IBS OPC SERVER Version 2.1x

INTERBUS OPC Server for Data Exchange Between Distributed INTERBUS Networks and Visualization Systems

OLE for Process Control

Data Sheet

01/2005

Product Description

The INTERBUS OPC server for Windows NT, Windows 2000 and Windows XP enables network-wide communication between distributed INTERBUS networks and visualization systems (according to the client/server principle).

Data is exchanged either via direct memory access (MPM), serial interface (V.24) or Ethernet (TCP/IP).

Features

– Supports OPC standard functions as well as all optional interfaces according to the OPC DA specifications 2.04 and 1.0a
– Supports several controller boards simultaneously
– Network compatibility (remote server)
– Automatic data acceptance from the programming and configuration tools
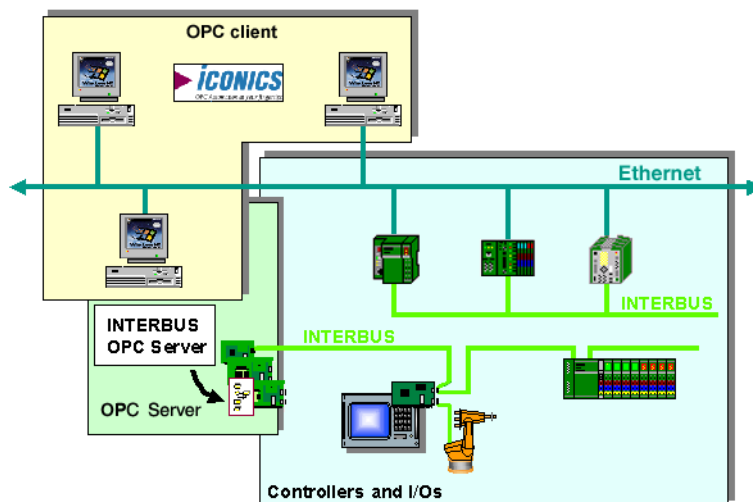– Option for specifying update times
– Integrated OPC test client

Figure 1   INTERBUS OPC server application

For detailed information on the IBS OPC SERVER, please refer to the relevant online help.

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OPC - General Description

OPC (OLE for process control) is a flexible solution for use of standard automation products in the Windows environment.

The introduction of the standard OPC interface enables easy and standardized data exchange between automation devices and PC applications such as visualization systems and office applications.

From a technical point of view OPC is designed according to an object-oriented client/server principle, which enables data exchange between different software components. Object interfaces describe the server objects. Their functions can be accessed by the client.

The OPC server interfaces are always the same, independent of the system (fieldbus, control system) used by the OPC server. In this way the client and server applications can be developed independently of one another by means of the OPC specification.

Manufacturers of hardware components map their fieldbus or control system in an OPC server. Software providers use the OPC interface as a client application. The OPC client always sees and may access the same interface with defined objects.

The OPC specification defines the OPC server objects (items) with the associated attributes and methods visible from outside. Items may be simple variables or data structures.

OPC Access Mechanisms

Access to an individual item is not provided in the OPC specification. An item must always belong to a group in order for access to be granted. A group may comprise several items and an item may also belong to more than one group. The client communicates with the server via the defined groups. Synchronous and asynchronous access can be enabled. In the event of synchronous access, the write/read function is only disabled after the process has been completed. Asynchronous calls simply order the jobs in a queue on the server, and then immediately return to the client.
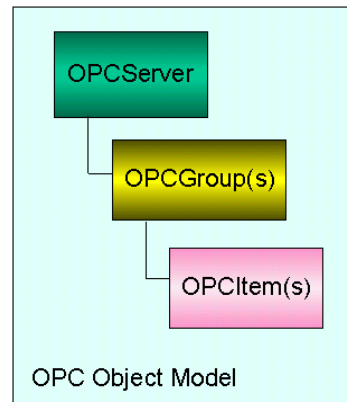

Figure 2   OPC object model

OPC Interfaces

In addition to the standard functions all optional interfaces are implemented in the INTERBUS OPC server.

All items known in the server can be directly read using the browse interface. This saves manual work with regard to entering data and thus avoids input errors.

The OPC server provides two interface types for the high-level language programmer:

–   The custom interface can be used for direct calling of the server function by the client and is suitable for programming languages like C or C++ with function pointer support.

–   The automation interface enables clients, using script languages like Visual Basic or Delphi, to call the server functions.

Selecting the Items (Variables)

The INTERBUS OPC server can be used to access the following data:

–   INTERBUS process data
    The IN and OUT process data of the INTERBUS controller board can be directly read from the OPC server.

–   CSV variables
    Access to selected variables from the PC WorX application program.

–   Directly addressed variables
    Select this option to access all variables, which are at direct addresses on the control system or computer.
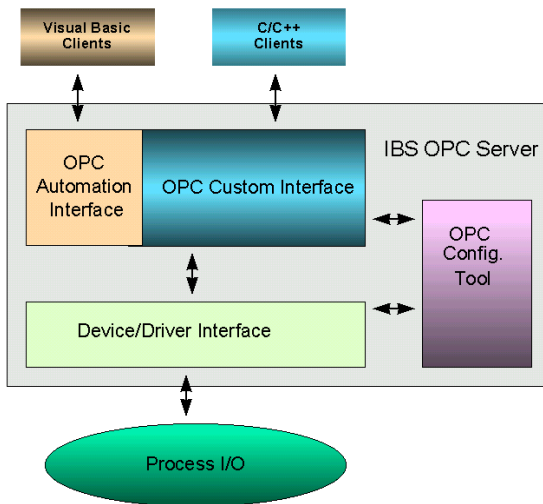

Figure 3   INTERBUS OPC server interfaces

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Technical Data

General
The OPC interface supports all interfaces of the OPC DA specifications 2.04 and 1.0a including the optional interfaces.

Hardware Requirements	
PC	IBM-compatible PC
CPU	Pentium II 400 MHz or higher
Main memory	256 MB
CD-ROM drive	Yes
Interfaces	Serial (COM1 ... COM4)
Input devices	Keyboard, mouse

Supported Controller Boards	Order Designation	Order No.	Remark
Can be programmed in high-level language with Ethernet interface	FL IL 24 BK	28 31 05 7	
	FL IL 24 BK-PAC	28 62 31 4	
	FL IL 24 BK-B	28 33 00 0	
	FL IL 24 BK-B-PAC	28 62 32 7	
	FL IBS SC/I-T	28 31 06 0	
	IBS 24 ETH DSC/I-T	28 31 06 0	
Can be programmed in high-level language with PCI interface	IBS PCI SC/I-T	27 25 26 0	
	IBS PCI SC RI/I-T	27 30 08 0	
	IBS PCI SC RI-LK	27 30 18 7	
Can be programmed in high-level language with ISA interface	IBS PC ISA SC/I-T	27 19 23 4	
	IBS ISA RI/I-T	27 23 07 1	
Can be programmed in high-level language with PC/104 interface	IBS PC 104 SC-T	27 21 70 1	
Can be programmed in high-level language with PCCARD interface	IBS PCCARD SC/I-T	27 24 87 6	
Can be programmed according to IEC 61131-3 with Ethernet interface	RFC 430 ETH-IB	27 30 19 0	With PC WORX 3.x from FW 4.6x
	RFC 450 ETH-IB	27 30 20 0	
	RFC 430 ETH-IB	27 30 19 0	With IBS PCWORX 2.x
	RFC 450 ETH-IB	27 30 20 0	
Can be programmed according to IEC 61131-3 with PCI interface	FC 200 PCI	27 30 66 6	With PC WORX 3.x
	FC 350 PCI ETH	27 30 84 4	

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Supported Controller Boards	Order Designation	Order No.	Remark
Can be programmed according to IEC 61131-3 with ISA interface	IBS ISA FC/I-T	27 22 02 7	With IBS PCWORX 2.x
	IBS ISA FC/486DX/I-T	27 22 08 5	With IBS PCWORX 2.x
Inline Controllers programmable according to IEC 61131-3	ILC 200 IB	27 29 80 0	With PC WORX 3.x from FW 4.6x
	ILC 200 IB-PAC	28 62 28 8	
	ILC 200 UNI	27 30 90 9	With PC WORX 3.x
	ILC 200 UNI-PAC	28 62 29 1	
	ILC 200 IB	27 29 80 0	With IBS PCWORX 2.x
	ILC 200 IB-PAC	28 62 28 8	
	ILC 350 ETH	27 37 20 3	With PC WORX 3.x

Software Requirements
Microsoft Windows® NT 4.0 with Service Pack ≥4, Microsoft Windows® 2000 or Microsoft Windows® XP

OPC Configuration	
OPC configurator of the IBS OPC SERVER version 2.1x	PC WORX 3.x
OPC configurator of the IBS OPC SERVER version 2.0x	IBS PCWORX 2.x, IBS CMD G4 4.5x (or higher)
Factory Line OPC configurator of the IBS OPC SERVER version 2.0x	FL IL 24 BK...

Supported Data Types
BOOL, BYTE, DINT, DWORD, INT, REAL, SINT, STRING, TIME, WORD, and ARRAY

Data Consistency	
CSV variables	Word-consistent transfer
Directly addressed variables and process data	Byte-consistent transfer

System Restrictions	
The hardware supported by the OPC server at the same time is limited to:	– 16 Ethernet connections – 4 controller boards in the same PC – 1 serial connection
– 3200 CSV variables, maximum, per controller (depending on the length of the variable names).	
– Up to 96 kbytes directly addressed variables (depending on the controller board).	
– Up to 8192 INTERBUS I/O variables (depending on the controller board).	

☞ The maximum number of items (variables, arrays, data items) for all simultaneously operated Controllers is limited to 20,000. As all variables are cyclically scanned, the entire data length must be shorter than 20 kbytes.

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General Marginal Conditions
–   1 OPC server per computer.
–   When using CSV variables the compiled PC WorX project must be on the same computer as the OPC server.
–   Arrays and structures are transmitted as byte streams.
–   Outputs can be read back.

Update Times of the OPC Server

Access Via CSV Variables	
1404 items (BOOL), Pentium II reference computer - 400 MHz:	
FC 200 PCI	600 ms
IBS ISA FC/486DX/I-T	400 ms
RFC 430 ETH-IB	400 ms

Access Via Directly Addressed Variables	
1500 items (all variables types, addressing in ascending order), Pentium II reference computer - 400 MHz:	
FC 200 PCI	100 ms
IBS ISA FC/486DX/I-T	100 ms
RFC 430 ETH-IB	200 ms

All directly addressed items which you register at the OPC server are grouped together in a block when the data is read or written. The OPC server determines the first and last address used. Each block is then completely read or written. It is recommended to assign the direct addresses of the variables without gaps as it is not important whether variables actually occupy the memory areas in the blocks when the blocks are formed. This reduces the memory area used and the transmission time.

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☞ The update times of the OPC server depend on different parameters and should therefore only be considered as guide values.

The main parameters are:

Local operation:
– CPU type (speed)
– CPU capacity
– Memory capacity

Network operation: When using Ethernet networks the update times depend on the network load. For example:
– 20% network load in Ethernet networks correspond to 100% capacity of the network bandwidth.
– In a typical configuration no more than 20 active network devices (i.e., simultaneous network activity) should be connected per Ethernet segment.
– For offloading individual segments, routers or switches should be taken into account when configuring the network.

Ordering Data

Description	Order Designation	Order No.
INTERBUS OPC server CD-ROM with German and English product version 2.1x and online documentation. Additional language versions are available on request.	IBS OPC SERVER	27 29 12 7

Phoenix Contact GmbH & Co. KG
Flachsmarktstr. 8
32825 Blomberg
Germany

☎ + 49 - (0) 52 35 - 3-00

📠 + 49 - (0) 52 35 - 3-4 12 00

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