compatible with you

NETLink® PRO

Application Examples with RFC 1006

Edition 1 / 07.05.2008

Systeme Helmholz Products

S7/S5 OPC Server (Systeme Helmholz)

Products of other Manufacturers

INAT-OPC-Server (INAT GmbH)

InTouch V9.5 (Wonderware GmbH)

KEPserverEx V4.0 (KEPware Inc.)

PROCON-Win V3.2 (GTI Control)

VisAM Win32 (VISAM GmbH)

WinCC flexible 2005/2007 (Siemens AG)

ZenOn V6.2 (COPA-DATA)

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Note:

We have checked the content of this manual for conformity with the hardware and software described. Nevertheless, because deviations cannot be ruled out, we cannot accept any liability for complete conformity. The information in this manual is regularly updated. When using purchased products, please heed the latest version of the manual, which can be viewed in the Internet at www.helmholz.de, from where it can also be downloaded.

Our customers are important to us. We are always glad to receive suggestions for improvement and ideas.

Revision history of this document:

Edition	Date	Revision
1	07.05.2008	First edition

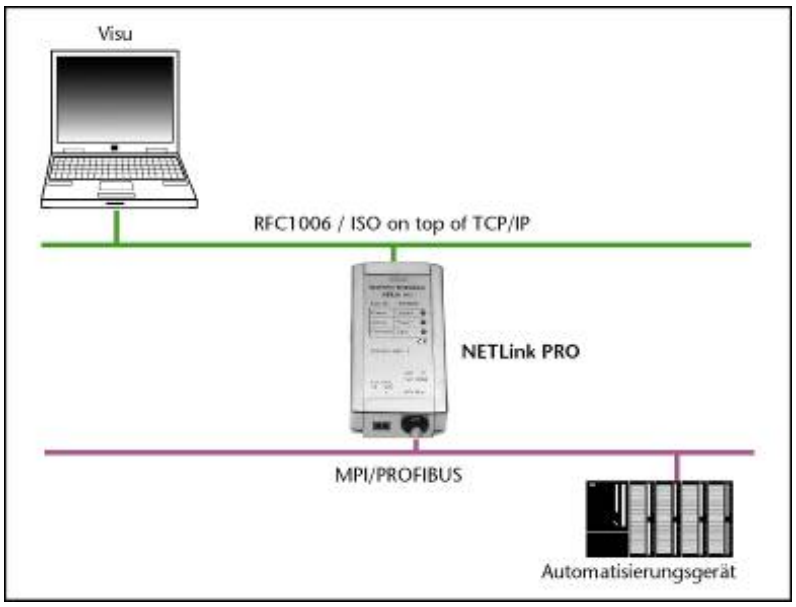
Contents

1 Overview

1.1 Application and function description

This document is intended as a supplement to the “NETLink® PRO” Manual.

Many visualization manufacturers support the TCP/IP protocol *‘RFC1006’* also known as *‘ISO on top of TCP’* to be able to communicate with S7-300/S7-400 systems, for example.



If this *‘RFC1006’* function is activated in NETLink® PRO, explicit adaptations must be made to the software products. This manual describes step by step the basic settings of a small selection of visualization solutions for transferring data via this communication path.

It is assumed that the reader is familiar with the development environment of the software solutions mentioned in this document, as only the points specific to the connection are described

More extensive support with commissioning and parameterization of the various SCADA/OPC server systems is available directly from the manufacturers in question.

It does not describe how Internet teleservice via VPN and port forwarding is implemented with the NETLink® PRO.

1.2 Information in the figures

Please pay attention to the information in the figures

Many of the figures in this document contain settings and directions for use marked or highlighted in red.

2 RFC 1006 Activation via the Web Interface

All the examples described here require the prior activation of the RFC 1006 functionality in NETLink® PRO.

A detailed description is also given in the NETLink® PRO Manual!

2.1 Requirements

The NETLink® PRO is connected to the PC via a network card. One of the SCADA/OPC server programs described below is also installed on this PC. The Webinterface function must not be deactivated. It is accessed via one of the installed Internet browsers (for example, Mozilla Firefox, Opera, Konqueror, or Internet Explorer).

You do not need to install any additional drivers for the NETLink® PRO.

The applications described here were performed on the Window XP Operating System with Service Package 2.

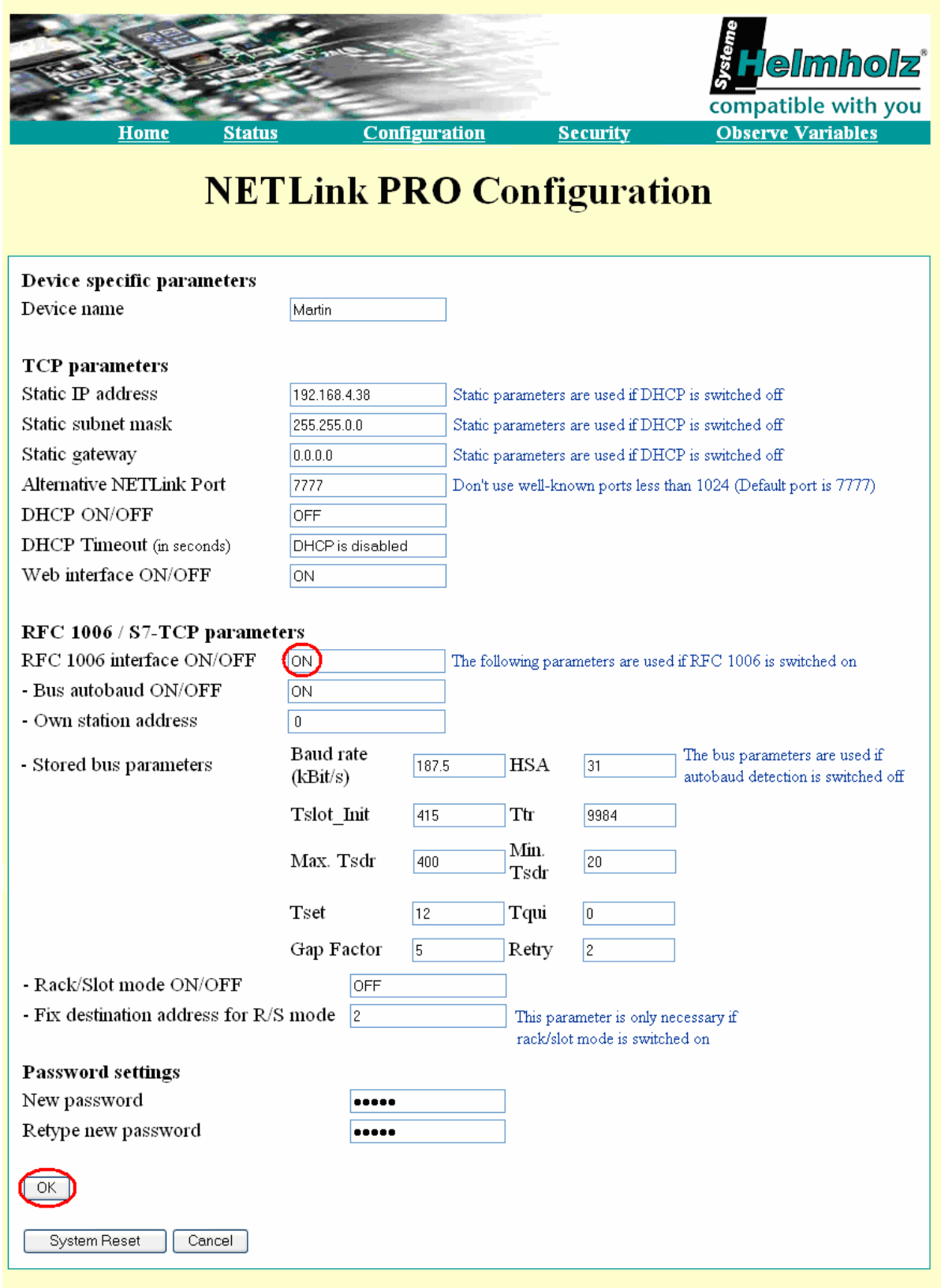
2.2 Adapting the configuration side

As soon as the Web interface is opened by entering the relevant URL *'http://<ip address>'*, the link to "*Configuration"* opens. As soon as you have answered the security query, you can write to all parameters.

The *'RFC 1006 interface ON/*OFF' option is activated by entering *"ON"* and confirming with the *"OK"* button (see Fig.)

In the next window, the settings are displayed again and must be confirmed with *"OK"* before they are finally transferred to the NETLink® PRO.

Configuration menu in NETLink® PRO:



Rebooting can take up to 15 seconds.

After the new parameterization data have been stored, the NETLink® PRO is restarted to activate the new configuration.

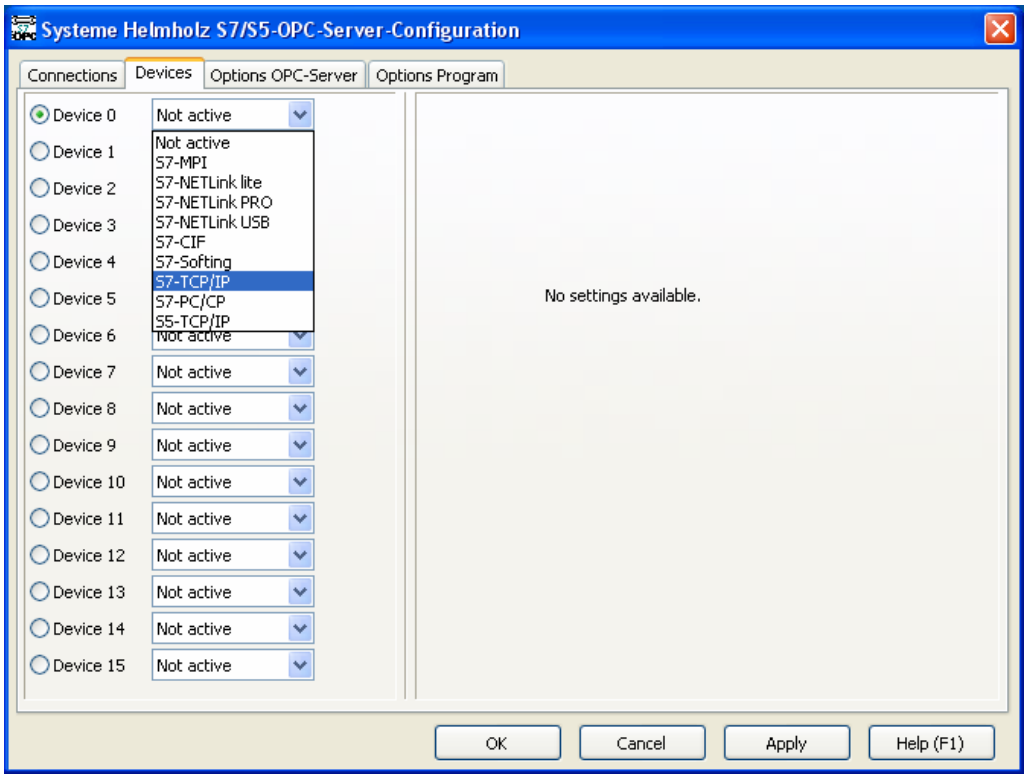
3 S7/S5 OPC Server (Systeme Helmholz)

The following steps must be performed in the described sequence (status April 2008):

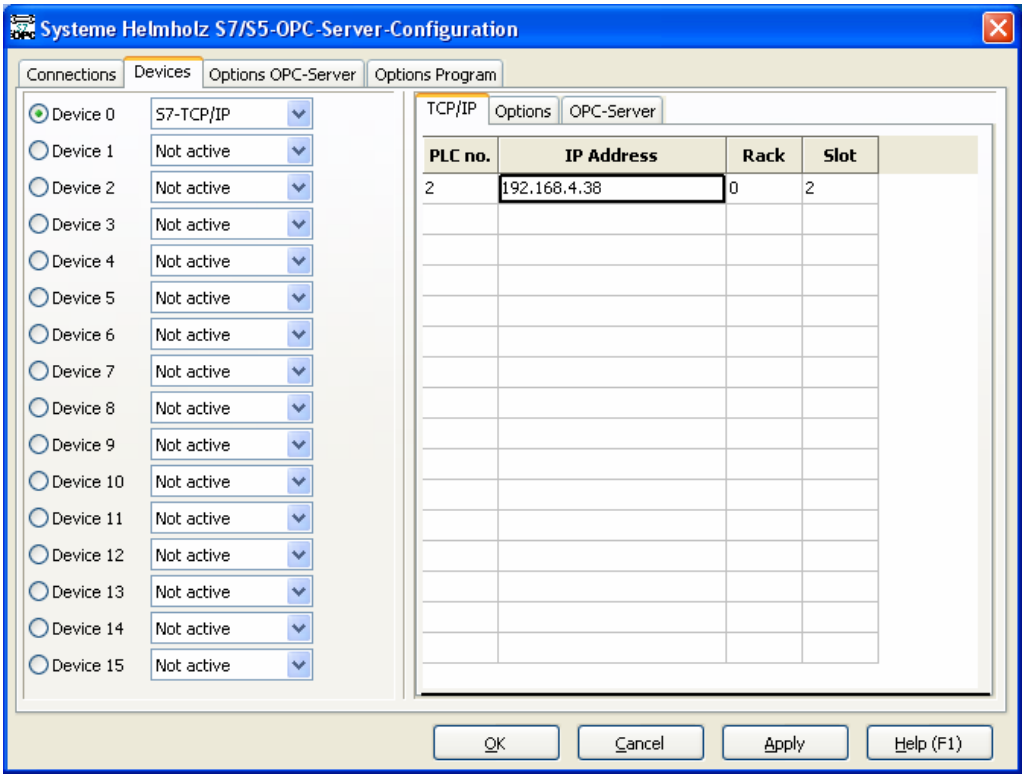
3.1 Configuration of the communication partner

Start the *"Configuration S7-OPC Server"* program module via *Start/Programs/Systeme Helmholz/S7-OPC-Server*:

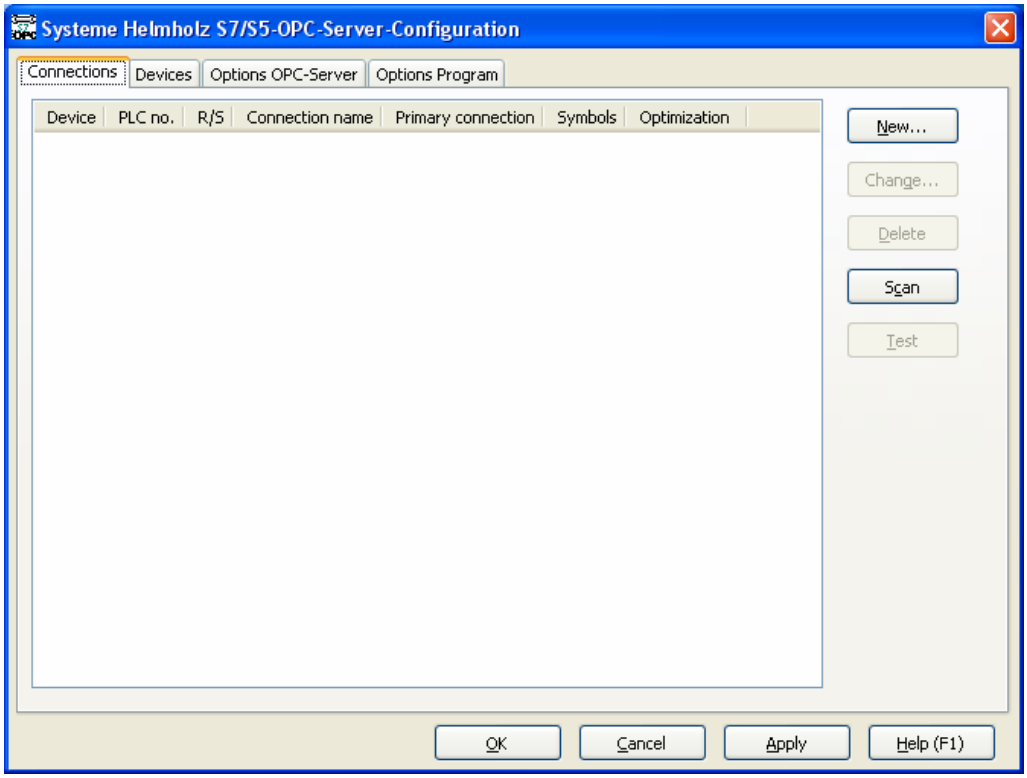
- Select tab card *"Devices"*.
- In this example, click device 0 and then select *"S7-TCP/IP"* from the pull-down menu.



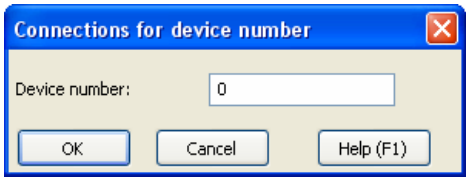
- The PLC No. in this example is not relevant.
- Enter NETLink® PRO in the IP address field.
- Enter the CPU address in the slot.
- Complete your settings with *"Apply"*.



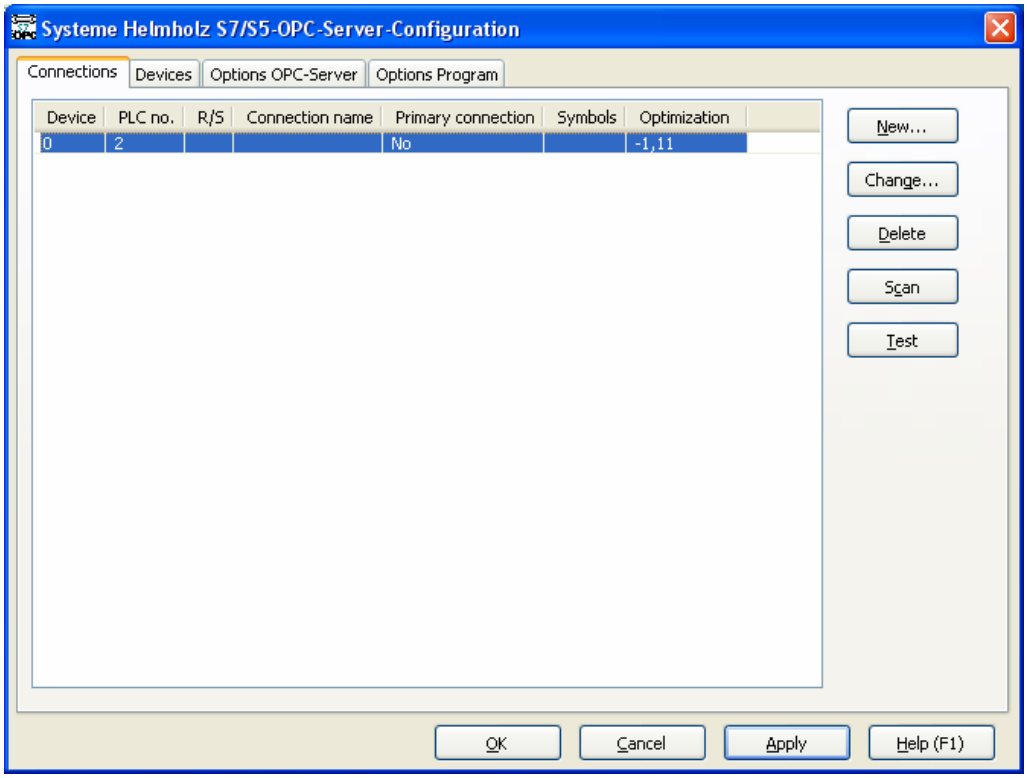
- Select the *"Connections"* tab card.
- Click the *"Find"* button.



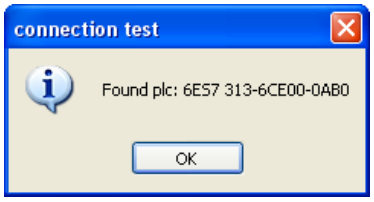
- Enter the configured device number. In this example, 0 (see Page 2)
- Confirm with *"OK"*.



- The connection to the adapter is established and displayed.
- The CPU can be determined with *"Test"*.



- The connection test was successful and can be confirmed with "OK".



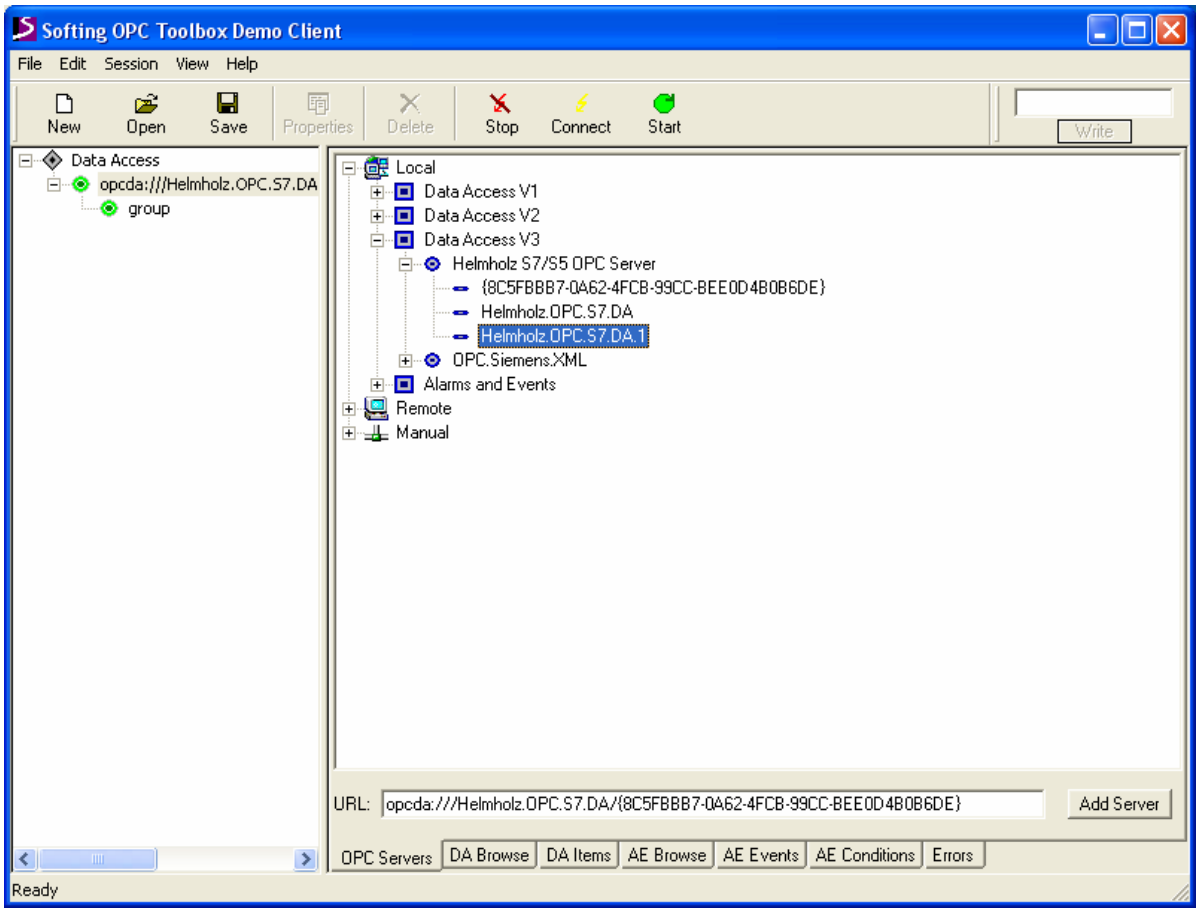
The OPC server is now configured for a NETLink® PRO connection.

3.2 Setting up the OPC Toolbox demo client

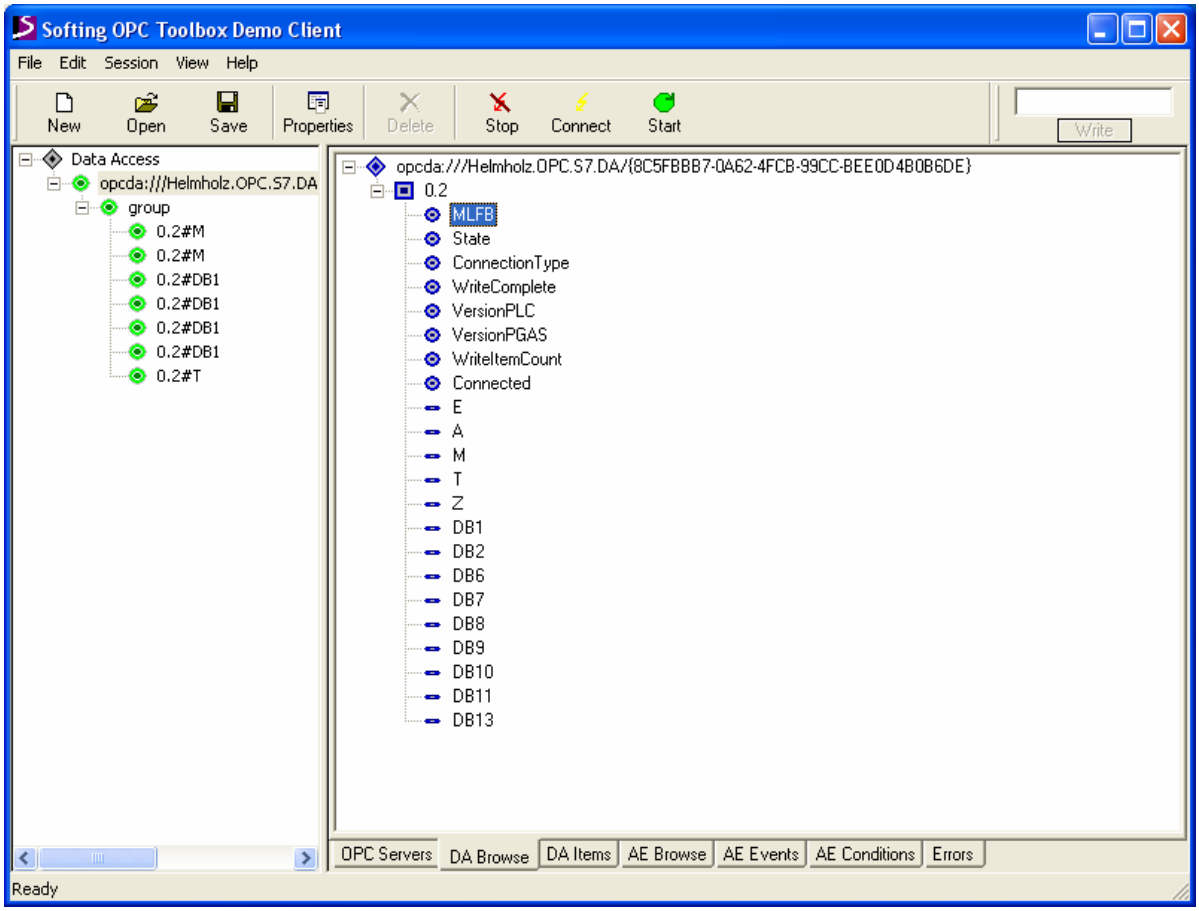
The following steps are provided as an example only and are not obligatory for customer applications. They serve as a visual check whether data exchange is taking place.

Start program module *"OPC Toolbox demo client"* with *Start/Programs/Systeme Helmholz/S7-OPC-Server*. The various tab cards are displayed below. The *"OPC Servers"* field opens first:

- Click the *"Local"* cross
- Click *"Data Access V3"*
- Click the *"Helmholz S7/S5 OPC Server"*
- Double-click *"Helmholz.OPc.S7.DA.1"*
- The *"group"* opens in the left field. The green circle indicates that the connection has been started.

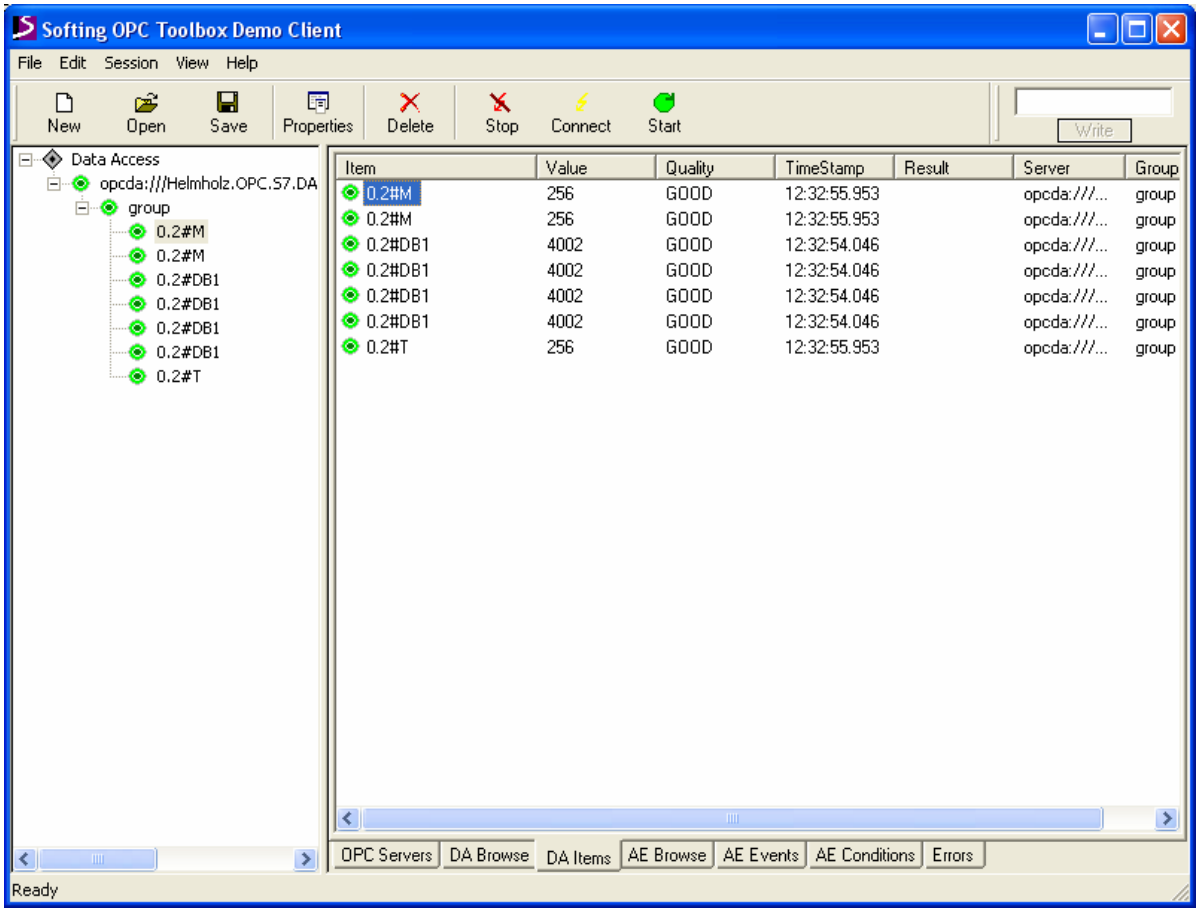


- Now switch to the *"DA Browse"* tab card.
- Click the "*opcda://Helmholz.OPC.S7.DA.1/{…"* cross.
- A device is displayed when it has been found (in this case *"0.2"*).
- When you click the cross, the data access objects are searched from the CPU and then listed.

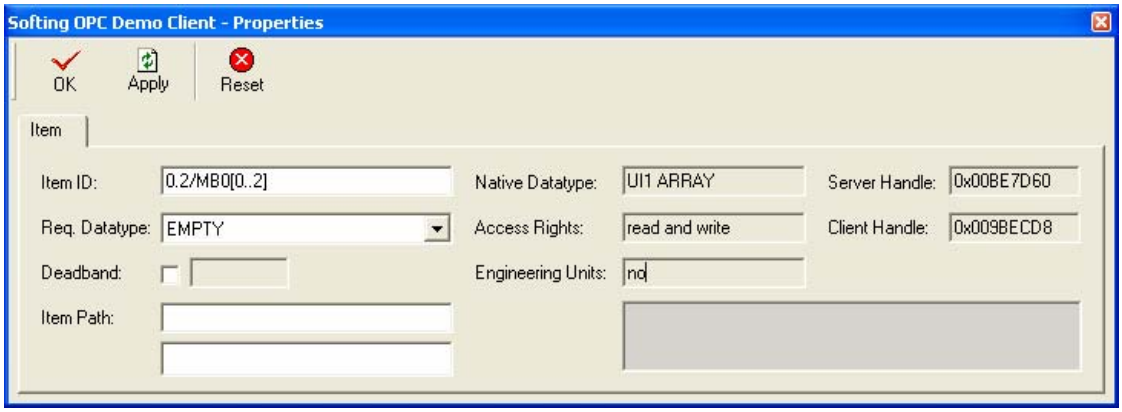


- Transfer the selected items into the left column by double clicking (multiple selections possible).

- Now switch to the *"DA Items"* tab card.
- The connection quality status is displayed in the *"Quality"* column.
- Currently, only the permissible name range elements are displayed under *"Value"*.

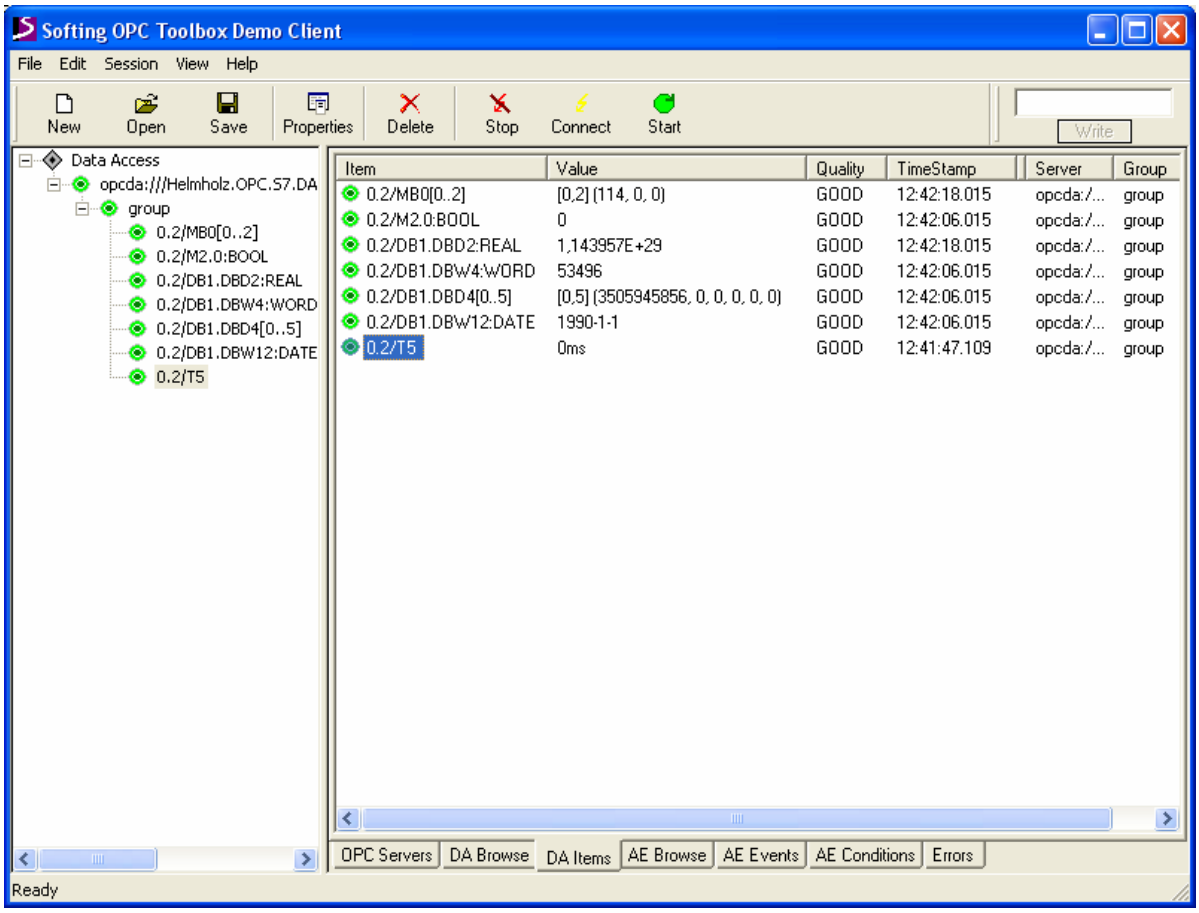


- Every item can be edited by selecting it and then clicking the *"Properties"* button.



- The changes are adopted with *"Apply"* and *"OK"*.

Further examples of the syntax of various items:

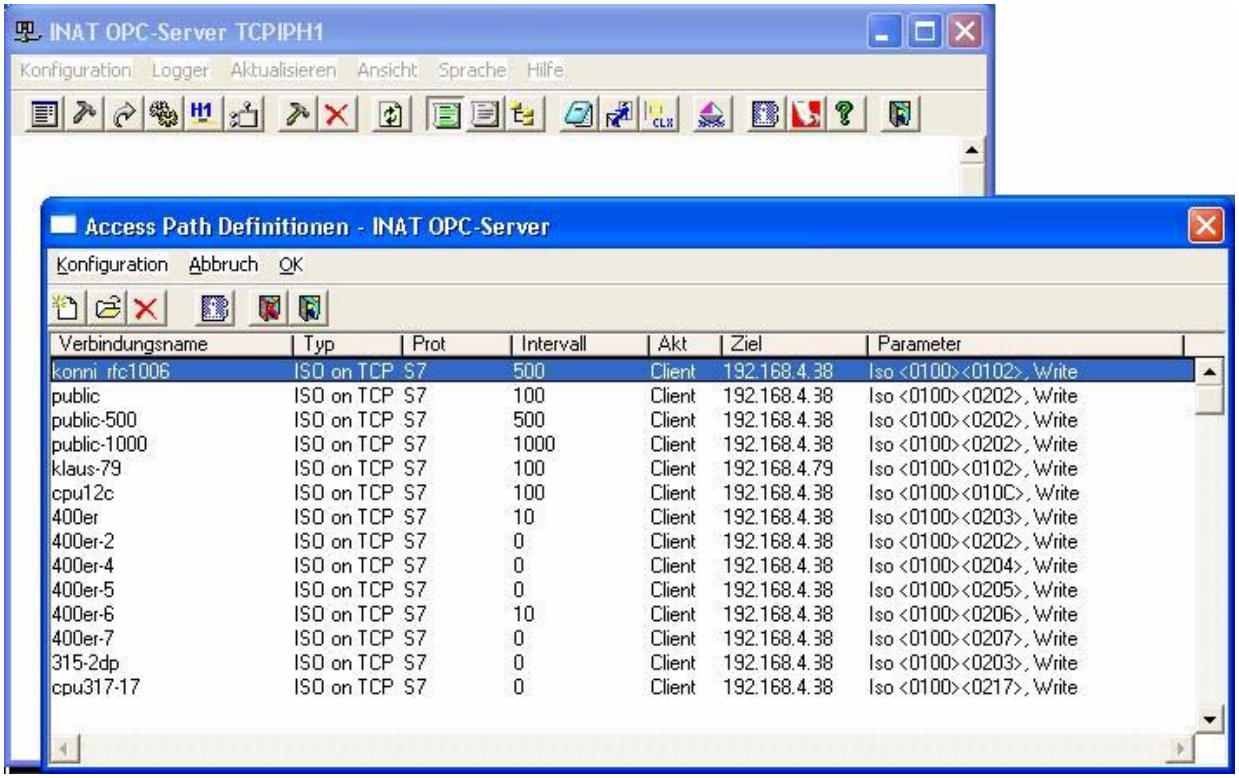


4 INAT-OPC-Server (INAT GmbH)

The following steps must be performed in the described sequence (status May 2008):

4.1 Configuring the INAT OPC server

The following dialog box opens when you select "Configuration->AccessPathDefinition" from the menu:



Verbindungsname	Typ	Prot	Intervall	Akt	Ziel	Parameter
konni_rfc1006	ISO on TCP	S7	500	Client	192.168.4.38	Iso <0100><0102>, Write
public	ISO on TCP	S7	100	Client	192.168.4.38	Iso <0100><0202>, Write
public-500	ISO on TCP	S7	500	Client	192.168.4.38	Iso <0100><0202>, Write
public-1000	ISO on TCP	S7	1000	Client	192.168.4.38	Iso <0100><0202>, Write
klaus-79	ISO on TCP	S7	100	Client	192.168.4.79	Iso <0100><0102>, Write
cpu12c	ISO on TCP	S7	100	Client	192.168.4.38	Iso <0100><010C>, Write
400er	ISO on TCP	S7	10	Client	192.168.4.38	Iso <0100><0203>, Write
400er-2	ISO on TCP	S7	0	Client	192.168.4.38	Iso <0100><0202>, Write
400er-4	ISO on TCP	S7	0	Client	192.168.4.38	Iso <0100><0204>, Write
400er-5	ISO on TCP	S7	0	Client	192.168.4.38	Iso <0100><0205>, Write
400er-6	ISO on TCP	S7	10	Client	192.168.4.38	Iso <0100><0206>, Write
400er-7	ISO on TCP	S7	0	Client	192.168.4.38	Iso <0100><0207>, Write
315-2dp	ISO on TCP	S7	0	Client	192.168.4.38	Iso <0100><0203>, Write
cpu317-17	ISO on TCP	S7	0	Client	192.168.4.38	Iso <0100><0217>, Write

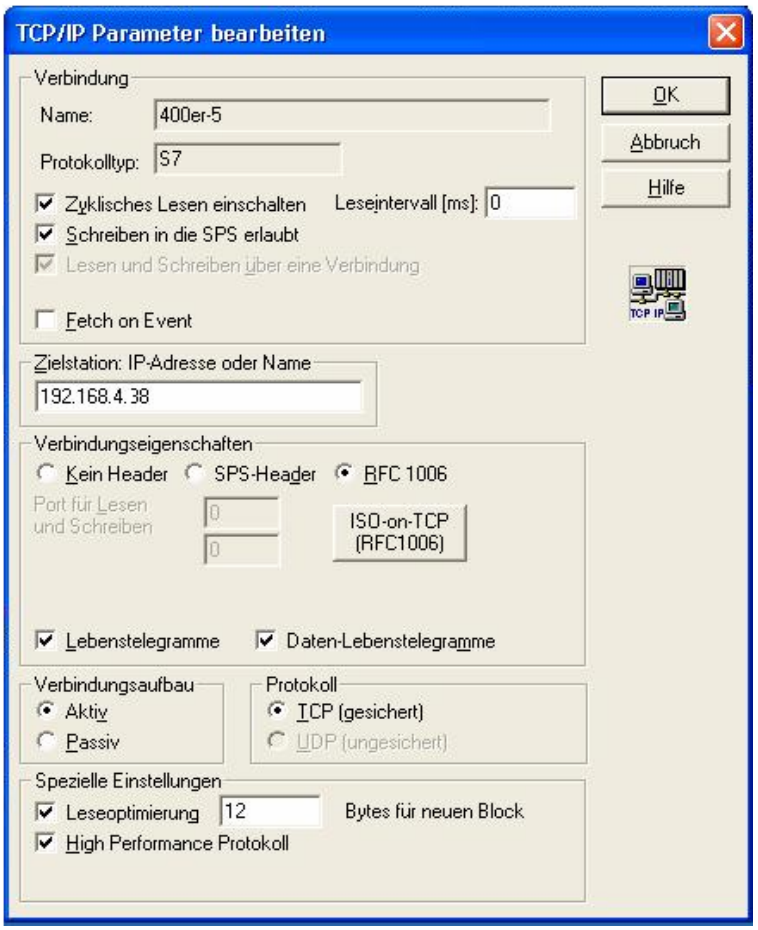
A new connection is generated via menu "*Configuration->New*" in dialog box "*Access Path Definiton*".

The following dialog box opens.

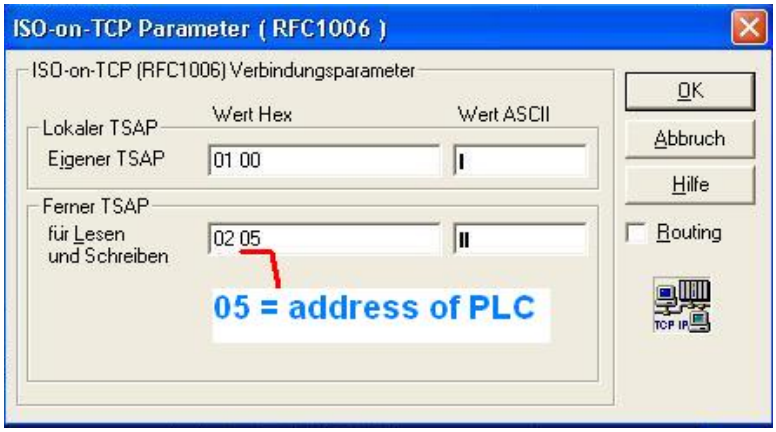
When you have confirmed the new connection with the OK button, you can set the parameters in the subsequent dialog box:

The most important entries are:

- The IP address of the target station
- Connection properties RFC1006



The RFC1006 setting is configured via the "*ISO-on-TCP*" button.

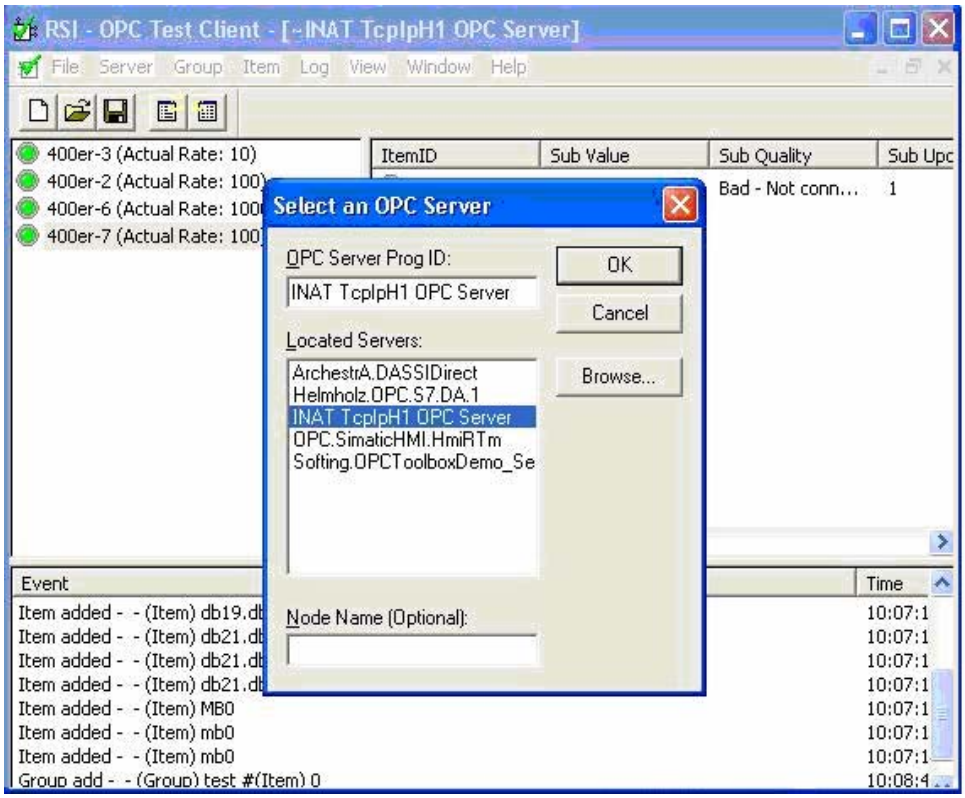


4.2 INAT-OPC Client

Select the OPC Server

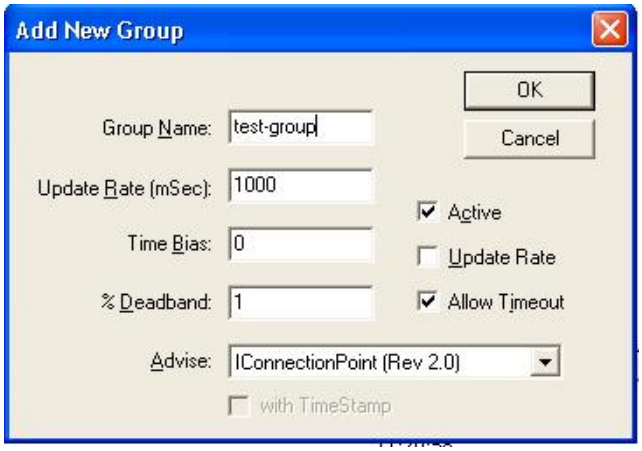
Once the server is configured, you can access the data of the controller via the OPC Client.

You can select the OPC server from which the configured data will be fetched via menu item *"File->New"*.



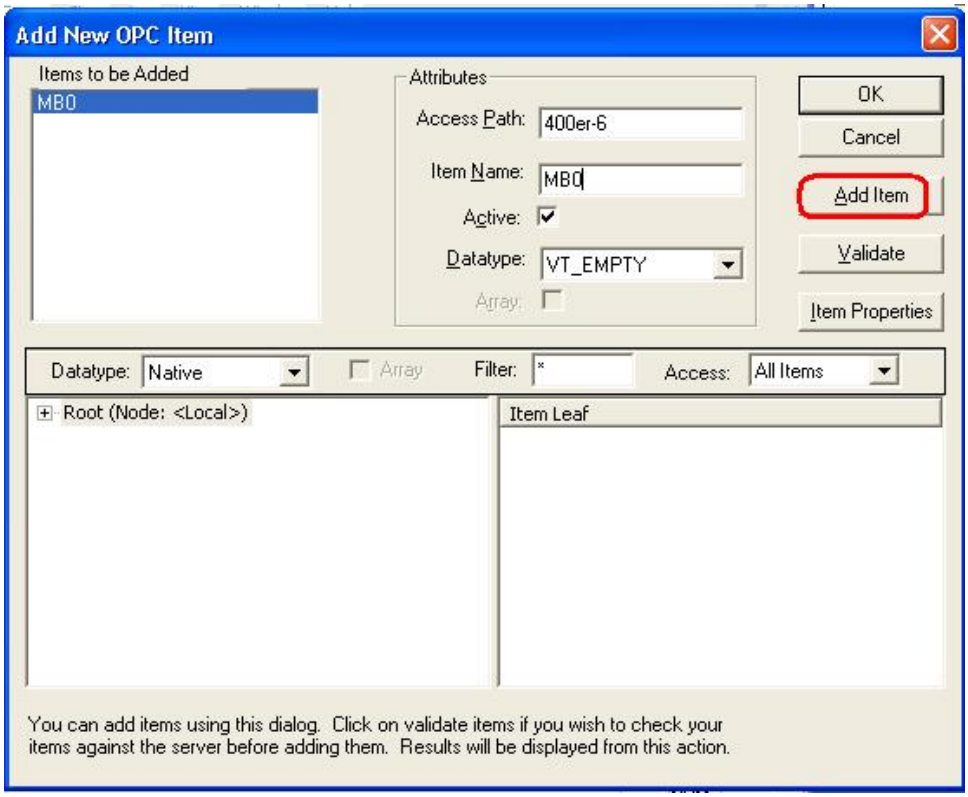
Configuring visualization data

- First of all, create a "*Group*":
- Menu *"Group->Add Group…"*



- Then select menu *"Item->Add Item…"*
- Important! In field *"Access Path"* you must enter the name of the connection exactly as designated in the OPC server.
- For "Item Name" enter the variable from the SPC.

- Finally press button "*Add Item*" and then "*OK*":



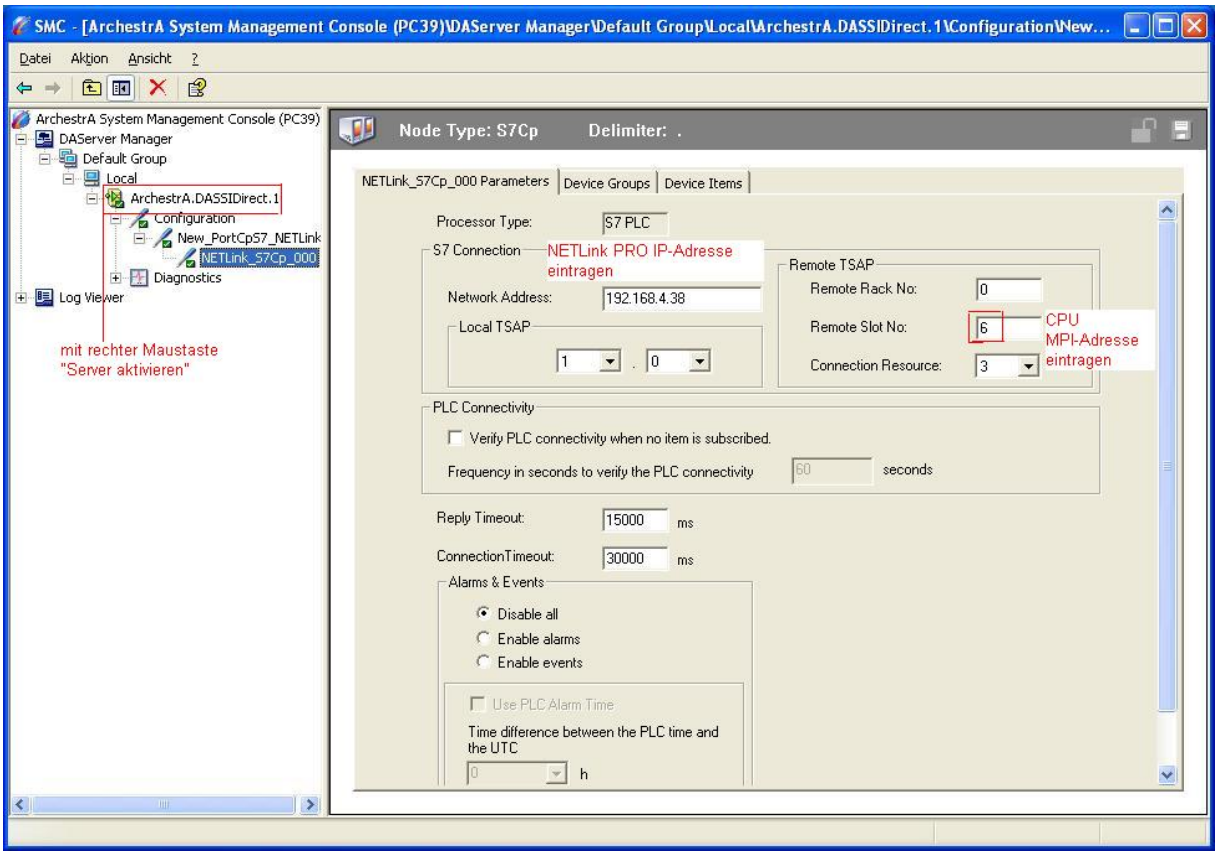
5 InTouch V9.5 (Wonderware GmbH)

(System Management Console 2.0 Version 5.1)

The following steps must be performed in the described sequence (status July 2007):

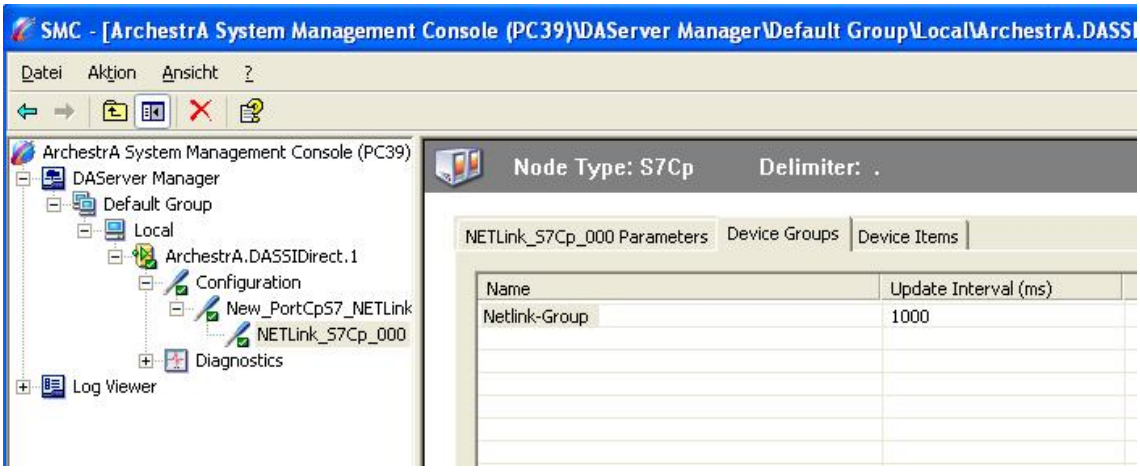
5.1 Starting the System Management Console

"*Start->Programs->Wonderware->System Management Console*"



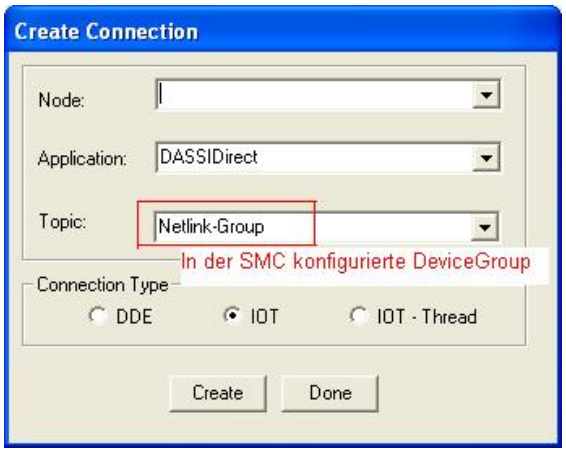
5.2 Configuring the Device Group

Enter Device Group (later the NETLink® PRO will be addressed with this name from the WWClient)



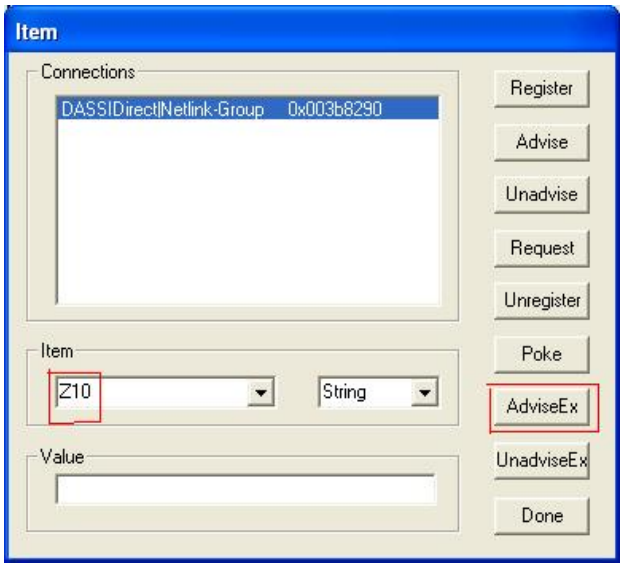
5.3 Configuring the Wonderware Client

"Start -> Programs -> Wonderware Factory Suite -> Common-> WWClient" to establish connection

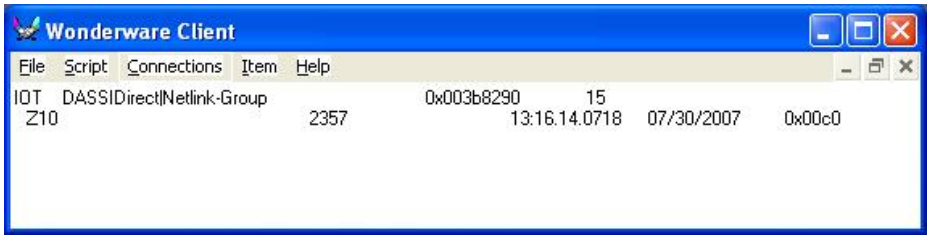


If the connection has been set correctly, the following display opens:

Configuring the item



If the Item configuration is correct and the SIDirect DAServer has been activated, the configured “Item” is updated in the “Wonderware Client” window.

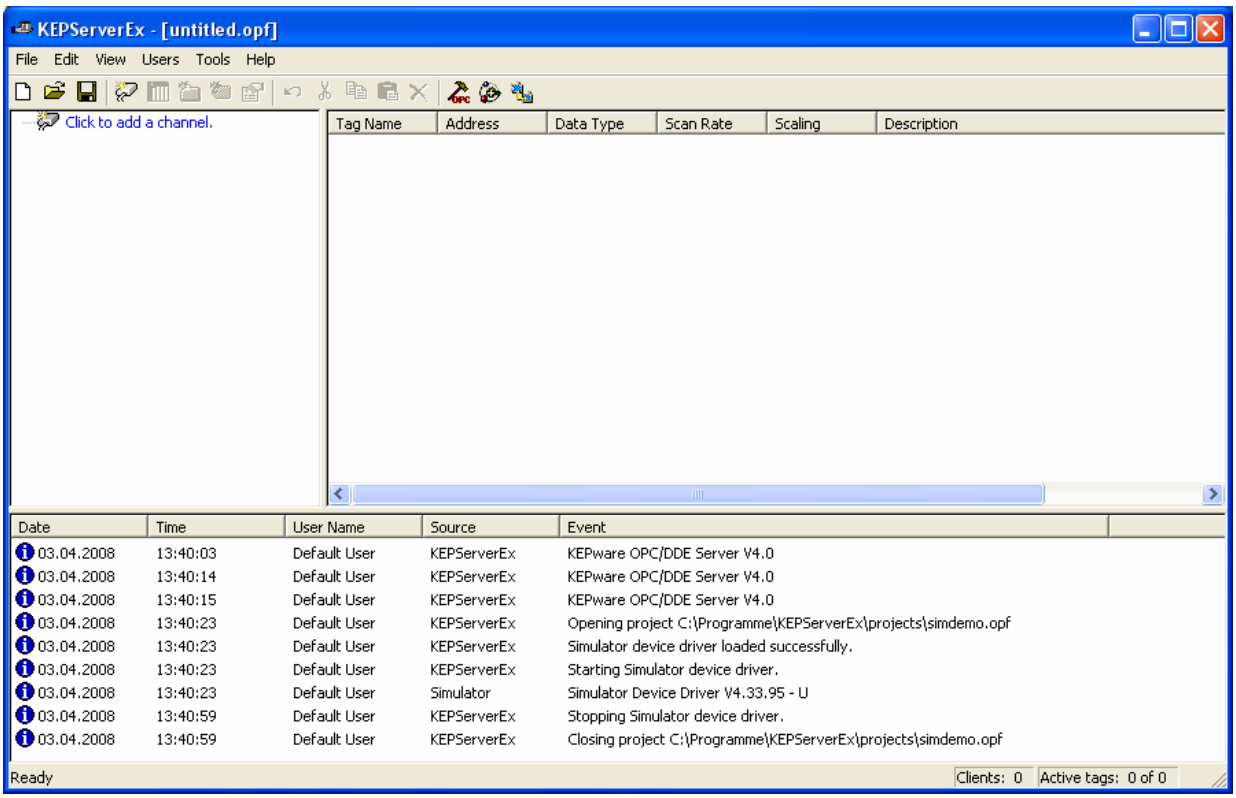


6 KEPserverEx V4.0 (KEPware Inc.)

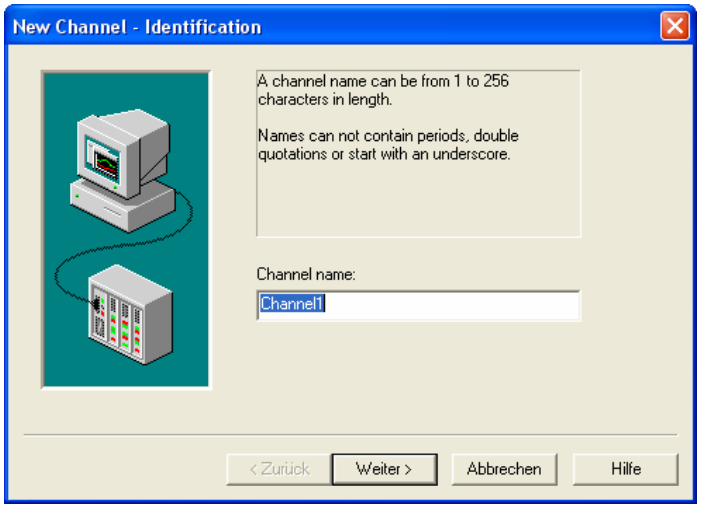
The following steps must be performed in the described sequence (status April 2008):

6.1 Configuring KEPserverEx

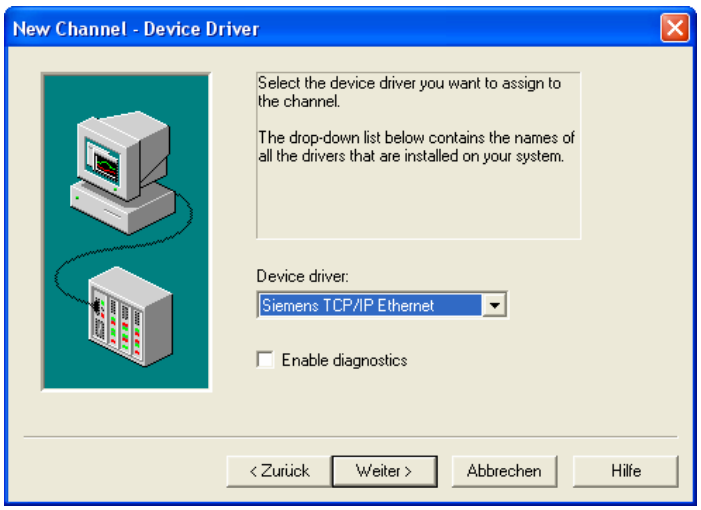
Start program module KEPServerEx, create a new project and open *"Click to add a channel"*



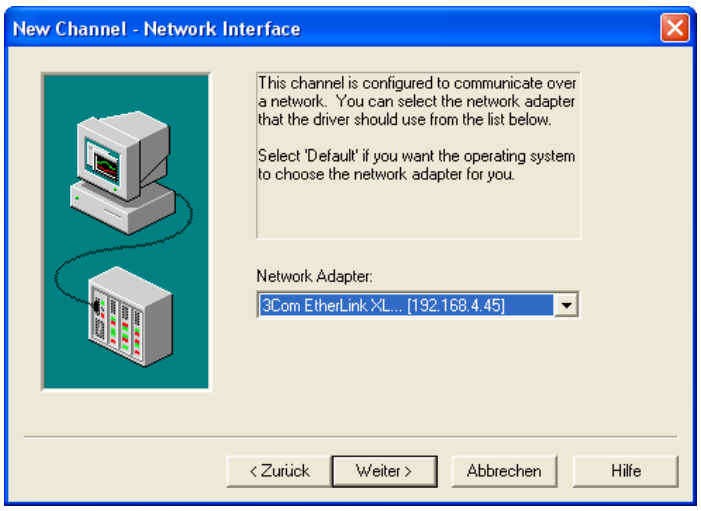
Enter a new name or leave the existing one and *"Continue"*



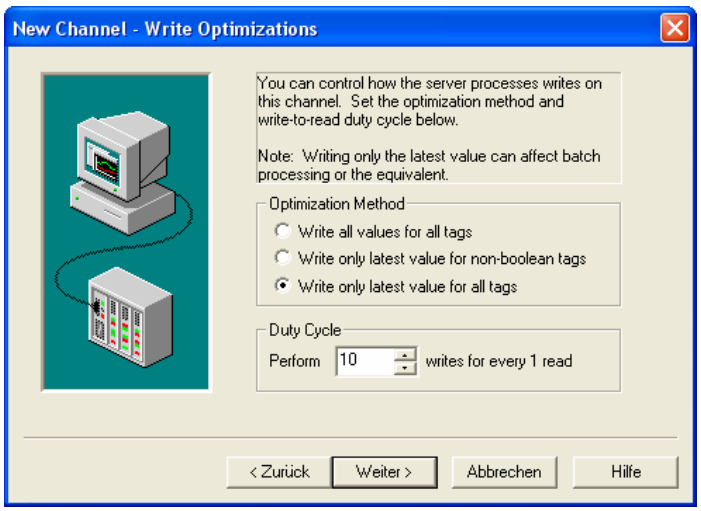
Select device driver *"Siemens TCP/IP Ethernet"*



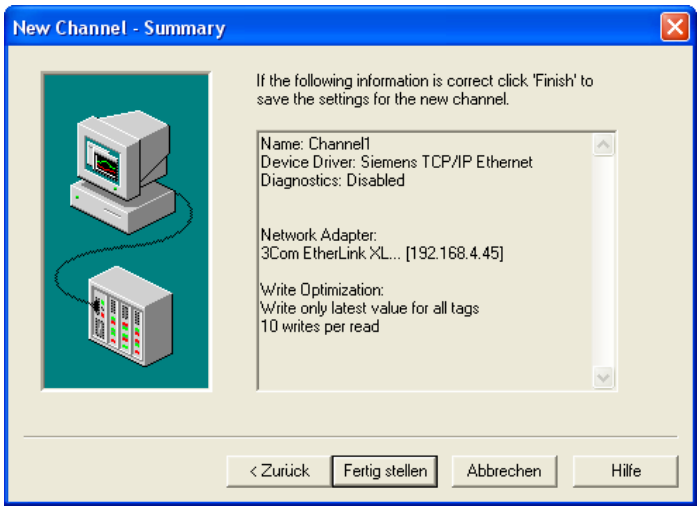
Select the computer's own network card



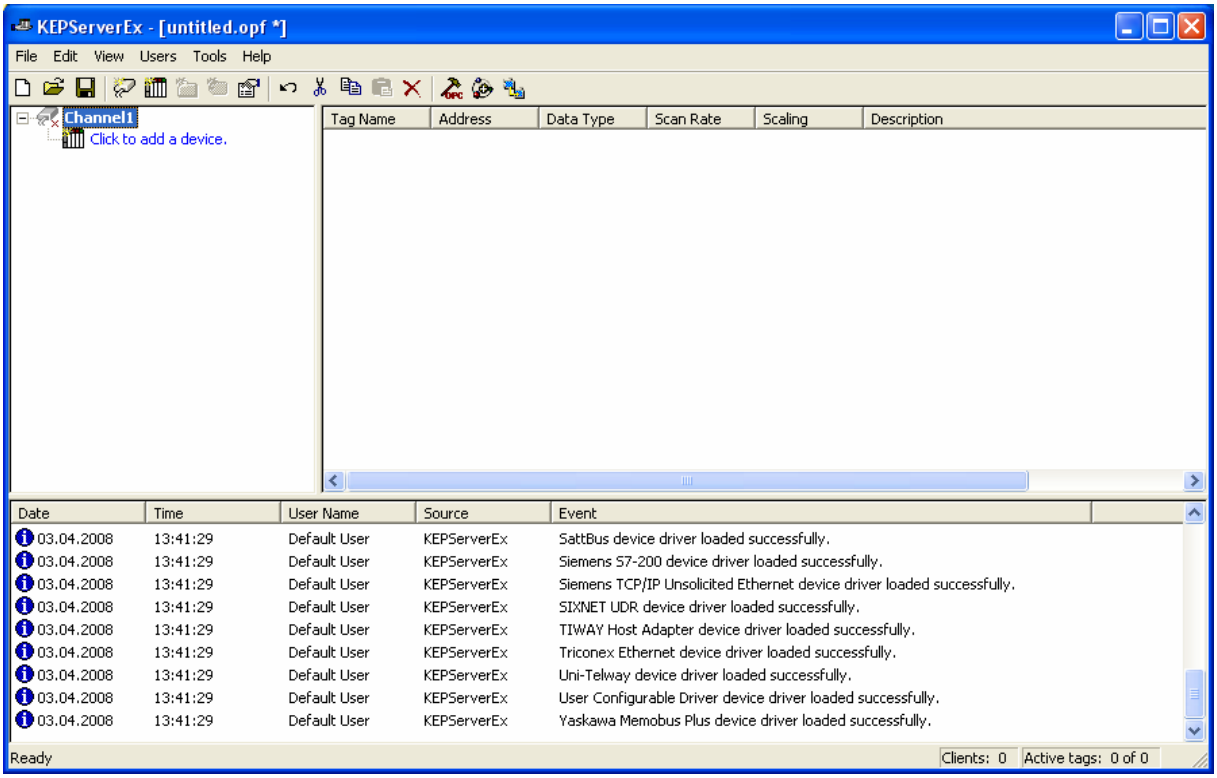
Leave default optimizations and confirm with *"Continue"*.



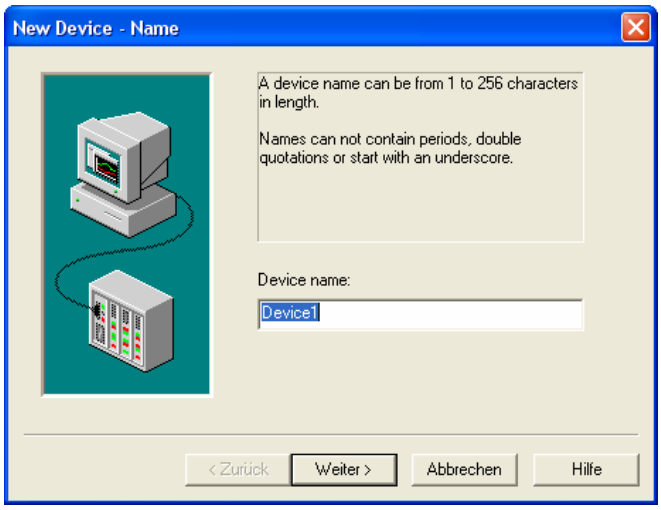
"Finish" the channel settings.



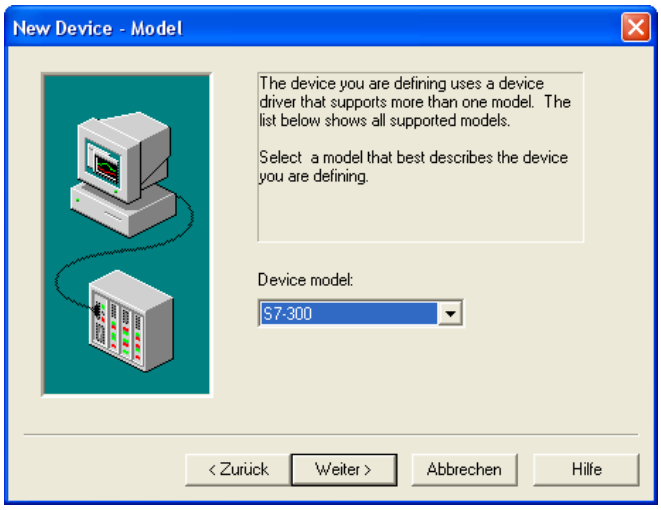
Select *"Click to add a device"* to assign the NETLink® PRO as a device



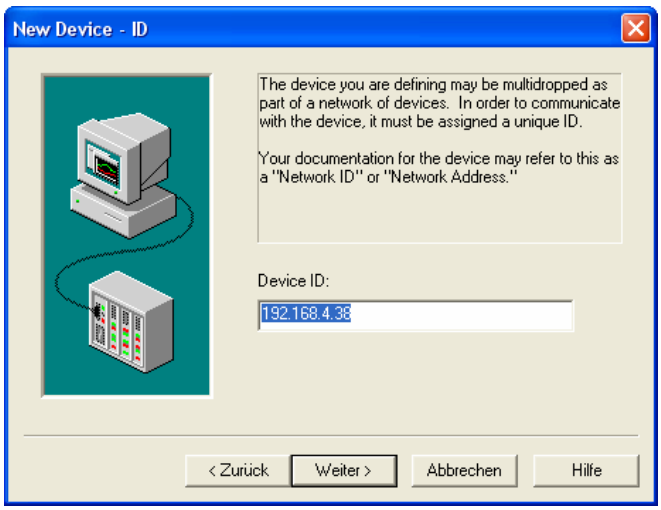
Enter a new name or leave the existing one and *"Continue"*



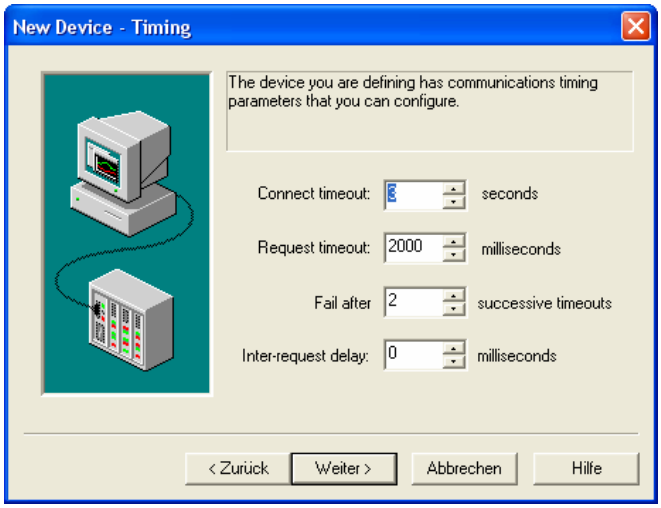
Select device model *"S7-300"*



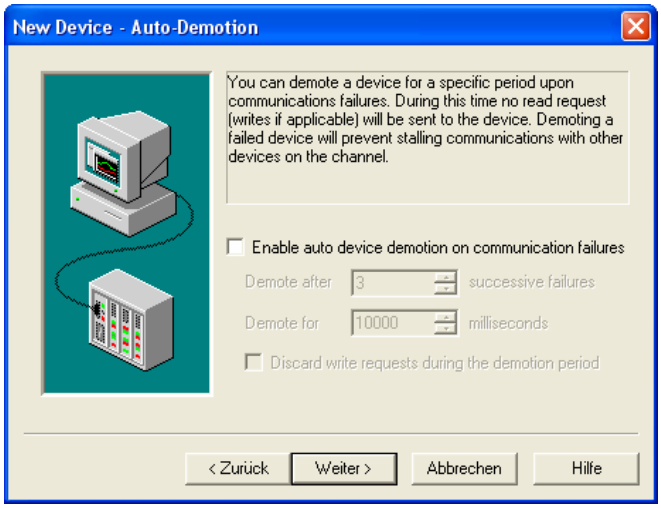
Enter the IP address of the connected NETLink® PRO here.



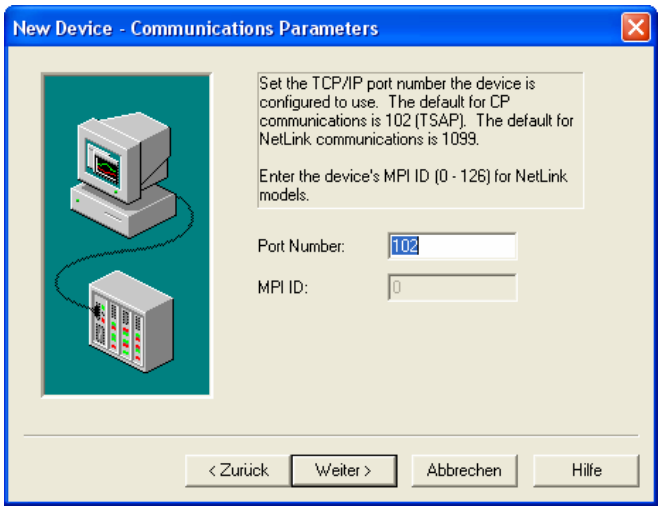
Leave default timing and confirm with *"Continue"*.



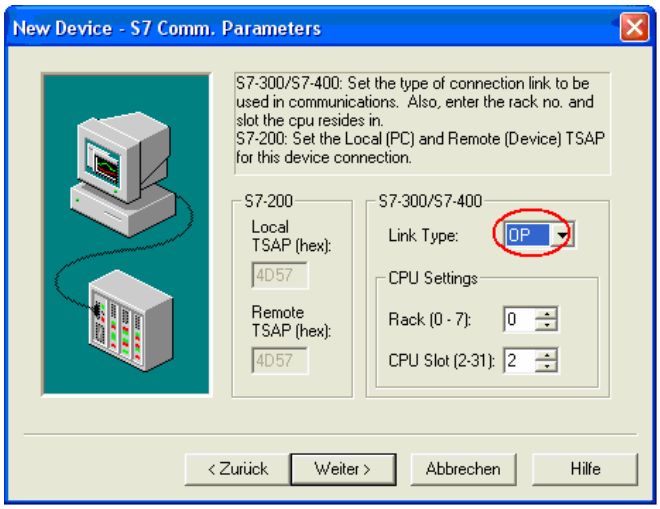
No changes, *"Continue"*



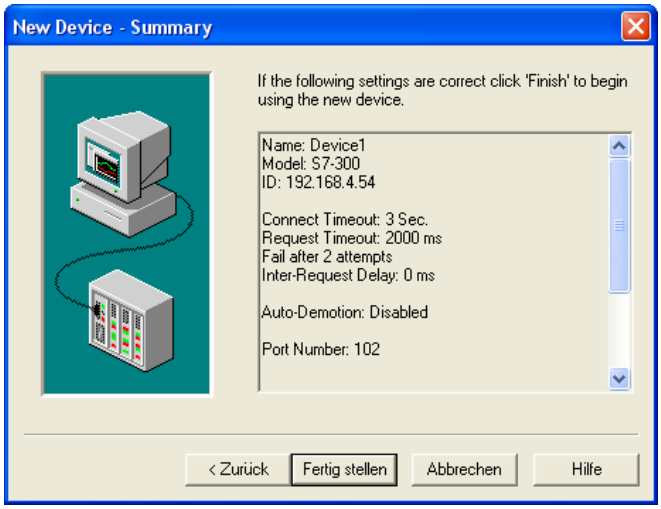
The communications port for RFC 1006 is 102 (default)



The link type must be set to *"OP"*!

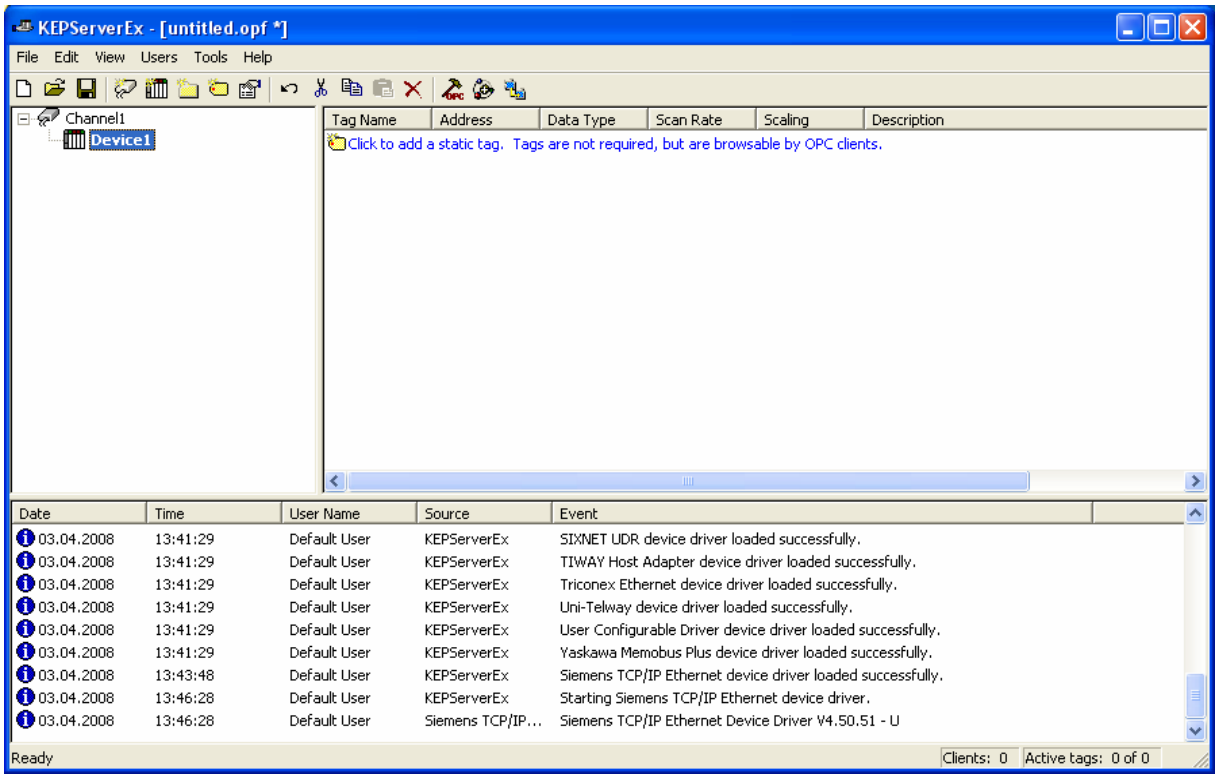


"Finish" the device settings.

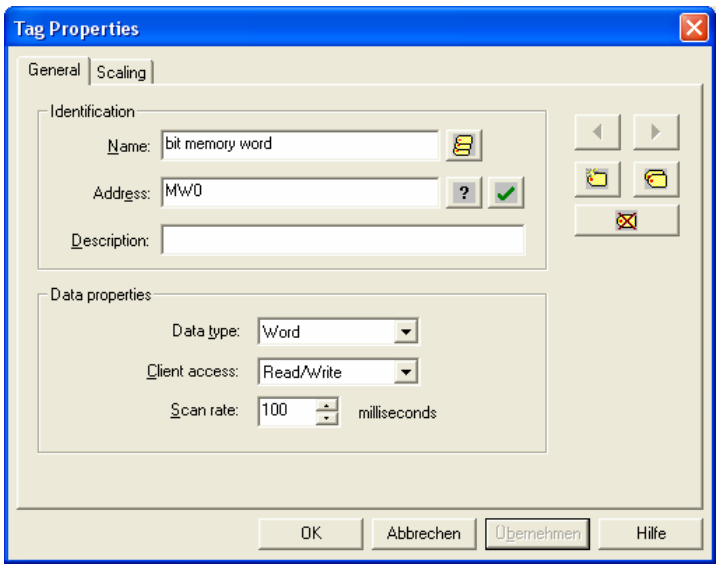


The following steps are provided as an example only and are not obligatory for customer applications. They serve as a visual check whether data exchange is taking place.

By clicking *"Click to add a static tag"* in this example, only one item will be assigned.



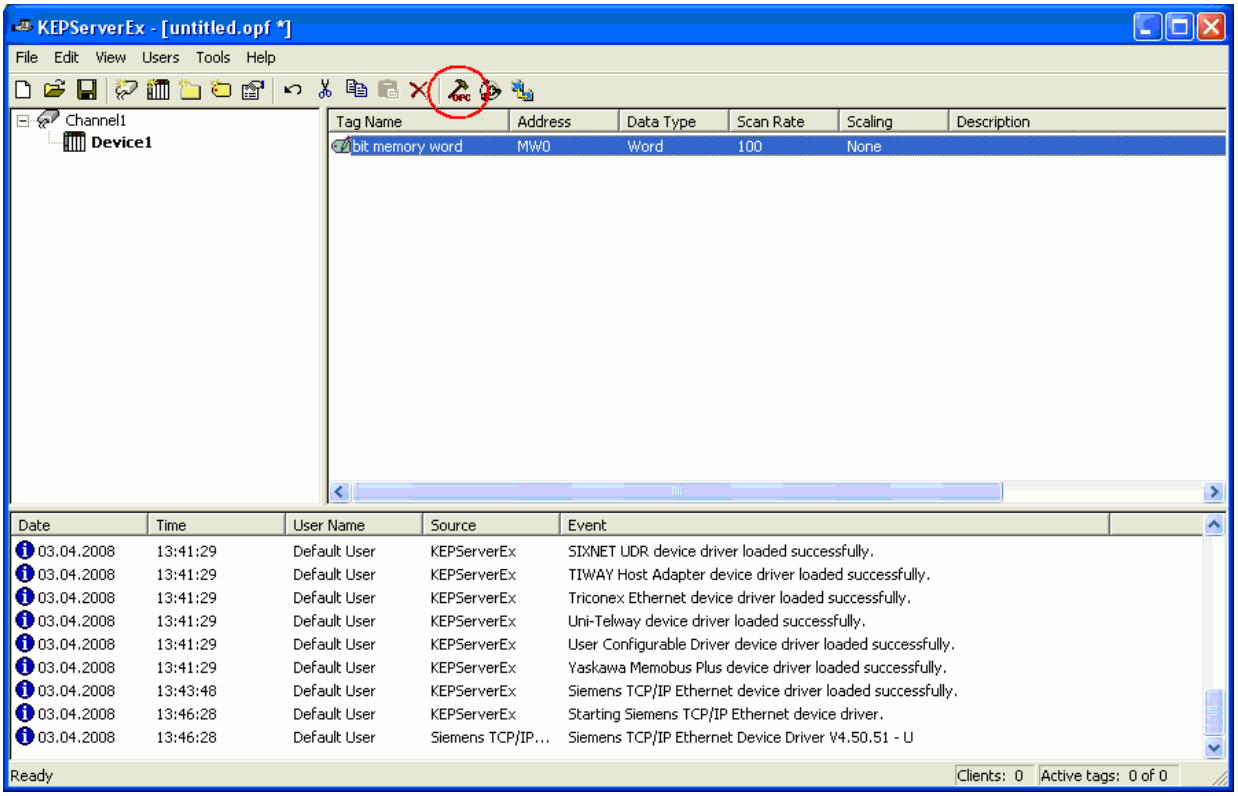
The flag word zero will be processed in the sequential program of the connected CPU.



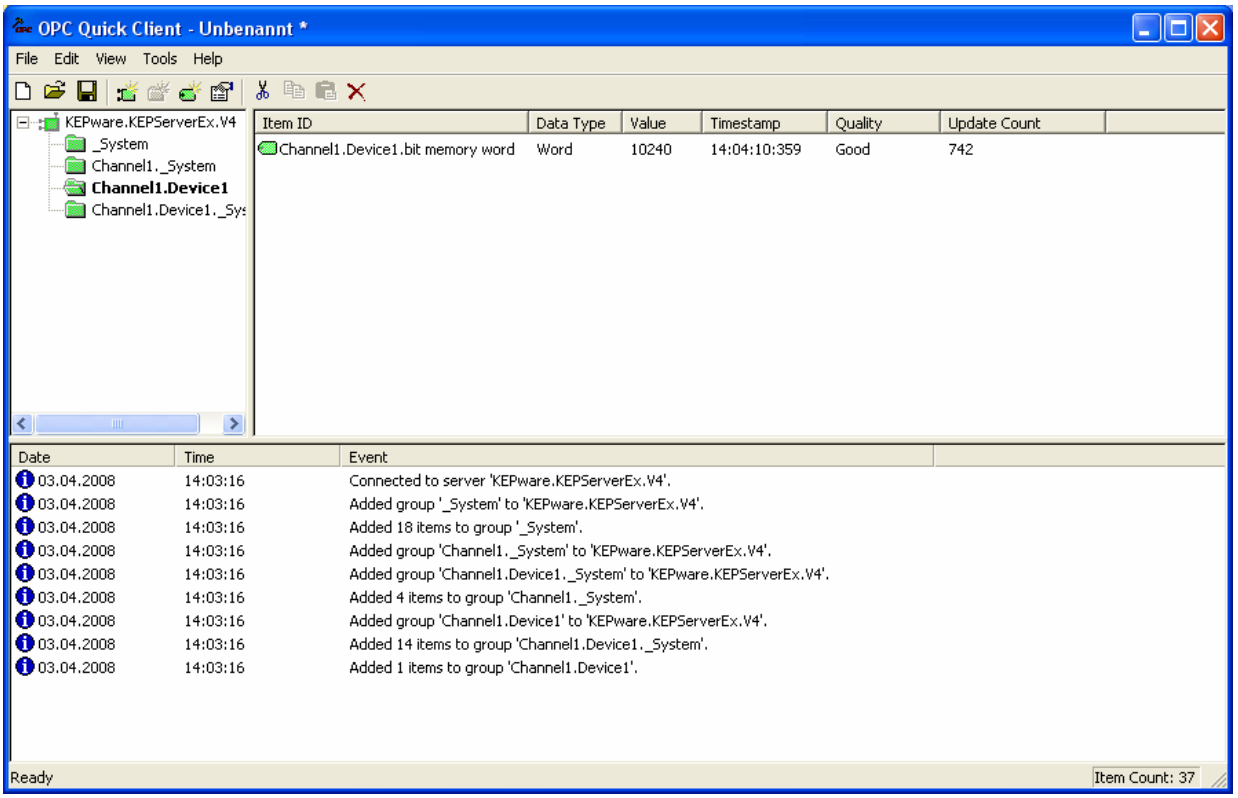
Complete with *"Apply"* and *"OK"*

6.2 Starting the OPC quick Client

The Quick Client can be started via the marked icon:



The program module *OPC Quick Client* opens and the status of the item is displayed by marking the channel and device you previously created



7 PROCON-Win V3.2 (GTI Control)

7.1 Available soon

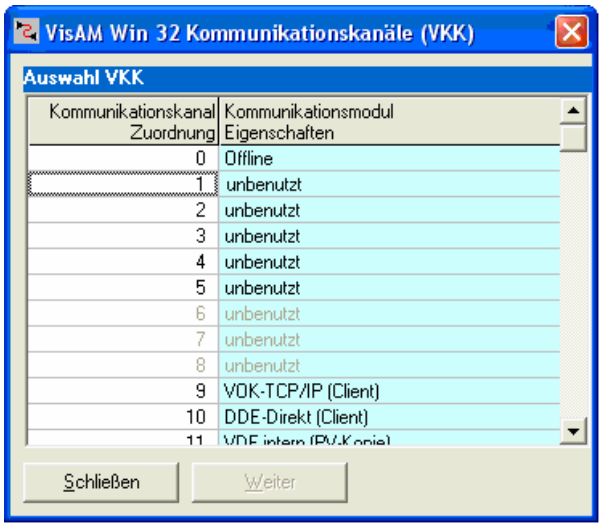
8 VisAM Win32 (VISAM GmbH)

The following steps must be performed in the described sequence (status May 2008):

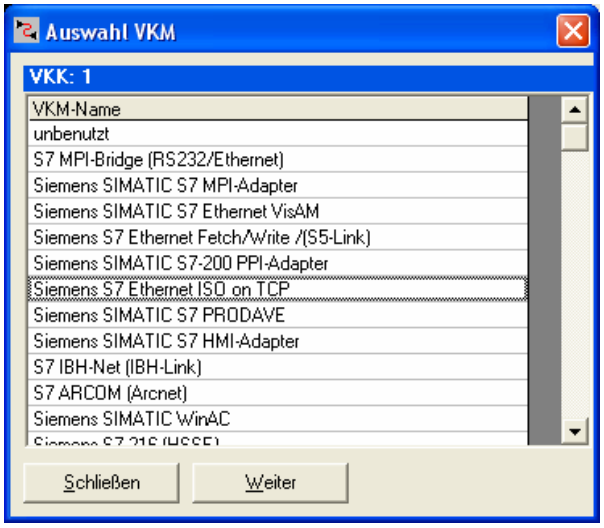
8.1 Configuring VisAM Win 32

Open the program module VisAM editor

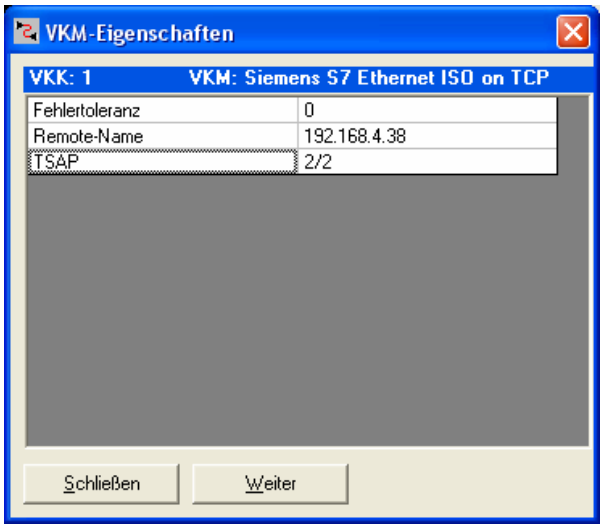
- Communication -> Select channels
- Click assignment 1 in the communication channel selection.



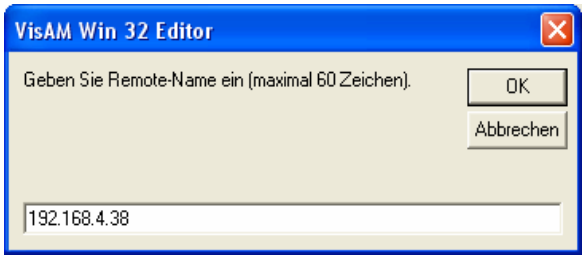
In the selection, select assignment “Siemens S7 Ethernet ISO on TCP” as the VKM name and confirm with “Continue”.



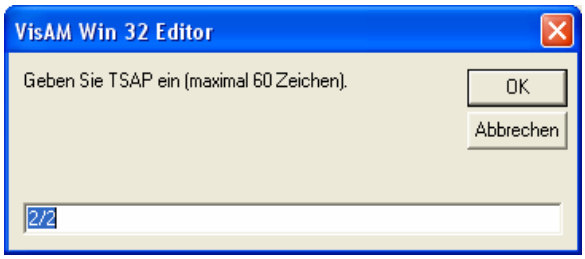
Click the remote name and…



...enter the IP address of the NETLink® PRO

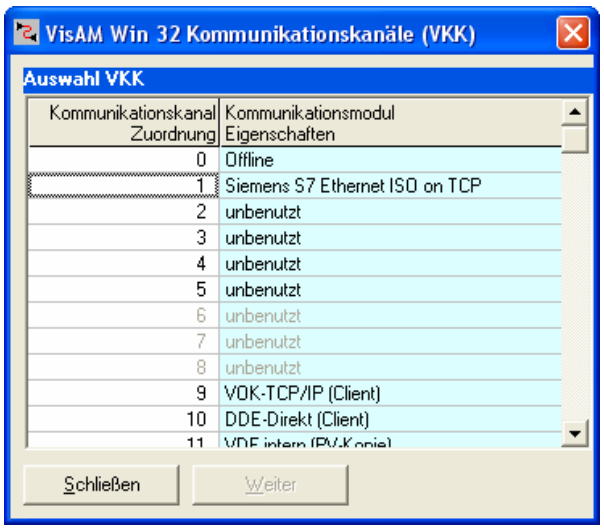


Confirm with “OK” and click TSAP…



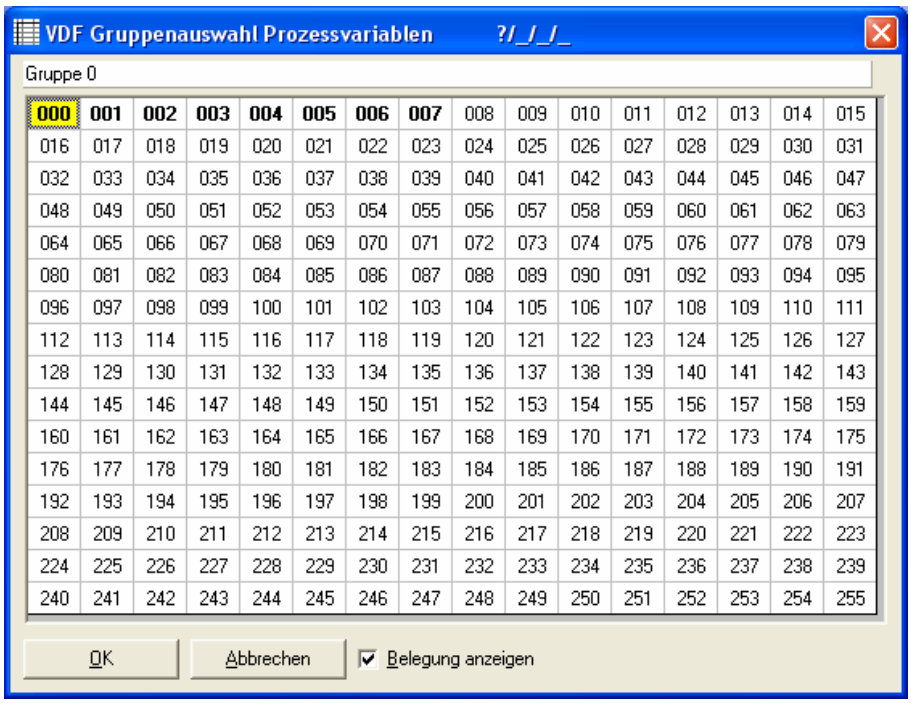
…and enter address. In this case 2/2 for bus address 2, rack 0, slot 2 (see Chapter 10.3.1 -> Address conversion table in NETLink® PRO Manual).

Confirm with *"OK"*.

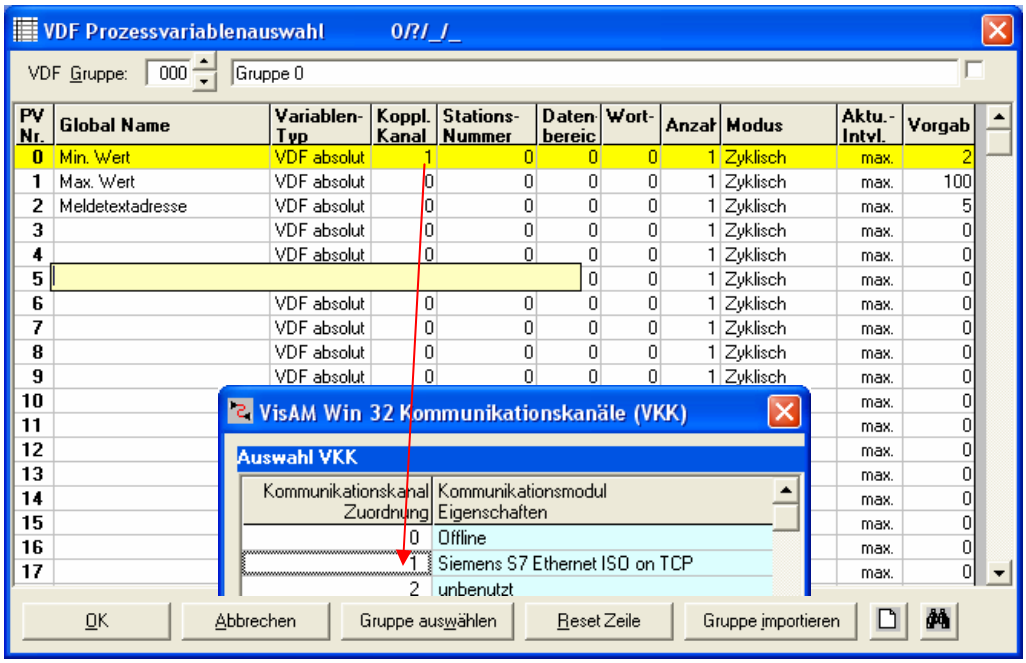


You have now created the communications channel and can apply the settings with "Close".

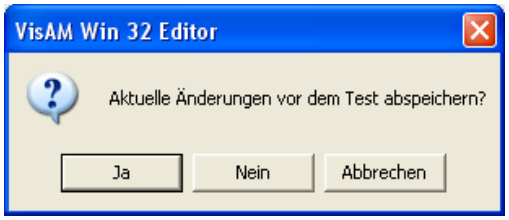
Select Communication -> VDF Data Field



Select Group 0 and click the “000" field to activate process variable selection.

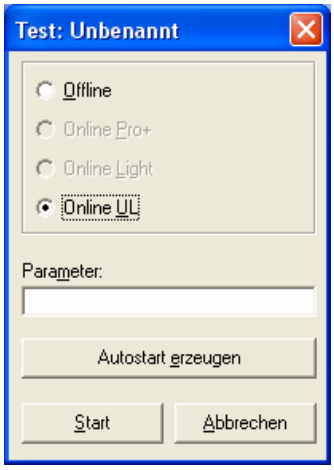


Coupling channel 1 is referenced to the previously defined communications channel. Confirm with *“OK”*.



8.2 Starting visualization

Select Project -> Test (hotkey F5)

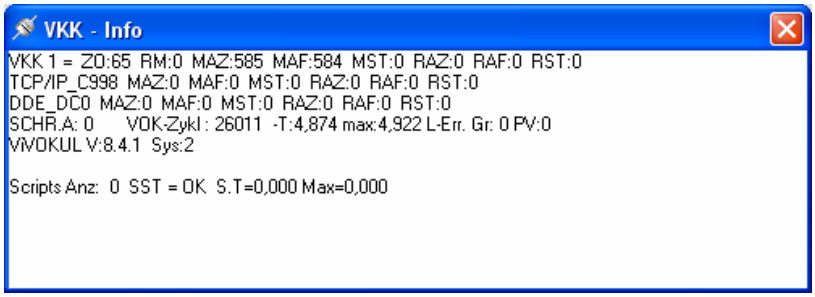


Select”Online UL” and click “Start”

Process visualization opens and the communications link is started.

The connection monitor switches from “offline” to “online” mode.

The transmission information can be displayed in Info.



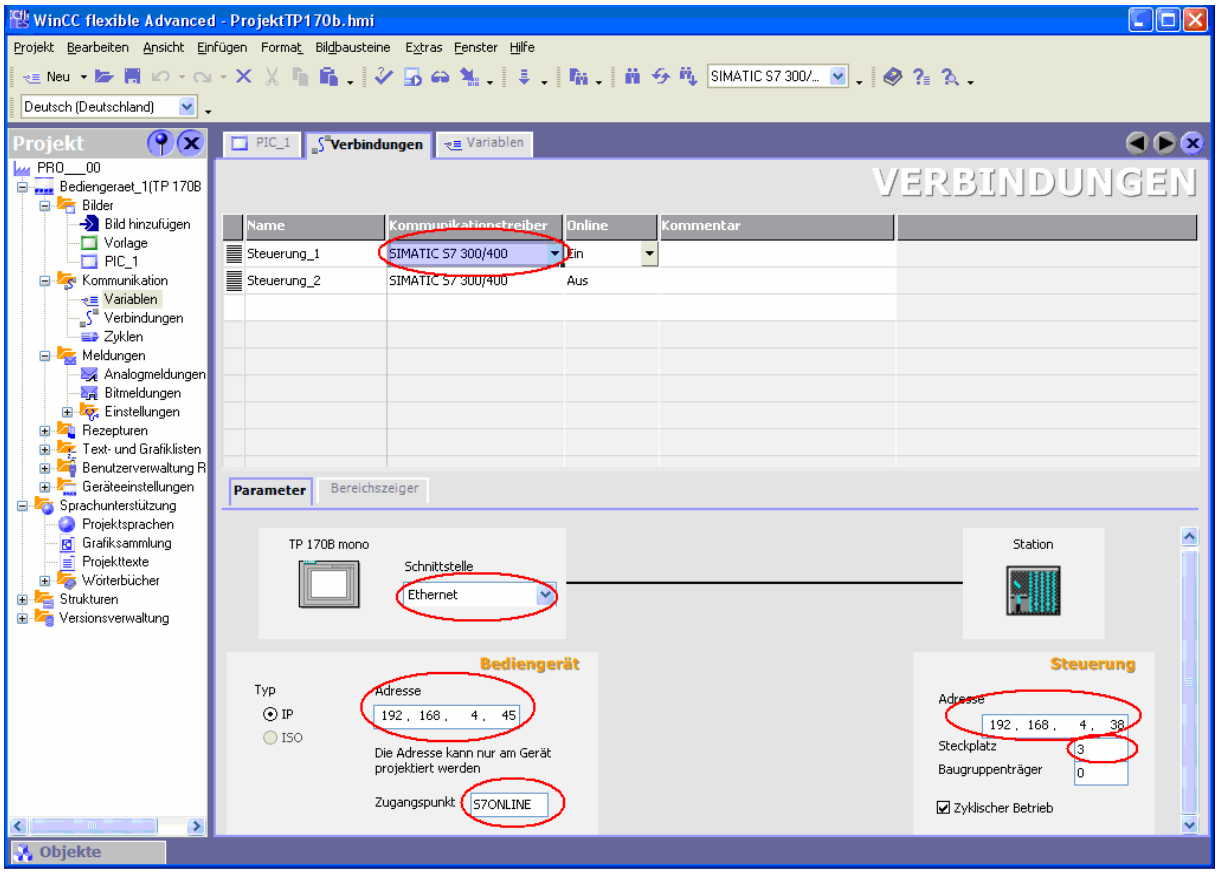
9 WinCC flexible 2005/2007 (Siemens AG)

The following steps must be performed in the described sequence (status April 2008):

9.1 Configuring connections

Start WINCC flexible Project and open the connections in the communications register:

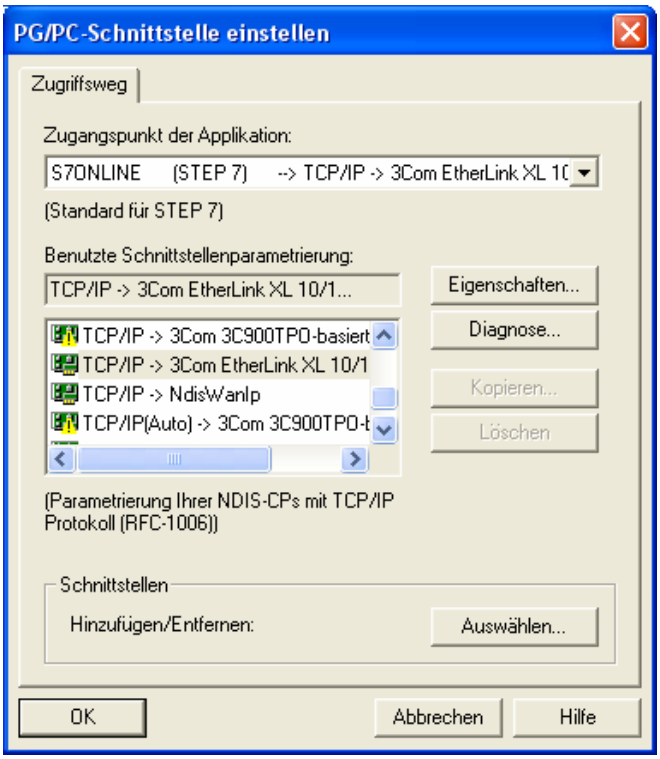
- Select communications driver *"SIMATIC S7 300/400"*
- Interface: Ethernet
- The operator panel address is the local IP address of the computer network card
- Access point: S7ONLINE
- The Control address is the IP address set in NETLink® PRO
- The Slot is the MPI address of the CPU to be addressed



9.2 Configuring the PG/PC interface

In the control panel, open the “Setting the PG/PC Interface” module.

- Select the network card with protocol “TCP/IP” installed in the computer system as the *“Used Interface Parameterization”*.
- Check whether “*S7ONLINE (Step7) --> TCP/IP ->…“* is active for *“Access point of application”*
- Confirm with *“OK”*.



All variables that are linked to *“Controller_1”* can now be accessed via the RFC 1006 protocol.

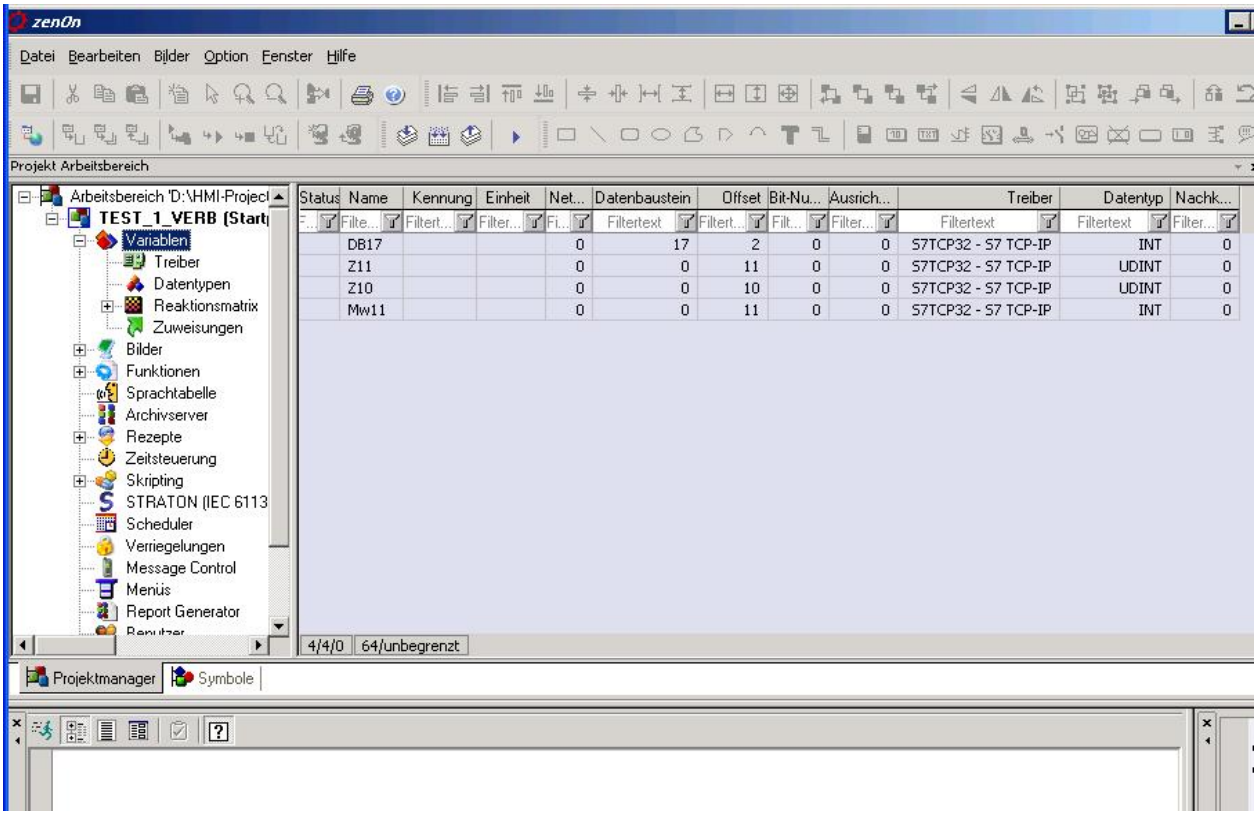
10 ZenOn V6.2 (COPA-DATA)

The following steps must be performed in the described sequence (status August 2007):

10.1 Configuring Zenon

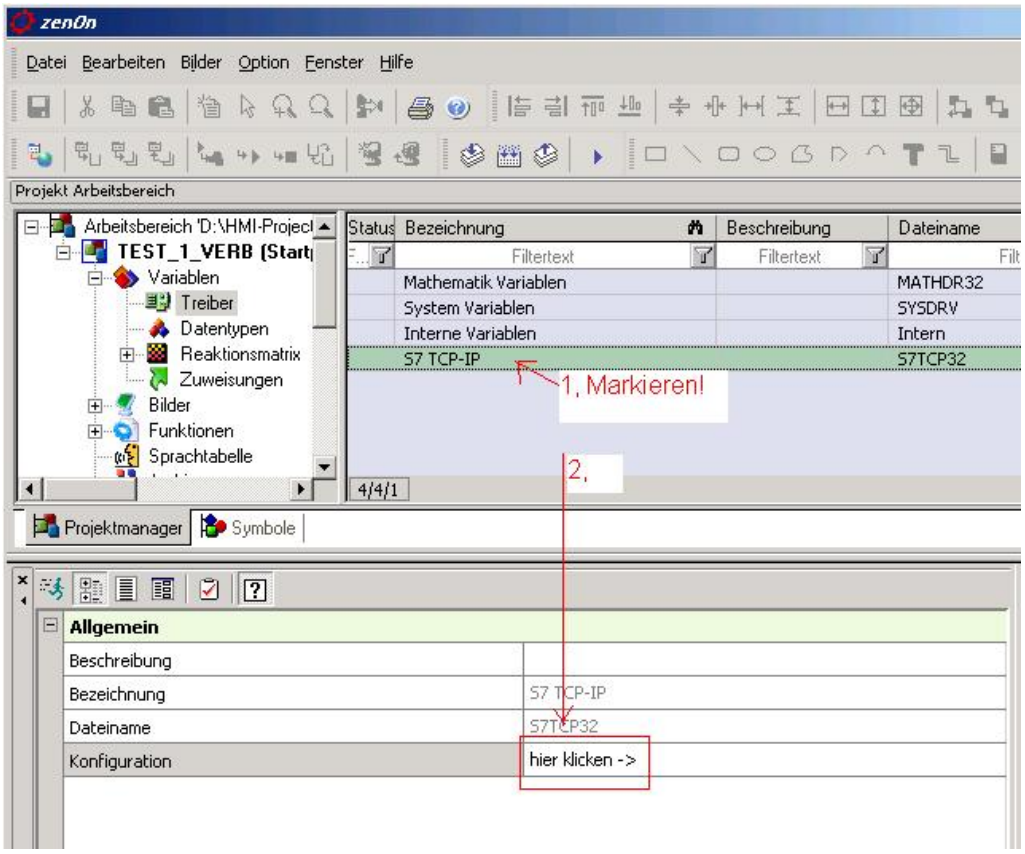
Start Zenon and create a new project or adapt an existing one and define variables.

Configuring variables:



10.2 Setting the driver

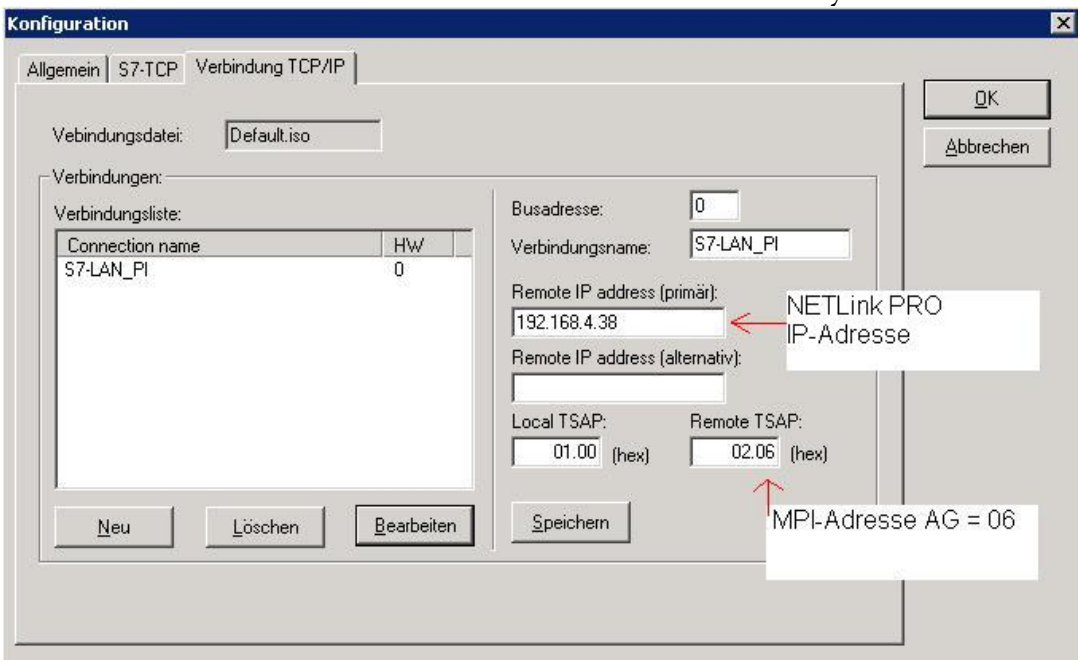
- Mark “S7 TCP-IP”
- Press “Click here->” in the configuration



10.3 Driver configuration

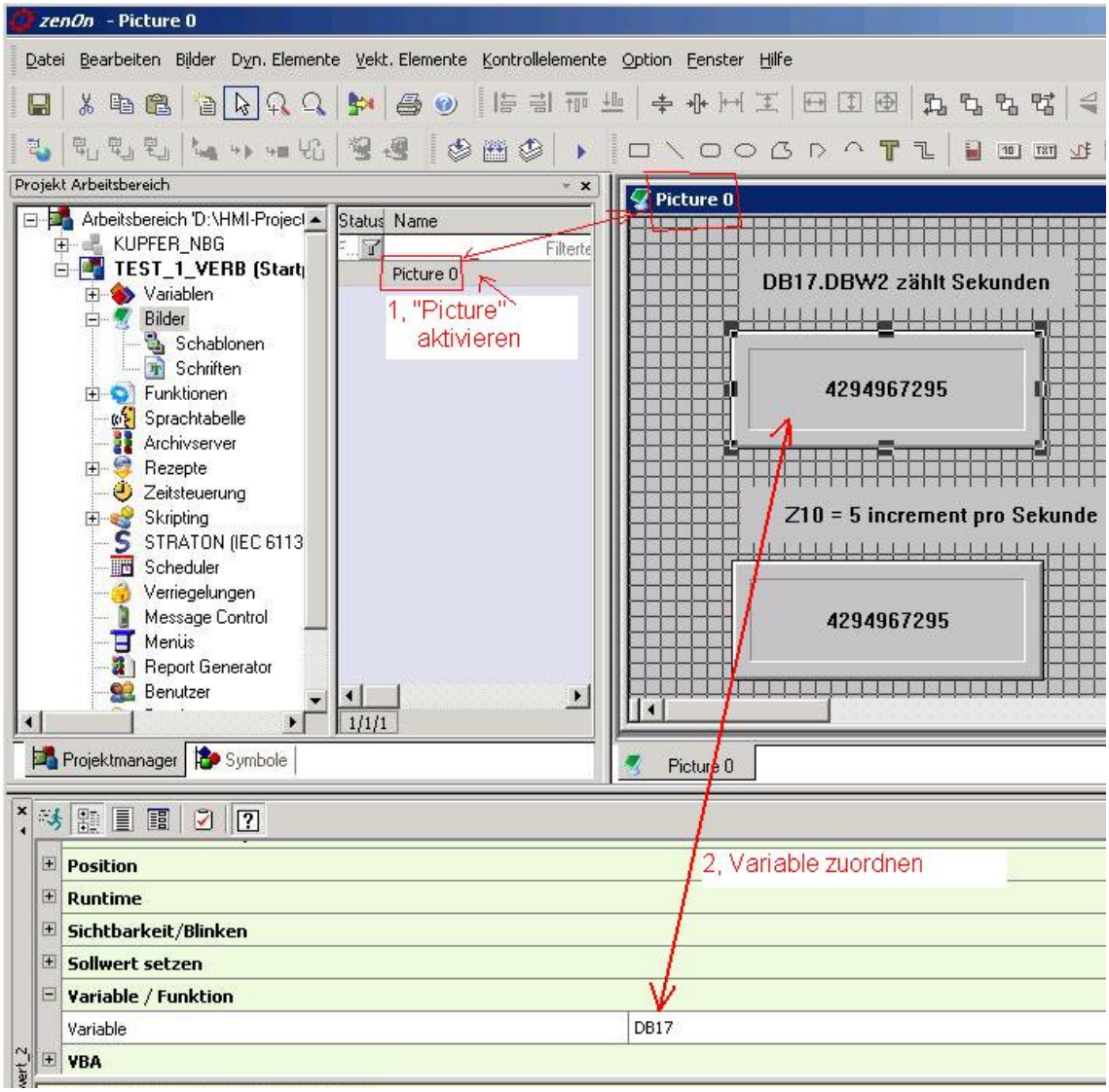
- “New” button:
- Enter data
- (remote IP address = IP address from NETLink® PRO
  Remote TSAP = MPI address of PLC)
- “Save” button (important: before button “OK”)
- “OK” button

ATTENTION: First “Save” button and only then “OK” !!!

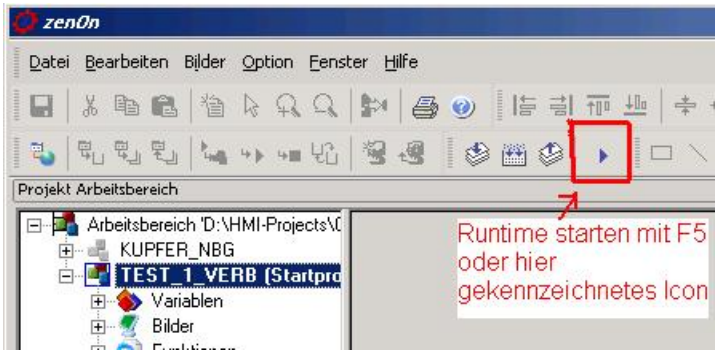


10.4 Integrating variables in images

Configuring images



Finally, start the runtime:



11 Troubleshooting

The points described here show some typical errors that can occur when using the RFC 1006 function.

Please also refer to the descriptions for troubleshooting in the NETLink® PRO manual!

If a problem is not described here and this manual does not provide any information on how to remedy it, the support of Systeme Helmholz GmbH will gladly help you to solve the problem.

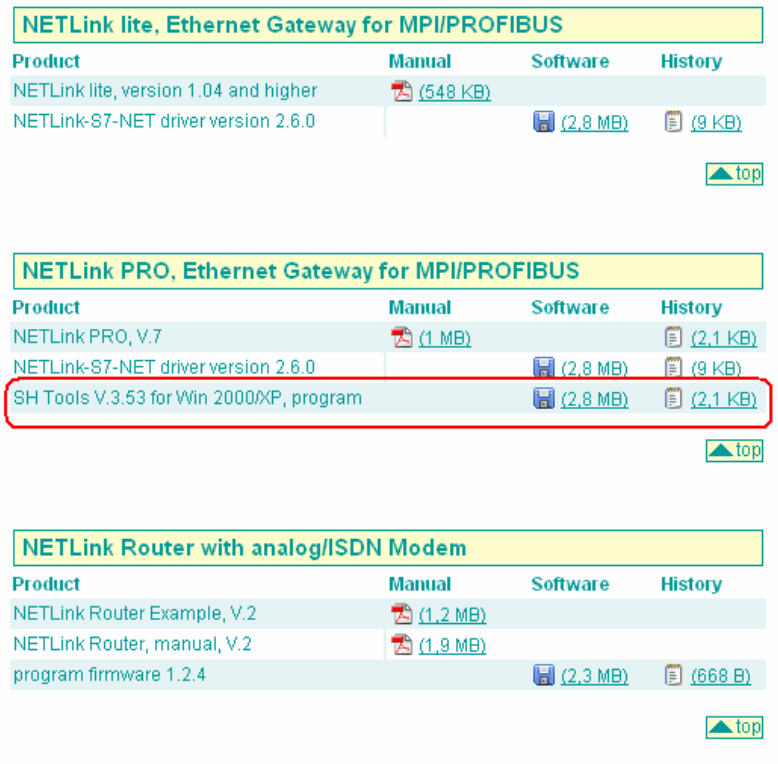
F: How is a firmware update in NETLink® PRO adapter made?

A: The following steps need to be performed:

1) download up-to-date software "SHTools" from the Systeme Helmholz website

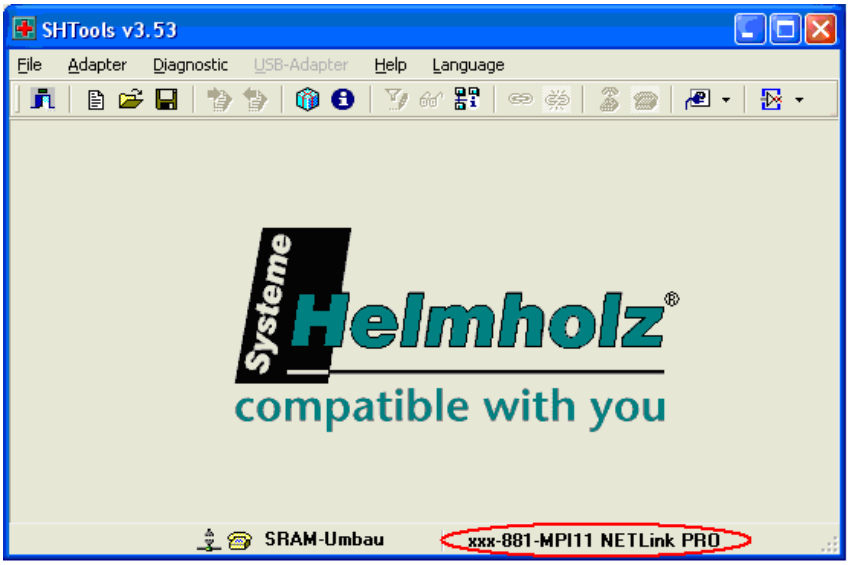
www.helmholz.de -> download -> NETLink® PRO.

(extract of pull-down selection menue):

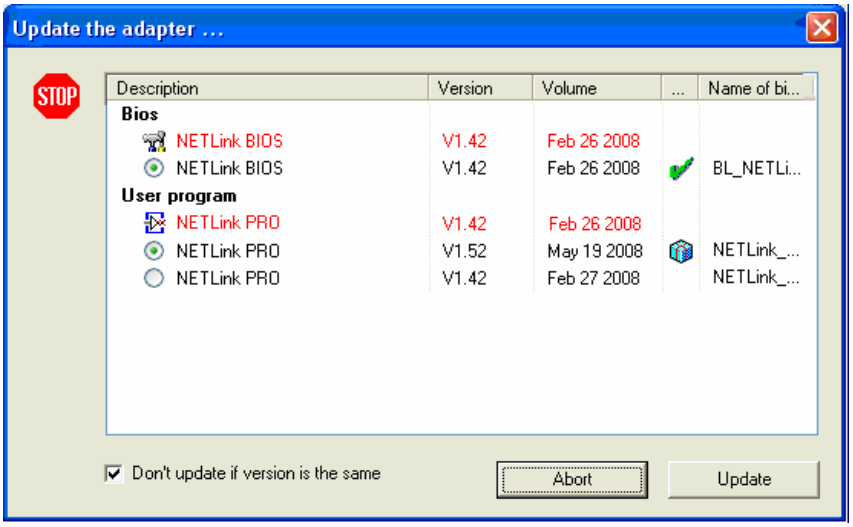


2) after starting "SHTool" make sure that the status line "NETLink® PRO - Family" is activated (if not, press right mouse button on status line and choose "NETLink® PRO - Family" in the dialogue window.)

Choose product by name or order number:



3) After activating the menu "Adapter -> update adapter" the following dialogue window will appear (example):



If a firmware version lower than V1.42 is to be updated to a version higher than V1.42, it is necessary to take an intermediate step and update to V1.42. first. Afterwards it will be possible to update to all higher versions in a consecutive updating session.

Q: Why do I get an address conflict when trying to communicate via Step 7 with the RFC 1006 mode activated even though the station-related address has been adapted in the driver?

A: You have most probably changed your own address in the Web interface (default =0). The NETLink® PRO automatically tries to go online with this address on the bus in RFC mode. Conflicts will occur if another node uses the same address. In this case, the altered entry in Step 7 is ignored. Check the status of the active stations in the Web interface.

Q: What must I observe when calling your technical support?

A: Please have all relevant data of your system constellation with the connected stations and program modules at hand when you contact technical support at Systeme Helmholz GmbH.

12 Directory of Sources

INAT-OPC server
(http://www.inat.de/index.php?18&backPID=18&tt_products_sof
=236)

InTouch V9.5 (http://de.wonderware.com/products/intouch10)

KEPserverEx V4.0
(http://www.kepware.com/Products/OPC_Servers.html)

PROCON-Win V3.2 (http://www.gti-control.de/html/index.html)

S7/S5 OPC server
(http://www.helmholz.de/prod.d,17_129,41663660246121525002
136039033614.html?prod=39)

VisAM Win32
(http://www.visam.de/03_produkte/visam/index.php)

WinCC flexible 2005/2007
(http://www.automation.siemens.com/hmi/html_00/products/sof
tware/wincc-flexible/index.htm)

ZenOn V6.2 (http://www.copadata.at/de/ger/home.html)