, if not please start the program "START.EXE" in root path. This application will copy all necessary files to the hard disk.
- 2 Go to "Software Installation"
- 3 Choose your operating system, **is important**.
- 4 Choose your hardware component at the selection box then press "Start Installation". If the file is started (\*.com file), follow the steps on the screen. If necessary type in the password, found on cover.
- 5 If password is correct software will be installed successful.
- 6 Select on Windows START-button the item ...  
"Settings" ("Einstellungen")  
"Controlpanel"("Systemsteuerung")  
"Hardwaremanager"  
and **install without** using the ...  
**"automatic hardware detection"**  
("automatische Hardware Erkennung")  
the driver for the *PcNetBoard II* which is delivered.

#### Application installation:

- 1 Insert the CD. The setup programm will start automatic, if not please start the program "START.EXE" in root path.
  - 2 Go to "Software Installation"
  - 3 Choose your operating system.
  - 4 Choose PcCANControl component at the selection box then press "Start Installation". If the file is started (\*.com file), follow the steps on the screen. If necessary type in the password, found on cover.
  - 5 Installation complete.
-

The components, which make up your *PcNetBoard II* and the way they work together.

## **3 Hardware**

### **3.1 Functional description**

The *PcNetBoard II* is a short PC-Card with a short 8 Bit ISA-Slot.

The protocol chip and the physical interface are located on the baby boards; this allows easy adaptation of user specific solutions if necessary.

Clock generation for the protocol chip is done by an own oscillator on the *PcNetBoard II*.

An ELPD performs the interfacing between PC-bus and the protocol chip.

Hardware reset of the protocol chip is performed in two cases; on the one hand the reset signal on slot becomes active; the other way is issued by a write access to a special address, performed by the user.

It is easy to change the physical layer. You only have to insert another Transceiver-BabyBoard (TxBB) and close/open some pads. There is a lot of TxBB's available: e.g. ISO High/Low Speed, galvanically decoupled CAN and many more.

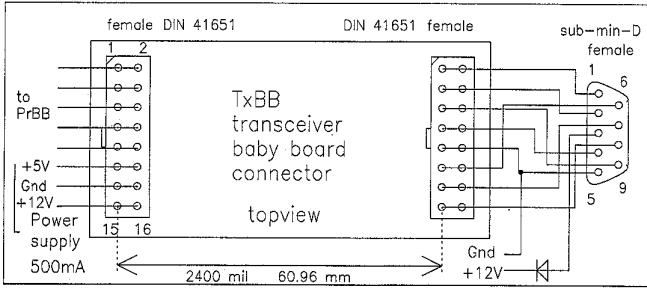
## **3.2 CAN-Controller**

The *I+ME PcNetBoard II* includes the Philips 82C200 on board.

In order to get more power you found most the chip 80C251 on board.

### 3.3 Physical Interface

The physical interface is realised by a transceiver babyboard (TxBB) This is ISO 11898 conform.

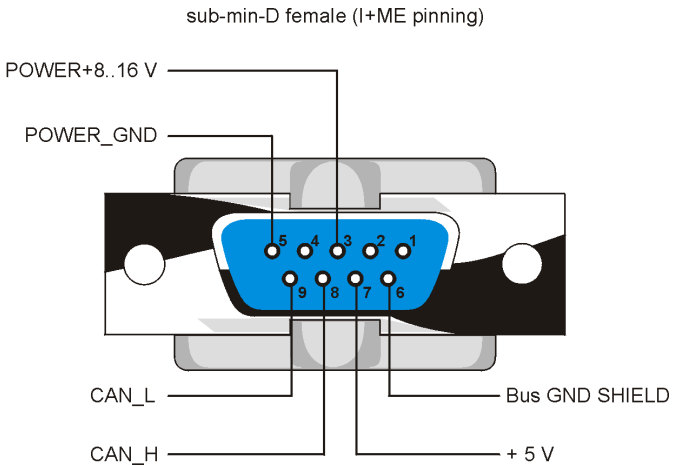


### 3.4 Connector

#### *CAN Channel*

#### 9pol sub-min-D female

The CAN connector is based on the I+ME ACTIA standard. It is a 9pol sub-min-D female connector.



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Common problems and how to solve them. How to get in touch with our after-sales support experts if you so desire.

## **4 Troubleshooting & Techn. Support**

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## 4.1 What to do if you have problems

First and foremost, please read **Installation** very closely and make sure that you performed your installation exactly as described.



### **For developers:**

The Key is often used in developing environments in combination with the API and/or DLL. If the PcCANControl software is functioning properly, then there is no problem with general CAN access. You should check your usage of the API of DLL.

If the PcCANControl software is not functioning, please consult the list of common problems below and their possible solutions.

#### 4.1.1 Solutions for all parts ...

##### **The system crashes after choose the hardware at PcCANControl:**

*The selected memory area is not free, or the selected interrupt is being used by another application. Make sure that no conflicts exist on your system. If you get a blue screen under Win NT it is most likely that a memory or IRQ conflict is occur.*

##### **PcCANControl launches correctly, but CAN access is not possible:**

*Check the transceiver cable and CAN connectors. If a connector is not correctly plugged, connect it right. If the sub-min-D connectors at the end of the cables are hot, remove the Key and call I+ME. If you use **higher baudrates**, remember to protect the end of line with **resistors** [120Ohm]*

#### **4.1.2 Solutions for PCMCIA**

**The system crashes after the installation of the Key client:**

*The selected memory area is not free, or the selected interrupt is being used by another application. Refer to Installation.*

**The system crashes when the Key is inserted or removed:**

*The selected memory area is not free, or the selected interrupt is being used by another application. Refer to Installation.*

**Windows will not launch after the installation of the client and services:**

*Make sure that there is a memory area reserved in the SYSTEM.INI file. The selected memory area is not free, or the selected interrupt is being used by another application. Refer to Installation.*

**The acknowledge sound after inserting or removing the Key is sounded twice:**

*There are two services installed on your system. One can be found in the CONFIG.SYS and the other in the device manager. In the device manager, under the topic PCMCIA, you can disable one of the services.*

**The Key is not inserted and PcCANControl starts with the message: I+ME CARD not available or drive not ready.**

*Insert the Key.*

**The Key is inserted and PcCANControl starts with the message: I+ME CARD not available or drive not ready.**

*Some aspect of the resource allocation is wrong.  
Refer to **Installation** for more information.*

#### **4.1.3 Non-Supported PCMCIA Drives**

In the current version there are some PCMCIA drives which are incompatible with the *PCMCIA Key*. Today, as a general rule, some PCI connected drives result in compatibility problems. The following is a list of known incompatible drives and any laptops which are known to use these drives.

Drive	Known Laptops Using Drive
Cirrus Logic PCIC compatible	SIEMENS NIXDORF Scenic Mobile 700 COMPAQ Armada

#### **4.1.4 Solutions for NetPorty II**

##### **You start PcCANControl but the connection doesn't work correct:**

*For parallel port usage it is necessary to have the EPP-loader-firmware (BOOTLOAD.H86) in the NetPorty II -Flash-EPROM. All Porty's are delivered with this loader!*

##### **You have overwrite the delivered EPP-Loader by your own firmware.**

*In this case it is possible to download the EPP-firmware again into the NetPorty II -Flash. This software is a Win32-Console-Application and runs under Win95 and WinNT.*

##### **How to use:**

- Connect your NetPorty II with one serial port.
- If you do not use COM1 please change it into the file L.BAT.
- Start L.BAT.

*If you get an error messages like "BSL: no response from the target hardware" it is possible that you have used the wrong COM port.*

- If you get the message below "-- COMx Loading bootload.h86..Ready" without any error message in the next line, all activities are correct finished
- Leave the software with pressing the ESC key, sometimes Alt X does not work.

##### **Info:**

*The program LDFSER.EXE is a loader that burns firmware in the Porty-Flash and also it is a serial monitor. The serial parameter are 115200,8,n,1. I+ME also can deliver a loader to start firmware in the RAM and a little firmware demo (Keil-C). Please contact us if you want to develop your own firmware.*

**The NetPorty II doesn't work under parallel port:**

*Use the right EPP mode on BIOS. It can be only one of the EPP modes work with one Win-System together. In past we find out that EPP 1.7 is necessary for Win9x and EPP 1.9 is necessary for Win NT. Please try out the right mode.*

**Using a printer and NetPorty II under Win NT:**

*If you use NetPorty II under NT note that you are not able to print!*

**Using a printer and NetPorty II under Win 9x:**

*If you use NetPorty II under Win9x the normal printer driver is active but it can make problems while printing with the active driver.! One way to solve this problem is to load the firmware into the flash of the NetPorty II.*

**Troubleshooting &  
Techn. Support**

What to do if you have problems

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If you encounter difficulties which are not discussed in the manual, or if you need more help than is offered in **Installation** and **Troubleshooting**, please call our after-sales service. Our experts will do their best to solve whatever problem you might have.

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For better understanding...

## **5 Glossary**

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## Glossary

### **Adapter**

A piece of hardware which contains one or more PCMCIA sockets. The Adapter contains the interface between the Socket Controller and the Host System.

### **AUTOEXEC.BAT**

A set of commands in the form of a batch file program that are automatically executed by DOS to help configure your system when you *Boot-Up* your computer.

### **BIOS**

An abbreviation for Basic Input/Output System. A set of instructions/routines stored in ROM. These routines work closely with hardware devices (memory chips, disk drives and monitor) to input and output interrupt requests indicating when a device is ready to accept or send data.

### **CONFIG.SYS**

A system configuration command file that contains installable device drivers, memory management commands and control files that DOS accesses and uses when your system starts up.

### **DPRAM**

Dual Ported Random Access Memory. The data for communication between PC and CANcard are exchange via a DPRAM.

### **I/O**

An abbreviation for Input Output. Refers to the sending (input) and receiving (output) of data through an 110 channel in the CPU. *Example:* The keyboard inputs data to the 110 channel in the CPU that in turn is output to the monitor.

### **IRQ**

An abbreviation for Interrupt Request. A signal sent by a device and routed through the BIOS indicating when a device is ready to accept or send data.

### **PCMCIA**

Personal Computer Memory Card International Association, a trade association of leading hardware and software vendors, established to adopt a set of standards pertaining to adapter slots and PC cards for portable PC accessories.

### **Slot**

A receptacle on a micro, portable, laptop or palmtop computer that is used to insert and operate PCMCIA PC Cards. Also referred to as a *Socket*.

### **Socket**

Same as *Slot* (see above).

**Socket-Controller**

A PC system hardware component that manages the operation of PCMCIA sockets in conjunction with system software.

**SYSTEM.INI**

A Windows initialization file (similar to the CONFIG.SYS file for DOS) that contains Windows device drivers, commands and settings you can use to customize Windows for your system's hardware.

**Upper-Memory**

Memory area within the PC address space between 640 KB and 1 MB. This area is used by hardware devices like graphics controller. The DPRAM of the CANcard is located in the Upper Memory.



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For more informations ...

## **6 Literature**

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## Literature

- [1] SAB 80C167CR User Manual  
Siemens AG.
- [2] SAB C167CR Description of the  
On-chip CAN-Module  
Siemens AG.
- [3] CiA DS 102-1CAN in Automation e.V