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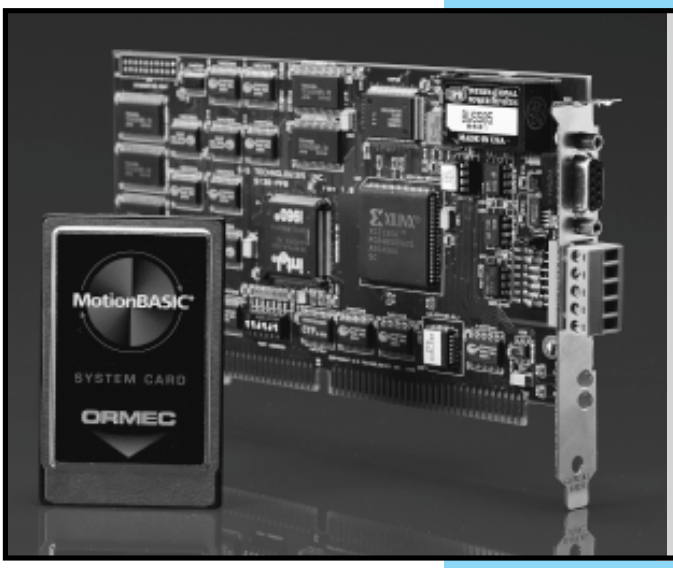
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Find the *Molex / Woodhead / SST 5136-PFB-PCI* at our website: *Click HERE*

ORMEC
Profibus DP Communications

ORMEC provides Profibus connectivity to the ORION® motion controllers by using a standard Profibus communications adapter and a MotionBASIC® Extension (MBX) to implement either Profibus DP Master or Slave communications.

Connectivity to the ORION® controller provides the machine developer with a modern approach to machine control networking using Profibus DP communications.



A Profibus communications adapter and MotionBASIC® Extension provide ORION® Profibus DP connectivity. Users can integrate ORION® with Siemens PLCs or PCs running HMI or SoftPLC programs, and use the open Profibus DP network for distributed I/O.

Features and Benefits

Profibus DP communications provides a number of key advantages:

❒ *Factory connectivity*: Profibus DP provides a convenient way to integrate ORION® with PLCs or PCs running HMI or soft PLC programs and using the open Profibus DP network for distributed I/O.

❒ *High-speed, cost-effective*: A standard Profibus adapter provides performance up to 12 Mbits/sec using a master-slave protocol with up to 126 nodes.

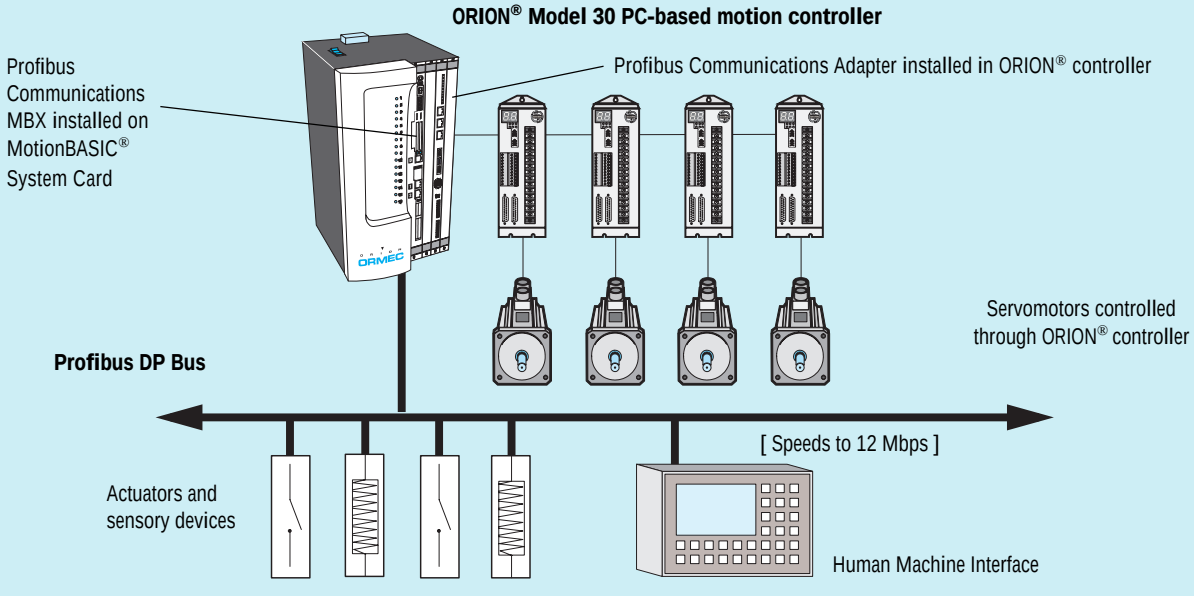
❒ *Minimal impact on MotionBASIC program execution speed*: Once initialized, Profibus communications between the Master and Slave(s) takes place as a background task controlled by a processor on the Profibus Adapter, minimizing application program complexity and workload on the ORION controller.

Overview

Profibus is a vendor-independent, open fieldbus standard for a wide range of applications in manufacturing.

Vendor independence and openness are guaranteed by the Profibus standard EN 50170. With Profibus, a developer provides uniformity between devices of different manufacturers by using a fast and efficient communications protocol. Profibus can be used for both high-speed time critical data transmission and extensive complex communication tasks without interface modifications.

Profibus DP - Field level machine control bus architecture using the ORION® motion controller



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High-speed, time-critical data transmission at the fieldbus level is defined by the Profibus DP specification.

Profibus DP Bus Interface

The combination of a Profibus Communications Adapter and Profibus MBXs gives Profibus DP Master or Slave functionality to an ORION® motion controller.

Slaves on a Profibus DP bus appear as I/O drops with up to 244 bytes of inputs and 244 bytes of outputs each. The inputs and outputs can be divided between bit data and 16-bit word data. The word data is used to pass system parameter and status information between the Slave and a Profibus DP Master.

Profibus DP Architecture

Profibus DP defines the technical and functional characteristics of a serial Fieldbus which interconnects distributed digital field devices in the low (sensor/ actuator level) up to the medium (cell level) performance range. The basic system architecture consists of one or more master devices and one or more slave devices. Any master device can control the bus. When it has the right to access the bus, a master will transfer messages without waiting for a remote request.

Slave devices are peripheral devices that have no bus access rights - i.e. they may only acknowledge received messages or, at the request of a master, transmit messages.

Profibus DP Configuration

A network configuration program and device configuration file (*.GSD) are supplied with the Profibus adapter. The device configuration file is used by the network configuration program to create the configuration data file that is read by the DP Master. The device configuration file tells the network configuration program what the capabilities of the node are and whether the user can choose how much data to transfer. In the case of a simple solenoid bank or proximity sensor, the amount of data available from the node is predetermined and fixed. In the case of a configurable node the user can program the amount of data the node is able to exchange.

In either case, each slave device needs a configuration data file to use at initialization time to know how the node will present its data on the network and how many inputs and outputs each node will have.

The Profibus Communications adapter used with ORION as a DP Slave provides this type of configurable node. Network configuration file (netslv.ncf) and a slave configuration file (slave.scf), modified by the user, tell the Profibus DP Slave MBX driver how to split up 244 bytes of input data and 244 bytes of output data between bits and words, how many bytes of inputs and outputs are being transferred, its node address and the baud rate of the card. The PFB.DUMP commands and PFBLOG.TXT file verify installation.

The Profibus Communications adapter used with an ORION as a DP Master uses the configuration data file to initialize all the configurable nodes on the network at startup. The configuration data file also tells the Profibus DP Master MBX how much of each data type to read from each DP Slave node.

MotionBASIC® Extensions for Profibus DP Master

❑ **DATA AND I/O ACCESS STATEMENTS**

Digital Data

DPM.DIO@ (bit#)	read or write value of a single bit of data from the table

Analog Data

DPM.AIO@ (word#)	read or write a word value (8 or 16 bits wide) of data local to the table

❑ **LOCAL STATUS QUERY STATEMENTS**

Programming Level for error handling and recovery control

DPM.PORTOPEN@	flag - indicates adapter firmware driver is installed
DPM.CTR@	23 counters recording the real-time DP network activity and statistics
DPM.SLVERROR@	indicates 11 possible error conditions detected during bus initialization
DPM.STATUS@	non-zero value indicating condition of adapter after powerup

❑ **BUS STATUS QUERY COMMANDS and INFORMATION**

User Level for maintenance and system level debugging

DPM.DUMP	print current setting of Profibus adapter to MotionDesk screen
DPM.DUMP DPS	display the I/O configuration file to MotionDesk screen
DPMLOG.TXT	text file written to System Card during the bootup sequence

❑ **PROFIBUS MASTER HARDWARE CONTROL STATEMENTS**

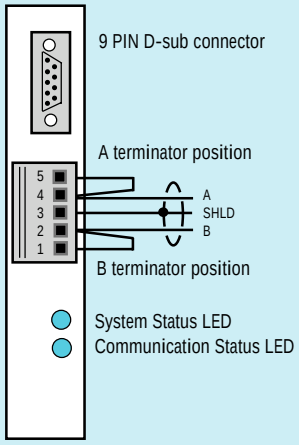
DPM.INIT	routine to initalize the Profibus adapter driver
DPM.RESETCTR	reset DP network counters
DPM.VER@	floating point number indicating driver version installed in adapter

ORDERING GUIDE

MotionBASIC® Extension (MBX) and Adapter for Profibus Communications

ORN-PFB	Profibus Communications Adapter board.
MBX-DPM-5	Profibus DP Master communications MBX provided on a 3.5" disk (MBX-UPG) with all MotionBASIC® Extensions. Also available via free download from the ORMEC User website. *Requires 500 MotionCredits in the ORION® hardware key to enable this software.*
MBX-PFB-5	Profibus DP Slave communications MBX provided on a 3.5" disk (MBX-UPG) with all MotionBASIC® Extensions. Also available via free download from the ORMEC User website. *Requires 300 MotionCredits in the ORION® hardware key to enable this software.*

Profibus Adapter Connectors



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Hardware Interface

The Profibus communications MBX uses the adapter installed in the ORION's ISA bus backplane. Two LEDs on the card provide system status and bus network status indications. The bus interface is a 9-pin D-sub connector. A Siemens 6GK1500-0FC00 (or equivalent) is included with the Profibus Adapter. No special tools or soldering is required to attach the Profibus Cable to the Siemens 9-pin connector.

Physical Layer

The recommended cable is Belden Profibus Cable 3079A. A Profibus network must be terminated at devices located at each end. Siemens 9-pin cable connectors have switches in their shell to turn the terminator on and off. The default bus transfer rate is set at 12M bps. Scan rates are dependent on the total number of inputs and outputs on all nodes of the bus.

Profibus DP Slave Installation

To install Profibus DP Slave communications in an ORION® motion controller, simply:

- ❒ insert the communications adapter and connect the physical communications link;
- ❒ install the Profibus DP Slave MBX (MBX-PFB-5) on to the MotionBASIC® System (PCC-SYS5) Card using the Upgrade Director in MotionDesk.
- ❒ modify the network configuration file (*.ncf) and a slave configuration file (*.scf)
- ❒ add the configuration files to the MotionDesk Project and Synch
- ❒ reset the ORION controller and test the interface.

MotionBASIC® Extensions for Profibus DP Slave

❑ DATA AND I/O ACCESS STATEMENTS

Input Data

PFB.I@ (bit#)	read value of a single bit of data from the table.
PFB.AI@ (word#)	read a word value (16 bits wide) of any data from the table.

Output Data

PFB.Q@ (bit#)	write value of a single bit of data to the table
PFB.AQ@ (word#)	write a word value (16 bits wide) of data local to the table

❑ LOCAL STATUS QUERY STATEMENTS

Programming Level for error handling and recovery control

PFB.PORTOPEN@	flag - indicates adapter firmware driver is installed
PFB.CFG@	flag - DP Master received configuration file, slave can access data
PFB.CTR@ (y)	23 counters recording the real-time DP network activity and statistics
PFB.SLVERROR@	indicates 8 possible error conditions detected during bus initialization
PFB.STATUS@	non-zero value indicating condition of adapter after powerup

❑ BUS STATUS QUERY COMMANDS and INFORMATION

User Level for maintenance and system level debugging

PFB.DUMP	print current setting of Profibus adapter to MotionDesk screen
PFB.DUMP DPS	display the I/O configuration file to MotionDesk screen
PFBLOG.TXT	text file written to System Card during the bootup sequence

❑ ORN-PFB HARDWARE CONTROL STATEMENTS

PFB.INIT	routine to initalize the Profibus adapter driver
PFB.RESETCTR	reset DP network counters
PFB.VER@	floating point number indicating driver version installed in adapter

Profibus DP Master Installation

To install Profibus DP Slave communications in an ORION® motion controller, simply:

- ❒ insert the communications adapter and connect the physical communications link;
- ❒ install the Profibus DP Master MBX (MBX-DPM-5) on to the MotionBASIC® System (PCC-SYS5) Card using the Upgrade Director in MotionDesk.
- ❒ create the network configuration data file (config.bss) using the network configuration program included with the Profibus Adapter.
- ❒ add the configuration file to the MotionDesk Project and synchronize the project
- ❒ reset the ORION controller and test the interface.

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