

OPC Server 3 Installation and Usage

This document is a summary of the official 3S document **OPC_V3_how_to_use_E.pdf** with more details about the way to configure the OPCserver.

This OPC_V3_how_to_use_E.pdf is installed with SoMachine & it is available in the directory: C:\Program Files\Schneider Electric\SoMachine\CoDeSys OPC Server 3

1 Overview on OPC

OPC₁ is a standardized interface for access on process data. It is based on the Microsoft standard **COM/DCOM**₂ and enlarged due to the requirements of data access in automation, where the interface is mainly used to read data from or write data to the controller. Typical OPC clients are visualizations, programs in purpose to register operating data, etc. Typical providers of OPC Servers are PLC systems and field bus interface cards.

The OPC Server is an executable program that is started automatically during the establishment of a connection between client and PLC. Hence, the OPC Server is able to inform the client about changed variable values or states.

The OPC Server provides all variables (referred to as **Items** in) that are available on the PLC (**Item Pool** or **Address Space**). These items are managed within a **Data Cache** ensuring a fast access to their values. Also possible is a direct, not cached access on the items of the PLC.

In the OPC Server the items can be organized in so-called **Groups (Private and Public)**.

The private groups can be composed in the client arbitrarily from particular items. Initially they do not effect the groupings in the OPC Server, but if necessary can be transformed to Public Groups. Working with Private Groups for example is useful in order to be able to activate or inactivate certain groups of variables with just one single command, depending on whether they should be accessible or not.

Grouped data should be read from the OPC Server consistently, i.e. all variables should be read at the same time. Regard however that this is not always possible in case of target systems with restricted communication buffers!

Due to the characteristics of DCOM it is possible to access an running on another computer. It is also allowed that more than one client accesses the data source at the same time. The applicability of different languages (C++, Visual Basic, Delphi, Java) is another benefit of employing COM.

2 Overview on CoDeSys OPC Server 3

The CoDeSys OPC Server is based on the PLCHandler of 3S - Smart Software Solutions GmbH. This communication module permits a direct communication to **all** PLCs programmable with CoDeSys. Thereby, the OPC Server V3.x supports the following OPC specifications:

- OPC Common Definitions and Interfaces Version 1.0
- Data Access Custom Interface Standard Version 1.0
- Data Access Custom Interface Standard Version 2.05A
- Data Access Custom Interface Standard Version 3.0
- Data Access Automation Interface Standard Version 2.0

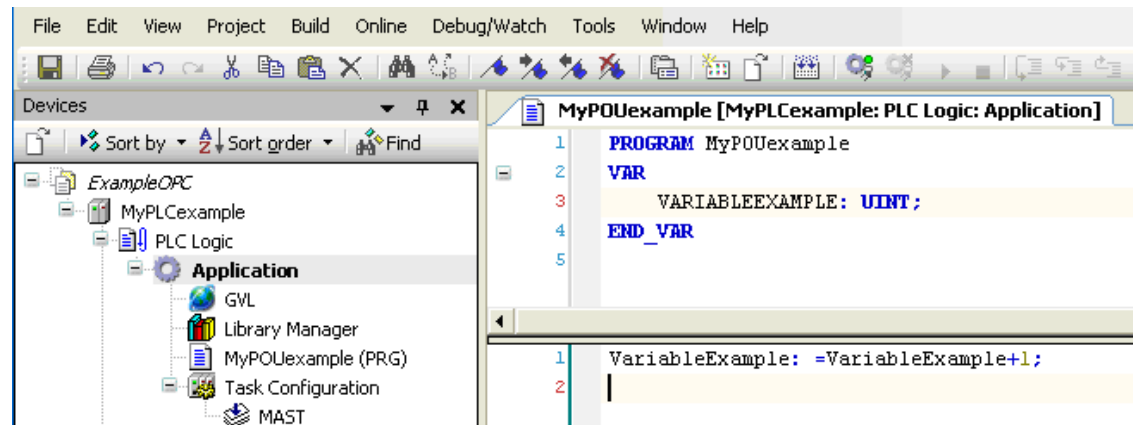
Communication between OPC Server and PLC can be carried out via the following interface:

- Gateway V3

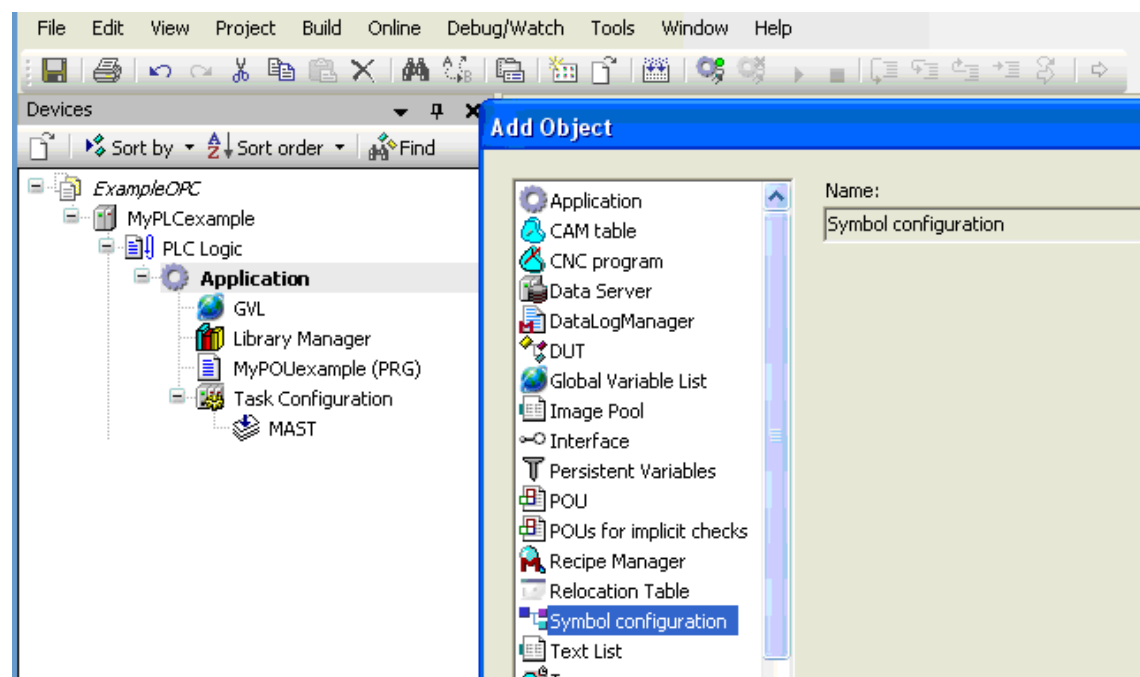
3 Declare a variable to be used with OPC

Follow the sequence:

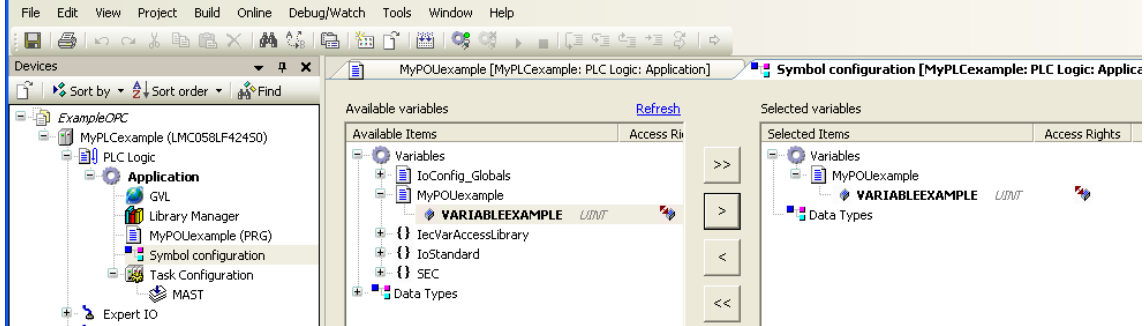
- Create a Project (eg: ExampleOPC)
- Add & select a Controller using “Add Device”
- Configure the name of the Application with double click on the name (eg: MyPLCexample)
- Create a Program in your application using “Add Object” when click right on “Application”
- Configure the name of the Program (eg: MyPOUexample)
- Double Click on a task (eg: MAST) & associate the Program (eg: MyPOUexample) to the task
- Make a “Build All” using Build Menu & verify there is no error during Build execution



- Create a Symbol Configuration Object in your application using “Add Object” when click right on “Application”.
- Select “Symbol Configuration” & click on Open



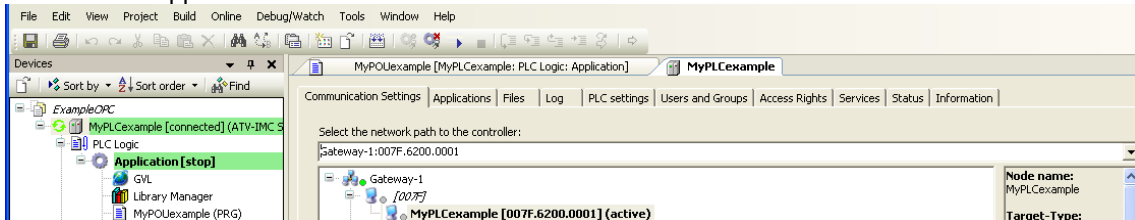
- Click on “Refresh” link Button
- Expand the “Variables” object”
- Select the variable (eg: VARIABLEEXEMPLE) you want to share with your OPC client from your Program (eg: MyPOUexample)
- Click on “>”Button to send the variable to shared data base & give access for the OPC Client



- Make a “Build All” using Build Menu & verify there is no error during Build execution
- Close the window “Symbol Configuration”
- You can have a look in the directory where you have stored you Project to see a xml file which describe the list of the variables which are accessible for OPC client (eg: ExampleOPC.MyPLCexample.Application.xml)

```
<?xml version="1.0" encoding="utf-8"?>
<Symbolconfiguration xmlns="http://www.3s-
software.com/schemas/Symbolconfiguration.xsd">
  <Header>
    <Version>3.3.0.0</Version>
    <SymbolConfigObject version="3.3.0.0" />
    <ProjectInfo name="ExampleOPC" devicename="MyPLCexample"
  appname="Application" />
  </Header>
  <TypeList>
    <TypeSimple name="T_UINT" size="2" swapsize="2" typeclass="UInt"
  iecname="UINT" />
  </TypeList>
  <NodeList>
    <Node name="Application">
      <Node name="MYPOUEXAMPLE">
        <Node name="VARIABLEEXEMPLE" type="T_UINT" access="ReadWrite" />
      </Node>
    </Node>
  </NodeList>
</Symbolconfiguration>
```

- Connect your PC to your PLC using the Communication Setting window
 - Download the Application
 - Make it running
- it will appear as follows:



4 Installation of the CoDeSys OPC Server

OPC Server V3 is delivered in setup form. All files needed for the OPC communication get installed and the OPC Server will be registered automatically as COM server.

Note: For using the OPC Server V3 on a Windows Vista system, it is strongly recommended to run the OPC client in Windows XP SP2 compatibility mode and with extended administrator rights in order to get a continuous updating of the values.

- Go to the directory:
C:\Program Files\Schneider Electric\SoMachine\CoDeSys OPC Server 3
- Double Click on :
WinCoDeSysOPC.exe

4.1. *Parallel installation and registration*

With command

WinCoDeSysOPC /RegServer

the server is registered as COM server. Thereby as location path always the current position of WinCoDeSysOPC.exe will be used. Thus the call only may be done from a local path.

4.2. *Registration as service*

With command

WinCoDeSysOPC /Service

WinCoDeSysOPC.exe gets installed as system service. Started once, the service will stay “started” until the system gets terminated. The communication to the configured PLCs survives. Also here the service gets installed in the current position of WinCoDeSysOPC.exe.

4.3. *Uninstalling the*

With command

WinCoDeSysOPC /UnRegServer

all entries of the OPC Server will be removed from the registry. The installed files will not be removed.

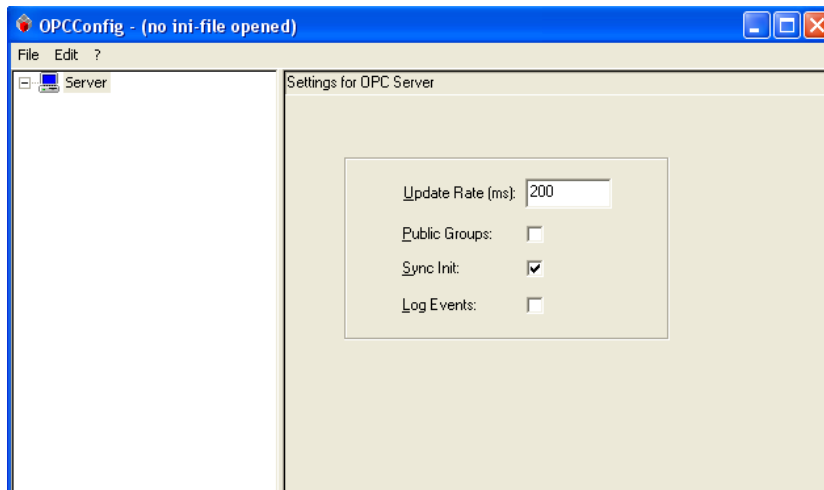
5 OPC Server Configuration by OPCconfig.exe

It is now necessary to configure the OPCserver & link it with the Project you have done.

- Go to the directory:
C:\Program Files\Schneider Electric\SoMachine\CoDeSys OPC Server 3
- Double Click on :
OPCConfig.exe

The configuration tool OPCconfig.exe allows to generate an ini-file which is needed to initialize the OPC Server with the desired parameters for the communication between CoDeSys project and PLC(s).

The configuration tool contains a menu bar, a tree view for mapping the assignments of one or several PLCs to the Server, and a configuration dialog always corresponding to the currently selected tree entry. After having started the tool, primarily it will appear as follows, only containing the default common settings:



5.1 File menu

This menu provides commands for loading and saving the configuration files to/from the configuration tool:

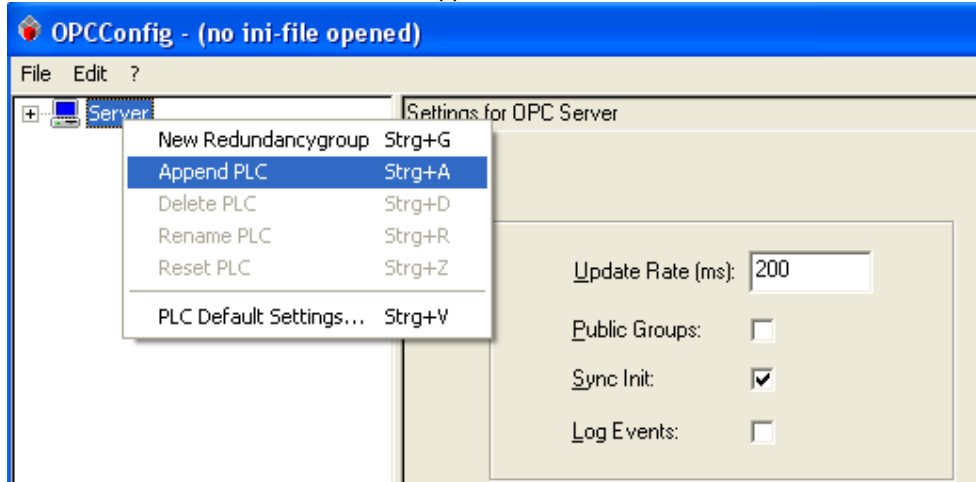
Command	Description
Open <Ctrl>+<O>	For editing an existing configuration. The default dialog for opening a file will appear, where you can select an already existing ini-file. The filter is automatically set to „OPCconfig Files *.ini“. The configuration described in the chosen ini-file will be loaded to the configuration tool.
New <Ctrl>+<N>	For creating a new configuration. If currently already a configuration is opened you will be asked whether it should be saved before getting closed. Then the configuration tool will show the default settings like after having started the tool.
Save <Ctrl>+<S>	Saves the current configuration to the currently loaded ini-file. Regard that modifications of a configuration do not get valid before having got saved to the respective configuration file.
Save as	Saves the current configuration to a file, which you can specify in the default dialog for storing a file. Regard that modifications of a configuration do not get valid before having got saved to the respective configuration file.
<n> recently opened ini-files	List of the ini-files which had been edited since having started the tool last time. You can select any of them to get it reloaded to the configuration tool.
Exit	The tool will be terminated. If any changes on the currently loaded configuration have not yet been stored, you will be asked whether you want to do that.

5.2 Edit menu

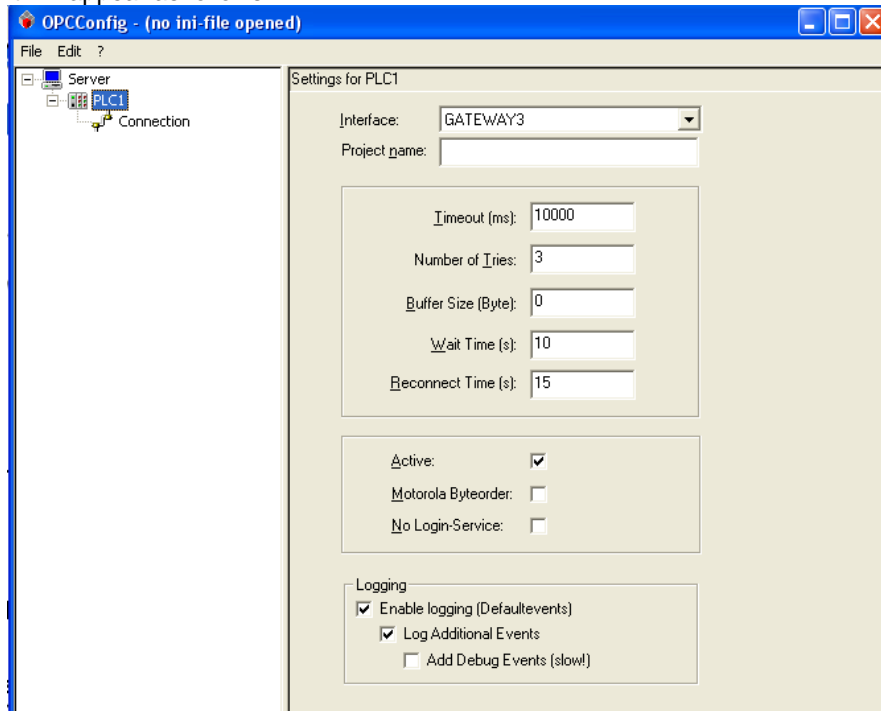
This menu provides the commands for editing the configuration tree in the left part of the configurator.

Command	Description
New Redundancygroup <Ctrl>+<G>	A Redundant Group entry will be added below “Server”. If there are already PLC or Redundant Groups listed in the tree, the new Redundant Group will be appended at the end. Per default a new entry is named Redundant<n>, whereby n is a running number starting with 1. If you want to rename the entry, select it in the tree and either use command Edit / Rename PLC or perform a mouseclick on the entry to get the string editable.
Append PLC <Ctrl>+<O>	A PLC entry will added below “Server”. A new PLC will always be appended at the end of the existing tree. Per default a new entry is named PLC<n>, whereby n is a running number starting with 1. If you want to rename the entry, select it in the tree and either use command Edit / Rename PLC or perform a mouseclick on the entry to get the string editable.
Delete PLC <Ctrl>+<D>	The currently selected PLC entry will be removed from the configuration tree.
Rename PLC <Ctrl>+<R>	The currently selected PLC entry can be renamed.
Reset PLC <Ctrl>+<Z>	The settings of the currently selected PLC entry will be reset to the default values defined in the PLC Default Settings.
PLC Default Settings...	not yet available The 'PLC Default Settings' dialog opens, where you can define values for the PLC configuration settings. This dialog corresponds to the PLC Settings dialog, described in chap. 5.3.5. The specified values will be stored after confirmation with OK and can be reloaded via command 'Edit' 'Reset PLC' for the PLC which is currently selected in the configuration tree.

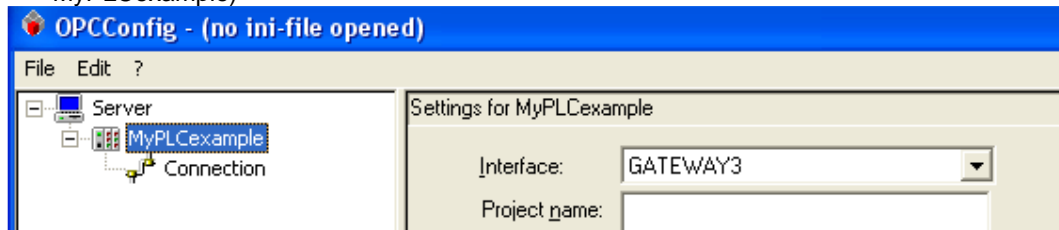
- Click on the Icon Server & select AppendPLC



it will appear as follows:

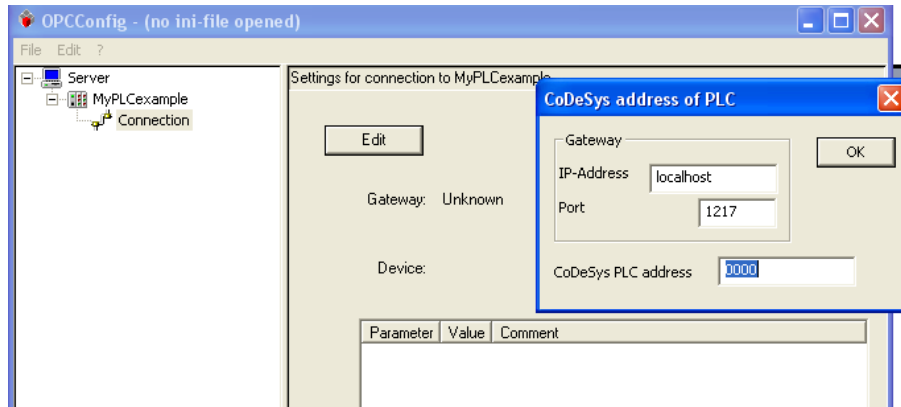


- Select Gateway 3 in the list Interface.
- Rename the name of PLC1 (with double click on it) with the name of your PLC name (eg: MyPLCexample)



- Double Click on the Icon Connexion & select "Edit"

it will appear as follows:



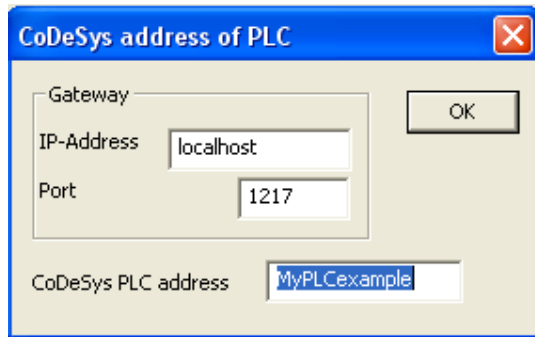
To be able to access from your OPC client to your variable you need to enter the address of the PLC (eg: MyPLCexample), The address is given in the Communication Setting window of your Project.

The address can be Physical or Logical. It is **better** to use Logical addressing to avoid address value reconfigured when you have many devices in your project

For logical addressing:

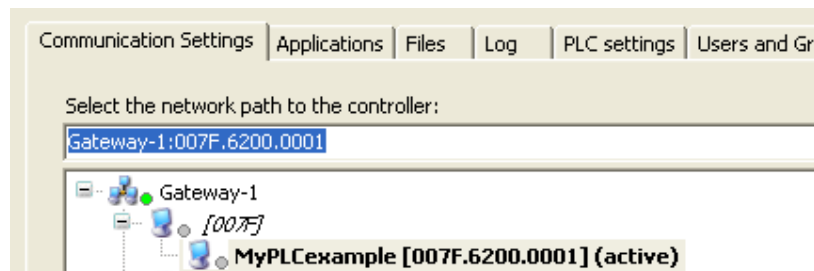
In our example the address is: "MyPLCexample"

Enter directly the Node Name given in the Communication Setting window of your Project. To configure the Node Name use "Edit" button

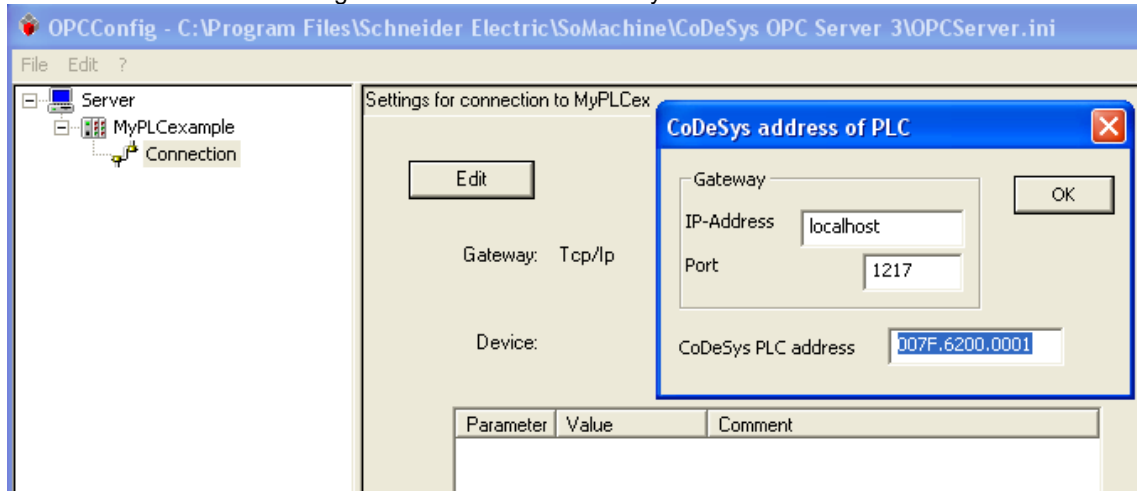


For Physical addressing:

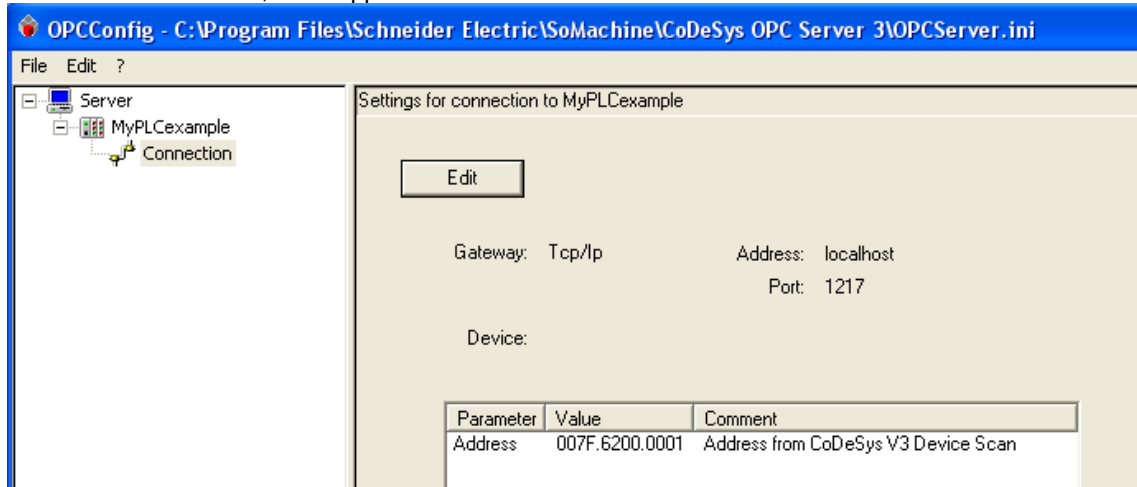
In our example the address is: "007F.6200.0001"



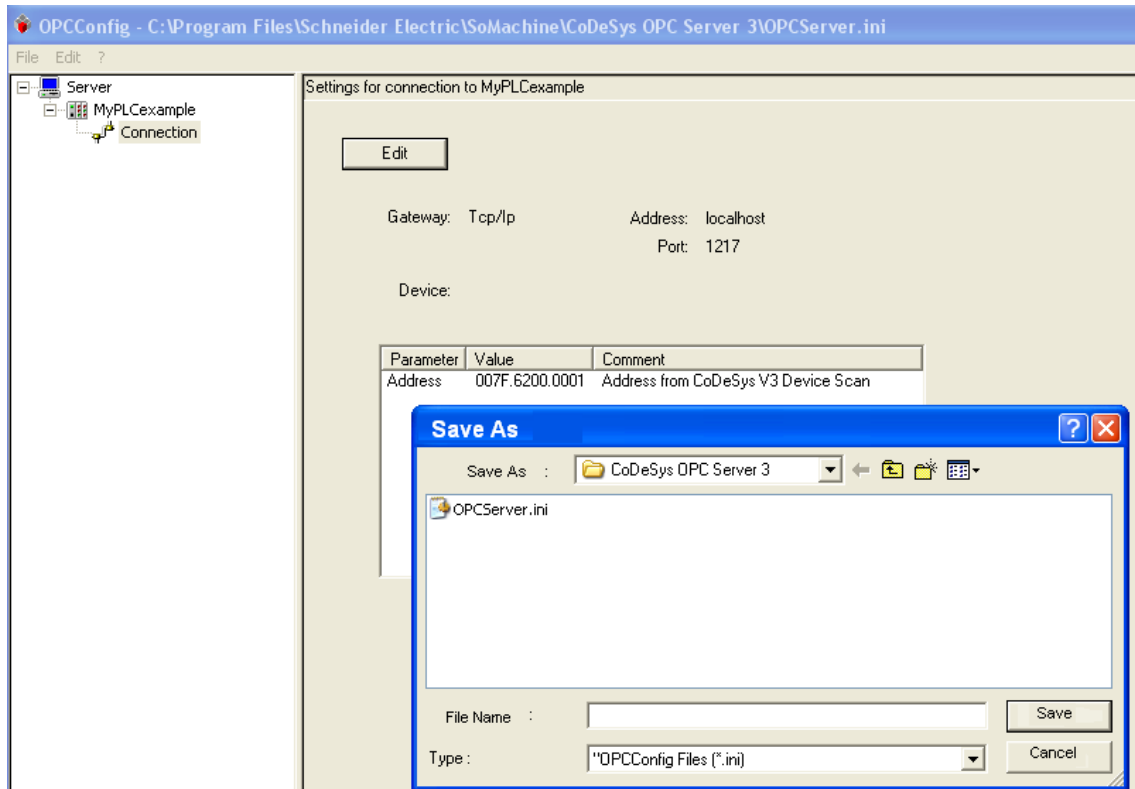
- Take this address & configure the value of the CoDeSys PLC address



- Click on OK button, it will appear as follows:



- Goto menu File & "Save As..."
- Click on OK button, it will appear as follows:



- Select OPCServer.ini & Save the file

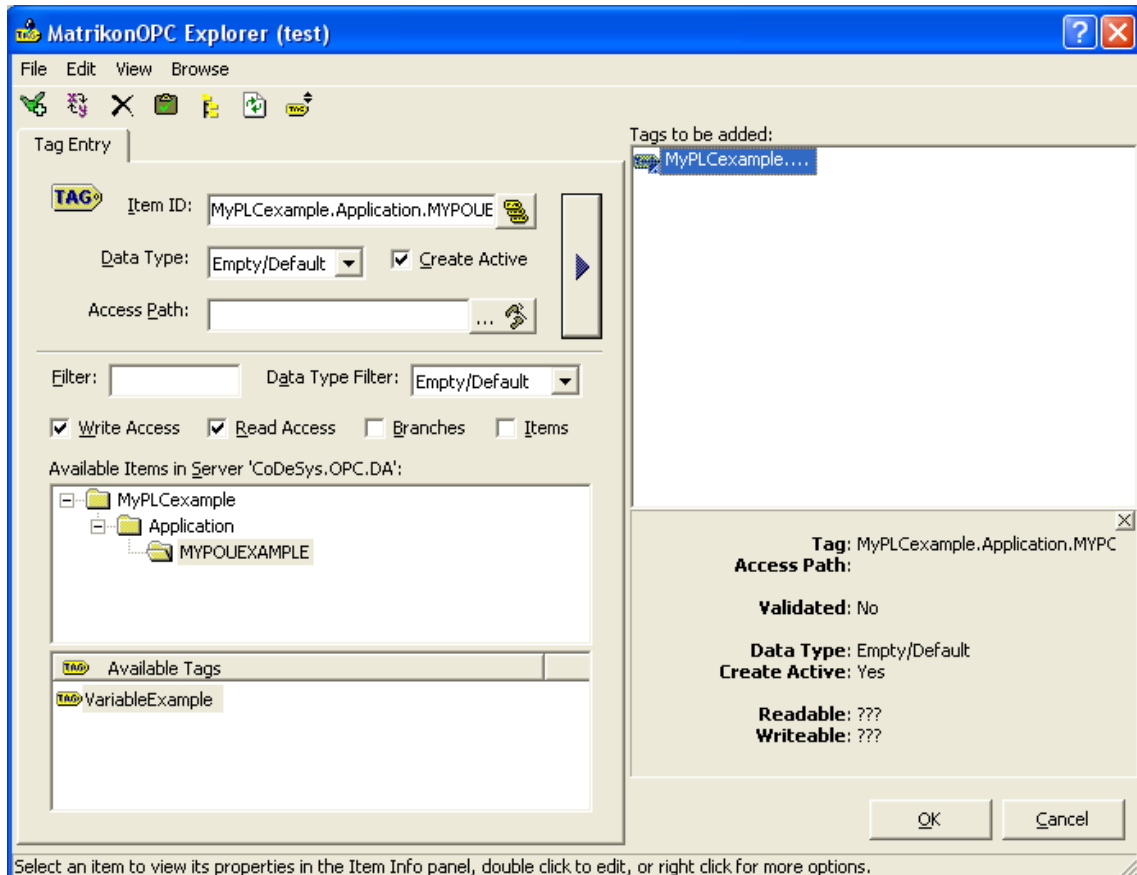
6 Usage of the CoDeSys OPC Server

After the installation of the OPC Server it should be offered for selection by the OPC client (e.g. visualization). The name of the OPC Server is **CoDeSys.OPC.DA**.

The OPC Server will be started automatically by the operating system as soon as a client establishes a connection. The OPC Server then will terminate automatically as soon as all clients have closed their connections to the server.

There will be no OPC Server icon in the task bar, but it will be only handled in the Windows Task Manager as a process.

As example using MatrikonOPC explorer



Variable which have been shared using Symbol Configuration is now available
As example using MatrikonOPC explorer

