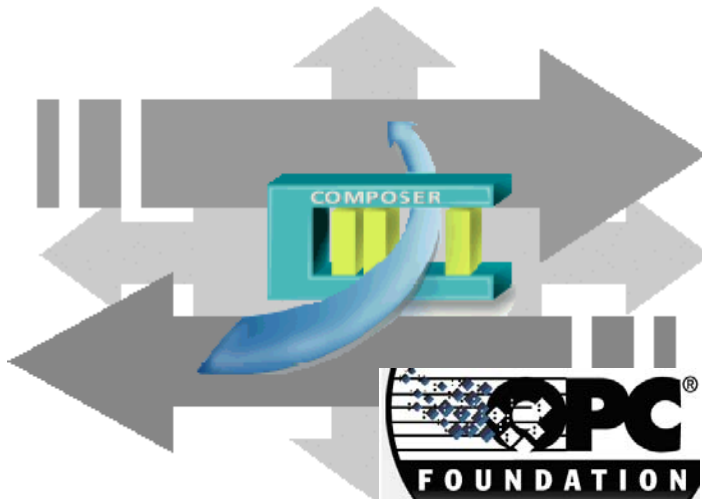


SIEMENS



MM8000 MP4.20

Generic subsystems via OPC

SIMATIC S7 via OPC

OPC Connectivity Guide

Building Technologies

Fire Safety & Security Product

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About this document

Purpose of this document

This manual is a guide to the configuration procedures for the integration of OPC servers into the MM8000 system. It is specifically for those individuals responsible for the commissioning of the management station, such as technical project managers, engineers, and commissioning personnel.

This guide is part of the general DMS8000 documentation set which includes the Composer Technical Manual, the DMS8000 Network, Fire and Intrusion Connectivity Guide, the DMS8000 Access Control Connectivity Guide, the DMS8000 Video Connectivity Guide, and the MM8000 Installation, Configuration and Commissioning manual.

Note that this document does not deal with the server functions provided by the MK8000 OPC server, which is also part of DMS8000 family.

Target audience

This documentation is intended for the following users:

- Project Managers
- Project Engineers
- Commissioning Personnel

Individuals performing the operations described in this manual are expected to have a good knowledge of the OPC standard, a prior expertise and training in the field of safety and/or security, a good level of familiarity with the target control units, and experience with the installation and configuration of MM8000 management systems.


Documentation resource information

The **DMS8000 Documentation Resource Information Guide** document assembles in one place important information regarding documentation resources. It contains the following:

- Comprehensive definitions of the target audiences for FS DMS documents
- Training program information including the Siemens intranet link
- A complete list of all available DMS8000 documents
- Instructions for how to obtain a document via the Siemens intranet using the STEP Documentation Repository System
- A map of relevant documents for each target audience group
- Customer Support links & resources
- A glossary containing definitions of all terms and acronyms used in DMS8000 documentation

To access the **DMS8000 Documentation Resource Information Guide** (STEP #A6V10089056), go to the link and follow the instructions below:

<https://workspace.sbt.siemens.com/content/00001123/default.aspx>

1. Click on the **STEP WEB Client** image: 
2. Choose **04 Fire -3F** from the **Product Segment** box and select **Activate filter**.
3. Select **All** in the **Documents** section of the **Quick Search** page and then select **Advanced Search**.
4. Enter the document number in the **Brochure No.** field (e.g. A6V10089056) and press **Enter**.

Operational and safety regulations



Before beginning work on the DMS8000 systems, you must have read and understood the related documents, in particular the Safety Regulations included in the Installation, Configuration, and Commissioning manual (ICC) for each specific product.

Liability disclaimer for damage or injuries

Before products are delivered, they are tested to ensure they function correctly when used properly. Siemens disclaims all liability for damage or injuries caused by the incorrect application of the instructions, or the disregard of danger advisories. This disclaimer applies in particular to personal injuries or damage caused by:

- Improper and/or incorrect use.
- Disregard of safety instructions in the documentation or on the product.
- Poor maintenance or a lack of maintenance.

We have checked the contents of this manual for agreement with the hardware and software described. Since deviations cannot be precluded entirely, we cannot guarantee full agreement. However, the data in this manual are reviewed regularly and any necessary corrections included in subsequent editions. Suggestions for improvement are welcome.

Modification index

Document no.	Date	Notes
A6V10065253_a_en	06.2009	Corresponds with DMS8000 MP4.20
A6V10065253_a_en	06.2008	Corresponds with DMS8000 MP4.15
A6V10065253_a_en	06.2007	First edition Corresponds with DMS8000 MP4.10

1 Introduction

This is a guide to the software configuration procedures for the subsystems providing an OPC server interface. In addition, the SIMATIC S7 connectivity to MM8000 via OPC is discussed.

For a complete guide to the configuration process, this manual should be used with the MM8000 Installation, Configuration, and Commissioning manual (document no.A6V10062413) and with the DMS8000 Connectivity Guides for

1.1 What has been changed in MP4.20 configuration tools

Here is the list of modifications included in MP4.20 for new functions and software improvements.

Section, Page	Modifications
Page 12	Multiple item selection now possible in server address space
Page 15	New Manual Call Point object available in the predefined OPC types
4.3, p.30	Info-box about multiple data sets per item class.
4.4, p.30	Info-box about item class renumbering after Save/Load.

1.2 Overview of OPC connectivity in MM8000

OPC is a widely accepted industrial communication standard that enables the exchange of data between multi-vendor devices and control applications without any proprietary restrictions. **OPC is a Client / Server technology**. One application acts as the *server* providing data, and another acts as a *client* using data.

DMS8000 systems can provide both **OPC server** and **OPC client** functions in various configurations.

MK8000 OPC Server: MM8000 option and Stand-alone product

In MM8000, in order to connect additional OPC client stations and enable them to communicate with the field units controlled by the MM8000 server and stations, you can enable the **MK8000 OPC server** functions, as described in the MM8000 ICC manual (document no.A6V10062413).

In addition, MK8000 can run as a stand-alone OPC Server, without MM8000.

Note that this document does not discuss the MK8000 OPC server. Instead, refer to MK8000 ICC manual (document no.A6V10062407).

OPC Client functions in MM8000

In case MM8000 has to connect to OPC server that provide the data connection to field control units, the MM8000 OPC clients functions are used, as described in this document.

Software version

The supported OPC version is Data Access 2.0.x.

Limitations

Multiple OPC channels can be programmed with no limitations on top of the general maximal system dimensioning (please refer to latest edition of MM8000 Data-sheet. Document no. A6V10062415).

Software License

A specific license id required for enabling the OPC client functions in MM8000. The license defines the allowed number of connections to OPC servers.

Also, the subsystems (physical control units) and points (physical and logical objects, but not the OPC items) configured in Composer for connecting via OPC are charged according to the general sales policy related to the system size.

→ Please refer to the local sales support for more details about MM8000 licenses.

Windows configuration: DCOM settings

In case of network-distributed solutions, DCOM security must be configured in order to enable the correct communication between PCs over the network.

→ For more information about DCOM settings, please refer to section 5 on page 31.

1.3 Generic subsystems via OPC

MM8000 systems can integrate safety and security control units by applying the OPC connectivity functions. A generic type of subsystem - including safety, security, and general-purpose objects - is available in the Composer environment, and can be connected to the OPC server via a specialised MM8000 driver (NS8019).

The configuration of generic subsystems is presented in section 2 on page 6.

1.4 SIMATIC S7 via OPC

The SIMATIC S7 PLC units can be integrated in the MM8000 systems applying the OPC connectivity functions. A specific S7 type of subsystem is available in the Composer and a set of safety, security, and general-purpose objects can be used to map the OPC items information into MM8000. The MM8000 OPC driver (NS8019) allows connecting to the S7 OPC server.

Section 3, on page 17, deals with the configuration of SIMATIC S7 PLC.

2 Configuration of generic OPC subsystem

2.1 Overview

The entire configuration related to control units connected to MM8000 via an OPC server is defined in Composer.

The OPC configuration in MM8000 includes 3 main logical steps:

1. Definition OPC items provided by the OPC server

In Composer, MM8000 can support an OPC Driver (NS8019) that can connect to one or more OPC servers.

For each server, the NS8019 driver can handle a set of OPC items, defined in Composer by importing a CSV file (recommended), or browsing in the Server address space and selecting the required items, or entering the list of OPC items manually.

2. Definition of the subsystem(s) and related points

The **subsystem representing the OPC control unit** can be added in the Composer tree in the same way as other types of units.

In the subsystem, you can then add the required number of data **points**, representing in MM8000 the physical and logical entities provided by the OPC items. Composer can support typical safety and security objects (e.g.: zones, doors) and well as general purpose objects (e.g. inputs, outputs, generic objects).

Note that the use of system templates can remarkably help you in performing this step whenever the same structure of points and folders can be used more than once. Once a reusable structure is built up, you can save as template and add it again with a simple mouse click. The template is stored in the local Composer and applicable on any other project.

3. Link between subsystem's points and OPC items

OPC items and the subsystem points are finally linked in order to enable the communication mechanism. In the link, you have to set the logical rule that applies to the actual value or information when it is moved from OPC into MM8000. A number of **Item classes** are available for this purpose and maintained by a dedicated engineering tool (OPCXMLeditor).

Each item class deals with data types and format and defines the way states, commands, and transactions are interpreted in the OPC items and then handled by MM8000.

2.2 OPC subsystem configuration

2.2.1 Configuration Checklist

Verify that you have satisfied the items needed in the first checklist before proceeding to the configuration procedure that follows.

ITEMS NEEDED FOR CONFIGURATION

- ❑ OPC server
 - The OPC Server name (ProgID).
 - The PC name or IP address of the machine where the OPC server runs.
- ❑ OPC items
 - OPC items list -- or-- CSV file (strongly recommended) including such a list.
 - The MM8000 OPC item class, defining the conversion rules to MM8000 points.
- ❑ Control unit objects
 - The objects to define in Composer as data points and then link to the OPC items.
- ❑ Plug-ins needed:
 - Plug-ins #357701 (OPC driver) and #357801 (Generic OPC), which must be installed before you can configure your system.

2.2.2 Configuration procedure

The following are the configuration procedures for an OPC unit.

Adding the OPC driver

1. Open the Composer project.
2. If not already done, add the OPC driver. You need to select the Station node in the path:
Supervision System Setting → MM8000 System → Physical configuration → server Station (e.g. 'My Station')

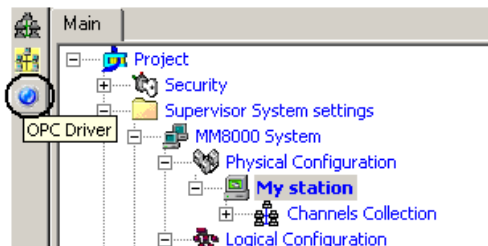



Fig 1 Adding the OPC driver

3. Click on the OPC driver icon  in the icon toolbar (Fig 1)
→ The new OPC driver node appears in the station folder

Note: By default, the node will be named “OPC Driver #1”, you can customise the Description text typing in a new name. For instance, you can remove “#1”.

Adding the folder for the OPC subsystem

Optionally, create a folder for the unit connected via OPC server.

Adding the OPC subsystem node

1. Select the destination folder.

- In the menu General purpose (Fig 2), select the 'Generic OPC' subsystem to add the new node (Fig 3).

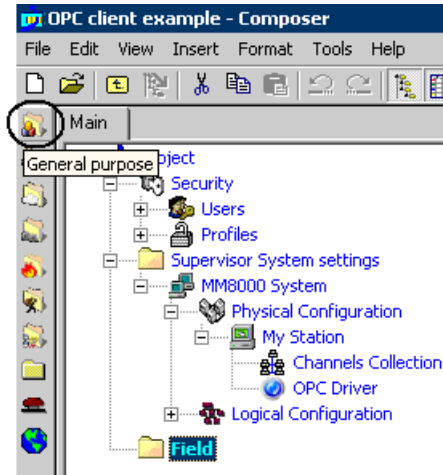


Fig 2 'General purpose' icon

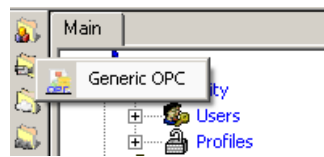


Fig 3 Adding a generic OPC subsystem

→ The new OPC unit node appears in the destination folder

Note: By default, the node will be named "Generic OPC #1", you can customise the Description text by clicking the name, typing F2, and then entering a new text.

Linking the new subsystem to the OPC driver

- Select the new OPC subsystem node.
- Expand the Management Station folder until you reach the 'OPC Driver' node:
'<MM8000 System> → Physical Configuration → <Station name> → OPC Driver
- Drag the subsystem node to the 'OPC Driver' node (see Fig 4).

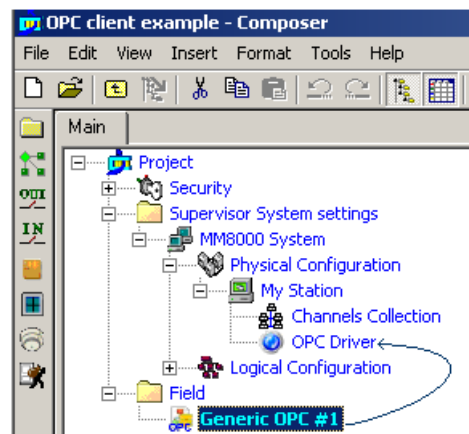


Fig 4 Linking the OPC subsystem to the corresponding driver

→ When the link is established, a new node appears on the structure tree, just below the driver node, and it takes the same name as the subsystem node.

Configuring the OPC server

The link node between the subsystem and the OPC driver allows defining the list of OPC items to handle.

1. Click the link node and select the 'Node' tab.

➔ On the right, the OPC configuration form appears (Fig 5).

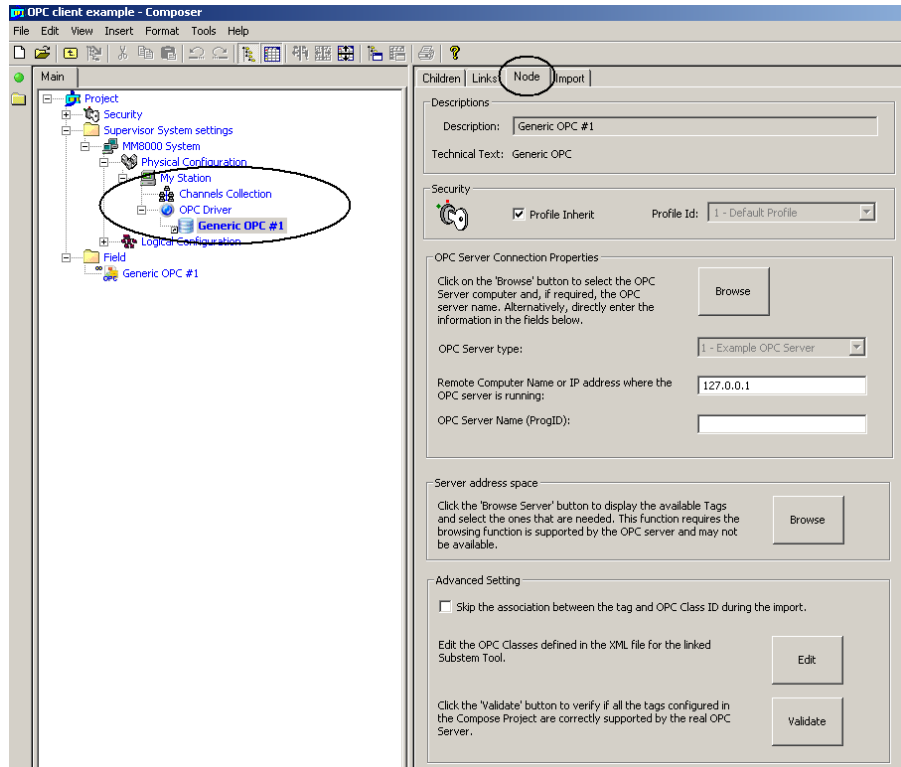


Fig 5 Accessing the OPC configuration form

In the form, the 'OPC Server Connection properties' section permits to define the computer and the name of the OPC server providing the field information for MM8000.

2. Click the button 'Browse' to show the server selection window (Fig 6).

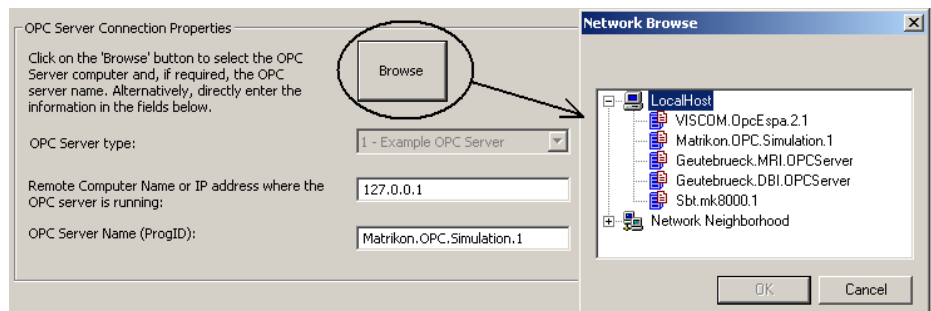


Fig 6 Selecting the OPC server

The server can be both local (click Local Host) or networked (click Network Neighborhood and then navigate until you reach the server computer).

3. Select the OPC server in the list and then click OK.



Alternatively, you can directly enter the PC's name or IP address and then the OPC server name in the corresponding fields.

Configuring the OPC items: 3 options

You now need to define the OPC items that will be connected to the MM80000 points. You can perform this step in 3 ways:

- Importing a CSV file, which includes the basic information of all items (recommended)
- Browsing in the Server address space (assuming the Server can support this optional feature) and selecting the required items
- Entering the OPC items manually

Configuring the OPC items: option 1, importing a CSV file

Using the OPC server software tools and/or office applications, you need to generate a CSV file that contains the OPC items to handle.

To import the file:

- Select the link node and then the menu: Tools → Import (Fig 7)

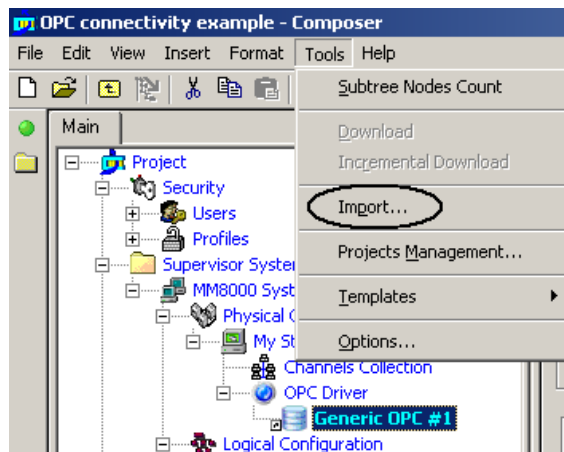


Fig 7 Start importing OPC items in CSV data

- In the file browsing window that appears, select the CSV file to import and click 'Open'
- When the Import Wizard page shows up, press Next.
- In the first page you can set the data separator character (typically comma or semicolon) and the starting line (1 or possibly 2 if a title row is present)

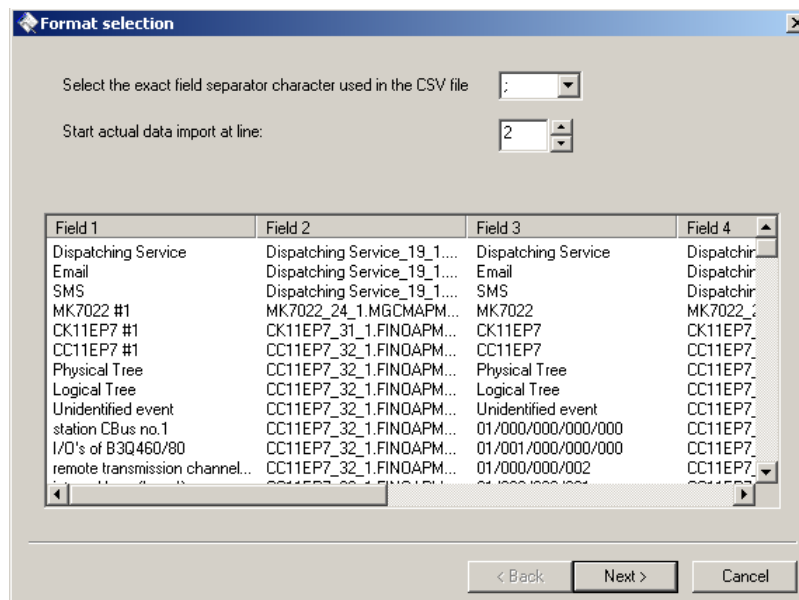


Fig 8 Step 1 of Import Wizard: separation character and starting line

- Next, you can identify the columns to import in the file. Three types of information can be imported; namely:
 - Full Tag Name, i.e. the OPC item identifier (mandatory)
 - A description text associated to the OPC item (optional, but recommended)

- The DMS8000 OPC class to apply for treating the OPC data (optional, but recommended)
 - ➔ OPC classes are discussed in section 4 on page 27.
 - Note that, if the CVS file does not include the class information, this needs to be configured manually as described on page 13 (“Configuring the OPC item classes ...”).
- Select the corresponding column in the three fields on the top of the window (Fig 9). Only the first column is mandatory to execute the import. After the selection, press Next to proceed.

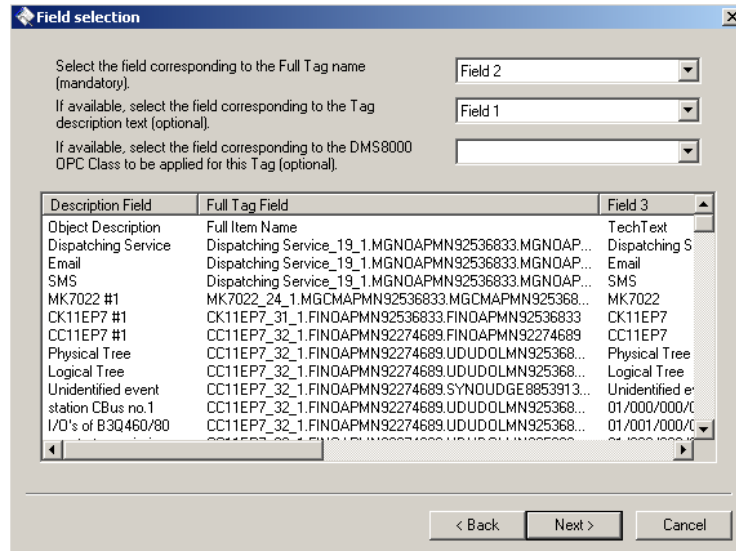


Fig 9 Step 2 of Import Wizard: select columns

- Finally, check that the column selection is correct and click Finish to start executing the import (Fig 10).

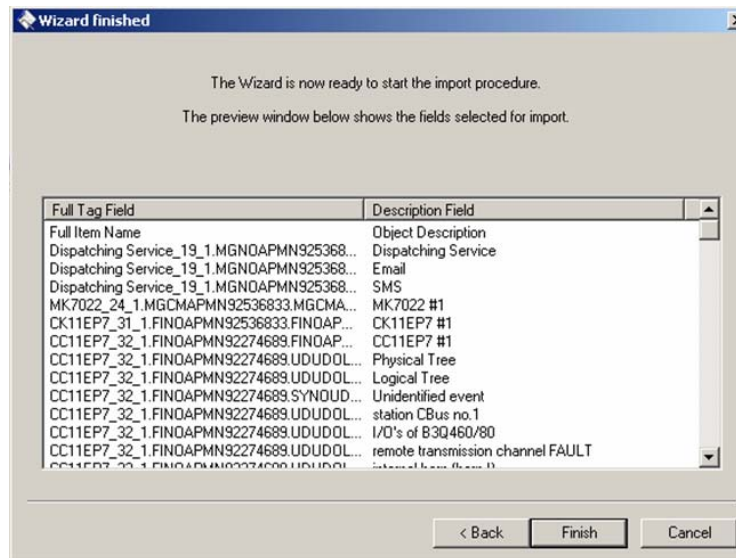


Fig 10 Step 3 Import Wizard: check selection and finish

In a short while, the OPC items will be imported, thus populating the Composer tree below the OPC driver link (Fig 11).



Note that, although you may customise the OPC items in Composer by adding, re-naming or deleting objects, we recommend you to keep the CSV file updated first and then import it again.

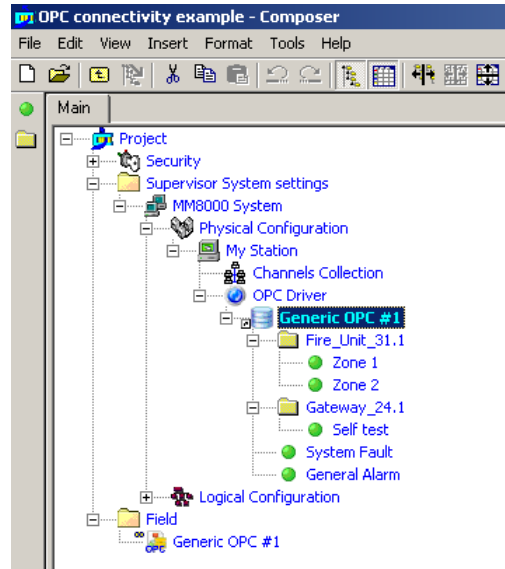


Fig 11 OPC items imported

Configuring the OPC items: option 2, browsing the OPC server space

Alternatively, you can browse in the OPC server address space and select the required items (the server must support the navigation and view function).

- Select the 'Browse' button (Fig 12) in the 'Server address space' section of the form

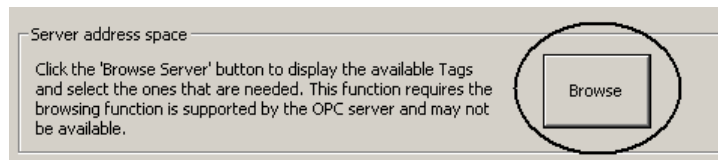


Fig 12 Selecting the OPC server browsing

- A new window shows up ('Data Access OPC Server Address Space'), press 'Connect' to start browsing into the server data (Fig 13).



Fig 13 Connecting to the OPC server

- In the 'Server Address Space' section, the left section show all the existing items. You can navigate and select an entire folder ('Add all tags') or a single node ('Add tags') to add items for MM8000 to handle. Note that selected items are shown in bold (Fig 14).
- Select all items required. When clicking on them, keep the CTRL key pressed to select multiple items and add them all in one shot.
- When finished, click OK.

The OPC items will then be linked, thus populating the Composer tree below the OPC driver link. Note that, for each item, the OPC item class still need to be configured as described on page 13 ("Configuring the OPC item classes ...").

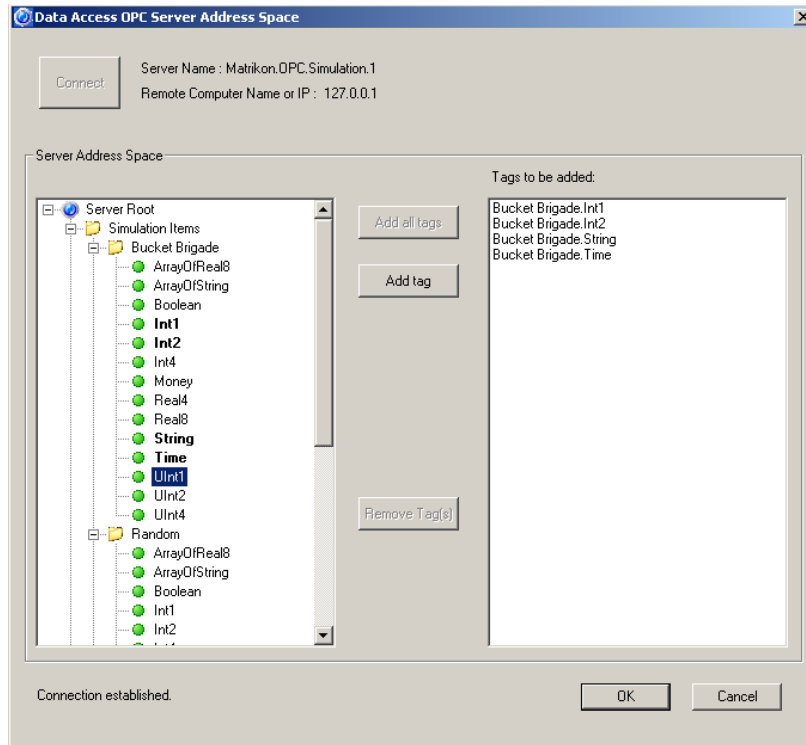


Fig 14 Browsing the server space and selecting the OPC items

Configuring the OPC items: option 3, manual setup

As last option, you can also entering the OPC items manually: a folder and a 'Tag' icon are available in the OPC link node as shown in Fig 15.

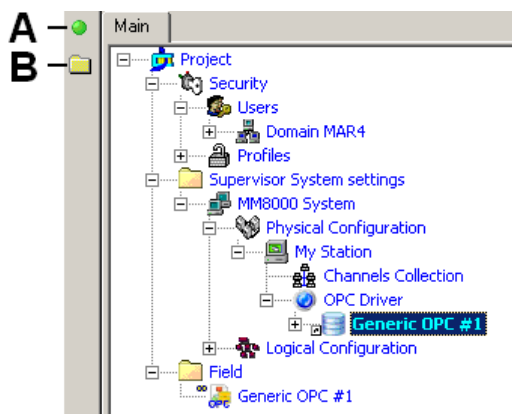


Fig 15 Adding items manually

- A Add a single item
- B Add a folder of items

Configuring the OPC item classes for MM8000 handling

If you have not imported the OPC item class using the import file (only possible with the option 1 above), you have now to define which *OPC item class* is associated to each item. The item class describes the type of item or, more precisely, the conversion rule to apply in order to exchange data (in one or both directions) between the OPC item and the MM8000 data point. To configure the item class:

1. Expand the Composer branch containing the OPC items.
2. Select the first item and then the Node tab.
 - ➔ On the right, the OPC class form appears (Fig 16).
3. In the 'Tag properties' section, select the item type (or the type of data conversion to apply).

4. Continue with the next item until the end.

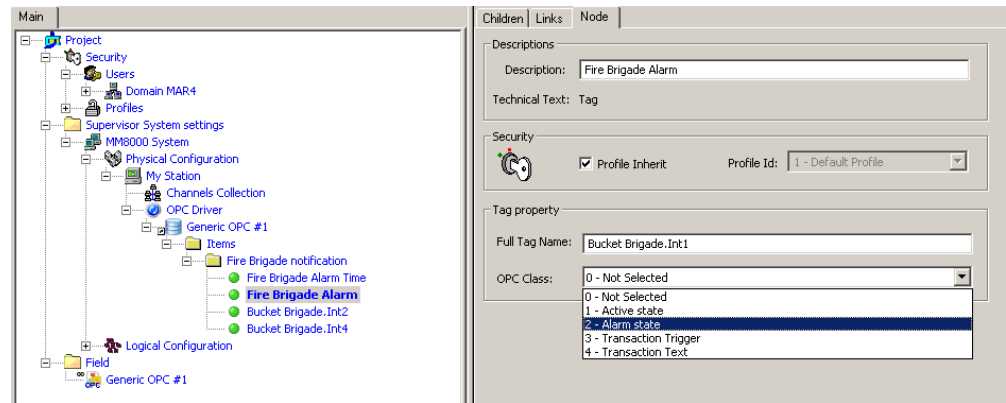


Fig 16 Selecting the OPC item class



Be informed that OPC item classes can be easily imported, along with the OPC item list, from a CSV file (see page 10). For more general information about MM8000 OPC item classes and how to configure them, please refer to section 4 on page 27.

Checking OPC items

The configured OPC items can be validated in order to make sure that the OPC server is actually supporting all the linked items. This verification can be performed using the “Validate” button in the Advanced setting section of the OPC driver link node (see Fig 5 above). Proceed as follows:

1. Select the OPC driver link node
2. Click Validate in the Advanced setting
3. In the windows that appears, click “Connect” and then “Start”
4. The items are checked done after the other and the corresponding tag names and descriptions appear in the list. On the right hand side, the “Test Result” column shows whether the test passed or failed (Fig 17).
5. The faulty items can be removed right away from the MM8000 link list: the procedure prompts you for an immediate purge.

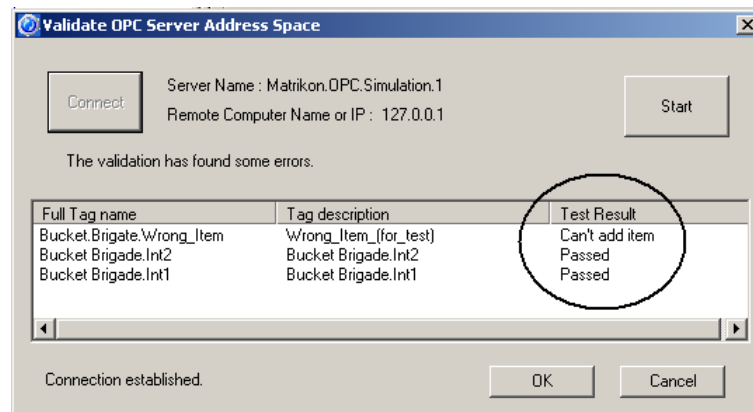


Fig 17 Validation check passed

Adding data points

Once the OPC items are configured and verified, you can focus on the MM8000 representation that you need for them. The OPC subsystem needs to be populated with the appropriate list of points. Proceed as follows:

1. Select the OPC unit node.
2. In the toolbar menu, select the OPC object icons to add new nodes.
Build up the unit structures using the available objects (Fig 18 and Fig 19)

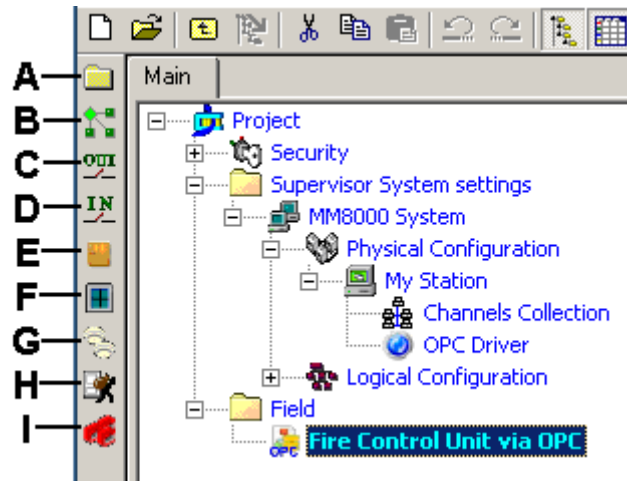


Fig 18 Data points

- A Add a generic folder
- B Add a generic object
- C Add an output point
- D Add an input point
- E Add a door point
- F Add a window point
- G Add a fire zone point
- H Add an intrusion zone point
- I Add a manual call point



Save as Composer templates (menu: Tools → Templates → Save as) and then reuse data structures or entire subsystems that you need to insert frequently.

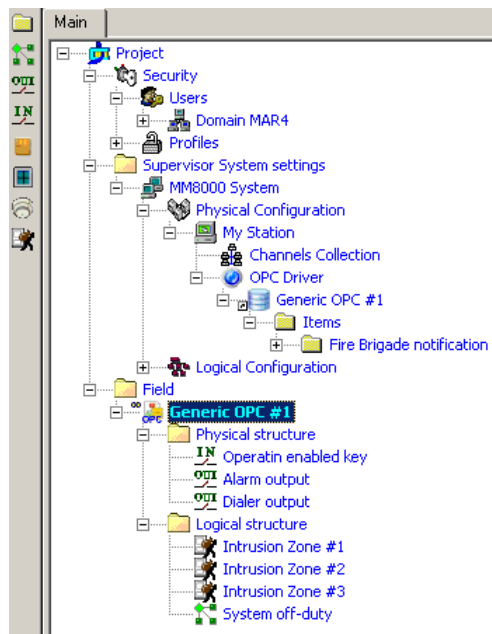


Fig 19 Adding data points (example with a simple intrusion unit settings)

Linking the OPC items to the points

1. Expand the folder with OPC items (Tags)
2. Expand the folder with OPC subsystem and points
3. Drag and drop each OPC item (Tag) node to the corresponding point (Fig 20)

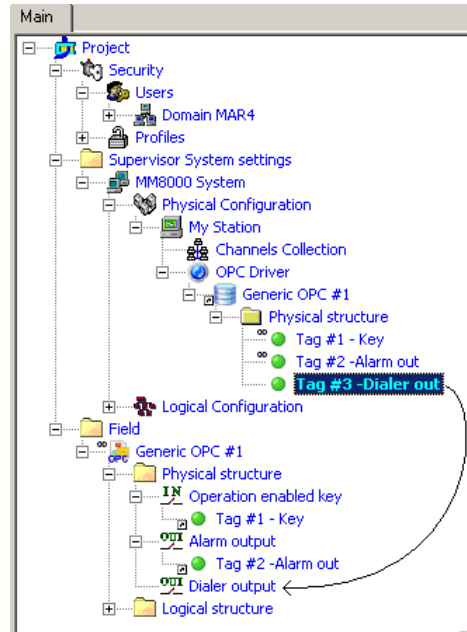


Fig 20 Linking OPC items and data points



You can link more than one OPC items to the same MM8000 data points as long as the associated item classes can consistently cooperate to convert multiple OPC information into the point properties.

3 Configuration of SIMATIC S7

3.1 Overview

SIMATIC S7 is the key family of PLC products of the Siemens A&D division. In MM8000 you can integrate the S7 PLC units via an OPC server.

The configuration is very similar to the one described above for a generic OPC subsystem. As discussed more fully in section 2.1 above, the configuration includes three logical steps:

1. Add the OPC Driver (NS8019), and define links to OPC server and items
2. Add the S7 subsystem and the related points
3. Link points to OPC items and set the item class that defines data conversions.

3.2 SIMATIC S7 configuration

3.2.1 Configuration Checklist

Verify that you have satisfied the items needed in the first checklist before proceeding to the configuration procedure that follows.

ITEMS NEEDED FOR CONFIGURATION

- OPC server
 - The PC name or IP address of the machine where the OPC server named “OPC.SimaticNET” runs.
- OPC items
 - OPC items list -- or-- CSV file (strongly recommended) including such a list.
 - The MM8000 OPC item class, defining the conversion rules to MM8000 points.
- Control unit objects
 - The objects to define in Composer as data points and then link to the OPC items.
- Plug-ins needed:
 - Plug-ins #357701 (OPC driver) and #357601 (S7), which must be installed before you can configure your system.

3.2.2 Configuration procedure

The following are the configuration procedures for an S7 unit.

Adding the OPC driver

1. Open the Composer project.
2. If not already done, add the OPC driver. You need to select the Station node in the path:
Supervision System Setting → MM8000 System → Physical configuration → server Station (e.g. ‘My Station’)

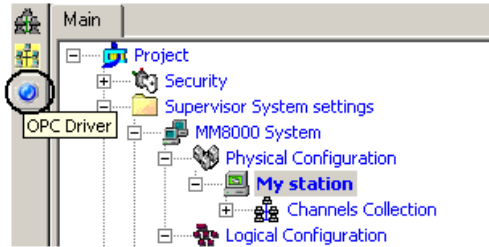


Fig 21 Adding the OPC driver

3. Click on the OPC driver icon  in the icon toolbar (Fig 21)

→ The new OPC driver node appears in the station folder

Note: By default, the node will be named “OPC Driver #1”, you can customise the Description text typing in a new name.

Adding the folder for the OPC subsystem

Optionally, create a folder for the S7 unit connected via OPC server.

Adding the OPC subsystem node

1. Select the destination folder.
2. In the menu General purpose (Fig 22), select the ‘Generic OPC’ subsystem to add the new node (Fig 23).

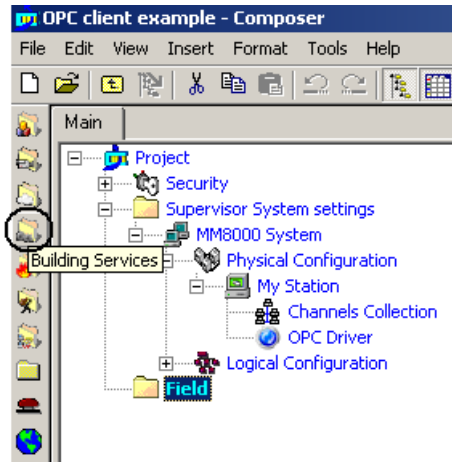


Fig 22 ‘General purpose’ icon

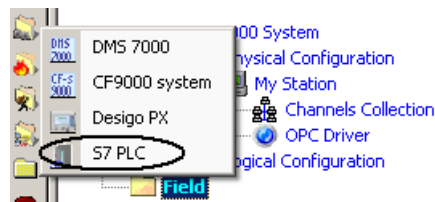


Fig 23 Adding a S7 subsystem

→ The new S7 unit node appears in the destination folder

Note: By default, the node will be named “S7 PLC #1”, you can customise the Description text by clicking the name, typing F2, and then entering a new text.

Linking the new S7 subsystem to the OPC driver

1. Select the new S7 subsystem node.
2. Expand the Management Station folder until you reach the ‘OPC Driver’ node:
 <MM8000 System> → Physical Configuration → <Station name> → OPC Driver
3. Drag the S7 subsystem node to the ‘OPC Driver’ node (see Fig 24).

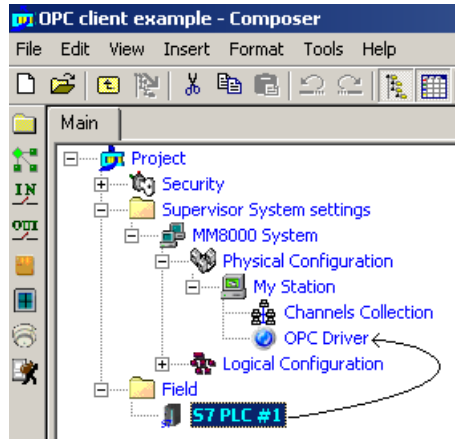


Fig 24 Linking the OPC subsystem to the corresponding driver

➔ When the link is established, a new node appears on the structure tree, just below the driver node, and it takes the same name as the subsystem node.

Configuring the OPC server

The link node between the subsystem and the OPC driver allows defining the list of OPC items to handle.

1. Click the link node and select the 'Node' tab.

➔ On the right, the OPC configuration form appears (Fig 25).

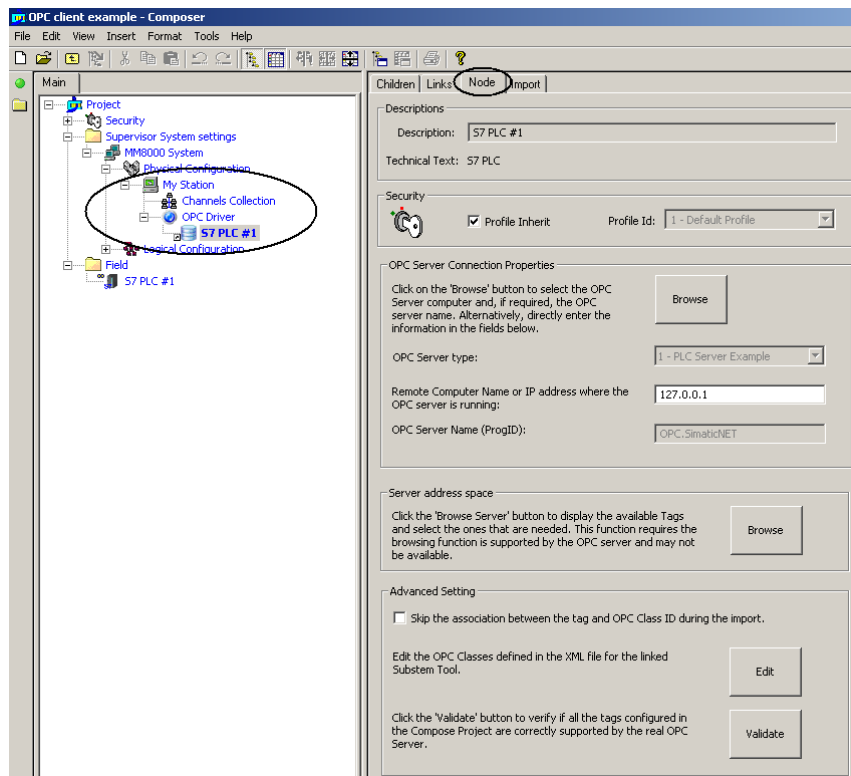


Fig 25 Accessing the OPC configuration form

In the form, the 'OPC Server Connection properties' section permits to define the computer where the OPC server runs. Note that the OPC server name (ProgID) is fixed to 'OPC.SimaticNET'.

2. Click the button 'Browse' to show the server selection window (Fig 26).

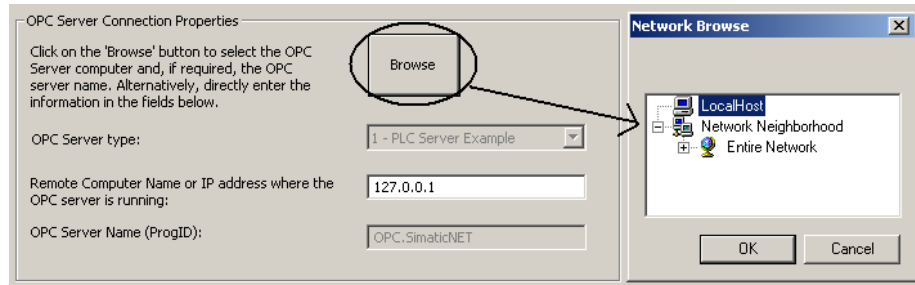


Fig 26 Selecting the OPC server

The server can run both on local PC (click Local Host) or networked computers (click Network Neighborhood and then navigate until you reach the server computer).

3. Select the computer name in the list and then click OK.

Note that you will not see the actual OPC server but only the computer names.



Alternatively, you can directly enter the PC's name or IP address in the corresponding field.

Configuring the OPC items: 3 options

You now need to define the OPC items that will be connected to the MM80000 points. You can perform this step in 3 ways:

- Importing a CSV file, which includes the basic information of all items (recommended)
- Browsing in the Server address space (assuming the Server can support this optional feature) and selecting the required items
- Entering the OPC items manually

Configuring the OPC items: option 1, importing a CSV file

Using the S7 software tool and/or office applications, you need to generate a CSV file that contains the OPC items to handle. To import the file:

- Select the link node and then the menu: Tools → Import (Fig 27)

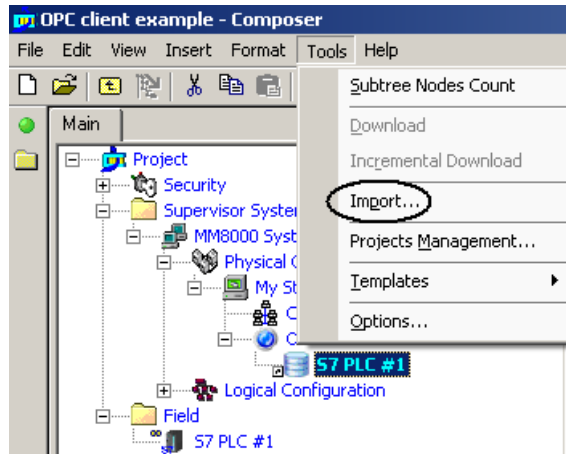


Fig 27 Start importing OPC items in CSV data

- In the file browsing window that appears, select the CSV file to import and click 'Open'
- When the Import Wizard page shows up, press Next.
- In the first page (Fig 28) you can set the data separator character (typically comma or semicolon) and the starting line (1 or possibly 2 if a title row is present)

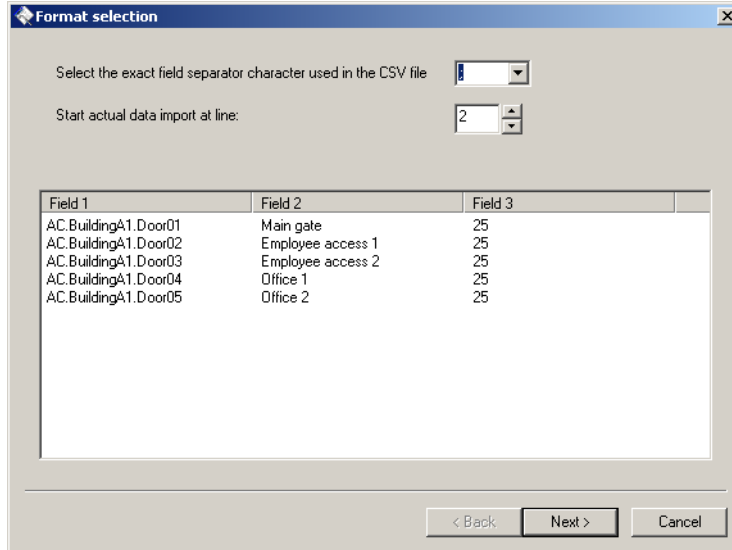


Fig 28 Step 1 of Import Wizard: separation character and starting line

- Next, you can identify the columns to import in the file (Fig 29). Three types of information can be imported; namely:
 - Full Tag Name, i.e. the OPC item identifier (mandatory)
 - A description text associated to the OPC item (optional, but recommended)
 - The DMS8000 OPC class to apply for treating the OPC data (optional, but recommended)
 - ➔ OPC classes are discussed in section 4 on page 27.
- Note that, if the CVS file does not include the class information, this needs to be configured manually as described on page 23 (“Configuring the OPC item classes ...”).

Select the corresponding column in the three fields on the top of the window (Fig 9). Only the first column is mandatory to execute the import. After the selection, press Next to proceed.

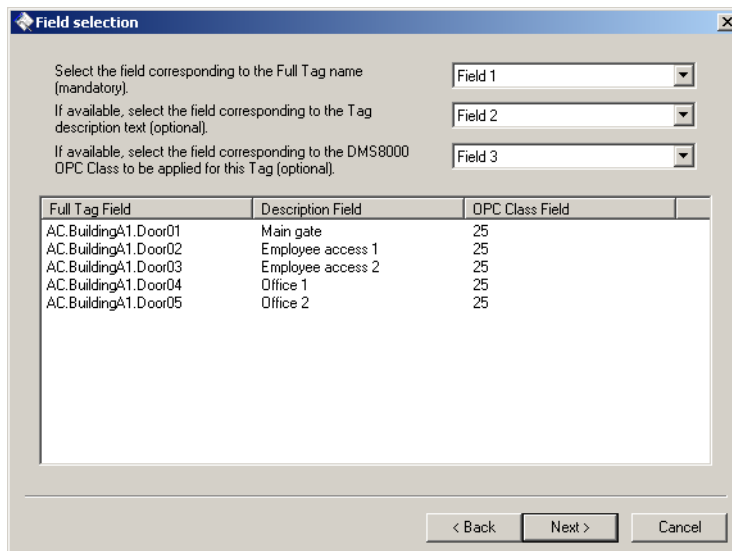


Fig 29 Step 2 of Import Wizard: select columns

- Finally, check that the column selection is correct and click Finish to start executing the import (Fig 30).

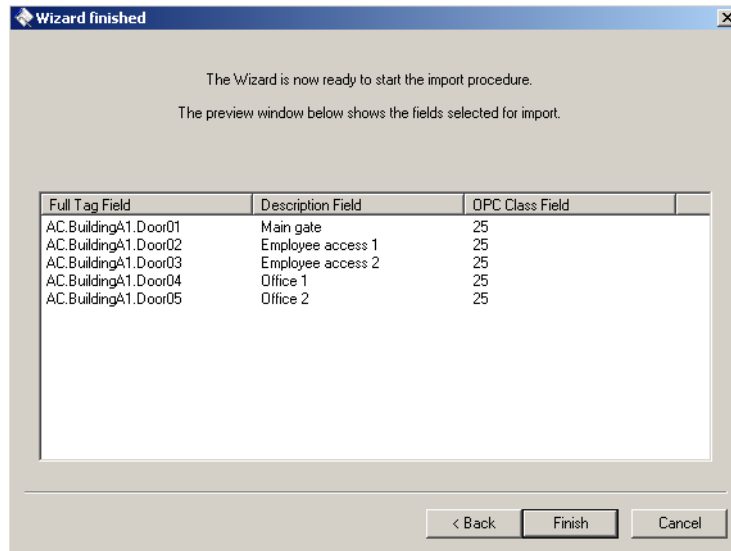


Fig 30 Step 3 Import Wizard: check selection and finish

In a short while, the OPC items will be imported, thus populating the Composer tree below the OPC driver link (Fig 31).



Note that, although you may customise the OPC items in Composer by adding, re-naming or deleting objects, we recommend you to keep the CSV file updated first and then import it again.

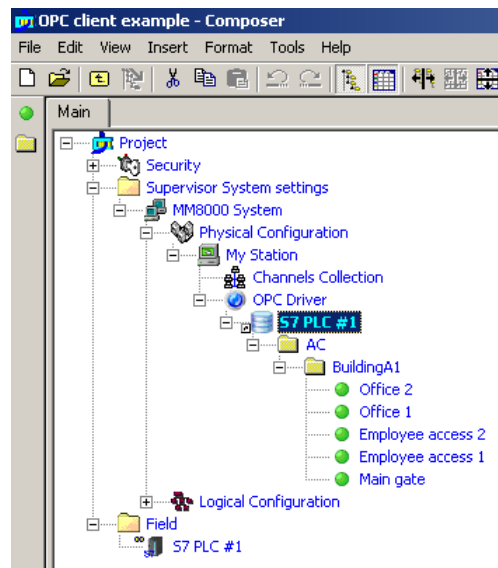


Fig 31 OPC items imported

Configuring the OPC items: option 2, browsing the OPC server space

Alternatively, you can browse in the OPC server address space and select the required items (the server must support the navigation and view function).

- Select the 'Browse' button (Fig 32) in the 'Server address space' section of the form

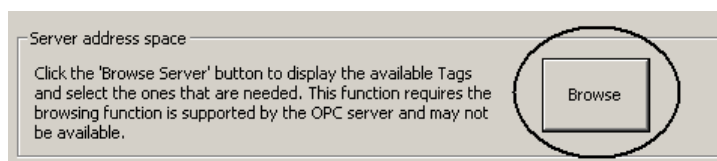


Fig 32 Selecting the OPC server browsing

- A new window shows up ('Data Access OPC Server Address Space'), press 'Connect' to start browsing into the server data (Fig 33).

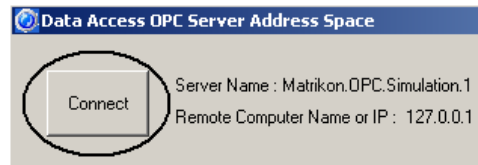


Fig 33 Connecting to the OPC server

- In the 'Server Address Space' section, the left section show all the existing items. You can navigate and select an entire folder ('Add all tags') or a single node ('Add tags') to add items for MM8000 to handle. Note that selected items are shown in bold.
- Select all items required, then click OK.

The OPC items will then be linked, thus populating the Composer tree below the OPC driver link. Note that, for each item, the OPC item class still need to be configured as described on page 23 ("Configuring the OPC item classes ...").

Configuring the OPC items: option 3, manual setup

As last option, you can also entering the OPC items manually: a folder and a 'Tag' icon are available in the OPC link node as shown in Fig 34).

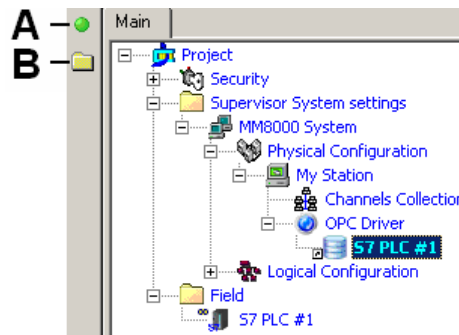


Fig 34 Adding items manually

- A Add a single item
- B Add a folder of items

Configuring the OPC item classes for MM8000 handling

If you have not imported the OPC item class using the import file (only possible with the option 1 above), you have now to define which *OPC item class* is associated to each item. The item class describes the type of item or, more precisely, the conversion rule to apply in order to exchange data (in one or both directions) between the OPC item and the MM8000 data point. To configure the item class:

1. Expand the Composer branch containing the OPC items.
2. Select the first item and then the Node tab.
 - On the right, the OPC class form appears (Fig 35).
3. In the 'Tag properties' section, select the item type (or the type of data conversion to apply, see Tab.1 below).
4. Continue with the next item until the end.

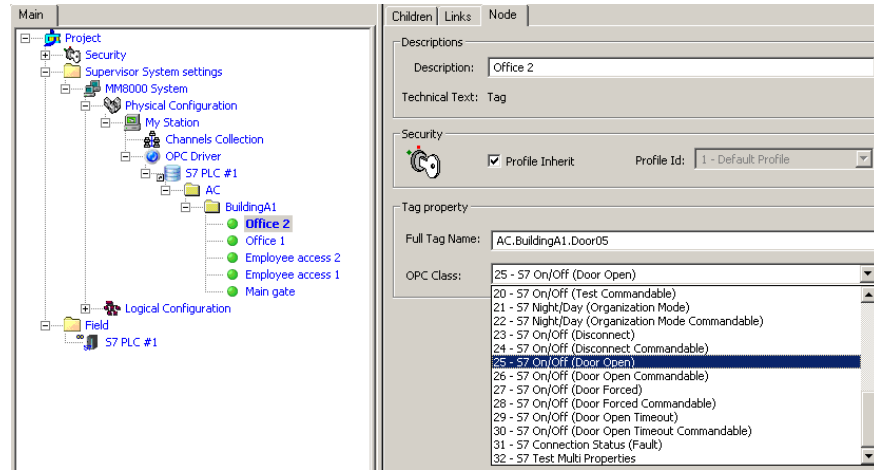


Fig 35 Selecting the OPC item class



Be informed that OPC item classes can be easily imported, along with the OPC item list, from a CSV file (see page 20). For more general information about MM8000 OPC item classes and how to configure them, please refer to section 4 on page 27.

0	Not selected
1	On/Off (Active)
2	On/Off (Active Commandable)
3	On/Off (Alarm)
4	On/Off (Alarm Commandable)
5	On/Off (Fault)
6	On/Off (Fault Commandable)
7	On/Off (Anomaly)
8	On/Off (Anomaly Commandable)
9	On/Off (Off)
10	On/Off (Off Commandable)
11	On/Off (PreAlarm)
12	On/Off (PreAlarmCommandable)
13	On/Off (NotReady)
14	On/Off (NotReadyCommandable)
15	On/Off (Tamper)
16	On/Off (Tamper Commandable)
17	On/Off (Duress Alarm)
18	On/Off (Duress Alarm Commandable)
19	On/Off (Test)
20	On/Off (Test Commandable)
21	Night/Day (Organization Mode)
22	Night/Day (Organization Mode Commandable)
23	On/Off (Disconnect)
24	On/Off (Disconnect Commandable)
25	On/Off (Door Open)
26	On/Off (Door Open Commandable)
27	On/Off (Door Forced)
28	On/Off (Door Forced Commandable)
29	On/Off (Door Open Timeout)
30	On/Off (Door Open Timeout Commandable)
31	Connection Status (Fault)
32	Test Multi Properties

Tab.1 Default items class list for SIMATIC S7

Checking OPC items

The configured OPC items can be validated in order to make sure that the OPC server is actually supporting all the linked items. This verification can be performed using the “Validate” button in the Advanced setting section of the OPC driver link node (see Fig 25 above). Proceed as follows:

1. Select the OPC driver link node
2. Click “Validate” in the “Advanced” setting
3. In the windows that appears, click “Connect” and then “Start”
4. The items are checked done after the other and the corresponding tag names and descriptions appear in the list. On the right hand side, the “Test Result” column shows whether the test passed or failed.
5. The faulty items can be removed right away from the MM8000 link list: the procedure prompts you for an immediate purge.

Adding data points

Once the OPC items are configured and verified, you can focus on the MM8000 representation that you need for them. The S7 subsystem needs to be populated with the appropriate list of points. Proceed as follows:

1. Select the S7 unit node.
2. In the toolbar menu, select the OPC object icons to add new nodes.
Build up the S7 structures using the available objects (Fig 36 and Fig 37)

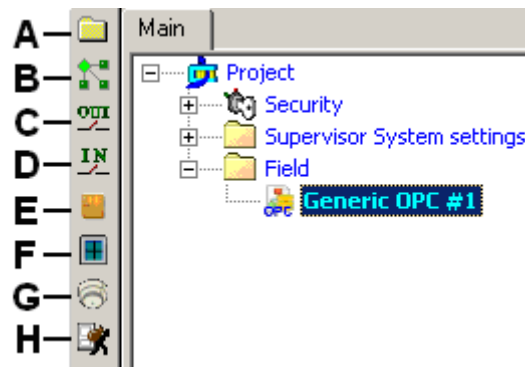


Fig 36 Data points

- A Add a generic folder
- B Add a generic object
- C Add an output point
- D Add an input point
- E Add a door point
- F Add a window point
- G Add a fire zone point
- H Add an intrusion zone point



Save as Composer templates (menu: Tools → Templates → Save as) and then reuse data structures or entire subsystems that you need to insert frequently.

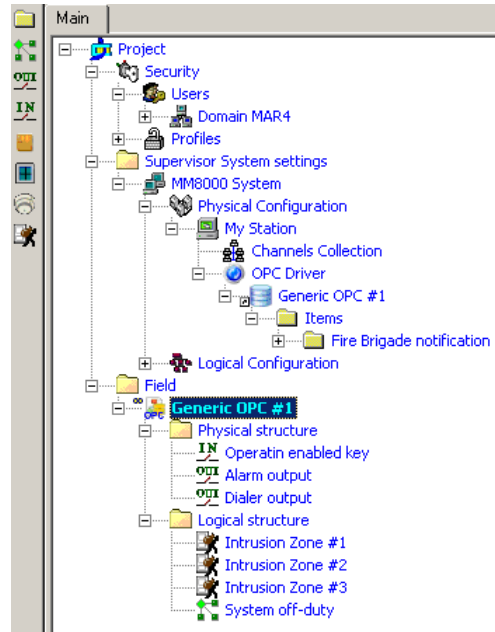


Fig 37 Adding data points (example with a simple intrusion unit settings)

Linking the OPC items to the corresponding data points

1. Expand the folder with OPC items (Tags)
2. Expand the folder with OPC subsystem and points
3. Drag and drop each OPC item (Tag) node to the corresponding point (Fig 38)

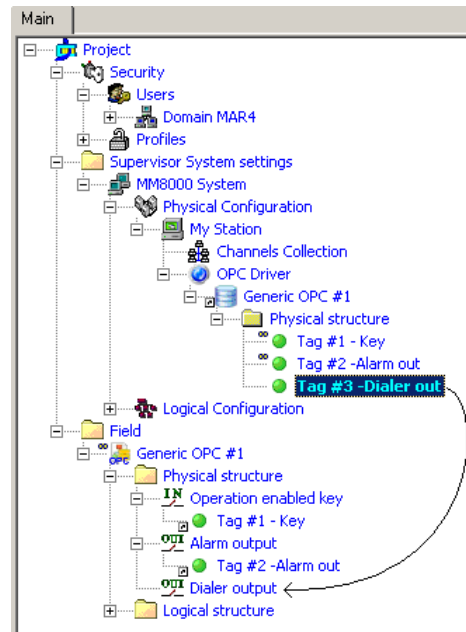


Fig 38 Linking OPC items and points



You can link more than one OPC item to the same MM8000 data points as long as the associated item classes can consistently cooperate to convert multiple OPC information into the same point.

4 OPC item classes



This section described an advanced configuration function, which may not needed if an appropriate data set of OPC item classes is installed in Composer. If in doubt, check with your technical supervisor.

4.1 Need of conversion rules

OPC items can be based on various data formats. OPC standard includes several data types, e.g.: integer (I), unsigned integer (UI), real (R), Date, Boolean (BOOL), String (BSTR). Also, data types may have multiple byte lengths: e.g.: Integer 1 (I1), Integer 2 (I2), Integer 4 (I4), Integer 8 (I8), in order to allocate data of different size. Information in the data types may also vary, depending which actual values are used and associated to a specific application conditions, e.g.: an alarm state.

On the other hand, the MM8000 process image is organised in data points that are made up of elementary or digital properties (DP). An MM8000 DP represents a field condition, shown in one of the following states:

- Quiet: indicates the normal condition
- Active: indicates an abnormal or activated condition for 2-state (on/off) properties (e.g. a communication state that can be normal or faulty)
- Unack: indicates an unacknowledged active condition for acknowledgeable alarm properties (e.g. a fire alarm or fault that requires acknowledgement from the operator)
- Ack: indicates an acknowledged active condition for acknowledgeable alarm properties
- Unreset: indicates a normal condition following an active (or Unack/Ack active) event for properties that require a reset before entering the Quiet state again (e.g. a fire alarm requires reset from the operator)

Conversion rules are required to map the OPC data values in to an MM8000 DPs. In Composer, these rules are called 'OPC item class'.

4.2 Editing item classes

The item classes available in the Tag properties of OPC items (see Fig 16 above) are defined in a tool named 'OPCXMLeditor', which can handle various sets of item classes and save/restore them into/from an XML file.

The OPCXMLeditor tool can be started by the 'Edit' button in the 'Advanced setting' section of the OPC link / Node tab area (Fig 39).

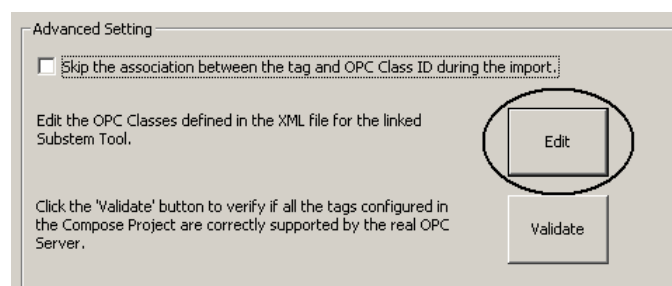


Fig 39 Starting the editor of OPC item classes

The tool opens a window that include a toolbar on the top, a large data area on the centre, and the standard 'OK/Cancel' buttons on the bottom right (Fig 40).

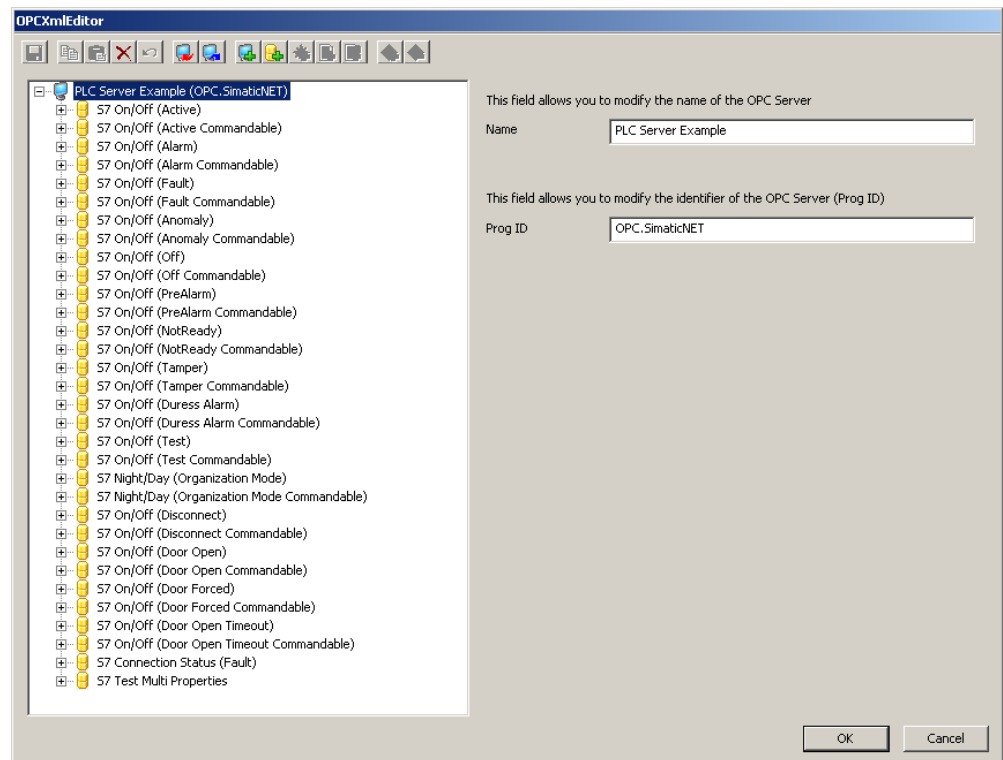


Fig 40 OPCXMLeditor interface (SIMATIC S7 item classes)

On the left side of the data area, one or more data sets (associated to OPC servers) are shown in a tree-based structure. For SIMATIC S7, a large set of predefined classes is given. Instead, for generic OPC units, an example of data set named 'Example OPC server' is provided by default.

The command bar includes the following options:



- A** Save the last changes on disk files
- B** Copy (currently not available)
- C** Paste (currently not available)
- D** Delete the select object
- E** Undo (currently not available)
- F** Load an XML file previous saved by OPCXMLeditor
- G** Save the selected data set into an XML file
- H** Add a new data set of item classes (= a new OPC server): a name and an (optional) server 'Prog ID' are required. If no Prog ID is specified, then the data set is defined as generic and can be applied to any server.
- I** Add a new OPC item class, which can then contains command, state and transaction data
- J** Add a command life-cycle data. This is an OPC data for transmitting a command from MM8000 to the field via the OPC server.
Format type and MM8000 property are required. Supported formats are: Empty/Default (same format as the state), Short Integer (2 bytes), Integer (4 bytes), Single floating point (4 bytes), Double floating point (8 bytes) Currency, String. The MM8000 property applied in this item class must be selected in a drop-down list.

- K** Add a state life-cycle data. This is an OPC data for acquiring a state information from the field to MM8000 via the OPC server.
Format type and MM8000 property are required. Supported formats are: Enumeration, Bit-mask, String, and Analog. The MM8000 property applied in this item class must be selected in a drop-down list.
- L** Add a transaction data. This is an OPC data for acquiring a transaction information from the field to MM8000 via the OPC server. The associated MM8000 transaction property is required and must be selected in a drop-down list.

4.3 Configuration examples

4.3.1 Item class for ‘on/off’ conditions

The item classes define the conversion rules to be applied when moving information from OPC server to MM8000 and vice versa.

For example, an on/off condition, stored in OPC items as numeric 0/1 value and controlled by ‘active’ and ‘de-active’ commands, can be converted into the MM8000 ‘Active’ property as illustrated in the next two images.

A state life-cycle data (Fig 41) defines that OPC values 0 and 1 are associated to the Quiet and Active states, respectively. Also, ‘Active/Deactive’ commands are available (note that the appropriate command, either Active or De-active, will be presented by the MM8000 software based on the current property state).

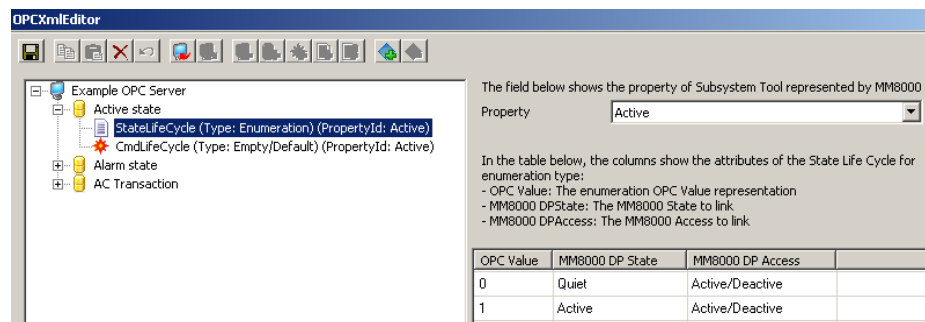


Fig 41 Item class definition (states) for on/off conditions

For the same item class, a command life-cycle data (Fig 42) defines the OPC values corresponding to the De-active and Active commands.

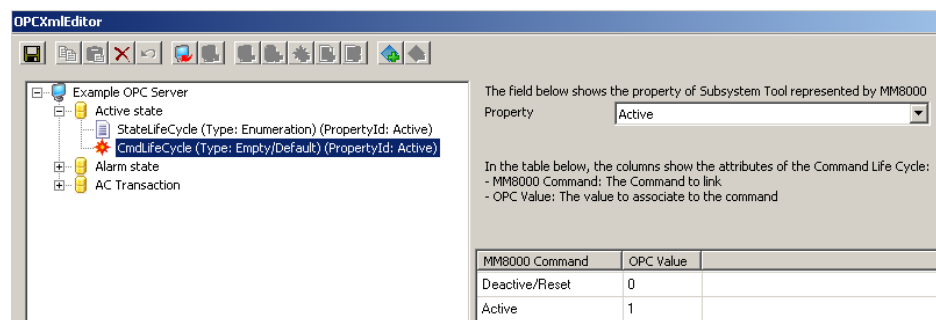


Fig 42 Item class definition (commands) for on/off conditions

4.3.2 Item class for ‘alarm’ conditions

Instead, an alarm condition with ack and reset, stored in OPC items as numeric 0, 1, and 2 value, can be converted into the MM8000 ‘Alarm’ property as illustrated in the next two images.

A state life-cycle data (Fig 43) defines that OPC values 0, 1, and 2 are associated to the Quiet, Unack, and Unreset states, respectively. Also, ‘Ack/Reset’ commands

are available (note that the appropriate command, either Ack or Reset, will be presented by the MM8000 software based on the current property state).

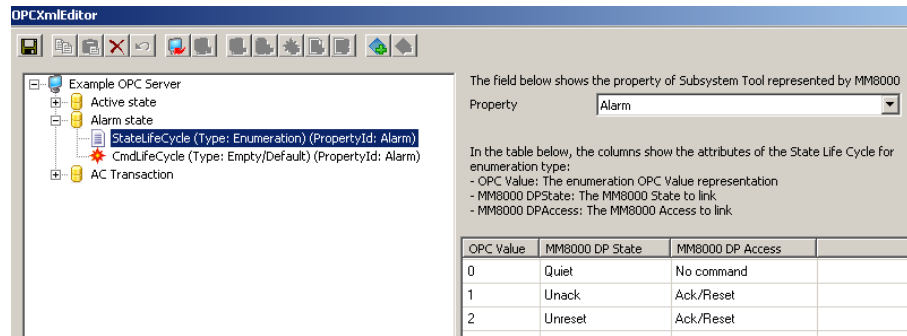


Fig 43 Item class definition (states) for on/off conditions

For the same item class, a command life-cycle data (Fig 44) defines the OPC values corresponding to the Ack and Reset commands.

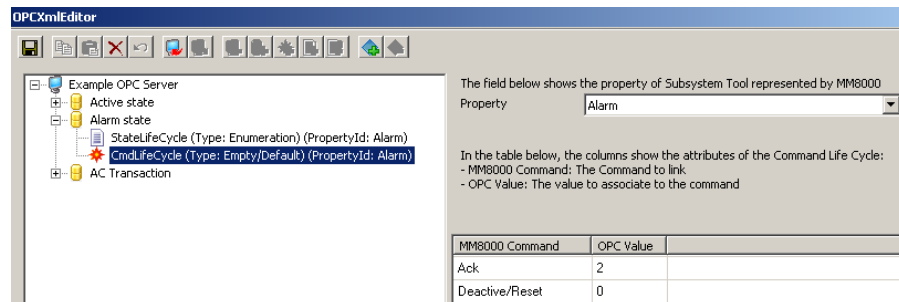


Fig 44 Item class definition (commands) for on/off conditions



The examples above show only one data set (corresponding with the MM8000 property Alarm) per Item class (corresponding with the MM8000 point). Note that more data sets can be added to the class when the OPC item is mapped on multiple properties.

4.4 Item numbering

Item classes in each adapt set are numbered so that each class can be easily referenced in the CSV file for import. The Fig 45 shows how the class number is shown in the class selection page associated to each item linked to the MM8000 OPC Driver.

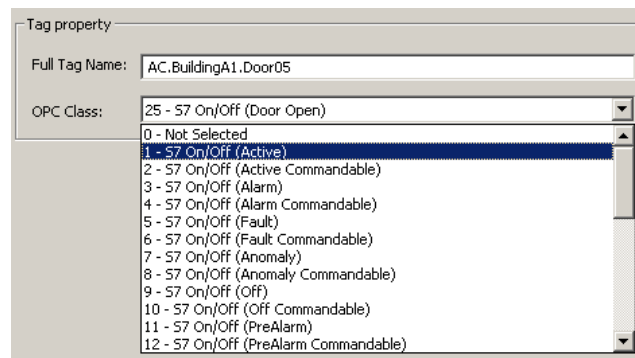


Fig 45 Numbering of MM8000 OPC item class for S7



Note that non-sequential numbering, resulting from the deletion of classes, is then modified by the Save and Load operations that reorganise the list.

5 DCOM settings for OPC communication

The communication infrastructure for OPC over a network is called DCOM. DCOM (Distributed Component Object Model) is a Microsoft Windows inter-process communication framework in which client programs can request services from server programs - on other networked computers - through a defined set of interfaces. DCOM is based on the Component Object Model (COM), which provides a set of services allowing clients and servers to communicate within the same computer.

DCOM security

DCOM includes a security configuration and, in order to set up a networked OPC connection, you need to acquire some understanding of Windows security, and in particular the Distributed COM Configuration tool (DCOMCNFG), which defines the security model for COM applications used remotely.

When a COM server is run remotely, it can run as the 'interactive user', i.e. the user who is currently logged in, or under the identity of a special user, whose account is created specifically for the purpose of running the OPC server.

In the case of MM8000, this user is normally called "DMS8000_PROC" (this is the default setting, refer to MM8000 Installation, Configuration, and Commissioning manual or ICC, doc. A6V10062413). In fact, in MM8000, all services run under the identity of this "internal" user, rather than as the "interactive user" or the "launching user".

In order to properly communicate with MM8000, the OPC server computer must authorise the MM8000 internal user to access the entire server computer, or at least the OPC server software task, in the "DCOM Config" list.

On the other hand, it is also necessary that the user running the OPC server (that you need to identify in the server documentation) is granted access to the entire MM8000 computer or at least to the "MM8000server" software task.

User definition

If the server and client computers run in a common Windows domain, then the users are defined at domain level and therefore visible from all machines.

Instead, if a network workgroup is used, then the users involved in the OPC and DCOM settings must be defined locally on each machine, using exactly the same username and password.

On the MM8000 PC, the internal user called "DMS8000_PROC" is automatically defined. If not available at domain level, the same user must be manually added in the OPC server PC.

Similarly, the user associated to the OPC server's identity may have to be added to the MM8000 Windows user list.

DCOM Configuration tool

The DCOMcnfg application allows setting the DCOM security parameters involved in network OPC links. In other words, this application permits you to add a user to the list of the ones allowed to access and launch any task or a specific task.

In order to run the application, click the "Start" button and then "Run". At this point, in the small window that appears, type "DCOMcnfg" and then "OK".

On Windows XP SP2 machine, the "Component Services" window opens (Fig 46).

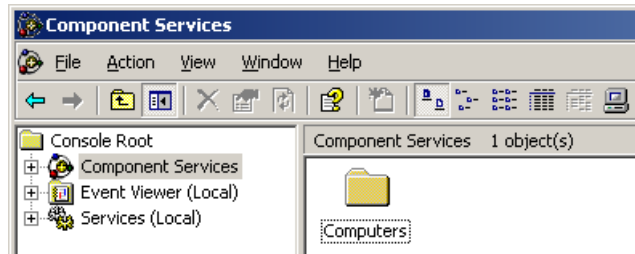


Fig 46 Component Services window

Double click the Component Services and then expand the structure below it. You can now operate at machine (recommended) or at task level.

In order to set the DCOM security at machine level, right click “My Computer” and select “Properties”. In the new window (Fig 47), click the “COM security” tab and consider both “Access Permissions” and “Launch and Activation Permissions” sections.

Here, select “Edit Limits” and “Edit Defaults” (both of them are required), and add the user (“DMS8000_PROC” user on the OPC server PC or the OPC server identity user on the MM8000 PC), setting the “allow” attributes for all positions.

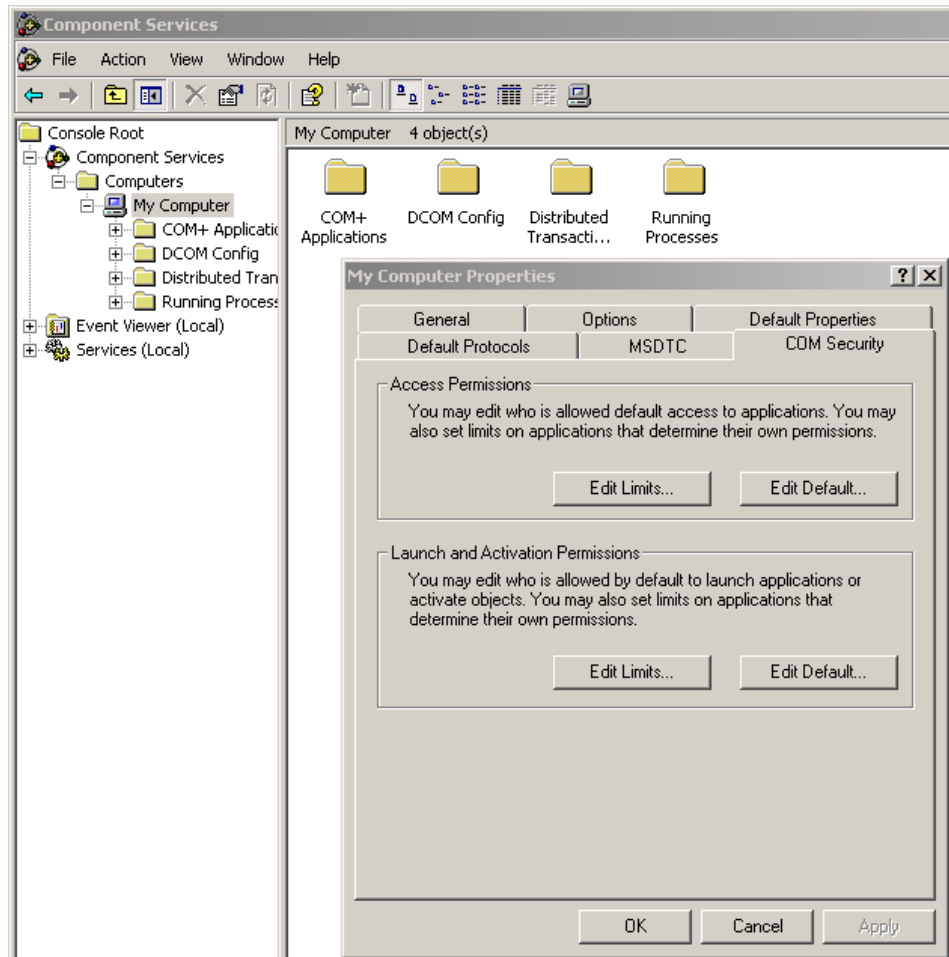


Fig 47 Computer properties

The “Edit Defaults” settings described above will affect all software tasks. Alternatively, you can enable users at individual software task level (note that the “Edit Limits” configuration is required anyway).

In order to do so, expand the list of tasks in the “DCOM Config” node, and locate the task: “MM8000server” on the MM8000 PC (Fig 48) or the OPC server name on the OPC server PC). Right click the task name and select the “Security” tab.

At this point, customise both “Launch and Activation Permissions” and “Access Permissions” defaults, adding the user (“DMS8000_PROC” user on the OPC

server PC or the OPC server user on the MM8000 PC) and setting the “allow” attributes.

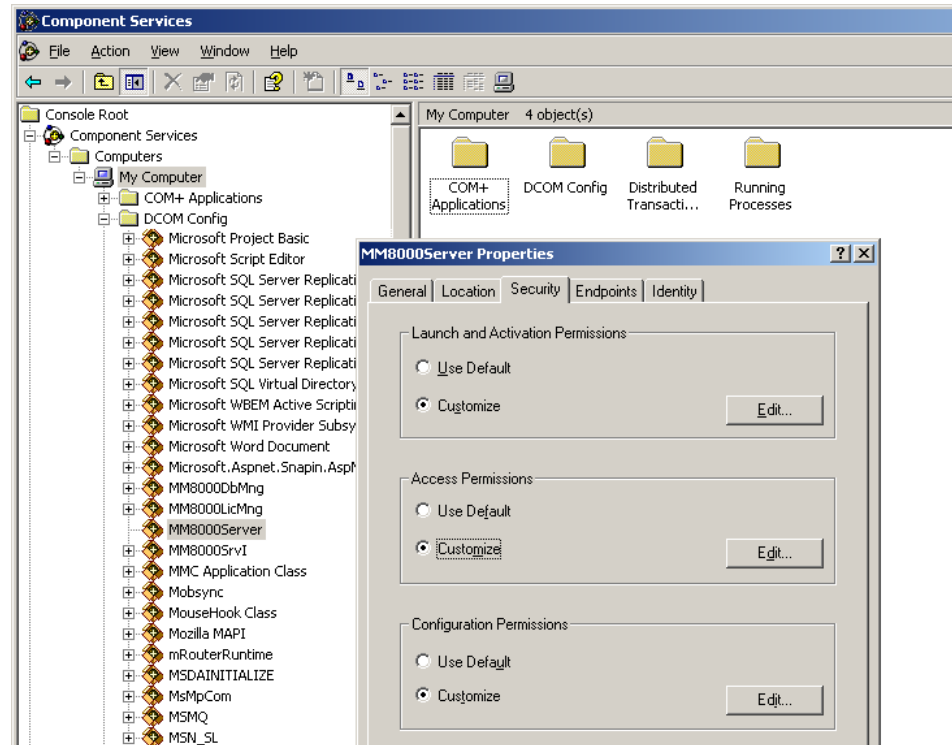


Fig 48 Task properties

5.1 DCOM troubleshooting

In case of problems in the OPC client/server communication, you can check the DCOM error logs, which require to be manually enabled for the Windows event logging.

As described in the MM8000 ICC manual (A6V10062413), use the DCOMX-PLogEnable registry script (located in the “Utilities\Reg” folder of the DMS8000 installation folder) to activate the DCOM logging.

Launch the registry script on the MM8000 PC and then reboot. You can also copy the “reg” files onto the OPC server PC and enable logging exactly in the same way.

At this point, you can test the communication again and check the corresponding log events: the event viewer is available in the Computer Management Console.

You can open it following these steps:

- Right click the “My Computer” icon on the desktop.
- Under the “System Tools” node, expand “Event Viewer” and select “Application”.
- In the list that appears on the right hand side of the Console window, look for the events related to the COM and COM+ sources (Fig 49). Note that you can sort and filter the event list in various ways. For more information, please refer to the Computer Management Console on-line help (see the Event Viewer section).

If event logs are not clear and do not help you in solving the problem, contact the technical support and provide them with the export of the log list for further analysis.

Note: Do not forget to disable the DCOM logging at the end of the test session. In order to do so, use the DCOMXPLogDisable registry script

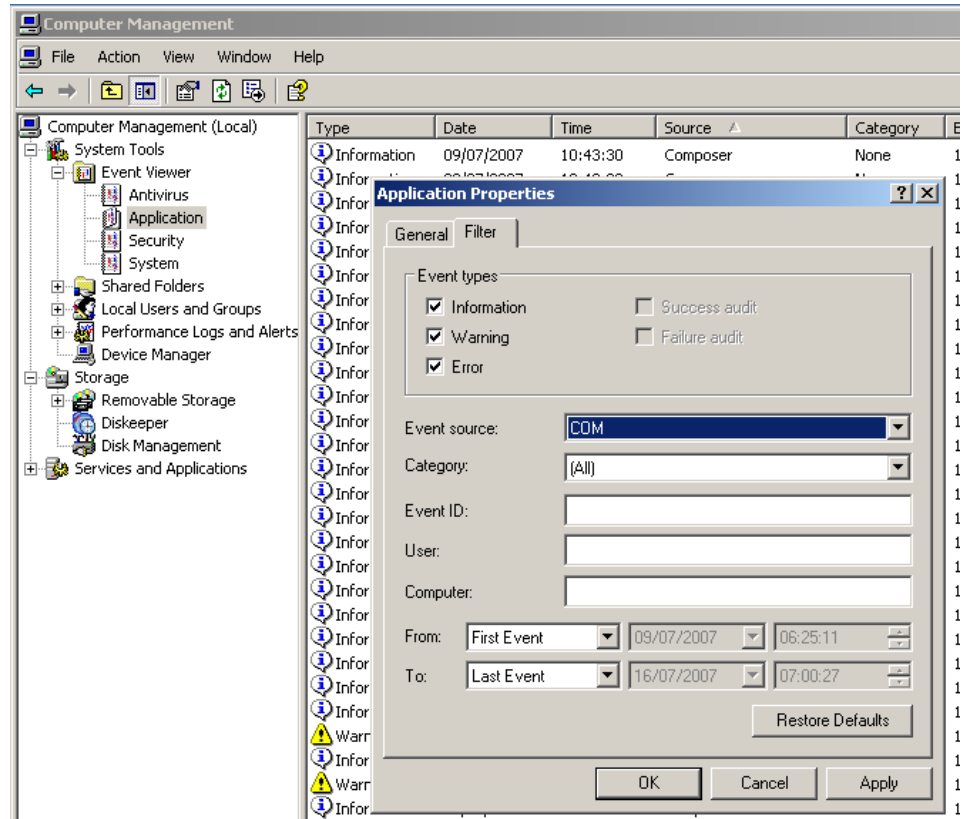


Fig 49 Event Viewer

Siemens Switzerland Ltd
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Gubelstrasse 22
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Tel +41 41 724 24 24
Fax +41 41 724 35 22
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