# COMOS

## Automation
### Automation interfaces

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Legal information

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⚠️ **WARNING**

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⚠️ **CAUTION**

indicates that minor personal injury can result if proper precautions are not taken.

**NOTICE**

indicates that property damage can result if proper precautions are not taken.

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Note on file-based data exchange

When using file-based data exchange, ensure that the sources for an import are trusted. Check that the files and data carriers are free from viruses and apply the usual security measures. To protect your data, make sure that the data carriers or folders are accessible to authorized persons only.
2.1 Objective

The SPI interface imports an Access database that contains a "Smart Plant Instrumentation" (SPI) project. This requires the following workflow to be carried out:

- Data in SPI > Import SPI data into Access > Import Access DB into COMOS

No work on the content of the SPI project needs to be done in advance. The data are prepared in COMOS during the import.

Scope of the interface

The import process takes into account the following information (among other things):

- Structures (unit structure, location structure)
- Positions
- Logical components (loops, functions, device requests)
- Electrical components (terminal strips, terminals, cables, wires)
- Control components (PLC, DCS)

The SPI interface is mainly used within the context of E&I engineering.

The following are not imported:

- User-defined SPI data types ("UDF fields")
- SPI-specific data types ("UID fields")

Interface flexibility

The COMOS administrator defines the mapping between the information from SPI and the COMOS data. Since COMOS data structures are more flexible than SPI data structures, the administrator can freely define the target structure in COMOS.

Changes to the COMOS data can be taken into account in advance. For this purpose, the administrator defines standard assignments in the "Default objectt" fields in addition to the concrete assignment. In the following cases, the standard assignment is used instead and the import process is continued:

- The COMOS data have changed.
- No specific assignment was found during the import.
2.2 Basic principle of importing

Basic principle of exporting from SPI to Access

An ODBC driver controls the process of exporting from SPI to Access. ODBC drivers have their own versions. Switching to a different ODBC driver may change the data that is exported from SPI.

The COMOS installation does not contain any ODBC drivers for SPI.

The COMOS SPI interface does not include an Access license.

Importing an SPI project into Access

You can find additional information on importing an external data source into an empty Access DB using an ODBC driver in the Access documentation.

Make sure you adhere to the following rules:

- Import the source data into the database.
- Import all objects.
- Access 2003 and Access 2007 are supported.

See also

- Opening the SPI interface and Access DB (Page 9)
- Overview of the import process (Page 10)

2.3 Setting up the ODBC data source

Procedure

1. Open "Control panel > Administrative tools > Data sources (ODBC)" in Windows.
2. Select the "System DSN" tab.
   Windows 7: Select the "User DSN" tab.
3. Click "Add" and select an ODBC driver.
   You can find more information on the required ODBC driver in the SPI documentation.
   Example: You can use the ODBC driver "SQL Anywhere 9" for "Sybase DB 7".
4. Click "Finish".
   The names of the next window that appears and the tabs in it depend on the ODBC driver you select.
   The steps below use the example of the "SQL Anywhere 9" driver.
5. Select the "ODBC" tab and enter the name of the data source.
6. Select the "Login" tab.
7. Select the "Supply user ID and password" option.  
   You can find out your user ID and password from your SPI administrator.

8. Select the "Database" tab.

9. Click "Browse" and select a database.  
The database may be located in the in the "Instrumentation" subfolder of the SPI installation  
   folder, for example.

See also

- Opening the SPI interface and Access DB (Page 9)
- Basic principle of importing (Page 8)

2.4 Opening the SPI interface and Access DB

Requirement

- An ODBC data source has been created.  
  See section Setting up the ODBC data source (Page 8)

Procedure

1. Open a project in COMOS.
2. Select the "Plugins > Automation > SPI interface" command from the menu bar.
3. Select the "General" tab.
4. In the "File:" field, select the Access DB in which the SPI project is stored.
5. Select the required SPI project in the "Project name" list.
6. Confirm your entries.

See also

- Assigning attributes (Page 21)
- Importing data (Page 21)
- Basic principle of importing (Page 8)
2.5 Overview of the import process

Import process sequence

The SPI information is imported in the following sequence:

1. Hierarchy elements
   Units and locations
2. Positions
3. Functions, panels, and measuring devices
   Functions are created below the positions.
   Panels and measuring devices are created below the locations.
4. Terminal strips
   Terminal strips are created below the panels or measuring devices.
5. PLC/DCS structures
   Racks, cards, and channels
6. Cables, stranding and wires
7. Terminals/connectors
   SPI contains "terminals" which may serve as both terminals and connectors.
8. Connections between the connectors
   Auxiliary connectors are created if necessary.

This process is described according to COMOS terminology.

See also

Reference: Fixed mapping rules (Page 23)
Basic principle of importing (Page 8)
Notes on the import steps (Page 11)
2.6 Notes on the import steps

Hierarchy of all objects in the "Units" tab

The following structure is created during the import:

1. Unit
2. Subunit
3. Folder (optional; for the technique "category folder", for example)
4. Position or loop
5. Position diagram
6. Function
7. Folder ("Substructure")
8. Measuring device
9. Control component ("Structure element") or measuring device request

This process is described according to COMOS terminology. See also section Reference: Fixed mapping rules (Page 23).

Importing SPI-specific standard elements

The "Empty" and "Default" SPI elements are imported for reasons of completeness. These elements do not contain any project-specific information.

Importing a function with multiple devices

Definition:
- The information labeled "Component" in SPI is referred to as "Function" here.
- The information labeled "Panel, category 4" in SPI is referred to as "Measuring device" here.

If a function has multiple devices, the following applies:
- All the devices are created below the functions.
- The devices receive the connector objects.
2.6 Notes on the import steps

Importing a device assigned to multiple functions
If a device has multiple signals, it must be assigned to multiple functions. In this case:
- All the functions found are imported.
- All connector objects are assigned to the device. The device is assigned to the first function that is found.

Importing functions without devices
If a function for import does not have any devices, the function is imported and does not have any connectors.

Importing SPI connectors
Connectors for devices and terminals are treated in the same way in SPI. For connectors of the panel categories 1, 2, 3 and 5, 6, 7, the following applies:
- Terminals are created below the terminal strips.
- The connectors are grouped below the terminals.

The following applies to the connectors of panel category 4:
- The panel is treated as a measuring device.
- A measuring sensor is created below the measuring device.
- The connectors are created below the measuring sensor.

The connectors are separated logically during the import. Device connectors are created below the devices in the form of connector objects without terminal strips. Terminals are created below terminal strips.

The following "Cable" information is set as attributes:
- "JUMPERS"
  "JUMPERS" are imported as wire jumpers with the following versions:
  - Internal Connector (I): Index = "@B.VBI"
  - External Connector (O): Index = "@B.VBE"
- "CROSS WIRE"
  - Wire color

See also
Overview of the import process (Page 10)
2.7 Preparing to import objects (assignment)

2.7.1 Information on the "Hierarchy objects" tab

Initializing the tab

Definition: The term "hierarchy" is used in SPI. this corresponds to the unit structure in COMOS.
The button "Load hierarchy information from database" creates a table. This table lists the
hierarchies of the SPI project.

Information on assignment

Work in SPI is carried out using fixed hierarchies.

Here is an example based on 3 levels:

- Top level
  The top level does not have an owner. In COMOS, this level corresponds to the top object
  in the "Units" tab. It is not technically essential to use such an object in COMOS.

- Second level
  The second level is created below the "top level" in the hierarchy. During the import,
  additional levels can be created between the top level and second level by using defaults
  in the COMOS base data.
  Additional levels cannot be created in the "Hierarchy objects" tab. The visible entries, and
  therefore the minimum number of levels to be created, are defined by the database to be
  imported.

- Third level
  The third level is created below the "second level" in the hierarchy. During the import,
  additional levels between the second level and third level can be created using COMOS
  templates.

Example

Some examples of SPI table names provide a clear overview of how this system works:

- Top level: DEMO_PLANT
- Second level: DEMO_PLANT_AREA
- Third level DEMO_PLANT_AREA_UNIT.

The assignment could be as follows:

<table>
<thead>
<tr>
<th>Level</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>Level 1</td>
<td>&quot;@30 &gt; M40 &gt; A30 &gt; A10 &gt; A10 &gt; A10 Plant&quot;</td>
</tr>
<tr>
<td>Level 2</td>
<td>&quot;@30 &gt; M40 &gt; A30 &gt; A10 &gt; A10 &gt; A20 &gt; A10 Unit&quot;</td>
</tr>
<tr>
<td>Level 3</td>
<td>&quot;@30 &gt; M00 &gt; A30 &gt; A20 &gt; A10 &gt; A30 &gt; A10 Subunit&quot;</td>
</tr>
</tbody>
</table>
2.7 Preparing to import objects (assignment)

Note
Creation mode "Free"

Use the creation mode "Free" for the COMOS base objects of the first two levels on the "System" tab. Alternatively, add the folder which you wish to use in the "SPI interface" plugin on the "Structure objects" tab as an element.

Note
Recommendation on the subunit

If you use the recommended subunit, the objects are stored in the underlying folder "EI&C" during the import. If this folder does not exist, no objects are imported under the subunit. You can find the base object of the folder here: "@30 > M00 > A35 > A10 > A50 EI&C".

See also

Overview of the import process (Page 10)

2.7.2 Information on the "Structure objects" tab

Information on assignment

Definition: The term "structure" is used in SPI. This corresponds to the location structure in COMOS.

The COMOS Navigator contains the "Units" and "Locations" tabs, each of which has a separate hierarchy.

In SPI, however, there is no clear distinction between the unit tree and location tree. From the user's perspective, all of the nodes/folders are located in the same tree. During the import, a location is created in COMOS for each top-level unit that is created.

Other lower-level location structures are derived from the SPI project data. Standard projects contain the following folders, for example:

- Component Locations
- Panel Locations
- Panels by category
  - SPI features 7 types (or "categories") of panels. A subfolder is prepared for each category.

Example

The assignment could be as follows:

<table>
<thead>
<tr>
<th>&quot;Location:&quot;</th>
<th>&quot;@30 &gt; M00 &gt; A40 &gt; A20 &gt; A10 &gt; A10 &gt; A10 Plant&quot;</th>
</tr>
</thead>
<tbody>
<tr>
<td>&quot;Panel location:&quot;</td>
<td>&quot;@30 &gt; M00 &gt; A40 &gt; A20 &gt; A10 &gt; A50 &gt; A10 Cabinet&quot;</td>
</tr>
</tbody>
</table>
2.7 Preparing to import objects (assignment)

See also

Overview of the import process (Page 10)

2.7.3 Information on the "Positions" tab

Initializing the tab

The button "Load loop information from database" creates a table. This table lists the positions of the SPI project and searches for suitable positions under the specified start object. If you have not yet created any positions, the table remains empty.

Information on assignment

The assignment in the "Default object" field is used for all entries without an appropriate individual assignment. If the position has multiple position diagrams in the "Default object" field, assign a position diagram in the "Document" list.

You use the "Start object" field to set the start object for automatic assignment. If COMOS finds a position with an appropriate position code under the start object, SPI position and COMOS position are assigned automatically. The default setting from the table applies here. You have the option of manually changing the automatically found assignment.

You also have the option of assigning the positions manually, on an individual basis. The SPI positions are based on the DIN/IEC standard for positions. In COMOS, a limited library is also available based on this standard.

Example

The assignment could be as follows:

<table>
<thead>
<tr>
<th>Start object</th>
<th>A self-defined position.</th>
</tr>
</thead>
<tbody>
<tr>
<td>Default object</td>
<td>&quot;@20 &gt; A25 &gt; A10 &gt; M00 &gt; A10 General position&quot;</td>
</tr>
<tr>
<td>Document</td>
<td>&lt;Position diagram&gt;</td>
</tr>
<tr>
<td></td>
<td>Here, you see the interactive reports that are under the object set in the &quot;Default object&quot; field.</td>
</tr>
<tr>
<td>Mapping table for loops</td>
<td>If you have set a default object, you can leave this table empty.</td>
</tr>
</tbody>
</table>

See also

Overview of the import process (Page 10)
2.7.4 Information on the "Functions" tab

Initializing the tab

The button "Load function information from database" creates a table. The table lists the functions of the SPI project and searches for suitable functions and measuring devices under the specified start object.

Information on assignment

If no individual assignment can be found for an entry, the assignment in the "Standard function" and "Standard measuring device" fields is used.

You can use the "Start object for function search" and "Start object for searching measuring devices" fields to set the start objects for automatic assignment. If COMOS finds a function with an appropriate function code below the start object, the SPI function is automatically assigned to the COMOS function. The default setting from the table applies here. You have the option of manually changing the automatically found assignment.

You also have the option of assigning the functions manually, on an individual basis. For this purpose, you need to set the COMOS measurement functions in the left area of the table. You can select multiple rows at once and implement a common assignment with a single drag&drop operation.

If the COMOS measurement function has a folder into which the devices are sorted, this folder is displayed in the "Substructure" column.

The right area of the table is where the COMOS devices are set. In the COMOS standard model, the devices associated with a measuring function are stored in the "01 Basic Engineering" folder.

Example

The assignment could be as follows:

| Start object for searching functions | "@30 > M00 > A60 > A10 General function structure" |
| Start object for searching measuring devices | "@30 > M41 > A50 > A10 > A10 Measurements" |
| Standard function | <Dependent on project> |
| Standard measuring device | <Dependent on project> |

An entry in the mapping table can, for example, be edited as follows:

<table>
<thead>
<tr>
<th>ID</th>
<th>Function type</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>27</td>
<td>FR</td>
<td>LOCAL FLOW RECORDER</td>
</tr>
</tbody>
</table>

COMOS function:
"@30 > M00 > A60 > A10 > A10 > F flow, flow rate"

COMOS measuring device:
"@30 > M41 > A50 > A10 > A10 > A10 > F > F5 General flow sensor"
2.7 Preparing to import objects (assignment)

2.7.5 Information on the "Devices" tab

Information on assignment

The devices are assigned in this tab. Category "4" SPI panels and SPI components count as devices.

The "Default object" field is used for all entries without an appropriate individual assignment.

If you assign the "Search object", "Manufacturer specification", and "Model type specification" fields, COMOS can also assign the objects using a manufacturer device search.

In the COMOS standard model, these objects are created in the "Locations" tab.

When possible, COMOS sets the attribute "Sys.Areaname" for the devices during the import.

The devices are located below the functions and contain the connectors.

Example

The assignment could be as follows:

<table>
<thead>
<tr>
<th>Object</th>
<th>Path</th>
</tr>
</thead>
<tbody>
<tr>
<td>Terminal box</td>
<td>@30 &gt; M00 &gt; A40 &gt; A20 &gt; A10 &gt; A30 &gt; A30 Field panel</td>
</tr>
<tr>
<td>Marshalling</td>
<td>@30 &gt; M00 &gt; A40 &gt; A20 &gt; A10 &gt; A50 &gt; A10 Cabinet</td>
</tr>
<tr>
<td>Control cabinet</td>
<td>@30 &gt; M00 &gt; A40 &gt; A20 &gt; A10 &gt; A50 &gt; A10 !A10 Control (PLC)</td>
</tr>
<tr>
<td>DCS</td>
<td>@30 &gt; M00 &gt; A40 &gt; A20 &gt; A10 &gt; A60 &gt; A10 Station</td>
</tr>
<tr>
<td>PLC</td>
<td>@30 &gt; M00 &gt; A40 &gt; A20 &gt; A10 &gt; A60 -&gt; A10 !A10 Control (PLC)</td>
</tr>
<tr>
<td>Telecommunication device</td>
<td>Base object of a control cabinet; e.g.:</td>
</tr>
<tr>
<td></td>
<td>@30 &gt; M00 &gt; A40 &gt; A20 &gt; A10 &gt; A50 &gt; A10 Cabinet</td>
</tr>
</tbody>
</table>

See also

Overview of the import process (Page 10)

2.7.6 Information on the "Terminal strips" tab

Information on assignment

The standard terminal strip is assigned in this tab.

When possible, COMOS sets the attribute "Sys.Areaname" during the import.
2.7 Preparing to import objects (assignment)

Example

The assignment could be as follows:

| Standard terminal strip | "@30 > M41 > A50 > A30 > A10 > A20 > A10 Terminal strip, general" |

See also

Overview of the import process (Page 10)

2.7.7 Information on the "Terminals" tab

Information on assignment

The default terminals are assigned in this tab.

The "Default object" field is used for all entries without an appropriate individual assignment.

If you assign the "Search object", "Manufacturer specification", and "Model type specification" fields, COMOS can also assign the objects using a manufacturer device search.

Example

The assignment could be as follows:

<table>
<thead>
<tr>
<th>Terminal</th>
<th>&quot;@30 &gt; M41 &gt; A50 &gt; A10 &gt; A10 &gt; A20 &gt; A20 &gt; A10 Lead-through terminal, 2 conductors&quot;</th>
</tr>
</thead>
<tbody>
<tr>
<td>Terminal (N)</td>
<td>&quot;@30 &gt; M41 &gt; A50 &gt; A10 &gt; A10 &gt; A20 &gt; A20 &gt; A10 Lead-through terminal, 2 conductors, N&quot;</td>
</tr>
<tr>
<td>Terminal (PE)</td>
<td>&quot;@30 &gt; M41 &gt; A50 &gt; A10 &gt; A10 &gt; A20 &gt; A20 &gt; A10 Lead-through terminal, 2 conductors, PE&quot;</td>
</tr>
<tr>
<td>Terminal (H)</td>
<td>&quot;@30 &gt; M41 &gt; A50 &gt; A10 &gt; A10 &gt; A20 &gt; A20 &gt; A10 &gt; A30 Shield terminal&quot;</td>
</tr>
</tbody>
</table>

See also

Overview of the import process (Page 10)

2.7.8 Information on the "Cables" tab

Information on assignment

The default cables are assigned in this tab.

The assignment in the "Default object" field is used for all entries without an appropriate individual assignment.
When you assign the fields "Search object:“, "Manufacturer specification:“ and "Model type specification:“, COMOS can also assign the objects by means of a manufacturer device search.

In SPI, a cable can be created below a function or a device as well as below a terminal strip. During the import, all cables receive a device or measuring device as the owner.

The SPI cables "CROSS WIRE” and "JUMPER” are not created as a cable object during the import. Instead, this information is created as an attribute at the connector object.

Example

The assignment could be as follows:

<table>
<thead>
<tr>
<th>Default object:</th>
<th>&quot;@30 &gt; M41 &gt; A50 &gt; A30 &gt; A10 &gt; A50 &gt; A10 Cable, unspecified&quot;</th>
</tr>
</thead>
<tbody>
<tr>
<td>Search object:</td>
<td>&quot;@30 &gt; M41 &gt; A50 &gt; A30 &gt; A10 &gt; A50 Cable&quot;</td>
</tr>
</tbody>
</table>

See also

Overview of the import process (Page 10)

2.7.9 Information on the "Wires" tab

Information on assignment

The default wires are assigned in this tab.
The following structure must be used in SPI:
Cables > Stranding > Wires.
Both the "Default wire" and "Default stranding” fields have to be assigned for the import of wires.

Example

The assignment could be as follows:

<table>
<thead>
<tr>
<th>Default wire</th>
<th>&quot;@30 &gt; M41 &gt; A50 &gt; A10 &gt; A20 &gt; B40 &gt; A10 Wire“</th>
</tr>
</thead>
<tbody>
<tr>
<td>Default shield</td>
<td>&quot;@30 &gt; M41 &gt; A50 &gt; A10 &gt; A20 &gt; B40 &gt; A20 Shield&quot;</td>
</tr>
<tr>
<td>Default stranding</td>
<td>&quot;@30 &gt; M41 &gt; A50 &gt; A10 &gt; A20 &gt; B40 &gt; A30 Stranding&quot;</td>
</tr>
</tbody>
</table>

See also

Overview of the import process (Page 10)
2.7.10 Information on the "PLC/DCS" tab

Information on assignment

The default control components are assigned in this tab.

Example

The assignment could be as follows:

<table>
<thead>
<tr>
<th>Rack:</th>
<th>&quot;@10 &gt; A60 &gt; A10 &gt; A10 &gt; A60 &gt; A30 Rack&quot;</th>
</tr>
</thead>
<tbody>
<tr>
<td>Card:</td>
<td>&quot;@10 &gt; A60 &gt; A10 &gt; A10 &gt; A30 &gt; A10 Unspecified module&quot;</td>
</tr>
<tr>
<td>Channel:</td>
<td>&quot;@10 &gt; A60 &gt; A10 &gt; A10 &gt; A30 &gt; A30 &gt; A10 !A10 Input/output&quot;</td>
</tr>
</tbody>
</table>

See also

Overview of the import process (Page 10)

2.8 Preparing to import attributes (assignment)

2.8.1 Information on the attribute tabs

Information on assignment

The SPI data fields are assigned to COMOS attributes in the tabs below the "Attribute mapping" tab. Only assigned data fields are imported.

However, assigning SPI data fields to COMOS attributes is optional; all the other elements of the import can still be used, even if nothing has been assigned to the attributes.

The "Min" and "Max" information is stored in separate fields in SPI. In COMOS, this information is part of an attribute object. For this reason, you only assign a COMOS object once; the "Min" and "Max" information is assigned automatically.

See also

Assigning attributes (Page 21)
2.8.2 Assigning attributes

Requirement

- The SPI interface and Access DB are open.
  See section Opening the SPI interface and Access DB (Page 9).
- The "Attribute mapping" tab is displayed.

Procedure

1. Select the tab for the attributes you wish to assign.
   Example: "Cables" tab
2. Click the "...Load from database" button.
   A table appears in the tab.
   A row is created for each SPI data field.
3. To assign a COMOS attribute to an SPI data field, drag&drop an attribute from the Navigator
   to the "COMOS attribute" column of the required SPI data field.
   - "Description of COMOS attribute" column
     The value in this column is entered automatically.
   - "Min/Max" column
     The value in this column is entered automatically.

See also

Importing data (Page 21)
Information on the attribute tabs (Page 20)

2.9 Importing data

Requirement

- An ODBC data source has been created.
  See section Setting up the ODBC data source (Page 8).
- The SPI interface and Access DB are open.
  See section Opening the SPI interface and Access DB (Page 9).
- Optional: The attributes have been assigned. If no attributes have been assigned, no
  attribute values are applied.
  See section Assigning attributes (Page 21).
Controlling the import

- To create a working layer below the current working layer during import, enable the "Create working layer" option.
- Click the "Stop" button to cancel the import process. The "Stop" button appears when the import process is started.

Starting the import

1. Select the "General" tab.
2. Click on the "Execute" button.

Note
"Execute" button

The "Execute" button is shown on every tab of the plugin. You can start the import from any tab. While the import is running, all tabs are locked.

Checking the import

The import status is displayed in the COMOS status bar.

Enable the "Show log file" option to display the log file in the standard text tool.

The location at which the log file is saved depends on your operating system and your system settings. To find the storage location, open any Explorer window and enter "%APPDATA%" in the address bar. You can find the log file in the folder "\Comos_Industry_Solutions\SPI_Import".

The assignments in the SPI interface are stored in the following profile object:
"@99 > A50 > <User>"
or
"@System > @Profiles > <User> > Comos.IC.SPI"

2.10 Continuing an earlier import

Requirement

- An ODBC data source has been created. See section Setting up the ODBC data source (Page 8).
- The SPI interface and Access DB are open. See section Opening the SPI interface and Access DB (Page 9).
- The attributes have been assigned. See section Assigning attributes (Page 21).
- Data has already been imported.
- See section Importing data (Page 21).
Procedure

1. Open the plugin.
2. Select the "General" tab.
3. Activate the "Continue earlier import" option.
   The earlier imports are listed. Only imports from the same Access DB and the same working layer or a higher working layer can be selected.
4. Select an entry from the list.
5. From the "Resume from" list, select the import step from which the import should be resumed.
   You can only select steps if their preceding steps have already been completed. The first two steps must also be carried out again when an import is resumed and are therefore not available for selection.
6. To delete the temporary files including the resume information, click on the "Discard earlier import" button.
7. Click on the "Execute" button.

2.11 Reference: Fixed mapping rules

Logical assignment of base objects

<table>
<thead>
<tr>
<th>SPI</th>
<th>COMOS</th>
</tr>
</thead>
<tbody>
<tr>
<td>Loop</td>
<td>Position</td>
</tr>
<tr>
<td>Component</td>
<td>Function</td>
</tr>
<tr>
<td>Panel (Cat. 4)</td>
<td>Measuring device</td>
</tr>
<tr>
<td>Panel</td>
<td>Location</td>
</tr>
<tr>
<td>Strip</td>
<td>Terminal strip</td>
</tr>
<tr>
<td>Terminal</td>
<td>Terminal object or connector object</td>
</tr>
<tr>
<td>Cable</td>
<td>Cable</td>
</tr>
<tr>
<td>Wire</td>
<td>Wire</td>
</tr>
<tr>
<td>Location</td>
<td>Location</td>
</tr>
<tr>
<td>Panel (Cat. 5)</td>
<td>Station</td>
</tr>
<tr>
<td>Cabinet_Rack</td>
<td>Rack</td>
</tr>
<tr>
<td>Rack_Position</td>
<td>Slot</td>
</tr>
<tr>
<td></td>
<td>No object to be created. Instead, the rack card is given the slot name.</td>
</tr>
<tr>
<td>Apparatus</td>
<td>Card/rack</td>
</tr>
<tr>
<td>Channel</td>
<td>Channel</td>
</tr>
</tbody>
</table>
### Logical assignment of SPI panel categories

<table>
<thead>
<tr>
<th>Category</th>
<th>SPI</th>
<th>COMOS</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Junction box</td>
<td>Field panel</td>
</tr>
<tr>
<td>2</td>
<td>Marshaling cabinet</td>
<td>Marshaling panel (field)</td>
</tr>
<tr>
<td>3</td>
<td>Control cabinet</td>
<td>Marshaling panel (control)</td>
</tr>
<tr>
<td>4</td>
<td>Panel</td>
<td>Measuring device (field device)</td>
</tr>
<tr>
<td>5</td>
<td>DCS</td>
<td>Control component</td>
</tr>
<tr>
<td>6</td>
<td>PLC</td>
<td>Control</td>
</tr>
<tr>
<td>7</td>
<td>Telecom device</td>
<td>Cabinet</td>
</tr>
</tbody>
</table>
3.1 Aim of the generic Excel import

The generic Excel import process involves the following functions:

- Importing hierarchy information and creating objects
  Available for system type: Base object (CDevice), document (Document)
- Importing or changing Values
  Available for system type: Attribute (Specification)
- Importing or changing standard properties
  Available for system type: Base object (CDevice)

Advantages of generic Excel import

- You can create and store multiple mapping configurations
- Drag&Drop functionality instead of scripting
- You can flexibly use different list formats, for example vendor information

See also

Notes on structure of the Excel table (Page 25)
Opening the "Generic Excel import" plugin (Page 26)

3.2 Notes on structure of the Excel table

Structure of the Excel table

The Excel data must have the following structure:

- Header
- Data rows
  The values in all the cells of a column must have the same structure. Example:
  If a cell contains the "FullName" of an attribute, all values in the column must have the structure "<Tab>.<Attribute name>", e.g. "M001.T1", "B01.T23".

Changes to the structure of the Excel table

The import rules for a "configuration" apply to a fixed structure in the Excel table.
The following actions in the Excel table override the import rules:

- Creating and deleting columns
- Moving columns
- Renaming columns

When making such changes, you can save a new or modified configuration.

3.3 Opening the "Generic Excel import" plugin

Procedure

1. Open a project in COMOS.
2. From the menu bar, select the "Plugins > Automation > Generic Excel import" command.

3.4 Select an Excel file

Requirement

- The "Generic Excel import" plugin is open. See chapter Opening the "Generic Excel import" plugin (Page 26).
- The structure of the Excel file is as specified. See chapter Notes on structure of the Excel table (Page 25).

Procedure

1. Select the required Excel file in the "Excel file" field.
2. Select the required entry from the "Excel worksheet" list.
3. Enter a value in the "Excel start row" field.
   The "Excel start row" is the first row of the data area. All rows above are part of the header.
4. Click the "Load worksheet" button. The columns of the Excel file are displayed in the "Import data" area.

5. Enable the columns you want to import in the "Import data" area. Depending on what you select, the number of entries in the "Data assignment" working area will either increase or decrease.

**Result**

Each column of the Excel spreadsheet that is displayed in the "Data assignment" area is created by default with an empty rule.

**Note**

**Deleting empty rules**

Delete the empty rules in order to avoid errors during the import.

**See also**

- Defining import settings (Page 27)
- Data assignment for importing hierarchies (Page 31)
- Data assignment for importing a value (Page 33)
- Data assignment for importing changed properties (Page 34)
- Divide into rules (Page 35)
- Creating the data assignment configuration (Page 40)

**3.5 Defining import settings**

**Requirement**

- An Excel file has been selected. See section Select an Excel file (Page 26).
Procedure

1. Optional: If a data assignment has already been saved as a configuration, click the "Configuration" button. See section [Creating the data assignment configuration](#) (Page 40).

2. Drag&drop the required engineering object or project node from the Navigator to the "Start object" field.
   - The objects are created or edited below the start object during the import.
   - The "Base" field is also set in line with the input in the "Start object" field. In this way, a root is also set for the Navigator in the "Data assignment" area.
   - If necessary, click on the "Remove pointer" button to the right of the "Base" field to remove this specification.

3. Drag&drop the required base object from the Navigator into the "Base object" field.
   The base objects used in the "Data assignment" area are provided below this base object.

See also

- [Divide into rules](#) (Page 35)
- [Data assignment for importing hierarchies](#) (Page 31)
- [Data assignment for importing a value](#) (Page 33)
- [Data assignment for importing changed properties](#) (Page 34)

3.6 Interface reference for the "Data assignment" area

Requirement

- Columns have been selected in the "Import data" area.
- The "Load worksheet" command has been executed. See chapter [Select an Excel file](#) (Page 26).

Control elements in the working area for rules

A header is displayed for each column in the "Data assignment" area.

These entries have the following control elements:
3.6 Interface reference for the "Data assignment" area

1. "Header of the rules" for showing / hiding rules
2. Split into rules
3. Create new rule
4. Set the base object using drag&drop.
   The base object must be below the object entered in the "Base" field.
5. Delete reference to base object
6. Create new rule for the search
7. Preview
8. Create new rule for changing the property
9. Copy rule
   A copy of the rule is inserted at the end of the rule list.
10. Edit rule
11. Undo rule change / Repeat rule
12. Delete rule
13. Extended rule options

Context menus
3.7 Notes on importing hierarchies

Operation mode

The value of the Excel cell is read out and split. A base object is assigned to each of the partial values. During the import, an engineering object is created for each partial value. The result is a hierarchy of engineering objects, which is determined and created on the basis of the Excel cell value.

Alternatively, an Excel cell receives exactly the information of a hierarchy level. In this case, the Excel cell value is not split. Instead, there are various Excel columns, which collectively contain the same hierarchy information.

Base objects for the administration of base data

COMOS includes base objects that are only used in the "Base data" tab. These base objects are used to administer and sort base data. These are base objects with the following properties, for example:

- "System" tab, "Block" placement option
- "System" tab, "Group" placement option
- "System" tab, "Structure" placement option

Base objects with these properties cannot be set in the "Data assignment" area.

Hierarchy of base data in COMOS

COMOS checks the hierarchy of the base objects below the object in the "Base" field during the import.
The following conditions apply:

- If the base objects have a hierarchy and these base objects are used in the "Data assignment" area, the engineering objects are also created hierarchically.
- If base objects are next to each other, the engineering objects will also be next to each other.
- If the base objects have a hierarchy that is only partially mapped in the "Data assignment" area, the gaps in the hierarchy will be filled with dummy objects.
- You can use base objects in the hierarchy to manage the base data. These are ignored if the hierarchy is created at the engineering end.
- The sequence of columns in Excel does not have to match the sequence in the hierarchy. The columns are assigned in the "Data assignment" area of the hierarchy level.

**Point to note when importing loops**

If a new position diagram is created during an import, note the following:

The components belonging to the loop only become visible when the "Place automatically" function is used.

The segments are visible from the first time you open a loop.

**See also**

[Data assignment for importing hierarchies](Page 31)

### 3.8 Working with rules

#### 3.8.1 Data assignment for importing hierarchies

**Requirement**

- Columns have been selected in the "Import data" area. See section [Select an Excel file](Page 26).
- A base object has been set in the "Base" field. See section [Defining import settings](Page 27).
Procedure

To define a rule for reading a partial value, follow these steps:

1. In the "Data assignment" area, click "Create empty rule".
   - Optional: Click "Edit rule".
   - Select the relevant entry from the "Select a function" list.
   - Define the rule for the selected entry.
     See also section Working with the "Splitting" dialog (Page 36).
   - Confirm your entries.

2. Drag & drop a base object from the "Data assignment" area to the "Base object" field:

   ![Diagram of Data assignment area with base objects]

   **Note**
   The "Find base object based on name" option affects evaluation of the "Base object" field.
   See also section Extended rule options (Page 39).

   Valid entries in the "Base object" field for creating new objects are:
   - Base objects (CDevice)
   - Documents

3. To create an additional rule for the same Excel column, click "Create empty rule" in the "Data assignment" area again.

4. Edit the next rows in the "Data assignment" area using the same procedure.

Result

The "Data assignment" area shows an example of what effect the rule has on the first cell in the column. During the import, the rule is applied to all the cells in the column. Engineering objects are created or found on the basis of the base object that is set. The engineering objects that are created are given a name in accordance with the name displayed at the base object.
See also

Data assignment for importing a value (Page 33)
Notes on importing hierarchies (Page 30)
Interface reference for the "Data assignment" area (Page 28)
Importing data (Page 43)

3.8.2 Data assignment for importing a value

Requirement

- Columns have been selected in the "Import data" area.
  See section Select an Excel file (Page 26).
- A base object has been set in the "Base" field.
  See section Defining import settings (Page 27).

Procedure

To define a rule for importing a "Value" attribute property, follow these steps:

1. In the "Data assignment" area, click "Create empty rule".
   - Optional: Click "Edit rule".
   - Select the relevant entry from the "Select a function" list.
   - Define the rule for the selected entry.
     See also section Working with the "Splitting" dialog (Page 36).
   - Confirm your entries.

2. Drag&drop the base object of an attribute from the "Data assignment" area into the "Base object" field.
   The checks in the "Extended rule options" dialog are deactivated because only the default properties are permitted.

3. To create an additional rule for the same row, click "Create empty rule" in the "Data assignment" area again.

4. Edit the next rows in the "Data assignment" area using the same procedure.

Result

A search for the CDevice owner is performed for the base object of the attribute. A search is performed for the engineering object associated with this owner, and the attribute is updated here.
3.8.3 Data assignment for importing changed properties

Operation mode

To change a property, you need two items of information:

- Entry with the previous name
  Below, this Excel column is referred to as: Name column.
  The object is identified with this entry.
- Entry with the property to be changed
  Below, this Excel column is referred to as: Property column.
  Properties that can be changed are:
  - Name
  - Description
  - Label

Requirement

- Columns have been selected in the “Import data” area.
  See chapter Select an Excel file (Page 26).
- A base object has been set in the “Base” field.
  See chapter Defining import settings (Page 27).
Procedure

To define a rule for importing changed properties, follow these steps:

1. To edit the "Data assignment" of the name column, follow these steps:
   - In the "Data assignment" area, select the name column entry.
   - Click "Create empty rule".
   - Optional: Click "Edit rule" and edit the dialog.
     See also chapter Working with the "Splitting" dialog (Page 36).
   - Drag&drop a base object (CDevice) from the "Data assignment" area to the "Base object" field.
     Do not change the default settings in the "Extended rule options" dialog.

2. To edit the "Data assignment" of the property column, follow these steps:
   - In the "Data assignment" area, select the property column entry.
   - Optional: Click "Edit rule" and edit the dialog.
     See also chapter Working with the "Splitting" dialog (Page 36).
   - Drag&drop the same base object (CDevice) as in the previous step from the "Data assignment" area to the "Base object" field.
   - Open the "Extended rule options" dialog.
     See also chapter Extended rule options (Page 39).
   - Select an entry in the "Target property" list

3. Edit the next rows in the "Data assignment" area using the same procedure.

Result

An engineering object is searched for in accordance with the value in the name column and
the set base object. The property is updated here in accordance with the value in the property column.

See also

Divide into rules (Page 35)
Importing data (Page 43)

3.8.4 Divide into rules

Requirement

- Columns have been selected in the "Import data" area.
  See chapter Select an Excel file (Page 26).
- A base object has been set in the "Base" field.
  See chapter Defining import settings (Page 27).
Procedure

1. Select a rule. The column to which the selected rule belongs is highlighted in the "Import data" area.
2. Select the command "Split into rules" in the header of the rule.
3. Enter a separator.
4. Confirm your entries.

Result

The value of the Excel cell is divided into several partial values. The value of the Excel cell is searched for the separator for this purpose. A rule is created for each hit.

See also

- Creating the data assignment configuration (Page 40)
- Working with the "Splitting" dialog (Page 36)

3.8.5 Working with the "Splitting" dialog

Purpose

The "Splitting" dialog is used for the following tasks:

- Edit rule
- Reading out only part of the contents of an Excel cell

If each Excel cell contains exactly the text required during import, the "Splitting" dialog is not needed.

Opening the "Splitting" dialog

The "Splitting" dialog is opened in the "Data assignment" area using the "Edit rule" button:
"Select a function" list

- "Regular expression"
  You use regular expressions to separate data. Regular expressions can also help you to define the cells to which a rule should be applied.
  Example: One rule has the regular expression "A" and the other has the expression "B". This means that the first rule is only applied to cells containing "A" and the second rule is only applied to cells containing "B".
  Regular expressions as per .NET are permitted.
  You can find more information on this topic on the Internet, keyword ".NET Framework Regular Expressions".
  - "Regular expressions (examples)" field:
    The "." character acts as a wildcard for any one character.
    The "*" character acts as a wildcard for any number of characters.
    The "\d" characters stand for any one digit.
  - "Predefined expressions" field
    Contains frequently required applications for regular expressions

- "Split character"
  Separates data at the point where the specified character is found.
  Fill out either the "From front" field or the "From back" field.

- "Substring action"
  Separates the data after the specified number of characters.
  Fill out either the "From front" field or the "From back" field.

"Predefined expressions" list

This list includes examples for regular expressions. The examples can be applied with "Insert".

---

**Note**

If you have defined a regular expression, the evaluation of the first call is displayed with the next call of the function of the same location. Another definition is performed for the first result. The function is thus additive. To make a change, first delete the existing expression.

---

**See also**

- [Divide into rules](Page 35)
- [Data assignment for importing hierarchies](Page 31)
- [Data assignment for importing a value](Page 33)
- [Data assignment for importing changed properties](Page 34)
- [Information on editing rules](Page 40)
### 3.8.6 Create new rule for the search

You create a new rule for the search, for example, when you want to create a new rule to change the properties. Another possible application is searching for base objects by name.

**Requirement**

- Columns have been selected in the "Import data" area.  
  See chapter [Select an Excel file](Page 26).
- A base object has been set in the "Base" field.  
  See chapter [Defining import settings](Page 27).

**Procedure**

Click the "Create search rule" button in the "Data assignment" area.

**Result**

A new row is created.

### 3.8.7 Creating a new rule for changing the properties

**Introduction**

You can use special rules to change the Name, Label and Description properties of an object during the import.

**Requirement**

- A column is defined in the Excel spreadsheet that contains the new value of the property.
- A rule for creating objects exists and a base object is defined.

**Procedure**

1. Drag a column from the "Import data" area and drop it on the line of the new rule.
2. Select the "Link object" entry from the "Property" list:
3. 
4. Select the "Base structure" tab in the "Data assignment" area.
5. Navigate to the attribute of the object that you want to change.
6. Drag&drop the desired attribute button "Drag&drop column here to create a rule".
3.8.8 Extended rule options

Extended rule options are available for the following objects:

- Base object (CDevice)
- Document (Document).

You cannot change the entries in the dialog if an attribute is set.

- "Find base object based on name"
  Purpose: Name-based assignment of a base object to a rule
  Starting at the specified node, the Excel content determined by the rule is interpreted as
  the name of a base object that is located below the node.
  Example: Different base objects exist for signals. As creating a separate rule for each signal
  would be overly complex, the following procedure can be used:
  - At the rule, set the owner base object that has the various base objects of the signals
    as subobjects.
  - You enable the extended option "Find base object based on name".

- "Target property"
  The selection in the "Target property" list can be evaluated both for newly created objects
  and when existing objects are changed.
  - "Standard"
    For base object and document: The imported or calculated string is interpreted as a
    name. If an object with this name is found, it is processed. If no object with this name is
    found, a new object is created.
    For attribute: The imported or calculated string is interpreted as a value (Value).

Note

Not all attributes use the value (Value) as a standard property. The "Edit field" attribute
 can be used for testing.

- "Name"
  Changes or sets the name of the object

- "Description"
  Changes or sets the description of the object

- "Label"
  Changes or sets the label of the object
3.8.9 Information on editing rules

The following information will make it easier for you to work with rules:

- The history of editing steps for a rule remains available for as long as the "Generic Excel import" tab is open.
  To access the editing steps, use the "Forward" and "Back" arrow buttons.

- Provided the "Generic Excel import" tab is open, you can, if required, hide a column in the "Import data" area without losing the editing steps history for the corresponding rules.
  The rules will be displayed again when the column is shown again. You can then access the editing steps again.

See also

- Working with the "Splitting" dialog (Page 36)
- Opening the "Generic Excel import" plugin (Page 26)

3.9 Editing the data assignment configuration

3.9.1 Creating the data assignment configuration

Requirement

- Columns have been selected in the "Import data" area.
  See chapter Defining import settings (Page 27).

- A base object has been set in the "Base" field.
  See chapter Select an Excel file (Page 26).

Procedure

1. Click the "Configuration..." button in the "Import settings" area.
   The "Configuration..." window opens.

2. Click "New...".
   A new entry appears in the list on the left. The name of the configuration contains the date and time of creation.

3. Select the new entry.

4. Click "Save".

Result

The "Configuration..." window is closed.

Configurations are stored in the database as follows:

"@99 > A50> <User> > GenericExcelImport Profile/user settings"
3.9 Editing the data assignment configuration

3.9.2 Editing a configuration

Requirement

- A configuration has been created.
  See also chapter Creating the data assignment configuration (Page 40).

Procedure

1. Open the “Configuration” window.
2. Select one of the following options:
   - If you have changed the rules in the "Data assignment" area and want to store the changes in an existing configuration, select the configuration.
   - To rename the configuration, double-click the name in the list and overwrite the existing name.
   - To make a configuration available for other users, select the configuration in the list and click the "Release for all" button.
     You require administrator and project management rights.
     The release cannot be rescinded. In this case, delete the configuration.
   - To delete a configuration, select the configuration and click the "Delete" button.
3. Save your entries.

3.9.3 Importing or exporting a configuration

Export configuration

1. Open the "Configuration" window.
2. Select a configuration from the list.
3. Click "Export".
4. Enter a name.
   The configuration is exported as an XLM file.
5. Save your entries.

Import configuration

1. Open the "Configuration" window.
2. Click "Import".
3. Select an XML file. The selected configuration is displayed in the list.
4. Select the imported configuration from the list.
5. To use the configuration, click "Load".

3.9.4 Configuration version

The version information in the "Configuration" dialog specifies the COMOS version with which the configuration was created. For configurations that were created with COMOS 10.2, the dialog displays the version number 2.00. Configurations from older COMOS versions have the version 1.00.

The version information does not depend on how often the configuration has already been edited or stored.

Conversion of old configurations

If you load an existing configuration with a more recent COMOS version, the configuration is checked and converted. Contained rules which can possibly not be converted are displayed in the "Data assignment" area with a red frame.

3.10 Using templates

Requirement

- An Excel spreadsheet is prepared. See also chapter Notes on structure of the Excel table (Page 25).
- The import settings are made. See also chapter Defining import settings (Page 27).

Procedure

1. Select the "Templates" tab in the "Data assignment" area.
2. Select one of the following options:
   - To use templates from the current project, select the "Current project" option.
   - To use templates from the base project, select the "Base project" option.
3. Select one of the following options:
   - To use templates from the "Units" tab in the navigator, select the "Units" option.
   - To use templates from the "Locations" tab in the Navigator, select the "Locations" option.
   The available folders from the "@Template" node are displayed.
4. Drag&drop the required folder into the "Base object" field in the working area for rules.
Result

During the import, the object is created under the folder specified here.

Example

If you drag & drop the folder "M41 EI&C" from the "@Templates" node into the "Base project" field of a function, the function is imported in the navigator under the folder "A50 EI&C". The value "SearchValue" is displayed in the properties of the superior position in the "Target object" field of the "Task" tab. The "SearchValue" folder of the function is referenced here.

Using different templates for an Excel worksheet

In order to use different templates for the individual rows of the Excel worksheet, define a search property, for example "Label", in the advanced rule options. If the search finds a template with the desired search property, it is copied under the current owner into the hierarchy of the engineering data.

3.11 Importing data

Requirement

- Data assignment for importing hierarchies is complete. See chapter Data assignment for importing hierarchies (Page 31).
- Data assignment for importing a value is complete. See chapter Data assignment for importing a value (Page 33).
- Data assignment for importing changed properties is complete. See chapter Data assignment for importing changed properties (Page 34).

Checking the import preview

1. Enter the desired values in the "Preview line" field in the "Import settings" control group. The line cannot be smaller than the Excel start line and cannot be larger than the last data line.
2. Click the "Preview window" button. The "Preview window" dialog opens. An import is simulated in this dialog on the basis of the object in the "Start object" field.
3. Check that you have configured the rules correctly.

The new objects are only visible in the preview. The Navigator continues to show the original view.

Deleting empty rules

Delete the empty rules in order to avoid errors during the import.
"Import into working layer" option
When this option is activated, a new working layer that contains the import data is created with the import.

"Delete upon matching" option
When this option is activated, you can delete the objects that exist in the Navigator but are not included in the Excel table. The "Import into working layer" option is activated automatically because working layer technology is used for the matching.

During matching, objects which were created when the owner was created are ignored.

Use the working layer display of the Navigator to show which objects have remained unchanged after the import and which objects were deleted or created again.

Initiating import
If you want to import the data in the open working layer, click the button "Import".

Status window
When you open the "Generic Excel import" plugin, the status window opens in the detail area of the Navigator. Errors, warnings and notes are output here during the import.

Effect on inventory data
If you import data multiple times or an import takes place on top of existing data, the data from the Excel table is added to the database or the existing data in the database is overwritten.

Creating structure objects
Objects with the "Structure" creation option are taken into account in the import.

If a base object is prepared as element with the "Structure" creation option, the following applies:

If the element was created with the property "Virtual: Off", it is automatically created when the parent object is imported.

This means a COMOS-specific object structure is created during the import.

3.12 Creating and performing tasks

Requirement
- The import settings have been made. See chapter Defining import settings (Page 27).
- Data assignment for importing changed properties is complete. See chapter Data assignment for importing changed properties (Page 34).
Procedure

1. Create a new rule for the search below the position. See chapter Create new rule for the search (Page 38).

2. Drag the task from the base structure into the "Base object" field of the new search rule. To apply the rule for the import, open the extended rule options and select the "Execute engineering task" option.

3. Create another rule for the search.

4. Select the "Y00A03136 target object" attribute in the "System data" tab of the task in the base structure.

5. Drag the attribute from the base structure into the "Base object" field of the new search rule.

6. Create a new rule to change the properties. See chapter Creating a new rule for changing the properties (Page 38).

7. Drag a column from the "Import data" area and drop it on the line of the new rule.

8. Select the "Link object" entry from the "Property" list:
   The object must be created already.

   **Note**
   **Reference column in Excel**
   The reference column "Path to link object" of the imported Excel worksheet must contain the PathFullName.

9. Click on the "Import" button.

Result

The link object is entered in the "Target object" field of the "Tasks" tab for the properties of the position. If you have enabled the "Execute engineering task" option, the status of the task is green.
3.12 Creating and performing tasks
4.1 Objective

OPC = Open Process Control

You use an OPC connection to access values provided by an OPC server and display them on the OPC client. The values displayed are not initially saved.

OPC servers are primarily used for process visualization purposes.

See also
- Basic principle of visualization (Page 47)
- Examples of supported OPC servers (Page 47)

4.2 Basic principle of visualization

The OPC client queries the current values of signals from the OPC server. These values are then saved in the "OPC" tab of the signal.

The OPC connection is implemented in COMOS as follows:

- An OPC server must be available; this is not included in the COMOS scope of delivery.
- COMOS has its own OPC client.
- A script is entered at an attribute. This script automatically starts the COMOS OPC client as soon as the displayed value (DisplayValue) of the attribute is accessed.

See also
- Objective (Page 47)
- Examples of supported OPC servers (Page 47)
- Attributes at the engineering object: Calling the OPC Client (Page 48)
- Project attributes: Specifying the OPC Server (Page 48)

4.3 Examples of supported OPC servers

COMOS has an OPC client that can address any OPC server.
Examples of software with the OPC Server:
- Siemens: WinCC
- ETM: PVSS II

See also
- Objective (Page 47)
- Basic principle of visualization (Page 47)

4.4 Project attributes: Specifying the OPC Server
You specify the OPC server in the current project, in the "OPC" tab of the base project properties.

The following table describes the settings you set in the "OPC" tab in the properties of the base project:

<table>
<thead>
<tr>
<th>Control element</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>&quot;Server name&quot; field</td>
<td>Only evaluated when &quot;Start automatically&quot; is deactivated. If the OPC server and COMOS are installed on different PCs, you also need to enter the server name prefixed with &quot;&quot;, e.g. \Comp007&quot;. If the OPC server and COMOS are installed on the same PC, you do not need to specify a server name.</td>
</tr>
<tr>
<td>&quot;Computer name&quot; field</td>
<td>Only evaluated when &quot;Start automatically&quot; is deactivated.</td>
</tr>
<tr>
<td>&quot;Autostart&quot; option</td>
<td>Specifies whether the OPC client is started automatically.</td>
</tr>
<tr>
<td></td>
<td>- Deactivated: A registration form is displayed when the OPC client starts up. Enter the name of the server and the PC in this form.</td>
</tr>
<tr>
<td></td>
<td>- Activated: No form is displayed when the OPC client starts up. The necessary information is taken from the &quot;OPC&quot; tab in the project.</td>
</tr>
</tbody>
</table>

See also
- Technical implementation / Application (Page 49)
- Attributes at the engineering object: Calling the OPC Client (Page 48)
- Basic principle of visualization (Page 47)

4.5 Attributes at the engineering object: Calling the OPC Client
You specify information on the OPC server in the properties of a base object in the "Attributes > OPC" tab. If the tab is not there, contact the responsible administrator.

Example:
Open the “Attributes > OPC” tab in the properties of the following base object:
"@20 > A40 > A10 > A10 Signals by IEC 1175"

The following table describes the settings you set in the "OPC" tab in the properties of a base object:

<table>
<thead>
<tr>
<th>Control element</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>&quot;OPC variable name&quot;</td>
<td>Full name of the signal</td>
</tr>
</tbody>
</table>
| "Online value" | ● The entry "Graphical user interface with script" must be selected in the "Edit mode" list in the attribute properties.  
● Displays the current value of the signal transmitted by the OPC Server  
● Links using the GetDisplayValue function |

**Function GetDisplayValue()**

Script function at the "Online value" attribute that determines the output value of the attribute.

Return value: String

The GetDisplayValue function is edited in the base project, in the "Script" tab in the properties of the following attribute:
"@20 > A40 > A10 > Y00T00024 > Y00A00423 Online value"

**See also**

Technical implementation / Application (Page 49)  
Basic principle of visualization (Page 47)  
Project attributes: Specifying the OPC Server (Page 48)

**4.6 Technical implementation / Application**

The OPC client is automatically accessed when the "Y00A00423 online value" attribute is accessed. Automatic access only works at the engineering end.

**Procedure**

Proceed as follows to access the "Y00A00423 online value" attribute:

1. Open the engineering object properties.
2. Open the tab in which the "Y00A00423 online value" attribute is located.
3. Expand the nodes in the Navigator until the following attribute is displayed in the "Units" tab: "Y00A00423 online value"

4. Open the report in which the "Y00A00423 online value" attribute is output
   Upon initial access, the GetDisplayValue script block starts.
   An OPCItem object is created and the name of the to be linked OPC variable is transmitted. The COMOS OPC client starts.

Result

If there is no item with the name entered, the item is processed. The item is added to the group of the active variable. The current value is returned and displayed at the attribute.

See also

- Project attributes: Specifying the OPC Server (Page 48)
- Attributes at the engineering object: Calling the OPC Client (Page 48)
5.1 Virtual commissioning with COMOS and SIMIT

Advantages of virtual commissioning

The objective of COMOS and SIMIT is to obtain data for the simulation from the design of the plant, which has been created, for example, with P&ID. By exchanging data between COMOS and SIMIT, Simulation Framework offers the following advantages:

- Better engineering quality due to simulations and virtual commissioning
- Reduced commissioning times, total project costs and risks
- Lower costs in the development of simulations and faster return on investment
- Maximum re-use of data from the plant design
Virtual commissioning with COMOS and SIMIT from plant design to simulation

Overview

Design Optimization  
Virtual Commissioning  
Process Design  
DCS-Engineering  
Commissioning  

Data exchange
5.2 Working with the interface

5.2.1 Importing a SIMIT component interface

Introduction

The data is imported into the project that is open when the plugin is started. If an engineering project is open, the data is created as local base objects and can only be used in this project. If you want to use the data in more than one project, open the base project before you open the plugin.

Requirement

- The project into which the data is to be imported is open.
- The files of the type ".simcomp" are stored and you have access to the storage location.

Procedure

1. Select the command "Plugins > Automation > SIMIT interface > SIMIT interface configuration" in the menu bar. The plugin opens. The "SIMIT components" tab is displayed.
2. Click one of the following buttons in the menu bar of the plugin:
   - "Add SIMIT components from files"
   - "Add SIMIT components from folders"
   - "Add SIMIT components from SIMIT archive"
   See also chapter "SIMIT components" tab (Page 57).
3. Select the desired components.
4. Click "Open". The components are imported and displayed in the "SIMIT Components" table. The components are created under the node "@123 SIMIT Interface > LIB SIMIT Components" on the "Base objects" tab in the Navigator. If the node does not exist in the Navigator, it is created automatically.
5. In order to display the details of an individual component, click the component in the "SIMIT Components" table. The details appear in the "SIMIT component details" field.

Result

The COMOS-relevant data such as the physical size, connection information and parameters are evaluated. The behavior of the component is imported and administered as a black box in COMOS. This is necessary so that an executable simulation is available in SIMIT, regardless of the SIMIT library components contained in the target installation.
If the SimComp file already exists and contains COMOS-specific information, you have the option of overwriting the existing data in COMOS or storing a new version of the component.

5.2.2 Working with components mappings

Requirement

- The "SSIMIT interface configuration" plugin is open.
- SIMIT components were imported.

See chapter Importing a SIMIT component interface (Page 53).

Procedure

1. Select the "Components mapping" tab in the "SIMIT interface configuration" plugin.
2. Click on the "New configuration" button.
   The "New configuration" window opens.
3. Enter a name for the configuration.
4. Confirm your entries.
5. To save the configuration, click on the "Save configuration" button.
6. Select the "Base objects" tab in the Navigator.
7. Navigate to the base object of one of the components.
8. Drag the base object from the Navigator into the "COMOS source object" column of the "Component mappings" list.
   A field appears in the "SIMIT component" column.
   You have the option to use objects from the "Units" tab in the Navigator.
9. Drag the appropriate component from the "Imported SIMIT components" list into the field of the "SIMIT component" column.
   You can assign imported components multiple times.
   You also have the option to drag the imported SIMIT components in the "Base mappings" area into the "SIMIT component" field.
   If you work with topologies and use them in the "SIMIT component" field, you then need to decide if the connector is right or left in the "Detail mapping" field of the properties of the connector mappings. This is how you define whether the COMOS object is connected to a free SIMIT connector via the X connector or the Y connector.
10. To edit the properties of the COMOS source object, select the object in the "COMOS source object" column and change the settings in the "Detail mapping" area.

Result

When you save your configuration, your changes are saved automatically.

The component mappings are valid for all engineering objects with the same type as the selected base object.
5.2.3 Editing user-defined SIMIT parameters

Objective

If no identical mapping of COMOS properties is possible for the SIMIT component, you can use complex conversions with block-based recalculation.

Requirement

- The "SSIMIT interface configuration" plugin is open.
- SIMIT components have been imported.
  See also chapter Importing a SIMIT component interface (Page 53).
- Components mappings have been defined.
  See also chapter Working with components mappings (Page 54).

Procedure

1. Select an object in the "Component mappings" area.
2. Define the object's properties in the "Detail mapping".
3. Click on the "Customize parameter mapping" button next to one of the attributes. The "SIMIT custom parameter mapping" tab opens.
4. Click button behind one of the parameters in the "Node palette" area.
5. The parameter is placed in the working area. The properties of the parameter are displayed in the "Node settings" area.
6. To edit the properties of the parameter, change the details in the "Node settings" area.
7. To move the parameters within the work area, left-click on the placed parameters, hold down the mouse button and drag the parameter to the desired location.

Display of the user-defined SIMIT parameters

If you want to zoom the display of the fields in or out, left-click in any field and move the mouse wheel in the desired direction.

To move all fields, right-click on any field, keep the mouse button pressed and drag the fields to the desired position. For example, this provides the option of centering the view.
5.2.4 Exporting component shells

Requirement

- The "SSIMIT interface configuration" plugin is open.
- SIMIT components were imported.
  See also chapter Importing a SIMIT component interface (Page 53).
- Changes to the components are saved.
  See also chapter Working with components mappings (Page 54).

Procedure

1. Select the "Create component shell" tab in the "SIMIT interface configuration" plugin.
2. Select the "Base data" tab in the Navigator.
3. Drag a suitable base object drop from the Navigator into the "COMOS object" field.
   The tabs of the base object are displayed in the "Exported parameters" table.
4. Select one of the following options:
   - To export all the attributes of a tab, select the option in front of the name of the tab.
   - To export individual attributes of a tab, expand the Attributes of the tab and select the
     option in front of the names of the desired attributes.
     A suggestion for the name of the attribute in SIMIT appears in the "SIMIT name" column.
     You can change the name.
5. Select the desired entry from the "Symbol type" list.
6. Click on the "Export .simcmp" button.
7. Select the storage location for the file.
8. Confirm your entries.

5.2.5 Export data

Requirement

- A COMOS document has been created and edited.
- If you are working with flow directions, check them.
Procedure

1. Select the command "Plugins > Automation > SIMIT interface> SIMIT export" in the COMOS menu bar. The "SIMIT Export" opens. See also chapter "SIMIT Export" plugin (Page 60).
2. Drag the start object from the Navigator and drop it into the "Start object" field. Use a document or node under which the documents are created. The "Start object" box only displays documents.
3. Select the target path.
4. Enter the desired file name. The file must be type ".xml". Example: "Filename.xml"
5. Select an mapping configuration.
6. Click on the "Export" button.

Note
No check of the units
There is no check of the units. Therefore, ensure that the units used to calculate in SIMIT match the units used in COMOS. SI units are used in SIMIT usually.

Note
No check for components with the same names
No check is performed on the name property for the mapping of the component name for SIMIT to ensure that components with the same name do not occur on the resulting SIMIT model. In this case, a message will be output in SIMIT. Rename the component manually.

5.3 User interface reference

5.3.1 "SIMIT interface configuration" plugin

5.3.1.1 "SIMIT components" tab

<table>
<thead>
<tr>
<th>Control element</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>&quot;Add SIMIT components from files&quot; button</td>
<td>You use this button to import an individual component.</td>
</tr>
<tr>
<td>&quot;Add SIMIT components from folders&quot; button</td>
<td>You use this button to import several components from a folder. Subfolders of the selected folder are also evaluated.</td>
</tr>
<tr>
<td>&quot;Add SIMIT components from SIMIT archive&quot; button</td>
<td>Use this button to import an entire SIMIT archive with all components contained therein.</td>
</tr>
</tbody>
</table>
### Control element

<table>
<thead>
<tr>
<th>Control element</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>&quot;Delete selected SIMIT components&quot; button</td>
<td>This button deletes the selected components. The components are deleted both from the &quot;SIMIT Components&quot; table and the &quot;Base objects&quot; tab in the Navigator. This button is active if the option of one or more components is activated in the first column of the &quot;SIMIT Components&quot; table. Otherwise, the button is grayed out.</td>
</tr>
<tr>
<td>&quot;SIMIT Components&quot; table</td>
<td>This table displays the imported components.</td>
</tr>
<tr>
<td>&quot;SIMIT component details&quot; area</td>
<td>This section shows the details of a component. Click on the component in the &quot;SIMIT Components&quot; table for this.</td>
</tr>
</tbody>
</table>

#### 5.3.1.2 "Component mapping" tab

<table>
<thead>
<tr>
<th>Control element</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>&quot;Save configuration&quot; button</td>
<td>You can use this button to save the active configuration. The configurations are stored in the Navigator in the &quot;Base objects&quot; tab under &quot;@123 SIMIT Interface &gt; MAPPING configuration&quot;.</td>
</tr>
<tr>
<td>&quot;Active configuration&quot; list</td>
<td>Select the desired configuration from this list.</td>
</tr>
<tr>
<td>&quot;Create new configuration&quot; button</td>
<td>You use this button to create a new configuration.</td>
</tr>
<tr>
<td>&quot;Rename configuration&quot; button</td>
<td>You can use this button to rename the active configuration.</td>
</tr>
<tr>
<td>&quot;Delete configuration&quot; button</td>
<td>You can use this button to delete the active configuration.</td>
</tr>
</tbody>
</table>

#### "Base mappings" area

<table>
<thead>
<tr>
<th>Column</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>&quot;Base mapping&quot;</td>
<td>Standard component for cross-chart interconnection and half-open connections</td>
</tr>
<tr>
<td>&quot;SIMIT component&quot;</td>
<td>Drag the component from the &quot;Imported SIMIT components&quot; table into this column.</td>
</tr>
</tbody>
</table>

#### "Imported SIMIT components" area

<table>
<thead>
<tr>
<th>Column</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>&quot;Name&quot;</td>
<td>This column displays the name of the imported SIMIT component.</td>
</tr>
<tr>
<td>&quot;Version&quot;</td>
<td>This column displays the version of the imported SIMIT component.</td>
</tr>
<tr>
<td>&quot;Library&quot;</td>
<td>This column indicates which SIMIT library is assigned to the component.</td>
</tr>
<tr>
<td>&quot;ID&quot;</td>
<td>This column displays the SIMIT ID of the component.</td>
</tr>
</tbody>
</table>
"Component mappings" area

<table>
<thead>
<tr>
<th>Control element</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>&quot;Delete checked component mappings.&quot; button</td>
<td>You can use this button to delete the selected component mapping.</td>
</tr>
<tr>
<td>Column</td>
<td>Use this column to select the component mapping.</td>
</tr>
<tr>
<td>&quot;COMOS source object&quot; column</td>
<td>You drag the base object serving as COMOS source object into this column.</td>
</tr>
<tr>
<td>&quot;SIMIT component&quot; column</td>
<td>Drag the component from the &quot;Imported SIMIT components&quot; table into this column.</td>
</tr>
</tbody>
</table>

"Detail mapping" area

<table>
<thead>
<tr>
<th>Control element</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>&quot;Export detail mapping...&quot; button</td>
<td>You use this button to export detailed mapping. An XML file is exported.</td>
</tr>
<tr>
<td>&quot;Export detail mapping...&quot; button</td>
<td>You use this button to import detailed mapping. XML files are imported.</td>
</tr>
<tr>
<td>&quot;Basic property mapping&quot; area</td>
<td>This area shows the base mapping of selected component mapping. You can edit individual properties.</td>
</tr>
<tr>
<td>&quot;Parameter mapping&quot; area</td>
<td>This area shows the parameter mapping of selected component mapping. You can edit the values.</td>
</tr>
<tr>
<td>&quot;Additional parameter mapping&quot; area</td>
<td>This area displays additional parameter mappings of selected component mapping. You can edit the values.</td>
</tr>
<tr>
<td>&quot;Connector mapping&quot; area</td>
<td>This area shows the connection mapping of selected component mapping. You can edit the values.</td>
</tr>
<tr>
<td>&quot;OK&quot; button</td>
<td>Use this button to close the &quot;SIMIT Interface Configuration&quot; plugin. Save your settings before closing the active configuration. When there are unsaved changes, you are asked if you want to save them.</td>
</tr>
<tr>
<td>&quot;Cancel&quot; button</td>
<td>Use this button to close the &quot;SIMIT Interface Configuration&quot; plugin. When there are unsaved changes, you are asked if you want to save them. The changes are immediately discarded.</td>
</tr>
</tbody>
</table>

5.3.1.3 "Create component shell" tab

<table>
<thead>
<tr>
<th>Control element</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>&quot;COMOS object&quot; field</td>
<td>You drag the appropriate COMOS base object into this field.</td>
</tr>
<tr>
<td>&quot;Symbol type&quot; list</td>
<td>Select the symbol type to be exported from this list.</td>
</tr>
<tr>
<td>&quot;Exported parameters&quot; table</td>
<td>You select the parameters of the base object to be exported from this table.</td>
</tr>
<tr>
<td>&quot;Exported connectors&quot; table</td>
<td>In this table, you define the assignment of the connectors to the SIMIT connectors.</td>
</tr>
<tr>
<td>&quot;Export .simcmp&quot; button</td>
<td>You use this button to export the selected properties.</td>
</tr>
</tbody>
</table>
### 5.3.2 "SIMIT Export" plugin

<table>
<thead>
<tr>
<th>Control element</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>&quot;Start object&quot; field</td>
<td>This field displays the start object for the export. The start object must be a document.</td>
</tr>
<tr>
<td>&quot;Target path&quot; field</td>
<td>This field indicates where the export file is stored. The file must be saved as an XML file.</td>
</tr>
<tr>
<td>&quot;Browse&quot; button</td>
<td>Use this button to open the &quot;Save as&quot; dialog.</td>
</tr>
<tr>
<td>&quot;Mapping configuration&quot; list</td>
<td>Select the mapping configuration to be exported from this list.</td>
</tr>
<tr>
<td>&quot;Include original components in export&quot; option</td>
<td>When the option is selected, the SIMIT original components are exported as well.</td>
</tr>
<tr>
<td>&quot;Export&quot; button</td>
<td>Use this button to start the export.</td>
</tr>
</tbody>
</table>
6.1 Objective and performance scope of the interface

Objective

You have the possibility of importing GSD files and automatically creating a base object structure under a desired node from this interpretable device description. The created structure describes the possible slots and module configurations of the devices as a COMOS base object structure with elements per slot and module. When the elements and slots have been assigned, you can create the specific device structure in the Navigator under the device by using the context menu.

Note

GSDML not supported

The GSDML format is not supported.

Performance scope of the interface

- Finding suitable devices for the functional requirements
- Providing information on the properties of the selected measuring device
- Setting parameters and configuration for a device
- Documenting the selected properties of a device
- Deciding which signals are made available by a modular device
- Deciding which manufacturer device is used and direct access to the correct GSD file
- Providing the information on the configuration of the modular devices in the plant documentation
- Defining and documenting the I/O assignment of a modular device
- Providing the information on the implementation of the devices in the DCS system

Plugins

The following plugins are available to you in the menu "Plugins > Automation > GSD interface":

<table>
<thead>
<tr>
<th>Plugin</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>&quot;Import GSD files&quot;</td>
<td>See also chapter Importing GSD files (Page 62).</td>
</tr>
<tr>
<td>&quot;Assign GSDs&quot;</td>
<td>See also chapter Assigning GSD objects (Page 63).</td>
</tr>
</tbody>
</table>
6.2 Importing GSD files

Introduction

The data is imported into the project that is open when the plugin is started. If an engineering project is open, the data is created as local base objects and can only be used in this project. If you want to use the data in more than one project, open the base project before you open the plugin.

Requirement

- The project into which the data is to be imported is open.
- The GSD files are stored locally or you have the access data for Web access at hand.

Procedure

1. If you do not want to import the data into an existing node in the base objects, create the node.
2. Select the "Plugins > Automation > GSD interface > GSD file" command from the menu bar.
   The plugin opens. The "Select target" tab is displayed.
3. Select the node in the displayed base object structure under which the data is to be imported.
4. Click "Next".
5. Select the desired source for the import.
6. Click "Next".
7. Select one of the following options:
   - To import GSD files from the Internet, enter your access data.
     Click the "Add URLs..." button.
     Copy the desired URLs to the "Add URLs" window.
     Confirm your entries.
   - To import GSD files that are stored locally, click the "Add files" button.
     Select the desired file.
     Click "Open".
     Repeat the last two steps for each additional file that you want to import.
8. Click the "Import" button.

Result

The files are imported and the objects are created under the specified base object nodes.
6.3 Assigning GSD objects

Introduction

You have the possibility of creating objects from the "Plants" tab in the Navigator as an Implementation on the "Locations" tab. You can make the imported GSD objects available as elements at the implementation.

Requirement

- GSD data has been imported. See also chapter Importing GSD files (Page 62).
- Objects with the attribute "PMD.PMD_ACF864_001_000" or "Y30T00001.GSDFile" are available in the plant structure. Objects with this attribute are available, for example, on the "Base objects" tab under the nodes "@50 > A20 > A10 > A20 > A10 > A10 > A20 > A10 > A40 > A10 Interface modules" and "@30 > M41 > B20 PIA LCM Device requirements". Only these objects are evaluated.

Procedure

1. Select the "Plugins > Automation > GSD interface > Assign GSDs" command from the menu bar. The plugin opens. The most recent selection of the start object and destination is saved and automatically set.
2. Drag&drop the base object under which the GSD structure lies into the "GSD source" field.
3. In order to find the assignable objects, click the "Find assignable devices" button in the menu bar of the plugin. All the field devices found under the start object are listed. The "Unit object" column shows the objects which has one of the required attributes. If an implementation already exists for the plant object, the row in the table is write-protected.
4. Deselect the objects in the first Objects column that you want to assign at a later point.
5. If a GSD base object structure exists, you can select the uppermost node of the base object structure in the "GSD file" column.
6. Click the "Assign" button.

Result

The field devices are assigned to the GSD objects on the "Locations" tab in the Navigator. If the GSD object was not already placed on the "Locations" tab, it is placed and implemented automatically.

If the attribute GSD download path (GSDUri) exists and no GSD base object is found, two buttons are displayed. Using these buttons, you call the "Import" plugin or open the Website for downloading the files. So you can use direct information from PIA LCP and must not search for it.
GSD

6.3 Assigning GSD objects