SMLC/CoDeSys OPC tutorial

OPC Overview

OPC configuration steps:

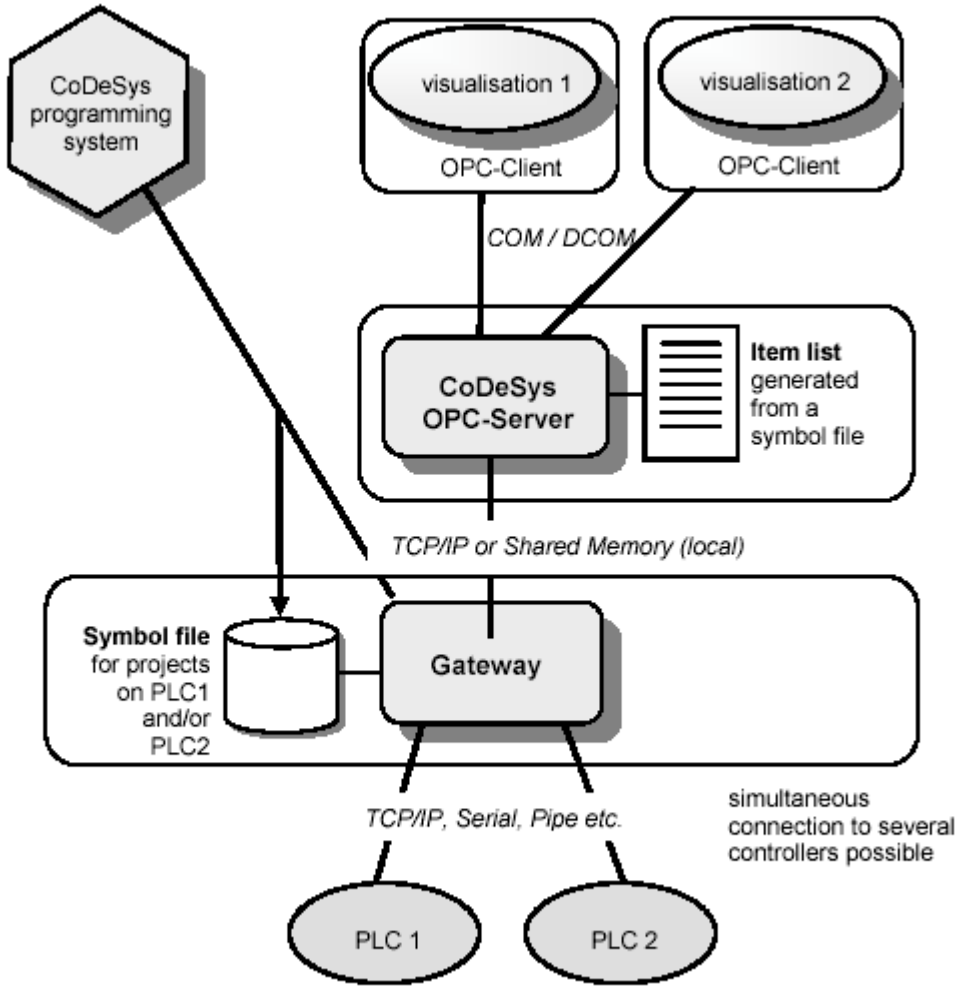
1) Configure the CoDeSys project
    a) Resource tab - Target settings - General - check Download symbol file
    b) Project | Options | Symbol configuration - check Dump symbol entries
    c) Project | Options | Symbol configuration - Configure symbol file
    d) Online | Communication parameters - Gateway setting

2) Install/Configure the CoDeSys OPC server
    a) Installation of the OPC server
    b) run the Gateway
    c) run the OPCConfigurator

3) Configure the OPC client
    Note: in this tutorial we will use the Matrikon OPC Explorer test client
    a) running the Matrikon test client
    b) connect to the CoDeSys OPC Server
    c) add a group
    d) add items

CoDeSys OPC overview

Architecture of the CoDeSys OPC-Server V2.0:

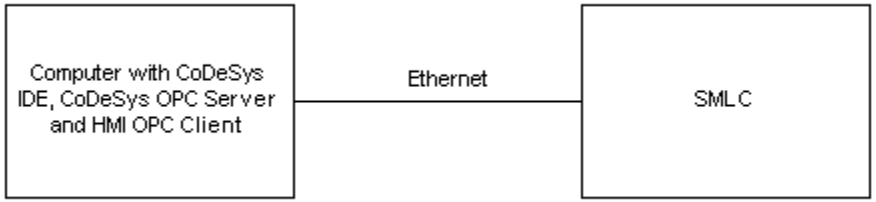


The CoDeSys OPC server is based on the CoDeSys Gateway Server (Gateway).

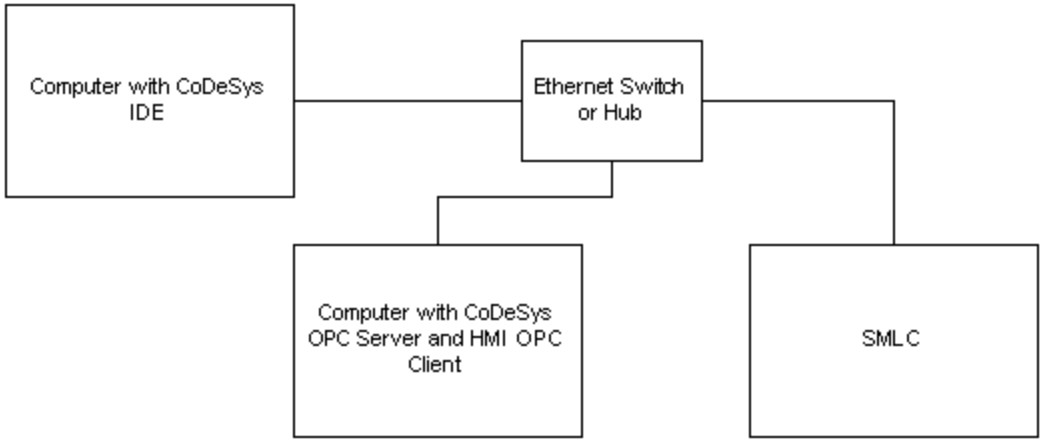
CoDeSys OPC overview

There are two scenarios:

1) The CoDeSys IDE is running on the same computer where the OPC server (with HMI OPC client) is installed. In this scenario step 1d is not required because you are using the local gateway on the development computer.



2) The OPC server (with HMI OPC client) is installed on a remote computer. This is the more likely case. See section 1d for configuring the remote gateway connection in the CoDeSys IDE.



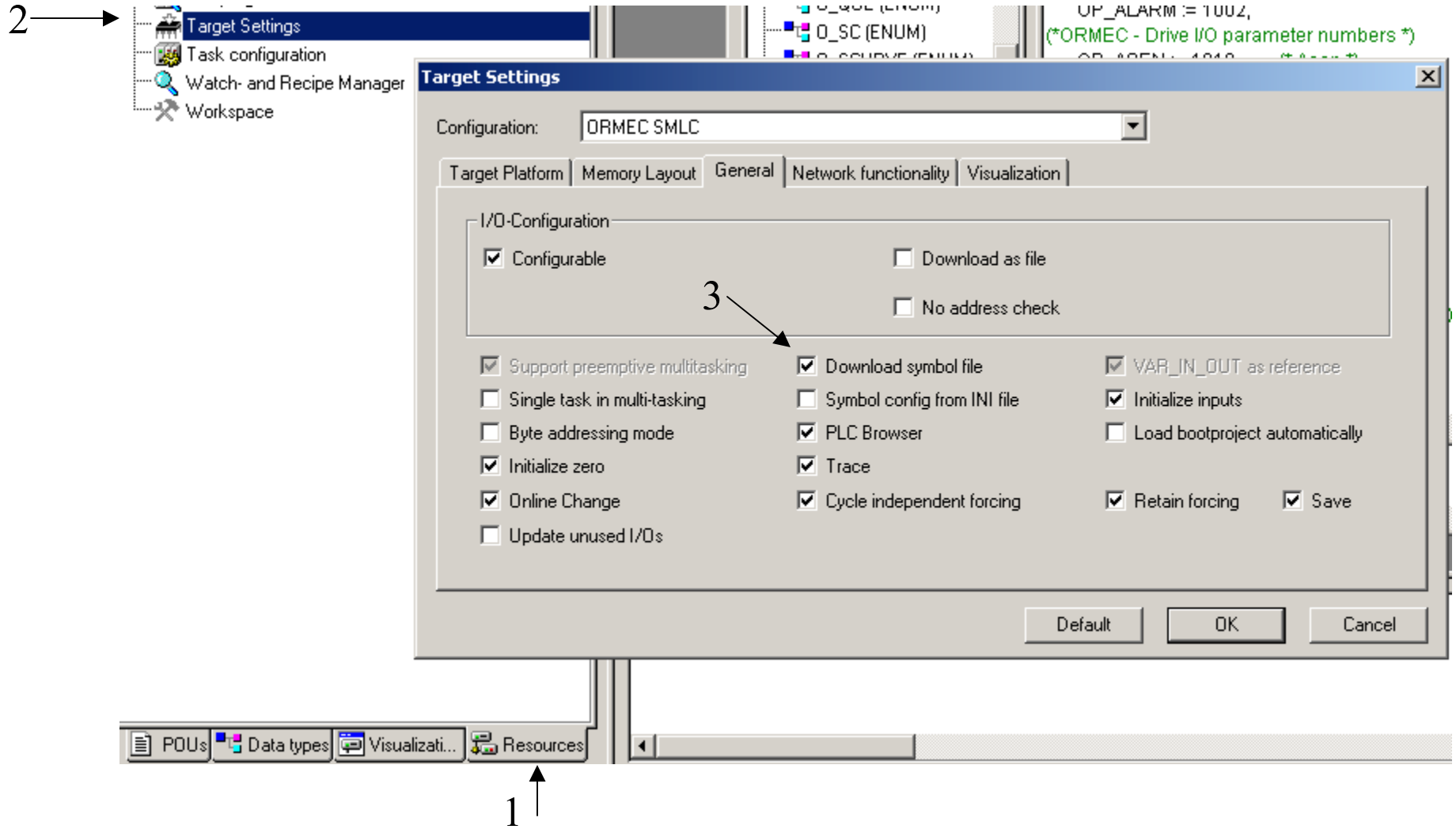
CoDeSys OPC additional background information

In order for the CoDeSys OPC Server to know what symbols (tags) are accessible, it needs to have a list of the symbols that are in your SMLC program (.pro file). This is why you need to download your program “through” the “remote” CoDeSys Gateway Server that is on the same computer as the CoDeSys OPC Server (this is scenario 2 on the previous page). When you download through the remove gateway a .sdb (symbol database) file is automatically stored on the gateway computer (in Win2k it is stored in c:\winnt\Gateway Files as can be seen in the graphic in section 1e, in WinXP this may be c:\windows\Gateway Files). Note that this file will only contain the symbols that you have chosen to be available to the OPC server - see section 1c.

Once you have downloaded the symbols via this “remote” gateway you don’t need to do it again unless you add or remove variables from your application program and you want the OPC Server to be aware of these changes. Of course if you are running the CoDeSys IDE on the same computer that is running the OPC Server this is not an issue.

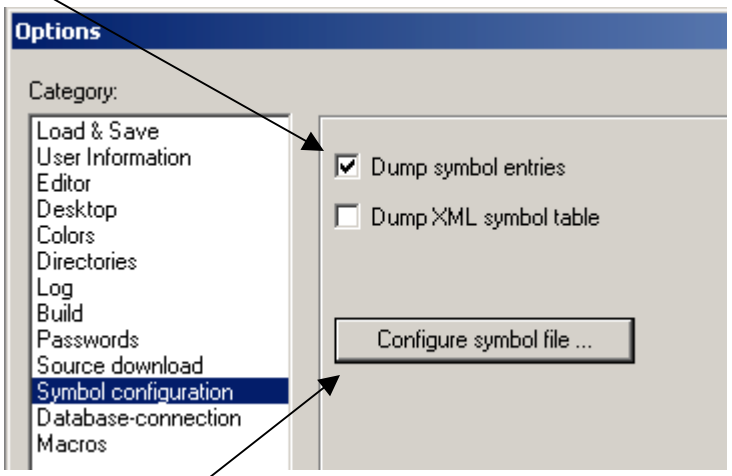
1a) check Download symbol file

In CoDeSys go to the Resources tab (1) and select the Target Settings (2). Check Download symbol file (3). Note that you must be Offline to change the Target Settings!



1b) check Dump symbol entries

In CoDeSys: Go to Project | Options | Symbol configuration
Check “Dump symbol entries”

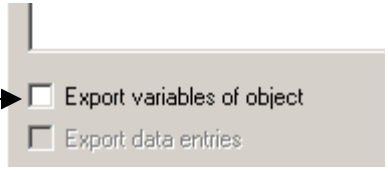


Then, press the “Configure symbol table” button

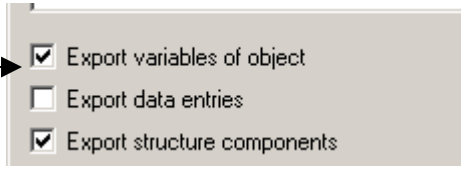
1c) Configuring the symbol file - all variables

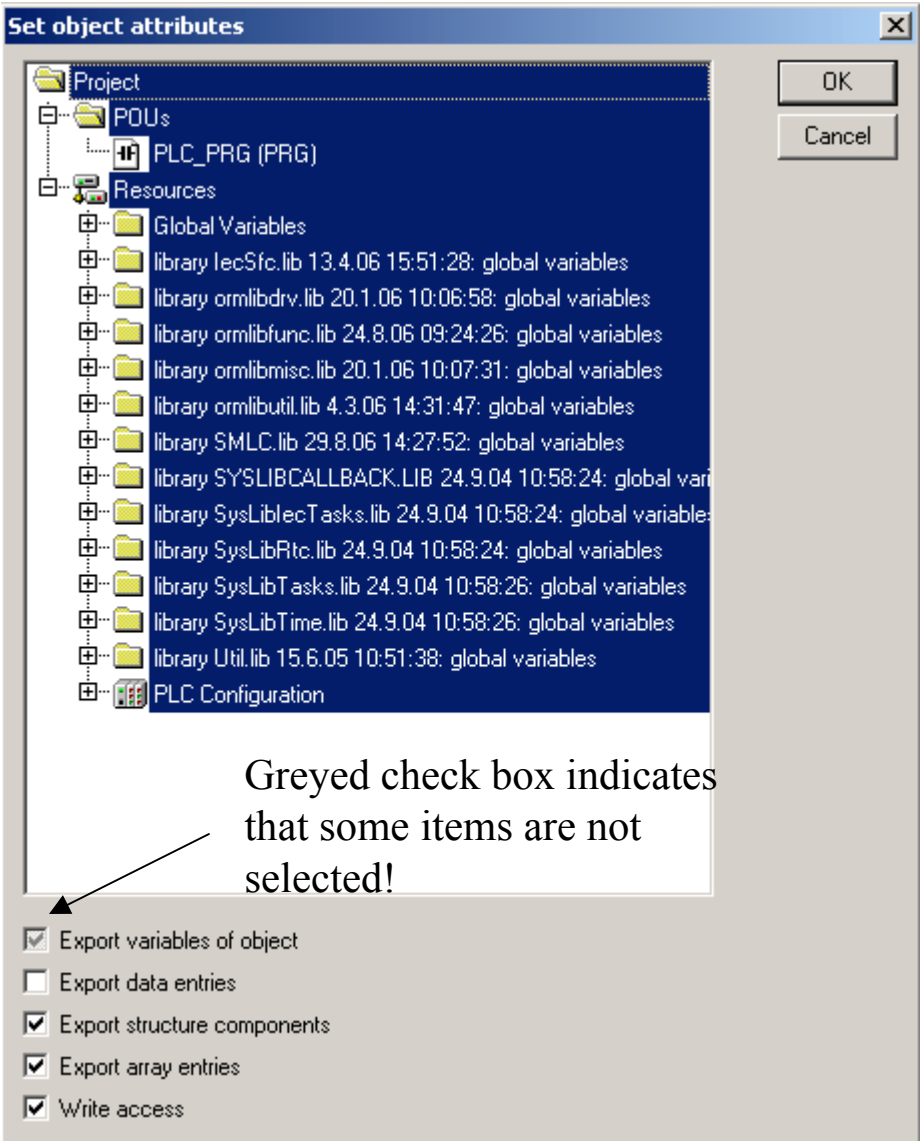
By default in a new project CoDeSys DOES NOT enable the exporting of POUs, Global Variables or PLC Configuration. This is why the "Export variables of object" check box is greyed. The quick way to enable export of all variables is to uncheck "Export variables of object" and then check it again. Be sure that all objects are selected in the tree as shown at the right.

Clear the check box



Check the check box

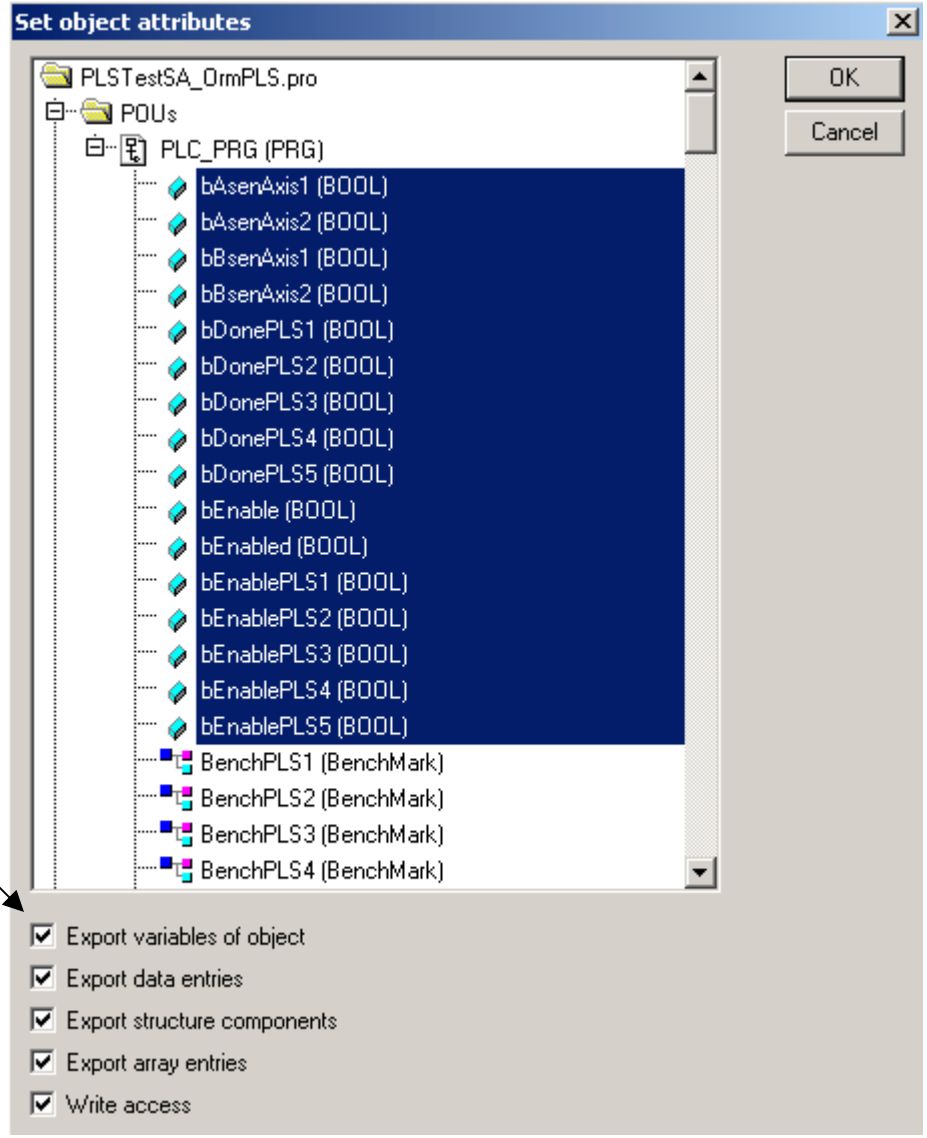




1c) Configuring the symbol file - selected variables

By expanding individual sections (POUs, Global Variables, PLC Configuration, etc.) you can select variables individually or in groups to be available to the OPC server.

As you select each variable (or group of variables) you can check or uncheck "Export variables of object".

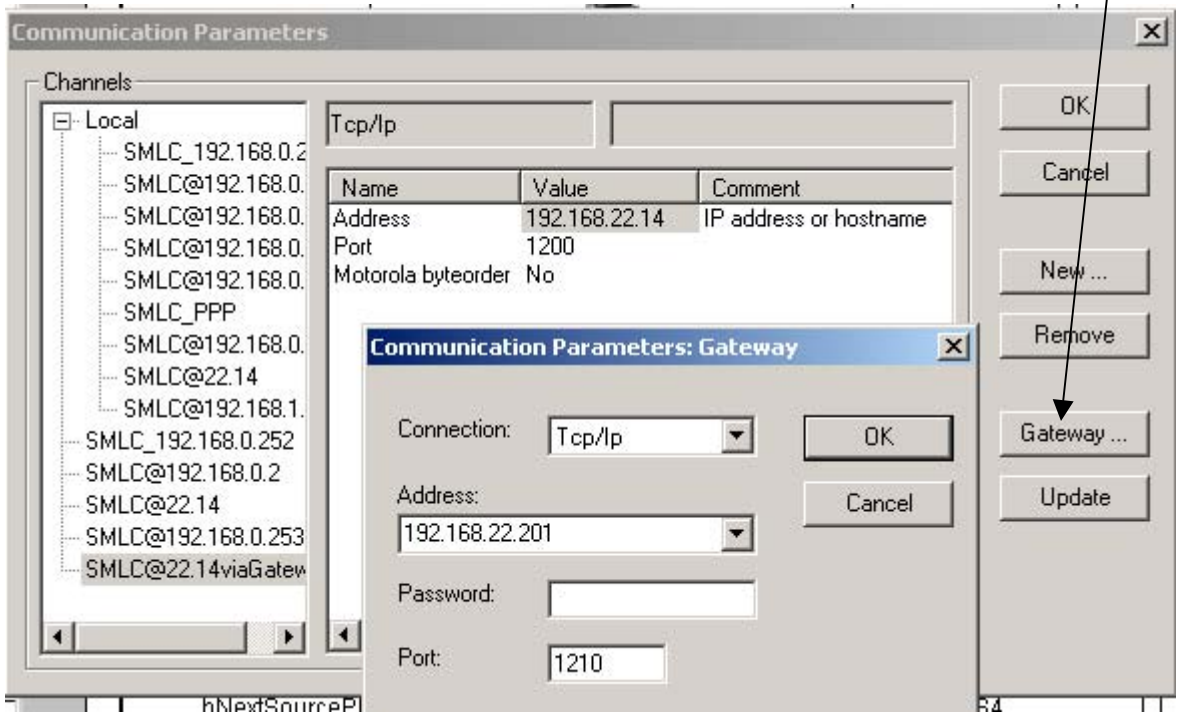


1d) Connecting to the SMLC via the remote gateway

In order to communicate with the SMLC via the Gateway on the remote computer, start CoDeSys on your development computer and open up the Communication Parameters dialog. Click on the Gateway button, select Tcp/Ip and enter the IP address of the remote computer where the OPC Server is installed.

NOTE: The Gateway setting is saved by the CoDeSys IDE, not within each communication setting so you will have to remember to set the Gateway back to Local when you want to talk directly with the SMLC again (without going through the remote gateway).

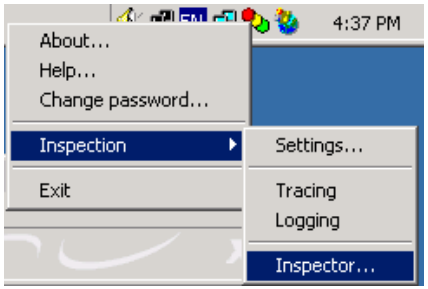
Before attempting to go Online using the remote gateway connection be sure to complete Step 2 to install the Gateway Server on the remove computer.



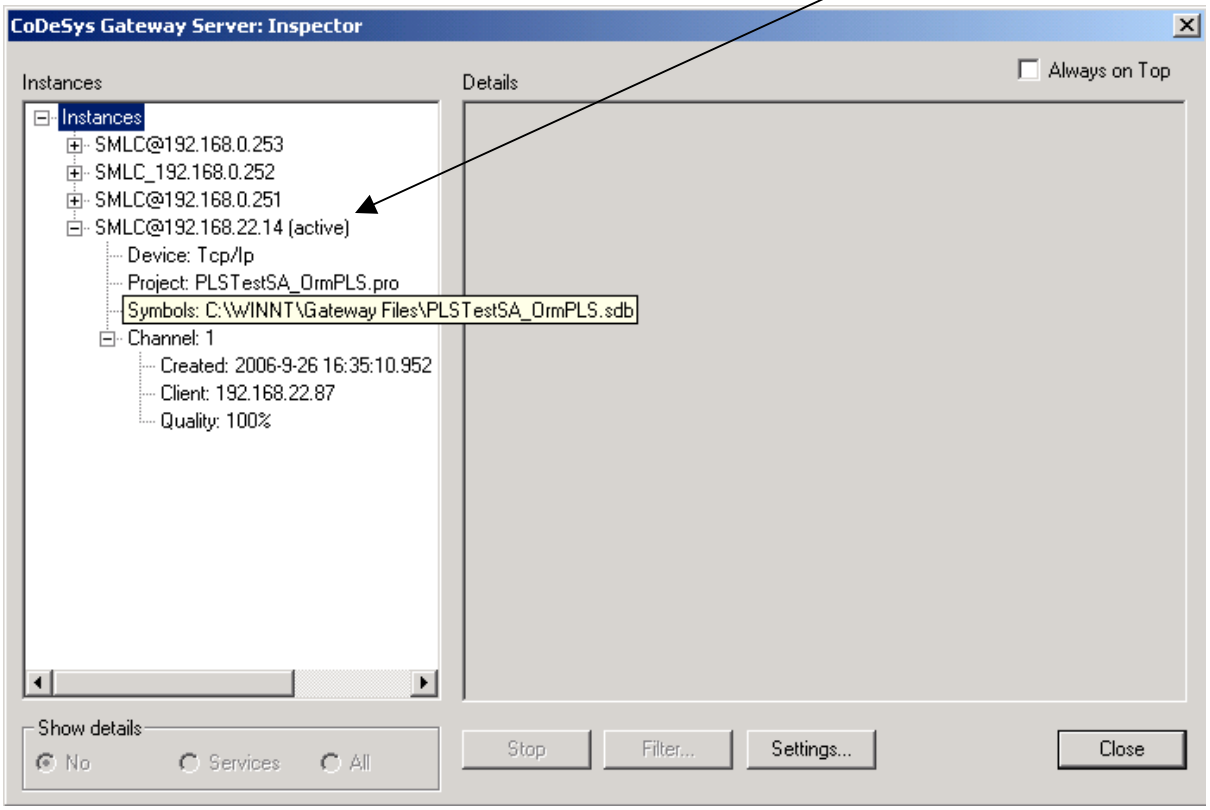
1e) verifying the connection to the SMLC via the remote gateway

For this test you should be logged into the SMLC via the CoDeSys IDE that is on your development computer and you should be using the remote gateway. Look in the task bar of the computer running the Gateway and OPC servers. The 3 ring CoDeSys icon should be “lit”. By right clicking on the icon you can select Inspection | Inspector and see that the connection you are using is active and that the symbol file has been loaded.

3 rings lit



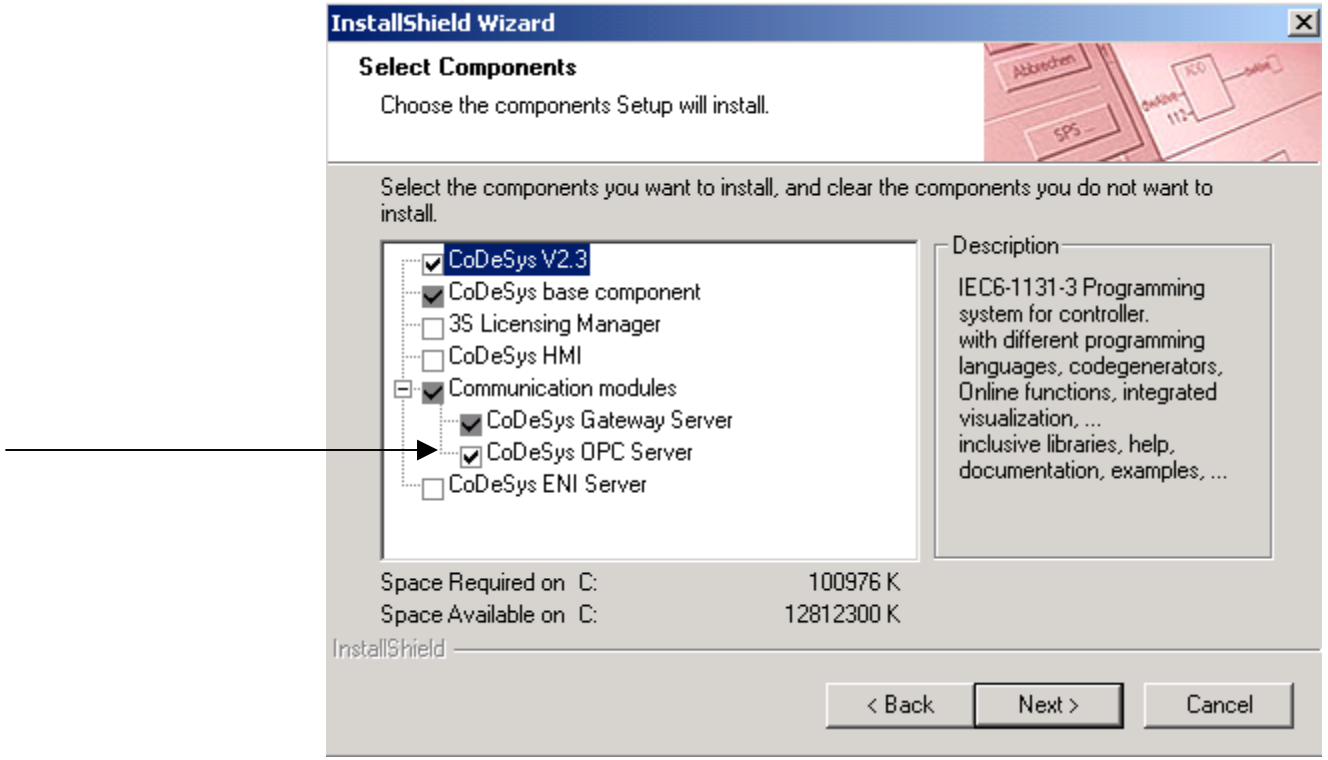
running the Inspector



2a) CoDeSys OPC server installation from CDS-SDK

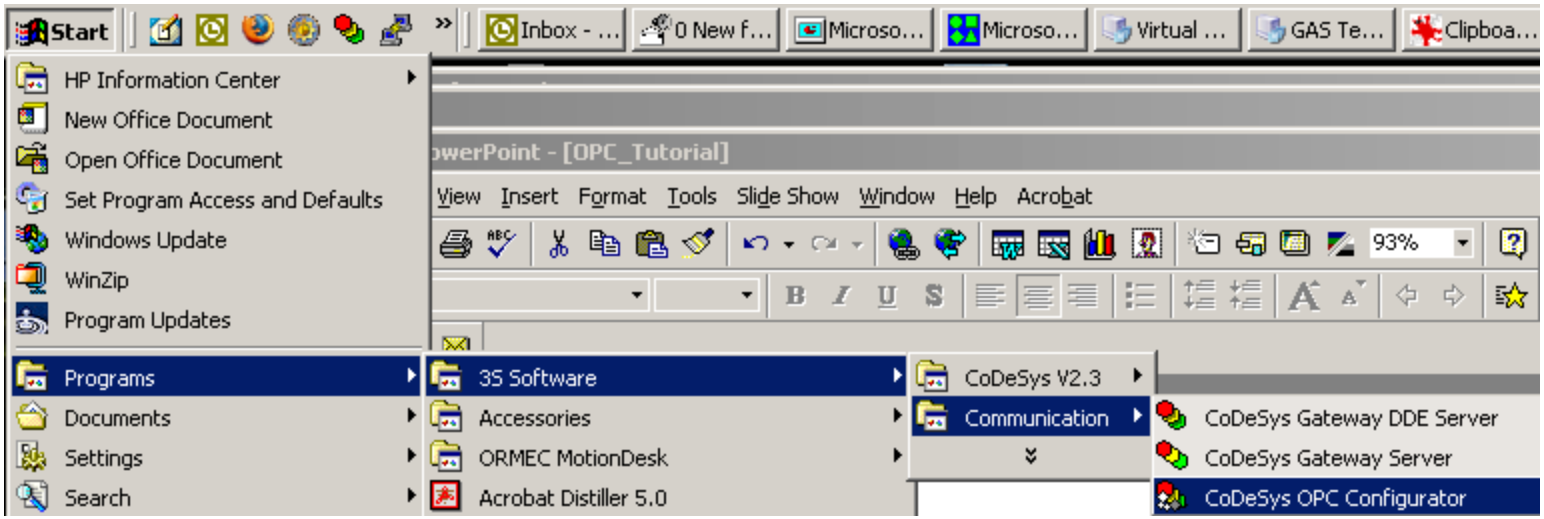
If the HMI software (OPC client) is running on the same computer as the CoDeSys IDE you don't need to do anything extra as long as you have the CoDeSys OPC server installed.

The CoDeSys OPC Server was an optional part of the CoDeSys installation on the CDS-SDK CD-ROM that is checked by default. As long as you didn't uncheck it during the installation you should have it.



2a) Checking to see if the OPC Server is installed

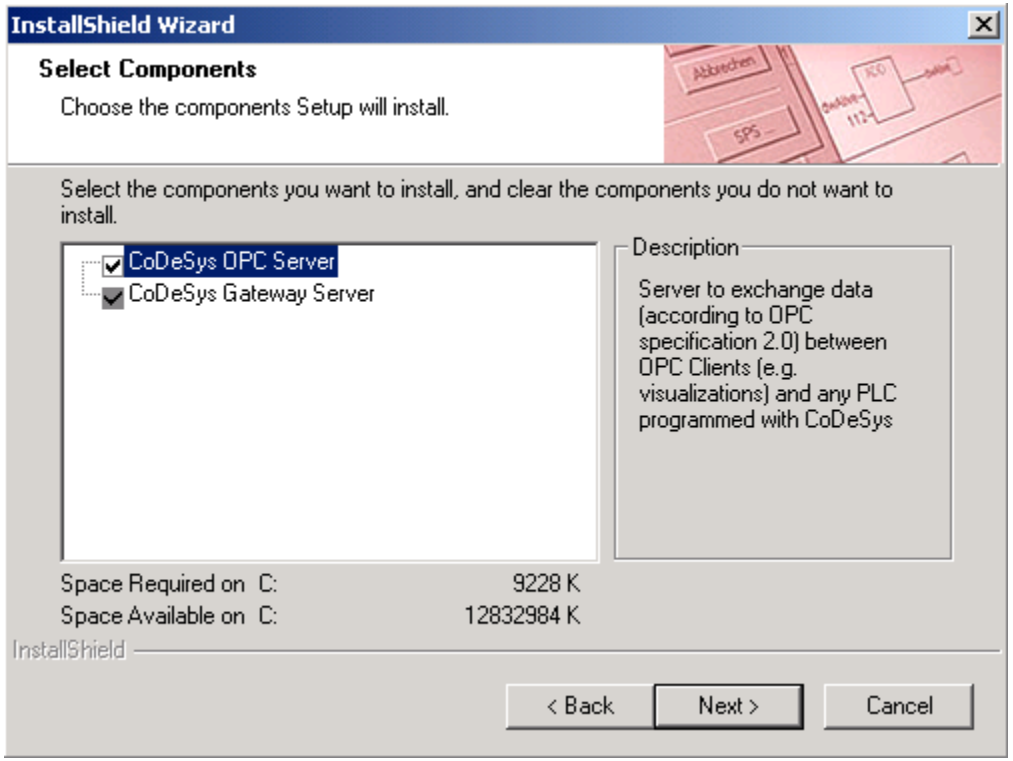
To check if you have the CoDeSys OPC Server already installed go to Start | Programs | 3S Software | Communication. If you see the CoDeSys OPC Configurator then you the CoDeSys OPC Server is installed.



2a) CoDeSys OPC server installation - standalone installer

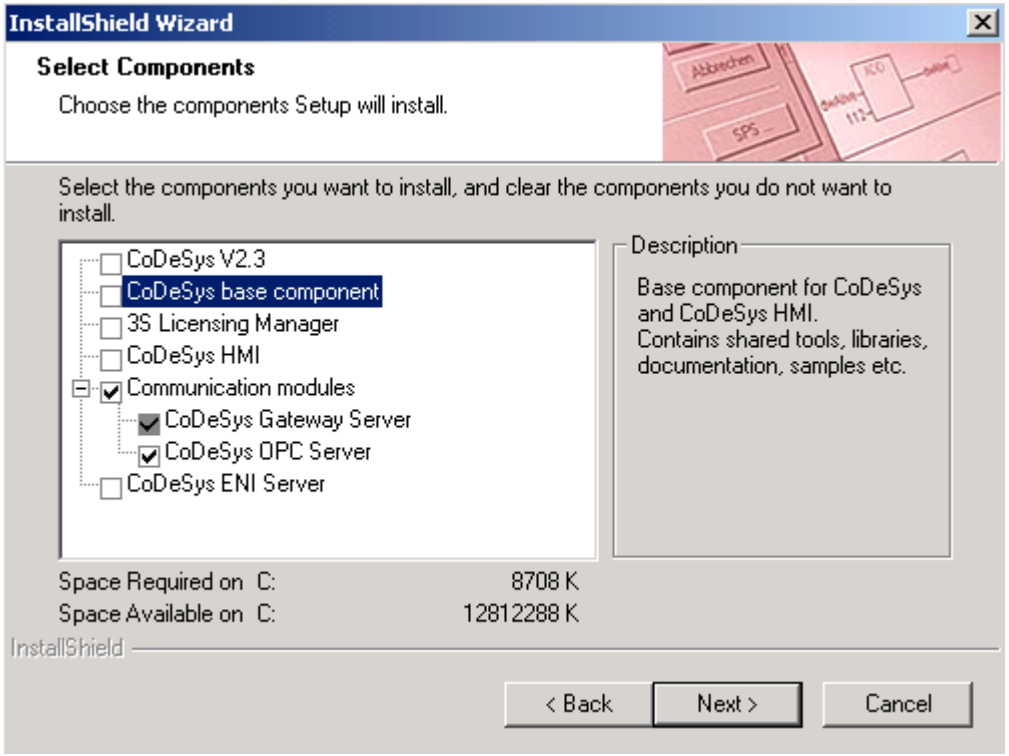
If the HMI software (OPC client) is running on a remote computer you need to install the CoDeSys OPC Server on it.

There is a standalone CoDeSys OPC server installer that you can use for this purpose included on the CDS-SDK (and on the SMLC download page on the ORMEC web site). This installer will also install the CoDeSys Gateway Server that will allow you to communicate with the SMLC connected to the HMI computer.



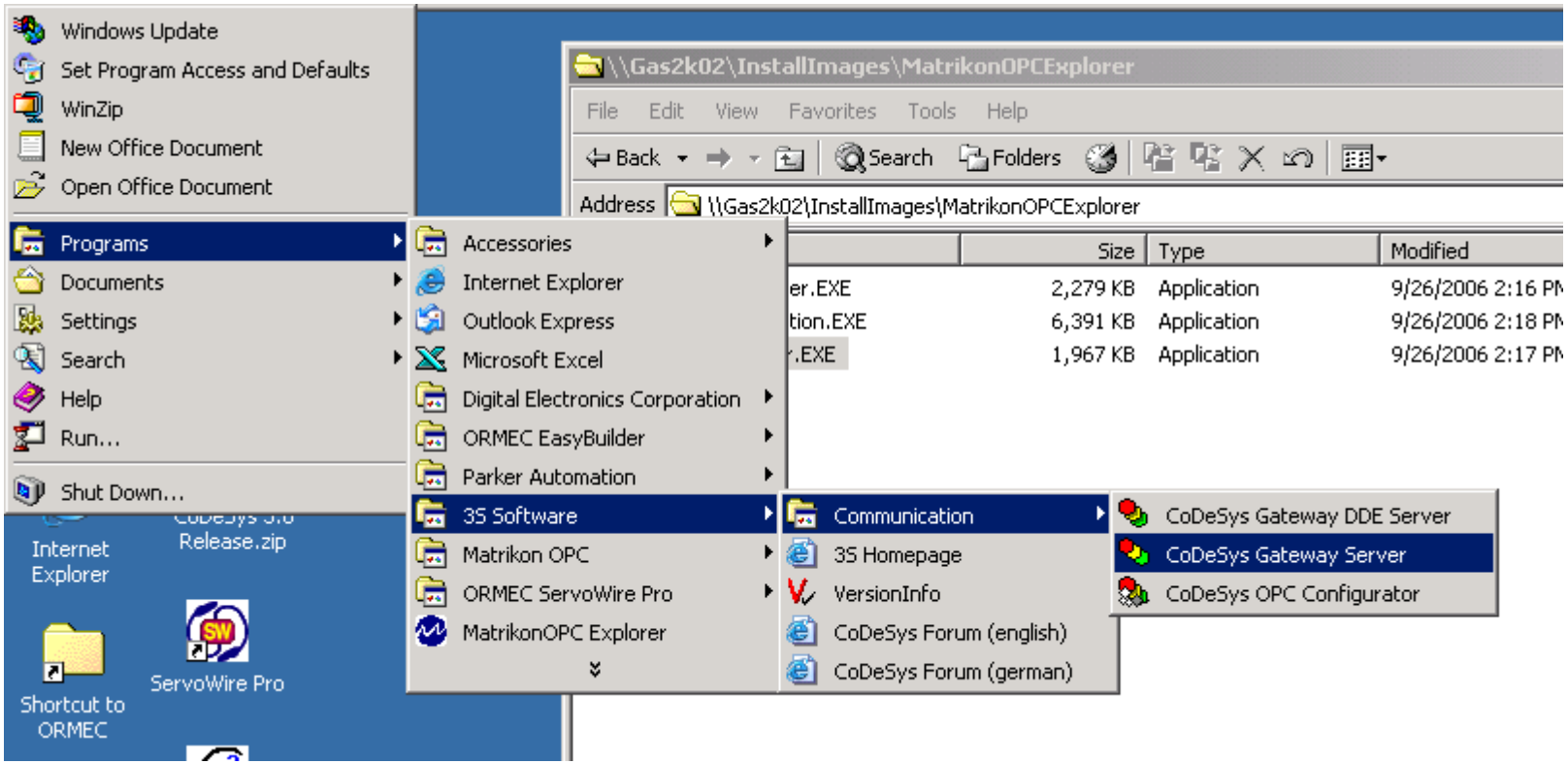
2a) CoDeSys OPC server installation - using CDS-SDK

You can also use the main CoDeSys installer on the CDS-SDK CD-ROM to install the CoDeSys OPC Server and Gateway Server on your remote PC. Simply uncheck all items except the Communication modules in the main installation menu.



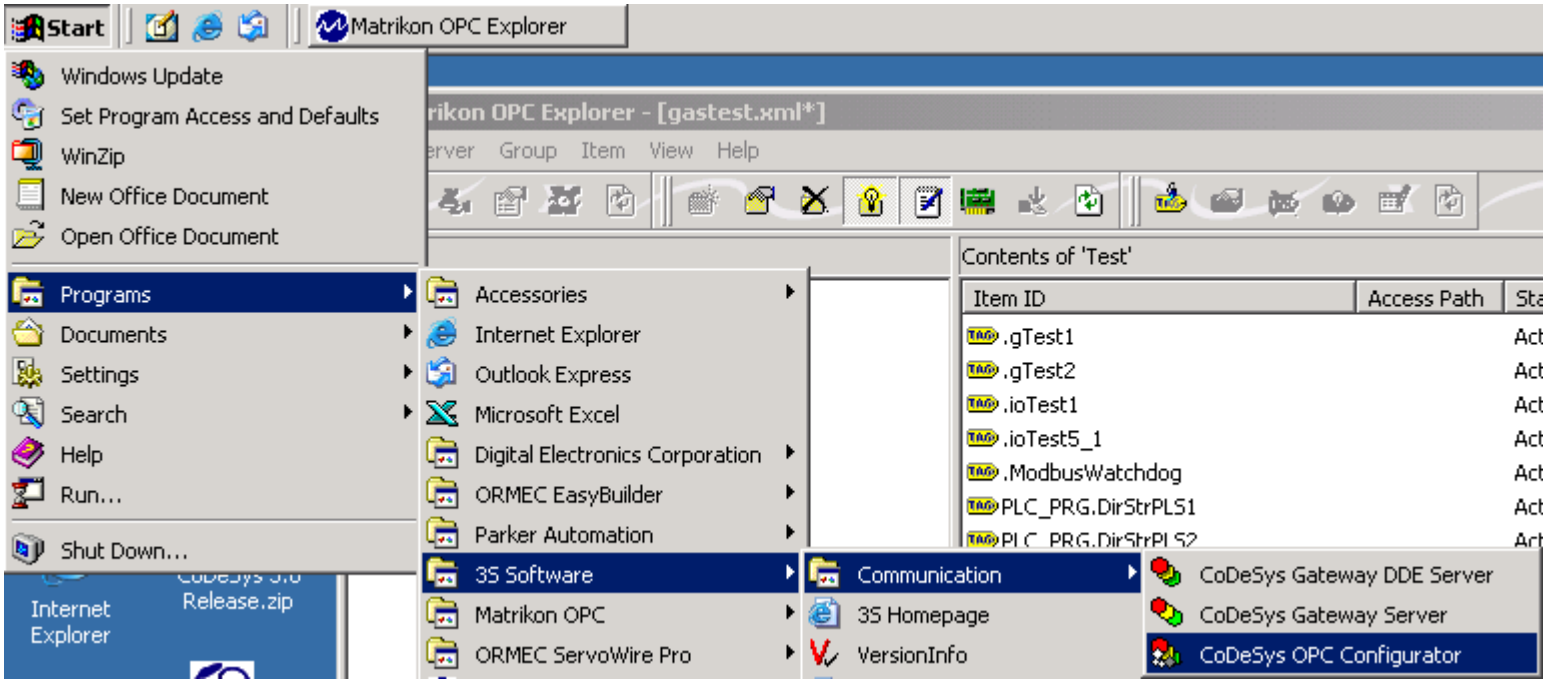
2b) Running the CoDeSys Gateway Server

If you are using a remote computer as the OPC server you need to run the CoDeSys Gateway Server. You probably want to put a shortcut to this in your startup group so it runs automatically when the computer is started.



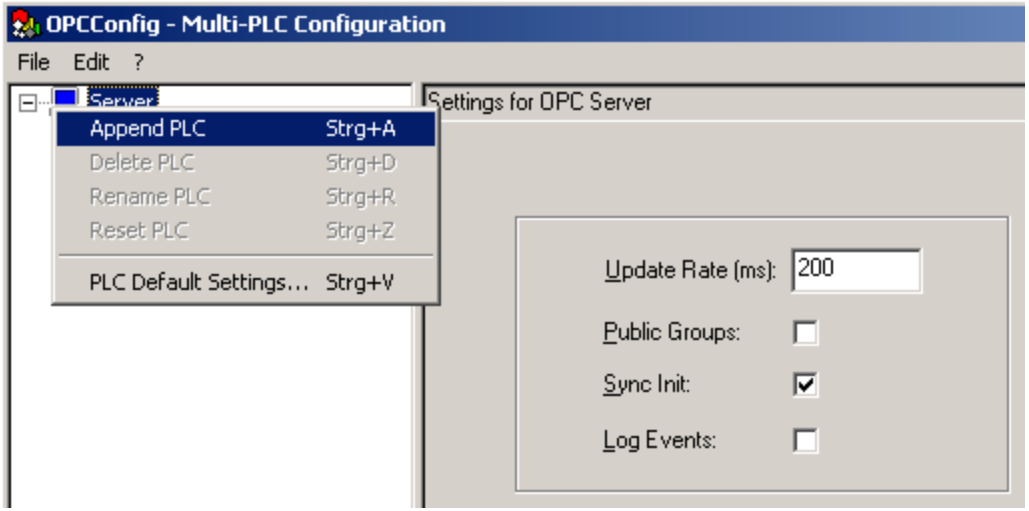
2c) running the CoDeSys OPC Configurator

Run the CoDeSys OPCConfigurator. The OPC Configurator is used to tell the CoDeSys OPC Server the location (IP address) of each SMLC on the network that the OPC Server needs to query. You only need to run the OPC Configurator once unless you change the network configuration (e.g. SMLC's IP address).



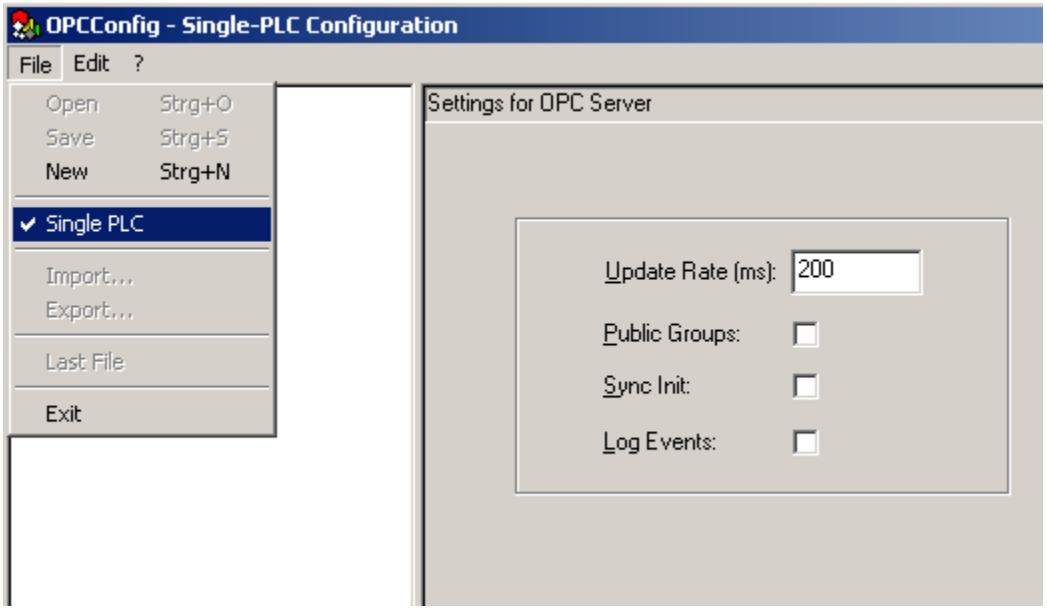
2c) running the CoDeSys OPC Configurator

Right click on the Server and select Append PLC



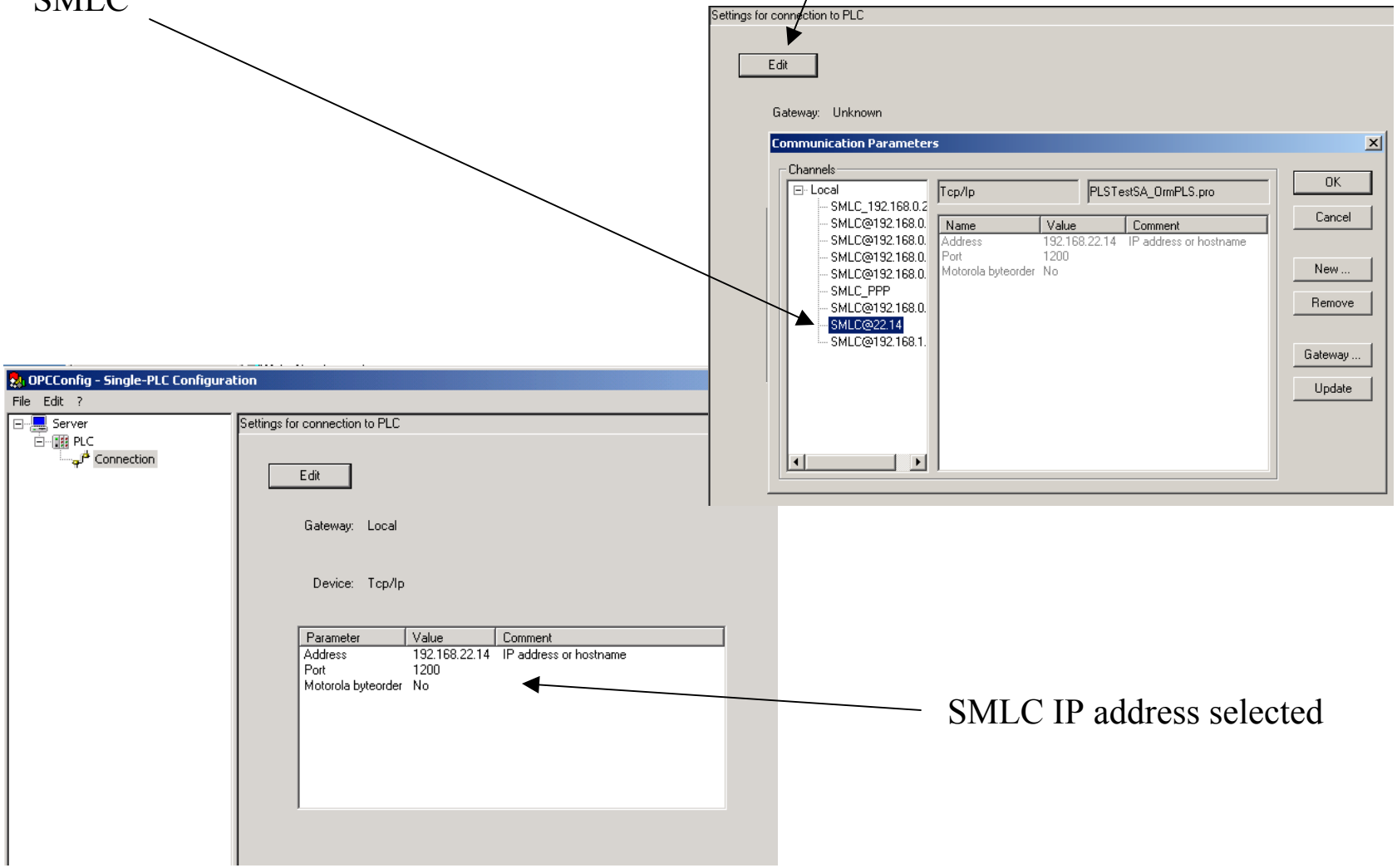
2c) running the CoDeSys OPC Configurator

If this network will only have one SMLC select Single PLC from the File menu. The OPC Configurator allows you to have multiple CoDeSys nodes. If you do have multiple nodes then do not select Single PLC and right-click Append PLC for each SMLC in the system.



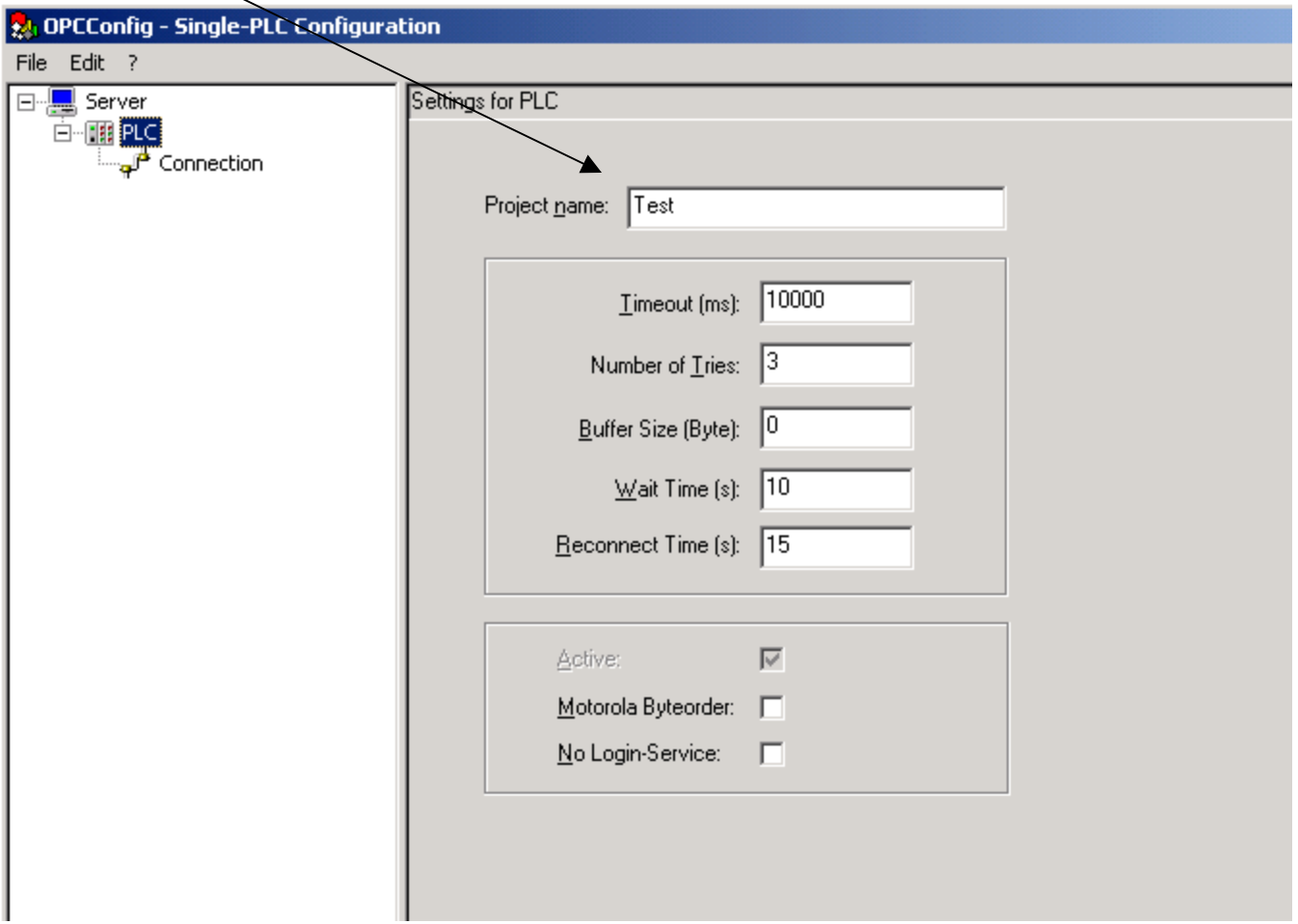
2c) running the CoDeSys OPC Configurator

For each PLC node select the connection and hit the Edit button, select the IP address of this SMLC



2c) running the CoDeSys OPC Configurator

You can name this configuration and save it from the File menu

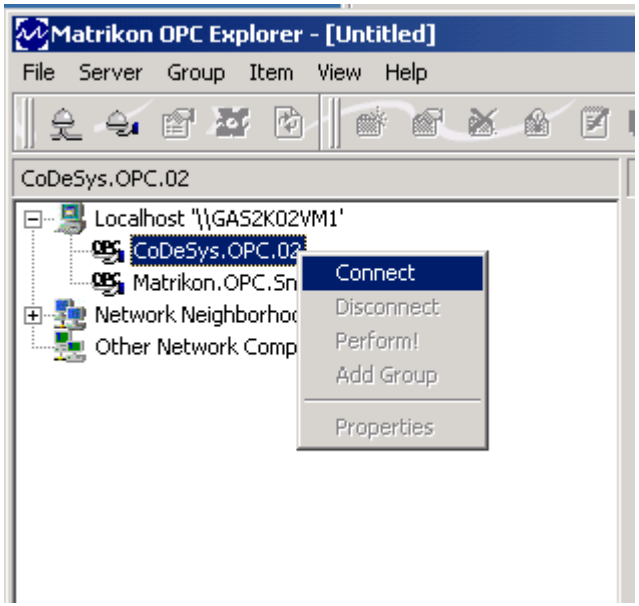


3a) Running the Matrikon OPC test client

The Matrikon OPC test client is freeware and is available at www.matrikonopc.com.
At this point you can configure your own OPC client or you can download, install and run the Matrikon OPC Explorer on the computer that is running the CoDeSys OPC server.
This tutorial will use the Matrikon test client.

3b) Connecting to the CoDeSys OPC server

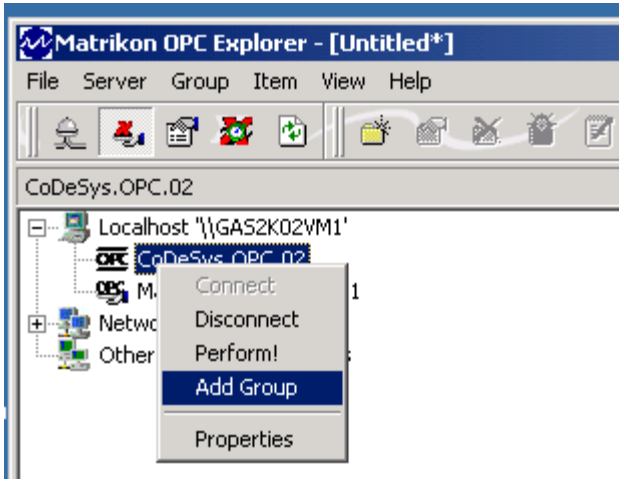
When the test client starts up it will automatically scan the local computer for any OPC servers. It should locate the CoDeSys.OPC.02 server and display it in the tree.
Right click on the CoDeSys.OPC.02 entry and select Connect



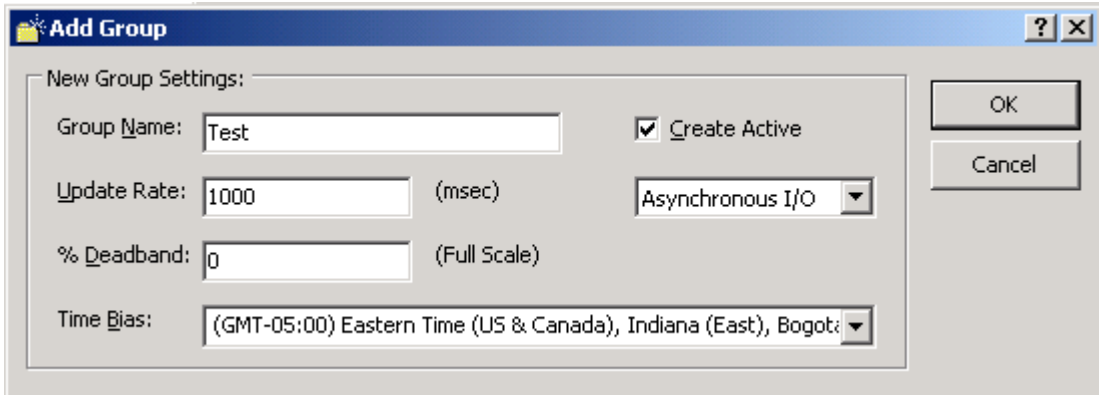
The 3S OPC icon in the toolbar will automatically appear when the connection is made

3c) Add a group

Right click on the CoDeSys OPC server and select Add Group.

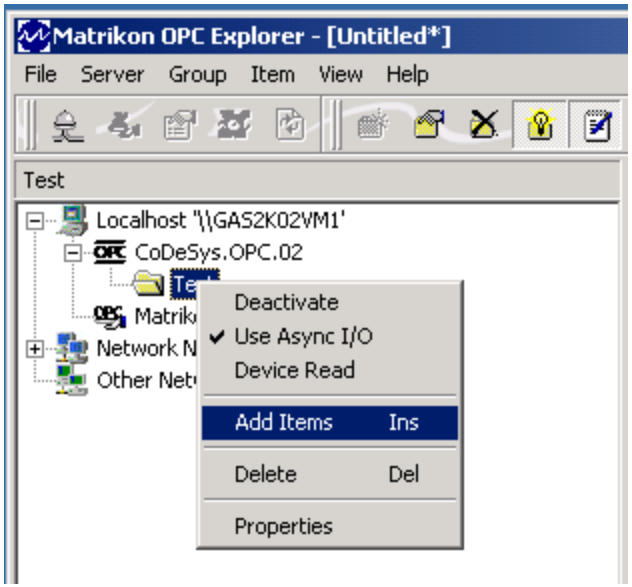


Name the group and set the Update Rate, press OK



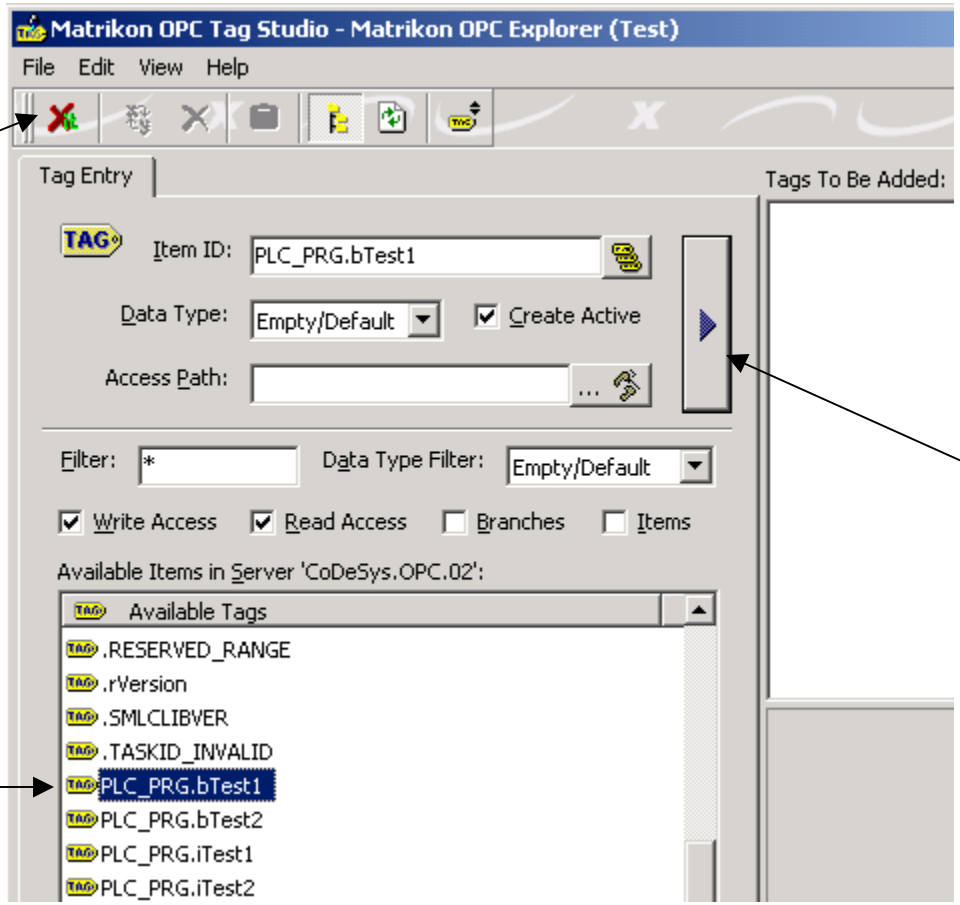
3d) adding items

Right click on the group and select Add Items



3d) adding items

Select the items from the Available Tags list that you wish to monitor. In the Matrikon test client you must double click on the individual item to load it into the Item ID field, then press the right arrow button to add the item to the list to be monitored.



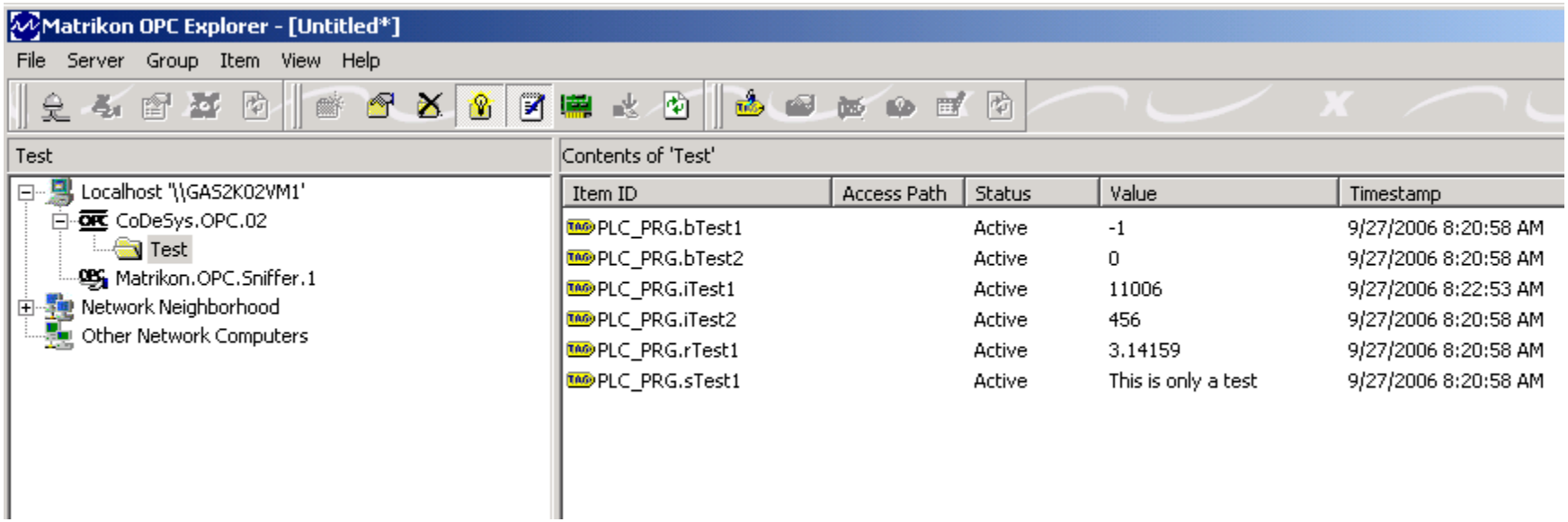
3) Click here to close the Tag Studio when finished

2) Click here to add the item to list of items to be monitored.

1) Double click on each item to move it up to the Item ID field

3d) viewing the added items

The selected items are now displayed in the right pane. Change the values in the SMLC program and see that they change in the OPC Explorer display



This concludes the SMLC/CoDeSys OPC tutorial