Tech Note 303

Setting Up an MPI Connection with Siemens SIMATIC NET 6.0 Software Using a CP5611 Profibus Card and an S7-400 PLC (CPU 413-1)

Topic: 001110
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This *Tech Note* outlines how to set up an MPI connection with Siemens SIMATIC NET 6.0 software using a CP5611 Profibus Card and an S7-400 PLC (CPU 413-1).

Before You Get started, Please Do the Following:

1. Install the Siemens CP5611 adapter card part number (6GK15611AM00 - CP5611 + MPI-cable) on your pc.
The following are part numbers for the CP5611 separately:

6GK1561-1AA00 - SIMATIC NET, PB, CP 5611 PCI CARD (32 BIT) FOR CONNECTION OF A PG OR PC WITH PCI BUS TO PROFIBUS OR MPI
6GK1561-1AM00 - SIMATIC NET, PB, CP 5611-MPI CONS. OF: PCI CARD CP 5611 (32BIT) F. CONN. OF PC/PG WITH PCI BUS TO PROFIBUS OR MPI INCL. MPI CABLE, 5 M

2. Install the Siemens SIMATIC NET 6.0 Software + SP2 or higher.

3. Install the MPI cable (Connect it from the CP5611 adapter card to the MPI port on the CPU of the S7.) Siemens part number (6ES7901-0BF00-0AA0).

4. Install the Wonderware Siemens S7 I/O Server version 7,5,0,11.

5. Make sure that the S7 Plc is connected via the MPI cable to the pc and is in **Run** mode.

Starting a new Project with SIMATIC Manager

1. Click on **File/New** from the SIMATIC Manager main menu.

The following screen appears:

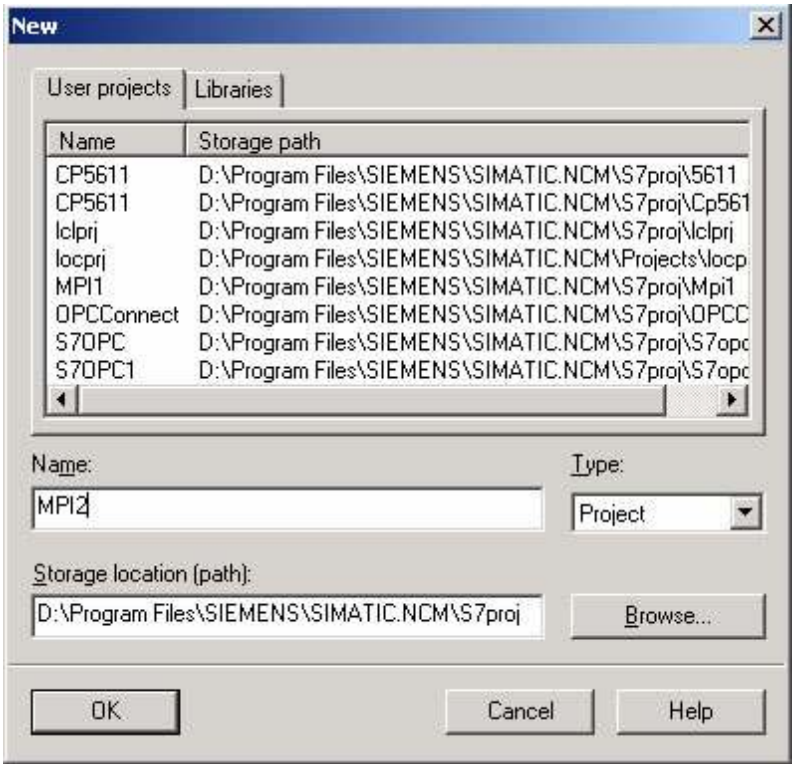

FIGURE 1: NEW PROJECT

Note On your desktop, you should see an ICON like the following: SIMATIC NCM PC Manager.lnk. It might read **SIMATIC Manager**. You can also double-click on the icon to start a new project.

2. Enter a project name in the **Name:** box and click **OK**. In the above example, **MPI2** was used.

The following Project is now created:

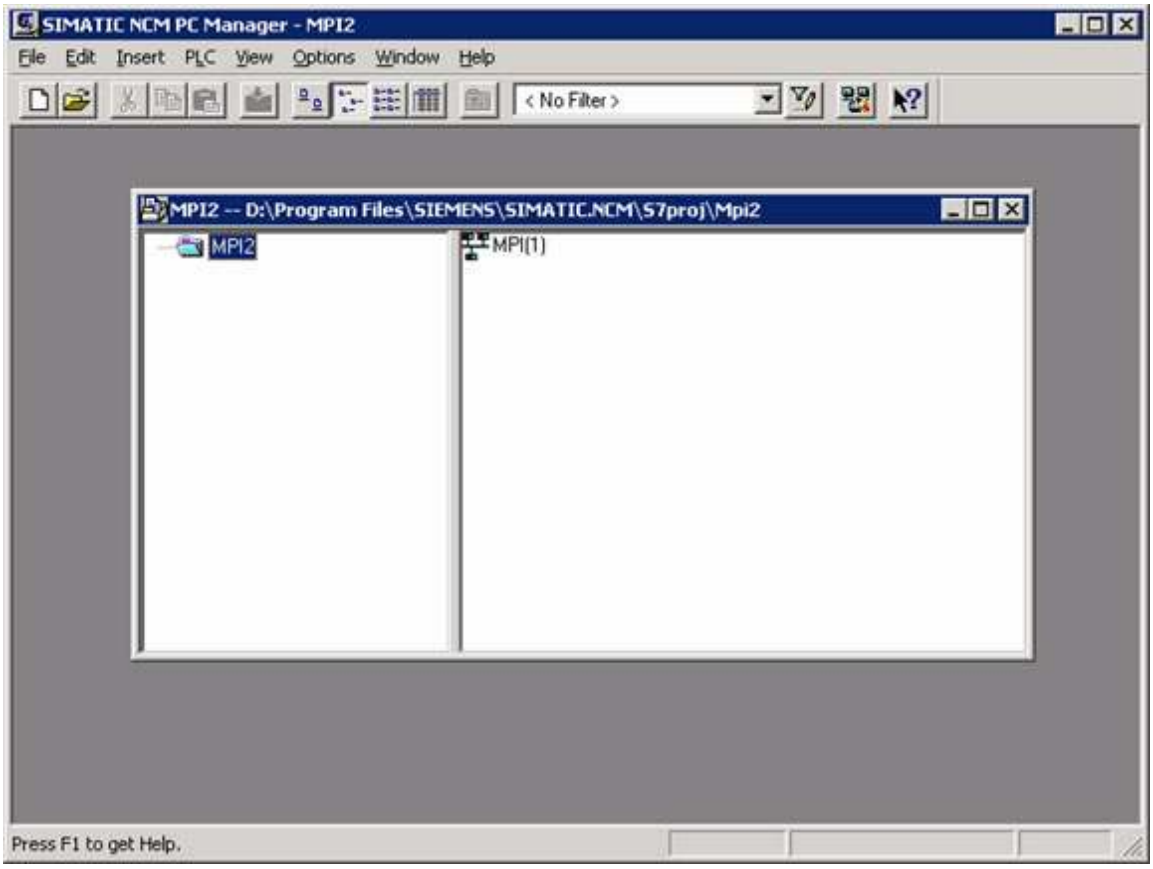

FIGURE 2: NEW PROJECT

3. Select **Insert/Station/SIMATIC PC Station** (see following figure) from the main menu:

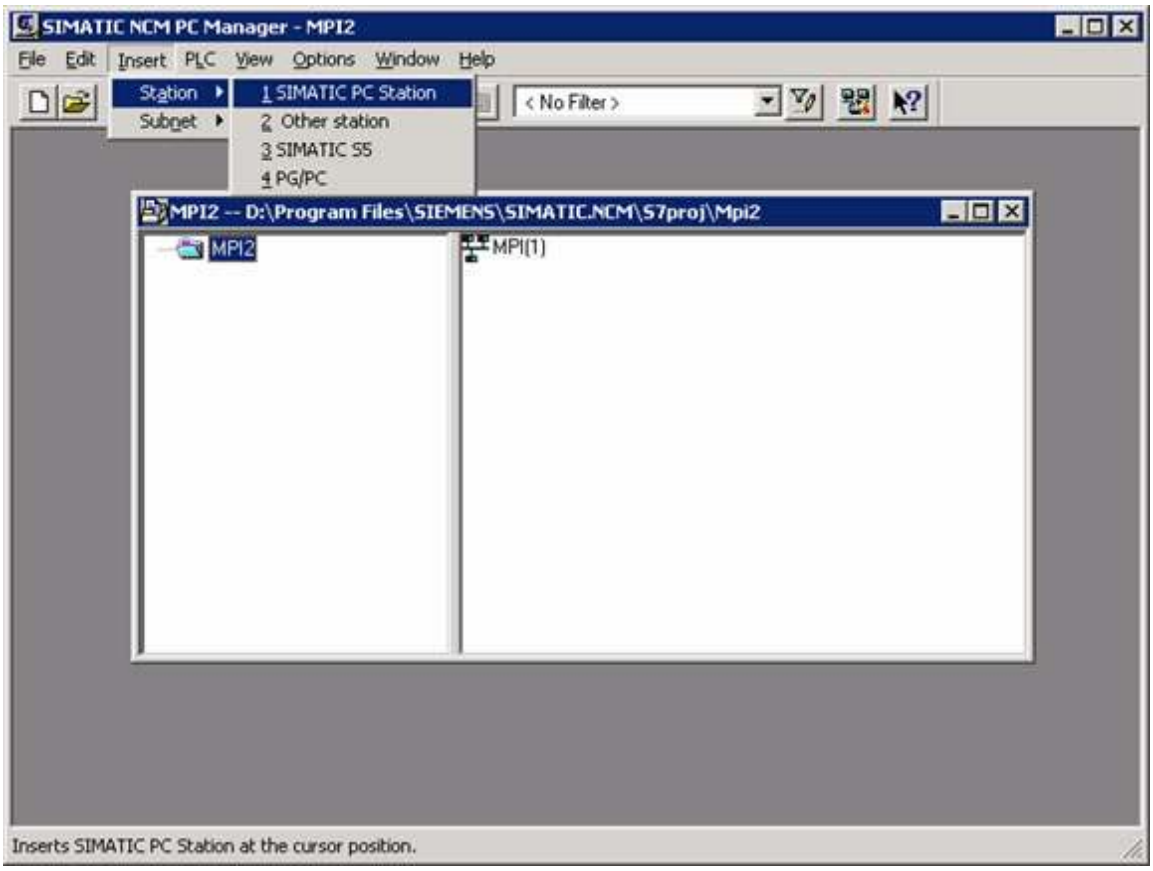

FIGURE 3: INSERT...PC STATION

4.Highlight **SIMATIC PC Station**, right-click, and select **Rename**. Enter **PCStation** (following figures) as the new name:

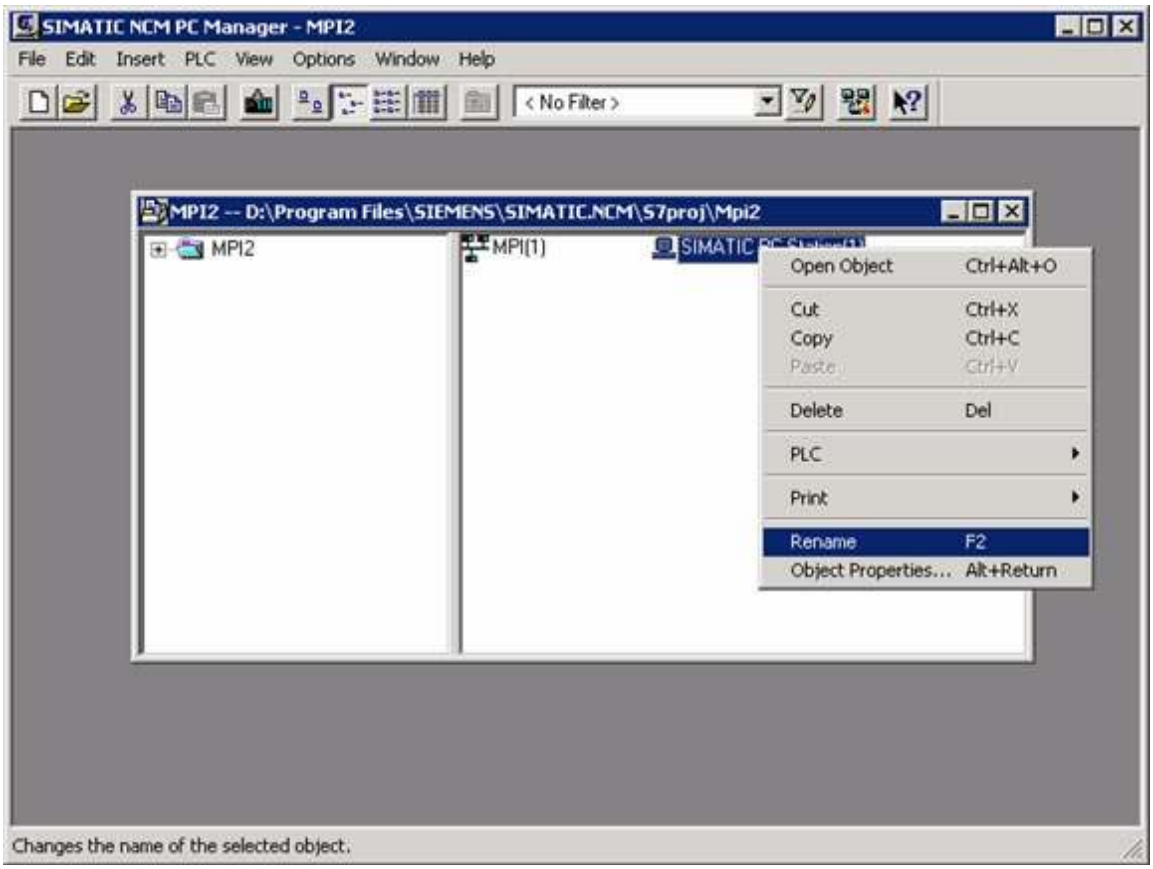

FIGURE 4: RENAME

Note The PCStation name MUST must match up with the name in the Station Configuration Editor (see **Figure 51**).

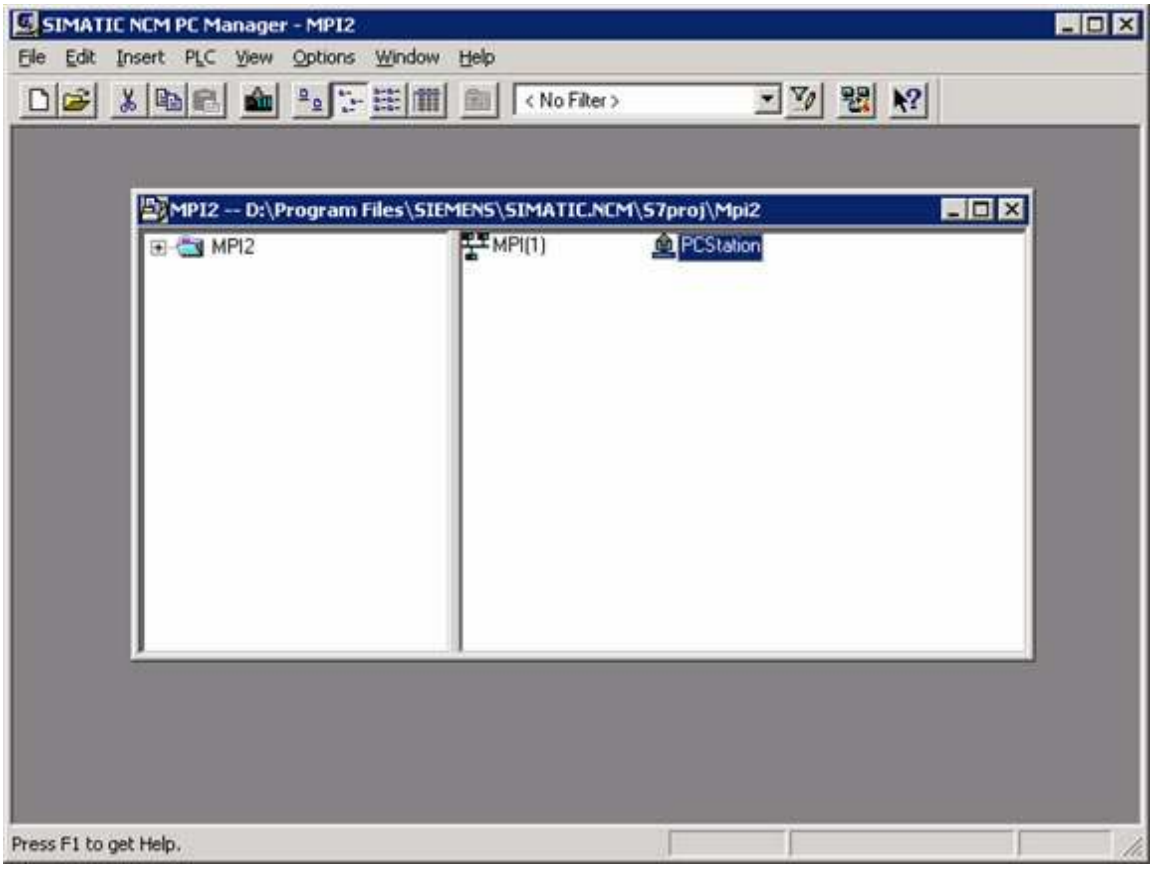

FIGURE 5: PCSTATION

5. Highlight and expand the **MPI2** icon. The following window appears:

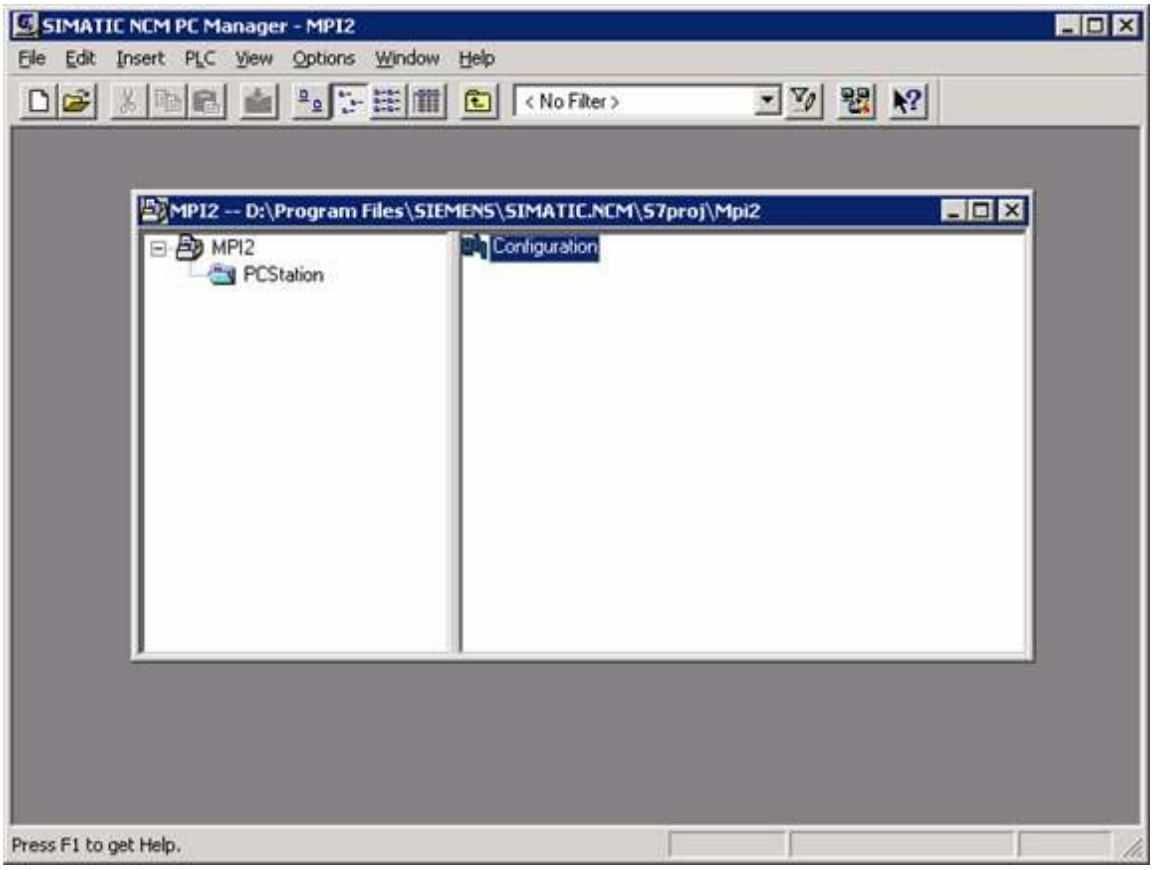

FIGURE 6: CONFIGURATION ICON

6. Double-click the **Configuration** Icon in the right pane of the above figure to open up the SIMATIC Manager PC Config screen. This enables the **PCStation** setup.

Setting up the PCStation in the SIMATIC Manager PC Config Screen

The following window should now be visible:

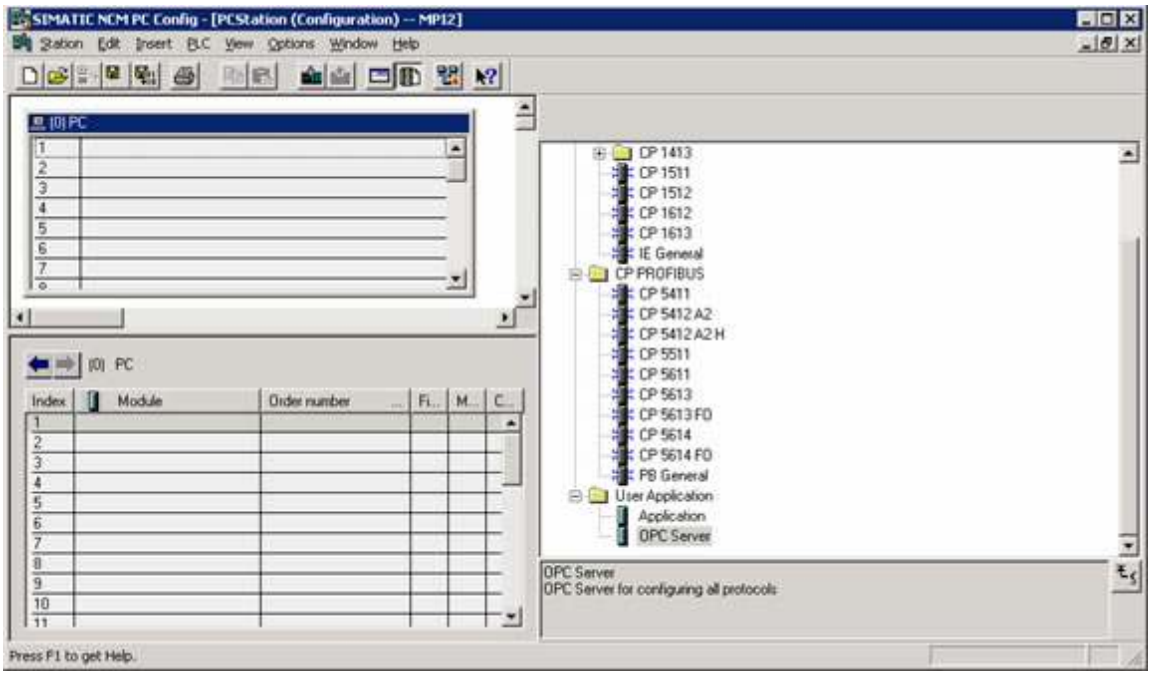

FIGURE 7: PCCONFIGURATION WINDOW

1. Add the **Application** component of the **PCStation** by selecting it in the right hand pane of the PC Config window. In the previous figure, it appears under **User Application**. Drag it over to the the top left box labeled **(0) PC**, and drop in the first line in order to configure the **Application** component as Index **1** (see following figure):

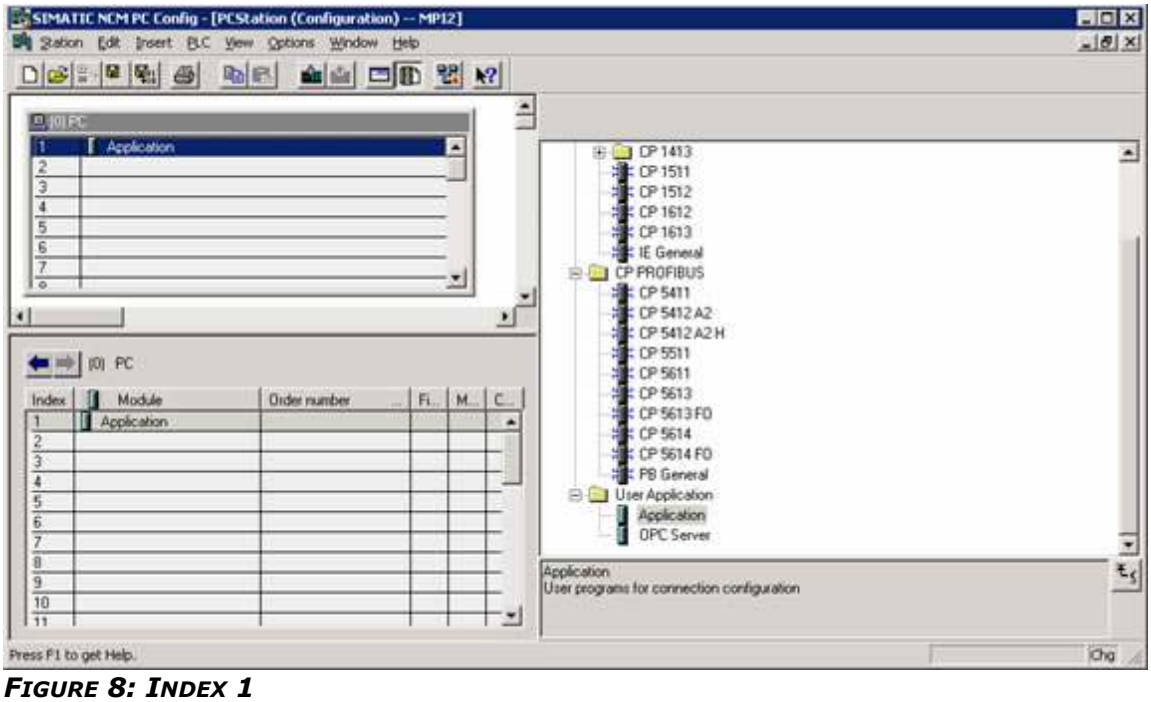

FIGURE 8: INDEX 1

2. Select the **CP 5611** module (under the **CP Profibus** folder), and drag it to the second line of the

(0) PC box. This creates **Index 2** for the **CP5611** component in the **PCStation** (see following figure):

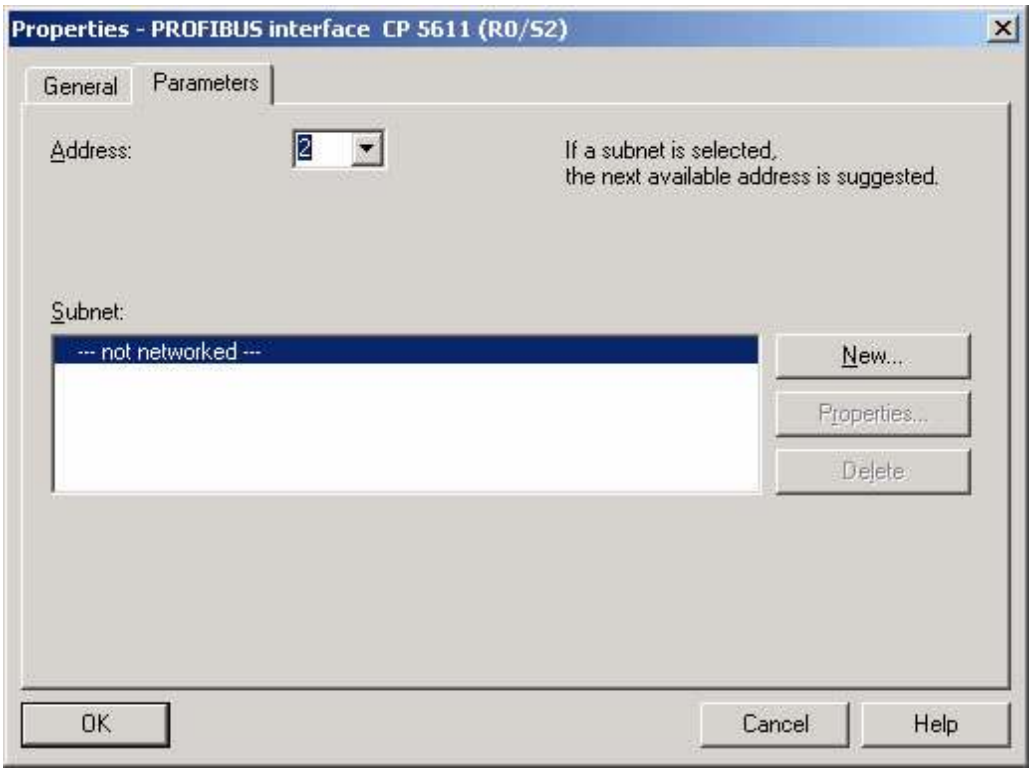

FIGURE 9: CP 5611 (RO/S2) DIALOG BOX

3. Click **OK**. The following figure shows the CP 5611 in index 2:

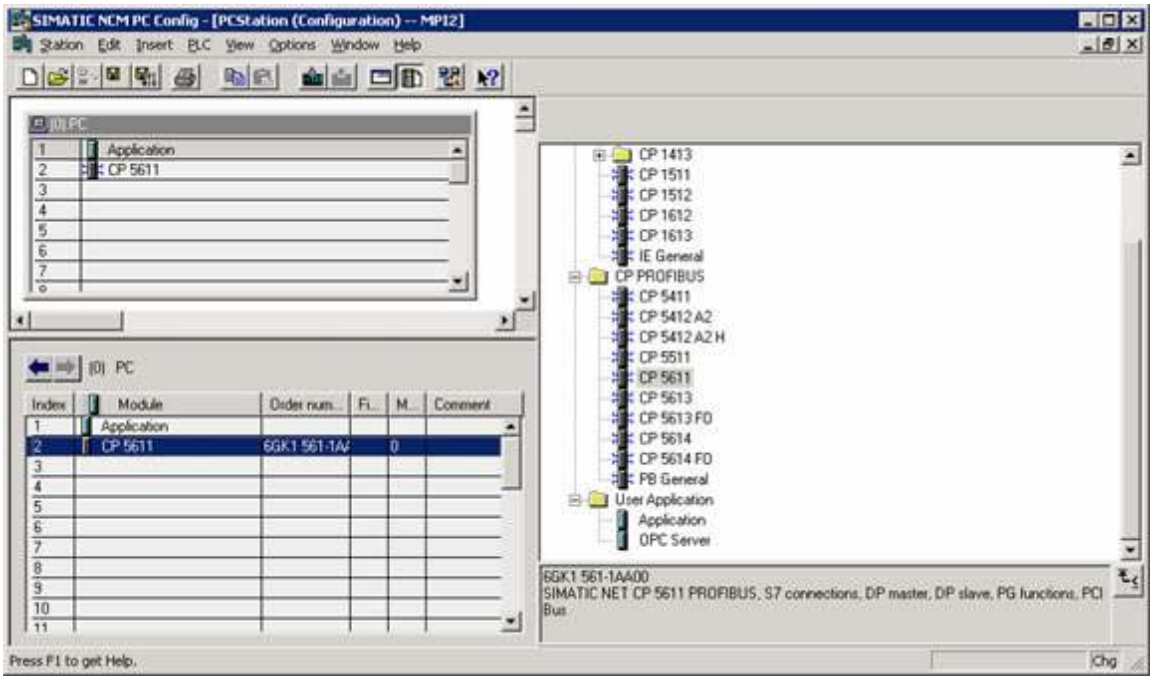

FIGURE 10: ITEM 2 - CP5611

4. Double click the **CP5611** module that you just added to Index 2. The following dialog box appears:

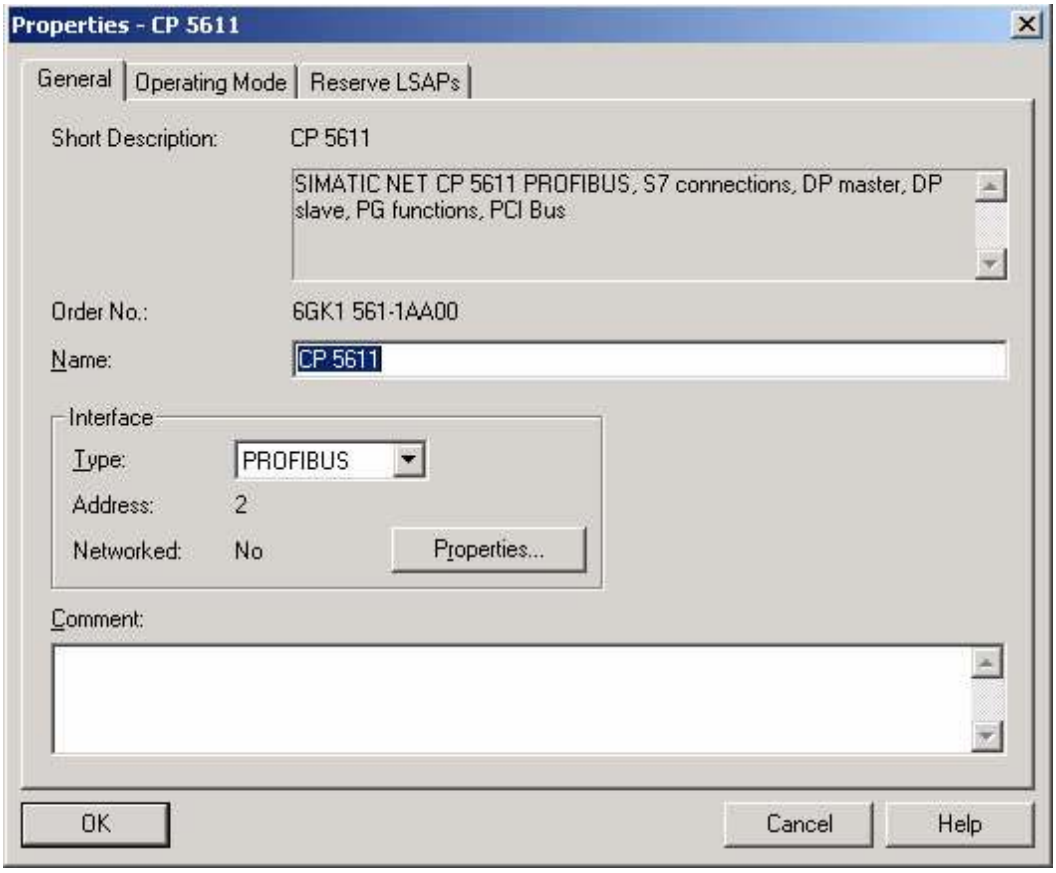

FIGURE 11: SELECT INTERFACE TYPE: DIALOG

5. In the **Interface Type:** area (shown above), open the **Type:** drop-down list and select **MPI**.

6. Click **OK**. The following message appears:

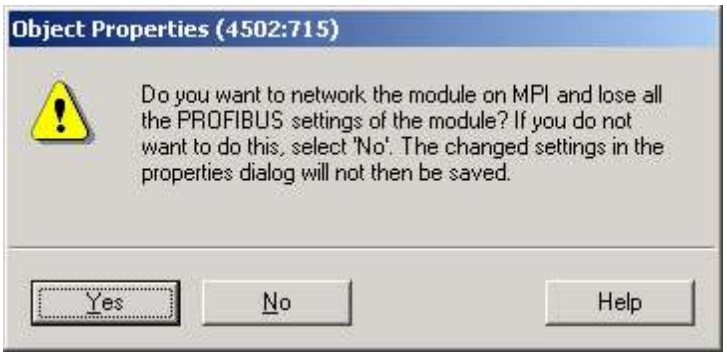

FIGURE 12: OBJECT PROPERTIES MESSAGE

7. Click **Yes**. The **Properties - CP 5611** dialog box reappears.

8. Click **Properties** (see following figure):

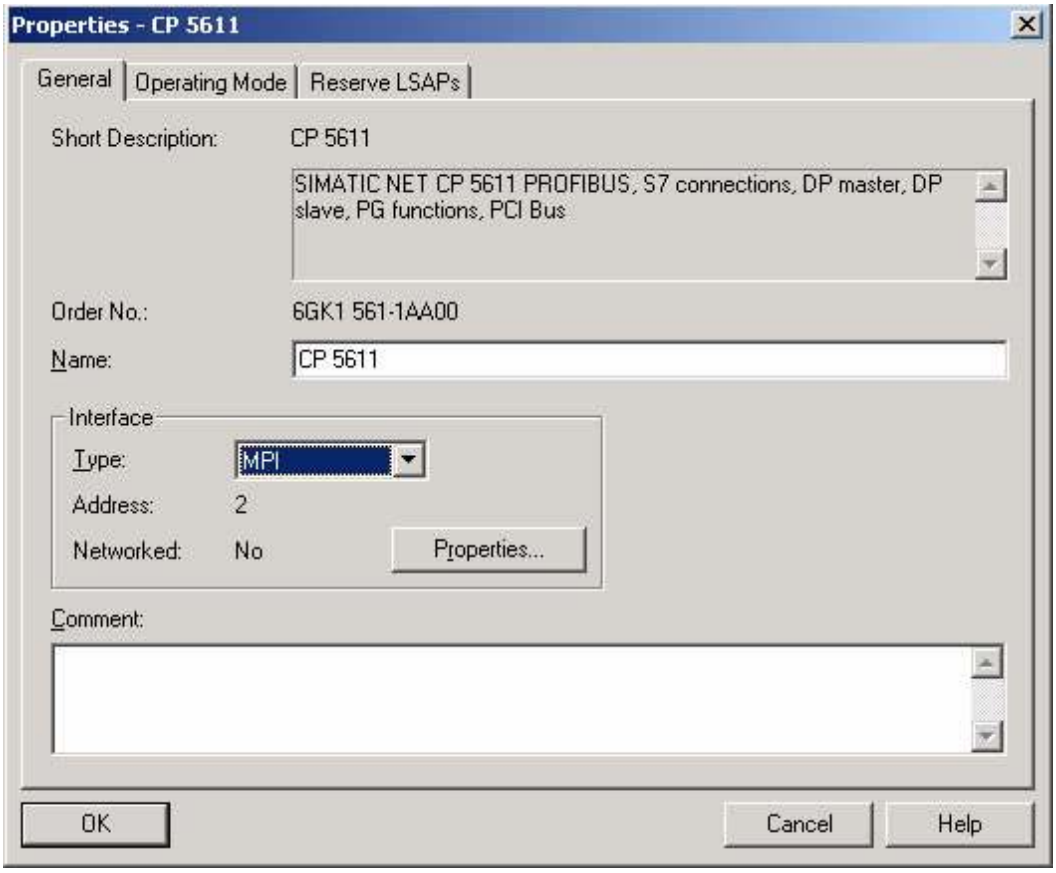

FIGURE 13: PROPERTIES - CP 5611 DIALOG BOX

The **MPI interface** dialog box appears (following figure):

9. Click **New** (following figure):

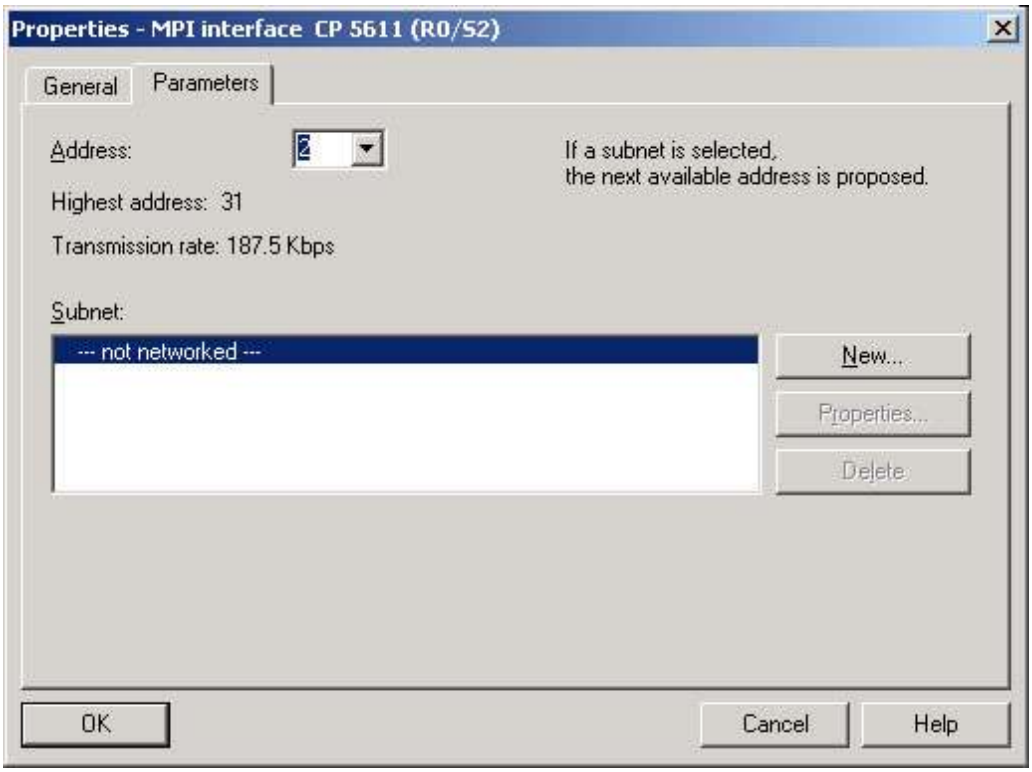

FIGURE 14: NEW INTERFACE SETTING (CAPTION)

Note We will change the Bus address to correspond to the actual Bus address of the CP5611 card

in a subsequent step.

The **New subnet MPI** dialog box appears:

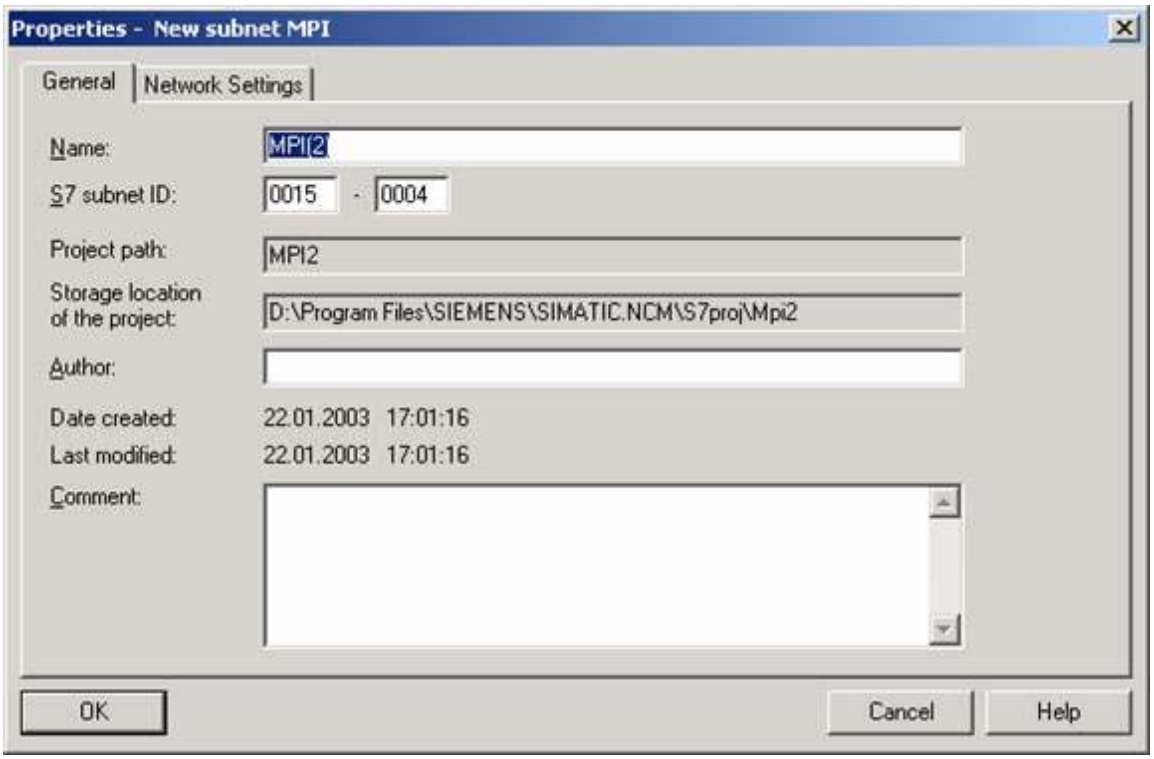

FIGURE 15: MPI CONFIGURATION

10. Select the **Network Settings** tab (see following figure):

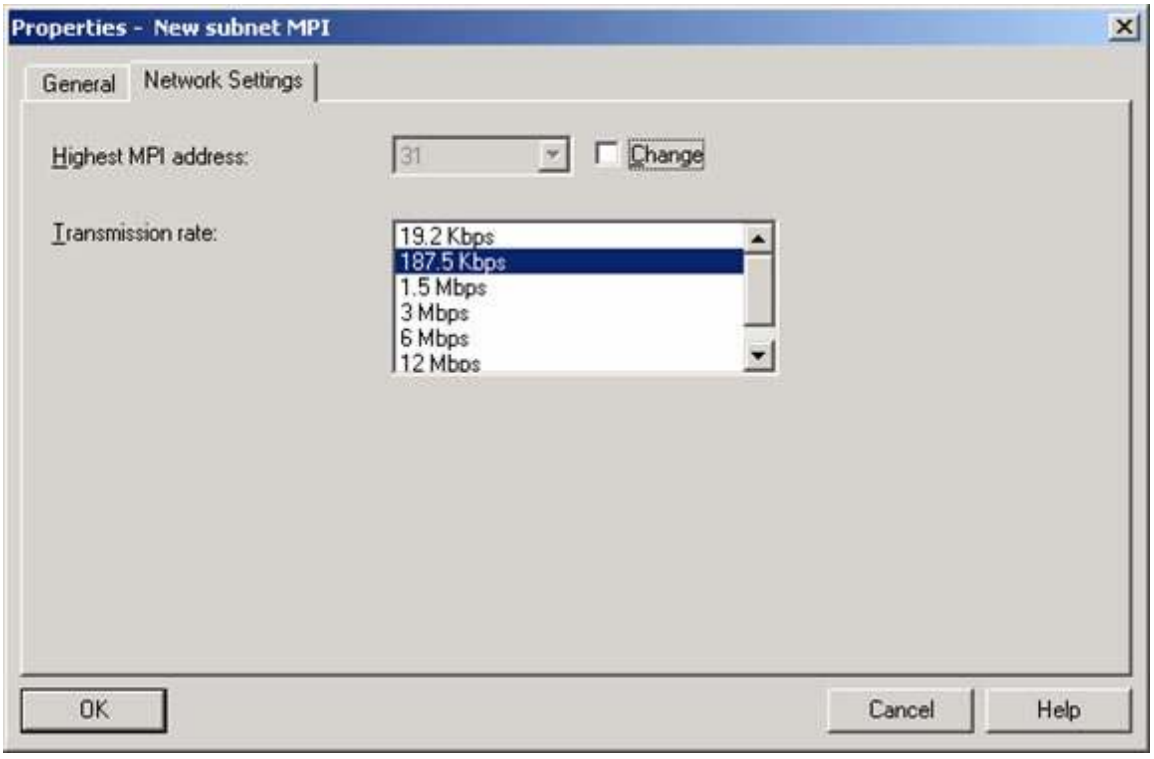

FIGURE 16: PROPERTIES/NETWORK SETTINGS TAB

11. Select the **Transmission rate:**. For this test, **187.5 kbps** is selected.

Note Your MPI Cable should have the baud rate printed on it.

12. Click **OK**.

Note The correct address of the CP5611 adapter card MUST be selected for the MPI interface. In this example, it is 0. Settings are configured and verified from within the **Configuration Console**. **MPI Bus** addresses are verified by running **Start/Simatic/SIMATIC NET/ Settings/Configuration Console:** (if the Wizard appears, click **Cancel** to return to the Configuration Console window). The following figure shows the Configuration Console screen: node **0** is the **CP5611** adapter card, and the CPU is **3**:

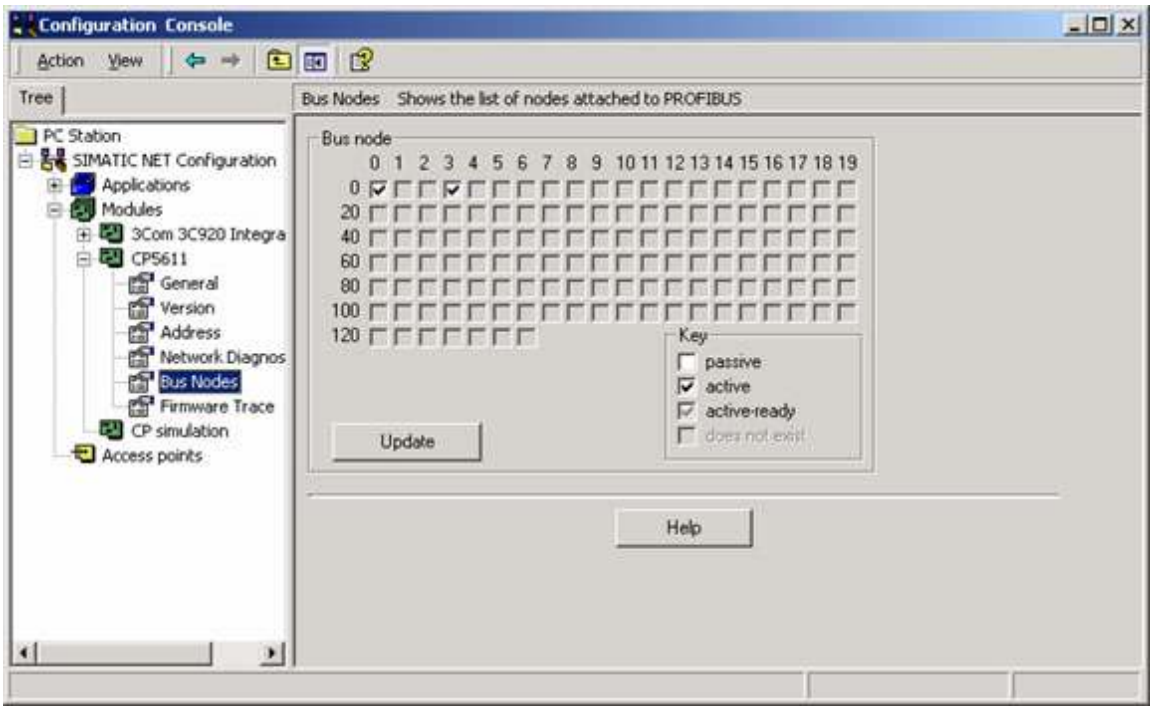

FIGURE 17: CONFIGURATION CONSOLE INTERFACE

13. Next, select the correct address of the **CP5611** in the **Properties - MPI interface** dialog:

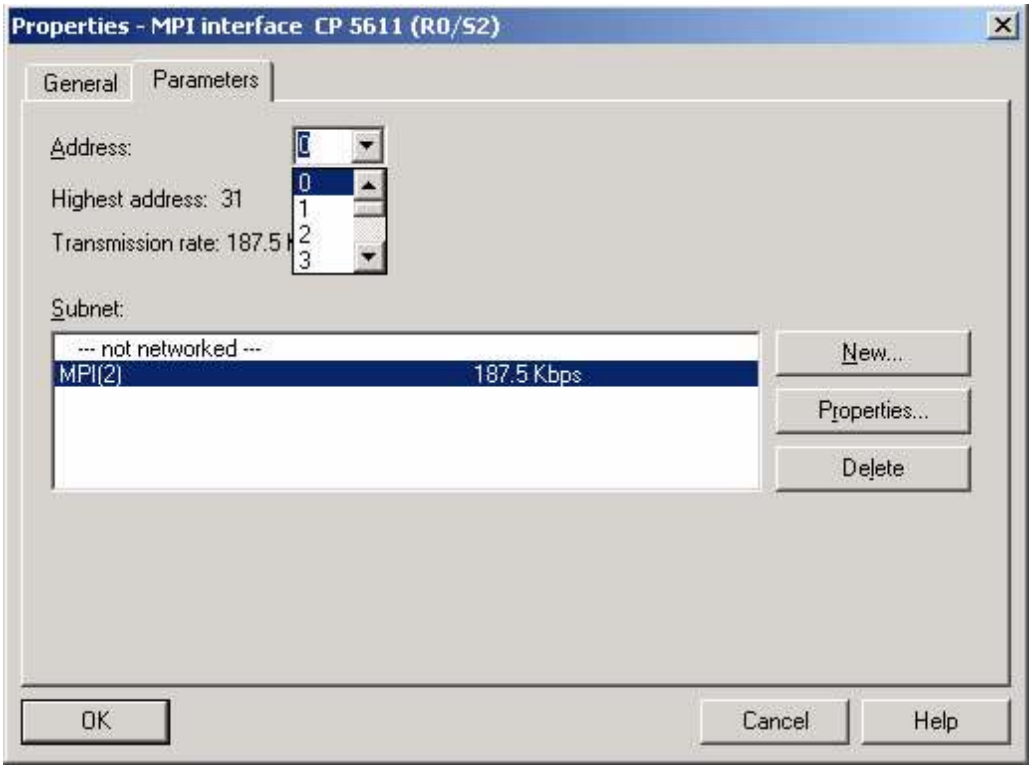

FIGURE 18: ADDRESS LIST

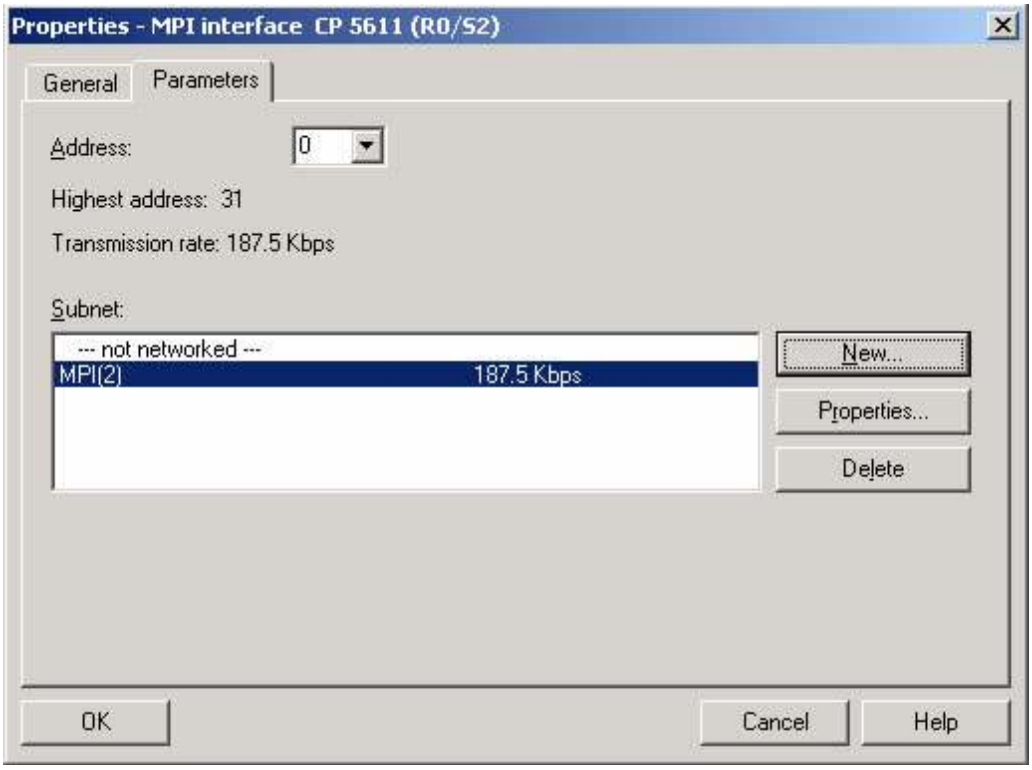

FIGURE 19: ADDRESS SELECTED

14. Click **OK** (on both the **MPI Interface** and **CP 5611** dialogs) to save the configuration and exit the dialog boxes.

Your **PC Config** of **PCStation** should now look like the following figure:

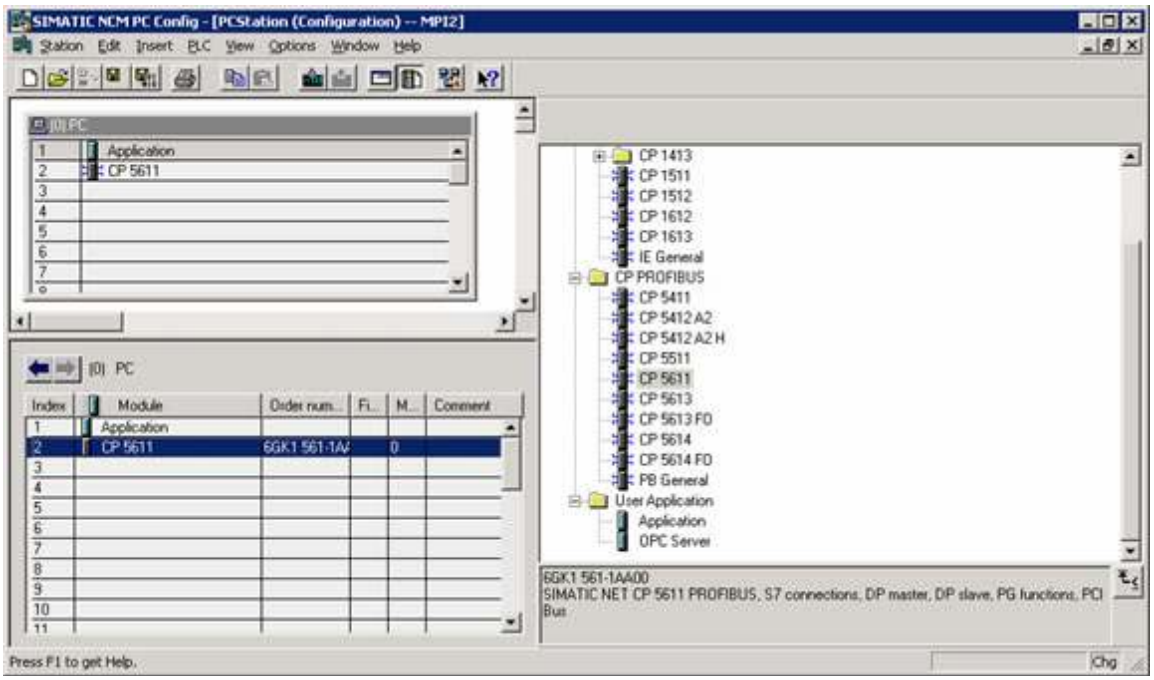

FIGURE 20: PC CONFIG COMPLETED

15. **(Optional)** Adding the OPC Server component to the **PC Config PCStation**: Under the **User Application** folder in right-hand pane of the PC Config window, select the **OPC Server** component and drag it over to line **3** in the (0) PC pane. This creates the OPC Server as Index 3. The PC Config PCStation window should now look like the following figure:

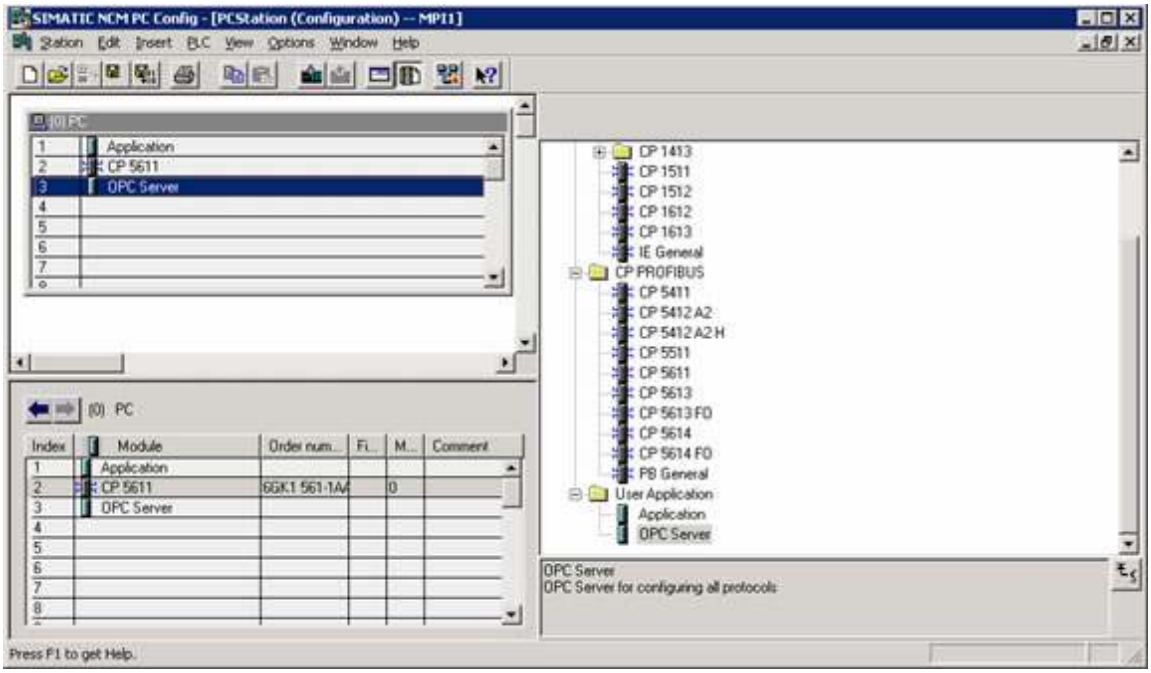

FIGURE 21: SELECT OPC SERVER

16. Click **Station**, then **Save and Compile**, to check for errors in your configuration (see following figure):

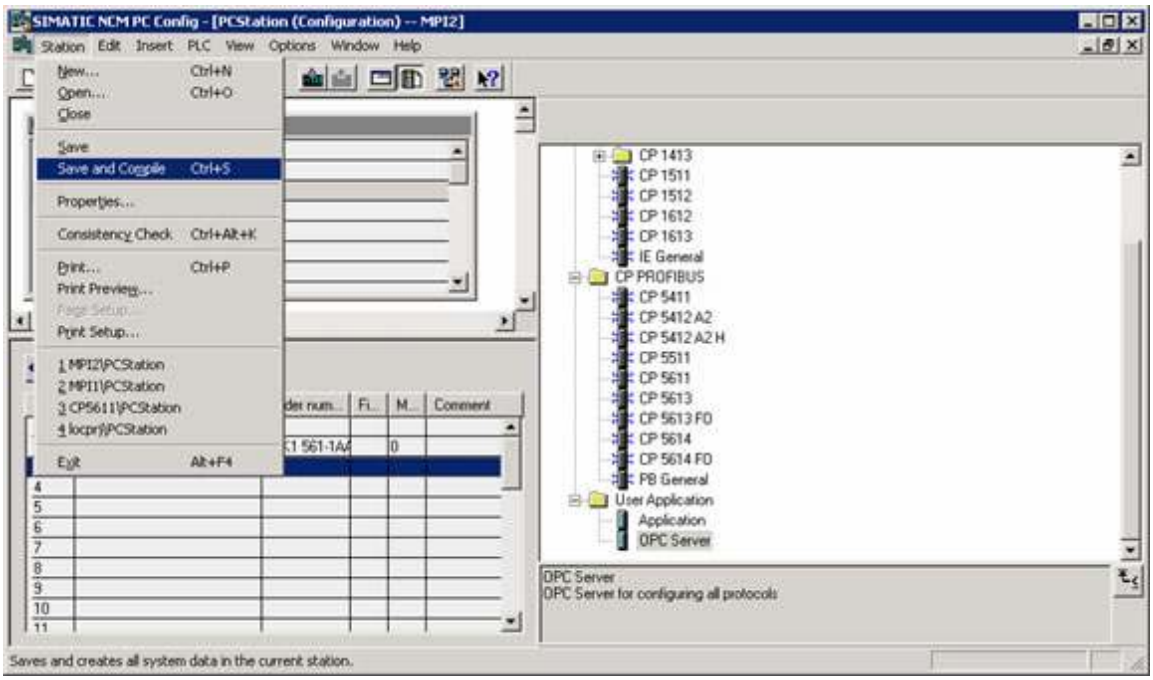

FIGURE 22: SAVE AND COMPILE

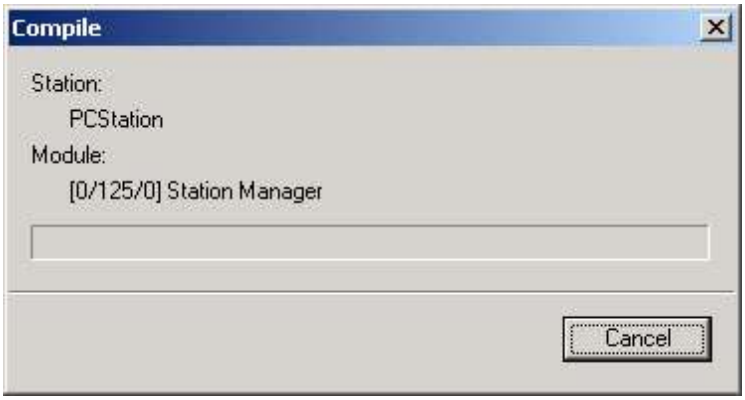

FIGURE 23: COMPILING PROGRESS

Your configuration in **PC Config** for PCStation should now be complete.

Verifying Your Configuration in NetPro, and Creating Connections for the CP 5611 MPI - and OPC Server.

1. Select **Options/Configure Network** from the main menu to start NetPro (see following figure):

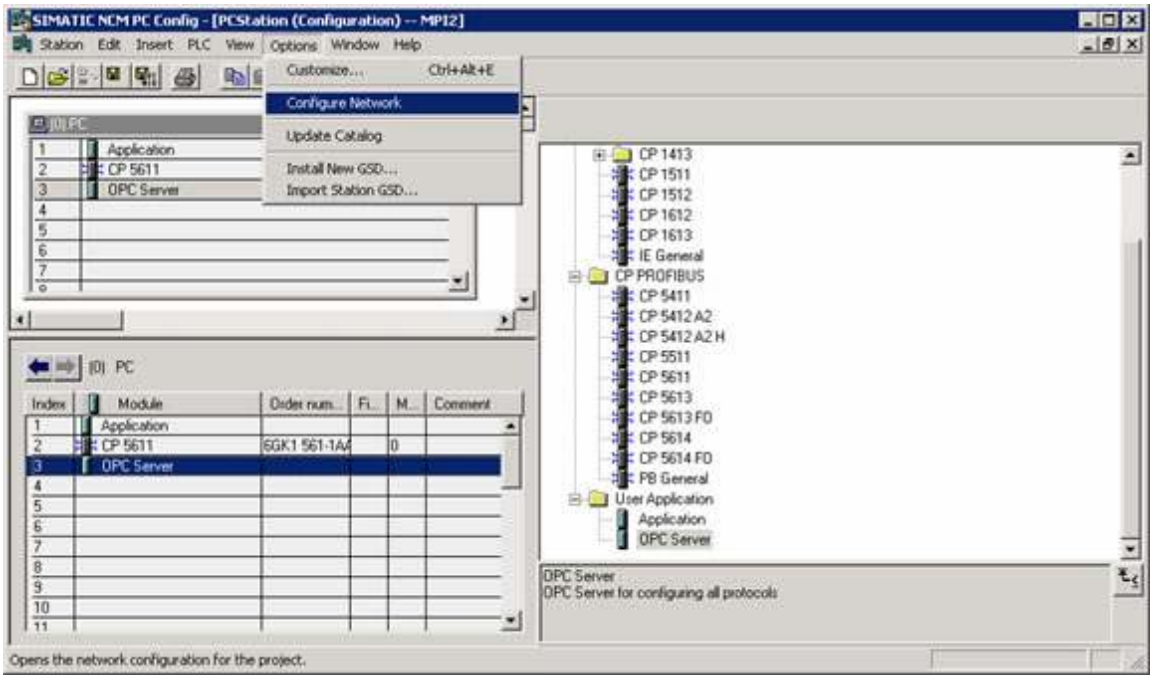

FIGURE 24: START NETPRO

The following NetPro Window displays your current PCStation configuration without any connections to the CP5611 module or the OPC Server components:

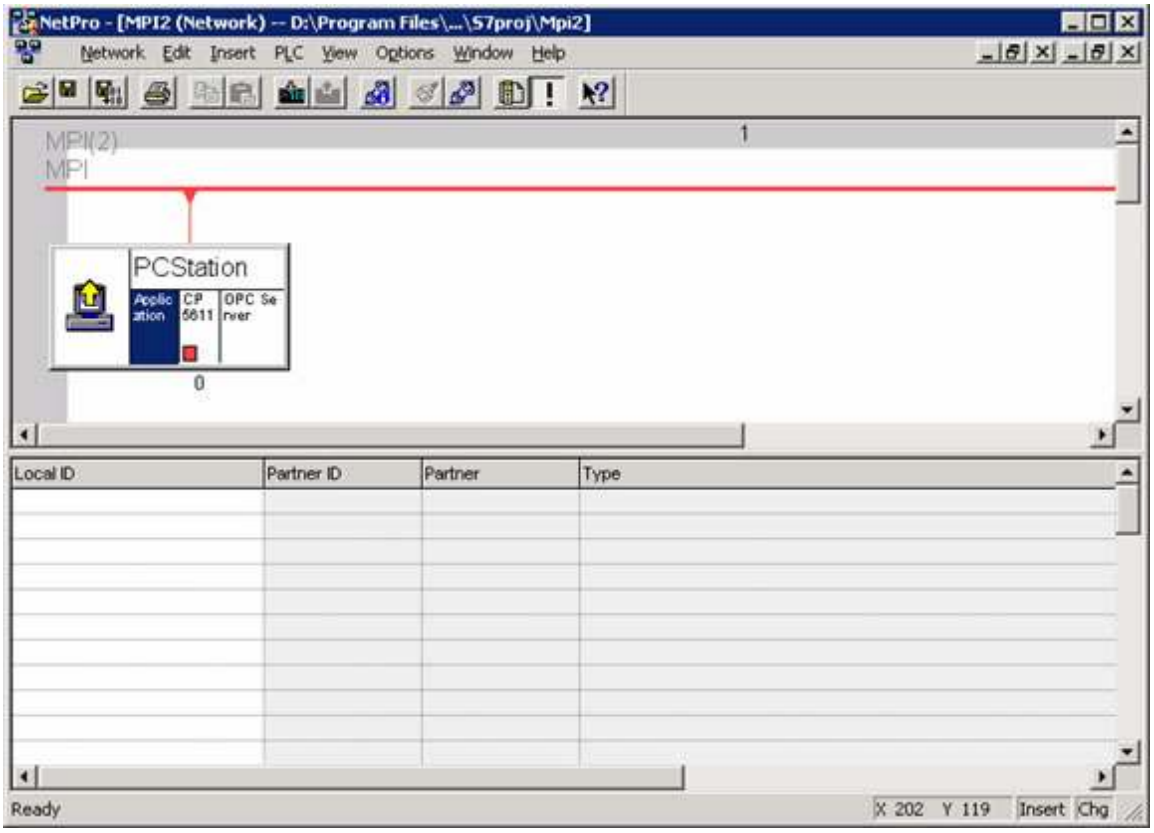

FIGURE 25: NETPRO WINDOW

2. Highlight the **Application** index in the PCStation box (see previous figure) to display the connection window. Right-click the first row in the connection window and select **Insert New Connection**:

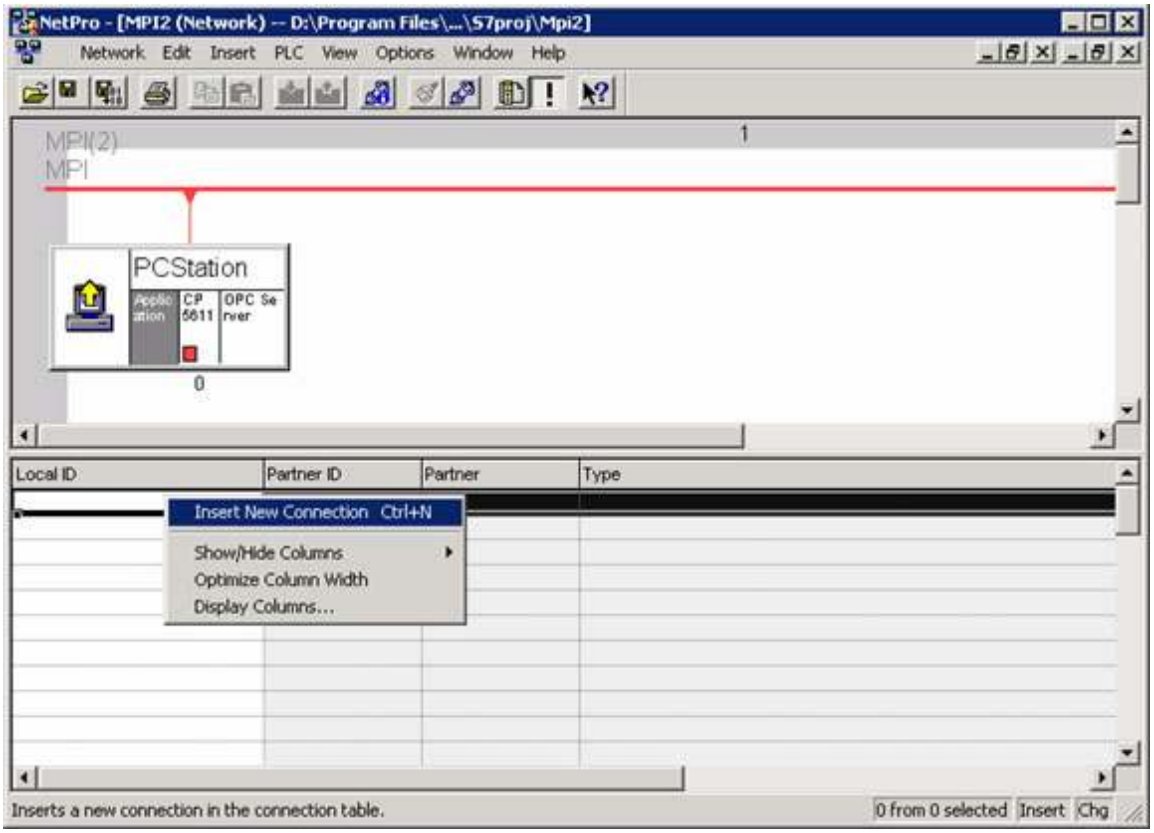

FIGURE 26: INSERT NEW CONNECTION

The following dialog box appears:

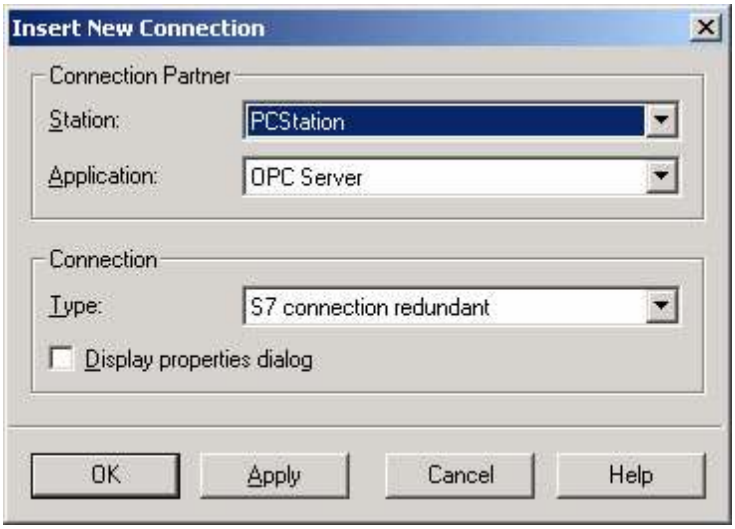

FIGURE 27: INSERT NEW CONNECTION DIALOG BOX (DEFAULT SELECTIONS)

3. Select **Unspecified** from the **Station** drop down list, then **S7 connection** from the **Connection Type:** drop-down list (see following 3 figures):

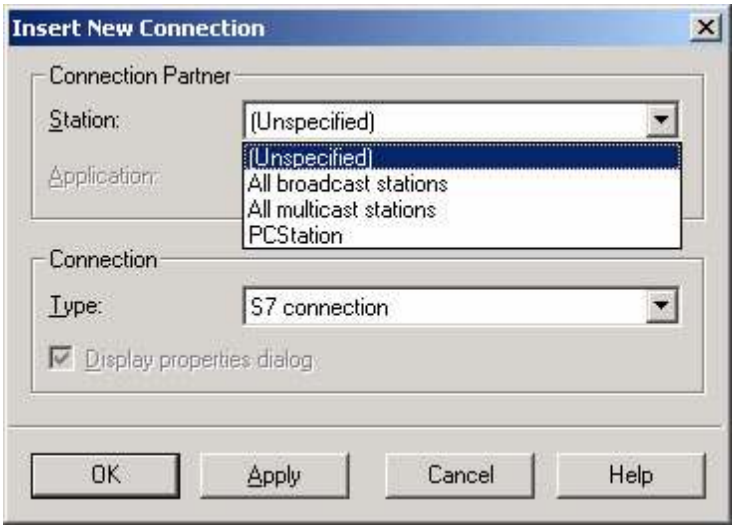

FIGURE 28: STATION: UNSPECIFIED

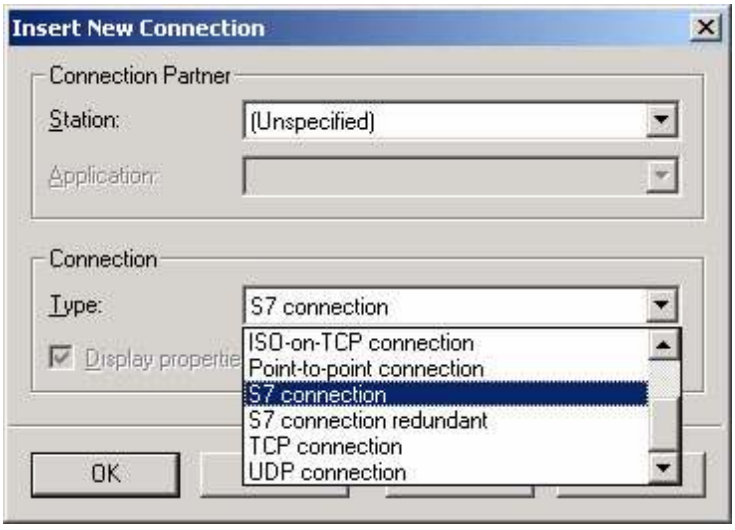

FIGURE 29: CONNECTION: S7 CONNECTION

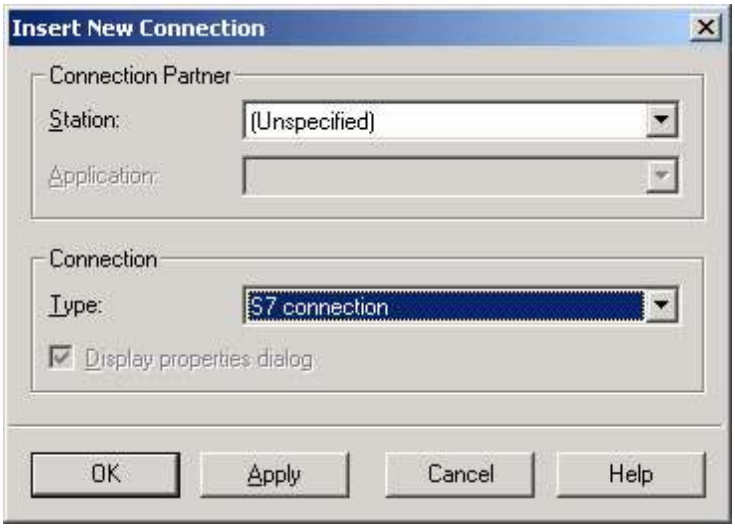

FIGURE 30: CONNECTION CONFIGURED

4. Click **Apply**. (The **OK** button changes to **Close**).

The **Properties - S7** dialog box appears:

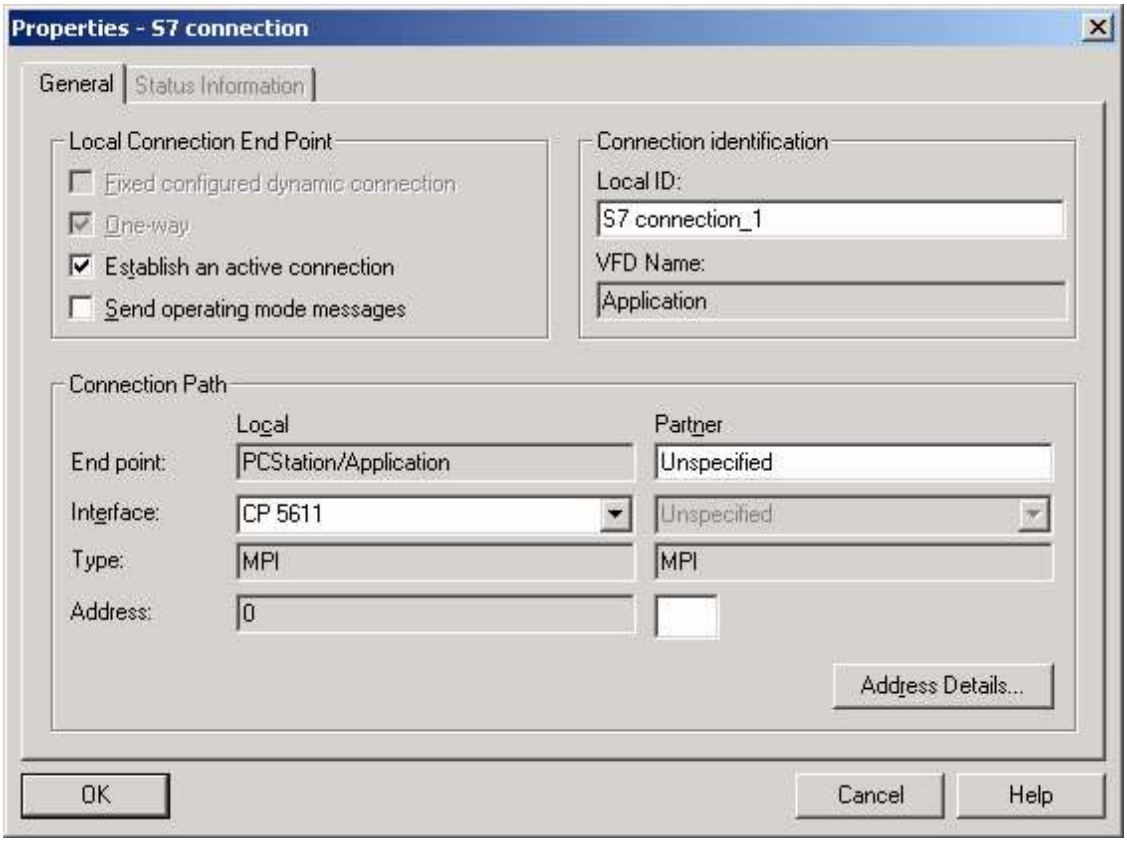

FIGURE 31: S7 CONNECTION PROPERTIES

Note The three fields in Figure 29 labled **Local ID**, **Partner**, and **Partner Address** are very important. You need to input the correct information.

In the following figure, notice that the Partner address is **3** and corresponds to the Bus addresses found in the test that was run in the Configuration Console earlier in this technote. In this example, the **LocalID:** will be **MPI1**and the **Partner End point:** will be **MPI**.

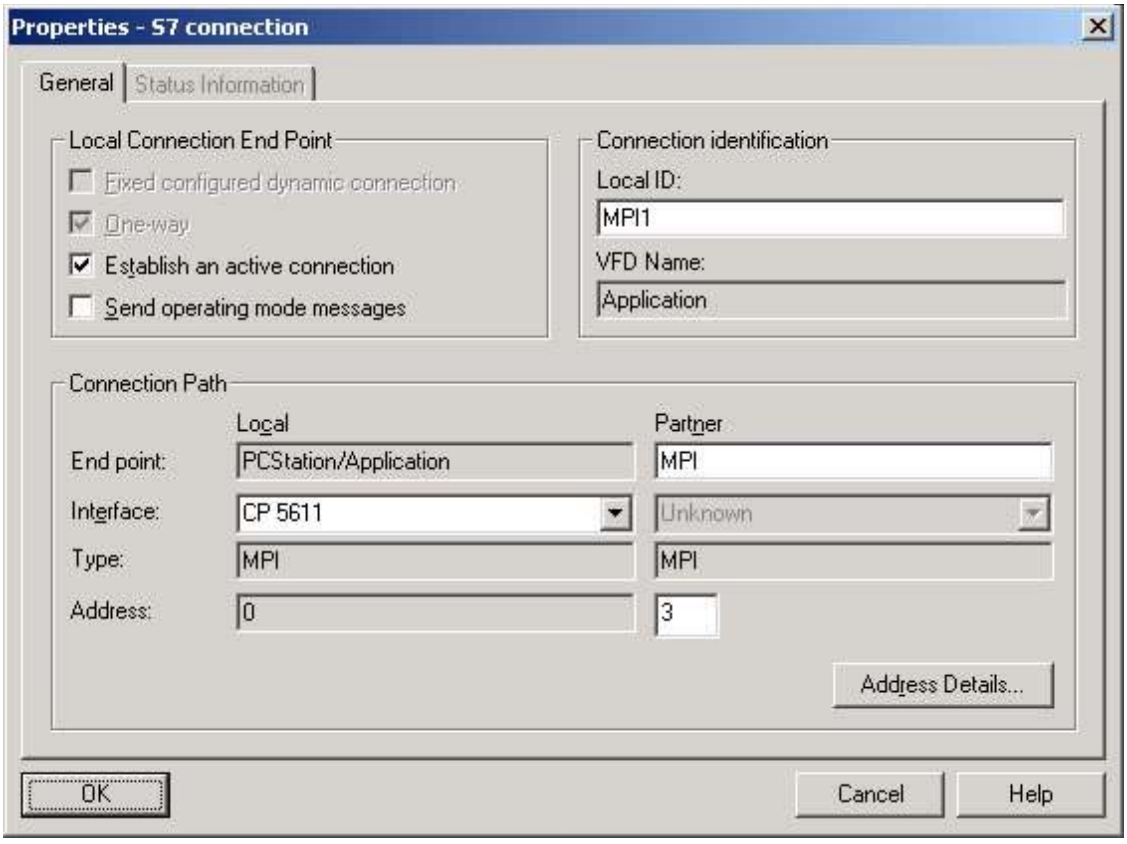

FIGURE 32: LOCAL ID, PARTNER FIELDS

5. Click the **Address Details** button. The following dialog box appears:

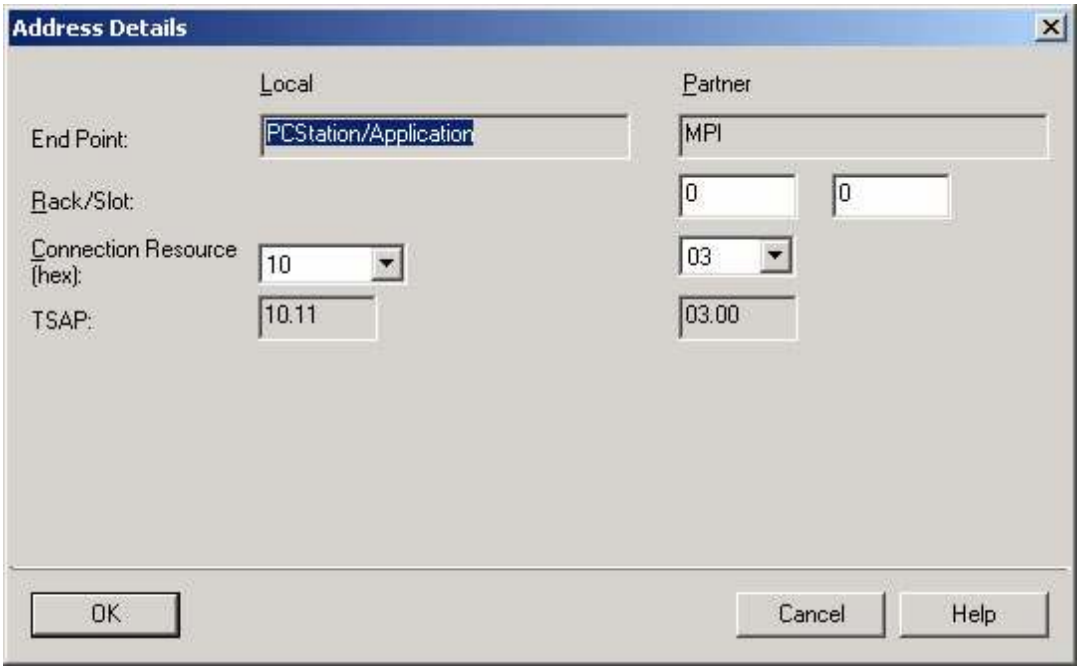

FIGURE 33: ADDRESS DETAILS DIALOG BOX

Note The connection resource is automatically assigned by SIMATIC NET when you add a new connection, so leave the default value. It is very important that the **Partner Rack/Slot** value be correct. Since the **MPI** port is on the CPU module, it is likely to be **3**. Use the slot number of the CPU for this entry.

The CPU in our example is located in slot **3**, so that is what is entered (see following figure):

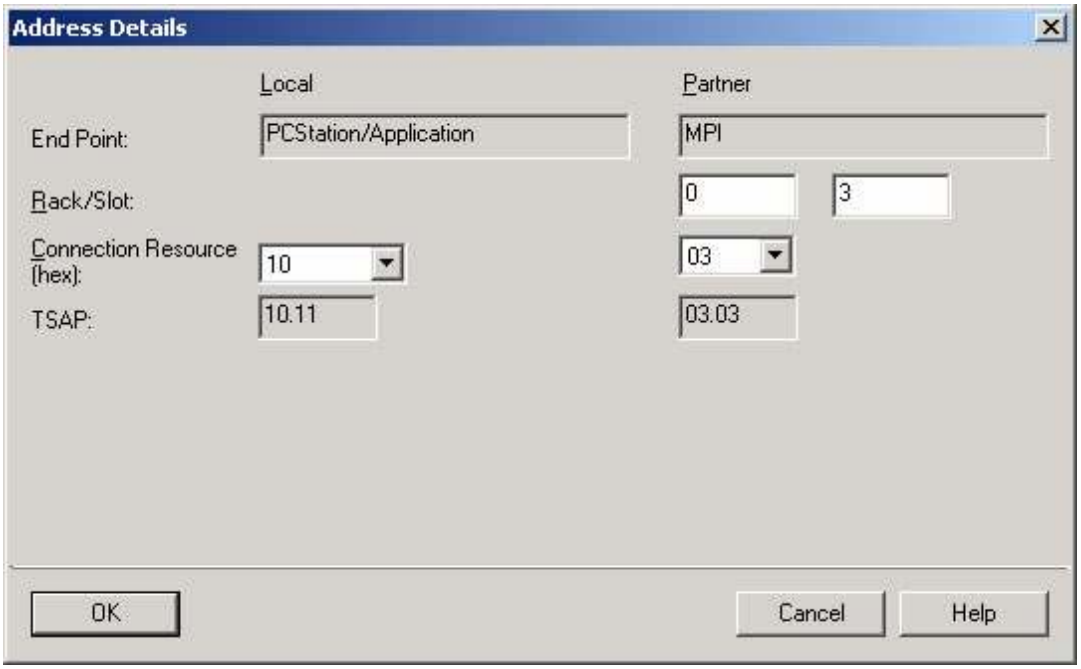

FIGURE 34: MPI RACK/SLOT: SETTINGS

6. Click **OK** twice to exit the dialog boxes. The **Insert New Connection** dialog box should now be visible:

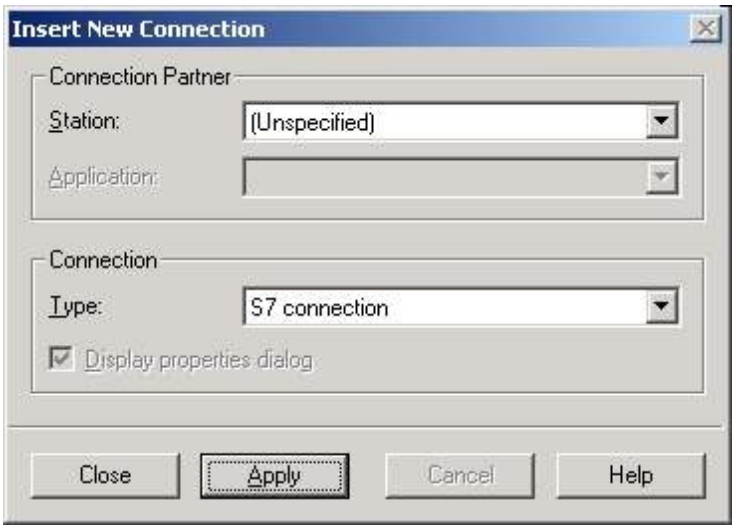

FIGURE 35: INSERT NEW CONNECTION DIALOG BOX WITH CLOSE BUTTON

7. Click **Close**.

The main **NetPro** window should now be visible. The following figure shows the new connection in the NetPro window:

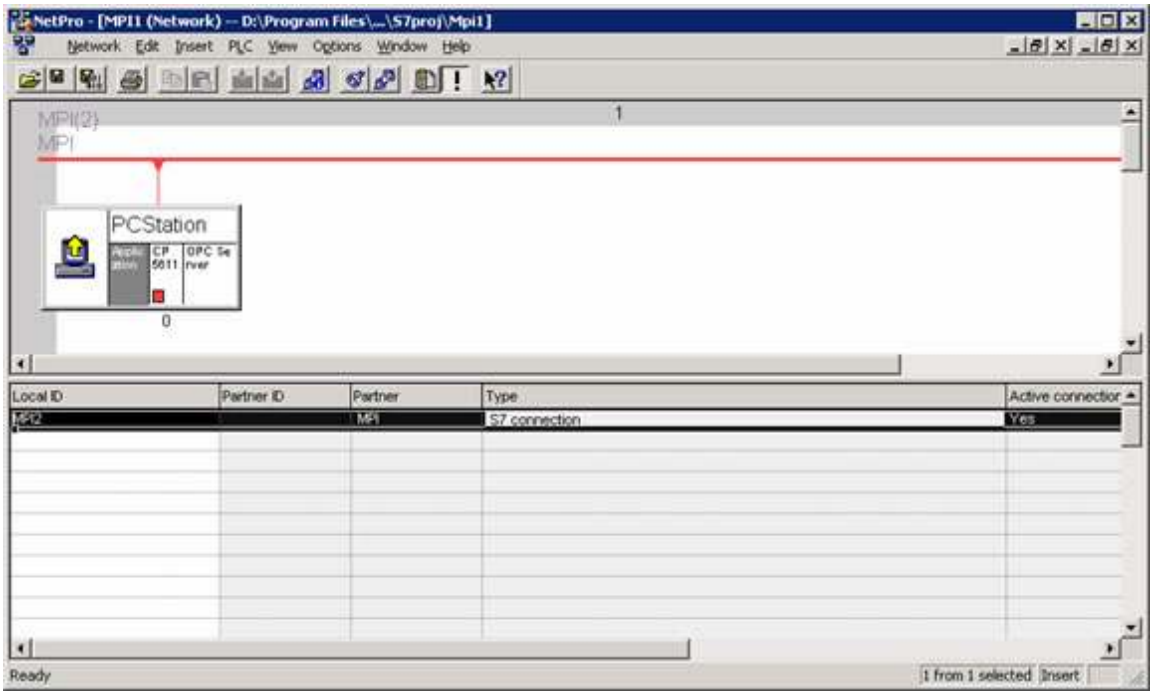

FIGURE 36: MAIN NETPRO WINDOW CONNECTION DISPLAY

7. Save and compile your PCStation in NetPro by selecting **Network/Save and Compile** from the main menu (see following figure):

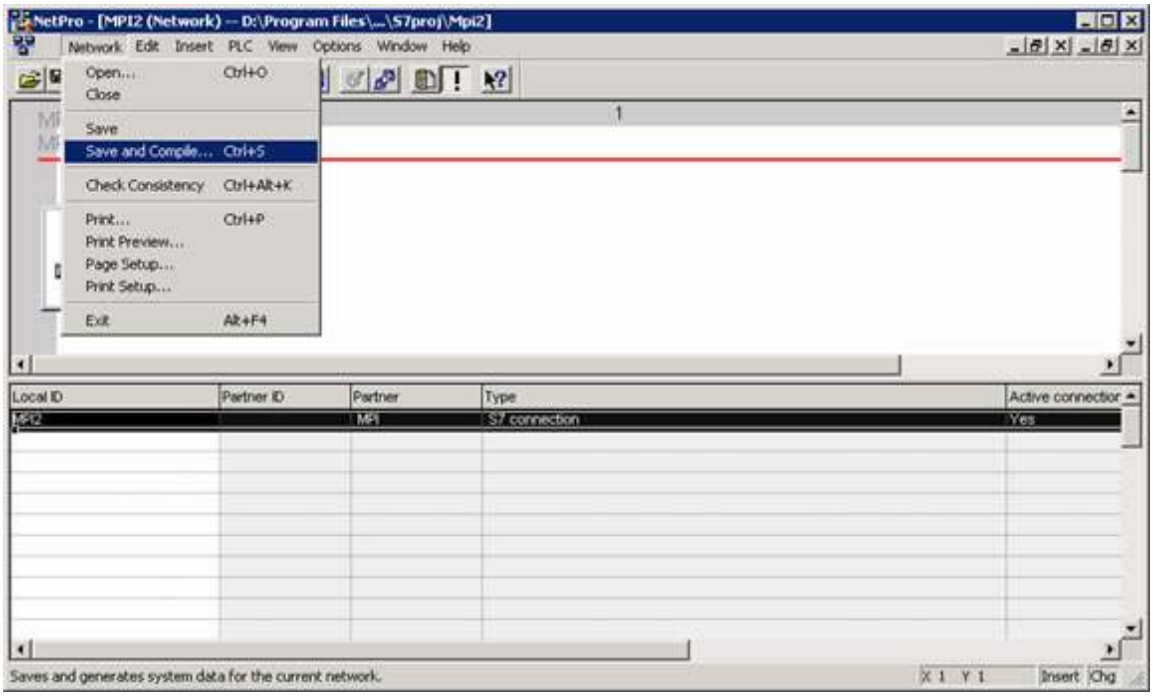

FIGURE 37: SAVE AND COMPILE THE CONNECTION CONFIGURATION

Note Whenever you make changes to NetPro (i.e. add a new connection), you MUST Save and Compile.

The following dialog box appears:

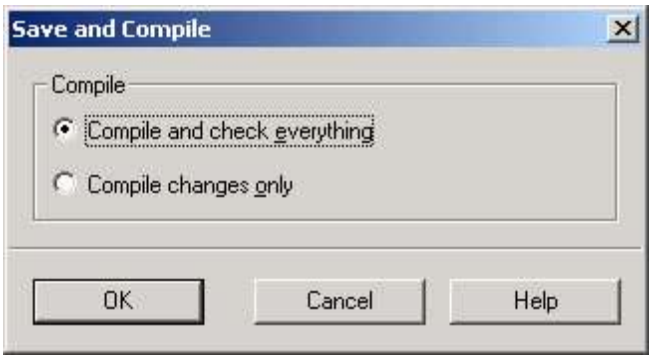

FIGURE 38: COMPILE AND CHECK EVERYTHING

8. Click **OK**.

You should see the following:

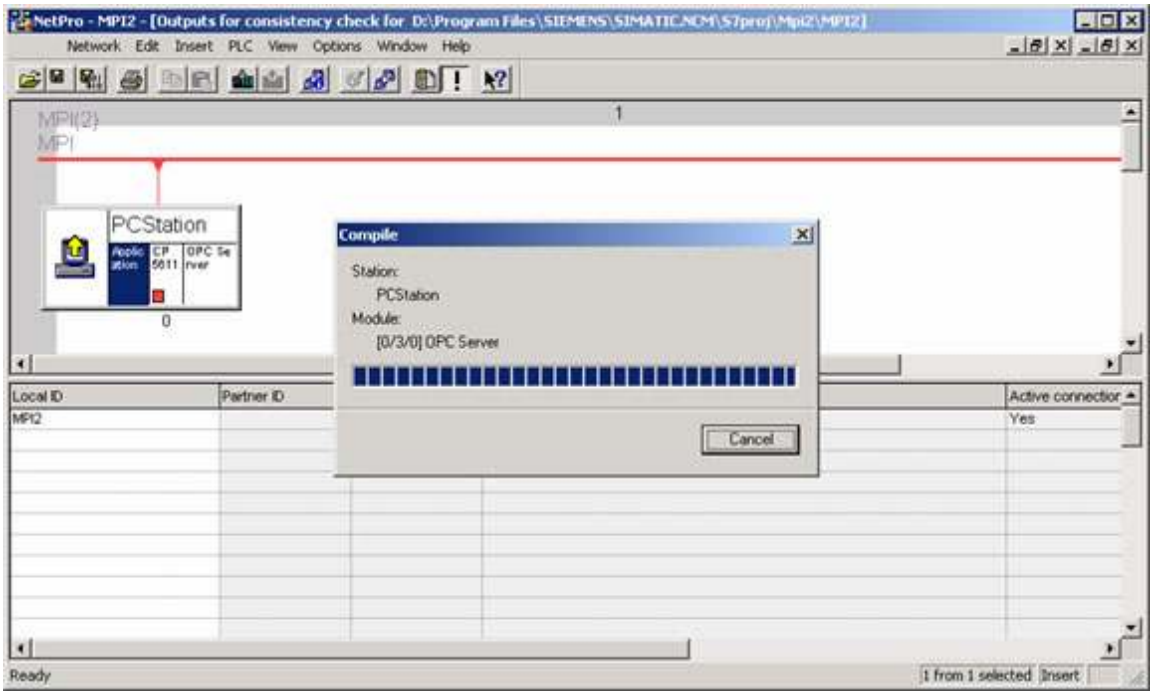

FIGURE 39: COMPILE PROGRESS

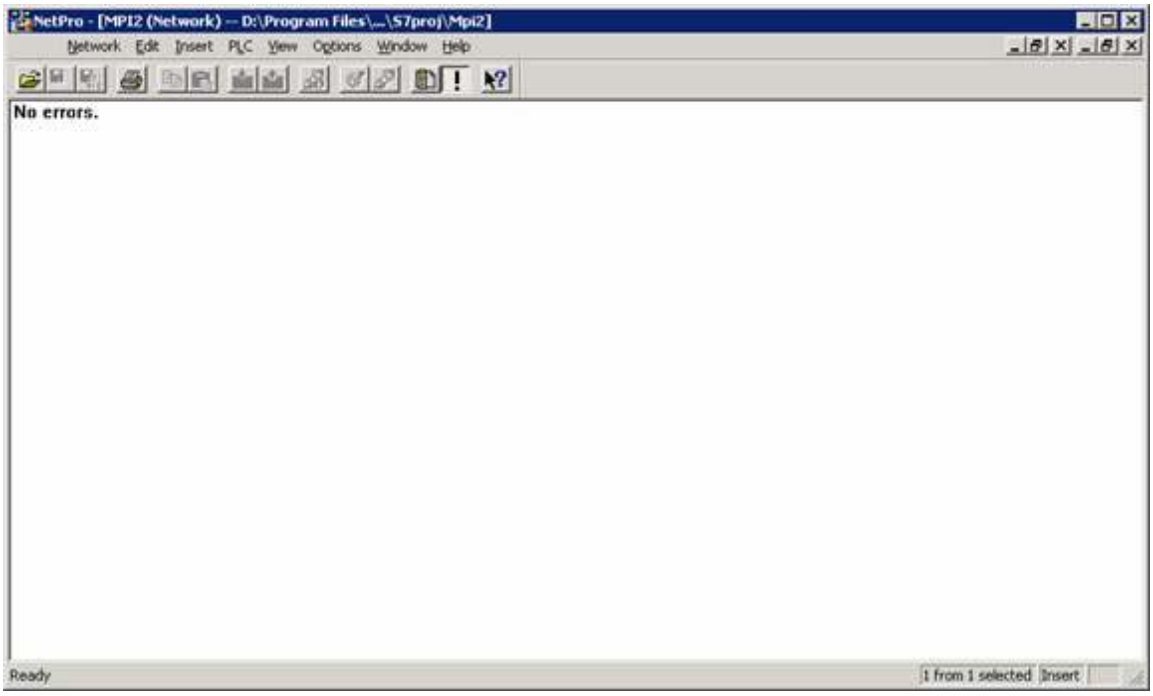

FIGURE 40: NO COMPILE ERRORS

(Optional) For an OPC Server Connection, repeat the steps 2 thru 7 (above) for the **CP5611** OPC connection.

In **Step #2**, click the **OPC Server** to highlight it instead of the Application. Then continue through steps 3-7 to complete the configuration.

To see what the final NetPro configuration looks like, select **Window** from the main NetPro menu, then select your project from the sub-menu (see following figure):

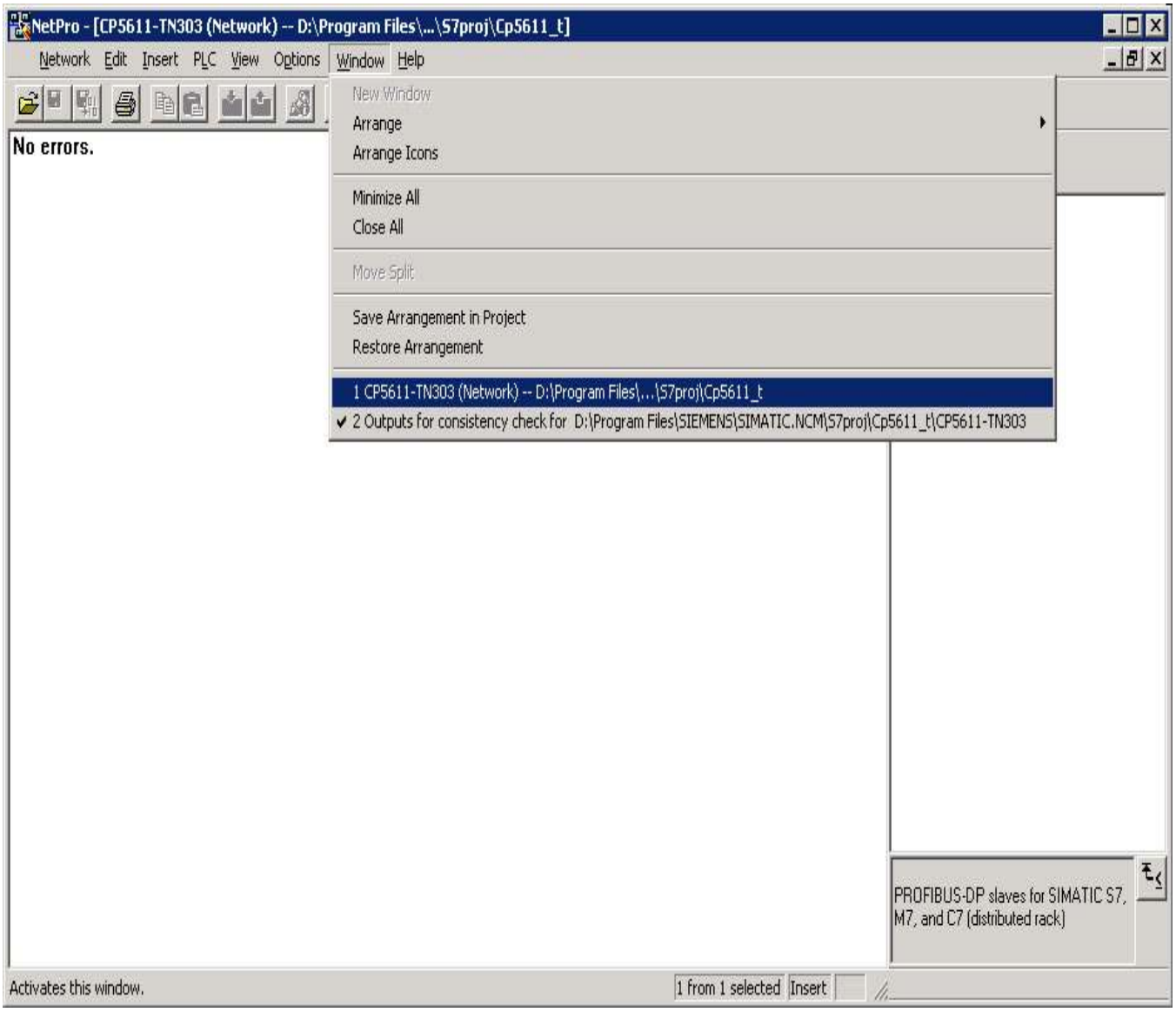

FIGURE 41: SELECT YOUR PROJECT

At this point your project is complete. The following figure shows two connections: one for the Application CP5611 at Bus address 0, and the optional **OPC Server** connection:

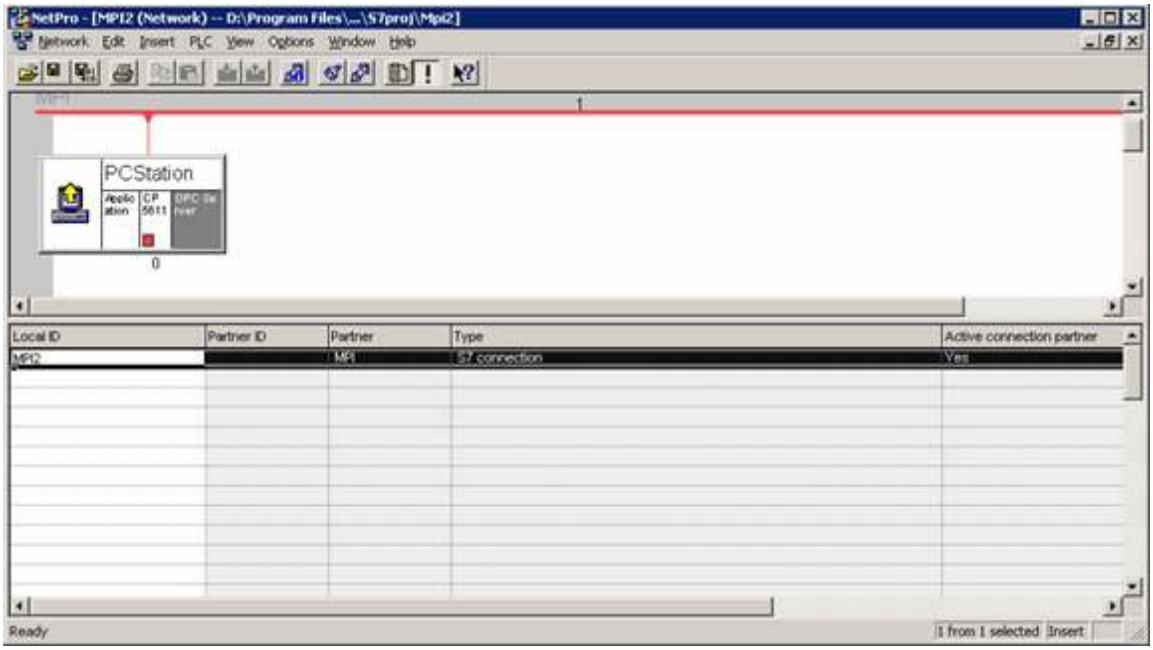

FIGURE 42: OPC CONNECTION DISPLAY

Note If necessary, you can edit your S7 connections by double-clicking the blank cell under the **Partner ID** column heading in the MPI2 row.

If you open your current project **MPI2** in SIMATIC Manager , you will see the following screen. It contains an overview of the PCStation in PC Config, and NetPro (see following figure):

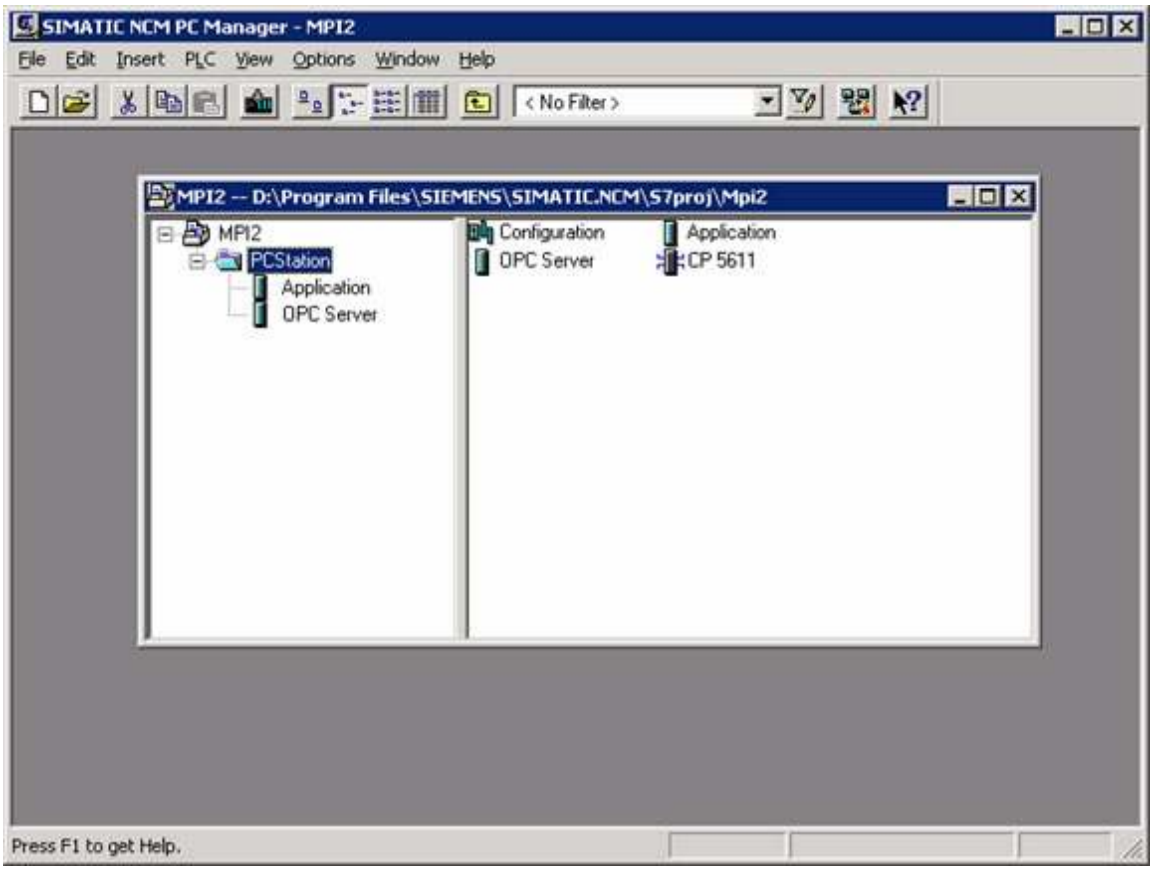

FIGURE 43: CONNECTION OVERVIEW

Setting the Access Point Active in the SIMATIC NET Configuration Console

1. Start the Configuration Console (**Start/Simatic/SIMATIC NET/Settings/Configuration Console**).

Note 1: If you are running the Configuration Console for the first time, or if you switch your PCStation from one module to another, (i.e., you setup a TCP/IP connection instead of an MPI) you will likely see the **Commissioning Wizard**. If you have already set your access point to reflect the current module, then you can cancel out of the Commissioning Wizard and continue to use the Configuration Console. Even if you haven't configured any access points in the Configuration Console at the time you first open it, you can still click the **Cancel** button to continue making manual configuration changes in the Configuration Console. Doing so is recommended for this technote (see following figure):

FIGURE 44: CANCELLING THE WIZARD TO MAKE MANUAL CONFIGURATION CHANGES

Click **Cancel** and continue through Step 2 (below) after you see the **Configuration** console main screen:

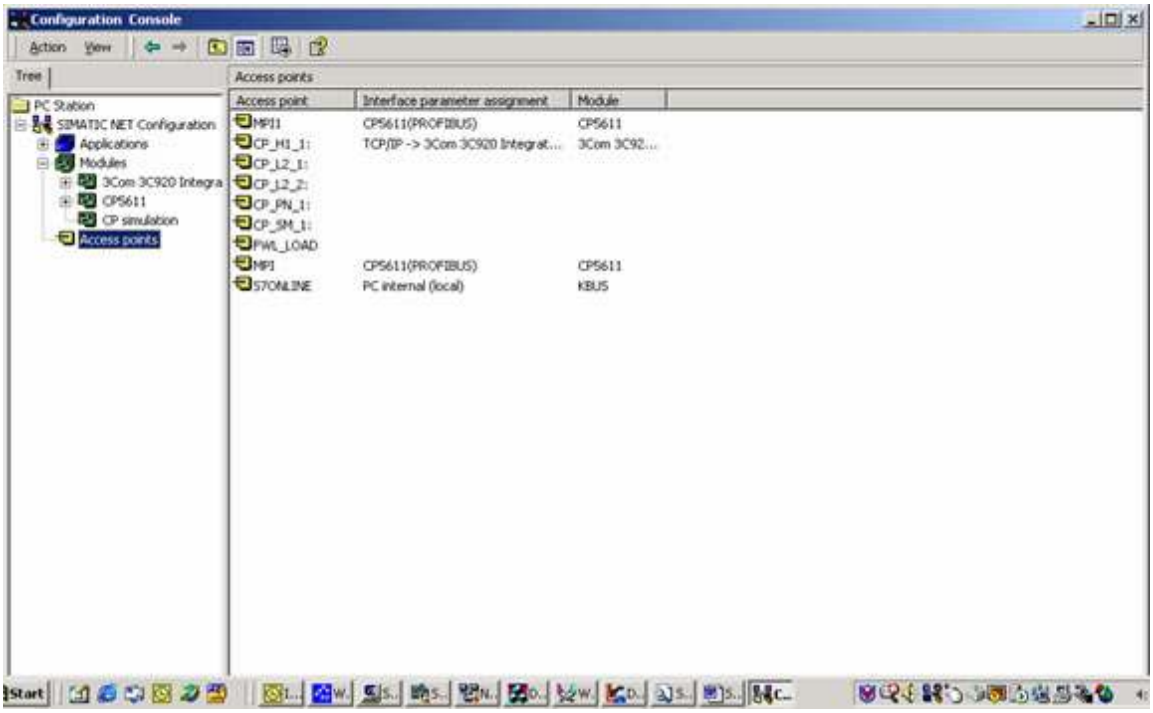

FIGURE 45: CONTINUE MANUAL CONFIGURATION

Note In the previous figure, the (default) MPI Access point is the CP5611 Module.

2. Highlight **Access Points**, and expand the hierarchy tree to view the available access points for the **CP5611** module (see following figure):

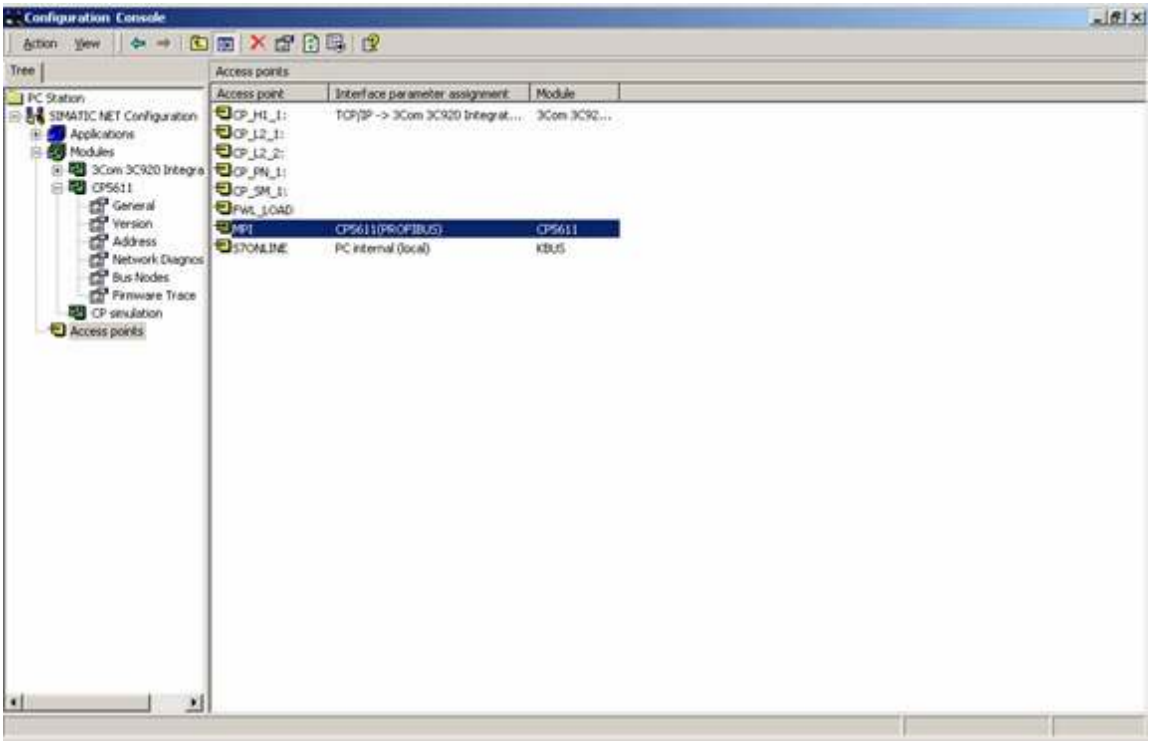

FIGURE 46: HIGHLIGHT AND EXPAND MODULES

In the above figure the Access point **MPI** is highlighted. You will use this access point when you configure the S7 I/O Server later in this technote.

3. Expand the **PCStation** entry in the Configuration Console (in the tree view pane/left-hand side of the window). Drill down to the **Modules/CP5611**.

4. In the **General: Module properties** pane, select **Configuration mode** from the drop-down list as the mode of the module (see following figure):

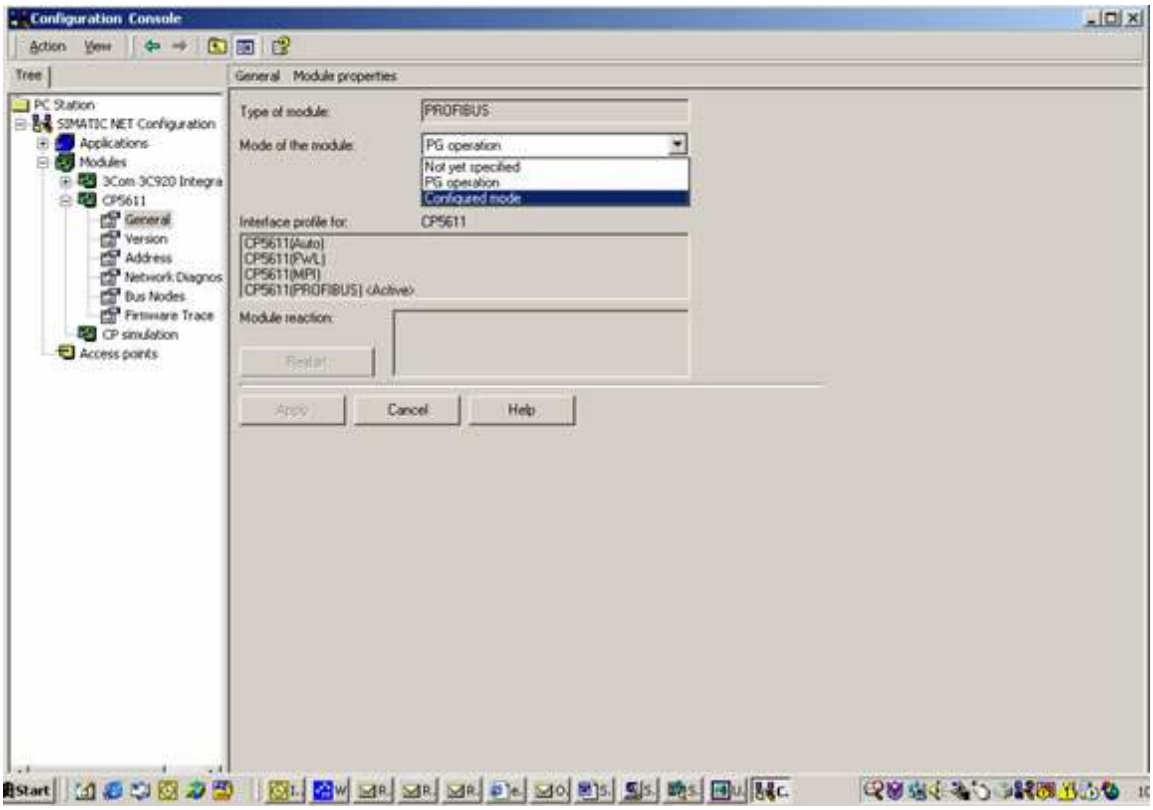

FIGURE 47: SELECT THE MODULE MODE

5. After selecting the **Mode of the module:** to be **Configuration mode**, a selection for the **Index** value appears.

6. Expand the drop-down list and select index **2**, since it was configured in your S7 Project. Notice that the **Apply** button becomes enabled (see following figure):

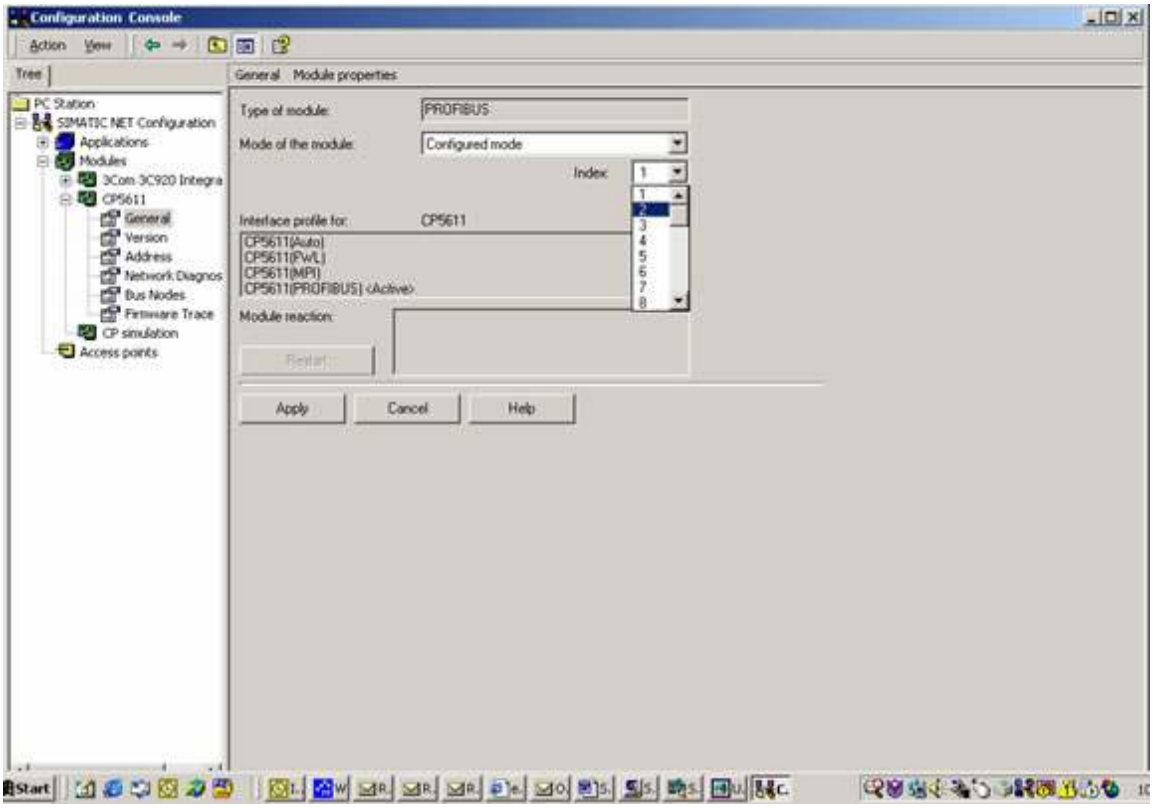

FIGURE 48: SELECT INDEX VALUE

7. Click **Apply**. The following dialog box appears:

FIGURE 49: CHANGE CONFIGURATION PROMPT

8. Click **OK** since you need to configure the PCStation in your project to use the **CP 5611** module.

The following screen shows that the CP5611 module is now configured and ready for use with your S7 project:

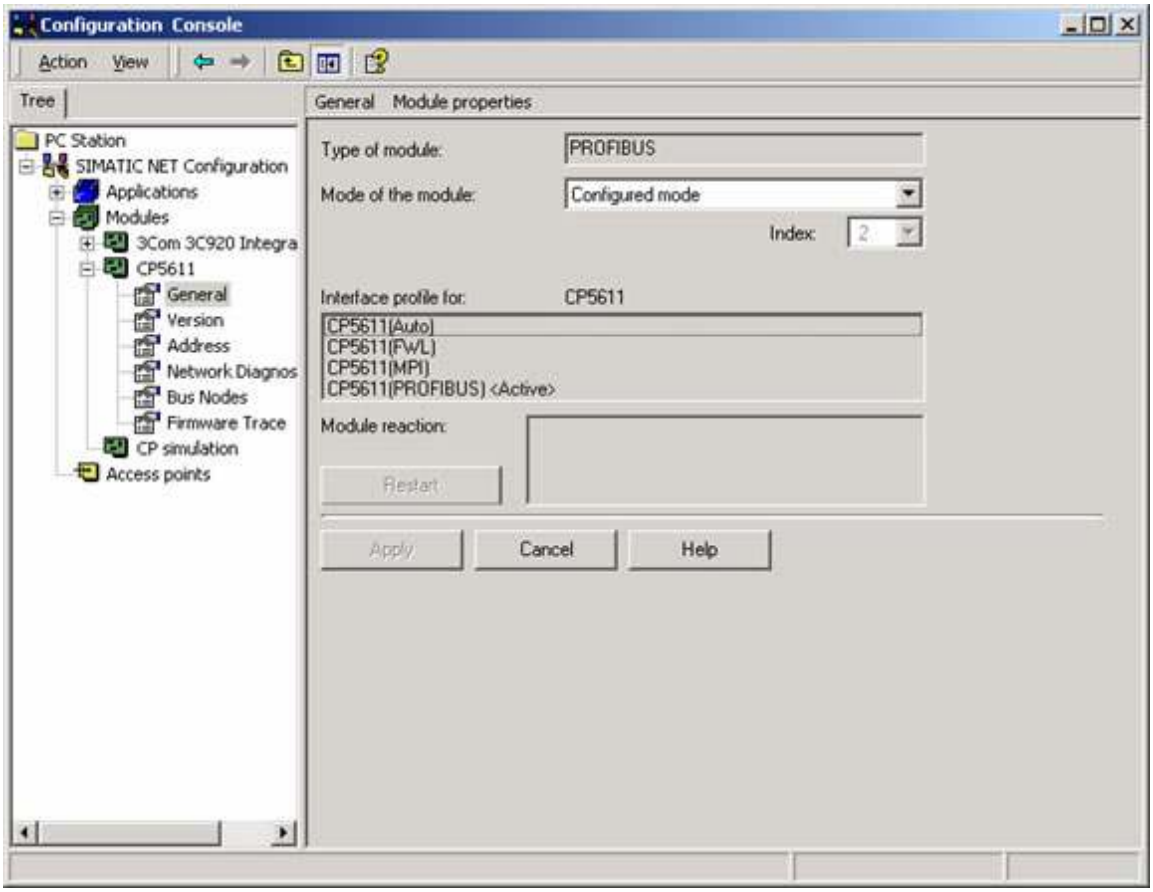

FIGURE 50: COMPLETED CONFIGURATION

You can now close the **Configuration Console**.

Configuring the Station Configuration Editor (It Appears in the System Tray, and it Looks Like a Computer!)

1. Open the Station Configuration Editor. After setting the CP5611 to **Configuration Mode**, it will automatically be added to the Station Configuration Editor as index **2** (see following figure):

Note The **Station:** name (**PCStation**) in the following figure is the same as the one entered in Step 4 of **Starting a New Project**.

Return to Step 4

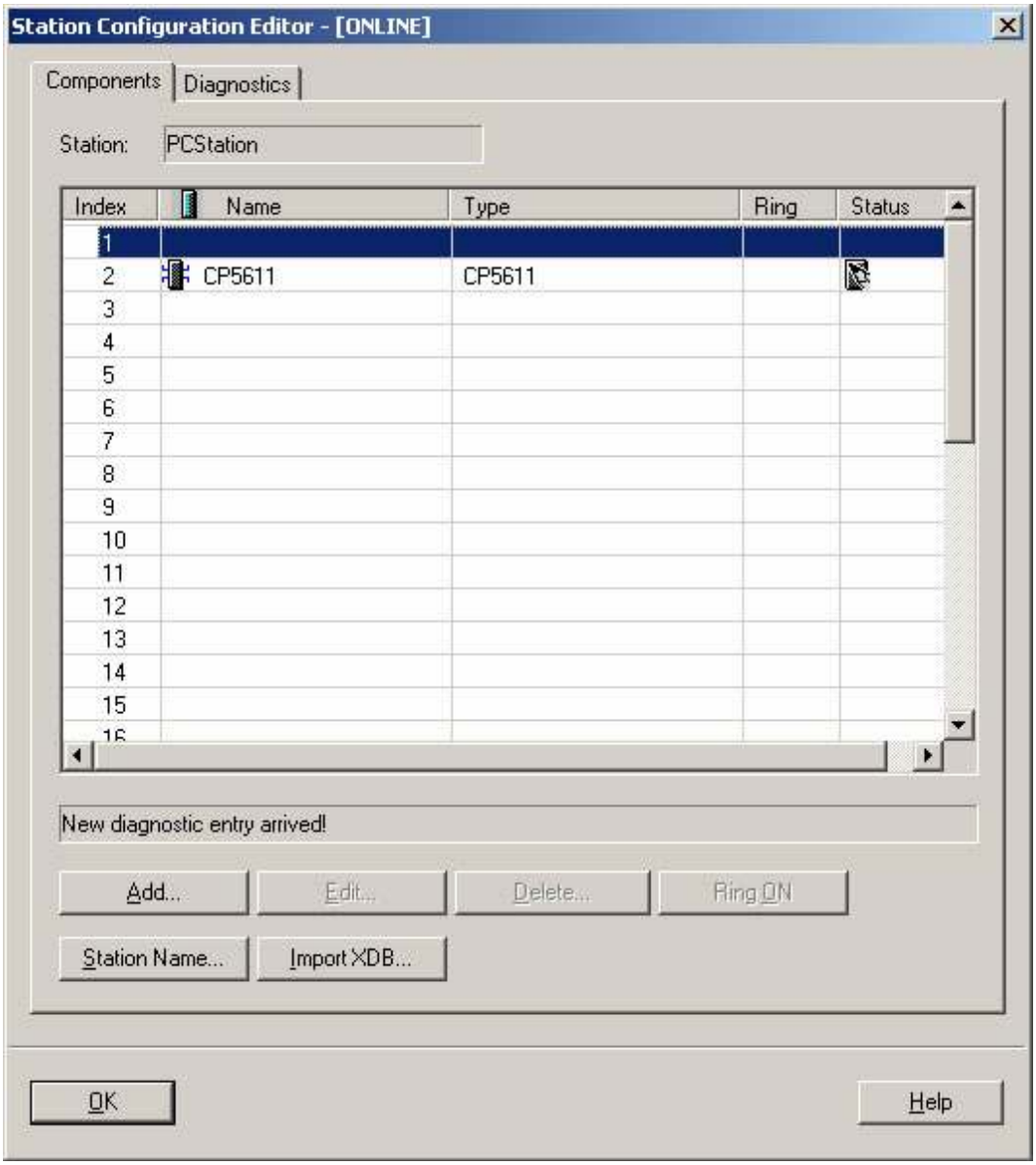

FIGURE 51: STATION CONFIGURATION EDITOR

2. Highlight index **1** (as shown in the above figure), and click the **Add** button to add the **Application** component to the Station Configuration Editor (see following figure):

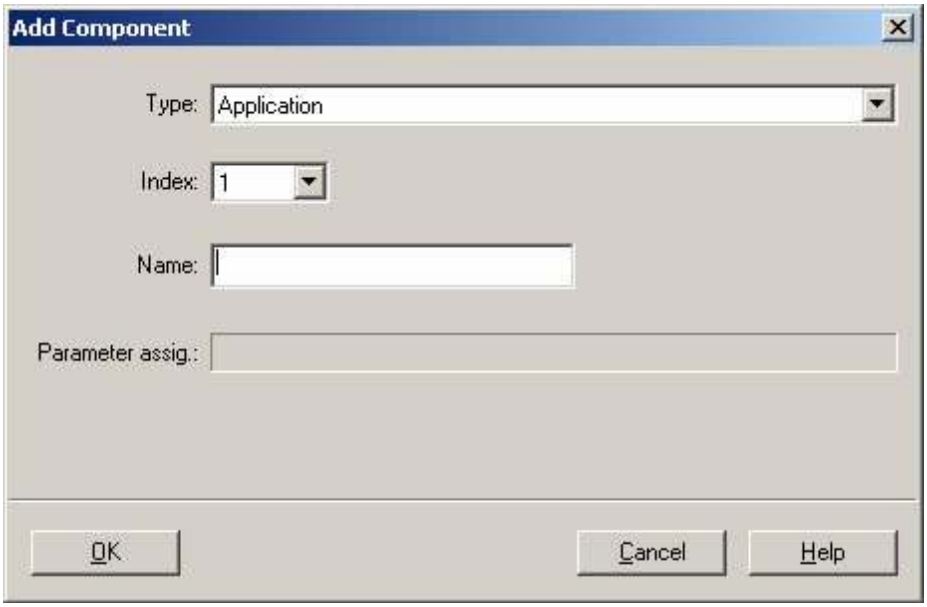

FIGURE 52: ADD COMPONENT

Note The configuration in the Station Configuration Editor should match up with the configuration in NetPro. (i.e. index 1 – Application, index 2 – CP 5611, [optional:index 3 – OPC Server]).

3. Enter **Application** in the name field to match the component type (see following figure):

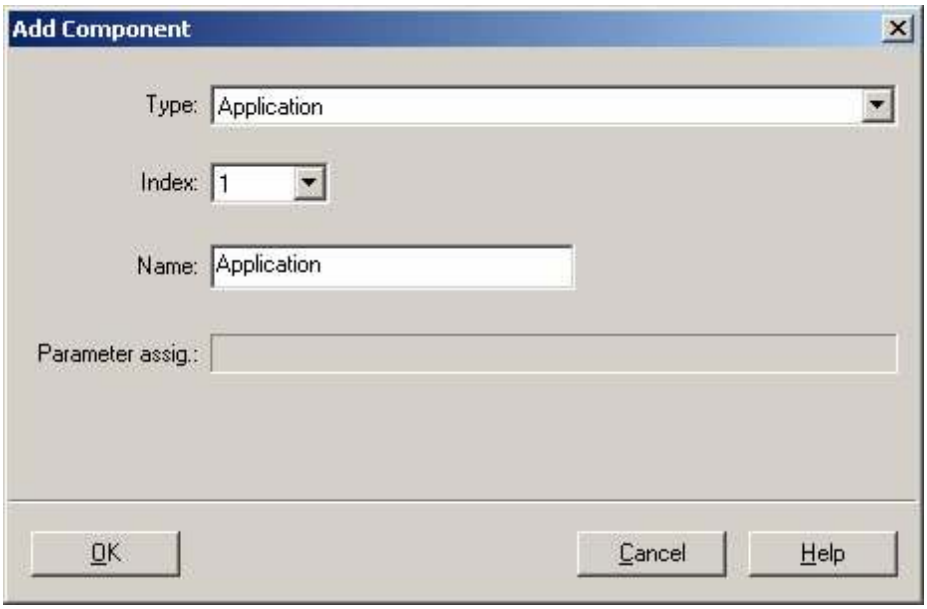

FIGURE 53: NAME APPLICATION COMPONENT

4. Click **OK** to add the **Application** component. The following pop up message will appear:

FIGURE 54: CHANGE CONFIGURATION MESSAGE

5. Click **OK**. The Station Configuration Editor should now display two components, **Application** as index 1, and the **CP 5611** as index **2** (see following figure):

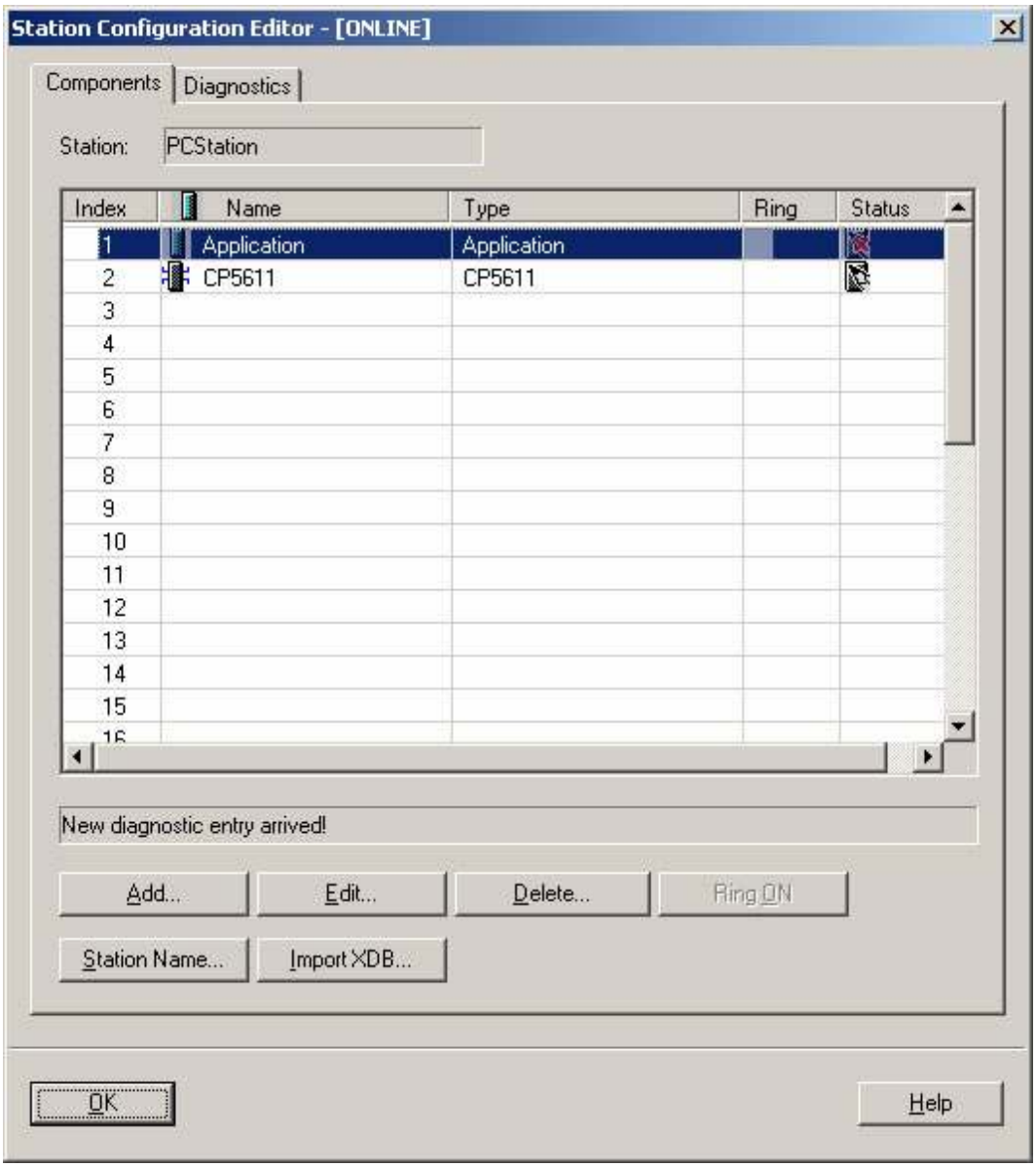

FIGURE 55: APPLICATION AND CP5611 COMPONENTS

5. If required, repeat steps 2 thru 5 to add the **OPC Server** component as index **3** (see following figure):

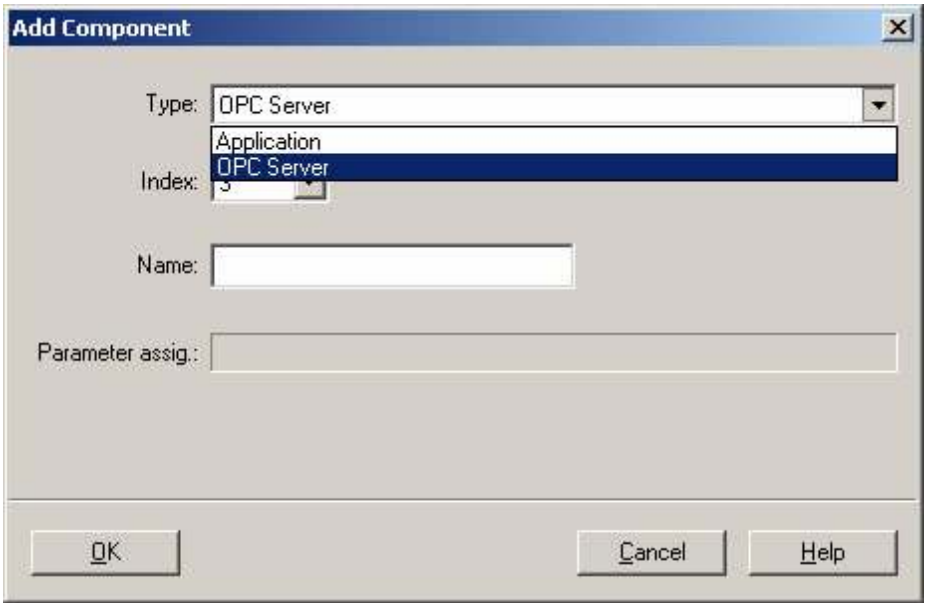

FIGURE 56: ADD OPC SERVER COMPONENT

6. The following figure shows the completed Station Configuration Editor window with all three components from **PCStation** (Application, CP 5611, and OPC Server):

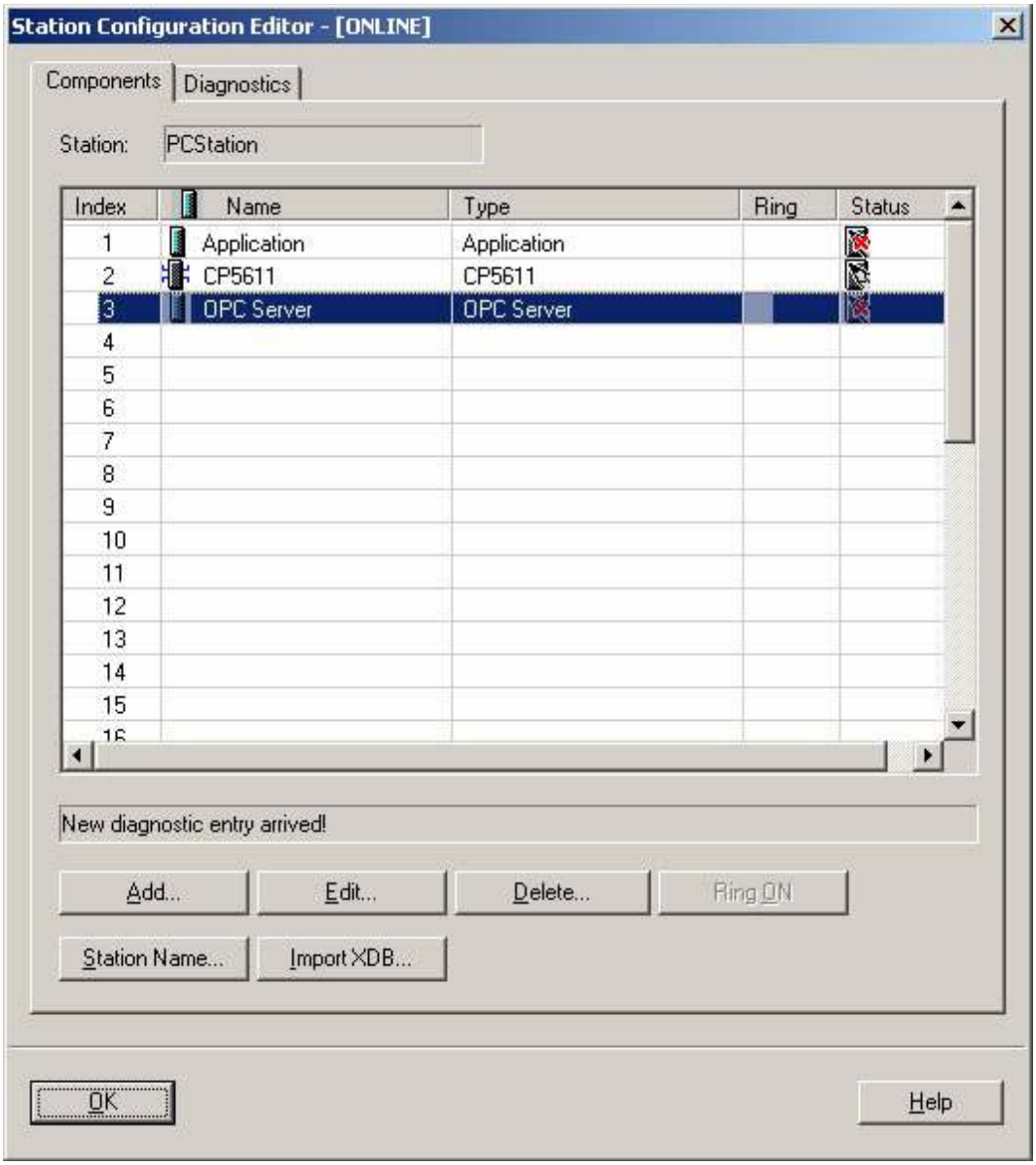

FIGURE 57: THREE PCSTATION COMPONENTS

Note the red X next to the Application and OPC Server rows in the above figure. This means that the database is not updated.

You must now download the configuration from the the **PCStation (Configuration)** main window and the NetPro interface (step 12 below).

7. The following figure shows downloading your current project configuration to the S7 CPU through your MPI connection (**PLC/Download**):

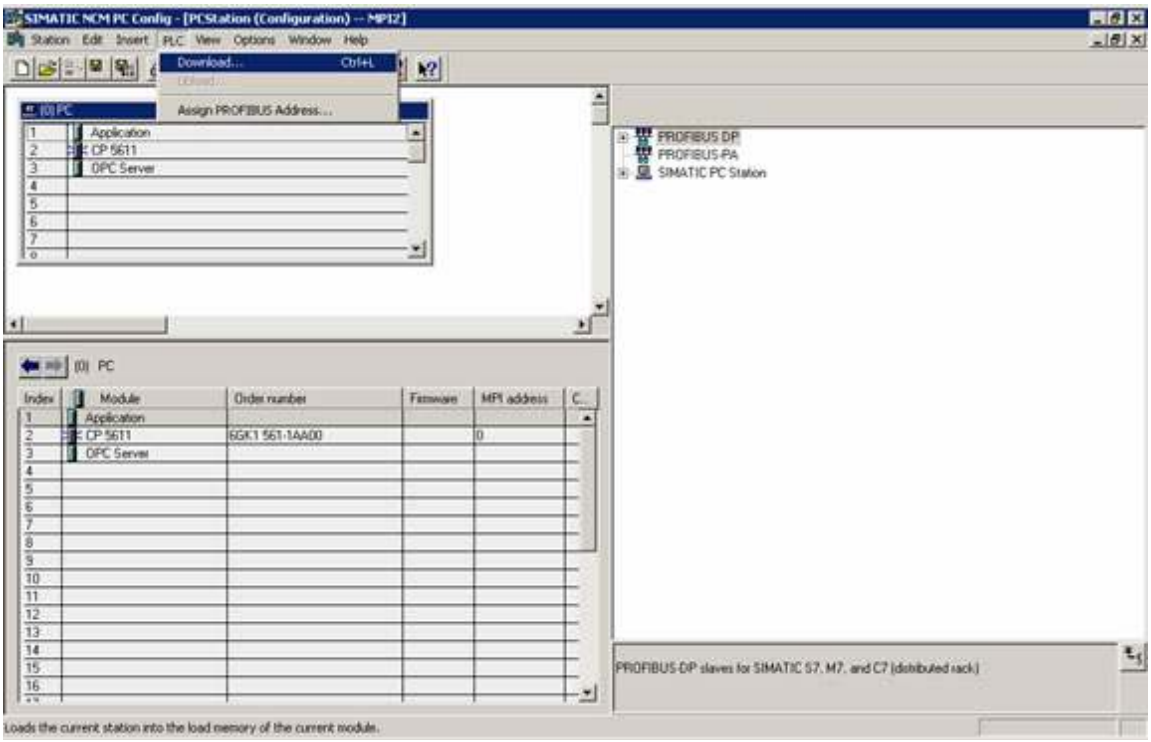

FIGURE 58: DOWNLOAD THE PROJECT CONFIGURATION

8. When you select the **Download** command from the menu, the following pop up appears:

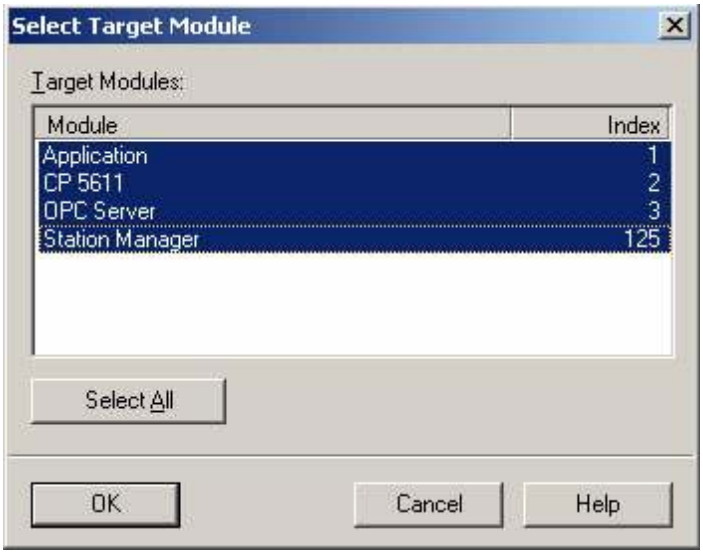

FIGURE 59: TARGET MODULE SELECTION

9. Click **OK** to select the four modules.

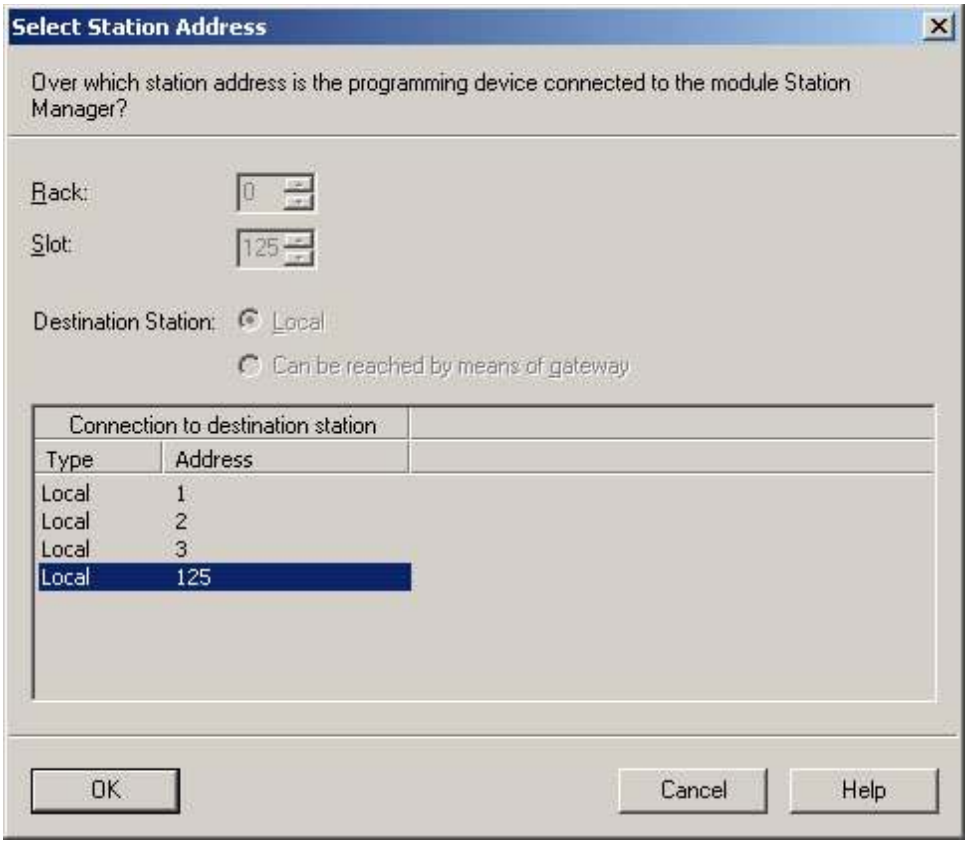

FIGURE 60: SELECT STATION ADDRESS

10. Click **OK** to continue with the download.

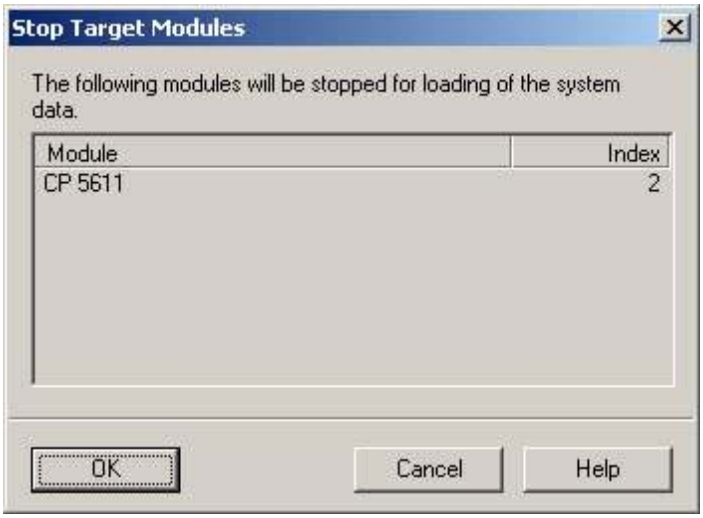

FIGURE 61: STOP TARGET MODULES

11. Click **OK** to select the CP 5611 module.

12. In NetPro, highlight **PCStation** and select **PLC/Download Selected Stations** from the main menu (see following figure). Click **OK** when the download is complete.

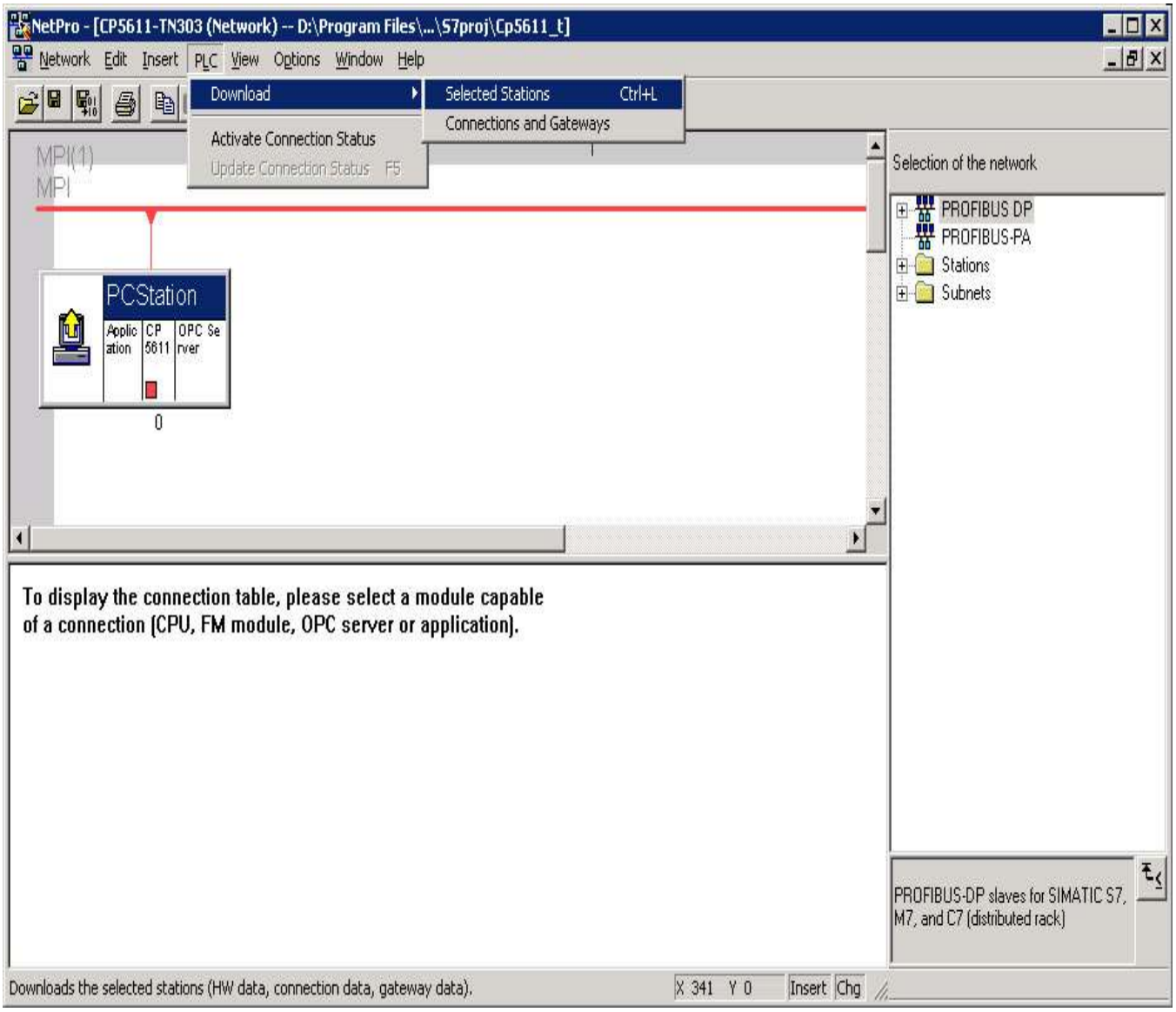

FIGURE 62: DOWNLOAD SELECTED STATIONS

At this point, your SIMATIC NET configuration is complete. Proceed to the next section to configure the S7 IOServer.

Configuring the S7 I/O Server

1. Start the S7 I/O Server. Select **Configure/Topic Definition** from the main menu (see following figure):

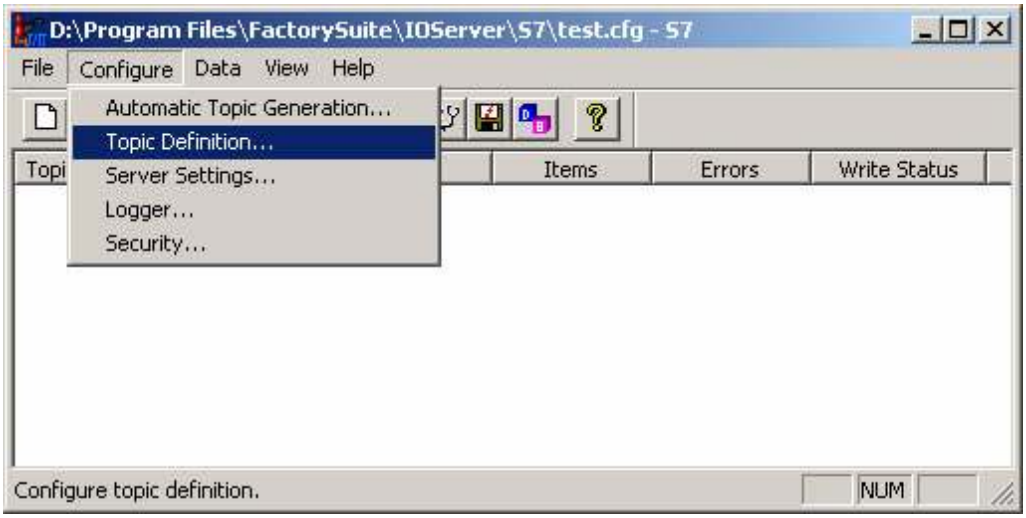

FIGURE 63: CONFIGURE/TOPIC DEFINITION

A blank **Topic Definition** dialog box appears.

2. Click **New** to add the topic **MPITEST** or whatever you want to call your topic. After adding **MPITEST** as your topic name, select **MPI** as your CP-Name, **Application** as the VFD, and **MPI1** as your connection.

Note If the VFD and Connection values don't show up automatically, you might have done something wrong in your S7 Project. Try re-starting the I/O Server and re-creating the topic, or re-save and compile your configuration in the SIMATIC PC Config. section of SIMATIC Manager (see following figure):

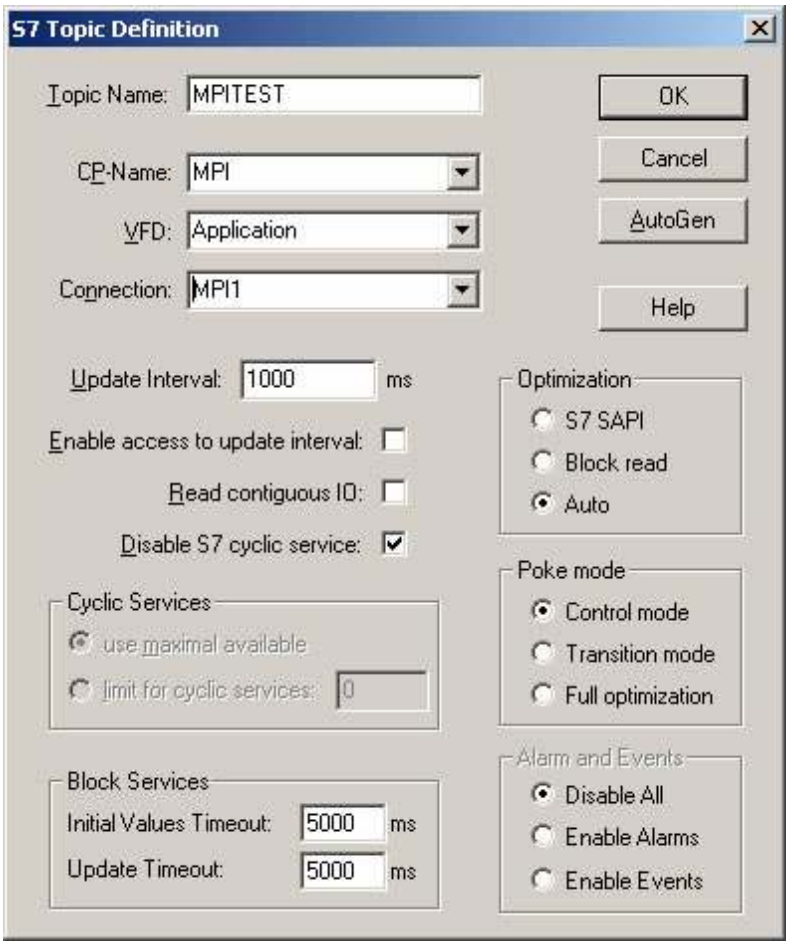

FIGURE 64: NEW TOPIC

3. Click **OK** to save the new topic.

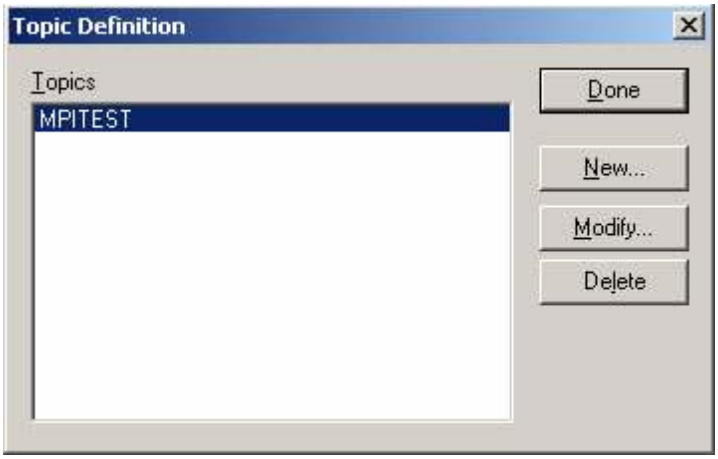

FIGURE 65: NEW TOPIC DEFINITION

4. Click **Done** to exit the **Topic Definition** dialog box.

The S7 I/O Server configuration is now complete.

Testing Your S7 Configuration With wwClient

1. Start wwClient, select **Connections/Create** to create a new connection to the S7 ioserver (see following figure):

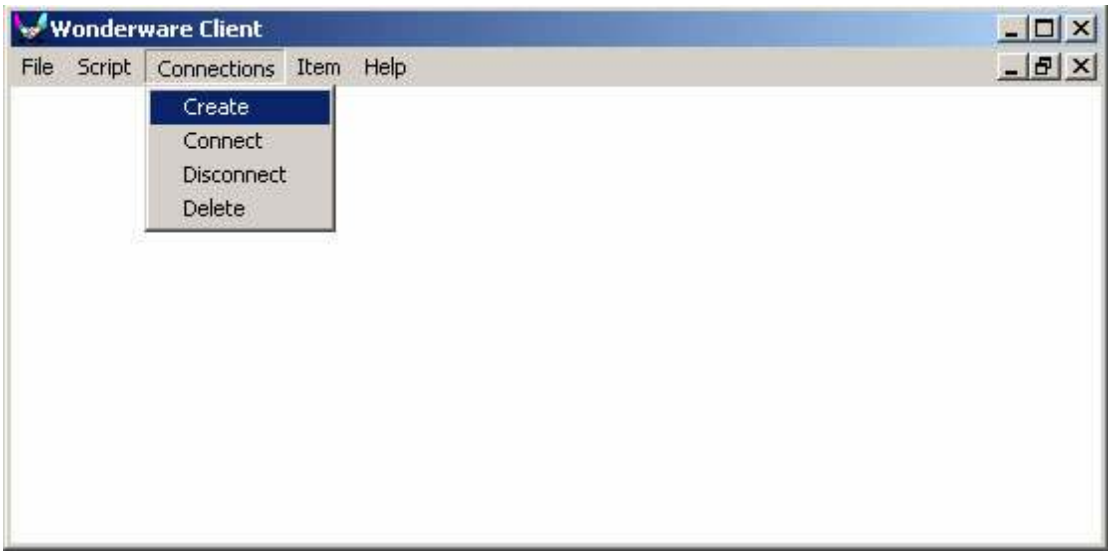

FIGURE 66: CREATE A NEW CONNECTION

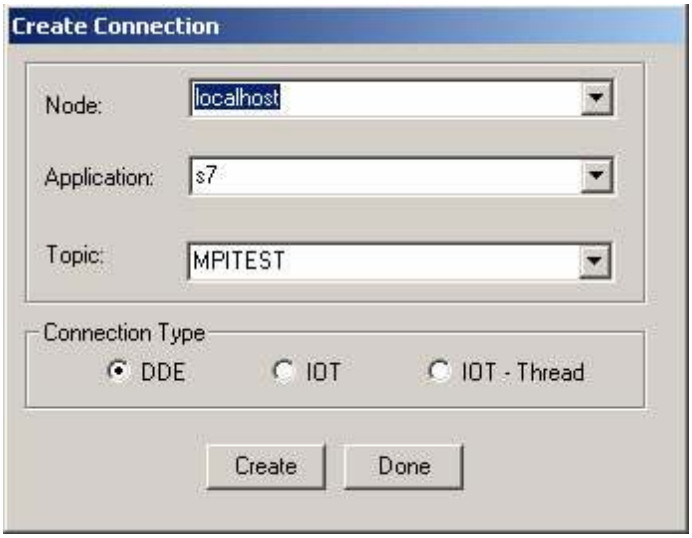

FIGURE 67: DDE CONNECTION

2. After entering the above information, click the **Create** button, and then **Done**. The following figure shows the DDE connection to the S7 I/Oserver:

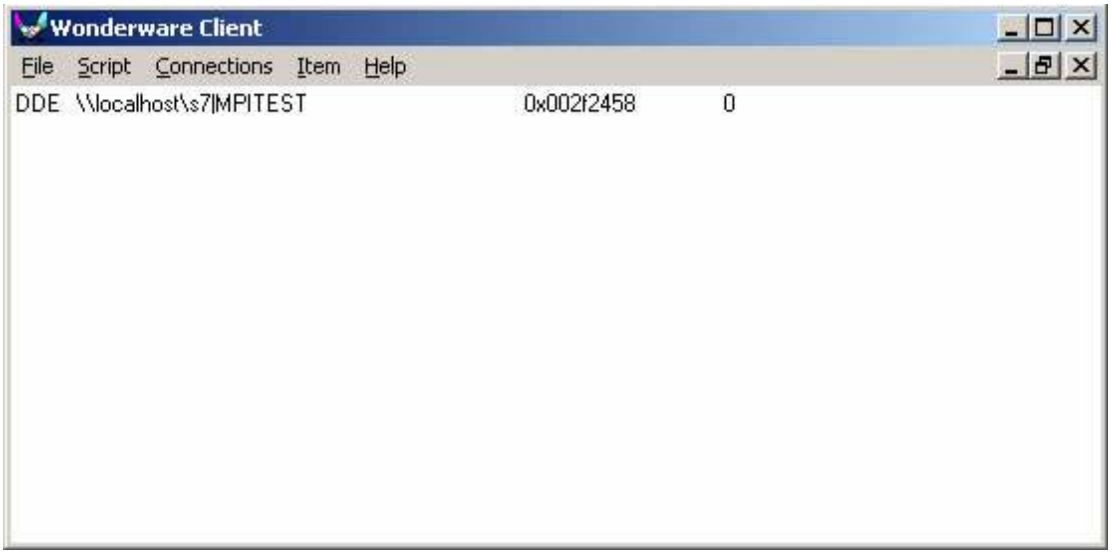

FIGURE 68: DDE CONNECTION

3. Click on **Item**, and the following window appears:

FIGURE 69: ITEM PROPERTIES

4. Enter in **mb90** (or any valid item in the PLC) for the **Item**, and click the **AdviseEx**, and **Done** buttons. The following figure shows a "good" value (0X00C0) counting on the second line of the wwClient window:

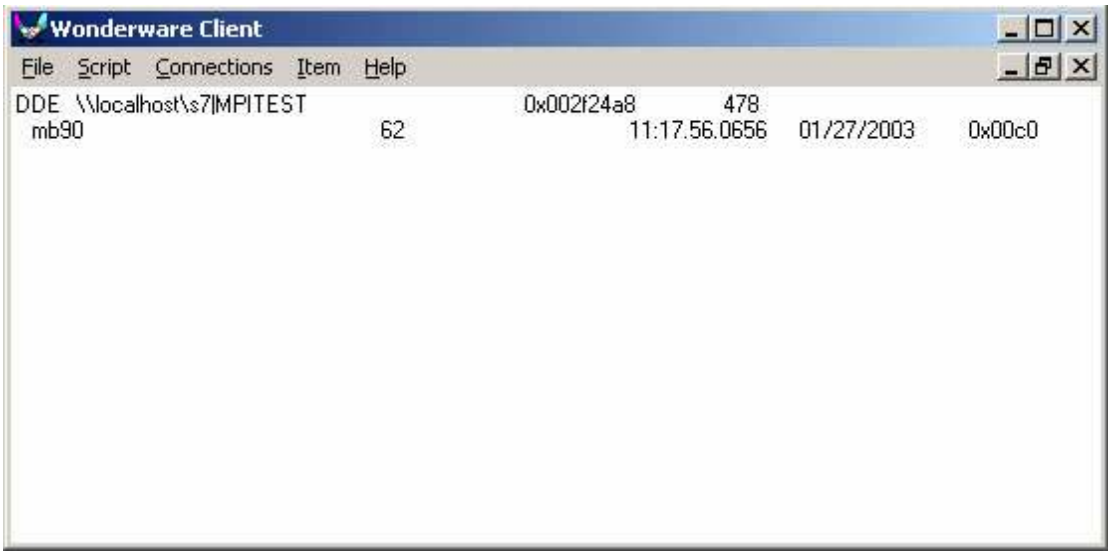

FIGURE 70: WWCLIENT WINDOW

The following figure shows the S7 I/O Server window with the item **mb90** on advise and a topic status of **GOOD**, and **0** errors:

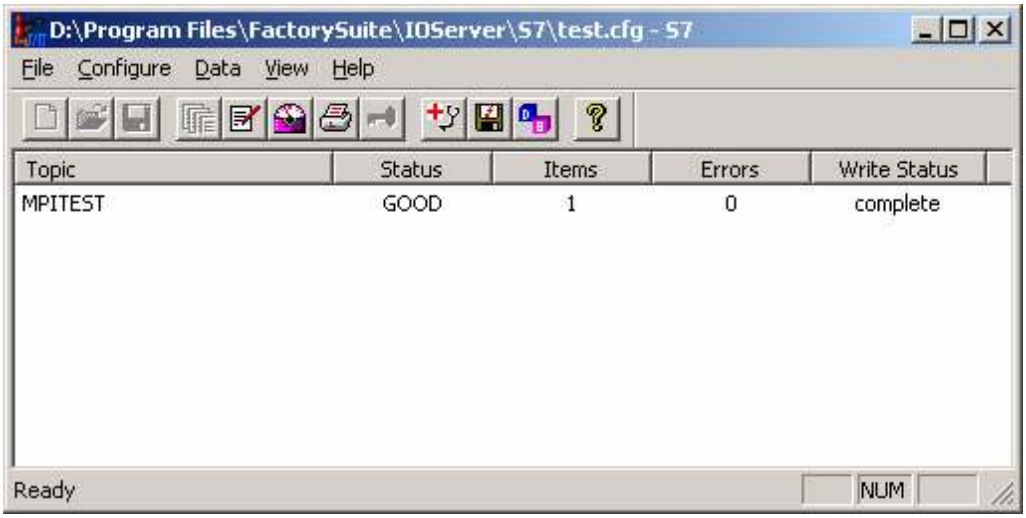

FIGURE 71: S7 I/O SERVER WINDOW

The following screen shows the **S7 Data Monitor** with the item **MB90** with a good Quality value (**00C0**).

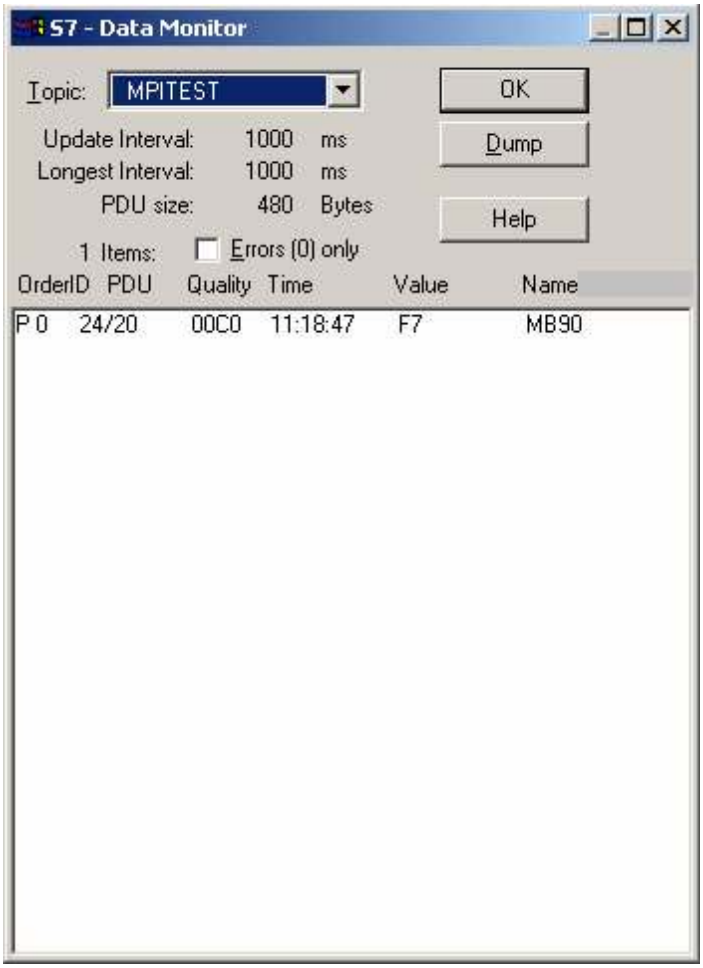

FIGURE 72: S7 DATA MONITOR

You have successfully configured SIMATIC NET 6.0 to communicate to the Wonderware Siemens S7 IOServer.

D. Plesset

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