



AUCOTEC
Create Synergy – Connect Processes

Engineering Base

How to create Circuit Components

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1 Circuit Components

1.1 About Circuit Components

Circuit Components are assemblies of shape (Shape: A shape is an instance of a master that is dragged from a stencil onto the diagram. More than 2000 IEC compliant shapes are provided with Engineering Base. Most of them are shapes representing electro-technical symbols used to create control schematics.)s (with object(Object: An entity represented in the Explorer.)s), connection (Connection: A connection is created using the Visio connector tool.)s, and graphics. They are organized in stencils. Folders can be used for structuring the circuit components stencils.

1.2 Abbreviations / Acronyms

Abbreviation	Description
EB	Engineering Base (AUCOTEC)
FS	Flow Sheet
P&ID	Process/Piping & Instrumentation Diagram
SLD	Single Line Diagram
DCS	Distributed Control System
CAD	Computer Aided Design
PFD	Process Flow Diagram
IDS	Intelligent Data Sheets
RMB	Right Mouse Button

1.3 Keyboard shortcuts

Command	Functionality
Working with the Explorer	
To choose this command	Press
Open	F2
Next window	CTRL+SHIFT+TAB
Next tab	CTRL+TAB
New association	Drag-and-drop + ALT
Replace	Drag-and-drop + SHIFT
Copy	Drag-and-drop + CTRL
Copy Merge	Drag-and-drop + CTRL+M
Copy Interface	Drag-and-drop + CTRL+G

Working with dialog boxes	
To choose this command	Press
Next tab	CTRL+TAB
Next field	TAB
Previous field	SHIFT+TAB
Working with worksheets	
To choose this command	Press
Open	F2
Filter on / off	F4
Zoom in / out	CTRL + Mouse Wheel
Next window	CTRL+SHIFT+TAB
Working with Visio	
To choose this command	Press
Copy shape	Drag-and-drop + SHIFT
Copy shape with device	Drag-and-drop + CTRL
Working between Explorer and Visio	
To choose this command	Press
New association	Drag-and-drop object from Explorer to Shape
Command	Press
Pointer Tool	CTRL+1
Text Tool	CTRL+2
Connector Tool	CTRL+3
Pencil Tool	CTRL+4
Freeform Tool	CTRL+5
Line Tool	CTRL+6
Arc Tool	CTRL+7
Rectangle Tool	CTRL+8
Ellipse Tool	CTRL+9
Zoom in	SHIFT+CTRL+LEFT MOUSE BUTTON
Zoom out	SHIFT+CTRL+RIGHT MOUSE BUTTON
Zoom to page width	CTRL+ SHIFT +W
Switch between open sheets	CTRL+TAB
Refresh	F5

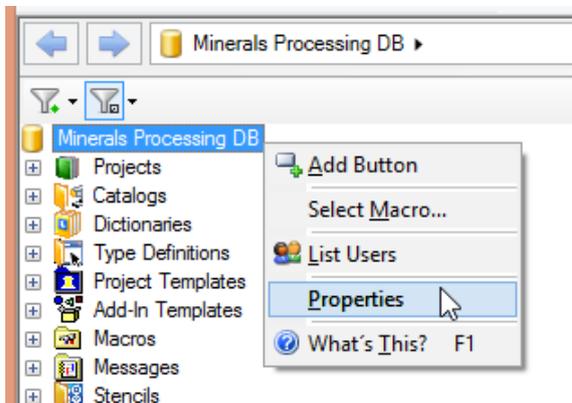
2 Pre-requirements

2.1 Database setting

Engineering Base offers a way, to insert circuit components with functional objects and functional structures into the functional hierarchy according to the needs of the user. But, to make this option available, the database properties have to be updated.

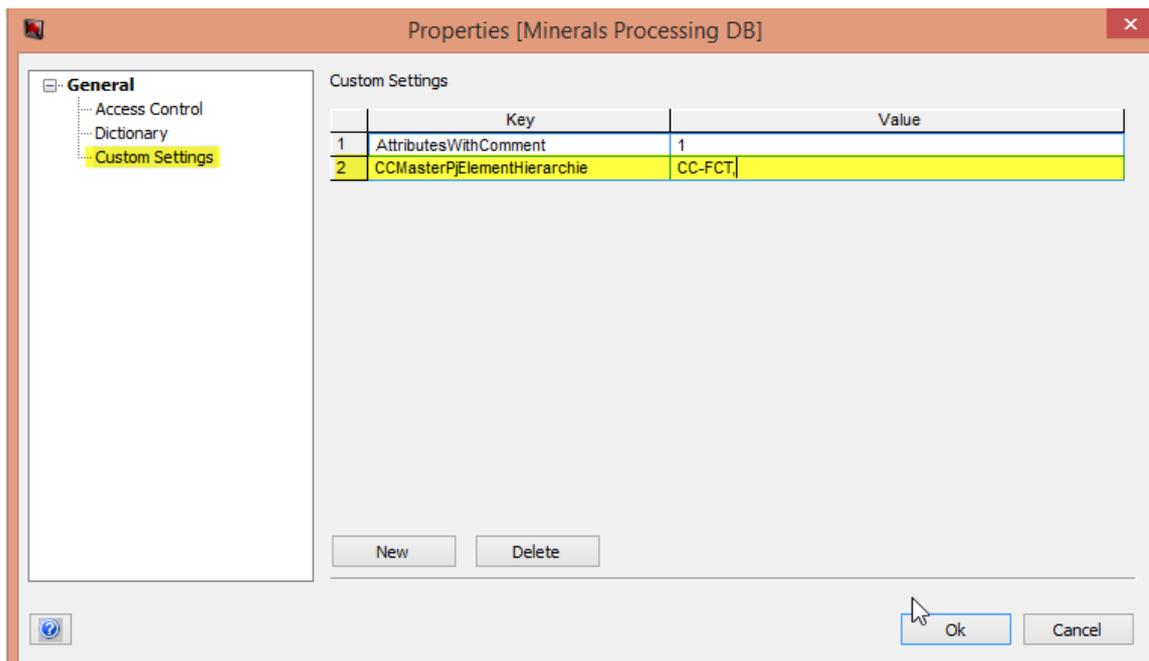
To update the database properties for circuit components with functional objects

1. In the Engineering Base Explorer, click **Database**.
2. Select the database root folder.
3. On the shortcut menu, click **Properties**.



This opens the Properties dialog for the database.

4. In the tree, click **Custom Settings**.
5. If needed, click **New** to create a new line below Custom Settings.
6. Enter the string "**CCMasterPjElementHierarchie**" into the field Key and "**CC-FCT,**" (please, include the comma!) into the field Value.
7. Click **OK**.

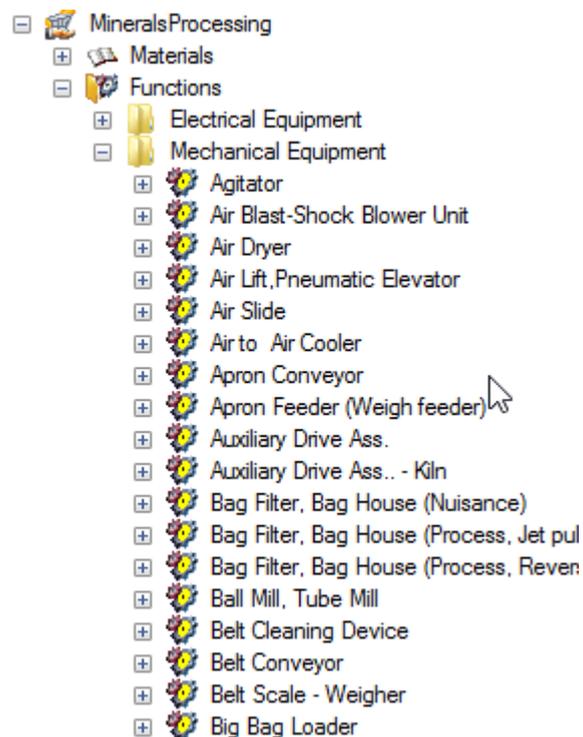


After restarting Engineering Base, the database is now prepared to insert circuit components with functional objects and functional structures into the functional hierarchy.

2.2 Specification Catalog (Optional)

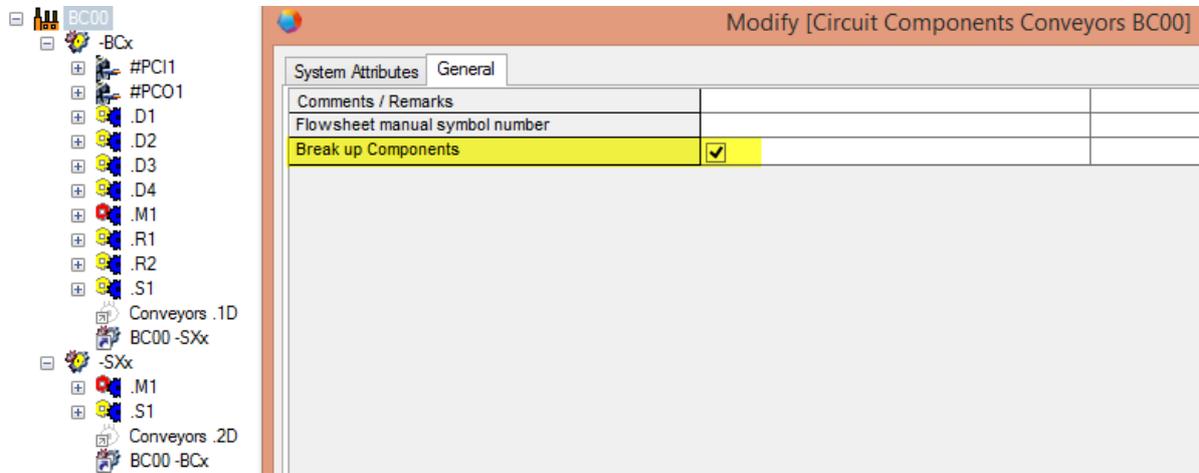
For the Minerals Processing environment, we have assigned all the Circuit Components with specifications in advance based on the Specification Catalog.

If you are planning to assign in advance then you need the Specification Catalog as the screenshot below.



2.3 Attribute required

Attribute “Break up Components” is required for the Plant type in the upper level in the functional structure for circuit component, which consists of several simple circuits.



The screenshot shows a software interface with a tree view on the left and a dialog box on the right. The tree view displays a hierarchy of components under 'BC00', including sub-items like '#PCI1', '#PCO1', '.D1', '.D2', '.D3', '.D4', '.M1', '.R1', '.R2', '.S1', 'Conveyors .1D', 'BC00 -SXx', '-SXx', '.M1', '.S1', 'Conveyors .2D', and 'BC00 -BCx'. The dialog box, titled 'Modify [Circuit Components Conveyors BC00]', has a 'General' tab and a table with the following content:

System Attributes	
General	
Comments / Remarks	
Flowsheet manual symbol number	
Break up Components	<input checked="" type="checkbox"/>

3 How to create Circuit Components

The project **Symbols for flow sheet** can be divided into several topics.

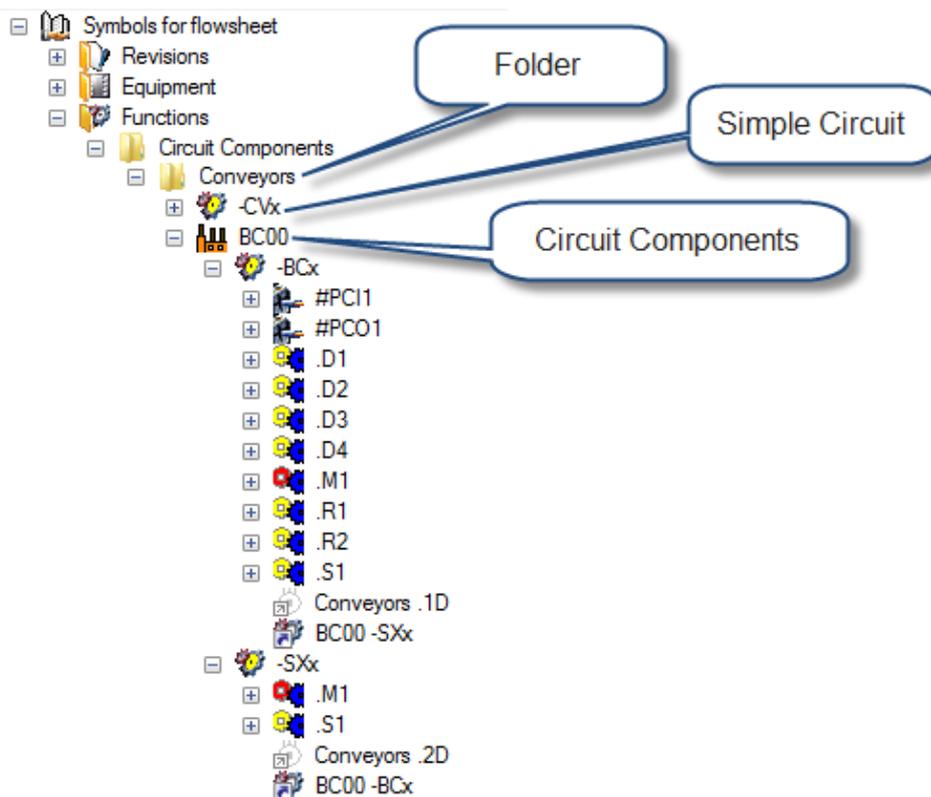
- **Compressors, Fans, Blowers**
- **Control Instrumentation**
- **Conveyors**
-

For each topic, there are various different Stencils. These Stencils are **Circuit Components** which can be placed on a flow sheet.

A distinction is made under a simple circuit, which with a **-CVx** is characterized and a circuit component, which consists of several simple circuits without a "-".

To break up a Circuit Component, use the assistant "**Break up component**". This assistant is used for Circuit Components without a "-".

Below is an example of the Circuit Components.



3.1 Create a new project

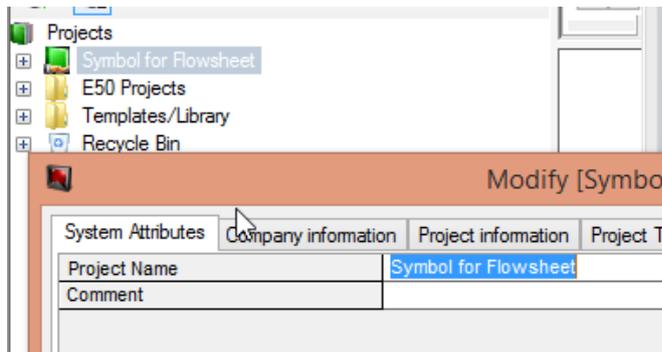
Create a new project in Engineering Base by right mouse button from the project and select **Minerals Processing** or **Standard** project.



If you have the Minerals Processing database then you have the option to select the **Minerals Processing**.

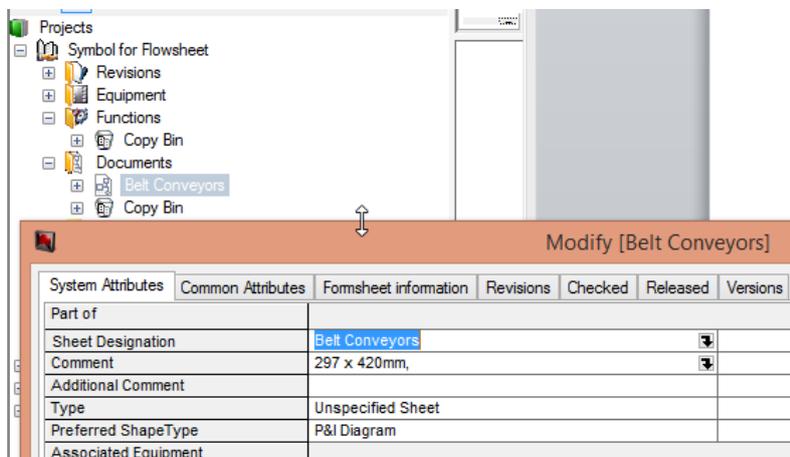


Name the project as you like, in the example the project was named as "Symbol for Flow sheet".



3.2 Create a new sheet

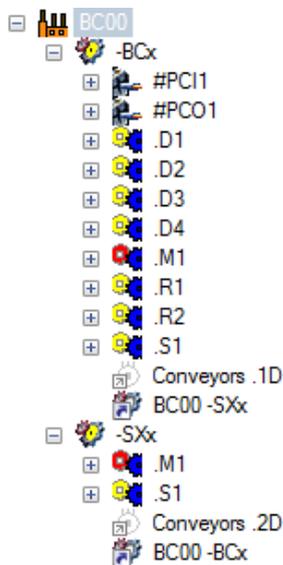
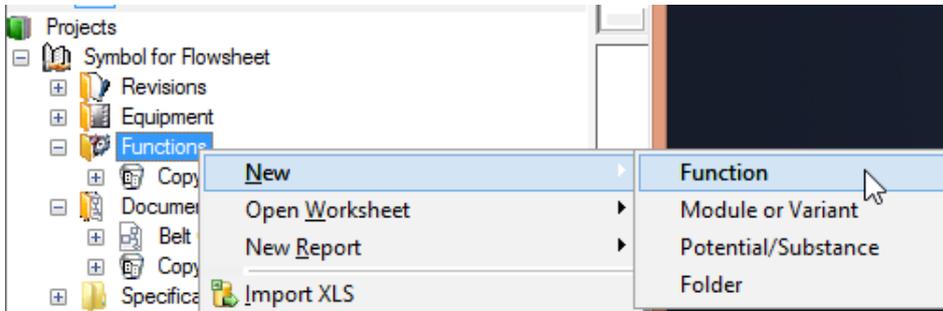
Create a new sheet under the Documents folder by right click and select the desired flow sheet size. Then name the sheet accordingly, in this example I have named as "Belt Conveyors". Select the Preferred Shape Type as "P&I Diagram" and Type as "Unspecified Sheet".



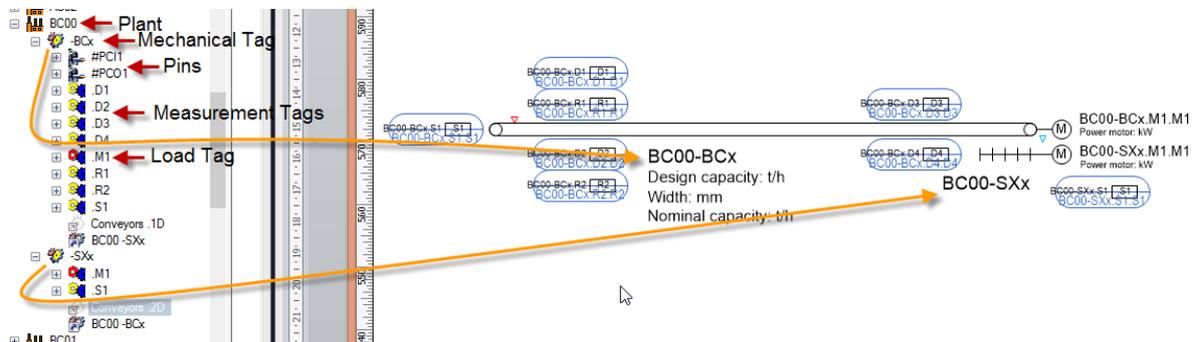
3.3 Define functional objects and structures

Define circuit components with functional objects and functional structures into the functional hierarchy according to the needs of the user.

In the Project, select the **Functions** folder and right click and select new function from the context menu.

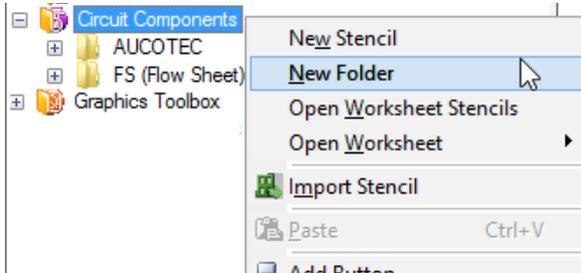


Open the sheet and place your new component on the sheet with the left mouse key by dropping the preferred master and make your modifications in the drawing.

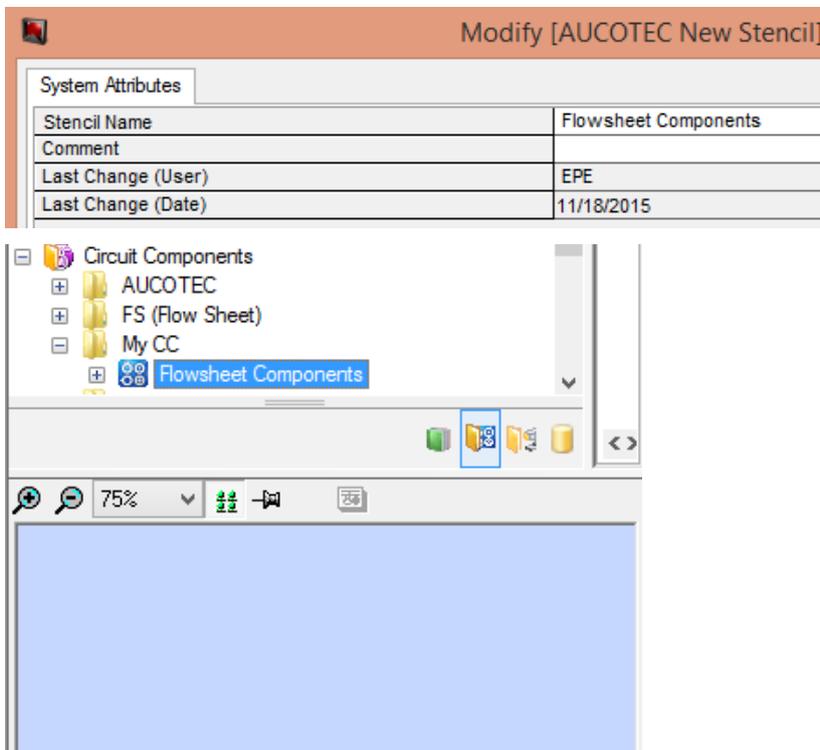


3.4 Saving the new components as a circuit components

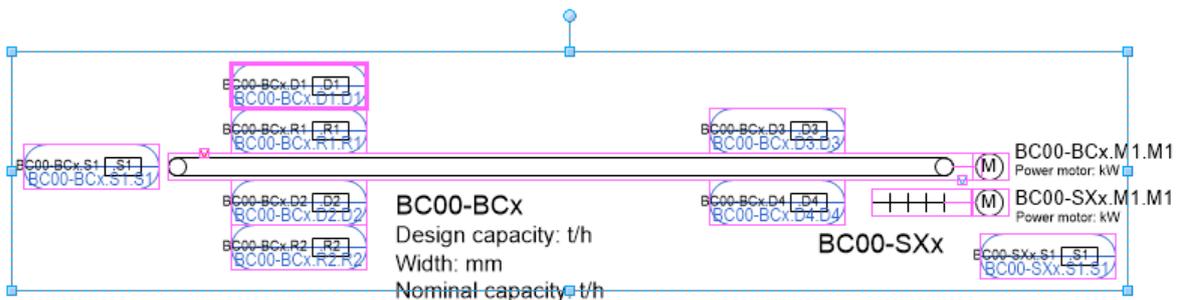
Create your own circuit components master folder in the Circuit Components folder.



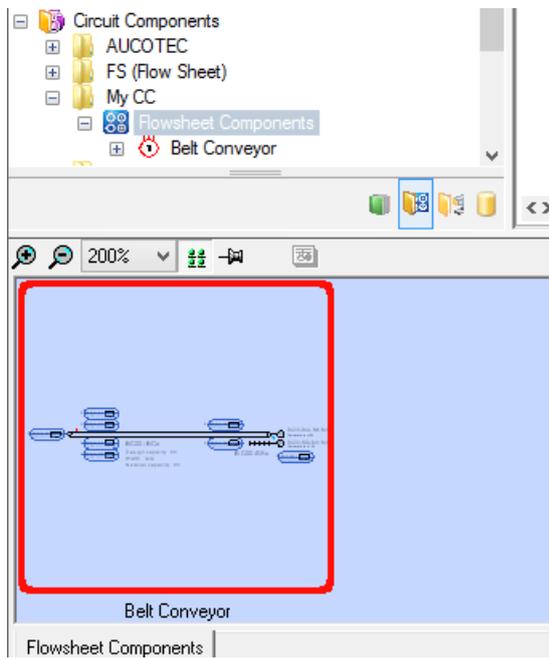
Create your own circuit components stencil.



Select the area around the components including all parts.



Move the selection into the new stencil with left mouse key and rename it.



4 How to insert Circuit Components

1. Select the circuit component from the Circuit Components folder.
2. Open the sheet in Visio.
3. Drag the circuit component with right mouse button pressed from the stencil to the sheet and release the circuit component.

This opens the new dialog for the newly inserted circuit component.

System Attributes		General
Part of		...
Function Name	BC00	▼
Comment		▼
Type	Plant	
Typical		▼
Protected	<input type="checkbox"/>	

Ok Cancel

-- User Dialog --

4. In the line **Part of**, click the button to fix the position of the circuit component in the functional hierarchy.
5. In the field **Function Name**, enter the new name of the circuit component.
6. Click **Ok** to store the circuit component into the chosen position of the functional hierarchy.