

Profibus Master

Protocol Driver Manual

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1.00	First public release	12/19/00
2.00	Updated for hardware version 2.00	03/13/01

Related Documents & Reference Materials

Several resources are available to assist with the configuration and support of the ProLinx Communication Gateways, Inc. modules. The following files are available off the web site:

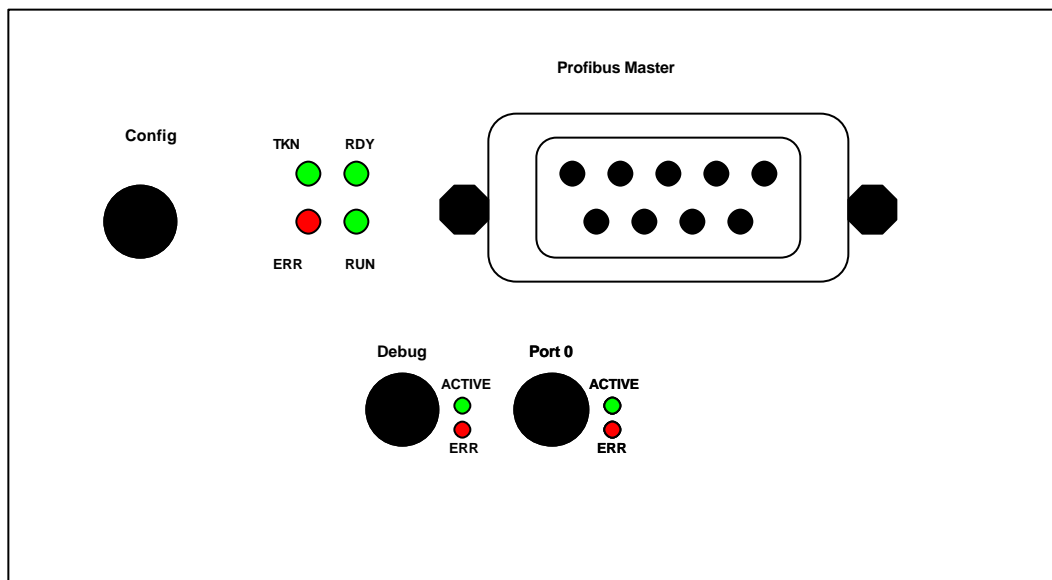
Debug/Configuration Port User Manual	www.prolinxgateways.com/downloads	
	Debug_Port_Manual.pdf	Debug/Config Port User Manual

1 Functional Overview

The Profibus Master protocol driver exists as a single port implementation. The driver can be configured as a Class 1 Profibus Master to interface with other Profibus slave devices. The unit is also used for configuration of the nodes on the Profibus network. It provides access to both standard as well as extended diagnostic information and freeze/sync capability. The Profibus master port can be used to continuously interface with Profibus slave devices over a serial communication interface (RS-485).

1.1 Profibus Master Port

The ProLinux module is capable of supporting the Profibus Master protocol as a Master on either a Mono-Master or Multi-Master network.

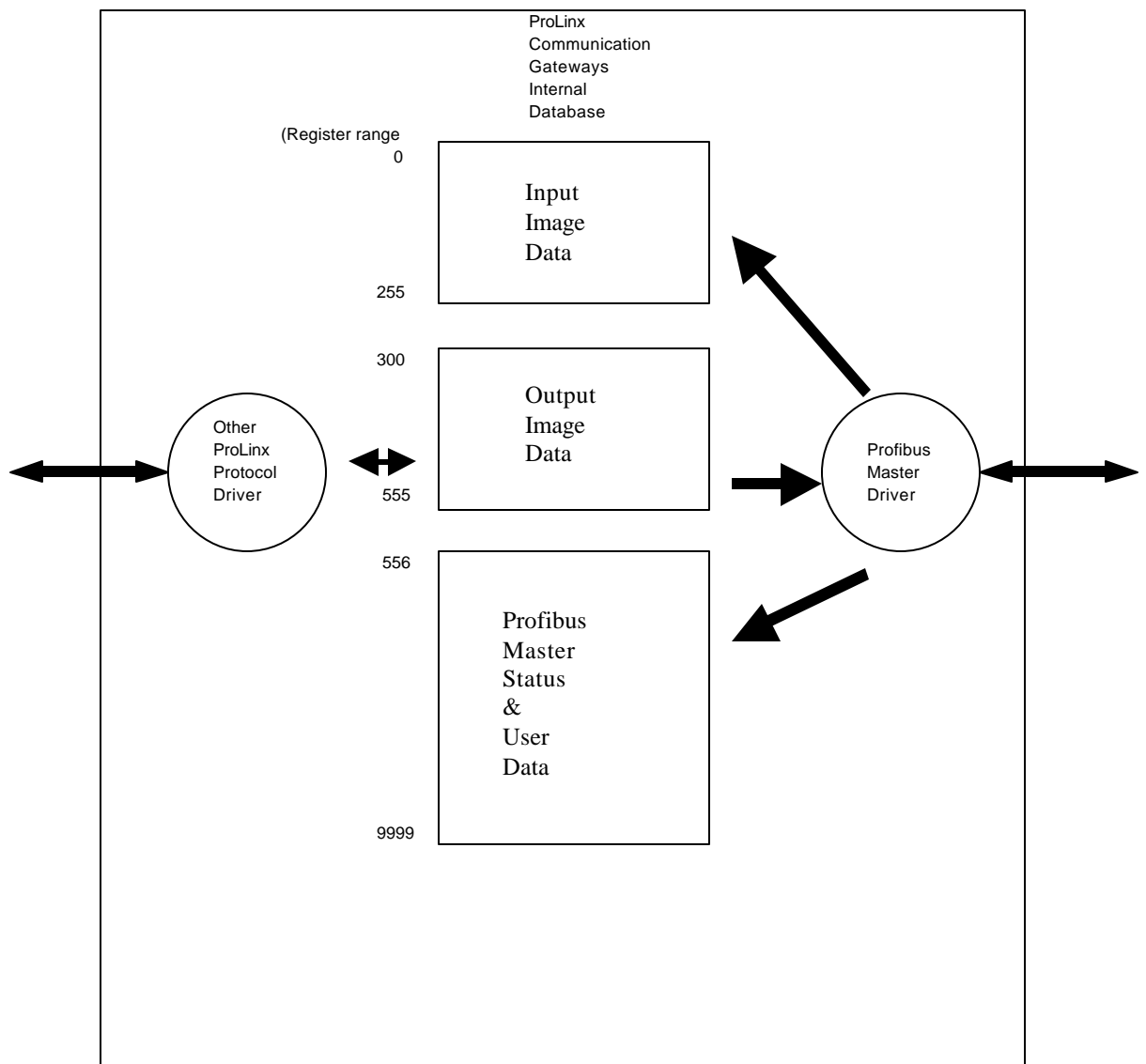


The relationship between the port labeling on the front of the ProLinux module and the application is as follows:

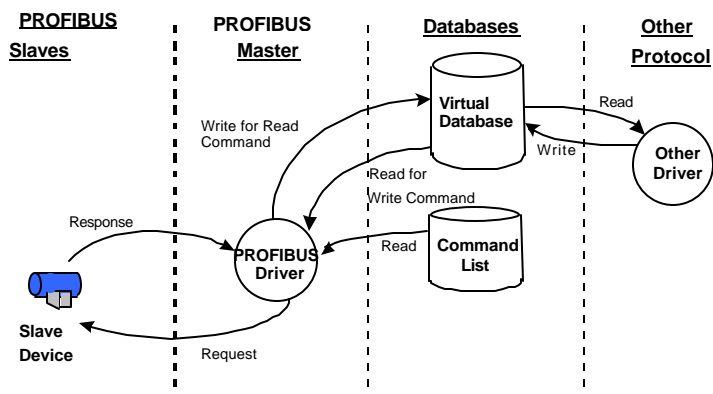
Port Label	Function
Debug	Debug/Configuration
Port 0	Communication Port 0
Config	Profibus Master Configuration Port
Profibus Master	Profibus Master Port

1.2 Module Internal Database

Central to the functionality of the module is the internal database. This database is shared between all the ports on the module and is used as a conduit to pass information from one device on one network to one or more devices on another network. This permits data from devices on one communication port/network to be viewed and controlled by devices on another port/network. In addition to data from the master port, status and error information generated by the module can also be mapped into the internal database.



1.2.1 Profibus Master Port Access to Database



The Master driver uses the database in two ways:

1. A read command issued to a slave device by the master driver will return the slave data into the internal database
2. A write command issued to a slave device by the master driver uses the data in the internal database to write to the slave device

In addition to data from the master port, status and error information generated by the module can also be mapped into the internal database.

2 Configuration

2.1 Configuring the Profibus Network

Configuration of the Profibus network is accomplished using the ProLinx SyCon Configuration software. Please refer to the ProLinx SyCon Manual in Appendix A for installation and configuration of Profibus master/s and slave/s on the network.

3 Port Physical and Protocol Specifications

3.1 Profibus Master Port Specifications

Type	Specifications
General Parameters	
Internal Database	Up to 10000 registers (words) available. Less may be available in some protocol combinations
Communication parameters	Baud Rate: 9.6 kbit/s – 12 Mbit/s
Profibus Master	
Command List	Read Diag Global Cmd Read Cntrs Reset Cntrs
Status Data	Error codes available on an individual command basis. In addition, a slave status list is maintained per active Profibus Master port.
Profibus Master	
Node address	0 - 125 – software selectable.
Status Data	Error codes, counters and port status available per configured slave on the network.

3.2 Serial Port Specifications

Type	Specifications
Serial Ports	
Serial Port Cables (DB-9M Connector)	One DIN to DB-9M cable included per configurable serial port
Config Port	DB-9M connector
Serial Port Isolation	2500V RMS port-to-port isolation per UL 1577. 3000V DC min. port to ground and port to logic power isolation.
Serial Port Protection	RS485/422 port interface lines TVS diode protected at +/- 27V standoff voltage. RS232 port interface lines fault protected to +/- 36V power on, +/- 40V power off.

4 PDPM Protocol Specific Configuration

The following is excerpted from a configuration file showing typical examples of the Profibus Master Port and Profibus Master Command sections of a CFG file for a PDPM port. Shipped with each unit (or available off the web) is a default configuration file that can easily form the basis for a working solution. This file can either be downloaded off the web or be uploaded from the unit.

```
# PBMMCM.CFG
# $Id: pbmmcm.cfg,v 1.2 2000/10/07 19:57:15 root Exp root $
# $Date: 2000/10/07 19:57:15 $
#
# Example configuration file for the 4104-PDPM-MCM communication module.
#
# COMPANY   : ProLinx Communication Gateways, Inc.
# DATE      :
# LOCATION  :
#
# This is the data area for setting the Profibus Master parameters

[Profibus Master]
Swap Input Bytes      :      0 #0=No, 1=Swap bytes in input image
Swap Output Bytes     :      0 #0=No, 1=Swap bytes in output image
Comm Failure Mode     :      1 #0=x-fer on comm fail, 1=no x-fer on fail
Error/Status Pointer  :    700 #Location of Profibus status data
Error/Status Frequency :   1000 #Update frequency of Profibus status update
Command Count         :      0 #0-200 Profibus commands for module
```


5 CFG File: [PROFIBUS MASTER] Section

[SECTION]/Item	Range	Description
[PROFIBUS MASTER]		Configuration Header for the Profibus Master.
Error/Status Pointer:	-1 to 9956	Starting register location in database for the Profibus error/status table. If a value of -1 is entered; the error/status data will not be placed in the database. All other valid values determine the starting location of the data.
Error/Status Frequency:	0 to 65535	Program cycle count to be used to delay the writing of the Profibus error/status data to the database. A value of 0 will disable writing of this data. All other values will delay the write operation until the specified number of program cycles has occurred.
Swap Input Bytes:	0 or 1	This parameter specifies if the data in the input data area of the module is to be byte swapped. If the order of the bytes in the words stored in the database is not correct, use this option. A value of 1 is used to have the module's program swap the bytes in each word. A value of 0 indicates no byte swapping will occur.
Swap Output Bytes:	0 or 1	This parameter specifies if the data in the output data area of the module is to be byte swapped. If the order of the bytes in the words stored in the database is not correct, use this option. A value of 1 is used to have the module's program swap the bytes in each word. A value of 0 indicates no byte swapping will occur.
Comm Failure Mode:	0 or 1	This parameter is used to set the data transfer mode of the module's Profibus input image to the internal database when a communication failure on the Profibus interface is detected. If the parameter is set to 0, the input image will continue to be transferred. If the parameter is set to 1, the input image will not be transferred and the last values will be retained.
Command Count:	0 to 200	This parameter specifies the number of commands to be processed on the module.

6 CFG File: [PROFIBUS MASTER COMMANDS] Section

The [PROFIBUS COMMANDS] section of the CFG file is used to set the Profibus master port command list. This list is used to poll slave devices attached to a master port. The module supports three commands. This permits the module to interface with a wide variety of Profibus slave devices.

The command list is formatted differently than the other sections of the configuration file. Commands are present in a block between the labels **START** and **END**. These labels are used to inform the program where the list resides. The module's program will parse all commands after the **START** label until it reaches the **END** label or until the command count entered for the port is reached.

The format of each command in the list is the same with the content dependent on the operation to perform. The table below displays the format and list of Profibus Master functions supported:

Column #	1	2	3	4	5	6	7
Function Type	Enabled	Database Address	Register Count	Polling Interval	Node Address	Command Code	Data Length
Read Diag	1 or 2	0 to 9999	1 to 122	0 to 65535	0 to 126	66	32 or 106
Global Cmd	1 or 2	0 to 9999	0	0 to 65535	0 to 127	70	Group
Read Cntrs	1 or 2	0 to 9997	0	0 to 65535	0 to 126	254	1 to 40
Reset Cntrs	1 or 2	0	0	0 to 65535	0	254	0

An example of a command list section of the CFG file is displayed below:

[Profibus Master Commands]							
#	Database	Register	Poll	Command	Data		
# Enabled	Address	Count	Interval	Node	Code	Length	
START							
	1	600	10	0	3	66	32
	1	610	7	0	4	66	32
	2	620	0	10	3	254	2
	2	0	0	1200	0	254	0

Each parameter is discussed in detail in the following table:

Command Parameter	Description
66 – Read Diag	Execute a station diagnostic command to the specified node placing the response message at the Database Address specified but only using the number of registers entered in the Register Count field.
70 – Global Cmd	Execute global command using the value at the specified Database Address to the Node Address. The Data Length field is used to specify the Group Select parameter.
254 – Read Cntrs	If the Data Length parameter is set to zero, the command will reset the counters for all slaves. If the Data Length is specified, it represents the number of slaves to read the static counter data. The Node Address specifies the first slave node to consider in the request. The counter data returned is placed at the Database Address in the command.

COMMAND 70 CONTROL BYTE

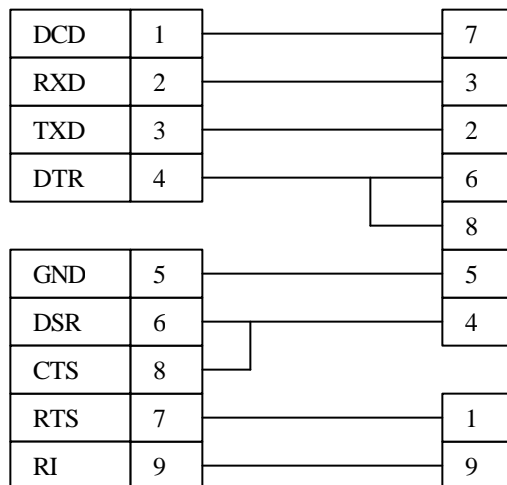
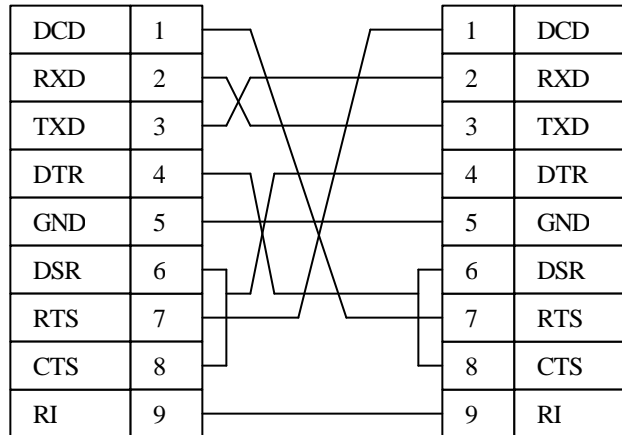
The Freeze and Sync commands are used for synchronization purposes. The Freeze command causes a slave to freeze its inputs and the Sync command causes a slave to hold the outputs.

BIT	DEFINITION
0	Reserved
1	Clear output data
2	Unfreeze input data
3	Freeze input data
4	Neutralize the sync command
5	Freeze output data until sync command is neutralized
6	Reserved
7	Reserved

BIT 2 OR 4	BIT 3 OR 5	DEFINITION
0	0	No function
0	1	Function will be activated (i.e. Freeze input data)
1	0	Function will be inactivated (i.e. Unfreeze input data)
1	1	Function will be inactivated (i.e. Unfreeze input data)

7 Communication Port Cables

The diagram below shows the Null-modem cable required for ProLinx SyCon configuration software to Profibus Master.

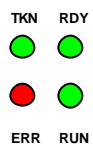


8 LED Indicators

Troubleshooting the operation of the Profibus Master ports can be performed using several methods.

The first and quickest is to scan the LEDs on the module to determine the existence and possible cause of a problem. This section provides insight into the operation of the Profibus Master Port status LEDs. Details on the module's other LEDs can be found in the product User Manual.

8.1 LEDs for the Profibus Master Port



LED	Color	Description
TKN - Token	Green On	Profibus Master owns token.
RDY – Ready	Off	Hardware error.
	Green On	Module OK.
	Green cyclic flash, approx. 1 Hz.	Flash only contains boot loader, no valid firmware stored in flash.
	Green cyclic flash, approx. 4 Hz.	Hardware or system error or firmware/configuration database download in progress.
ERR – Error	Red Off	No errors detected.
	Red On	Error on communication line. Shows if a bus error has occurred, e.g. a remote node was not found.
RUN - Run	Green On	Communication running.
	Green cyclic flash, approx. 4 Hz.	Ready for communication.
	Green acyclic flash	Configuration error or fatal error.

9 Profibus Master Error and Status Data

The second and most thorough troubleshooting method for debugging the operation of the PDPM driver (and the module in general) is the powerful Debug port on the module which provides much more complete access to the internal operation and status of the module. Accessing the Debug capabilities of the module is accomplished easily by connecting a PC to the Debug port and loading a terminal program. If using a module with hardware version 1, download PSTerm (see 'Module Configuration & Debug Port Manual'). If using hardware version 2 (indicated with a 'V2' sticker on the back of the module) any terminal program can be used.

9.1 Profibus Master: Error and Status Data

The Profibus Master Error and Status Data area is discussed in this section. The user is able to configure an Error/Status value, which locates a 44 word data block in the module's internal database. The Error Status Pointer value is set in the configuration file within the [PROFIBUS MASTER] section.

The data area is initialized with zeros whenever the module is initialized. This occurs during a cold-start (power-on), reset (reset push-button pressed) or a warm-boot operation (commanded or loading of new configuration). The format of this data area is displayed below:

WORD	DESCRIPTION
0	Module state (0= not running, 1=running)
1	Mailbox state (0=not in use, 1=in use)
2	Loop counter. This counter is incremented each time the Profibus master code is executed.
3	Data move counter. This counter is incremented each time data is transferred between the database and the modules dual-port RAM.
4	Mailbox counter. This counter is incremented each time a message is sent out from the mailbox.
5	Mailbox error counter. This counter is incremented each time an error is recognized by the mailbox task.
6	Global command counter. This counter is incremented each time a global command is executed.
7	Slave diagnostic counter. This counter is incremented each time a slave diagnostic message is executed.
8	Slave counter. This counter is incremented each time a slave static counter request is executed.
9	Device error (see device error table)
10	Master recognition (0=master module, <>0 on slave modules)
11	Data exchange mode (should be 0x2n).
12	Global bits. Bit 0=parameter error, bit 1=device branched into auto clear mode because of remote node error and bit 2= at least one remote node is not in data exchange mode or reports fatal error if any of them are set.
13	Master state. 0=Offline, 64=Stop, 128=Clear and 192=Operate.
14	Error remote address.
15	Error number.
16	Heavy bus error count.
17	Number of rejected Profibus telegrams.
18	Data exchange mode set (should be 1)
19	Bus cycle time set.

20 to 27	Remote node configured bits. One bit for each slave node (0-126). If bit set, slave is configured. Each word contains the bits for 16 slave units.
28 to 35	Remote node active state bits. One bit for each slave node (0-126). If bit set, slave is active. Each word contains the bits for 16 slave units.
36 to 43	Remote node diagnostic bits. One bit for each slave node (0-126). If bit set, slave has new diagnostic data available. Each word contains the bits for 16 slave units.

Refer to the following Error Codes section to interpret the status/error codes present in the data area.

9.1.1 Standard Profibus Slave Diagnostic Bytes

The diagnostic information consists of 6 bytes of standard diagnostic information plus any user-related diagnostic information. The standard information is shown in the tables below.

BYTE	DESCRIPTION
0	Station status 1
1	Station status 2
2	Station status 3
3	Master address
4	Ident number high
5	Ident number low

9.1.2 Byte 0 - Station Status 1 Bits

BIT	DESCRIPTION
0	Station not existent
1	Station not ready
2	Configuration fault
3	Extended diagnostic data present
4	Not supported
5	Invalid slave response
6	Parameter fault
7	Master lock

9.1.3 Byte 1 - Station Status 2 Bits

BIT	DESCRIPTION
0	Parameter request
1	Static diagnostic
2	Slave device
3	Watchdog on
4	Freeze mode
5	Sync mode
6	Reserved
7	Slave deactivated

9.1.4 Byte 2 - Station Status 3 Bits

BIT	DESCRIPTION
0	Reserved
1	Reserved
2	Reserved
3	Reserved
4	Reserved
5	Reserved
6	Reserved
7	Extended diagnostic overflow

9.1.5 Byte 3 – Master Address

This byte will show the address of the assigned Profibus master after parameterization. If there is an error during the parameterization process this byte will display the value FF (hexadecimal).

9.1.6 Byte 4 – Ident Number High

This byte shows the high byte of the specific Ident Number assigned to the module by the Profibus User Organization.

9.1.7 Byte 5 – Ident Number Low

This byte shows the low byte of the specific Ident Number assigned to the module by the Profibus User Organization.

9.1.8 Device Error Listing

ERROR	DESCRIPTION
0	No error
14	OS module, firmware download
50	RAM check not OK
53	FLASH PROM checksum not OK
100 to 107	Internal system error
200	Unknown interrupt received
201	Internal watchdog expired
202	Unexpected transmit interrupt from serial channel
203	Unexpected receive interrupt from serial channel
252	Firmware download or database download active
253	Bootstrap loader active, firmware not running

Appendix A

Overview – ProLinx SyCon Profibus Configurator

- **PROLINX SyCon** is a PROFIBUS-DP configurator

All devices are configured in one tool. PROLINX SyCon checks the dependencies between the devices. PROLINX SyCon only allows configurations that make sense. In case of doubts, PROLINX SyCon will give a warning.

- **PROLINX SyCon** documents the fieldbus system

After the configuration detailed documentation of the fieldbus network can be printed out. The details can be switched on/off. Documentation can be printed with details between the bus topology and the utmost detail of one device.

- **PROLINX SyCon** uses standardized configuration files

PROLINX SyCon supports standardized files containing information about all features and limitations of the slave device and uses these files for configuration.

- **PROLINX SyCon** is a diagnostic tool

After the configuration, PROLINX SyCon can be switched into a diagnostic mode. All status information of fieldbus devices can be watched. View diagnostic information, e.g. life list or slave diagnostic information on PROFIBUS. In case a slave is not operating correctly, it will be displayed in a different color.

9.2 System requirements

PROLINX SyCon requires:

A CD-ROM drive

486 or better CPU

20Mb of free hard disk space

Minimum 16 Mb RAM

A screen and graphics card capable of 800x600 resolution

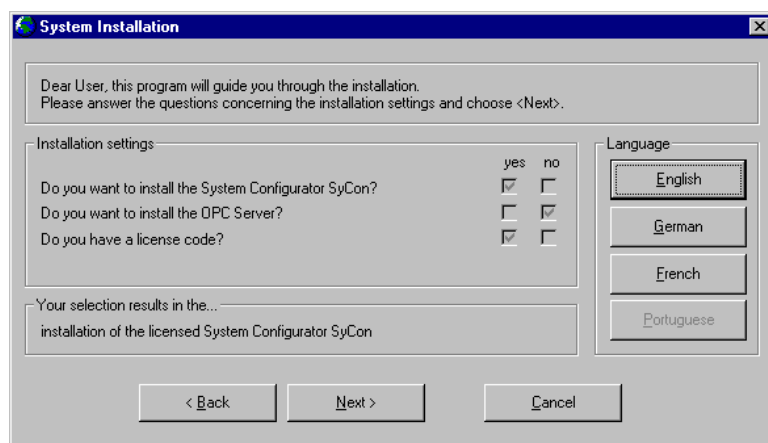
Windows 95, Windows 98, Win NT4 with Service Pack 3 or higher

For Windows 95, minimum Service Pack 1

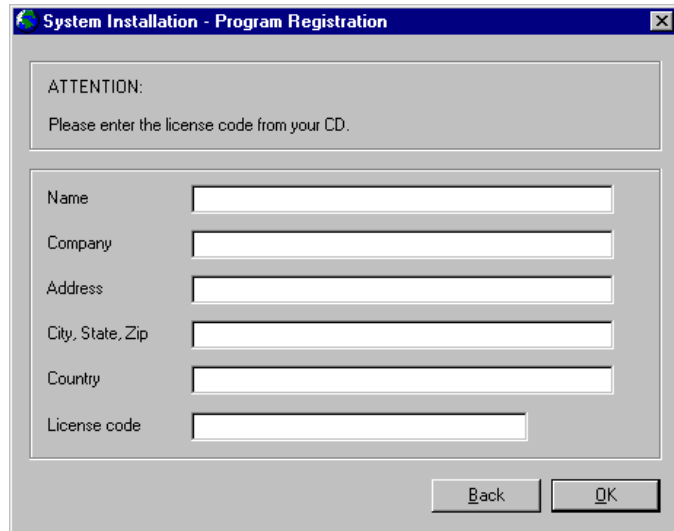
For Windows NT 4.0, minimum Service Pack 3

10 Installation

Close all active applications before starting the installation program, and begin the installation by launching the program file SETUP.EXE. The installation program will ask for components to install, answer with yes – no – yes, as is shown in the figure below. PROLINX SyCon does not use the OPC server, and a license number must be entered in order to finish the installation.



When the installation program asks about the license code, enter it together with company information.



The System Installation program will automatically launch the PROLINX SyCon installation program, and when it asks for which components to install, mark the **Configurator**, as well as the **CIF Device Driver**.

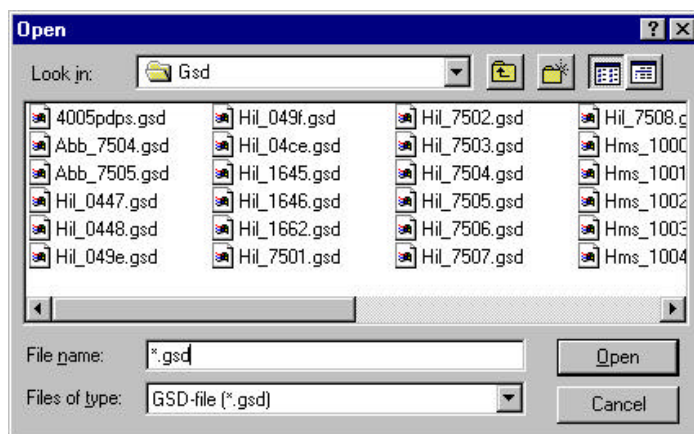
10.1 Available GSD Files

GSD (Electronical Data Sheet for the device) files are used to define the different PROFIBUS devices. The set of these files build the device database.

At program startup, PROLINX SyCon automatically reads in all GSD files that are in the **GSD** directory. Thus, for instance, device names are placed in an internal list. The device specific data is taken online directly from the GSD file during the configuration phase.

Should it be necessary to use a GSD file that is not included in the selection list during the configuration phase, it has to be copied into the GSD directory with the **File - Copy GSD** menu option. Another possibility to make a GSD file available in PROLINX SyCon online is to manually copy it with the windows explorer into the PROLINX SyCon GSD directory. Afterwards the reread command of all included GSD files has to be activated by using the menu **Settings - Path** and **OK** acknowledgement.

In the menu **Tools - GSD Viewer** all GSD files of the directory are shown.



11 Configuration of PROFIBUS with PROLINX SyCon

11.1 Basic Steps of Configuration

PROLINX SyCon configures the PROFIBUS system fast and successfully.

Generally follow these steps:

1. First create a new file. Select the menu item **File-New**. PROLINX SyCon will start the configuration mode and open the window with the bus line.
2. Insert the master you are defining on the bus.
3. Insert DP slaves and assign them to the master. Next step is to configure these DP slaves with the actual I/O modules, parameter data etc. Be sure the right addressing mode has been selected.
4. If using a multi-master network, check the dependencies/connections between the devices by selecting one master after the other as actual master to check your configuration.
5. Select the baud rate and bus parameters
6. Set up the device assignment that defines how PROLINX SyCon can communicate with the devices.
7. Save the configuration.
8. Select the port to be configured and perform the download process to all devices.
9. Connect the PROFIBUS cable to the device. Start the debug mode to check the communication.
10. Print out the documentation of the PROFIBUS system. If PROFIBUS is running, start with the installation of the application.

11.2 GSD Files

Each PROFIBUS-DP manufacturer uses standard device description files to define the PROFIBUS-DP device functionalities on the network. These definitions are called GSD files. The set of device description files (GSD files) build the device database.

PROLINX devices

The GSD files for PROLINX devices are already included in the delivery of the system configurator PROLINX SyCon.

Other devices

For other devices these files should be provided and updated by the device manufacturer.

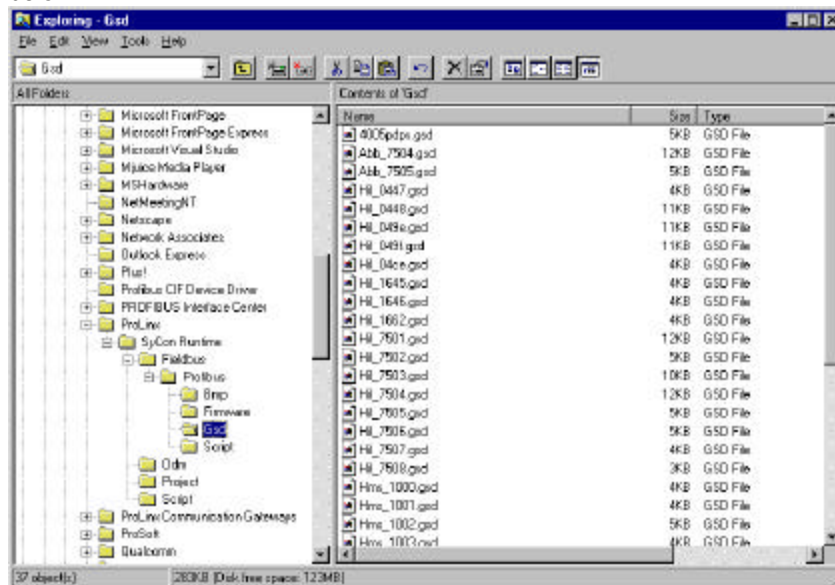
You can also get the GSD files from the homepage of the PROFIBUS user association:

<http://www.profibus.com>

For all available configurations, GSD files must be contained in the directory GSD. During installation of the program PROLINX SyCon, the available files will be included. If you need another GSD file during PROLINX SyCon runtime you have to copy this file with the menu item **File - Copy GSD**.

The GSD directory path is changeable. To modify it from the default to another path use the menu **Settings - Path**.


All GSD files have to be present in this directory. The default path for ProLinx SyCon is shown below:



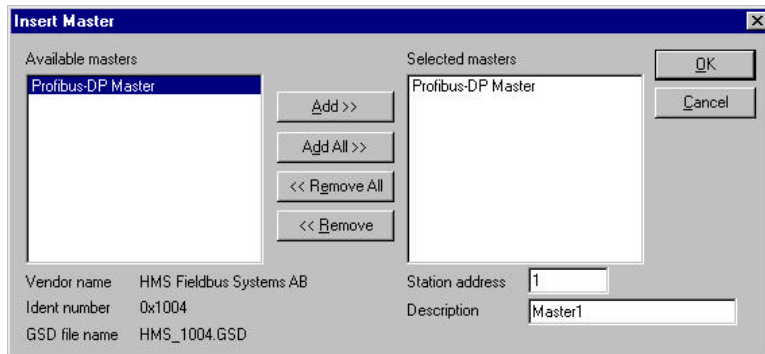
11.3 Selecting a Fieldbus System and Creating a new File

At the beginning of a design a new configuration file has to be created, which is done in the menu item **File - New**. The name for the configuration can be assigned when leaving the system configurator or using the menu **File - Save As**.

11.4 Insert Master

To insert a master in the configuration, select the **Insert - Master** menu to open the selection dialog box or click the following button: 

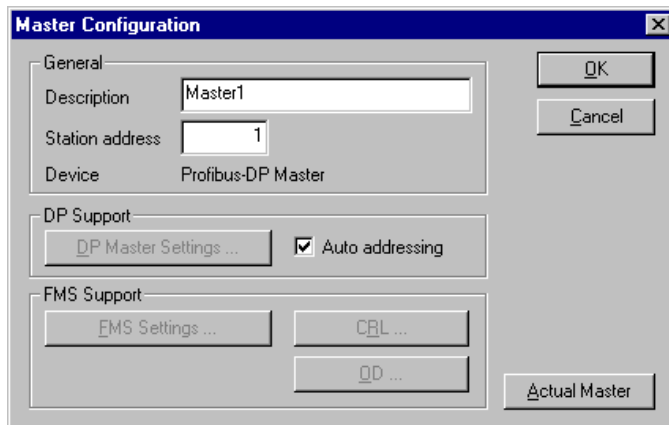
The mouse cursor changes automatically to the insert master cursor. Click on the position where you want to insert the new master. A dialog box appears where you can select one or more masters. Different master types can be selected (depending on the vendor brand). If the ProLinx Profibus Master is chosen the Vendor information is shown exactly as in the example below:



In this example a PROFIBUS-DP Master will be added with the **Station address 1** and the Description **Master 1**.

11.5 Master Configuration


The master specific configuration must be performed using the following dialog box. Double-click the master to configure it. Following dialog box appears.



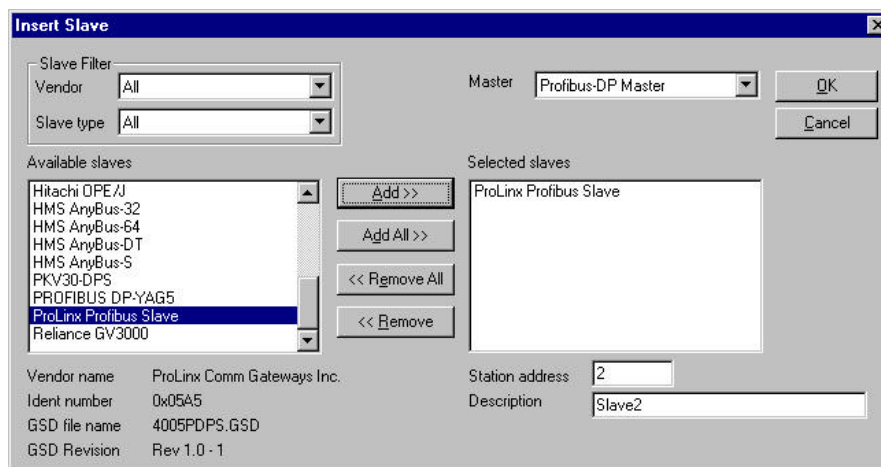
In this master configuration window, following parameters can be assigned:

- The station address of the master
- A (symbolic) description for this master
- This master as the actual master (to do a download for example)
- Activate or deactivate the auto addressing

11.6 Insert Slave

To insert new PROFIBUS-DP slaves in the configuration, select the **Insert – Slave** menu to open the selection window or click the following button: 

The mouse cursor changes automatically to the insert slave cursor. Click on the position where you want to insert the new slave. A dialog box appears where you have to select one or more slaves.



The left list-box displays all slave devices present in the GSD directory. If there are too many you can set a filter to select a special slave family. If one slave is selected, you can see some additional information about that slave below the list box. With a double click or with the command button **Add**, the slave appears in the right list box. All devices in this box will be connected to the active master that is displayed in the window. Select the slaves one by one. Every device can be given a name or a short description in the field **Description** and get an assigned Station Address.

With every slave the station address is incremented and can be overwritten in the field **Station address**.

Note: it is possible to chose one slave several times but each device must have its own station address to distinguish them on the network.

11.6.1 Slave Configuration

The slave specific configuration is accomplished using the following dialog box. Here the modules and their data are assigned to the address of the process data image in the master device. Remember that these addresses correspond to the application in the PLC.

Select the menu **Settings - DP Slave Configuration** or double-click on a slave to open this dialog box.

There are two types of DP-slaves. A **simple slave** has a fixed data length. The data length of a **modular slave** is configurable. This type of slave can be understood as an assembly of one or more simple slaves with one bus address.

The dialog box 'Slave Configuration' contains the following sections:

- General:**
 - Device: ProLinX Profibus Slave
 - Station address: 6
 - Description: Slave2
 - ☒ Activate device in actual configuration
 - ☒ Enable watchdog control
 - GSD file: 4005PDPS.GSD
- Limits:**

Max. length of in-/output data	400 Byte	Length of in-/output data	4 Byte
Max. length of input data	200 Byte	Length of input data	2 Byte
Max. length of output data	200 Byte	Length of output data	2 Byte
Max. number of modules	14	Number of modules	2
- Module List:**

Module	Inputs	Outputs	In/Out	Identifier
Empty Slot				0x00
1 Word Input	1 Word			0x50
2 Words Input	2 Word			0x51
3 Words Input	3 Word			0x52
4 Words Input	4 Word			0x53
5 Words Input	5 Word			0x54
- Assigned master:**
 - Station address 1
 - Master1
 - 1 / Profibus-DP Master
- Actual slave:**
 - Station address 6
 - Slave2
 - 6 / ProLinX Profibus Slave
- Configuration Table:**

Slot	Idx	Module	Symbol	Type	I Addr.	I Len.	Type	O Addr.	O Len.
1	1	1 Word	Module1	IW	0	1			
2	1	1 Word	Module2				QW	0	1
- Buttons:** OK, Cancel, Parameter Data..., DPV1 Settings, Append Module, Remove Module, Insert Module, Predefined Modules, Symbolic Names.

The upper table contains all available modules of the slave. In case of a simple slave, there is only one module that is already automatically copied into the lower table by PROLINX SyCon. If it is a modular slave, this must be done by the user with a direct double click on the module or selected module in combination with the button **Append Module**. If a module has several inputs or outputs (sub modules), then it gets more lines in the configuration table. These additional lines will be signed with a higher index in the column **Idx**. The column **Slot** counts the modules. To configure the modules of the slave do the following steps:

- If not already present, select all modules from the upper table and insert them in the lower table to be configurable. The sequence of the modules in the lower list is important and must correspond to the real physical slave configuration.
- Assign the addresses of the module data in the process image for each module in the lower table. This is done in the columns **Type** and **Address** for input and output separately. The I/O address can be entered by the user or set automatically by PROLINX SyCon. Therefore the flag **Auto Addressing** must be set in the window **Master Settings**. If active, PROLINX SyCon will place all I/O data offsets in physical order. This is done during the download procedure and the assigned addresses can be checked in the **Address Table**. If the addresses are entered manually the default address 0 in the field **I Address** respectively **O Address** must be overwritten.

Note: Offset addresses are entered as a word (16-bit) address.

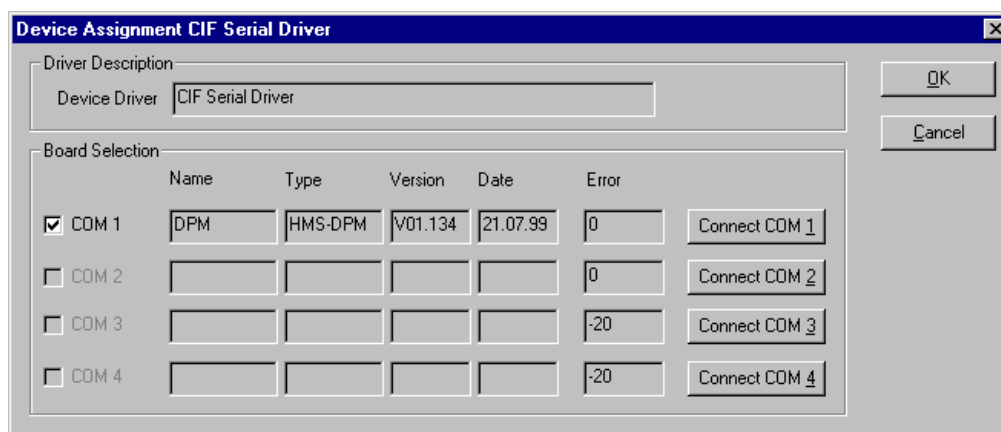
With the flag **Watchdog Control activated** it is fixed how the slave will react to the interruption of the communication with the belonging master. Is this flag activated and the slave recognized the interrupted communication over the control interval, the slave will set all outputs to 0 and will set itself into the main mode.

Caution: If **Watchdog Control** is switched off, possible set outputs will not be reset by the slave, although the communication is broken.

12 Settings

12.1 Device Assignment

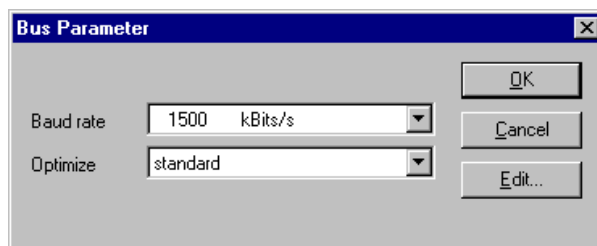
PROLIX SyCon is able to configure different devices in a PROFIBUS network. To run the online functions of such a device, it must be defined how PROLIX SyCon can communicate with it. This is done in the menu item **Device Assignment**.



The external connection can be checked with the buttons **Connect COM 1** to **Connect COM 4**. PROLIX SyCon sends a request on that COM port and asks for the firmware. If there is a Master device connected, the firmware is displayed otherwise there will be a timeout error.

12.2 Bus Parameter

For a PROFIBUS DP system with one master, the only parameter that must be selected is the baud rate.



The baud rate of the PROFIBUS is common for all bus devices. Changing the baud rate has the consequence that all other parameters will be re-calculated. The System Configurator checks if the baud rate is supported by all configured devices on basis of the entries in the GSD file.

If the System Configurator finds at least one device in the configuration that does not support the selected baud rate, an error message appears. Opening the Edit Bus Parameter dialog box with the command button Edit to check the actual parameters. Some of the parameters can be changed individually. Please note, that if any changes are made in the bus parameters, the parameter for the field **Optimize** must be changed from **standard** to **by user**.

Edit Bus Parameter			
Baud rate	1500 kBits/s		
Slot Time	300	tBit	
Min. Station Delay of Responders	11	tBit	
Max. Station Delay of Responders	150	tBit	
Quiet Time	0	tBit	
Setup Time	1	tBit	
			Target Rotation Time: 2497 tBit (1.6647 ms)
			GAP Actualization Factor: 10
			Max Retry Limit: 1
			Highest Station Address: 2
Tid1	37	tBit	
Tid2	150	tBit	
Auto Clear: <input checked="" type="radio"/> Auto clear modus OFF <input type="radio"/> Auto clear modus ON			
			Poll Timeout: 10 ms
			Data Control Time: 1200 ms
			Min Slave Interval: 1.700 ms
			Watchdog control: 200 ms

Caution: Changing the bus parameter individually can force a communication break. The **Highest Station Address** is the highest bus address up to which the master will search for other active master stations to pass the send permission. This value should not be set below the master address.

12.3 DP Master Settings

The current version of PROLINX SyCon does not allow changing of DP-Master settings. These are the default parameters:

- Watchdog time: 1000 ms
- Addressing mode: Word addresses
- Storage formats: Big Endian

12.4 Parameter Data

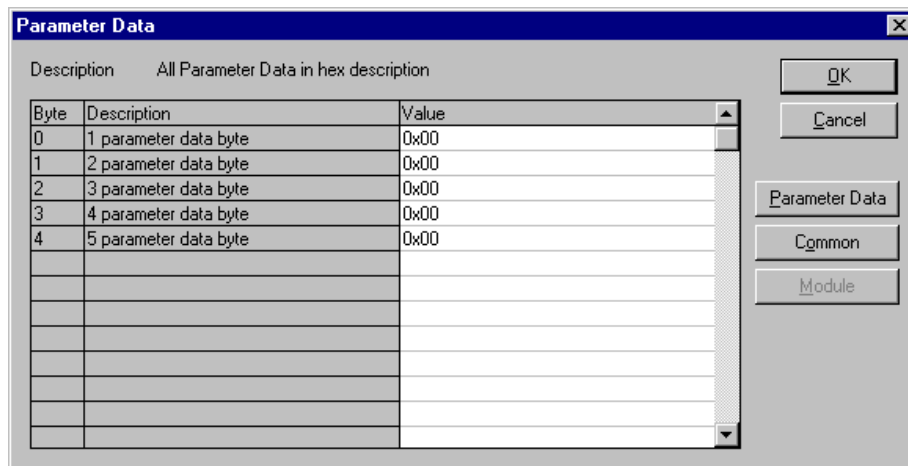
In the menu **Settings - Parameter Data** user parameter data can be edited.

If default parameters are configured in the GSD file for this slave, they are inserted automatically when the menu is chosen the first time.

Some DP-Slave devices need some further parameterization data to change for example a measurement limitation or a value range. These data are slave specific and the functionality cannot be explained at this point.

The explanation can normally be found in the corresponding slave manual.

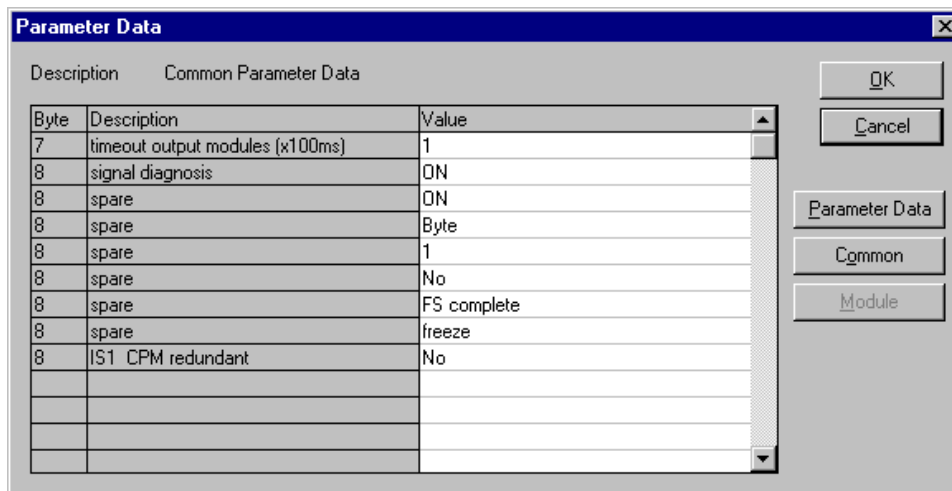
This dialog box below shows an example of parameter data of a slave.



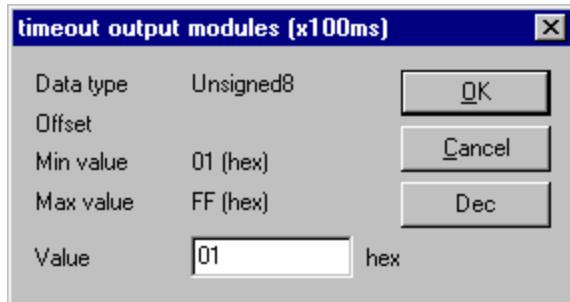
A modular PROFIBUS-DP slave station may need parameter data for one or more modules and for the slave station itself (head station). There are three selections possible:

- **Hex** All parameters of the slave are shown in hexadecimal representation
- **Common** Parameter data of the head station
- **Module** Parameter data of the separate modules

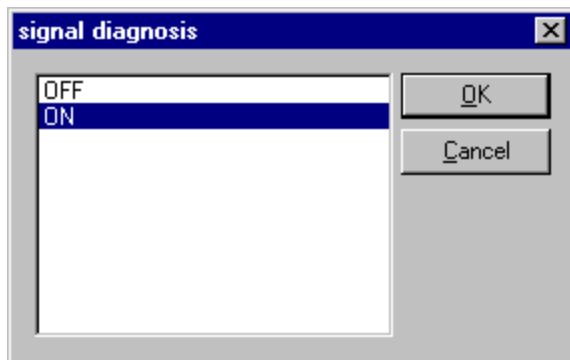
After selecting the Common command button, following dialog box appears with the common parameter data. These parameters are for the head station.



It is possible to change back into the hexadecimal description by selecting the Hex button.
With a double click on one row of the parameter data, you are able to change the value using the dialog box presented as shown below:



The description can also be selected by common adjustment.



If there is more than one module configured, the relevant module has to be selected first.
All parameter dialogs are taken from the GSD file. If there is no text dialog, the input is only possible as a hex value.

12.5 Group Membership

After a master is chosen, the slaves can be assigned to 8 different groups. These groups can be parameterized using the following dialog box. Select the Menu **Settings – Group Membership**. Make the selection which group should support the DP-Freeze and DP-Sync command.

Group	Freeze	Sync
Gr 1: Group 1	<input type="checkbox"/>	<input checked="" type="checkbox"/>
Gr 2: Group 2	<input checked="" type="checkbox"/>	<input type="checkbox"/>
Gr 3: Group 3	<input checked="" type="checkbox"/>	<input type="checkbox"/>
Gr 4: Group 4	<input type="checkbox"/>	<input checked="" type="checkbox"/>
Gr 5: Group 5	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>
Gr 6: Group 6	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>
Gr 7: Group 7	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>
Gr 8: Group 8	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>

Buttons: OK, Cancel, Group Assignment...

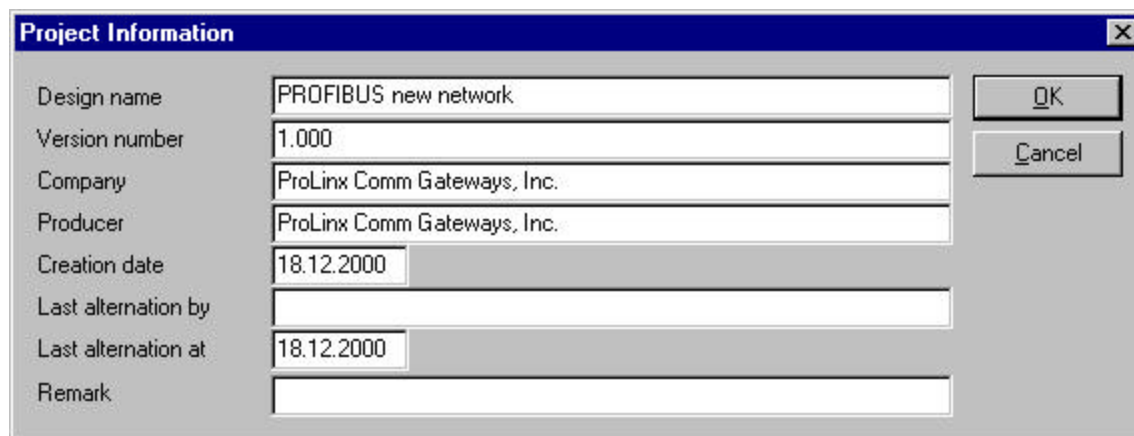
Using the **Group Assignment** command button, the slaves can be assigned to the groups with the desired characteristics. The upcoming table shows all configured slave devices from the main editor window. Use this dialog box to assign slaves to selected groups.

[illegible]

The chosen group selection is transferred to the slaves within their startup sequence. The group selection serves as a filter for a special DP command called 'global control', which can be sent as a broadcast message to selective groups. This command is normally used by an application program to send the output data Sync and the input data Freeze command.

12.6 Project Information

Common information regarding the project can be written to the documentation of your configuration in the menu **Settings – Project Information**. The information can be printed out or shown in the menu.



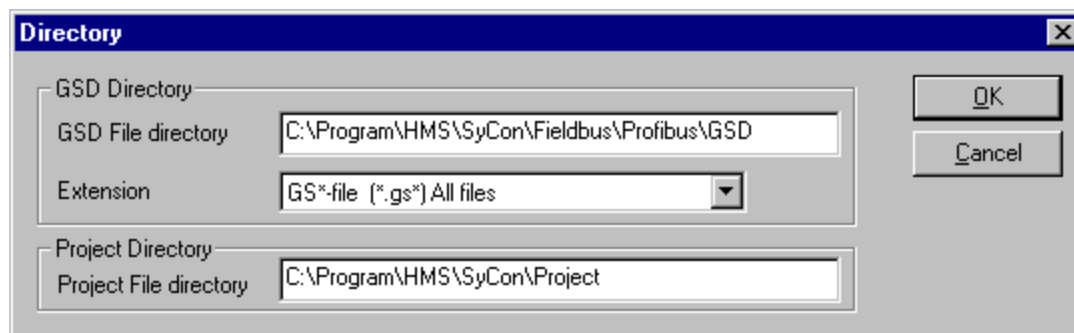
The 'Project Information' dialog box contains the following fields and controls:

Field	Value
Design name	PROFIBUS new network
Version number	1.000
Company	ProLinx Comm Gateways, Inc.
Producer	ProLinx Comm Gateways, Inc.
Creation date	18.12.2000
Last alternation by	
Last alternation at	18.12.2000
Remark	

Buttons: OK, Cancel

12.7 Path

If the menu **Settings - Path** is selected the path directory of the GSD files are shown.



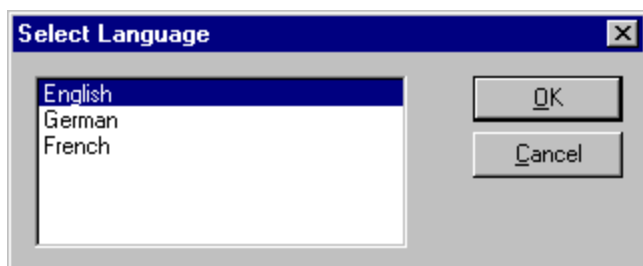
The 'Directory' dialog box contains the following fields and controls:

Field	Value
GSD Directory	
GSD File directory	C:\Program\HMS\SyCon\Fieldbus\Profibus\GSD
Extension	GS*-file (*.gs*) All files
Project Directory	
Project File directory	C:\Program\HMS\SyCon\Project

Buttons: OK, Cancel

12.8 Language

Select the menu **Settings - Language** and the dialog box below will appear. You are able to change the language for the system configurator with the following dialog box. Select the desired language, and confirm the entry with the **OK** button. A comment will appear, and ask you to restart the application to make the changes effective. After a restart, PROLINX SyCon will be changed into the selected language.

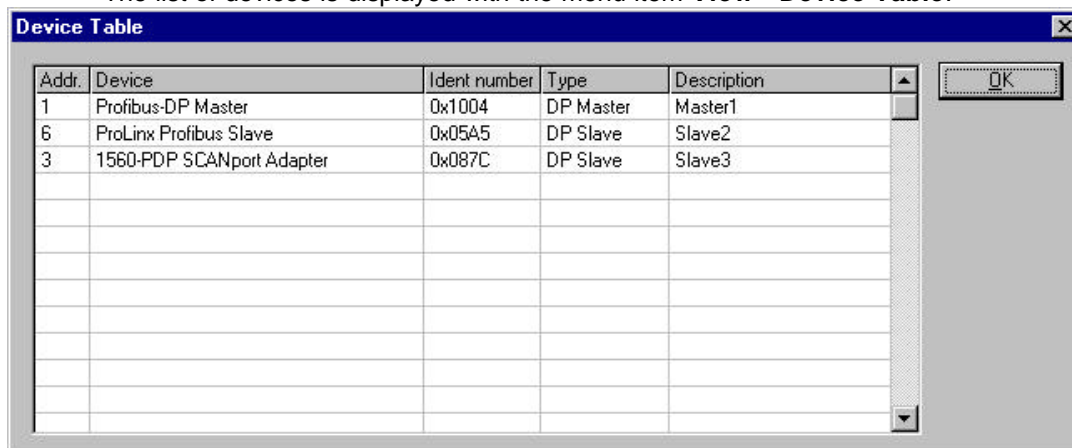


View, Print, Save and Export

12.9 View the Configuration

12.9.1 View Device Table

The list of devices is displayed with the menu item **View - Device Table**.



Addr.	Device	Ident number	Type	Description
1	Profibus-DP Master	0x1004	DP Master	Master1
6	ProLinx Profibus Slave	0x05A5	DP Slave	Slave2
3	1560-PDP SCANport Adapter	0x087C	DP Slave	Slave3

12.9.2 Address Table

To display the address list of addresses, use the menu **View - Address Table**. Select the master as actual master to display the address table. It is possible to sort the addresses by station addresses or by data addresses. Select the button **Address Overview** to get an overview about the addresses in the input and output area.

[illegible][illegible]

The auto addressing mode has to be inactive to be able to change the assignment of the addresses. Click with the left mouse button to a cross and hold the button. The mouse pointer is changed to an arrow. Push the arrow (with the mouse button pressed) to the desired new (still not used) position and let go of the mouse button. Then a question will appear, if the change should be executed or not.

The assignment of the offset addresses can also be selected in the menu **Slave Configuration**. Overlapped addresses are shown with a red cross. This means that this address is used by more than one module.

The information of which slave the address is used is shown by a double click on the corresponding cross. The **Byte Information Window** is opened.

Note: While the addresses are given in bytes (8-bit), a block of data can only be placed on a word (16-bit) boundary.

12.10 Print Documentation of your PROFIBUS System

After you have selected the actual printer with the menu item **Print Setup** a printout of the configuration can be made with the menu item **Print**. If you want to have a preview of the print before printing you can use the function **Print Preview**.

12.11 Save the Configuration

You can save the configuration with the menu item **Save** if the file name is known otherwise the function **Save as** must be used with a new file name.

13 Online Functions

Here all the functions are gathered together that directly affect the PROFIBUS devices, e.g. ProLinx PDPM.

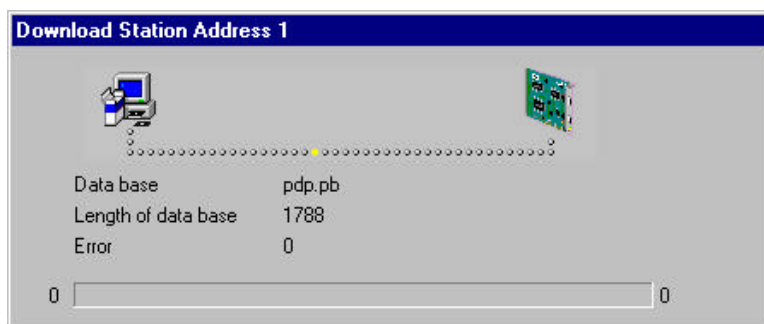
Please note that this will also permit interruption of a running communication or that outputs can be switched On or Off.

13.1 Download the Configuration

To enable the configuration and network access, it has to be transferred (to download) to the master with the menu **Online - Download**. This will trigger a warning that the communication on the PROFIBUS will be interrupted. This has to be confirmed.

Before the download is accomplished, the configurator will check the configuration. If any error messages appear, the configuration should be checked. The most common errors are overlapped addresses, which can be located by looking into the **Address Table** overview. Should the addressing of the slaves be performed automatically, chose **Auto addressing** in the window **Master Configuration**.

The configuration will be transmitted to the selected device and stored into a FLASH memory statically. This will enable it to be available after the power is switched off and on in this device.



After the download procedure, the device executes an internal restart and begins with the communication if the start condition in **DP Master Settings** has been set to **Automatic release of the communication by the device**.

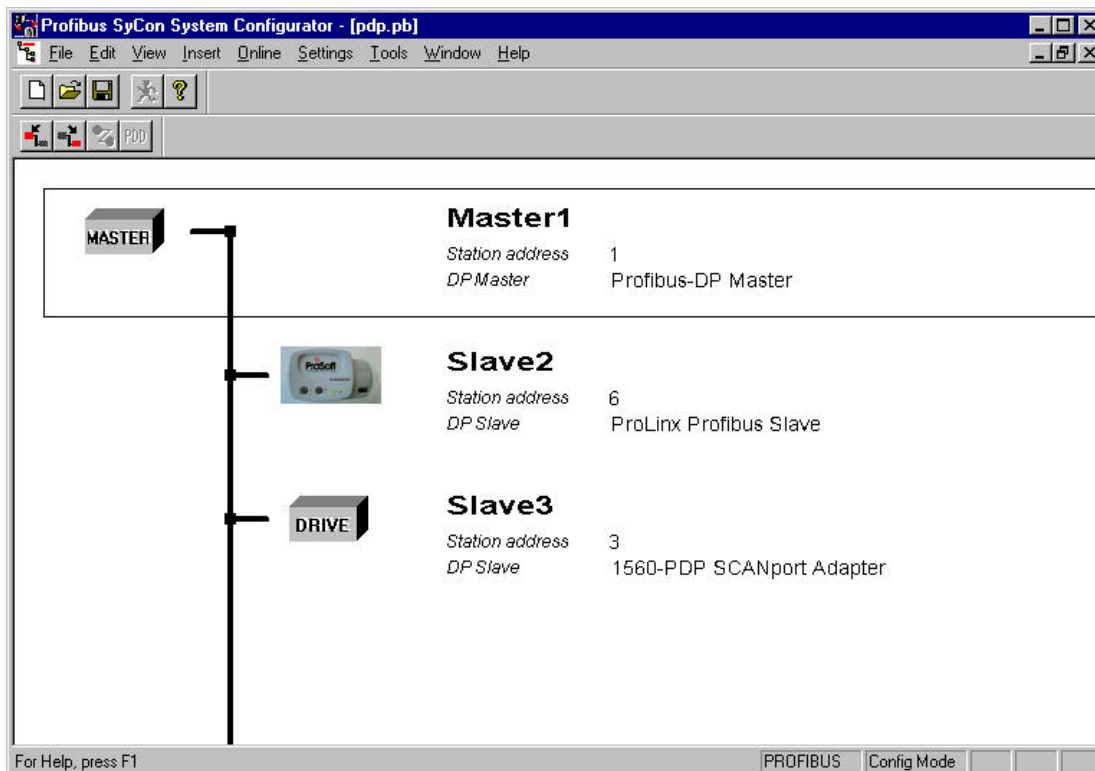
13.2 Starting the Debug Mode

Click the menu item **Online - Start Debug Mode**. The system configurator cyclically interrogates the status of the network communication on the master and the individual condition of the devices. To end the Debug Mode, select the menu **Online - Stop Debug Mode**.

13.2.1 The Debug Window

When the debug session is started the configuration window changes into the debug window. The devices and the line between them are displayed in green or red color depending on the established network communication. After the debugger is started, PROLINX SyCon requests the status of all devices from the master. If there is an error on a device, the bus line to this device is drawn in red otherwise it is green. PROLINX SyCon also displays the letters **Diag** if the device signals diagnostic information. This information is displayed closer if you click with the mouse onto the corresponding device in debug mode.

To activate the debug mode select the menu **Online - Start Debug Mode**. The menu **Online - Device Diagnostic** activates the PROFIBUS device diagnostic. To end the Debug Mode, select the menu **Online - Stop Debug Mode**.



If diagnostic information is available for a specific device, next to the device icon the text **Diag** appears in red. To access further device specific diagnostic information, double-click on the device itself or set the focus to the device and select **Online - Device Diagnostic**.

13.3 Device Diagnostic

An example diagnostic dialog box is displayed below:

Diagnostic Station Address 2		
Station Status 1	Station Status 2	Station Status 3
<input type="checkbox"/> Master Lock	<input type="checkbox"/> Slave Deactivated	<input type="checkbox"/> Ext Diag Overflow
<input type="checkbox"/> Parameter Fault	<input type="checkbox"/> reserved	<input type="checkbox"/> reserved
<input type="checkbox"/> Invalid Slave Response	<input type="checkbox"/> Sync Mode	<input type="checkbox"/> reserved
<input type="checkbox"/> Not Supported	<input type="checkbox"/> Freeze Mode	<input type="checkbox"/> reserved
<input type="checkbox"/> Extended Diag	<input type="checkbox"/> Watchdog On	<input type="checkbox"/> reserved
<input type="checkbox"/> Configuration Fault	<input type="checkbox"/> Slave Device	<input type="checkbox"/> reserved
<input type="checkbox"/> Station Not Ready	<input type="checkbox"/> Static Diag	<input type="checkbox"/> reserved
<input type="checkbox"/> Station Non Existent	<input type="checkbox"/> Parameter Req used	<input type="checkbox"/> reserved

Assigned Master Address 0 Real Ident Number 0x0000
GSD Ident Number 0x7508 Error 0

OK
Ext. Diagnostic
Compare Configuration

The **Device Diagnostic** and its meaning.

- **Master_Lock**
The slave has already been parameterized by another master and is locked in its access. Check, if another master is present on the network and delete its assignment to this slave station or remove the other assigned master from the network to get the communication with this slave running.
- **Parameter_Fault**
This bit is automatically set by the slave, when the parameters sent by the master contain wrong or insufficient data. On every received parameter telegram, the slave executes a check routine on the whole parameter telegram. If the slave detects a faulty parameter value or illegal data during its check, it will report the 'parameterization error'. During the check routine, the slave compares its ident_number with the one sent by the master. If the slave reports this error, first compare the real ident_number shown in the slave diagnostic field in debugger mode with the one read out of the GSD-File. Use the menu 'View/Device table'. Another problem can be if parameter data is configured in PROLINX SyCon, but the slave does not support any. If this is the case, reduce the parameter data in PROLINX SyCon to a length of zero.
- **Invalid_Slave_Response**
This bit is set by the master when the master receives an invalid answer from the slave. The physical contact to the slave works principally, but the logical does not or was interrupted. This can for example happen if a PROFIBUS-FMS slave is connected to the DP-master. The slave does not understand the DP-Telegrams and rejects them. It is handled as 'Invalid_Slave_Response'.

- **Not_Supported**
This bit is set by the slave when a function should be performed which is not supported. Newer releases of slave stations normally support the Sync and Freeze Mode for I/O data. This is set in the GSD file, read by PROLIX SyCon and transferred to the slave in the parameter telegram. If 'Not_Supported' is reported, the GSD file declares at least one of these commands as supported, but the slave does not. Ask the manufacturer of the slave device for another GSD file or ask if the slave reports 'Not_Supported' on other wrong parameter data.
- **Extended_Diag**
This bit is set by the slave if optional extended diagnostic data are a containment of the slave diagnostic field. A slave station normally uses extended diagnostic data if module specific diagnostic information, for example, exceeded analog values or low power should be reported to the master. A Hex-dump of the reported values can be accessed by using the command button 'Extended Diagnostic'.
- **Configuration_Fault**
During the PROFIBUS-DP startup procedure, the slave compares its internal I/O configuration with the one configured in the master. If the slave detects differences, it will report the 'Cfg_Fault' error. This indicates that the master has a different I/O module constellation for this slave configured than the slave device physically holds down. First compare visually all configured I/O modules in the configuration data of PROLIX SyCon for this slave with its real physical constellation. Note that the order of the module is important and should also be compared. Some slaves need virtual I/O modules to be configured first or empty slot modules to get an even number of modules to run. This slave specific I/O module behavior can normally be read out in the slave documentation. Last help to get the slave module constellation is to read out its constellation by a PROFIBUS-DP command **Compare Configuration**. Click on this command button in the diagnostic field and get a Hex-Dump of the real slave configuration data and the configured one (**Real Configuration and PROLIX SyCon Configuration**). Note that the DP-configuration data is coded in bit defined byte arrays to hold the I/O information very compressed. The DP configuration is coded in a very compact form. The code for the modules is shown in the **slave configuration**.
- **Station_Not_Ready**
When or at which event the slave sets this bit is not defined in the norm specification. The meaning 'Not_Ready' can be seen as not ready to do the I/O data exchange. This can indicate several slave specific reasons. Usually the bit is set in combination with one of the other fault bits.
- **Station_Non_Existent**
This bit is automatically set by the master if this slave is not responding on the bus. If this error occurs, compare the configured station address with the physical one of the slave. Then check if the slave module supports the configured baud rate. Some old modules only support bps rates up to 1.5 Mbps. Other modules must be jumpered to DP-Norm behavior first to be operative with a DP-Norm master. Then check your bus cable. Only the TX/RX-pins 3<->3 and 8<->8 must be connected to get the contact between two PROFIBUS components.
- **Slave_Deactivated**
This bit is automatically set by the master if the slave in its parameter set is marked as inactive, so that it is taken out from the cyclic I/O processing.
- **Sync_Mode**
This bit is set by the slave when it has received the sync control command.
- **Freeze_Mode**
This bit is set by the slave when it has received the freeze control command.
- **Watchdog_ON**
This bit is set by the DP-slave when its watchdog control is active to supervise its corresponding master connection.

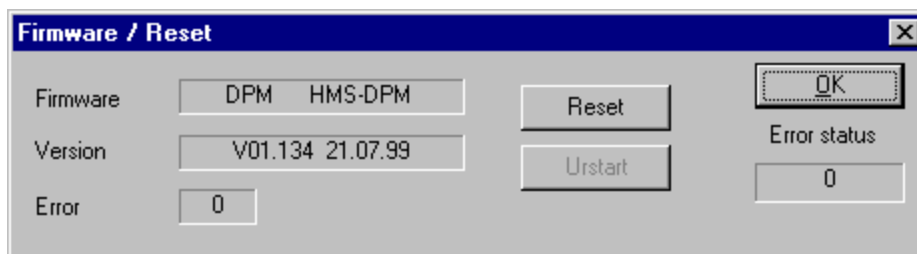
- **Static_Diag**
The slave sets this bit to indicate the master system is not operative for I/O because of a general error. In a case of a set static diagnostic bit, the master has to collect diagnostic information as long as this bit is active. On which events or at what time this bit can be set by a slave device is not defined in the norm description.
- **Parameter_Req_used**
The slave sets this bit to force the master system to do a new parameterization. This bit is set as long as new parameterization must be performed.
- **Ext_Diag_Overflow**
This bit is set if there is more extended diagnostic information to report to the master than can be given to the master in one DP-diagnostic telegram. The DP-slave sets this bit for example if there is more diagnostic channel information than the slave can hold down in its diagnostic buffer.
- **Assigned_Master_Address**
In this octet, the address of the DP-master that has done the parameterization of the slave is entered. If the DP-slave is not parameterized from any DP-master, the DP-slave puts the address 255 dec here.
- **Real_Ident_Number**
With the Ident_Number, the slave reports its own unchangeable identification number that was assigned by the PROFIBUS user organization. This identification code can serve in PROLIX SyCon to compare it with the Ident code of the GSD file of the configured slave if a parameterization error is reported.

13.4 Firmware Download

If you want to make a Firmware download select the menu **Online – Firmware Download** and the open window appears. Select the new Firmware and confirm your entry with the open command button. Now, the new Firmware is downloaded.

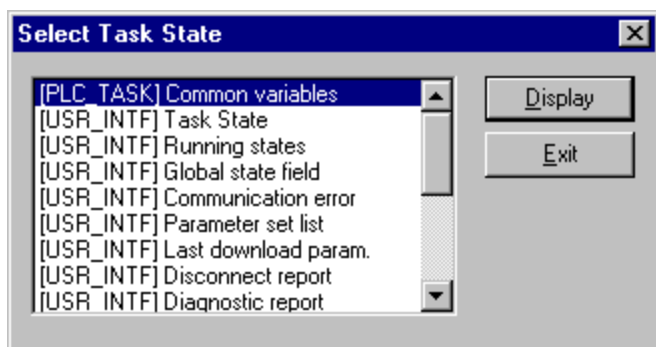
13.5 Firmware / Reset

The menu **Online - Firmware Reset** shows the name of the firmware and the actual version of the firmware from the selected device. You can push the reset button to reset the device.



13.6 Extended Device Diagnostic

The menu item **Online - Extended Device Diagnostic** helps to find possible bus and configuration faults while trying to get the bus fully operative. When the normal debugger does not supply any helpful information any more to get the fault localization use this option. This menu activates a list of available structures. The listed structures can be displayed to show the values. There are online counters, values, parameters and states that can be displayed. Several task states are available.



Note: All items in this list do not work for this master.

13.7 Global State Field

Select the menu **Online - Global State Field** to see details about the global state field. The first row shows the Online master main state e.g. **OPERATE, STOP**. The next row shows the collective status bits. An activated bit is red. Further contents are given:

Collective online error location and corresponding error

Statistic bus information

Device specific status bits: **Parameterized Devices, Activated Devices** and **Devices with Diagnostic** are shown if you click on that command button. The activated addresses are white numbers.

This application updates the status online in the global state field.

You can see the diagnostic by double-clicking at a highlighted station address of a device. The meaning of the shortcuts is listed below:

Global state field [X]

Online master main state: OFFLINE [OK]

Collective status bits: ☐ TOUT ☐ NRDY ☐ EVE ☐ FAT ☐ NEXC ☐ ACLR ☐ CTRL

Collective online error location and corresponding error

Error at remote address: 0 dec

Corresponding error event: No error

Statistic bus information

Counter of detected bus short circuits: 0 dec

Counter of rejected telegram transmissions: 0 dec

Device specific status bits

☒ Parameterized Devices ☐ Activated Devices ☐ Devices with Diagnostic

0	1	2	3	4	5	6	7	8	9	10	11	12	13
14	15	16	17	18	19	20	21	22	23	24	25	26	27
28	29	30	31	32	33	34	35	36	37	38	39	40	41
42	43	44	45	46	47	48	49	50	51	52	53	54	55
56	57	58	59	60	61	62	63	64	65	66	67	68	69
70	71	72	73	74	75	76	77	78	79	80	81	82	83
84	85	86	87	88	89	90	91	92	93	94	95	96	97
98	99	100	101	102	103	104	105	106	107	108	109	110	111
112	113	114	115	116	117	118	119	120	121	122	123	124	125
126													

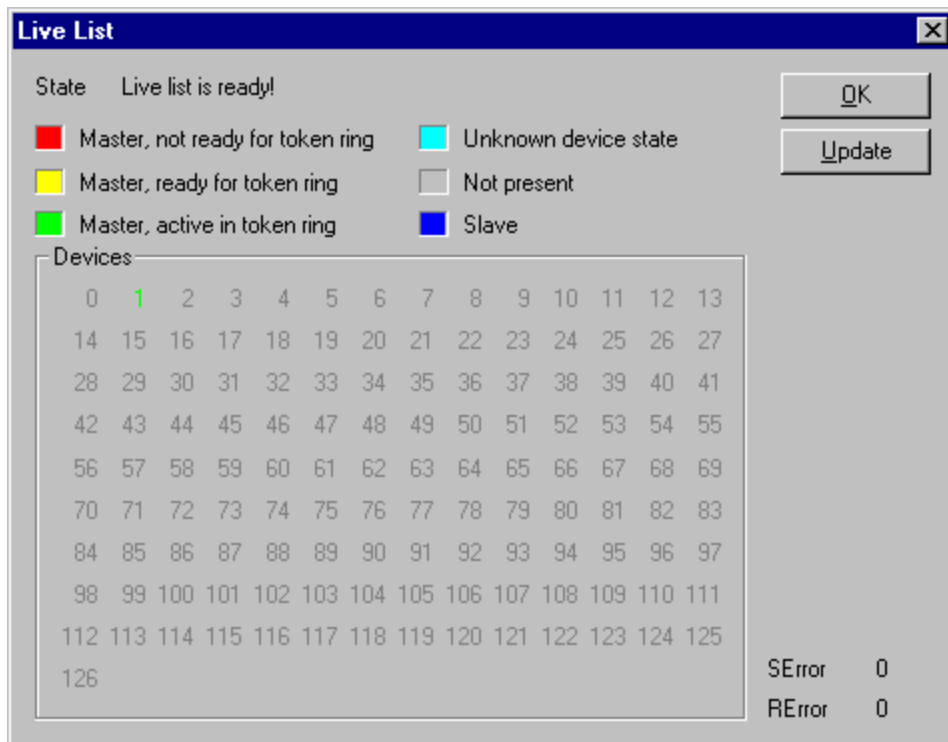
Error: 0

Collective status bits:

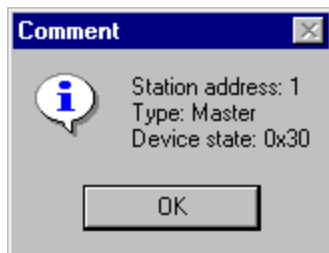
- **TOUT** (TIMEOUT-ERROR) the device has detected an overstepped timeout supervision time because of rejected PROFIBUS telegrams. It's an indication for bus short circuits while the master interrupts the communication. The number of detected timeouts is fixed in the statistic bus information variable. The bit will be set when the first timeout was detected and will not be deleted any more.
- **NRDY** (HOST-NOT-READY-NOTIFICATION) indicates if the host program has set its state to operative or not. If this bit is set the host program is not ready to communicate.
- **EVE** (EVENT-ERROR) the device has detected bus short circuits. The number of detected events is fixed in the statistic bus information variable. The bit will be set when the first event was detected and will not be deleted any more.
- **FAT** (FATAL-ERROR) because of heavy bus error, no further bus communication is possible.
- **NEXC** (NON-EXCHANGE-ERROR) at least one slave has not reached the data exchange state and no process data exchange is possible with it.
- **ACLR** (AUTO-CLEAR-ERROR) device stopped the communication to all slaves and reached the auto-clear end state.
- **CTRL** (CONTROL-ERROR) parameterization error.

13.7.1 Live List

If the menu **Online - Live List** is selected an overall view of all active devices on your PROFIBUS network is shown. A green number (the number is the station address) for the master and a blue number for the slave is norm. The meaning of the colors is in the list above the table. The status of the live list is not automatically updated online. You have to click on the **Update** command button after you changed your inputs to actualize this window.



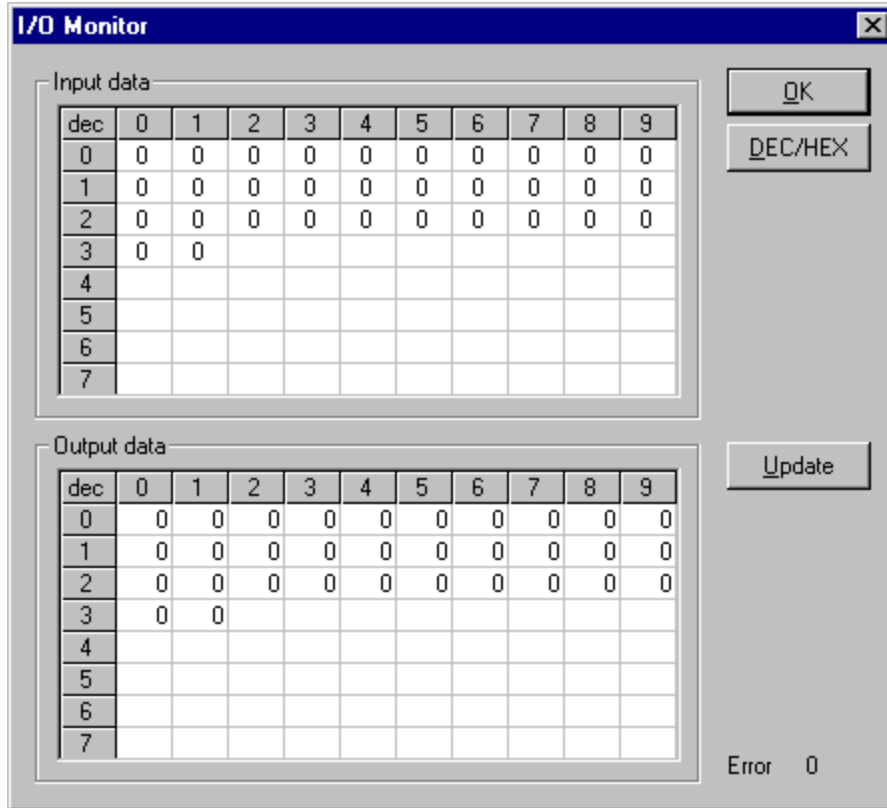
If you click on a colored station address you are given the Device type and Device state.



13.7.2 I/O Monitor

This is a simple tool that can be used to display and enter only the first 32 bytes of the process image. In the next release this will be more sophisticated.

Note: the I/O monitor can not be used with the ProLinx Profibus master unit.



The I/O Monitor dialog box features two data entry tables. The 'Input data' table has columns labeled 'dec' and 0-9, with rows 0-7. The 'Output data' table has the same structure. To the right of the input table are 'OK' and 'DEC/HEX' buttons. To the right of the output table is an 'Update' button. At the bottom right, an 'Error' label displays the value '0'.

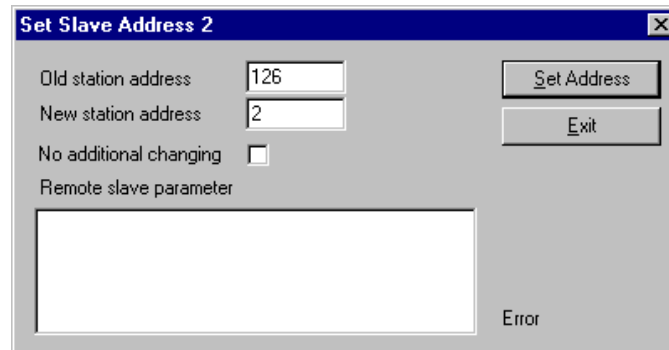
dec	0	1	2	3	4	5	6	7	8	9
0	0	0	0	0	0	0	0	0	0	0
1	0	0	0	0	0	0	0	0	0	0
2	0	0	0	0	0	0	0	0	0	0
3	0	0								
4										
5										
6										
7										

dec	0	1	2	3	4	5	6	7	8	9
0	0	0	0	0	0	0	0	0	0	0
1	0	0	0	0	0	0	0	0	0	0
2	0	0	0	0	0	0	0	0	0	0
3	0	0								
4										
5										
6										
7										

13.7.3 Set Slave Address

Select the menu **Online - Set Slave Address** to change a slave address.

Write the new address in the row **New Station Address**. If no further changes shall be allowed, select the field **No additional changing**. If necessary, add additional parameters in hex in the field **Slave parameter**. Activate the command with the **Set Address** command button.



The Set Slave Address 2 dialog box contains input fields for 'Old station address' (126) and 'New station address' (2). It includes a 'Set Address' button, an 'Exit' button, a 'No additional changing' checkbox, and a 'Remote slave parameter' label above a large text area. An 'Error' label is at the bottom right.

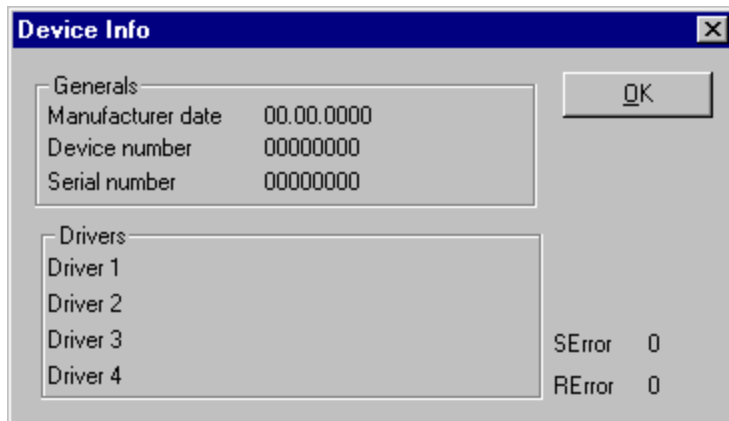
Old station address	126
New station address	2

13.7.4 Start/Stop Communication

Manually start or stop the communication between masters and slaves by selecting menu **Online - Start Communication** and **Stop Communication** respectively.

13.7.5 Device Info

Select the menu **Online - Device Info** to see details about the selected hardware in the configuration. The manufacturer date, the device number and the serial number are given.



14 Error Numbers

14.1 Serial Driver Error Numbers (-20 ... -71)

This is the list of error numbers using the serial driver associated with the Profibus Master Configuration Port.

Error Number	Description
-20	DRIVER: No COM handle found
-21	DRIVER: COM port already opened
-22	DRIVER: Function call into driver failed
-23	DRIVER: Internal driver error
-24	DRIVER: Could not create read thread
-25	DRIVER: Could not create read event
-26	DRIVER: Could not create write event
-27	DRIVER: Could not create timer event
-28	DRIVER: Error by writing data
-29	DRIVER: Wrong COM state
-30	DRIVER: Set COM state error
-31	DRIVER: COM buffer setup failed
-32	DRIVER: COM set timeout failed
-33	DRIVER: RX buffer overrun
-34	DRIVER: RX buffer full
-35	DRIVER: TX busy
-36	DRIVER: Error during close driver

Table of serial driver error numbers

Error Number	Description
-40	USER: COM port not opened
-41	USER: Invalid handle value
-42	USER: Invalid COM number
-43	USER: Size parameter invalid
-44	USER: Size parameter zero
-45	USER: Buffer pointer is NULL
-46	USER: Buffer too short
-47	USER: Setup error
-50	USER: Send message, timeout error
-51	USER: Could not send a message
-52	USER: Send message, no device connected
-53	USER: Error by send message, message receiving
-54	USER: Telegram collision
-55	USER: Telegram, no acknowledgement received
-56	USER: Telegram, noise
-57	USER: Telegram, data overrun
-58	USER: Telegram, parity error
-59	USER: Telegram, framing error
-60	USER: Telegram, unknown error
-70	USER: Timeout by receive a message
-71	USER: No message received

Table of serial driver error numbers

14.2 RCS Error Numbers (4 ... 93)

This is the list of error numbers returned by the RCS (Real-time Communication System), that is the operating system. The error number is returned in an answer message. Command messages and answer messages are used to communicate between the application (e.g. the system configurator) and the master device. An example of this communication is the download of a configuration.

Error Number	Description
0	No error
4	Task does not exist
5	Task is not initialized
6	The MCL is locked
7	The MCL rejects a send command because of an error
20	Database not configured
21	Data base segment not configured or not existent
22	Number for message wrong during download
23	Received number of data during download does not match to that in the command message
24	Sequence identifier wrong during download
25	Checksum after download and checksum in command message does not match
26	Write/Read access of data base segment
27	Download/Upload or erase of configured data base type is not allowed
28	The state of the data base segment indicated an error. Upload not possible
29	The access to the database segment needs the bootstrap loader. The bootstrap loader is not present
30	Trace buffer overflow
31	Entry into trace buffer too long
37	No or wrong license. The OEM license of the system configurator allows only communication to devices that have the same license inside
38	The database created by the system configurator and the database expected by the firmware is not compatible
39	DBM module missing

Table of RCS error numbers (answer message)

Error Number	Description
40	No command free
41	Command unknown
42	Command mode unknown
43	Wrong parameter in the command
44	Message length does not match to the parameters of the command
45	Only a MCL does use this command to the RCS
50	FLASH occupied at the moment
51	Error deleting the FLASH
52	Error writing the FLASH
53	FLASH not configured
54	FLASH timeout error
55	Access protection error while deleting the FLASH
56	FLASH size does not match or not enough FLASH memory
60	Wrong structure type
61	Wrong length of structure
62	Structure does not exist
70	No clock on the device
80	Wrong handle for the table (table does not exist)
81	Data length does not match the structure of this table
82	The data set of this number does not exist
83	This table name does not exist
84	Table full. No more entries allowed
85	Other error from DBM
90	The device info (serial number, device number and date) does already exist
91	License code invalid
92	License code does already exist
93	All memory locations for license codes already in use

Table of RCS error numbers (answer message)

14.3 Data Server Error Numbers (1001 ... 1009)

This is the list of error numbers using the Data Server.

Error Number	Description
1001	Invalid handle value
1002	No Driver object found
1003	No dual-port memory driver object found
1004	No serial driver object found
1005	Driver not found
1006	Wrong device ID
1007	Create command error
1008	Command ID not found
1009	Null pointer given by the application

Table of data server error numbers

14.4 Command Administrator Error Numbers (2001 ... 2006)

This is the list of error numbers using the Command Administration.

Error Number	Description
2001	Function ID unknown
2002	Task ID unknown
2003	Wrong timeout value
2004	User function invalid
2005	User function pointer invalid
2006	User data invalid

Table of data server error numbers

14.5 Converting Functions Error Numbers (4000 ... 4098)

The following table lists the error numbers of the converting functions.

Error number	Description
4000	No table existing
4001	Success in comprimizing
4002	Set not existing
4003	Last respectively first entry reached
4004	Not enough memory
4005	Table directory full
4006	Max number of entries reached
4007	No writing to this table possible, because the table is located in the FLASH
4008	Table name does already exist
4009	File name does not exist
4010	Free RAM length from RCS_CNF.P86 is smaller than E_F_INDEX * 2
4011	Parameter 'next' wrong
4012	Not enough free space to copy data set
4013	Set is deleted
4014	Value for Index is wrong
4015	Access not allowed
4016	open_file used before init_file
4034	Length of converting stream is 0
4035	Non equal data set found
4036	Writing of set 0 is no allowed
4037	No entry in this file
4038	Data set has length 0
4039	The function DbmInit has assigned a Zero pointer during RCS initialization
4040	Printer not ready
4041	The data base is used from an other function
4042	New length of data base is smaller than used
4043	Unknown access mode
4044	Old databases has to be converted
4045	Error while converting. Function not known
4046	Unknown type in set 0 found
4047	No float function available
4048	Function not in RCS module

Table of error numbers of converting functions

Error Number	Description
4050	Checksum check failed
4051	More segments are existing in file, than in the structure FILE_INFO_T in wMaxEintraege
4052	SegLen in structure FILE_INFO_T is smaller then the length in the file. Return of function dbm_restore_data
4053	The header file holds an other information for a length than in the segment itself
4054	Not enough memory for allocation on the PC
4055	No index for file handle in structure FLASH_DIR of RCS found
4056	-
4057	File type 2 cannot be printed because of too many definitions
4058	The definitions need too many lines to display them, than in the program available
4059	An unknown format for the parameter. Valid is U, H, or S
4060	Unknown parameter type
4061	The database was transmitted into the FLASH
4062	Set 0 contains no structure definition
4063	Set 0 cannot be deleted
4064	Error during execution of a ODBC data base access
4065	Initializing of DBM through RCS had no success
4066	Passed data length incorrect
4067	Sorting function not linked
4068	Error in function parameter
4069	Error from ODBC table
4070	No free handle available. Too many data base links are already opened
4071	Unknown data type found in the table
4072	Structure of table GLOBAL not correct or no such table existing
4073	No name of an ACCESS database
4074	Download window can't be created
4075	Download not fully performable
4076	Parameter SourceType of table SourceTab not existing
4077	Parameter Translate of table CreateTab does not exists
4078	Parameter Sourcefile of table CreateTab does not exists
4079	Parameter Sourcetable of table CreateTab does not exists

Table of error numbers of converting functions

Error Number	Description
4080	Parameter Desttable of table CreateTab does not exists
4081	Parameter Special of table CreateTab does not exists
4082	More than 32 tables should be created
4083	No entry in element szSourceFile
4084	ODBC connection initialization not possible. This could happen when in file ODBCINST.INI in section [Microsoft Access Driver (*.mdb)] is no valid path to ODBCJT16/32.DLL.
4085	Error in structure in the ACCESS database that is in DBM format
4086	Error in structure in the ACCESS database that is in DBM format
4087	No data in a ODBC table
4088	No entry
4089	ODBC set length not valid
4090	Not enough data sets in ODBC table
4091	Table CreateTab not found
4092	Error in structure of table CreateTab
4093	No entry in element szSourceTable
4094	No entry in element szDestTable
4095	Entry in iSourceType of table CreateTab is wrong
4096	Entry in iTranslate of table CreateTab is wrong
4097	Function SQLAllocStmt reports an error
4098	ODBC source table not found

Table of error numbers of converting functions

14.6 Data Base Functions Error Numbers (5001 ... 5008)

The following table lists the error numbers of data base functions DBM32.DLL.

Error number	Description
5001	Function PackLongToByteShort: Not enough space in pvD (Number of elements greater than reserved memory)
5002	Function PackLongToByteShort: Not enough space in pvD. Detected during converting of pvS
5003	Function StringToByte: Not enough space in pvD
5004	Function IntToByte: Not enough space in pvD
5005	Function LongToShort: Not enough space in pvD
5006	Function PackStringDumpToByteArray: Not enough space in pvD
5007	Function PackStringBumpToByteArray: A character was found, which does not match a HEX value
5008	Function PackStringDumpToByteArray: Number of character odd

Table of error numbers of data base functions