AUTOMATION STUDIO™5.5

Product description / What's New?

"With its new functionalities
Automation Studio™
increases engineering productivity
and product deployment cost-savings"

Famic Technologies Inc.

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Famic Technologies Inc.

Dear valuable Automation Studio™ user,

Famic Technologies Inc. is proud to present you the newest version of Automation Studio™, the leading software for system design, simulation and documentation of hydraulic, mobile hydraulic, pneumatic and electrotechnical projects.

Due to the constant evolution of technologies, hydraulic, pneumatic and electrical systems are getting more and more complex. In order to maintain or improve their competitiveness, equipment manufacturers who develop and create products and projects including fluid power, electrical or automated systems, must satisfy their clients' quantity and quality requirements, while at the same time stay productive and cost-effective. therefore, it is essential for all these manufacturers to rely on efficient, complete and profitable tools, allowing them to optimize the products' and services' workflow, from concept, through training, to maintenance.

In addition to the powerful design, simulation, and documentation functionalities, that make Automation Studio™ one of the most efficient and flexible software solutions to create, analyze, test, troubleshoot, and validate systems, this newest version (version 5.5) features multiple new tools and enhancements that have been partly suggested by our users. These new characteristics, combined with Automation Studio™ usability and intuitive interface will undoubtedly enable design departments, maintenance and service divisions as well as training centers, to boost productivity and optimize the efficiency and quality of their workflow.

We are continuously staying tuned to the needs and concerns of our customers, and we focus our energy to offer you the most efficient and innovative tool possible. The Famic Technologies team hopes that you acknowledge, like thousands of other users who have recognized over the past 20 years, the results of our efforts in the research and development of Automation Studio™, as well as the advantages our software provides to your company.

We thank you for your loyalty and confidence in our product,

Best regards,

Denis Lenoble

Product Manager Automation Studio™

Famic Technologies Inc.

1   Automation Studio™ 5.5: New Features

This section outlines all new features included in Automation Studio™. These functionalities are developed to help you gain in productivity and efficiency. All the service releases of version 5.4 are included in this new version.

1.1   New version

This version is declined in 32 bits.

A System Design version (drawing only) and a Runtime version (simulation only) will follow Automation Studio™ 5.5 release.

1.2   New library

The Pneumatic library is completed with the addition of new elements of Proportional Pneumatics. The transducers, instructions generator and controller allow conceiving circuits in open and closed loops.
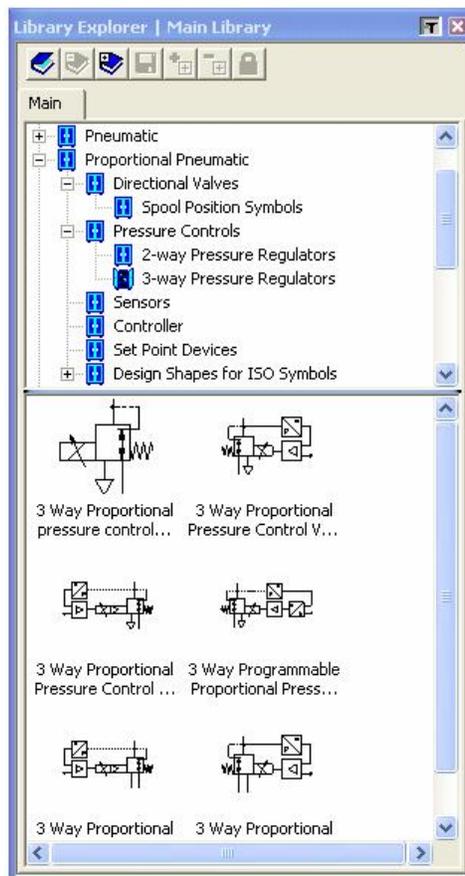

Figure 1: Proportional Pneumatic Library

2 Edition

Automation Studio™ is well known for its drawing, documentation and simulation capacities, as well as for its multi-technology environment. But one of the most important features that have built Automation Studio™ reputation is its user-friendly interface.

The following section presents the new functions added or improved to facilitate the realization of your hydraulic, pneumatic, electric, and automation projects.

2.1 Standard Editor

2.1.1 New functions

2.1.1.1 Installation and circuit management

According to the ISO 1219-2 norm, a hydraulic or pneumatic system is divided in installations, which are themselves divided in circuits. In Version 5.4 and older, the application of this norm was restricted to the construction of the ISO identifier. The 5.5 version includes an installation and circuit management incorporating the ISO1219-2 Norm recommendations, without limiting itself to them.

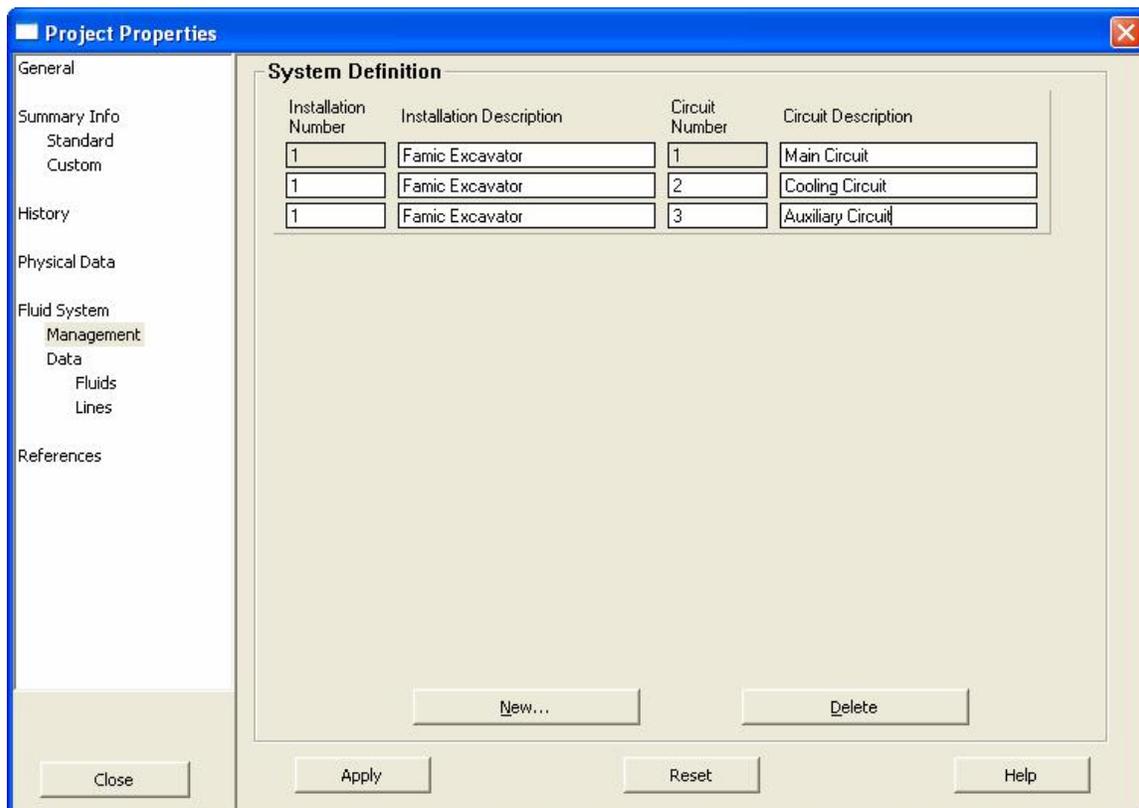The installation and circuit management is done through the Project Properties.

Figure 2: Project Properties Dialogue À Fluid System À Management

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With the new version it is possible to define (by default), every pressure line type, its properties, its material and appearance, and this for each pair installation-circuit. You can also reload the pressure line properties for a pair (installation, circuit) from the Project Properties Dialog Box:
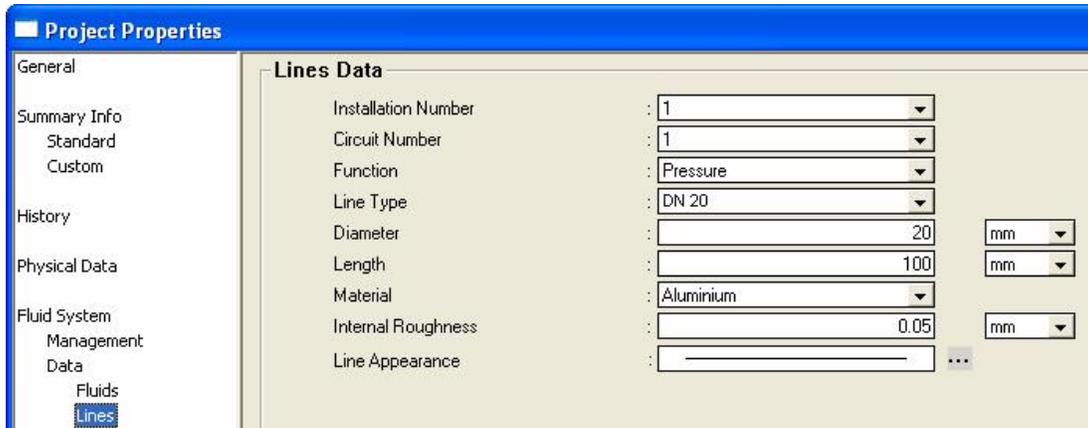

Figure 3: Dialogue Project Properties Dialog à Fluid System à Lines

Figure 4: Project Properties Dialog à Fluid System à Lines

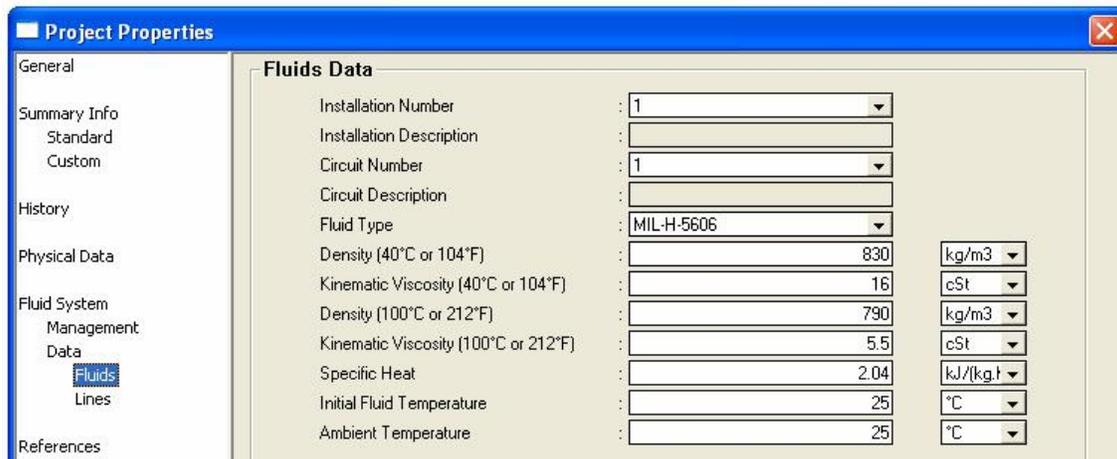The new version 5.5 allows defining the oil type for each pair (installation, circuit).

Figure 5: Project Properties Dialog Box à Fluid System à Fluids

In order to satisfy the entire hydraulic mobile, industrial and pneumatic market, the number of functional line types has been increased by adding Load Sense Line, Return Line and several Custom Lines.
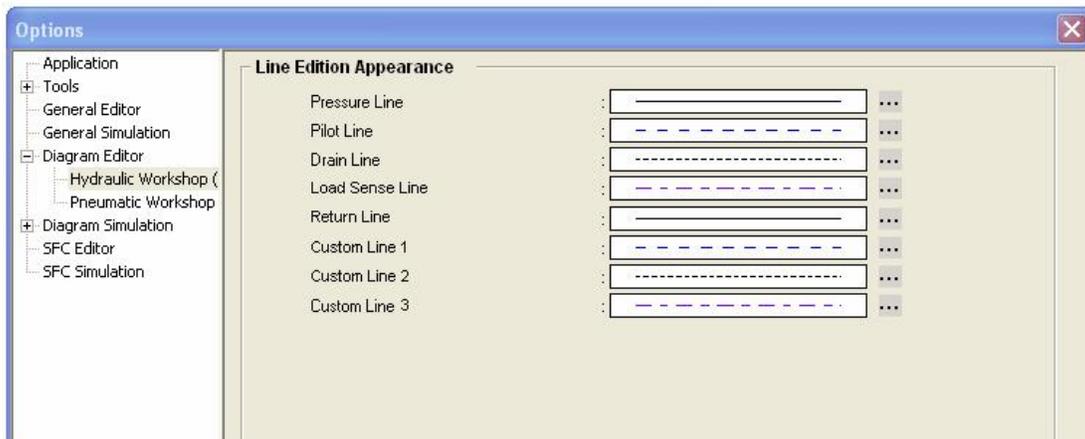
Figure 6: Project Properties Dialog Box à Fluid System à Pressure lines

It is now easy to identify a component and to modify its destination (installation, circuit), with the help of the Tool Bar "View".

Figure 7: Tool Bar "View" à (Installation, Circuit)

2.1.1.2   Multiple Fluid Configuration

In the versions 5.4 and older, the available fluids were limited to an incomplete list. It is from now on possible to create and save fluids using the "Tools" Menu.
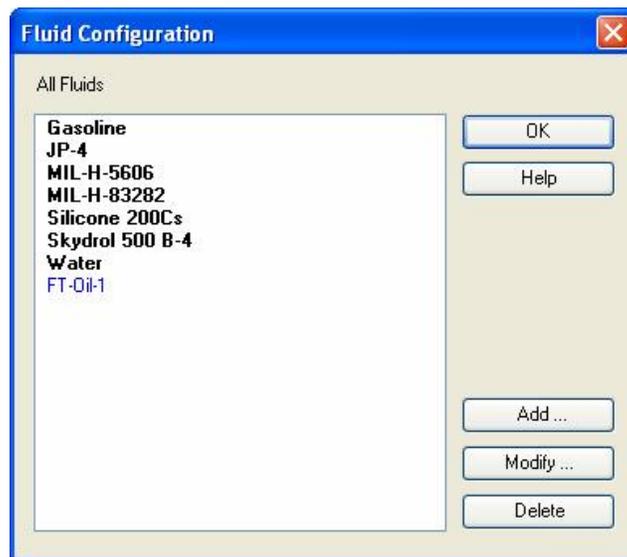
The data is saved from one version to another.

Figure 8: Fluid Configuration Dialog
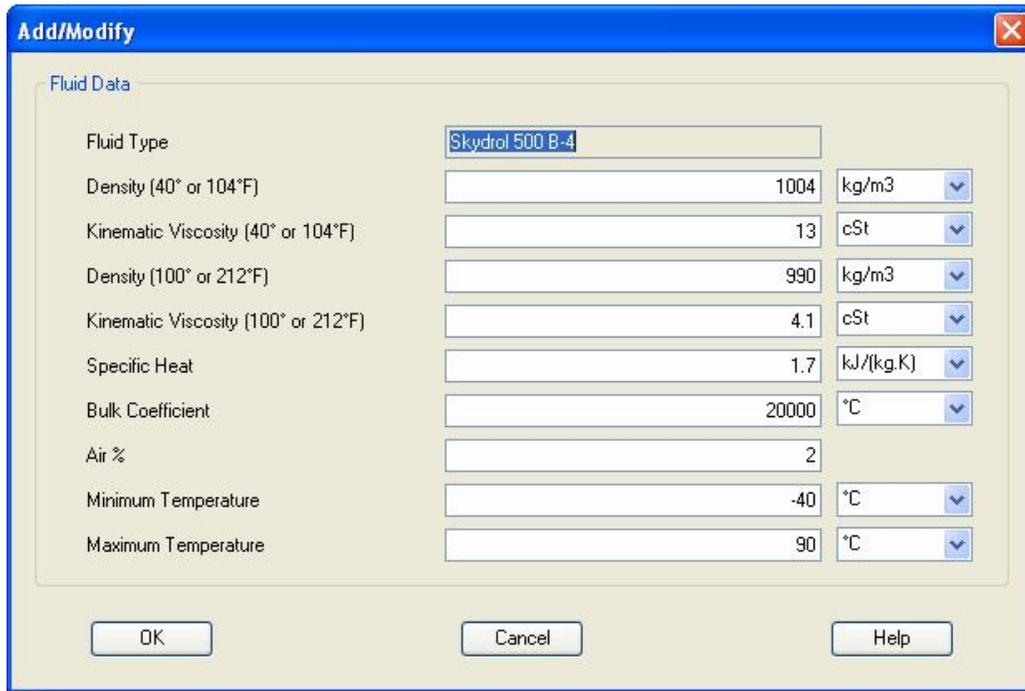
A fluid can be created, modified and removed.

Figure 9: Add/Modify Dialog Box

2.1.1.3 Material Configuration

The hydraulic simulator considers the power lines' material when calculating the system losses. In versions 5.4 and prior, the list of available materials was limited. Now, it is possible to create and save one's own pressure line materials using the "Tools" Menu.
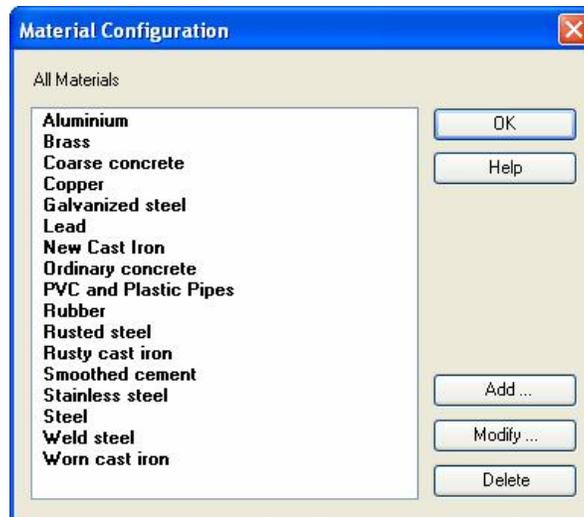

Figure 10: Material Configuration Dialog Box

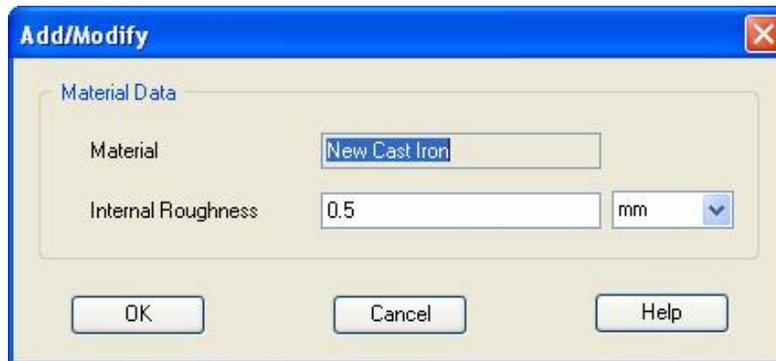It is now possible to create, modify and remove a material.

Figure 11: Add/Modify Material Dialog Box

2.1.1.4   Line Type Configuration

In the versions 5.4 and older, the available pressure lines were limited to an incomplete list. It is presently possible to create and save different pressure lines, using the "Tools" Menu.

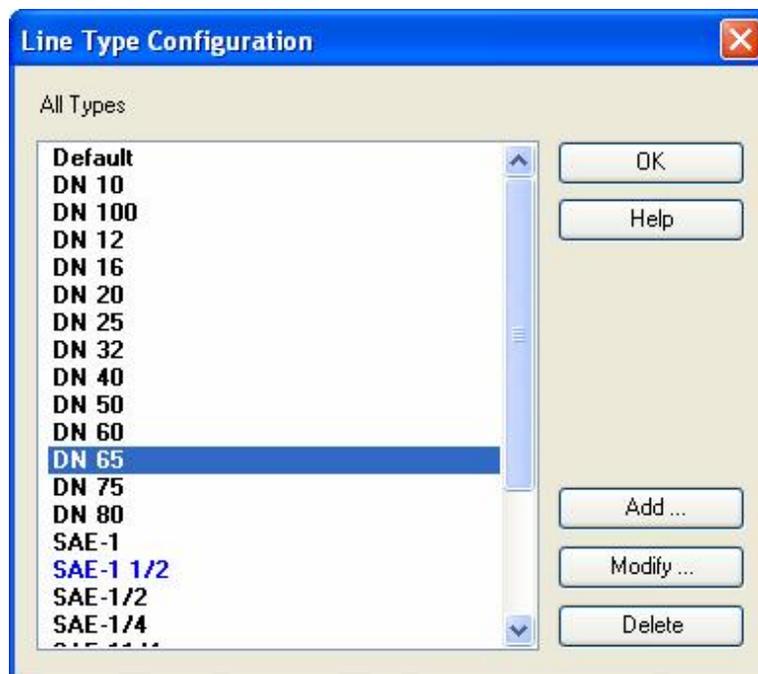The data is saved from one version to another

Figure 12: Lint Type Configuration Dialog Box

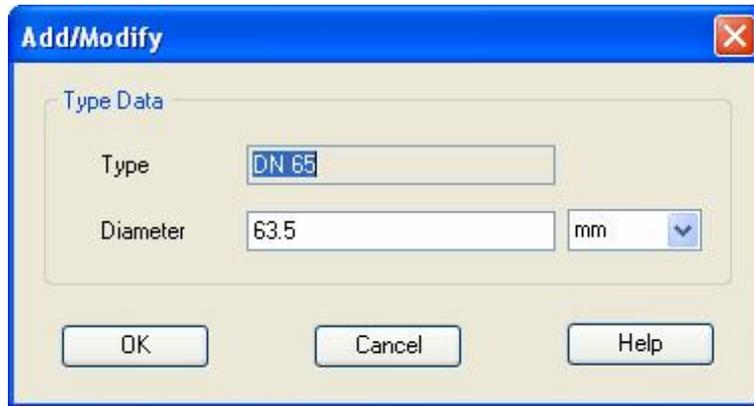It is now possible to create, modify and remove a pressure line.

Figure 13: Add/Modify Dialog Box for Power Line Types

2.1.1.5 References

The component references on the plans, as we find them in industrial design, allow locating the principle circuit elements and the optional components. All of them are displayed on the diagram.

A reference is a label placed on the component to help its identification and to include it in a Bill of material or a Report.
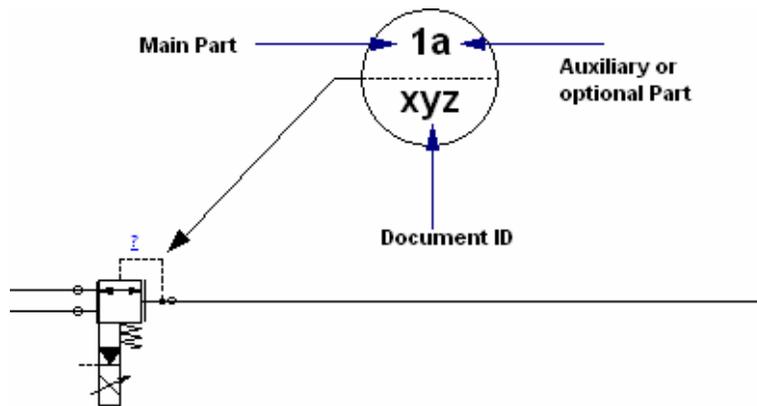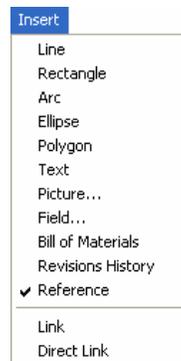

Figure 14: Details of a reference

Figure 15: Access to the Reference function through "Insert" Menu

Figure 16: "Insert" Tool Bar – reference function

A reference could be associated to one element, to a group, to an assembly or a sub-component of an assembly. With the Selection Tool chosen, pass the mouse over the items you want to reference. A blue background appears under the single elements, the groups or the assemblies and a red background appears under the sub-components of an assembly. You have to click once to select the item to reference, twice to position the origin of the reference on the element, and a third time to position the reference itself.
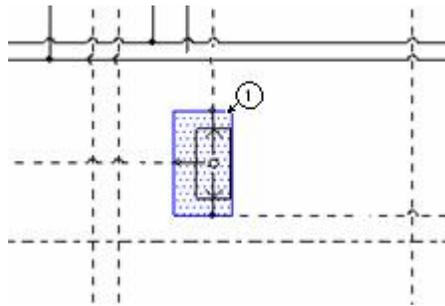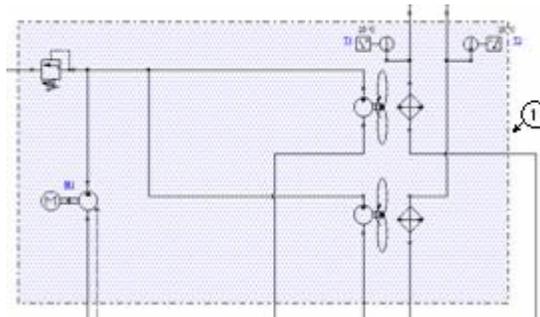

Figure 17: Selection of a simple component

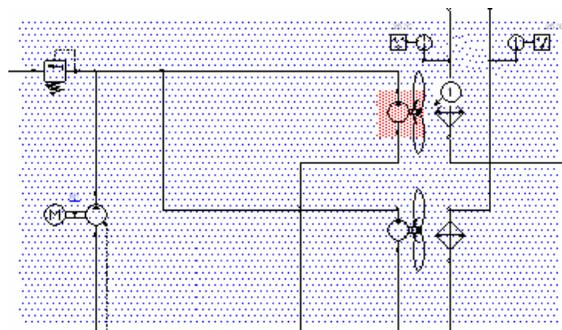*Figure 18: Selection of a group or assembly*

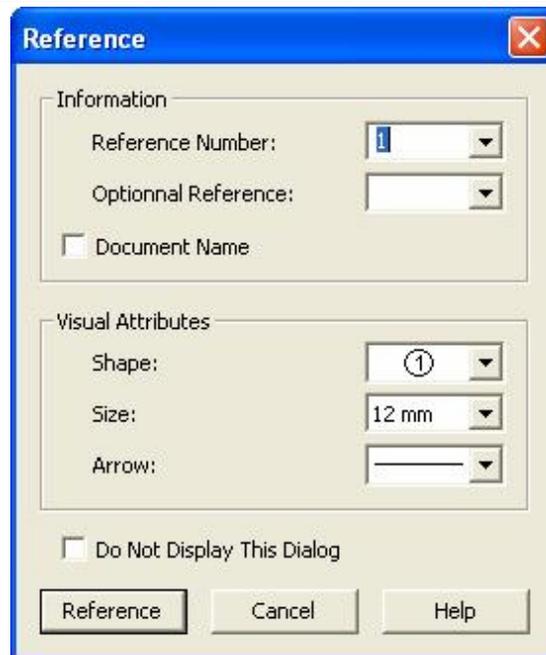*Figure 19: Selection of a sub-component of an assembly*

Figure 20: Reference Dialog Box

This dialog box appears when: (1) a new reference is created; and (2) the properties of a referenced component are inquired, whatever the means: menu, tool bar, contextual menu, double-clicks, Alt-Enter, etc.

The Reference button is used to confirm the creation of a reference.

Zone or Component	Description
Reference Number	The principle reference is an alphanumerical chain of characters, no accents, with Upper and Lower Case distinction. Its maximum length is 5 characters by default, editable. The main number cannot be empty. The editable list contains numbers already present in the project, in alphabetical or increasing order. The editable field contains the first available number.
Optional Reference	The optional reference allows referencing a component as an option to the principle reference. It consists of an alphanumerical chain of characters, no accents, with Upper and Lower Case distinction. Its maximum length is 5 characters by default, editable. The option can be empty.
Document Name	Shows the name of the document in the bubble.
Shape	Allows choosing shape for the reference frame.
Size	Allows defining the size of the reference on the diagram.

Zone or Component	Description
Arrow	Allows choosing whether to display the arrow or not.
Dialog display	The Check Box "Do not display this Dialog" appears only when creating a new reference.

All 'by default' reference options could be defined for an application, a current project of a current diagram.
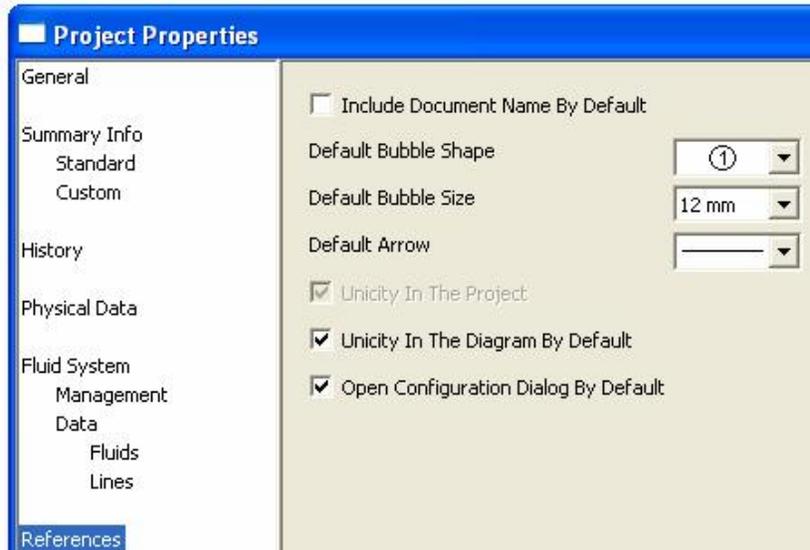

Figure 21: Project Properties Dialog Box à References

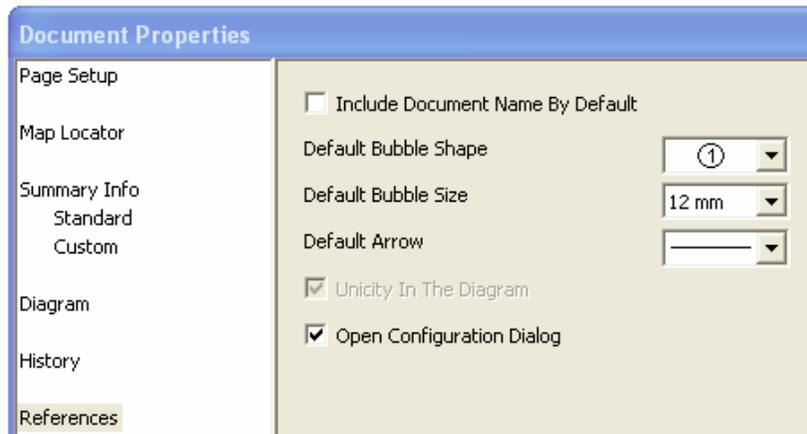| Zone or Component	Description
Unicity in the Project	Allows defining the unicity of the references in the project. The option is gray if a reference is already present in the project.
Unicity in the diagram	Allows defining the references in a diagram, only when the unicity in a project is not required.

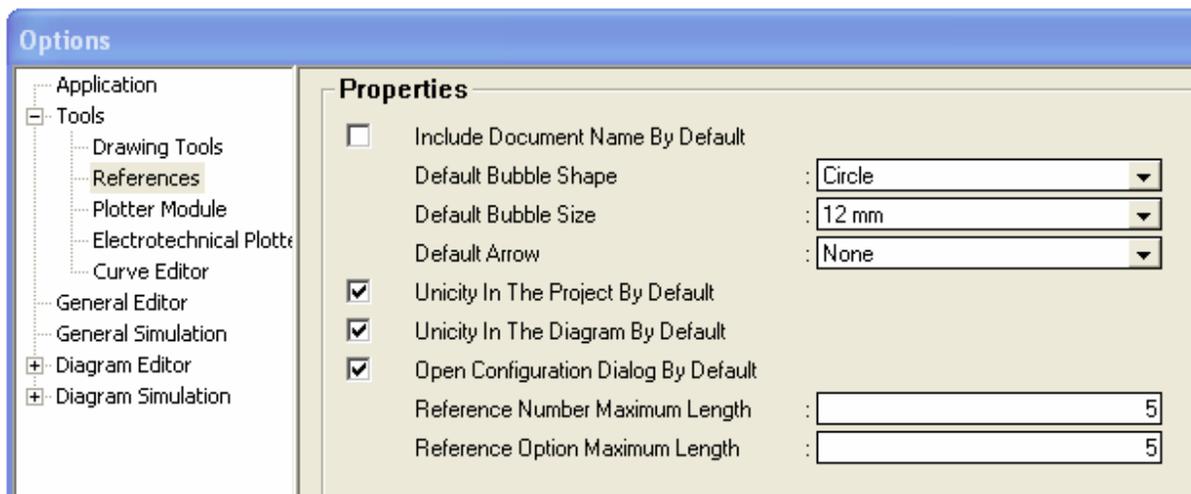*Figure 22: Document Properties Dialog Box à References*

Figure 23: Application Options à Tools à References

The reference components could be listed in a Bill of material. Hyperlinks allow visualising quickly any component on the diagram.
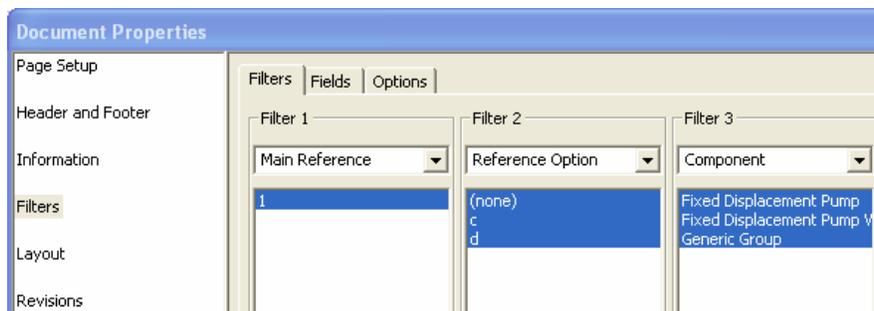

Figure 24: Report Configuration à Reference Filters

2.1.1.6   Video Capture

It is hereafter possible to register and share as AVI format files all the actions accomplished by the user in project

editing or simulation mode, as well as in diagram simulation mode. Now it becomes easy to visually illustrate the technical explanations concerning your project, and to share your knowledge of Automation Studio™ use.

Figure 25: Video Capture Tool Bar

	Command	Description
	Record	Starts the recording of a video.
	Synchronised Record	Configures the recording of a video to synchronise with the beginning and the end of the simulation.
	Pause	Allows pausing during the two record modes.
	Stop	Interrupts a recording and offers to save the created AVI file.
	Configuration	Allows configuring the different video recording elements: compression rate, image number per second, visualisation of the mouse cursor.

2.1.2 Improvements

2.1.2.1 Report and Bill of material

All Reports and Bills of material in Automation Studio™ have been standardized.

The available Report options have been enhanced. It is now possible to make a report by circuit or installation number. New filter and sorting options have been added. A Bill of Material inserted on a diagram may contain items from any other current document or project. New reference filters have been added.
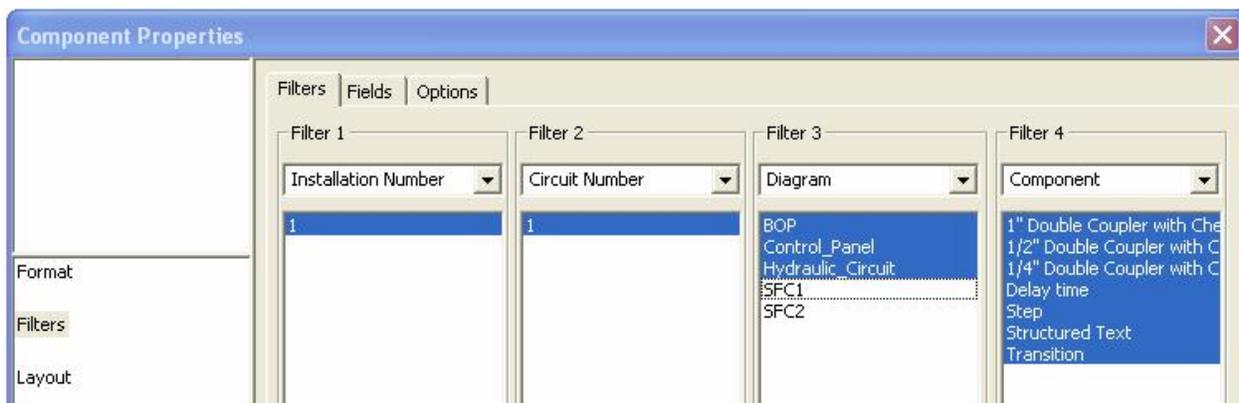
Figure 26 : Report or Bill of Material Dialog Box

2.1.2.2   HMI and Control Panels

The HMI Library has new functionalities related to the continuous movement of objects. As a result, you could represent rotation, translation and continuous outflow of fluids.
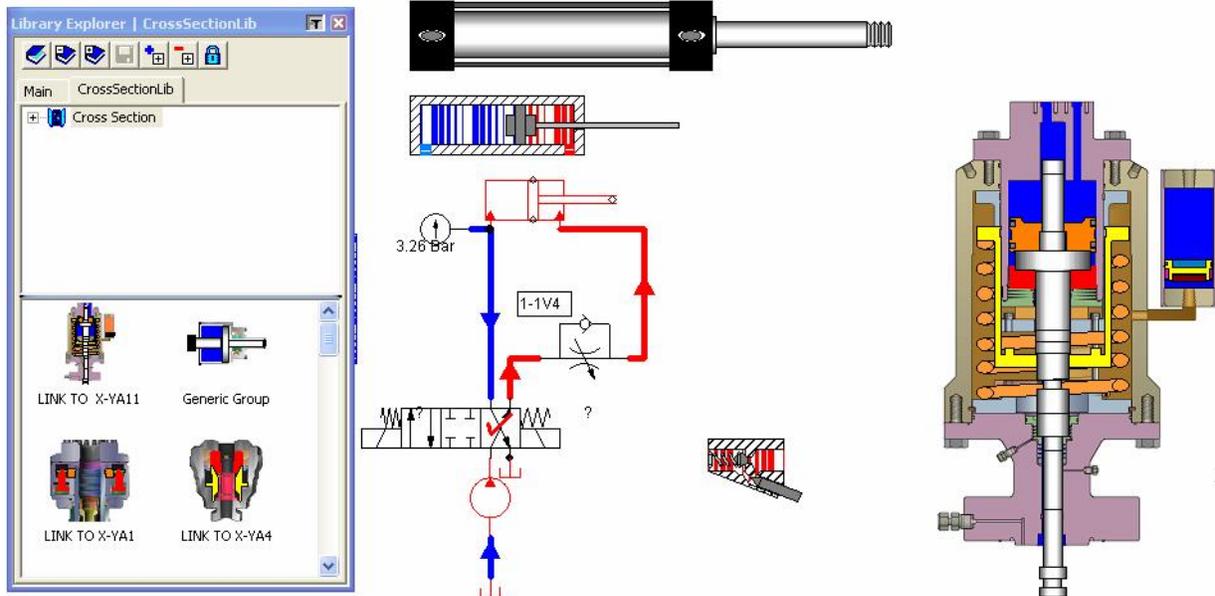

Figure 27: Library and Cross Section views synchronized with a component

2.1.2.3   Text

The object 'Text', which can be inserted in a diagram, receives all the attributes enriching and accelerating its formatting (Size, Alignment, and Frame)

Figure 28: "Text" Tool Bar

2.1.2.4   Automatic Sheet Move

When you have to complete an action reaching beyond the visible zone of the screen (power line layout, object drawing, object expansion by its selection handles, etc.), the view is automatically shifted in the proper direction

2.1.2.5   Link Intersection Position Change

An intersection of pressure, electric or any other kind of line, can now be moved from one position to another, without having to redesign the line itself.
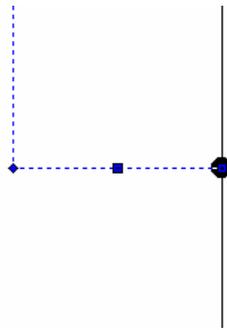
Figure 29: Line selection and intersection shift

2.1.2.6   Selection of a small component

Manipulation of components becomes difficult on diagrams composed by many symbols, especially when they are zoomed on a big scale (pulling of the symbol rather than moving it). In order to solve this problem, the selection of small components is made easier.

2.1.2.7   Plotter

It is possible to select and export selection of variables in the same file, by keeping CTRL button pressed. You could also delete the selection this way.
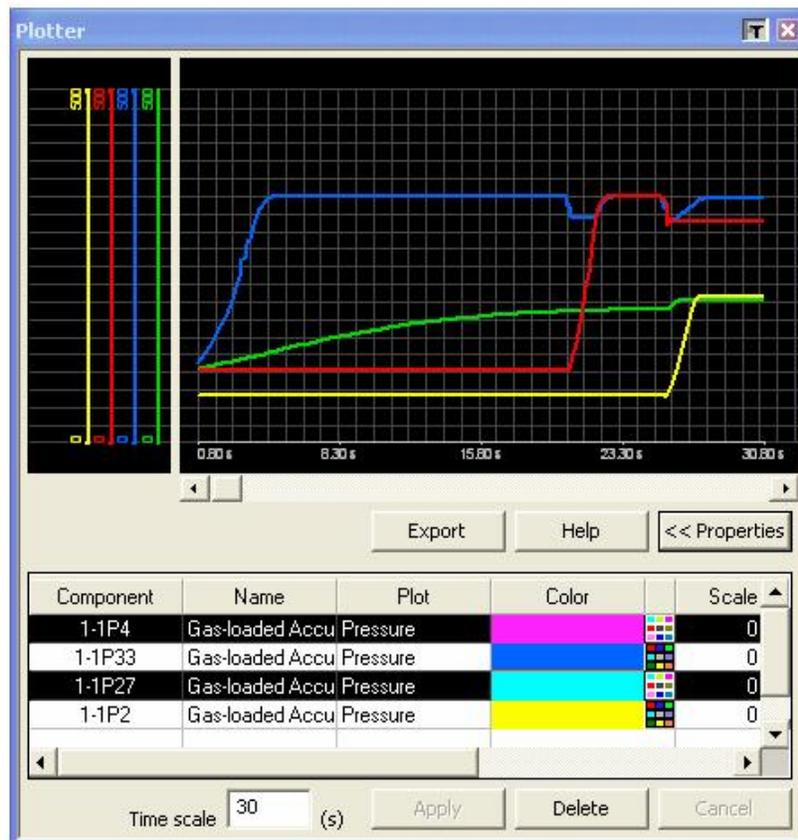

Figure 30: Variables Multi-selection in the Plotter

2.1.2.8   Free Connectors

The fluid simulator cannot be launched if all the component ports are not connected. In order to quickly identify these connectors, the message window shows the number of the free ports causing errors in the simulator. In the new version, a list of all concerned components in the project appears in the message window. A double click on the appropriate line launches the display of the component in the diagram.
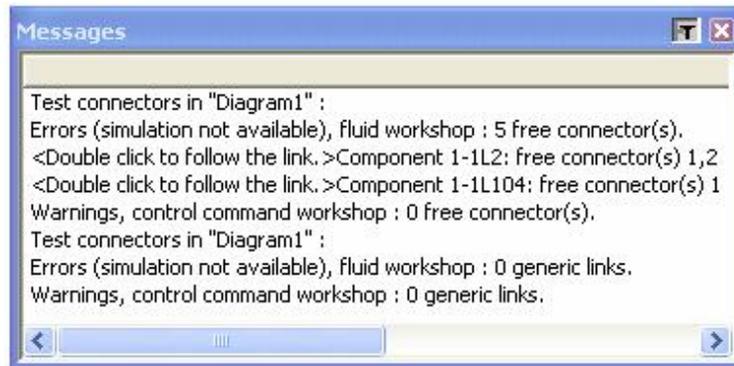

Figure 31: Messages window

2.2   Fluid Simulator

2.2.1   Customized Reservoir

The customized reservoir allows fluid transfers by gravity, through one of its connectors towards another reservoir situated in a lower position. A fluid can be transferred from a lower to a higher place by a driving force higher than the hydrostatic pressure. A customized reservoir can be configured from the branch "Builder". It is possible to choose the number of ports, their nature, their position on the ribs of the reservoir, their respective height, as well the value of input and output debit coefficient for each of them. Pressure, temperature and level sensors could also be incorporated.

Adding the new reservoir, with its connectors and sensors situated at different levels, as well as the newly developed conduct model, makes it possible to better illustrate the notions of emptying between reservoirs, and it is easier than using the tank.
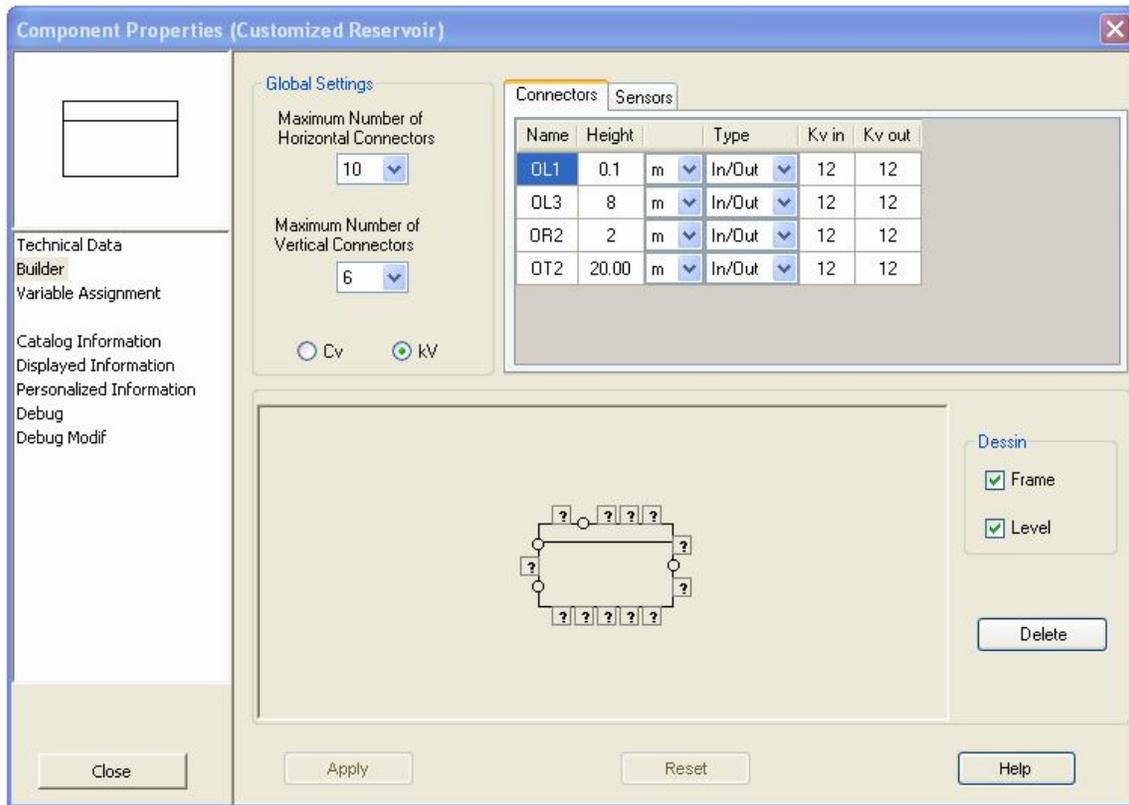
Figure 32: Customized Reservoir Builder Dialog

Zone or elements	Description
Maximum number of horizontal connectors	Sum of the inferior and superior connectors.
Maximum number of vertical connectors	Sum of the left and right connectors
Connector Tab	Allows identifying the used connectors, assigning them height, type, opening, input and output no-return valve, as well as a debit coefficient Kv, according to the flow.
Frame	Allows displaying or not the border of the reservoir.
Level	Allows displaying or not the fluid level (this line is not animated in simulation).
Delete	Allows deleting a chosen connector.

Figure 33: Reservoir Customizing Dialog Box – Reservoir Tab

2.2.2 Pressure Line Model

The pressure line simulation model is enhanced by two new behaviours.

(1) Flexible pressure lines (hydraulic and pneumatic): the pressure acts upon the real volume of the pressure line. The law adopted for the line behaviour is the law for flexible conducts.

(2) Hydrostatic pressure line (hydraulic): in versions 5.4 and older, the elevation was used to simulate the weight effect of an oil column, but only when the fluid was in movement. In the new version, the hydrostatic pressure is actually calculated. However, the mathematical model used in this case, requires more calculation time, compared to a normal pressure line. This means that the hydrostatic pressure should not be used for lines with substantial vertical differences.

Figure 34: Component Properties Pressure Line Technical Data

2.2.3 Gearbox

The gearbox is a toothed wheel transmitting mechanical force from a power outlet (electrical or combustion motor) to one or more receptors, such as hydraulic pump or compressor. This component is used to distribute mechanical power from an angular speed and a train device to other mechanisms. The ratio of the box determines the variation between the entry and the exit speeds and couple strengths. This mechanical behaviour is such that the input power is equal to the sum of the output powers, balanced by the mechanical rendering of each gear.
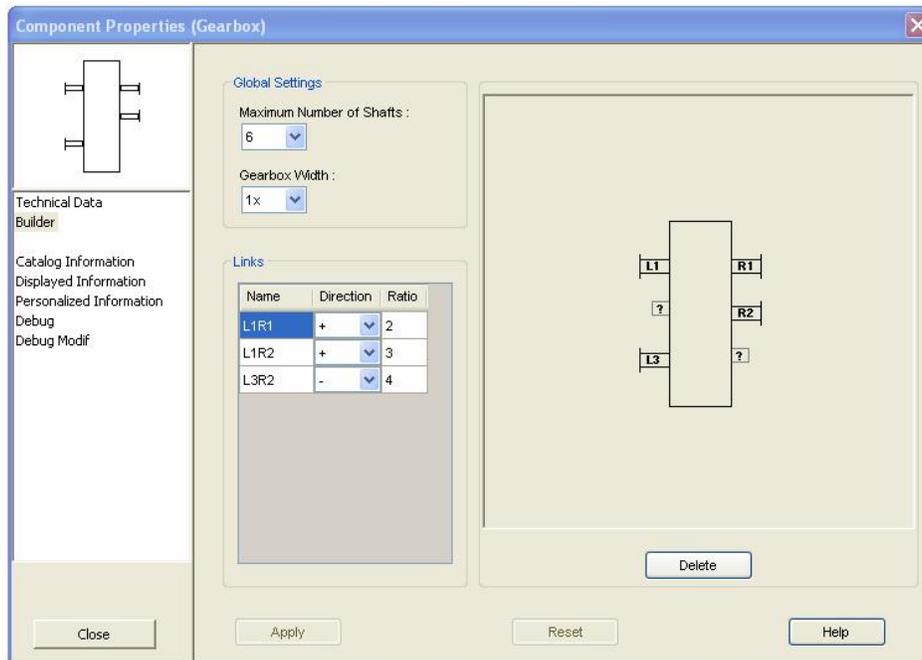

Figure 35: Component Properties Dialog Box – Gear Box

Zone or elements	Description
Maximum number of shafts	This is the number of external exit shafts; the interior gear box details are not mentioned.
Gear box width	Defines the width of the symbol on the diagram.
Links table	Allows defining the driving ratio between different output shafts. The ratio is named using the names of the two related shafts.
Delete	Allows deleting the shafts selected

2.2.4 Hydro Mechanical Coupling

In version 5.4 and earlier, only kinematics data transmissions between actuators and receptors were simulated. This was calculated without power loss. In the new version, the simulation calculates the transfer of mechanical power

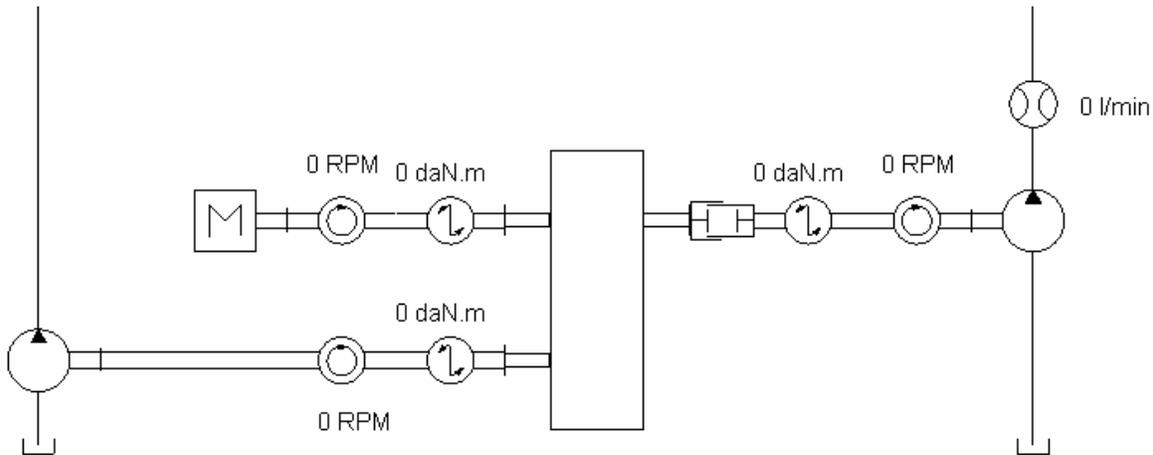through the transmission mechanisms, like gear boxes, shafts, and clutches.

Figure 36: Transfer of mechanical power

2.2.5 Other components

2.2.5.1   New custom pumps

Manufacturers	Models
Bosch-Rexroth	A4VO…LR
	A4VO…SR
	A4VO…LA
Kawasaki	K3VG

2.3   Electrotechnical Editor

2.3.1 Upgrades

• Diagnosis of a document selection;

• Diagnosis detecting non-registered components in a catalogue;

• The identification format of a component could be customized;

• Rapports on the automat modules, ducts and rails;

• Global numbering, not per group, of relay contacts and interrupters;

• Contextual menu for a multiple wire selection, in order to allow changing their type.