INSTALLATION AND
OPERATION MANUAL

smar - SYSCON

First in Fieldbus

Syscon - System Configurator

SEP/ 08

SYSCON

VERSION 6.2

FOUNDATION

SYSCONME

www.smar.com

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INTRODUCTION

The new ***Syscon 6.2*** is the software tool that configures, maintains and operates the newest SMAR products line and communicates with the comprehensive new series of controllers. These controllers are all connected to the High Speed Ethernet providing field network connections to well-known protocols such as FOUNDATION Fieldbus™, Profibus and DeviceNet.

The friendly Man-Machine Interface (MMI) provides an efficient and productive interaction with the user, without previous knowledge of the software. A large library of preconfigured and tested templates for devices, control strategies and graphic symbols makes system engineering as efficient and as fast as it can be. Only a minimum of data needs to be entered when defining I/Os, networking, and control strategies.

The plant control configuration is now managed by a unique tool, the ***Studio302***, which integrates all applications included in the SMAR SYSTEM302 Enterprise Automation System and incorporates Windows-based Users and Groups to provide a multi-user environment. Now the ***Syscon*** project files have controlled access defined for each professional operating the plant and a precise register of the history of modifications to guarantee the integrity of the project configuration data.

Syscon 6.2 runs on Microsoft® Windows 2000, Windows XP or Windows Server 2003.

This manual refers to the version 6.2 of ***Syscon*** available on ***SYSTEM302 version 7.1.3***.

This product is protected by US patent numbers 6,095,674; 5,841,654 and other U.S. Patents pending.

NOTE
It is recommended that you read and follow the installation procedures described on the **SYSTEM302 Installation Guide** included on the product package. Further information about ***SYSTEM302 version 7.1.3*** is also available on the **Studio302 User's Manual**, which is included on the *SYSTEM302 Documentation CD*.

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Section 1

GETTING STARTED

Starting on ***System302 version 7.0***, ***Syscon*** is only executed from the ***Studio302*** application.

From the **Start** menu, select **Programs > System302 > Studio302** and click **Studio302**, as indicated in the next figure:

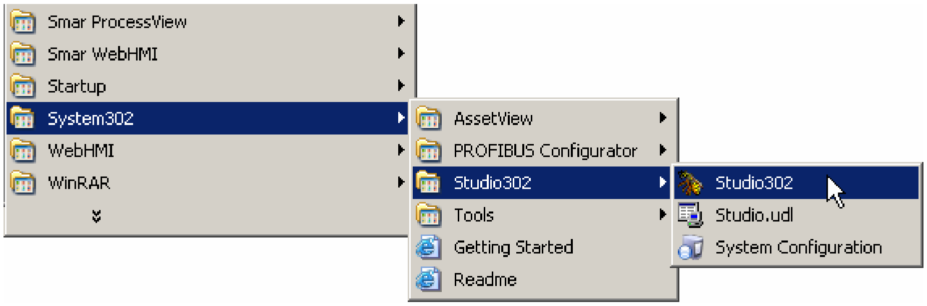


Figure 1.1. Starting Studio302

Click the button on the ***Studio302*** toolbar to run ***Syscon 6.2***.

Using Syscon in Stand Alone Mode

In *Stand Alone* mode, ***Syscon*** will save the configuration files in the local machine, and the *Database Manager* will not manage the alterations made to the configurations.

Using Syscon in Multi-User Mode

In *Multi-User* mode, the *Database Manager* manages all ***Syscon*** configuration files, which means that any configuration file created using ***Syscon*** will be saved in a common storage folder and the access of all machines connected to the communication network to the files will be controlled.

To guarantee that the configuration file saved in the *Database Manager* reflects the most recent alterations, it is necessary to execute the **Commit** procedure. Open the configuration file using ***Syscon*** and click the button **Commit** on the main toolbar. The *Database Manager* will apply the alterations and manage the information for the other machines.

IMPORTANT
To update the configuration file at the machine in **View Mode** using the **Commit** procedure, ***Syscon*** communication must be in **Offline Mode**.

To discard the alterations applied to a local file and restore the original configuration file from the *Database Manager*, click the button **Revert** on the main toolbar.

To edit a configuration file managed by the *Database Manager*, you must have the access rights to change that file. Also, the file must be available for edition, which means that there can’t be another user editing the same configuration.

The button **Edit/View Mode** will only be available on the main toolbar when the *Database Manager* is being executed and the configuration file has been already imported to the current ***Studio302*** Database.

When a ***Syscon*** configuration file is on **View Mode**, it can not be altered, because another user may be editing that same file or because the current user does not have access rights to that file.

Section 2

SYSCON 6.2 USER INTERFACE

Working with Project Files

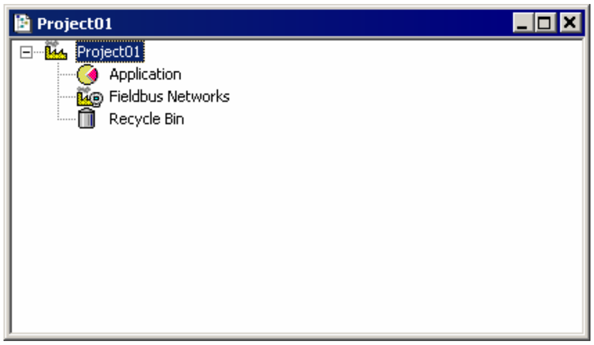
A project (.ffp) file brings together all the elements of a fieldbus network configuration project.

The project file contains information about the logical plant (or Application) and the physical plant (or Fieldbus Network).

Creating a Project file

To create a project file, click the button **New** on the main toolbar and select the option **Project**.

The **Setup New Project** dialog box will open. Select the folder where the project file will be saved and type the name for the project. Click **Save** to conclude. The *Project* window will open:



Project01

- Project01
  - Application
  - Fieldbus Networks
  - Recycle Bin

Figure 2.1. Project Window

Syscon will automatically create a folder with the selected project name inside the selected folder. If you are using ***Syscon*** in **Multi-User** mode, the default path for the project files is *C:\Program Files\Smar\ConfigurationWorkspace\Client\CWFiles\System302*.

Creating a HSE Project file

On the main toolbar, click **New** and select the option **HSE Project**.

In the **Setup New Project** dialog box, select the folder where the project file will be saved. In **Multi-User** mode, the default path for the project files is *C:\Program Files\Smar\ConfigurationWorkspace\Client\CWFiles\System302*.

Type the name for the project and click **Save** to conclude. ***Syscon*** will automatically create a HSE project adding the fieldbus channel and the *Foundation Fieldbus HSE Host*. The *Project* window will open as indicated in the figure below:

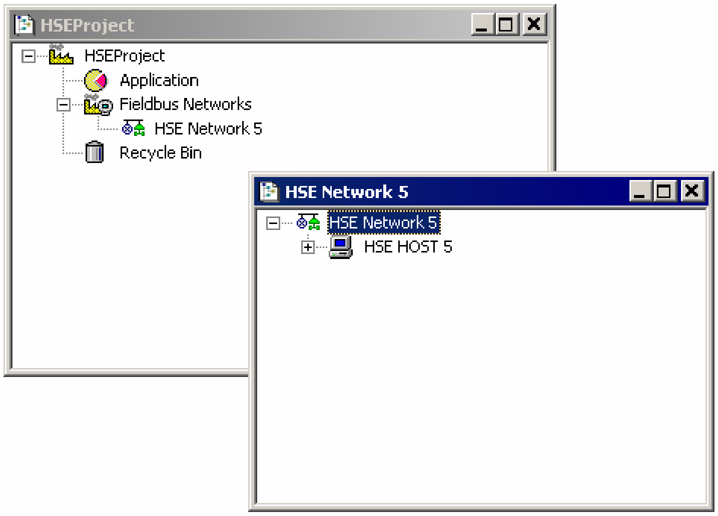


Figure 2.2. HSE Project

Converting a SE Project to a HSE Project

From ***Syscon version 6.2*** on, the SE configuration can be converted to a HSE configuration, which means that a **DF51** bridge with H1 Fieldbus channels can be replaced with a **DF63**, and the field devices created in the H1 channels will be connected to the channels from the new bridge. On the other hand, blocks and parameters that are not compatible with the new bridge should be replaced causing the least possible impact to the plant control strategy.

ATTENTION

It is not possible to directly convert the SE project using a **DF51** bridge to a HSE project with **DF62**. First, it is necessary to execute the steps described in this subsection to convert the SE project to a **DF63** project configuration.

Then, the **DF63** should be replaced with the **DF62** using the **Exchange** procedure described in details in section **Exchanging Devices** at **Section 3** of this manual.

In the **Project File** menu, select the option **SE to HSE Replacement** to open the dialog box:

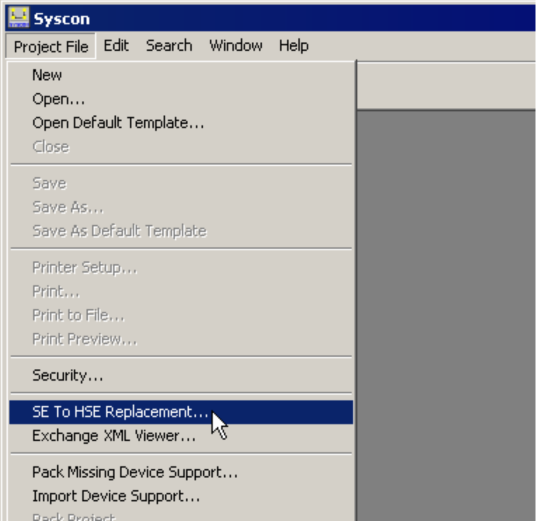
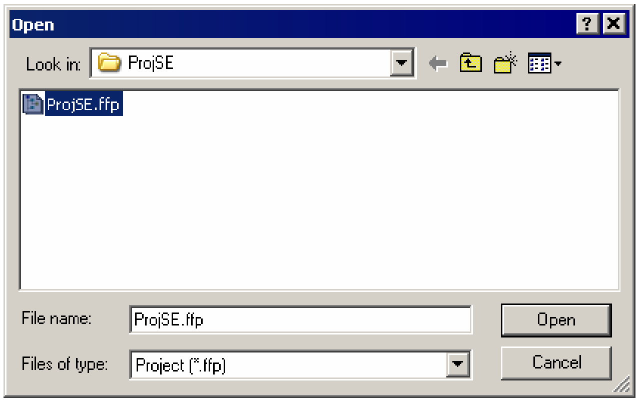


Figure 2.3. Converting the SE Project to HSE

Select the project configuration file that will be converted and click **Open**. See the example below:



Look in: ProjSE

ProjSE.ffp

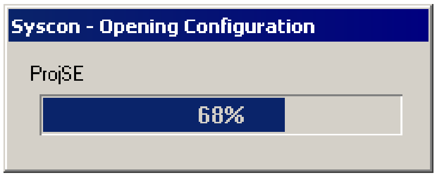
File name: ProjSE.ffp

Files of type: Project (*.ffp)

Figure 2.4. Selecting the SE Project

NOTE
A SE configuration may have two or more bridges. When converting this type of configuration, each bridge **DF51** is replaced with the **DF63**, respecting the topology of the channels and devices connected to each H1 channel.

Wait a few seconds while the configuration is converted. The new project topology with the **DF63** is displayed in ***Syscon***.



ProjSE

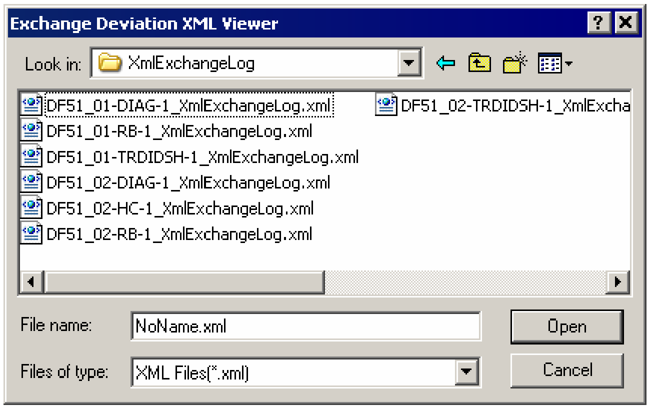
68%

Figure 2.5. Converting a SE project

The file **Syscon.ini** has a section named *Default ReplacementSeToHse*, which indicates the correspondence of old blocks in the **DF51** that should be replaced by **DF63** blocks.

For each converted block during the bridge replacement, ***Syscon*** creates a log file in XML format that contains the discrepancies between blocks. These XML files are stored in the project folder corresponding to the current configuration.

To open the XML file of a block, go to the **Project File** menu and select the option **Exchange XML Viewer** to open a dialog box and select the XML file. See the example below:



Look in: XmlExchangeLog

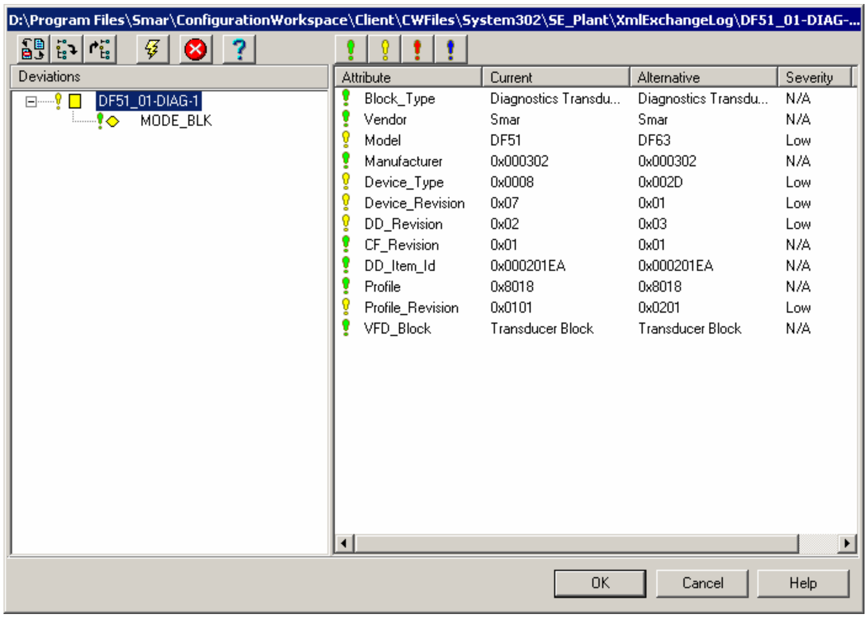
DF51_01-DIAG-1_XmlExchangeLog.xml
DF51_01-RB-1_XmlExchangeLog.xml
DF51_01-TRDIDSH-1_XmlExchangeLog.xml
DF51_02-DIAG-1_XmlExchangeLog.xml
DF51_02-HC-1_XmlExchangeLog.xml
DF51_02-RB-1_XmlExchangeLog.xml
DF51_02-TRDIDSH-1_XmlExcha

File name: NoName.xml

Files of type: XML Files(*.xml)

Figure 2.6. XML log files for blocks

Select the icon of the desired file and click **Open**. The **XML Viewer** window shows the alterations made to convert the project file, that is, attributes that were replaced in the new bridge and blocks that had to be deleted. Select the icon of a block to see the details about compatible and non-compatible parameters.



D:\Program Files\Smar\ConfigurationWorkspace\Client\CWFiles\System302\SE_Plant\XmlExchangeLog\DF51_01-DIAG-...

DF51_01-DIAG-1
MODE_BLK

Attribute	Current	Alternative	Severity
Block_Type	Diagnostics Transdu...	Diagnostics Transdu...	N/A
Vendor	Smar	Smar	N/A
Model	DF51	DF63	Low
Manufacturer	0x000302	0x000302	N/A
Device_Type	0x0008	0x002D	Low
Device_Revision	0x07	0x01	Low
DD_Revision	0x02	0x03	Low
CF_Revision	0x01	0x01	N/A
DD_Item_Id	0x000201EA	0x000201EA	N/A
Profile	0x8018	0x8018	N/A
Profile_Revision	0x0101	0x0201	Low
VFD_Block	Transducer Block	Transducer Block	N/A

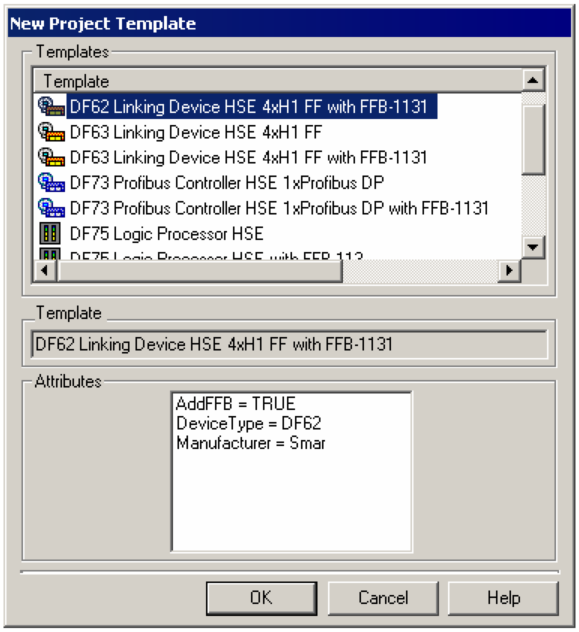
Figure 2.7. XML Viewer Window

Refer to subsection **Using the XML Viewer Window** at the end of this section for further details about the **XML Viewer** window.

Creating a Project file from a Project Template

You can create a project file from a HSE Project template. This file will be automatically created with the HSE Host, the bridges and devices, the resource and transducer blocks for each device, and the FFB blocks.

Click **New** on the main toolbar and select the option **Project Template**. The **New Project Template** dialog box will show the list of project templates available for each linking device. Click each template icon to view the project details and attributes:



New Project Template

Template
DF62 Linking Device HSE 4xH1 FF with FFB-1131
DF63 Linking Device HSE 4xH1 FF
DF63 Linking Device HSE 4xH1 FF with FFB-1131
DF73 Profibus Controller HSE 1xProfibus DP
DF73 Profibus Controller HSE 1xProfibus DP with FFB-1131
DF75 Logic Processor HSE

Template: DF62 Linking Device HSE 4xH1 FF with FFB-1131

AddFFB = TRUE
DeviceType = DF62
Manufacturer = Smar

Figure 2.8. Project Templates

Select the icon of the project template and click **Ok**. The **Setup New Project** dialog box will open. Type the name for the project file and click **Save**.

The *Project* window will open and the selected configuration will be displayed. The figure below shows the example for the template **DF62 Linking Device HSE 4xH1 FF**:

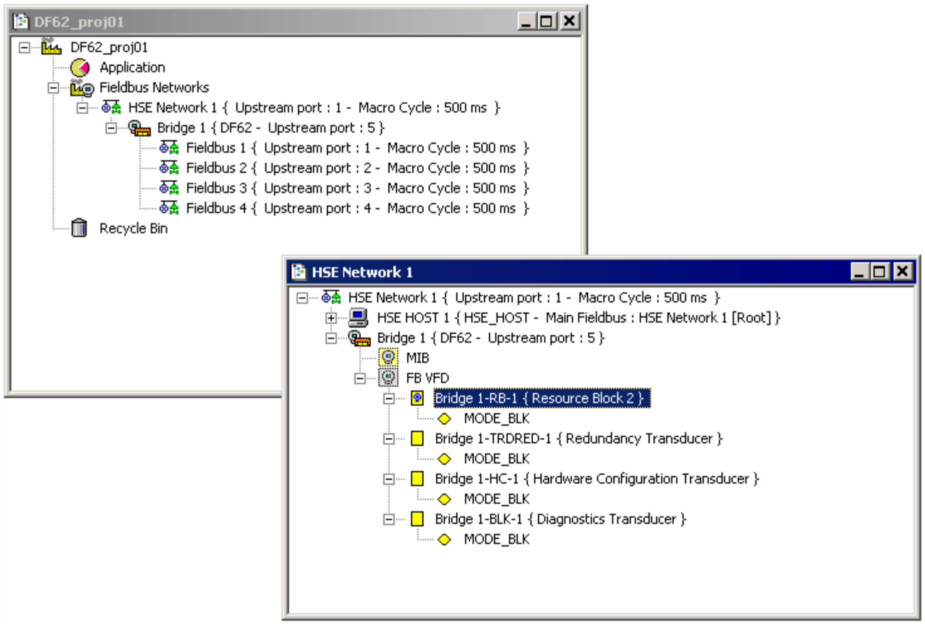

DF62_proj01
DF62_proj01
Application
Fieldbus Networks
HSE Network 1 { Upstream port : 1 - Macro Cycle : 500 ms }
Bridge 1 { DF62 - Upstream port : 5 }
Fieldbus 1 { Upstream port : 1 - Macro Cycle : 500 ms }
Fieldbus 2 { Upstream port : 2 - Macro Cycle : 500 ms }
Fieldbus 3 { Upstream port : 3 - Macro Cycle : 500 ms }
Fieldbus 4 { Upstream port : 4 - Macro Cycle : 500 ms }
Recycle Bin
HSE Network 1
HSE Network 1 { Upstream port : 1 - Macro Cycle : 500 ms }
HSE HOST 1 { HSE_HOST - Main Fieldbus : HSE Network 1 [Root] }
Bridge 1 { DF62 - Upstream port : 5 }
MIB
FB VFD
Bridge 1-RB-1 { Resource Block 2 }
MODE_BLK
Bridge 1-TRDRED-1 { Redundancy Transducer }
MODE_BLK
Bridge 1-HC-1 { Hardware Configuration Transducer }
MODE_BLK
Bridge 1-BLK-1 { Diagnostics Transducer }
MODE_BLK

Figure 2.9. Example of a project template

IMPORTANT
Syscon users can not create project templates. Templates are defined by the devices' manufacturers.

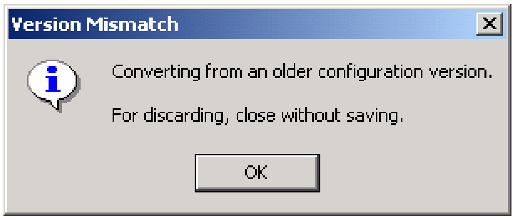
Opening a Project File

To open an existing project file, click **Open** on the main toolbar. The **Open** dialog box will appear. Click the project file icon or type the name in the **File name** box, then click **Open**.

NOTE
Depending on the number of blocks and devices included in a plant control configuration, ***Syscon*** may take a few minutes to open a project file.

Checking the version

Starting from version 5.10, ***Syscon*** verifies if the configuration file was generated by previous or later versions. If you are trying to open a configuration file generated in an older ***Syscon*** version, the following message will open:



Converting from an older configuration version.

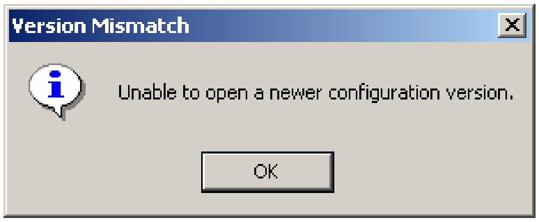
For discarding, close without saving.

Figure 2.10. Version Mismatch Message Box

To upgrade the configuration, go to the **Project File** menu and click **Save as**, typing a new name for the project or using the same name to override the old project.

If you upgrade the configuration converting it to the new file format, it won't be possible to open the configuration in an older ***Syscon*** version again.

If ***Syscon*** detects that you are trying to open a configuration file that was generated in a newer version, the following message will open:



Unable to open a newer configuration version.

Figure 2.11. Version Mismatch Message Box

IMPORTANT
Versions prior to 5.10 do not verify the configuration file. Those versions will open the project file generated in a newer version causing no error warnings, but the consistency of the project will not be assured.

Saving a Project File

To save the changes made to the project or any of its parts, such as the *Process Cell* window or the *Strategy* window, click **Save** on the main toolbar.

NOTE
The template is not part of the plant project configuration. It is necessary to set the focus on the *Template* window and click **Save** to save the changes made to the template configuration.

Creating a Copy of the Project File

To create a backup copy or rename the project file, go to the **Project File** menu and click **Save as**.

Type a new name for the project and click **Save**. A new folder will be created with the name of the project file and the files related to the project will be stored in this folder.

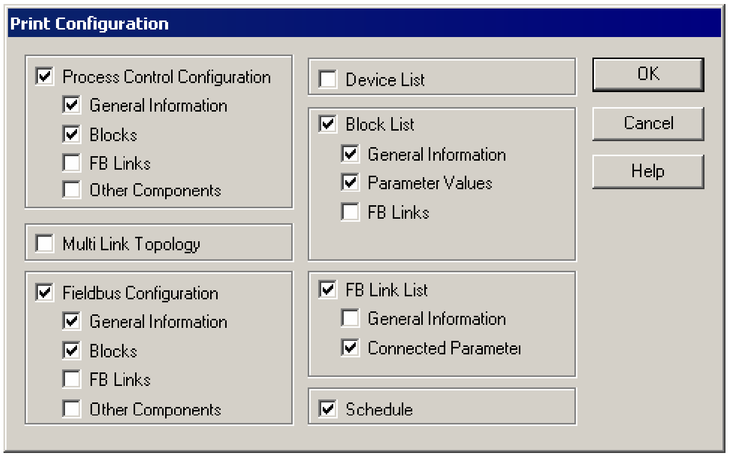
IMPORTANT
This option will only be available in **Advanced** Mode. The copy of the configuration file will be saved in the local machine, when ***Syscon*** is operating in **Multi-User** mode. This copy of the project file will no longer be managed by the *Database Manager*. A message box will indicate that the user will be working in the **Stand Alone** mode.

Printing the Project Configuration

From the **Project File** menu, click the option **Printer Setup** to open the **Page Setup** dialog box to set personal printing preferences for your project. These preferences include the page orientation, the tray from which paper is sent, and the number of copies printed.

Printing the project configuration file

Select the *Project* window, go to the **Project File** menu and click **Print**, or click the button **Print** on the main toolbar. The **Print Configuration** dialog box will open. Select the items from the project to be printed:



- ☑ Process Control Configuration
  - ☑ General Information
  - ☑ Blocks
  - ☐ FB Links
  - ☐ Other Components
- ☐ Multi Link Topology
- ☑ Fieldbus Configuration
  - ☑ General Information
  - ☑ Blocks
  - ☐ FB Links
  - ☐ Other Components
- ☐ Device List
- ☑ Block List
  - ☑ General Information
  - ☑ Parameter Values
  - ☐ FB Links
- ☑ FB Link List
  - ☐ General Information
  - ☑ Connected Parameter
- ☑ Schedule

Figure 2.12. Print Configuration Dialog Box

Process Control Configuration: Select this item to print the information about the *Process Control Configuration*.

General Information: prints the general information about the configuration.

Blocks: prints the information about the blocks, listed by control modules.

FB Links: prints the information about the links between those blocks.

Other Components: prints further information about the *Process Control Configuration*.

Multi Link Topology: Select this item to print the information about the topology, with the bridges and fieldbuses.

Fieldbus Configuration: Select this item to print the information about the *Fieldbus Configuration*.

General Information: prints the information about the configuration.

Blocks: prints the information about the blocks, listed by devices.

FB Links: prints the information about the links between those blocks.

Other Components: prints further information about the *Fieldbus Configuration*.

Device List: Select this item to print the information about the devices and their attributes.

Block List: Select this item to print the information about the blocks.

General Information: prints the information about blocks, their attributes and location.

Parameter Values: prints the information about the parameters configured for the blocks.

FB Links: prints the information about the connected parameters.

FB Link List: Select this item to print the list with all of the links in the configuration.

General Information: prints the general information about the links.

Connected Parameter: prints the information about the parameters.

Schedule: Select this item to print the information about the *Schedule*, including both *Function Block Execution Schedule* and *Traffic Schedule*.

Click **Ok** to close this dialog box and print the project configuration.

Printing the control strategy drawing

Select the *Strategy* window, go to the **Project File** menu and click **Print**, or click the button **Print** on the main toolbar. Configure the printer options and click **Ok** to print the control strategy.

Print the project configuration to file

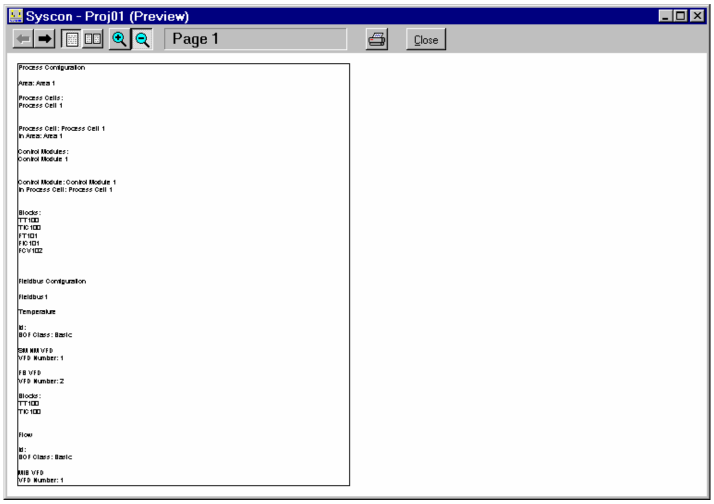
This option is only available when you select the *Project* window. Go to the **Project File** menu and click **Print to File**. The **Print Configuration** dialog box will open. Select the items from the project to be printed, as described above, and click **Ok**.

Then, the **Save As** dialog box will open. Select the folder to save the file, type the file name and click **Save**. The file will be saved as a *Report File* in the **txt** format.

To print this file, open the *Windows Explorer* window and locate the file. Then right-click the file icon and click **Print**. The project configuration will be printed.

Print Preview

This option allows you to view the project configuration report before printing it. Go to the **Project File** menu and click **Print Preview**, or click the **Print Preview** button on the main toolbar. It will be necessary to select the items from the project to be printed on the **Print Configuration** dialog box. Click **Ok** and the *Preview* window will open.



```
Process Configuration

Area: Area 1

Process Cells:
Process Cell 1


Process Cell: Process Cell 1
In Area: Area 1

Control Modules:
Control Module 1


Control Module: Control Module 1
In Process Cell: Process Cell 1


Blocks:
TT100
TIC100
FT101
FIC101
FCV102



Fieldbus Configuration

Fieldbus 1

Temperature

Id:
BOF Class: Basic

SM MIB VFD
VFD Number: 1

FB VFD
VFD Number: 2

Blocks:
TT100
TIC100


Flow

Id:
BOF Class: Basic

MIB VFD
VFD Number: 1
```

Figure 2.13. Print Preview: Project Window

On the *Preview* window toolbar:

⬅	Shows the previous page.
➡	Shows the next page.
▤	Shows the entire page on the screen.
◫	Shows two pages at the same time on the screen.
⊕	Activates the *Zoom* tool. Click the page to zoom in.
⊖	Deactivates the *Zoom* tool. Click the page to zoom out.

Page 1	Indicates the number of the page(s) being displayed at the moment.
🖨	Opens the **Print** dialog box to print the report.
Close	Closes the *Preview* window and returns to ***Syscon***.

Packing the Project files

IMPORTANT

The Packing procedure **can NOT** be executed for configuration files that contain **FFB Blocks**. If the devices in the project configuration have FFB blocks, you must follow the **Pack and Go** procedure from the ***Studio302*** toolbar, since these devices use other files, besides DD and CF files, which are not packed by ***Syscon***.

Syscon can pack all files related to the project configuration, including the DD and CF files, in a single compacted file or as a project folder, according to the preferences set by the user at the **Pack & Go** tab, on the **Preferences** dialog box.

Follow this procedure to pack the project configuration files:

1. Open the configuration project.
2. On the **Project File** menu, click **Pack Project**.
3. A dialog box will open warning the user to check if the Device Support has all of the DDs and CFs files used in the project. Click **Ok** to continue.
4. Select the directory where the project package folder or the compacted file will be created and click **Ok**.
5. A message box will appear indicating if the operation was successful.
6. Click **Ok** to conclude.

Unpacking Project files

IMPORTANT

If the devices in the project configuration have FFB blocks, you must follow the **Unpack** procedure from the ***Studio302*** toolbar, since these devices use other files, besides DD and CF files, which are not packed by ***Syscon***.

Follow this procedure to unpack a project configuration:

1. Go to the **Project File** menu and click **Unpack Project**.
2. Select the directory where the project package folder (or the compacted file) is located and click **Ok**.
3. Select the directory where the project package folder (or the compacted file) will be saved and click **Ok**.
4. A message box will appear indicating if the operation was successful.
5. Click **Ok** to conclude.

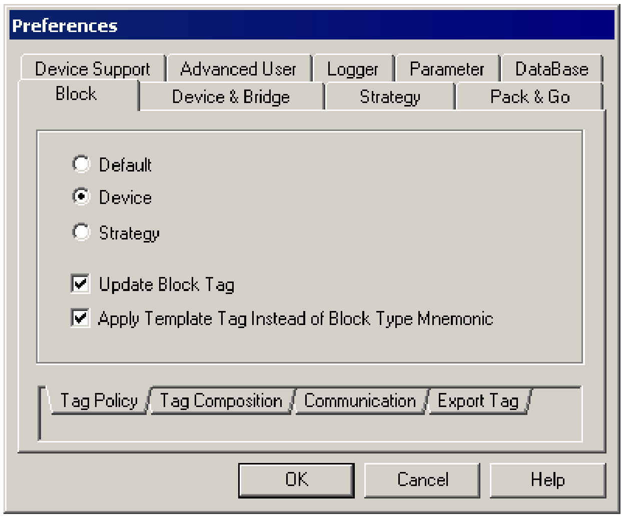
Preferences

To set the project preferences, go to the **Project File** menu and click **Preferences**. The **Preferences** dialog box will open.

Block Tab - Tag Policy

Choose one of the options for the block tag name generation:

- **Default:** when creating a block at the Strategy or the device, the tag will have the default format: `["block" + id number]`.
- **Device:** when creating a block attached to the device, the tag will have the device tag concatenated with the block mnemonic and an internal sequential number: `[device tag + separator + block mnemonic + id number]`.
- **Strategy:** when creating a block attached to the strategy, the tag will have the Strategy tag concatenated with the block mnemonic and an internal sequential number: `[strategy tag + separator + block mnemonic + id number]`.



○ Default
● Device
○ Strategy

☑ Update Block Tag
☑ Apply Template Tag Instead of Block Type Mnemonic

Figure 2.14. Block Tag Policy Options

Update Block Tag: if this option is selected, the block tag will be updated when the block is moved to another device or control module, or when the device tag or the control module tag is changed, according to the options selected by the user to automatically generate block tags.

HINT

Do not select this option to prevent the block tag to be accidentally changed when the block is moved or the device is renamed, for example.

Apply Template Tag Instead of Block Type Mnemonic: if this option is selected, the block tag from the template file will be used instead of the block mnemonic, when importing a *Device*, *Bridge* or *Strategy* template.

NOTE

If the tag based on the device or the strategy exceeds 32 characters, which means that **[device or strategy tag + separator + block mnemonic + id number]** has more than 32 characters, the block tag will be generated according to the **Default** option: ["block" + id number].

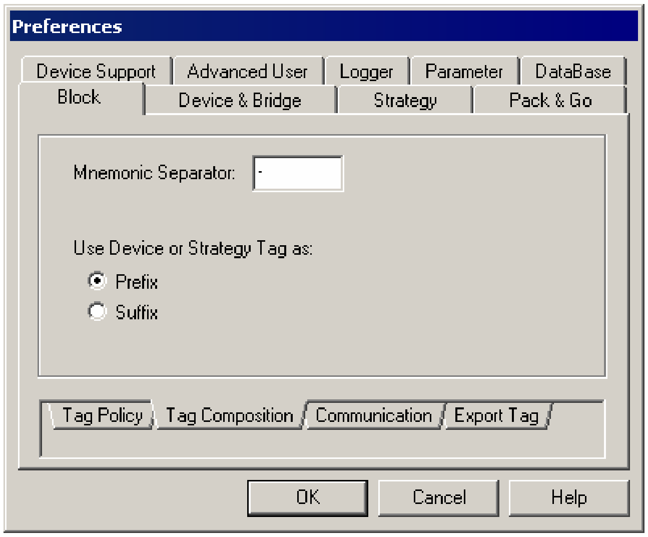
See section **Automatic Block Tag Generation** for further details.

Block Tab - Tag Composition

This tab will be available if the block tag name generation is based on the device or the strategy tag.

The **Mnemonic Separator** is a set of alphanumeric characters that separates the name of the device or strategy from the name of the block.

Select the option to apply the device or strategy tag as a prefix or suffix to the block tag.



Mnemonic Separator: -

Use Device or Strategy Tag as:

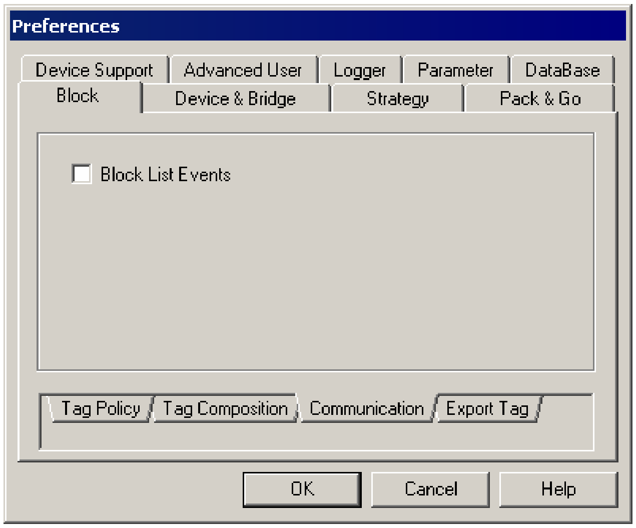
● Prefix

○ Suffix

Figure 2.15. Block Tag Composition Options

Block Tab - Communication

Select the option **Block List Events** to enable the *Automatic Checking* for the block events. The *Automatic Checking* verifies if the list of block attached to the device match the list of block attached to the corresponding device in the field, for all devices on the *Fieldbus* windows opened. If this option is not selected, the checking will be executed when the user opens the **Block List**.



☐ Block List Events

Figure 2.16. Block Communication Options

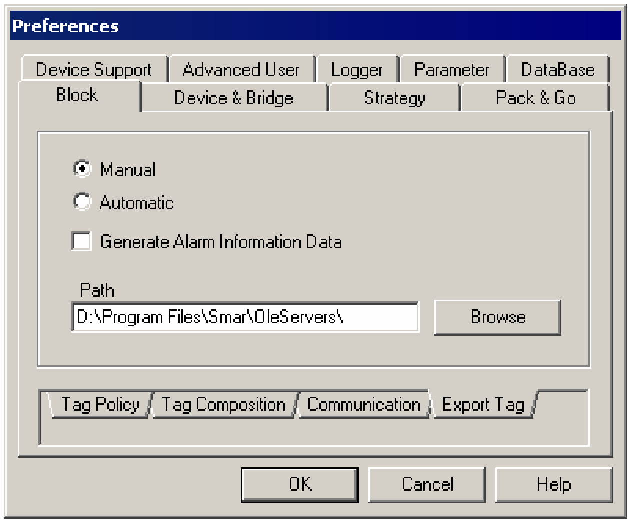
NOTE
It is necessary to re-initialize the communication every time the **Preferences** for the **Block List Events** option change, so the changes will take effect.

Block Tab - Export Tag

Select the mode for the **Export Tags** operation and the path for the **taginfo.ini** file, where the tags will be saved.

- **Manual:** you must execute the **Export Tags** command to update the information in the **taginfo.ini** file.
- **Automatic:** the **Export Tags** operation will be executed every time a relevant online procedure requires the tag to be exported. In this mode, a message box will open for the user to confirm the **Export Tags** operation.

Select the option **Generate Alarm Information Data** to generate the **AlarmInfo.ini** file that provides the information related to alarm and events configured in ***Syscon*** to the ***A&E Server***. The file is automatically created when executing the **Export Tags** operation.

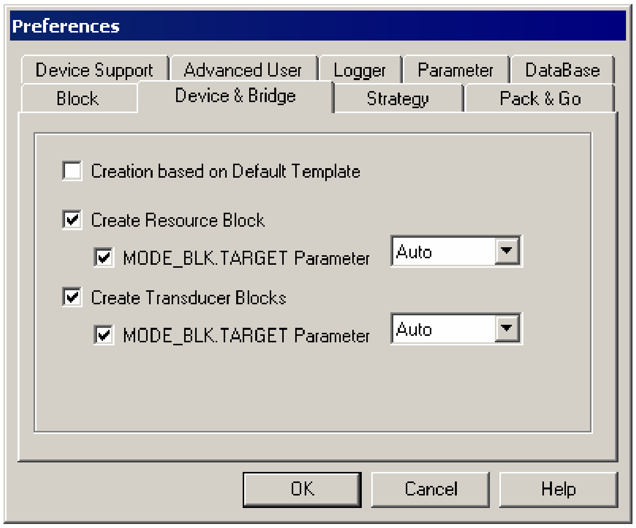


● Manual
○ Automatic
☐ Generate Alarm Information Data
Path
D:\Program Files\Smar\OleServers\

Figure 2.17. Export Tag Options

Device and Bridge Tab

Set the options to automatically create and configure blocks, parameters and internal links when a device or bridge is added to the configuration, according to the *Capabilities File*.



☐ Creation based on Default Template
☑ Create Resource Block
  ☑ MODE_BLK.TARGET Parameter: Auto
☑ Create Transducer Blocks
  ☑ MODE_BLK.TARGET Parameter: Auto

Figure 2.18. Device & Bridge Options

Creation Based on Default Template: Select this option to create the blocks, parameters and internal links based on the *Default Template* file of the device being created, located in the corresponding *Device Support* folder. If the *Default Template* is not found, ***Syscon*** will automatically create the *Resource Block* and the *Transducer Blocks* of the selected device.

Create Resource Block: Select this option to automatically create the *Resource Block* of the selected device, according to the *Capabilities File*.

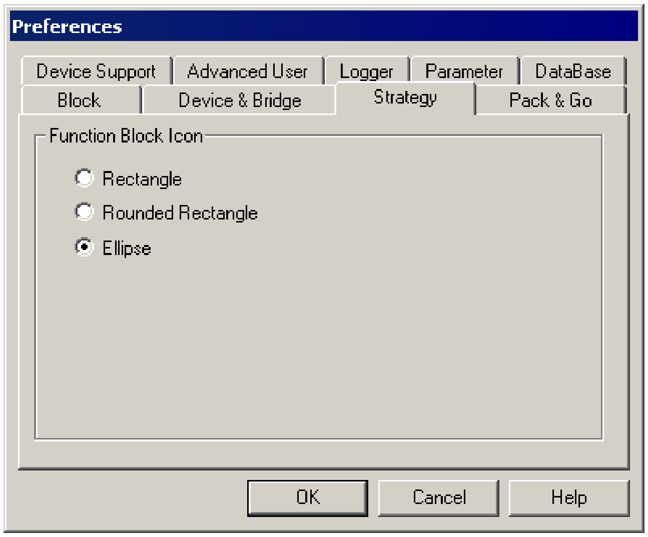
> **MODE_BLK.TARGET Parameter:** Select the default initial value for the *Mode Block* parameter: AUTO or OOS.

Create Transducer Blocks: Select this option to automatically create the *Transducer Blocks* of the selected device, according to the *Capabilities File*.

> **MODE_BLK.TARGET Parameter:** Select the default initial value for the *Mode Block* parameter: AUTO or OOS.

Strategy Tab

Select the default block format to be used when a block is added to the *Strategy* window. The ellipse is the default graphical representation for a block in ***Syscon***.



Function Block Icon
○ Rectangle
○ Rounded Rectangle
● Ellipse

Figure 2.19. Strategy Options

The following figure shows the different block formats:

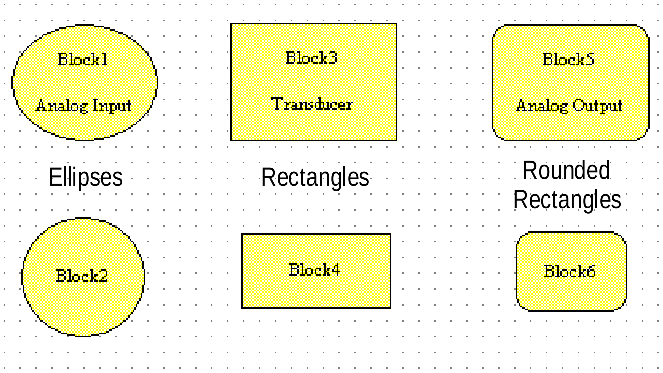
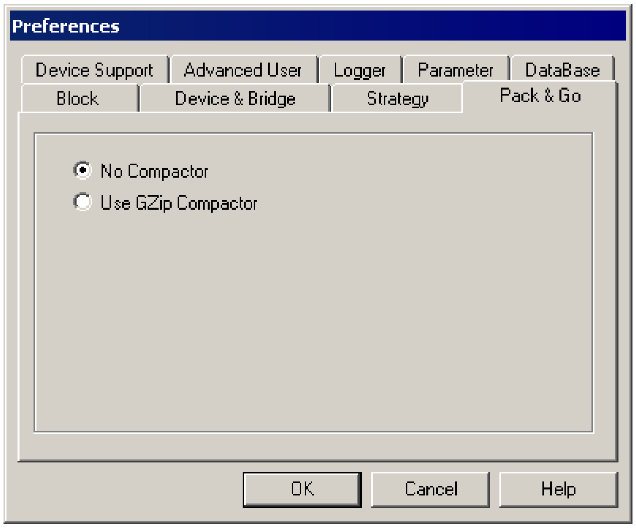


Figure 2.20. Block Formats

Pack and Go Tab

All of the project configuration files, including the DD and CF files, can be packed and sent to another machine, where ***Syscon*** will unpack the files.



● No Compactor
○ Use GZip Compactor

Figure 2.21. Pack & Go Options

No Compactor: the configuration package will be a folder that contains all of the necessary files.

Use GZip Compactor: the configuration package will be a compacted file. The ***GZip Compactor*** is the application used to create the file. The ***GZip*** installation file is included in the SYSTEM302 Installation CD, at the *Tools* folder. The compacted file will have the extension **.tgz*, and it is compatible with ***Winzip*** and other applications.

Device Support Tab

Select the default path to browse for files that are missing in the *Device Support*, using the option **Import Device Support** from the **Project File** menu.

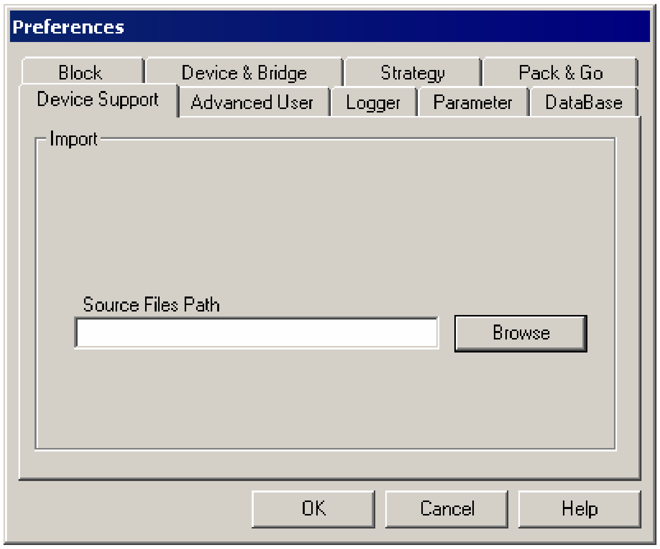


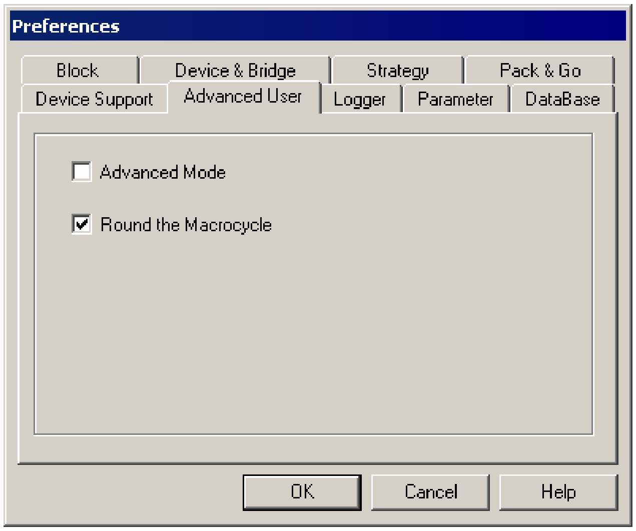
Figure 2.22. Device Support Options

If the user selects another folder while importing the files, that new path will be the default one. This means that ***Syscon*** will always store the last path selected by the user.

Advanced User Tab

Check the option **Advanced Mode** to enable the functionalities for the advanced users, such as editing the device address and save a local copy of the configuration file.

Check the option **Round the Macrocycle** to round the value of the macrocycle to a value multiple of 500, according to the number of elements on each fieldbus channel. If this option is **not** selected, ***Syscon*** executes the standard calculation that results on the smallest recommended possible value for the macrocycle, considering the elements on each fieldbus channel.



☐ Advanced Mode

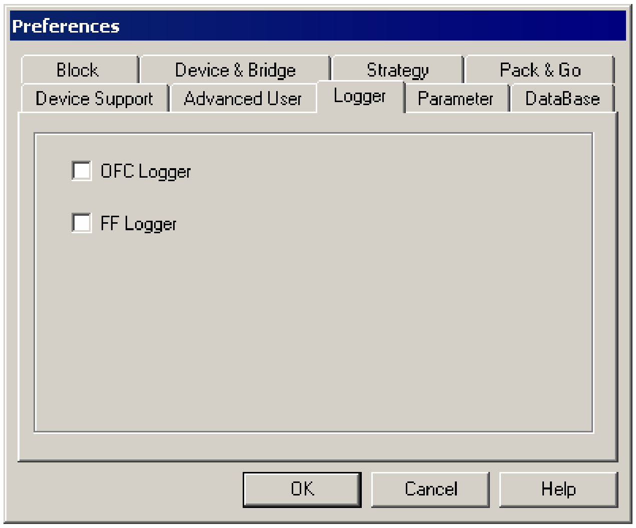
☑ Round the Macrocycle

Figure 2.23. Advanced User Options

Logger Tab

When eventual problems occur during the communication, such as communication or download failures that are not described in section **Troubleshooting**, enable the event logger to save the events that can be debugged and analyzed by Smar's Tech Support Team.

The communication events are saved on the file *OFCLogger.txt* located on the ***Syscon*** installation folder.



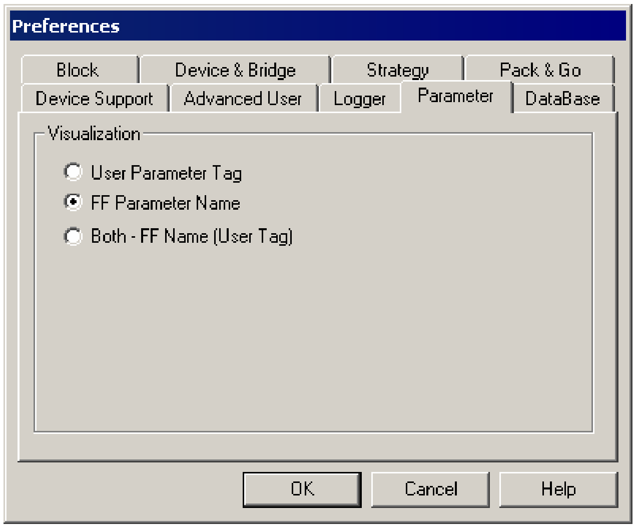
☐ OFC Logger

☐ FF Logger

Figure 2.24. Logger Options

Parameter Tab

Select the option to display the parameter tag as defined by the user or as defined by the device manufacturer.



Visualization

○ User Parameter Tag
● FF Parameter Name
○ Both - FF Name (User Tag)

Figure 2.25. Parameter Tag Visualization

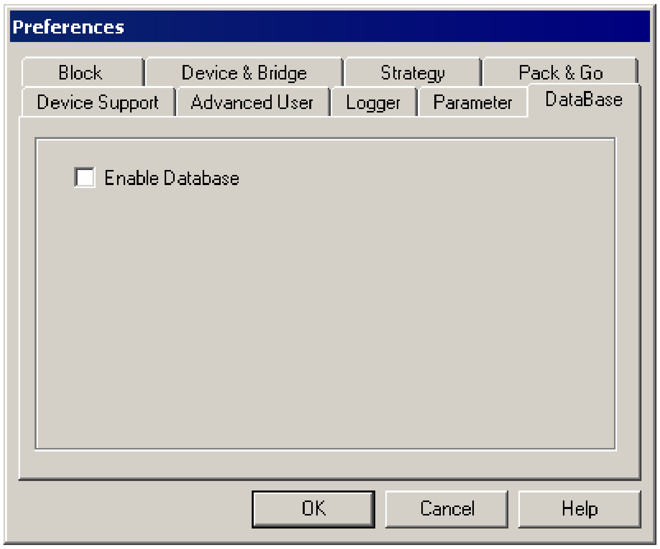
User Parameter Tag: shows the tags of the parameters as defined by the user in the **User Parameter Tag** dialog box.

FF Parameter Name: shows the tags of the parameters as defined by the device manufacturer.

Both - FF Name (User Tag): shows the tags of the parameters as defined by the device manufacturer followed by the tag defined by the user, in parentheses.

Database Tab

Check the option **Enable Database** to enable the *Database Manager* in the local machine.



☐ Enable Database

Figure 2.26. Database Options

Automatic Block Tag Generation

When you create a block and do not define a tag, the tag is automatically generated and assigned to the block based on the **Preferences** settings.

Default Block Tag

The default tag for a new block is described as follow:

```
["Block" + id number]
```

Where:

`Block:`	default text for a block.
`id number:`	sequential number that identifies the block internally in the project.

Block Tag Based On Device Tag

When the tag generation is based on the device tag, a new block is created in a device and the user does not define a tag, then the block tag will have the following format:

- **Using the Device Tag as prefix:**
  `[device tag + separator + block mnemonic + id number]`
- **Using the Device Tag as suffix:**
  `[block mnemonic + id number + separator + device tag]`

Where:

`device tag:`	tag of the device where the block is attached.
`separator:`	set of alphanumeric characters that separates the name of the device from the name of the block.
`block mnemonic:`	set of characters related to the block type.
`id number:`	sequential number related to the mnemonic of the block.

NOTE

Assuming that the option **Update Block Tag** is selected in the **Preferences** dialog box:

- If you change the device tag, the tag of all blocks attached to this device will be updated based on the new device tag.
- If the block is moved from one device to another, the tag will be automatically updated based on the tag of the target device.

If a block is created in the strategy and you do not define a tag, the block tag will be generated based on the strategy tag since the block is not attached to any device yet. Once the block is attached to a device, the block tag will be automatically updated based on this device tag.

Yet, if a block is detached from a device, the block tag will be updated again based on the strategy tag.

NOTE

The general rule is if the block is not attached to a device but it is attached to a strategy, the block tag will be automatically generated based on the strategy tag, even if the tag generation method chosen is based on device tag.

Block Tag Based On Strategy Tag

When the tag generation is based on the strategy tag, a block is created in a strategy and the user does not define a tag, the block tag will have the following format:

- **Using the Strategy Tag as prefix:**
  `[strategy tag + separator + block mnemonic + id number]`

- **Using the Strategy Tag as suffix:**
  `[block mnemonic + id number + separator + strategy tag]`

Where:

`strategy tag:`	tag of the strategy where the block is attached to.
`separator:`	set of alphanumeric characters that separates the name of the strategy from the name of the block.
`block mnemonic:`	set of characters related to the block type.
`id number:`	sequential number related to the mnemonic of the block.

NOTE

Assuming that the option **Update Block Tag** is selected in the **Preferences** dialog box:

- If you change the strategy tag, the tag of all blocks attached to this strategy will be updated based on the new strategy tag.
- If the block is moved from one strategy to another, the tag will be automatically updated based on the tag of the target strategy.

If a block is created in the device and you do not define a tag, the block tag will be generated based on the device tag since the block is not attached to any strategy yet. Once the block is attached to a strategy, the block tag will be automatically updated based on this strategy tag.

Yet, if a block is detached from a strategy, the block tag will be updated again based on the device tag.

NOTE

The general rule is if the block is not attached to a strategy but is attached to a device, the block tag will be automatically generated based on the device tag, even if the tag generation method chosen is based on the strategy tag.

Security

The **Security Manager** prevents the configuration file to be open by unauthorized users.

Only the **Administrator** may activate and deactivate the **Security Manager**, and change and configure the users' database. The **Administrator** is the default user of the **Security Manager**.

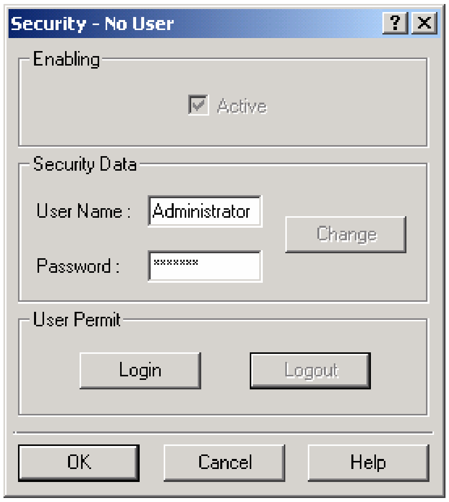
IMPORTANT

When using the **Security Manager** for the first time, the default user will be *Administrator* and the default password will be *UnitXVI*.

Enabling the Security

Go to the **Project File** menu and click **Security**. The **Security** dialog box will open:

1. Type **Administrator** as the user name.
2. Type the password and click **Login**.



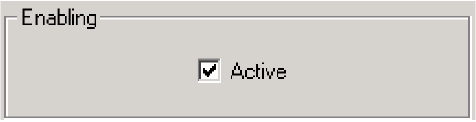
☑ Active

User Name : Administrator

Password : *******

Figure 2.27. Administrator Login

The **Active** box will be enabled.



☑ Active

Figure 2.28. Security Manager Enabled

To activate the **Security Manager**, mark the option **Active**. When this option is selected, it is necessary to log to the application every time ***Syscon*** is executed.

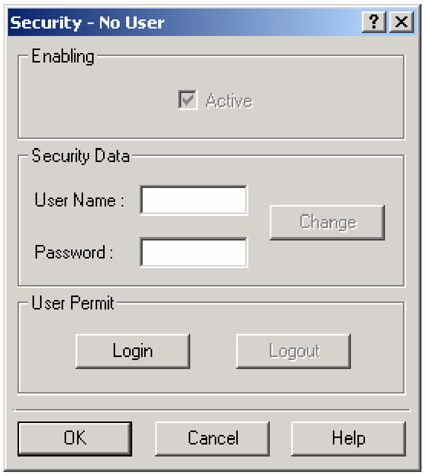
To deactivate the **Security Manager**, unmark the option **Active**. The **Security Manager** will not verify users' accesses and any user can run ***Syscon*** and open a configuration file.

NOTE

The **Security Manager** is deactivated by default. It is necessary to follow this procedure and activate the **Security** when using ***Syscon*** for the first time.

User Login

On the **Project File** menu, click **Security** to open the **Security** dialog box:



☑ Active

Figure 2.29. Security dialog box

Type the **User Name**, the **Password** and click **Login**. If the information is correct, the user will be logged in the application.

Click **Ok** to close the **Security** dialog box and start using ***Syscon***.

REMEMBER
The **User Name** and the **Password** are case-sensitive.

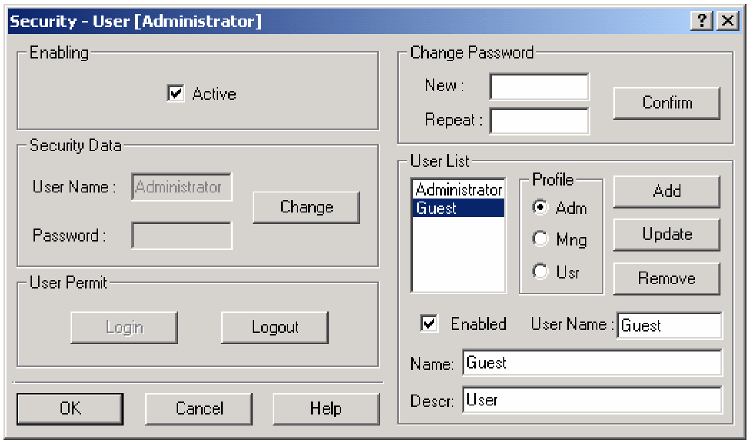
User Logout

To logout from the **Security Manager**, go to the **Project File** menu and click **Security**. On the **Security** dialog box, click **Logout**. A message box will open to confirm the operation.

Users Management

The user with the **Administrator** profile can change any attribute from any user. A user with the **User** profile can only change the password.

On the **Security** dialog box, click **Change** to expand the dialog box.



☑ Active

User Name : Administrator

Password :

Administrator
Guest

● Adm
○ Mng
○ Usr

☑ Enabled

User Name : Guest

Name: Guest

Descr: User

Figure 2.30. Security dialog box: User Attributes

The **Change Password** area is used to change the user's password. The password must have at least four alphanumeric characters.

The **User List** displays the users who may log to the application.

The option **Enabled** is used to enable or disable a user account. When a user account is disabled, the account still exists in the database but the user will not be able to logon or run the application.

Creating a User

Only the user with the **Administrator** profile can add other users to the **Security Manager**.

To add a new user to the **User List**:

1. Type the login name for the user in the **User Name** text box.
2. Type the password in the **New** text box and re-type the password in the **Repeat** text box.
3. Type the full name of the user in the **Name** text box.
4. Type a description of the user in the **Descr** text box.
5. Click **Add** to conclude.

User Profile

The **Profile** option determines the type of access for the user.

The **Administrator (Adm)** profile allows the user to create, update or remove users from the database. It is not possible to change the information about the *Administrator*.

The **Manager (Mng)** profile allows the user to modify the password and verify the information about the other users. Creating, updating or removing users from the database is not enabled for the *Manager*.

The **User (Usr)** profile allows the user to log and execute ***Syscon***. This user does not access the information about other users. The **Change** button is disabled.

Updating the Attributes for the User

The user with the **Administrator** profile can change any attribute of a user. The user with the **User** profile can only change the password.

To update the attributes for a user, select the name from the **User List**. The information about the user will be displayed in the **Security** dialog box.

The password, the profile, the name, the description and also the user name can be changed.

Enter the new information about the user and click the button **Update** to save the values.

Changing the Password

To change the password:

1. Select the name of the user in the **User List**.
2. Type the new password in the **New** text box.
3. Re-type the password in the **Repeat** text box.
4. Click **Confirm**.
5. Click **Yes** to conclude this procedure.

Removing a User

Only the user with the **Administrator** profile can remove users from the **Security Manager**.

To remove a user from the database, select the user name in the **User List** and click the button **Remove**.

A message box will be displayed to confirm this operation. Click **Yes** to remove the user or click **No** to cancel.

IMPORTANT
It is not possible to remove a user that is logged to the system.

Using the XML Viewer Window

When a defective device is replaced by a new device that has a newer or different *Device Revision*, or when you change the revision number of the device, the **Exchange** procedure is executed to verify the inconsistencies or incompatibilities between devices and make the necessary alterations in the project configuration.

Blocks, parameters, and other functionalities may be lost when exchanging devices. For example, a block that does not exist in the new device may be replaced by a compliant block.

When the **Exchange** procedure is executed for a bridge or device, ***Syscon*** creates a log file in XML format that contains the discrepancies between the instruments. This XML file is stored in the project folder corresponding to the current configuration, in a subdirectory specific for XML log files named **XmlExchangeLog**.

For example, if a device is exchanged in the configuration where the project file is named **Smar_Demo_Plant.ffp**, the XML file corresponding to this substitution will be located in the **Smar** folder, and the default path is: *“C:\Program Files\Smar\ConfigurationWorkspace\Client\CWFiles\System302\Smar_Demo_Plant\XmlExchangeLog”*.

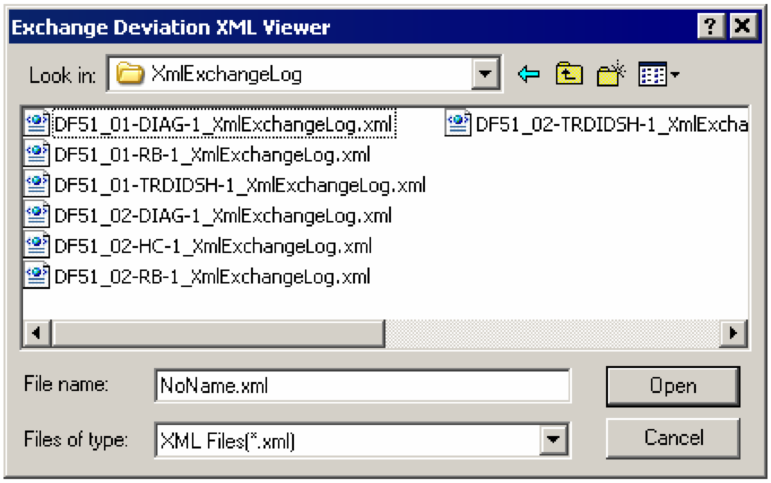
The name of the XML file is composed by the name of the device followed by the string “*_XmlExchangeLog*” and the file extension “*.xml*”. For example, the device LD302 with the tag **LD302_01** is exchanged in the project configuration. The name of the log file corresponding to this device will be **LD302_01_XmlExchangeLog.xml**.

Blocks are also converted or replaced when a SE configuration is replaced by a HSE configuration, using the **SE to HSE Replacement** procedure (described in subsection **Converting a SE Project to a HSE Project**). This procedure exchanges the bridge **DF51** with the **DF63** transparently to the user.

For each block converted during the **SE to HSE Replacement** procedure, ***Syscon*** creates a log file in XML format with the information related to block compatibility. The XML files are also stored in the project folder corresponding to the current configuration, indicated above.

The name of the XML file for a block is composed by the name of the block followed by the string “*_XmlExchangeLog*” and the file extension “*.xml*”. For example, the bridge with the tag **DF51** has an arithmetic block with the tag **DF51-ARTH**. The name of the log file corresponding to this block will be **DF51-ARTH_XmlExchangeLog.xml**.

To view the XML files, go to the **Project File** menu and select the option **Exchange XML Viewer** to open the dialog box and select the XML file. See the example below:



Look in: XmlExchangeLog

DF51_01-DIAG-1_XmlExchangeLog.xml
DF51_01-RB-1_XmlExchangeLog.xml
DF51_01-TRDIDSH-1_XmlExchangeLog.xml
DF51_02-DIAG-1_XmlExchangeLog.xml
DF51_02-HC-1_XmlExchangeLog.xml
DF51_02-RB-1_XmlExchangeLog.xml
DF51_02-TRDIDSH-1_XmlExcha

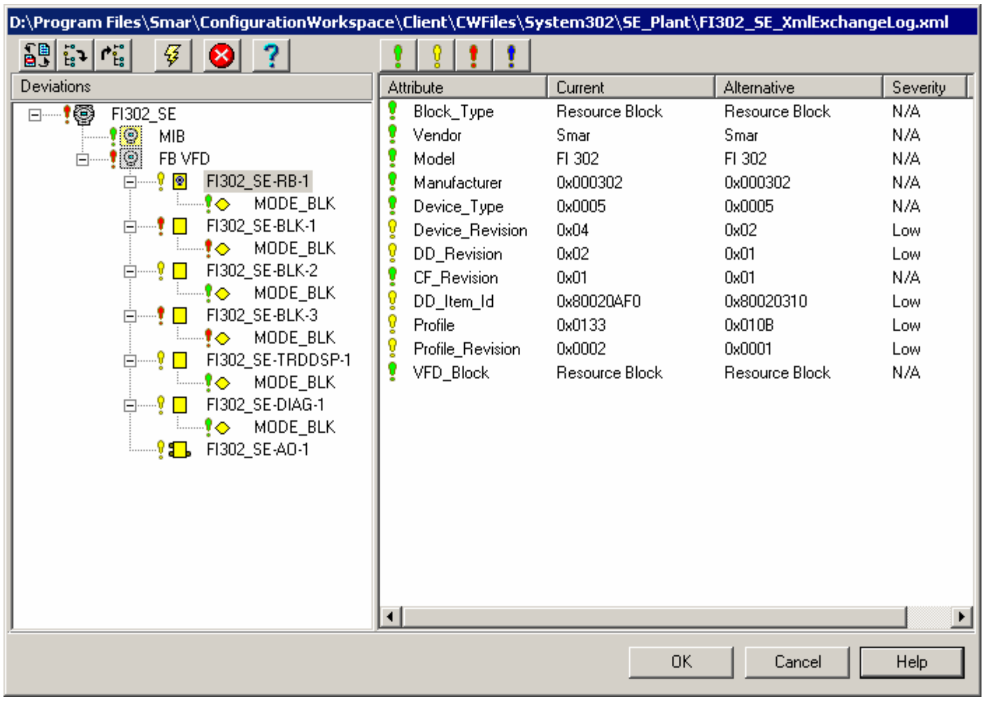
File name: NoName.xml

Files of type: XML Files(*.xml)

Figure 2.31. XML log files for blocks

Select the icon of the desired file and click **Open** to open the **XML Viewer** window.

If the selected XML file corresponds to a device or bridge exchange, the **XML Viewer** window shows the alterations made to the instrument in the configuration, that is, whether the device, blocks and parameters were replaced, and blocks and parameters that were removed. See the example below:


D:\Program Files\Smar\ConfigurationWorkspace\Client\CWFiles\System302\SE_Plant\FI302_SE_XmlExchangeLog.xml

Deviations

- FI302_SE
  - MIB
  - FB VFD
    - FI302_SE-RB-1
      - MODE_BLK
    - FI302_SE-BLK-1
      - MODE_BLK
    - FI302_SE-BLK-2
      - MODE_BLK
    - FI302_SE-BLK-3
      - MODE_BLK
    - FI302_SE-TRDDSP-1
      - MODE_BLK
    - FI302_SE-DIAG-1
      - MODE_BLK
    - FI302_SE-AO-1

Attribute	Current	Alternative	Severity
Block_Type	Resource Block	Resource Block	N/A
Vendor	Smar	Smar	N/A
Model	FI 302	FI 302	N/A
Manufacturer	0x000302	0x000302	N/A
Device_Type	0x0005	0x0005	N/A
Device_Revision	0x04	0x02	Low
DD_Revision	0x02	0x01	Low
CF_Revision	0x01	0x01	N/A
DD_Item_Id	0x80020AF0	0x80020310	Low
Profile	0x0133	0x010B	Low
Profile_Revision	0x0002	0x0001	Low
VFD_Block	Resource Block	Resource Block	N/A

Figure 2.32. XML Viewer Window

If the selected XML file corresponds to a block, the **XML Viewer** window shows the alterations made when converting a SE project to a HSE project, indicating the blocks that were replaced in the new bridge and blocks that were deleted.

The left panel on the **XML Viewer** window shows the blocks and parameters configured in the original device before the **Exchange** procedure (or before converting the SE configuration). Select the icon of a block to see the details about block or parameter compatibility.

The column **Attribute** shows the attributes of a selected block. The column **Current** shows the value of the attribute in the previous device and the column **Alternative** indicates the new value of the attribute, when there is a compliant parameter in the new device.

The filter levels classify the compatibility of blocks and parameters attributes:

!	The attributes classified by this filter are compliant in the new device.
!	The *Low Severity* filter indicates the attributes are not compliant but the information was not lost.
!	The *High Severity* filter indicates the attributes are not compliant and the information was lost or converted.
!	This filter displays all attributes.

Click **Ok** to close this window and return to ***Syscon***.

PLANT CONFIGURATION

The project is initially divided in two major parts:

- The Logical Plant or *Application*.
- The Physical Plant or *Fieldbus Networks*.

The logical plant in the ***Syscon*** configuration was defined according to the ISA S88 model and the physical plant was defined according to the FF-581 and FF-890 models.

The *Application* is where the project's logical part is configured, for example, linking the function blocks to create a control strategy. *Process Cells* and *Control Modules* are created in the *Application*. *Process Cells* are modules created to subdivide areas or processes of the plant. *Control Modules* are modules created to configure the control strategy related to the areas or processes created in the *Process Cells*.

The *Fieldbus Networks* is where the physical installation is represented and all fieldbus segments or networks are configured. The controllers and field devices are distributed in the segments on the same way they are installed in the field.

Naturally, these two parts are related. The relation between them is the function block, which is created in both parts.

Syscon was designed to make it possible to start a configuration from different points and go through different ways. For example, it is possible to configure the Physical part first, creating segments, devices and function blocks, and then attach the blocks to the Logical part. Or the user can first configure the Logical Plant creating the control strategy and, after that, create the Physical plant and attach the function blocks previously created in the Logical part to it.

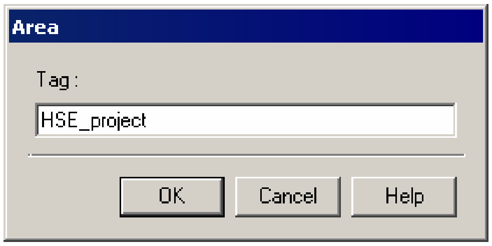
IMPORTANT
The ***Studio302*** *Database Manager* manages all project configuration files, and the configurations created using ***Syscon*** are saved in a common storage directory where all machines connected to the communication network can access those files. It is important to have a common practice to name tags in your company, to avoid consistency problems. For example, in *Multi-user* mode, if User A creates a configuration in a machine with the same name that User B created the configuration in another machine, one of the configuration files will be deleted and overlaid by the other file, when the configurations are committed. Likewise, it will not be possible to type the same tag for two or more control modules (or devices, blocks, etc) in different project configuration files.

Area

Changing the area attributes

Right-click the area icon and click **Attributes**. The **Area** dialog box will open.

Type the new tag and click **Ok**.



Tag : HSE_project

Figure 3.1. Area Attributes Dialog Box

Process Cells

Creating Process Cells

To create a process cell, right-click the application icon and click **New Process Cell**. The **Process Cell** dialog box will open. Type the process cell tag and click **OK**.

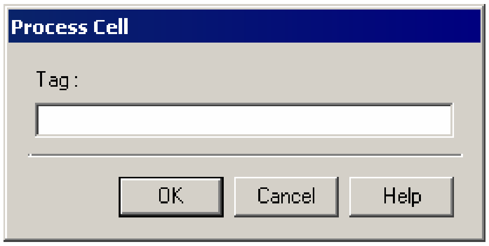


Figure 3.2. Process Cell Dialog Box

If you do not define the tag, **Process Cell n** will be the default tag, where **n** is a sequential number for process cells.

After creating the process cell, the *Project* window will look like the following figure:

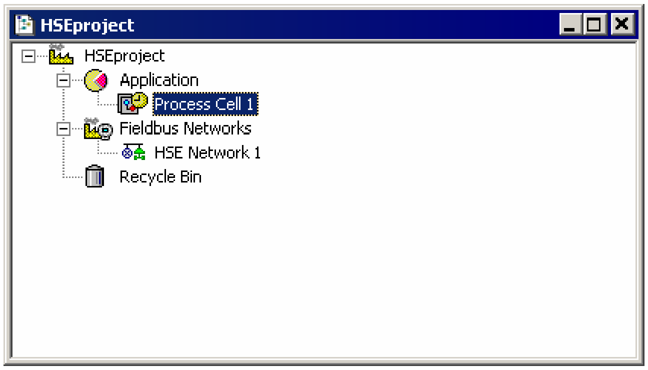


Figure 3.3. Project Window

The process cell has its own window. Right-click the process cell icon and click **Expand**, or double-click the process cell icon:

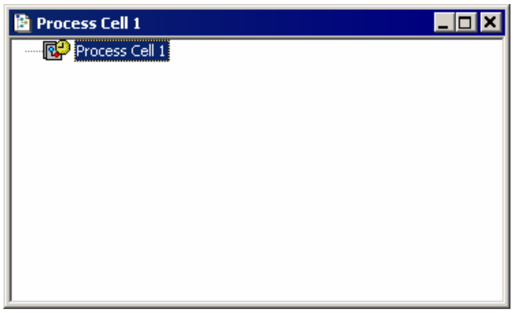
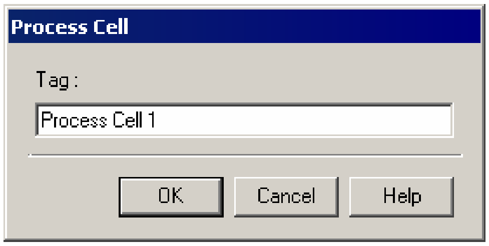


Figure 3.4. Process Cell Window

Changing Process Cell Attributes

Right-click the process cell icon on the *Process Cell* window and click **Attributes**. The **Process Cell** dialog box will open. Type the new process cell tag and click **Ok**.



Tag : Process Cell 1

Figure 3.5. Process Cell Dialog Box

Deleting Process Cells

Right-click the process cell icon and click **Delete Process Cell**, or press the **Delete** key on the keyboard.

The **Warning** dialog box will open. Click **Yes** to confirm the operation.

NOTE
If you confirm the operation, the process cell and the control modules will be removed from the project and will not be sent to the **Recycle Bin**.

Control Modules

Creating Control Modules

Right-click the process cell icon on the *Process Cell* window and click **New Control Module**. The **Control Module** dialog box will open. Type the control module tag and click **OK**.

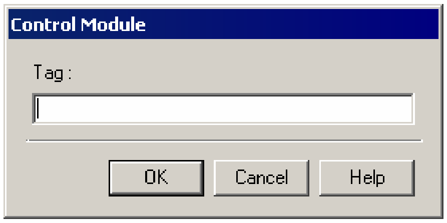
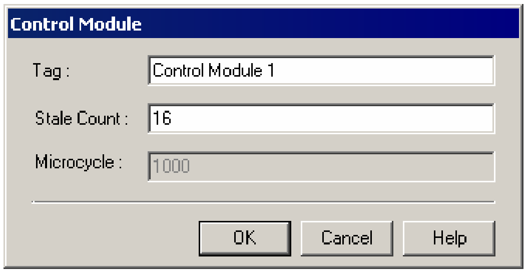


Figure 3.6. Control Module Dialog Box

NOTE
If you do not define a new tag, **Control Module n** will be the default, where **n** is a sequential number for the control modules.

Changing Control Module Attributes

To change the control module attributes, right-click its icon and click **Attributes**. The **Control Module** dialog box will open.



Tag : Control Module 1

Stale Count : 16

Microcycle : 1000

Figure 3.7. Control Module Attributes Dialog Box

The *Stale Count* is the number of macrocycles used to signal that the data was not updated in the link. The *Microcycle* is the supervision cycle for the control module, and its value is the same from the macrocycle.

Type the new control module tag and click **OK** to close this dialog box.

Deleting Control Modules

To remove a control module from a process cell, right-click its icon and click **Delete Control Module**, or press **Delete** on the keyboard.

The **Warning** dialog box will open. Click **Yes** to confirm the operation.

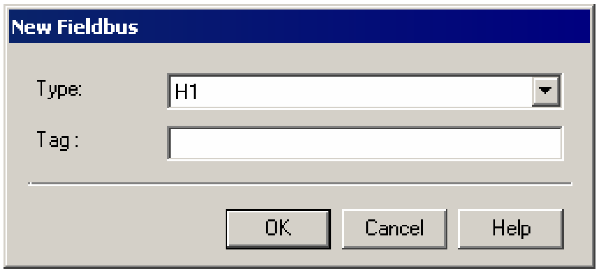
NOTE
If you confirm the operation, the control module and the related Strategy will be removed from the project and will not be sent to the **Recycle Bin**.

Fieldbus Networks

Creating a H1 or HSE Fieldbus

Right-click the fieldbus networks icon and click **New Fieldbus**. The **New Fieldbus** dialog box will open.

Select the communication type for the Fieldbus, **H1** or **HSE**, type the tag and click **OK** to conclude.



New Fieldbus

Type: H1

Tag :

Figure 3.8. Fieldbus Dialog Box

IMPORTANT
If the **HSE** type is selected, the **HSE Host** will be automatically added to the fieldbus channel and the **HSE OLE Server** will be automatically selected in the **Communication Settings** dialog box.

If you do not define the tag, **Fieldbus n** will be the default tag, where **n** is a sequential number for the fieldbuses. The Fieldbus Networks do not have a direct correspondence to any of the existing process cells.

The fieldbus has its own window, where you can create and edit devices, bridges and function blocks. Right-click the fieldbus icon and click **Expand**, or double-click the fieldbus icon. The *Fieldbus* window will open:

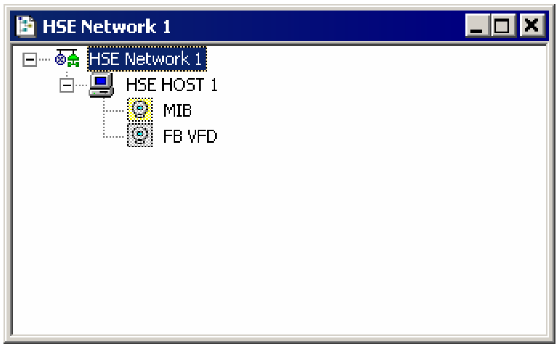


Figure 3.9. Fieldbus Window

Creating a Profibus Network

It is necessary to add a Profibus controller to the HSE network to create a Profibus network (see section **Creating a Controller** for details). The **DF73** module is the **Smar** solution for Profibus applications. The **DF73** works as Profibus DP-HSE gateway to provide connectivity and flexibility to the system application. Using the HSE network and other **DFI302** modules, field devices from different industrial protocols can communicate.

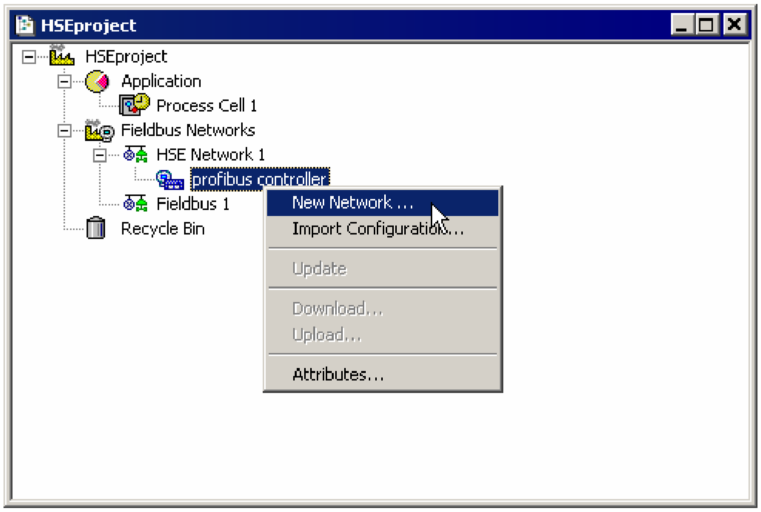


Figure 3.10. Creating a Profibus Network

On the *Project* window, right-click the Profibus controller icon and click **New Network**. The ***Network Configurator*** tool will automatically open to configure the network. Edit the master and slaves Profibus devices, save the configuration and close the ***Network Configurator*** tool.

Return to ***Syscon*** and the ***Mapping Tool*** application will automatically open. Map the inputs and outputs according to your project configuration and click **Ok** to close and return to ***Syscon***. Refer to the **Tutorial: Mapping Tool** from this manual for details about using the ***Mapping Tool***.

Creating a DeviceNet Network

It is necessary to add a DeviceNet controller to the HSE network to create a DeviceNet network (see section **Creating a Controller** for details). The **DF79** module is the **Smar** solution for providing connectivity and flexibility between HSE networks and DeviceNet devices.

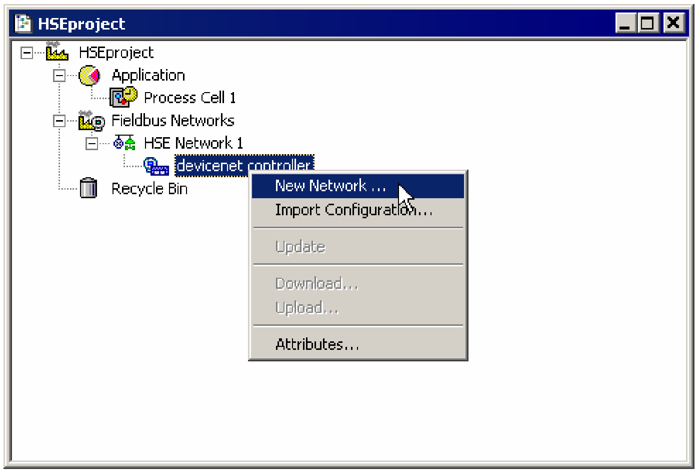


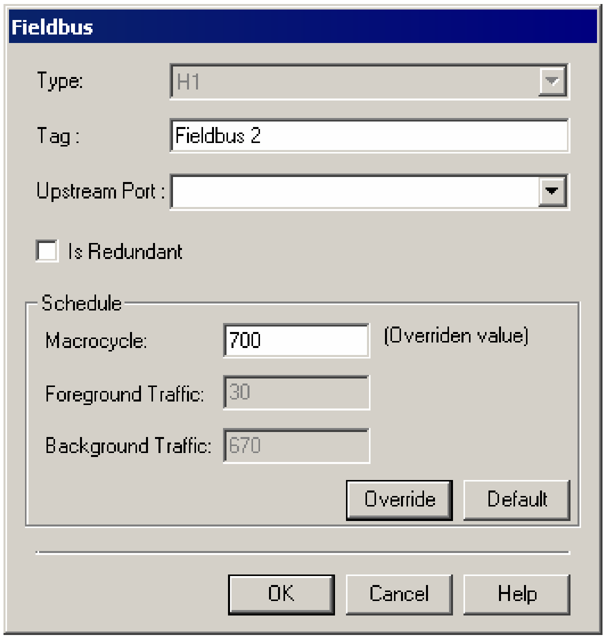
Figure 3.11. Creating a DeviceNet Network

Right-click the DeviceNet controller icon and click **New Network**. The ***Network Configurator*** tool will automatically open to configure the network. Edit the master and slaves DeviceNet devices, save the configuration and close the ***Network Configurator*** tool.

Return to ***Syscon*** and the ***Mapping Tool*** application will automatically open. Map the inputs and outputs according to your project configuration and click **Ok** to close and return to ***Syscon***. Refer to the **Tutorial: Mapping Tool** from this manual for details about using the ***Mapping Tool***.

Changing the H1 or HSE Fieldbus attributes

Open the *Fieldbus* window, right-click the fieldbus icon and click **Attributes**. The **Fieldbus** dialog box will open.


Fieldbus

Type: H1

Tag : Fieldbus 2

Upstream Port :

☐ Is Redundant

Schedule

Macrocycle: 700 (Overriden value)

Foreground Traffic: 30

Background Traffic: 670

Figure 3.12. Fieldbus Dialog Box

Type the new fieldbus tag. You can also select the **Upstream Port** for H1 fieldbuses. For Profibus networks, you can only change the fieldbus tag.

Also, you can determine the time dedicated to the **Background Traffic**. The **Background Traffic** (in ms) will affect the refreshing time of the variables under supervision. The minimum value is 100 ms. The macrocycle is automatically updated.

To set the macrocycle, type the new value and click **Override**. The values for the **Background Traffic** and the **Foreground Traffic** are calculated. Click **Ok** to accept these values and conclude this task.

In case you need to restore the macrocycle to the default value, click **Default** and then click **Ok**.

After clicking **Override** or **Default** (before closing the **Fieldbus** dialog box) the previous value of the macrocycle can be restored. Click **Cancel** to close the dialog box without applying the changes to the fieldbus. All modifications will be discarded, and all fieldbus parameters will be restored to the initial state.

IMPORTANT
Once configured by the user and validated by the ***Syscon*** automatic calculation, the value of the macrocycle will not be altered by the application tool, except when there is a significant alteration in the configuration project, such as when the user deletes or adds function blocks or links to a fieldbus channel. Every time the configuration is altered, ***Syscon*** automatically calculates the value of the macrocycle and if the result is higher than the value previously configured by the user, ***Syscon*** will automatically overwrite the user's value with the new value of the macrocycle. For some bridges, the macrocycle standard value calculated by ***Syscon*** is not enough for stable operation of the device and good response to monitoring and supervision. In these cases, there is a minimum value and a desired maximum value for the macrocycle that can be defined in the *Capabilities File* related to the bridges. ***Syscon*** compares the standard value, the values defined on the *Capabilities File* and the value defined by the user (if this value exists), dynamically. The biggest value among these values will be applied to the macrocyle.

Modifying the Profibus or DeviceNet Fieldbus configuration

Open the **Profibus** or **DeviceNet** window, right-click the Profibus or DeviceNet icon and select **Modify Configuration**. The ***Network Configurator*** tool will automatically open to configure the network.

When you finish editing, save the configuration and close the ***Network Configurator*** tool.

Return to ***Syscon*** and the ***Mapping Tool*** application will automatically open. Map the inputs and outputs according to your project configuration and click **Ok** to close the ***Mapping Tool*** and return to ***Syscon***. Refer to the **Tutorial: Mapping Tool** for details about using the ***Mapping Tool***.

Deleting Fieldbuses

On the *Project* window, right-click the fieldbus icon and click **Delete Fieldbus**, or press **Delete** on the keyboard.

The **Warning** dialog box will appear. Click **Yes** to confirm the operation.

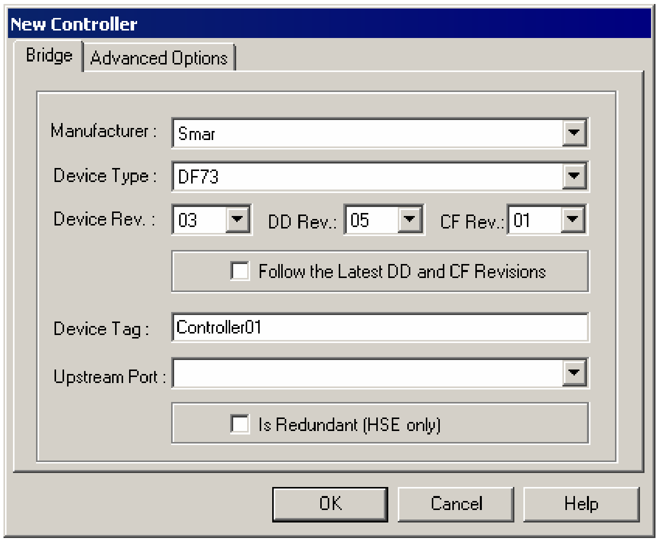
NOTE
If you confirm the operation, the fieldbus and the devices attached to the fieldbus will be removed from the project and will not be sent to the **Recycle Bin**.

Controllers

Controllers can only be added to the HSE Fieldbus.

Creating a controller

On the *HSE Network* window, right-click the fieldbus icon and click **New > Controller**. The **New Controller** dialog box will open.



Manufacturer : Smar
Device Type : DF73
Device Rev. : 03
DD Rev.: 05
CF Rev.: 01
☐ Follow the Latest DD and CF Revisions
Device Tag : Controller01
Upstream Port :
☐ Is Redundant (HSE only)

Figure 3.13. Fieldbus Dialog Box

Select the *Manufacturer* from the list and the *Type* provided by the selected manufacturer. Select the *Device Revision*. Then, select the *DD Revision* and the *CF Revision*.

If the option **Follow the Latest DD/CF Revision** is selected, ***Syscon*** will update the controller with the latest revision of the DD and CF every time you open the configuration file.

Type a related tag for the controller. If you do not define the tag, **Controller n** will be the default tag, where **n** is a sequential number for controllers.

At the **Advanced Options** tab, select the options to automatically create and configure blocks, parameters and internal links, according to the *Capabilities File*.

Click **Ok** to add the controller to the configuration.

Creating the Controller from a Template

On the *HSE Network* window, right-click the fieldbus icon and click **New > Controller from Template**.

Select the directory where the template file is located, select the controller template file and click **Open**. A message box will open to confirm the operation. Click **Ok** to proceed.

The **Tag Table** will open, showing the list of blocks with the tags based on the preferences settings and the old tags used in the template file. To edit a tag, right-click the icon at the **New Tag** column and click **Rename**. Type the new tag and press **Enter** on the keyboard.

Click **Ok** to close the **Tag Table** dialog box and add the controller to the configuration.

Changing the controller attributes

Right-click the controller icon and select **Attributes**. Type the new tag for the controller and click **Ok** to conclude.

Adding Redundancy to the controller

While creating the controller, select the option **Is Redundant (HSE only)** to indicate the controller is redundant. If the controller was already created in the configuration, right-click the controller icon and select **Attributes**. Select the option **Is Redundant** and click **Ok**.

Then, right-click the controller icon again and select the option **Commission**. Verify the information about the controller and click **Ok** to commission. Open the **Controller Attributes** dialog box again and select the **Redundancy** tab. ***Syscon*** automatically configures the backup serial number.

Consult the **DFI302 User's Manual** for details about redundancy for controllers.

Deleting a controller

Right-click the controller icon and click **Delete**, or press **Delete** on the keyboard. The **Warning** dialog box will appear. Click **Yes** to confirm the operation.

Bridges

Use bridges when a block should supply a value to another block but these blocks are inside different fieldbus links.

Creating Bridges

Right-click the fieldbus icon on the *Fieldbus* window and click **New > Bridge**. The **New Bridge** dialog box will open:

1. Select the *Bridge Manufacturer* from the list.
2. Select the *Type* provided by the selected manufacturer.
3. Select the *Device Revision*, then select the *DD Revision* and the *CF Revision*, or check the option **Follow the Latest DD/CF Revision** to apply the latest revision for the selected bridge.

ATTENTION
If the option **Follow the Latest DD/CF Revision** is selected, ***Syscon*** will update the bridge with the latest revision of the *DD* and *CF* every time the configuration file is opened. To disable the automatic update, right-click the bridge icon, click the option **Exchange** and unmark that option on the **Exchange** dialog box.

4. Type a related tag for the bridge. If you do not define the tag, **Bridge n** will be the default tag, where **n** is a sequential number for the bridges.
5. Select the upstream port to connect the bridge to the communication channel.
6. At the **Advanced Options** tab, select the option to automatically create and configure blocks, parameters and internal links according to the *Capabilities File* or based on the *Default Template* file for the selected *Device Revision*, located in the corresponding *Device Support* folder.

NOTE
If the *Default Template* file is not found, ***Syscon*** will automatically create the *Resource* and *Transducer Blocks* for the selected bridge.

7. Click **Ok** to add the bridge to the configuration.

IMPORTANT

The *HSE Host*, *linking devices* and *I/O Gateways* can only be added to the *HSE Fieldbus*. Likewise, the *H1 Bridge* can only be added to the *H1 Fieldbus*.

Creating a Bridge from a Template

To create a bridge based on a *Bridge Template File*, right-click the fieldbus icon on the *Fieldbus* window and click **New > Bridge from Template**.

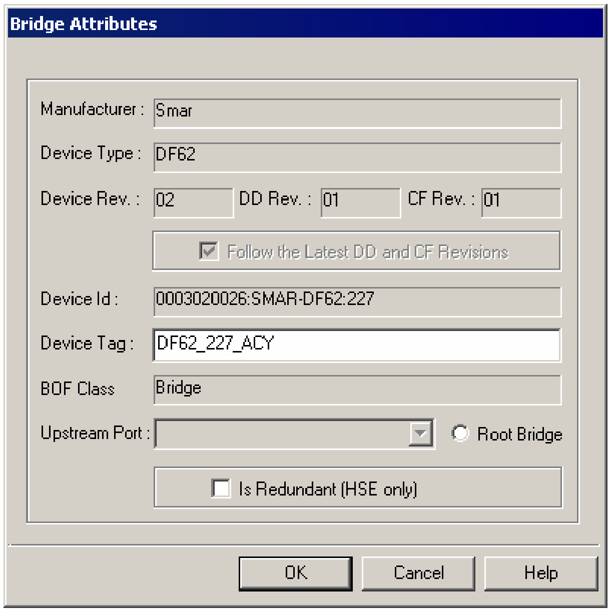
Select the directory where the template file is located, select the bridge template file and click **Open**. A message box will open to confirm the operation. Click **Ok** to proceed.

The **Tag Table** will open, showing the list with block and bridge tags based on the preferences settings and the old tags used in the template file. To edit a tag, right-click the block or bridge icon at the **New Tag** column and click **Rename**. Type the new tag and click **Enter** on the keyboard.

Click **Ok** to close the **Tag Table** dialog box and add the bridge to the configuration.

Changing Bridge Attributes

Right-click the bridge icon and click **Attributes**. The **Bridge Attributes** dialog box will open.


Bridge Attributes

Manufacturer : Smar

Device Type : DF62

Device Rev. : 02 DD Rev. : 01 CF Rev. : 01

☑ Follow the Latest DD and CF Revisions

Device Id : 0003020026:SMAR-DF62:227

Device Tag : DF62_227_ACY

BOF Class Bridge

Upstream Port : ○ Root Bridge

☐ Is Redundant (HSE only)

Figure 3.14. Bridge Attributes Dialog Box

You can change the bridge tag and configure the redundancy for HSE networks.

Click **Ok** to conclude.

ATTENTION

To disable the automatic update configured with the option **Follow the Latest DD/CF Revision**, use the **Bridge Exchange** procedure: right-click the bridge icon, click **Exchange** and unmark that option on the **Exchange** dialog box.

Deleting Bridges

To remove a bridge, right-click its icon on the *Fieldbus* window and click **Delete Bridge**, or press **Delete** on the keyboard.

The warning dialog box will open. Click **Yes** to confirm the operation.

IMPORTANT
If the bridge has blocks with *External Links*, it will be necessary to delete the links before deleting the bridge.

Adding Redundancy to the HSE Bridge

There are three possible ways to add redundancy to the HSE bridge using ***Syscon***: adding redundancy while creating the bridge, editing the bridge attributes or changing to online mode when a switch over occurs in the active CPU.

Mode 1: Adding redundancy while creating the bridge

In this case, the redundancy is configured when the user is creating the HSE bridge. Follow the procedure described in section **Creating Bridges** to create the HSE Bridge and on the **New Bridge** dialog box, select the option **Is Redundant (HSE only)** as indicated in the figure below.

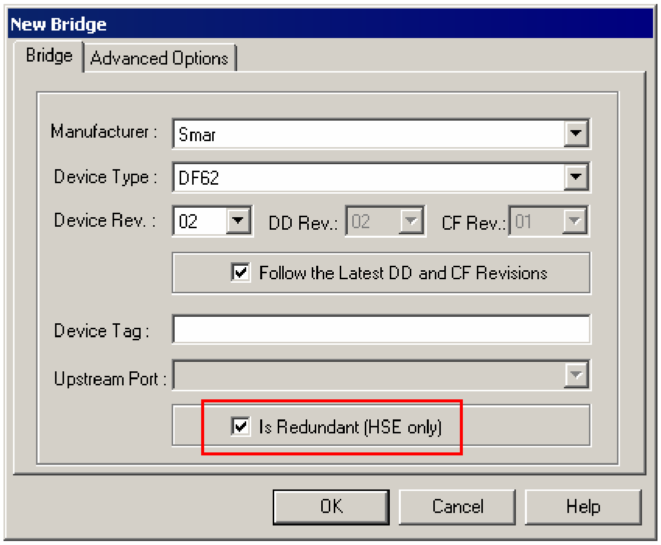
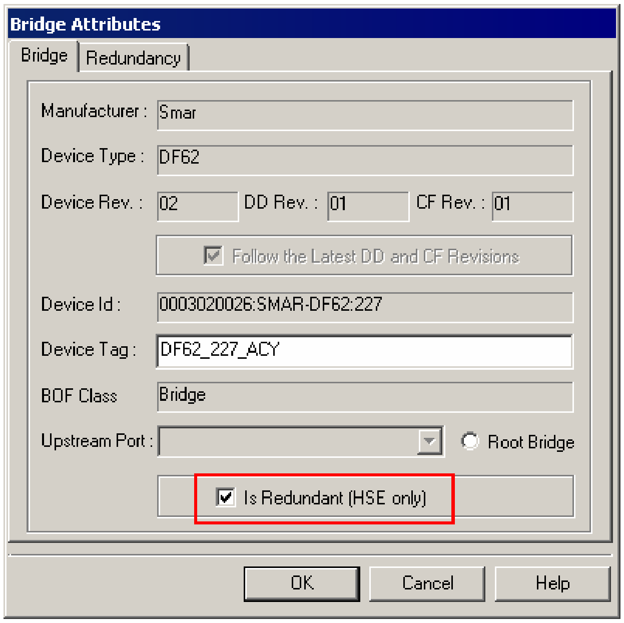

New Bridge
Manufacturer : Smar
Device Type : DF62
Device Rev. : 02
DD Rev.: 02
CF Rev.: 01
☑ Follow the Latest DD and CF Revisions
Device Tag :
Upstream Port :
☑ Is Redundant (HSE only)

Figure 3.15. Add redundancy while creating the bridge

Mode 2: Editing the bridge attributes

In this case, the redundancy will be configured by editing the bridge attributes after creating the HSE bridge in ***Syscon***.

Right-click the bridge icon and click **Attributes** to open the **Bridge Attributes** dialog box. Select the option **Is Redundant (HSE only)** as indicated in the figure below.



Bridge Attributes

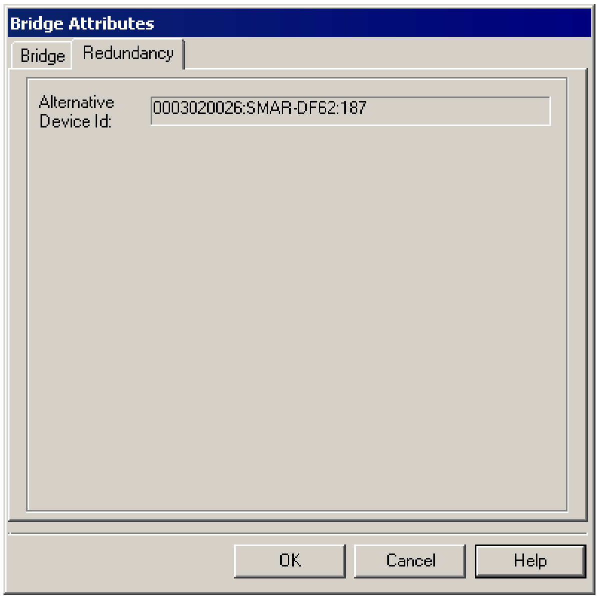
Manufacturer : Smar
Device Type : DF62
Device Rev. : 02 DD Rev. : 01 CF Rev. : 01
☑ Follow the Latest DD and CF Revisions
Device Id : 0003020026:SMAR-DF62:227
Device Tag : DF62_227_ACY
BOF Class Bridge
Upstream Port :
○ Root Bridge
☑ Is Redundant (HSE only)

Figure 3.16. Editing the bridge attributes to add redundancy

The **Redundancy** tab will appear after checking the redundancy option. Click **Ok** to close the **Bridge Attributes** dialog box.

Commission the bridge. Right-click the bridge icon and click **Commission**. Verify the information about the HSE bridge, select the *Device* ID and click **Ok** to commission this bridge.

Open the **Bridge Attributes** dialog box again and select the **Redundancy** tab. The serial number of the backup bridge will be displayed in the **Alternative Device ID** field. ***Syscon*** automatically configures this serial number. See the following figure:



Bridge Attributes

Alternative Device Id: 0003020026:SMAR-DF62:187

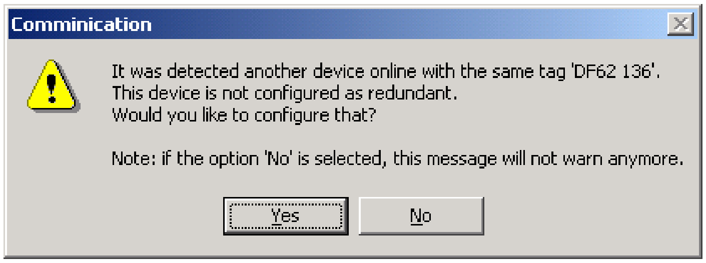
Figure 3.17. Redundancy tab

NOTE
When ***Syscon*** is online and the user marks the redundancy option in the **Bridge Attributes** dialog box, the **Device ID** field will indicate the serial number of the *Active Bridge* and the **Alternative Device Id** field will indicate the serial number of the *Backup Bridge*.

Mode 3: Setting the redundancy after a switch over

In this case, the redundancy is configured while the system is operating in the online mode because, for example, although the hardware may have been installed with redundancy, the user did not set the redundancy parameter for the HSE Bridge in the project configuration.

After a failure occurs in the *Active Bridge*, the system will identify a *Backup Bridge*. The following message will appear prompting the user to configure the redundancy.


Comminication

It was detected another device online with the same tag 'DF62 136'.
This device is not configured as redundant.
Would you like to configure that?

Note: if the option 'No' is selected, this message will not warn anymore.

Figure 3.18. Configuring the bridge as redundant

Click **Yes** to configure the redundancy. If you click **No**, the message above will not appear again and ***Syscon*** will assume that the bridge is not redundant.

Connecting a Bridge to a Fieldbus

Note the following situation:

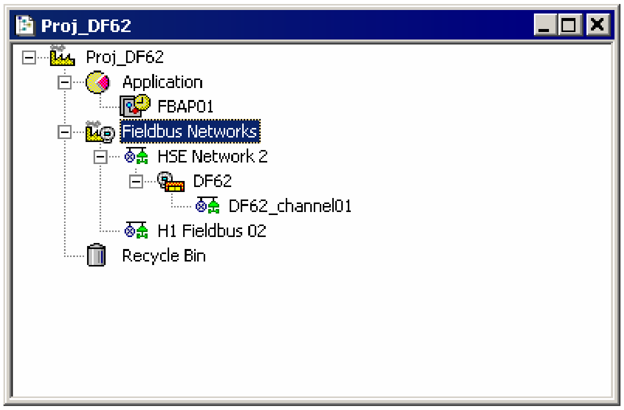
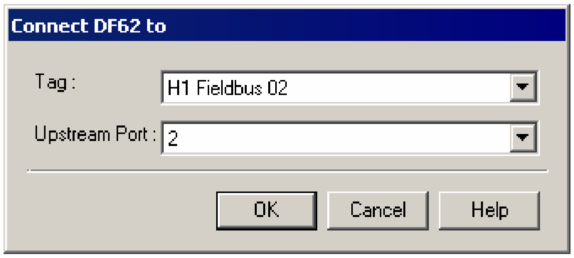


Figure 3.19. Project Window

In this example, a H1 fieldbus segment was added to the configuration but this channel is not connected to any bridge.

To enable the communication to this channel, right-click the bridge icon on the *Project* window and click **Connect to**. The **Connect Bridge to** dialog box will open. Select the fieldbus segment in the **Tag** box and the port to connect the fieldbus in the **Upstream Port**. Click **Ok** to conclude.


Connect DF62 to

Tag : H1 Fieldbus 02

Upstream Port : 2

Figure 3.20. Connect Bridge Dialog Box

NOTE
If you are connecting the bridge to a HSE fieldbus, the **Upstream Port** field will not be active. Only one bridge can be connected to the HSE Fieldbus.

The following figure shows the project tree after the connection:

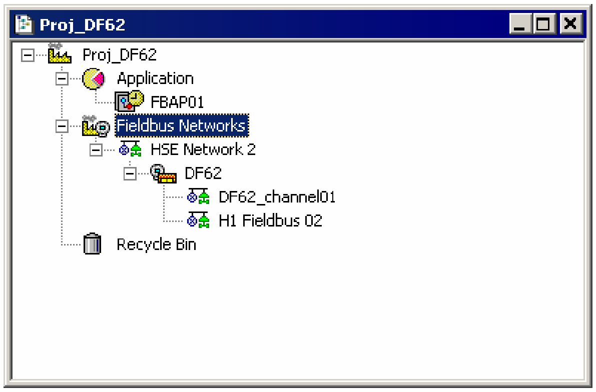


Figure 3.21. Project Window

Disconnecting a Bridge from a Fieldbus

To disconnect a fieldbus segment from a bridge channel, right-click the bridge icon and click **Disconnect from**. The **Disconnect Bridge from** dialog box will open.

Select the fieldbus in the **Fieldbus** box and click **Ok**.

Bridge Exchange

The procedure to exchange a bridge is the same as described in section **Device Exchange** further ahead. Please refer to this section for further information.

Devices

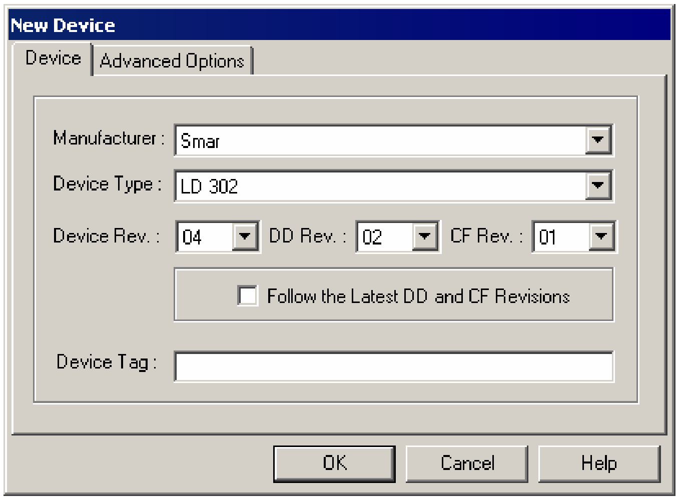
Creating Devices

On the *Fieldbus* window, right-click the fieldbus icon and click **New > Device**. The **New Device** dialog box will open.

Select the *Device Manufacturer* from the list and the *Device Type* provided by the selected manufacturer.

Select the *Device Revision*, then select the *DD Revision* and the *CF Revision*, or check the option **Follow the Latest DD/CF Revision** to apply the latest revision for the selected device.

NOTE
If the option **Follow the Latest DD/CF Revision** is selected, ***Syscon*** will update the device with the latest revision of the *DD* and *CF* every time the configuration file is opened. To disable the automatic update, right-click the device icon, click **Exchange** and unmark that option on the **Exchange** dialog box.



Manufacturer : Smar

Device Type : LD 302

Device Rev. : 04 DD Rev. : 02 CF Rev. : 01

☐ Follow the Latest DD and CF Revisions

Device Tag :

Figure 3.22. Device Dialog Box

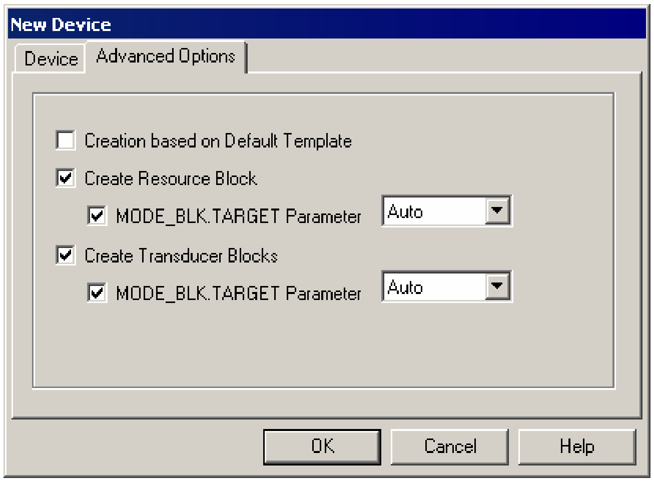
Type a related tag for the device. If you do not define the tag, **Device n** will be the default tag, where **n** is a sequential number for devices.

At the *Advanced Options* tab, select the options to automatically create and configure blocks and parameters, according to the *Capabilities File*:

Creation Based on Default Template: creates the device based on the *Default Template* file for the selected *Device Revision*, located in the corresponding *Device Support* folder.

Create Resource Block: automatically creates the *Resource Block* of the selected device. You can set the initial value for the *Mode Block* parameter.

Create Transducer Blocks: automatically creates the *Transducer Blocks* of the selected device. You can set the initial value for the *Mode Block* parameter.



☐ Creation based on Default Template

☑ Create Resource Block

  ☑ MODE_BLK.TARGET Parameter Auto

☑ Create Transducer Blocks

  ☑ MODE_BLK.TARGET Parameter Auto

Figure 3.23. Advanced Options

Click **Ok** to add the device to the configuration.

NOTE
If the *Default Template* file is not found, ***Syscon*** will automatically create the *Resource* and *Transducer Blocks* for the selected device.

IMPORTANT

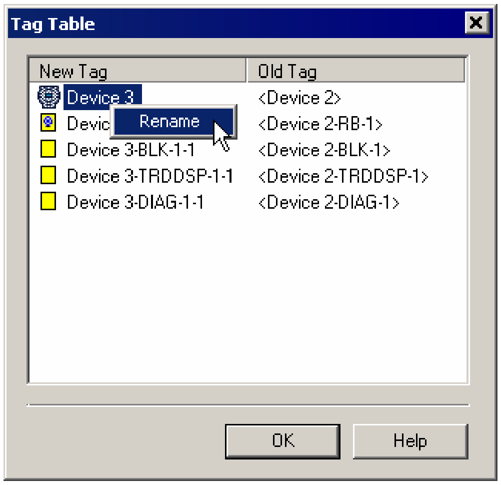
The *HSE Device* can only be added to the *HSE Fieldbus*. Likewise, the *H1 Device* can only be added to the *H1 Fieldbus*.

Creating a Device from a Template

On the *Fieldbus* window, right-click the fieldbus icon and click **New > Device from Template**.

Select the directory where the template file is located, select the device template file and click **Open**. A message box will open to confirm the operation. Click **Ok** to proceed.

The **Tag Table** will open, showing the list with block and device tags based on the preferences settings and the old tags used in the template file. To edit a tag, right-click the block or device icon at the **New Tag** column and click **Rename**. Type the new tag and click **Enter** on the keyboard.



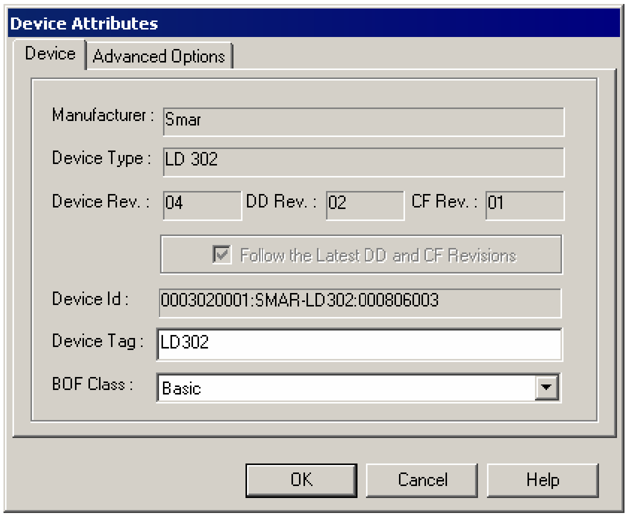
New Tag	Old Tag
Device 3	<Device 2>
Devic	<Device 2-RB-1>
Device 3-BLK-1-1	<Device 2-BLK-1>
Device 3-TRDDSP-1-1	<Device 2-TRDDSP-1>
Device 3-DIAG-1-1	<Device 2-DIAG-1>

Figure 3.24. Tag Table dialog box

Click **Ok** to close the **Tag Table** dialog box and add the device to the configuration.

Changing the Device Attributes

Right-click the device icon and click **Attributes**. The **Device Attributes** dialog box will open.



Manufacturer : Smar
Device Type : LD 302
Device Rev. : 04 DD Rev. : 02 CF Rev. : 01
☑ Follow the Latest DD and CF Revisions
Device Id : 0003020001:SMAR-LD302:000806003
Device Tag : LD302
BOF Class : Basic

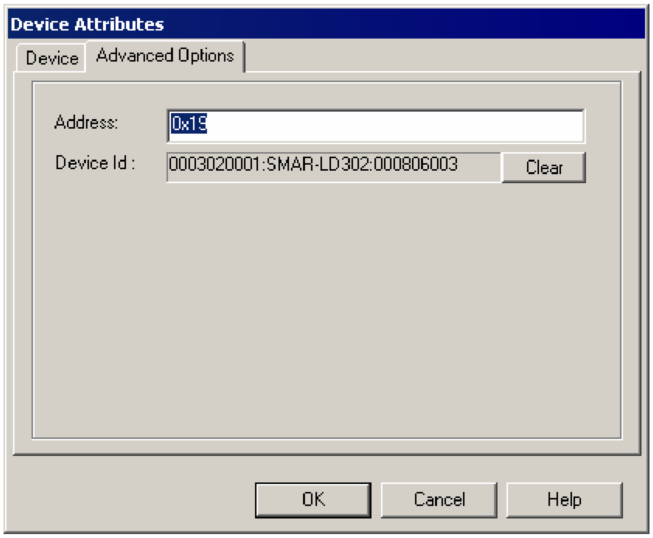
Figure 3.25. Device Attributes Dialog Box

You can type a new tag for the device and select the BOF class.

ATTENTION

To disable the automatic update configured with the option **Follow the Latest DD/CF Revision**, right-click the device icon, click **Exchange** and unmark that option on the **Exchange** dialog box.

When operating in the **Advanced User** mode, the tab **Advanced Options** will be available in the **Device Attributes** dialog box. Type the new physical address for the device.



Address: 0x19

Device Id : 0003020001:SMAR-LD302:000806003

Figure 3.26. Advanced Options

It is recommended to execute the normal commissioning operation using the options **Commission** (see section **Commissioning a Device**) and **Decommission** (see section **Decommissioning a Device**). Only for some engineering and test scenarios, using ***Syscon*** in **Advanced Mode**, it is possible to delete the *Device Id* from the instrument without using the decommissioning procedure.

Click **Clear** to delete the *Device Id*. This procedure do not replace the option **Decommission**, it only disassociates the physical instrument from the instrument on the configuration.

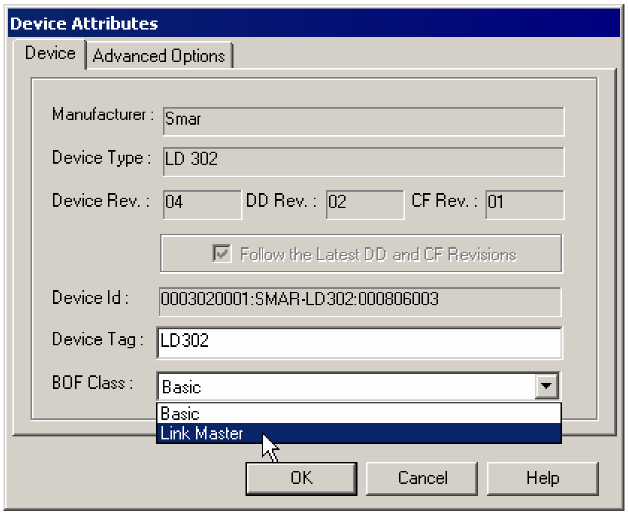
Click **Ok** to apply the alterations and conclude.

Master Backup Device

To configure the device to operate as a *Master Backup*, a *Link Master* should be selected.

Right-click the device icon and click **Attributes**. Click the down arrow of the **BOF Class** box and select the option **Link Master**.

Click **Ok** to conclude.



Device Attributes

Manufacturer : Smar

Device Type : LD 302

Device Rev. : 04 DD Rev. : 02 CF Rev. : 01

☑ Follow the Latest DD and CF Revisions

Device Id : 0003020001:SMAR-LD302:000806003

Device Tag : LD302

BOF Class : Basic

Figure 3.27. Configuring the Link Master Device

NOTE
When ***Syscon*** is online, the option **Change BOF Class** is available on the device menu. Right-click the device and click **Change BOF Class**.

A message box will inform that it is necessary to reinitialize the device. Reset the device and execute the **Download Schedule** in the channel where the device is configured: right-click the fieldbus icon and select **Download Schedule**.

After the download, the device will operate as a *Link Master*.

NOTE
During the download, all *Master Backups* in the *Fieldbus Network* will be configured with the *Traffic Schedule*.

Deleting Devices

To remove a device from the *Fieldbus* window, right-click its icon and click **Delete**, or press **Delete** on your keyboard.

The warning dialog box will appear. Click **Yes** to confirm the operation.

Ordering Devices

Select a device icon and drag it over the other device icon. The selected device will be placed above the other device in the configuration tree.

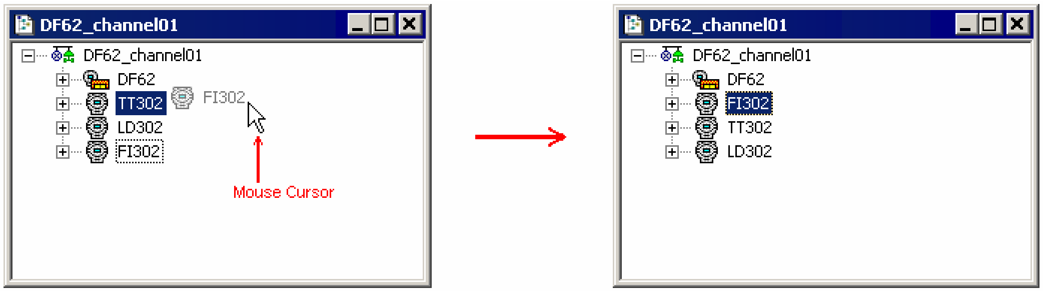


Figure 3.28. Ordering Devices in the Fieldbus Window

Moving Devices

To move a device from one fieldbus to another, click to select the device icon in the *Fieldbus* window and drag the device over the other *Fieldbus* window.

If there are any block links connecting the device to its original *Fieldbus* window, these links may no longer be available for the communication, because no valid path would be found in the topology. The **unrealized** links will be identified by a **dotted line** in the *Strategy* window.

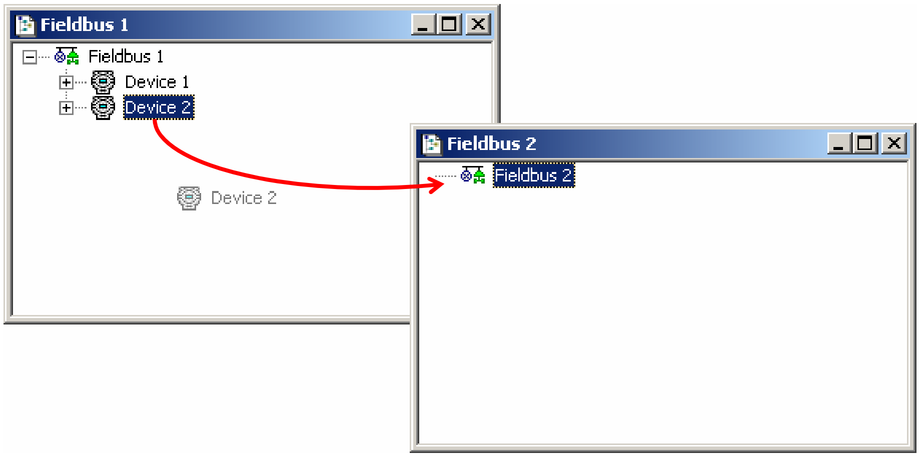


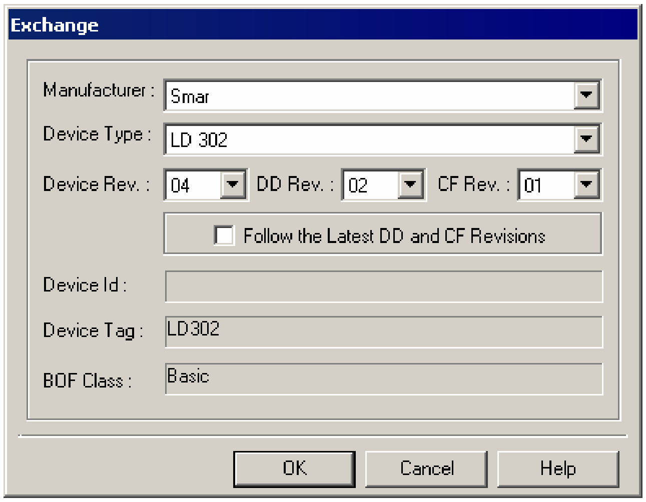
Figure 3.29. Moving a Device

Device Exchange

When a defective device must be replaced by a new device that has a newer or different *Device Revision*, it is possible to exchange these devices easily without modifying the existing configuration. You can also use the **Exchange** procedure to change the *Device Revision* of the device.

The *Device Exchange* verifies the inconsistencies, incompatibilities and interchangeability problems, and generates a report about the changes that will affect the configuration.

To exchange a device, right-click its icon and click **Exchange**. The **Exchange** dialog box will open:


Exchange

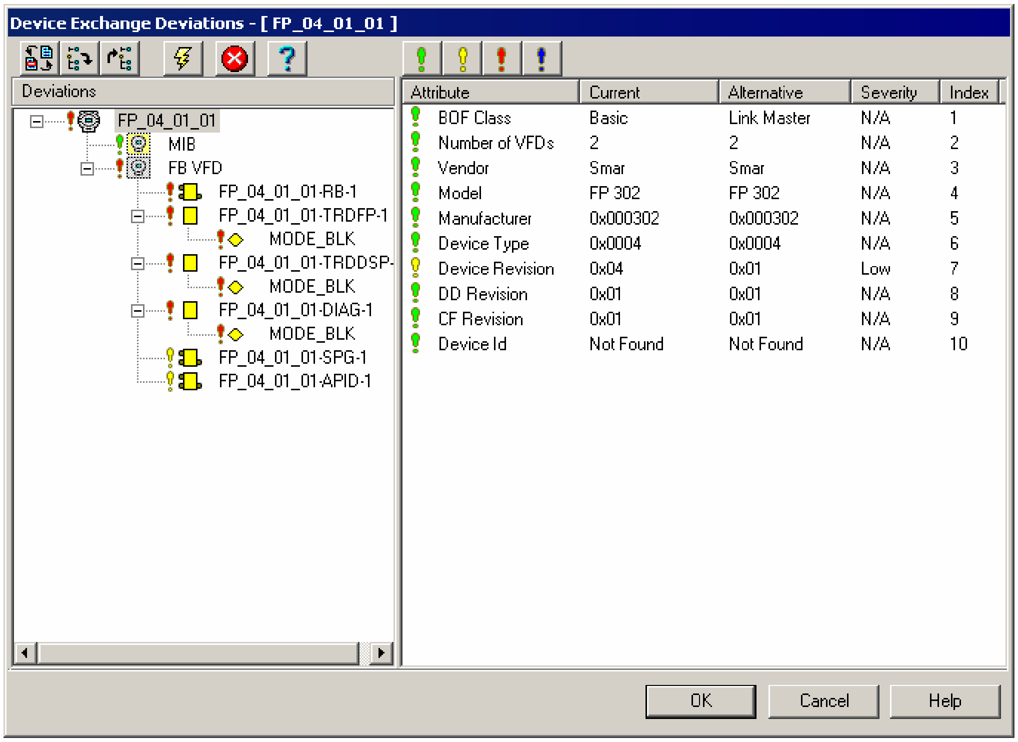
Manufacturer : Smar
Device Type : LD 302
Device Rev. : 04 DD Rev. : 02 CF Rev. : 01
☐ Follow the Latest DD and CF Revisions
Device Id :
Device Tag : LD302
BOF Class : Basic

Figure 3.30. Device Exchange Dialog Box

You can change the *Manufacturer*, the *Device Type* and the *Device Revision*. Edit the attributes and click **Ok**.

Syscon will compare the new device capabilities with the previous device capabilities and display the incompatibilities at the **Device Exchange Deviations** dialog box.

The **Deviations** dialog box shows detailed information about the device, blocks and parameters, indicating to the user the functionalities that can be lost when exchanging the device. See the example below:



Attribute	Current	Alternative	Severity	Index
BOF Class	Basic	Link Master	N/A	1
Number of VFDs	2	2	N/A	2
Vendor	Smar	Smar	N/A	3
Model	FP 302	FP 302	N/A	4
Manufacturer	0x000302	0x000302	N/A	5
Device Type	0x0004	0x0004	N/A	6
Device Revision	0x04	0x01	Low	7
DD Revision	0x01	0x01	N/A	8
CF Revision	0x01	0x01	N/A	9
Device Id	Not Found	Not Found	N/A	10

Figure 3.31. Device Deviations Dialog Box

The panel on the left shows the blocks and parameters configured in the original device and indicates the compatibility to the new device.

The panel on the right compares the attributes of the original device to the new equipment selected. Click the column headers (*Attribute*, *Current*, *Alternative*, *Severity* or *Index*) to sort the list of parameters. Clicking the column header will also toggle between ascendant and descendent sorting.

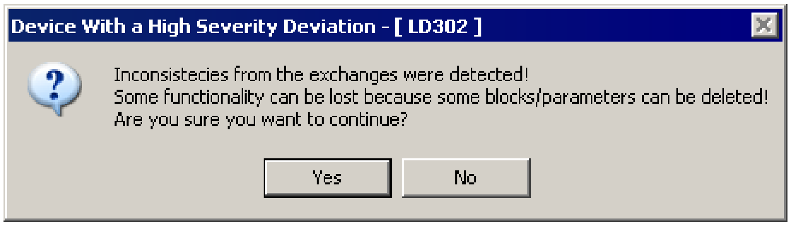
The **Deviations** dialog box has its own toolbar. The following table describes the functionalities of the buttons:

	Click this button to refresh the information on the dialog box.
	Click this button to expand all nodes.
	Click this button to collapse all nodes.
⚡	Click this button to accept the changes and close the **Deviations** dialog box.
⊗	Click this button to cancel the **Exchange** procedure and close the **Deviations** dialog box.
?	Click this button to open the **Syscon Online Help**.

The **Deviations** dialog box has four filter levels that classify all of the blocks and parameters attributes for the device:

!	The attributes classified by this filter are compliant with the device.
!	The *Low Severity* filter indicates that the attributes are not compliant but the information won't be lost.
!	The *High Severity* filter indicates that the attributes are not compliant and the information can be lost or converted.
!	This filter will display all attributes.

Click **Ok** to confirm the **Exchange** procedure. ***Syscon*** will verify the compatibility of the blocks. If a block is not available in the target device, a dialog box will open alerting the user that inconsistencies were detected and some functionalities will be lost if the device is exchanged.

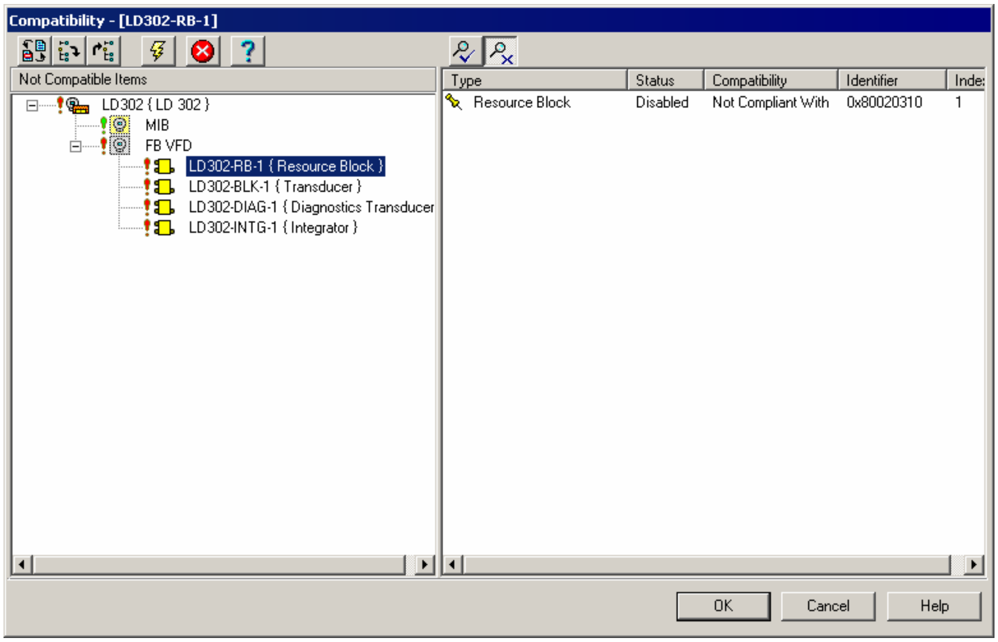


Inconsistecies from the exchanges were detected!
Some functionality can be lost because some blocks/parameters can be deleted!
Are you sure you want to continue?

Figure 3.32. Detecting Inconsistencies

Click **Yes** to confirm the exchange or click **No** to cancel the procedure and discard the device alterations.

If you confirm the **Exchange** procedure, the **Compatibility** dialog box will open. The **Compatibility** dialog box allows you to replace the blocks from the previous device that are not compatible with the new device. See the example below:



- LD302 { LD 302 }
  - MIB
  - FB VFD
    - LD302-RB-1 { Resource Block }
    - LD302-BLK-1 { Transducer }
    - LD302-DIAG-1 { Diagnostics Transducer
    - LD302-INTG-1 { Integrator }

Type	Status	Compatibility	Identifier	Inde
Resource Block	Disabled	Not Compliant With	0x80020310	1

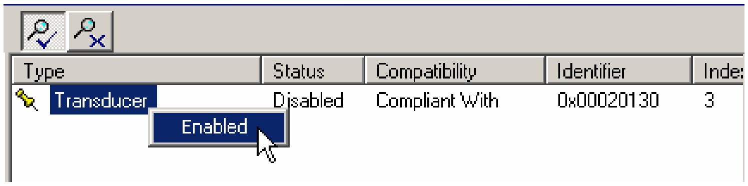
Figure 3.33. Compatibility Dialog Box

The panel on the left indicates the blocks that are not compatible with the new device. For each block not compatible, click its icon and the panel on the right will show the types of the compatible blocks.

Use the buttons in the toolbar to filter the blocks:

✓	This filter shows the list of blocks from the new device, which are compatible to the blocks from the previous device.
✗	This filter shows the list of blocks from the new device, which are **not** compatible to the blocks from the previous device.

Right-click the icon of the compatible block and click **Enable** to replace the old block in the device.



Type	Status	Compatibility	Identifier	Inde:
Transducer	Disabled	Compliant With	0x00020130	3

Figure 3.34. Selecting a compliant block

Repeat this procedure for each block that is not compatible with the new device. Click **Ok** to confirm the alterations and close the **Compatibility** dialog box.

ATTENTION
In the online operation mode, when the **Exchange** procedure is complete, a dialog box alerts the user that it is necessary to execute a **Device Download** and assign the tags. Click **Yes** to execute the download or click **No** to postpone the download.

Blocks that cannot be converted will be removed from the configuration and sent to the **Recycle Bin**. Parameters cannot be converted. If there is no identical parameter in the new device, the parameter will be deleted and will **not** be sent to the **Recycle Bin**.

Syscon checks if the device being exchanged has trends attached to it, and if there is any, Syscon checks if the parameter the trends were based on were removed. If the parameter were deleted in the **Exchange** procedure, the trends will also be deleted.

ATTENTION
For each replaced bridge or device, ***Syscon*** creates a log file in XML format that contains the discrepancies between the instruments. This XML file is stored in the project folder corresponding to the current configuration. To view the XML file, go to the **Project File** menu and select the option **Exchange XML Viewer**. Select the desired XML file and the **XML Viewer** window shows the alterations made in the Exchange procedure, that is, whether the device (or bridge), blocks and parameters were replaced or not, and blocks and parameters that were removed. Refer to subsection **Using the XML Viewer Window** in **Section 2** for further details about the **XML Viewer** window.

Function Blocks

Creating Blocks in the Control Module

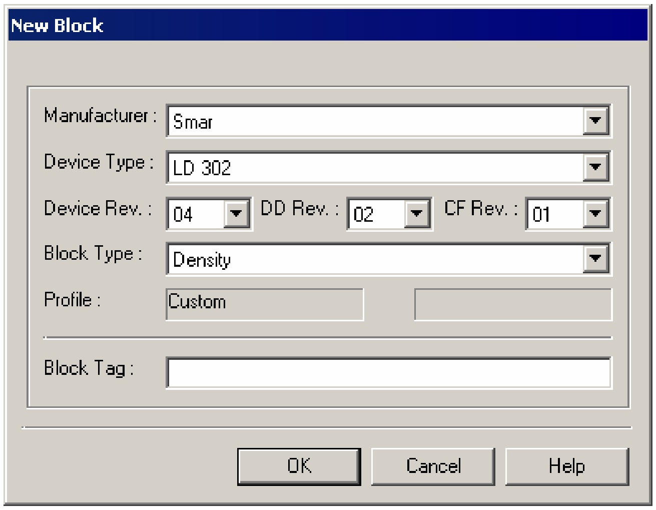
Right-click the control module icon on the *Process Cell* window and click **New Block**. The **New Block** dialog box will open.

Select the *Block Manufacturer* from the list, and then select the *Device Type* provided by the manufacturer.

Syscon uses the latest revision of the *Device Revision*, the *DD Revision* and the *CF Revision* as the default values for the new block. Change these values according to the device being used in the plant and its revision.

Select the *Block Type* and type a related tag for the block. If the tag is not typed, the tag will be generated according to the **Preferences Settings** of the current configuration.

Click **OK** to conclude.



Manufacturer : Smar
Device Type : LD 302
Device Rev. : 04 DD Rev. : 02 CF Rev. : 01
Block Type : Density
Profile : Custom
Block Tag :

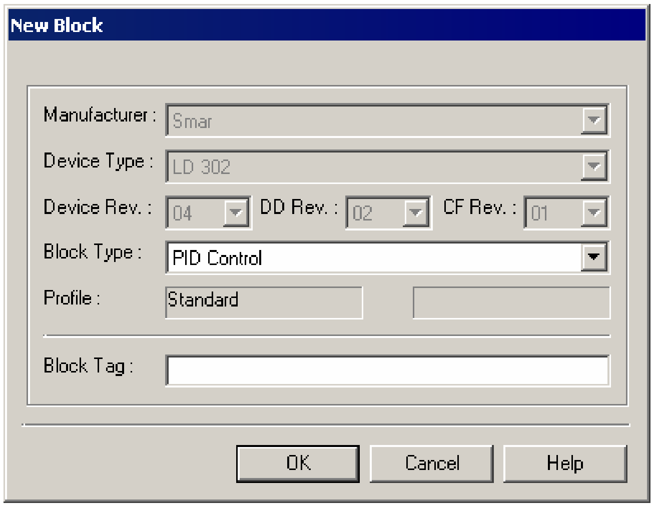
Figure 3.35. New Block Dialog Box

Creating Blocks in the Device

Click the device expansion sign ⊞ to select the VFD icon. Then, right-click the VFD icon and click **New Block**. The **New Block** dialog box will open.

Select a block type and type a related tag for the block. If a new tag is not typed, the tag will be generated according to the **Preferences Settings** of the current configuration.

Click **OK** to conclude.



Manufacturer : Smar
Device Type : LD 302
Device Rev. : 04 DD Rev. : 02 CF Rev. : 01
Block Type : PID Control
Profile : Standard
Block Tag :

Figure 3.36. New Block Dialog Box

NOTE
The *Resource Block* and the *Transducer Blocks* can only be created in the devices or bridges, and they have a different representation from the other blocks. *Resource* and *Transducer Blocks* cannot be moved or attached to the control module or the Strategy window.

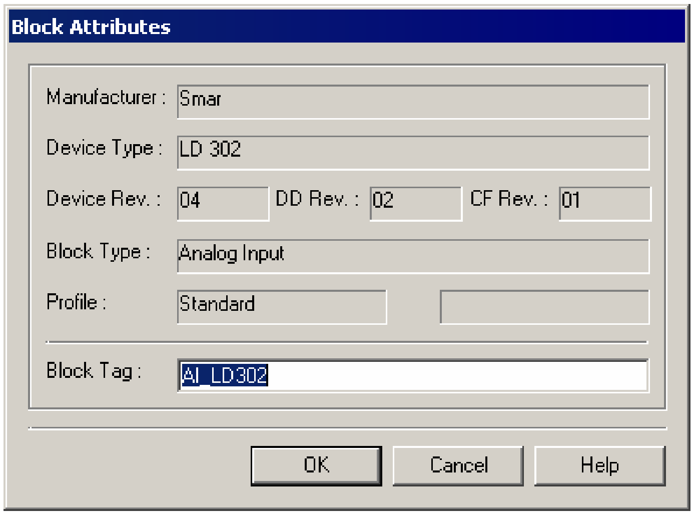
NOTE

When converting a configuration file from an older version, the *Resource* and *Transducer Blocks* will be deleted from the control module and the *Strategy* window.

Changing Block Attributes

The tag is the only block attribute that can be changed.

Right-click the block icon and click the option **Attributes**. Edit the tag and click **Ok** to conclude.



Manufacturer : Smar

Device Type : LD 302

Device Rev. : 04

DD Rev. : 02

CF Rev. : 01

Block Type : Analog Input

Profile : Standard

Block Tag : AI_LD302

Figure 3.37. Block Attributes Dialog Box

Deleting Blocks

Right-click the block icon and click **Delete Block**, or press the **Delete** key on the keyboard.

The warning dialog box will open. Click **Yes** to confirm the operation.

IMPORTANT

When deleting a block from the control module, the block is removed from the device too, and vice-versa, even if it is attached to a fieldbus or drawn at the *Strategy* window. The block will be sent to the **Recycle Bin**, and can be restored to the project if its original fieldbus or control module is not deleted.

If the block being deleted has any trend associated to it, ***Syscon*** will also delete the trends but **only** the block will be sent to the **Recycle Bin**. Restoring the block to the configuration later on will not restore any trend.

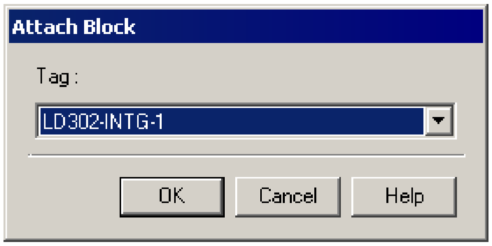
Blocks from *Profibus* and *DeviceNet* devices can not be deleted from the device; they can only be deleted from the *Strategy* window and detached from the control module.

Attaching Blocks to the Control Module

A block can be attached to the control module after being added to the device.

On the *Process Cell* window, right-click the control module icon and click **Attach Block**. The **Attach Block** dialog box will open.

Select the block from the list and click **Ok** to conclude.



Tag : LD302-INTG-1

Figure 3.38. Attach Block Dialog Box

Another easy way to attach blocks to the control module is dragging them from the *Fieldbus* window. Click the block icon on the *Fieldbus* window and hold the mouse button while dragging the block over the control module icon on the *Process Cell* window, then release the mouse button.

You can also click the block icon and drag it to the *Strategy* window. Once you release the mouse button, the block will be attached to the control module at the same time that it is drawn on the *Strategy* window.

Detaching Blocks from the Control Module

A block can only be detached if it exists in the control module and in the device. On the *Process Cell* window, right-click the block icon and click **Detach Block**.

The warning dialog box will open. Click **Yes** to detach the block.

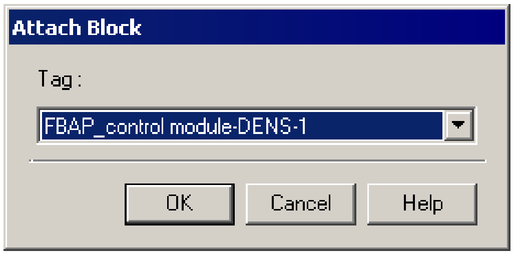
The block is removed from the control module but it still exists on the project, attached to the device.

Attaching Blocks to the Device

If at least one block has been added to the control module, or to another device, that block can be attached to the device.

On the *Fieldbus* window, click the expansion sign ⊞ of the device, right-click the VFD icon and click **Attach Block**. The **Attach Block** dialog box will open.

Select the block from the list and click **OK** to conclude.

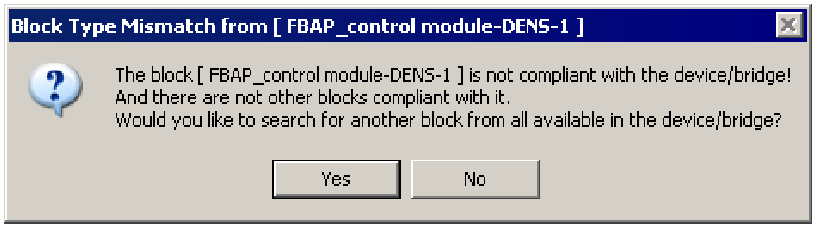


Tag : FBAP_control module-DENS-1

Figure 3.39. Attach Block Dialog Box

Another easy way to attach blocks to the device is dragging them from the *Process Cell* window. Click the block icon on the *Process Cell* window and hold the mouse button while dragging the block over the VFD icon on the *Fieldbus* window, then release the mouse button.

If the block being attached is not compliant with the target device, for example, device of a different type or with a different *Device Revision*, a message box will open alerting the user to search for a compatible block.

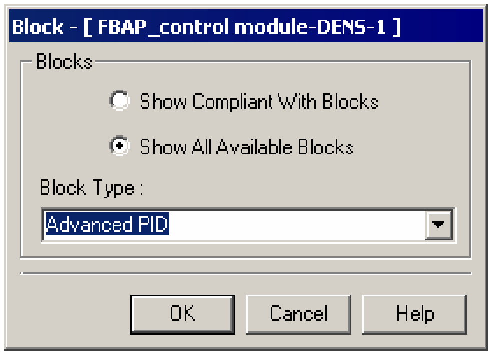


Block Type Mismatch from [FBAP_control module-DENS-1]

The block [FBAP_control module-DENS-1] is not compliant with the device/bridge!
And there are not other blocks compliant with it.
Would you like to search for another block from all available in the device/bridge?

Figure 3.40. Block Inconsistencies

Click **Yes** on this message box and the **Block** dialog box will open:



Block - [FBAP_control module-DENS-1]

Blocks

○ Show Compliant With Blocks

● Show All Available Blocks

Block Type : Advanced PID

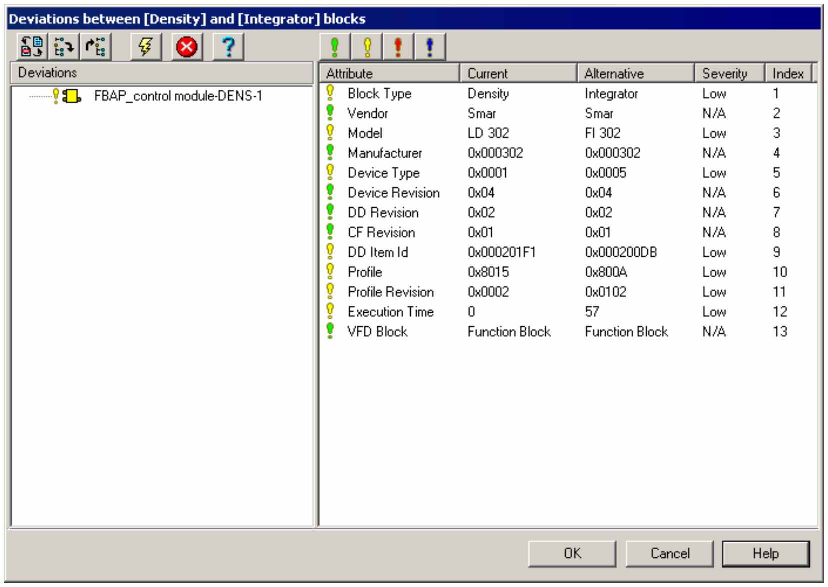
Figure 3.41. Selecting a Compliant Block

Select **Show Compliant With Blocks** to display the list of compatible types of blocks available in the target device, or select **Show All Available Blocks** to display the list of all types of blocks available in the target device.

Then, select the block type from the list and click **Ok** to accept the changes.

NOTE
When you are exchanging a device and the procedure for selecting a compliant block is canceled, the block is deleted from the device. If this block is not attached to a control module, it will be sent to the **Recycle Bin**.

The **Deviation** dialog box will open. Analyze the differences between the original block and the new block and click **Ok** to accept the changes. See the example below:



Deviations between [Density] and [Integrator] blocks

Deviations

FBAP_control module-DENS-1

Attribute	Current	Alternative	Severity	Index
Block Type	Density	Integrator	Low	1
Vendor	Smar	Smar	N/A	2
Model	LD 302	FI 302	Low	3
Manufacturer	0x000302	0x000302	N/A	4
Device Type	0x0001	0x0005	Low	5
Device Revision	0x04	0x04	N/A	6
DD Revision	0x02	0x02	N/A	7
CF Revision	0x01	0x01	N/A	8
DD Item Id	0x000201F1	0x000200DB	Low	9
Profile	0x8015	0x800A	Low	10
Profile Revision	0x0002	0x0102	Low	11
Execution Time	0	57	Low	12
VFD Block	Function Block	Function Block	N/A	13

Figure 3.42. Block Deviations Dialog Box

Detaching Blocks from the Device

A block can only be detached if it exists in the control module and in the device. On the *Fieldbus* window, right-click the block icon and click **Detach Block**.

The warning dialog box will open. Click **Yes** to confirm the operation.

The block is only removed from the device but it still exists on the project, attached to the control module.

Blocks from *Profibus* and *DeviceNet* devices can not be detached from the device.

Moving Blocks

You can drag a block from one control module to another, from one device to another, in the same *Process Cell* or *Fieldbus* window or between different windows. This procedure is similar to the **Attach Block** procedure.

Before dragging a block from one window to the other, remember to tile the windows to facilitate the process. In the **Window** menu, click **Tile**.

NOTE
When a block is moved between control modules or devices, its tag will be updated according to the **Preferences** set by the user. To prevent undesired changes, select the option **Default** for the automatic block tag generation in the **Preferences** dialog box.

If the block is moved to a device of a different type or with a different *Device Revision*, this block may not be available in the target device. In this case, a message box will open alerting the user to search for a compatible block. See section **Attaching Blocks to the Device**.

Ordering Blocks

The blocks can be organized only in the Fieldbus window to define the download sequence. The download sequence can also be defined ordering devices and parameters on the *Fieldbus* window.

Select the block icon and drag it over another block icon. The selected block will be placed above the other one on the configuration tree.

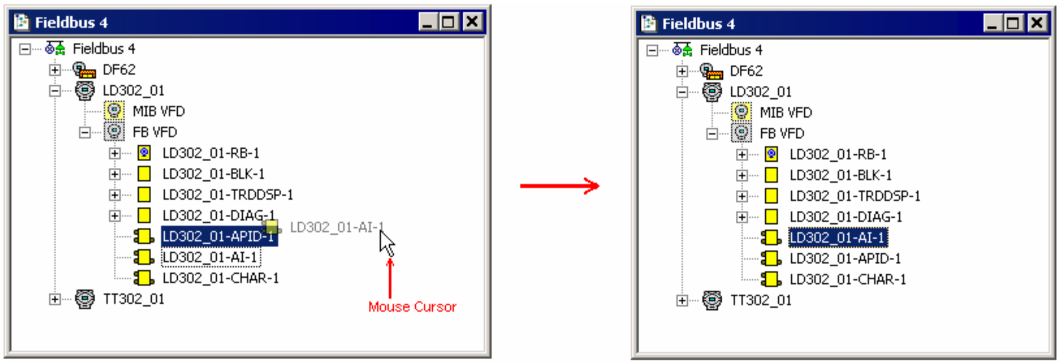


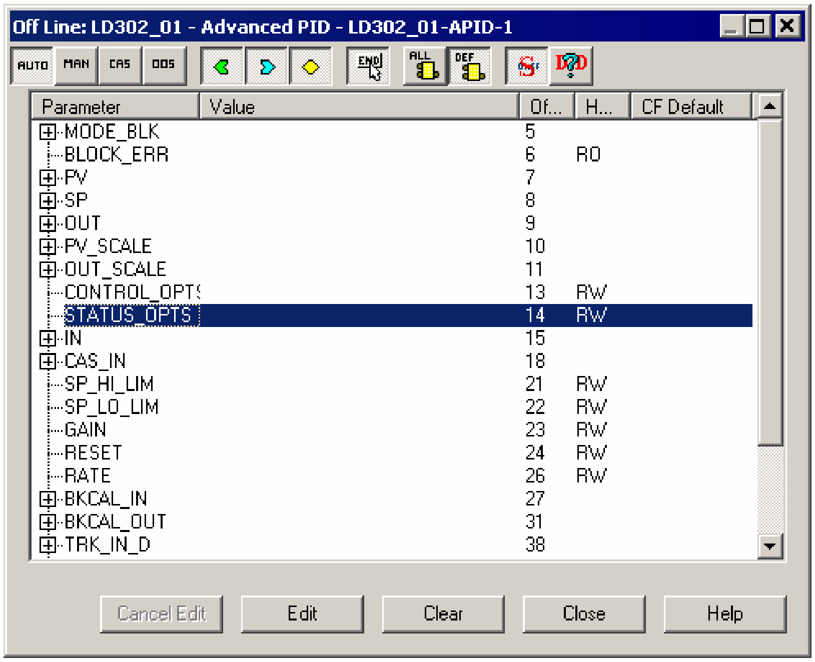
Figure 3.43. Ordering Blocks at the Fieldbus Window

Block Off Line Characterization

You can configure the value of the parameters in the **Characterization** dialog box.

ATTENTION
If ***Syscon*** is operating in **offline** mode, double-click the block icon to open the **Off Line Characterization** dialog box. When ***Syscon*** is in **online** mode, double-clicking the block icon will open the **On Line Characterization** dialog box.

Select the block to be parameterized, right-click its icon and click **Off Line Characterization**.



Parameter	Value	Of...	H...	CF Default
⊞ MODE_BLK		5		
BLOCK_ERR		6	RO	
⊞ PV		7		
⊞ SP		8		
⊞ OUT		9		
⊞ PV_SCALE		10		
⊞ OUT_SCALE		11		
CONTROL_OPTS		13	RW	
STATUS_OPTS		14	RW	
⊞ IN		15		
⊞ CAS_IN		18		
SP_HI_LIM		21	RW	
SP_LO_LIM		22	RW	
GAIN		23	RW	
RESET		24	RW	
RATE		26	RW	
⊞ BKCAL_IN		27		
⊞ BKCAL_OUT		31		
⊞ TRK_IN_D		38		

Figure 3.44. Off Line Characterization Dialog Box

You can sort the parameters by clicking the column header on the **Off Line Characterization** dialog box. Clicking the column header will toggle between ascendant and descendent sorting.

On the **Characterization** toolbar, click to list all parameters or click to list the parameters defined by type. See section **Customizing the Parameters List**.

Right-click the area at the bottom of the **Characterization** dialog box to open the menu and select specific types of parameters and non-default columns to be displayed in this dialog box. See section **Characterization Toolbar** for details.

To edit the value of the parameter, click its line and click the button **Edit** at the bottom of the **Characterization** dialog box. After editing the **Value** column, click the button **End Edit** to confirm the changes to the parameter. If the values edited into the parameter are incorrect or don't have to be changed, click **Cancel Edit** and they will return to the previous value.

Click **Clear** to clear the value typed for the highlighted parameter. If the parameter is not part of a link in the *Strategy* window, it will be removed from the configuration.

After finishing editing the parameters, click **Close** to exit the **Characterization** dialog box.

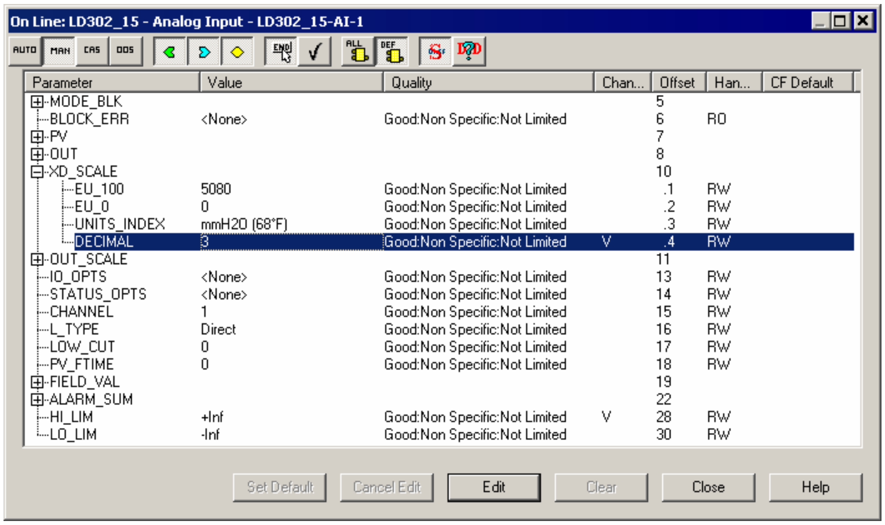
For further information about the parameter from the blocks manufactured by **SMAR**, please refer to the **Function Blocks Instruction Manual**.

Block On Line Characterization

The **Online Characterization** changes the block parameter values directly in the devices.

ATTENTION
Syscon must be in **online** mode, but if the communication is not online, you can click the option **On line Characterization** from the block menu and the communication will be initialized only for the selected block.

If ***Syscon*** is communicating to the plant, right-click the block icon and click **On Line Characterization**. The **On Line Characterization** dialog box will open.



Parameter	Value	Quality	Chan...	Offset	Han...	CF Default
⊞ MODE_BLK				5		
BLOCK_ERR	<None>	Good:Non Specific:Not Limited		6	RO	
⊞ PV				7		
⊞ OUT				8		
⊟ XD_SCALE				10		
EU_100	5080	Good:Non Specific:Not Limited		.1	RW	
EU_0	0	Good:Non Specific:Not Limited		.2	RW	
UNITS_INDEX	mmH2O (68°F)	Good:Non Specific:Not Limited		.3	RW	
DECIMAL	3	Good:Non Specific:Not Limited	V	.4	RW	
⊞ OUT_SCALE				11		
IO_OPTS	<None>	Good:Non Specific:Not Limited		13	RW	
STATUS_OPTS	<None>	Good:Non Specific:Not Limited		14	RW	
CHANNEL	1	Good:Non Specific:Not Limited		15	RW	
L_TYPE	Direct	Good:Non Specific:Not Limited		16	RW	
LOW_CUT	0	Good:Non Specific:Not Limited		17	RW	
PV_FTIME	0	Good:Non Specific:Not Limited		18	RW	
⊞ FIELD_VAL				19		
⊞ ALARM_SUM				22		
HI_LIM	+Inf	Good:Non Specific:Not Limited	V	28	RW	
LO_LIM	-Inf	Good:Non Specific:Not Limited		30	RW	

Figure 3.45. On Line Characterization Dialog Box

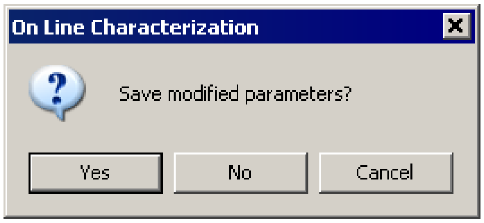
Use the same procedure described above for the **Off Line Characterization** to edit the parameters values. If any parameter is altered, the changes are also applied in the corresponding device.

The parameters that were edited will be marked with a **V** in the **Changed** column.

To save a parameter value that has not been edited, click the button **Mark to save** ✓ on the **Characterization** toolbar. The parameter will be marked with a **V** in the **Changed** column. Or use the **Mark to save** button to unmark a parameter whose value has been changed but the changes are not to be saved.

The **CF Default Value** column shows the default parameter values defined by the device manufacturer in the *Capabilities File*. To apply the default value to a parameter, select the parameter in the **On Line Characterization** dialog box and click the button **Set Default**. The button **Set Default** is only available in the **On Line Characterization** dialog box and for parameters defined as **read/write**.

Click **Close** to exit the **Characterization** dialog box, and the following dialog box will open:



Save modified parameters?

Figure 3.46. Save Parameters Dialog Box

Click **Yes** to save the changes to the configuration file and close the **Characterization** dialog box.

FFB Blocks

The feature for creating FFB blocks is only available in ***Syscon*** version 6.1 on, working in *Multi-User* or *Stand Alone* mode.

IMPORTANT
Do not add FFB blocks and HC blocks to the same bridge. Otherwise, it will cause a conflict in the ***LogicView*** configuration. Refer to the **LogicView User's Manual** for further information on how to create FFB templates and logics.

Creating FFB Blocks

Right-click the control module icon (or the FB VFD icon of the bridge) and click the option **New Block**. The **New Block** dialog box will open.

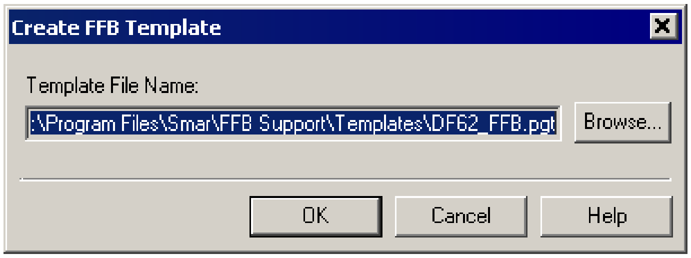
Select the type of the FFB block from the list and type a related tag for the block. If you do not type the tag, the tag will be generated according to the **Preferences Settings** of the current configuration.

Click **Ok** to conclude.

Creating FFB Templates

You can create a *FFB Template* from an instance of a FFB block included in the configuration project, to be used in another configuration.

Right-click the FFB block icon and click **Create Template**. The **Create FFB Template** dialog box will open.



Template File Name: :\Program Files\Smar\FFB Support\Templates\DF62_FFB.pgt

Figure 3.47. Create FFB Template Dialog Box

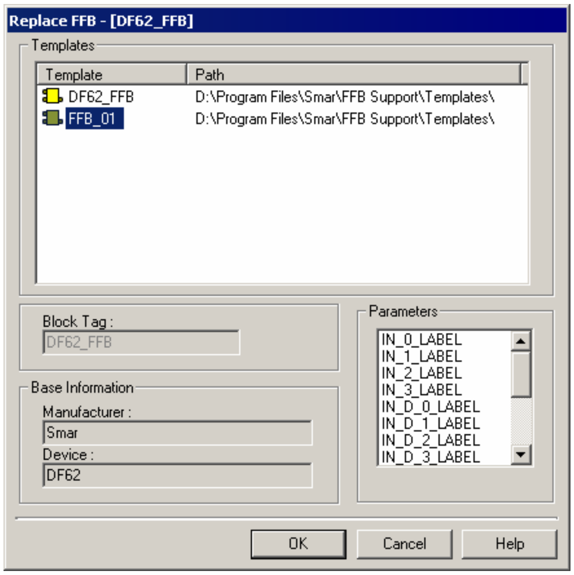
By default, the block tag is used as the name of the template file and the default file path is *C:\Program Files\Smar\FFB Support\Templates\*. Click **Browse** to type or select another name for the file. It is not possible to change the default file path.

Click **Ok** and a message box will open indicating if the template was successfully created. Click **Ok** to close the message box and return to ***Syscon***.

Replacing FFB Blocks

To replace the FFB block included in the project configuration by another FFB block template, right-click the FFB block icon and click **Replace**. The **Replace FFB** dialog box will open.

Click the template name in the list of templates available and the information related to the manufacturer, the device and the configured parameters will be displayed. The block tag cannot be changed.



Replace FFB - [DF62_FFB]

Templates

Template	Path
DF62_FFB	D:\Program Files\Smar\FFB Support\Templates\
FFB_01	D:\Program Files\Smar\FFB Support\Templates\

Block Tag : DF62_FFB

Base Information

Manufacturer : Smar

Device : DF62

Parameters

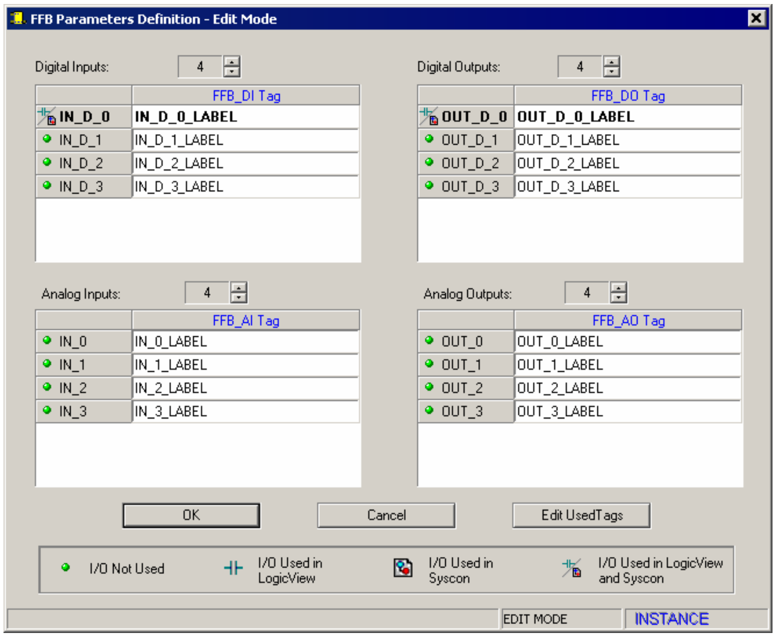
IN_0_LABEL
IN_1_LABEL
IN_2_LABEL
IN_3_LABEL
IN_D_0_LABEL
IN_D_1_LABEL
IN_D_2_LABEL
IN_D_3_LABEL

Figure 3.48. Replacing the FFB Block

Select the FFB template to replace the FFB block in the configuration and click **Ok** to conclude.

Defining Parameters for the FFB Block

To define the parameters for the FFB block, right-click the FFB block icon and click **Define Parameters**. The **FFB Parameters Definition** dialog box will open.



FFB Parameters Definition - Edit Mode

Digital Inputs: 4

	FFB_DI Tag
IN_D_0	IN_D_0_LABEL
IN_D_1	IN_D_1_LABEL
IN_D_2	IN_D_2_LABEL
IN_D_3	IN_D_3_LABEL

Digital Outputs: 4

	FFB_DO Tag
OUT_D_0	OUT_D_0_LABEL
OUT_D_1	OUT_D_1_LABEL
OUT_D_2	OUT_D_2_LABEL
OUT_D_3	OUT_D_3_LABEL

Analog Inputs: 4

	FFB_AI Tag
IN_0	IN_0_LABEL
IN_1	IN_1_LABEL
IN_2	IN_2_LABEL
IN_3	IN_3_LABEL

Analog Outputs: 4

	FFB_AO Tag
OUT_0	OUT_0_LABEL
OUT_1	OUT_1_LABEL
OUT_2	OUT_2_LABEL
OUT_3	OUT_3_LABEL

Figure 3.49. Defining Parameters

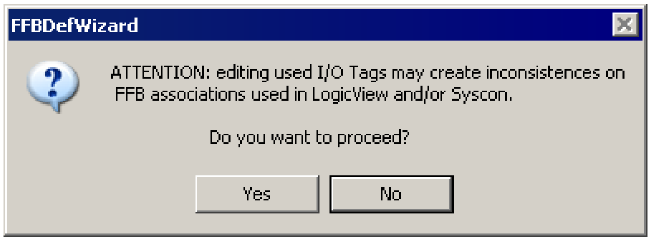
Select the numbers of input and output parameters. You can change the tag of the parameters clicking the **FFB Tag** column of each parameter.

IMPORTANT
If you change the name of a parameter configured in the FFB block using the **Define Parameters**, the parameter will be deleted. If this parameter is linked to other(s) parameter(s), the links of the FFB block will be lost.

The **Define Parameters** tool indicates the status of the FFB inputs and outputs, according to their icons:

Not Used	the parameter is not being used and can be edited.
Used in LogicView	the parameter is associated in a FFB logic used in ***LogicView*** and the tag is not available for edition.
Used in Syscon	the parameter is being used in the control module in ***Syscon*** and the tag is not available for edition.
Used in LogicView and Syscon	the parameter is being used in the control module in ***Syscon*** and it is associated in a FFB logic used in ***LogicView***. The tag is not available for edition.

To edit the parameters that are being used in a control module or logic, and therefore were not available for edition, click the button **Edit Used Tags**. A message box will warn you that the **Define Parameters** tool will unlock the inputs and outputs for edition.



ATTENTION: editing used I/O Tags may create inconsistences on FFB associations used in LogicView and/or Syscon.

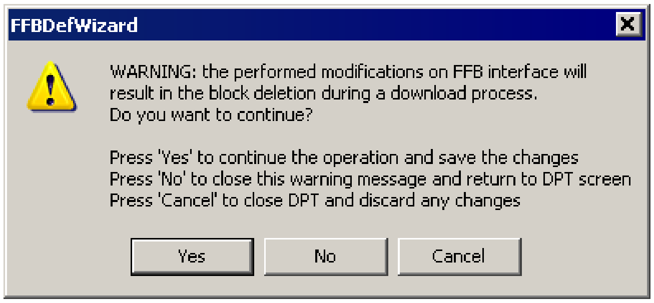
Do you want to proceed?

Figure 3.50. Editing used tags

Click **Yes** to continue and the status of the I/O points will change to **Not Used** ●.

ATTENTION
Editing tags that were already being used in ***LogicView*** or ***Syscon*** may cause inconsistencies. Blocks links may be removed from ***Syscon*** or variables may be deleted from the FFB internal logic.

After editing the parameters, click **Ok** in the **FFB Parameters Definition** dialog box and a warning box will open.



WARNING: the performed modifications on FFB interface will result in the block deletion during a download process.
Do you want to continue?

Press 'Yes' to continue the operation and save the changes
Press 'No' to close this warning message and return to DPT screen
Press 'Cancel' to close DPT and discard any changes

Figure 3.51. Confirming the alterations

Click **Yes** to save the changes and the links between the parameters are automatically included in the configuration file.

In that warning box, click **No** to return to the **FFB Parameters Definition** dialog box and continue editing the parameters. If you click **Cancel**, the **FFB Parameters Definition** dialog box will be closed and the changes will be discarded.

NOTE
It is recommended to download the configuration to the bridge or controller where the modified FFB block is attached to prevent inconsistencies in the plant.

Viewing and Editing the Logic for the FFB Block

To view the ladder logic associated to the FFB block, right-click the FFB block icon and select the option **View Logic**. The ***LogicView for FFB*** application will open in *View Mode* and no alterations can be made.

To create or edit the logic for the FFB block, right-click the FFB block icon and select the option **Edit Logic**. The ***LogicView for FFB*** application will open the FFB configuration to be edited. Edit the configuration and save the alterations.

ATTENTION
If the logic is being edited by any user, the option **Edit Logic** will not be available.

Close the ***LogicView*** application to return to ***Syscon***.

Refer to the **Logic View User's Manual** for further information on how to edit the logic for the FFB Block.

Trends

A *Trend* is a parameter configured to transmit, at customized intervals, its value to a server, which consolidates the information providing historic reports from the parameter behavior.

Only input or output parameters from Function Blocks and Flexible Function Blocks can be configured as *Trends*.

A *Fieldbus Foundation* device supports a limited number of trends, and the type of each trend can be: **Float**, **Discrete** or **BitString**.

The number of trends supported in a device is defined in the device's *Capabilities File*, on the following section:

```
[VFD <i> OD Directory]
NumberOfTrendObjectsInTheVfd = <n>
```

Where:
<i> is the VFD number;
<n> is the number of trends for the device.

For each trend, there must be a section indicating the trend type, as described below:

```
[VFD <i> Trend Object Usage <n>]
TrendType = <type>
```

Where:
<i> is the VFD number;
<n> is the trend number (between 1 and *NumberOfTrendObjectsInTheVfd*);
<type> indicates FLOAT, DISCRETE or BITSTRING.

Therefore, if a device has 3 trends (`NumberOfTrendObjectsInTheVfd = 3`), there should be 3 sections `[VFD <i> Trend Object Usage <n>]`, one section for each trend.

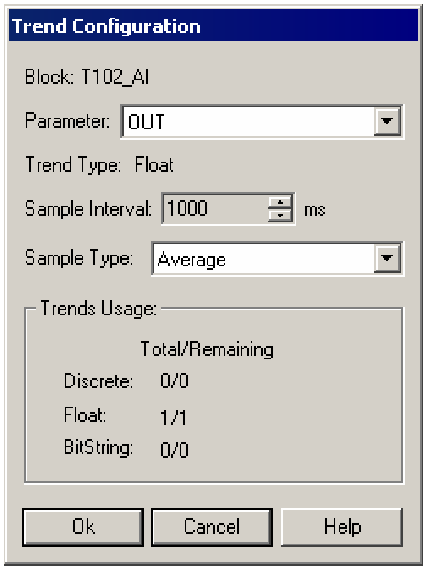
IMPORTANT

The section `[VFD <i> Trend Object Usage <n>]` is mandatory for *Capabilities File Version 1.6 or higher*.

If the *Capabilities File* from a device indicates only the total number of trends (through the *Capabilities File* key **NumberOfTrendObjectsInTheVfd**) and not the types for the trends (through the *Capabilities File* key **TrendType**), ***Syscon*** will consider that only **ONE** Float Trend is available.

Creating a Trend

The trend can only be created in the *Fieldbus* window. Right-click the block icon and click **New Trend**. The **Trend Configuration** dialog box will open.



Trend Configuration

Block: T102_AI

Parameter: OUT

Trend Type: Float

Sample Interval: 1000 ms

Sample Type: Average

Trends Usage:

	Total/Remaining
Discrete:	0/0
Float:	1/1
BitString:	0/0

Figure 3.52. Trend Configuration dialog box

Select the input or output parameter from the **Parameter List**. The **Trend Type** box shows the type of the selected input or output parameter.

At the **Sample Interval** box, select the trend's transfer interval in milliseconds. The minimum value is the value of the macrocycle from the device's upstream Fieldbus.

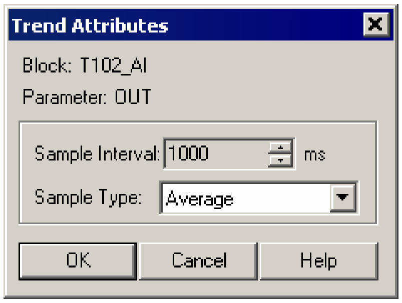
Select the **Sample Type**. The **Sample Type** is only available for *Float* trends and it determines how the float trend is transmitted.

The **Trends Usage** box shows the information related to how many trends are supported and used by the device.

Click **Ok** to conclude and the new node will be displayed in the *Fieldbus* window.

Changing the Trend attributes

Right-click the trend icon and select the option **Attributes**. The **Trend Attributes** dialog box will open.



Block: T102_AI
Parameter: OUT
Sample Interval: 1000 ms
Sample Type: Average

Figure 3.53. Trend Attributes dialog box

Select the **Sample Interval** and the **Sample Type** (only available for *Float* trends).

Click **Ok** to conclude.

Deleting the Trend

Right-click the trend icon and select **Delete Trend**, or press the **Delete** key on the keyboard. A warning box will open.

Click **Yes** to confirm the operation.

ATTENTION
When a trend is deleted it is not sent to the **Recycle Bin**, and therefore cannot be restored to the project. When a device is exchanged or a Flexible Function Block is replaced, ***Syscon*** checks if there are trends attached to the device or related to the FFB block. If the parameters the trends were based on were deleted, the trends will also be deleted. If a trend is associated to a block and this block is deleted, ***Syscon*** will also delete the trend and send only the block to the **Recycle Bin**. Restoring the block from the **Recycle Bin** will not restore the trend.

Generating the Trend Information File

The configuration related to trends is consolidated in the **TrendInfo.ini** file locate at the default path *C:\Program Files\Smar\OleServers*.

Syscon generates this file when the **Export Tags** procedure is executed.

Right-click the plant icon and select **Export Tags**. Click **Ok** on the **Browse** dialog box to save the file in the default path.

Parameters

Editing Parameter Tags

Parameter tags provide a symbolic reference to define inputs, outputs, and data that control the function block operation. Those tags are previously defined by the device’s manufacturer, but you can create a customized reference for the parameters configured in your project file.

By default, the tags defined by the device’s manufacturer are displayed in the *Process Cell*, *Fieldbus* and the *Strategy* window. But according to the preferences set in the **Parameter** tab, in the **Preferences** dialog box, the tags defined by the user, or both the tags defined by the manufacturer and the user, can be displayed in the *Process Cell*, *Fieldbus* and the *Strategy* window. See section **Preferences** for details.

Consider the following example: the block **Advanced PID** was added to the **LD302** device.

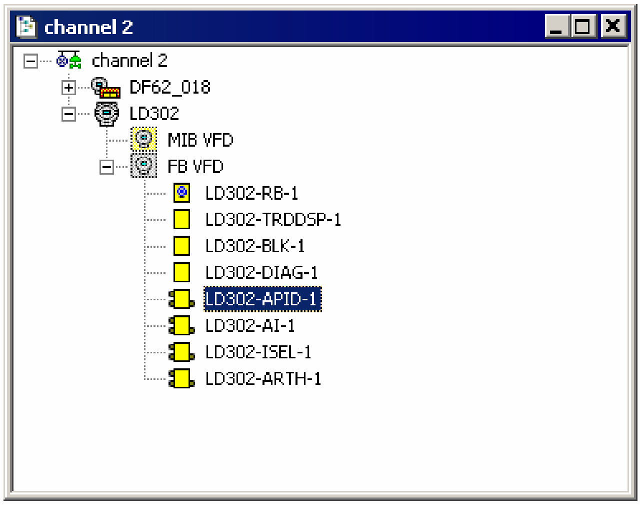
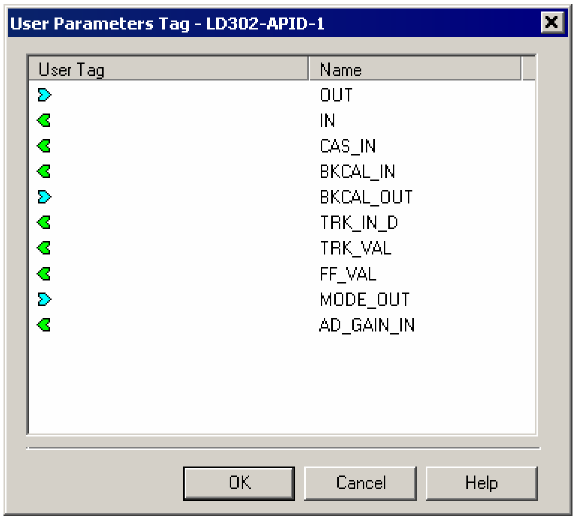


Figure 3.54. Example

Right-click the block icon (in the *Process Cell*, *Fieldbus* or *Strategy* window) and click **Edit User Parameter Tags**. The **User Parameter Tag** dialog box will open.

The following figure shows the **User Parameter Tag** dialog box for the **Advanced PID** block. Different blocks will have different parameter tags available for edition.

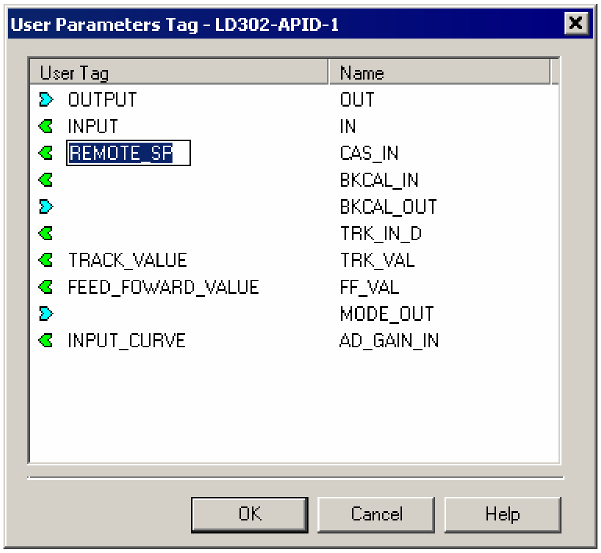


User Tag	Name
▷	OUT
◁	IN
◁	CAS_IN
◁	BKCAL_IN
▷	BKCAL_OUT
◁	TRK_IN_D
◁	TRK_VAL
◁	FF_VAL
▷	MODE_OUT
◁	AD_GAIN_IN

Figure 3.55. User Parameter Tag dialog box

Right-click the parameter icon on the **User Tag** column and click **Edit**. Type the custom tag and press **Enter** on your keyboard. Do not use blank spaces!

See the example below:

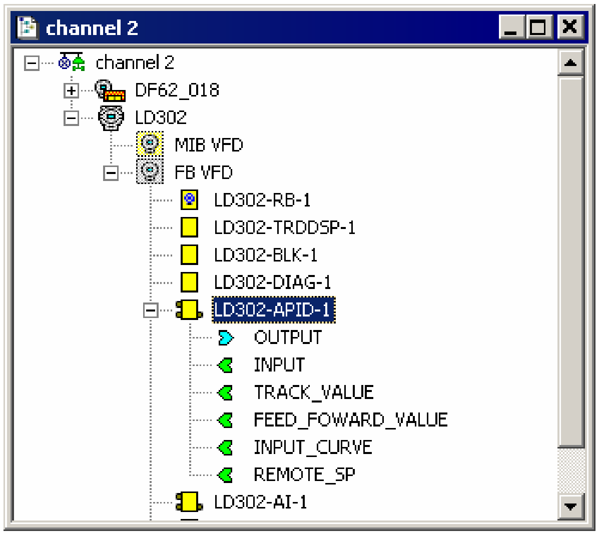

User Parameters Tag - LD302-APID-1

User Tag	Name
OUTPUT	OUT
INPUT	IN
REMOTE_SP	CAS_IN
	BKCAL_IN
	BKCAL_OUT
	TRK_IN_D
TRACK_VALUE	TRK_VAL
FEED_FOWARD_VALUE	FF_VAL
	MODE_OUT
INPUT_CURVE	AD_GAIN_IN

Figure 3.56. Custom Parameter Tags

After editing the parameter tags, click **Ok** to close the **User Parameter Tag** dialog box.

According to the **Parameter Preferences** set by the user, the *Fieldbus* window will show the parameter tags *defined by the user*, and the example above will look like the following figure:


channel 2

- channel 2
  - DF62_018
  - LD302
    - MIB VFD
    - FB VFD
      - LD302-RB-1
      - LD302-TRDDSP-1
      - LD302-BLK-1
      - LD302-DIAG-1
      - LD302-APID-1
        - OUTPUT
        - INPUT
        - TRACK_VALUE
        - FEED_FOWARD_VALUE
        - INPUT_CURVE
        - REMOTE_SP
      - LD302-AI-1

Figure 3.57. Parameter tags defined by the user

If the option **Both - FF Name (User Tag)** is selected in the **Parameter Preferences** dialog box, the tags of the parameters defined by the device manufacturer will be followed by the tag defined by the user in parentheses, as in the following figure:

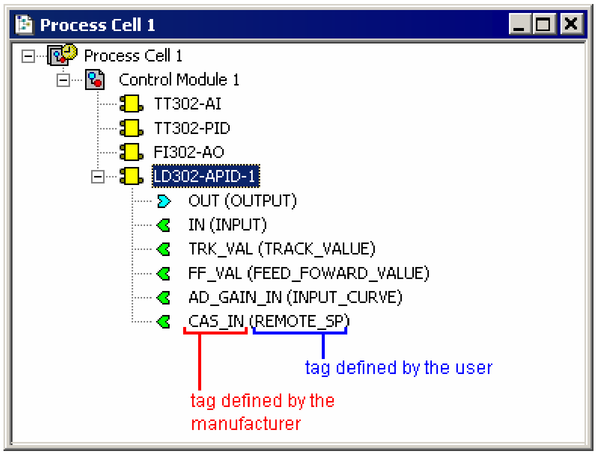


Figure 3.58. Parameter tags defined by the user

Customizing the Parameters List

You can customize the list of parameters displayed in the **Characterization** dialog box.

Right-click the block icon and click **Customize Characterization**. The **Customization** dialog box will open.

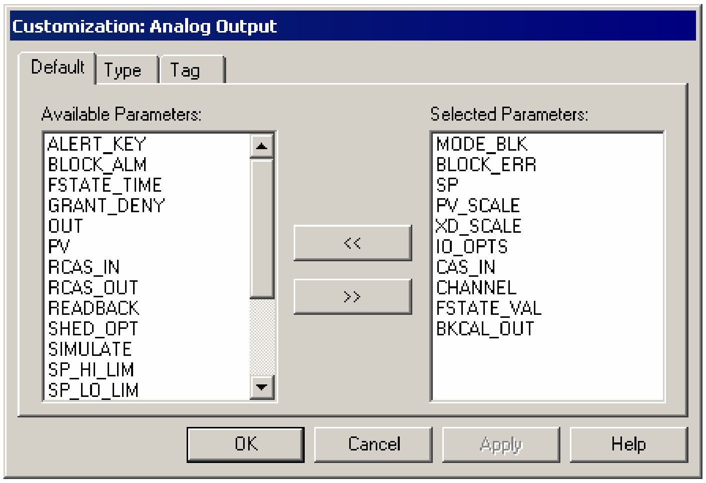


Figure 3.59. Customization Dialog Box

At the **Default** tab, select the parameters that are shown for the block from the same type as the one selected, when you click the **Customization by Type (Default)** button on the **Characterization** toolbar. This customization will affect all project configurations.

At the **Type** tab, select the parameters that are shown for the block from the same type as the one selected, when you right-click the bottom of the **Characterization** dialog box and mark the option **Type**. This customization will affect just the current configuration.

At the **Tag** tab, select the parameters that are shown just for the block selected, when you right-click the bottom of the **Characterization** dialog box and mark the option **Tag**. This customization will affect just the current configuration.

To include a parameter on the list, select the parameter on the **Available Parameters** box and click >>.

To exclude a parameter from the list, select the parameter on the **Selected Parameters** box and click <<.

Click **Ok** to apply all changes made to the list of selected parameter and close the **Customization** dialog box.

ATTENTION
The **Apply** button does not close the **Customization** dialog box but applies all changes made to the list of selected parameter, therefore clicking **Cancel** to discard the alterations on the **Customization** dialog box after clicking **Apply** will not undo the alterations since they have already been accepted.

Ordering Parameters

Block parameters can be ordered on the *Process Cell* or the *Fieldbus* window.

Select the parameter icon and drag it over the other parameter icon. The selected parameter will be placed above the other one on the list.

The changes made to the parameter list on the *Process Cell* window will be reflected on the *Fieldbus* window, and vice-versa.

Deleting Parameters

To remove a block parameter, right-click the parameter icon and click **Delete Parameter**, or press the **Delete** key on the keyboard.

The warning dialog box will open. Click **Yes** to confirm the operation.

ATTENTION
Parameters from *Profibus* and *DeviceNet* devices can not be deleted.

Strategies

Creating Strategies

There is a *Strategy* window for every control module. Right-click the control module icon and click **Strategy**, or double-click the control module icon.

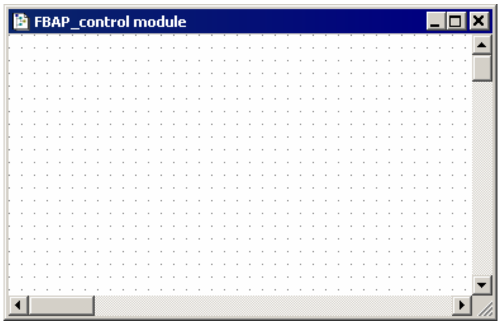


Figure 3.60. Strategy Window

Use the same procedure to open an existing Strategy.

Saving Strategies

Click on the *Strategy* window in case the focus is on another window and click **Save** on the main toolbar. Anytime the drawing is changed, do not forget to save it.

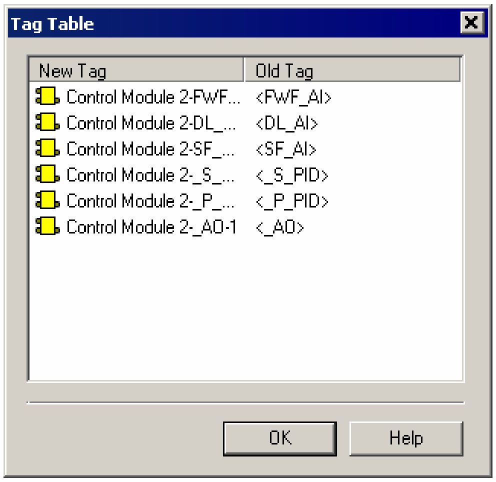
Importing a Template into the Strategy window

Open the *Strategy* window and click **Import Strategy Template** on the **Strategy** toolbar. The **Open** dialog box will open.

In the **Look in** box, select the folder that contains the desired template file. Double-click the template file icon to import the strategy.

The template drawing will be added to the *Strategy* window. Click **Ok** to confirm the import procedure.

The **Tag Table** dialog box will show the list with the new block tags, based on the preferences settings, and the old block tags, used in the template file. See the example below:



New Tag	Old Tag
Control Module 2-FWF...	<FWF_AI>
Control Module 2-DL_...	<DL_AI>
Control Module 2-SF_...	<SF_AI>
Control Module 2-_S_...	<_S_PID>
Control Module 2-_P_...	<_P_PID>
Control Module 2-_AO-1	<_AO>

Figure 3.61. Tag Table Dialog Box

To edit a tag, right-click the block icon at the **New Tag** column and click **Rename**. Type the new tag and click **Enter** on the keyboard. Click **Ok** to close the **Tag Table** dialog box.

The blocks, links and parameters will be attached to the corresponding control module.

NOTE
From ***Syscon*** version 5.20 on, the block created or imported from a template file in the *Strategy* window is automatically attached to the corresponding control module. If you are opening a configuration file from a previous version of ***Syscon*** and this file contains block templates in the Strategy, these blocks will appear in the *Strategy* window but will not be attached to the control module. Right-click the block in the *Strategy* window and select the option **Attach to Model**.

Exporting a Template from the Strategy window

Open the *Strategy* window and select the blocks and links that will be included in the template file, using the **Select** tool .

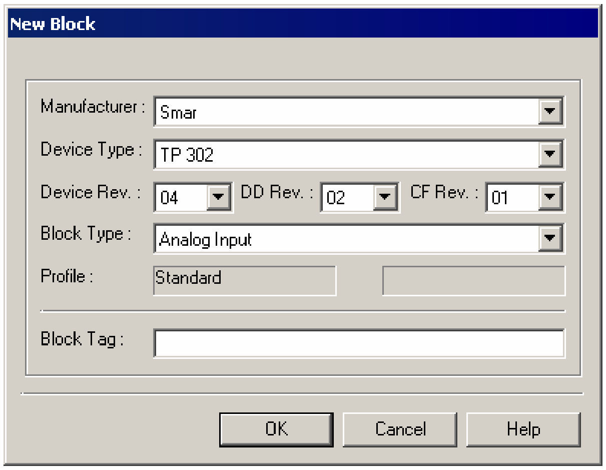
Click **Export Selected Strategy as Template** on the **Strategy** toolbar. The **Save As** dialog box will open. In the **Save in** box, select the folder where the template file will be saved. It is recommended to save templates files in the default folder, in the ***Syscon*** installation directory. The default path is *C:\Program Files\Smar\Syscon\Templates*.

Type the name for the template in the **File Name** box and click **Save** to conclude. The selected *Strategy* will be saved in a file and it can be used in another project configuration.

Adding Blocks to the Strategy

On the **Strategy** toolbar, click the button **Function Block** . Then, click the drawing area and the **New Block** dialog box will open.

Select the *Block Manufacturer* from the list and the *Device Type* provided by the selected manufacturer. Select the *Block Type* and type a related tag for the block. If a new tag is not typed, the tag will be generated according to the **Preferences Settings** of the current configuration.



Manufacturer : Smar
Device Type : TP 302
Device Rev. : 04 DD Rev. : 02 CF Rev. : 01
Block Type : Analog Input
Profile : Standard
Block Tag :

Figure 3.62. Adding a Block in the Strategy Window

Click **Ok** to conclude.

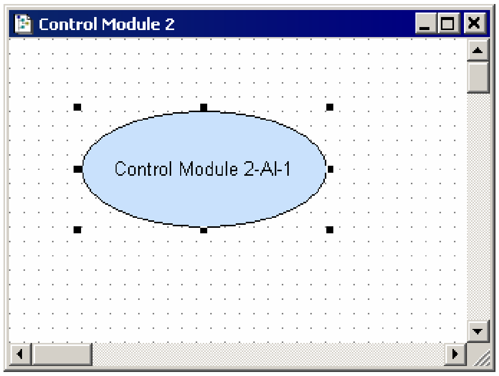


Figure 3.63. New Block in the Strategy Window

After adding at least one block, use the popup menu to add other blocks from the same manufacturer and from the same device type. Click the button **Function Block** and right-click the drawing area. Select the type of the block from the list and the new block will be drawn on the *Strategy* window.

Dragging Blocks to the Strategy window

Select the block icon on the *Process Cell* or *Fieldbus* window and hold the mouse button down while dragging the block to the drawing area of the *Strategy* window. If the block is dropped too close to another block already added to the *Strategy* window, the block will not be drawn.

You can create more than one graphical representation of the block in the *Strategy* window by dragging the block icon, but only one block is attached to the control module.

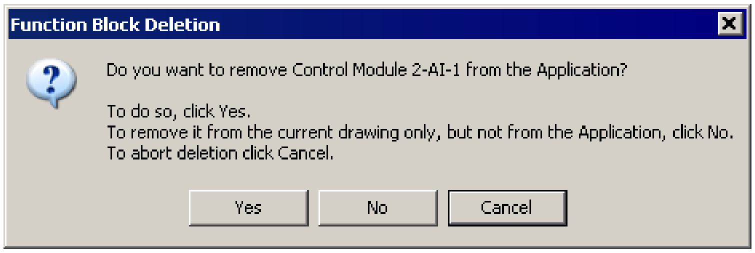
Remember that you can display the windows side by side to organize the windows and make them easy to be used: go to the **Window** menu and click **Tile**, and it will organize the windows opened inside the application.

Removing Blocks from the Strategy

Be very careful when removing a block from the *Strategy* window! You can remove the block only from the *Strategy* window or from the project.

Click **Select** on the **Strategy** toolbar and select the block to be removed from the *Strategy* window. Right-click the block and click **Delete** from the menu or press **Delete** on the keyboard.

The **Function Block Deletion** dialog box will open. If more than one block is selected, this dialog box will open to confirm the deletion of each block. Observe the following figure:



Do you want to remove Control Module 2-AI-1 from the Application?

To do so, click Yes.
To remove it from the current drawing only, but not from the Application, click No.
To abort deletion click Cancel.

Figure 3.64. Function Block Deletion

Click **Yes** to remove the block from the project. **Attention!** Clicking this button will remove the block from the *Strategy* window, from the control module and from the device. You will lose the block parameters and links.

Click **No** to remove the block only from the *Strategy* window. Later on, you can drag the block again and restore the links. See section **Restoring Links**. If the block is not to be deleted, click **Cancel**.

To delete all objects from the *Strategy* window, press **Ctrl+Del** on the keyboard.

Selecting Objects at the Strategy Window

- To select a single object, click **Select** on the **Strategy** toolbar and click the object.
- To select two or more objects, click **Select** on the **Strategy** toolbar, click the drawing area and hold the mouse button down while dragging a rubber band around the objects. Or click each object on the *Strategy* window while holding down the **Shift** key on the keyboard.
- To select all objects, press **Ctrl+A** on your keyboard.

Changing Blocks Appearance

Changing the Block Tag

Click the button **Strategy Modify** on the **Strategy** toolbar and click the block label. Type the new tag and click the drawing area to exit the edit mode.

The new tag will automatically change in the *Process Cell* window.

Changing Block Dimension Attributes

Click **Select** on the **Strategy** toolbar. Right-click the block on the drawing area and click the option **Same Width and Height** from the menu.

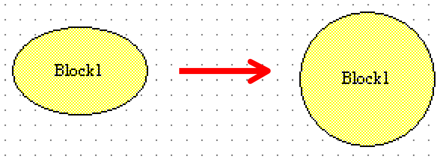


Figure 3.65. Changing Block Dimension

Showing Block Types

Click **Select** on the **Strategy** toolbar. Right-click the block on the drawing area and click the option **Show Info** from the menu.

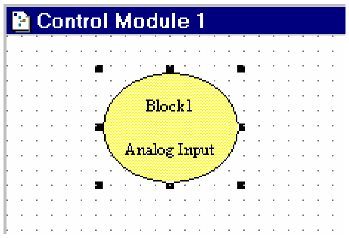
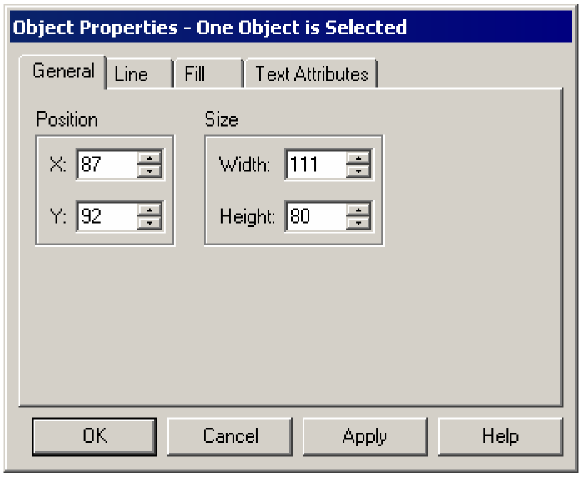


Figure 3.66. Showing Block Type

Changing Block Properties

Click **Select** on the **Strategy** toolbar. Right-click the block on the drawing area and click the option **Properties**. The **Object Properties** dialog box will open.


Object Properties - One Object is Selected

Position
X: 87
Y: 92

Size
Width: 111
Height: 80

Figure 3.67. Object Properties Dialog Box

You can change different properties at each tab. See section **Object Properties** for details.

Click **Ok** to close the dialog box and return to the *Strategy* window.

Changing the Block Default Format

The default format for blocks is the ellipse. To change the default format, go to the **Option** menu, select **Function Block Icon** and click one of the available formats: **rectangle**, **rounded rectangle** or **ellipse**.

The next figure shows the different block formats:

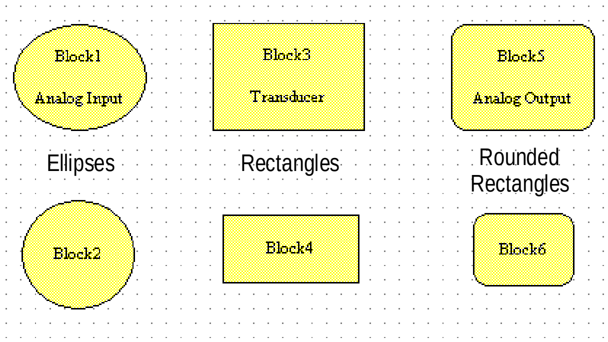


Figure 3.68. Block Formats

You can also define the block default format on the **Strategy Preferences** dialog box. See section **Strategy Preferences**.

Block Links

Graphical Representation for Links

Links between blocks can be graphically represented in four different formats, according to the physical localization of the field devices which contain the blocks connected in the strategy window.

- ***Internal Link***: this link is represented by a solid line and indicates the connection between function blocks from a single field device.

  The example below shows the graphical representation of an internal link between the blocks **TT302_AI** and **TT302-PID-1** from the device **TT302**.

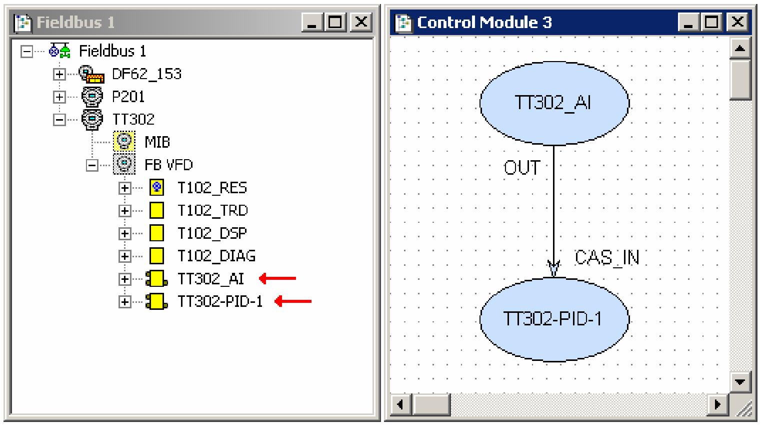


Figure 3.69. Example of Internal Link

- ***External Link***: this link is represented by a solid line and indicates the connection between function blocks from different field devices which are connected through the same bridge.

  The example below shows the graphical representation of an external link between the block **P201-AI** from the device **P201** and the block **TT302-PID-1** from the device **TT302**. The field devices are connected through the bridge **DF62_153** in the same fieldbus channel.

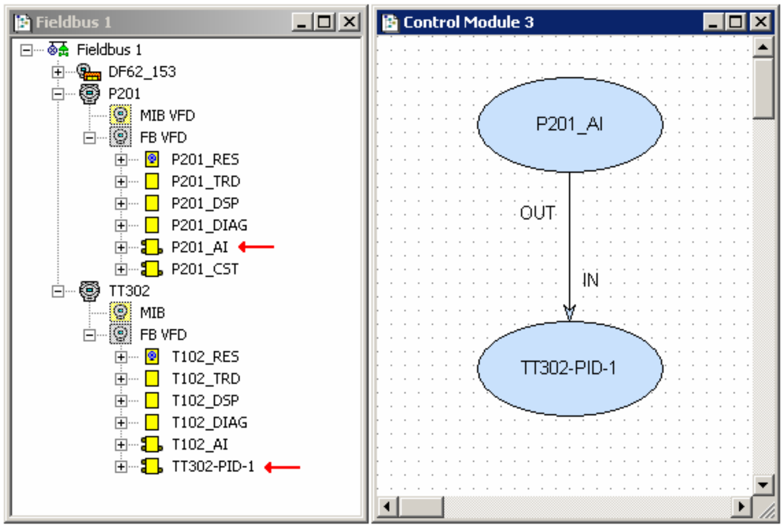


Figure 3.70. Example of External Link

IMPORTANT
In ***Syscon***, a link between function blocks from different *linking devices* is considered an external link and therefore it is represented by a solid line.

- ***Bridge Link***: this link is represented by a dashed line and indicates that the blocks are linked through two or more networks, such as H1-H1 or H1-HSE or H1-HSE-H1.

  The example below shows the graphical representation of a link between blocks using bridges. The block **TT302_AI** from the device **TT302** is attached to the bridge **DF62_153**. This block is linked to the **TIC102_PID** from the device **FI302** attached to the **DF62_146**.

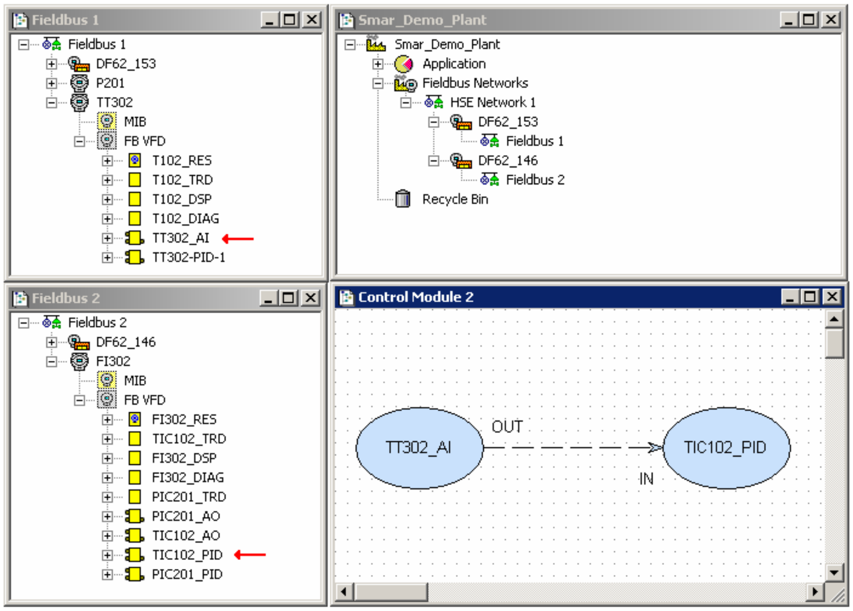


Figure 3.71. Example of Bridge Link

- ***Unrealized Link***: a link is called unrealized when one of the function blocks is not attached to any device in the configuration or when the function blocks are attached to devices that are included in the configuration but there is no physical network between the devices to enable the communication between the blocks. This link is represented by a dotted line.

  See the example below. There is no physical network to enable the communication between the block **LD302_01-AI-1** from the device **LD302_01** and the block **TT302_01-EPID-1** from the device **TT302_01**.

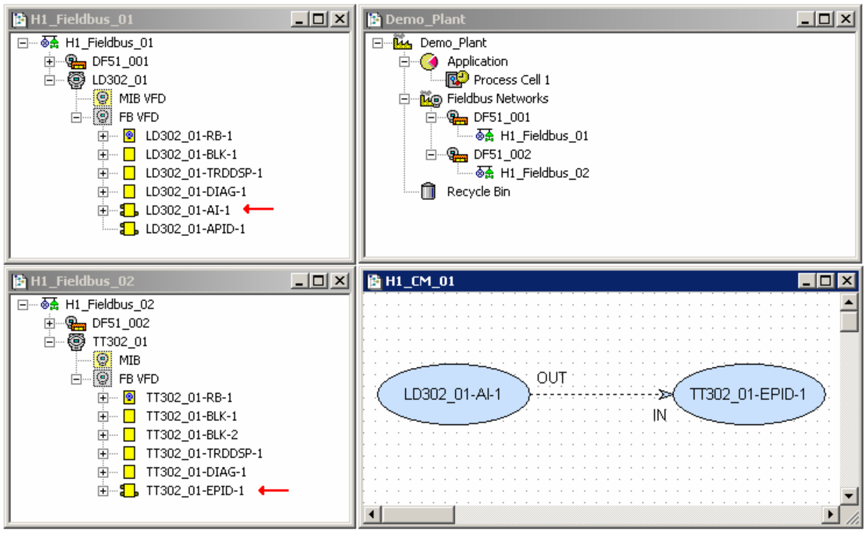


Figure 3.72. Example of Unrealized Link

Creating a Link

Blocks can only be linked inside the *Strategy* window.

Click the button **Link** on the **Strategy** toolbar and click the block.

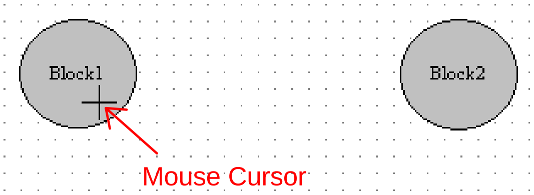
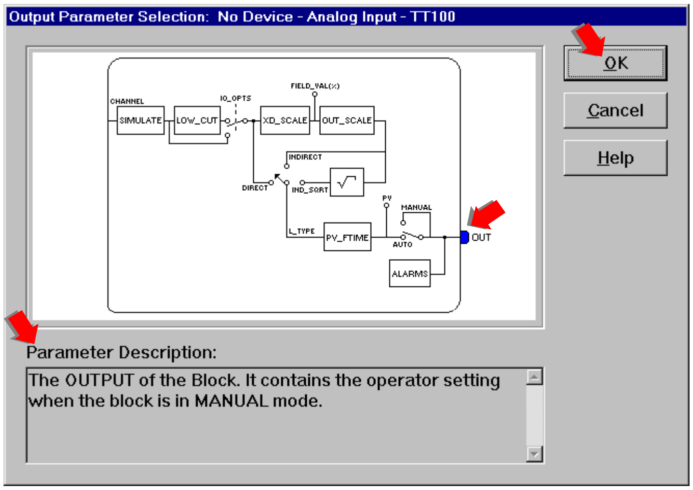


Figure 3.73. Linking Blocks - Output Parameter

The **Output Parameter Selection** dialog box will open:



Parameter Description:

The OUTPUT of the Block. It contains the operator setting when the block is in MANUAL mode.

Figure 3.74. Output Parameter Selection Dialog Box

Place the cursor over the **OUT Parameter** and a short explanation will be displayed at the **Parameter Description** text box. Click the **OUT Parameter** to select it and click **Ok**.

Return to the *Strategy* window and click the target block for the link.

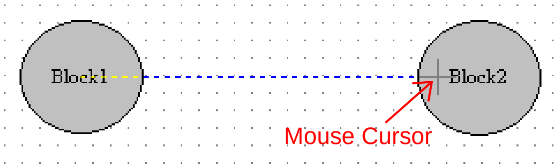
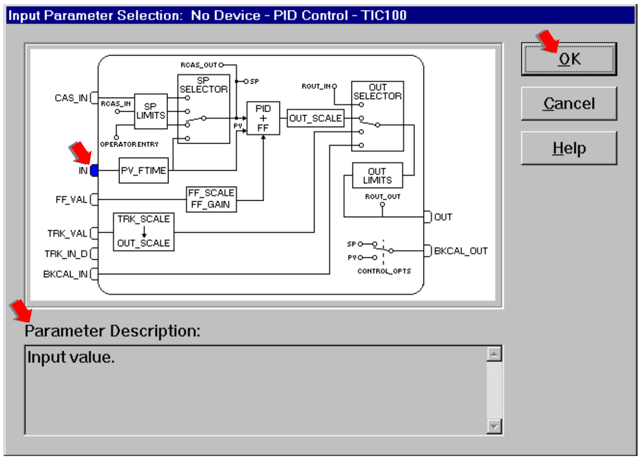


Figure 3.75. Linking Blocks - Input Parameter

The **Input Parameter Selection** dialog box will open:



Parameter Description:
Input value.

Figure 3.76. Input Parameter Selection Dialog Box

Select the **Input Parameter** and click **Ok**. The link will be automatically drawn:

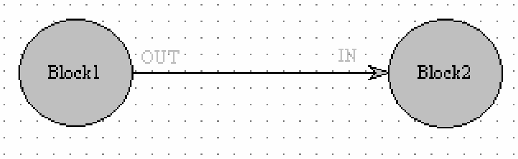


Figure 3.77. Linked Blocks

Fast Link Process

Click the button **Link** on the **Strategy** toolbar.

Right-click the block and select the **Output Parameter** from the list. Then right-click the target block and select the **Input Parameter** from the list.

See the following example of linked block into a Cascade Control design:

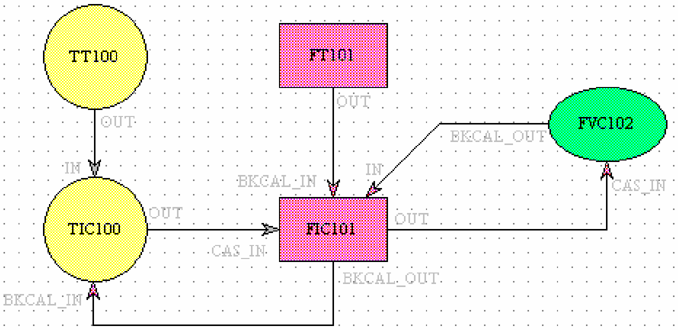


Figure 3.78. Cascade Control Example

Link Attributes

Use the button **Select** on the **Strategy** toolbar to select a link or right-click the link to activate the menu.

On the **Labels** submenu:

- **Show Link Label:** shows the link label if the option is checked.
- **Show Output Parameter:** shows the *Link Output Parameter* label if the option is checked.
- **Show Input Parameter:** shows the *Link Input Parameter* label if the option is checked.

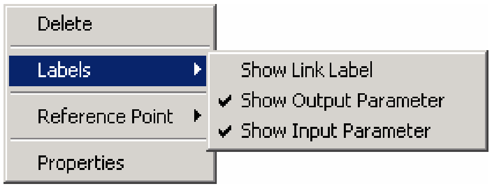


Figure 3.79. Labels Menu

On the **Reference Point** submenu, select the reference point for the **Modifying** tool:

- **Ref. On Current Point:** the selected handle is the reference itself.
- **Ref. On Previous Point:** the selected handle will be placed based on the position of the previous handle.
- **Ref. On Next Point:** the selected handle will be placed based on the position of the next handle.

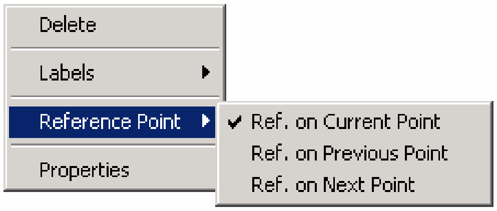


Figure 3.80. Reference Point Menu

Click the option **Properties** to open the **Object Properties** dialog box and change the line and fill colors, for example. See section **Object Properties**.

Removing Links

Click **Select** on the **Strategy** toolbar. Right-click the link and click **Delete**. Or select the link and press **Delete** on the keyboard.

A message box will open. Click **Yes** to remove the link from the project. Click **No** to remove the link only from the *Strategy* window. In this case, the link can be restored later. See section **Restoring Links**.

Restoring Links

Links that are removed from the *Strategy* window **only** can be graphically restored later on.

Right-click the block that had a link deleted at the *Strategy* window and click **Show Hidden Links**.

The links once removed from the *Strategy* window will be restored.

Redrawing Links

A link line can be redrawn dragging the modifying handles in the drawing area, creating a new handle or removing a handle.

Consider the following strategy:

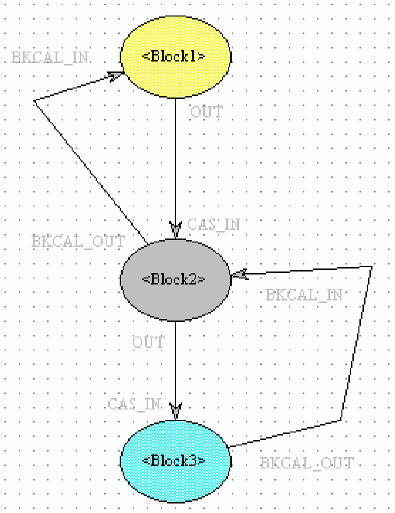


Figure 3.81. Another Example of Control Strategy

Click **Select** on the **Strategy** toolbar. Select the link line and click **Modify** on the **Strategy** toolbar.

Click the link line to create a new modifying handle. See the example:

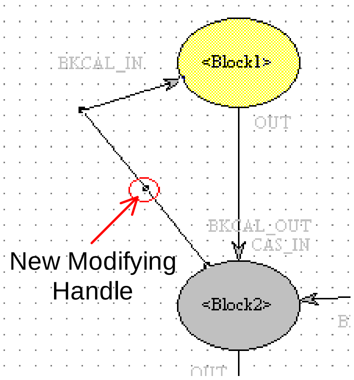


Figure 3.82. Modify Handle Tool

Click the handle and drag it over the drawing area to redraw the link.

According to the reference point, hold the **Ctrl** key while dragging the handle to draw a horizontal or vertical line from the reference handle. Or hold the **Shift** key while dragging the handle to draw a diagonal line from the reference handle.

See in the following figure the new link:

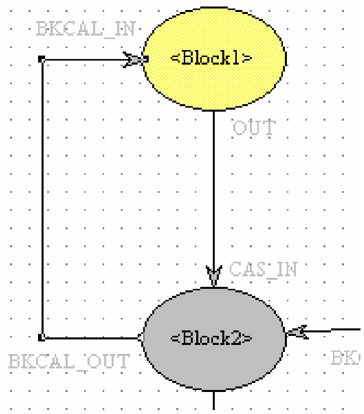


Figure 3.83. Redrawn Links

Click on the link line to create a new handle and right-click a handle to remove the modifying handle.

Section 4

COMMUNICATION

Introduction

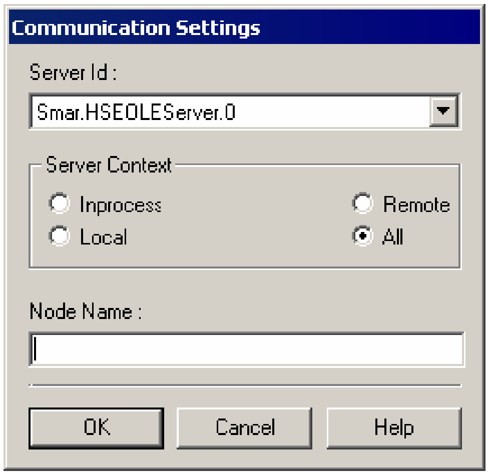
Once the configuration is completely ready, you can make ***Syscon*** communicate to the plant.

First of all, remember that a **Communication Interface** must be included in the project configuration. If you do not have a **Communication Interface** in the project configuration, see section **Creating a Controller** and **Creating a Bridge**.

> **NOTE**
>
> ***Syscon*** can detect errors in the server to avoid a crash in the system when operating offline. After an error occurs in the server, ***Syscon*** does not go to **Offline** mode automatically nor abort the download operation. You must terminate the communication and restart it. Click **Refresh** on the main toolbar to update the information displayed on the ***Syscon*** window.

Communication Settings

To configure the communication server, right-click the fieldbus networks icon and click **Communication Settings**. The **Communication Settings** dialog box will open:



Communication Settings

Server Id : Smar.HSEOLEServer.0

Server Context

○ Inprocess ○ Remote
○ Local ● All

Node Name :

Figure 4.1. Communication Settings

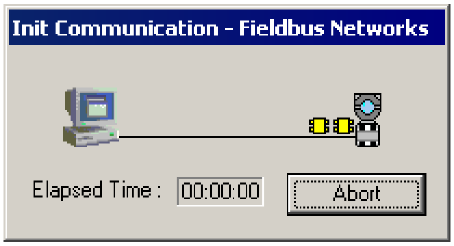
Select the **Server ID**. If the configuration has a HSE fieldbus, the *HSE OLE Server* will be selected when you click the **On-line** button .

Select the server context and type the name of the server node. Click **Ok** to conclude.

Initializing the Communication

Click the **On-line** button on the main toolbar to initialize the communication.

The video clip below should appear for a few seconds. During this time, ***Syscon*** identifies and associates any bridge and fieldbus channels from the configuration to the real plant.



Init Communication - Fieldbus Networks

Elapsed Time : 00:00:00

Figure 4.2. Initializing Communication

Syscon indicates the bridges and devices included in the project configuration are not associated to the physical equipments, or whether a device is not communicating properly to the network.

The following indications are used for devices in the *Fieldbus* window:

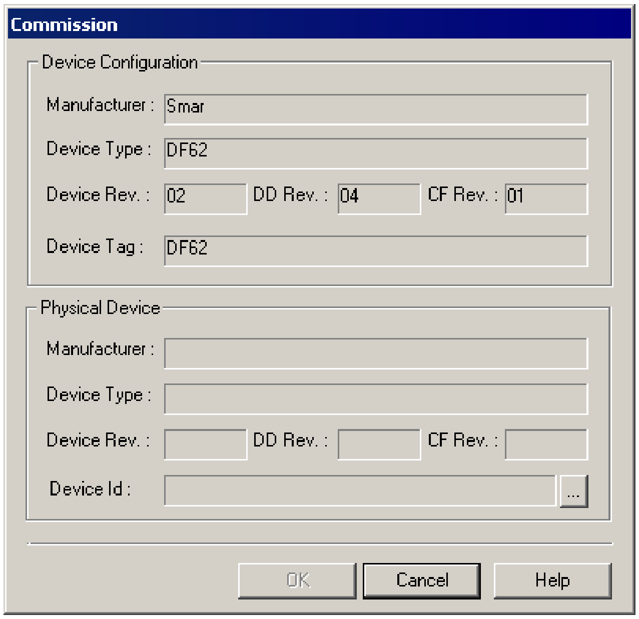
	The device is operating properly.
	The device is not connected or there is a communication failure.
	The device is communicating but it is not configured correctly. It is necessary to commit the device.

To associate bridges and devices, see section **Commissioning a Device** below.

Commissioning a Device

The **Commissioning** procedure will automatically configure the equipment tag, ID and address. This procedure associates the bridges and devices from the project configuration file to the physical equipments. The option **Commission** is only available in the *Fieldbus* window.

Open the *Fieldbus* window, right-click the equipment icon and click **Commission**. The **Commission** dialog box will open and display the information about the device in the configuration:



Commission

Device Configuration

Manufacturer : Smar

Device Type : DF62

Device Rev. : 02 DD Rev. : 04 CF Rev. : 01

Device Tag : DF62

Physical Device

Manufacturer :

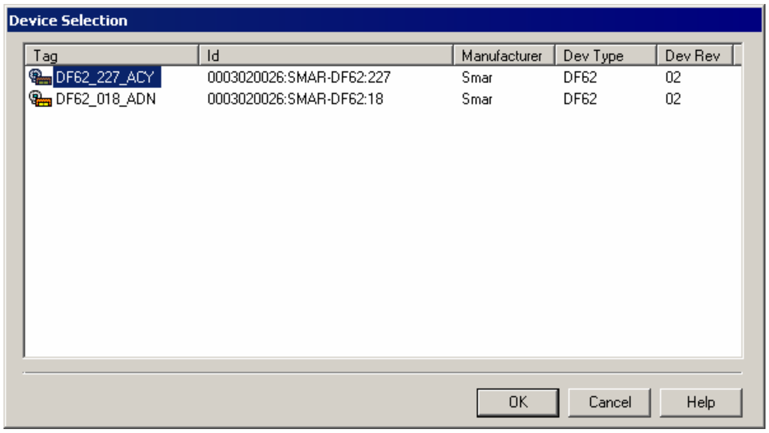
Device Type :

Device Rev. : DD Rev. : CF Rev. :

Device Id :

Figure 4.3. Commissioning a device

Click the button ... to open the **Device Selection** dialog box and locate the device.



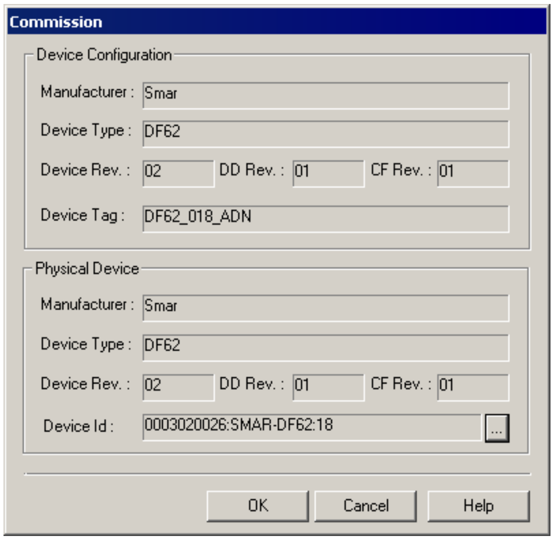
Device Selection

Tag	Id	Manufacturer	Dev Type	Dev Rev
DF62_227_ACY	0003020026:SMAR-DF62:227	Smar	DF62	02
DF62_018_ADN	0003020026:SMAR-DF62:18	Smar	DF62	02

Figure 4.4. Device Selection

When ***Syscon*** is online, the **Device Selection** dialog box lists the physical devices that have not been commissioned to the equipments in the project configuration file. For each physical device, the **Device Selection** dialog box indicates the device tag and ID, the manufacturer of the device, the type and the revision of the device.

Select the icon of device and click **Ok**. When you return to the **Commission** dialog box, the information about the physical device is detailed. See the example below:



Commission

Device Configuration

Manufacturer : Smar

Device Type : DF62

Device Rev. : 02
DD Rev. : 01
CF Rev. : 01

Device Tag : DF62_018_ADN

Physical Device

Manufacturer : Smar

Device Type : DF62

Device Rev. : 02
DD Rev. : 01
CF Rev. : 01

Device Id : 0003020026:SMAR-DF62:18

Figure 4.5. Selecting the physical device

Click **Ok** to conclude.

NOTE
A warning dialog box will open informing the user that it may be necessary to download the configuration. If there are other devices to be commissioned, click **No**. After commissioning all devices in the project configuration file, you can execute the complete download. See section **Downloading the Configuration**.

Repeat this procedure for every bridge and device in every fieldbus channel, if the device has not been commissioned yet. Once the device's attributes in the project configuration matches the attributes of the physical device, this step will not be necessary again. ***Syscon*** automatically associates the equipments.

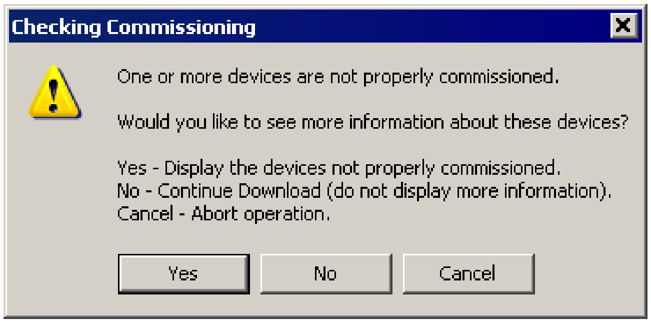
Open the fieldbus live list to check the plant communication and the configuration of the equipments. Right-click the fieldbus icon and click **Live List**. Each fieldbus has its own **Live List**. See section **Live List**.

Checking Commissioning

Before the download, ***Syscon*** verifies the commissioning to prevent fails during the download caused by noncommissioned devices.

This verification is executed for each device by comparing the values of the Device ID, the tag and the address defined in the configuration file to the online values read in real time from the physical device in the plant.

If there are any differences in the attributes, the device is considered noncommissioned. A message box opens and indicates to the user that devices were not commissioned, as illustrate in the figure below. Click **Yes** to open a window that display the noncommissioned devices and then continue executing the download procedure. Click **No** to download the configuration without checking the differences among the attributes or click **Cancel** to abort the download.



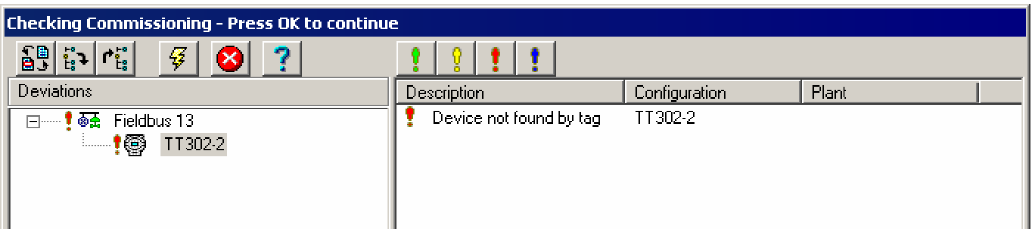
One or more devices are not properly commissioned.

Would you like to see more information about these devices?

Yes - Display the devices not properly commissioned.
No - Continue Download (do not display more information).
Cancel - Abort operation.

Figure 4.6. Checking Commissioning

If you click **Yes**, the information related to noncommissioned devices will be displayed in the **Checking Commissioning** window. Click the icon of a device to see the details about the status of the device. The information is displayed on the right panel of the **Checking Commissioning** window. See the example below:



Description	Configuration	Plant
Device not found by tag	TT302-2	

Figure 4.7. Example of noncommissioned device

If there is a device in the plant with the same tag specified in the configuration file, but the Device ID or the address is different, the right panel of the **Checking Commissioning** window will display the values of the Device ID or the address of the device according to the configuration file in the **Configuration** column, and the online values of the Device ID or the address of the device read from the physical device in the **Plant** column.

NOTE
Note that no procedure can be executed in the **Checking Commission** window.

Click **Ok** to close this window and return to ***Syscon*** and execute the download.

If you cancel the download procedure, return to ***Syscon***, edit the device's attributes and solve the problems related to commissioning. If the values of the Device ID, tag or address are different, you must execute the **Commissioning** procedure for the specific device.

After correcting the differences for the devices, execute the download again. If the commissioning is correct, the download procedure will be completed with success.

Decommissioning a Device

Right-click the device icon and click **Decommission**.

Syscon will clear the device tag, the device ID and the address of the physical device in the project configuration.

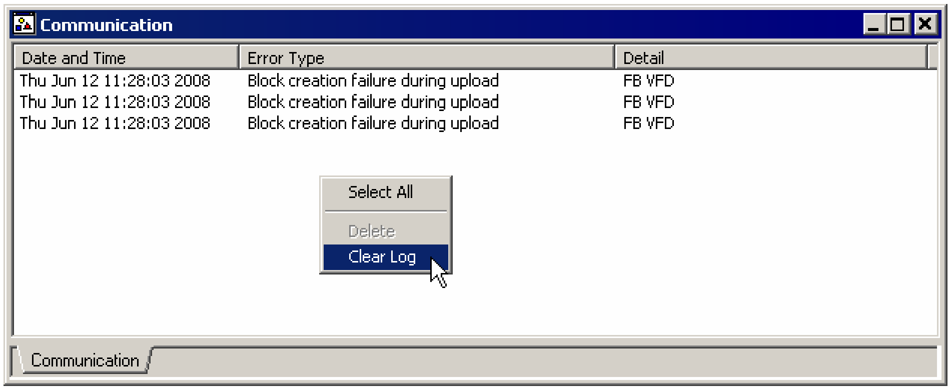
IMPORTANT
Only for some engineering and test scenarios using ***Syscon*** in **Advanced Mode**, it is possible to delete the *Device Id* from the instrument without using the decommissioning procedure. See section **Changing the Device Attributes** for details.

Error Log Registry

The *Error Log* window reports the errors that occurred during the communication. It is important to clear the **Error Log Registry** before downloading the configuration, because any eventual error that might occur during the download process will be easily detected as the **Error Log** window pops up automatically at the occurrence of its first error.

Click the **Error Log** button on the main toolbar to open the **Error Log** window.

Right-click the window area to activate the menu and click the option **Clear Log**.



Date and Time	Error Type	Detail
Thu Jun 12 11:28:03 2008	Block creation failure during upload	FB VFD
Thu Jun 12 11:28:03 2008	Block creation failure during upload	FB VFD
Thu Jun 12 11:28:03 2008	Block creation failure during upload	FB VFD

Figure 4.8. Error Log Window

Downloading the Configuration

The download procedure sends the configuration defined by the user to the devices in the plant. There are two download procedures: non-incremental download and incremental download.

The ***incremental* download** includes a phase that compares the configuration stored in the physical device in the plant with the configuration in the ***Syscon*** project file, managed by the ***Studio302*** *Database*, and only the differences are downloaded. The download scope can be delimited by the user.

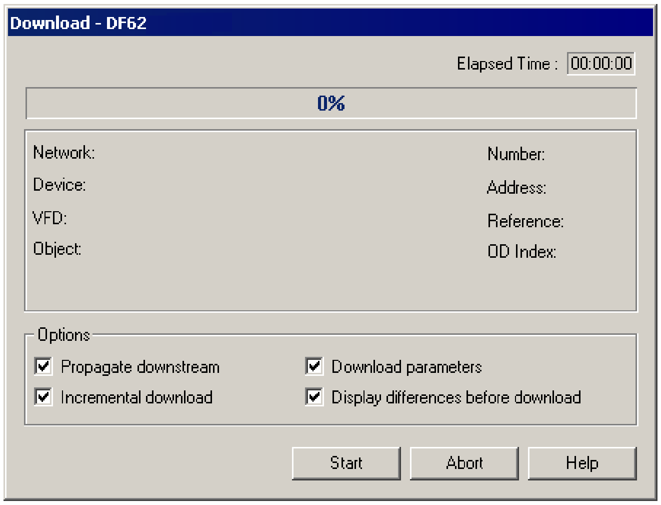
On the other hand, in the ***non-incremental* download** the entire configuration stored in each device is deleted and the new configuration is downloaded to the devices.

The download can affect a network (by selecting a Fieldbus network, a HSE network or a channel of the *Linking Device*), or the download can affect a particular device, which can be a HSE device (*Bridge*, *Linking Device*, *I/O Gateway*) or a H1 device. In this last case, the operation is also called ***partial* download**.

The download procedure is only available when ***Syscon*** is **online**, communicating to the plant and to the devices which were already commissioned.

Clear the **Error Log** window before the download to easily detect eventual errors that might occur. See section **Error Log Registry** above.

When selecting the option to execute the download procedure, the following dialog box will open:


Download - DF62

Elapsed Time : 00:00:00

0%

Network:
Device:
VFD:
Object:
Number:
Address:
Reference:
OD Index:

Options
☑ Propagate downstream
☑ Incremental download
☑ Download parameters
☑ Display differences before download

Figure 4.9. Download options

By default, the option **Incremental Download** is not selected. The other options for the download procedure are:

- **Propagate downstream:** this option is available for bridges download and indicates that the download must be executed for the H1 fieldbus channels of the bridge. See details in section **Bridge Download**.

- **Download parameters:** when selected, this option indicates the download procedure must compare and download H1 parameters. This option is available and automatically selected only when the option **Incremental download** is selected. See details in section **Incremental Download**.

- **Display differences before download:** when selected, this option indicates that before executing the download procedure, the user must be informed about which items are different in the project configuration when compared to the network configuration. This option is available and automatically selected only when the option **Incremental download** is selected. See details in section **Incremental Download**.

Incremental Download

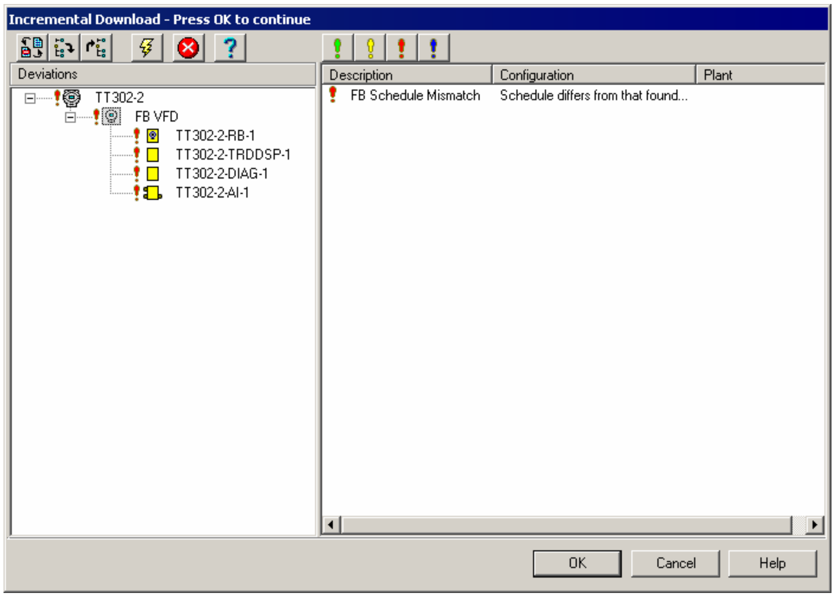
Syscon can compare the project configuration with the plant configuration and then execute the download only for the discrepant information, without sending unnecessary information to the physical device. This procedure is called *Incremental Download*.

Blocks and links that exist in the plant configuration but not in the project configuration file are deleted in order to preserve the project configuration consistency. New block and links (and new values for the parameters, if the user selects the option **Download parameters**) are downloaded to the plant.

In the **Download** dialog box, select the option **Incremental download** to compare the project configuration with the plant configuration. Two other options are available:

- **Download parameters:** this option forces ***Syscon*** to compare parameters of blocks in the project configuration to the parameters read from the physical devices and only download parameters that are different. If this option **is not marked**, ***Syscon*** will not compare nor download any parameter; therefore **existent block parameters in the physical devices will not be altered!**

- **Display differences before download:** if this option is marked, first ***Syscon*** compares the project configuration and the configuration in the physical devices without downloading any information. After the comparison, ***Syscon*** indicates in another window which items related to the devices (such as blocks and links) in the project configuration are different from the items read from the physical devices.



Incremental Download - Press OK to continue

Deviations
- TT302-2
  - FB VFD
    - TT302-2-RB-1
    - TT302-2-TRDDSP-1
    - TT302-2-DIAG-1
    - TT302-2-AI-1

Description	Configuration	Plant
FB Schedule Mismatch	Schedule differs from that found...	

Figure 4.10. Incremental Download window

The panel on the left shows the topology tree. The panel on the right describes the discrepancies for the item selected on the left panel.

The **Incremental Download** window has its own toolbar. The following table describes the functionalities of the buttons:

⟳	Click this button to refresh the information on the window.
⊞	Click this button to expand all nodes.
⊟	Click this button to collapse all nodes.
⚡	Execute the download and close the **Incremental Download** window.
⊗	Cancel the download and close the **Incremental Download** window.
?	Click this button to open the **Syscon Online Help**.

The **Incremental Download** window has four filter levels that classify all of the blocks and parameters attributes for the device:

!	Indicates that there are no discrepancies in the configurations and the download is not necessary for the selected device.
!	The *Low Severity* filter indicates that there are discrepancies in the configurations but there is no impact and the download is not necessary for the selected device. For example, a misused resource is detected. See section **Misused Resource Indication** below.
!	The *High Severity* filter indicates that there are discrepancies in the configurations and it is necessary to download the selected device.
!	This filter will display all attributes.

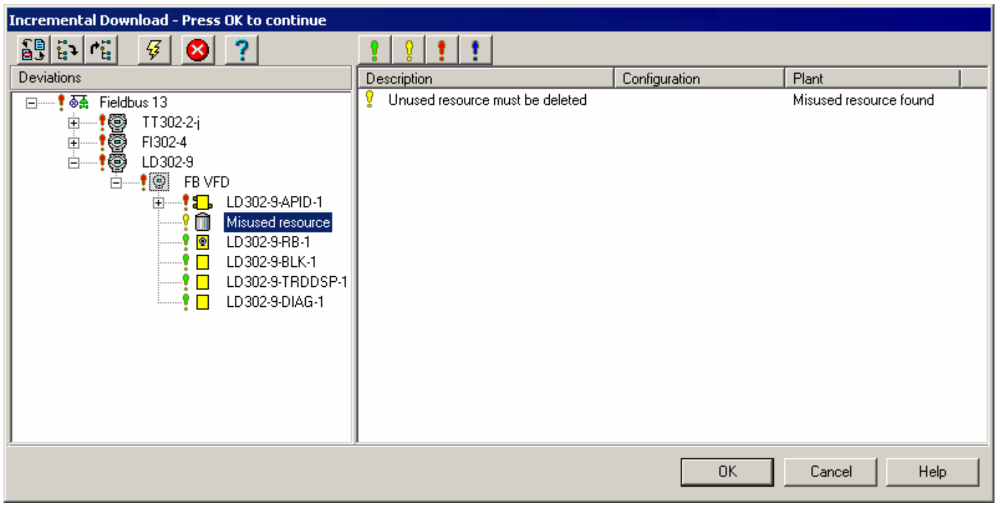
Click the column headers (*Description*, *Configuration* or *Plant*) on the right panel to sort the list of information. Clicking the column header will toggle between ascendant or descendent sorting.

After analyzing which items are affected, you can continue and execute the download procedure clicking **Ok**, or abort the operation clicking **Cancel**.

Misused Resource Indication

In the *Incremental Download* procedure, when the phase of comparing configurations is concluded, the window with the differences opens and indicates whether the items in the ***Syscon*** project configuration have discrepancies or not considering the devices connected to the network.

When several download procedures are executed in a period of time, a H1 device, bridge or controller may indicated a *Misused Resource* in the **Incremental Download** window.



Description	Configuration	Plant
Unused resource must be deleted		Misused resource found

Figure 4.11. Misused resource indication

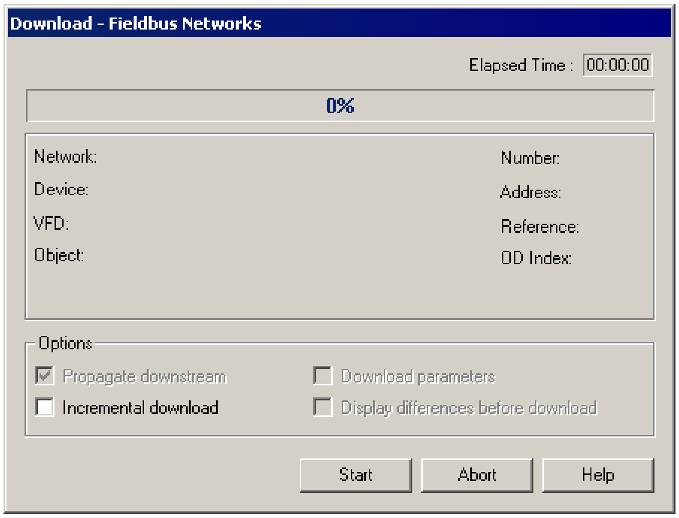
This indication appears every time ***Syscon*** detects that there is a resource allocated in the device that is no longer needed and therefore can be deleted during the incremental download.

The severity level for this indication is low, which means that if a misused resource is the only discrepancy reported in the comparison phase, the download will not be necessary since the device is operating properly.

Plant Configuration Download

The plant download executes the complete download procedure, which means that the information from every bridge, every H1 channel connected to each bridge and every device connected to each H1 channel will be downloaded. The option **Propagate downstream** is always selected.

Right-click the *Fieldbus Networks* icon on the *Project* window and click **Download**. The **Download** dialog box will open.



Download - Fieldbus Networks

Elapsed Time : 00:00:00

0%

Network:
Device:
VFD:
Object:
Number:
Address:
Reference:
OD Index:

Options

☑ Propagate downstream
☐ Incremental download
☐ Download parameters
☐ Display differences before download

Figure 4.12. Downloading the Plant Configuration

As mentioned above, the option **Propagate downstream** is always enable, since the entire configuration should be downloaded to the plant.

Select the options to execute the incremental download and click **Start**. See section **Incremental Download** for further details.

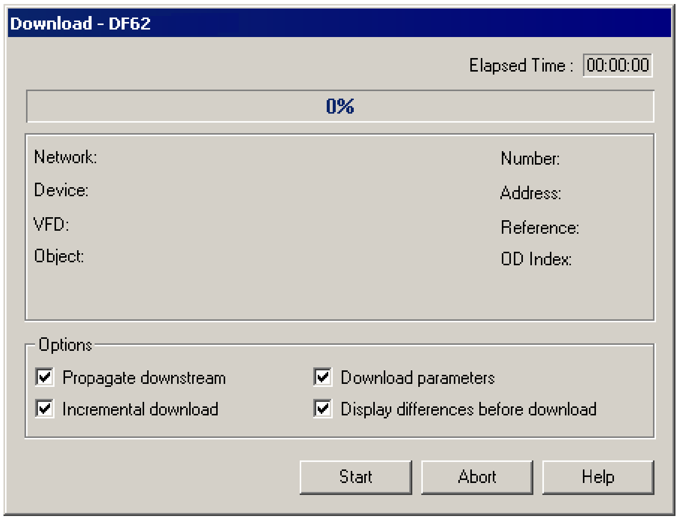
Bridge Download

A partial download can be executed for a bridge, that is, only the information related to the selected bridge will be downloaded (the option **Propagate downstream** is **not** marked), or the download procedure can be executed for the selected bridge, the H1 channels and the devices connected to these channels (the option **Propagate downstream** is **selected**).

In a **partial download** (**Propagate downstream** is disabled), ***Syscon*** downloads the configuration of blocks, parameters and links related to the bridge, and the *block schedule* and *traffic schedule* for each H1 channel connected to that bridge.

When the option **Propagate downstream** is **selected**, ***Syscon*** executes the download for the selected bridge and propagates the procedure to the H1 fieldbus channels, which means the download will be executed for the devices connected to all H1 channels.

Right-click the bridge icon and select the option **Download** to open the **Download** dialog box.



Download - DF62

Elapsed Time : 00:00:00

0%

Network:
Device:
VFD:
Object:
Number:
Address:
Reference:
OD Index:

Options

☑ Propagate downstream
☑ Incremental download
☑ Download parameters
☑ Display differences before download

Figure 4.13. Downloading the Bridge

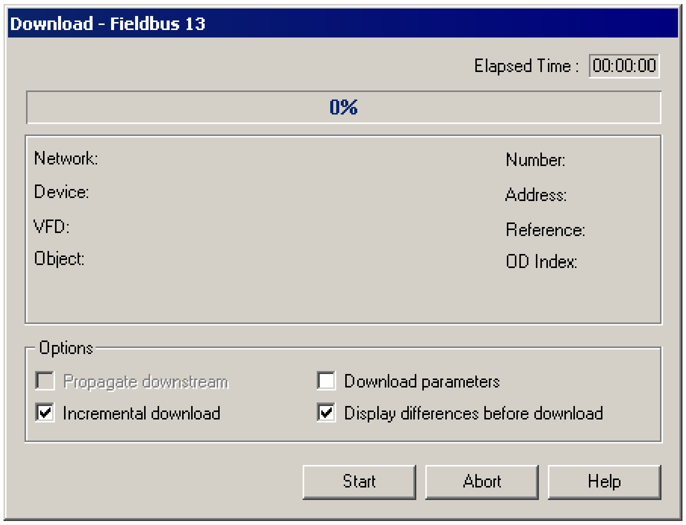
Select the options to execute the incremental download and click **Start** to download the bridge information. See section **Incremental Download** for details.

Fieldbus Download

When the HSE Fieldbus channel is selected, the download is executed for the bridges connected to this channel, and the traffic schedules are also downloaded for every H1 channel connected to the bridges. The H1 devices connected to the H1 channels of the bridges **are not downloaded**.

When a H1 fieldbus channel is selected, the download is executed for all devices connected to this channel, except for the upstream bridge.

Right-click the fieldbus icon and click **Download**. The **Download** dialog box will open.



Download - Fieldbus 13

Elapsed Time : 00:00:00

0%

Options

☐ Propagate downstream

☑ Incremental download

☐ Download parameters

☑ Display differences before download

Figure 4.14. Downloading the Fieldbus Segment

By default, the option **Propagate downstream** is always disabled for H1 and HSE Fieldbus download, since only the information related to the devices connected to a channel should be downloaded.

Select the options to execute the incremental download and click **Start**. See section **Incremental Download** for details.

H1 Device Download

To execute the download for the device, double-click the icon of the fieldbus channel where the device is connected to open the corresponding *Fieldbus* window. Right-click the device icon and click **Update**. See the example below:

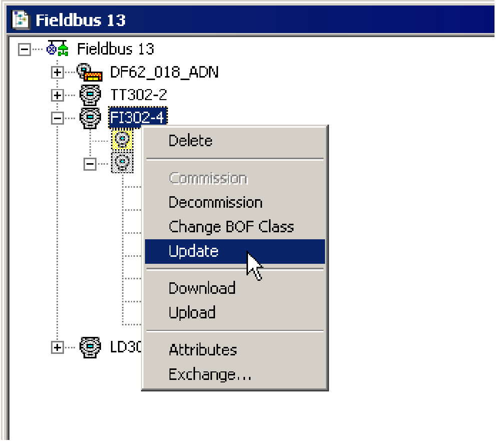
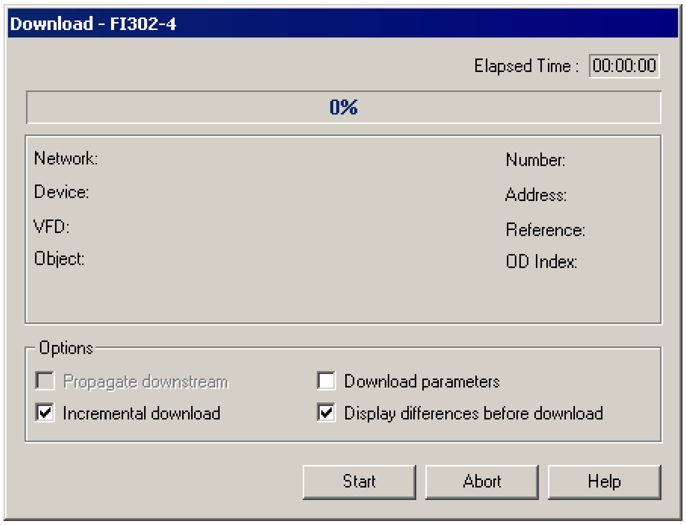


Figure 4.15. Updating the device information

The replaced device tag will exit the **Live List** and the new device tag will appear. Now you can run the partial download.

The procedure for a H1 device downloads blocks, parameters, flexible function blocks, links, and function block schedule related to the device, and also downloads the traffic schedule of the H1 channel where the device is connected.

To execute the device download, open the *Fieldbus* window corresponding to the channel where the device is connected, right-click the device icon and click **Download**. The **Download** dialog box will open.



Elapsed Time : 00:00:00

0%

☐ Propagate downstream
☑ Incremental download
☐ Download parameters
☑ Display differences before download

Figure 4.16. Downloading the Device

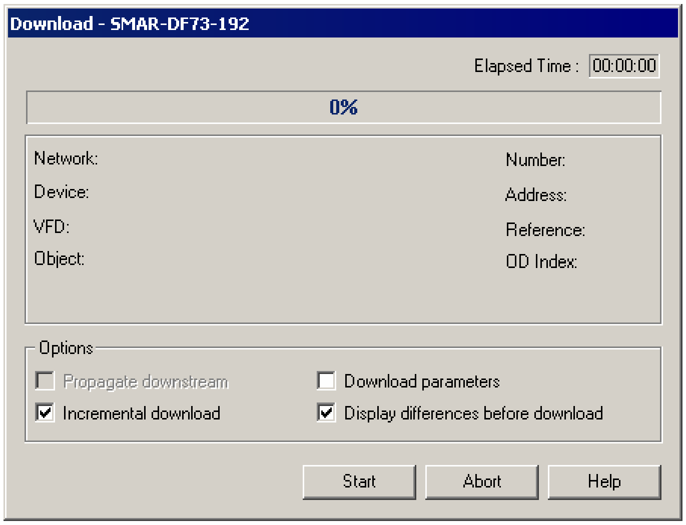
Select the options to execute the incremental download and click **Start**. See section **Incremental Download** for details.

ATTENTION
The device download automatically downloads the traffic schedule of the upstream channel of the device.

Controller Download

The procedure for a controller downloads blocks, parameters, links, and block schedule, and also downloads the configuration of a Profibus, DeviceNet or ASi network.

Right-click the device icon and select the option **Download**. The **Download** dialog box will open.



Download - SMAR-DF73-192

Elapsed Time : 00:00:00

0%

Network:
Device:
VFD:
Object:
Number:
Address:
Reference:
OD Index:

Options

☐ Propagate downstream
☑ Incremental download
☐ Download parameters
☑ Display differences before download

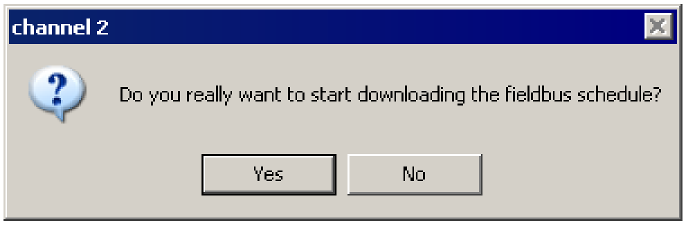
Figure 4.17. Downloading the controller

Select the options to execute the incremental download and click **Start**. See section **Incremental Download** for details.

Download Schedule

The schedule can be defined in the **Fieldbus Attributes** dialog box. See section **Changing the Fieldbus attributes** for details.

Right-click the fieldbus icon and click **Download Schedule**. A message box will open to confirm the operation.



channel 2

Do you really want to start downloading the fieldbus schedule?

Figure 4.18. Confirming the Schedule Download

Click **Yes** to download the schedule.

NOTE
The option **Download Schedule** is not available for HSE fielbuses.

Usual Cases for the Download Procedure

Plant Download – Non-Incremental

The first configuration download must always be the complete download for the plant, because the entire project configuration should be downloaded to the physical devices. The option **Incremental Download** should not be selected since there is no comparison to be made to the configurations.

Incremental Download (Plant, HSE and H1 channels, Devices)

If the project configuration changes and the download should not cause a big impact in the plant communication, the incremental download should be executed. Analyze the alterations made to the project configuration and select the appropriate level for download.

If only one device configuration was altered, the incremental download should be executed in that device; however, if several bridges and devices were altered, the incremental download should be executed for the *Fieldbus Networks*.

Partial Device Download

Whether a failure occurred in the device or the device was replaced, or a new device was committed, it is necessary to download the device **only if the plant configuration (other devices, for example) has not been affected**.

Alterations made to one device can affect other equipments. For example, an alteration in an external link will affect at least two devices and the LAS. Therefore, if the project configuration was altered, all device affected by this alteration must be downloaded; otherwise a partial download may generate unexpected results. In this case, it is recommended to execute a plat download.

Partial Bridge Download

Whether a failure occurred in the bridge or the bridge was replaced, it is necessary to download that bridge **only if the plant configuration has not been affected and the devices connected to the Fieldbus channels do not have a link-bridge**, which is a link between two devices that are not connected to the same Fieldbus channel.

The following figure shows examples of link-bridge:

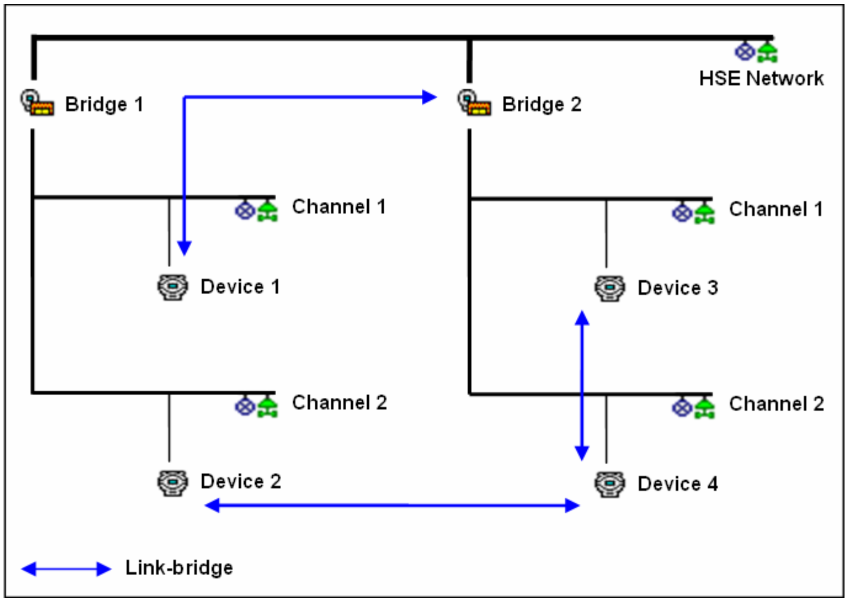


Figure 4.19. Link-bridge examples

- **Link H1 - HSE:** link between a device and a bridge that are not connected through H1 channels, they are connected only through the HSE channel. In the example above, the link between **Device 1** and **Bridge 2**;
- **Link Bridge - H1:** link between two devices connected to two different H1 channels, but to the same bridge. In the example above, the link between **Device 3** and **Device 4**;
- **Link Bridge H1 - HSE - H1:** link between two devices connected to H1 channels from different bridges. In the example above, the link between **Device 2** and **Device 4**.

If the devices connected to the H1 channel of the selected bridge have *link-bridges*, it will be necessary to execute the download for that bridge selecting the option **Propagate downstream**. This way the download will also be executed for the devices and the *link-bridges* will be correctly downloaded.

If the configuration was altered, you must execute a partial download in all equipments affected by the alteration, always considering the case mentioned above related to downloading bridges with *link-bridges*. Otherwise a partial download may generate unexpected results.

Download Failures

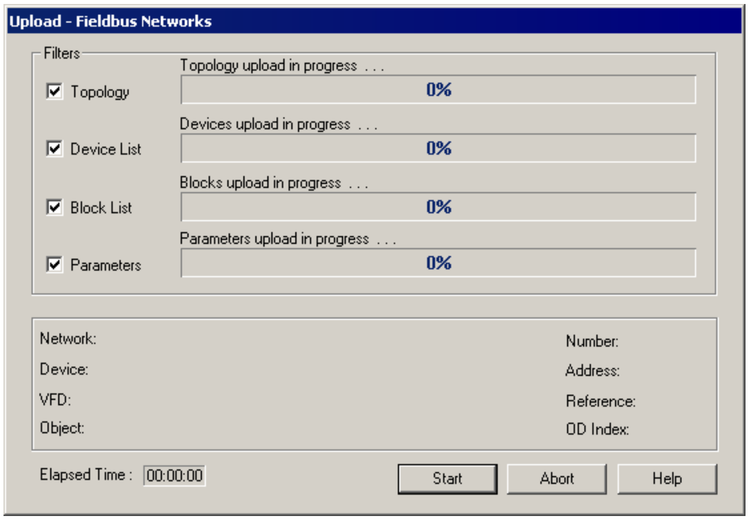
If the ***Syscon*** download procedure reports a download failure for any equipment, follow the steps below to correct the failures:

- Wait until the download procedure is concluded, when the **Download** dialog box automatically closes;
- For each equipment that indicated a download failure, right-click its icon and select the option **Update**;
- Then, execute the download for the equipments that were updated. See section **Device Download** for details.

Uploading the Configuration

This procedure uploads the configuration from the physical bridges and devices to the project file. It is necessary to initialize the communication to execute the upload. Click the **On-line** button on the toolbar.

Right-click the Fieldbus Networks icon on the *Project* window and click **Upload**. The **Upload** dialog box will open.



Upload - Fieldbus Networks

Filters

☑ Topology — Topology upload in progress . . . 0%

☑ Device List — Devices upload in progress . . . 0%

☑ Block List — Blocks upload in progress . . . 0%

☑ Parameters — Parameters upload in progress . . . 0%

Elapsed Time : 00:00:00

Figure 4.20. Upload Dialog Box

Mark all the **Filters** to upload the entire plant configuration: *Topology*, *Device List*, *Block List* and *Parameters*. Click **Start**. The progress bars indicate that ***Syscon*** is reading the information from the fieldbuses and adding the devices, blocks and parameters to the configuration file.

You can stop this process at any time during the upload by clicking **Abort** in the **Upload** dialog box.

Partial Upload

You can run a partial upload for fieldbuses, devices or blocks according to the filters selected on the **Upload** dialog box.

Remember it is necessary to click the button to initialize the communication and execute the upload.

Topology Upload
Syscon uploads the bridges and the connected fieldbus channels.

Right-click the Fieldbus Networks icon on the *Project* window and click **Upload**. On the **Upload** dialog box, select only the filter **Topology** and click **Start**.

Device Upload
Syscon uploads the devices for the selected Fieldbus channel.

Right-click the Fieldbus icon on the *Fieldbus* window and click **Upload**. On the **Upload** dialog box, the filter **Topology** is already selected. Select the filter **Device List** and click **Start**.

Block Upload
Syscon uploads the blocks for the selected device.

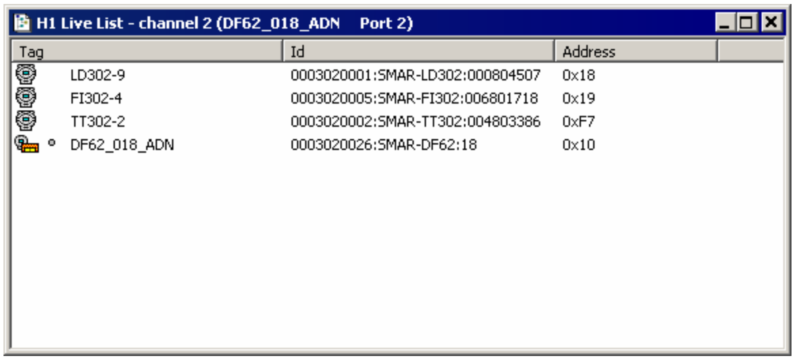
Right-click the device icon on the *Fieldbus* window and click **Upload**. On the **Upload** dialog box, the filters **Topology** and **Device List** are already selected. Select only the filter **Block List** and click **Start**.

Parameter Upload
Syscon uploads the parameters for the selected block.

Right-click the block icon on the *Fieldbus* window and click **Upload**. On the **Upload** dialog box, select the filter **Parameters** and click **Start**.

Live List

Use the **Live List** to check the devices communicating on the channel. Each fieldbus has its own **Live List**. Right-click a fieldbus icon and click **Live List**. The **Live List** window will open.



H1 Live List - channel 2 (DF62_018_ADN Port 2)

Tag	Id	Address
LD302-9	0003020001:SMAR-LD302:000804507	0x18
FI302-4	0003020005:SMAR-FI302:006801718	0x19
TT302-2	0003020002:SMAR-TT302:004803386	0xF7
∘ DF62_018_ADN	0003020026:SMAR-DF62:18	0x10

Figure 4.21. Live List Window

The **Live List** indicates the devices and bridges, identified by the Device Tag, Device ID and Device Address, as well as the device configured as the *Active LAS*. The *Active LAS* will be indicated with a different icon in the **Live List**. The following table describes the icons that identify devices and bridges on the **Live List** window:

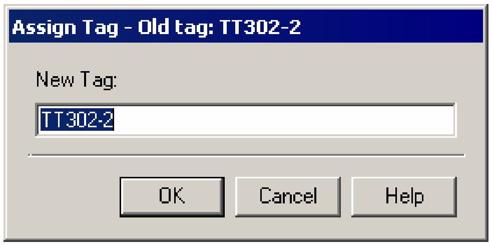
☼	Active LAS Bridge.
∘	Bridge configured to assume the LAS function when the Active LAS stops communicating.

	Active LAS Device.
	Device configured to assume the LAS function when the Active LAS stops communicating.
	H1 or HSE Bridge.
	H1 or HSE Device.
	Device information reading in progress.
	HSE Host.
	Profibus or DeviceNet Controller.
	Profibus or DeviceNet Device.
	Controller or I/O Module.
?	Bridge or device missing support files (DD, CF or FFB block files). This scenario occurs when a FFB block with ladder logic is added to the configuration.

Live List Menu Options

Right-click the device icon on the **Live List** window and select one of the options described below.

Assign Tag
The **Assign Tag** dialog box will open. Define a new tag for the device and click **Ok**.



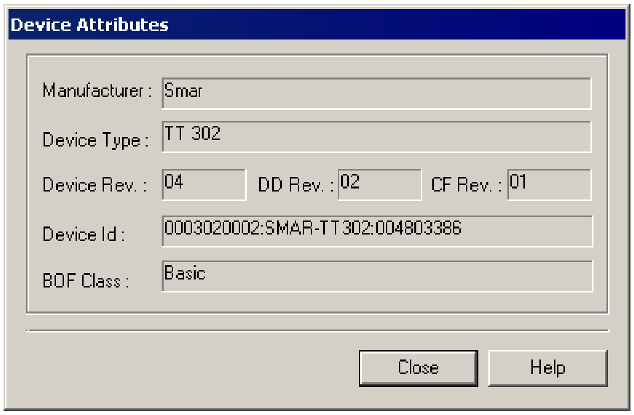
Assign Tag - Old tag: TT302-2

New Tag: TT302-2

Figure 4.22. Assign Tag Dialog Box

Attributes
The **Device Attributes** dialog box will open. This dialog box displays the attributes for the selected device, such as its manufacturer, revision and ID.

It is not possible to edit the device attributes in this dialog box.



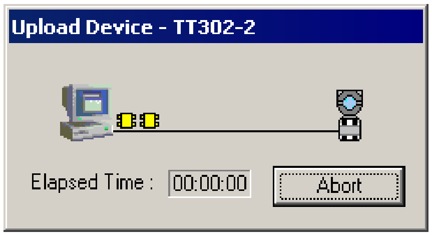
Device Attributes

Manufacturer : Smar
Device Type : TT 302
Device Rev. : 04 DD Rev. : 02 CF Rev. : 01
Device Id : 0003020002:SMAR-TT302:004803386
BOF Class : Basic

Figure 4.23. Device Attributes Dialog Box

Upload
Click this option to upload the selected device to the corresponding Fieldbus channel. The following

dialog box will open while the device is being uploaded.



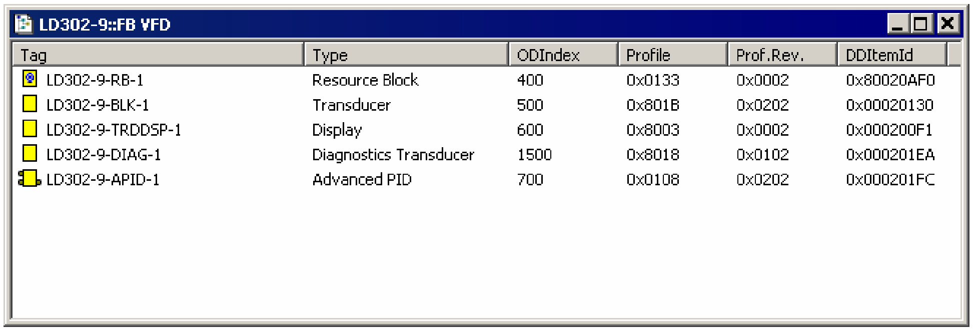
Elapsed Time : 00:00:00

Figure 4.24. Uploading the Device

Block List

Use the **Block List** to check the blocks that are instantiated in the device. Each device has its own **Block List**. On the *Fieldbus* window, click the expansion sign of the device and right-click the VFD icon. Click the option **Block List** from the menu.

The **Block List** window will open.



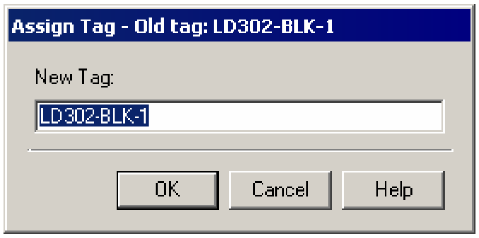
Tag	Type	ODIndex	Profile	Prof.Rev.	DDItemId
LD302-9-RB-1	Resource Block	400	0x0133	0x0002	0x80020AF0
LD302-9-BLK-1	Transducer	500	0x801B	0x0202	0x00020130
LD302-9-TRDDSP-1	Display	600	0x8003	0x0002	0x000200F1
LD302-9-DIAG-1	Diagnostics Transducer	1500	0x8018	0x0102	0x000201EA
LD302-9-APID-1	Advanced PID	700	0x0108	0x0202	0x000201FC

Figure 4.25. Block List Window

Block List Menu Options

Right-click the block icon on the **Block List** window and select one of the options described below.

Assign Tag
The *Assign Tag* dialog box will open. Type the new tag and click **Ok**.

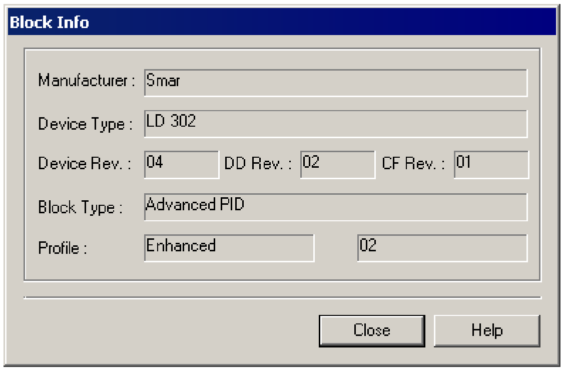


New Tag: LD302-BLK-1

Figure 4.26. Assign Tag Dialog Box

Attributes
The **Block Info** dialog box will open. This dialog box displays the attributes for the selected block, such as the Device Revision and block type.

It is not possible to edit the block attributes in this dialog box.



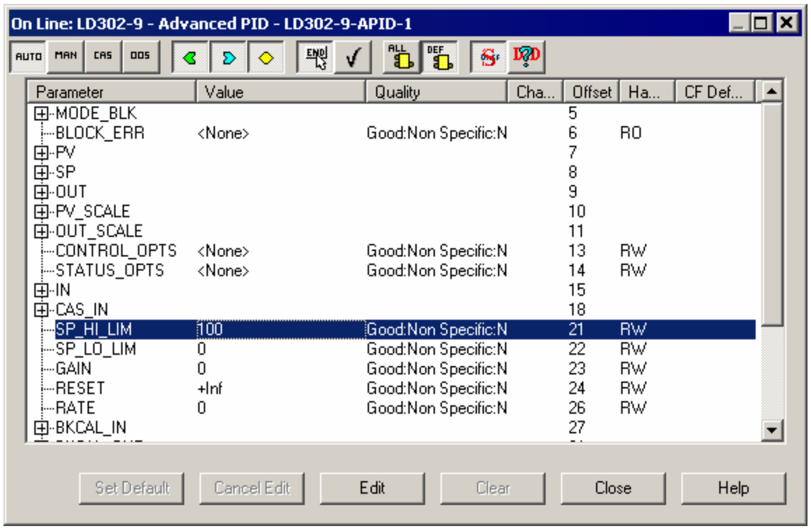
Block Info

Manufacturer :	Smar
Device Type :	LD 302
Device Rev. :	04
DD Rev. :	02
CF Rev. :	01
Block Type :	Advanced PID
Profile :	Enhanced 02

Figure 4.27. Block Info Dialog Box

Characterization

The **On Line Characterization** dialog box will open. See section **Block On Line Characterization** for details.



On Line: LD302-9 - Advanced PID - LD302-9-APID-1

Parameter	Value	Quality	Cha...	Offset	Ha...	CF Def...
MODE_BLK				5		
BLOCK_ERR	<None>	Good:Non Specific:N		6	RO	
PV				7		
SP				8		
OUT				9		
PV_SCALE				10		
OUT_SCALE				11		
CONTROL_OPTS	<None>	Good:Non Specific:N		13	RW	
STATUS_OPTS	<None>	Good:Non Specific:N		14	RW	
IN				15		
CAS_IN				18		
SP_HI_LIM	100	Good:Non Specific:N		21	RW	
SP_LO_LIM	0	Good:Non Specific:N		22	RW	
GAIN	0	Good:Non Specific:N		23	RW	
RESET	+Inf	Good:Non Specific:N		24	RW	
RATE	0	Good:Non Specific:N		26	RW	
BKCAL_IN				27		

Figure 4.28. Characterization Window

Upload Block

Click this option to upload the selected block to the corresponding device.

Exporting Tags

The **Taginfo.ini** file contains all tags from devices and function blocks created in the configuration file and it enables the on-line communication with the parameters of the blocks. Every time any tag is changed in the configuration, it is necessary to repeat the **Export Tag** procedure, otherwise the supervision of the new tag will not be allowed.

Right-click the project icon and click **Export Tags**. Select the folder to save the **Taginfo.ini** file and click **Save**. The default path for the **Taginfo.ini** file is *C:\Program Files\Smar\OleServers\*.

You can set the option to automatically export the tags, in the **Preferences** dialog box, every time a relevant online procedure requires a tag to be exported. In this case, a message box will ask you to confirm the **Export Tag** procedure. See section **Block Preferences**.

To update the **Taginfo.ini** file manually, right-click the project icon and click **Update OPC Database**.

ATTENTION

ATTENTION

If there are two or more configuration files, the tag lists from these sources must be consolidated in a single list, so the OPC Server can use the entire list of tags to provide the information requested by any OPC client application.

You must assure that the tags used in all of the configuration files are unique. If there are duplicated tags, only one tag will be exported to the **Taginfo.ini** file.

When you export the tags or update the OPC database of a configuration that has a consolidated tag list, the consolidated list is updated with the tag list corresponding to the configuration current open.

IMPORTANT

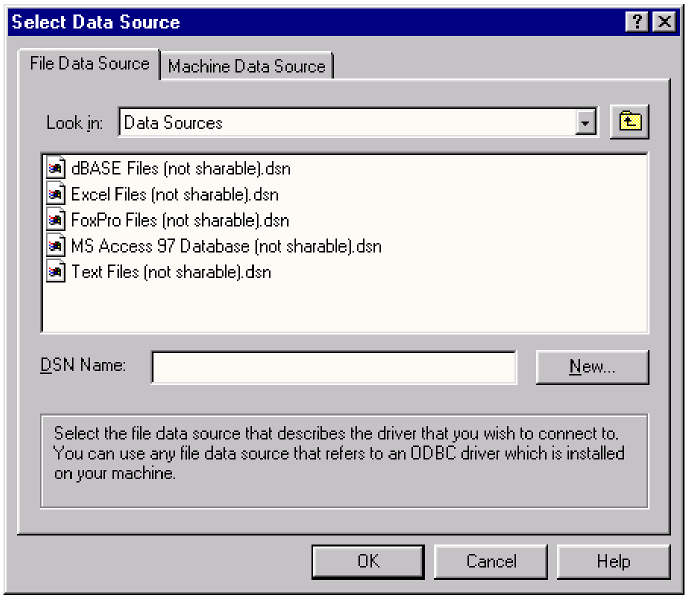
The **Export Tags** procedure also automatically creates the file **TrendInfo.ini**, which consolidates the configuration of trends created in the ***Syscon*** project, and the file **AlarmInfo.ini**, which provides the information related to alarm and events configured in ***Syscon*** to the ***Smar A&E Server***.

Refer to sections **Trends** and **Preferences** for further details about these files.

Exporting the Configuration

You can export the project configuration to an existing database. Right-click the project icon and click **Export Configuration**. The **Select Data Source** dialog box will open.

Double-click the data source icon on the **File Data Source** tab. Select the source that describes the driver that is to be connected. You can use any file data source that refers to an ODBC driver, which is installed on the machine. See the example below:



Look in: Data Sources

dBASE Files (not sharable).dsn
Excel Files (not sharable).dsn
FoxPro Files (not sharable).dsn
MS Access 97 Database (not sharable).dsn
Text Files (not sharable).dsn

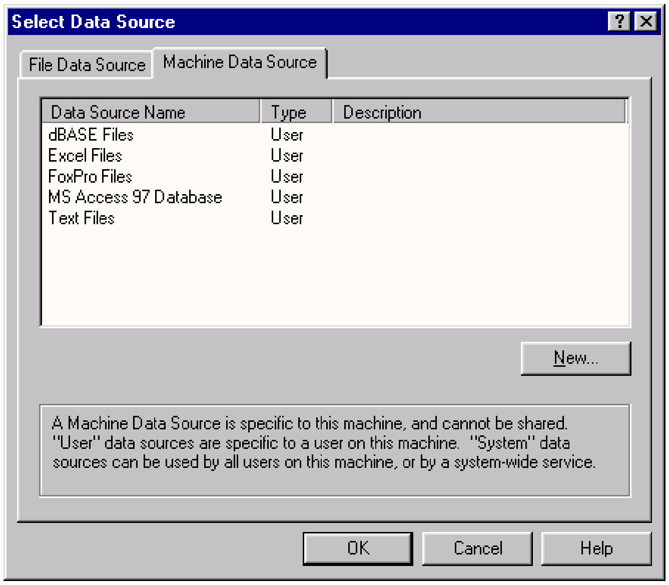
DSN Name:

Select the file data source that describes the driver that you wish to connect to. You can use any file data source that refers to an ODBC driver which is installed on your machine.

Figure 4.29. Select Data Source Dialog Box

Or you can also use the **Machine Data Source** tab. The **Machine Data Source** is specific to the machine and cannot be shared. According to the **Type** column, "User" data sources are specific to a user on the machine, and "System" data sources can be used by all users on the machine, or by a system-wide service.

Double-click the data source name to select the machine. See the following example:



A Machine Data Source is specific to this machine, and cannot be shared. "User" data sources are specific to a user on this machine. "System" data sources can be used by all users on this machine, or by a system-wide service.

Figure 4.30. Select Data Source Dialog Box

The **Select Workbook** dialog box will open:

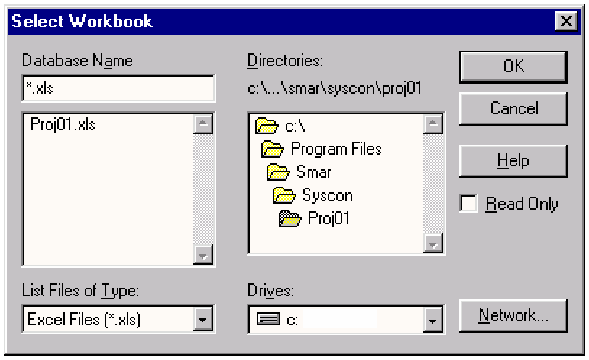


Figure 4.31. Select Workbook Dialog Box

Select the folder where the data file is and double-click the workbook icon. The project configuration will be saved to the workbook file.

Consolidating the OPC Database

When working with two or more configuration files, the tag lists from these source files must be consolidated in a single list.

On the *Project* window, right-click the project icon and click **Consolidate OPC Database**. The **Consolidate OPC Database** dialog box will open.

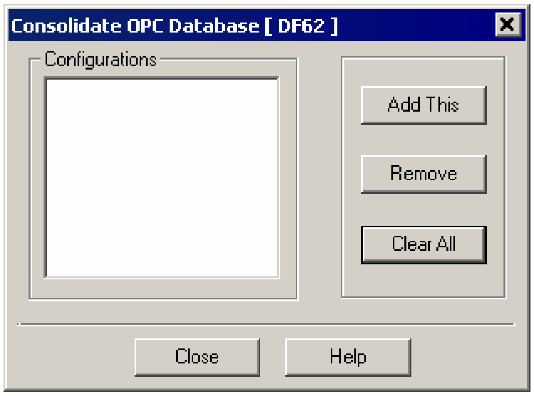
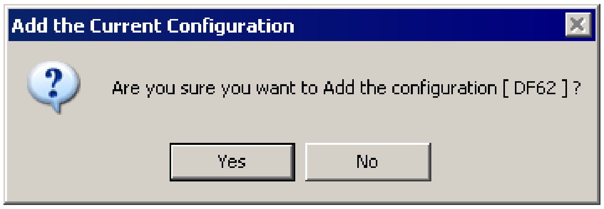


Figure 4.32. Consolidate OPC Database dialog box

Adding a Configuration

To add the current configuration to the consolidate list, click **Add This** on the **Consolidate OPC Database** dialog box. A message box will open to confirm the operation.



Are you sure you want to Add the configuration [DF62] ?

Figure 4.33. Adding a Configuration

Click **Yes** to include the tag list of the current configuration to the tag list of the OPC Server. The name of the configuration will be added to the list of configurations.

To add another configuration to the list, it is necessary to open the configuration in ***Syscon*** application and repeat this procedure.

Removing a Configuration

To remove a configuration from the consolidate list, select the name of the configuration in the **Configurations** list and click **Remove**.

A message box will open to confirm the operation. Click **Yes** to remove the selected configuration from the tag list of the OPC Server. The name of the configuration will be removed from the list of configurations.

Updating a Configuration

If the tag list of a consolidated configuration changes, it will be necessary to update the tag list of the OPC Server.

Open the configuration file that had the tag list updated. Right-click the project icon and click **Consolidate OPC Database**. On the **Consolidate OPC Database** dialog box, click **Update This**.

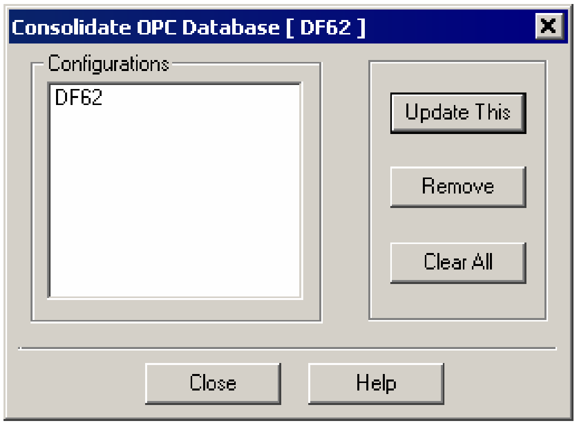


Figure 4.34. Updating the tag list

A message box will open to confirm the operation. Click **Yes** to update the tag list in the OPC Server.

IMPORTANT
This procedure has the same functionality of the **Export Tags** and **Update OPC Database** options, in the **Export** menu.

Clearing the Consolidated List

To reset the list of consolidated configurations and remove all of the tag lists from the OPC Server, open any configuration file in ***Syscon***, right-click the project icon and click **Consolidate OPC Database** to open the dialog box.

The list of configurations that have been consolidated will be displayed. Click the button **Clear All**. A message box will open to confirm the operation.

Click **Yes** to reset the consolidated tag list of the OPC Server.

TEMPLATES

It is possible to use a ready Strategy or part of it, in another project file or even in another process cell. It is necessary to create a template file from a *Strategy Configuration*. After which, just import the template into the control module, change the tags and assign the blocks to the devices.

Syscon 6.2 also creates controller, bridge and device templates, attaching blocks and configuring parameters. You can open the template file and the project file at the same time, and then attach the devices or blocks to the configuration by dragging them to the desired fieldbus channel.

Using templates can speed up the strategy development work tremendously. This will make it very productive at the same time as the boring repetitive work is eliminated. Engineering time and costs are reduced.

At the same time the configurations become more consistent and neater looking, and therefore easier to troubleshoot. Pre-configured templates also eliminate many chances of mistakes. The tedious process of instantiating block after block, and the agony of that forgotten parameter is a thing of the past.

Creating Templates

Click **New** on the main toolbar and select the type of the desired template: **Strategy**, **Device**, **Bridge** or **Controller**.

See sections **Editing Strategy Templates** and **Editing Device, Bridge and Controller Templates** below for further details.

Opening Template Files

Click **Open** on the main toolbar.

On the **Open** dialog box, select the template type in the **Files of type** box. The files ***.fft** are *Strategy Templates*; files ***.dtp** are *Device Templates*; files ***.btp** are *Bridge Templates*, and files ***.ctp** are *Controller Templates*.

Double-click the template file icon to open its window in ***Syscon***.

Saving a Template File

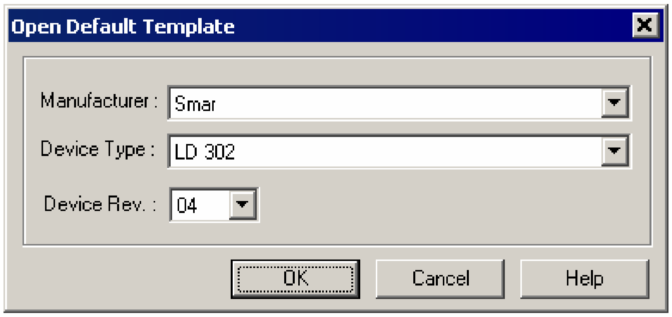
Click **Save** on the main toolbar. On the **Save As** dialog box, select the folder where the template file will be save. The default path for ***Syscon*** templates is *C:\Program Files\Smar\Syscon\Templates*.

Type the name for the template and click **Save**.

Anytime a change is made to the template drawing, do not forget to save it.

Opening the Default Template

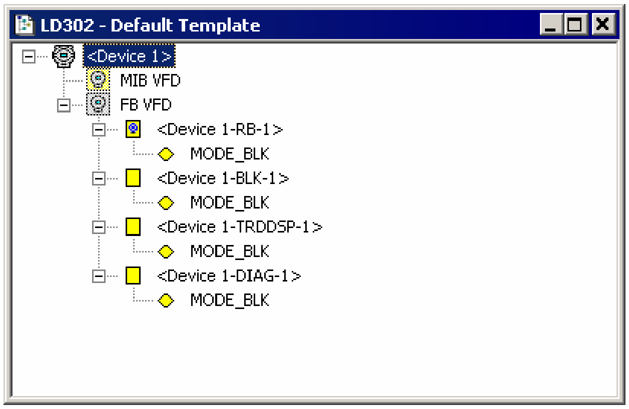
On the **Project File** menu, click **Open Default Template**. The **Open Default Template** dialog box will appear.



Manufacturer : Smar
Device Type : LD 302
Device Rev. : 04

Figure 5.1. Open Default Template Dialog Box

Choose the manufacturer from the list. Then, select the device type and the device revision. Click **Ok** and the *Template* window will open. See the example below:



```
<Device 1>
  MIB VFD
  FB VFD
    <Device 1-RB-1>
      MODE_BLK
    <Device 1-BLK-1>
      MODE_BLK
    <Device 1-TRDDSP-1>
      MODE_BLK
    <Device 1-DIAG-1>
      MODE_BLK
```

Figure 5.2. Device Template Window

Saving the Default Template

To save the device, bridge pr controller template as the *Default Template*, go to the **Project File** menu and click **Save As Default Template**.

The *Default Template* file is located in the *Device Support* folder of the device's manufacturer. The name of the template file is automatically composed by the *Device Revision number* (2-digits hexadecimal number) and the file extension: **dtp** for devices, **btp** for bridges and **ctp** for controllers.

Editing Strategy Templates

The *Strategy Template* window has the same properties as the *Strategy* window. You can draw blocks and links, and also configure block attributes. The only difference is that the blocks will not be attached to a control module or a device.

Adding Blocks

Click the button **Function Block** on the **Strategy** toolbar and click the drawing area to open the **New Block** dialog box.

Select the manufacturer from the list and the device type provided by the selected manufacturer. Select the *Device Revision*, the *DD Revision* and the *CF Revision*.

Select the type of the block and type a related tag. Click **Ok** to conclude.

After adding at least one block, use the popup menu to add other blocks from the same manufacturer and from the same device type. Click the button **Function Block**, right-click the drawing area and select the block type from the list.

Changing the Block tag

Click the button **Strategy Modify** on the **Strategy** toolbar and click the block label. Type the new tag for the block and click the drawing area to exit the edition mode.

Block Off Line Characterization

Click the button **Select** on the **Strategy** toolbar and double-click the block. The **Off Line Characterization** dialog box will open. Edit the values for the parameters and click **Close** to exit the **Off Line Characterization** dialog box.

See section **Block Off Line Characterization** for details.

Creating Links

Click the button **Link** on the **Strategy** toolbar. Right-click the block and select the **Output Parameter** from the popup menu, then drag the cursor to the target block and right-click it to select the **Input Parameter** from the popup menu.

See section **Links** for details.

Editing Device, Bridge and Controller Templates

Device, bridge or controller templates contain one device and the corresponding *Resource* and *Transducer* blocks. You can add or remove blocks and configure the parameters.

The *Device* template files are those with the extension **dtp**, the *Bridge* templates are those with the extension **btp** and the *Controller* templates are those with the extension **ctp**.

Click **New** on the toolbar and select the template type: **Device**, **Bridge** or **Controller**. The *Template* window will open.

Select the manufacturer from the list and the device type. Select the *Device Revision*, the *DD Revision* and the *CF Revision*, or check the option **Follow the Latest DD and CF Revision** to apply the latest revision for the selected device. When this option is selected, ***Syscon*** updates the device with the latest revision of the DD and CF every time the configuration file is opened.

Type a related tag for the device.

At the **Advanced Options** tab, select the options to automatically create the *Resource* and *Transducers* blocks.

Click **Ok** to conclude and then save the template file.

Changing Attributes

Right-click the equipment icon and select the option **Attributes**.

For the devices, you can type a new tag and select the BOF class. For bridges and controllers, you can type a new tag and enable redundancy.

Click **Ok** to conclude and click **Save** to save the alterations.

Creating Blocks

Only the *Resource* and *Transducers* blocks can be added to the device, bridge or controller template.

Right-click the FB VFD icon and click **New Block**. The **New Block** dialog box will open. Select the block type and type a related tag for the block. If you do not type a tag for the block, ***Syscon*** will combine the device tag with the block mnemonic to generate the new tag.

Click **Ok** to conclude and click **Save** to save the alterations.

Changing Block Attributes

Right-click the block icon and select **Attributes**. Only the block tag can be changed.

Type the new tag for the block and click **Ok** to conclude.

Click **Save** to save the alterations to the template file.

Block Off Line Characterization

Right-click the block icon and click **Off-line Characterization**. The **Off Line Characterization** dialog box will open.

Edit the values for the parameters and click **Close** to exit the **Off Line Characterization** dialog box.

See section **Block Off Line Characterization** for details.

RECYCLE BIN

The items that were sent to the **Recycle Bin** can be recovered at any time, even if the configuration is closed and opened again.

To open the *Recycle Bin* window, double-click its icon on the *Project* window.

Devices and blocks are identified by their original configuration attributes, such as tags, IDs or control modules. Click the button **Details** on the main toolbar, to display the detailed information about the devices, blocks and parameters.

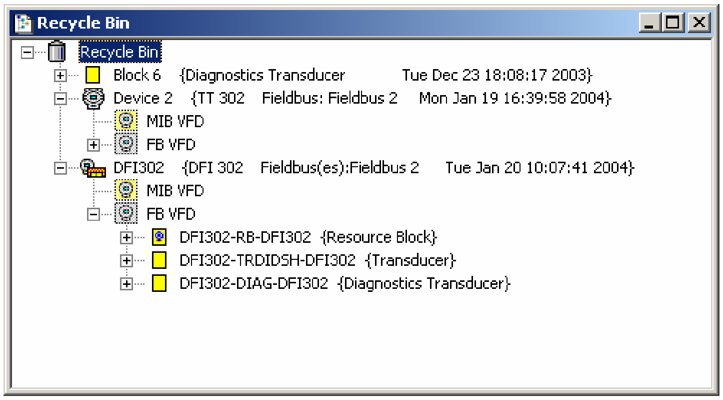

Recycle Bin
Recycle Bin
Block 6 {Diagnostics Transducer Tue Dec 23 18:08:17 2003}
Device 2 {TT 302 Fieldbus: Fieldbus 2 Mon Jan 19 16:39:58 2004}
MIB VFD
FB VFD
DFI302 {DFI 302 Fieldbus(es):Fieldbus 2 Tue Jan 20 10:07:41 2004}
MIB VFD
FB VFD
DFI302-RB-DFI302 {Resource Block}
DFI302-TRDIDSH-DFI302 {Transducer}
DFI302-DIAG-DFI302 {Diagnostics Transducer}

Figure 6.1. Recycle Bin Window

Right-click the device or block icon and select **Attributes** to open the **Attributes** dialog box. It is not possible to edit the attributes in this dialog box.

Restoring Devices and Blocks

To restore a bridge, device or block to the configuration, right-click the icon at the *Recycle Bin* window and click **Restore**.

The selected device or block, and all of its contained information, will be restored to the configuration and attached to its original fieldbus or control module.

ATTENTION
If the fieldbus or control module where the device or block was attached is removed, it will not be possible to restore the item.

If the restored item has a duplicated tag, the **Tag Table** dialog box will open and the new tag of the item will be generated based on the preference set by the user. To edit the tag, right-click the icon of the item at the **New Tag** column and click **Rename**. Type the new tag and press **Enter** on the keyboard.

Deleting Items from the Recycle Bin

When an item is deleted from the **Recycle Bin**, it is completely removed from the configuration and cannot be restored later on.

To remove an item from the *Recycle Bin* window, right-click the icon and click **Delete**.

To remove all items form the **Recycle Bin**, right-click the Recycle Bin icon and click **Empty Recycle Bin**.

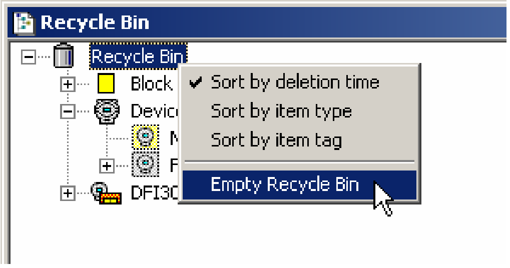


Figure 6.2. Deleting all elements from the Recycle Bin

Ordering Items in the Recycle Bin Window

The items in the *Recycle Bin* window can be ordered by the date and time they were deleted, by the tag or by the type of the items.

Right-click the Recycle Bin icon at the *Recycle Bin* window and select one of the options as indicated in the figure below:

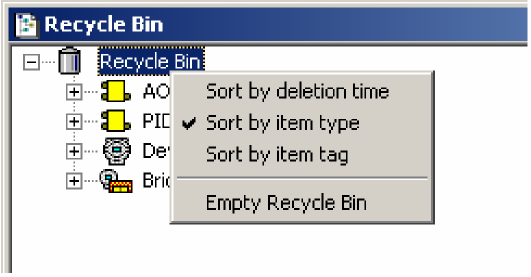


Figure 6.3. Ordering Items in the Recycle Bin Window

Sort by deletion time: Select this option to order the blocks, devices and bridges based on the date and time they were deleted from the configuration.

Sort by item type: Select this option to order the blocks, devices and bridges alphabetically based on the **type** of the items.

Sort by item tag: Select this option to order the blocks, devices and bridges alphabetically based on the **tag** of the items.

Section 7

SEARCH MENU

You can search for devices and blocks on the project configuration file.

Go to the **Search** menu and click **Find**. The **Find Tags** dialog box will open:

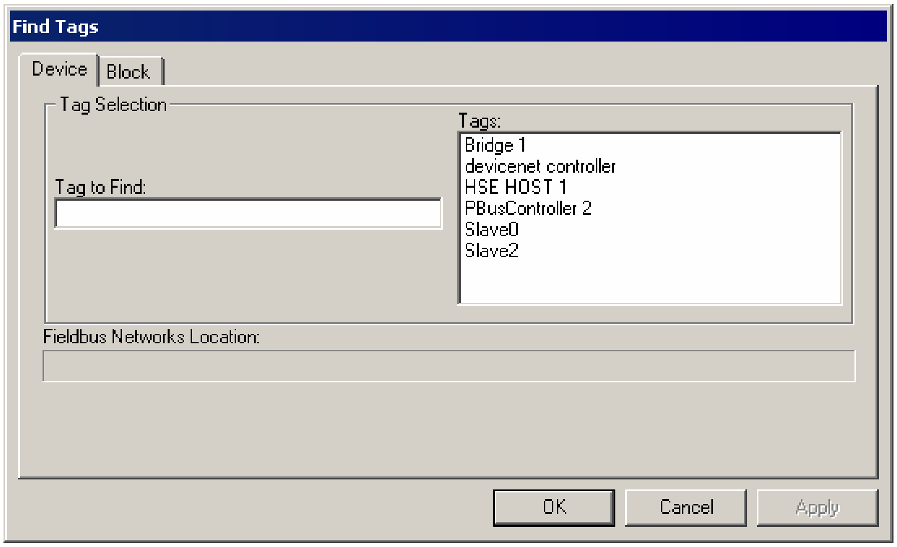


Figure 7.1. Find Tags Dialog Box

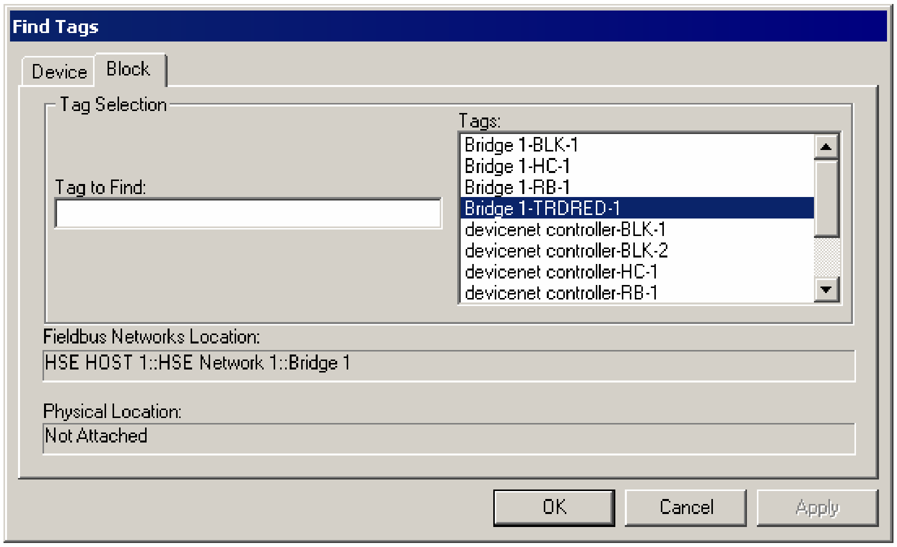
To search for a device, click the **Device** tab and type the tag on the **Tag to Find** text box, or select the tag on the **Tags** box. The device's location will be indicated in the **Fieldbus Networks Location** box.

Click **Ok** to open the *Fieldbus* window where the selected device is located.

To search for a block, click the **Block** tab and type the tag on the **Tag to Find** text box, or select the tag on the **Tags** box. The block's location will be indicated in the **Fieldbus Networks Location** box.

The **Physical Location** box shows to which process cell and control module the block is attached.

Click **Ok** to open the *Fieldbus* window and locate the selected block.



Fieldbus Networks Location: HSE HOST 1::HSE Network 1::Bridge 1

Physical Location: Not Attached

Figure 7.2. Locating a block

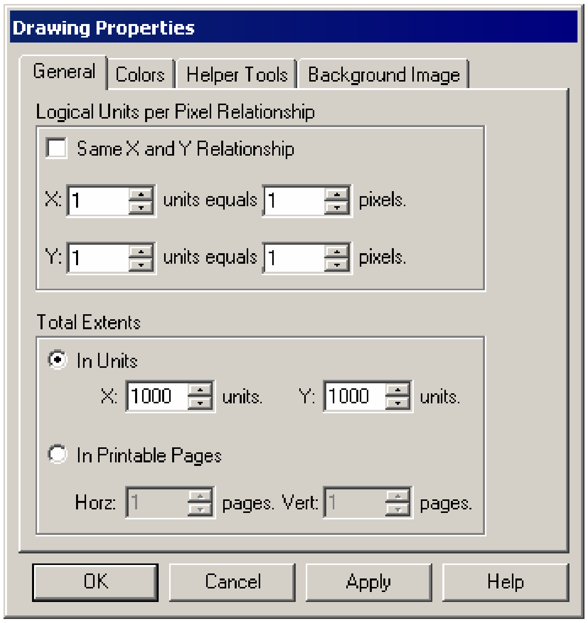
Section 8

PROPERTIES

Drawing Properties

This section presents a brief explanation about the drawing properties. For example, you can change the number of pixels representing a logical measure unit, the background and the grid colors, or choose a background image to be placed at the drawing area in the *Strategy* window.

Right-click the drawing area in the *Strategy* window and click **Drawing Properties**. The **Drawing Properties** dialog box will open.



Logical Units per Pixel Relationship

☐ Same X and Y Relationship

X: 1 units equals 1 pixels.

Y: 1 units equals 1 pixels.

Total Extents

● In Units

X: 1000 units. Y: 1000 units.

○ In Printable Pages

Horz: 1 pages. Vert: 1 pages.

Figure 8.1. Drawing Properties Dialog Box

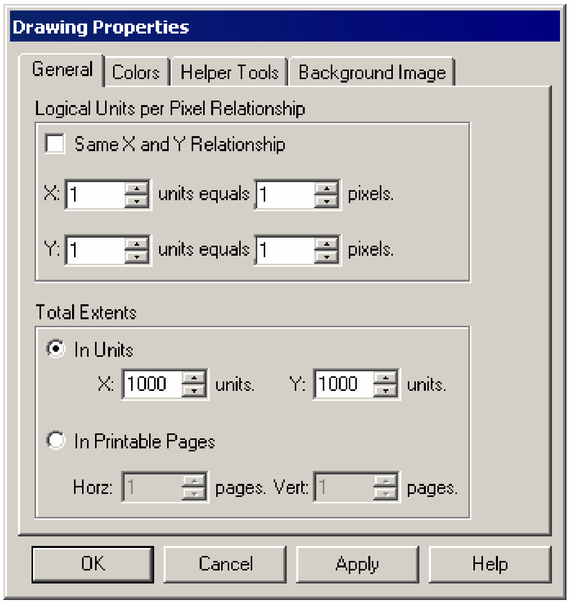
After editing the properties, click **Ok** to apply the changes and close the dialog box.

Click **Apply** to apply the changes and show the alterations in the *Strategy* window without closing the **Drawing Properties** dialog box. It is not possible to undo the changes after clicking this button.

Click **Cancel** to discard the changes and close the dialog box. **ATTENTION!** The changes will not be discarded if you clicked **Apply** before clicking **Cancel**.

General Tab

Change the drawing visualization and the total extents of the drawing in the **General** tab.



Logical Units per Pixel Relationship

☐ Same X and Y Relationship

X: 1 units equals 1 pixels.

Y: 1 units equals 1 pixels.

Total Extents

● In Units

X: 1000 units. Y: 1000 units.

○ In Printable Pages

Horz: 1 pages. Vert: 1 pages.

Figure 8.2. Drawing Properties Dialog Box: General Tab

The **Logical Units per Pixel Relationship** rectangle defines:

- How many X units will correspond to a determined number of pixels, increasing or decreasing the numbers at the **X** boxes. This will increase the width view.
- How many Y units will correspond to a determined number of pixels, increasing or decreasing the numbers at the **Y** boxes. This will increase the height view.

Check the **Same X and Y Relationship** box to maintain the correct proportion between the X variable and the Y variable.

At the **Total Extents** rectangle choose to represent the drawing:

- **In Units:** you will work in a specific area independently from the paper size, except when printing the drawing. In this case, the software will make a correspondence, independent of the number of pages it will take. Increase or decrease the number of horizontal and vertical units typing or selecting a number at the **X** and **Y** boxes.
- **In Printable Pages:** the drawing is displayed in a page format, according to the *Print Setup* definitions and pre-defined units size. Define the number of side-by-side pages at the **Horz** box, and the number of pages one after the other vertically at the **Vert** box.

Colors Tab

Change the background and the grid colors of the drawing area in the **Colors** tab.

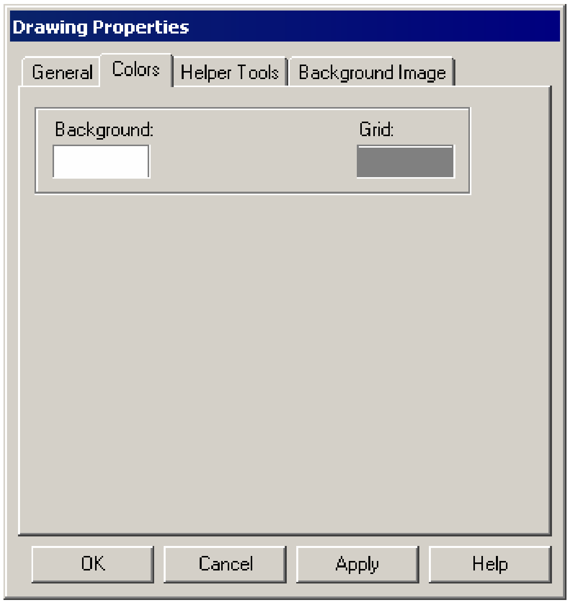


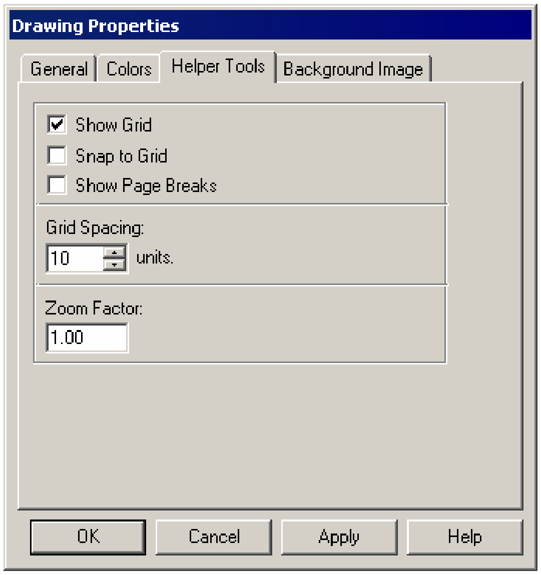
Figure 8.3. Drawing Properties Dialog Box: Colors Tab

Click the **Background** rectangle to open the **Color** box. Select the background color at the palette and click **Ok**.

Click the **Grid** rectangle to open the **Color** box. Select the grid color at the palette and click **Ok**.

Helper Tools Tab

In the **Helper Tools** tab, enable or disable gridlines, change the spacing between gridlines and type the zoom factor for the drawing view.



☑ Show Grid
☐ Snap to Grid
☐ Show Page Breaks
Grid Spacing: 10 units.
Zoom Factor: 1.00

Figure 8.4. Drawing Properties Dialog Box: Helper Tools Tab

- **Show Grid*:*** check this box to show the grid points at the *Strategy* window.
- **Snap to Grid*:*** check this box to make the objects snap to the grid.
- **Show Page Breaks*:*** check this box to view horizontal and vertical page breaks according to the number of horizontal and vertical pages defined in the **Printable Pages** option in the **General** Tab.

At the **Grid Spacing** rectangle, define the space between gridlines, increasing or decreasing the number of units at the **Units** box.

At the **Zoom Factor** rectangle, define the zoom factor typing the number that will determine how many times the drawing view will be increased or decreased.

Background Image Tab

In the **Background Image** tab, choose any bitmap to be placed on the drawing background, defining its position or stretching it to the window size.

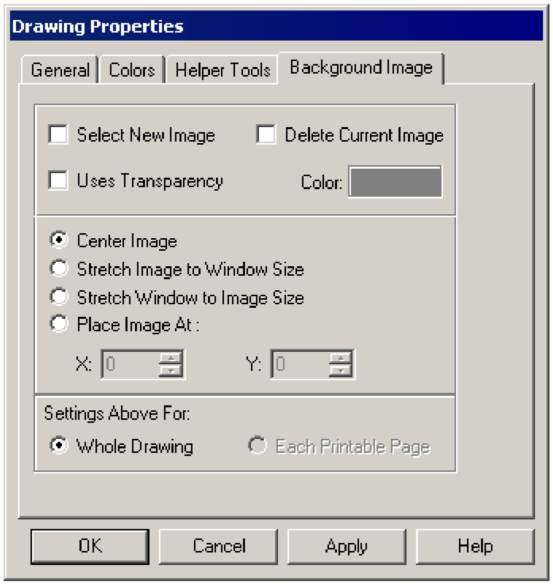


Figure 8.5. Drawing Properties Dialog Box: Background Image Tab

Check the **Select New Image** box to choose a bitmap as the background image. The **Open** dialog box will open to select the file.

Check the **Delete Current Image** box to delete the bitmap currently used on the drawing area.

Check the **Uses Transparency** box to select one color from the bitmap as transparent. Click the **Color** rectangle to open the palette and select the color.

You can also define the view properties, such as placing image at a determined position, or stretching it to the window size:

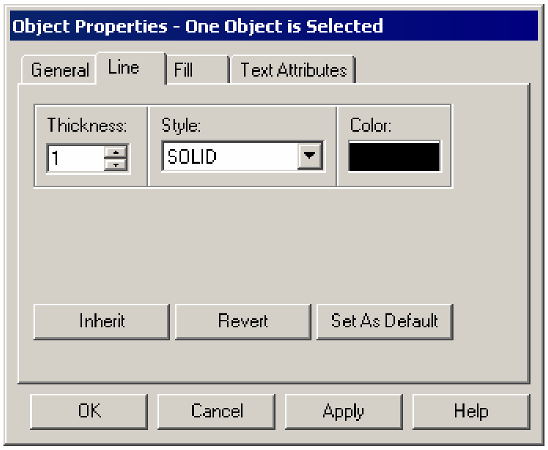
- **Center Image*:*** places the bitmap at the center of the drawing area.
- **Stretch Image to Window Size*:*** stretches the bitmap image to fit the window size.
- **Stretch Window to Image Size*:*** stretches the drawing area window to fit the bitmap image.
- **Place Image At*:*** defines a position for the bitmap image inside the drawing area. To define the horizontal position, select the value at the **X** box. To define the vertical position, select the value at the **Y** box.

At the **Settings Above For** rectangle, select the option **Whole Drawing** to apply the bitmap position to the whole drawing area, or select **Each Printable Page** to apply the bitmap position for each printable page.

Object Properties

This section presents a brief explanation about the object properties. For example, you can change the position, size, line color, fill color and text attributes of the block in the *Strategy* window.

Right-click the block or object in the *Strategy* window and click **Properties**. The **Object Properties** dialog box will open.



Thickness: 1

Style: SOLID

Color:

Figure 8.6. Object Properties Dialog Box

After editing the properties, click **Ok** to apply the changes and close the dialog box.

Click **Apply** to apply the changes and show the alterations in the *Strategy* window without closing the **Object Properties** dialog box. It is not possible to undo the changes after clicking this button.

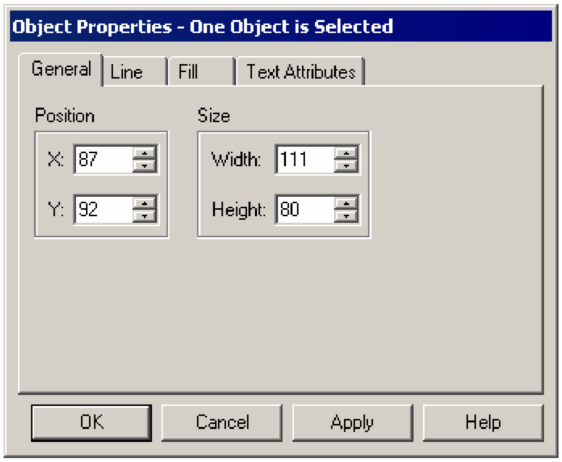
Click **Cancel** to discard the changes and close the dialog box. **ATTENTION!** The changes will not be discarded if you clicked **Apply** before clicking **Cancel**.

The **Line**, **Fill** and **Text Attributes** tabs have three additional buttons, which will be available when changing at least one object attribute:

- **Inherit*:*** apply the default configuration to the object.
- **Revert*:*** revert the settings to the previous configuration.
- **Set As Default*:*** set the current configuration as the default settings.

General Tab

In the **General** tab, you can precisely change the position and the size of the selected object. The **Status** bar, at the bottom of the ***Syscon*** window, displays information about the location of the cursor, while moving the cursor on the *Strategy* window.



X: 87
Y: 92
Width: 111
Height: 80

Figure 8.7. Object Properties Dialog Box: General Tab

At the **Position** rectangle:

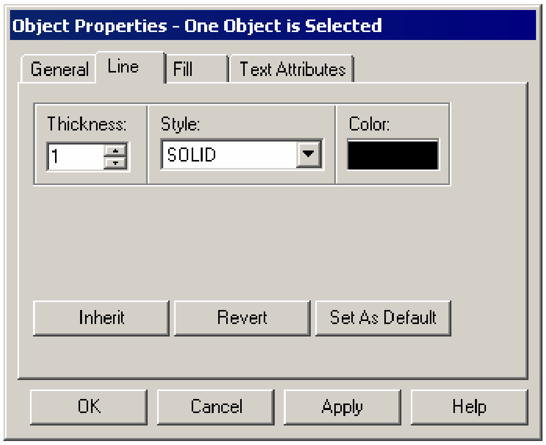
- Define the horizontal position of the object selecting the number at the **X** box.
- Define the vertical position of the object selecting the number at the **Y** box.

At the **Size** rectangle:

- Define the width of the object selecting the number of horizontal units at the **Width** box (the minimum width is 75 units).
- Define the height of the object selecting the number of vertical units at the **Height** box (the minimum height is 44 units).

Line Tab

In the **Line** tab, change the attributes of the line for the selected object.



Thickness: 1
Style: SOLID

Figure 8.8. Object Properties Dialog Box: Line Tab

At the **Thickness** rectangle, define the line thickness selecting the number. Examples:

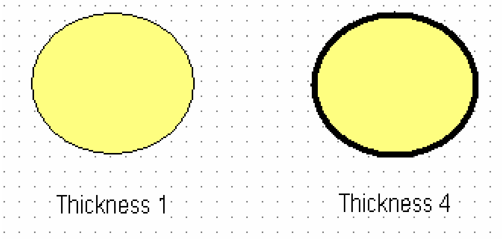


Figure 8.9. Line Thickness

At the **Style** rectangle, click the down arrow to select the line style: dashed line, doted line, dashed-dot line, dashed-dot-dot line, or solid line, which is the default. Examples:

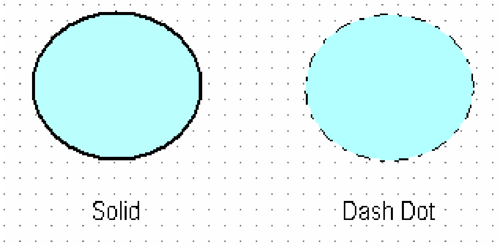


Figure 8.10. Line Styles

At the **Color** rectangle, click the rectangle to open the **Color** box and select the color at the palette. Examples:

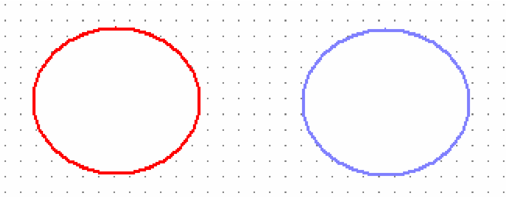
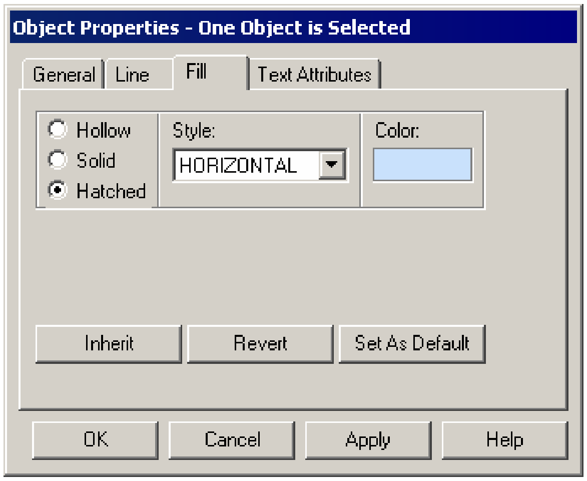


Figure 8.11. Line Colors

Fill Tab

In the **Fill** tab, change the fill attributes for the selected object.



○ Hollow
○ Solid
● Hatched

Style: HORIZONTAL

Color:

Figure 8.12. Object Properties Dialog Box: Fill Tab

Select one of the options to define the fill effect: **Hollow**, **Solid** or **Hatched**.

The **Style** rectangle is only available for the **Hatched** fill style. See the following examples of fill styles:

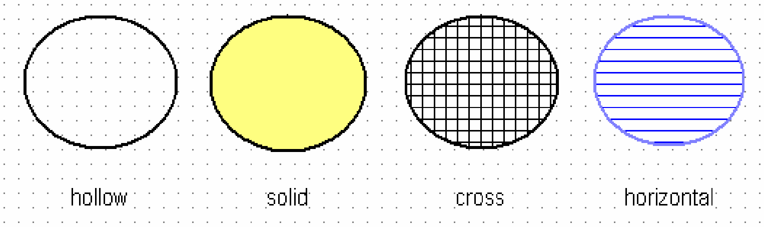


Figure 8.13. Fill Effects

The **Color** box is available for the **Solid** and **Hatched** fill style. Click the rectangle to open the **Color** box, select the color at the palette and click **OK**.

Text Attributes Tab

In the **Text Attributes** tab, change the attributes of the text for the selected object.

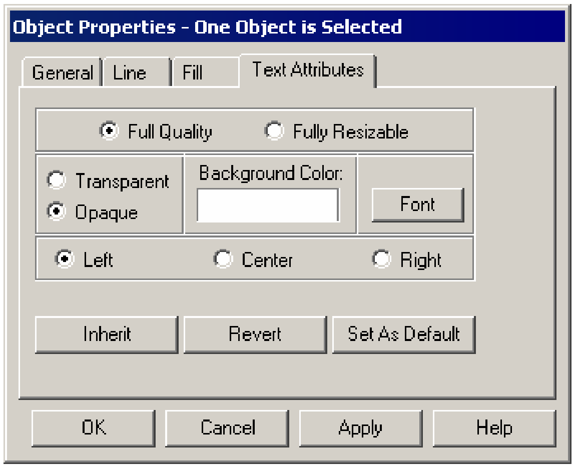


Figure 8.14. Object Properties Dialog Box: Text Attributes Tab

Select one of the options:

- **Full Quality*:*** this option limits the text to work with Windows restricted attributes. You won't be able to handle the text as an object, resizing or changing the line or fill attributes.
- **Fully Resizable*:*** this option enables changing any text attribute as an object.

Choose the background style for the text:

- **Transparent*:*** set a transparent background for the text.
- **Opaque*:*** set a filled background for the text.

The **Background Color** rectangle is available for the **Opaque** text background. Click rectangle to open the **Color** box. Select the color at the palette and click **Ok**.

The **Font** button opens the **Font** dialog box. Select the type, style, and size of the text, and click **Ok** to conclude.

Select the alignment for the text: click **Left** to align the text to the left; click **Center** to center the text; or click **Right** to align the text to the right.

Section 9

TOOLBARS

To activate a toolbar, go to the **Tool** menu, select **Tool Boxes** and click the option related to the toolbar. A check mark appears next to the toolbar when the toolbar is displayed.

The toolbars are placed at the left side of the ***Syscon*** window, but you can drag the toolbar to any location in the window. The **Tool Boxes** menus list the same functionalities available on the toolbars.

Main Toolbar

The main toolbar is automatically activated with ***Syscon***.

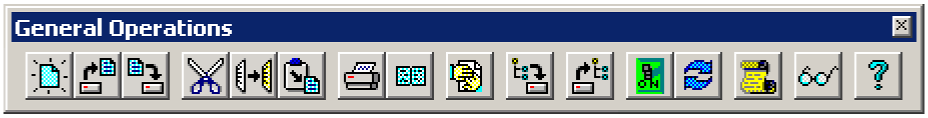


Figure 9.1. Main Toolbar

- New Button
Click this button to create a project file. See section **Creating a Project File**.

- Open Button
Click this button to open a project file. See section **Opening a Project File**.

- Save Button
Click this button to save the project or a template file. See section **Saving a Project File**.

- Cut Button
Click this button to remove the selection from the project and place it on the clipboard.

- Copy Button
Click this button to copy the selection to the clipboard.

- Paste Button
Click this button to insert the contents of the clipboard at the insertion point. This command is available after cutting or copying an object.

- Print Button
Click this button to print the project configuration or the drawing objects at the *Strategy* window. See section **Printing the Project Configuration**.

- Print Preview Button
Click this button to see how the project will look when printed. You can change the printer configuration and select the objects to be printed. See section **Print Preview**.

- View/Edit Mode Button
Click this button to toggles between the **View** mode and the **Edit** mode. This button is only enabled when the *Database Manager* is running and ***Syscon*** is operating in Multi-User mode.

- Commit Button
Click this button to send the current configuration file to the *Database Manager*.

This button is only available when *Syscon* is operating in Multi-User mode and the communication to the plant is Offline.

- Revert Button
Click this button to discard the alterations in the current configuration and restore the original configuration file from the *Database Manager*.

This button is only available when *Syscon* is operating in Multi-User mode and the communication to the Plant is Offline.

- Online Button
Click this button to initialize the communication. When selected, ***Syscon*** is operating in **Online** mode.

- Refresh Button
Click this button to update the information displayed in ***Syscon***. This button will only be enabled when the communication is **online**, and it is available for the *Project* window, the *Fieldbus* window, the *Live List* and *Block List* window.

- Error Log Button
Click this button to open the *Error Log* window. The *Error Log* window reports the errors that occurred during the communication.

- Show/Hide Button
Click this button to show or hide detailed information about blocks types, blocks parameters, devices types and fieldbus macrocycle.

- Contents Button
Click this button to open the ***Syscon Help Contents***.

Strategy Toolbar

The **Strategy** toolbar is displayed when the *Strategy* window is opened. Use these tools to create and manipulate blocks, links and strategy templates.

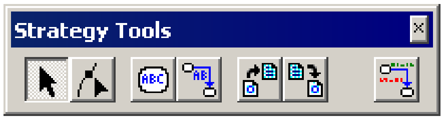


Figure 9.2. Strategy Toolbar

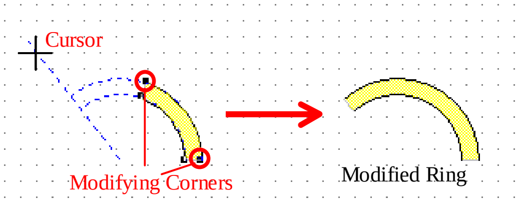
- Select Button
Click this button to select any object(s) at the *Strategy* window for moving, resizing, editing tags, etc.

To select a single object at the *Strategy* window, click **Select** and click the object.

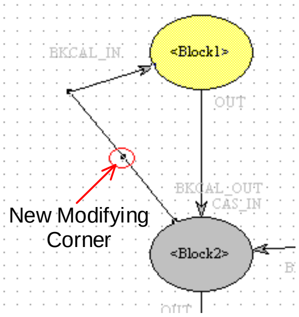
To select more than one object at the *Strategy* window, click **Select**, press and hold down the **Shift** key on the keyboard, and click the objects to be selected. Or click the drawing area, hold the mouse button down while dragging a rubber band around the objects to be selected.

- Modify Button
Click this button to change the shape of an object, to redraw the link line, or change the label of a parameter, a link or a block.

To use this tool, first select the object then click the **Modify** button. Click any corner of the object and drag the cursor to obtain the new figure. See the following illustration:



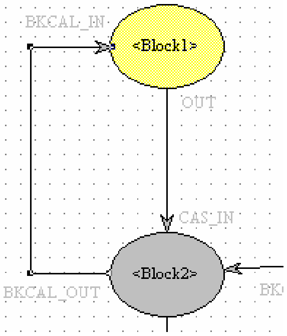
To redraw the link line, click **Select** to select the link and click **Modify**. Click the link line to create a *Modifying* corner or right-click the *Modifying* corner to remove it from the link line. Click the corner and drag it to redraw the link.



If the current corner is set as the reference point, hold down the **Ctrl** key while dragging the corner to draw it at the same horizontal or vertical direction. Hold down the **Shift** key while dragging the corner to draw it at a diagonal direction.

If the previous corner is set as the reference point, hold down the **Ctrl** key while dragging the corner to draw a horizontal or vertical line from the previous corner. Hold down the **Shift** key while dragging the corner to draw a diagonal line from the previous corner.

If the next corner is set as the reference point, hold down the **Ctrl** key while dragging the corner to draw a horizontal or vertical line from the next corner. Hold down the **Shift** key while dragging the first corner to draw a diagonal line from the next corner.



To modify the label from the parameter, block, or link, click **Modify** and click the label. Type the new label and click the drawing area to conclude. When a block label changes, the block tag is automatically updated in the *Process Cell* window and the *Fieldbus* window. The parameter label does not change in these windows.

- Function Block Button

Click this button and click the drawing area to create function blocks. The **New Block** dialog box will open. Configure the block attributes and click **Ok** to add the block to the drawing area. See section **Creating Blocks in the Strategy Window** for details.

- Link Button

Click this button to create links between function blocks. Right-click the block, select the **Output Parameter**, right-click another block and select the **Input Parameter**. See section **Creating Links** for further information.

- Import Strategy Template Button
Click this button to import a template to the *Strategy* window. The **Open** dialog box will appear. Select the template file and click **Open**. The template will be added to the *Strategy* window. See section **Import a Template into the Strategy window** for further information.

- Export Selected Strategy as Template Button
Click this button to create a template file with the selected blocks and links from the *Strategy* window. The **Save** dialog box will open. Type the name for the template file and click **Save**. See section **Exporting a Template from the Strategy window** for further information.

- On Line Monitoring Button
Click this button to put control strategy into the online mode.

Characterization Toolbar

The **Characterization** toolbar is displayed in the **Block Characterization** dialog box.

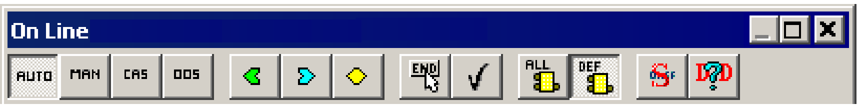


Figure 9.3. Online Characterization Toolbar

- Auto Button
Click this button to set the value of the *Mode Block* parameter to **Auto**.

- Man Button
Click this button to set the value of the *Mode Block* parameter to **Manual**.

- CAS Button
Click this button to set the value of the *Mode Block* parameter to **Cas:Auto**.

- OOS Button
Click this button to set the value of the *Mode Block* parameter to **OOS**.

- Input Button
Click this button to display the **Input** parameters of the block. An input parameter obtains its value from a source external to the block.

- Output Button
Click this button to display the **Output** parameters of the block. An output parameter is a parameter that may be linked to the input parameter of another block.

- Contained Button
Click this button to display the **Contained** parameters of the block. A contained parameter is a parameter whose value is configured, set by an operator, higher-level device or calculated.

- Confirmed Edition Button
If this button is highlighted, you will have to click the **End Edit** button at the bottom of the *Characterization* window to confirm the edition and accept the changes to the parameter value, or press **Enter** on the keyboard.

✓ - Mark to Save Button

This button is only available in the **On Line Characterization** Toolbar.

Click this button to save the parameter value even if it was not edited. The parameter will be marked with a **V** in the **Changed** column. Click this button to also unmark a parameter that changed the value but the changes are not to be saved.

- No Customization Button

Click this button to display all the parameters read from the DD.

- Customization By Type (Default) Button

Click this button to display the parameters selected by **Block Type** in the **Customization** dialog box. The **Default Customization** affects all project configurations. See section **Customize Characterization** for further details.

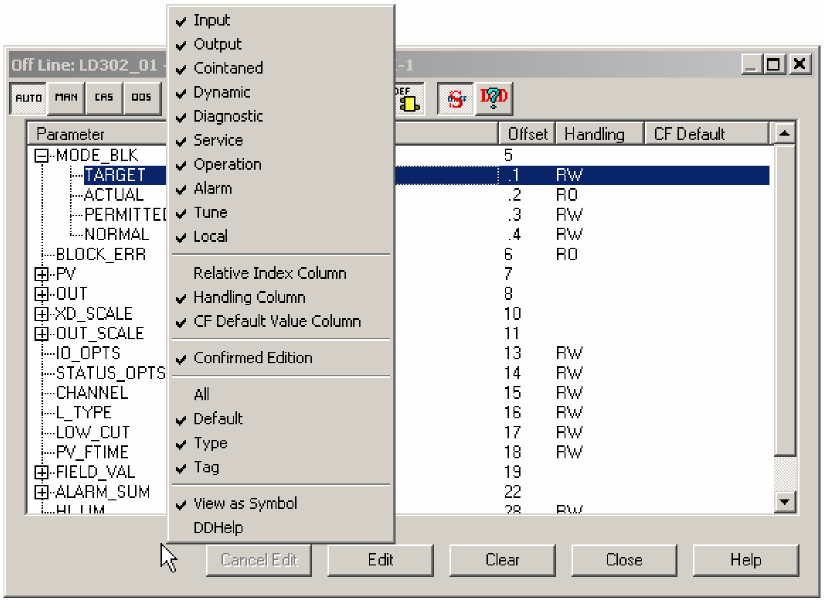
- Show Value as Symbol Button

Click this button to display the parameter value as a symbol or as a numeric value.

- DD Help Button

Click this button to display the DD's help information about the parameter at the bottom of the *Characterization* window.

Right-click the area at the bottom of the **Characterization** dialog box to open the menu and select other options:



Parameter	Offset	Handling	CF Default
MODE_BLK	5		
TARGET	.1	RW	
ACTUAL	.2	RO	
PERMITTE	.3	RW	
NORMAL	.4	RW	
BLOCK_ERR	6	RO	
PV	7		
OUT	8		
XD_SCALE	10		
OUT_SCALE	11		
IO_OPTS	13	RW	
STATUS_OPTS	14	RW	
CHANNEL	15	RW	
L_TYPE	16	RW	
LOW_CUT	17	RW	
PV_FTIME	18	RW	
FIELD_VAL	19		
ALARM_SUM	22		

Figure 9.4. Menu options for the Characterization window

Dynamic: shows the dynamic parameters of the block. Dynamic parameter values are calculated by the block algorithm and therefore do not need to be restored after a power failure.

Diagnostic: shows the diagnostic parameters of the block.

Service: shows the service parameters of the block.

Operation: shows the operate parameters of the block.

Alarm: shows the alarm parameters of the block. Alarms and events, known as alerts, represent state changes within function block applications.

Tune: shows the tune parameters of the block.

Local: shows the local parameters of the block.

Relative Index Column: shows the *Relative Index* column.

Handling Column: shows the *Handling* column.

CF Default Value Column: shows the default parameter values defined by the device manufacturer in the *Capabilities File*.

All: shows all parameters read from the DD.

Default: shows the parameters selected by *Block Type* in the **Customization** dialog box.

Type: shows the parameters selected by *Block Type* in the **Customization** dialog box. The **Customization By Type** affects only the current configuration.

Tag: shows the parameters selected for a specific *Block Tag* in the **Customization** dialog box. The **Customization By Tag** affects only the current configuration.

Drawing Toolbar

To activate the **Drawing** toolbar, go to the **Tools** menu, select **Tool Boxes** and click **Drawing**. The **Drawing** toolbar will open:

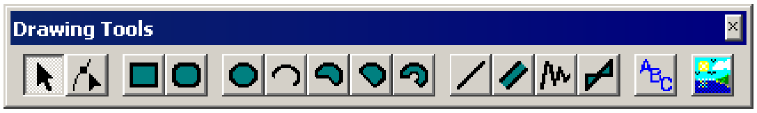
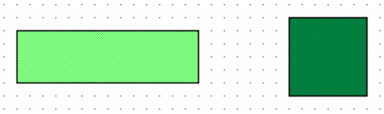


Figure 9.5. Drawing Toolbar

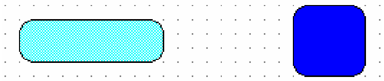
- Select Button
Click this button to select any object(s) at the *Strategy* window for moving, resizing, editing tags, etc. Refer to the **Select Button** on the **Strategy Toolbar** section.

- Drawing Modify Button
Click this button to change the shape of an object, to redraw the link line, or change the label of a parameter, a link or a block. Refer to the **Modify Button** on the **Strategy Toolbar** section.

- Rectangle Button
Click this button to draw a rectangle. Click the drawing area and drag the cursor diagonally in the desired direction to obtain the figure. To draw a square, press and hold down the **Shift** key while dragging the cursor.

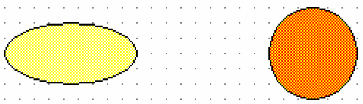


- Rounded Rectangle Button
Click this button to draw a rounded rectangle. Click the drawing area and drag the cursor diagonally in the desired direction to obtain the figure. To draw a rounded square, press and hold down the **Shift** key while dragging the cursor.



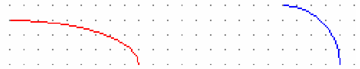
- Ellipse Button

Click this button to draw an ellipse. Click the drawing area and drag the cursor diagonally to obtain the figure. To draw a circle, press and hold down the **Shift** key while dragging the cursor.



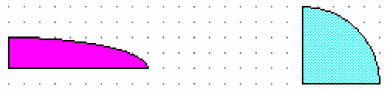
- Arc Button

Click this button to draw an arc. Click the drawing area and drag the cursor to obtain the desired figure. To draw an arc with the height equals to its width, press and hold down the **Shift** key while dragging the cursor.



- Pie Button

Click this button to draw a pie. Click the drawing area and drag the cursor to obtain the desired figure. To draw a pie with the height equals to its width, press and hold down the **Shift** key while dragging the cursor.



- Chord Button

Click this button to draw a chord. Click the drawing area and drag the cursor to obtain the desired figure. To draw a chord with the height equals to its width, press and hold down the **Shift** key while dragging the cursor.

- Ring Button

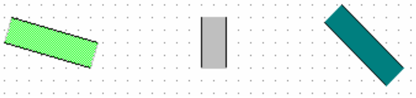
Click this button to draw a ring. Click the drawing area and drag the cursor to obtain the desired figure. To draw a ring with the height equals to its width, press and hold down the **Shift** key while dragging the cursor.

- Line Button

Click this button to draw a line. Click the drawing area and drag the cursor to obtain the desired figure. To draw a perfectly horizontal or vertical line, press and hold down the **Ctrl** key while dragging the cursor. To draw a perfectly 45-degree diagonal line, press and hold down the **Shift** key while dragging the cursor.

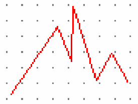
- Pipe Button

Click this button to draw a pipe Click the drawing area and drag the cursor to obtain the desired figure. To draw a perfectly horizontal or vertical pipe, press and hold down the **Ctrl** key while dragging the cursor. To draw a perfectly 45-degree diagonal pipe, press and hold down the **Shift** key while dragging the cursor.



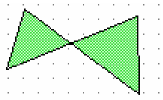
- Polyline Button

Click this button to draw a polyline. Click the drawing area, drag the cursor and click at each corner to draw the lines. To draw a perfectly horizontal or vertical line, press and hold down the **Ctrl** key while dragging the cursor. To draw a perfectly 45-degree diagonal line, press and hold down the **Shift** key while dragging the cursor. Right-click the drawing area to conclude.



- Polygon Button

Click this button to draw a polygon. Click the drawing area, drag the cursor and click at each corner of the polygon. To draw a perfectly horizontal or vertical line, press and hold the **Ctrl** key down while dragging the cursor. To draw a perfectly 45-degree diagonal line, press and hold down the **Shift** key while dragging the cursor. Right-click the drawing area to conclude the polygon.

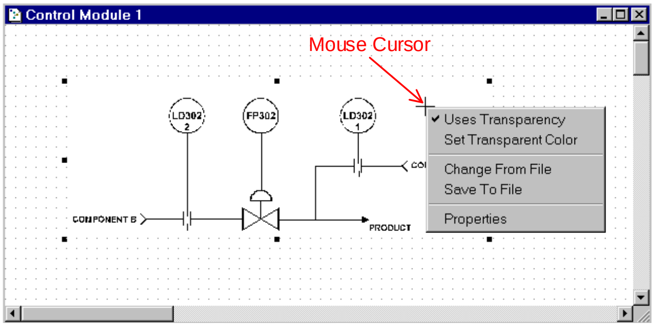


- Text Button

Click this button to type any text at the *Strategy* window. Click the drawing area and the cursor will change to a prompt. Type the text and click at the drawing area to conclude.

- Bitmap Button

Click this button to import a bitmap file to the *Strategy* window. Click the drawing area and the **Open** dialog box will appear. Select the bitmap file and click **Open**. The bitmap has its own settings:



Uses Transparency: set transparency for the bitmap.

Set Transparent Color: select the transparent color for the bitmap.

Change From File: select another bitmap to replaced the current one.

Save To File: save the bitmap as a .bmp file.

Properties: opens the **Object Properties** dialog box. See section **Object Properties** for details.

Alignment Toolbar

To activate the **Alignment** toolbar, go to the **Tools** menu, select **Tool Boxes** and click **Alignment**. The **Alignment** toolbar will open:

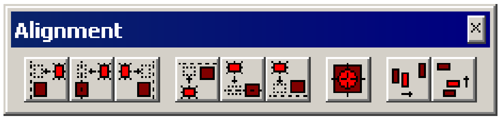
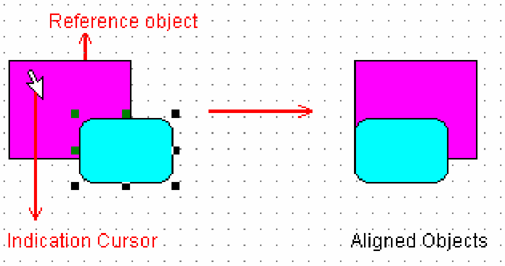


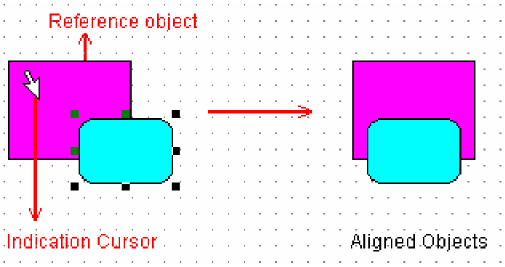
Figure 9.6. Alignment Toolbar

Use these tools to arrange or distribute drawing objects with equal distances from each other, or align their edges or centers, vertically or horizontally.

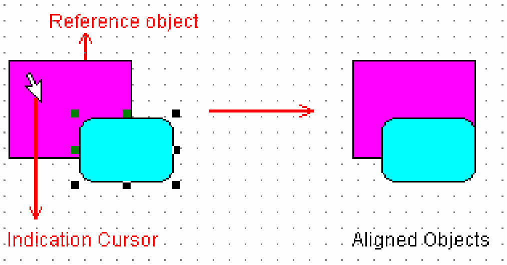
- Left Button
Click this button to align the left side of the selected object(s) to the left side of the anchor. First, select the object (or objects) to be aligned. Then click the button and click the reference object. See the example:



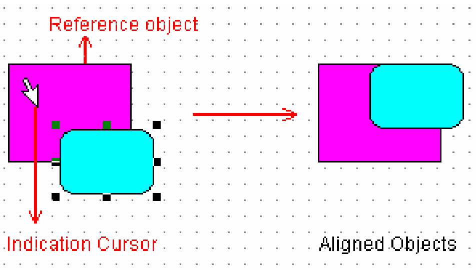
- Center Button
Click this button to align the horizontal center of the selected object(s) to the horizontal center of the anchor. First, select the object (or objects) to be aligned. Then click the button and click the reference object. See the example:



- Right Button
Click this button to align the right side of the selected object(s) to the right side of the anchor. First, select the object (or objects) to be aligned. Then click the button and click the reference object. See the example:

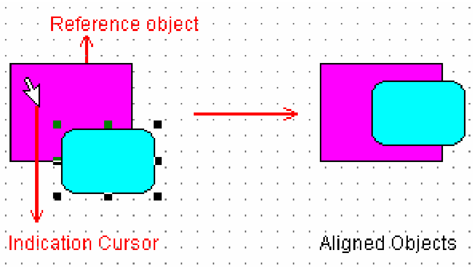


- Top Button
Click this button to align the top of the selected object(s) to the top of the anchor. First, select the object (or objects) to be aligned. Then click the button and click the reference object. See the example:



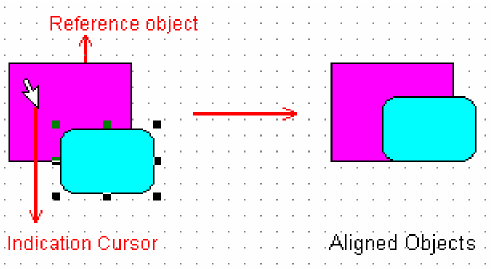
- Middle Button

Click this button to align the vertical center of the selected object(s) to the vertical center of the anchor. First, select the object (or objects) to be aligned. Then click the button and click the reference object. See the example:



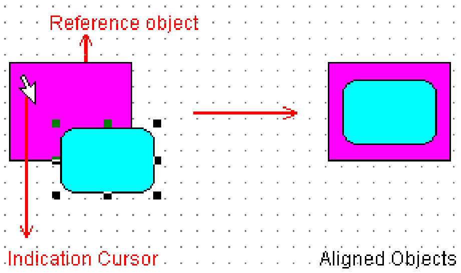
- Bottom Button

Click this button to align the bottom of the selected object(s) to the bottom of the anchor. First, select the object (or objects) to be aligned. Then click the button and click the reference object. See the example:



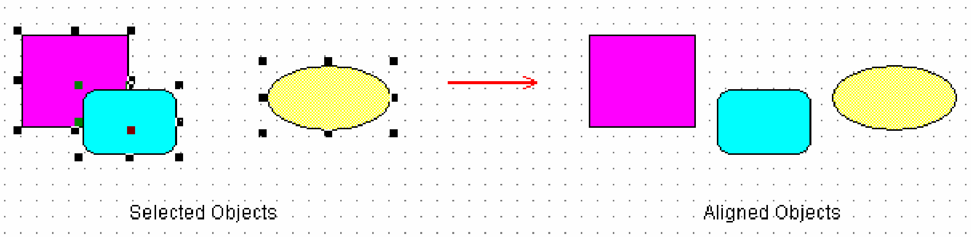
- Center Points Button

Click this button to align the center of the selected object(s) to the center of the anchor. First, select the object (or objects) to be aligned. Then click the button and click the reference object. See the example:

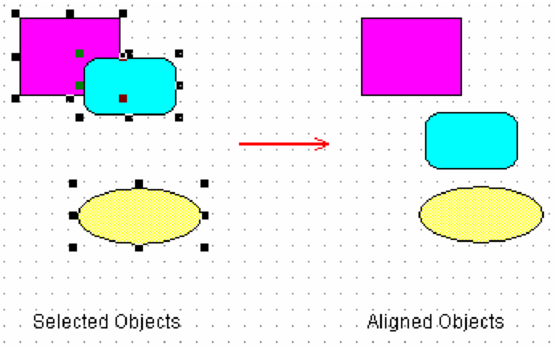


- Evenly Spaced - Horizontal Button

Click this button to distribute the selected objects horizontally and the horizontal distance between the edges of all the objects will be the same. This button is enabled for three or more objects. First, select all objects to be aligned, and then click this button. See the example:



- Evenly Spaced - Vertical Button
Click this button to distribute the selected objects vertically and the vertical distance between the edges of all the objects will be the same. This button is enabled for three or more objects. First, select all objects to be aligned, and then click this button. See the example:



Ordering Toolbar

To activate the **Ordering** toolbar, go to the **Tools** menu, select **Tool Boxes** and click **Ordering**. The **Ordering** toolbar will open:

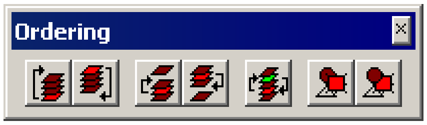
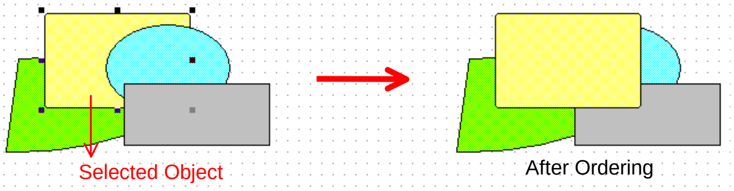


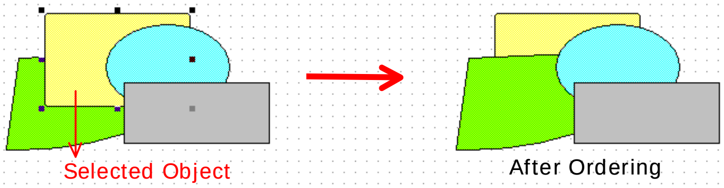
Figure 9.7. Ordering Toolbar

Use these tools to overlap as many drawing objects as desired and rearrange them in the stack.

- To Front Button
Click this button to place the selected object in front of other overlapping objects. First, select the object and then click this button.

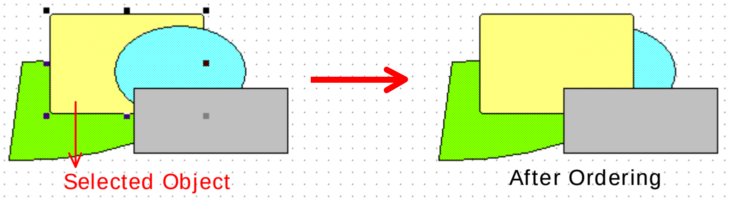


- To Back Button
Click this button to place the selected object behind other overlapping objects. First, select the object and then click this button.



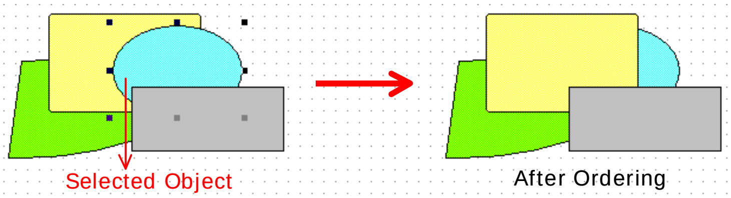
- Forward One Button

Click this button to move the selected object one position forward in the stacking order. First, select the object and then click this button.



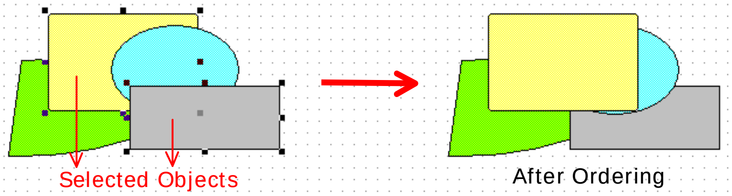
- Backward One Button

Click this button to move the selected object one position backward in the stacking order. First, select the object and then click this button.



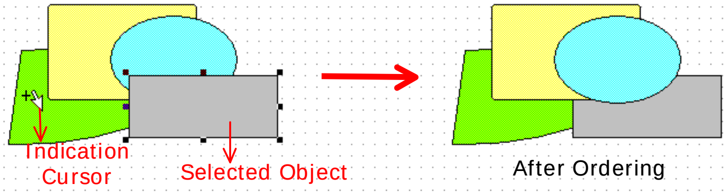
- Reverse Order Button

Click this button to reverse the stacking order of two selected objects. First, select the objects and then click this button, and the stacking order will be reversed.



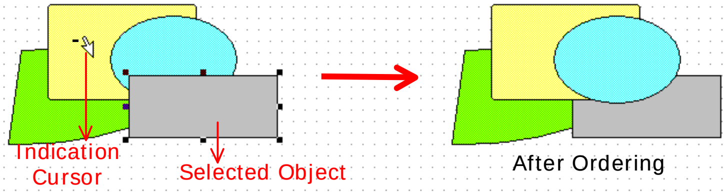
- In Front Of Button

Click this button to place the selected object in front of another object in the stack. First, select the object to be moved and click this button. Then, click the reference object in the stack to place the previously selected object in front of it.



- Behind Button

Click this button to place the selected object behind another object in the stack. First, select the object to be moved and click this button. Then, click the reference object in the stack to place the previously selected object behind it.



Copy Attributes Toolbar

To activate the **Copy Attributes** toolbar, go to the **Tools** menu, select **Tool Boxes** and click **Copy Attributes**. The **Copy Attributes** toolbar will open:

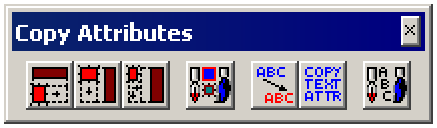
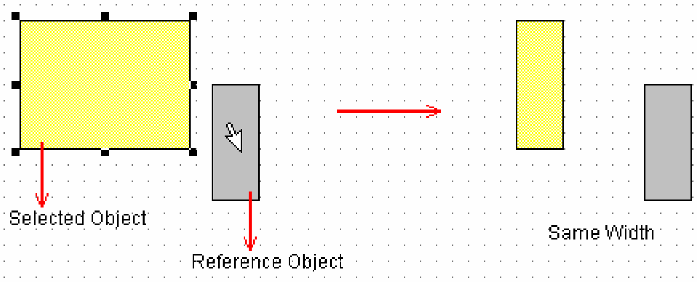


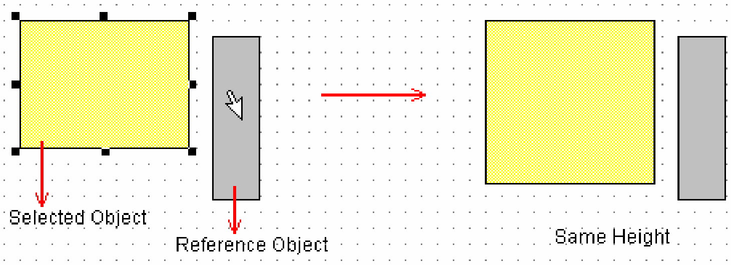
Figure 9.8. Copy Attributes Toolbar

Use these tools to apply the appearance of an object to another object.

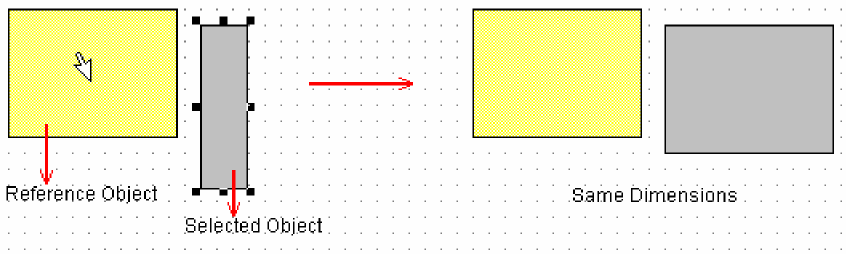
- Same Width Button
Click this button to copy the width from one object to another. Select the object that will be changed, click this button and then click the reference object to conclude. Example:



- Same Height Button
Click this button to copy the height from one object to another. Select the object that will be changed, click this button and then click the reference object to conclude. Example:

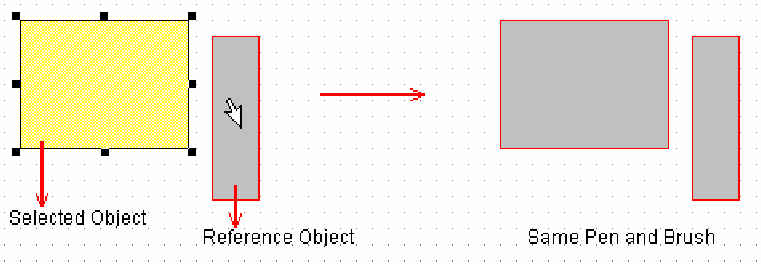


- Same Dimensions Button
Click this button to copy the width and the height from one object to another. Select the object that will be changed, click this button and then click the reference object to conclude. Example:



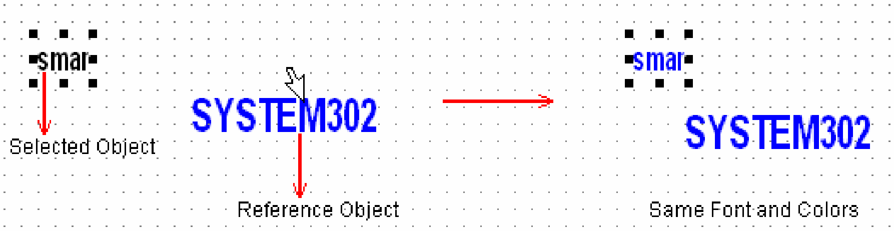
- Same Pen & Brush Button

Click this button to copy the line and fill color from one object to another. Select the object that will be changed, click this button and then click the reference object to conclude. Example:



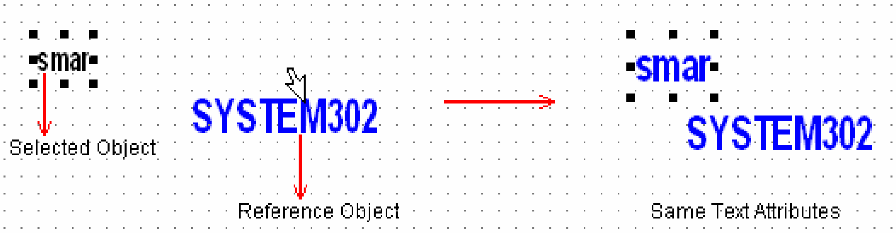
- Same Font & Colors Button

Click this button to copy the text font and colors from one object to another. Select the object that will be changed, click this button and then click the reference object to conclude. Example:



- Same Text Attributes Button

Click this button to copy the text font, size and colors, from one object to another. Select the object that will be changed, click this button and then click the reference object. Example:



- Set Attributes As Default Ones Button

Click this button to set the attributes of the selected object as the default attributes. Select the reference object and click this button. All other objects will be drawn with the same line color, fill color, text font and text size as the selected object.

Section 10

DEVICE SUPPORT

Including New DD and Capabilities File

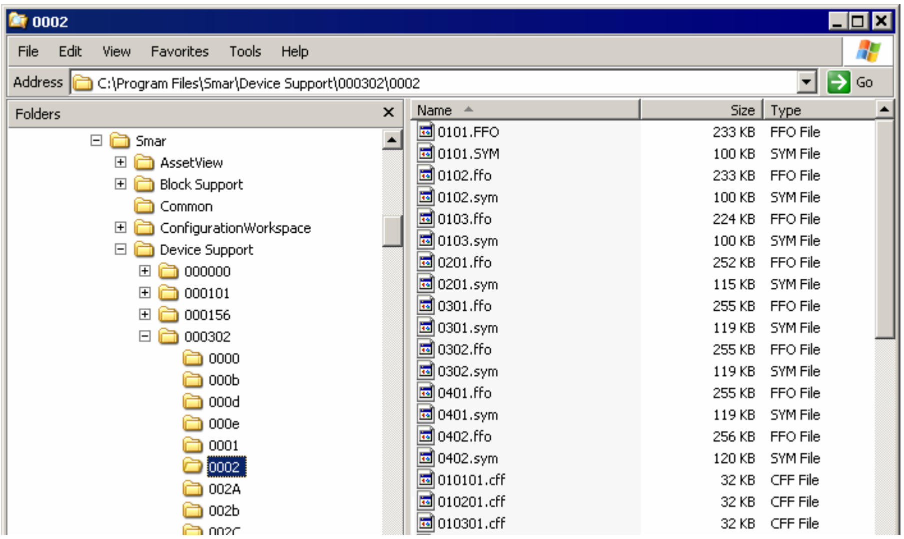
The *Device Description* for a particular device is provided by the device's manufacturer and distributed by the *Fieldbus Foundation*. If it is not currently available from the *Fieldbus Foundation*, you may need to contact the manufacturer and get a copy of the DD.

There is a DD for each device type, and it consists of the files whose extensions are "***.ffo***" and "***.sym***".

The *Capabilities File* is used to define the device capabilities – e.g., dynamic block instantiation capability - and the resources available for creating *Function Block Applications*, *Resource Blocks*, *Transducer Blocks*, and *Function Blocks*.

The *Capabilities File* consists of the files with the extension "***.cff***", and they are placed together with the *DD* files.

The files are organized in the folders for each manufacturer, as the following figure shows:



Address C:\Program Files\Smar\Device Support\000302\0002

Name	Size	Type
0101.FFO	233 KB	FFO File
0101.SYM	100 KB	SYM File
0102.ffo	233 KB	FFO File
0102.sym	100 KB	SYM File
0103.ffo	224 KB	FFO File
0103.sym	100 KB	SYM File
0201.ffo	252 KB	FFO File
0201.sym	115 KB	SYM File
0301.ffo	255 KB	FFO File
0301.sym	119 KB	SYM File
0302.ffo	255 KB	FFO File
0302.sym	119 KB	SYM File
0401.ffo	255 KB	FFO File
0401.sym	119 KB	SYM File
0402.ffo	256 KB	FFO File
0402.sym	120 KB	SYM File
010101.cff	32 KB	CFF File
010201.cff	32 KB	CFF File
010301.cff	32 KB	CFF File

Figure 10.1. Device Support Folders

Syscon needs *DD* and *Capabilities Files* in order to configure a device.

Adding DDs and Capabilities Files

Open the **Device Support** installation folder and create a new folder for the manufacturer, if it is not there yet. The folder name should be the 6 hexadecimal digits representing the manufacturer's code, for example, the folder 000302 represents **SMAR**. The default path for the **Device Support** installation folder is *C:\Program Files\Smar\Device Support*.

Inside the manufacturer's folder, create the **Device Type** folder. The name for this folder should be the 4 hexadecimal digits of the *Device Type* code, for example, the folder 0001 inside the folder 000302 represents the **LD302**.

Copy the *DD* and the *Capabilities Files* for the new device to the newly created **Device Type** folder in the **Device Support** folder.

After that, ***Syscon*** will be able to reference the new *DDs* in the dialog boxes when creating devices and blocks, indicating the *Manufacturer ID* and the *Device Type* code.

However, ***Syscon*** will not be able to show the manufacturer name or the device name, because you must define them in the **Device Support.ini** file. See section **Defining Manufacturers and Device names**.

If the device supports dynamic instantiation of function blocks, you must define the *Function Block Mnemonics*. See section **Defining a Block Mnemonic**.

If the *Capabilities File* is not provided, you can define it since the necessary information is available. See section **Creating the Capabilities File**.

Defining Manufacturers and Device Names

The file **Device Support.ini** located in the **Device Support** folder maintains all name definitions for the manufacturers and devices, and you may need to add definitions in this file to show those names in the dialog boxes when adding device or blocks to the project configuration.

In the **Device Support** folder, open the **Device Support.ini** file and create the manufacturer in the **[Manufacturers By Id]** section. The definition of the name for a particular manufacturer has the following format:

<manufacturer_id> = <manufacturer_name>

where
"manufacturer_id" is the 6 hexadecimal digits manufacturer's code;
"manufacturer_name" is the manufacturer's name indicated in the dialog boxes.

Example:

```
[Manufacturers By Id]
000302=Smar
```

Create a section to maintain the new manufacturer's devices. The definition of the section for a particular manufacturer has the following format:

[<manufacturer_id> Devices By Code]

where
"manufacturer_id" is the 6 hexadecimal digits manufacturer's code.

Example:

```
[000302 Devices By Code]
```

Define the devices' names in this new section. The definition of the name for a particular device has the following format:

<device_type_code>=<device_name>

where
"device_type_code" is the 4 hexadecimal digits of the Device Type code;
"device_name" is the device's name indicated in the dialog boxes.

Example:

```
0001=LD 302
```

Remember to save the alterations to the **Device Support.ini** file.

Creating the Capabilities File

If the *Capabilities File* is not provided, it can still be defined since you have the necessary information. The source of the information may be the *Device Manufacturer*, the device itself or the old ***.ini*** or ***.drf*** *Resource Files*.

Copy the template file **Capabilities.cff** located in the ***Syscon*** folder and paste it in the device folder corresponding to the device being created in the *Capabilities File*, in the **Device Support** folder.

Rename the file to match the corresponding DD files. Edit the template file and provide all of the necessary information.

If the device supports dynamic instantiation of function blocks, the **Function Block Mnemonics** will still have to be defined in the **Device Support.ini** file. See section **Defining a Block Mnemonic**.

Defining a Block Mnemonic

When defining a *Capabilities File* for a device that can dynamically create instances of function blocks, you must create a section for each one of these blocks in the ***.cff*** file.

Open the **Device Support.ini** file and locate the section named **[Block Type Mnemonics]**. The definition of the *Mnemonic* for a particular function block has the following format:

<m_id> <d_type> <d_revision> <dd_revision> <block_dditemid> = <block_mnemonic>

where
"m_id" is the 6 hexadecimal digits manufacturer's code;
"d_type" is the 4 hexadecimal digits of the Device Type;
"d_revision" is the Device Revision;
"dd_revision" is the DD Revision;
"block_dditemid" is the DDItemId;
"block_mnemonic" is the mnemonic for the block.

Example:

```
[Block Type Mnemonics]
000302 0001 01 02 800202B0=PID
```

where:
000302 is the SMAR manufacturer code;
0001 is the code for the **LD302** Device Type;
01 is the Device Revision;
02 is the DD Revision;
800202B0 is the DDItemId for the block **PID**.

Follow this pattern to add new definitions.

Importing Device Support Files

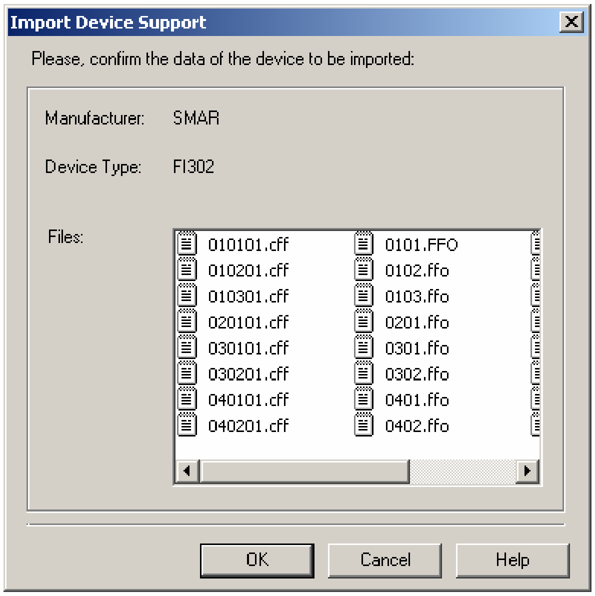
Syscon can automatically import the *DD* and *CF* files of a device. This procedure will execute the steps described in the sections above to include a new *DD* and *CF*, define the manufacturer, the device name and the block mnemonics.

Using this procedure to import files will add another step, which is to verify the *CF* file and abort the import operation if the *CF* file does not have the mandatory information or has the wrong information according to the *FF-103 Foundation Specification Common File Format*. This process assures that the device and block creation in ***Syscon*** is successful.

IMPORTANT
You must be logged as the **Administrator** or a member of the **Administrators** group to import **Device Support** files.

On the **Project File** menu, click **Import Device Support**. The **Browse** dialog box will open. Select the directory where the *DDs* and *CFs* of the device being imported are located and click **Ok**.

The **Import Device Support** dialog box will open showing the list of files that will be imported in the **Device Support** folder of the corresponding manufacturer:



Import Device Support

Please, confirm the data of the device to be imported:

Manufacturer: SMAR

Device Type: FI302

Files:

010101.cff
010201.cff
010301.cff
020101.cff
030101.cff
030201.cff
040101.cff
040201.cff
0101.FFO
0102.ffo
0103.ffo
0201.ffo
0301.ffo
0302.ffo
0401.ffo
0402.ffo

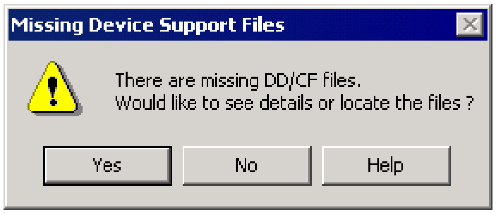
Figure 10.2. Confirming the files to be imported

Click **Ok** and a message box will appear informing the user that the operation was successful. Click **Ok** to conclude.

Checking Missing Device Support

Every time you open a project configuration file, ***Syscon*** verifies if the *DDs* and *Capabilities Files* used in the configuration are installed with the application.

A message box opens informing the user if one or more files are missing.

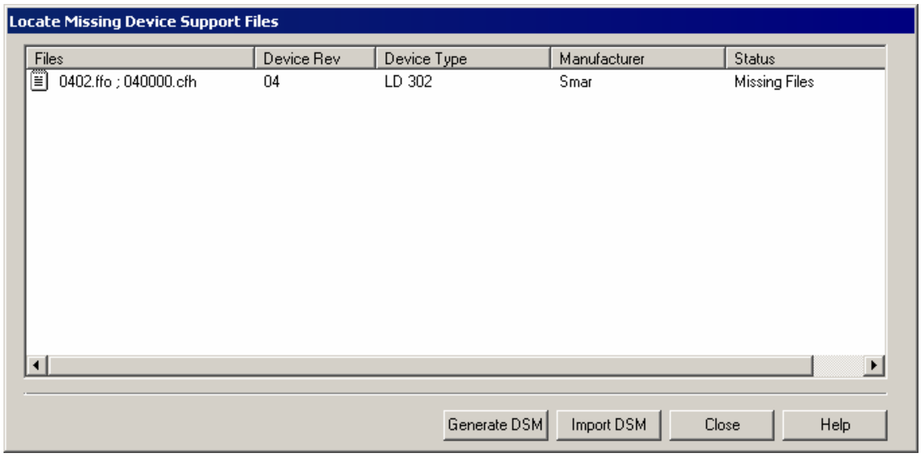


Missing Device Support Files

There are missing DD/CF files.
Would like to see details or locate the files ?

Figure 10.3. Checking Missing Device Support

Click **Yes** on the message box to open the **Locate Missing Device Support Files** dialog box:



Locate Missing Device Support Files

Files	Device Rev	Device Type	Manufacturer	Status
0402.ffo ; 040000.cfh	04	LD 302	Smar	Missing Files

Figure 10.4. Displaying the Missing Files

If you click **No**, ***Syscon*** will open the configuration file, but some blocks and parameters will not be available.

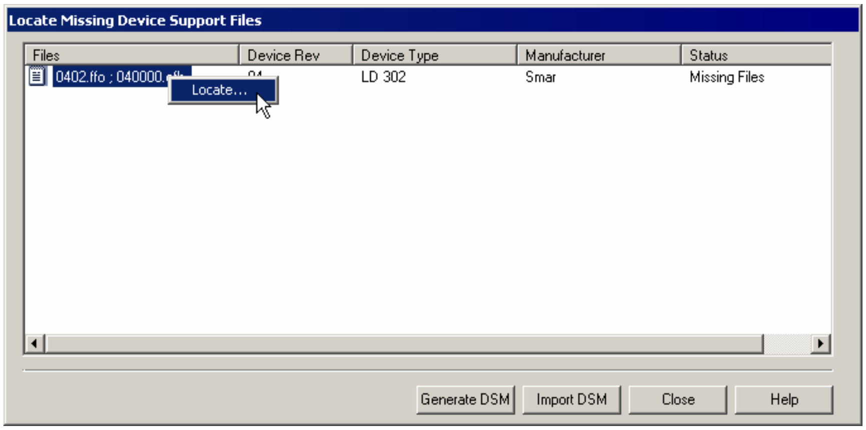
The following sub-sections describe the steps to locate missing *Device Support* files.

Locating the Missing Files Manually

IMPORTANT

You must be logged as the **Administrator** or a member of the **Administrators** group to copy the DD and CF files to the **Device Support**.

On the **Locate Missing Device Support Files** dialog box, right-click the file icon and click **Locate**:



Files	Device Rev	Device Type	Manufacturer	Status
0402.ffo ; 040000.	04	LD 302	Smar	Missing Files

Figure 10.5. Locating the Missing Files

The **Browse** dialog box will open. Browse the directories to select the folder where the DD and CF files are located.

Click **Ok** and ***Syscon*** will automatically create the device folder copying the *DDs* and *CFs*.

Repeat this procedure for each file listed on the **Locate Missing Device Support Files** dialog box. After locating all missing files, click **Close** to return to ***Syscon*** and open the configuration file.

Generating the DSM File

The *Device Support Maintenance* file, **DSM file**, contains the list of support files that are missing in the configuration.

IMPORTANT

You must be logged as the **Administrator** or a member of the **Administrators** group to create the **DSM file** and copy the DD and CF files to the **Device Support**.

The support files related to the FFB blocks will not be included in the **DSM file**.

In the **Locate Missing Device Support Files** dialog box, click the button **Generate DSM** to open the **Browse** dialog box. Select the folder where the DSM file will be saved and click **Ok**.

A message box will appear informing the user that the operation was successful. Click **Ok** to return to the **Locate Missing Device Support Files** dialog box and then click **Close**.

The **DSM file** should be sent to the machine that has the missing *DDs* and *CFs*, usually the machine where the configuration was originally created. See section **Packing the Missing Device Support Files**.

When you receive the pack with the DD and CF files, in a directory named **Missing Files**, import these files to the target machine. See section **Importing Missing Device Support Files**.

Packing the Missing Device Support Files

To create a package with the missing DD and CF files, it is necessary to send the **DSM file** generated in the machine where the files are missing to a machine that has a consistent **Device Support** directory.

IMPORTANT
You must be logged as the **Administrator** or a member of the **Administrators** group to copy the DD and CF files. The support files related to the FFB blocks will not be included in the **DSM file**.

Open ***Syscon***, go to the **Project File** menu and click **Pack Missing Device Support**. The **Open** dialog box will appear. Browse the directories to locate the **DSM file**, select its icon and click **Open**.

The **Browse for Folder** dialog box will open. Select the directory where the package with the missing files will be created and click **Ok**.

A message box will appear informing the user that the operation was successful and the folder **Missing Files** was created.

Click **Ok** to conclude.

The folder **Missing Files** should be sent to the machine where the *DDs* and *CFs* are missing. See section **Importing Missing Device Support Files** below.

Importing Missing Device Support Files

Syscon can automatically import DD and CF files of a device missing in the configuration project, using the **DSM file**. This procedure locates the **DSM file** and the **Missing Files** directory to include the DDs and CFs, defining the manufacturer and the device name.

IMPORTANT
You must be logged as the **Administrator** or a member of the **Administrators** group to import the **Device Support** files.

In the **Locate Missing Device Support Files** dialog box, click the button **Import DSM**. The **Open** dialog box will appear. Browse the directories to locate the **Missing Files** folder, select the **DSM file** and click **Open**.

A message box will appear informing the user that the operation was successful. Click **Ok** and then click **Close** in the **Locate Missing Device Support Files** dialog box to return to the application and open the configuration file.

KNOWN PROBLEMS AND LIMITATIONS

1. Version Mismatch
Converting from an older configuration version.
For discarding, close without saving.

This is a message, not an exception. It means that you are trying to open a configuration file, which was generated in an older version of the tool that had an old-fashioned file format. If you accept to upgrade, the configuration will be converted to the new file format and you will not be able to open the configuration in a ***Syscon*** version that supports the old file format. This message is only issued from version 5.10 on of ***Syscon***.

2. ***Version Mismatch***
Unable to open a newer configuration version.

This is a message, not an exception. It means that you are trying to open a configuration file generated in an earlier ***Syscon*** version. ***Syscon*** cannot perform configuration downgrade. This message is only issued from version 5.10 on.

3. DD Exception
Standard Dictionary Not Found!

This means that the **Standard.dct** file is missing in the **Device Support** and may generally happen because of problems during the system installation.

4. FF Exception
Block with Profile 0x#### and Profile Revision 0x#### could not be found.
DD and CF: ######\####\####(##).
DDItem = 0x########

This happens because some block type could not be recognized. It means there were problems with DDs or CFs installation. During the opening of a configuration file it has a special meaning, and it can easily be identified by the null Profile and Profile Revision numbers. In this case, ***Syscon*** is trying to upgrade a configuration generated with an old version (4.x or earlier) that did not work - therefore did not retain the numbers.

During the configuration file upgrade, ***Syscon*** tries to get the Profile and Profile Revision for the blocks in the configuration by searching the CF given the DDItemID for the block. This FF exception occurs because the CF is not present or, in case the CF exists, the exception occurs because the CF might be inconsistent. It is very common when a configuration is generated in one machine and moved to another one that maintains a different set of DDs and CFs from the original machine. The DD and CF information in the message identifies which CF file has been searched.

5. Maximum number of Blocks has been exceeded.
License Violation

It means that you are trying to open a configuration that has more blocks than the ***Syscon*** license allows. This usually happens when the project file has been generated with a ***Syscon*** version that supports the number of blocks configured in the project, but the user is trying to open the project with another software version with a license that allows fewer blocks than has been configured in the project file.

6. DD Not Found

If ***Syscon*** tries to use a DD file that is missing or corrupted, the *Device Description Error* message will be sent to the user through the *Error Log* window. This message indicates the DD file that is missing or corrupted and reports the details about the error.

There is one situation that a missing DD will stop the application. When a configuration file is generated with version 4.x, or previous versions, and the user attempts to open the file with version 5.20, the application will generate an exception indicating the information that is missing and, after the user acknowledgement, ***Syscon*** will continue loading the configuration but the **file consistence** will **NOT** be assured.

7. The HSE port of the DFI has address 0

This problem may occur when:

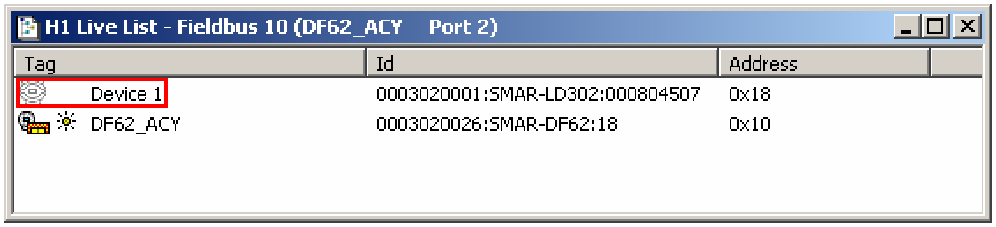
- The address was not read because the bridge was not found in the **Live List**.
- The bridge was not in the **Live List** during the **Init Communication**.

These conditions mean that the problem occurs rarely. If it occurs, it will be necessary to terminate the communication and restart it.

8. Communication events were not updated in Syscon

The Windows OS might lose some communication events and therefore ***Syscon*** would not display the information correctly. Such events could be:

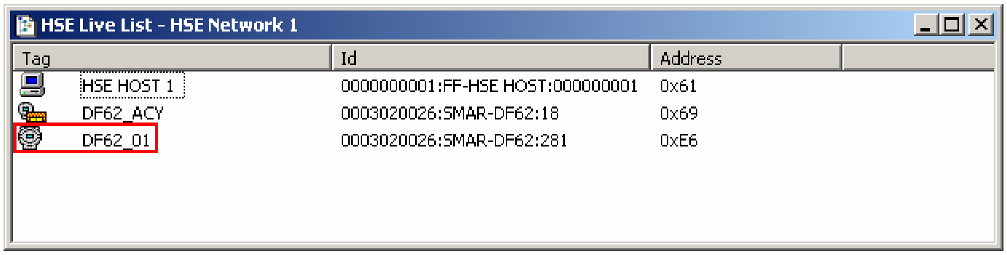
- A device is disconnected from the network but it still appears on the **Live List**. Or the device is connected and operating on the network but the **Live List** indicates the device is not communicating correctly, as the example in the figure below shows:



H1 Live List - Fieldbus 10 (DF62_ACY Port 2)

Tag	Id	Address
Device 1	0003020001:SMAR-LD302:000804507	0x18
DF62_ACY	0003020026:SMAR-DF62:18	0x10

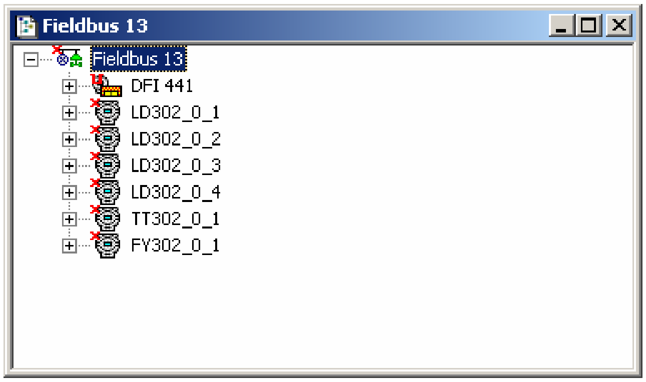
- A bridge is represented by a device icon on the **Live List**:



HSE Live List - HSE Network 1

Tag	Id	Address
HSE HOST 1	0000000001:FF-HSE HOST:000000001	0x61
DF62_ACY	0003020026:SMAR-DF62:18	0x69
DF62_01	0003020026:SMAR-DF62:281	0xE6

- The *Fieldbus* window shows the channel is not communicating:



Click **Refresh** on the main toolbar to make sure that the information displayed on the ***Syscon*** window is updated.

9. Parameter value not available

Syscon displays the message **<not available>** as the parameter value in the **On-line Characterization** dialog box when the DD Server doesn't return a valid value for the parameter.

You must close the **Characterization** dialog box and open it again to recover the correct values of the parameters.

10. Missing Capabilities File for Devices with Multiple DDs (Device Number 0008-DFI302 and 0018-FC302)

DO NOT COPY the Capabilities File from ***System302*** installation previous to version 6.1.3.

Syscon 5.20 or higher uses a new revision of the Capabilities File that is not installed with ***System302*** version 6.1.2 or older.

Copying the files will cause the configuration to be converted incorrectly and ***Syscon*** will operate improperly.

Contact Smar to receive the new Capabilities File and DDs.

11. Converting the HSE configuration from Syscon version 5.2x to version 6.x

Follow the steps below to convert an HSE project configured in ***Syscon*** version 5.2x to ***Syscon*** version 6.x:

a) Open the HSE configuration in ***Syscon*** version 6.x;

b) Disconnect all bridges from the HSE fieldbus, right-clicking each bridge and selecting **Disconnect from**;

c) Remove the HSE fieldbus, right-clicking the fieldbus icon and selecting **Delete**;

d) Add a new HSE fieldbus, right-clicking the fieldbus networks icon and selecting **New Fieldbus**. The **New Fieldbus** dialog box will open. Select the **HSE type**, edit the fieldbus tag and click **Ok***;*

e) Connect all bridges to the HSE fieldbus, right-clicking each bridge and selecting **Connect to**. The **Connect to** dialog box will open. Select the HSE network and click **Ok**.

12. Syscon crashed when shutting down the Database Manager and disabling the communication

If the **Database Client** application is running and the user shuts down the **Database Manager**, ***Syscon*** will crash.

It is **not** recommended to shut down the **Database Client** or the **Database Manager** while the ***Syscon*** application is running.

13. Customizing DFI302 Access to the Subnets

If a firewall is installed in the workstation, it must be disabled or configured to permit the **DFI302** to access the OPC Server.

14. Using FFB Blocks in Redundant Systems

The use of FFB Blocks requires the redundant linking devices to be installed in different subnets.

Make sure the values of the last field in the IP address of the linking devices are also different, because these values are used as the node address of each device in the ***Syscon*** configuration file.

15. Limitations for Profibus Configurations

Profibus configurations created using ***System302 version 7.0.x*** are supported in ***System302 version 7.1.x*** but there are some limitations related to the **Mapping Tool** in ***Syscon***:

- For the module DF73 revision 0x1 and 0x2, new Profibus channels can not be created; the existent channels can be edit using the previous version of the **Mapping Tool**.

- The revision 0x3 or higher of the module DF73 uses the new version of the **Mapping Tool** available in ***Syscon version 6.2*** on.

16. Possible errors during download, partial download or incremental download

Some problems may occur during the download, partial download or incremental download procedures, such as when the number of links exceeds the number of resources available in the **DFI302** to publish those links.

VCRs allocation and traffic schedule resources requires an elaborated management because of the different types of links (internal, external, bridge) and the types of VCR. The schedule algorithm is also very complex and will not be documented in this manual. Future ***Syscon*** versions will implement the automatic schedule of link resources. In current ***Syscon*** versions, the workaround is to use two or more **DFI302s** to reduce the number of links on each **DFI302**.

Note that the same download error can occur in different situations. Please contact the ***Smar Tech Support Team*** for further details.

Example of possible errors:

- **download failure: <link input parameter tag>** - indicates a resource problem when configuring a link.

- **download failure: <fieldbus tag>** - indicates a resource problem when configuring the traffic schedule.

NOTE – Advanced Users

Events related to the communication can be saved in the text file **OFClogger.txt**, located in the ***Syscon*** installation folder. To track and save those events during ***Syscon*** operation, mark the option **OFC Logger** in the **Preferences** dialog box.

Example of errors shown by the **OFC Logger**:

- indicating a resource problem when configuring a link, the valid values for **Status Description** and **Status** are:
  - E_NO_PUBLISH_BNU_VCR and 0x80048008;
  - E_NO_SUBSCRIBER_BNU_VCR and 0x80048009;
  - E_OBJ_LINK_NOT_FOUND_IN_PUB and 0x8004800C;
  - E_OBJ_LINK_NOT_FOUND_IN_SUB and 0x8004800D;
  - E_NO_FREE_VCR_TO_USE and 0x80048032;
  - E_FAIL_NO_SESSION_ENTRY_TO_CONF_SUB and 0x8004807F;
  - E_NOT_FOUND_FREE_UDP_PORT and 0x80048080;
  - E_SUBSCRIBER_HSE_INFO_NOT_FOUND and 0x80048081;
  - E_NO_PUBLISHER_BNU_VCR_IN_LD and 0x80048083;
  - E_NO_SUBSCRIBER_BNU_VCR_IN_LD and 0x80048084;
  - E_NO_SUBSCRIBER_HSE_VCR and 0x80048085;
  - E_FAIL_SEARCH_HSE_LD_VCR and 0x80048086;
  - E_NO_PUBLISHER_HSE_VCR and 0x80048087;
  - E_FAIL_NO_SESSION_ENTRY_TO_CONF_PUB and 0x80048088;
  - E_PUBLISHER_HSE_INFO_NOT_FOUND and 0x80048089;
  - E_NO_HSE_VCR_IN_PUB_DEV and 0x8004808B;
  - E_NO_HSE_VCR_IN_SUB_DEV and 0x8004808C;
  - E_FAIL_NO_REPUBLISH_ENTRY_TO_CONF and 0x8004808E;
  - E_NOT_FOUND_FREE_MULTICAST_IP and 0x8004808F.
- indicating a resource problem when configuring the traffic schedule, in the domain, the valid values for **Status Description** and **Status** are:
  - E_DOMAIN_IS_NOT_ENOUGH_TO_STORE_SCHEDULE and 0x80048067;
  - E_SUB_SCHEDULES_NOT_ENOUGH and 0x8004808D.

Section 12

CREATING A FOUNDATION FIELDBUS CONFIGURATION

Introduction

This section will describe how to configure a Foundation Fieldbus strategy using a DF62 as a bridge. The process using a cascade control will be used as an example. The diagram below shows the process control that will be implemented.

PROJ_DF62

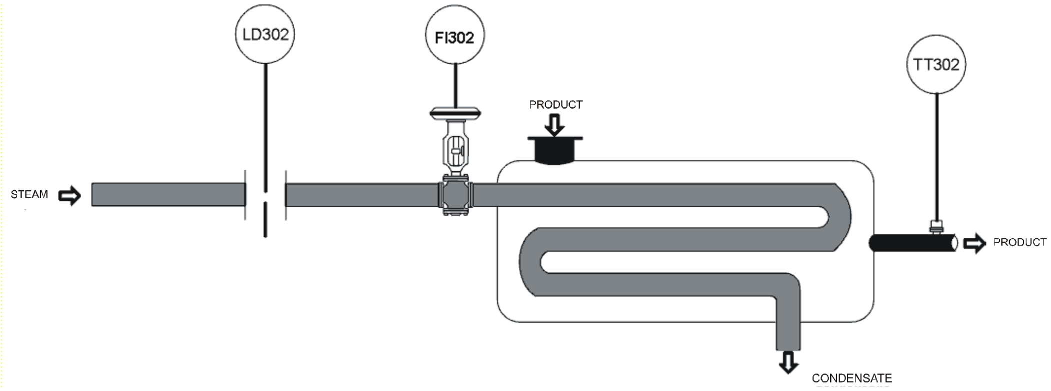


Figure 12.1. Cascade Control Configuration

The purpose of this process is to control the product outlet temperature (controlled variable) using a steam flow rate (manipulated variable) to heat it. The product temperature will be sent to the master controller, where it will be compared to the temperature set point.

The master output would be the slave controller set point, which will control the steam flow rate to the heat exchanger.

Step by Step Configuration

Starting the project

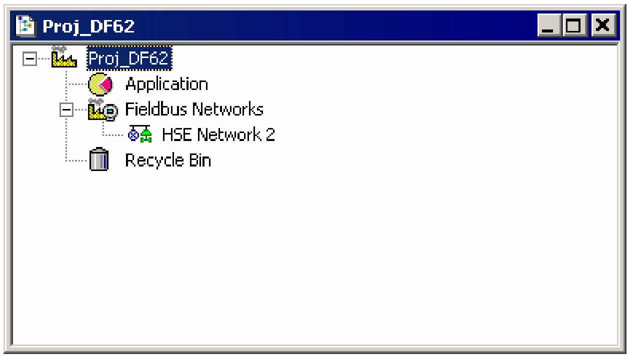
To create a project, click **New** on the main toolbar and select **HSE Project** as the type of the project.

The **Setup New Project** dialog box will open. Type the name **Proj_DF62** for the project file and click **Save**. A new folder will be created with the name of the project and the extension **.ffp**.

IMPORTANT
The project must be saved in the default Smar folder configured for the ***Studio302*** Database. For details, refer to the **System302 Studio User's Manual**.

A project window will open and it has the following icons:

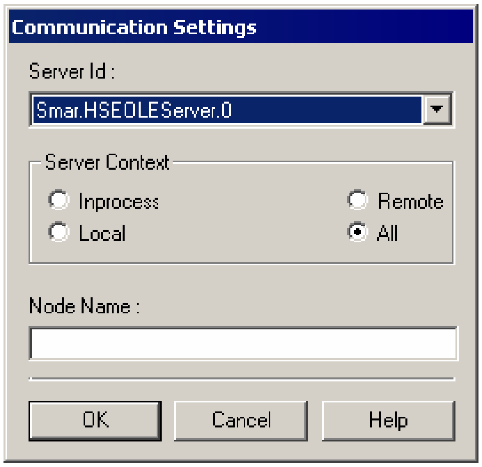
- **Application** - In this section, the control strategies are created.
- **Fieldbus Networks** - In this section, the equipments and function blocks are added.



Proj_DF62

Figure 12.2. Project Window

In the project window, named **Proj_DF62**, right-click the *Fieldbus Networks* icon and click **Communication Settings**. The **Communication Settings** dialog box will open to set the communication parameters.



Communication Settings

Server Id : Smar.HSEOLEServer.0

Server Context

○ Inprocess ○ Remote

○ Local ● All

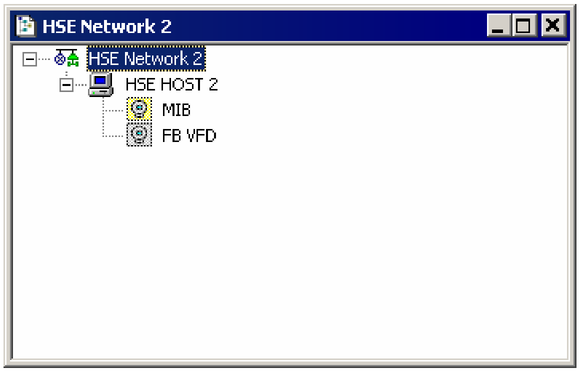
Node Name :

Figure 12.3. Selecting the server

Make sure the option **Smar.HSEOLEServer.0** is selected and click **Ok**.

Opening the Fieldbus Window

After selecting the communication server for the project, expand the *Fieldbus Networks* and double-click the *HSE Network 2** icon. The *HSE Network* window will open:



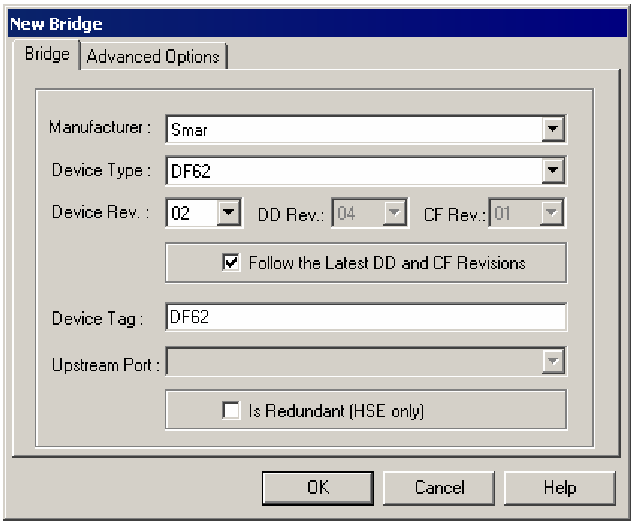
HSE Network 2

Figure 12.4. HSE Network Window

***** This number depends on the number of fieldbuses created previously in this project.

Adding the Bridge

In the *HSE Network 2* window, right-click the *HSE Network 2* icon, select **New** and click **Bridge**. The **New Bridge** dialog box will open.



Manufacturer : Smar
Device Type : DF62
Device Rev. : 02
DD Rev.: 04
CF Rev.: 01
☑ Follow the Latest DD and CF Revisions
Device Tag : DF62
Upstream Port :
☐ Is Redundant (HSE only)

Figure 12.5. Configuring the Bridge for the Project

Select **Smar** from the **Manufacturer** list, and select **DF62** as the **Device Type**. On the **Device Tag** box, type **DF62** (or another related tag) and click **Ok**.

IMPORTANT

Remember that there are some characters that cannot be used in the tag. The valid characters are:

A-Z a-z 0-9 # { } [ ] ( )+ -

The invalid characters are:

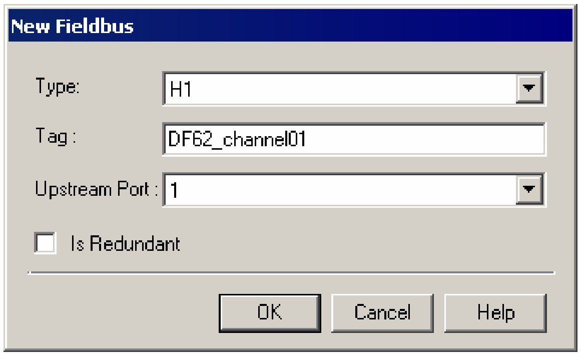
~ ` ! @ # $ % ^ & * = | : ; , . < > ? / ' " \

HINT

To better identify the equipments used in the project, it is recommended to use the equipment's serial number as the device tag. In this example, use **DF62_244**, where **244** is the serial number of the **DF62** used in the project. This hint also applies to field devices added to the project.

Adding Fieldbus Devices

After adding the bridge to the project, add the equipments that are also part of this configuration. First, on the project window, right-click the DF62 icon and click **New Fieldbus** to configure the DF62 channels. The **New Fieldbus** dialog box will open.



New Fieldbus

Type: H1

Tag : DF62_channel01

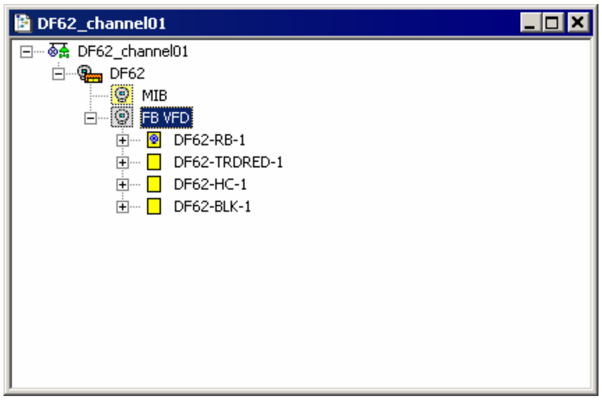
Upstream Port : 1

☐ Is Redundant

Figure 12.6. Typing the tag for the Fieldbus Channel

Select **H1** as the **Type** and type the tag. If you do not type a specific tag, the default tag will be **Fieldbus n** (n is a number automatically generated by ***Syscon*** that depends on the number of channels previously created). Click **Ok** to conclude.

On the project window, double-click the fieldbus channel icon to open its window.



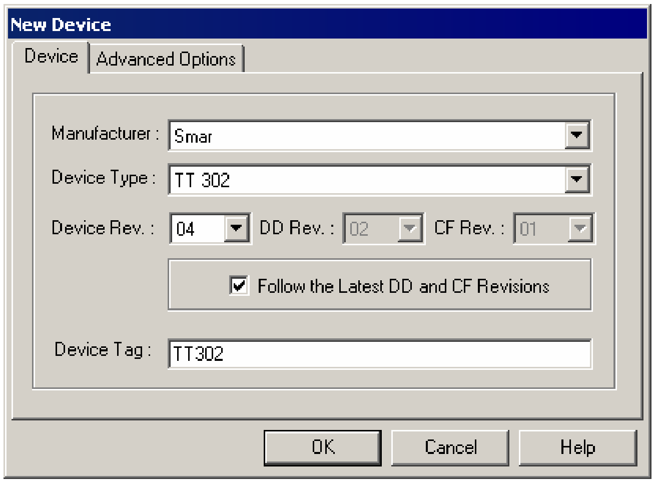
DF62_channel01

- DF62_channel01
  - DF62
    - MIB
    - FB VFD
      - DF62-RB-1
      - DF62-TRDRED-1
      - DF62-HC-1
      - DF62-BLK-1

Figure 12.7. Fieldbus Window

NOTE
The **DF62** supports up to 4 H1 channels, therefore it is recommended to use numbers for the H1 channels tags to better identify the channels.

On the **DF62_channel01** window, right-click the fieldbus icon, select **New** and click **Device**: The **New Device** dialog box will open.



New Device

Manufacturer : Smar

Device Type : TT 302

Device Rev. : 04 DD Rev. : 02 CF Rev. : 01

☑ Follow the Latest DD and CF Revisions

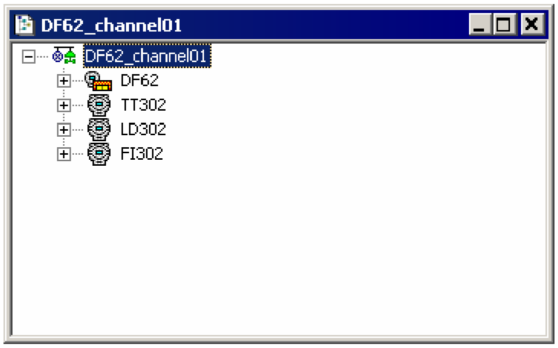
Device Tag : TT302

Figure 12.8. Configuring the Device

Select **Smar** as the **Manufacturer** and **TT302** from the **Device Type** list. On the **Device Tag** box, type the tag **TT302** or another related tag and click **Ok**.

Repeat this procedure to add the transmitter (**LD302**) and the converter (**FI302**) for the control valve.

By the time you finish configuring the devices, the **DF62_channel01** window will be similar to the figure below:


DF62_channel01

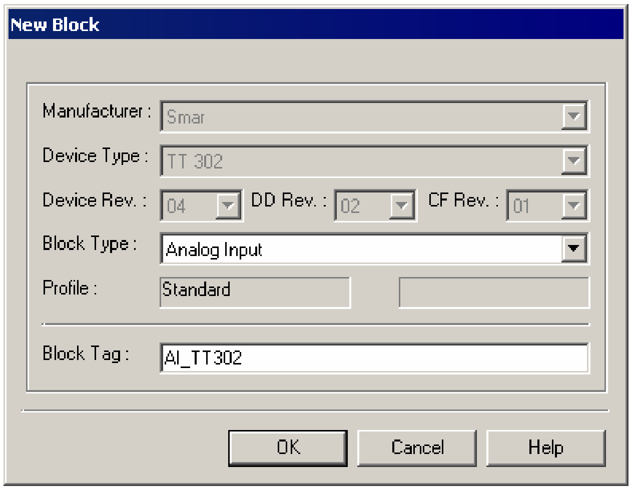
- DF62_channel01
  - DF62
  - TT302
  - LD302
  - FI302

Figure 12.9. Devices in the Fieldbus Channel

Adding Function Blocks

Now you can add the function blocks. The VFD is responsible for the data management.

Click the expansion sign ⊞ of the **TT302** icon, right-click the *FB VFD* icon (*Virtual Field Device*) and click **New Block**. The **New Block** dialog box will open.


New Block

Manufacturer : Smar

Device Type : TT 302

Device Rev. : 04 DD Rev. : 02 CF Rev. : 01

Block Type : Analog Input

Profile : Standard

Block Tag : AI_TT302

Figure 12.10. Configuring a block

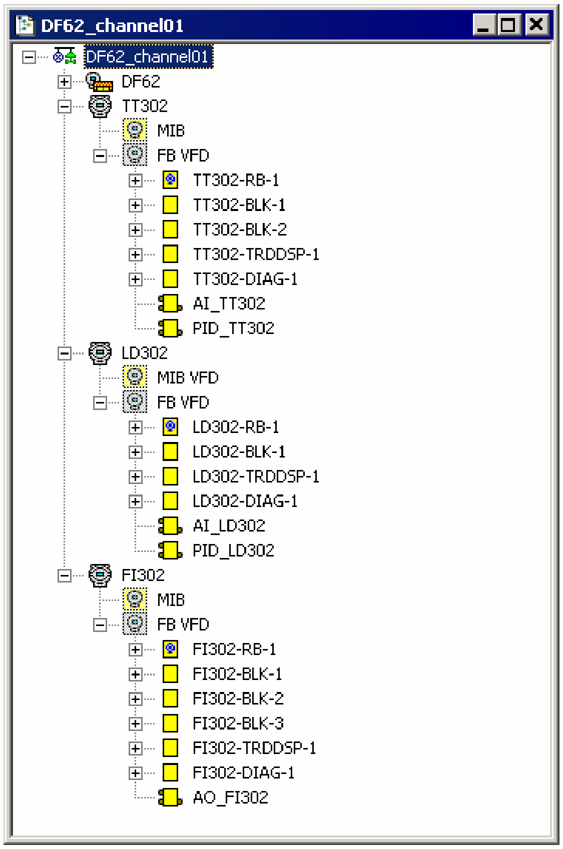
In the **Block Type** box, select the **Analog Input** block from the list of blocks available in the device. On the **Block Tag** box, type a related tag for the block. In this example, the tag **AI_TT302** is used.

Repeat these steps to configure the cascade control system and add the **PID Control** block for the **TT302**, the blocks **Analog Input** and **Advanced PID** for the **LD302**, and the **Analog Output** block for the **FI302**.

NOTE

From ***Syscon*** version 6.00 on, it is no longer necessary to configure the *Transducer Block* (TRD), the *Resource Block* (RES), *Diagnostics* (DIAG) and *Display* (DSP), because these blocks are automatically instantiated when the equipment is added to the project configuration.

The channel configuration with all devices and blocks is represented in the figure below. The *Transducer*, *Resource* and *Diagnostics* blocks have specific tags to better identify them.



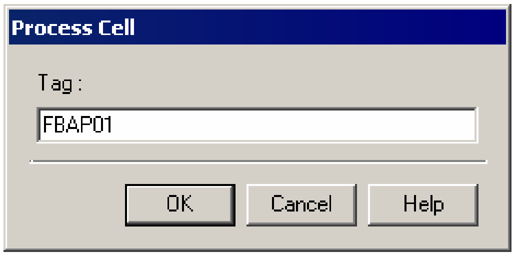
DF62_channel01
- DF62_channel01
  - DF62
  - TT302
    - MIB
    - FB VFD
      - TT302-RB-1
      - TT302-BLK-1
      - TT302-BLK-2
      - TT302-TRDDSP-1
      - TT302-DIAG-1
      - AI_TT302
      - PID_TT302
  - LD302
    - MIB VFD
    - FB VFD
      - LD302-RB-1
      - LD302-BLK-1
      - LD302-TRDDSP-1
      - LD302-DIAG-1
      - AI_LD302
      - PID_LD302
  - FI302
    - MIB
    - FB VFD
      - FI302-RB-1
      - FI302-BLK-1
      - FI302-BLK-2
      - FI302-BLK-3
      - FI302-TRDDSP-1
      - FI302-DIAG-1
      - AO_FI302

Figure 12.11. Fieldbus Channel Configuration

Now, you can start creating the strategy control.

Creating Areas

The Logical project can be divided in many areas, according to the plant configuration. Right-click the *Application* icon on the project window and click **New Process Cell**. The **Process Cell** dialog box will open:



Process Cell

Tag : FBAP01

Figure 12.12. Typing a tag for the Process Cell

Type the tag for the process cell and click **Ok**. The project window will be similar to the following figure:

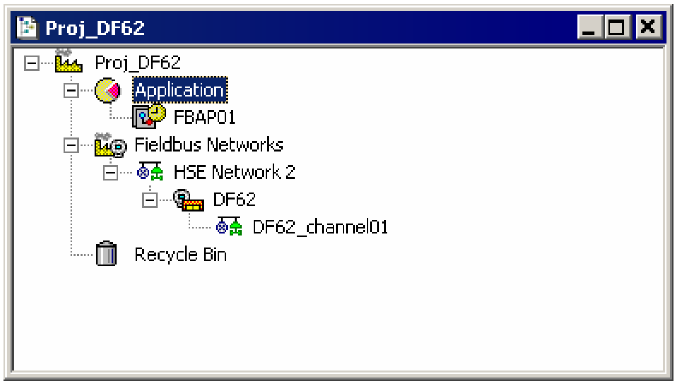


Figure 12.13. Project Window

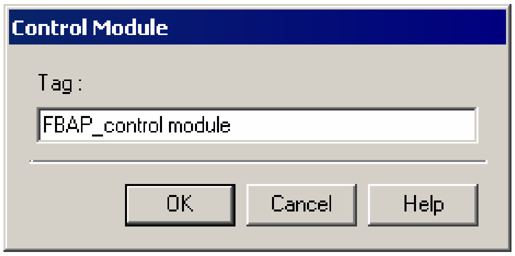
NOTE

Remember that the *Application* is just a virtual division. The main purpose is to divide a large plant. For instance, if the plant contains two networks, they can be named *FBApplication* in ***Syscon***. An *Application* can contain several *FBApplications*, but the *FBApplication* cannot be added to more than one *Application*.

Creating a Control Module

Proceeding with the project, create a *Function Block Application* in the *Application*. Double-click the *FBAP01* icon to open its window.

On the *FBAP01* window, right-click the *FBAP01* icon and click **New Control Module**. The **New Control Module** dialog box will open. Type the tag for the control module and click **Ok**.

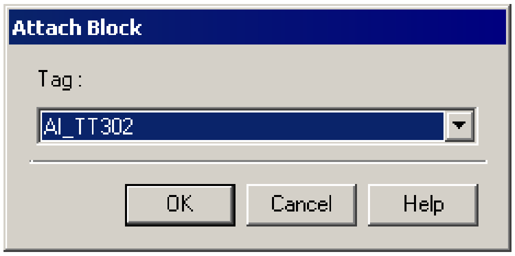


Tag : FBAP_control module

Figure 12.14. Editing the tag for the control module

Attaching the blocks to the control module

Now you can attach the blocks from the devices to the control module. Right-click the *FBAP_control module* icon and click **Attach Block**. The **Attach Block** dialog box will open:



Tag : AI_TT302

Figure 12.15. Attaching blocks

The blocks that can be attached to the control module are listed in this dialog box. Select each block and click **Ok**.

The process cell window will be similar to the figure below:

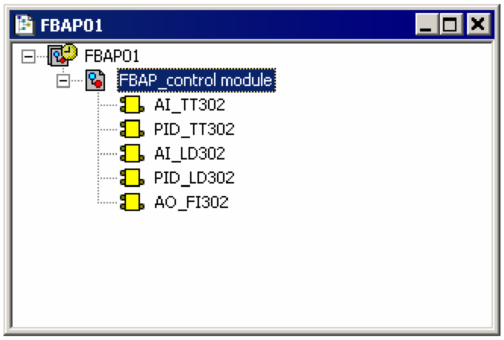


Figure 12.16. Blocks added to the Control Module

Another easy way to attach the blocks to the control module is select the block icon in the fieldbus window and drag it to the process cell window.

Configuring the Control Strategy

Double-click the *FBAP_control module* icon to open the *Strategy* window.

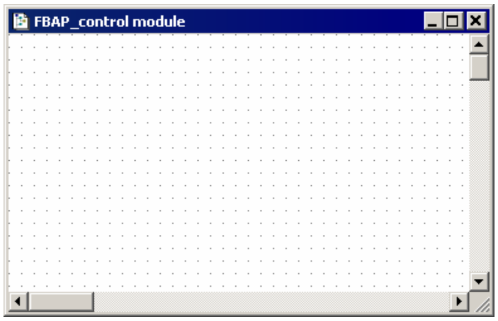


Figure 12.17. Strategy Window

At this moment, there might be 3 or 4 windows opened in ***Syscon***. Minimize the project and the fielbus windows, go to the **Window** menu and click **Tile**. If your monitor is not bigger than 17", it is recommended to maximize the *Strategy* window to visualize the entire project.

The strategy window offers several drawing tools. For details, refer to the **Syscon Online Help**.

Adding Blocks to the Strategy Window

Select the first block **AI_TT302** in the *FBAP_control module* window and drag it to the *Strategy* window. The block will be automatically created. See the following picture:

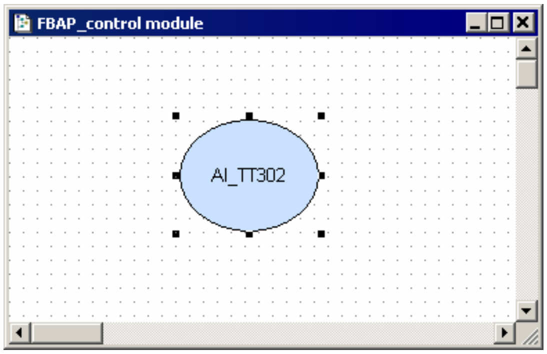


Figure 12.18. Block added to the Strategy Window

Repeat this procedure and drag the blocks **AI_LD302**, **PID_LD302**, **PID_TT302** and **AO_FI302** to the *Strategy* window. See the following example:

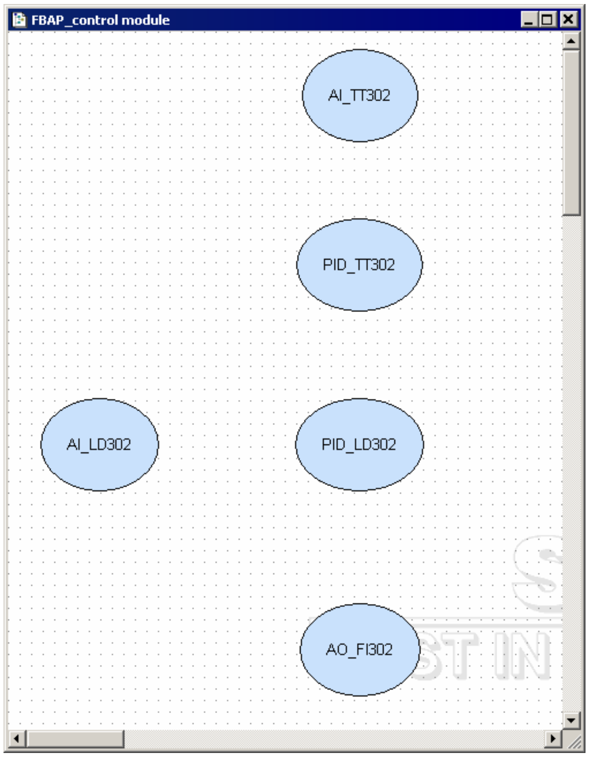


Figure 12.19. Strategy Control

Linking Blocks

Links between blocks are created in the *Strategy* window.

Click the **Link** button in the **Strategy** toolbar. Right-click the **AI_TT302** block and click **Out** from the menu. Move the mouse cursor over the **PID_TT302** block, right-click this block and click **In** from the menu. The link is created:

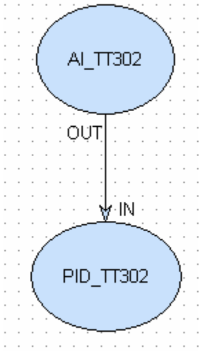


Figure 12.20. Linking blocks

Create the following links for this strategy:

Direct Links:

- OUT(AI_TT302) ➔ IN(PID_TT302)
- OUT(PID_TT302) ➔ IN(PID_LD302)
- OUT(PID_LD302) ➔ CAS_IN(AO_FI302)
- OUT(AI_LD302) ➔ CAS_IN(PID_LD302)

Return Links:

- BKCAL_OUT(PID_LD302) ➔ CAS_IN(PID_TT302)
- BKCAL_OUT(AO_FI302) ➔ BKCAL_IN(PID_LD302)

The figure below shows the strategy window after connecting the parameters listed above.

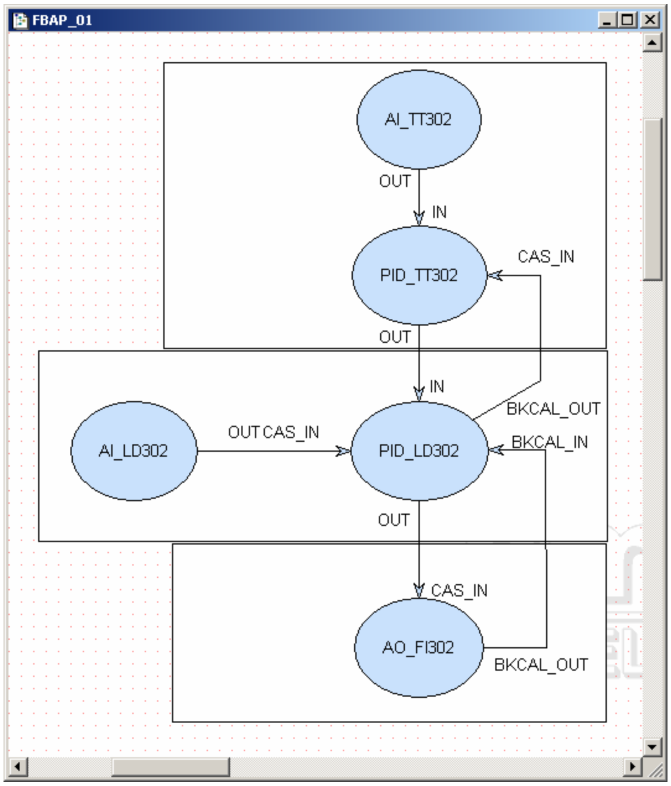


Figure 12.21. Strategy Window

Block Characterization

The blocks added to the project must be parameterized according to the application.

The characterization can be performed in *offline* or *online* mode. In the *offline* mode, the parameters are configured before initializing the communication with the devices. In the *online* mode, the parameters are configured in the devices when the plant is already communicating to the system.

Follow these steps to configure the block parameters:

1. From the Strategy Window

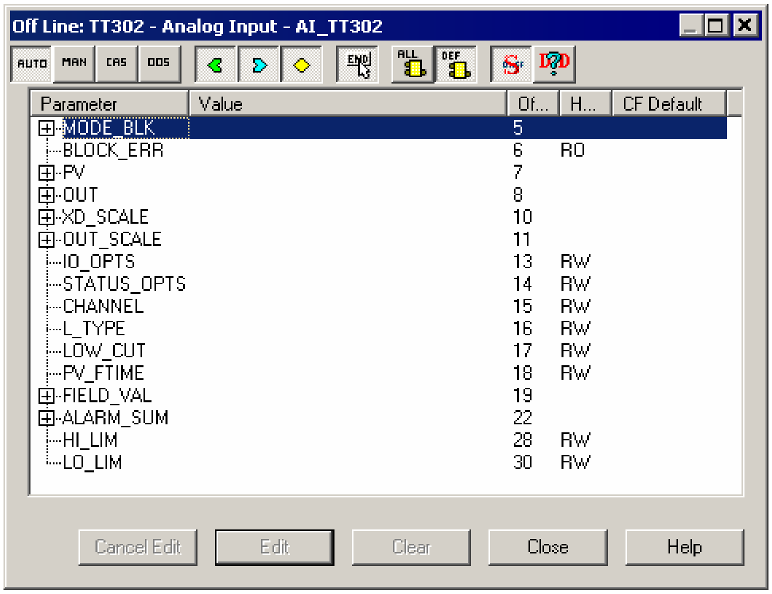
Click the button **Select** on the **Strategy** toolbar, right-click the block to be configured and click **Off Line Characterization**.

ATTENTION
If ***Syscon*** is operating in **offline** mode, double-click the block to open the **Off Line Characterization** dialog box. When ***Syscon*** is in **online** mode, double-clicking the block will open the **On Line Characterization** dialog box.

2. From the Fieldbus or Process Cell Window

Double-click the block icon to open the **Characterization** dialog box. Remember that when ***Syscon*** is operating in **offline** mode, the **Off Line Characterization** dialog box will open. Likewise, when ***Syscon*** is in **online** mode, double-clicking the block will open the **On Line Characterization** dialog box.

In both cases, the **Block Characterization** dialog box will open:



Parameter	Value	Of...	H...	CF Default
MODE_BLK		5		
BLOCK_ERR		6	RO	
PV		7		
OUT		8		
XD_SCALE		10		
OUT_SCALE		11		
IO_OPTS		13	RW	
STATUS_OPTS		14	RW	
CHANNEL		15	RW	
L_TYPE		16	RW	
LOW_CUT		17	RW	
PV_FTIME		18	RW	
FIELD_VAL		19		
ALARM_SUM		22		
HI_LIM		28	RW	
LO_LIM		30	RW	

Figure 12.22. Block Characterization Dialog Box

Double-click the **Value** column in front of the parameter that will be modified. Or click the parameter and click the button **Edit** to edit the parameter value. Click **End Edit** to conclude the alteration.

The list of the parameters to be configured in this project is described below:

DEVICE	TAG	BLOCK	PARAMETER
LD302	**LD302_DF62**	TR	MODE_BLK.Target = AUTO
		RS	MODE_BLK.Target = AUTO
		DSP	MODE_BLK.Target = AUTO
			BLOCK_TAG_PARAM_1= FT101_AI
			INDEX_RELATIVE_1 = 8
			MNEMONIC_1 = VAZAO
			ACCESS_1 = MONITORING
			ALPHA_NUM_1 = MNEMONIC
			DISPLAY_REFRESH = UPDATE DISPLAY
		AI_LD302	MODE_BLK.Target = AUTO

			XD_SCALE.EU_100 = 100
			XD_SCALE.EU_0 = 0
			XD_SCALE.UNITS_INDEX = inH2O(4ºC)

			OUT_SCALE.EU_100 = 100
			OUT_SCALE.EU_0 = 0
			OUT_SCALE.UNITS_INDEX = %

			CHANNEL = 1
			L_TYPE = INDIRECT
		PID_LD302	MODE_BLK.Target = AUTO

			PV-SCALE.EU_100 = 100
			PV-SCALE.EU_0 = 0
			PV-SCALE.UNITS_INDEX = %

			OUT_SCALE.EU_100 = 100
			OUT_SCALE.EU_0 = 0
			OUT_SCALE.UNITS_INDEX = %

			GAIN = 0.5
			RESET = 1
			RATE = 0

DEVICE	TAG	BLOCK	PARAMETER
TT302	**TT302_DF62**	TR	MODE_BLK.Target = AUTO
			SENSOR_TYPE = PT100IEC
			SENSOR_CONNECTION = THREE WIRES
			SENSOR_TRANSDUCER_NUMBER = 1
		RS	MODE_BLK.Target = AUTO
		DSP	MODE_BLK.Target = AUTO
			BLOCK_TAG_PARAM_1 = TT100_AI
			INDEX_RELATIVE_1 = 8
			MNEMONIC_1 = TEMP
			ACCESS_1 = MONITORING
			ALPHA_NUM_1 = MNEMONIC
			DISPLAY_REFRESH = UPDATE DISPLAY
		AI_TT302	MODE_BLK.Target = AUTO

			XD_SCALE.EU_100 = 500
			XD_SCALE.EU_0 = 0
			XD_SCALE.UNITS_INDEX = ºC

			OUT_SCALE.EU_100 = 100
			OUT_SCALE.EU_0 = 0
			OUT_SCALE.UNITS_INDEX = %

			CHANNEL = 1
			L_TYPE = INDIRECT
		PID_TT302	MODE_BLK.Target = AUTO

			PV_SCALE.EU_100 = 100
			PV_SCALE.EU_0 = 0
			PV_SCALE.UNITS_INDEX = %

			SP = 50
			GAIN = 0.5
			RESET = 1
			RATE = 0

DEVICE	TAG	BLOCK	PARAMETER
FI302	**FI302_DF62**	TR	MODE_BLK.Target = AUTO
			TERMINAL_NUMBER = 1
		RS	MODE_BLK.Target = AUTO
		DSP	MODE_BLK.Target = AUTO
			BLOCK_TAG_PARAM_1 = FCV102_AO
			INDEX_RELATIVE_1 = 9
			MNEMONIC_1 = VALVULA
			ACCESS_1 = MONITORING
			ALPHA_NUM_1 = MNEMONIC
			DISPLAY_REFRESH = UPDATE DISPLAY
		AO_FI302	MODE_BLK.Target = AUTO

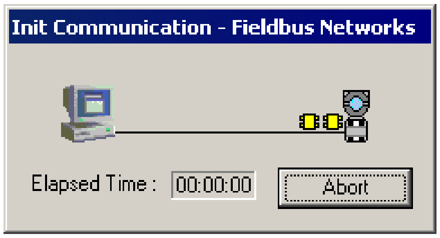
			PV_SCALE.EU_100 = 100
			PV_SCALE.EU_0 = 0
			PV_SCALE.UNITS_INDEX = %

			XD_SCALE.EU_100 = 20
			XD_SCALE.EU_0 = 4
			XD_SCALE.UNITS_INDEX = mA

Initializing the Communication

Click the **On-line Mode** button on the main toolbar to initialize the communication.

The video clip below should appear for a couple of seconds. During this time, ***Syscon*** identifies and attaches any bridges connected to the communication network and added to the project configuration.



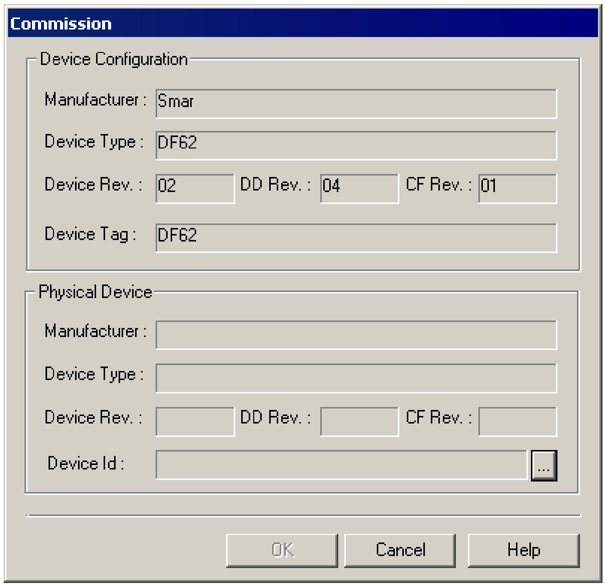
Elapsed Time : 00:00:00

Figure 12.23. Initializing the Communication

Commissioning the Bridge

Note that at this point, if all procedures were completed successfully, a red symbol will be displayed in the top-left side of each device and bridge icon ( ). This means that the *Device IDs* were not commissioned yet.

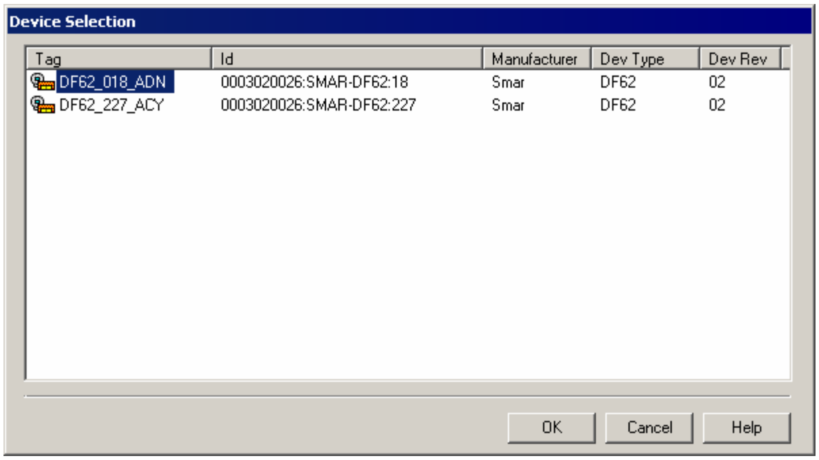
On the *Fieldbus* window, right-click the bridge icon and click **Commission**. The **Commission** dialog box will open:



Manufacturer : Smar
Device Type : DF62
Device Rev. : 02 DD Rev. : 04 CF Rev. : 01
Device Tag : DF62

Figure 12.24. Device Commissioning Dialog Box

Click the button ... and the **Device Selection** dialog box will open.



Tag	Id	Manufacturer	Dev Type	Dev Rev
DF62_018_ADN	0003020026:SMAR-DF62:18	Smar	DF62	02
DF62_227_ACY	0003020026:SMAR-DF62:227	Smar	DF62	02

Figure 12.25. Device Selection Dialog Box

Select the bridge icon and click **Ok** to close the **Device Selection** dialog box. Click **Ok** in the **Commission** dialog box. The following dialog box will be displayed while the device is being commissioned:

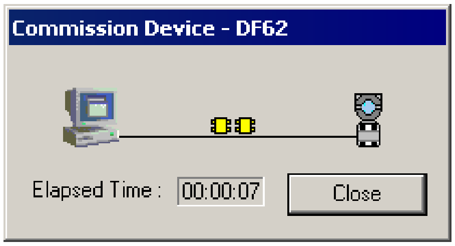


Figure 12.26. Commissioning the Bridge

When the commissioning is complete, a message box will ask the user to execute the download. Click **No** to execute the download later.

Now the red symbol will not appear in the bridge icon:

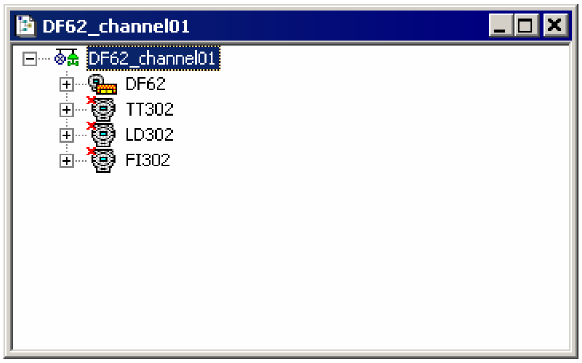


Figure 12.27. Fieldbus Channel after commissioning the DF62

Commissioning Devices

Each device must be commissioned using the same procedure described for the bridge. Right-click the device icon, click **Commission** and select the proper *Device ID* for each device.

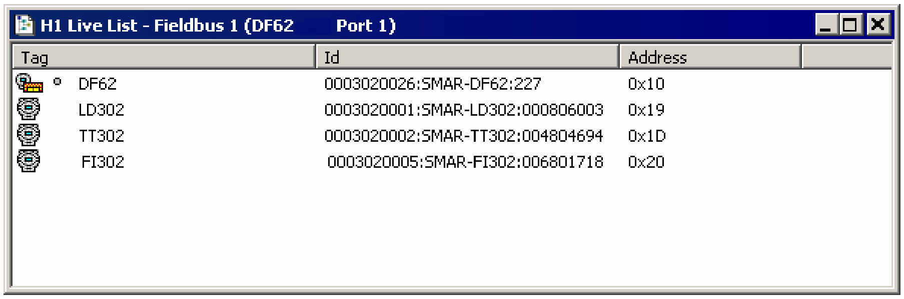
IMPORTANT
If there are differences between the device configuration in the ***Syscon*** file and the physical device, ***Syscon*** will execute the **Exchange** procedure for the device, which means that the information in the configuration should be compatible to the information in the physical equipment.

Don't forget to save the project configuration.

Checking the Commissioning

For every channel (or segment), open the *Fieldbus* window, right-click the fieldbus icon and click **Live List**.

The *Live List* window will list all devices connected to the selected channel, as in the example below:



H1 Live List - Fieldbus 1 (DF62 Port 1)

Tag	Id	Address
DF62	0003020026:SMAR-DF62:227	0x10
LD302	0003020001:SMAR-LD302:000806003	0x19
TT302	0003020002:SMAR-TT302:004804694	0x1D
FI302	0003020005:SMAR-FI302:006801718	0x20

Figure 12.28. Checking the Live List

Erasing the Error Log Registry

It is important to clear the *Error Log Registry* before downloading the configuration, because any eventual error that might occur during the download process will be easily detected as the *Error Log* window pops up automatically when the first error occurs.

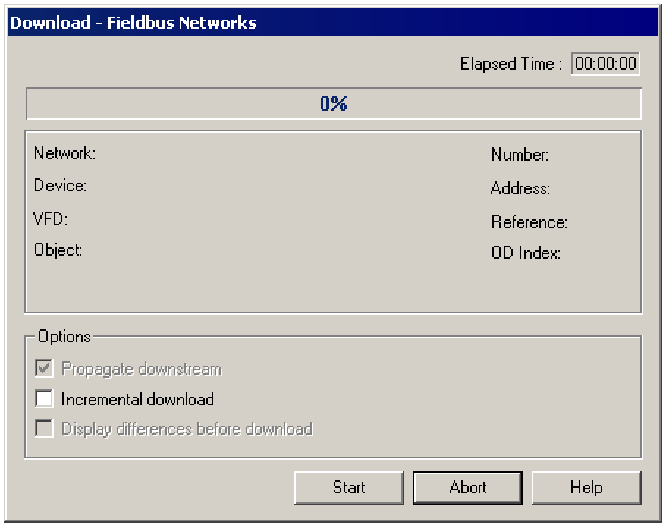
Click the **Log Window** button on the main toolbar to open the *Error Log* window. Right-click inside this window and click **Clear Log**.

All previous events listed in the *Error Log* window will be deleted.

Plant Configuration Download

In the project window, right-click the *Fieldbus Networks* icon and click **Download**.

The **Download** dialog box will open. To download the entire configuration to the plant, do not select the option **Incremental Download** and click **Start**.



Download - Fieldbus Networks

Elapsed Time : 00:00:00

0%

Network:
Device:
VFD:
Object:
Number:
Address:
Reference:
OD Index:

Options
☑ Propagate downstream
☐ Incremental download
☐ Display differences before download

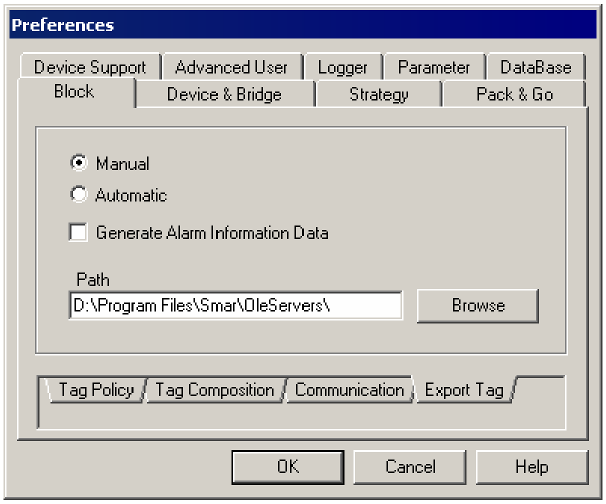
Figure 12.29. Complete Download

Exporting Tags

Editing the Preferences

Before executing the *Export Tags* procedure, select the operation mode and the path to the **Taginfo.ini** file.

On the **Project File** menu, click **Preferences**. The **Preferences** dialog box will open. Select the **Block** tab and then click the **Export Tag** tab.



● Manual
○ Automatic
☐ Generate Alarm Information Data

Path
D:\Program Files\Smar\OleServers\

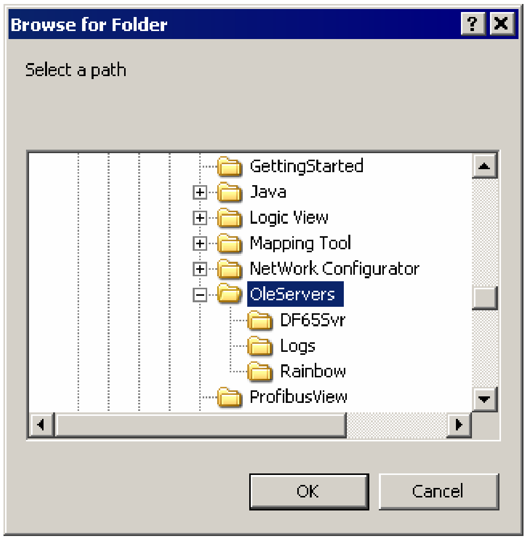
Figure 12.30. Setting the Export Tag Preferences

Select **Manual** or **Automatic** and confirm the default path to the **Taginfo.ini** file. The path to the file should be *C:\Program Files\Smar\OleServers*.

Click **Ok** to conclude.

Exporting the Tags

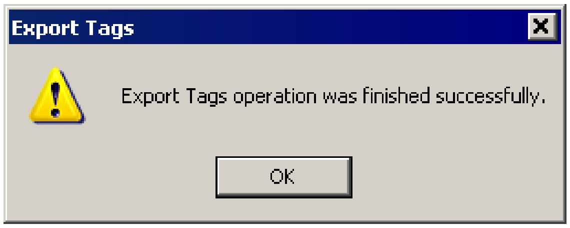
In the project window, right-click the project icon and click **Export Tags**. The **Browse for Folder** dialog box will open. Confirm the default path to save the **Taginfo.ini** file and click **Ok**.



Select a path

Figure 12.31. Selecting the folder to export the tags

A message box will confirm if the operation was successful:



Export Tags operation was finished successfully.

Figure 12.32. Exporting the tags

Click **Ok** to conclude.

NOTE

The *Export Tags* procedure will be executed only once, unless the tags in the project configuration are changed. In this case, executed the procedure to update the file.

On-Line Supervision

It is possible to monitor the control strategy when ***Syscon*** is operating in **On-Line Mode**.

Open the *Strategy* window and click **On Line Monitoring** on the **Strategy** toolbar. The figure below shows the process values being monitored.

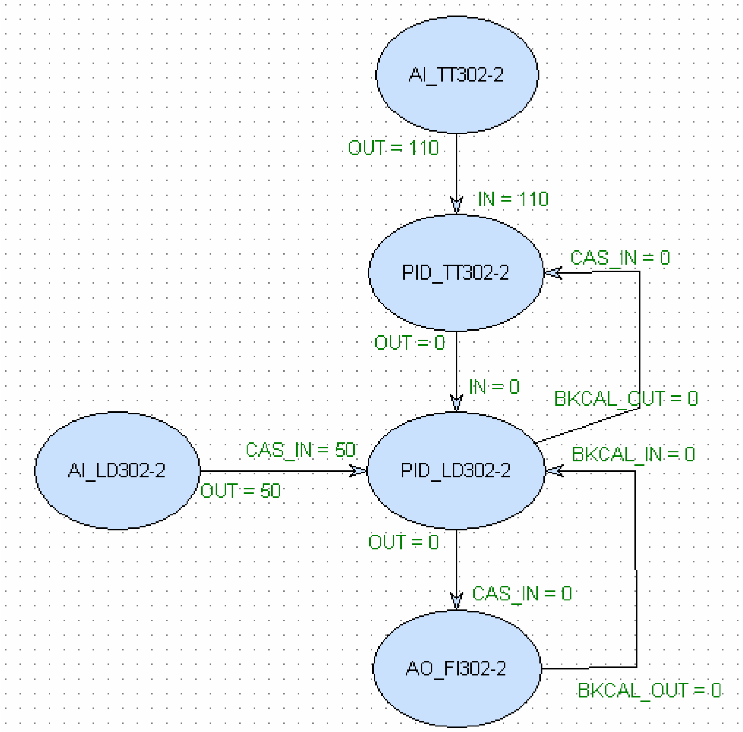


Figure 12.33. On-Line Supervision

The green links indicate that there are no communication failures. When a failure occurs, the link color changes to red.

See the example in the figure below that simulates a failure in the temperature sensor *PT100*.

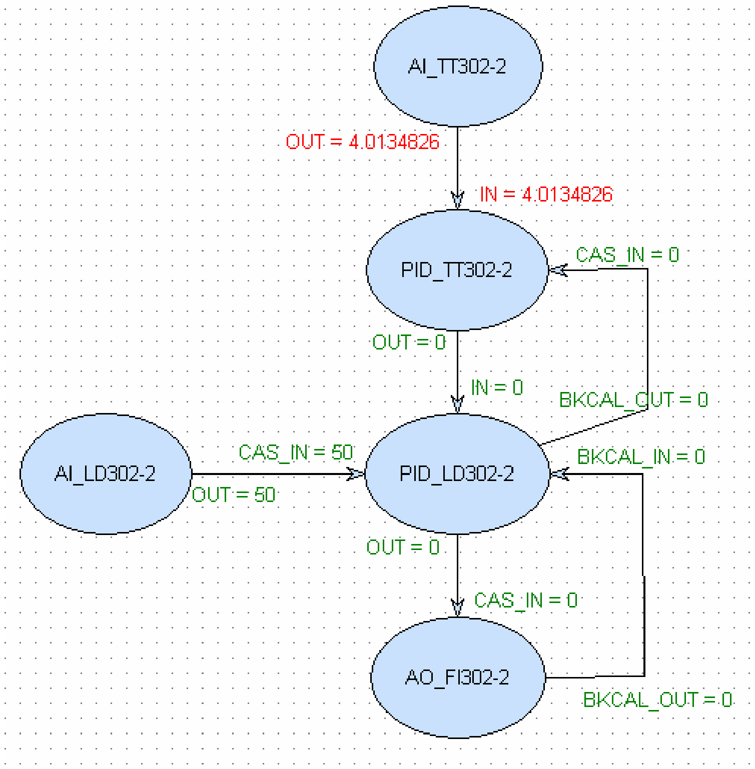


Figure 12.34. Failure Simulation in the Strategy Window

Section 13

TUTORIAL: MAPPING TOOL

Introduction

Mapping Tool integrates Profibus and DeviceNet configurations created in the application ***Network Configurator*** to project configurations created in ***Syscon***.

The table below lists terms and definitions used in this tutorial:

Standard I/O Connection	Input or output bytes that are automatically mapped as a Function Block (with Parameters) and/or I/O Point Group (with I/O Points).
Non-Standard I/O Connection	Input or output bytes that can be mapped as a Function Block (with Parameters) and/or I/O Point Group (with IO Points) by the user, in an interactive process.
Controller	A CPU with the same functionalities of *Gateway*, *Linking Device*, *Remote I/O*, logical controller, etc.
I/O Point	Mapped representation of a physical I/O point.
I/O Point Group	One or more groups of I/O Points defined for each network device. I/O Point Group may or may not be associated to a Function Block by its tag.

In brief, you must first create an HSE project in ***Syscon***, open the *HSE Network* window, and then add a Profibus or DeviceNet controller in the HSE channel. Return to the *Project* window, right-click the controller icon and select the option **New Network** to create a network configuration. See the example below:

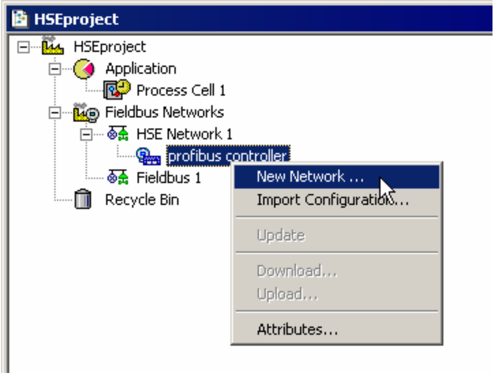


Figure 13.1. Creating a Network Configuration

This network is configured in ***Network Configurator***, where you can define the Profibus or DeviceNet bus structure, that is, type of connections, baud rate and devices connected to the network.

To create a Profibus or DeviceNet network, configure the master controller, add slave devices and configure the parameters. For further information, refer to the **Help** file in ***Network Configurator***.

After configuring the Profibus or DeviceNet network, save the changes, close ***Network Configurator*** and return to ***Syscon***. Then, ***Mapping Tool*** is started automatically. It opens the network configuration file, validates all tags of each slave device and creates the topology tree that represents the controller and devices in the network within the project configuration in ***Syscon***. This tool also identifies, for each device, Standard I/O Connections and maps them as Function Blocks and/or I/O Point Groups. Tags from each Function Block, IO Point Groups and I/O Points are also set by ***Mapping Tool***.

By now, ***Mapping Tool*** shows the controller, network devices, Function Blocks and I/O Point Groups, standard and non-standard I/O connections, and the Memory Map when an I/O Connection or I/O Point is selected.

The example in the figure below shows the ***Mapping Tool*** window:

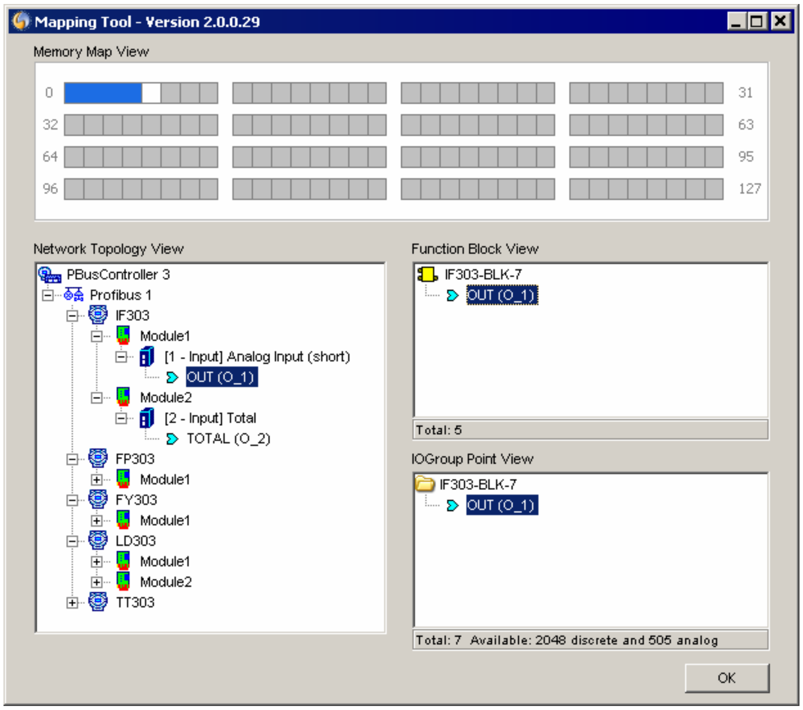


Figure 13.2. Mapping Tool Window

To map I/O Points after creating a Profibus or DeviceNet network and closing ***Mapping Tool***, right-click the icon of the Profibus or DeviceNet network, in the corresponding network window as indicated below, and select the option **Modify I/O Mapping**.

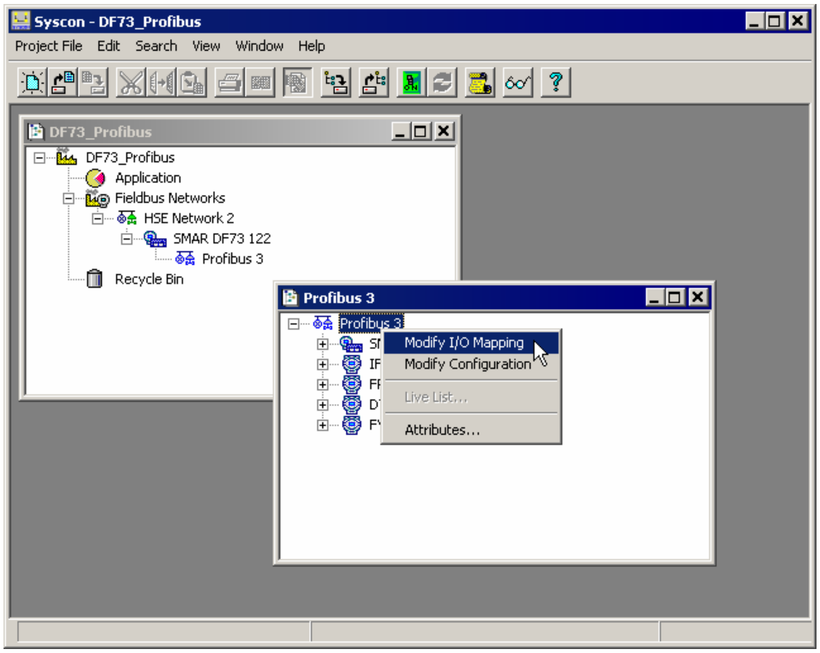


Figure 13.3. Opening the Mapping Tool window

The sections below describe the ***Mapping Tool*** interface and procedures for mapping input and output I/O points.

User Interface

The following table shows the icons that graphically represent the network topology, in the ***Mapping Tool*** window:

	Profibus or DeviceNet Controller
	Network Channel
	Profibus or DeviceNet Device
	I/O Connection List
?	I/O Connection List with unmapped connections
	Mapped I/O Connection
?	Unmapped I/O Connection
🟨	Function Block
◀ ▶	Parameters and I/O Points
📁	I/O Points Group

Right below the **Function Block View** area, the total number of blocks is indicated, and below the **I/O Point Group View** area the total number of I/O points created, and the numbers of available analog and discrete I/O points are also indicated for the entire configuration displayed in the network topology tree.

Network Topology View

The **Network Topology View** shows the current network configuration, created with ***Network Configurator***. It is not possible to edit the network configuration topology in ***Mapping Tool***, only I/O connection mapping can be altered.

For example, click the icon of a mapped I/O connection on the **Network Topology View** to display the memory map, function blocks and I/O points related to that I/O connection.

Memory Map View

The **Memory Map View** shows byte positions of the I/O connection selected in the topology network tree. Each byte is represented by a different color, where:

☐ **White Byte:** indicates that the memory position is available. Click on it to map I/O points;

▨ **Grey Byte:** indicates that the memory position is not available;

🟦 **Light Blue Byte:** byte mapped as analog;

🟦 **Dark Blue Byte:** byte mapped as analog and the corresponding I/O point is selected;

🟨 **Light Yellow Byte:** byte mapped as digital;

🟨 **Dark Yellow Byte:** byte mapped as digital and the corresponding I/O point is selected.

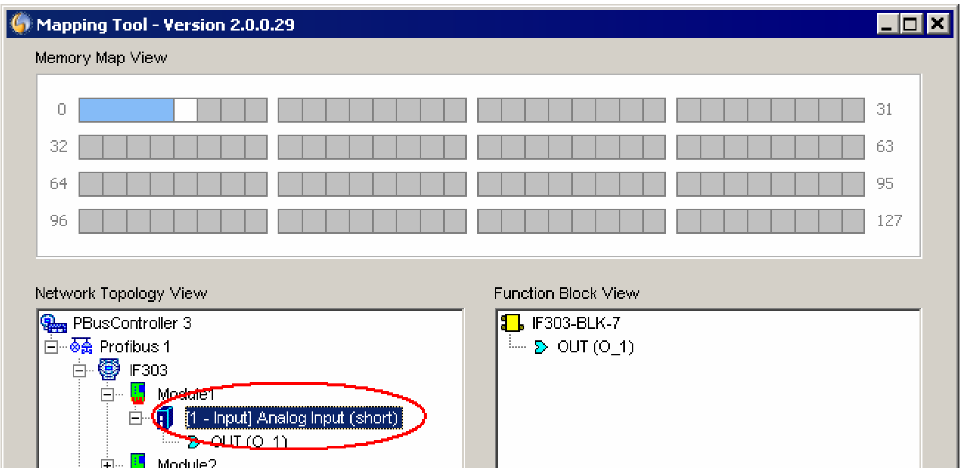


Figure 13.4. Example of Memory Map View

Blocks and Parameters View

The **Function Block View** lists function blocks and parameters related to the icon selected in the network topology tree. For example, when the icon of the controller is selected, blocks and parameters of all devices connected to the channels from that controller are listed. Likewise, when the icon of the device is selected, only the blocks and parameters configured for that specific device are listed.

When you select a parameter in the **Function Block View**, the related memory map is displayed, and mapped bytes are indicated in blue for analog bytes, or yellow for discrete bytes.

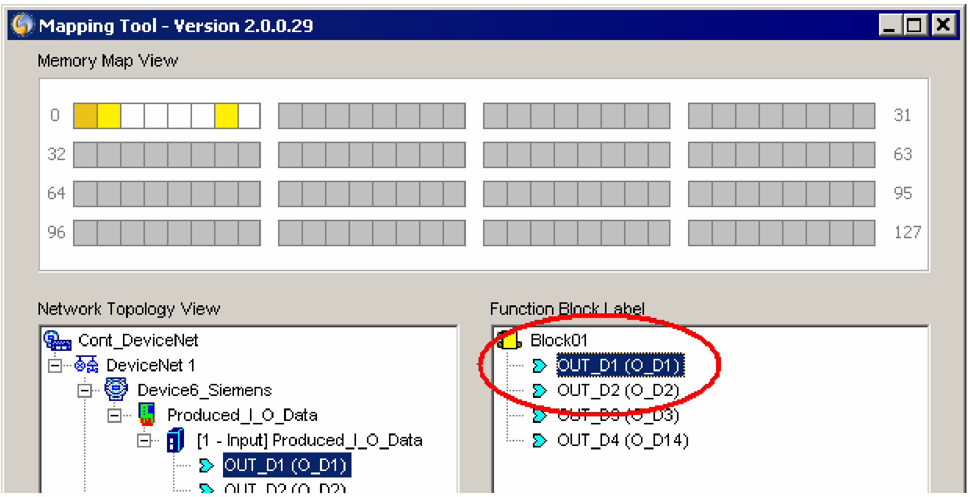


Figure 13.5. Mapping for the Selected Parameter

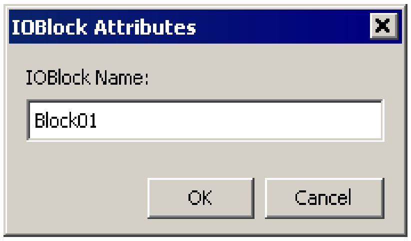
I/O Point Group View

The **I/O Point Group View** shows the I/O points grouped by device, according to the icon selected in the topology tree. Similarly to the **Function Block View**, select the icon of the I/O point to display the related memory map. Mapped bytes are displayed in blue, for analog bytes, or yellow for discrete bytes.

Using Mapping Tool

Renaming Blocks or I/O Point Groups

You can change the tag of a block or I/O point group using ***Mapping Tool***. Right-click the icon of the block or I/O point group and select the option **Rename**. Type the new tag for the block (or group) and click **Ok**.


IOBlock Attributes

IOBlock Name: Block01

Figure 13.6. Changing Block Tag

The tag of the I/O Point Group based on the selected block is updated as well. The changes are also applied to the project configuration, in ***Syscon***. Moreover, the I/O points must be updated in the logic project file related to that block, if the logic was created in ***LogicView***. When the user opens a logic configuration file in ***LogicView***, or if there is another user editing the file when the tag was changed, a message box warns the user to update the configuration file.

If the renamed group has a block associated to it, the block tag is also updated.

Removing Blocks, I/O Point Groups or I/O Points

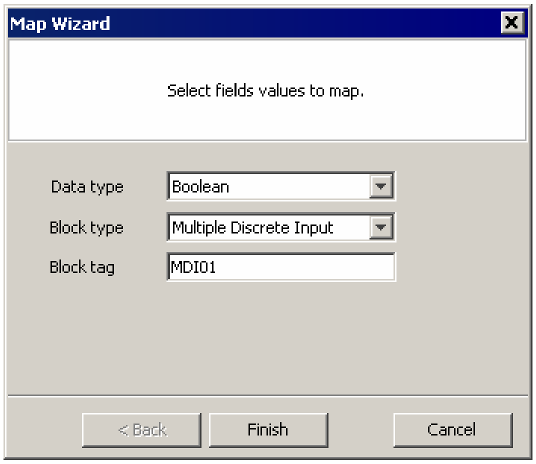
To remove a block or I/O point group, right-click the icon and select the option **Delete**.

I/O points associated to the block are removed and the block is deleted from the ***Syscon*** project configuration. If I/O points associated to the block were being used in a logic configuration in ***LogicView***, they are also deleted from the logic.

Mapping I/O Connections

Select the icon of an I/O connection to map it as an I/O point and the memory map is displayed in the ***Mapping Tool*** window, indicating available memory positions and positions that are already mapped.

Click an available position represented by a white byte to open the **Map Wizard** dialog box.


Map Wizard

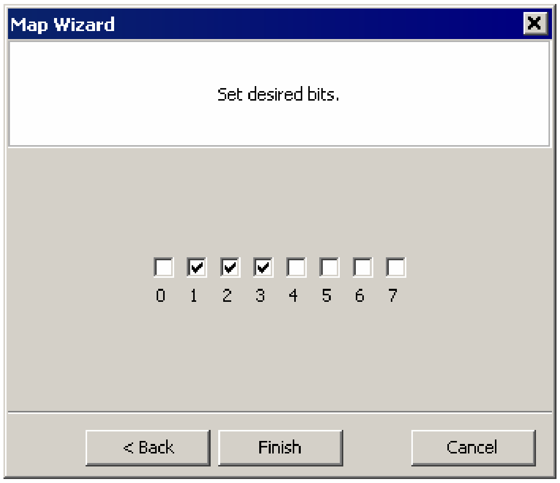
Select fields values to map.

Data type: Boolean
Block type: Multiple Discrete Input
Block tag: MDI01

Figure 13.7. Map Wizard Dialog

Select a data type and the type of the block. When the block type is set as **None**, you can type a block or I/O point group tag.

If data type **Bit** (discrete) is selected, click **Next**, set the bits that represent I/O points and click **Finish** to conclude.

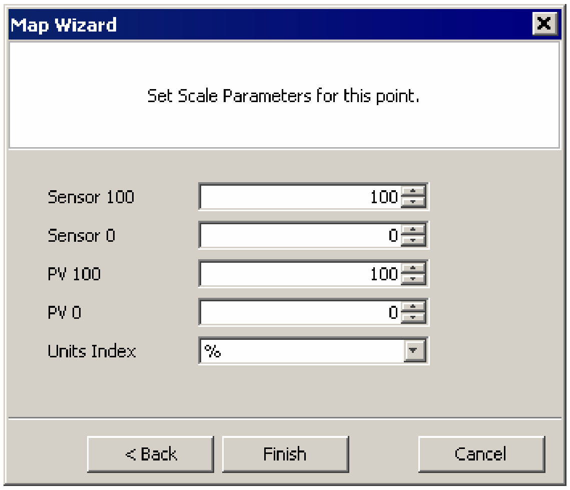


Set desired bits.

☐ 0 ☑ 1 ☑ 2 ☑ 3 ☐ 4 ☐ 5 ☐ 6 ☐ 7

Figure 13.8. Mapping Bits

If analog data type is selected, click **Next**, configure values for scale parameters (*Sensor, PV and Unit*) and click **Finish** to conclude.



Set Scale Parameters for this point.

Sensor 100: 100
Sensor 0: 0
PV 100: 100
PV 0: 0
Units Index: %

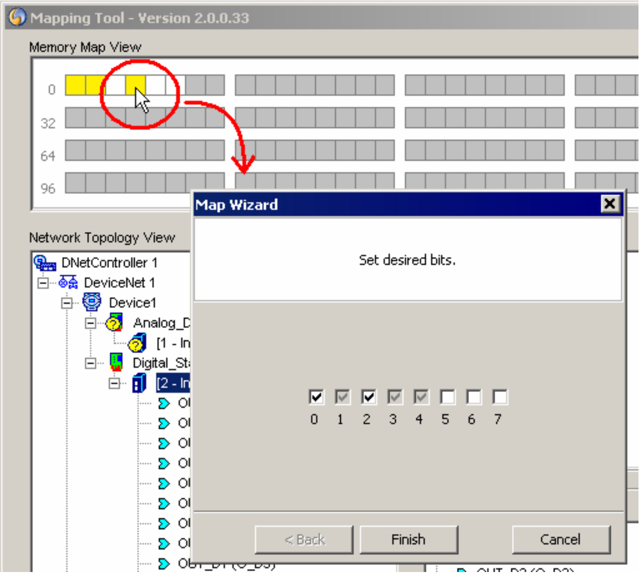
Figure 13.9. Scale Configuration

If discrete data type is selected, except **Bit** type, just click **Finish** to conclude.

ATTENTION
The maximum size for a block or I/O point group tag is 32 characters. The block or I/O point group tag must be unique within ***Studio302*** *Database*. ***Mapping Tool*** automatically creates tags for I/O points according to the standard format described below: • Analog Input: <Block_Tag or Group_Tag>.**IN_#** • Analog Output: <Block_Tag or Group_Tag>.**OUT_#** • Discrete Input: <Block_Tag or Group_Tag>.**IN_D#** • Discrete Output: <Block_Tag or Group_Tag>.**OUT_D#**

Editing Digital Bits

On the **Memory Map View** area, click the bit mapped as a digital I/O point to open the **Map Wizard** dialog box. Remember that digital bytes are represented in yellow. See the example below:



Set desired bits.

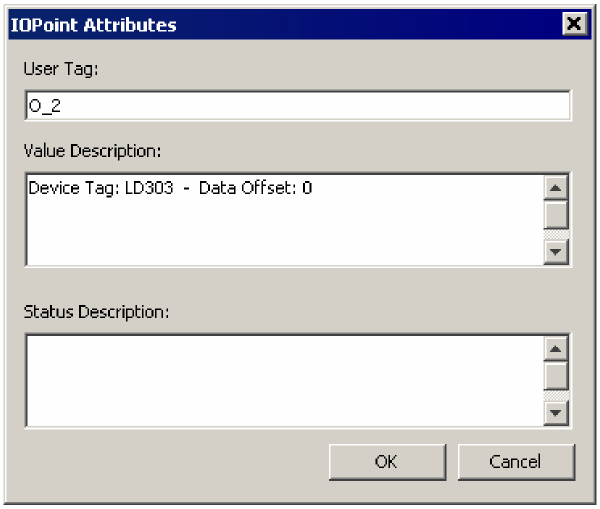
☑ 0 ☑ 1 ☑ 2 ☑ 3 ☑ 4 ☐ 5 ☐ 6 ☐ 7

Figure 13.10. Editing bits

Select the bits to represent the I/O point and click **Finish** to conclude.

Editing I/O Point Attributes

Right-click the icon of an I/O point and select the option **Attributes** to open the **Attributes** dialog box. You can change the user tag of an I/O point, which is indicated in parentheses in the ***Mapping Tool*** window, and type a brief description for value and status of the I/O point:



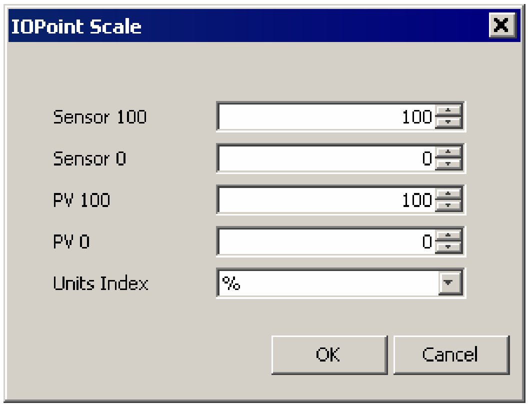
User Tag: O_2

Value Description: Device Tag: LD303 - Data Offset: 0

Status Description:

Figure 13.11. Changing Attributes

If an I/O point is an analog data type, you can also configure the scale values. Right-click the icon of an I/O point and select the option **Scale**.

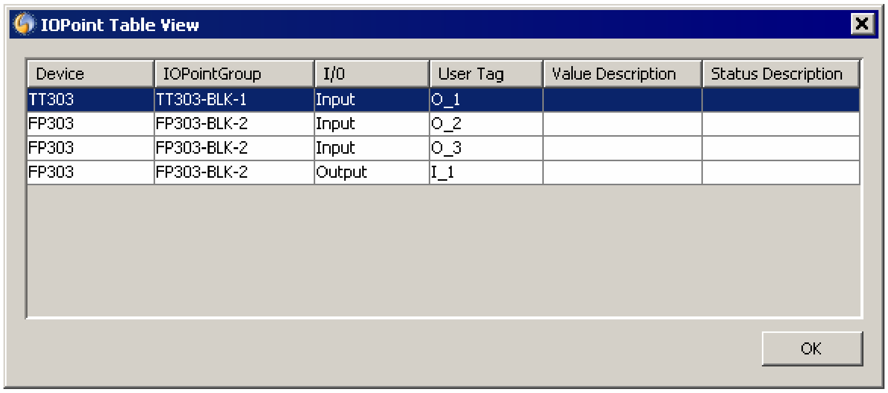


Sensor 100: 100
Sensor 0: 0
PV 100: 100
PV 0: 0
Units Index: %

Figure 13.12. Changing Scale Values

Editing I/O Point Attributes with I/O Point Table

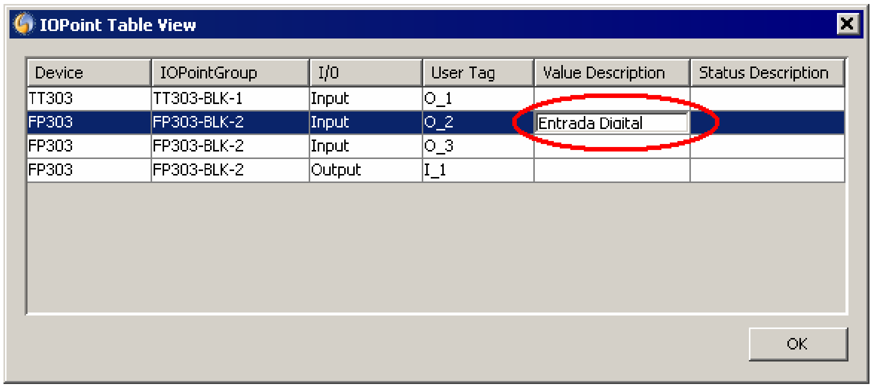
I/O Points Table lets you edit attributes of all I/O points, from every device displayed in the network topology tree. Right-click the controller icon and click the option **I/O Point Table View**. The **I/O Point Table** window shows up:



Device	IOPointGroup	I/O	User Tag	Value Description	Status Description
TT303	TT303-BLK-1	Input	O_1		
FP303	FP303-BLK-2	Input	O_2		
FP303	FP303-BLK-2	Input	O_3		
FP303	FP303-BLK-2	Output	I_1		

Figure 13.13. I/O Points Table

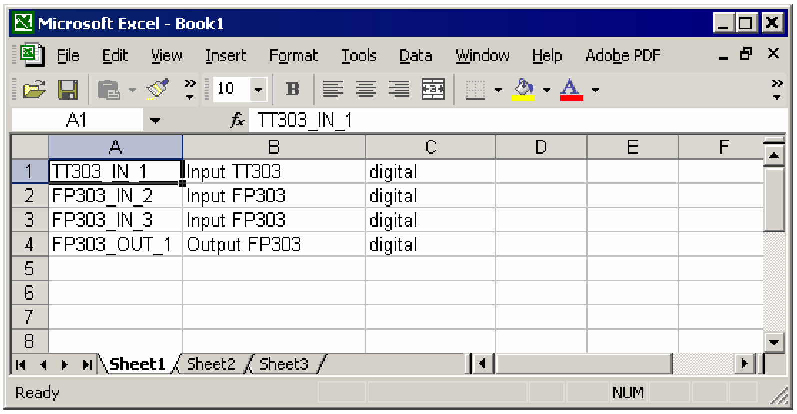
You can change user tags and also type value and status descriptions for I/O points. Select a line on the table and double-click the cell on the column **User Tag** to change the tag created by a user (this tag is displayed in parentheses in the ***Mapping Tool*** window). Double-click the cell on the column **Value Description** to type a value description, and on the column **Status Description** to type a status description for I/O point. When you finish editing the data, press **Enter** on the keyboard to conclude.



Device	IOPointGroup	I/O	User Tag	Value Description	Status Description
TT303	TT303-BLK-1	Input	O_1		
FP303	FP303-BLK-2	Input	O_2	Entrada Digital	
FP303	FP303-BLK-2	Input	O_3		
FP303	FP303-BLK-2	Output	I_1		

Figure 13.14. Editing the I/O Points Table

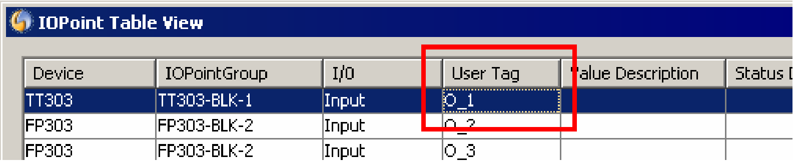
Another fast way to edit data related to I/O points is using an ***Excel*** worksheet, considering the column order **User Tag**, **Value Description** and **Status Description**, as indicated in the example below:



	A	B	C	D	E	F
1	TT303_IN_1	Input TT303	digital			
2	FP303_IN_2	Input FP303	digital			
3	FP303_IN_3	Input FP303	digital			
4	FP303_OUT_1	Output FP303	digital			
5						
6						
7						
8						

Figure 13.15. Editing I/O Points using Excel

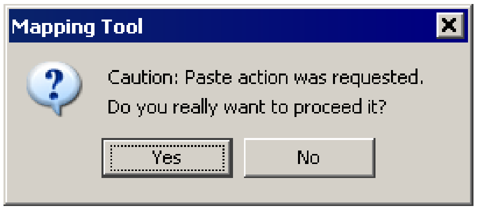
Type the desired information, select the cells on the table and click **Copy**, or press **Ctrl+C** on the keyboard. Return to the ***Mapping Tool*** window and select the field corresponding to the first point edited in the ***Excel*** table, on the column **User Tag** (a dashed line indicates the selection). See the example below:



Device	IOPointGroup	I/O	User Tag	alue Description	Status
TT303	TT303-BLK-1	Input	O_1		
FP303	FP303-BLK-2	Input	O_2		
FP303	FP303-BLK-2	Input	O_3		

Figure 13.16. Selecting the Column User Tag

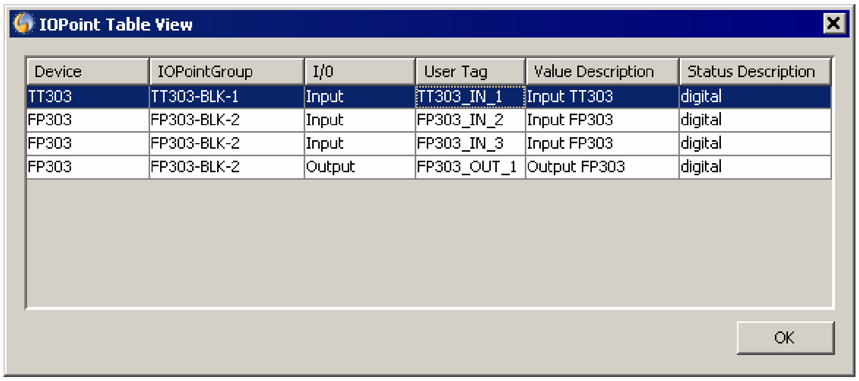
Press **Ctrl+V** on the keyboard. A message box opens to confirm the operation. Click **Yes** to proceed.



Caution: Paste action was requested.
Do you really want to proceed it?

Figure 13.17. Confirming the Operation

The data edited in the ***Excel*** table is copied to the **I/O Points Table**, as shown in the example below:



Device	IOPointGroup	I/O	User Tag	Value Description	Status Description
TT303	TT303-BLK-1	Input	TT303_IN_1	Input TT303	digital
FP303	FP303-BLK-2	Input	FP303_IN_2	Input FP303	digital
FP303	FP303-BLK-2	Input	FP303_IN_3	Input FP303	digital
FP303	FP303-BLK-2	Output	FP303_OUT_1	Output FP303	digital

Figure 13.18. Copying the Information

IMPORTANT

The tag of a block or I/O point group must be unique in the ***Studio302*** *Database*. ***Mapping Tool*** verifies if tags created in the **User Tag** column do not repeat, and alerts the user if a tag is not unique. Tags created by users that already exist in the configuration are **not** copied to the **I/O Points Table**.

Click **Ok** to close the **I/O Points Table** window and return to ***Mapping Tool***.

Defining reading order for bytes

According to the operational system being used, it is necessary to consider the byte order in which values are stored in memory. There are two possible reading/writing orders for bytes:

> **Little Endian:** the least significant value in hexadecimal is stored in memory at the lowest address; the other bytes will be stored in ascending order until the most significant byte is stored in the highest address. This method is also called reverse order.
>
> **Big Endian:** the high-order byte is stored in memory first, that is, at the lowest memory address. The least significant byte is stored at the highest address.

Right-click the icon of a device and select the reading order **Little Endian** or **Big Endian**.

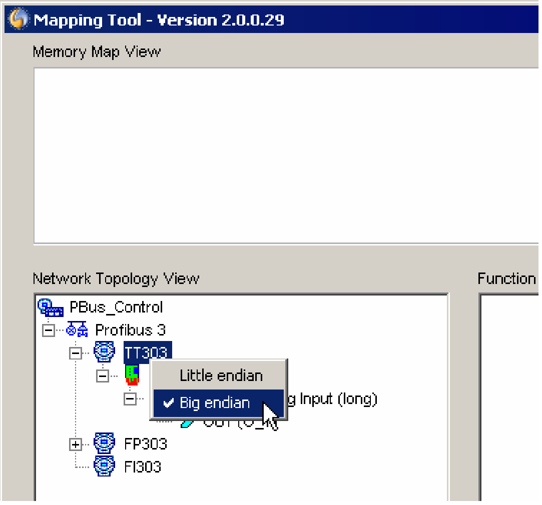


Figure 13.19. Reading Order

Copying the Memory Map

The memory map of the I/O connection (represented by the icon in the network topology tree) can only be copied to another I/O connection of the same type (an input or output connection). The target I/O connection must have a number of bytes available to map the points of the original I/O connection.

ATTENTION

It is not possible to copy the memory map for devices with automatic I/O mapping (*Standard I/O Connection*).

Right-click one I/O connection icon and select the option **Copy Mapping**.

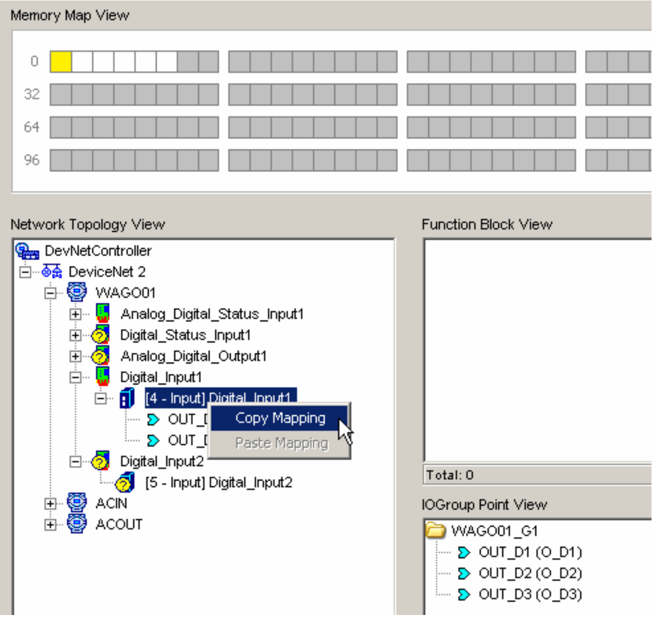


Figure 13.20. Copying the Memory Map

Then, right-click the icon of the target I/O connection of the same type and select the option **Paste Mapping** to conclude.

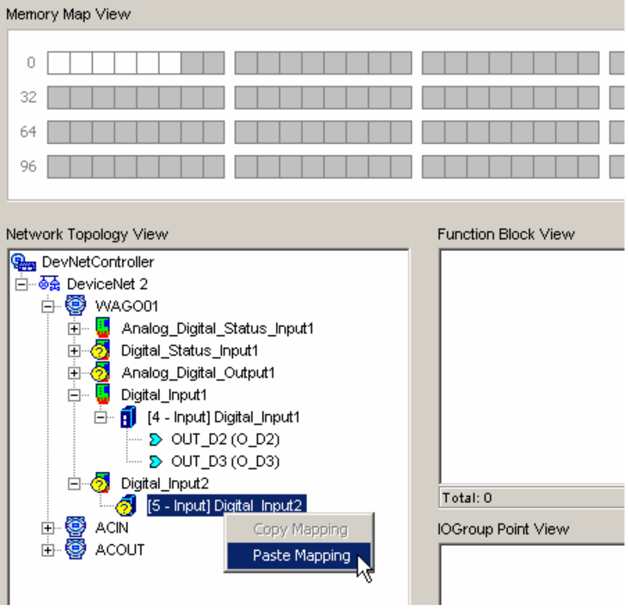


Figure 13.21. Pasting the Memory Map

The I/O Point mapping is copied to the target I/O connection and the tags of the parameters is automatically created.

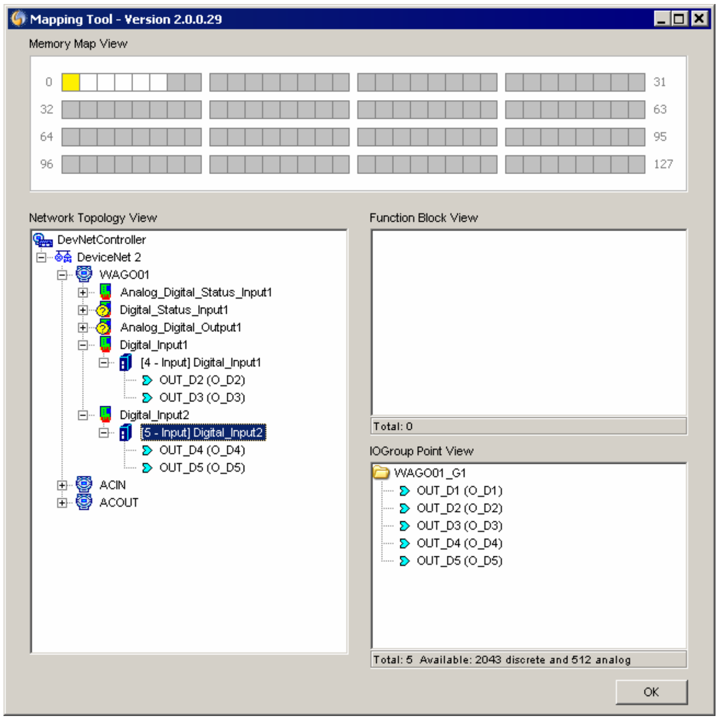


Figure 13.22. Copied I/O Connection

The default format of I/O point tag is described in section **Mapping I/O Connections**.

Deleting Mapped Bits

To delete a mapped I/O point, right-click its icon and select the option **Delete**.

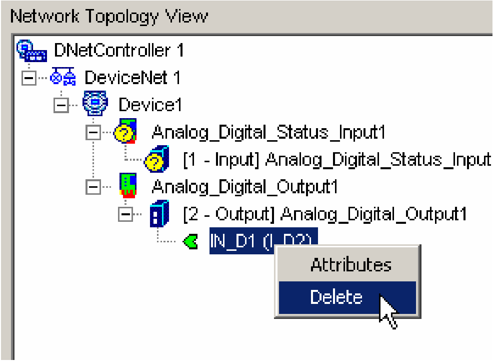


Figure 13.23. Deleting Mapped Bits

The selected I/O point is automatically deleted and will be available for new mapping.