



AUTOMATION STUDIO

ALOITUSOPAS / STARTING GUIDE



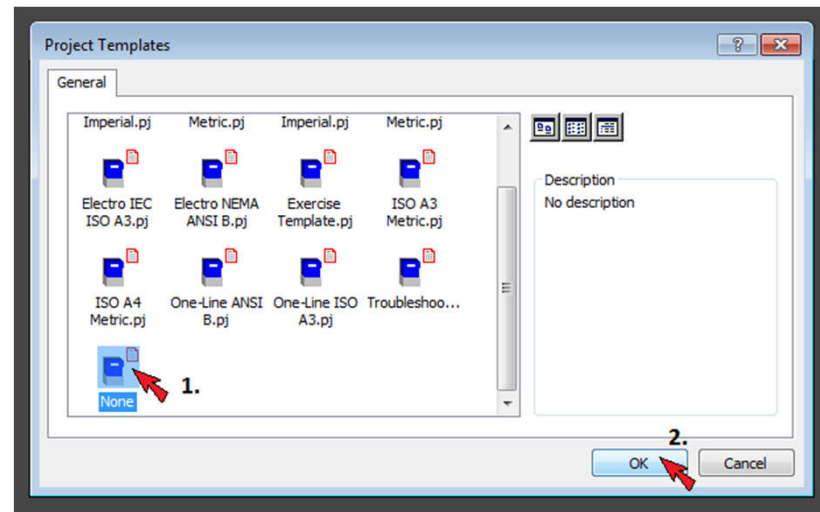
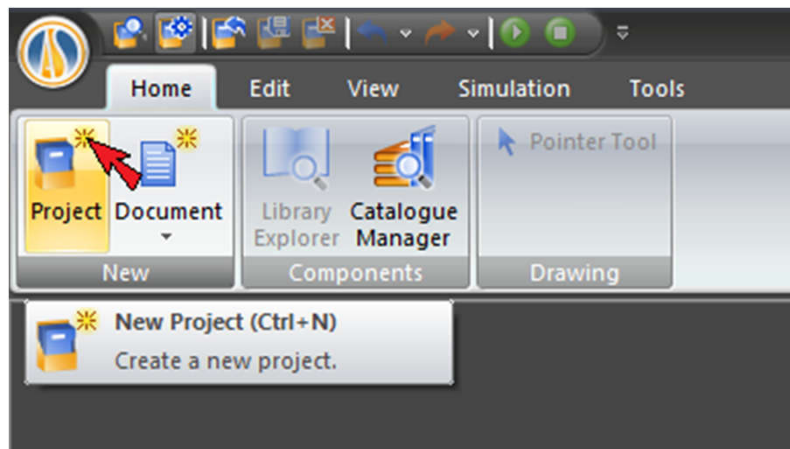
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3 NEW PROJECT

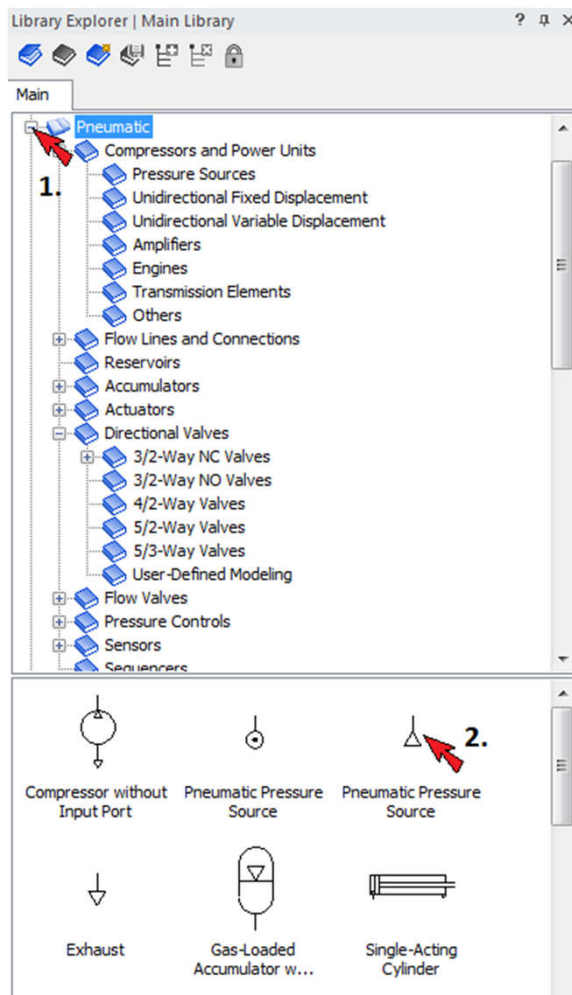
- First click Project to start New project.



Project Templates:

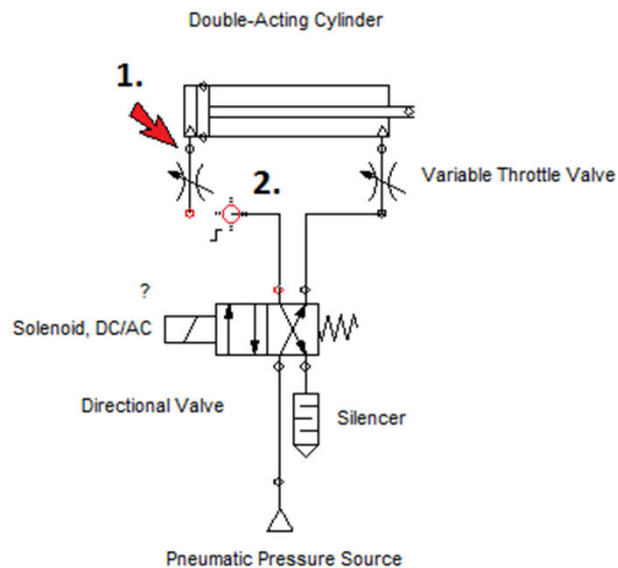
- 1. Choose [None]
- 2. Click OK.

4 COMPONENT LIBRARY



- 1. There is a component library tree view on the left which contains many different component types.
- 2. Top of the desired component, press mouse left and drag it into the project window.

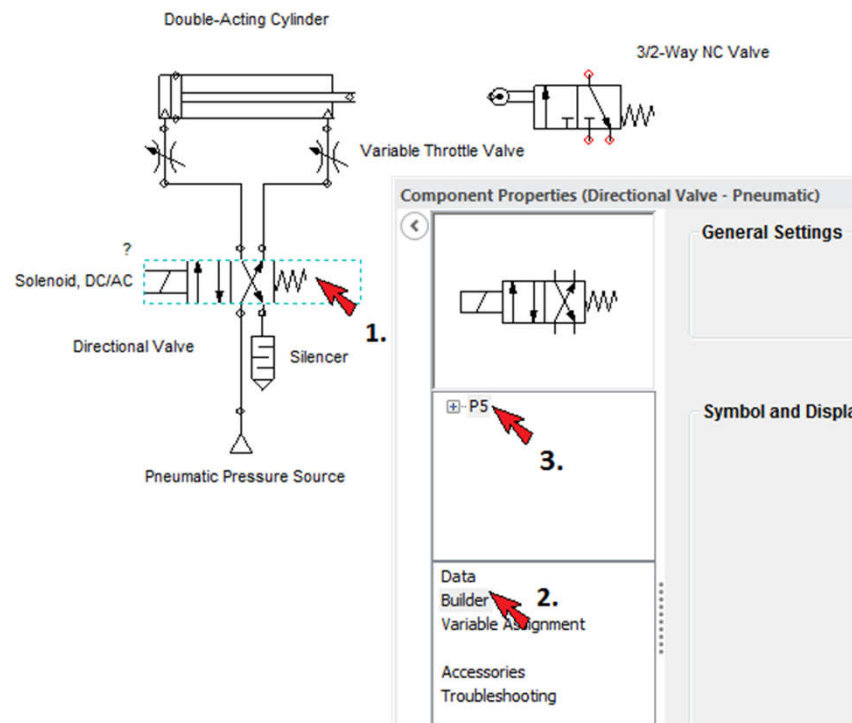
5 WIRING



How to connect component ports or -wires together, there are two options

- 1. Drag the component near another component-, and match little red balloons together, so they will connect automatically.
- 2. Press the left button of the mouse on the little balloon and draw the line where you want to connect it.
- If there is wiring already and there is a need to add a component in the middle of it, drag the component to the wire while pressing the SHIFT key.

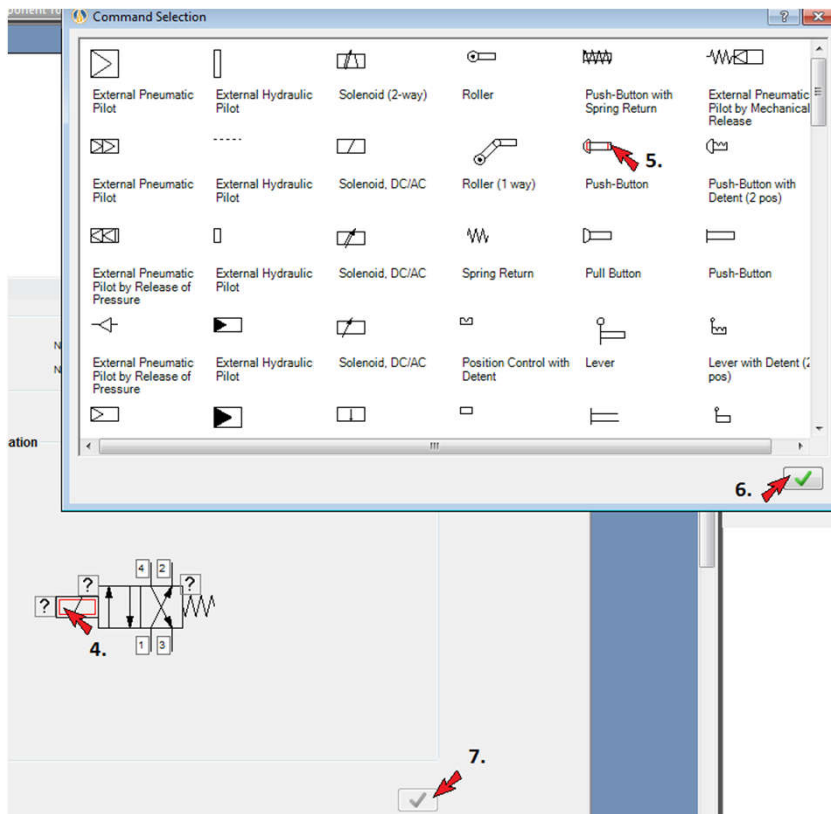
6 COMPONENT BUILDER 1



Changing component structure

- 1. First doubleclick the component.
- This opens the properties windows.
- 2. Find Builder tab and click.
- 3. To see what has been connected to a valve, open a tree view [P5]
- Remember that [P5 top tree view] has to be selected to modify the component in Builder tab.

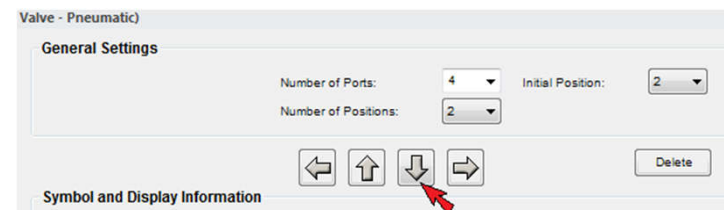
7 COMPONENT BUILDER 2



- Part position could be modified by clicking the arrows

Now there is a construction picture of a valve, for example.

- 4. Double click either the question mark or, what Command will control that valve, to change it.
- 5. Now you can choose the variety of parts to modify the valves control method.
- There can be many different control methods in a valve at the same time.
- When the parts have been selected, remember to "save" 6. and finally 7.



8 COMPONENT DATA

Double-Acting Cylinder

3/2-Way NC Valve

Variable Throttle Valve

Component Properties (Double-Acting Cylinder - Pneumatic)

Component image(s)

Technical - Modeling

Damping Coefficient	<input type="checkbox"/>	0,01	daNs/cm	<input type="checkbox"/>	<input type="checkbox"/>
Extension	<input checked="" type="checkbox"/>	70		<input type="checkbox"/>	<input type="checkbox"/>
Inclination	<input type="checkbox"/>	0	deg	<input type="checkbox"/>	<input type="checkbox"/>
Internal Leak	<input type="checkbox"/>	0	cm ³ /s/r	<input type="checkbox"/>	<input type="checkbox"/>
Material Density	<input type="checkbox"/>	7700	kg/m ³	<input type="checkbox"/>	<input type="checkbox"/>
Mobile Mass	<input type="checkbox"/>	1,7	kg	<input type="checkbox"/>	<input type="checkbox"/>
Orifice Model	<input type="checkbox"/>	Non configurable		<input type="checkbox"/>	<input type="checkbox"/>
Piston Thickness	<input type="checkbox"/>	50	mm	<input type="checkbox"/>	<input type="checkbox"/>

Technical - Characteristic

Extended Residual Volume	<input type="checkbox"/>	5	cm ³	<input type="checkbox"/>	<input type="checkbox"/>
Piston Diameter (D)	<input type="checkbox"/>	50	mm	<input type="checkbox"/>	<input type="checkbox"/>
Piston Side Area (Ap)	<input checked="" type="checkbox"/>	19,6349	cm ²	<input type="checkbox"/>	<input type="checkbox"/>
Piston Side Volume	<input checked="" type="checkbox"/>	490,8734	cm ³	<input type="checkbox"/>	<input type="checkbox"/>
Retracted Residual Volume	<input type="checkbox"/>	5	cm ³	<input type="checkbox"/>	<input type="checkbox"/>
Rod Diameter (d)	<input type="checkbox"/>	25	mm	<input type="checkbox"/>	<input type="checkbox"/>
Rod Side Area (Ar)	<input checked="" type="checkbox"/>	14,7262	cm ²	<input type="checkbox"/>	<input type="checkbox"/>
Rod Side Volume	<input checked="" type="checkbox"/>	368,1551	cm ³	<input type="checkbox"/>	<input type="checkbox"/>
Stroke (L)	<input type="checkbox"/>	250	mm	<input type="checkbox"/>	<input type="checkbox"/>

Technical - External Data

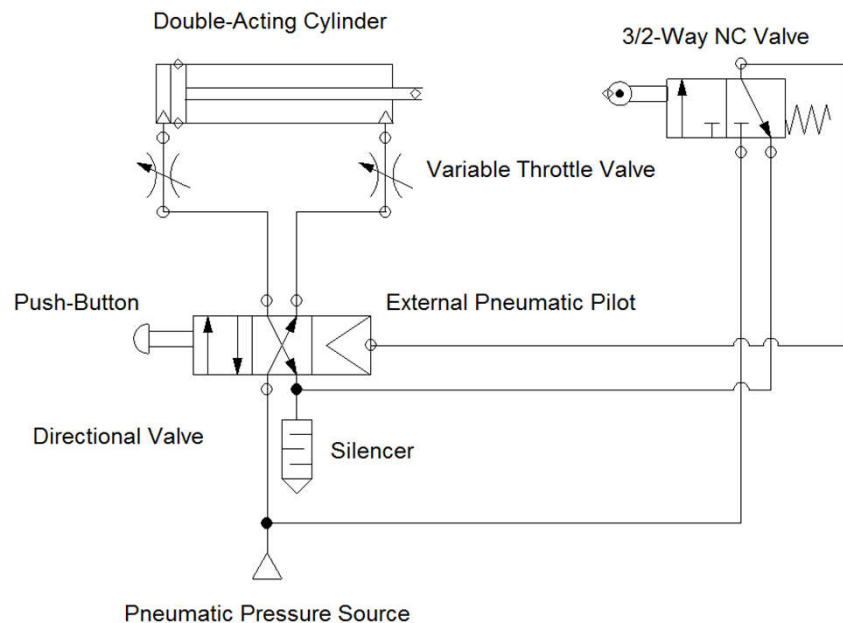
Area Sensor (%)	<input type="checkbox"/>	10		<input type="checkbox"/>	<input type="checkbox"/>
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Data
Force Curves 2.
Builder
Variable Assignment
Accessories
Troubleshooting

How to trigger sensors or some components?

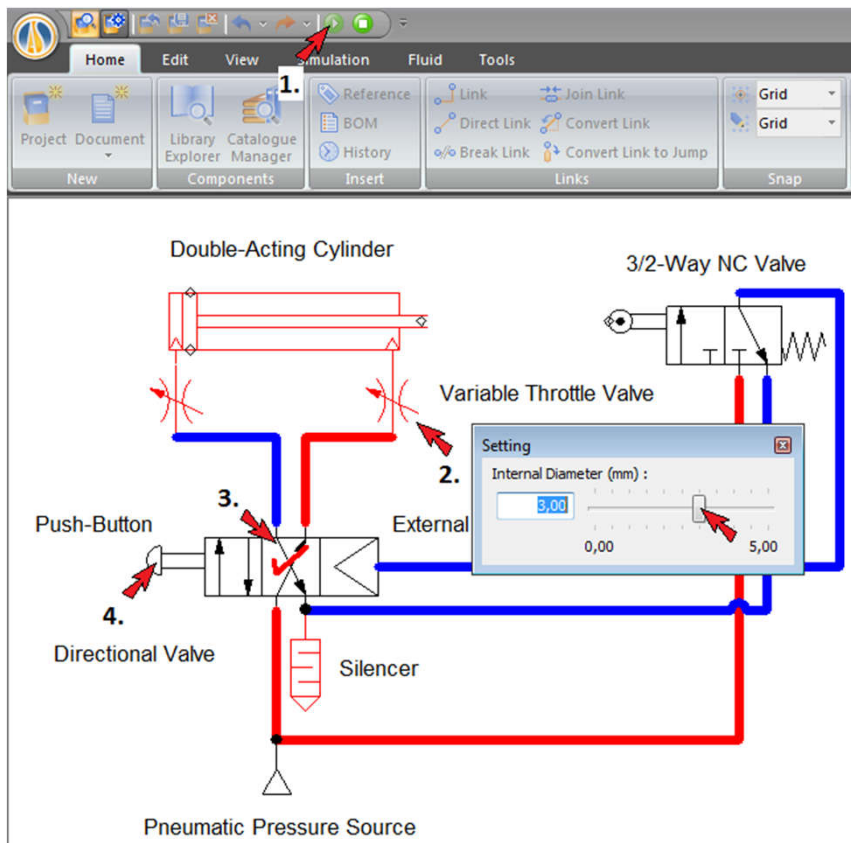
- 1. Double click the component.
- 2. Choose Data from the tree view.
- 3. There is a possibility to change the variety of things in the data tab.
- 3. The program will sense the movement of a piston, for example, when the little diamond (end of the piston rod) touches, in this case, the valve's diamond.
- 4. Press the Extension and input the number 100 there-, to see how far the piston rod goes-. Then move the valve so that the diamonds are one on the other.
- When a sensor or a valve has been moved in the right place, remember to change the Extension value back where it was!!

9 TEST PROJECT



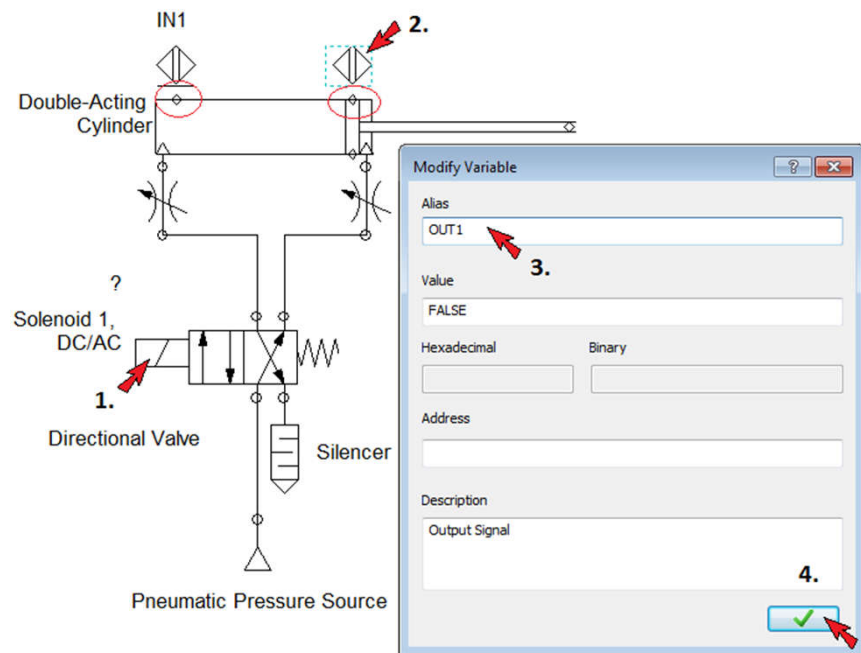
- Run a test project like this.
- If the push-button is pressed the cylinder goes out.
- When the piston is fully extended, the 3/2-way valve triggers and makes the directional valve go back to the original position.
- This makes the cylinder go back to the unextended position.

10 SIMULATION MODE



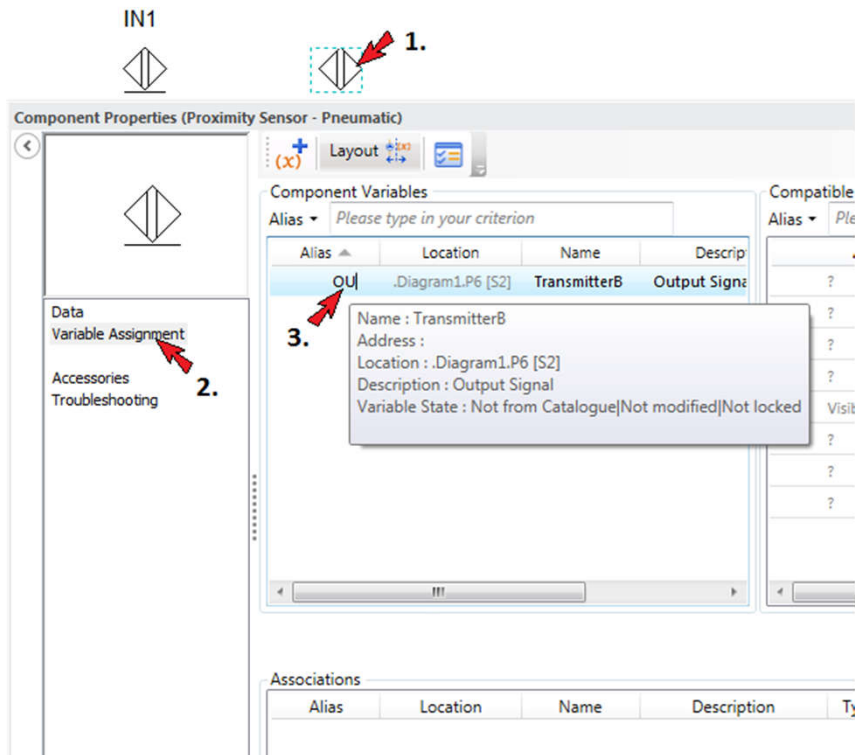
- 1. Click the "play" button to activate the simulation mode.
- 2. Click the Variable Throttle Valve to change the internal diameter of the valve and affect the movement speed of the cylinder.
- 3. To lock the valve in its position, click the position that needs to be locked.
- 4. Unlock by clicking either side of the valve.

11 COMPONENT VARIABLES 1



- 1. Now change the project that the Directional Valve is solenoid controlled with spring on other side.
- 2. Add some proximity sensors to the cylinder.
- Remember the "trigger diamonds".
- 3. Name the sensors IN1 and OUT1.
- 4. Save.

12 COMPONENT VARIABLES 2



- Components could be named afterwards too.
- 1. Double-click the component, to get properties.
- 2. Select Variable Assignment.
- 3. Click below the Alias tab, write the name and press enter.

13 COMPONENT VARIABLES 3

The screenshot displays an electrical control software interface. On the left, a circuit diagram is shown with a 24V AC source, a 0V DC source, a push-button (PB1), a normally open contact (marked with a question mark), a solenoid coil (COIL1), and a solenoid (SOL1). A red arrow labeled '1.' points to the 'Electrical Control (IEC Standard)' library. Another red arrow labeled '2.' points to the normally open contact in the circuit. A third red arrow labeled '3.' points to the 'Data Variable Assignment' field in the 'Component Properties' window. A fourth red arrow labeled '4.' points to the 'COIL1' entry in the 'Compatible simulation variables' table.

Component Properties (Normally Open Contact - Electrical Control (IEC Standard))

Component Variables

Alias	Location	Name	Description
?	>Diagram1.E9 [NO1]	ReceiverB	Input Signal

Compatible simulation variables

Alias	Name	Description
PB1	TransmitterB	Output Signal
COIL1	TransmitterB	Output Signal
Reset	TransmitterB	Output Signal
IN1	TransmitterB	Output Signal
SOL1	TransmitterB	Output Signal
OUT1	TransmitterB	Output Signal
State	State	
State	State	
State	State	
State	State	

Associations

Alias	Location	Name	Description	Type	Access	Alias	Name
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- 1. In Electrical Control, there are two choices. Use IEC Standard parts from library.
- Now draw an electric circuit to control the solenoid.
- When inserting the components, name them simply: Push-Button = PB1
- 2. Lastly insert normally open contact (double-click it to get properties).
- 3. Choose the variable Assignment.
- 4. Now choose the COIL1 in the "Compatible simulation variables" window, double-click it.

14 COMPONENT VARIABLES 4

The screenshot displays an electrical control circuit and its associated software interface. On the left, a circuit diagram shows a 24V AC source connected to a normally open contact labeled 'COIL1'. This contact is in series with a 0V source and a solenoid labeled 'SOL1'. A push button 'PB1' is also connected to the circuit. Red arrows labeled '7.' point to the 'COIL1' text in the diagram. The 'Component Properties' window for 'Normally Open Contact - Electrical Control (IEC Standard)' is open. It features a 'Component Variables' table and an 'Associations' table. Red arrows labeled '5.' point to the 'COIL1' entry in both tables. A red arrow labeled '6.' points to the 'Delete link' option in a context menu over the 'COIL1' entry in the 'Associations' table.

Alias	Location	Name	Description
COIL1	Diagram1.E9 [KA1]	ReceiverB	Input Signal

Alias	Location	Name	Description	Type	Access	Alias
COIL1	iaoram1.E9 [KA1]	ReceiverB	Input Signal	BOOL		COIL1

- 5. See that COIL1 is connected to the component on Associations.
- 6. If a wrong choice has been made, just right-click the variable and choose the Delete link.
- 7. If the color of the COIL1 text has been changed, it means, it is linked to the component.
- Test simulation to see if the circuit is working.

15 COMPONENT VARIABLES 5

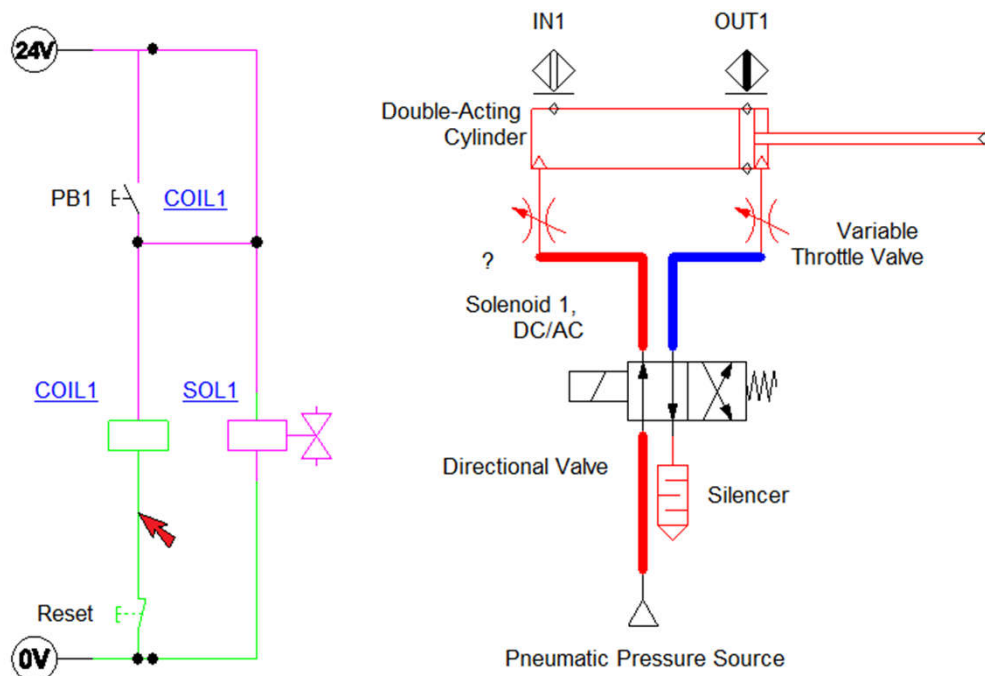
The screenshot shows a software interface for configuring a pneumatic circuit. On the left, a circuit diagram includes a Double-Acting Cylinder, Solenoid 1 (DC/AC), and a Directional Valve. A red arrow labeled '1.' points to the solenoid. The main window is 'Component Properties (Directional Valve - Pneumatic)'. It has a 'Component Variables' table with columns for Alias, Location, Name, and Description. Two entries are shown: 'ReceiverB' (Input Signal) and 'ReceiverI' (Input Signal). A red arrow labeled '2.' points to 'ReceiverI'. Below this is a small circuit diagram with a red box around a component labeled 'SOL1' and a red arrow labeled '5.' pointing to it. To the right is a 'Compatible simulation variables' table with columns for Alias, Name, and Description. A red box highlights the search field, and a red arrow labeled '3.' points to the 'SOL1' entry. At the bottom, an 'Associations' table has columns for Alias, Location, Name, Description, Type, Access, and Alias. A red arrow labeled '4.' points to the 'Location' column. The 'Data Builder' section shows 'Variable Assignment' and 'Accessories'.

- Search the variables by typing the variable name in the search field.

Next link the Directional Valve Solenoid1 to the circuit.

- 1. Double-click the valve.
- 2. Go to the Variable Assignment and choose ReceiverB.
- 3. Choose SOL1 from the list.
- 4. Check that the SOL1 is in the Associations.
- 5. And in the circuit, color of the SOL1 has changed.
- Exit from Properties.

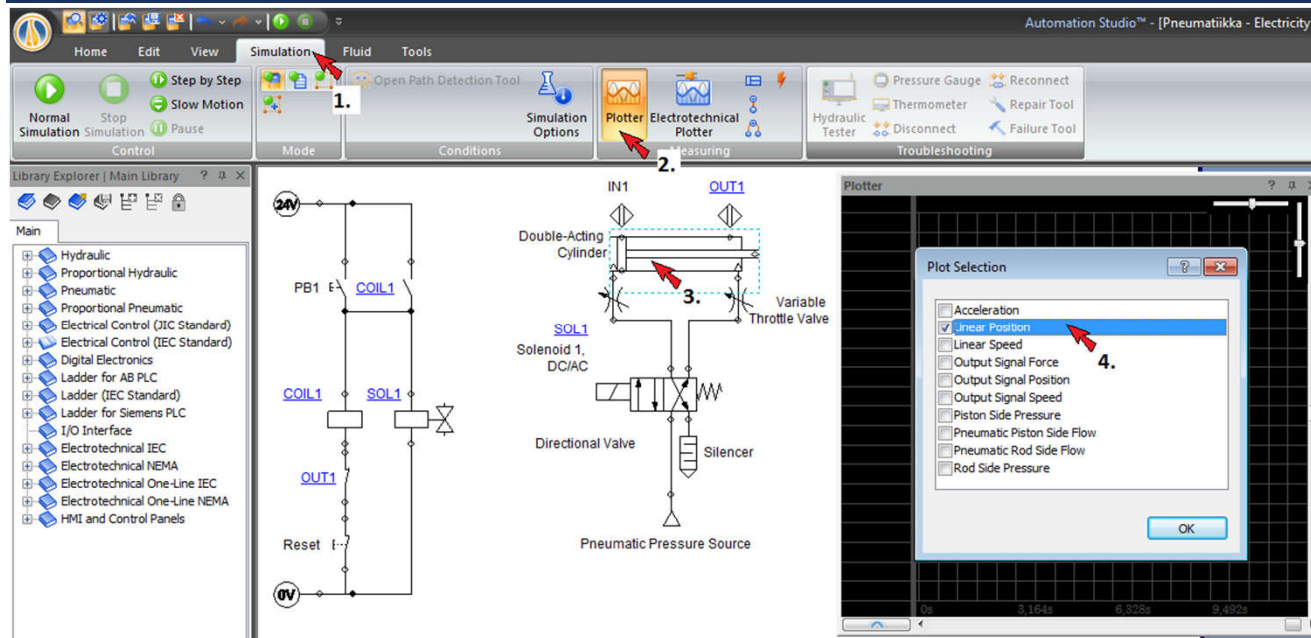
16 COMPONENT VARIABLES 6



- Note the colors of electrical wiring in simulation mode.

- Start the simulation.
- Movement should work by pressing the PB1 button.
- And resets in the Reset button.
- Try to add a normally closed contact below COIL1 and link it to the proximity sensor OUT1.
- Test the simulation again.

17 PLOTTER 1

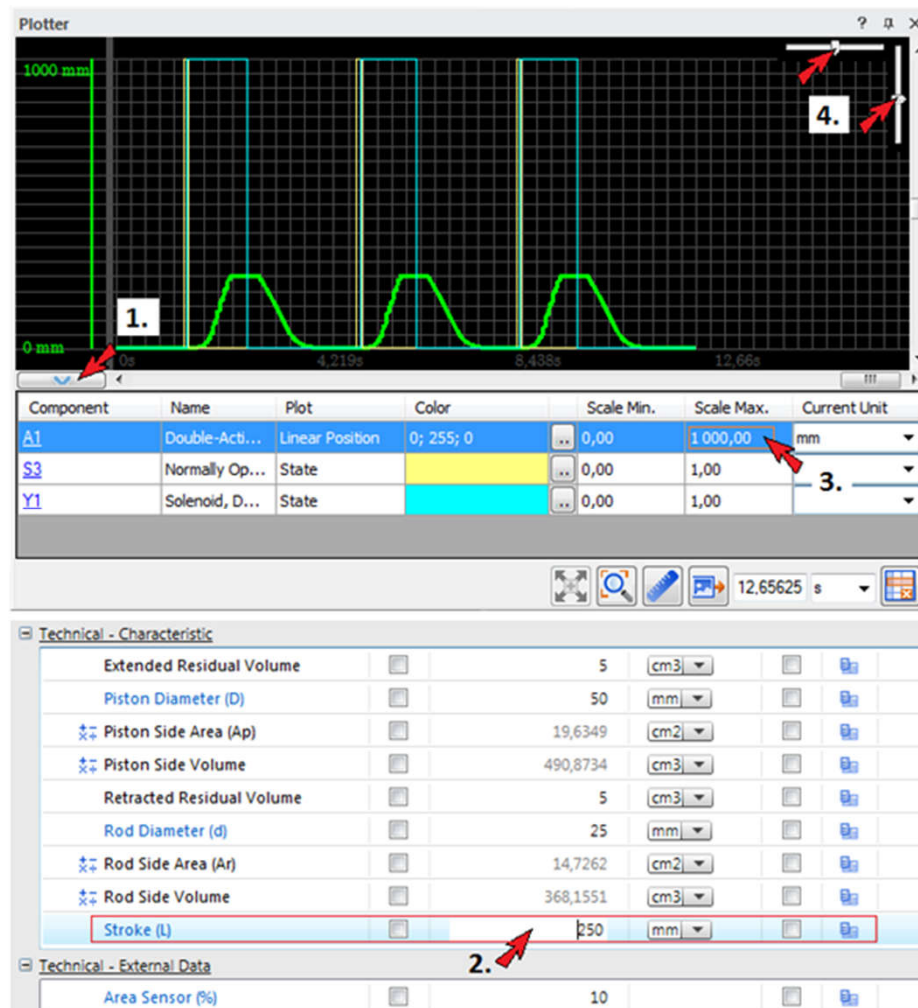


- 1. Click the Simulation tab.
- 2. Click a Plotter.
- 3. Choose the component to plot and drag it into Plotter window.

- The program has a plotter for drawing charts of the component's variables, such as movement.

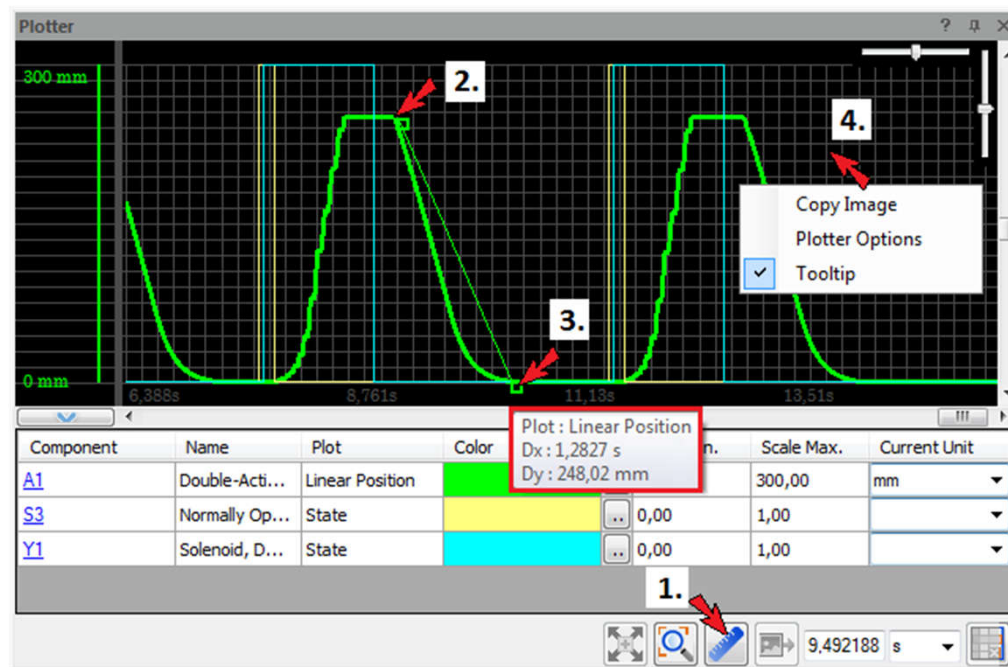
- 4. Choose what to print out from Plot Selection window.
- Click OK.
- Drag the Push-Button 1 and the SOL1 to a Plotter window.

18 PLOTTER 2



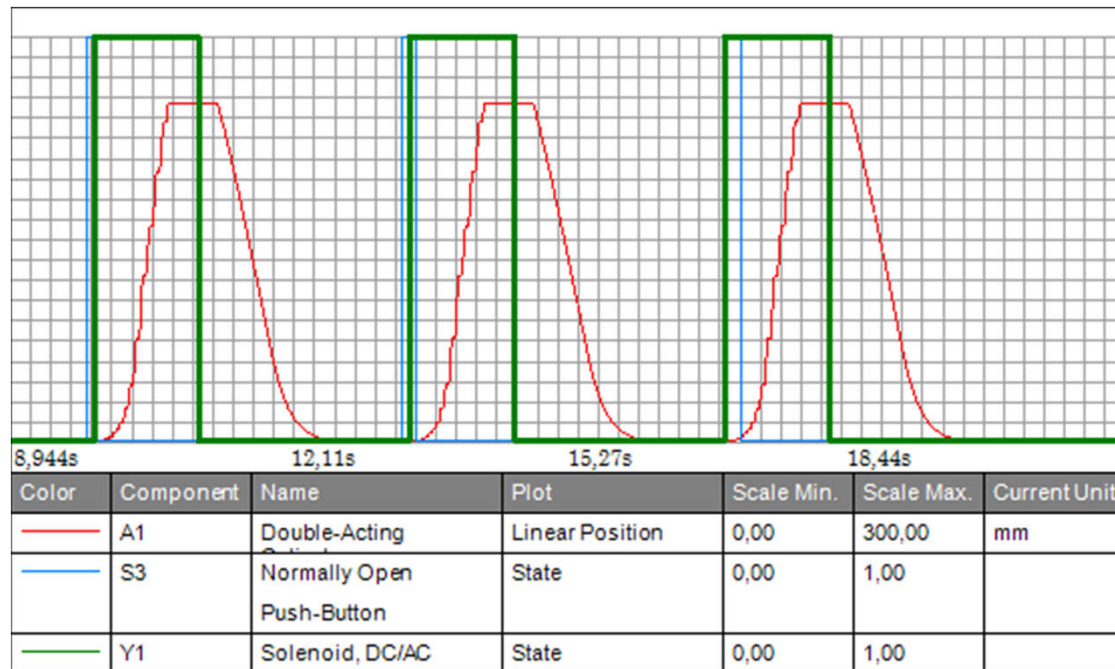
- 1. Press "arrow" to see the Plotted variables.
- Adjust the plotter scale of one variable, for example a cylinder's linear position.
- 2. Open the cylinder properties, go to the data and check, in this case, the cylinder Stroke.
- 3. See that the plotter scale is 1000mm where Stroke is 250mm, correct this by entering the plotter Scale Max. at 300mm.
- 4. The visual scale of the plotter could be adjusted by sliders.
- Close the cylinder Properties window and test the simulation.

19 PLOTTER 3



- 1. Measure the chart by using a ruler tool.
- 2. Click on the first point.
- 3. Then click on the second point.
- 4. This will open a grey box where the measured data is.
- 4. To save the plotted chart, right-click the mouse above the plotter and choose the Copy image. Now the plotted image can be saved.
- In the Plotter Options it is possible to adjust the background color and the grid color, for example.

20 PLOTTER 4



- Example of saved plotter view.
- Program saves pictures as .BMP – file.
- The colors have been changed to get a clearer view.
- The Y-axle shows the millimeters.
- The X-axle shows the time in seconds.