

CANPCI Series

A Line of CANbus® Network Interface Modules for PCI Bus Computers

INSTALLATION GUIDE

INTRODUCTION

The CANPCI Series of Controller Area Network (CAN) adapters provide fieldbus access to PCI bus computers. CAN is the Data Link layer technology used by CANopen, DeviceNet and Smart Distributed System. The CANPCI supports 8-bit transfers and takes advantage of the high-speed PCI bus. The **CANPCI-DN** implements the DeviceNet physical layer. The **CANPCI-CO** provides a CANopen physical layer.

The CANPCI features the [Philips SJA1000](#) CAN stand-alone controller chip which is used widely in both the automotive and industrial environments. Besides being backward compatible with the older 82C200, the SJA1000 has more features than its predecessor. The 82C200 is restricted to BasicCAN (11-bit identifiers) whereas the SJA1000 operates in either BasicCAN mode or the newer PeliCAN mode which supports the CAN 2.0B specification (29-bit identifiers). The SJA1000 maintains extended frame passivity while in the BasicCAN mode.

The SJA1000 operates from a 16 MHz clock and features a larger receive buffer and better acceptance-filtering — including the ability to extend the acceptance mask to the data field. It has the capability to operate at data rates as great as 1 Mbps.

Optically-isolated transceivers provide reverse voltage and short-circuit protection for either the **CANPCI-DN** (implementing the DeviceNet 5-position open style connector) or the **CANPCI-CO** (implementing the CANopen DB-9 connector as defined by [CAN in Automation](#)).

The PeliCAN mode includes:

- Error counters with read/write access
- Programmable error warning limit
- Last error code register
- Error interrupt for each CAN bus error
- Arbitration lost interrupt with detailed bit position
- Single-shot transmission (no re-transmission)
- Listen only mode (no acknowledge, no active error flags)
- Hot plugging support (software driven bit rate detection)
- Acceptance filter extension (4-byte code, 4-byte mask)
- Reception of 'own' messages (self reception request)

SPECIFICATIONS

<i>Power Requirements</i>	+5 V	+3.3 V
	100 mA	150 mA

Environmental

Operating temperature:	0°C	to +60°C
Storage temperature:	-40°C	to +85°C

Data Rates

50 kbps, 100 kbps, 125 kbps, 250 kbps, 500 kbps, 1 Mbps

Dimensions

4.72" x 2.52"

(120 mm x 64 mm)

Fieldbus Connectors

CANPCI-CO:	DB-9
CANPCI-DN:	Screw, 5-terminal

I/O Mapping

Occupies 128 bytes of I/O space

Interrupt Lines

Occupies one available PCI interrupt

Shipping Weight

1 lb. (.45 kg)

Compatibility

Compliant with [CAN 2.0A](#) and [CAN 2.0B](#)

Regulatory Compliance

[CE Mark](#)

[CFR 47](#), Part 15 Class A

INSTALLATION

HARDWARE: The CANPCI can be installed in any PCI computer bus. With power removed from the computer, remove its cover. Take care when installing the CANPCI because both it and the exposed computer motherboard are sensitive to electrostatic discharge. To prevent inadvertent damage, touch the metal chassis of the internal power supply to discharge yourself then remove the CANPCI from its protective ESD package.

CANbus Termination

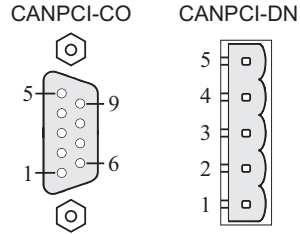
If the CANPCI is located at the end of a trunk, line-matching impedance is required. A 124-ohm resistor is supplied for this purpose and is invoked by a jumper on header **JP6**. If the CANPCI is not located at the end of a trunk, this jumper should be removed.

After termination is arranged, insert the CANPCI into an available PCI bus slot. Once the CANPCI is mounted, it can be attached to the CANbus. As illustrated below, the CANPCI-CO is provided with a DB-9 male connector for attaching to the CANbus, whereas the CANPCI-DN uses an open style male connector with screw terminals. To facilitate use of the screw terminals, a mating female connector has been provided.

Hardware installation is completed by replacing the computer cover.

Connector Pin Assignments

Function	CANPCI-CO	CANPCI-DN
V-	3,6	1
CAN_L	2	2
Drain	5	3
CAN_H	7	4
V+	9	5
Not Used	1,4,8	—



SOFTWARE: The CANPCI comes with a floppy disk which contains both driver files and utility files.

OPERATION

CANbus Transceiver Power

The **CANPCI-CO** takes its transceiver power from the host computer, but an onboard DC-DC converter provides 1500 volts of galvanic isolation.

The **CANPCI-DN** obtains its transceiver power from the CANbus, but an onboard circuit is provided to regulate that voltage to a constant 5 V.

DeviceNet Reverse Voltage Protection

The CANPCI-DN is protected from excessive voltage if the DeviceNet power connections are accidentally reversed. However, this protection results in the CANPCI-DN ground being about 700 mV above the CANbus ground.

CANTALK Utility

The CANPCI comes with a simple Windows program called CANTALK. This program allows ASCII CAN messages to be exchanged between CAN cards on two computers (each running CANTALK) or between two CAN cards on the same computer. Instructions are provided on the floppy disk.

CANPCI API

An Application Protocol Interface (API) is provided for use with the CANPCI. It covers the relationship between the Bit Rate Setting and the Sampling Point as well as the general message structure. The structure of CAN messages is treated in greater detail. The API includes 14 functions — each discussed in detail and all summarized in a flow chart — then provides a useful programming example. Two appendices furnish information on Data Types and Global Error Returns.

NEED MORE HELP INSTALLING THIS PRODUCT?

More information can be found on our web site at www.ccontrols.com. Browse the Technical Support section of our site for a look at our interactive on-line technical manuals, downloadable software drivers and utility programs that can test the product. When contacting one of our offices, ask for technical support.

Warranty

Contemporary Controls (CC) warrants its new product to the original purchaser for two years from the product shipping date. Product returned to CC for repair is warranted for one year from the date that the repaired product is shipped back to the purchaser or for the remainder of the original warranty period, whichever is longer.

If a CC product fails to operate in compliance with its specification during the warranty period, CC will, at its option, repair or replace the product at no charge. The customer is, however, responsible for shipping the product; CC assumes no responsibility for the product until it is received.

CC's limited warranty covers products only as delivered and does not cover repair of products that have been damaged by abuse, accident, disaster, misuse, or incorrect installation. User modification may void the warranty if the product is damaged by the modification, in which case this warranty does not cover repair or replacement.

This warranty in no way warrants suitability of the product for any specific application. IN NO EVENT WILL CC BE LIABLE FOR ANY DAMAGES INCLUDING LOST PROFITS, LOST SAVINGS, OR OTHER INCIDENTAL OR CONSEQUENTIAL DAMAGES ARISING OUT OF THE USE OR INABILITY TO USE THE PRODUCT EVEN IF CC HAS BEEN ADVISED OF THE POSSIBILITY OF SUCH DAMAGES, OR FOR ANY CLAIM BY ANY PARTY OTHER THAN THE PURCHASER.

THE ABOVE WARRANTY IS IN LIEU OF ANY AND ALL OTHER WARRANTIES, EXPRESSED OR IMPLIED OR STATUTORY, INCLUDING THE WARRANTIES OF MERCHANTABILITY, FITNESS FOR PARTICULAR PURPOSE OR USE, TITLE AND NONINFRINGEMENT.

Returning Products for Repair

Before returning a product for repair, contact Customer Service. A representative will instruct you on our returns procedure.

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DECLARATION OF CONFORMITY

Applied Council Directives:

[Electromagnetic Compatibility Directive](#), 89/336/EEC Council Directive as amended by Council Directive 92/31/EEC & Council Directive 93/68/EEC

[General Product Safety Directive](#) 92/59/EEC

Standards to which Conformity is Declared

EN 55022:1995, Class A, Limits and Methods of Measurement of Radio Disturbance Characteristics of Information Technology Equipment

EN 55024:1998, Information Technology Equipment — Immunity Characteristics — Limits and Methods of Measurement

Regulatory Compliance Standards			
Standard	Test Method	Description	Test Levels
EN 55024	EN 61000-4-2	Electrostatic Discharge	6 kV Contact
EN 55024	EN 61000-4-3	Radiated Immunity	10 V/m 80 MHz to 1 GHz
EN 55024	EN 61000-4-4	Fast Transient Burst	1 kV Clamp & 2 kV Direct
EN 55024	EN 61000-4-5	Voltage Surge	1 kV L to L & 2 kV L to Earth
EN 55024	EN 61000-4-6	Conducted Immunity	10 Volts (rms)
EN 55024	EN 61000-4-11	Voltage Dips & Interruptions	1 to 5 Seconds @ 100% Dip
EN 55022	CISPR 22	Radiated Emissions	Class A
EN 55022	CISPR 22	Conducted Emissions	Class B

Manufacturer:

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Type of Equipment:

CANBUS Network Interface Module Models CANPCI-CO & CANPCI-DN

Manufacturer's Declaration: I, the undersigned, hereby declare that the products specified above conform to the listed directives and standards.

George M. Thomas, President

June 1, 2003