IBS PC 104 SC-T

Controller Board for PC Systems

Data Sheet 5213C   08/2002

Product Description

Generation 4 INTERBUS controller board with a host interface for the PC/104 bus (8/ 16-bit slot).

Features

– INTERBUS protocol (EN 50254)

– Complete Generation 4 functionality

– Firmware bootable via RS-232 interface

– Parameter settings via CMD

– Permanent storage of the parameterization on the controller board

– User-defined addressing

– Data preprocessing on the controller board

– PCP 2.x

– Driver software for MS DOS, Windows 95/ 98, Windows NT 4.0 and Windows 2000
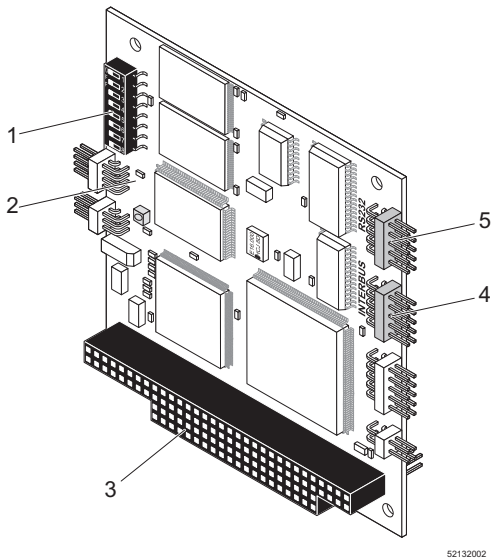
Applications

Connecting simple sensors/actuators and intelligent field devices directly to a control system with PC/104 interface via INTERBUS.
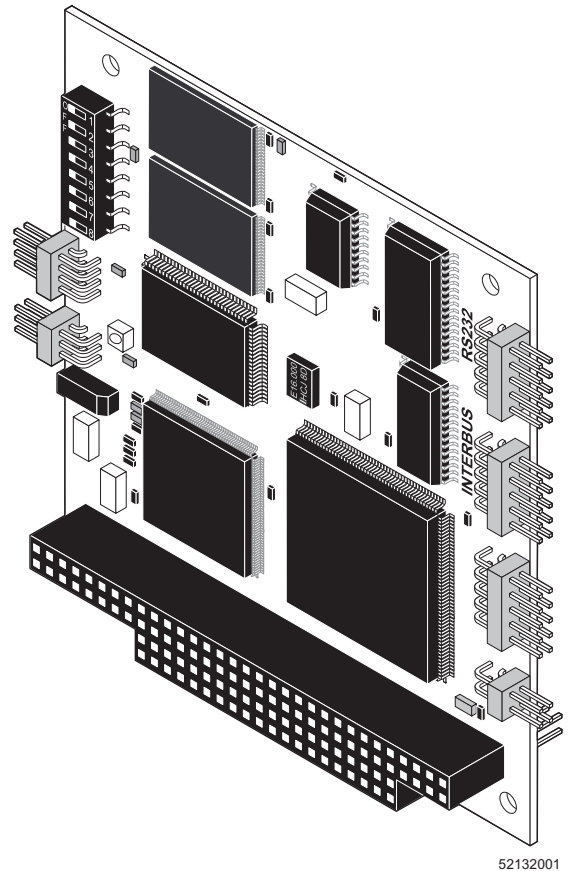
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Figure 1   IBS PC 104 SC-T

The controller board has the following components:

1 DIP switches to set the board address

2 *Board Ready* LED (green)

3 PC/104 connector

4 INTERBUS remote bus interface

5 RS-232-Schnittstelle

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Figure 2   Layout of the IBS PC 104SC-T controller board

RS-232 Interface (10-pos. DIL Male Connector)

It is possible to use the INTERBUS diagnostics via the serial interface (RS-232) using IBS CMD SWT G4. In addition, the firmware of the controller board can be downloaded. In this way, it is possible to meet future system requirements by means of updates.

> The RS-232 interface is a 10-pos. DIL male connector. A flat-ribbon cable, which terminates with a standard occupied 9-pos. D-SUB female connector, is part of the optional IBS PC 104 SC CAB mounting set (Order No. 27 24 43 6). The connection to the PC is realized via the RS-232 cable IBS PRG CAB (Order No. 28 06 86 2).
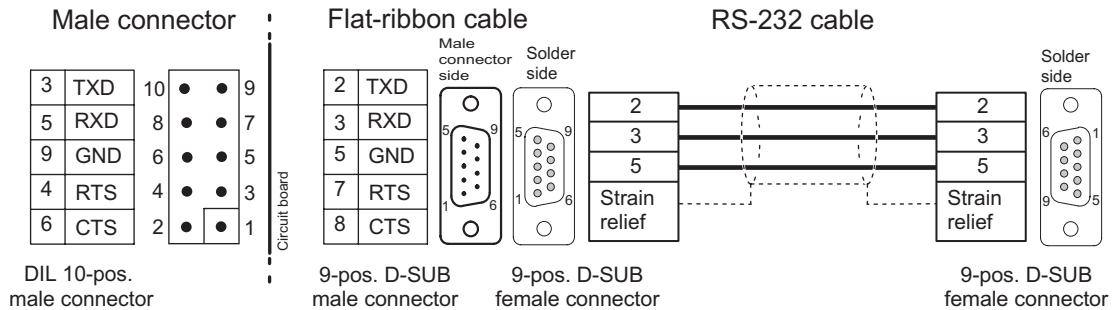

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Figure 3   RS-232 interface and cable for the connection with a PC

Remote Bus Interface

The remote bus interface connects the controller board with the INTERBUS devices. The interface of the printed circuit board has been designed as an angled 10-pos. DIL male connector. A preassembled flat-ribbon cable, which terminates with a standard 9-pos. D-SUB female connector, is part of the optional mounting set IBS PC 104 SC CAB (Order No. 27 24 43 6).
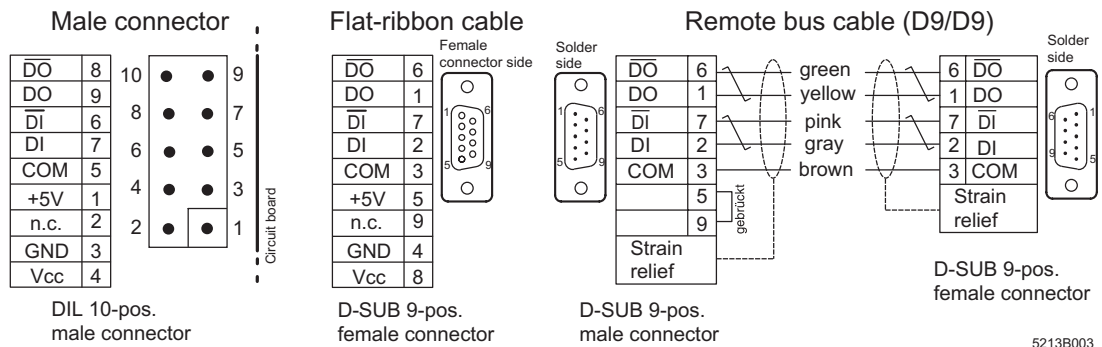

Figure 4   Remote bus interface and example of a remote bus cable (cable type D9/D9)

Programming

Individual applications are created with the support of the corresponding drivers. These drivers are available for commonly used operating systems and programming languages. The drivers execute write and read operations on the MPM and the I/O addresses.

Operating System	Driver
DOS	TSR program
Windows® 95/98	Virtual Device Driver (VxD)
Windows® NT 4.0	Kernel Mode Driver
Windows® 2000	WDM driver

Use the device driver development kit (order designation IBS PC DEV KIT G4, order no. 28 36 17 5) to create drivers for other operating systems.

Watchdog for Host Monitoring

On the controller board is a watchdog circuit that you can use for monitoring your PC program (PC system crash, program runtime error). When the watchdog is triggered, the INTERBUS system is set to a defined state (reset of all outputs).

User Interfaces

User interfaces are available for the following operating systems:

Operating System	DDI	HLI	OPC
DOS	X	X	
Windows® 95/98	X	X	
Windows® NT 4.0	X	X	X
Windows® 2000	X	X	X

Device Driver Interface (DDI)

The Device Driver Interface (DDI) is already installed with the drivers, providing the user with the basic functions for accessing the controller board.

High-Level Language Interface (HLI)

The High-Level Language Interface (HLI) can be used to enable easy development of control programs in a high-level language. It connects to the Device Driver Interface (DDI).

Advantages of the High-Level Language Interface:

– Direct configuration with CMD
– Operating system and hardware-independent access to INTERBUS
– Supports many programming languages
– Fast and easy data exchange using variable names
– Integrated bus and error management
– Identical access to all controller boards (IBS ... SC)
– Automatic PCP communication establishment and monitoring

HLI supports the following programming languages:

|	MS DOS	WIN 95/98	WIN NT 4.0	WIN 2000
Microsoft C/C++	X	X	X	X
Borland C/C++ (or compatible)	X	X	X	X
Microsoft VB 4.0 (or higher)		X	X	X
Borland Delphi 2.0 (or higher)		X	X	X

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INTERBUS OPC Server

It is also possible to use an OPC server (Designation IBS OPC SERVER, Order No. 27 29 12 7) as a high-level language interface or as an interface to any visualization system. The OPC server makes it possible to access INTERBUS data under Windows NT 2000 via a standardized software interface.

> For further information please refer to the OPC server data sheet.

Comparison of HLI and OPC

Figure 5   Comparison of HLI and OPC
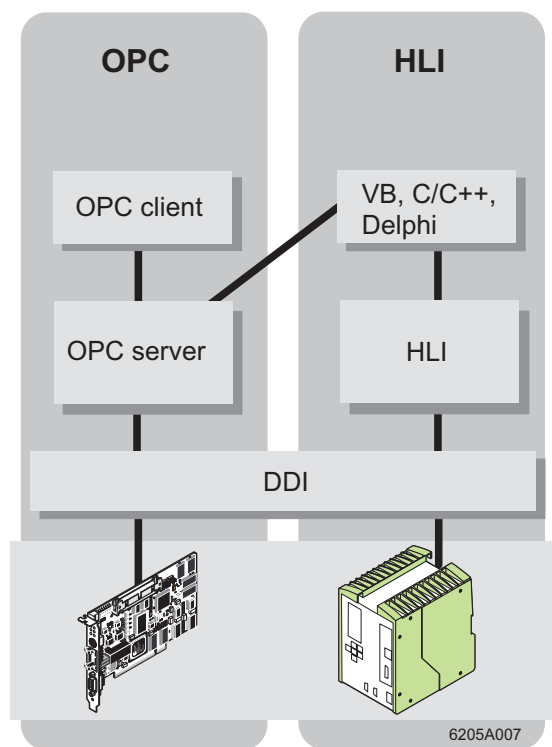
High-Level Language Interface:

– Windows 32 bits

– Fast data exchange

– High-level language programming

OPC server:

– Windows NT 4.0/Windows 2000

– Network-wide data exchange

– Worldwide standard according OPC DA 2 (high-level language interface and interface to almost all visualization packages)

Technical Data

Up-to-date information can be found on the Internet at www.phoenixcontact.com.

General Data	
Order Designation	IBS PC 104 SC-T
Order No.	27 21 70 1
Dimensions	90 mm x 96 mm (3.543 in. x 3.780 in.)

Power Supply	
$V_{S, controller}$ (PC supply)	5 V DC ±5%
Power consumption	Approximately 2 W, typical

Host Interface	
Connection method	PC/104 connector
Bus system	ISA PC AT according to IEEE P996
Data width	8 bits for I/O access 8 bits or 16 bits for memory access
Address area	8 addresses in the I/O channel 4 kbytes in the memory address area
Interrupts	IRQ 3, 5, 7, 9(2), 10, 11, 12, 15

Remote Bus Interface	
Connection method	10-pos. DIL male connector Connection cable to 9-pos. D-SUB female connector as an accessory (mounting set)
Interface type	RS-422
Electrical isolation	No

Diagnostic Interface	
Connection method	10-pos. DIL male connector Connection cable to 9-pos. D-SUB male connector as an accessory (mounting set)
Interface type	RS-232
Electrical isolation	No

Environmental Conditions	
Temperature (according to EN 60204-1)	Operation: 0 °C to 70 °C (32 °F to 158 °F), storage and transport: -25 °C to 75 °C (-13 °F to 167 °F)
Humidity (according to EN 60204-1)	Storage and operation: 75% on average, 85% occasionally (DIN 40040); no condensation
Air pressure	Operation: 860 hPa to 1 080 hPa (up to 2 000 m [4,921.26 ft.] above sea level)
	Storage and transport: 660 hPa to 1,080 hPa (up to 3,500 m [11,48 ft.] above sea level)
Vibration	1.5g, criterion 1 according to IEC 68-2-6

Conformance With EMC Directive 89/336/EEC		
Noise Immunity Test According to EN 50082-2		
Electrostatic discharge (ESD)	EN 61000-4-2 IEC 61000-4-2: 1995	Criterion B 4 kV contact discharge 8 kV air discharge
Electromagnetic fields	EN 61000-4-3 IEC 61000-4-3: 1996	Criterion A Field strength: 10 V/m
Fast transients (burst)	EN 61000-4-4/ IEC 61000-4-4: 1995	Criterion B Signal/data lines: 2 kV
Surge test	EN 61000-4-5 IEC 61000-4-5: 1995	Criterion B Signal/data lines: 1 kV (external protection required, e.g., Datatrab D-UFB-IB-S-RBO Order No. 27 48 36 0)
Conducted interference	EN 61000-4-6 IEC 61000-4-6: 1996	Criterion A Test voltage 10 V
Noise Emission Test According to EN 55011 (Industrial Area)		
Emitted interference	EN 55011	Class A

Ordering Data

Description	Order Designation	Order No.
Controller board	IBS PC 104 SC-T	27 21 70 1
System package with controller board, mounting set, user manual including driver software, and CMD software	IBS PC 104 SC SYSKIT	27 24 39 7
Controller board mounting set including the flat-ribbon cable for the INTERBUS interface and the RS-232 interface as well as the necessary spacing bolts with screws, spring washers and nuts.	IBS PC 104 SC-CAB	27 24 43 6
RS-232 cable, 3 m (9.84 ft.) in length	IBS PRG CAB	28 06 86 2
CD-ROM with documentation in German and English, HLI and driver	CD IBS ISA SC	On request
User manual for the controller board including HLI and the driver software for MS DOS, Windows 95/98, Windows NT 4.0, and Windows 2000	IBS PC 104 SC UM E	27 24 41 0
"Configuring and Installing INTERBUS" User Manual	IBS SYS PRO INST UM E	27 43 80 2
CMD operating software	IBS CMD SWT G4	27 21 43 9
INTERBUS OPC server (DA 2.04)	IBS OPC SERVER	27 29 12 7

MS-DOS, Windows 95, Windows 98, Windows NT, and Windows 2000 are trademarks of the Microsoft Corporation.

You will find all drivers, the HLI, the INTERBUS OPC server (demo version), and the complete documentation under www.phoenixcontact.com. They can be downloaded free of charge.

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