Operating Instruction Manual

SyConND

System Configurator NetDevices

NetLink, NetNode

Edition: 2
Language: English (EN)

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List of Revisions

Index	Date	Version	Chapter	Revision
1	06.06.02	SyCon.exe 2.643 NetNode.dll 2.010	all	created NetNode (Conversion Ethernet to serial Protocols, NN40, NN42) NetLink (NL-MPI)
2	25.06.02	SyCon.exe 2.643 NetNode.dll 2.010	all	revised

Although this program has been developed with great care and intensively tested, Hilscher Gesellschaft für Systemautomation mbH cannot guarantee the suitability of this program for any purpose not confirmed by us in writing.

Guarantee claims shall be limited to the right to require rectification. Liability for any damages which may have arisen from the use of this program or its documentation shall be limited to cases of intent.

We reserve the right to modify our products and their specifications at any time in as far as this contributes to technical progress. The version of the manual supplied with the program applies.

Table Of Contents

1 Overview SyCon

1.1 Main Functions

The main functions of the NetDevices System Configurator are:

Function	Section	Short Description
Configuration	*Overview*	Overview about possible protocol conversions and description of configuration steps
Diagnostic	*Diagnostic Functions*	Extended Device Diagnostic, Message Monitor
Documentation	*Project Information*	Set the project information
	Print	Print out the configuration

Table 1: SyCon Main Functions

1.2 SyConND

SyConND is a System Configurator for NetDevices. To NetDevices belong NetNode 40, NetNode 42 and NetLink MPI.

2 Installation and Licensing

2.1 System Requirements

- PC with 586-, Pentium processor or higher
- Windows 95/98/ME, Windows NT/2000/XP
- Free disk space: 30 - 80 MByte
- CD ROM drive
- RAM: min. 16 MByte
- Graphic resolution: min. 800 x 600 pixel
- Windows 95: Service Pack 1 or higher
- Windows NT: Service Pack 3 or higher
- Keyboard and Mouse

2.2 Software Installation

Close all application programs on the system!

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

Note: Administrator privileges are required on Windows NT/2000/XP systems for installation!

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

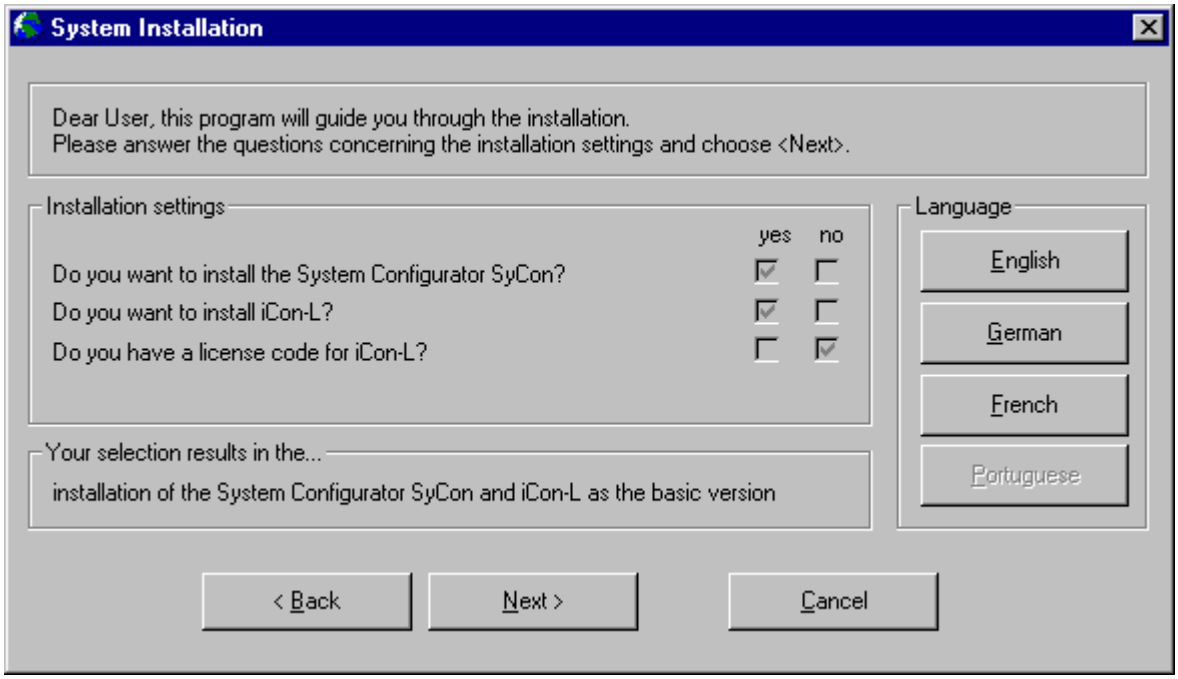

Figure 1: Selection for the Installation of the System Configurator and iCon-L in basic version

Note: iCon-L is only for NetNode 40 and NetNode 42, but not for NetLink.

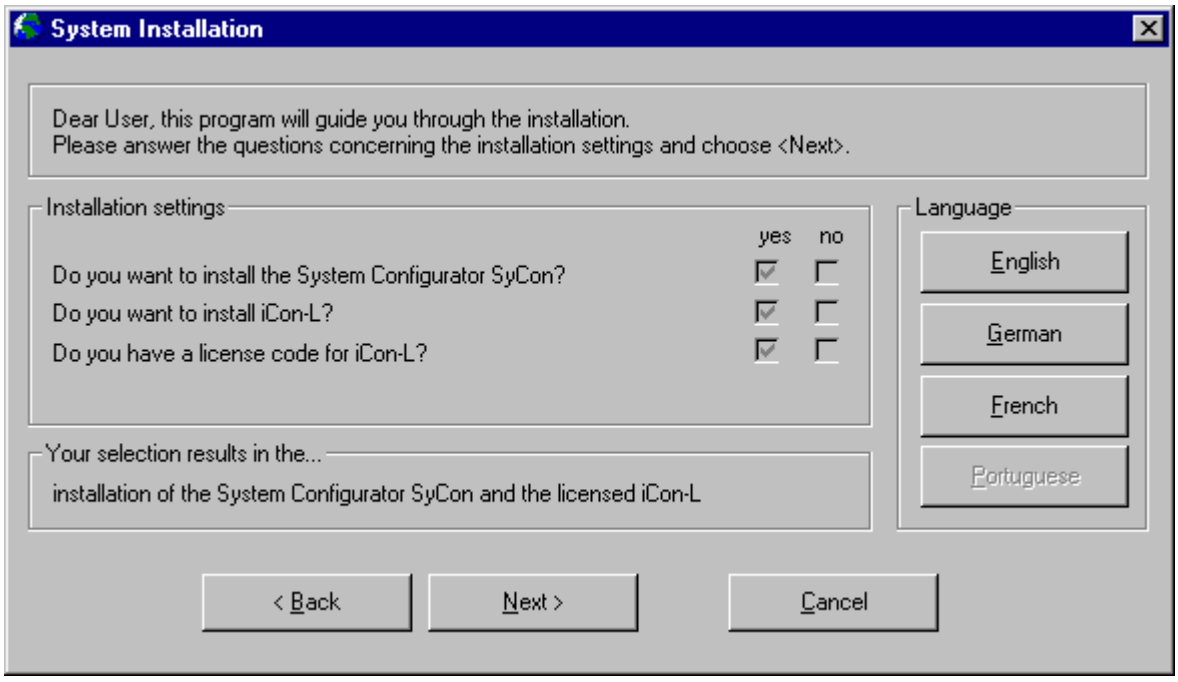

Figure 2: Selection for the Installation of the Programs SyCon and the licensed iCon-L version

It can be installed:

- System Configurator SyCon (Configuration and diagnostic tool)
- iCon-L (graphical programming system with module library and diagnostic tool)

If you have a license code or it is print on the label of the CD, then answer the question for an existing license code with **yes**, otherwise a basic version of iCon-L will be installed.

Note: For SyCon no license is needed, because the basic version includes all functions for operating the NetDevices.

2.3 Installation of the SyCon and iCon-L

During the installation of the licensed version of iCon-L you have to insert your Name and your Company Name during installation.

If you have a license code or it is labeled on the CD, it must also be entered now. Otherwise iCon-L will work as a basic version.

In the basic version of the System Configurator all functions of SyCon for operating the NetDevices are available.

In the basic version of iCon-L you have the possibility to load projects and download it to the NetNode. In this version you also can do diagnostic. In the licensed version you have the same possibilities and in addition to this you can create own projects with up to 100 blocks and do project engineering.

Follow the instructions of the installation program and answer the questions with **OK** or **NEXT**.

A license code for iCon-L can be ordered also subsequently 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.

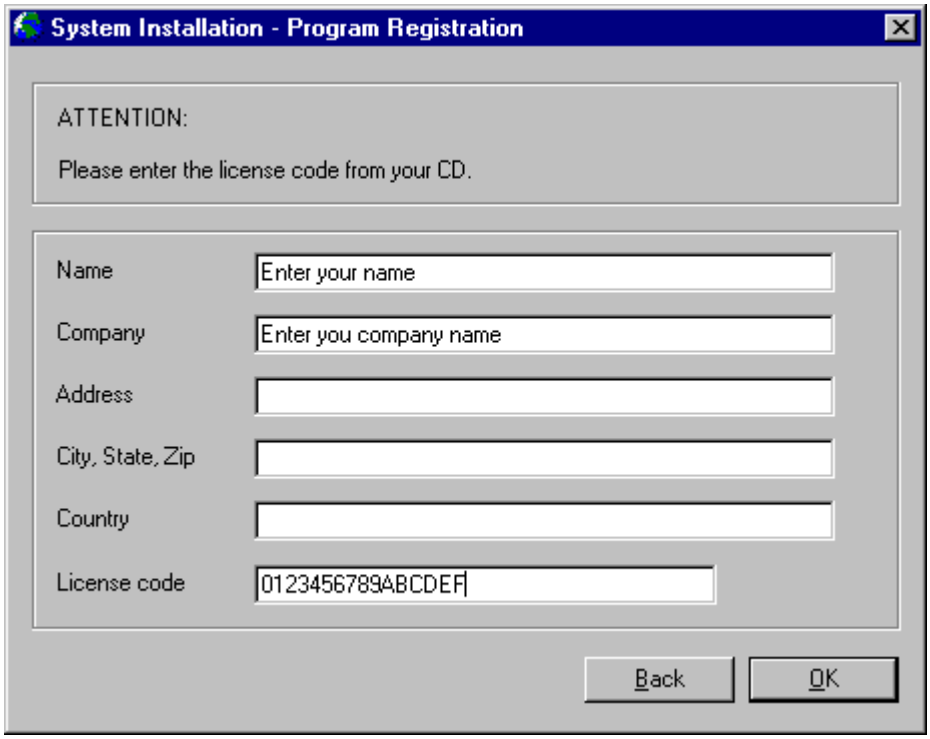

Figure 3: Enter the Name, the Company Name and the license code

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:

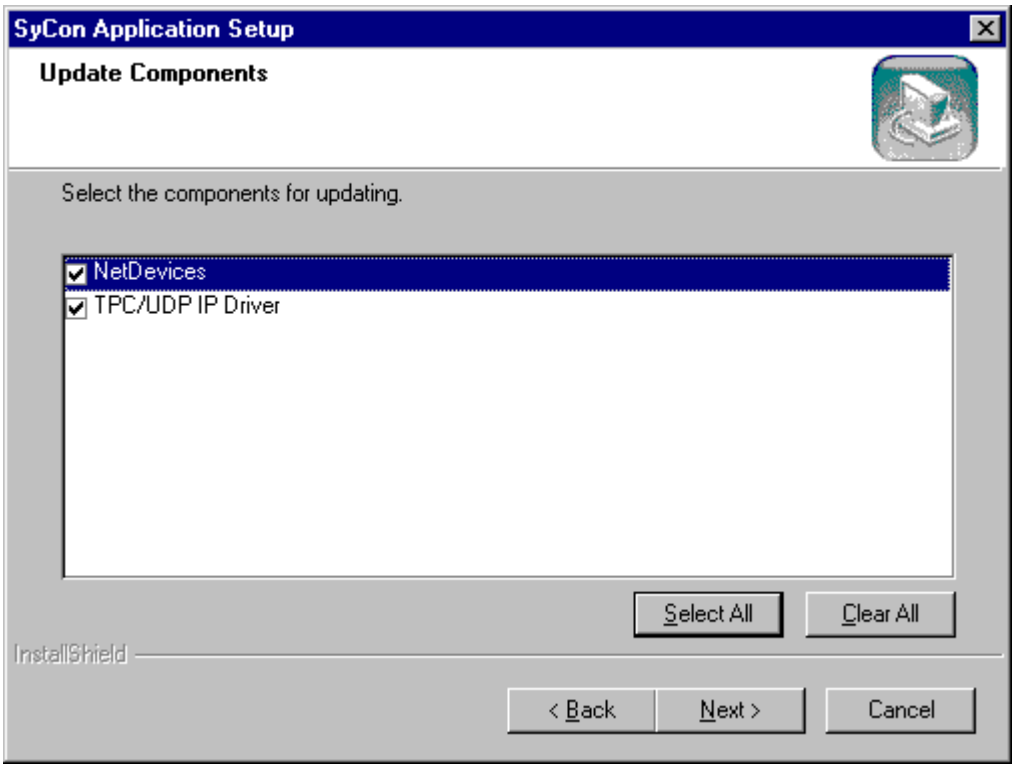

Figure 4: Selection of the destination directory and the NetDevices during installation

The installation program copies the program files and Bitmaps to the PC. Finally the system DLLs and the application are entered into the Registry.

2.4 Licensing

This section describes the steps to license iCon-L from the already installed basic version of this program. The licensing during installation was already described above.

Deliveries that contain a license for the module library iCon-L have a formula with. Fill out this paper (formulary) and fax it to your distributor or directly to us. After you receive the license code enter it as described in section *Enter the Licensecode* below on page *15*.

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

2.4.1 Ordering a License for iCon-L

This section describes how to act by iCon-L starting from the already installed basic version of this program. The licensing during installation was already described above.

To order the license code iCon-L select the menu **Help > Licensing**. The licensing window is opened.

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

To order a license code iCon-L select the iCon-L module by clicking on it.

There are three tables to do this. The first table list the modules, that are not licensed. Doubleclick or select a module and click the **Add** button to move them 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.

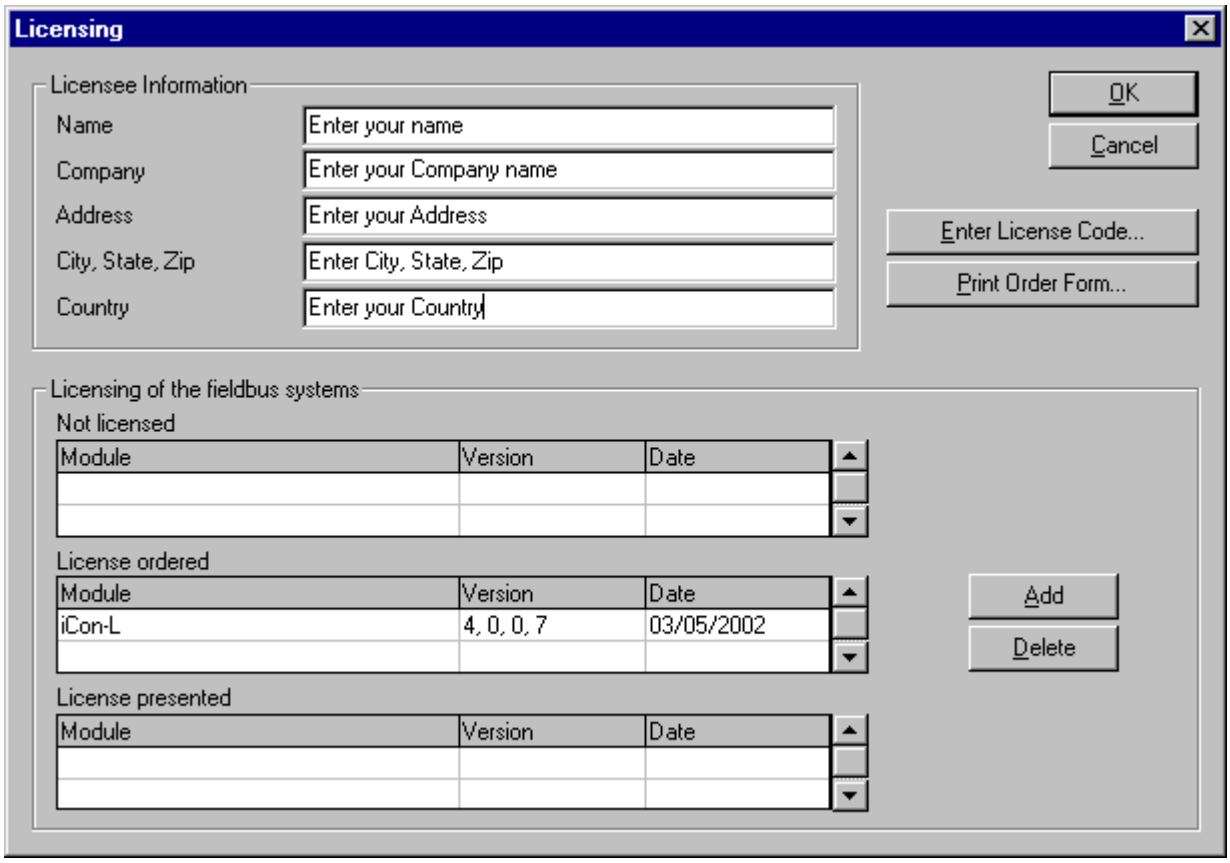

Figure 5: Selection of the Module iCon-L

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 Licensecode

Check if the name and the company name was entered exactly as printed on the fax.

Note: 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.

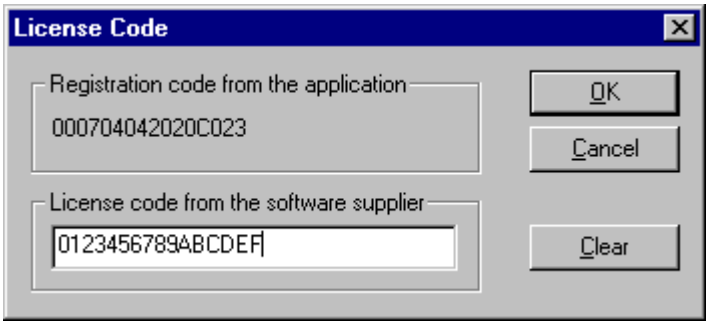

Figure 6: Enter the Licence Code

Note: The license code 0123456789ABCDEF 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 SyCon will ask you to exit and restart the System Configurator to activate the license. If the license code is invalid the following window appears.

Figure 7: 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

2.5.1 Scope of Functions of the Basic Versions

The basic version of the System Configurator SyCon has the following functionality:

- Full functionality for operating the NetDevices (both NetLink and NetNode)
- All diagnostic functions

The basic version of iCon-L contains:

- In the basic version existing projects can be opened, parameter of the modules can be changed and it can be sent to the NetNode
- The diagnostic functions for existing projects are available
- Modules can not be deleted or added!

2.5.2 Scope of Functions of the licensed iCon-L Version

The licensed version of the iCon-L has the following functionality:

- Projects with up to 100 blocks can be created
- It is possible to create new and to open existing projects, the parameters of modules can be changed and loaded into the NetNode
- Diagnostic functions
- Blocks can be deleted or added

3 Configuration Steps - Getting Started

3.1 Overview Protocol Conversions

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

Note: The booklet with the CD 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.

There are two different kinds of NetDevices:

Device	Page
NetLink	*17*
NetNode	*17*

Table 2: Overview NetDevices

3.1.1 NetLink

Device	Ethernet	Protocol	Described in section	Page
NetLink	Hilscher TCP/IP	PROFIBUS MPI	*Configuration NetLink MPI*	*18*

Table 3: Overview NetLink Communication

3.1.2 NetNode

Device	Ethernet	Protocol	Described in section	Page
NetNode 40/42	Ethernet	3946R / RK512	*Configuration of NetNode 40/42 with Ethernet / 3946R/RK512 Conversion*	*19*
	Ethernet	ASCII	*Configuration of NetNode 40/42 with Ethernet / ASCII Conversion*	*20*
	Ethernet	Modbus RTU	*Configuration of NetNode 40/42 with Ethernet / Modbus RTU Conversion*	*21*
	Ethernet + FTP	ASCII	*Configuration of NetNode 40/42 with Ethernet+FTP / ASCII Conversion*	*22*

Table 4: Overview Protocol Conversions NetNode

3.2 Configuration NetLink

3.2.1 Configuration NetLink MPI

The following table describes the steps to configure a Hilscher NetLink MPI device.

#	Action	Menu in the System Configurator	Detail information in section	Page
1	Create a new project	**File > New > NetDevices**	*Setting up the NetDevices Configuration*	*23*
2	Choose Hilscher NetLink device	**Insert > Device > NetLink**	*Insert Device*	*24*
3	Set Device Assignment	**Settings > Device Assignment > CIF TCP/UDP IP Driver**	*CIF TCP/IP Driver*	*30*
4	Set Protocol Parameter	**Settings > NetLink Parameter**	*Device Parameter* *IP Address* *PROFIBUS Parameter*	*35* *36* *39*
5	Save project	**File > Save**	*Save and Save As*	*69*
6	Download	**Online > Download**	*Downloading the Configuration*	*57*

Table 5: Configuration NetLink MPI

3.3 Configuration NetNode

3.3.1 Configuration of NetNode 40/42 with Ethernet / 3946R/RK512 Conversion

In the following table the steps to configure a Hilscher NetNode device with the conversion from Ethernet to 3946R / RK512 are described.

#	Action	Menu in the System Configurator	Detail information in section	Page
1	Create a new project	**File > New > NetDevices**	*Setting up the NetDevices Configuration*	*23*
2	Choose Hilscher NetNode device	**Insert > Device > NetNode 40** or **Insert > Device > NetNode 42**	*Insert Device*	*24*
3	Select Protocol Conversion	Protocol 1: **Ethernet** Protocol 2: **3946R / RK512**	*Select NetNode Protocol Conversion*	*25*
4	Set Protocol Parameter	**Settings > NetNode Parameter**	*Device Parameter* *IP Address* *TCP Parameter* *3964R / RK512 Parameter*	*35* *36* *38* *42*
5	Set Device Assignment	**Settings > Device Assignment**	*Device Assignment*	*27*
6	Save project	**File > Save**	*Save and Save As*	*69*
7	Download	**Online > Download**	*Downloading the Configuration*	*57*

Table 6: Configuration of NetNode 40/42 with Ethernet / 3946R/RK512 Conversion

3.3.2 Configuration of NetNode 40/42 with Ethernet / ASCII Conversion

In the following table the steps to configure a Hilscher NetNode device with the conversion from Ethernet to ASCII are described.

#	Action	Menu in the System Configurator	Detail information in section	Page
1	Create a new project	**File > New > NetDevices**	*Setting up the NetDevices Configuration*	*23*
2	Choose Hilscher NetNode device	**Insert > Device > NetNode 40** or **Insert > Device > NetNode 42**	*Insert Device*	*24*
3	Select Protocol Conversion	Protocol 1: **Ethernet** Protocol 2: **ASCII**	*Select NetNode Protocol Conversion*	*25*
4	Set Protocol Parameter	**Settings > NetNode Parameter**	*Device Parameter* *IP Address* *TCP Parameter* *ASCII Parameter*	*35* *36* *38* *44*
5	Set Device Assignment	**Settings > Device Assignment**	*Device Assignment*	*27*
6	Save project	**File > Save**	*Save and Save As*	*69*
7	Download	**Online > Download**	*Downloading the Configuration*	*57*

Table 7: Configuration of NetNode 40/42 with Ethernet / ASCII Conversion

3.3.3 Configuration of NetNode 40/42 with Ethernet / Modbus RTU Conversion

In the following table the steps to configure a Hilscher NetNode device with the conversion from Ethernet to Modbus RTU are described.

#	Action	Menu in the System Configurator	Detail information in section	Page
1	Create a new project	**File > New > NetDevices**	*Setting up the NetDevices Configuration*	*23*
2	Choose Hilscher NetNode device	**Insert > Device > NetNode 40** or **Insert > Device > NetNode 42**	*Insert Device*	*24*
3	Select Protocol Conversion	Protocol 1: **Ethernet** Protocol 2: **Modbus RTU**	*Select NetNode Protocol Conversion*	*25*
4	Set Protocol Parameter	**Settings > NetNode Parameter**	*Device Parameter* *IP Address* *TCP Parameter* *Modbus RTU Parameter*	*35* *36* *38* *49*
5	Set Device Assignment	**Settings > Device Assignment**	*Device Assignment*	*27*
6	Save project	**File > Save**	*Save and Save As*	*69*
7	Download	**Online > Download**	*Downloading the Configuration*	*57*

Table 8: Configuration of NetNode 40/42 with Ethernet / Modbus RTU Conversion

3.3.4 Configuration of NetNode 40/42 with Ethernet+FTP / ASCII Conversion

In the following table the steps to configure a Hilscher NetNode device with the conversion from Ethernet + FTP to ASCII are described.

#	Action	Menu in the System Configurator	Detail information in section	Page
1	Create a new project	**File > New > NetDevices**	*Setting up the NetDevices Configuration*	*23*
2	Choose Hilscher NetNode device	**Insert > Device > NetNode 40** or **Insert > Device > NetNode 42**	*Insert Device*	*24*
3	Select Protocol Conversion	Protocol 1: **Ethernet + FTP** Protocol 2: **ASCII**	*Select NetNode Protocol Conversion*	*25*
4	Set Protocol Parameter	**Settings > NetNode Parameter**	*Device Parameter* *IP Address* *TCP Parameter* *ASCII Parameter*	*35* *36* *38* *44*
5	Set Device Assignment	**Settings > Device Assignment**	*Device Assignment*	*27*
6	Save project	**File > Save**	*Save and Save As*	*69*
7	Download	**Online > Download**	*Downloading the Configuration*	*57*

Table 9: Configuration of NetNode 40/42 with Ethernet+FTP / ASCII Conversion

Note: In case of Ethernet + FTP / ASCII conversion maximal two serial interfaces can be used.

4 Configuration of NetDevices with SyCon

4.1 Setting up the NetDevices Configuration

To create a new configuration, choose the **File > New** menu. This will offer a selection list of fieldbus systems. Choose the **NetDevices**. If only the NetDevices was installed, then the configuration window will open directly.

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

4.2 Insert Device

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

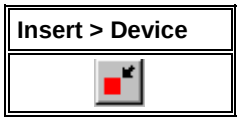

Figure 8: Symbol Insert > Device

A dialog box opens, from which exactly one device can be selected.

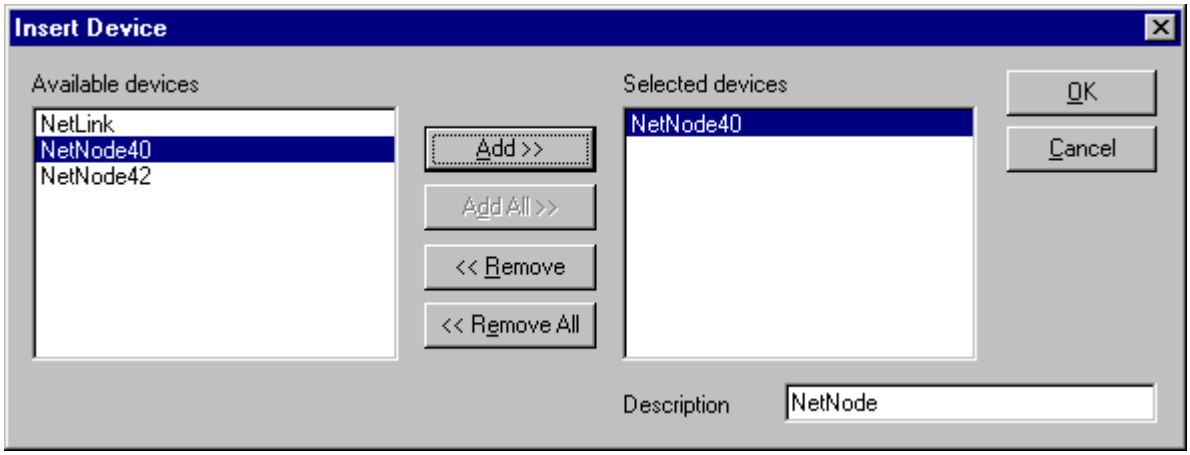

Figure 9: Insert > Device

In this window you select the device you want by clicking on it in the list **Available Devices** and then click the **Add** button or make a double click on the device to put the device to the list **Selected Devices**. With **OK** you confirm the selection.

This example shows a Net Node40 device that is inserted with the **Description NetNode.** The shown description depends on the insert device and can be changed the user.

4.2.1 Select NetNode Protocol Conversion

Note: This dialogue appears only, if a NetNode device is inserted into the configuration. In case of a NetLink this setting has not to be made.

After the selection of the NetNode device was confirmed by clicking at the **OK** button a new window appears where you have to select the protocol for this device.

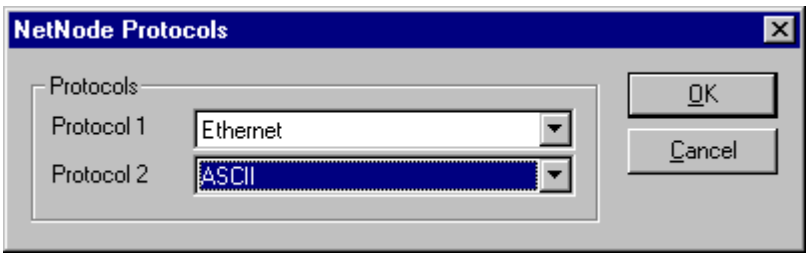

Figure 10: Select NetNode Protocol (here ASCII)

Here you see the possible protocol conversions:

Protocol 1	Protocol 2	Firmware
Ethernet	3946R / RK512	NNENNVR
Ethernet	ASCII	NNENASC
Ethernet	Modbus RTU	NNENMBR
Ethernet + FTP	ASCII	NNFTPASC

Table 10: Possible Protocol Conversions for NetNode Configuration

If you have selected a protocol and you confirm your selection by clicking on the **OK** button the NetNode will be insert with this protocol.

4.2.2 Replace Device

If a device already exists in the configuration and should be replaced against another device, you have to choose the menu **Insert > Device** or select the "Insert Device" Symbol.

The question appears if the device should be replaced.

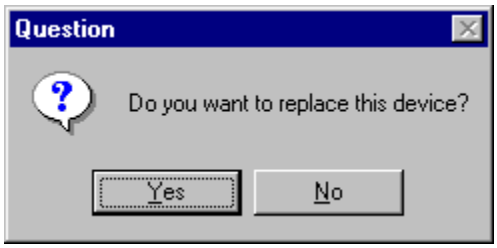

Figure 11: Security question replace device

If you click the **Yes** button a new window opens, where you can replace the device against another one.

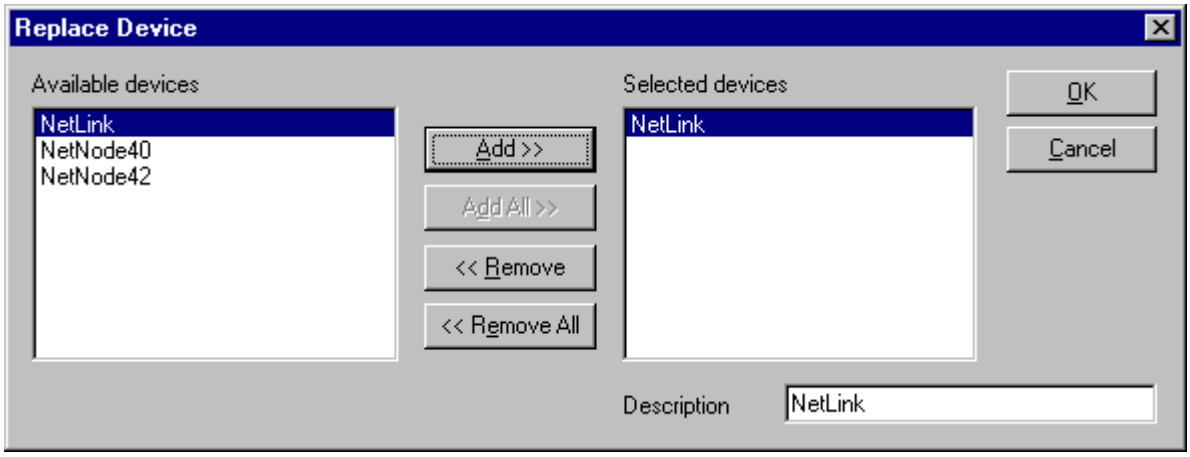

Figure 12: Edit > Replace Device

In this window you select the device you want by clicking on it in the list **Available devices**. By clicking the **Add** button you put the device in the list **Selected devices**. With **OK** you confirm the selection and the device will be replaced.

Note: If the previous device is replaced by a NetNode, you also have to select the protocol conversion, like descriped in section *Select NetNode Protocol Conversion* on page *25*.

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 assignment via the menu **Settings > Device Assignment**. The following possibilities are available:

CIF Serial Driver	CIF TCP/IP Driver

CIF Serial Driver:

- CIF Serial Driver: The System Configurator communicates with the NetNode 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 NetNode.
- This communication is utilized when the System Configurator has access the device over the diagnostic interface of the Hilscher device.

CIF TCP/IP Driver:

- CIF TCP/IP Driver: The System Configurator communicates with the Hilscher device via a TCP/IP connection.

5.1.1 CIF Serial Driver

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

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

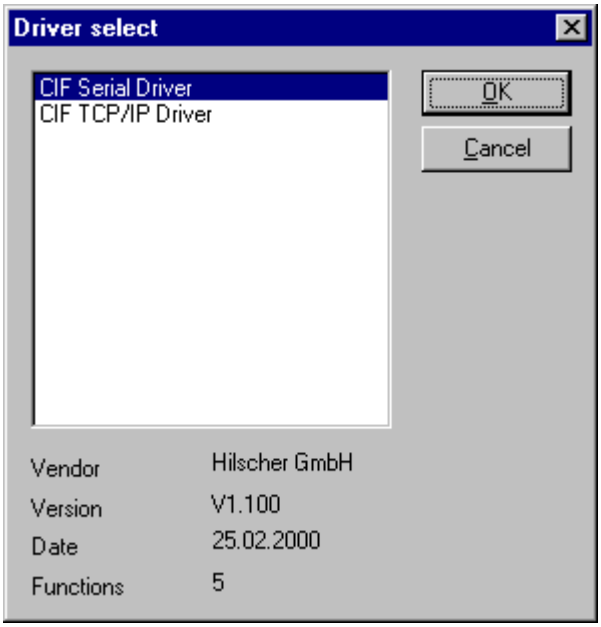

Figure 13: Driver Selection - CIF Serial Driver

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.

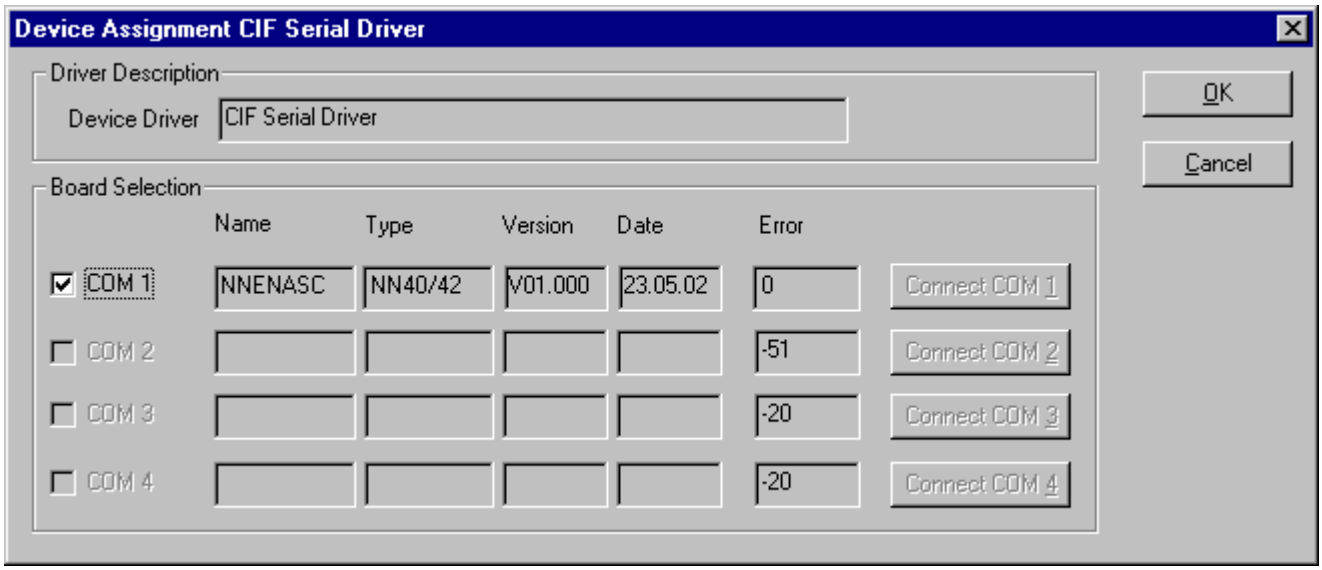

Figure 14: CIF Serial Driver - Device Assignment

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

5.1.2 CIF TCP/IP Driver

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

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

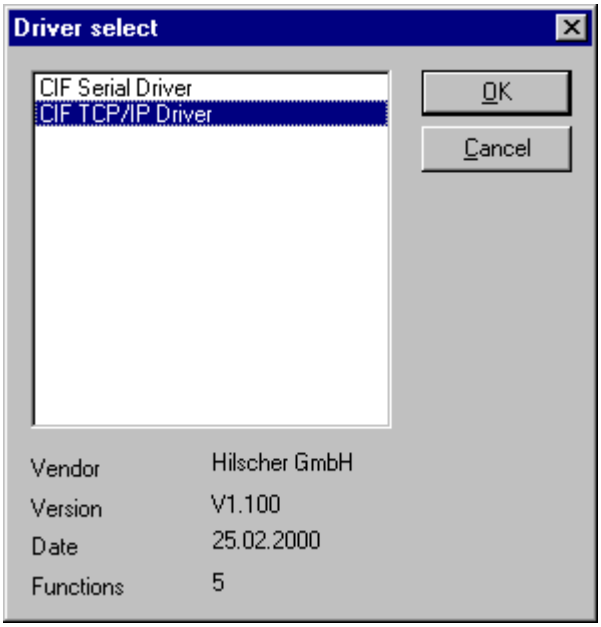

Figure 15: Driver Selection - CIF TCP/IP Driver

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

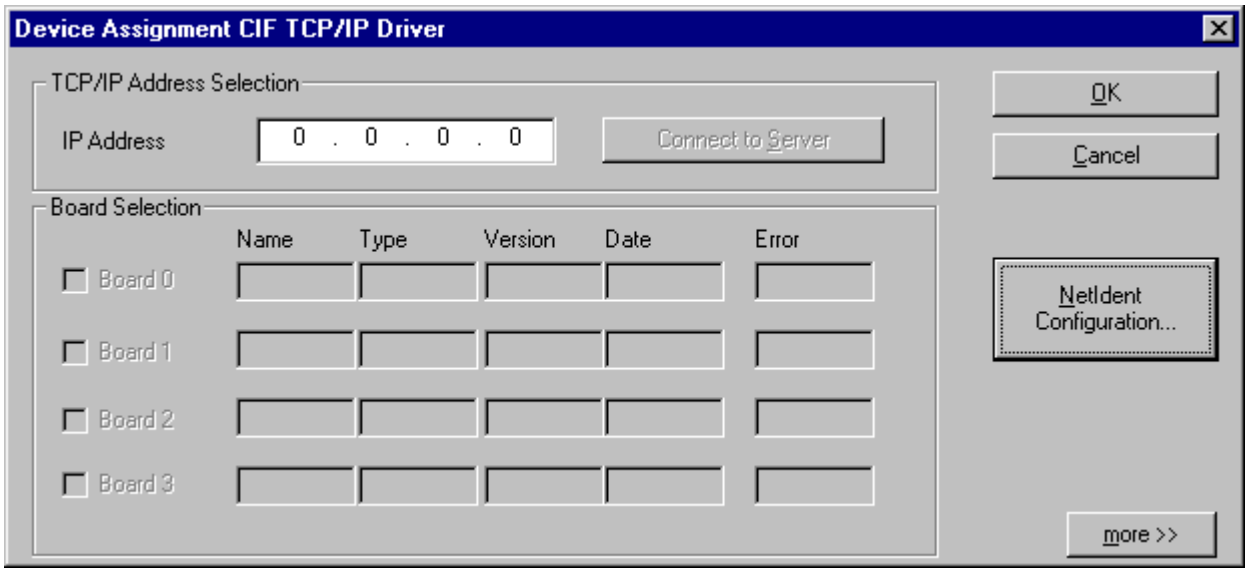

Figure 16: CIF TCP/IP Driver > Device Assignment

5.1.2.1 NetIdent Configuration

With the button **NetIdent Configuration** you can look for existing NetDevices in the network. A new window appears:

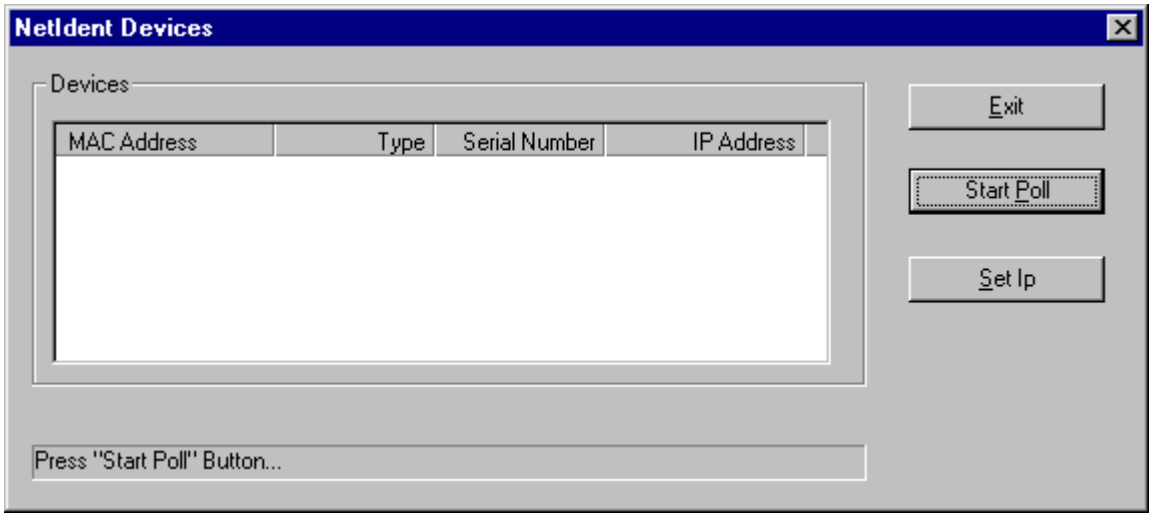

Figure 17: NetIdent Configuration

By clicking the **Start Poll** button the network is scanned for NetDevices.

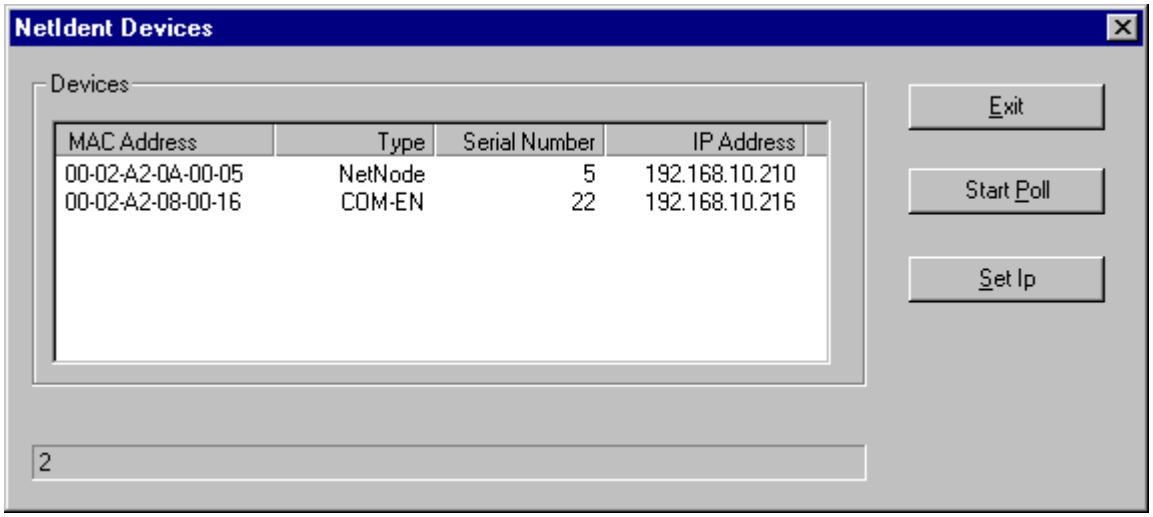

Figure 18: NetIdent Configuration > Start Poll

If one or more devices were found, they are shown with their **MAC Address**. Further more the device **Type**, the **Serial Number** and **the IP Address** are displayed.

Caution: To find devices with NetIdent and to set their IP Address, the devices have to be in the same network as the used PC.

If you type in the found IP Address of the required device and confirm by clicking the **Connect to Server** button, the device appears in the **Board Selection** if the Connection was successfull. If the name agrees with device in the configuration, now the device can be selected.

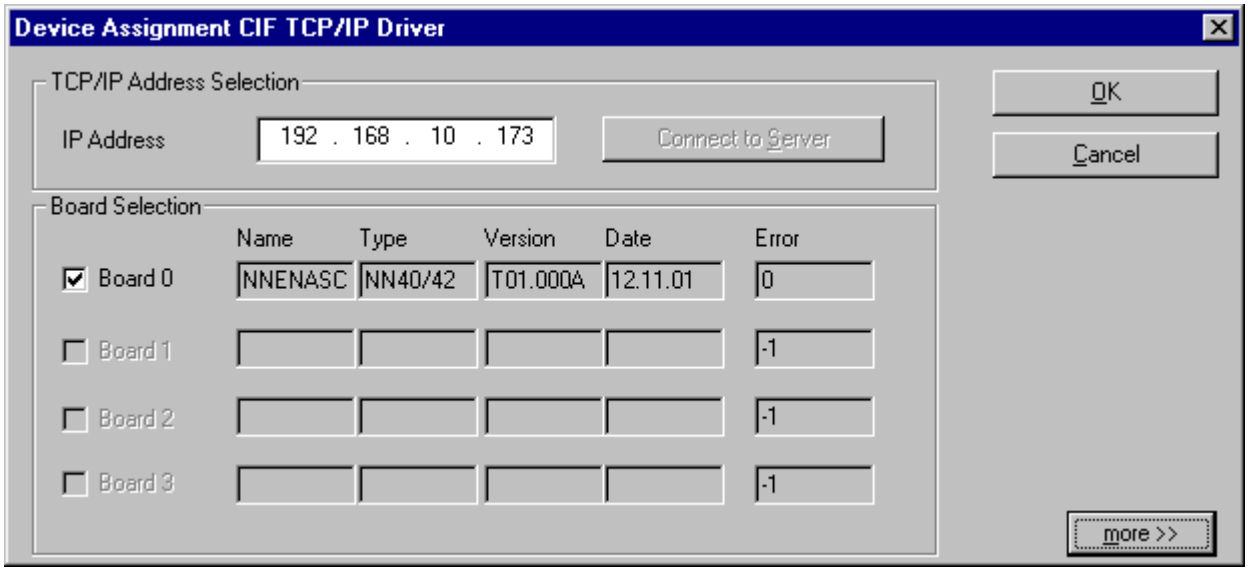

Figure 19: CIF TCP/IP Driver - Device Assignment

By confirming with the **OK** button, the device is assigned to the Device Assignment via TCP/IP.

5.2 Device Settings

Note: The device settings are only valid for NetNode devices. If a NetLink configuration is loaded, this menu point is not shown.

To enter the Device Settings, choose the menu **Settings > Device Settings** or click with the right mouse button on the device and select the **Device Settings** from the list that opens.

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

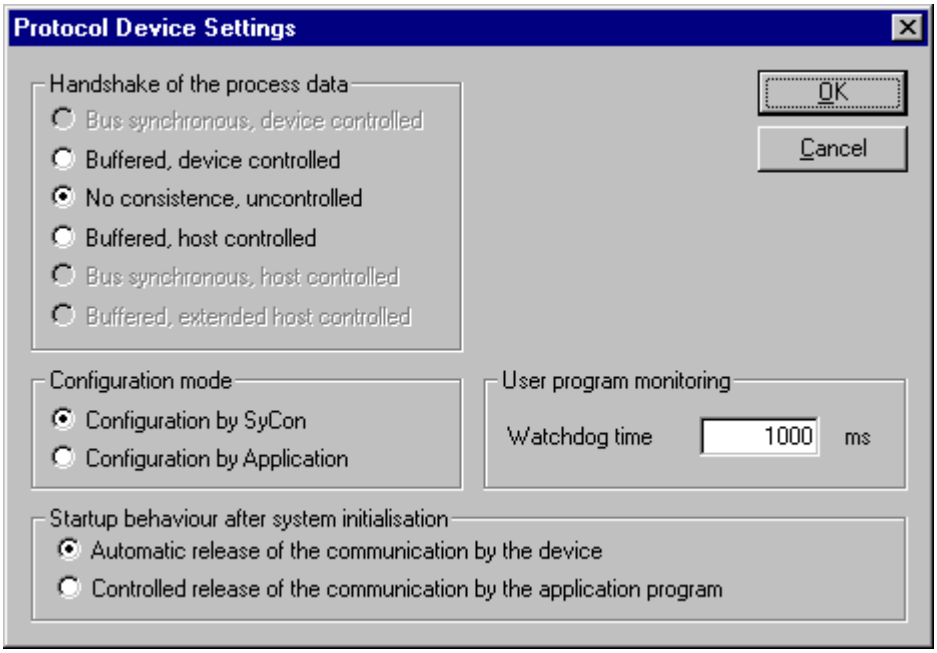

Figure 20: Settings > Device Settings

- **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.

- **Configuration Mode**

  If the device is to use the parameters of the configuration that is downloaded from SyCon then the **Configuration by SyCon** mode must be selected for the configuration mode. If the configuration is written online from an application into the Dual-port memory, then the **Configuration by Application** mode must be selected.

- **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.

- **Startup behaviour after system initialisation**

  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.

5.3 Device Parameter

The Device Parameter are the basis for the working data exchange. This section contains information for setting the Device Parameter and a description for the individual protocol- and busparameter.

NetLink	NetNode
The NetLink device parameters can be called up with the menu **Settings > NetLink Parameter**, if a NetLink configuration is loaded.	The NetNode device parameters can be called up with the menu **Settings > NetNode Parameter**, if a NetNode configuration is loaded. The displayed parameter depend on the protocols which where selected for the protocol conversion.

Table 11: Settings > Parameter

The settings of the individual parameter is described in the section given below.

Parameter	NetLink	NetNode	Described in section	Page
IP-Address	Yes	Yes	*IP Address*	*36*
Ethernet	Yes	Yes	*Ethernet Parameter*	*37*
TCP	No	Yes	*TCP Parameter*	*38*
PROFIBUS	Yes	No	*PROFIBUS Parameter*	*39*
3946R / RK512	No	Yes	*3964R / RK512 Parameter*	*42*
ASCII	No	Yes	*ASCII Parameter*	*44*
Modbus RTU	No	Yes	*Modbus RTU Parameter*	*49*

Table 12: Settings of Device Parameter

5.3.1 IP Address

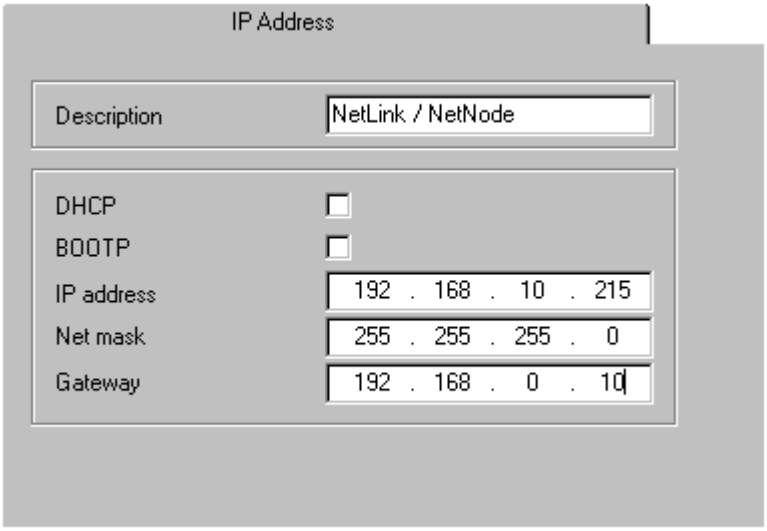

Figure 21: Settings > NetLink / NetNode Parameter > IP Address

Description:

The description of the device is shown in SyCon as the name of the device. The description is changeable in this field.

The handing over of the IP parameters (IP address, Net mask, Gateway) can result in three ways.

1. DHCP:

The device gets the IP parameters from a DHCP server.

2. BOOTP:

The device gets the IP parameters from a BOOTP server.

3. IP address, Net mask and Gateway:

The IP parameters can be entered in this fields. If more than one configuration way is activated (for example DHCP and manually entered IP parameters), the device trys to process the different configuration way one after the other. As soon as it got an IP configuration in one of this ways, the device starts with this parameters.

5.3.2 Ethernet Parameter

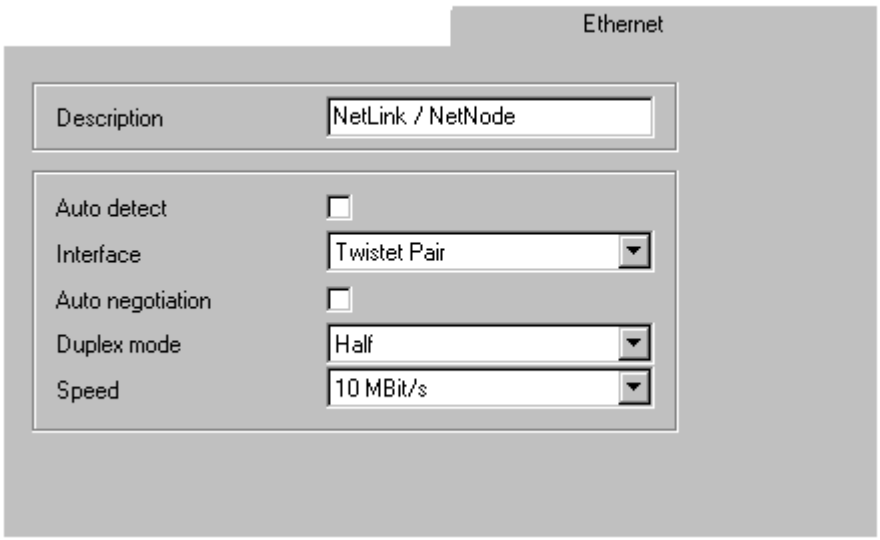

Figure 22: Settings > NetLink / NetNode Parameter > Ethernet

Description:

The description of the device is shown in SyCon as the name of the device. The description is changeable in this field.

Auto detect:

If this option is selected an automatic detection of the Ethernet interface results.

Interface:

Here the manually setting of the Ethernet can be done. The user has the possibility to select **Twisted Pair** or **AUI** but at the moment just Twisted Pair is supported. The description of this you find in section *Twisted Pair and AUI* at page *98*.

Auto negotation:

Auto negotation means, that in case of two connected devices the devices detect the hardware and the features (for example Half- or Full Duplex, 10 or 100 Mbits and so on) of the other device. If this option is selected, both devices work with the performance of the lower-powered device.

Duplex mode:

Here the Duplex mode of the Ethernet interface can be set. You can select between Full Duplex and Half Duplex but only Half Duplex is supported at the moment. The description of this you find in section *Full Duplex and Half Dupelx* at page *98*.

Speed:

Transmission speed of the data in MBits/s. In this window you can select between 10 MBits/s and 100 MBits/s, but only 10 Mbits/s are supported at the moment.

5.3.3 TCP Parameter

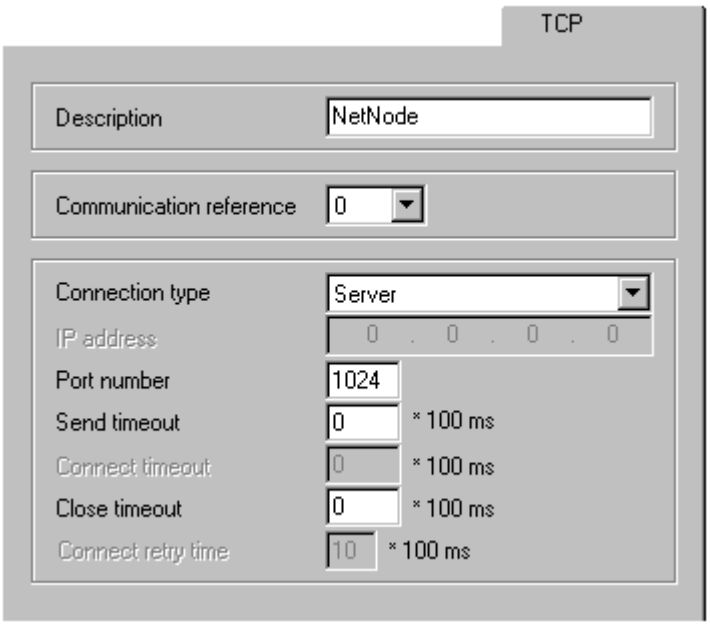

Figure 23: Settings > NetNode Parameter > TCP

Description:

The description of the device is shown in SyCon as the name of the device. The description is changeable in this field.

With the different **Communication references 0**, **1**, **2** and **3** you are able to set diffent communication kinds which are independend form each other. By selecting a communication kind the settings for this communication are loaded and the communication is done this way.

In the field **Connection type** you can select between **unused**, **Server** and **Client**. Depending on the selected Connection type the under settings (IP address, Connect timeout and so on) are grey.

If the **Connection type** unused is selected all other field are grey because no connection is selected.

If Server is selected as **Connection type** the field **Port number**, **Send timeout** and **Close timeout** are adjustable.

If Client is selected as **Connection type** all field are adjustable. In the field **IP Address** you have to type in the IP of the wanted Client. The field **Send timeout**, **Connect timeout**, **Close timeout** and **Connect retry time** are adjustable in multiple of 100 milliseconds.

5.3.4 PROFIBUS Parameter

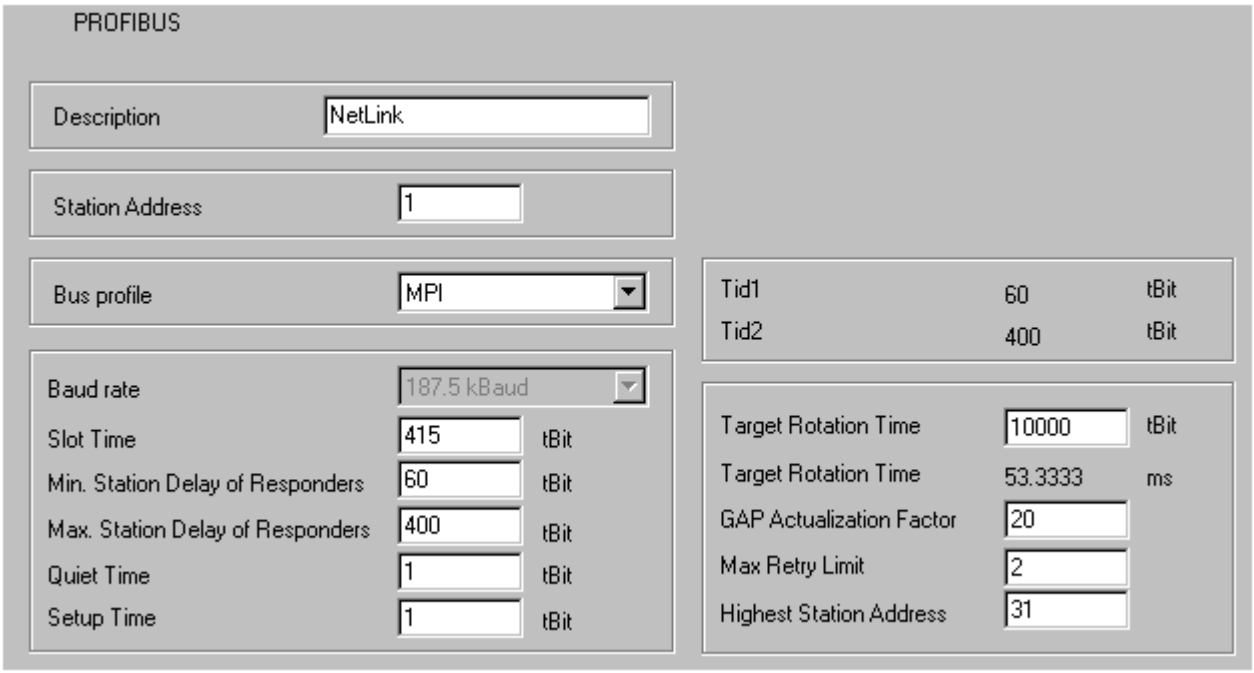

Figure 24: Settings > NetLink Parameter > PROFIBUS

The busparameters and their meaning:

- Station Address

  The Station Address of the NetLink

- Baudrate

  Transmission speed: Number of bits per second.

Baudrate	**Bit Time (t_{Bit})**
9,6 kBaud	104,2 us
19,2 kBaud	52,1 us
93,75 kBaud	10,7 us
187,5 kBaud	5,3 us
500 kBaud	2 us
1,5 Mbaud	666,7 ns
3 Mbaud	333,3 ns
6 Mbaud	166,7 ns
12 Mbaud	83,3 ns

Table 13: Baud rates and Bit times

- Minimum Station Delay of Responders (min T_{SDR})

  This is the shortest time period that must elapse before a remote recipient (Responder) may send an acknowledgement of a received query telegram. The shortest time period between receipt of the last Bit of a telegram to the sending of the first Bit of a following telegram.

  Value range: 1 .. 65535

- Maximum Station Delay of Responders (max T_{SDR})

  This is the longest time period that must elapse before a Sender (Requestor) may send a further query telegram. Greatest time period between receipt of the last Bit of a telegram to the sending of the first Bit of a following telegram.

  The Sender (Requestor, Master) must wait at least for this time period after the sending of an unacknowledged telegram (e.g. Broadcast only) before a new telegram is sent.

  Value range: 1 .. 65535

- Slot Time (T_{SL})

  'Wait for receipt' – monitoring time of the Senders (Requestor) of telegram for the acknowledgement of the recipient (Responder). After expiration, a retry occurs in accordance with the value of 'Max. telegram retries'.

  Value range: 52 .. 65535

- Quiet Time (T_{QUI})

  This is the time delay that occurs for modulators (Modulator-trip time) and Repeaters (Repeater-switch time) for the change over from sending to receiving.

  Value range: 0 .. 255

- Setup Time (T_{SET})

  Minimum period “reaction time” between the receipt of an acknowledgement to the sending of a new query telegram (Reaction) by the Sender (Requestor).

  Value range: 1 .. 255

- Target Rotation Time (T_{TR})

  Pre-set nominal Token cycling time within the Sender authorization (Token) will cycle around the ring. How much time the Master still has available for sending data telegrams to the Slaves is dependent on the difference between the nominal and the actual token cycling time.

  Value range: 1 .. 16.777.215

- GAP Update Factor (G)

  Factor for determining after how many Token cycles an added participant is accepted into the Token ring. After expiry of the time period $G*T_{TR}$, the Station searches to see whether a further participant wishes to be accepted into the logical ring.

  Value range: 1 .. 100

- Max number of telegram retries (Max_Retry_Limit)

  Maximum number of repeats in order to reach a Station.

  Value range: 1 .. 8

- Highest Station Address (HSA)

  Station address of the highest active (Master) Station.

Value range: 2 .. 126

5.3.5 3964R / RK512 Parameter

Note: If you use a NetNode 40 you have one register card (- 1) to set the serial interface. If you have load a NetNode 42 in the configuration three register cards (- 1, - 2, - 3) appear because the NetNode 42 has three serial interfaces.

If you have set a 3964R / RK512 configuration and you want to set the 3964R / RK512 Parameter select the menu **Settings > NetNode Parameter > 3964R / RK512**.

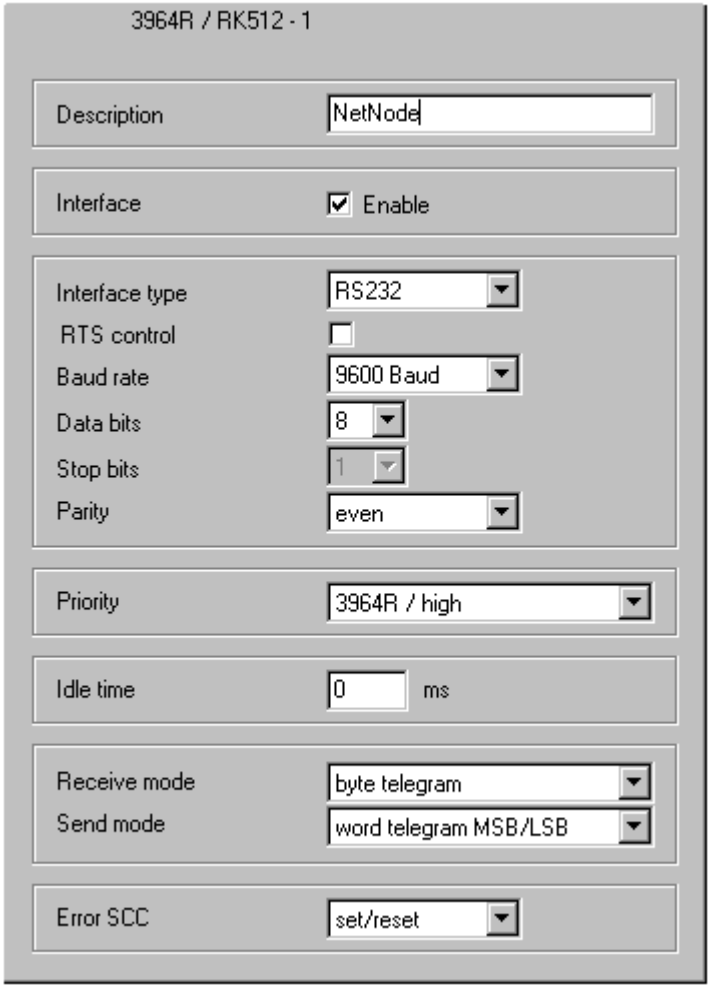

Figure 25: Settings > NetNode Parameter > 3946R / RK512

Description:

The description of the device is shown in SyCon as the name of the device. The description is changeable in this field.

Interface:

Interface of the device which is served by the protocol. This option can be activated or deactivated by the user.

Interface type:

Here you can select the interface type. You can select: **RS232**, **RS422** or **RS485**.

RTS control:

The RTS control must be activated (selected) if you use a RS485 interface. If you use a RS422 or RS232 interface this option is typically deactivated.

Baud rate:

Determination of the transmission rate. You have the possibility the select a Baud rate between 50 Baud and 19200 Baud. As default setting 9600 Baud is selected which is used mostly.

Data bits:

Number of data bits. You can select **7** data bits or **8** data bits.

Stop bits:

Number of stop bits: **1** stop bit.

Parity:

Determination of the Parity bit. You can select **no**, **even** and **odd**.

Priority:

Fixes which device is put back the send telegram in case of a initialisation conflict. The priority can be set to **low** or **high**.

Idle time:

Idle time in milliseconds before the start of a telegram repeat. The range of value is between 0 and 10000.

Receive mode:

Defines the type of the receive data. The following settings can be selected: **word telegram MSB/LSB**, **word telegram LSB/MSB**, **byte telegram** or **transparent**.

Send mode:

Defines how the word telegrams are sent of the line. **Either word telegram MSB/LSB** or **word telegram LSB/MSB**.

Error SCC:

If **set/reset** is selected in this field, an occurred error during a data transfer is deleted after a faultless transmission. If **set** is selected, the error is shown also after a faultless transmission and it is only deleted if the device is resetted.

5.3.6 ASCII Parameter

Note: If you use a NetNode 40 you have one register card (- 1) to set the serial interface. If you have load a NetNode 42 in the configuration three register cards (- 1, - 2, - 3) appear because the NetNode 42 has three serial interfaces.

If you have set an ASCII configuration and you want to set the ASCII Parameter select the menu **Settings > NetNode Parameter > ASCII**.

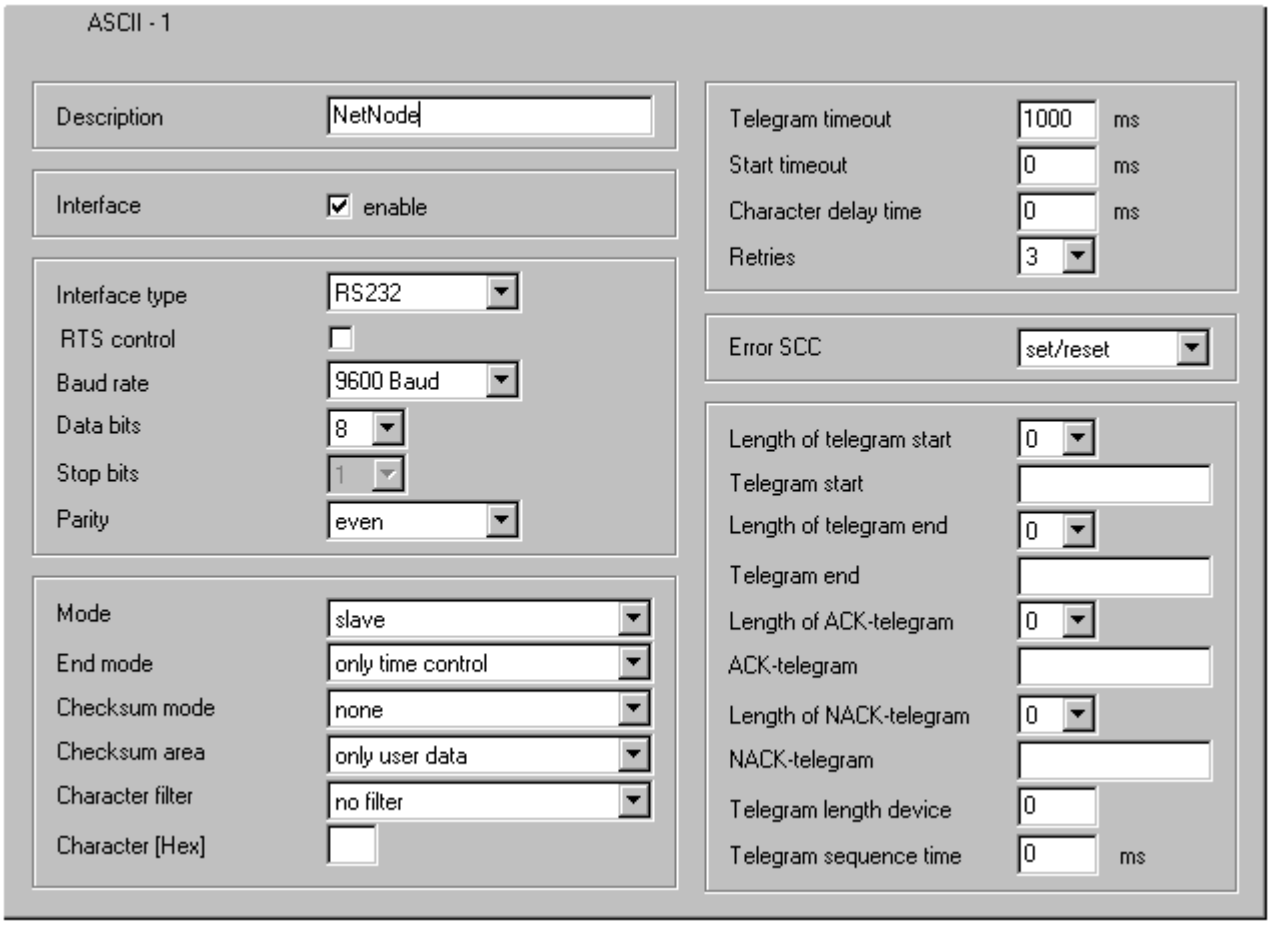

Figure 26: Settings > NetNode Parameter > ASCII

Description:

The description of the device is shown in SyCon as the name of the device. The description is changeable in this field.

Interface:

Interface of the device which is served by the protocol. This option can be activated or deactivated by the user.

Interface type:

Here you can select the interface type. You can select: **RS232**, **RS422** or **RS485**.

RTS control:

The RTS control must be activated (selected) if you use a RS485 interface. If you use a RS422 or RS232 interface this option is typically deactivated.

Baud rate:

Determination of the transmission rate. You have the possibility the select a Baud rate between 50 Baud and 19200 Baud. As default setting 9600 Baud is selected which is used mostly.

Data bits:

Number of data bits. You can select **7** data bits or **8** data bits.

Stop bits:

Number of stop bits. **1** stop bit.

Parity:

Determination of the Parity bit. You can select **no**, **even** and **odd**.

Mode:

The protocol works in two different modes: Master and Slave mode.

Master mode: The data transmission is introduced by the ASCII protocol. Data is sent to the remote partner and the answers are read in and transmit to the device internal processing.

Slave mode: The remote partner sends a telegram which is received and passed on by the ASCII protocol. Depending on the application related design it is already answered at the protocol layer with a positive acknowledgement and in case of a transmission error with a negative acknowledgement. After the processing of the telegram a answer telegram can be hand out to the remote partner.

This modes are selected to avoid initialisation conflicts by simultaneous sending. This has to be controlled at the protocol layer by the user.

In the Master mode the remote partner is only allowed to answer, if it has received a telegram before. Just then the ASCII protocol is ready to received.

In the Slave mode the ASCII protocol is always ready for send and receive. As a rule the telegram transfer is started by the Master, which waits for an answer afterwards before it sends the next telegram. In case of simultaneous receiving of the receive telegram and the transmit job the receive telegram has priority. The data transmission in this mode can be realized only from one transmission direction.

During the ASCII protocol sends data it is not ready to receive. Continuous receiving of data suppresses the send mode. The Master device and the user respectively is responsible for the synchronisation.

End mode:

The receive direction of the telegram is fixed over the end mode. At the moment the following end criterions are configurable:

only time control: As long as the set time control allows this additional characters can be received. The ending of the time control is not viewed as an error but as the end of the telegram.

end identifier: The end of a telegram is recognized at the character 'telegram end'. The time control is active corresponding to the set time.

acknowledge telegram: For the sent telegram only the configured acknowledge telegrams 'ACK telegram' and 'NACK telegram' are expected. The time control is active corresponding to the set time. Because in the Slave mode no acknowledge telegrams are defined in the receive direction, this mode is not allowed here.

end identifier / acknowledge telegram: This setting is the combination of the both last modes. That means the received data is controlled for a valid acknowledge telegram and for the telegram end. The control time is active according to the set time. Because in the Slave mode no acknowledge is defined, this mode is not allowed.

fixed data count: The end of the receive telegram is fixed by the 'telegram length device'. The time control is active according to the set time.

pass data count forward: The end of the receive telegram is defined by a passed forward data count in the send task. This is only possible in the Master mode.

Checksum mode:

The ASCII protocol is able to calculate the checksum for the telegrams which have to be send and it can insert the user data by itself. It also can check the checksum of the received telegrams. For this different processes of checksum mode and telegram possibilities for the calculation are configurable:

none: No checksum is determined and the send- and receive telegram get no checksum.

binary 7 bit: The checksum is formed by a byte fashioned addition of all data without overflow. The upper bit (D7) is firmed at 0.

binary 8 bit: The checksum is formed by a byte fashioned addition of all data without overflow.

CRC: The checksum is formed by 'exclusive or' of all data.

CRC in ASCII: The checksum is formed by 'exclusive or' of all data and afterwards converted into ASCII.

Checksum area:

Defines the telegram part by which the checksum is formed. You can select the following settings: **only user data**, **with start identifier, with end identifier** or **complete telegram**.

Character filter:

Some protocol use defined characters to mark the telegram end. If these characters are allowed inside the user data a distinction to the end character can be made by doubling the character. If the character appears inside the user data it is sent two times.

By receiving the character two times directly one after the other it is reject one time. If it was received just one time it is the telegram end.

This function can be activated in the parameter 'character filter'. Additional the character which has to be filtered must be set.

You have to take care that the ASCII protocol leads the filter function only inside the user data. The telegram start or the telegram end and the acknowledge telegram have to be provided with a doubled character and respectively as end mode with simple characters. The doubled characters are included for the ascertaining of the checksum. The checksum is unlessed from the filter function.

Character (Hex):

Gives the character for the active filter. The input is always hexadecimal.

Telegram timeout:

The telegram timeout is activated by switching on the receive mode and controls the receive of the hole telegram. It has priority over the 'Start timeout' and the 'character delay time'.

Start timeout:

The start timeout is activated with the switching on of the receive mode and controls the time until the receive of the first character. Requirement for this is that the 'telegram control time' is configured with 0.

Character delay time:

Controls the time between the receive of the single characters. Requirement is that the 'telegram control time' is configured with 0.

Retries:

Number of telegram retries in the case of errors.

Error SCC:

If **set/reset** is selected in this field, an occurred error during a data transfer is deleted after a faultless transmission. If **set** is selected, the error is shown also after a faultless transmission and it is only deleted if the device is resetted.

Length of telegram start:

Length of the telegram start. In case of length = 0 no start designation is sent. In case of negative length the belonging text is interpreted as text as hex character of 0...F. Otherwise it is used as ASCII text.

Telegram start and Telegram end:

Some transmission protocols expect defined characters at the beginning and at the end of the telegram. This characters are no user data but serve for the identification of the telegram start respectively the telegram end. This data can be independently add or delete by the ASCII protocol. For this a telegram start and a telegram end can be configured. These can be max. 8 characters long.

Length of telegram end:

Length of the telegram end identification. In case of length = 0 no end identification is sent. In case of negative length the belonging text is interpreted as hex character of 0...F. Otherwise it is used as ASCII text.

Length of ACK-telegram:

Length of the acknowledge telegram. In case of length = 0 no acknowledge telegram is sent. In case of negative length the belonging text is interpreted as hex character of 0...F. Otherwise it is used as ASCII text.

ACK-telegram:

Acknowledge telegram exists of 0-8 characters.

Length of NACK-telegram:

Length of the not acknowledge telegram. In case of length = 0 no not acknowledge telegram is sent. In case of negative length the belonging text is interpreted as hex character of 0...F. Otherwise it is used as ASCII text.

NACK-telegram:

Not acknowledge telegram exists of 0-8 characters.

Telegram length device:

Defines the telegram length of the remote partner when it is valid as ended. Just in the end mode the 'fixed data number' of importance.

Telegram sequence time:

With the parameter 'telegram sequence time' it is possible to definite a minimum time between the sending. In case the parameter is higher than 0 the ASCII telegram waits the defined time until it sends the next telegram. It counts the time from telegram start to telegram start. If more telegrams are sent one after the other these are hand out buffered and in the time of the 'telegram sequence time'.

5.3.7 Modbus RTU Parameter

Note: If you use a NetNode 40 you have one register card (- 1) to set the serial interface. If you have load a NetNode 42 in the configuration three register cards (- 1, - 2, - 3) appear because the NetNode 42 has three serial interfaces.

If you have set an Modbus RTU configuration and you want to set the Modbus RTU Parameter select the menu **Settings > NetNode Parameter > Modbus RTU**.

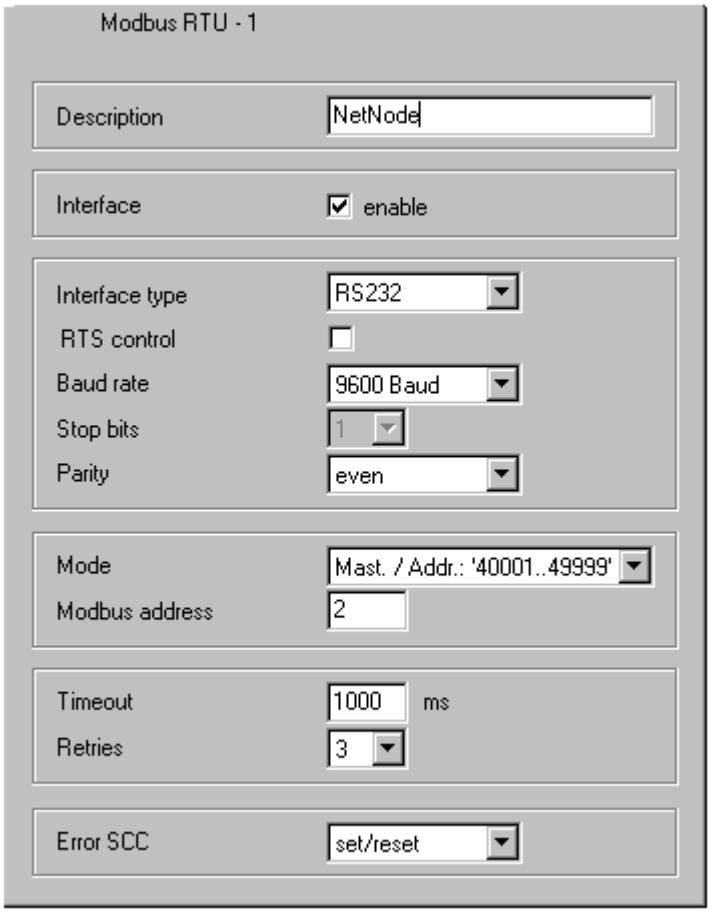

Figure 27: Settings > NetNode Parameter > Modbus RTU - 1

Description:

The description of the device is shown in SyCon as the name of the device. The description is changeable in this field.

Interface:

Interface of the device which is served by the protocol. This option can be activated or deactivated by the user.

Interface type:

Here you can select the interface type. You can select: **RS232**, **RS422** or **RS485**.

RTS control:

The RTS control must be activated (selected) if you use a RS485 interface. If you use a RS422 or RS232 interface this option is typically deactivated.

Baud rate:

Determination of the transmission rate. You have the possibility the select a Baud rate between 50 Baud and 19200 Baud. As default setting 9600 Baud is selected which is used mostly.

Stop bits:

Number of stop bits: **1** stop bit.

Parity:

Determination of the Parity bit. You can select **no**, **even** and **odd**.

Mode:

The mode defines the operation mode. It makes a differnece between Slave- and Master mode. It defines additionally the valid address sector of the data.

Slave / Address: 40001-49999

Master / Address: 40001-49999 (default setting)

Slave / Address: 1-65535

Master / Address: 1-65535

Slave / Address: 0-65535

Master / Address: 0-65535

Modbus address:

The Modbus address gives the state of the address at the Modbus. The range of value is 1..2..247. 2 is the default setting.

Timeout:

Master mode: Gives the maximum time in milliseconds how long the Master waits for an answer telegram of the Slave.

Slave mode: Gives the maximum time in milliseconds how long will be wait for an answer telegram of the application program.

Retries:

Defines the number of telegram retries in the case of errors. This is only of importance for the Master mode. The range of value is 1 to 10 and 3 is the default setting.

Error SCC:

If **set/reset** is selected in this field, an occurred error during a data transfer is deleted after a faultless transmission. If **set** is selected, the error is shown also after a faultless transmission and it is only deleted if the device is resetted.

5.4 Project Information

If the you create an own project, the project information can be typed in into the **Settings > Project Information** menu. Everybody can then read this entry when this menu is opened.

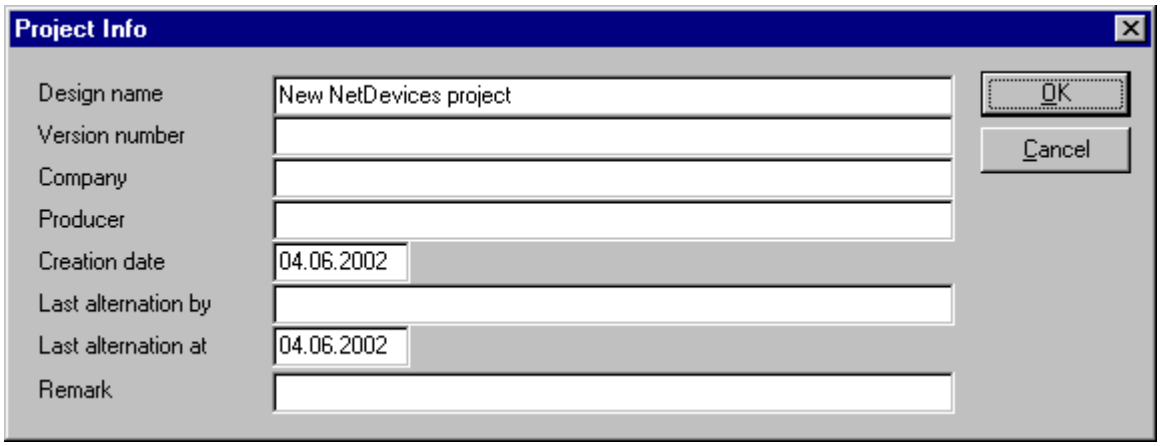

Figure 28: Settings > Project Information

5.5 Language

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

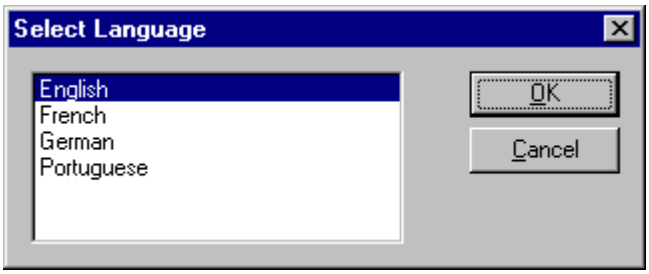

Figure 29: Settings > Language

Here can be set the language of the System Configurator. Select the required 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 selected one.

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

5.6 Start Options

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

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

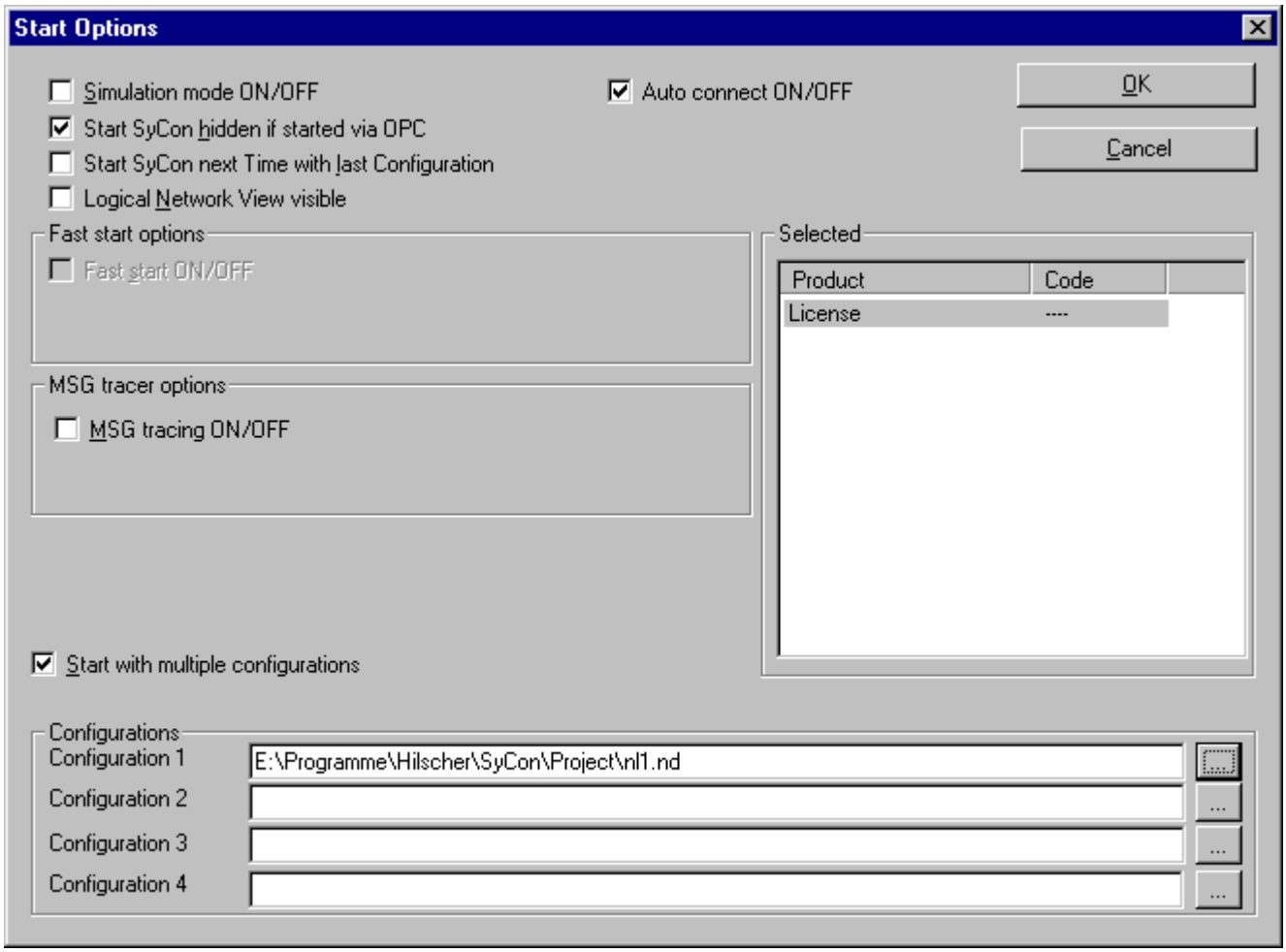

Figure 30: Settings > Start Options

- **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 changable there.

6 Online Functions

6.1 Introduction

In this section, all the functions that directly influence Hilscher NetDevices.

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 NetDevice

6.2.1 Firmware Download

If you want to carry out a Firmware download, act as follow: Select the menu **Online > Firmware Download**. A warning appears, that the communication on the bus will be interrupted. This warning has to be confirmed.

Figure 31: Securitiy question before Firmware Download

Caution: The Firmware Download overwrites the configuration in the device and the existing Gateway function (Image)!

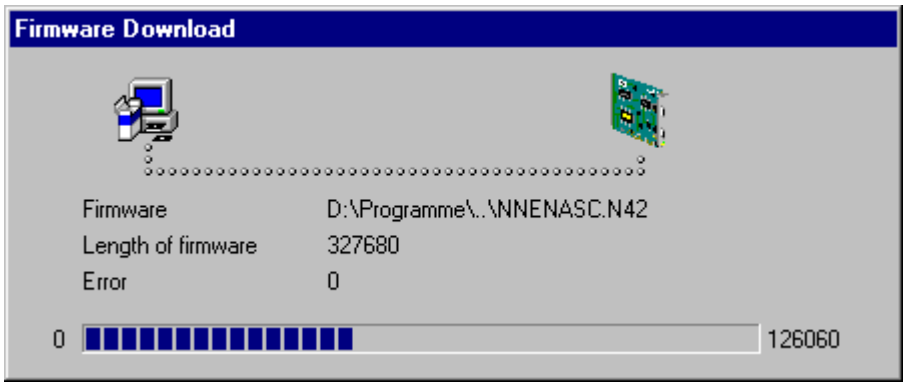

Figure 32: Online > Firmware Download

Note: The Firmware Download can only take place via the serial diagnostic interface. It is not possible to make a Firmware Download via the Ethernet interface.

The Firmware is transferred into the selected device and stored there in a power failure protected FLASH memory.

After the Firmware Download the configuration and after this the Standard Gateway function (Image file) is reloaded. Then the device is ready for operation.

6.2.2 Downloading the Configuration

In order to transfer the configuration, a transfer download to the device must be carried out with the menu **Online > Download**. A warning appears that the communication on the bus will be interrupted. This warning must be confirmed.

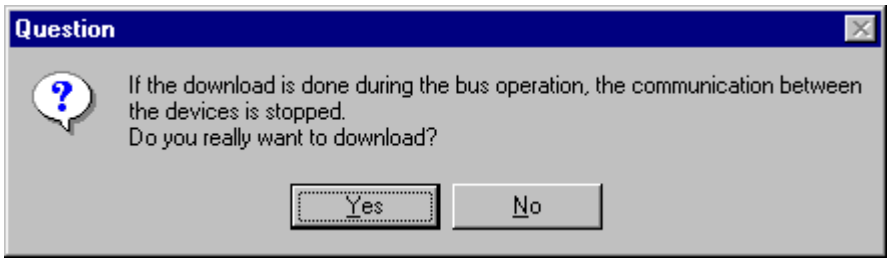

Figure 33: Security question before Download

Attention: The download overwrites the configuration in the device.

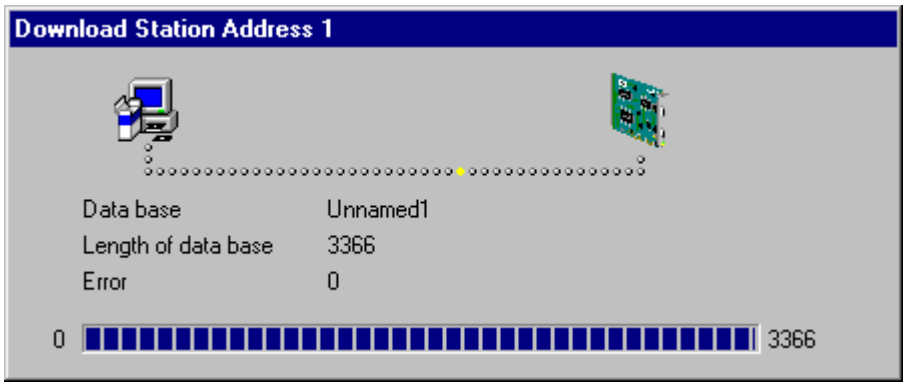

Figure 34: Online > Download

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 of the configuration the Standard Gateway function (Image file) can be reloaded.

After the Download the device makes an internal reset and starts with the communication.

Note: For NetNode devices it is necessary to select the menu point Automatic release of the communication by the device in the Device Settings.

6.2.3 Image Download

With the menu **Online > Image Download** you can download a binary data file (Image). From SyCon the standard Gateway function (Image) can be loaded.

A question appears, if the Download should be made.

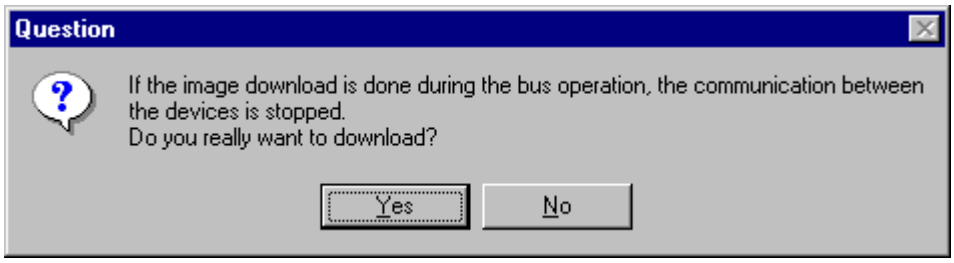

Figure 35: Security question before Image Download

Caution: The Image Download overwrites the existing Image in the device.

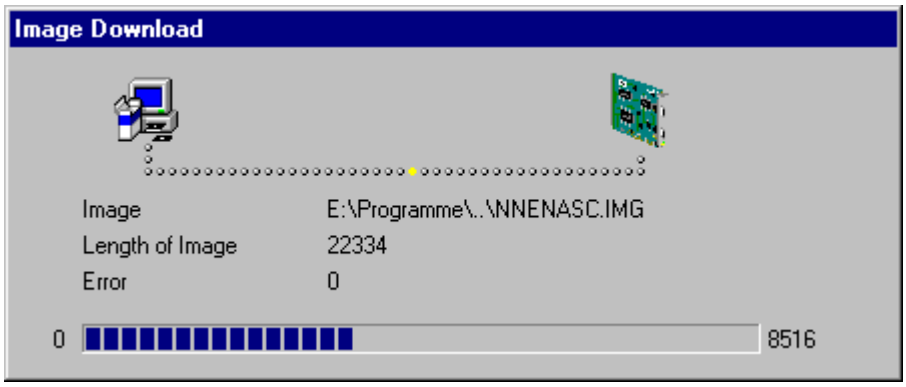

Figure 36: Online > Image Download

6.2.4 Firmware / Reset

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

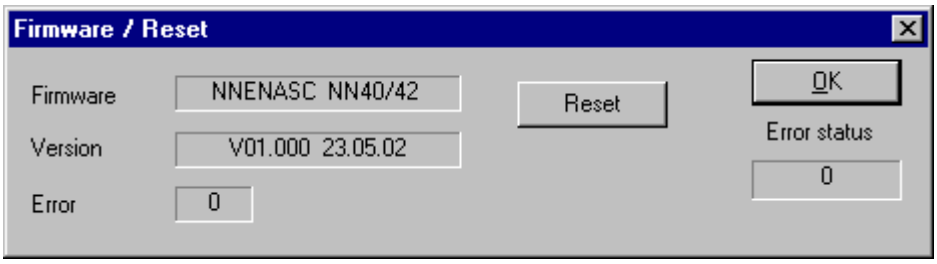

Figure 37: Online > Firmware / Reset

The device is resetted with the **Reset** button.

6.2.5 Device Info

Select the menu **Online > Device Info** in order to obtain information for the device.

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

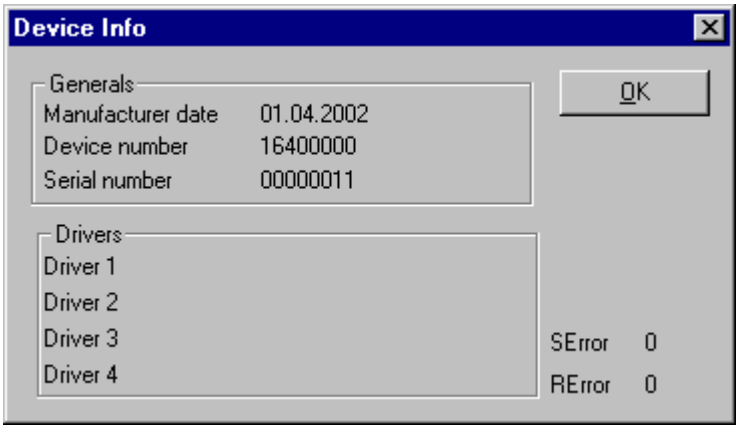

Figure 38: Online > Device Info

6.3 Diagnostic Functions

6.3.1 Extended Device Diagnostic NetLink

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, states and parameter information:

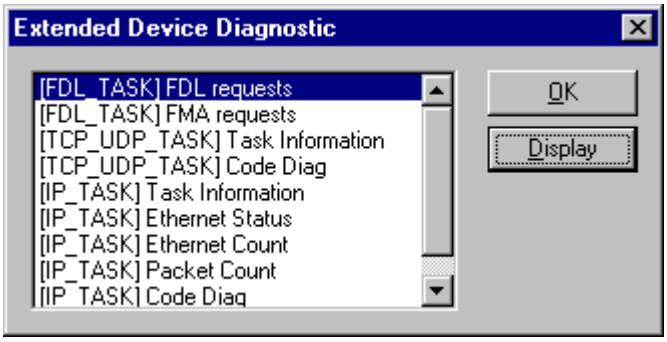

Figure 39: Online > Extended Device Diagnostic NetLink

Task / Task State	Page
FDL_TASK Requests	*91*
FDL_TASK FMA Request	*92*
TCP_UDP_TASK Information	*87*
TCP_UDP_TASK Code Diag	*87*
IP_TASK Task Information	*88*
IP_TASK Ethernet Status	*88*
IP_TASK Ethernet Count	*89*
IP_TASK Packet Count	*90*
IP_TASK Code Diag	*90*

Table 14: Online > Extended Device Diagnostic NetLink

6.3.2 Extended Device Diagnostic NetNode

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, states and parameter information:

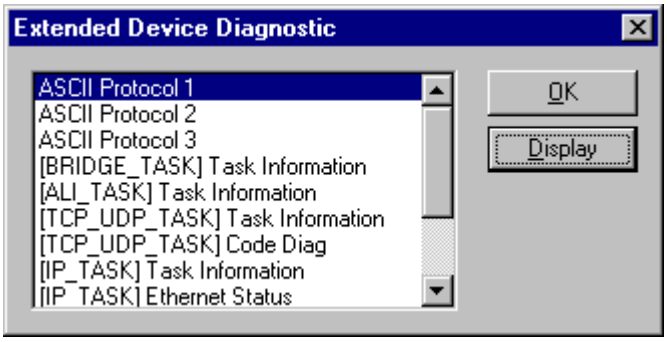

Figure 40: Online > Extended Device Diagnostic NetNode (by the example of ASCII protocol)

Depending on which protocol was selected for compilation by inserting the device, you get the diagnostic structures for the existing protocol in the Extended Device Diagnostic. Select from the following table the protocol you use. The Extended Device Diagnostic for the existing protocol is described in the given section.

Protocol 1	Protocol 2	Described in section	Page
Ethernet	3946R / RK512	*Extended Device Diagnostic with Ethernet / 3946R/RK512*	*62*
Ethernet	ASCII	*Extended Device Diagnostic with Ethernet / ASCII*	*63*
Ethernet	Modbus RTU	*Extended Device Diagnostic with Ethernet / Modbus RTU*	*64*
Ethernet + FTP	ASCII	*Extended Device Diagnostic with Ethernet + FTP / ASCII Conversion*	*65*

Table 15: Overview protocols in the Extended Device Diagnostic

6.3.2.1 Extended Device Diagnostic with Ethernet / 3946R/RK512 Conversion

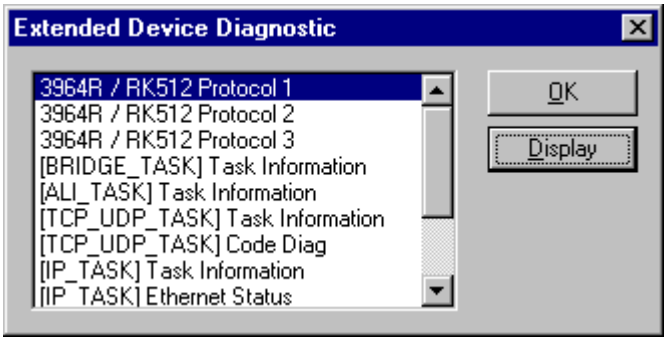

Figure 41: Online > Extended Device Diagnostic with Ethernet / 3946R/RK512 Conversion

Task / Task State	Page
3946R / RK512	*95*
BRIDGE_TASK Task Information	*94*
ALI_TASK Task Information	*93*
TCP_UDP_TASK Information	*87*
TCP_UDP_TASK Code Diag	*87*
IP_TASK Task Information	*88*
IP_TASK Ethernet Status	*88*
IP_TASK Ethernet Count	*89*
IP_TASK Packet Count	*90*
IP_TASK Code Diag	*90*

Table 16: Extended Device Diagnostic with Ethernet / 3946R/RK512 Conversion

6.3.2.2 Extended Device Diagnostic with Ethernet / ASCII Conversion

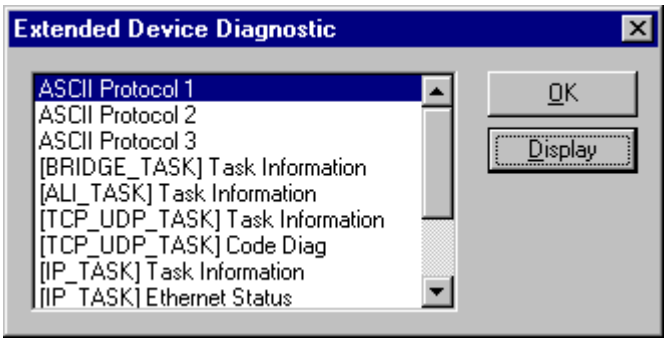

Figure 42: Online > Extended Device Diagnostic with Ethernet / ASCII Conversion

Task / Task State	Page
ASCII	*96*
BRIDGE_TASK Task Information	*94*
ALI_TASK Task Information	*93*
TCP_UDP_TASK Information	*87*
TCP_UDP_TASK Code Diag	*87*
IP_TASK Task Information	*88*
IP_TASK Ethernet Status	*88*
IP_TASK Ethernet Count	*89*
IP_TASK Packet Count	*90*
IP_TASK Code Diag	*90*

Table 17: Extended Device Diagnostic with Ethernet / ASCII Conversion

6.3.2.3 Extended Device Diagnostic with Ethernet / Modbus RTU Conversion

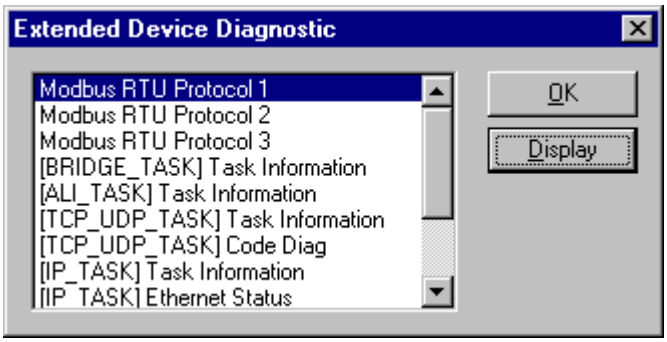

Figure 43: Online > Extended Device Diagnostic with Ethernet / Modbus RTU Conversion

Task / Task State	Page
Modbus RTU	*97*
BRIDGE_TASK Task Information	*94*
ALI_TASK Task Information	*93*
TCP_UDP_TASK Information	*87*
TCP_UDP_TASK Code Diag	*87*
IP_TASK Task Information	*88*
IP_TASK Ethernet Status	*88*
IP_TASK Ethernet Count	*89*
IP_TASK Packet Count	*90*
IP_TASK Code Diag	*90*

Table 18: Extended Device Diagnostic with Ethernet / Modbus RTU Conversion

6.3.2.4 Extended Device Diagnostic with Ethernet + FTP / ASCII Conversion

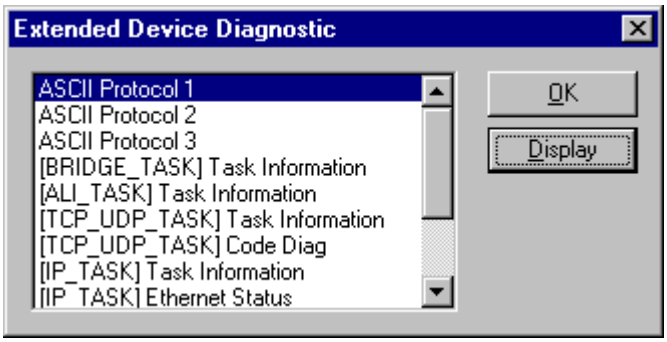

Figure 44: Online > Extended Device Diagnostic with Ethernet + FTP / ASCII Conversion

Task / Task State	Page
ASCII	*96*
BRIDGE_TASK Task Information	*94*
ALI_TASK Task Information	*93*
TCP_UDP_TASK Information	*87*
TCP_UDP_TASK Code Diag	*87*
IP_TASK Task Information	*88*
IP_TASK Ethernet Status	*88*
IP_TASK Ethernet Count	*89*
IP_TASK Packet Count	*90*
IP_TASK Code Diag	*90*

Table 19: Extended Device Diagnostic with Ethernet + FTP / ASCII Conversion

6.4 Message Monitor

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

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

Select the menu **Online > Message Monitor**.

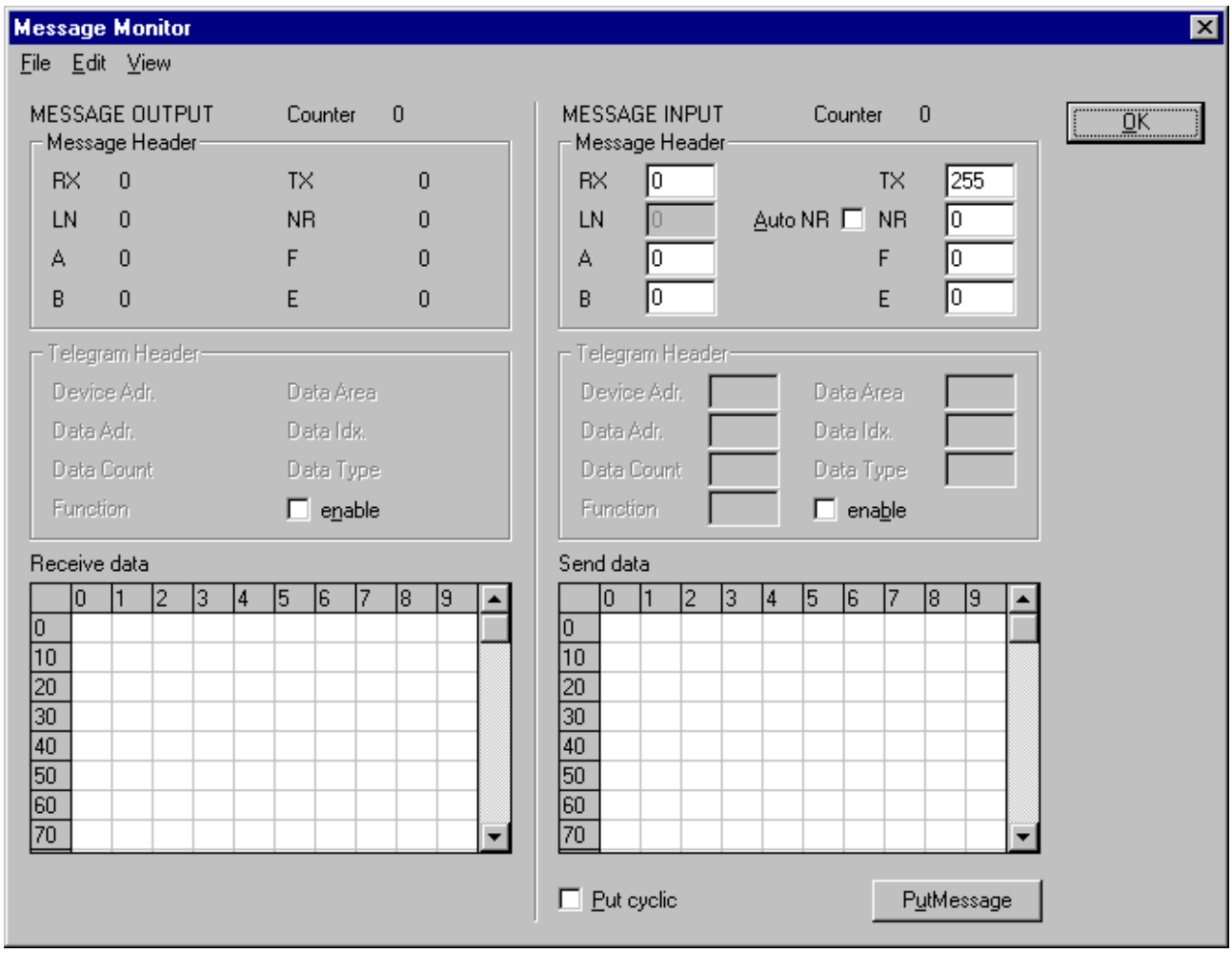

Figure 45: Online > Message Monitor

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 in it.

Figure 46: 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 (*.IB 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 Delete

To delete a device you have to have to select the menu **Edit > Delete**. Before SyCon deletes the device a security question appears. If you really want to delete this device you have to confirm this question with **Yes**, and the device will be deleted.

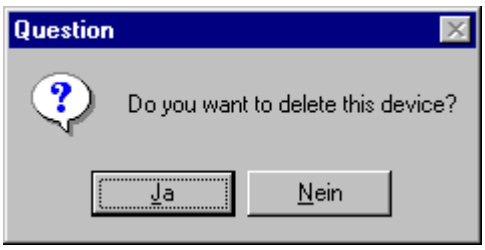

Figure 47: Security question delete device

Note: When you delete a device the settings and the configuration of this device get lost.

7.5 View

7.5.1 Logical Network View

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

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

7.5.2 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.

7.5.3 Status Bar

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

8 Tools

8.1 iCon-L as Graphical Programming System

Note: The menu tools is only displayed if a NetNode configuration is loaded. In case of a NetLin configuration this menu is not available.

iCon-L is started with the menu **Tools > iCon-L**.

iCon-L is a graphical programming system on basis of function modules. These are parameterized and connected graphically with each other via lines. With this the course and the processing of the data is fixed. The function modules are developed specially and realize to communication functions in a really efficient and understanding way.

The produced program is checked for syntax errors afterwards and downloaded into the NetNode. Start-up and test are done by the Online-Debugger of iCon-L directly in the graphical desktop.

A description about iCon-L you find in the program as help file.

9 Error Numbers

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

These 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 NULL
-46	User: Buffer too short
-47	User: Setup error

Table 20: 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 21: CIF Serial Driver Error Numbers (-20..-47)

9.2 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 initialised
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 licence. The OEM licence of the System Configurator allows only communication to devices that have the same licence 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 22: 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	Licence code invalid
92	Licence code does already exist
93	All memory locations for licence codes already in use

Table 23: RCS error numbers (answer message) (40..93)

9.3 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 24: Database Access Error Numbers (100..130)

9.4 Online Data Manager Error Numbers

9.4.1 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 DeviceObject 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 25: Online Data Manager Error numbers (1000..1018)

9.4.2 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 26: Error Numbers of the Message Handler of the Online Data Manager (2010..2027)

9.4.3 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 27: Error Numbers of the Driver Functions of the Online Data Manager (2501..2512)

9.4.4 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 28: Subfunction Error Numbers of the Driver Functions of the Online Data Manager (8001..8035)

9.5 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 29: 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 initialisation
4040	Printer not ready
4041	The data base is used from an other function
4042	New length of data base is smaller than used
4043	Unknown access mode
4044	Old 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 30: 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	Initialising 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 31: 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 initialisation 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 32: Error numbers of converting functions (4082..4199)

9.6 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 convertible 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 33: Error Numbers of data base functions (5000 .. 5012)

10 Appendix

10.1 Extended Device Diagnostic

10.1.1 Extended Device Diagnostic TCP UDP TASK

10.1.1.1 TCP_UDP_TASK Information

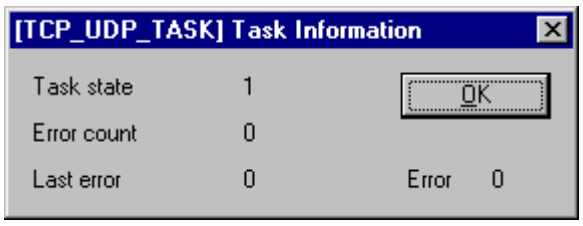

Figure 48: TCP_UDP_TASK Task Information

Variable	Meaning
Task state	State of the task
Error count	Number of appeared errors
Last error	Last appeared error

Table 34: TCP_UDP_TASK Task Information

10.1.1.2 TCP_UDP_TASK Code Diag

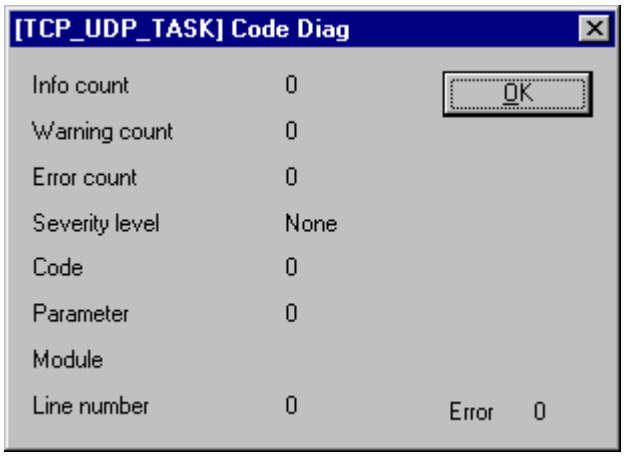

Figure 49: TCP_UDP_TASK Code Diag

Variable	Meaning
Info count	Counter for information reports
Warning count	Counter for warning reports
Error count	Counter for errors
Severity level	Level of the last appeared error
Code	Code of the last appeared error
Parameter	Additional information to the error
Module	Software-module
Line number	Line number inside the software-module

Table 35: TCP_UDP_TASK Code Diag

10.1.2 Extended Device Diagnostic IP TASK

10.1.2.1 IP_TASK Task Information

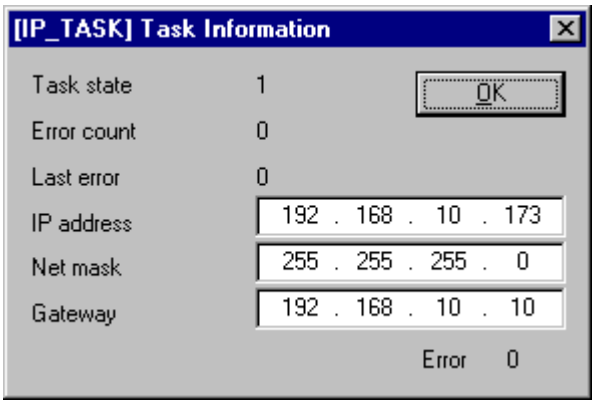

Figure 50: IP_TASK Task Information

Variable	Meaning
Task state	State of the Task: 1 = Task is running 2 = initialization is running 3 = initialization has failed
Error count	Counter for appeared errors
Last error	Last appeared error
IP address	IP-Address of the device
Net mask	Net mask of the device
Gateway	Gateway of the device

Table 36: IP_TASK Task Information

10.1.2.2 IP_TASK Ethernet Status

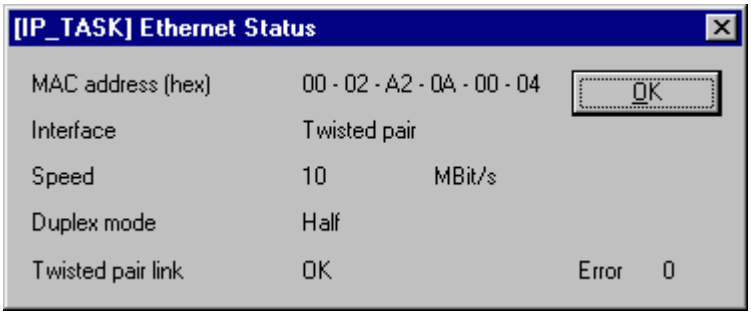

Figure 51: IP_TASK Ethernet Status

Variable	Meaning
MAC address (hex)	MAC address of the device
Interface	Actual known Ethernet interface
Speed	Transmission rate
Duplex mode	Shows the actual Duplex mode: Half-/Fullduplex
Twisted Pair link	State of the Twisted Pair connection

Table 37: IP_TASK Ethernet Status

10.1.2.3 IP_TASK Ethernet Count

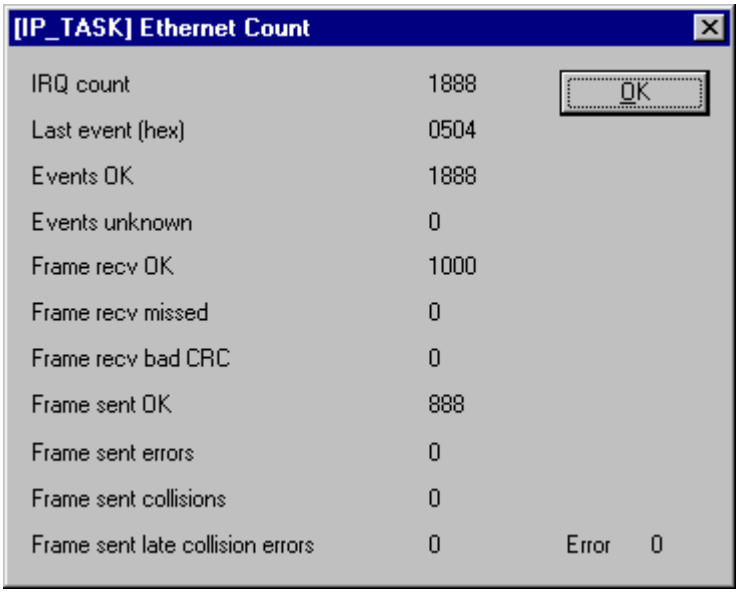

Figure 52: IP_TASK Ethernet Count

Variable	Meaning
IRQ count	Counter for interrupts of the Ethernet controller
Last event (hex)	Last appeared interrupt type
Events OK	Counter for known interrupt types
Events unknown	Counter for unknown interrupt types
Frame recv OK	Counter for received Ethernet frames
Frame recv missed	Counter for missed Ethernet frames
Frame recv bad CRC	Counter for Ethernet frames with CRC errors
Frame sent OK	Counter for sent Ethernet frames
Frame sent errors	Counter for send errors
Frame sent collisions	Counter for sending collisions
Frame sent late collision errors	Counter for late sending collisions

Table 38: IP_TASK Ethernet Count

10.1.2.4 IP_TASK Packet Count

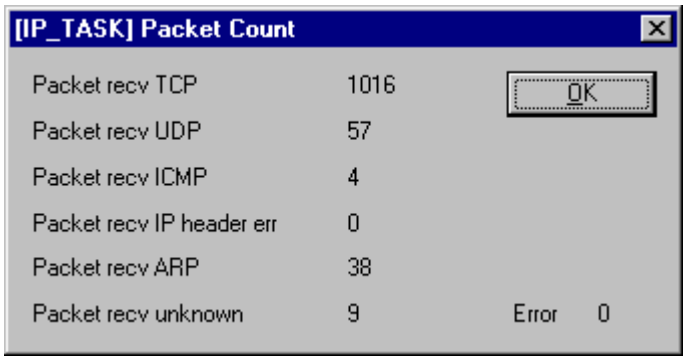

Figure 53: IP_TASK Packet Count

Variable	Meaning
Packet recv TCP	Counter for received TCP packets
Packet recv UDP	Counter for received UDP packets
Packet recv ICMP	Counter for received ICMP packets
Packet recv IP header err	Counter for received IP packets with errors
Packet recv ARP	Counter for received ARP packets
Packet recv unknown	Counter for received packets of an unknown type

Table 39: IP_TASK Packet Count

10.1.2.5 IP_TASK Code Diag

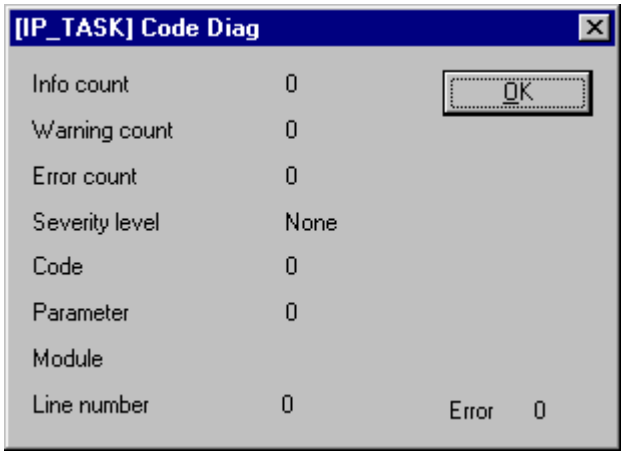

Figure 54: IP_TASK Code Diag

Variable	Meaning
Info count	Counter for information reports
Warning count	Counter for warning reports
Error count	Counter for errors
Severity level	Level of the last appeared error
Code	Code of the last appeared error
Parameter	Additional information to the error
Module	Software-module
Line number	Line number inside the software-module

Table 40: IP_TASK Code Diag

10.1.3 Extended Device Diagnostic PROFIBUS

10.1.3.1 FDL_TASK Requests

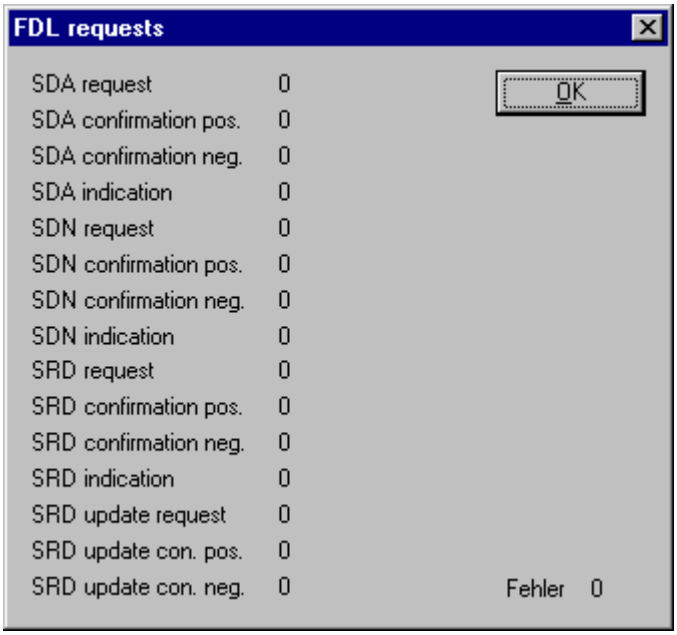

Figure 55: FDL_TASK Requests

Variable	Bedeutung
SDA request	Number of 'SDA' Request
SDA confirmation pos.	Number of 'SDA' Confirmation, positive
SDA confirmation neg.	Number of 'SDA' Confirmation, negative
SDA indication	Number of 'SDA' Indication
SDN request	Number of 'SDN' Request
SDN confirmation pos.	Number of 'SDN' Confirmation, positive
SDN confirmation neg.	Number of 'SDN' Confirmation, negative
SDN indication	Number of 'SDN' Indication
SRD request	Number of 'SRD' Request
SRD confirmation pos.	Number of 'SRD' Confirmation, positive
SRD confirmation neg.	Number of 'SRD' Confirmation, negative
SRD indication	Number of 'SRD' Indication
SRD update request	Number of 'SRD' Update Request
SRD update con. pos.	Number of 'SRD' Update Confirmation, positive
SRD update con. neg.	Number of 'SRD' Update Confirmation, negative

Table 41: FDL_TASK Requests

10.1.3.2 FDL_TASK FMA Request

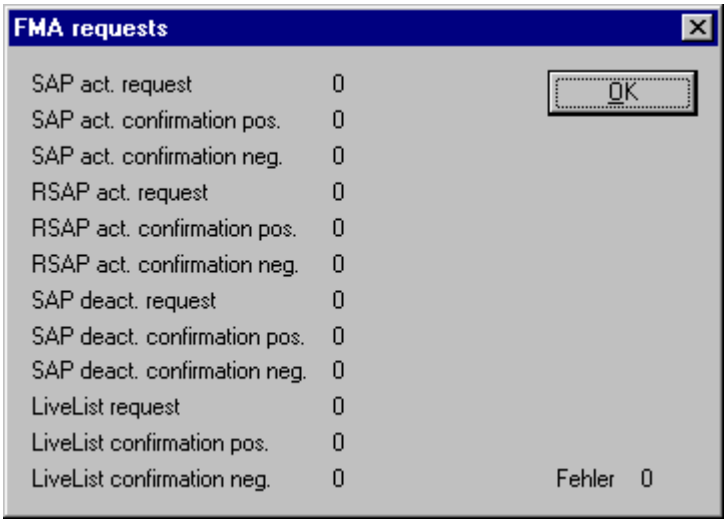

Figure 56: FDL_TASK FMA Request

Variable	Bedeutung
SAP act. Request	Number of 'SAP Activate' Request
SAP act. Confirmation pos	Number of 'SAP Activate' Confirmation, positive
SAP act. Confirmation neg	Number of 'SAP Activate' Confirmation, negative
RSAP act. Request	Number of 'RSAP Activate' Request
RSAP act. Confirmation pos	Number of 'RSAP Activate' Confirmation, positive
RSAP act. Confirmation neg	Number of 'RSAP Activate' Confirmation, negative
SAP deact. Request	Number of 'SAP Deactivate' Request
SAP deact. Confirmation pos	Number of 'SAP Deactivate' Confirmation, positive
SAP deact. Confirmation neg	Number of 'SAP Deactivate' Confirmation, negative
LiveList request	Number of 'LiveList' Request
LiveList confirmation pos	Number of 'LiveList' Confirmation, positive
LiveList confirmation neg	Number of 'LiveList' Confirmation, negative

Table 42: FDL_TASK FMA Request

10.1.4 Extended Device Diagnostic ALI TASK

10.1.4.1 ALI_TASK Task Information

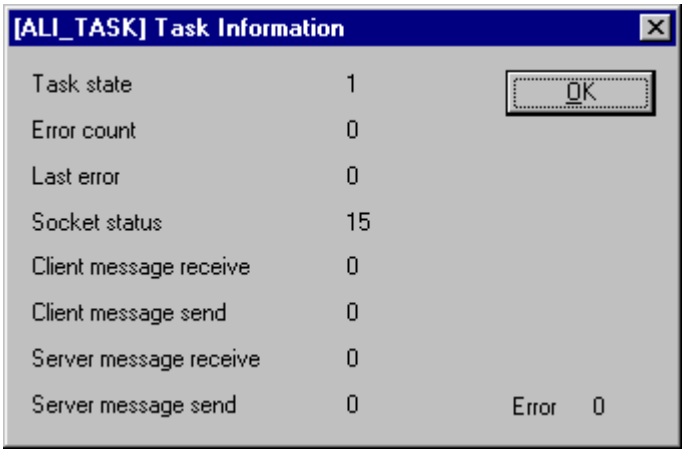

Figure 57: ALI_TASK Task Information

Variable	Meaning
Task state	State of the ALI Task: 0 = Task is not initialized 1 = Task is initialized and running 2 = Task is initializing 3 = Initialization error 4 = Task is initialized and waits for TCP-UDP Task
Error count	Number of occurred errors
Last error	Number of the last occurred error
Socket status	Information about the actual used TCP socket: 1 = Socket 0 (Connection 0 Close/Open, Bit 0) 2 = Socket 1 (Connection 1 Close/Open, Bit 1) 4 = Socket 2 (Connection 2 Close/Open, Bit 4) 8 = Socket 3 (Connection 3 Close/Open, Bit 8)
Message sent to TCP task	Number of messages which were sent to the TCP-UDP Task
Messages recv. from TCP task	Number of messages which were received by the TCP-UDP Task
Messages sent to user	Number of messages which were sent by the user
Messages received from user	Number of messages which were received by the user

Table 43: ALI_TASK Task Information

10.1.5 Extended Device Diagnostic Bridge TASK

10.1.5.1 BRIDGE_TASK Task Information

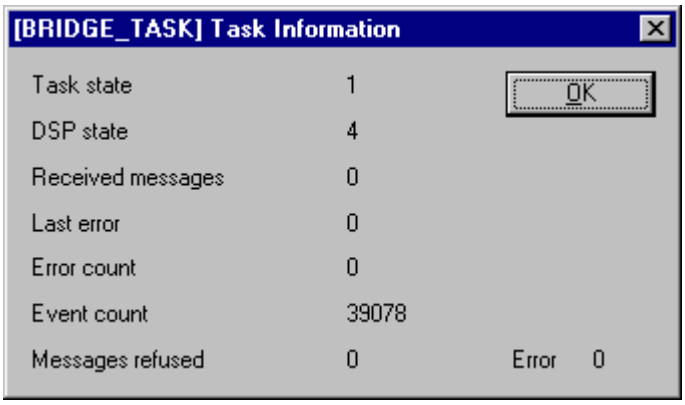

Figure 58: BRIDGE_TASK Task Information

Variable	Meaning
Task state	State of the task 0 = not initialized 1 = Basic state/ Bridgeprogram is running 2 = Bridgeprogram is not running
DSP state	State of the Icon-L Bridgetask: 1 = ICON_MODE_ONLINE 2 = ICON_MODE_OFFLINE 3 = ICON_MODE_STEP 4 = ICON_MODE_STOP 5 = ICON_MODE_RESET 6 = ICON_MODE_LOAD
Received messages	Number of messages which were sent to the Bridge
Last error	last occured error
Error count	Number of occured errors
Event count	shows if the Bridge is running cyclic
Messages refused	number of messages which were refused by the Bridge. Messages are refused, if the internal order book of the Bridge is full.

Table 44: BRIDGE_TASK Task Information

10.1.6 Extended Device Diagnostic 3946R / RK512

10.1.6.1 3946R / RK512

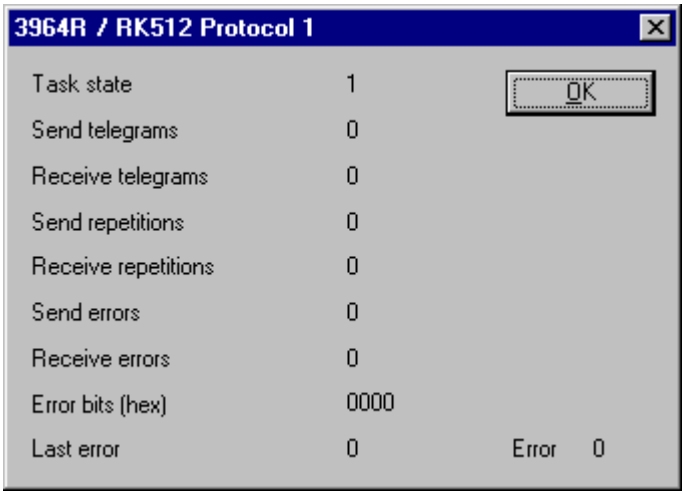

Figure 59: Extended Device Diagnostic 3946R / RK512 Protocol 1

Variable	Meaning
Task state	Actual state of the protocol process 0 = not initialized 1 = basic state 2 = telegram sequence time expires 3 = sending mode 4 = receiving mode
Send telegrams	Number of faultless transmitted telegrams
Receive telegrams	Number of faultless received telegrams
Send repetitions	Gives, how often a send telegram was repeated before it was transmit faultless or the max. number of repetition was reached
Receive repetitions	Gives, how often a receive telegram was refused before it was transmit faultless or the max. numer of repetiotions was reached
Send errors	Number of send tasks which got lost because of Syntax or transmission errors
Receive errors	Number of errors which have occurred by receiving data
Error bits (hex)	Assigns every reported error to an error class and shows this by setting a bit. It is only displayed, if the error has executed in spite of repeat a telegram loss
Last error	Number of the last reported error. It is only displayed, if the error has occurred in spite of repeat a telegram loss

Table 45: Extended Device Diagnostic 3946R Protocol 1

Note: For NetNode 40 devices only the protocol 1 is avaiable. For NetNode 42 device there also exist the protocols 2 and 3.

10.1.7 Extended Device Diagnostic ASCII

10.1.7.1 ASCII

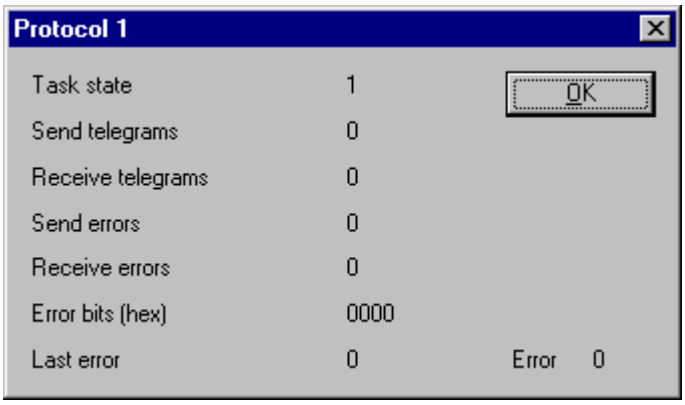

Figure 60: Extended Device Diagnostic ASCII Protocol 1

Variable	Meaning
Task state	Actual state of the protocol process 0 = not initialized 1 = basic state 2 = telegram sequence time expires 3 = send mode 4 = receive mode
Send telegrams	Number of faultless transmitted telegrams
Receive telegrams	Number of faultless received telegrams
Send errors	Number of send tasks which got lost because of Syntax or transmission errors
Receive errors	Number of errors which have occurred by receiving data
Error bits (hex)	Assigns every reported error to an error class and shows this by setting a bit. It is only displayed, if the error has executed in spite of repeat a telegram loss
Last error	Number of the last reported error. It is only displayed, if the error has occurred in spite of repeat a telegram loss The description of the error numbers see on the CD in the manual asc_pre.pdf

Table 46: Extended Device Diagnostic ASCII Protocol 1

Note: For NetNode 40 devices only the protocol 1 is avaiable. For NetNode 42 device there also exist the protocols 2 and 3.

10.1.8 Extended Device Diagnostic Modbus RTU

10.1.8.1 Modbus RTU

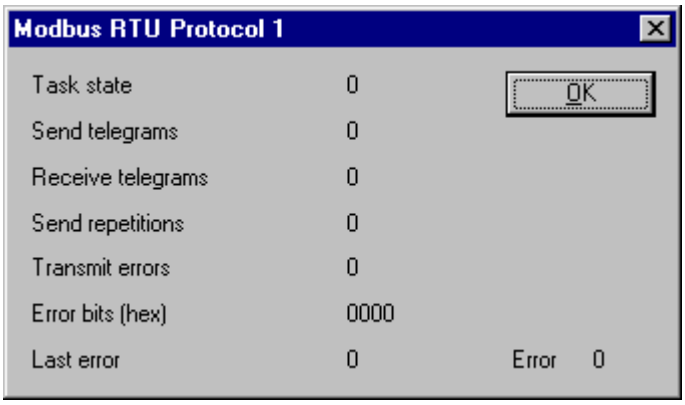

Figure 61: Extended Device Diagnostic Modbus RTU Protocol 1

Variable	Meaning
Task state	Actual state of the protocol process 0 = not initialized 1 = basic state 2 = telegram sequence time expires 3 = sending mode 4 = receiving mode
Send telegrams	Number of faultless transmitted telegrams
Receive telegrams	Number of faultless received telegrams
Send repetitions	Gives, how often a send telegram was repeated before it was transmit faultless or the max. number of repetition was reached
Transmit errors	Gives the number of tranmit errors
Error bits (hex)	Assigns every reported error to an error class and shows this by setting a bit. It is only displayed, if the error has executed in spite of repeat a telegram loss
Last error	Number of the last reported error. It is only displayed, if the error has occurred in spite of repeat a telegram loss The description of the error numbers see on the CD in the manual asc_pre.pdf

Table 47: Extended Device Diagnostic Modbus RTU Protocol 1

Note: For NetNode 40 devices only the protocol 1 is avaiable. For NetNode 42 device there also exist the protocols 2 and 3.

10.2 Full Duplex and Half Dupelx

Full Duplex:
Full Dupelx is the designation for a process of data transmission which allows a simultaneously transmission of the data in both directions. That means both devices can send and receive simultaneously.

Half Duplex:

In contrast to Full Duplex where two wires can be used to transmitt data (one for send and one for receive) the Half Duplex works mutually with one channel. That means one the device can send and the other device can receive.

10.3 Twisted Pair and AUI

Twisted Pair:
Twisted Pair cable are used for point to point connections and they need four cores therefore two pairs of cores for separate towards and back transmission. Partly this cable has to be crossed, for example by using two repeaters. In view of faster network constellations everywhere four double wires (eight wires) with Cat 5 cable should be used.
Twisted Pair is exclusively connected with RJ45 connectors.

AUI:
The interface between an Ethernet-Transceiver and an Ethernet-Interface which is connected by a direct connection beteween the Transceiver and the Interface or via an AUI cable.

10.4 MAC Address

(Media Access Control-Address) This is the hardware address of a component in the network which can generate the data packet on its own. The MAC Adress is given by the manufacturer who has a reservated memory location. The manufacturer guarantee that the address is unique.

11 Lists

11.1 List of Figures

11.2 List of Tables