FAQ Communication over PROFIBUS

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S7 communication over PROFIBUS

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FAQ

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http://support.automation.siemens.com/WW/view/en/15364951

Question

How do I configure a S7 connection for the SIMATIC NET OPC-Server over PROFIBUS with the SIMATIC NET PC Software?

Answer

The instructions and notes listed in this document provide a detailed answer to this question.

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1 Assignment of tasks

In this example a CP5611 is used that implements S7 communication over the OPC-Server with a SIMATIC S7 on PROFIBUS.

NOTE	The method which is described in these instructions also applies to the communication processors CP5613/14 A2, CP5621 and CP5511 and CP5512 respectively.

1.1 Condition

It is assumed that one of the two following configuration tools is installed:

- NCM PC
  NCM PC is supplied with the SIMATIC NET CD and allows you to create PC projects and open STEP 7 projects. It is, however, not possible to edit S7 blocks in the STEP 7 project with this software.

- STEP 7
  STEP 7 is a separate software package with which you can create S7-400, S7-300 and PC projects. S7 blocks can be edited with this software.

Only one of these tools can be installed.

In chapter 2 "Configuration of the PC station" is described the configuration of PC station so that you can use the S7 communication over PROFIBUS to exchange data between PC station and S7 station.

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2 Configuration of the PC station

After successful completion of the hardware and software installation of the SIMATIC NET CD and the configuration tool and after restarting your computer, you start NCM PC or STEP 7 with "Start → (in Windows XP: All Programs→) SIMATIC → SIMATIC Manager or SIMATIC NCM PC Manager or using the desktop icon of the same name.
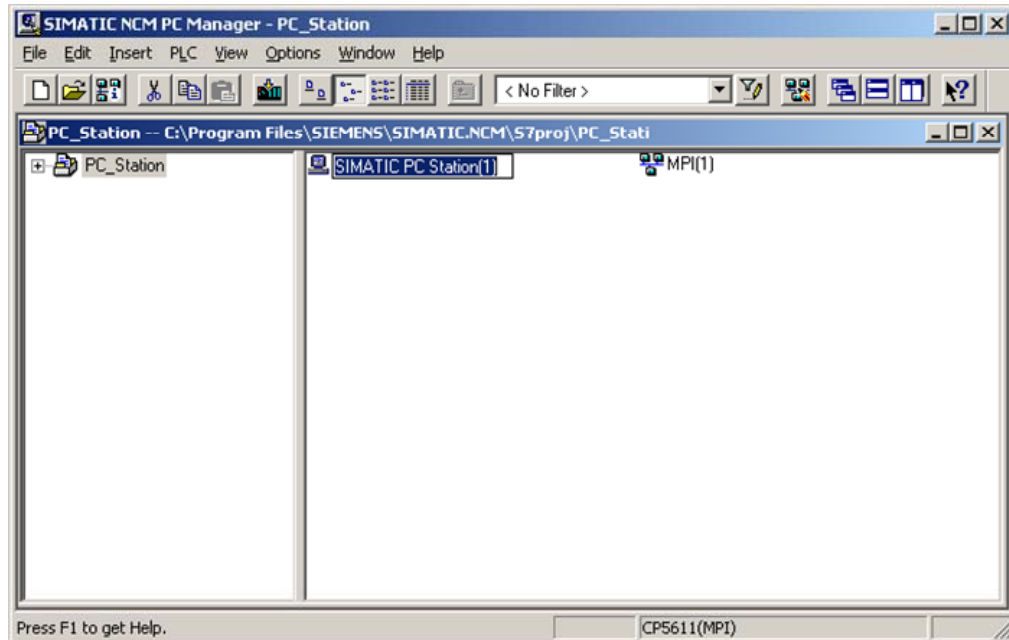
Create a new project with "File → New".
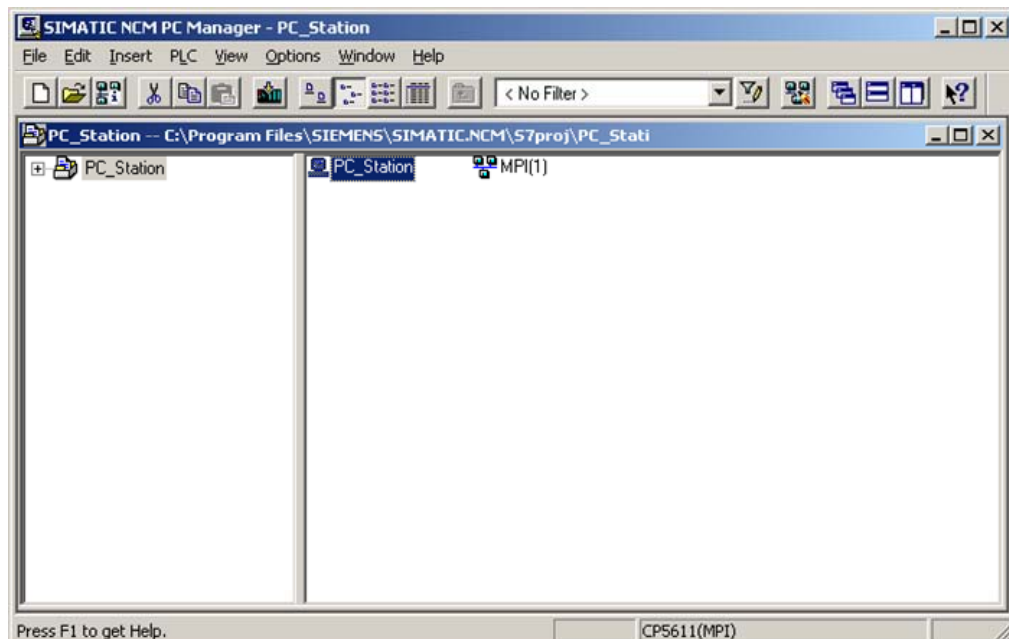
Figure 2-1 giving the project a name
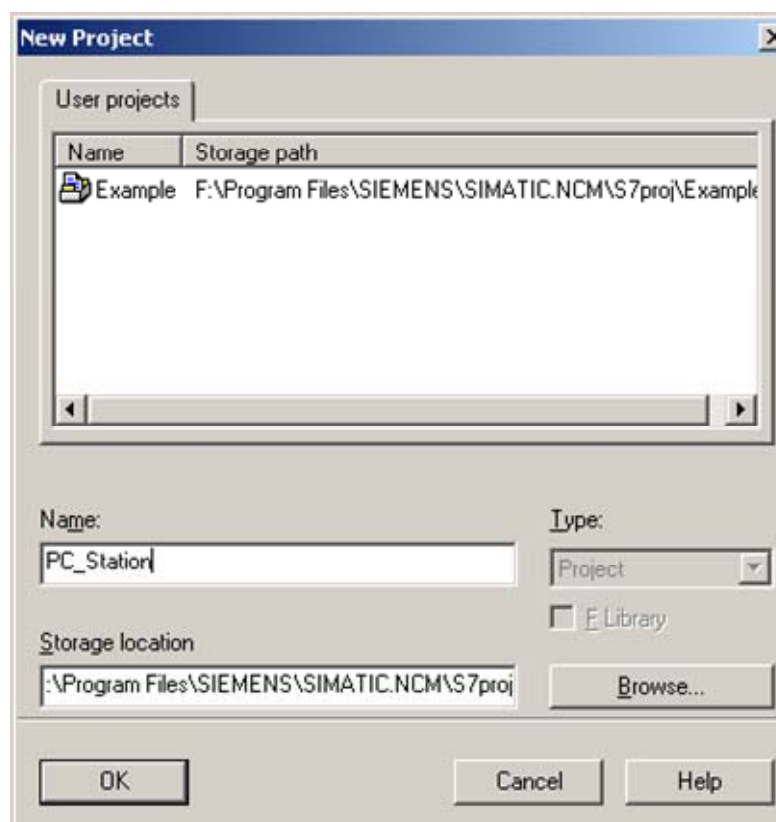
Confirm the project name you have entered (in the example: "PC_Station") with OK. An empty STEP 7 or NCM PC project is then created.

Figure 2-2 inserting the PC station

With the menu command "Insert → Station → SIMATIC PC Station", you insert the PC station.
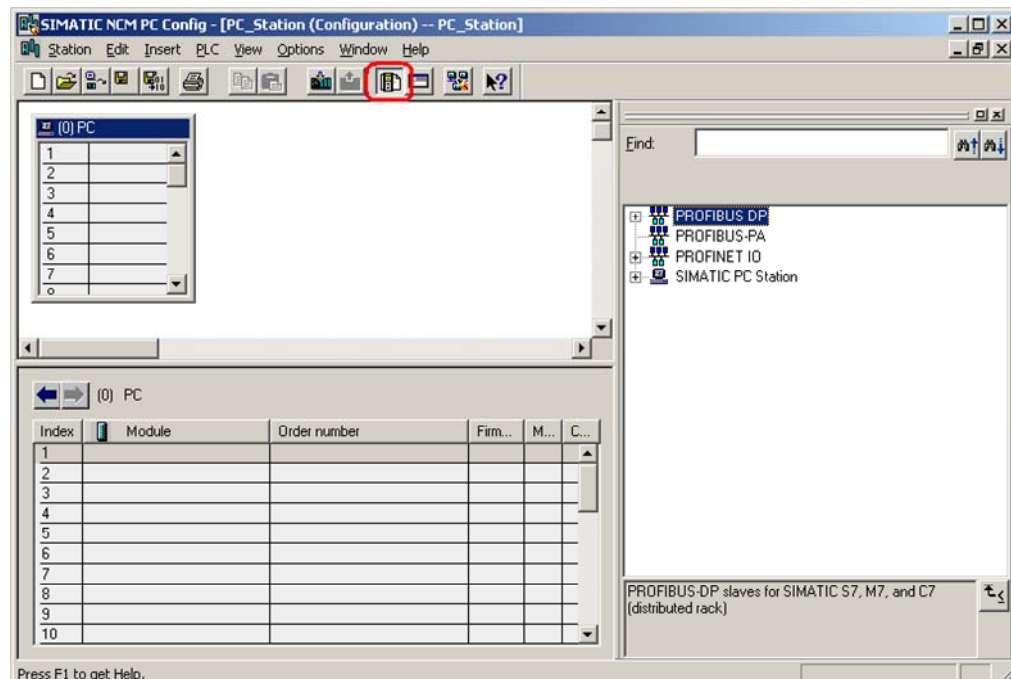
Figure 2-3 changing the name of the PC station

Give the PC station you have just inserted the same name as your computer (in the example: "PC_Station").
Now open the hardware configuration of the PC station by selecting the PC station, then pressing the right mouse button and selecting "Open Project" (STEP 7: "Open Object").
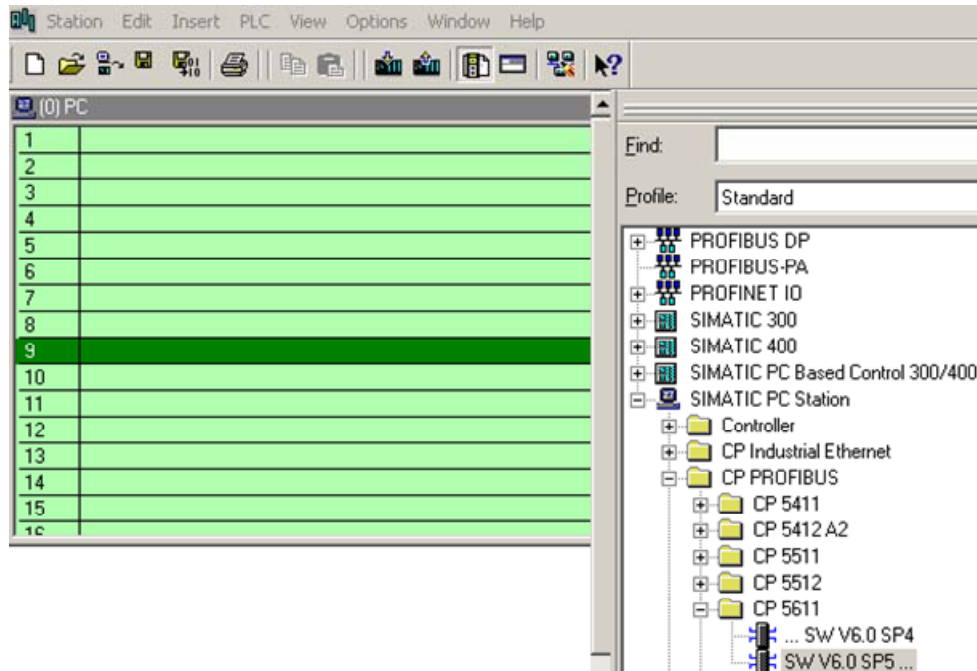
Figure 2-4 hardware configuration of the PC station

You will see an empty rack. If you cannot see the hardware catalog, click on the button marked in red.

Figure 2-5 selecting the modules from the hardware catalog

Now place your PC modules in this rack (for example by dragging them from the hardware catalog).

If you use a CP 5613/14 (A2) or CP5512 and CP5511 respectively, you will select the CP5613/14 (A2) or CP5512 and CP5511 respectively instead of the CP5611.

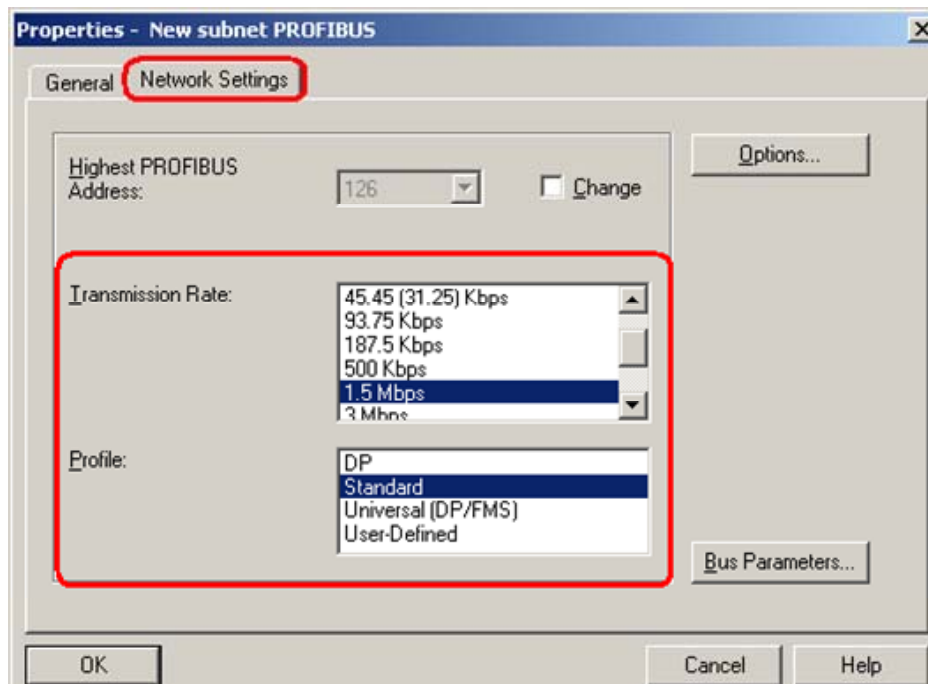If you use a CP5611 A2 or CP5621 you will configure these modules as CP5611.

The following dialog appears automatically after you insert the module in the PC station.

Figure 2-6 address assignment dialog
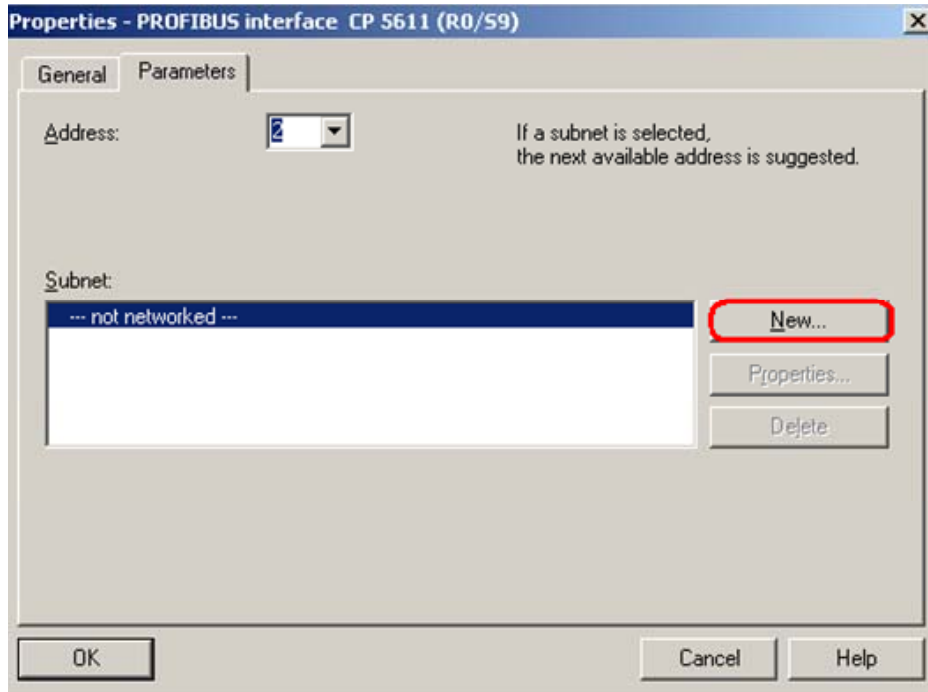
Click the button „New…" to configure a new PROFIBUS subnet.
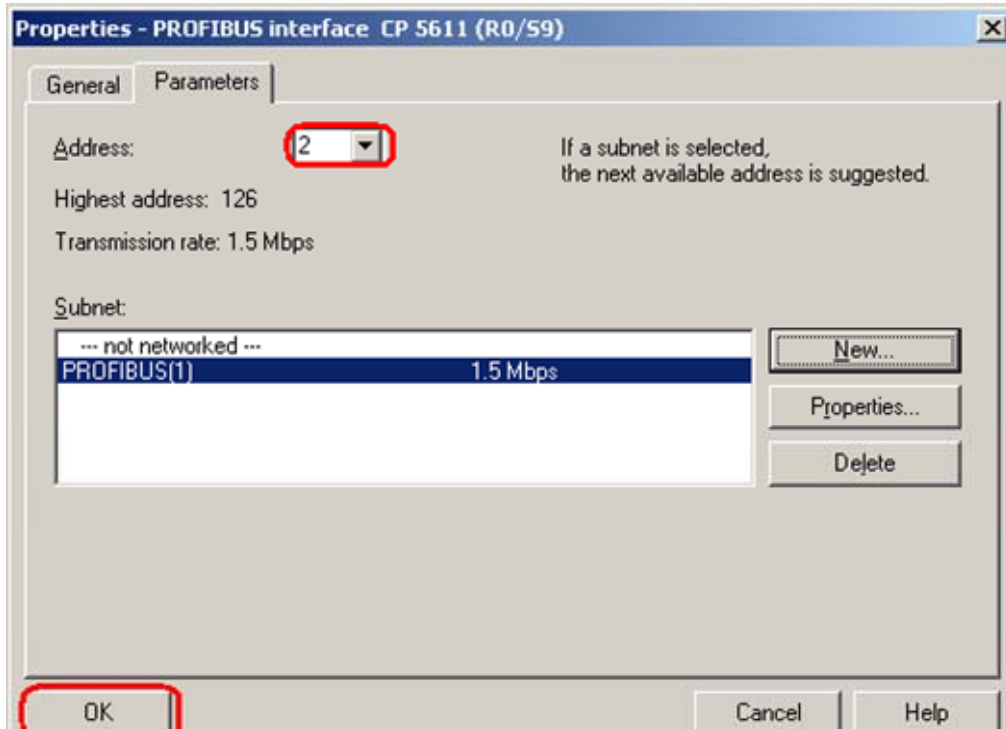
Figure 2-7 property view of the PROFIBUS subnet

Here you set the bus parameters for CP5611. We would recommend that the bus profile „Standard" is used.

If you use a CP5613/14 (A2) we would recommend that the bus profile „DP" is used.

Figure 2-8 address assignment dialog

In this dialog you set the PROFIBUS address of the CP5611. Following select the PROFIBUS subnet which you have just configured. Close the dialog with „OK". So the PROFIBUS subnet is assign to the CP 5611.
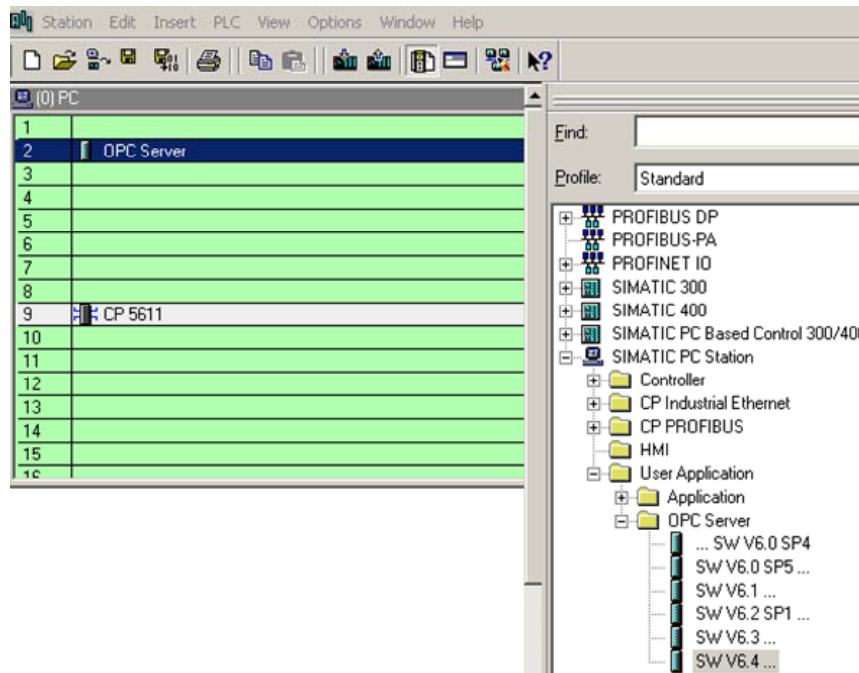
Now the configuration of the module CP5611 is finished. It's networked.

Figure 2-9 hardware configuration – projecting the CP5611
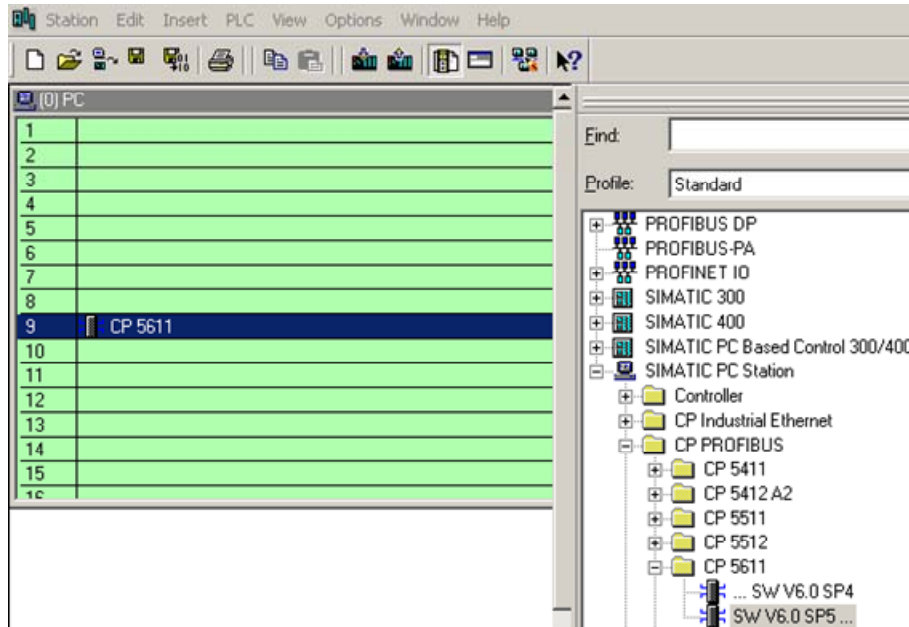
The CP5611 has now been placed in a slot in the rack. You can select any slot. There are no restrictions.

Figure 2-10 configuring the OPC-Server

Select the OPC server in the hardware catalog and then drag it to any slot.

Figure 2-11 symbol to open the NetPro program

Now open the NetPro program. Use the relevant symbol in the toolbar (see Figure 2-11 symbol to open the NetPro program).

In NetPro you configure a S7 connection to exchange data between PC station and S7 station.
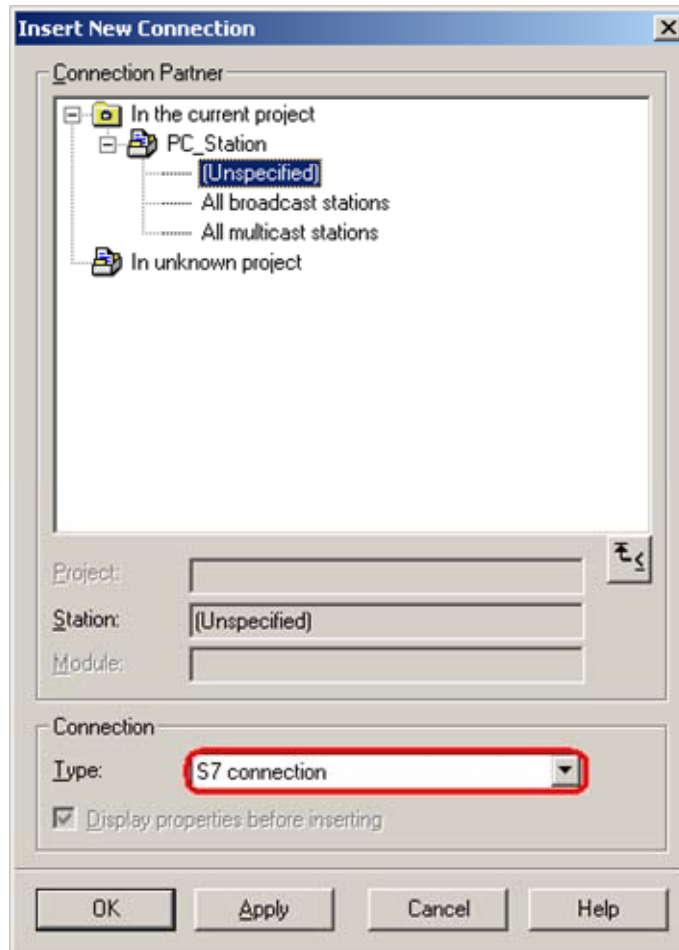
Figure 2-12 configuring S7 connection in NetPro
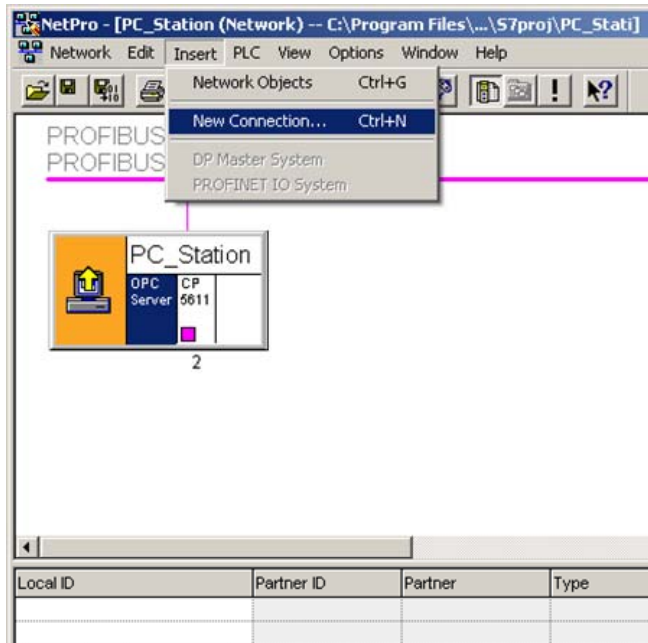
Select the OPC server and use the menu command "Insert → New Connection…" to insert a new connection.

Another possibility is to right-click the OPC server and selecting the menu command „Insert New Connection".

Figure 2-13 dialog „Insert New Connection"

It`s possible to select the communication partner when it is configured in the same S7 project like the PC station. In this case the connection is created automatically. Is the selected communication partner a S7 station, the connection must be downloaded into S7 station.

If the communication partner isn't configured in the same S7 project like the PC station, as in this example, an unspecified S7 connection will be configured. Select "unspecified" for communication partner in the dialog box.
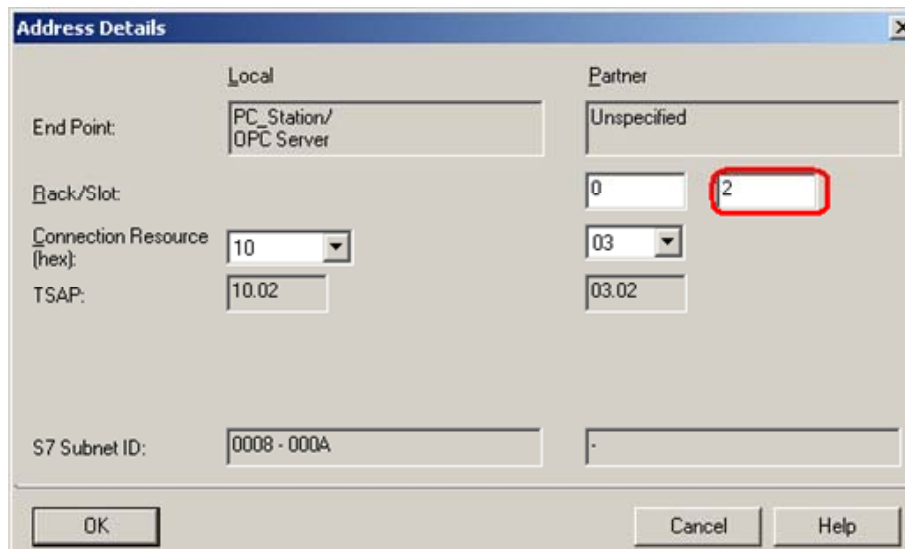
Click the button "Apply". Now the property view of the S7 connection will open.

Figure 2-14 property view of the S7 connection
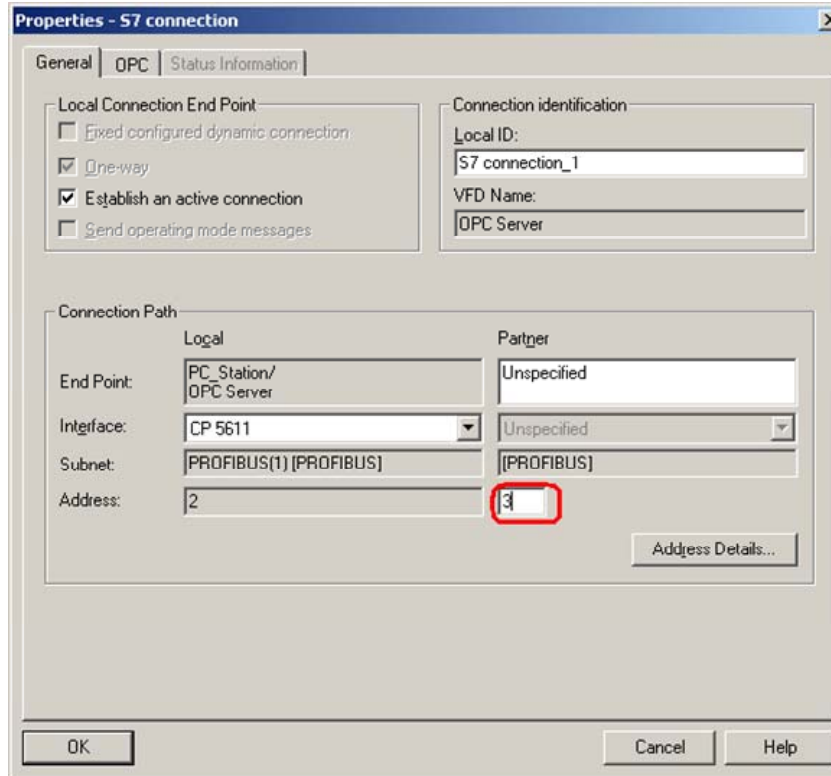
Here you enter the PROFIBUS address of the communication partner. Click the button „Address Details…". The following dialog will open.

Figure 2-15 Address Details of the S7 connection

Enter the slot of the CPU which is used in the SIMATIC S7 partner station. You can find out the slot of the CPU in the STEP 7 project of the SIMATIC S7 partner station (hardware configuration).

Confirm the setting with „OK". Following close the property view of the S7 connection with "OK". You come back to the dialog "Insert New Connection". Click the button "Close" to close this dialog.

If you select the OPC server you will see the S7 connection which you have just insert in the connection table of the PC station.

Figure 2-16 connection table
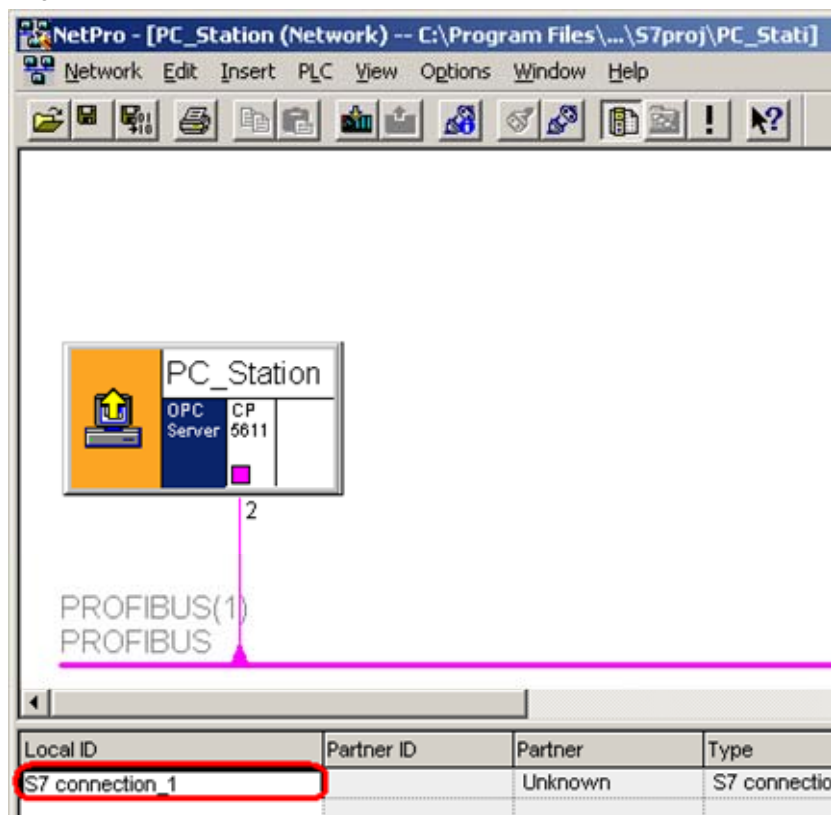
Now the configuration of the S7 connection is finished. You have to save and compile the S7 project. Therefore select the PC station in NetPro and click the button "Save and Compile" in the toolbar. This updates the information in the S7 project.

Figure 2-17 Save and Compile
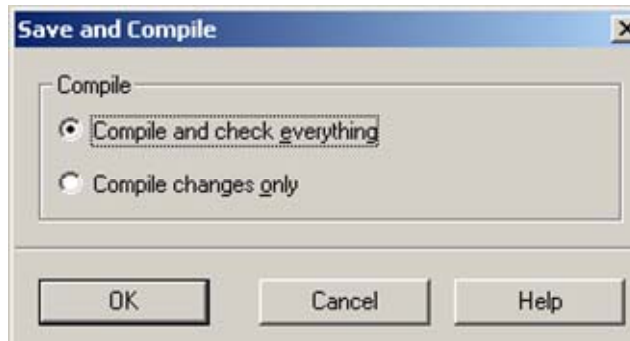
| NOTE	Warning indications can be displayed while proceeding with the "Save and Compile" of a S7 project. Warnings serve as piece of information and have no functional effect. In case error warnings occur, search for possible divergences in the previous steps of the instructions.

2.1 Download the configuration of the PC station

Open the „Station Configuration Editor" in the Windows START Menu →
„Station Configuration Editor" or with the following button in the Windows
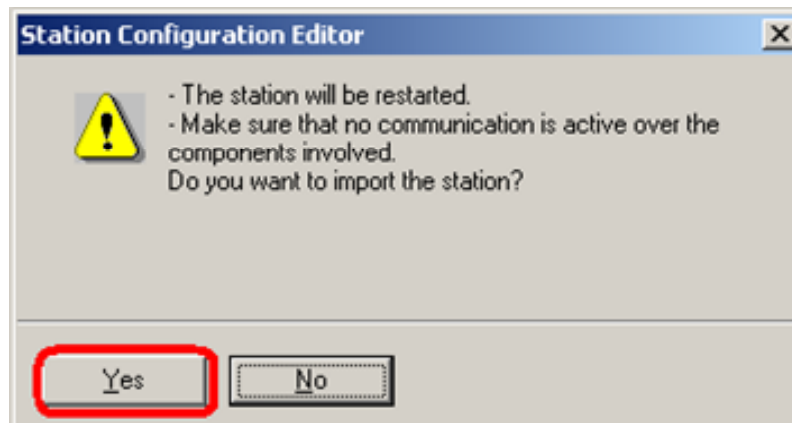task bar.

Figure 2-18 symbol „Station Configuration Editor"

Figure 2-19 Station Configuration Editor
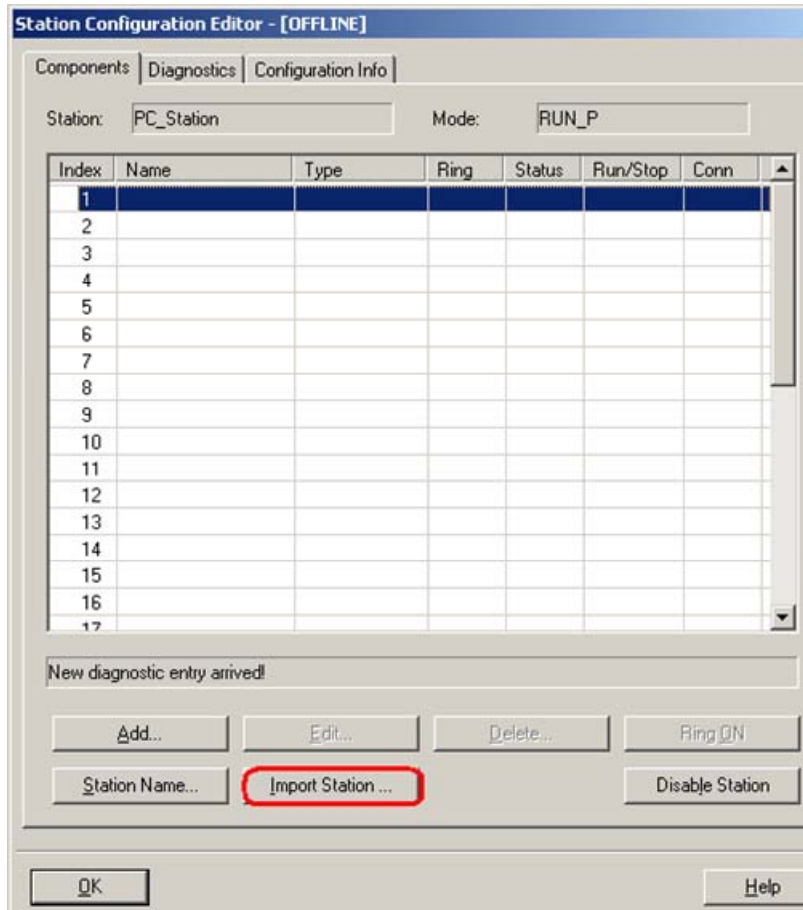
Click the button "Import Station…". The following message about restarting the PC station will open.
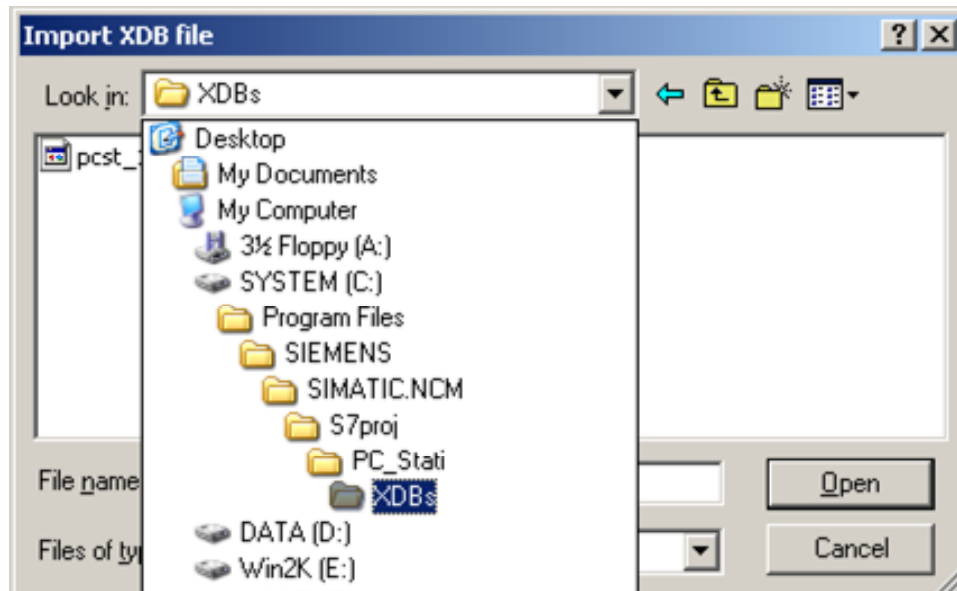
Figure 2-20 message about restarting the PC station

Confirm the message about restarting the PC station with „YES". The following dialog to select the XDB file, which should be import, opens.

Figure 2-21 selecting the XDB file

In this dialog you enter the path of the XDB file. The XDB file is always created in the project by NCM PC / STEP 7 (see Figure 2-1 giving the project a name). With the combo box "Search in:" you navigate in the path of the XDB file.

Figure 2-22 information from the XDB file
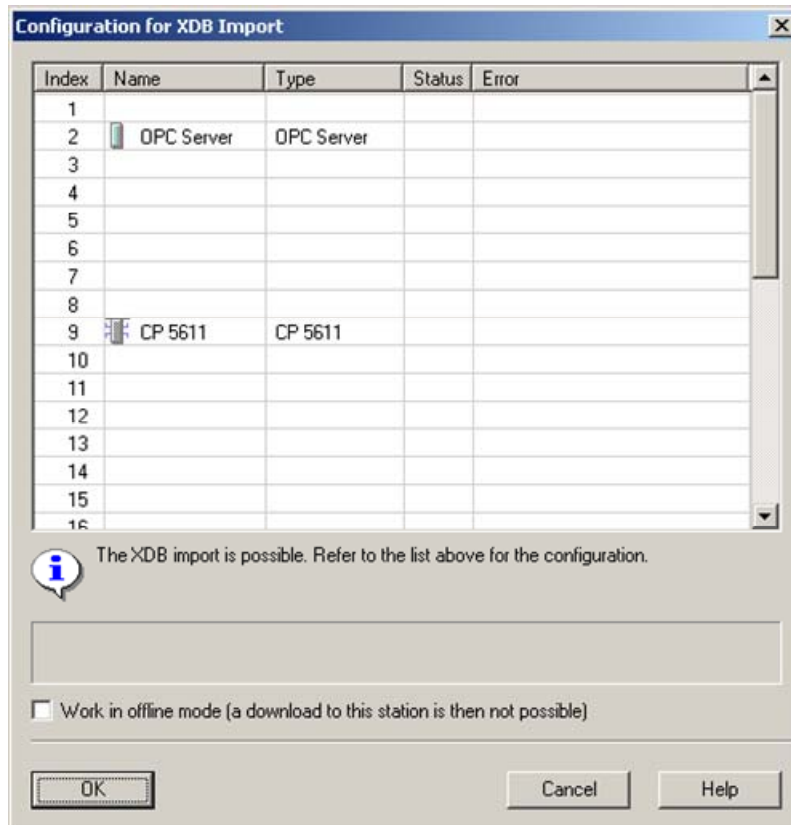
As information you can see once again which modules and applications are configured in the XDB file.

Figure 2-23 PC station is configured
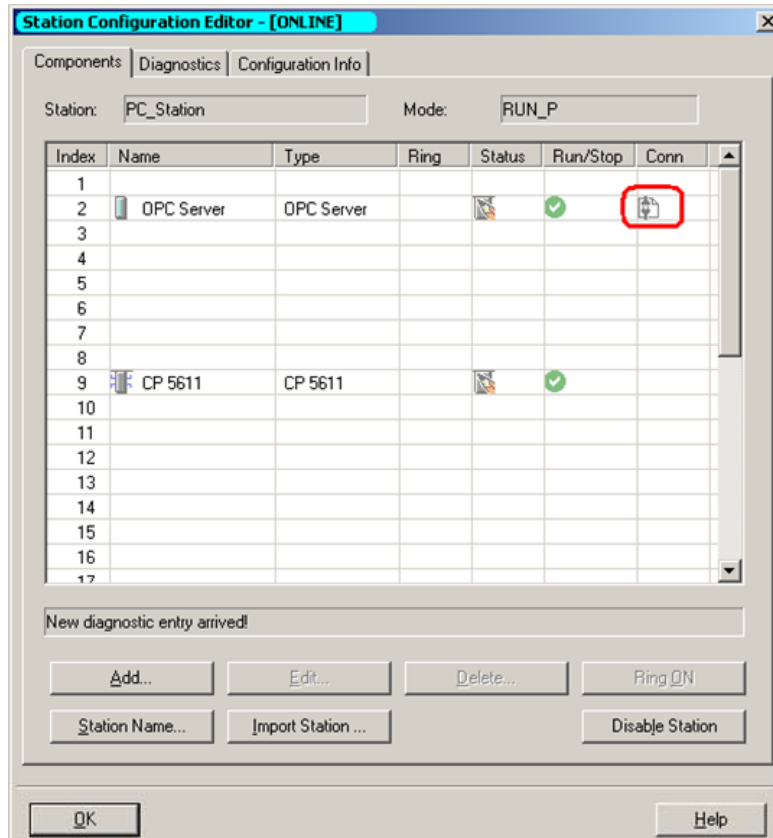
Now the import of the XDB file is finished and the configuration is downloaded.

In the column connection, which is marked red, you see that the connection is also been downloaded.

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3   Starting the OPC-Scout

Start the OPC Scout with "Start → SIMATIC → SIMATIC NET → OPC Scout".

Double-click the „OPC.SimaticNet" for connection with the SIMATIC NET OPC server. In the dialog that appears, enter a suitable group name and confirm this with "OK".

Figure 3-1 connecting with the OPC server and enter a group name
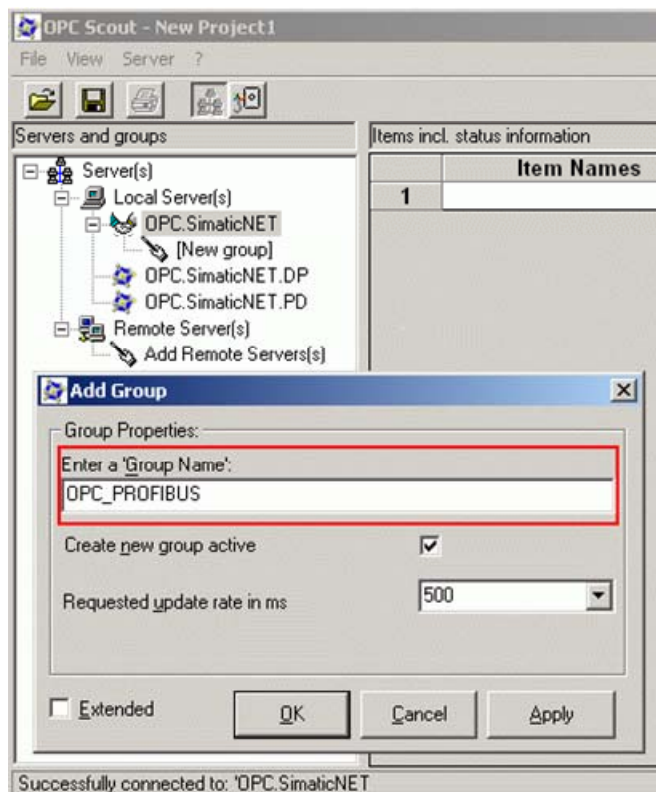
Double-click the OPC group which you have created, The "OPC-Navigator" opens. You will now see your protocols in the OPC Navigator. Double-click on "S7". The connection name you configured in NetPro appears.

Figure 3-2 OPC-Navigator
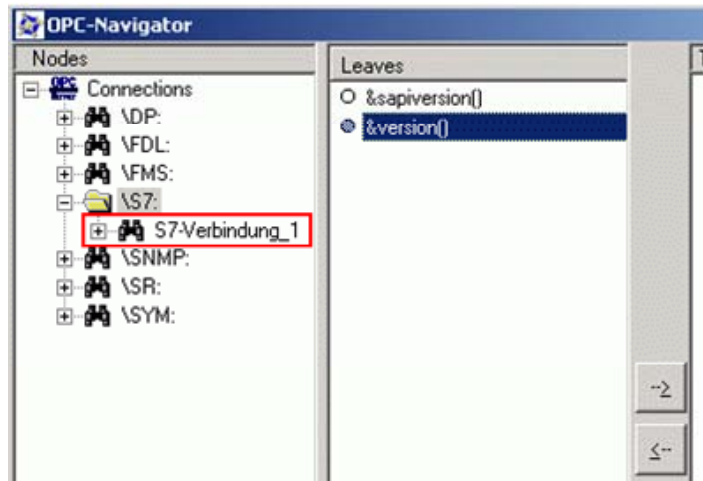
Double-click the connection name of your configured S7 connection. Under "Objects", the tree with the objects that can be accessed appears. If you have downloaded data blocks to the PLC of the S7 station, these will displayed.

Figure 3-3 objects in the OPC-Navigator
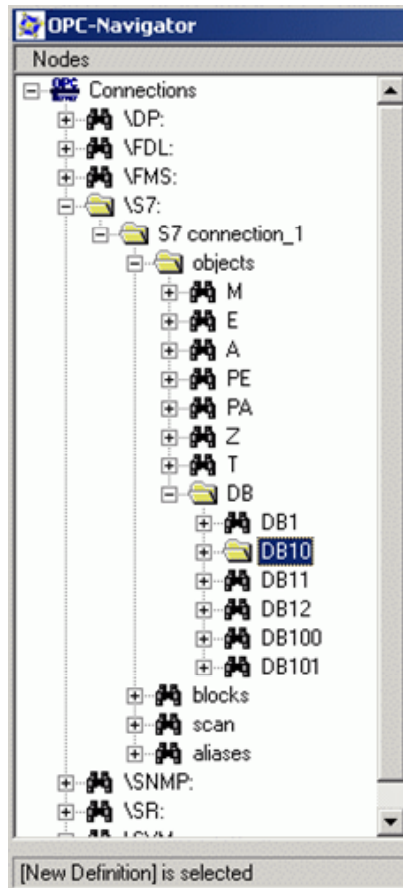
Double-click on a DB to create a variable. If the DB is crossed though in red, this is ok. You will find more detailed explanation of this behaviour in SIMATIC Technical Support on the Internet under the following entry:

http://support.automation.siemens.com/WW/view/en/8763769

To create an OPC item double-click on „New Definition". A new window appears in which you can define various variables and data types.

Figure 3-4 defining new OPC items in the OPC-Scout
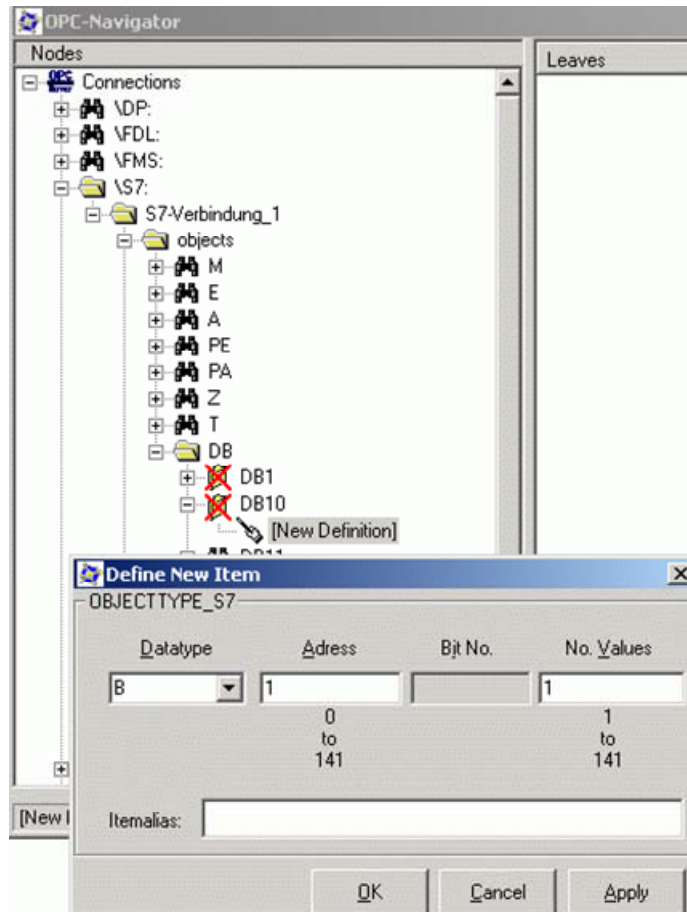
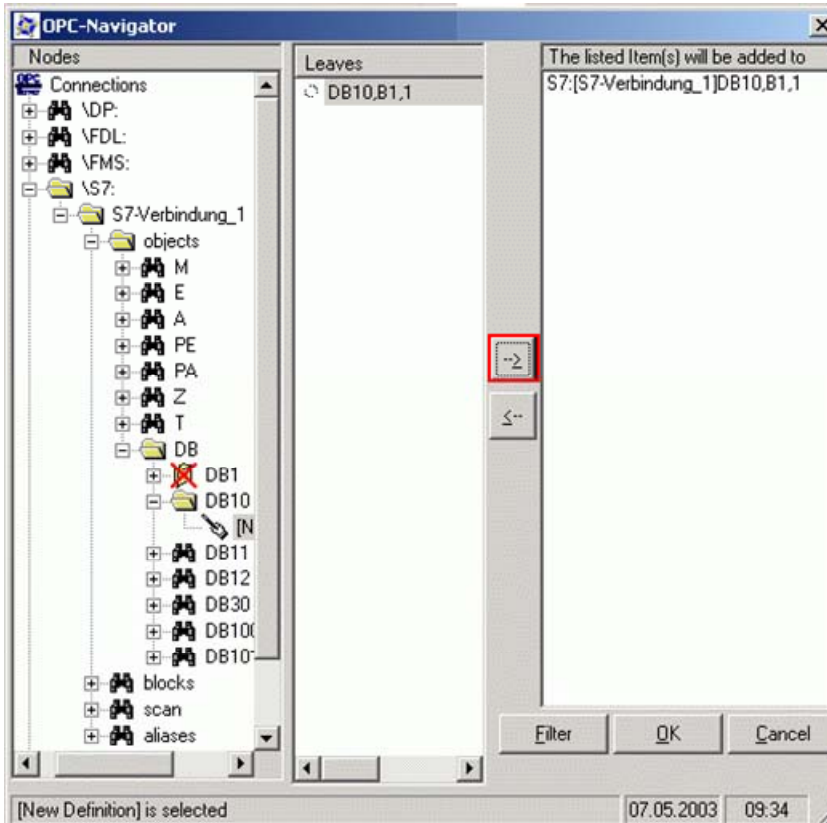In this example the 2nd Byte in data block DB10 will be accessed.

The syntax for DB is:
S7:[<connectionname>]DB<no>,{<type>}<address>{,<quantity>}

Now click the button "OK". The item is in the central area of the window.
Click the button "$\rightarrow$" to move the item to the right-hand column.
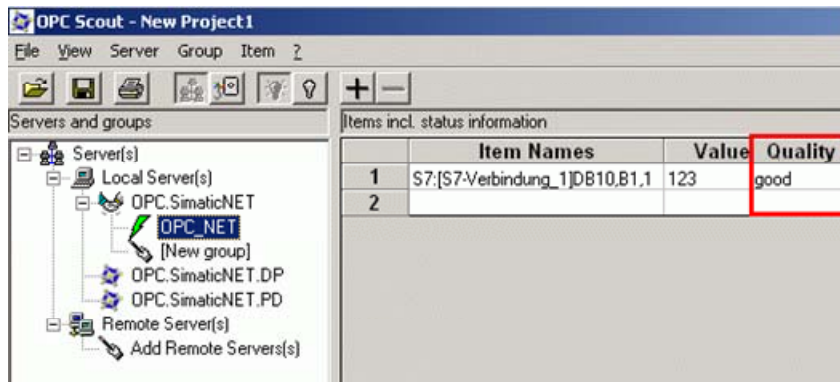
Figure 3-5 adding the new defined OPC item

Confirm the dialog with „OK" to add the new defined OPC item in the OPC Scout.

If the quality is good your connection is established and it is possible to read and write respectively the OPC items.
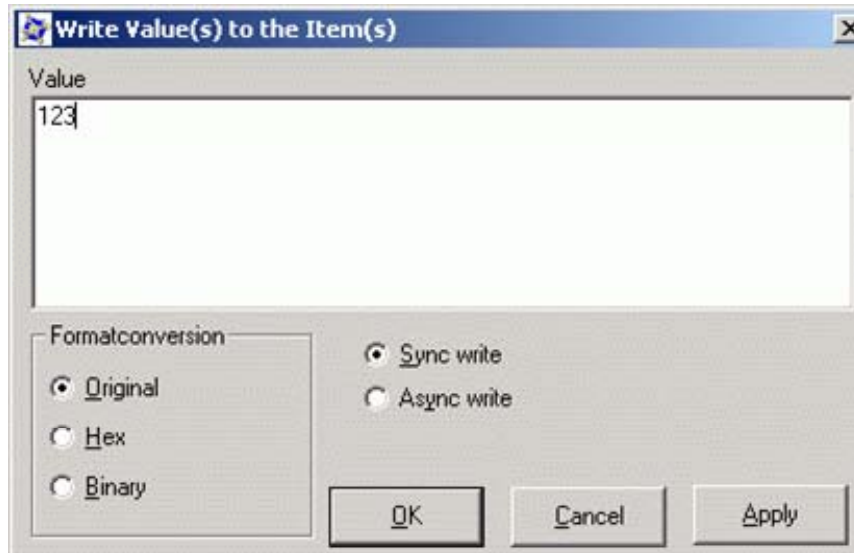
Figure 3-6 OPC-Scout

Double-click on the box of the value to write values into the PLC of the S7-Station.

Figure 3-7 writing values

4 History

Version	Date	Changes
V 1.0	09.04.2008	First Issue