Operating Instruction Manual
SyConASI
System Configurator AS-Interface

Hilscher Gesellschaft für Systemautomation mbH
www.hilscher.com
DOC011101OI06EN | Revision 6 | English | 2012-06 | Released | Public

List of Revisions

Index	Date	Version	Chapter	Revision
1	09.10.01	SyCon.exe 2.638 AS-Interface.dll 2.670	all	created
2	13.12.01	SyCon.exe 2.638 AS-Interface.dll 2.672	6.4 6.5 7.6	Set Device Address complemented Set Parameter Bits complemented View Menu SyCon complemented
3	24.07.03	SyCon.exe: 2.649 AS-Interface.dll: 2.682	6.6 10.2	Set Extended ID1 Code added ID2 Code added in existing table
4	19.11.09	SyCon.exe: 2.71x AS-Interface.dll: 2.70x	2.1	System Requirements: Windows® 2000 / Windows® XP / Windows® Vista / Windows® 7
5	10.01.11	SyCon.exe: 2.71x AS-Interface.dll: 2.70x	9.5	Error number 235 added
6	13.06.12	SyCon.exe: 2.71x AS-Interface.dll: 2.70x	2.1	System Requirements: Windows® 2000 removed

Table Of Contents

1 Overview SyCon

1.1 Main Functions

The main functions of the AS-Interface System Configurator are:

Function	Section	Short Description
Configuration	*Overview Communication Types*	Overview communication types and description of the configuration steps
	Automatic Network Scan	Scans the network
Diagnostic	*Diagnostic Functions*	Diagnostic functions, Debugger, Live List, Global State Field etc.
	User Data Transfer	I/O Monitor, I/O Watch, Message Monitor
Documentation	*Read Project Information*	Set the project information
	Print	Print out the configuration

Table 1: SyCon Main Functions

1.2 Properties

SyCon is an universal Fieldbus Configurator

This means you can configure the most important fieldbus systems like PROFIBUS, InterBus, CANopen, DeviceNet, AS-Interface etc. with the same tool.

SyCon is a global Fieldbus Configurator

You configure all devices with one tool. SyCon checks the dependencies between the devices. SyCon only allows configurations that make sense. In case of doubt SyCon will give you a warning.

To Hilscher devices you can make downloads of the configuration data. For other devices, export functions or documentation possibilities are available.

SyCon documents your Fieldbus system

After the configuration you can print out a detailed documentation of your fieldbus network. The details can be switched on/off. You can print a documentation with details between the bus topology and the detail of one device.

SyCon uses standardized configuration files

Some protocols support standardized files containing information about all features and limitations of the slave device. SyCon uses these files for the configuration.

SyCon is a diagnostic tool

After the configuration you can switch SyCon into the diagnostic mode. You can watch all status information of Hilscher devices, see protocol dependent diagnostic information. In this case a slave is not operating correctly will be displayed in a different color.

SyCon can be extended

SyCon consists of a universal EXE file and several protocol specific DLLs. Most customers demand SyCon only for one bus system.

SyCon can be enlarged later by adding one or more DLLs for any other available protocol. The configuration of the different protocols will be as similar as possible.

1.3 Legal Notes

1.3.1 Copyright

1.3.2 Important Notes

The user manual, accompanying texts and the documentation were created for the use of the products by qualified experts, however, errors cannot be ruled out. For this reason, no guarantee can be made and neither juristic responsibility for erroneous information nor any liability can be assumed. Descriptions, accompanying texts and documentation included in the user manual do not present a guarantee nor any information about proper use as stipulated in the contract or a warranted feature. It cannot be ruled out that the user manual, the accompanying texts and the documentation do not correspond exactly to the described features, standards or other data of the delivered product. No warranty or guarantee regarding the correctness or accuracy of the information is assumed.

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- for the design, construction, maintenance or operation of nuclear facilities;
- in air traffic control systems, air traffic or air traffic communication systems;
- in life support systems;
- in systems in which failures in the software could lead to personal injury or injuries leading to death.

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2 Installation and Licensing

2.1 System Requirements

- PC with Pentium processor or higher
- Windows® XP SP3 / Windows® Vista SP2 (32-bit) / Windows® 7 SP1 (32/64-bit)
- Free disk space: 30 - 80 MByte
- DVD ROM drive
- RAM: min. 256 MByte
- Graphic resolution: min. 800 x 600 pixel, recommended 1024 x 768
- Keyboard and Mouse

2.2 Software Installation

Close all application programs on the system!

Insert the DVD Hilscher System software in the local DVD ROM drive. The installation program will start by itself (Autostart enabled). Otherwise change into the root directory on the DVD and start Autorun.exe (Autostart disabled).

Note: Administrator privileges are required on Windows® XP/Vista/7 systems for installation!

The installation program ask for the components you want to install. Answer these questions with **Yes** or **No**.

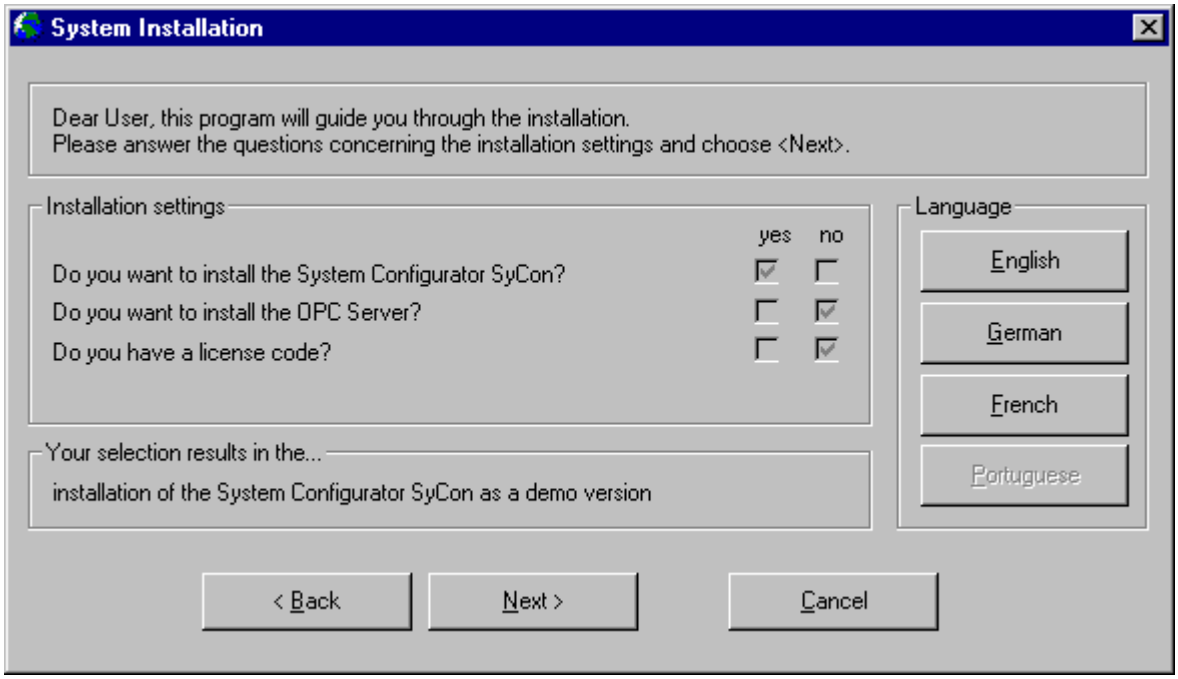


Figure 1: Selection for the Installation of the System Configurator in basic version

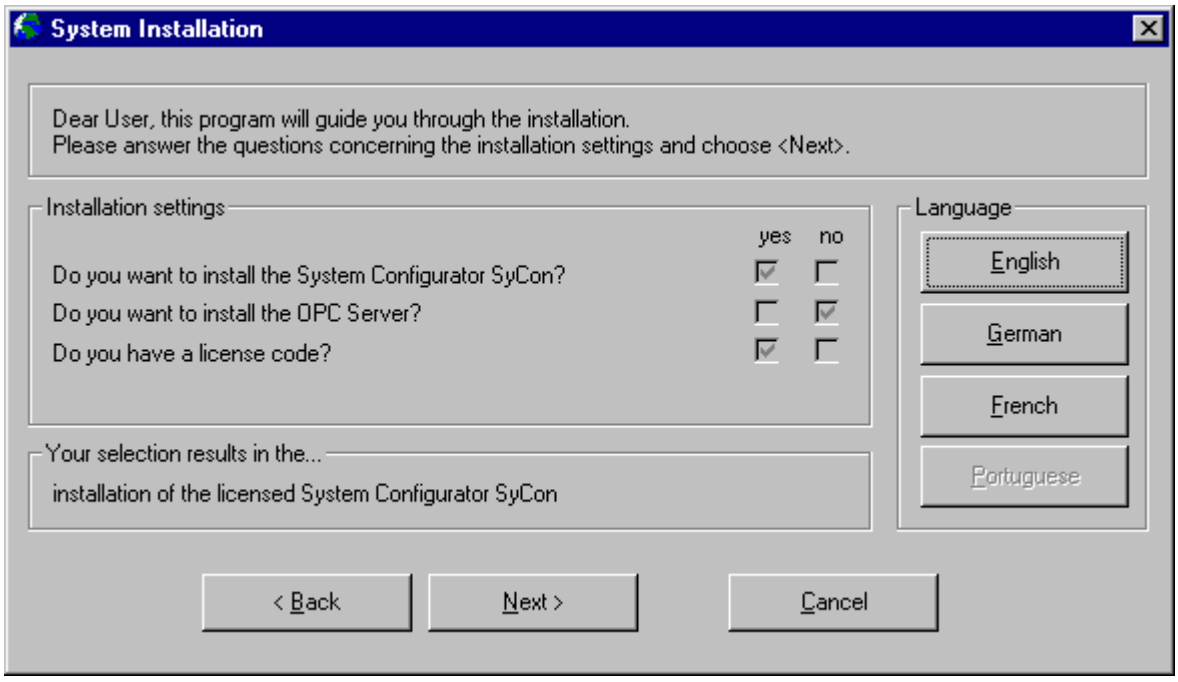


Figure 2: Selection for the Installation of the licensed System Configurator

It can be installed

- System Configurator SyCon (Configuration and diagnostic tool)
- OPC-Server (For OPC Communication)
- CIF Device Driver (Device Driver for access to the CIF)

If you have a license code or it is printed on the lable of the DVD, then answer the question for the license code with yes, otherwise a basic version of the System Configurator will be installed. Enter your name and the company name.

2.3 Installation of the System Configurator SyCon

During the installation the user name and the company name must be entered. If you have a license code or it is printed on the lable of the DVD, it must also be entered now. Otherwise the system configurator will work as a basic version. In this case, all functions are available, but the configuration is limited to two devices on the network, which is sufficient for slave devices.

A license can be ordered by filling out the order form under the menu item **Help > Licensing** and fax this order form either to the distributor or directly to us.

Follow the instructions of the installation program by selecting the fieldbus system to be installed and answer all the questions with **OK** or **NEXT**.

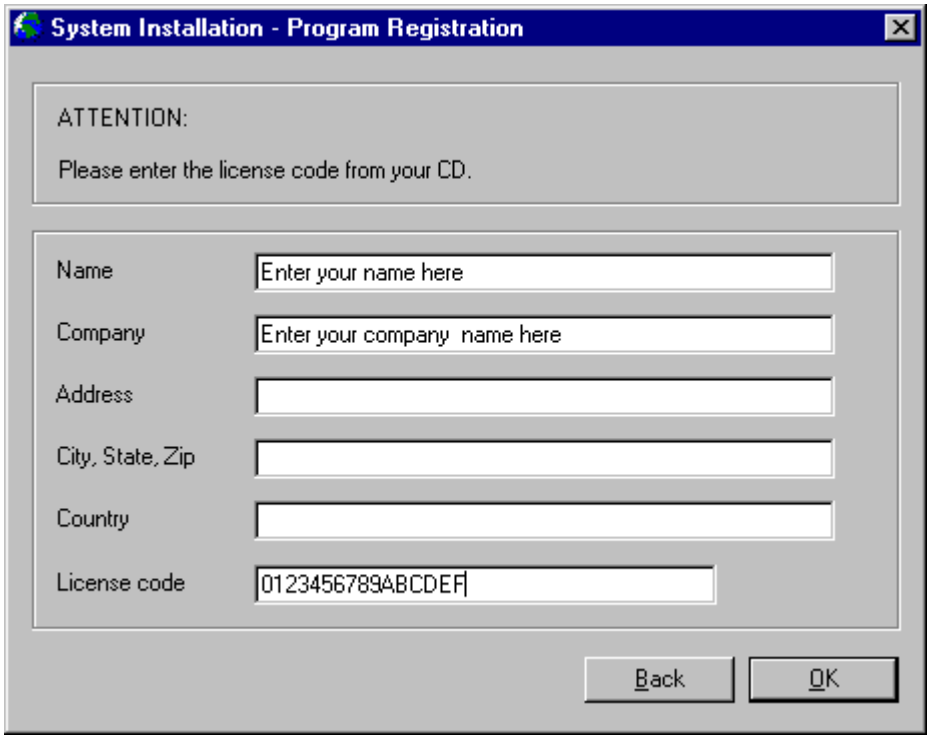


Figure 3: Enter the Name, the Company Name and the license code

Note: The License Code 0123456789ABCDEF is no valid code and is only used for explanation.

It is necessary to fill in the Name and the Company Name. It is optional to fill in the Address, the City, State, Zip and Country.

The installation program offers the following selections:

Selection	Default Settings	Meaning
Directory	C:\Programs\Hilscher\SyCon	Directory for Installation of the SyCon and its Components
AS-Interface	Selected	Program DLL and Components of the Fieldbus System or the Protocol
CANopen	Selected	
DeviceNet	Selected	
InterBus	Selected	
PROFIBUS	Selected	
Ethernet/Protocol	Selected	
CIF Device Driver	Selected C:\Programs\CIF Device Driver	CIF Device Driver
Program Menu	SyCon System Configurator	Folder under Start > Programs

Table 2: Selection during installation

The installation program copies the program files, GSD or EDS files and Bitmaps to the hard disk of your PC. Finally

- System DLLs,
- The Application,
- OLE Controls and
- ODBC Components

are entered into the Registry.

2.4 Licensing

This section describes the steps to license the System Configurator from the already installed basic version of the System Configurator. To license the System Configurator during installation was already described above.

Deliveries that contain a license for the System Configurator have a formula with. Fill out this paper (formula) and fax it to your distributor or directly to us. After you receive the license code enter it as described in section *Enter the License Code* as described below on page *18*.

An order form for a license for the System Configurator can be printed out and is described in the next section.

2.4.1 Ordering a License for the SyCon Configurator

To order the license code for the selected fieldbus systems select the menu **Help > Licensing**. The licensing window will be opened.

Fill in your name, the company name and the address for license information into the planed fields.

Select one or more fieldbus modules. There are three tables to do this. The first table list the modules, that are not licensed. Double click or select and click the **Add** button to move the desired modules into the table in the middle that are printed on the order form later. The modules, which are already licensed, are shown in the last table.

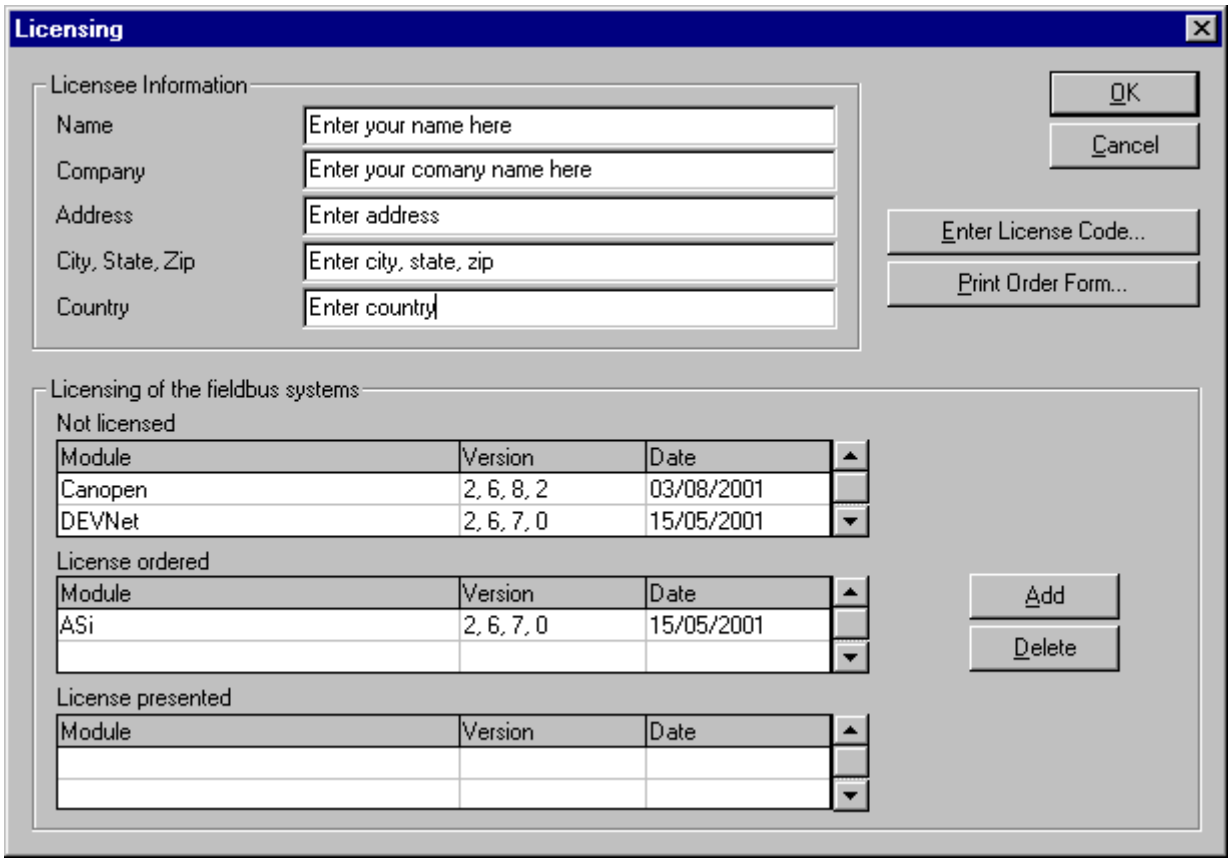


Figure 4: Example for select the Fieldbus Module AS-Interface

After selecting the modules select the button **Print Order Form** and send us this paper by fax or by mail.

2.4.2 Enter the License Code

This section describes the steps to license the System Configurator from the already installed basic version of the SyCon. To license the System Configurator during installation was already described above.

Select the menu **Help > Licensing**. The licensing window will be opened.

In the table in the middle are listed the fieldbus modules that were already selected for the order form. If this is not the case then select the fieldbus modules from the upper table by double click or by select and **Add**.

Check if the name and the company name was entered exactly as printed on the fax. Observe that the spelling is the same as on the fax, especially the small and capital letters.

Then select the button **Enter License Code**. The following windows appears. Enter the 16 digits of the license code.

Note: License codes with less than 16 digits can only be entered during the installation. In this case deinstall the System Configurator first and then restart the installation and enter the code. Also this System Configurator (license codes with less than 16 digits) expects a license in the device.

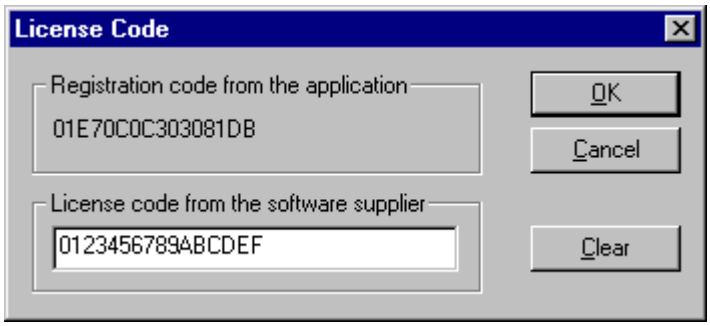


Figure 5: Enter the License Code

Note: The license code showed above is an invalid license code and is only used for explanation.

After you have entered the license code select the button **OK**. The code is verified. If the license code is valid the System Configurator will ask you to exit and restart the system to activate the license. If the license code is invalid the following window appears.

Figure 6: Note license code invalid

In this case check

- the license code with the information on the fax .
- the right spelling of the name and the company name with the information on the fax. Check especially for small and capital letters.

2.5 Scope of Functions of the Basic Version and unlicensed Fieldbus Modules

The basicmode and unlicensed fieldbus modules have the following functionality:

- Full functionality for configuring up to two devices. For the configuration of one Hilscher slave device this is enough.
- All diagnostic functions
- Open and download of an existing configuration file. If the configuration file has more than two devices, a modification of this configuration is not possible.

3 Getting Started – Configuration Steps

3.1 Overview Communication Types

Select from the following the communication that you want to use. The configuration steps are described in the given section.

Note: The booklet with the DVD ROM contains information for the hardware installation and information to the cable. At this point it is presupposed that the hardware installation was already done.

Communication	Device	Device	Described in section	Page
AS-Interface	Hilscher AS-Interface Master	Any AS-Interface Slave	*Configuration Hilscher AS-Interface Master to any AS-Interface Slave*	*22*

Table 3: Overview Communication Types

3.2 Configuration Hilscher AS-Interface Master to any AS-Interface Slave

The following table describes the steps to configure a Hilscher AS-Interface Master to any AS-Interface Slave as it is typical for many cases.

#	Action	Menu in the System Configurator	Detail information in section	Page
1	Create a new project	**File > New > AS-Interface**	*Setting up the AS-Interface Configuration*	*23*
2	Select Hilscher AS-Interface Master	**Insert > Master**	*Insert Master*	*24*
3	Select AS-Interface Slave	**Insert > Slave**	*Insert AS-Interface Slave*	*26*
4	Assign the offset addresses	Mark the Slave (left mouse click), then **Settings > Slave Configuration**	*Slave Configuration*	*28*
5	Set device assignment if no automatic assignment has occurred	Mark the Master (left mouse click), then **Settings > Device Assignment**	*Device Assignment*	*31*
6	Save project	**File > Save**	*Save and Save As*	*66*
7	Download	Mark the Master (left mouse click), then **Online > Download**	*Downloading the Configuration*	*46*
8	Start Debugger	Mark the Master (left mouse click), then **Online > Start Debug Mode**	*Debug Mode (AS-Interface Master)*	*55*
9	Device diagnostic	Mark the Slave (left mouse click), then **Online > Device Diagnostic**	*AS-Interface Slave Device Diagnostic*	*56*
10	Stop Debugger	**Online > Stop Debug Mode**	*Debug Mode (AS-Interface Master)*	*55*
11	Global diagnostic	Mark the Master (left mouse click), then **Online > Global State Field**	*Global State Field*	*57*
12	Transfer user data: Write output, Read input	Mark the Master (left mouse click), then **Online > I/O Monitor**	*I/O Monitor* **(*1)** or alternatively: *I/O Watch*	*61* *62*

Table 4: Steps for Configuration Hilscher AS-Interface Master to any AS-Interface Slave

Note (*1): Alternatively the CIF Device Driver Test program can be used for the test. After Board Select: Data Transfer > I/O Data > DevExchange I/O.

4 Configuration of AS-Interface with SyCon

4.1 Setting up the AS-Interface Configuration

To create a new configuration, choose the **File > New** menu. This will offer a selection list of fieldbus systems. Choose the **AS-Interface**. If only the AS-Interface fieldbus system is installed, the configuration window will open directly.

The name of the project file can be allocated when the configuration is finished or with **File > Save As**.

4.2 EDS Files

EDS (Electronic Data Sheet of a device) files contain and describe the functions and characteristics of the AS-Interface devices. All the available EDS files together from the device database.

When the System Configurator is started, the program automatically retrieves all the EDS files stored in the EDS directory. The device names for example are placed into an internal list. During the configuration, the device-specific data is retrieved directly from the EDS files.

If an EDS file for a device is needed which does not appear in the selection list it can be copied into the EDS directory with **File > Copy EDS**. Another possibility is to copy the EDS file into the SyCon EDS directory with the Windows Explore and then retrieve the EDS files into the EDS directory with **Settings > Path** and **OK**.

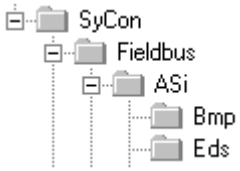


Figure 7: EDS files and bitmaps directory

The EDS files for Hilscher devices as well as devices from other manufacturers are already included in the scope of delivery and installed. The files are based on no standard and couldn't obtained from other manufacturers because of this reason.

If an EDS file for a Slave is missing you have to possibility to create it on your own with an ASCII editor. Therefore you have to copy an existing EDS files and to rename it. Then you can modify the new EDS file.

The EDS directory is adjustable. In order to alter the directory from the default setting in another directory, use the **Settings > Path** menu. All EDS files must be placed in this directory.

4.3 Master

4.3.1 Insert Master

In order to insert a Hilscher Master into the configuration, choose the **Insert > Master** menu, in order to open the selection window, or click on the symbol:

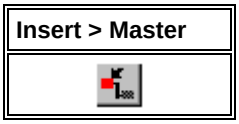


Figure 8: Insert > Master symbol

The window opens from which exactly one Master can be chosen. After this selection the chosen master is at the first position in the configuration window.

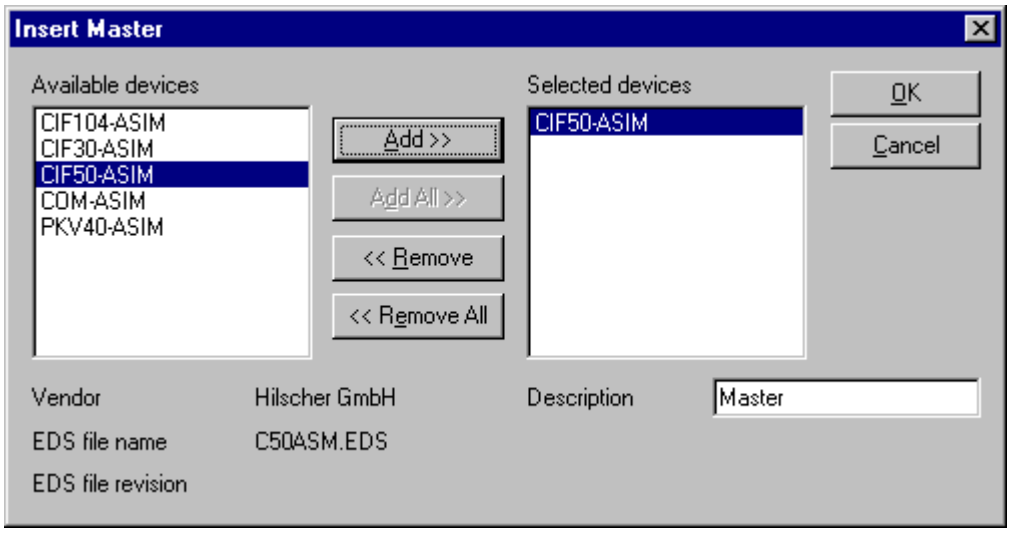


Figure 9: Insert > Master

This example shows a CIF50-ASIM. It gets no Station address but the standard description **Master**. This description is changeable in the field **Description**.

4.3.1.1 Hardware Assignment

If you have configured the CIF Device Driver Setup for your hardware and you insert the correct Master in the SyCon it detects this hardware. SyCon displays at which board and which driver was detected and ask if the hardware should be assigned.

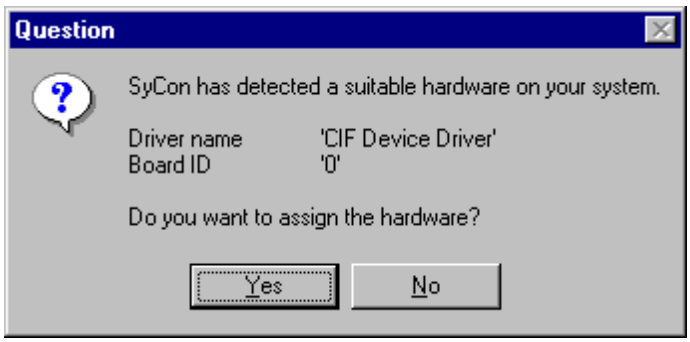


Figure 10: Assign hardware Master

If you answer with **Yes**, the hardware is assigned. If you answer with **No** you have to assign this hardware with **Settings > Device Assignment** (look in section *Device Assignment* at page *31*).

4.3.2 Master Settings

See section *Master Settings* at page *38*.

4.3.3 Replace Master

If a Master already exists in the configuration and should be replaced against another Master, you first have to set the focus on the Master (left mouse click at the Master) and then choose the menu **Edit > Replace**. In the opened window appears the question if the Master should be replaced.

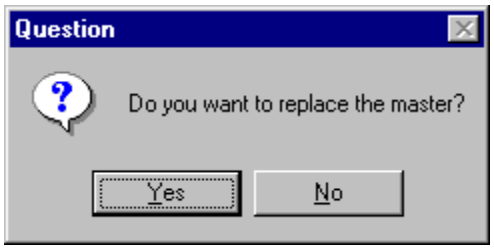


Figure 11: Security question replace Master

If you click the button **Yes** a new window opens, where you can replace the Master against the existing Master.

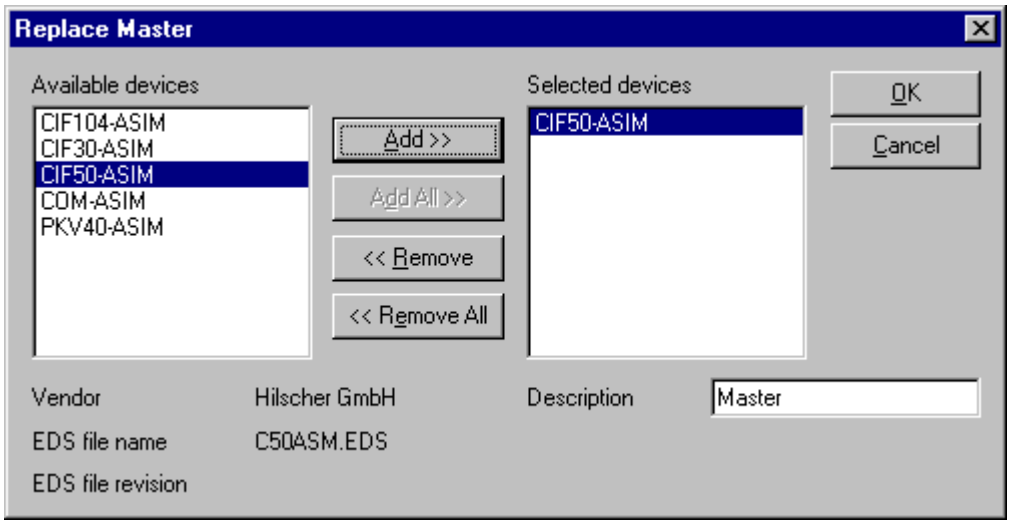


Figure 12: Edit > Replace Master

In this window you select the Master you want by clicking on it and then click the **Add** button to put the Master to **Selected devices**. With **OK** you confirm the selection and the Master will be replaced.

4.4 AS-Interface Slave

4.4.1 Insert AS-Interface Slave

In order to insert an AS-Interface Slave into the configuration, choose the menu **Insert > Slave**

or

click on the **Insert Slave** symbol:

Insert > Slave


Figure 13: Insert an AS-Interface Slave

The mouse pointer automatically changes to the Insert Slave pointer. First the a mouse pointer for “no insert position” appears.

Mouse pointer “no insert position”


Figure 14: Mouse pointer “no insert position“

Possible insert positions are displayed with a colored circle  .

Note: In the case of an AS-Interface network the Master has possible insert positions for the Slaves because the Master card has two channels which work independent to each other and are two different networks.

If you move the mouse pointer over the colored circle, it changes into this symbol to show that this is a possible insert position:

Mouse pointer for Insert > Slave


Figure 15: Mouse pointer for insert an AS-Interface Slave

Click on the position where the Slave is to be inserted.

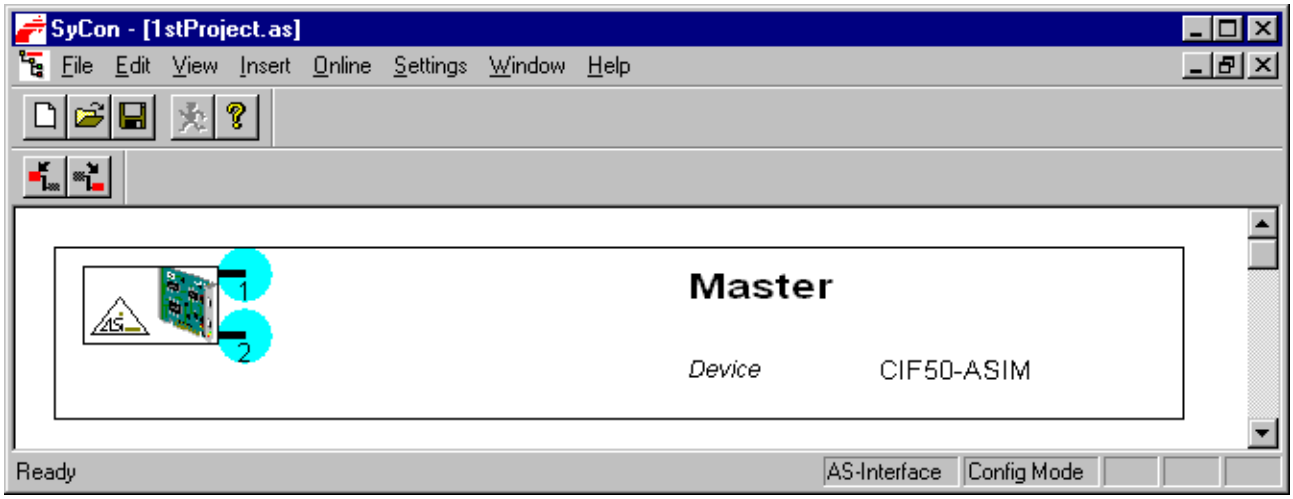


Figure 16: Possible insert positions of devices with identification by a colored circle

The window opens where one or more Slaves could be selected.

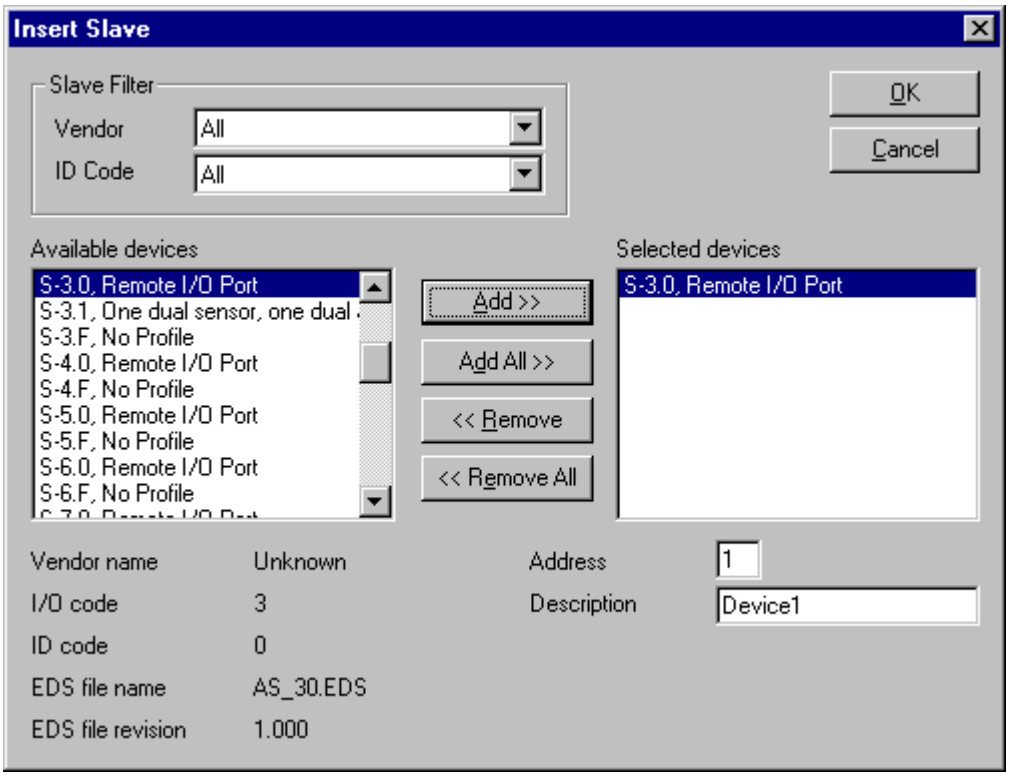


Figure 17: Insert > Remote Bus Device

The list on the left displays for selection all the Slave devices whose EDS files have been put in the EDS directory. A filter can be used to limit the selection list of the manufacturer. Further information on a Slave is shown below the selection list (**Available devices**) when it is selected (one mouse click).

Apart from the vendor name and the description especially the I/O code, the ID code and the extended ID2 code, the file name and the file revision are given. The Slave appears on the right-hand list with a mouse click or with the **Add** button. All devices in the right-hand list are assigned to the current insert point that is also shown in this window. If the Slaves in the right-hand list are chosen one after the other (a mouse click), then every Slave can be assigned a name in the **Description** field.

Furthermore you can assign a **Address** in the range of value from 1 to 62. This Address has to be unique.

4.4.2 Slave Configuration

First click the symbol of the Slave with the left mouse button and then choose the **Settings > Slave Configuration** menu.

or

open the Slave configuration window by double clicking on the AS-Interface Slave device.

The slave-specific configuration is carried out in this window. Here, the modules and their addresses are assigned in the process data memory in the Hilscher Master. Note that the address must agree with that in the PC application program.

Note: The information of the offset addresses refers to the addressing of the data in the Master! The address information does not refer to the addressing of the data in the Slave! The Slave organizes its own data addressing.

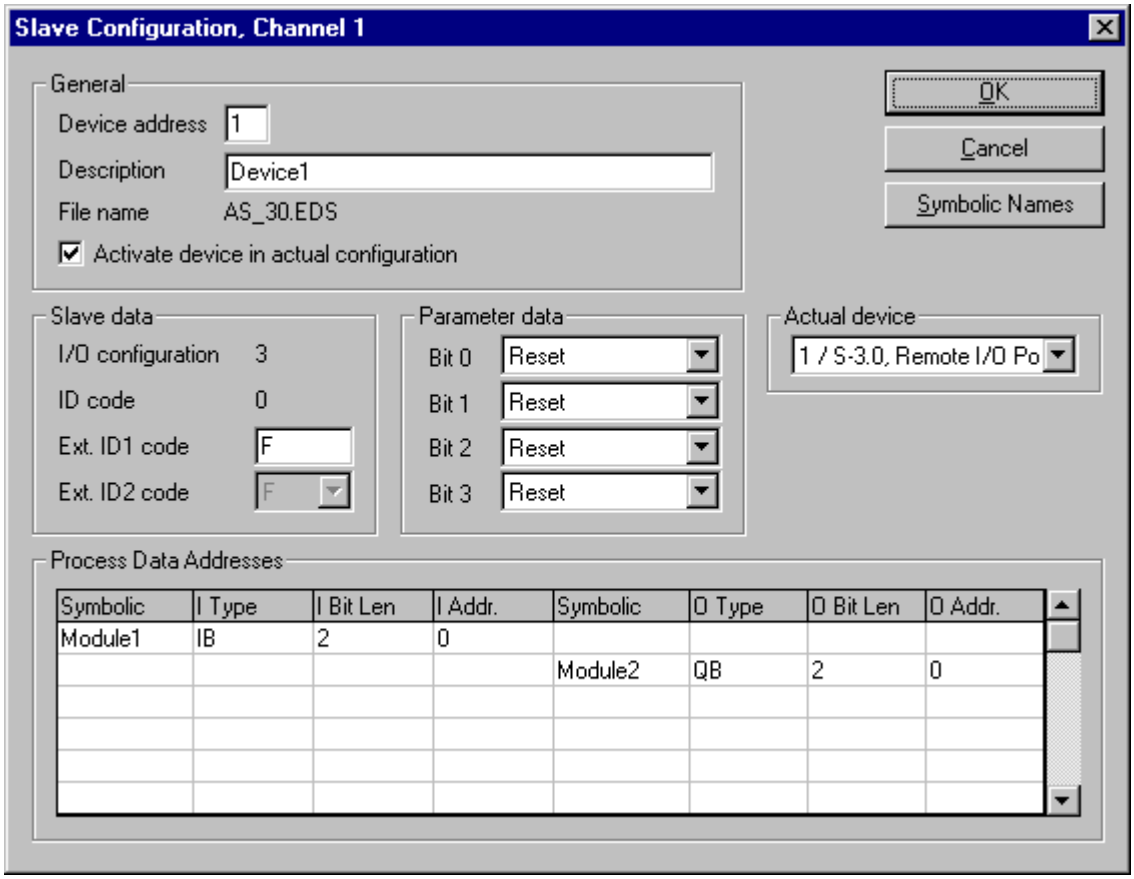


Figure 18: Settings > Slave Configuration

The device-specific configuration is carried out here. These are in detail:

- the **Device address**
- a **Description** of the device,
- **Activate** or **Deactivate** the Slave in the actual configuration,
- configuring the **Process Data Addressing** (see following description),
- selecting an other device without leaving the window.

If **Activate device in actual configuration** is selected, the Master carries out an data exchange to this device. Is this setting deactivated, then the master doesn't carry out a data exchange to this device. In both cases however the memory in the process image is used respectively reserved in the Master.

The I/O addresses can be automatically assigned by SyCon or can be allocated by the user. For this purpose you have to activate (Auto addressing) and deactivate (manual addressing) respectively it in the menu **Settings > Auto Addressing** the **Process Data Auto Addressing**. When the Auto Addressing is active, then the addresses of the Slaves will be allocated in their insert order by SyCon. The addresses can be viewed and checked in the **View > Address Table**. When the Auto addressing is deactivated, then only the address 0 is shown in the **I Addr** or **O Addr** and must be overwritten by the user.

Depending on the **Addressing mode**, which can be set in the **AS-Interface Master Settings**, the addresses are either Byte or Word addresses. For further details of this, see the description in the section *Addressing Mode* on page *40*.

At **Actual device** you can change to another Slave device without leaving the window.

In the field **Slave data** are the I/O code and the ID code of this device are shown. The description to this you find in section *I/O Code, ID Code,* at page *102*.

4.4.2.1 Parameter data

The parameter data is vendor specific and they are read from the EDS file.

If no more information is set in the EDS file the standard **Reset** respectively **Set** is shown. If information for the Parameterbit is set in the EDS file this information is shown.

For example by a reflective photointerrupter "dark" instead of **Reset** and "light" instead of **Set** can be shown in the field Parameter bit 1.

Figure 19: Setting of Parameter bits

4.4.3 Replace Slave

To replace a Slave device in the configuration against another you first have to set the focus on the Slave (left mouse click at the Slave) to mark it. Then select the menu **Edit > Replace** or make a right mouse click at the Slave and select **Replace**.

In the opened window the question appears if the Slave device should be replaced.

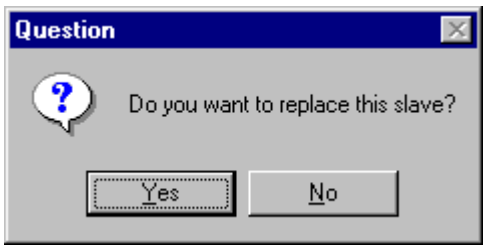


Figure 20: Security question replace slave

If you answer this question with **Yes**, the following window appears where you can select an other Slave device.

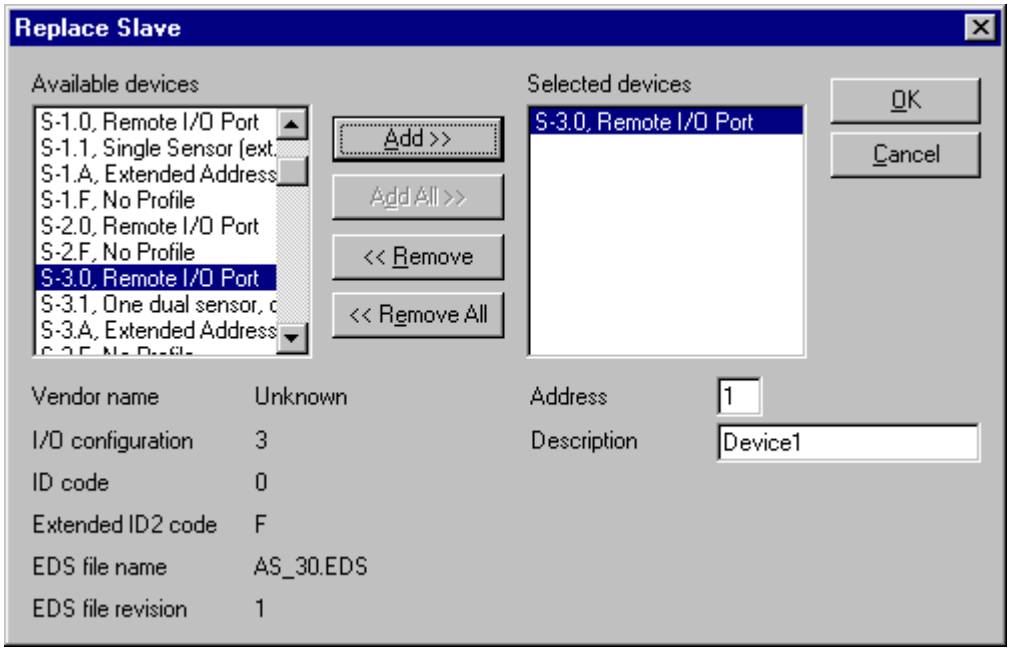


Figure 21: Edit > Replace Device

In this window you can choose the device you want by clicking on it. By clicking the **Add** button the Slave is shown under **Selected devices**. With **OK** you confirm the selection and the Slave will be replaced.

5 Settings

5.1 Device Assignment

The Device Assignment setting determines how the System Configurator communicates with the device. This is set in the device arrangement via the menu **Settings > Device Assignment**. The following possibilities are available:

CIF Device Driver	CIF Serial Driver	CIF TCP/IP Driver

CIF Device Driver:

- CIF Device Driver: The System Configurator communicates with the Hilscher device over the Dual-port memory of the device.
- This communication is utilized when the System Configurator is used on the same PC on which the Hilscher device (CIF) is installed.
- The CIF Device Driver must have been installed.

CIF Serial Driver:

- CIF Serial Driver: The System Configurator communicates with the Hilscher device over a serial connection. In this case, a COM port of the PC must be connected via a diagnostic cable with the diagnostic interface of the Hilscher device. The cable is shown in the manual for the DVD.
- This communication is utilized when the System Configurator has access the device over the diagnostic interface of the Hilscher device. The following two application cases are possible:
- Application case 1: The System Configurator is installed on another PC (e.g. a notebook) than the Hilscher device.
- Application case 2: The System Configurator is installed on the same PC on which the Hilscher device is situated. Then the application can use the Dual-port memory to access the Hilscher device and the diagnostic interface can be used at the same time to communicate with the device (diagnostic data).

CIF TCP/IP Driver:

- CIF TCP/IP Driver: The system configurator communicates with the Hilscher device via a TCP/IP connection.
- This communication is utilized when the System Configurator is installed on another PC than the Hilscher device and there is a TCP/IP connection between the two PCs.
- Our CIF Device Driver and a server program is required on the PC with the CIF and this server program is situated on the DVD in the UTIL\TCPIPSRV directory. The program is called Tcpipsrv.exe.

5.1.1 CIF Device Driver

The Device driver supports up to four devices in one PC and they are accessed via the Dual-port memory.

The Device driver is selected via **Settings > Device Assignment**.

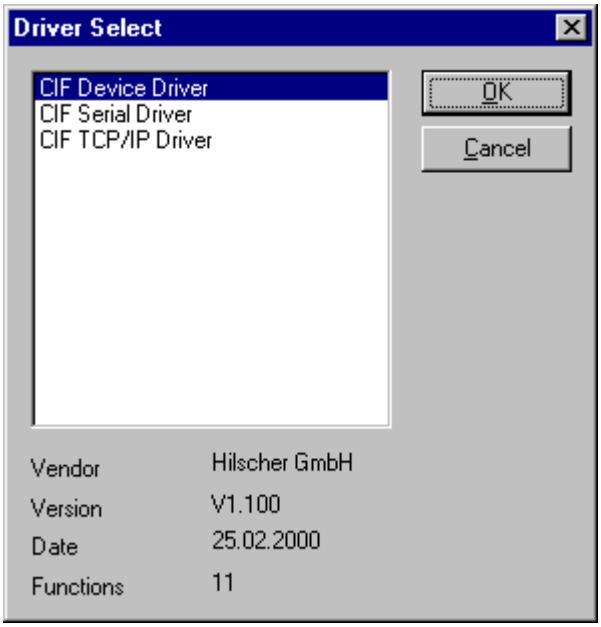


Figure 22: Driver Selection > CIF Device Driver

Choose **CIF Device Driver** and then **OK**, in order to select the CIF Device Driver.

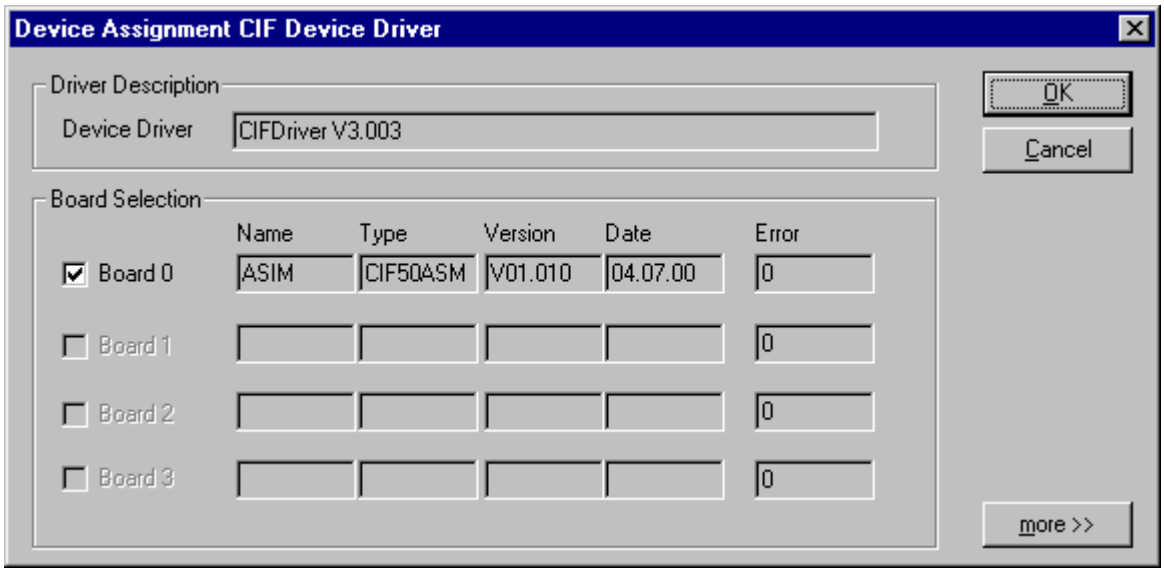


Figure 23: Driver Selection > CIF Device Driver

The assignment is carried out if the checkbox is selected. In addition the checkbox need to be accessible (not grey colored). If the checkbox is grey colored and selected the device is already assigned. In this case another configuration file is opened. You first have to close it, so that the assignment can take place.

5.1.2 CIF Serial Driver

The serial driver supports COM1 to COM 4, in order to communicate over the diagnostic interface with the device.

The Device is selected via **Settings > Device Assignment.**

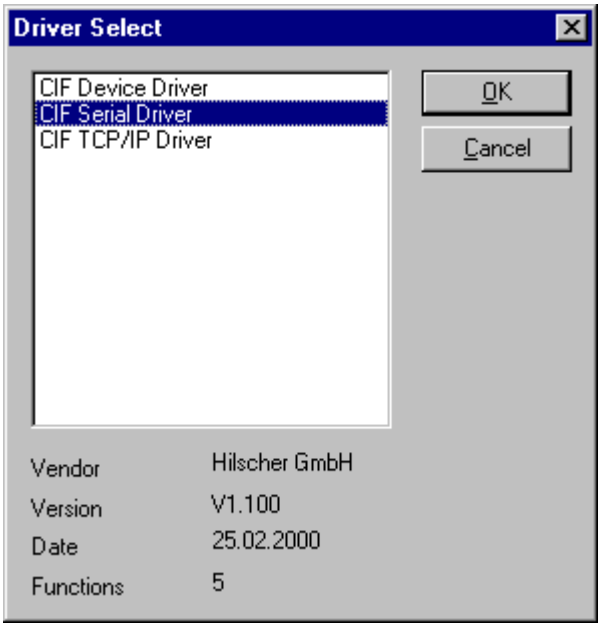


Figure 24: Driver Selection > CIF Serial Driver

Choose the **CIF Serial Driver** and then **OK**, in order to select the CIF Serial Driver.

The connection must first be established using the button **Connect COM1** or **Connect COM2** or **Connect COM3** or **Connect COM4**. They can be used depending on which COM ports are installed and free on the PC.

The System Configurator sends a request to the corresponding COM port and polls the Firmware name of the device. A display of the Firmware will indicate when a device is connected. In the other case, a Timeout error (-51) appears, which will state that no device is connected.

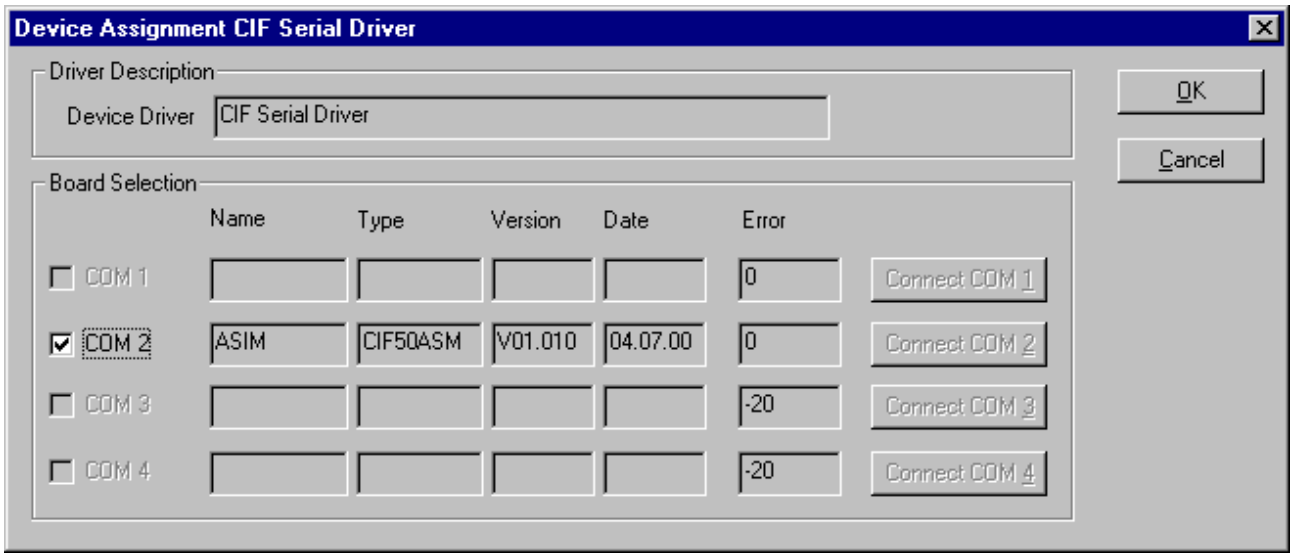


Figure 25: CIF Serial Driver > Device Assignment

The error number –20 indicates that this COM interface is not available or free.

5.1.3 CIF TCP/IP Driver

The TCP/IP driver connects up to four devices that can be accessed over a TCP/IP connection.

The driver must be installed on the PC with the CIF, the CIF must be configured and the Tcpipsrv.exe program, in UTIL\TCPIPSRV on the DVD, must be started.

The TCP/IP driver is chosen via **Settings > Device Assignment.**

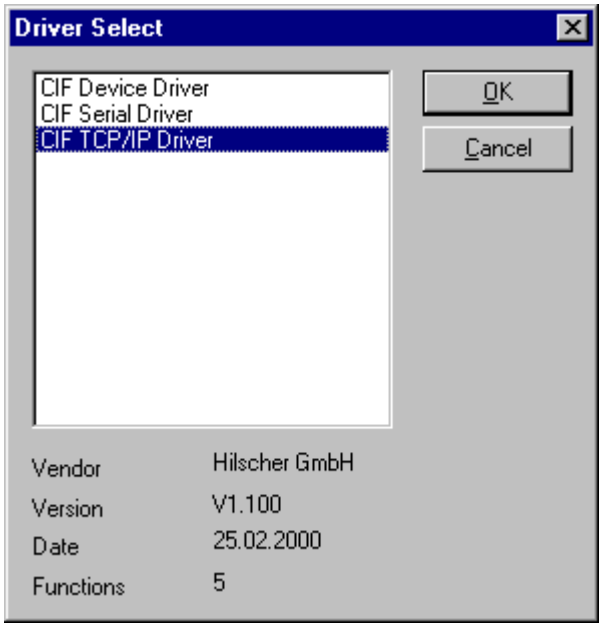


Figure 26: Driver Selection > CIF TCP/IP Driver

In order to select the CIF TCP/IP driver, choose **CIF TCP/IP Driver** and then **OK**.

Then the IP address of the PC on which the CIF is situated must be entered and **Connect to Server** must be chosen.

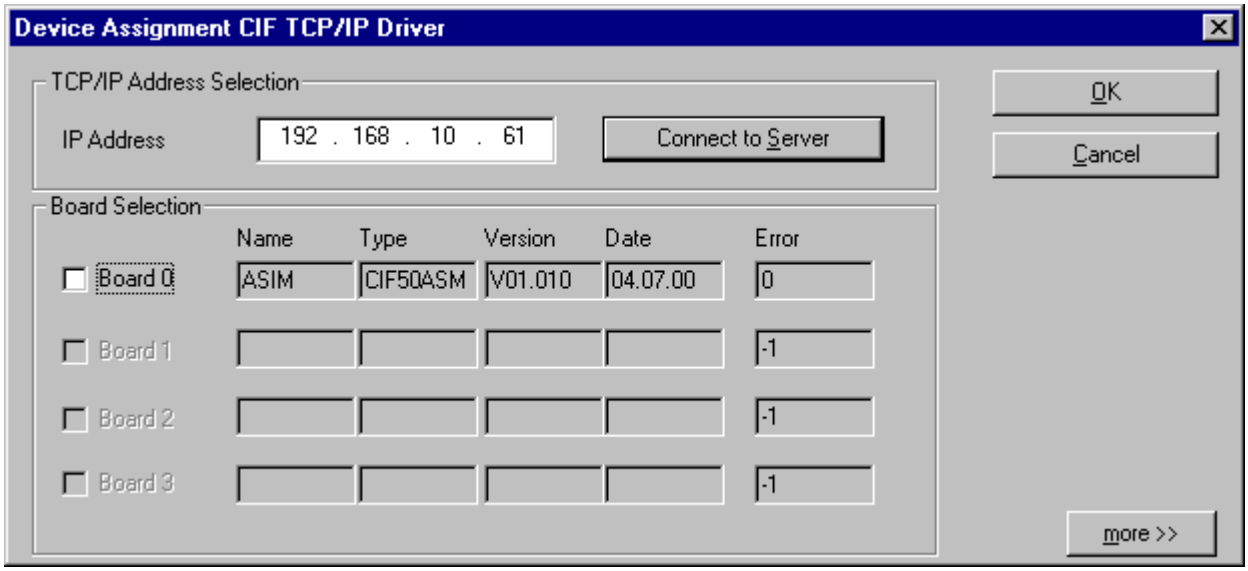


Figure 27: CIF TCP/IP Driver > Device Assignment

If the connection has been successful, the device that has been found will appear in the device selection. It will be selected if the name is the same as the selected device in the configuration.

5.2 Bus Parameter

The window Bus Parameter can be opened with the menu **Settings > Bus Parameter**.

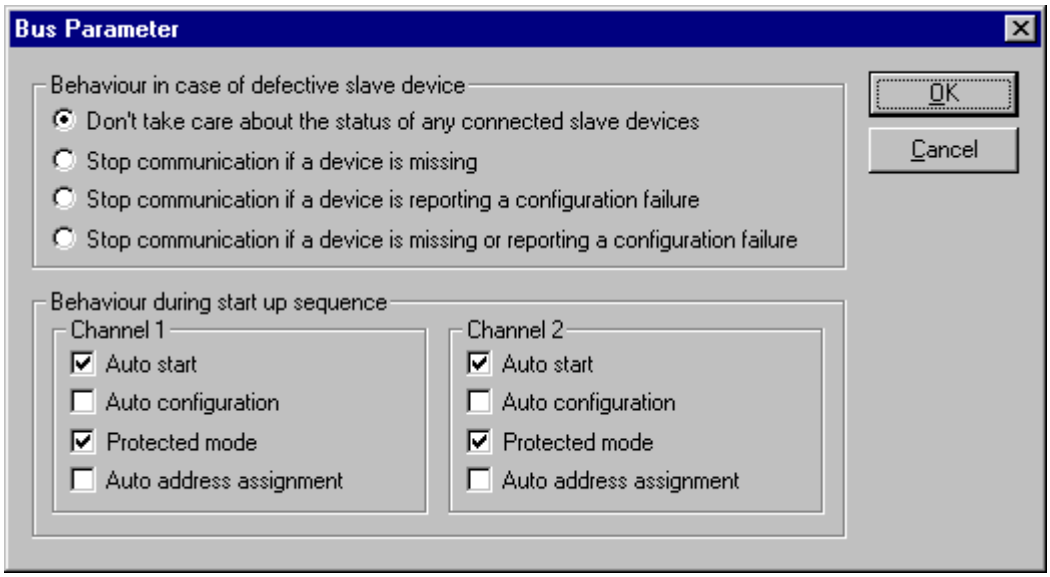


Figure 28: Settings > Bus Parameter

The **Behavior in case of defective slave device** determines the procedure of the Master, if a Slave is detected as missed during run time and during the first network start up phase

- **Don't take care about the status of any connected slave devices.** The Master tries to hold the network communication notwithstanding of the states of the connected Slaves.
- **Stop communication if a device is missing.** The Master stops network communication for both channels, if it detects a missing Slave during the first network scan or during the data exchange.
- **Stop communication if a device is reporting a configuration failure.** The Master stops network communication for both channels, if at least one Slave is reporting a configuration failure.
- **Stop communication if a device is missing or reporting a configuration failure.** The Master stops network communication for both channels, if it detects a missing Slave or a Slave reports a configuration failure.

The **Behavior during start up sequence** determines the procedure of the Master during the start up. It distinguishes between the Slaves which are connected to the **Channel 1** and the Slaves which are connected to the **Channel 2** at the Master.

- **Auto start**

  If this flag is set, the Master chip of the corresponding channel starts immediately after the initialization with data cycles.

- **Auto configuration**

  If this flag is set, the offsets of the slaves in the process image will be calculated automatically from the master. The offsets corresponds to the salve addresses, i.e. slave 1 has the offset 1, slave 2 the offset 2 and so on.

- **Protected mode**

  This flag decides, if the Master chip of the corresponding channel goes in the "protected data exchange mode" or in the "configuration mode".

- **Auto address assignment**

  If the Master detects a Slave which can replace a missing Slave (it needs the same I/O code, ID, ID1 and ID2 code) it assigns the address of the missing Slave to the detected on, if the new Slave has the address 0 (zero).

5.3 AS-Interface Master

5.3.1 Master Settings

To enter the Master settings, choose the **Settings > Master Settings** or click with the right mouse button on the corresponding Master symbol and select the menu Master Settings from the list that opens.

The Master settings contain parameters that determine the behavior of the Master device as well as the user interface. These settings are only valid for Hilscher devices and are included in the download of the configuration.

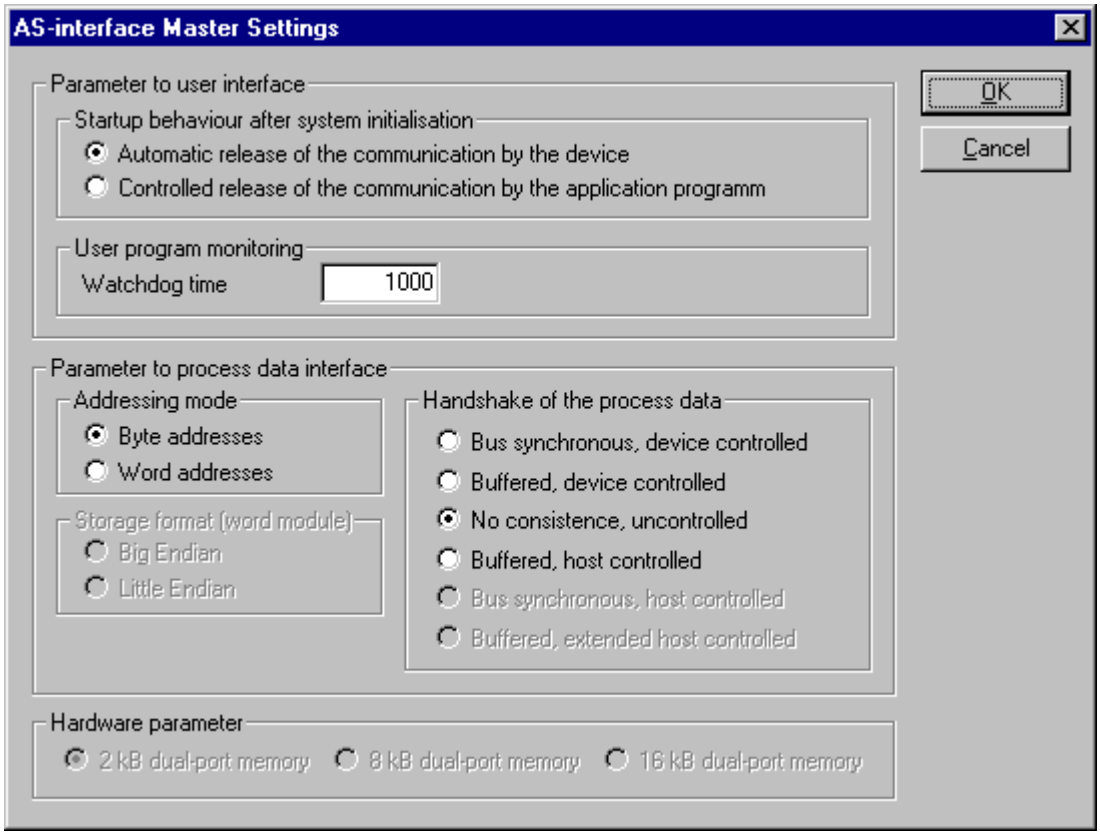


Figure 29: Settings > Master Settings

- **Startup behaviour after system initialization**

  When **Automatic release of the communication by the device** has been set, the Master device starts with the data exchange at the Bus after the initializing has been finished. When **Controlled release of communication by the application program** has been set, the application program has to activate the data exchange at the Bus.

- **User program monitoring**

  The **Watchdog time** determines how long the device waits for a triggering of the software watchdog by the application program until it sets the outputs of the Slave devices to zero. This behaviour must be activated by the user program and does not start automatically.

Note: This is not a special AS-Interface function.

An example of the use of this function can be a SoftPLC.

- **Addressing mode**

  The addressing mode of the process data image determines how the addresses (Offsets) of the process data are interpreted. Either of the addressing modes **Byte addresses** or **Word addresses** are possible. See also details on the next page.

- **Handshake of the process data**

  These various types are used for setting the handshake of the process data for the Master. The choice of used type is important for the correct data exchange between the application program and the device.

  The used handshake of the process data needs to be supported by the application program. Mostly the buffered, host controlled handshake is supported. The setting no consistence, uncontrolled works without handshake and the processes run free.

- **Hardware parameter**

  This parameter displays the full size of the dual-port memory. This is a read only information. If the size is for example 2KB then 1KB is usable for the process image.

5.3.2 Addressing Mode

The addresses in the configuration of the nodes define the starting point of the data in the process depiction. This can work in a Word or Byte oriented method by means of the **Addressing mode** parameter.

Addresses	Meaning
Byte addresses	The process image has a Byte structure and each Byte has its own address.
Word addresses	The process image has a Word structure and each Word has its own address.

Table 5: Addressing Mode

This has nothing to do with the physical size of the Dual-port memory – this is always Byte-oriented! When the application makes a Word access, it is automatically divided by the PC into two sequential Byte accesses.

The following table shows the different storing of the various data types in the Byte- or Word-oriented process image:

IEC address in Byte mode	IEC addresses in word mode	Offset addresses in the dual-port memory	Data in the process image	Output to an I/O Module
QB 0	QB 0	0	0000 0000	
QB 1		1	0000 0000	
QB 2	QB 1	2	0000 0010	Output of QB2 / QB1 to a Slave: D7 D6 D5 D4 D3 D2 D1 D0 0 0 0 0 0 0 1 0
QB 3		3	0000 0000	
QB 4 QB 5	QB 2	4 5	0000 0111 0000 0000	Output from QB4 / QB2 to a Slave D7 D6 D5 D4 D3 D2 D1 D0 D7 D6 D5 D4 D3 D2 D1 D0 0 0 0 0 0 0 0 0 0 0 0 0 0 1 1 1

Table 6: Example for data in the process data image

The following table is meant to clarify the method of addressing:

Byte addressing		
Byte 0	IB 0	IW 0
Byte 1	IB 1	
Byte 2	IB 2	IW 2
Byte 3	IB 3	
Byte 4	IB 4	IW 4
Byte 5	IB 5	

Word addressing		
Word 0	IB 0	IW 0
	-	
Word 1	IB 1	IW 1
	-	
Word 2	IB 2	IW 2
	-	

Table 7: Image of the method of addressing for input

Byte addressing		
Byte 0	QB 0	QW 0
Byte 1	QB 1	
Byte 2	QB 2	QW 2
Byte 3	QB 3	
Byte 4	QB 4	QW 4
Byte 5	QB 5	

Word addressing		
Word 0	QB 0	QW 0
	-	
Word 1	QB 1	QW 1
	-	
Word 2	QB 2	QW 2
	-	

Table 8: Image of the method of addressing for output

5.3.3 Auto Addressing

With the menu **Settings > Auto Addressing** it is set, if the process data addressing is executed automatically by SyCon (active selected) or manually by the user (active not selected).

5.4 Project Information

If the user creates his own project, the project information can be typed in into the **Settings > Project Information** menu. Anybody can then read this entry when this menu is opened.

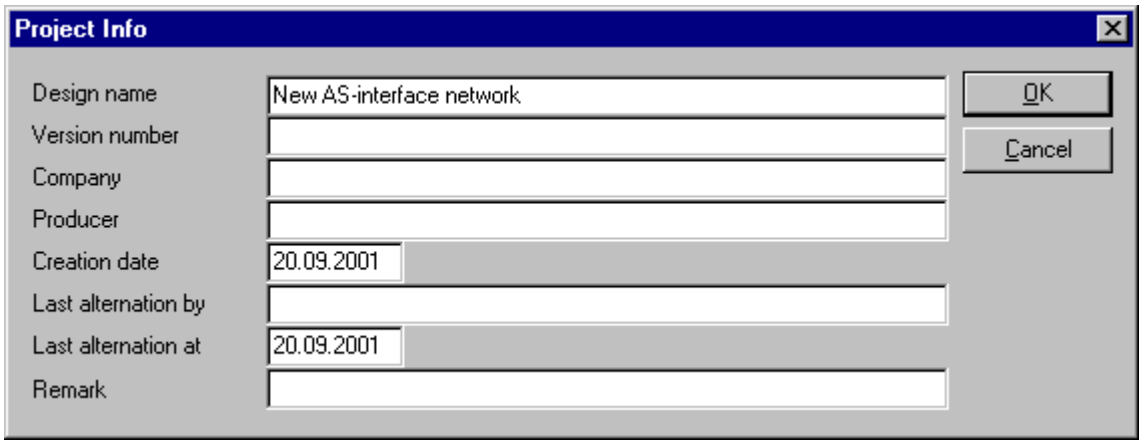


Figure 30: Settings > Project Information

By clicking the **OK** button the Project Information is saved.

5.5 Path

When the **Settings > Path** menu is selected, the search path for EDS files is displayed.

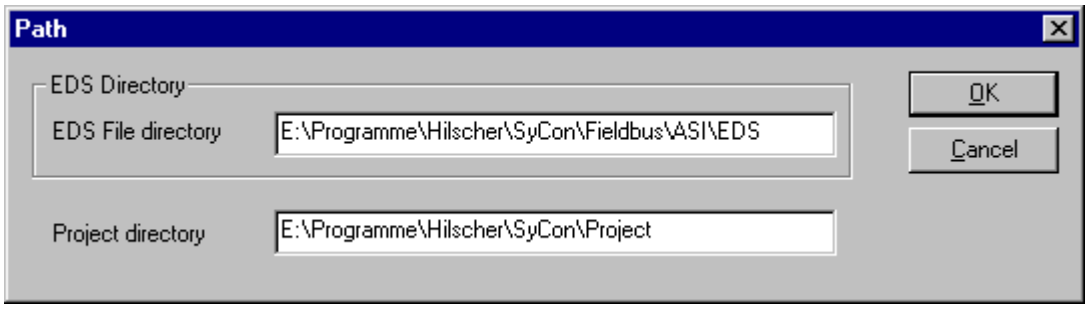


Figure 31: Settings > Path

If you click on the **OK** button all EDS files are read in.

5.6 Language

Choose the **Settings > Language** menu and the following window opens:

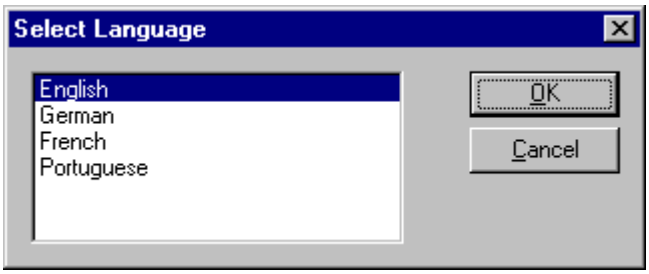


Figure 32: Settings > Language

Here can be set the language of the System Configurator. Select the desired language and confirm the entry with the **OK** button.

A message appears that the System Configurator must be started again in order to activate the selected language. Please carry this out.

After restarting the System Configurator, the language will have changed to the one selected.

Note: Up to now not all languages are available for all fieldbuses!

5.7 Start Options

Starting from the window Network View (menu **Window > Network View**) the menu **Settings > Start...** opens the window **Start Options**. The different start options or modes can be set. Some of these settings are only for the OPC server.

Note: This menu option Start Options is only displayed in the selection Settings, if a project is loaded.

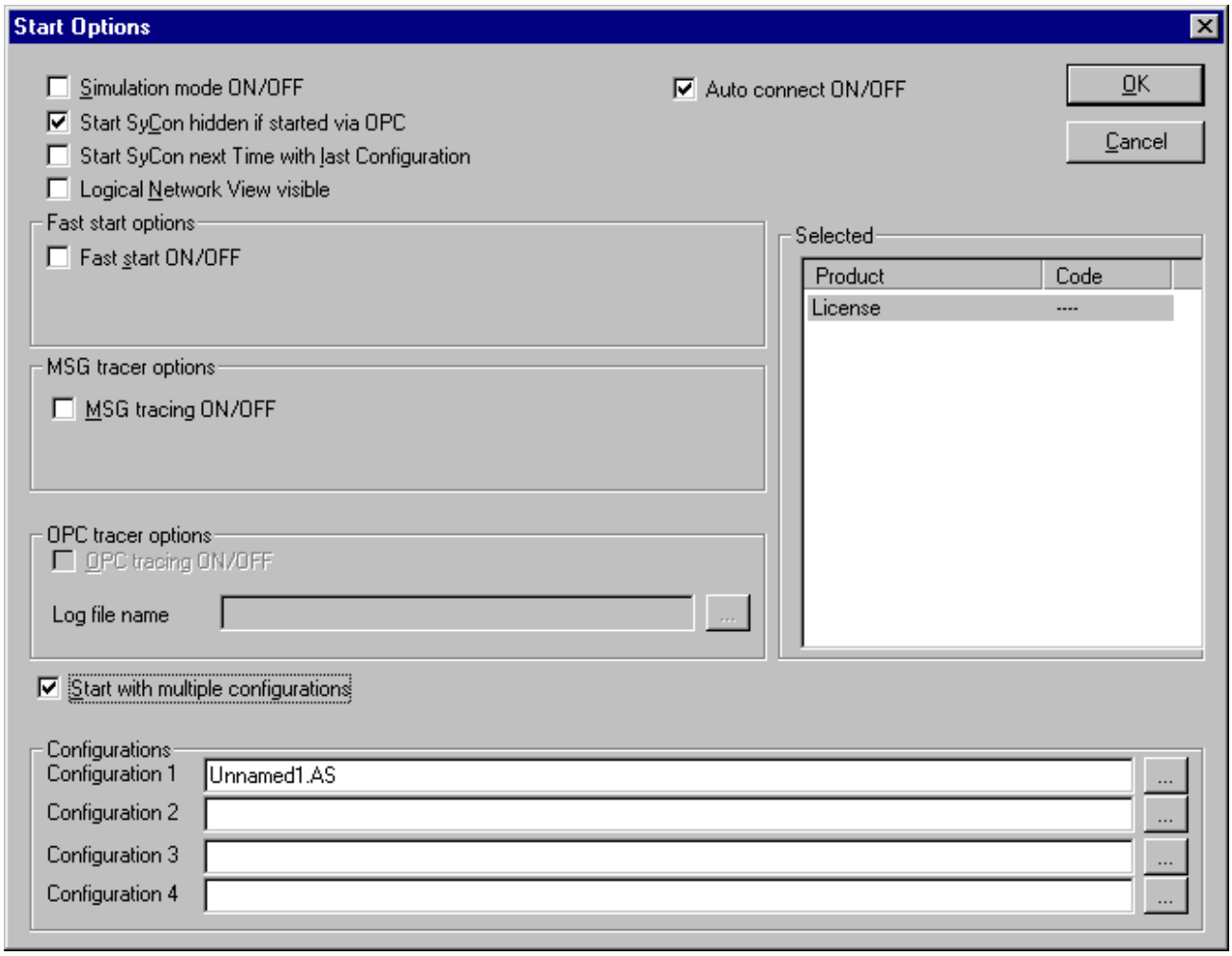


Figure 33: Settings > Start Options

- **Simulation mode ON/OFF**

  Only valid for the OPC Server.

- **Start SyCon hidden if started via OPC**

  Only valid for the OPC Server.

- **Start SyCon next time with last Configuration**

  When this is marked the last saved configuration in the SyCon is automatically loaded when the SyCon is started again.

- **Logic Network View visible**

  When this is marked, there is the possibility of diverting to the network mode without having to install the SyCon with OPC. It is also possible to use the Watch List from the network mode.

- **Fast start ON/OFF**

  Only valid for the OPC Server.

- **TAG tracing ON/OFF**

  Only valid for the OPC Server.

- **OPC tracing ON/OFF**

  Only valid for the OPC Server.

- **Auto connect ON/OFF**

  If this is marked, when opening a configuration automatically a connection to that Hilscher devices is manufactured without the device assignment additionally have to be executed.

- **Start with multiple configurations**

  If this option is selected you have the possibility to start SyCon with up to four configurations simultaneously. The paths are shown in the window and they are changeable there.

6 Online Functions

6.1 Introduction

In this section, all the functions that directly influence Hilscher AS-Interface devices, e.g. CIF50-ASIM, CIF30-ASIM, are presented.

Note: Please note that this also permits an interruption of the running communication or that input and output can be switched ON or OFF.

6.2 Online to the CIF

6.2.1 Downloading the Configuration

First, the desired device must be chosen for downloading by a left mouse click on the symbol of the device.

In order to transfer the configuration, a transfer download to the CIF/COM/PKV devices must be carried out on the **Online > Download** menu. A warning will appear that the communication on the AS-Interface will be interrupted. This warning must be confirmed.

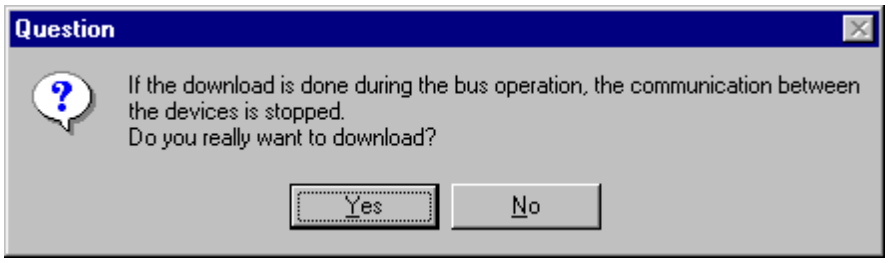


Figure 34: Security question before download

Attention: The download overwrites the configuration in the device and the communication with the connected devices is interrupted.

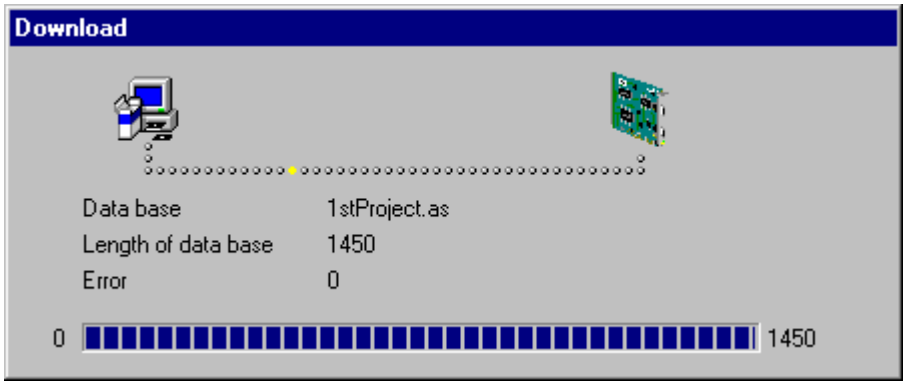


Figure 35: Online > Download

Before the Download is executed, the configuration is checked by the Configurator. The most common cause of error is overlapping of addresses in the process data image. This can be checked by calling up the address table with the **View > Address Table** menu.

If the assignment of addresses in the process data image should be carried out automatically, then the **Auto addressing** button in the **Master Configuration** window must be activated.

The configuration is transferred into the selected device and is stored there in FLASH memory in a zero voltage manner so that the configuration is available when the power supply is switched off and on again.

After the download, the device carries out an internal restart and begins with the communication if in **Master Settings** the **Automatic Release of Communication by the Device** menu has been set.

6.2.2 Firmware Download

If you want to carry out a Firmware download, act as follow: First the desired device for Firmware downloading must be chosen in that the symbol of the device is selected with a left mouse click. Then, call up the **Online > Firmware Download** menu. Select the new Firmware and retrieve it with **Download** into the device. The Firmware is now downloaded.

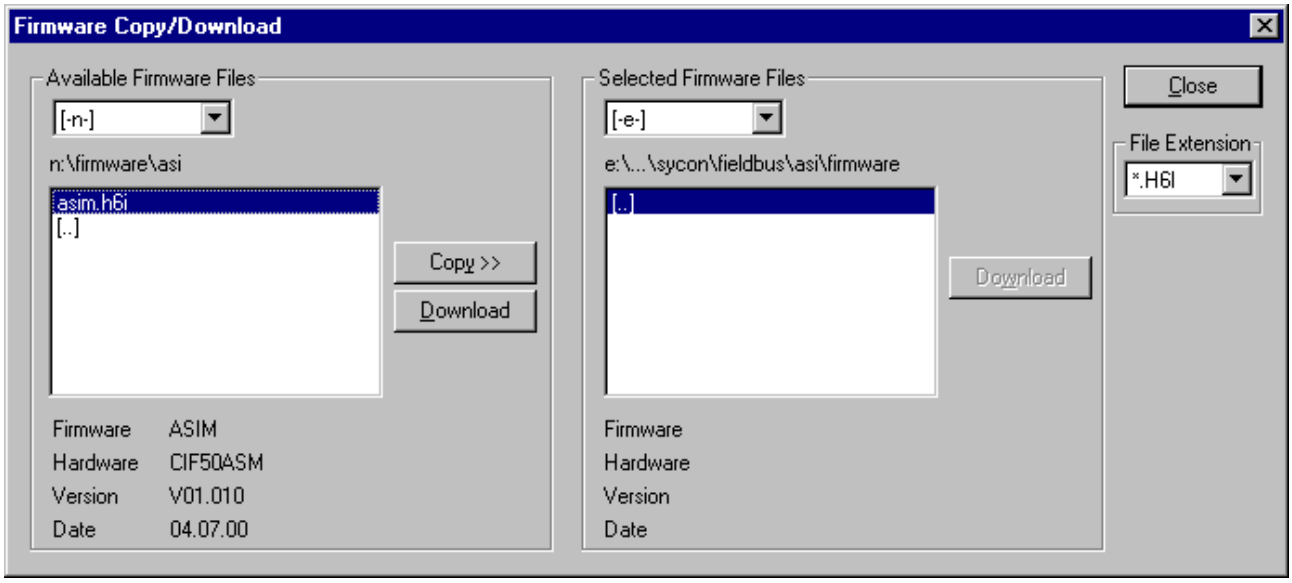


Figure 36: Online > Firmware Download

6.2.3 Firmware / Reset

The desired device must be chosen with a left mouse click on the symbol of the device. Then the **Online > Firmware / Reset** menu must be called up and the name and the version of the Firmware are displayed.

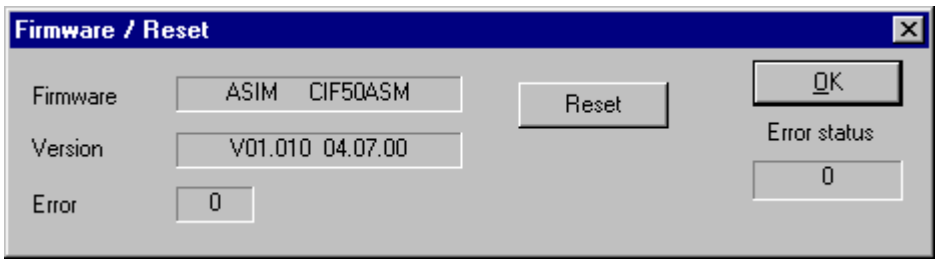


Figure 37: Online > Firmware / Reset

The device can be resetted with the **Reset** button.

6.2.4 Device Info

First the desired device must be chosen with a left mouse click on the symbol of the device. Then select the **Online > Device Info** menu in order to obtain further information on the selected device.

The manufacturer date, the device number and the serial number of the device is read out and shown.

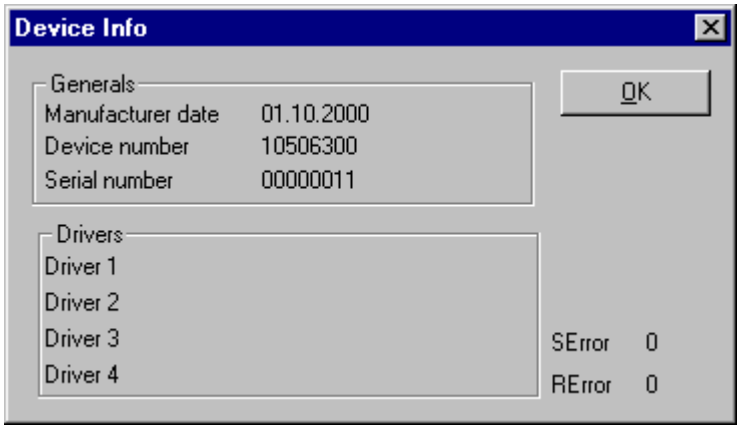


Figure 38: Online > Device Info

6.2.5 Read Project Information

With the menu **Online > Read Project Information** can be read out the project information from a device.

6.2.6 Activate Driver – Driver Licensing

The driver has to be licensed, if the software PLC or SyCon OEM is used.

If the driver was ordered by buying the SyCon, you don't need to license it because this was done before.

First the desired device must be chosen with a left mouse click on the symbol of the device. Then select the **Online > Activate Driver** menu.

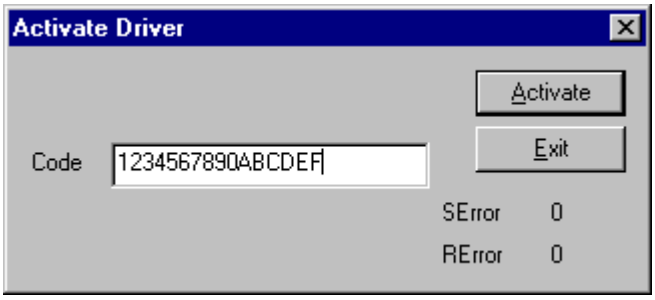


Figure 39: Online > Activate Driver

Note: The code 01234567890ABCDEF is not a valid code and is only an example.

6.3 Automatic Network Scan

This function scans the network structure. During the scan it will be detected which devices are connected to this AS-Interface. Therefore the following steps are necessary:

- Create a new project: Select the menu **File > New** and **AS-Interface**.
- Select the Master: Select the Master from the menu **Insert > Master**.
- If the Master isn't initialized you need to make a download first. To make this download select the menu **Online > Download**.
- Scan the network: Select the menu **Online > Automatic Network Scan** and select **Channel 1** or **Channel 2**. Hereby the I/O code and ID code of all at the network attached devices are determined.

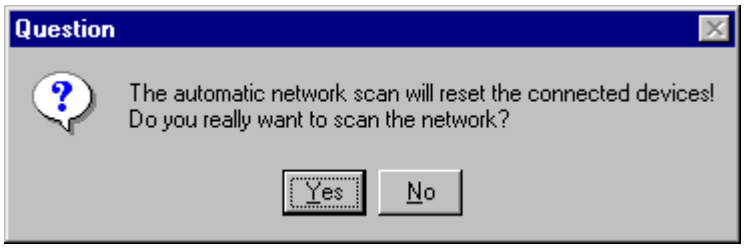


Figure 40: Online > Automatic Network Scan (security question)

Answer this question with **Yes**, if the connected AS-Interface network should be scanned. Answer this question with **No**, if this functions should not be performed.

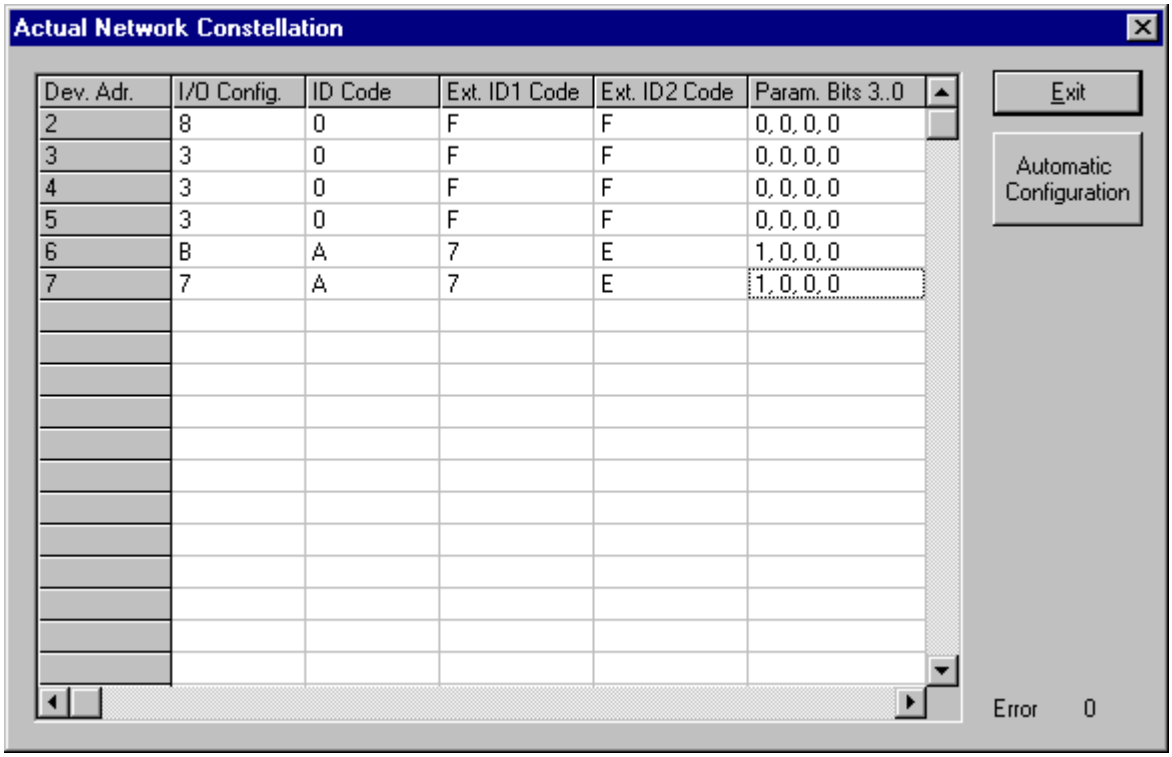


Figure 41: Online > Automatic Network Scan

6.3.1 Automatic Configuration

If you activate the button **Automatic Configuration**, the following safety question appears.

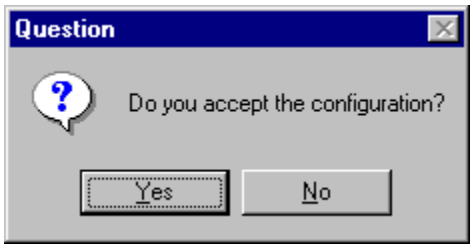


Figure 42: Online > Automatic Network Scan > Accept Configuration

Answer the question with **Yes**, if the read in structure is to be taken over as configuration. Answer the question with **No**, if the old configuration is to be maintained.

6.4 Set Device Address

By selecting a device and the menu **Online > Set Device Address** or a right mouse click at the Slave device and the selection of Set Device Address the dialog for setting the device address appears.

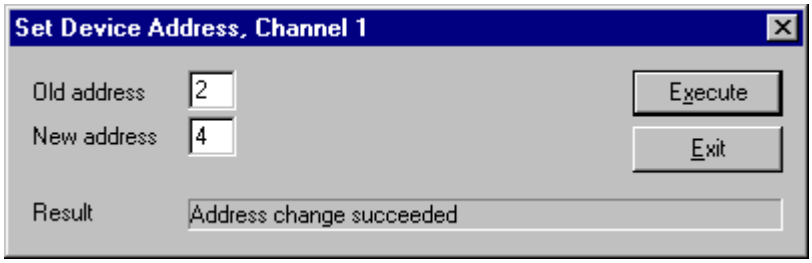


Figure 43: Online > Set Device Address

You have to type in the actual address of the device in the field **Old address**. In the field **New address** type in the address the device should get from now on. By clicking the button **Execute** it is shown in the field **Result**, if the changing was successful or which error has appeared. Possible reports are:

Report	Meaning
Address change succeeded.	-
Slave with new address detected.	The address you want to assign already exists at the bus.
Slave address is invalid.	This address can not be used.
Slave with old address not detected.	The address in the field **Old address** was not found at the bus.
New address stored temporarily.	-
Slave with address zero detected.	The address assignment failed because a Slave with the address zero already exists.

Table 9: Online > Set Device Address > Possible Results

6.5 Set Parameter Bits

By selecting a device and the menu **Online > Set Parameter Bits** the following window appears:

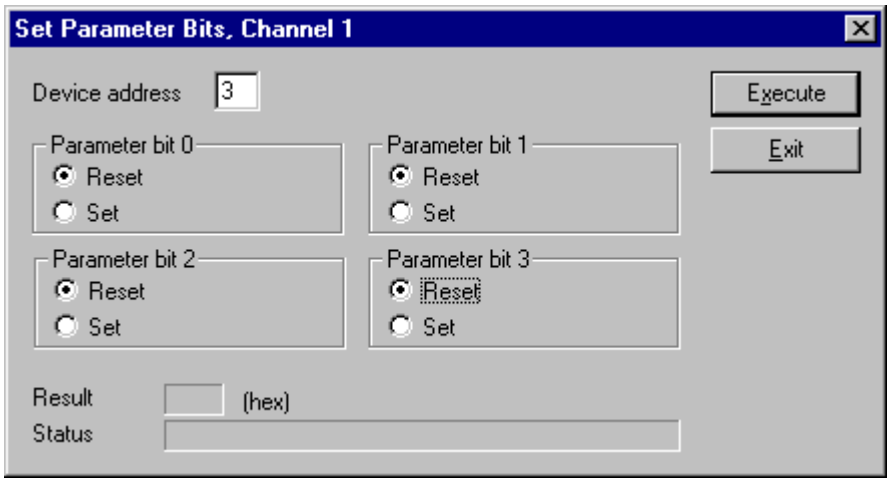


Figure 44: Online > Set Parameter Bits

The parameter bits 0 to 4 can be set or resetted. The description and using of the parameter bits depend on the manufacturer of the device and have to be looked up in the manuals of the manufacturer.

Note: The possibility to set and reset parameter bits is an Online function. That means the settings in this dialog are not stored in the configuration.

6.6 Set Extended ID1 Code

Selecting a device and then the menu **Online > Extended ID1 Code**, the following window opens:

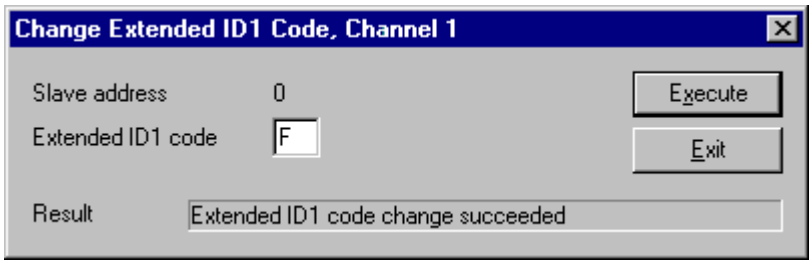


Figure 45: Online > Set Extended ID1 Code

This function is only accomplish for a Slave with address 0 and if this Slave supports this function. If a Slave supports this function and the use are manufacturer specific and have to be looked up in the device description of the Slave.

The new ID1-Code of the Slave has to be typed in the **field Extended ID1-Code**. The permissible range of value is 0 to F. In the field **Result** it is shown, if the overwriting of the Extended ID1-Code was successful or if an error has occurred, selecting the **Execute** button. Possible reports are:

Report	Meaning
Slave with address '0' not detected	-
Error while setting extended ID1	-
Error while reading extended ID1	The new ID1-Code could not read back from the Slave

Table 10: Online > Set Extended ID1-Code > Possible Results

6.7 Start/Stop Communication

First the desired Master must be chosen with a left mouse click on the symbol of the Master. The communication between the AS-Interface Master and the AS-Interface Slaves can be manually started or stopped. In order to do this select the **Online > Communication start** or **Online > Communication stop** menu.

6.8 Diagnostic Functions

The following table shows the diagnostic functions of SyCon:

Diagnostic Functions	Page
Live List	*54*
Debug Mode (AS-Interface Master)	*55*
AS-Interface Slave Device Diagnostic	*56*
Global State Field	*57*
Extended Device Diagnostic	*59*

Table 11: Diagnostic Functions

6.8.1 Live List

First you have to mark the Master with a left mouse click. Select the menu **Online > Live List** and **Channel 1** or **Channel 2** to get an overview over all active devices in the AS-Interface network.

Figure 46: Online > Live List > Channel 1

A blue number shows a connected Slave device, whereby the number indicates the Slave address. With a double click at a blue number the I/O Code, the ID Code and the extended ID1 and ID2 Code are shown.

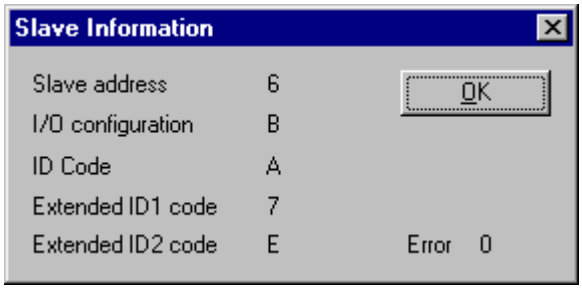


Figure 47: Slave Information

6.8.2 Debug Mode (AS-Interface Master)

Starting from the Master select the **Online > Start Debug Mode** menu. The system configurator cyclically reads out the status of the network communication on the Hilscher device and the individual condition of the devices.

To end the Debug Mode select the menu **Online > Stop Debug Mode**

or

in the running debug mode right mouse click on the Master and select **Stop Debug Mode**.

6.8.2.1 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.

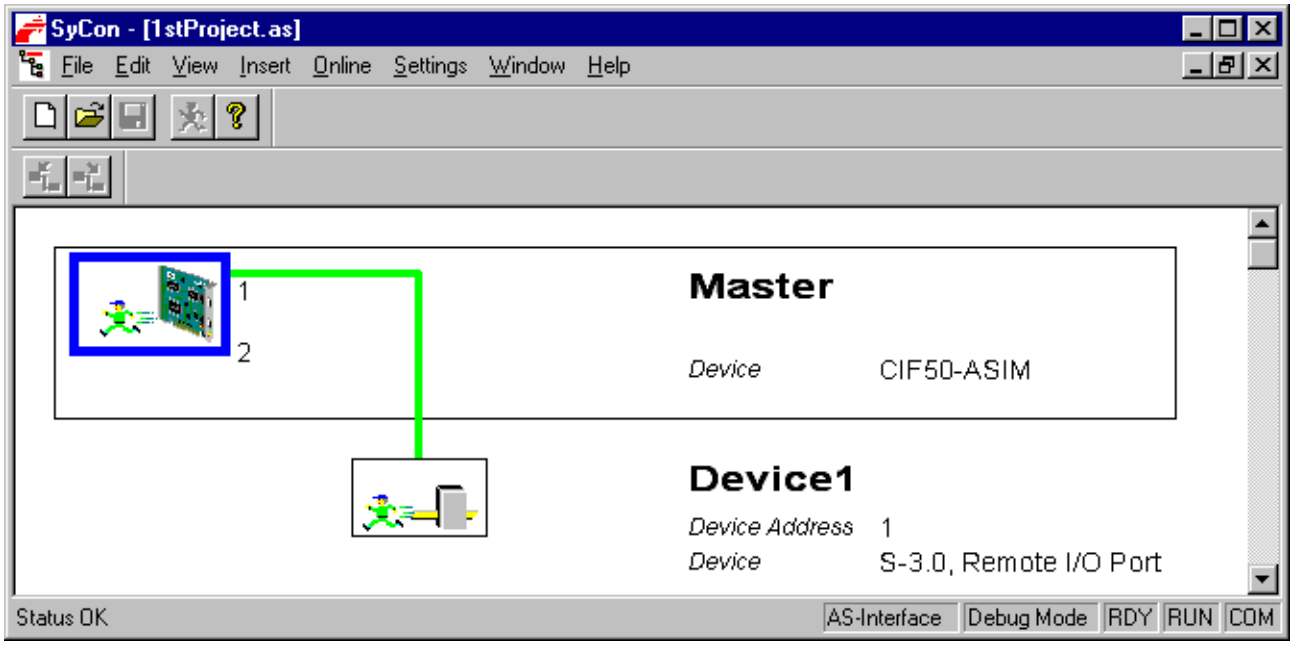


Figure 48: The Debug Window

If a diagnostic information is available for a specific device the text **Diag** appears in red, next to the device icon. To get further device specific diagnostic information then doubleclick on the Slave device itself or set the focus to the device and select **Online > Device Diagnostic**.

The master icon has the  sign to show the Master is in stop mode.

In run mode the master icon has the sign  .

6.8.2.2 AS-Interface Slave Device Diagnostic

After the debugger was started SyCon requests the status of all devices from the Master. If there is an error on a device the bus line to this slave is drawn in red color otherwise it is green. This information is displayed closer if you click with the mouse onto the corresponding device in debug mode.

To activate the debug mode you have to mark the Master and select the menu **Online > Start Debug Mode**. Then set the focus at the Slave and with the menu **Online > Device Diagnostic** you activate the AS-Interface device diagnostic. To end the Debug Mode you have to mark the Master again and select the menu **Online > Stop Debug Mode**.

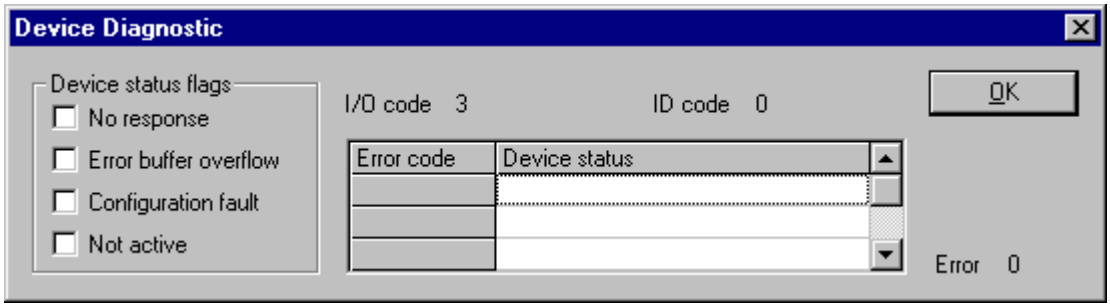


Figure 49: Online > Device Diagnostic (AS-Interface standard diagnostic)

The individual bits in the **Device Diagnostic** have the following meaning:

Device status flags in the Device Diagnostic	**Meaning**
No response	No Slave can be identified under the configured address.
Error buffer overflow	The maximum number of possible error entries (the maximum are 5 entries per Slave) was reached.
Configuration fault	The detected Slave corresponds in the I/O code and the ID code not to the Slave which was configured.
Not active	The Slave was deactivated, it is not included in the data exchange.

Table 12: Meaning of the bits in the Device Diagnostic

6.8.3 Global State Field

With the menu option **Online > Global State Field** and the selection **Channel 1** or **Channel 2** a window opens in that cyclically Statistic about the bus status and attached devices to be output.

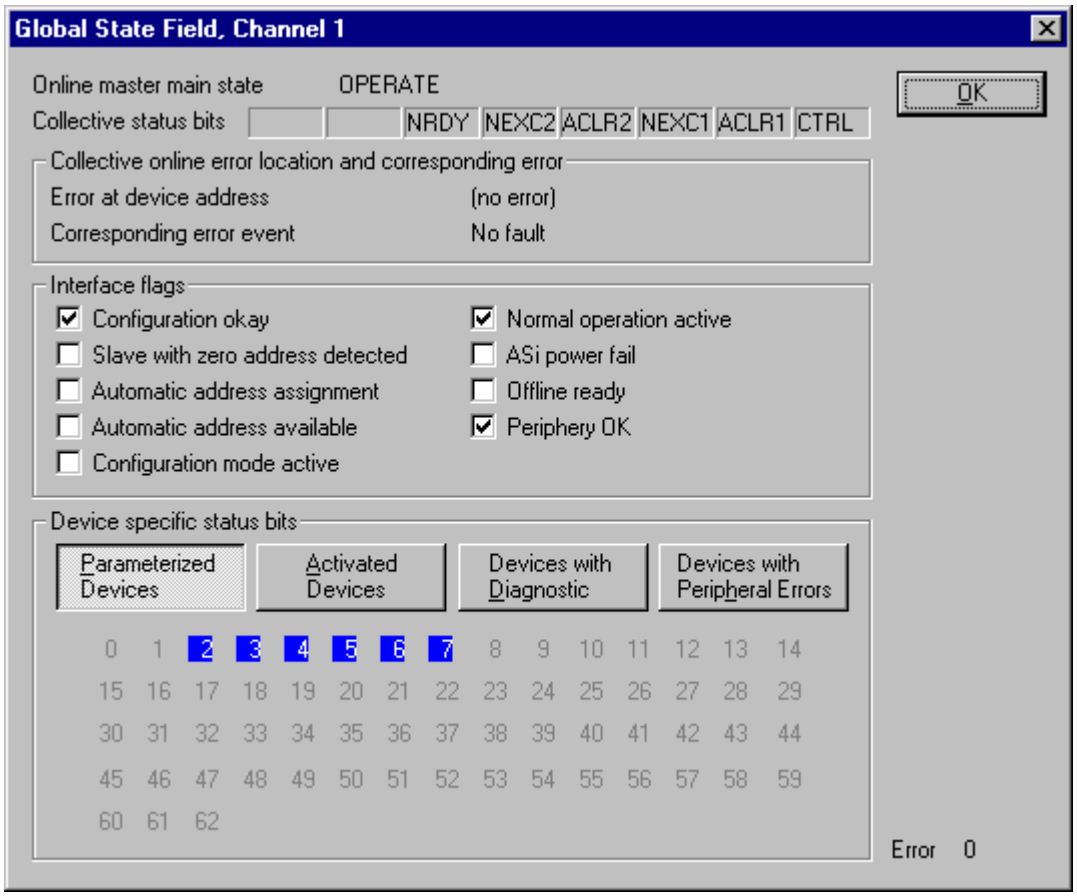


Figure 50: Online > Global State Field > Channel 2

The first row displays the main status of the Master. It can have the status **OPERATE** or **STOP**.
The next row displays individual bus errors. A pending error is displayed with a red field. The meaning of the individual abbreviations is described in the following.

Status Bits	Meaning
NRDY	NotReady: The Master is in the state NotReady
NEXC2	NoneExchange Channel 2: No data exchange at channel 2
ACLR2	AutoClear Channel 2: AutoClear error channel 2
NEXC1	NoneExchange Channel 1: No data exchange at channel 1
ACLR1	AutoClear Channel 1: AutoClear error channel 1
CTRL	ControlError: Configuration error or heavy runtime error

Table 13: Meaning of collecting status bits in the Global State Field

Further displays are:

Collective online error location and corresponding error

Shows at which Slave address and which error has occurred.

Interface flags	Meaning
Configuration okay	shows that the real configuration is the same. The flag makes a simple supervise of the ASI configuration possible.
Slave with zero address detected	reports that a Slave with the address 0 is available
Automatic address assignment	shows that the automatic address assignment of the station address is released
Automatic address available	shows that automatic address programming is available, that means that a device with the address 0 is insert for a missing device and the addressing has happened
Configuration mode active	shows the configuration mode. This flag is reset in the protected mode.
Normal operation active	is always set, if ASI is in the normal cyclic operation mode. The flag is set to zero during the initialization and the starting operation.
ASi power fail	shows that a voltage collapse at the ASI has occurred
Offline ready	shows that the offline phase is active that means that no data exchange take place
Periphery OK	this bit is set as soon as no Slave reports a periphery error

Table 14: Interface flags and their meaning

Devices specific status bits:

These display the **parameterized devices**, the **active devices**, **the devices with diagnostic** and the **device with peripheral errors** according to the activated button. A pending diagnostic information can be received by a double click on the respective number of the station.

This display is cyclically updated.

6.8.4 Extended Device Diagnostic

The extended device diagnostic helps to find bus and configuration errors when the SyCon menu functions are of no further help.

First select the Hilscher device with a left mouse click on the symbol of the device. Then select the **Online > Extended Device Diagnostic** menu.

This menu opens a list of diagnostic structures. These contain online counters, status information and parameter information:

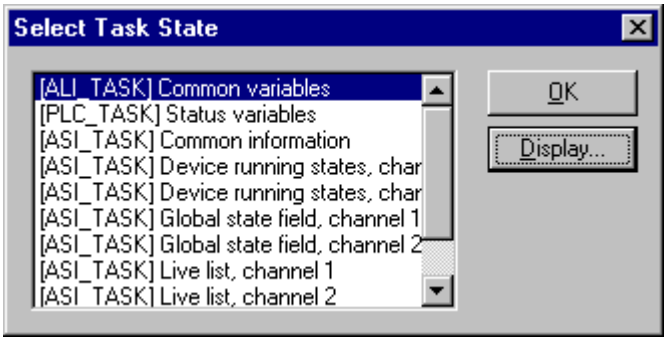


Figure 51: Extended Device Diagnostic by the example of AS-Interface Master

6.8.4.1 Extended Device Diagnostic for the AS-Interface Master

ASI_TASK: AS-Interface Administration

Task / Task State	Page
ALI_TASK Common Variables	*95*
PLC_TASK Status Variables	*96*
ASI_TASK Common Information	*97*
ASI_TASK Device Running States, Channel 1	*99*
ASI_TASK Device Running States, Channel 2	*99*
ASI_TASK Global State Field, Channel 1	*100*
ASI_TASK Global State Field, Channel 2	*100*
ASI_TASK Live List, Channel 1	*100*
ASI_TASK Live List, Channel 2	*100*
ASI_TASK IX System	*101*

Table 15: Extended Device Diagnostic for the AS-Interface Master

6.9 User Data Transfer

The following table shows test functions with user data transfer and the usability for Hilscher AS-Interface Master devices.

User data transfer function	Usage	Usable with Hilscher AS-Interface Master devices
I/O Monitor	Read input data and set output data. (cyclic I/O data exchange)	Yes
I/O Watch	Read input data and set output data. (cyclic I/O data exchange)	Yes

Table 16: Overview User Data Transfer

6.9.1 I/O Monitor

The I/O Monitor is an easy way of displaying and changing the first 32 Bytes of the process data image. To open the I/O Monitor select the menu **Online > I/O Monitor**.

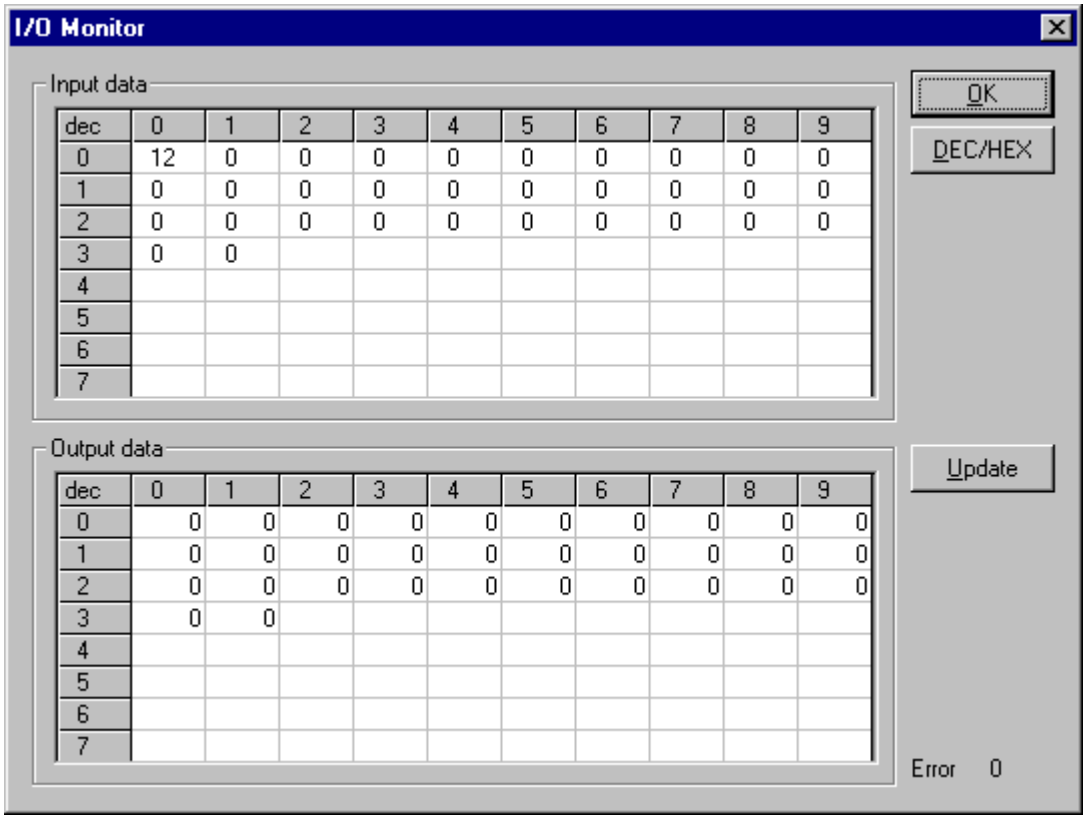


Figure 52: Online > I/O Monitor

DEC/HEX get the representation of the input data. The output data is always in the decimal form.

Enter the output value and then press **Update**.

Always the first 32 input and output Bytes of the process data image are shown, also when these Bytes have not been occupied by the configuration.

The display is always in a Byte manner.

A more comfortable display is offered by the I/O Watch Monitor which is described in the next section.

6.9.2 I/O Watch

The I/O Watch monitor can be used in place of the I/O Monitor and offers more functionality.

- Various data formats: Hex, Unsigned Decimal, Signed Decimal, Bit.
- The I/O Watch monitor works symbol oriented.
- It is not necessary to know the offset addresses.

The following firmware supports the I/O Watch monitor function:

Fieldbus	From Version
PROFIBUS-DP Master	1.040 (Combimaster) resp. 1.140 (DP-Master)
InterBus Master	2.040
CANopen Master	1.040
DeviceNet Master	1.058
AS-Interface Master	1.010

Table 17: Firmware for I/O Watch function

The following table lists the typical steps to use the I/O Watch monitor.

Preconditions:

- The project/configuration already exists, containing an AS-Interface Master and the AS-Interface Slave(s) as described in section *Getting Started – Configuration Steps* on page *21*.
- The Configuration has been downloaded into the AS-Interface Master using **Online > Download.**
- Running bus system

1. Open the existing project using **File > Open**.
2. Open the Windows dropdown menu and select **Window > Logical Network View** to change the window. A window with three sections opens

Left Window	Center Window	Right Window
Logical network view	Tag list	IO Watch

3. Open the tree structure in the left window to reach the I/O module of the device desired:

   Project > Master > Channel > Slave > Modul > (possible) Submodul

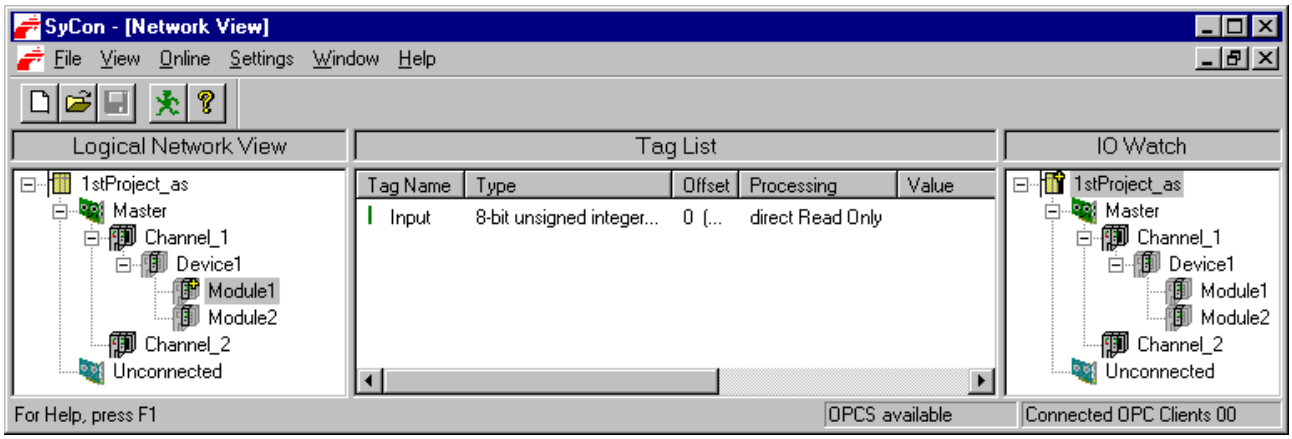


Figure 53: Logical Network View and I/O Watch

4. Left click on the module desired and the tags (I/Os) will be displayed in the center window of the Logical Network View.
5. Select with the left mouse button the tag/symbol desired and drag and drop them in the right window (I/O Watch) of the Logical Network View.
6. In the right hand side window select the desired tag with the left mouse click to highlight it then right mouse click to open a menu. Select **Start**. A new window called I/O Watch appears.
7. A table shows the Device, Symbolic Name, IEC Address (Offset), Data type Representation and Value.
8. Input data are displayed and can't be changed. Output data can be entered into the value column.

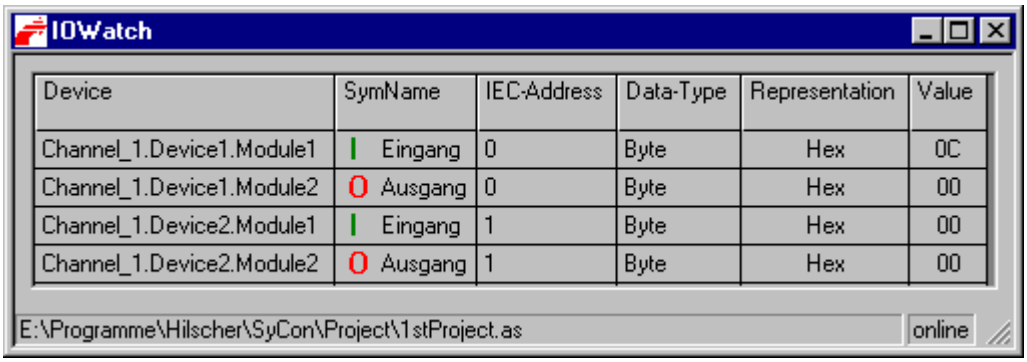


Figure 54: I/O Watch Window

In the column representation can be selected the data type: Bit Pattern, Character (Byte), Decimal Signed, Decimal Unsigned, Hex

6.10 Message Monitor

The Message Monitor permits access to the Mailbox of the CIF.

Note: The usage of the Message Monitor assumes advanced knowledge from the user.

First the Hilscher device must be chosen with a left mouse click on the symbol of the Hilscher device. Then select the **Online > Message Monitor** menu.

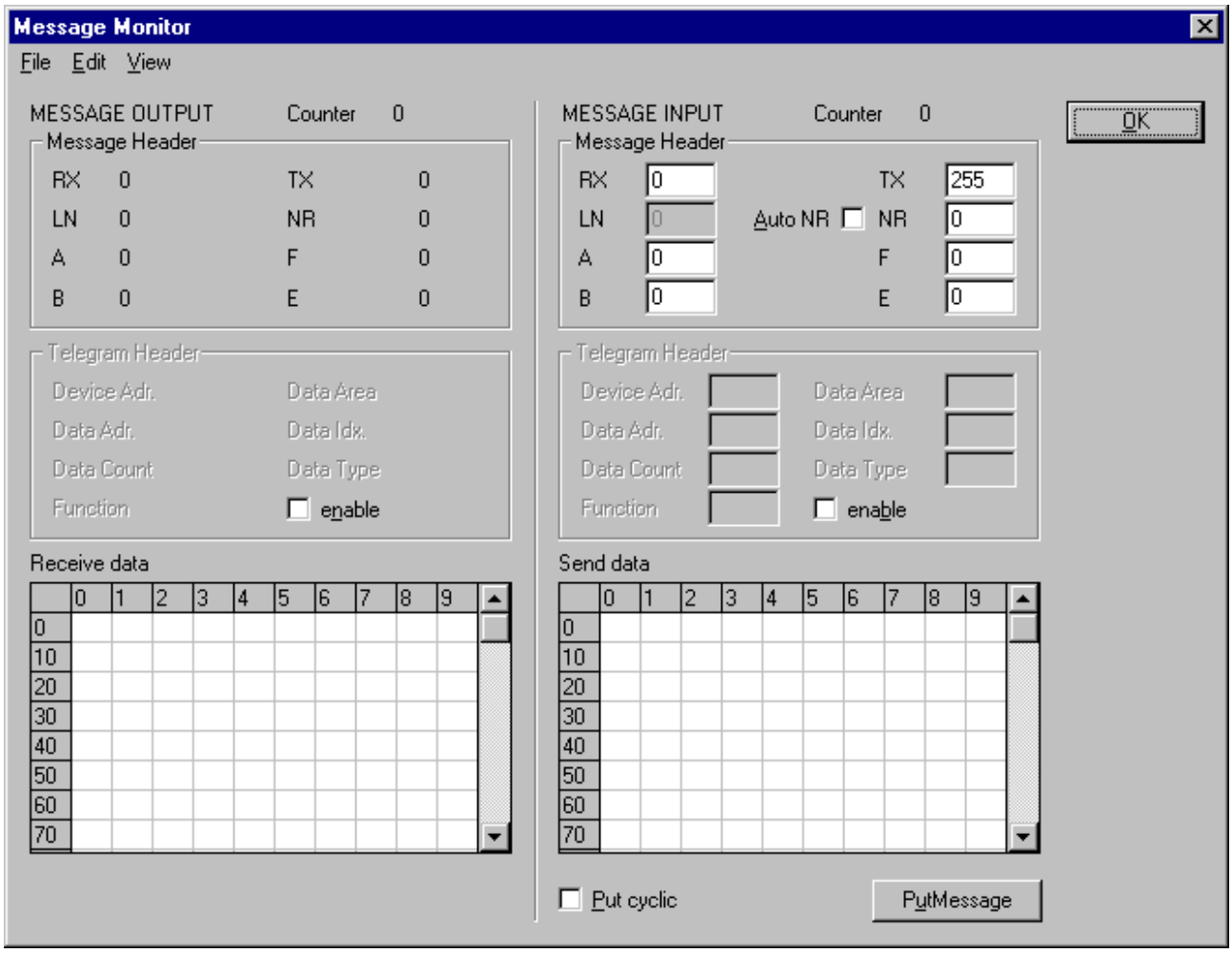


Figure 55: Online > Message Monitor

A Message can be saved and loaded and has the file extension *.MSG.

File > New: clears the window

File > Open: opens a Message (Message can be loaded)

File > Save or **File > Save As**: saves a Message

File > Exit: ends the Message Monitor and returns to the SyCon.

Edit > Create answer: creates an answer Message

Edit > Reset counter: resets the Message counter

View > Review the received data: all received data is shown

View > Review the send data: all the send data is shown

View > Number of receipt errors: the number of the received errors is shown

View > Decimal/Hexadecimal: Switch the display format

It is recommend to create a sub-directory MSG and to save the messages there.

Figure 56: Save a Message

7 File, Print, Export, Edit and View

7.1 File

7.1.1 Open

An existing project can be opened with **File > Open**.

7.1.2 Save and Save As

When the file name is known, then the configuration can be saved under the **File > Save** menu, otherwise the **File > Save As** menu must be selected.

7.1.3 Close

The current project can be closed with **File > Close**.

7.2 Print

After the current printer has been selected in the **File > Printer Setup** menu, the configuration can be printed out under the **File > Print** menu. For a page view, select the **File > Page View** menu.

7.3 Export Functions

7.3.1 DBM Export

Select the **File > Export > DBM** menu in order to save the previously saved project file (*.AS Microsoft Access Format) in a DBM file (Hilscher binary format). This DBM file can be loaded in the DOS Compro program. The configuration is stored in the Project directory in the path of the SyCon installation with the extension *.DBM.

Attention: The file name can have max. 8 characters.

7.4 Edit

7.4.1 Cut, Copy and Paste

With **Cut** and **Copy** you put the cut/copied Slave device with its settings and configuration (only not the description of the device) in the Clipboard and with **Edit > Paste** it can be insert.

The difference between **Cut** and **Copy** is:

With the menu option **Edit > Cut** you move a Slave device from one point in the configuration to another. With the menu option **Edit > Copy** you duplicate an existing Slave device.

If you select **Edit > Cut** a security question appears.

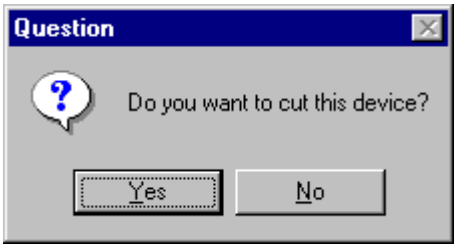


Figure 57: Security question cut device

If you answer this question with **Yes** the Slave device is cut and stays in the clipboard.

When you select **Edit > Paste** the device can be insert again at the position you want.

Possible insert positions are displayed with a colored circle  . If you move the mouse pointer over this circles it changes into one of these symbols depended on which Slave device was cut or copied.

possible insert positions


Table 18: Mousepointer - possible insert positions

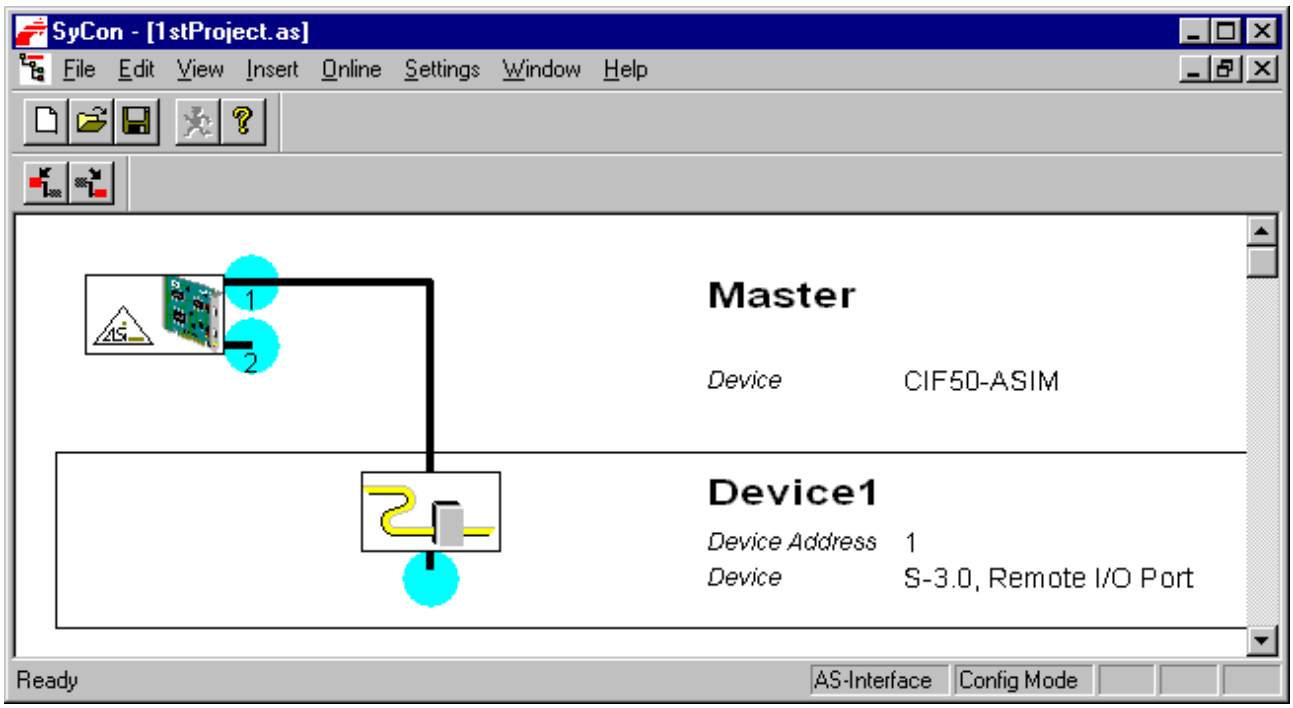


Figure 58: Paste a Slave device in the configuration

Click on the position where the Slave is to be inserted. A window opens where the cut/copied Slave device can be selected.

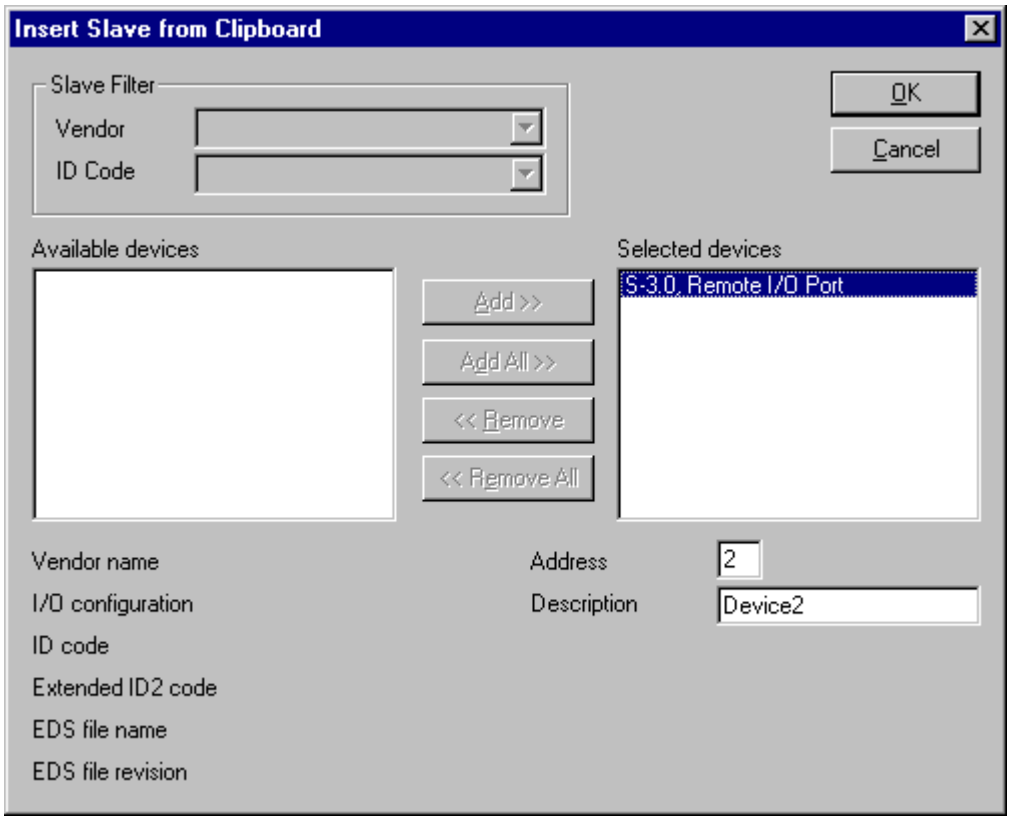


Figure 59: Edit > Paste Insert Device from Clipboard

The cutted/copied Slave appears in the list **Selected devices**. In the field **Address** it is possible to assign a device address manually. Further you can type in a new name for the Slave in the field **Description**. With the **OK** button the Slave will be insert.

7.4.2 Delete

To delete the Master or a Slave device you have to have to mark this device and then select the menu **Edit > Delete**. Before SyCon deletes the Master or a Slave a security question appears.

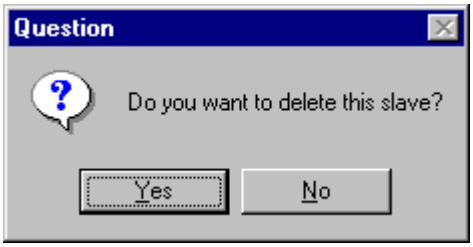


Figure 60: Security question delete device

Attention: When you delete a Master all connected Slaves, the settings and the configuration get lost.

7.4.3 Replace

With the menu **Edit > Replace** the Master or a Slave device can be replaced. How to replace the Master look in section *Replace Master* at page *25*. If you want to replace a Slave device look in section *Replace Slave* at page *30*.

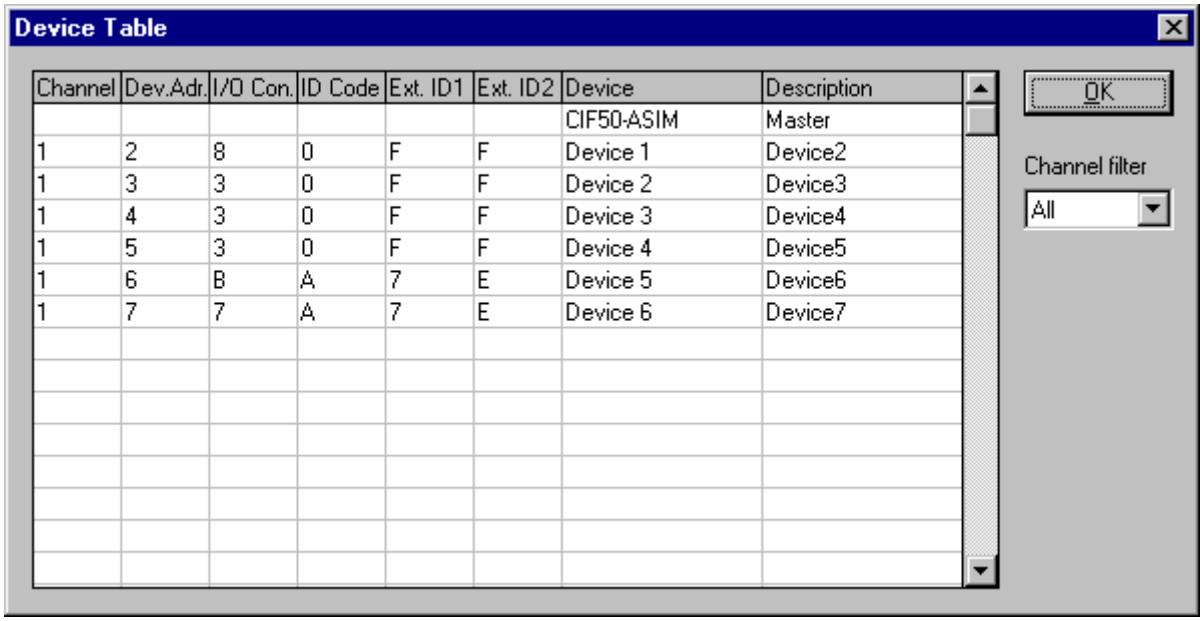
7.5 View of the Configuration

The configuration can be displayed in a table. The following tables are available:

- Device Table
- Address Table (Occupation of the process image memory in the Hilscher AS-Interface Master)

7.5.1 Device Table

The **View > Device Table** menu shows the list of all devices are used in the configuration.



Channel	Dev.Adr.	I/O Con.	ID Code	Ext. ID1	Ext. ID2	Device	Description
						CIF50-ASIM	Master
1	2	8	0	F	F	Device 1	Device2
1	3	3	0	F	F	Device 2	Device3
1	4	3	0	F	F	Device 3	Device4
1	5	3	0	F	F	Device 4	Device5
1	6	B	A	7	E	Device 5	Device6
1	7	7	A	7	E	Device 6	Device7

Figure 61: View > Device Table

7.5.2 Address Table

A list of all addresses used in the process data image is displayed in the **View > Address table** menu.

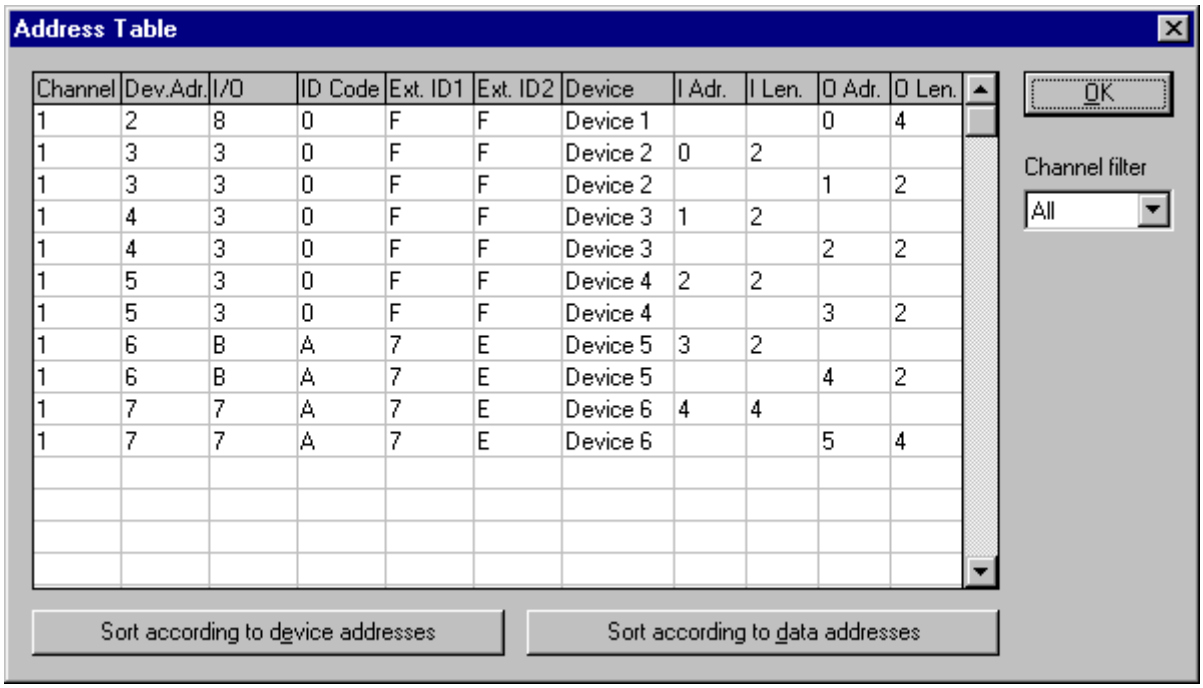


Figure 62: View > Address Table

It is possible to sort addresses according to Slave numbers or data addresses.

7.6 View Menu SyCon

7.6.1 Logical Network View

In the menu **View > Logical Network View** the user can activate or deactivate the network view by selecting its (with hook) or by not selecting it (without hook).

The network view is used for example for the Start Options.

7.6.2 Toolbars

In the menu **View > Toolbars** the user has the possibility to activate or deactivate the Toolbars **Standard** and **Fieldbus**. If this function is deactivated the toolbars are not shown.

7.6.3 Status Bar

In the menu **View > Status Bar** this bar can be activated (with hook) or deactivated (without hook).

8 Tools

8.1 PKV 40 Gateway

The loading of new files into the Gateway or the setting of the IP address of the Gateway is carried out by means of the tools contained in the SyCon from version 2.620.

To be able to use the configuration tools in the SyCon, it is necessary to create a configuration with a PKV 40 Gateway in SyCon. Now the menu entry **PKV40-XXX** (XXX here stands for the selected field bus system) appears in the **Tools** menu point. This makes it possible to choose between a serial RS-232 connection and a TCP/IP connection.

A crossed RS-232 cable is necessary for operation at the serial interface. This can be ordered from the Hilscher company (KAB-SRV).

The configuration via TCP/IP can also be carried out via a point to point connection with a crossed cable or, for example, via a Hub with commercially available Ethernet cables.

The Gateway is supplied with a default IP address (see information sheet).

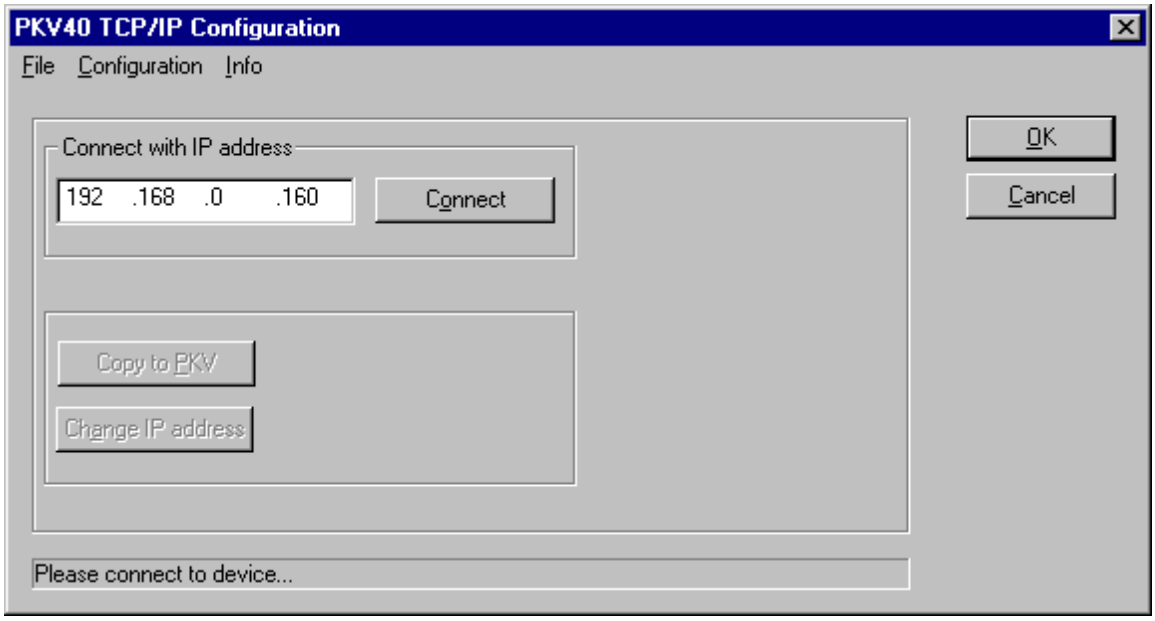


Figure 63: Configuration dialog for the PKV 40-PB Gateway via TCP/IP

The procedure for the serial configuration or the TCP/IP configuration is basically the same. First an IP address must be entered into the field provided for it or the serial interface with which the Gateway is connected must be selected. Then the **Connect** switch must be activated. If a valid connection to the Gateway has been established, the menu entries and the switches for configuration of the Gateway are released.

In order to ensure communication via TCP/IP, the TCP/IP protocol on the PC must be configured in such a way that a connection with the default IP address is possible (see user manual for Windows NT).

8.1.1 Loading Files into the Gateway

This function enables files to be loaded into the User FLASH or the RAM of the Gateway and to carry out applications after downloading or after the start of the operating system.

Note: So that gateway takes over the IP address, it must be started again.

Before a new application or a new and already available DLL can be downloaded, any running older versions of the application or programs that use DLLs must be ended. For this purpose, the corresponding running processes can be displayed under the **Configuration > View Running Tasks** menu entry. If an entry has been selected, then the **Stop Process** switch can be activated and the selected process is stopped.

In order to transfer a new file, select the **File > Copy to PKV40** menu point or activate the **Copy to PKV** button. Select the file to be loaded in the dialog that appears.

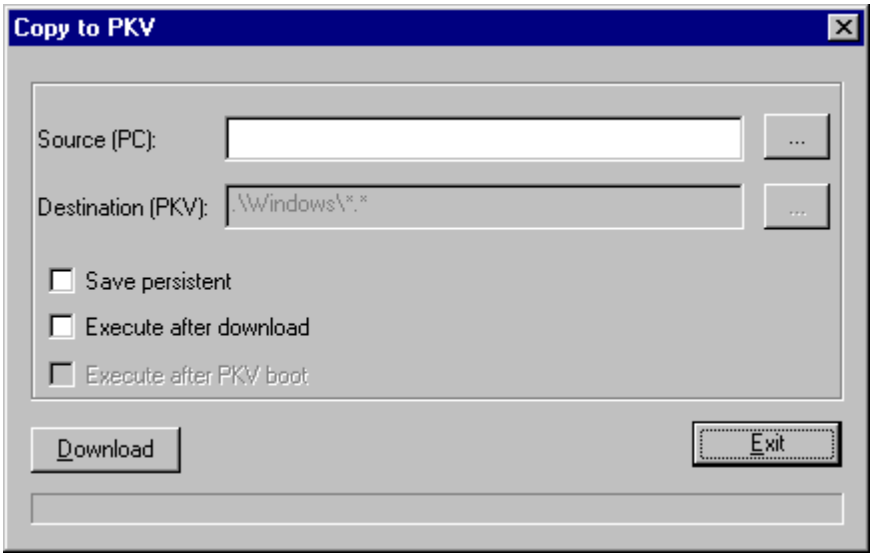


Figure 64: Dialog for loading files on to the PKV 40 Gateway

The path and name can be entered directly into the **Source (PC)** text field or select the path and file via the **...** button. The **Destination (PKV)** field cannot be edited at present. All the copied files are read into the Windows directory of the Gateway. According to requirements, mark the buttons **Save persistent**, **Execute after download** and **Execute after PKV boot**. Activate the **Download** button and the software is transferred to the Gateway. **Save persistent** means that the downloaded files are stored in a zero-voltage secure manner in the FLASH-EPROM of the Gateway. Only then a start of the downloaded EXE file(s) is possible after a restart (Power-Up). If Save persistent is not selected, the downloaded files are copied only temporarily in the RAM of the Gateway and are lost after a restart.

Note: During a test phase, it is recommended that the files are not permanently stored in the FLASH-EPROM!

8.1.2 Loading Files onto the Host PC

It is also possible to load files from the Gateway on to the Host-PC. For this purpose select the menu **File > Copy to PC**.

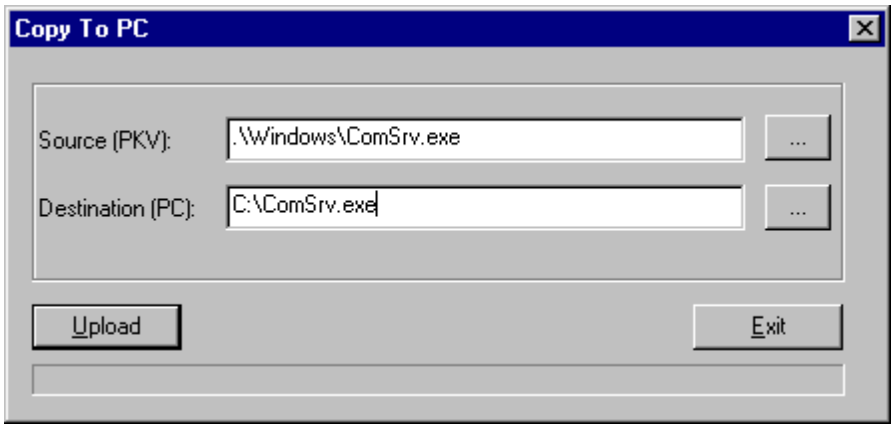


Figure 65: Loading files from the PKV 40 Gateway to the Host PC

The path of the file that is to be loaded can be entered directly into the **Source (PKV)** field or the contents of the FLASH can be viewed via the ... button and a file can be selected. Files that are situated only in the RAM system of the Gateway are not shown and must be entered manually into the **Source** field. Please note that there are no drive letters in Windows CE as is usual in other Windows operating systems. Instead a single dot must be entered as a drive designation (e.g.:.\Windows\ComSrv.exe).

The target place and target name can be entered in the **Destination (PC)** field or selected via the **...** button.

After activating the **Upload** button, the file is loaded onto the Host PC.

8.1.3 Deleting Files

In order to delete files, the menu **File > View Flash Dir** can be selected after a successful connection was built. A list of files that are permanently stored in the User FLASH memory is displayed. Now previously selected files can be deleted with the **Delete** Button.

It must be noted that the files are only deleted from the file system of Windows CE but not actually out of the FLASH memory. For this reason also, this memory is not released for renewed writing to and with repeated copying it can happen that no more files can be permanently stored as the memory is full.

In order to release memory again, the complete User FLASH must be deleted and the **Delete All** button is provided for this purpose.

In order to prevent the deletion of important files necessary for operation, the SaveFile.dat file contains entries of all files that are not to be deleted. This file can be loaded on the HostPC and edited there and then returned to the Gateway again in order to protect files from being inadvertent deleted. However, these files are only protected from deletion of the whole FLASH memory. An individual deletion of the files is still possible.

Attention: If the COM Server or a necessary DLL driver is deleted, then no configuration with SyCon is possible!

8.1.4 Setting the IP Address

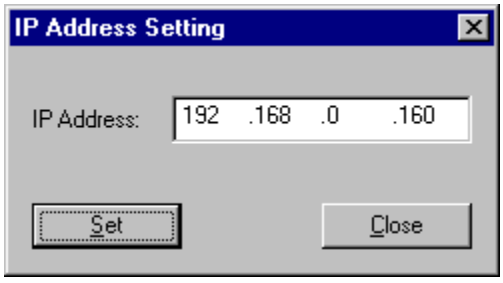


Figure 66: Setting the IP Address

Note: In order for the Gateway to accept the address, it must be restarted!

It is possible to allocate a new IP address to the Gateway with the menu **Configuration > Setting IP address**. For this purpose, a connection with the Gateway is necessary as already mentioned.

Now enter the desired valid IP address into the corresponding field. Press the **Set** button and the new address is allocated to the Gateway.

If the alteration of the IP was successful, it will be displayed. A request for restarting the Gateway will appear.

Please note that the newly allocated IP address is only valid after a restart of the Gateway.

8.1.5 Starting Applications

Applications that have already been entered on to the Gateway can also be started manually. For this purpose the menu **Configuration > Start Application** is selected. Now enter the name of the application into the field provided for this purpose and press the **OK** button.

9 Error Numbers

9.1 CIF Device Driver (Dual-port memory) Error Numbers (-1 .. -49)

This is the list of error numbers of dual-port memory access using the CIF Device Driver.

Error Number	Description
-1	Driver: Board not initialized The communication board is not initialized by the driver. No or wrong configuration found for the given board, check the driver configuration. Driver function used without calling DevOpenDriver() first.
-2	Driver: Error in internal ‘Init state‘
-3	Driver: Error in internal ‘Read state‘
-4	Driver: Command on this channel is active
-5	Driver: Unknown parameter in function occurred
-6	Driver: Version is incompatible The device driver version does not correspond to the driver DLL version. From version V1.200 the internal command structure between DLL and driver has changed. Make sure to use the same version of the device driver and the driver DLL.
-10	Device: Dual port memory RAM not accessable (board not found) Dual-ported RAM (DPM) not accessible / no hardware found. This error occurs, when the driver is not able to read or write to the Dual-port memory. Check the BIOS setting of the PC Memory address conflict with other PC components. Try another memory address, check the driver configuration for this board, check the jumper setting of the board.
-11	Device: Not ready (RDY flag=Ready, flag failed) Board is not ready. This could be a hardware malfunction or another program writes inadmissible to the dual-port memory.
-12	Device: Not running (RUN flag=Running flag failed) The board is ready but not all tasks are running, because of an initialization error. No data base is loaded into the device or a wrong parameter can causes that a task can't initialize.
-13	Device: Watch dog test failed
-14	Device: Signals wrong Operating System version No license code found on the communication board. Device has no license for the used operating system or customer software. No firmware or no data base to the device is loaded.

Table 19: CIF Device Driver Error Numbers (-1..-14)

Error Number	Description
-15	Device: Error in dual port memory flags
-16	Device: Send mailbox is full
-17	Device: Function PutMessage timeout No message could be send during the timeout period given in the DevPutMessage() function. If you use an interrupt, check the interrupt on the device and in driver setup. These settings have to be the same! Is an interrupt on the board set? Is the right interrupt set? The interrupt could already be used by another PC component, also if the operating system reports it as unused. If you use polling mode, make sure that no interrupt is set on the board and that polling is set in the driver setup. These settings have to be the same! Device internal segment buffer full and therefore PutMessage() function is not possible, because all segments on the device are in use. This error occurs, when only PutMessage() is used but not GetMessage(). HOST flag is not set for the device. No messages are taken by the device. Use DevSetHostState() to signal a board an application is available.
-18	Device: Function GetMessage timeout No message received during the timeout period given in the DevGetMessage() function. If you use an interrupt, then check the interrupt on the device and in driver setup. These settings have to be the same! Is an interrupt on the board set? Is the right interrupt set? The interrupt could already be used by another PC component, also if the operating system reports it as unused. If you use polling mode, make sure that no interrupt is set on the board and that polling is set in the driver setup. These settings have to be the same! The used protocol on the device needs longer than the timeout period given in the DevGetMessage() function.
-19	Device: No message available

Table 20: CIF Device Driver Error Numbers (-15..-19)

Error Number	Description
-20	Device: Reset command timeout The board is ready but not all tasks are running, because of an initialization error. No data base is loaded into the device or a wrong parameter can causes that a task can't initialize. The device needs longer than the timeout period given in the DevReset() function. Using device interrupts. The timeout period can differ between fieldbus protocols. If you use an interrupt, check the interrupt on the device and in driver setup. These settings have to be the same! Is an interrupt on the board set? Is the right interrupt set? The interrupt could already be used by an other PC component, also if the operating system reports it as unused. If you use polling mode, then make sure that no interrupt is set on the board and that polling is set in the driver setup. These settings have to be the same!
-21	Device: COM flag not set The device can not reach communication state. Device not connected to the fieldbus. No station found on the fieldbus. Wrong configuration on the device.
-22	Device: IO data exchange failed
-23	Device: IO data exchange timeout The device needs longer than the timeout period given in the DevExchangeIO() function. If you use an interrupt, check the interrupt on the device and in driver setup. These settings have to be the same! Is an interrupt on the board set? Is the right interrupt set? The interrupt could already be used by another PC component, also if the operating system reports it as unused. If you use polling mode, make sure that no interrupt is set on the board and that polling is set in the driver setup. These settings have to be the same!
-24	Device: IO data mode unknown
-25	Device: Function call failed
-26	Device: Dual-port memory size differs from configuration
-27	Device: State mode unknown

Table 21: CIF Device Driver Error Numbers (-20..-27)

Error Number	Description
-30	User: Driver not opened (device driver not loaded) The device driver could not be opened. Device driver not installed. Wrong parameters in the driver configuration. If the driver finds invalid parameters for a communication board and no other boards with valid parameters are available, the driver will not be loaded.
-31	User: Can't connect with device board
-32	User: Board not initialized (DevInitBoard not called)
-33	User: IOCTRL function failed A driver function could not be called. This is an internal error between the device driver and the DLL. Make sure to use a device driver and a DLL with the same version. An incompatible old driver DLL is used.
-34	User: Parameter DeviceNumber invalid
-35	User: Parameter InfoArea unknown
-36	User: Parameter Number invalid
-37	User: Parameter Mode invalid
-38	User: NULL pointer assignment
-39	User: Messagebuffer too short
-40	User: Size parameter invalid
-42	User: Size parameter with zero length
-43	User: Size parameter too long
-44	User: Device address null pointer
-45	User: Pointer to buffer is a null pointer
-46	User: SendSize parameter too long
-47	User: ReceiveSize parameter too long
-48	User: Pointer to send buffer is a null pointer
-49	User: Pointer to receive buffer is a null pointer

Table 22:CIF Device Driver Error Numbers (-30..-49)

Error Number	Description
1000	If the operating system of the device reports an initialization error, then a value of 1000 will be add to the error number and shown to the user

Table 23: CIF Device Driver Error Numbers (1000)

9.2 CIF Serial Driver Error Numbers (-20 .. -71)

This is the list of error numbers using the serial driver.

Error Number	Description
-20	Driver: No COM port found or COM port already in use.
-21	Driver: COM port already opened
-22	Driver: Function call into driver has 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: COM state error is set
-31	Driver: COM buffer setup failed
-32	Driver: COM set timeout failed
-33	Driver: Receive buffer overrun
-34	Driver: Receive buffer full
-35	Driver: Send busy
-36	Driver: Error during close driver
-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 zero
-46	User: Buffer too short
-47	User: Setup error

Table 24: CIF Serial Driver Error Numbers (-20..-47)

Error Number	Description
-50	User: Send message, timeout error
-51	User: Could not send a message Cable not connected. Wrong cable. Device does not respond.
-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 25: CIF Serial Driver Error Numbers (-20..-47)

9.3 RCS Error Numbers (4 .. 93)

This is the list of error numbers returned by the RCS (Realtime Communication System), that is the operating system of Hilscher devices. 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 Hilscher device. An example of this communication is the download of a configuration.

Error Number	Description
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	The user will download a database into the device that is not valid for this device type.
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 do 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 data base segment needs the bootstraploader. The bootstraploader 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 data base created by the system configurator and the data base expected by the firmware is not compatible
39	DBM module missing

Table 26: RCS error numbers (answer message) (4..39)

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 27: RCS error numbers (answer message) (40..93)

9.4 Database Access Error Numbers (100 .. 130)

The following table lists the error numbers of the database access errors

Error Number	Description
100	Database already opened
101	Dataset could not be opened
103	Error while opening database occurred
104	No valid path name
105	No connection to data base. Call function DbOpen().
106	Error in parameter
107	Error during opening a table
108	Nullpointer occurred
109	Table not opened. Call function OpenTable() first.
110	The first record is reached
111	The last record is reached
112	Unknown type in the record found
113	Data has to be truncated
114	No access driver installed on the system
115	Exception received
116	This table is set to read only
117	There is no data set in the table
118	The requested table could not be edit
119	An operation could not be completed
120	User gives an unexpected length in WritsDs().
121	An assertion failed
122	DLL not found
123	DLL couldn't be freed
124	Specified function not found in the DLL
125	ODBC Function returns an error
126	Count of data bytes in the record exceeds 1938
127	DBM32 DLL is not loaded
128	Field with the given index was not found
129	This table contains no records
130	Invalid character (' ') found in a Table or Column

Table 28: Database Access Error Numbers (100..130)

9.5 SyCon Error Number (235)

Error Number	Description
235	Project file with the same name already opened. Two project files with the same name can't be opended at the same time.

Table 29: SyCon Error Number (235)

9.6 Online Data Manager Error Numbers

9.6.1 Online Data Manager Error Numbers (1000 .. 1018)

The following table lists the error numbers of the Online Data Manager.

Error Number	Description
1000	Driver OnlineDataManager not opened
1001	Initialization of the OnlineDataManager has failed
1002	No DriverObject found. OnlineDataManager Sub DLL not found.
1003	No DeviveObject found. Device not found.
1004	Application not found
1010	Application has requested an unknown event
1011	Application has requested an unknown function mode, operating mode. Known function modes, operating modes are Reset, Download, Register Server, Unregister Server.
1012	Application has requested an unknown command
1013	Message Server already exists
1014	Message Server not registered
1015	Device already in use
1016	Device not assigned
1017	Device has changed
1018	Command active

Table 30: Online Data Manager Error numbers (1000..1018)

9.6.2 Message Handler Error Numbers (2010 .. 2027)

The following table lists the error numbers of the Message handler of the Online Data Manager.

Error Number	Description
2010	Message handler: Messagebuffer empty
2011	Message handler: Messagebuffer full
2021	Message handler: Invalid Message ID (msg.nr)
2022	Message handler: No entry
2023	Message handler: Message already active
2024	Message handler: Wrong Application
2025	Message handler: Message Timeout
2026	Message handler: Wait for Delete
2027	Message handler: No cyclic Message

Table 31: Error Numbers of the Message Handler of the Online Data Manager (2010..2027)

9.6.3 Driver Functions Error Numbers (2501 .. 2512)

The following table lists the error numbers of the Driver Functions of the Online Data Manager.

Error Number	Description
2501	OnlineDataManager Sub DLL not found
2502	Function missing
2503	'Read Thread' not created
2504	'Write Thread' not created
2505	'IO Thread' not created
2510	Function failed
2512	Assign reports error. Return neither OK or cancel

Table 32: Error Numbers of the Driver Functions of the Online Data Manager (2501..2512)

9.6.4 Online Data Manager Subfunctions Error Numbers (8001 .. 8035)

The following table lists the error numbers of the Subfunctions of the Online Data Manager.

Error Number	Description
8001	Driver not opened. E.g. CIF Device Driver
8002	Application has requested an unknown event
8003	Application has requested an unknown command
8004	Command has failed
8005	Command active
8006	Device invalid
8010	No device was assigned
8011	Device was already assigned
8020	Driver not connected
8021	Driver already connected
8030	Faulty 'GetState'
8031	Send error (PutMessage returns error)
8032	Send active (PutMessage active)
8033	Receive error (GetMessage returns error)
8034	Receive active (GetMessage active)
8035	IO Error (ExchangeIO returns error)

Table 33: Subfunction Error Numbers of the Driver Functions of the Online Data Manager (8001..8035)

9.7 Data Base Functions Error Numbers (4000 .. 4199)

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

Error Number	Description
4000	File does not exist
4001	Success in comprimizing
4002	Dataset does not exist
4003	Last respectively first entry reached
4004	Not enough memory
4005	File 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
4017	Drive is not ready
4018	Not enough drive memory
4019	File name or path does not exist
4020	Cannot create path
4021	Wrong path
4022	Wrong flag
4023	The delete path is the root path
4024	Path file exists
4025	Write error during write a file
4026	Error during create a file
4027	Error during close a file
4028	No DBM file
4029	Length of the read data is unequal of the file length

Table 34: Error numbers of converting functions (4000..4029)

Error Number	Description
4030	Path too long
4031	Directory changed
4032	Directory created
4034	Length of converting stream is 0
4035	Non equal data set found
4036	Non equal data set found
4037	Non equal data set found
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 another function
4042	New length of data base is smaller than used
4043	Unknown access mode
4044	Old data base 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
4049	Check failed
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
4057	File type 2 can not 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

Table 35: Error numbers of converting functions (4030..4060)

Error Number	Description
4061	The data base was transmitted into the FLASH
4062	Set 0 contains no structure definition
4063	Set 0 can not 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 data base
4074	Download window can’t be created
4075	Download not fully performable

Table 36: Error numbers of converting functions (4061..4075)

Error Number	Description
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 data base that is in DBM format
4086	Error in structure in the ACCESS data base 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
4099	ODBC data truncated
4100	Download timeout
4101	Library load error
4102	Library function error
4103	Error in description 'toggle'
4104	Error in description 'KB'
4105	Column does not exist
4106	ODBC structure different
4107	ODBC address error
4108	No CRC sum exists (table GLOBAL exists or old)
4109	Table GLOBAL is old
4110	Calculated CRC different to CRC in table GLOBAL
4199	Programming error

Table 37: Error numbers of converting functions (4082..4199)

9.8 Converting Functions Error Numbers (5001 .. 5008)

The following table lists the error numbers of converting functions.

Error Number	Description
5000	Function PackLongToByteShort: Not enough space in pvD (Number of elements greater than reserved memory)
5001	Function PackLongToByteShort: Not enough space in pvD. Detected during converting of pvS
5002	Function PackLongToByteShort: Not enough space in pvD
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 is not convertable into a HEX value
5008	Function PackStringDumpToByteArray: Number of character odd
5009	Function PackStringDumpToByteArray: Not enough space in pvD
5010	Function PackStringDumpToByteArray: The current data set needs to be appended the previous one
5011	Function PackStringDumpToByteArray: No corresponding function to the given number exist
5012	Converting error

Table 38: Error Numbers of data base functions (5000 .. 5012)

10 Appendix

10.1 Extended Device Diagnostic Master

On the following pages the task state structures of the AS-Interface Master are described.

10.1.1 ALI_TASK Common Variables

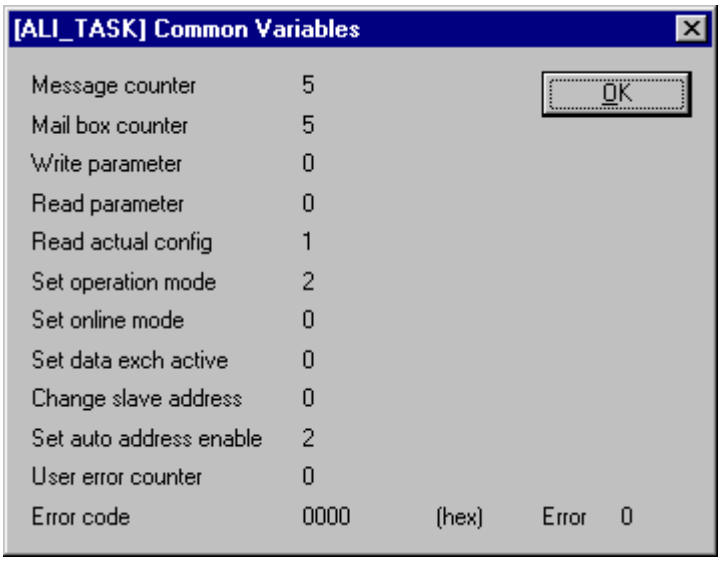


Figure 67: ALI_TASK Common Variables

Variable	Meaning
Message counter	Number of received command messages
Mail box counter	Number of received messages via the mail box
Write parameter	Number of received messages "Write parameter"
Read parameter	Number of received messages "Read parameter"
Read actual config	Number of received messages "Read actual config"
Set operation mode	Number of received messages "Set operation mode"
Set online mode	Number of received messages "Set online mode"
Set data exch active	Number of received messages "Set data exch active"
Change slave address	Number of received messages "Change slave address"
Set auto address enable	Number of received messages "Set auto address enable"
User error counter	Number of detected errors
Error code	Last detected error code

Table 39: ALI_TASK Common Variables

10.1.2 PLC_TASK Status Variables

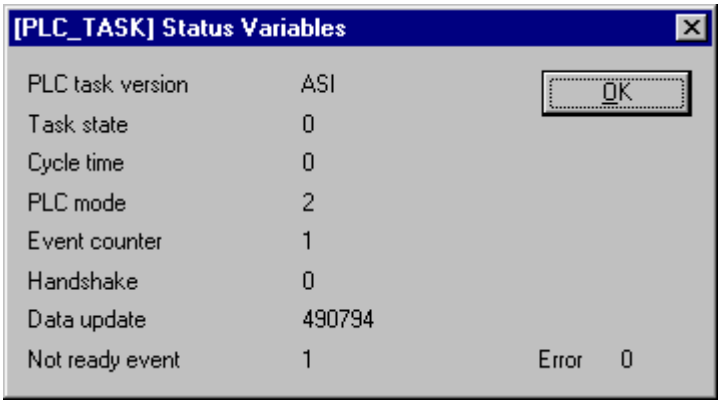


Figure 68: PLC_TASK Status Variables

Variable	Meaning
PLC task version	PLC-Task compiled for ASI
Task state	is not used
Cycle time	is not used
PLC mode	set Handshake mode This value represents the actual handshake mode between application and CIF 0 = Bus synchonous, Device Controlled 1 = Buffered, Device Controlled 2 = Uncontrolled 3 = Buffered, Host Controlled 4 = Bus synchonous, Host Controlled
Event counter	counter for detected task internal events
Handshake	counter for performed DPM handshakes
Data update	counter for the update of DPM I/O data
Not ready event	counter for detected "not ready events"

Table 40: PLC_TASK Status Variables

10.1.3 ASI_TASK Common Information

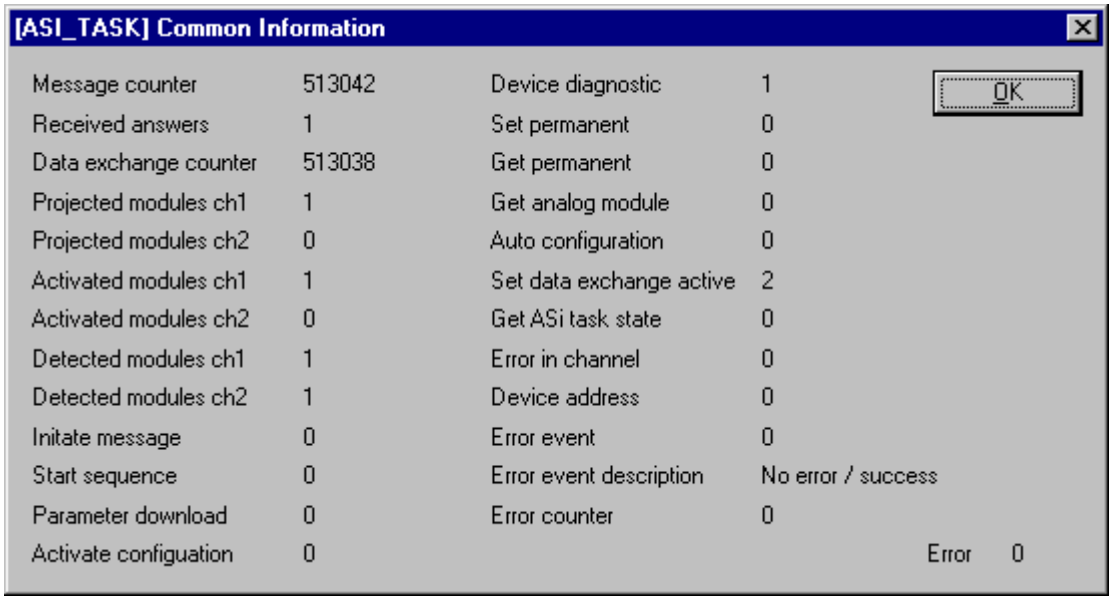


Figure 69: ASI_TASK Common Information

Variable	Meaning
Message counter	number of detected messages
Received answers	number of detected answer messages
Data exchange counter	number of data cycles of the ASI task
Project modules ch1	number of configured Slaves channel 1
Project modules ch2	number of configured Slaves channel 2
Activated modules ch1	number of activated Slaves channel 1
Activated modules ch2	number of activated Slaves channel 2
Detected modules ch1	number of detected Slaves channel 1
Detected modules ch2	number of detected Slaves channel 2
Initiate message	is not used
Start sequence	is not used
Parameter download	number of performed parameter downloads
Activate configuration	number of performed "Activate configuration" commands
Device diagnostic	number of detected " Device diagnostic" commands
Set permanent	is not used
Get permanent	number of performed "Get Permanent Configuration" commands
Get analog module	number of performed "Get analog module Description" commands
Auto configuration	number of detected "Auto configuration" commands
Set data exchange active	number of detected instructions to activate/deactivate of the data transmission
Get Asi task state	number of detected commands "Get Task State"
Error in channel	Channel, where the error was detected
Device address	Slave address where the error was detected
Error event	detected error
Error event description	description of error as text
Error counter	number of detected errors

Table 41: ASI_TASK Common Information

10.1.4 ASI_TASK Device Running States, Channel 1

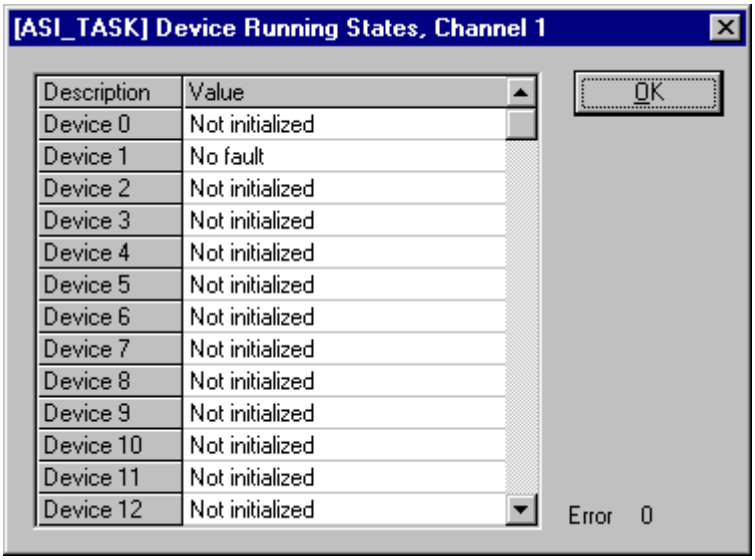


Figure 70: ASI_TASK Device Running States, Channel 1

This table contains information about the actual state of all Slaves. Possible values/descriptions/entries für the device state are: Not initialized, Not activated, No fault, Missing, Found, Configuration fault.

10.1.5 ASI_TASK Device Running States, Channel 2

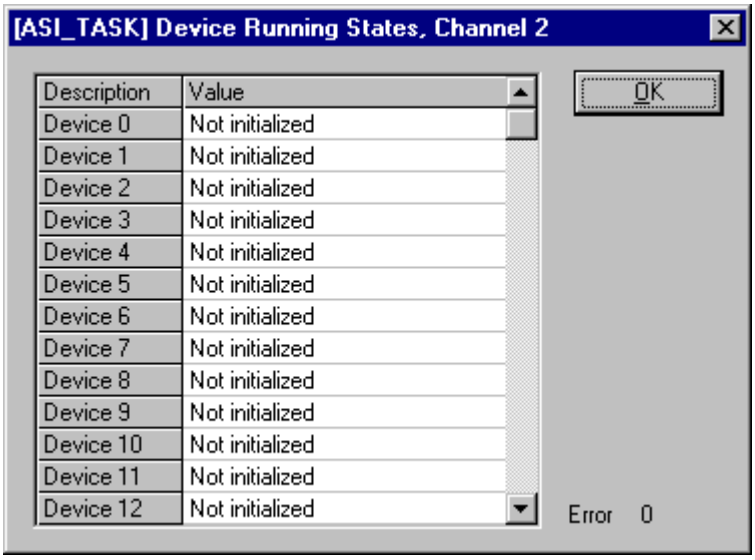


Figure 71: ASI_TASK Device Running States, Channel 2

This table contains information about the actual state of all Slaves. Possible values/descriptions/entries für the device state are: Not initialized, Not activated, No fault, Missing, Found, Configuration fault.

10.1.6 ASI_TASK Global State Field, Channel 1

See section *Global State Field* at page *57*.

10.1.7 ASI_TASK Global State Field, Channel 2

See section *Global State Field* at page *57*.

10.1.8 ASI_TASK Live List, Channel 1

See section *Live List* at page *54*.

10.1.9 ASI_TASK Live List, Channel 2

See section *Live List* at page *54*.

10.1.10 ASI_TASK IX System

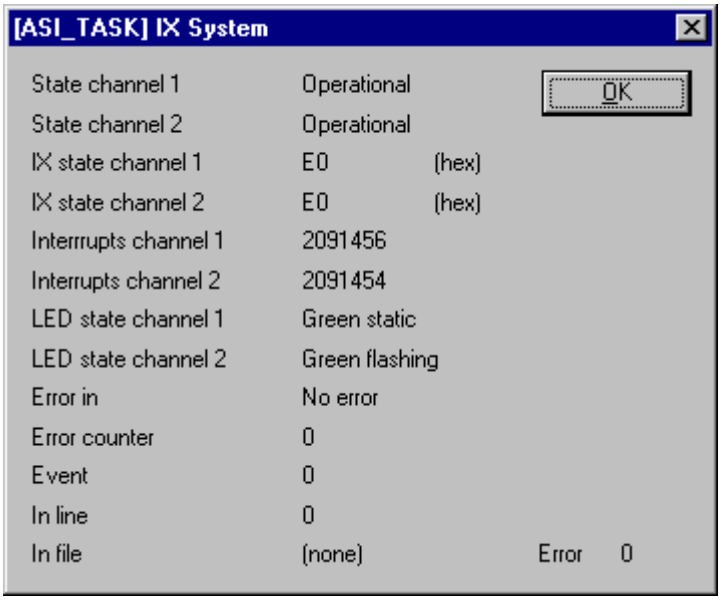


Figure 72: ASI_TASK IX System

Variable	Meaning
State channel 1	Init, Operational, Failure
State channel 2	Init, Operational, Failure
IX state channel 1	Internal state of data transmission to ASI-ASIC
IX state channel 2	Internal state of data transmission to ASI-ASIC
Interrupts channel 1	Counter for detected interrupts for ASIC CH1
Interrupts channel 2	Counter for detected interrupts for ASIC CH2
LED state channel 1	State of card LEDs (off, red flashing, green flashing, green) CH1
LED state channel 2	State of card LEDs (off, red flashing, green flashing, green) CH2
Error in	Error in channel 1 or channel 2
Error counter	Number of detected errors
Event	Error event / error number
In line	...detected in line
In file	...detected in file module

Table 42: ASI_TASK IX System

10.2 I/O Code, ID Code, ID2 Code and Slave Profiles

The **I/O Code** describes the direction of the data bits of a Slave. This can be: Input, Output, Bi-directional or Tristate.

The **ID Code** and **ID2 Code** is programmed by the production of a Slave and can not be changed by the user. It serves for the identification of the Slaves, which correspond to a fixed profile.

The identification of a Slave has to be done like the following:

S-[I/O-Code].[ID-Code].[ID2-Code].

I/O Code (4 Bit)	**I/O Configuration** D0	D1	D2	D3
0x0	IN	IN	IN	IN
0x1	IN	IN	IN	OUT
0x2	IN	IN	IN	I/O
0x3	IN	IN	OUT	OUT
0x4	IN	IN	I/O	I/O
0x5	IN	OUT	OUT	OUT
0x6	IN	I/O	I/O	I/O
0x7	I/O	I/O	I/O	I/O
0x8	OUT	OUT	OUT	OUT
0x9	OUT	OUT	OUT	IN
0xA	OUT	OUT	OUT	I/O
0xB	OUT	OUT	IN	IN
0xC	OUT	OUT	I/O	I/O
0xD	OUT	IN	IN	IN
0xE	OUT	I/O	I/O	I/O
0xF	TRI	TRI	TRI	TRI

Table 43: Possible I/O Codes of a Slave

IN = Input data
OUT = Output data
I/O = In- and Output data
TRI = Tristate

For example the I/O Code 7 of a Slave:

If a Slave has this profile all four data bits can be read and written, they are bi-directional. For this profile various ID Codes are already defined.

Slave Profile			ID Code														
			0	1	2	3	4	5	6	7	8	9	A	B	C	D	E	F
I/O Code	0	I, I, I, I	-	0.1									A/B Slaves	0.B				Free Profiles
	1	I, I, I, O	-	1.1														
	2	I, I, I, B	-															
	3	I, I, O, O	-	3.1														
	4	I, I, B, B	-															
	5	I, O, O, O	X.0															
	6	I, B, B, B	-															
	7	B, B, B, B	-	7.1	7.2	7.3	7.4							7.B		7.D	7.E	
	8	O, O, O, O	-	8.1														
	9	O, O, O, I																
	A	O, O, O, B	X.0															
	B	O, O, I, I		B.1														
	C	O, O, B, B	X.0															
	D	O, B, B, B		D.1														
	E	O, B, B, B	X.0															
	F	T, T, T, T																

Table 44: defined Slave profiles (released 01.03.2000)

I = Input data
O = Output data
B = In- and Output data
T = Tristate

The defined Slave profiles exist for:

I/O=X, ID=F	free profiles (X=O...E)
I/O=X, ID=0	remote I/O ports (X=0...E, not 9, B, D)
I/O=X, ID=A	reserved for A/B Slaves (X=0...E, not 2, A)
I/O=0, ID=1	two dual-signal sensors
I/O=0, ID=B	reserved for safety oriented sensors
I/O=1, ID=1	single sensor with extended control
I/O=3, ID=1	one dual-signal sensor, one dual actuator
I/O=3, ID=A	sensor with extended address function
I/O=7, ID=1	interface for the transfer of 6 to 18-bit signals
I/O=7, ID=2	extended Slave profile for the transmission of 6 to 21-bit signals
E/A=7, ID=3	extended Slave profile for the transmission of 16 bit signals
E/A=7, ID=4	extended Slave profile for the transmission of 16 bit signals to 4 bit digital values

Note: This table shows the defined Slave Profiles from the state 01.03.2000. Further extensions are possible.

The profile S-7.1 for example describes a device for the transmission of 6 to 18 bit signals (analog profile), the profile S-7.2 describes a device for the transmission of 6 to 21 bit signals (extended analog profile) and so on.

11 Lists

11.1 List of Figures

11.2 List of Tables

12 Glossary

SyCon

System Configurator.

Configuration and Diagnostic tool.

13 Contacts

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