

Forcing

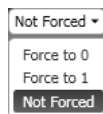
How to Force an Object

Objects can only be forced from an animation so the first step is to create an animation table which contains the object(s) to be forced. The animation table can also contain other objects to be monitored to see the effect of the force.



Used	Address	Symbol	Value	Force	Comment
<input checked="" type="checkbox"/>	%I0.7	START	0	Not Forced ▾	Start button for conveyors
<input checked="" type="checkbox"/>	%I0.6	STOP	0	Not Forced	Stop button for conveyor
<input checked="" type="checkbox"/>	%Q0.2	C1_RUN	0	Not Forced	Conveyor 1 run signal
<input checked="" type="checkbox"/>	%Q0.3	C2_RUN	0	Not Forced	Conveyor 2 run signal

Click the force column of the animation table and a drop-down box will appear, giving the choices Force to 0, Force to 1 or Not Forced. Select either Force to 0 or Force to 1 depending on the desired state.



How to Remove Forces

The Not Forced option in the animation table can be used to remove the force for a single object. Click the Force column in the animation table and select **Not Forced** from the menu.

If the object is not in an animation table or there are multiple objects to be unforced, these must be added to an animation table in order to unforce them.

When looking at a section of program, forced items can be identified by the letter 'F' displayed underneath the coil or contact, in front of the True/False state.

Exercise - Forcing

Learning Outcomes

By the completion of this exercise you will:

- Force a value

1 If SoMachine Basic is not running, start it and open the Conveyor Control Application.

2 Create an animation table

- i. Create an animation table containing the following objects:

START_BUTTON

STOP_BUTTON

C1_RUN

C2_RUN

C3_RUN

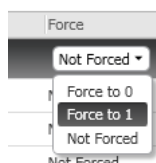
C2_FLT

3 Using Force to control the application.

- i. Click Not Forced in the Force column for the START_BUTTON symbol. This will select the object and allow it to be forced.

Used	Address	Symbol	Value	Force	Comment
<input checked="" type="checkbox"/>	%I0.7	START	0	Not Forced	Start button for conveyors
<input checked="" type="checkbox"/>	%I0.6	STOP	0	Not Forced	Stop button for conveyor
<input checked="" type="checkbox"/>	%Q0.2	C1_RUN	0	Not Forced	Conveyor 1 run signal
<input checked="" type="checkbox"/>	%Q0.3	C2_RUN	0	Not Forced	Conveyor 2 run signal

- ii. Drop down the selection box and select **Force to 1** from the menu.



The process will start and the outputs controlling the conveyors will turn on (%I0.2, %I0.3 and %I0.4).

Exercise - Forcing (cont.)

- iii. Drop down the selection box for the START_BUTTON object force and select **Not forced** from the menu.

The object will display the value 0 as the input is not on but the outputs will remain on as they have been latched by an internal contact.

- iv. Select the STOP_BUTTON object, drop down the selection box and select **Force to 1** from the menu.

The shutdown sequence will operate until all the outputs are off.

- v. Drop down the selection box and select **Not forced** from the menu.
-

4 Forcing an object on to test the output.

- i. Drop down the selection box for the C1_RUN object force and select **Force to 1** from the menu.

The output for conveyor 1 (%I0.2) will come on.

- ii. Drop down the selection box for the C2_RUN object force and select **Force to 1** from the menu.

The output for conveyor 2 (%I0.3) will come on.

- iii. Drop down the selection box for the C3_RUN object force and select **Force to 1** from the menu.

The output for conveyor 3 (%I0.4) will come on.



Note:

This process allows outputs field wiring and output devices to be tested without running the application.

5 Remove all forces from the program.

- i. For each item that is forced, drop down the force dialog box in the animation table and choose the **Not Forced** item from the menu.

Exercise - Forcing (cont.)

6 Forcing an object to a fixed state.

- i. Force the **START_BUTTON** object on to start the process. The outputs controlling the conveyors will turn on (%I0.2, %I0.3 and %I0.4).
- ii. Set the **START_BUTTON** object to **Not forced**.
- iii. Force the **C2_RUN** object to 1. There will be no visible difference on the front of the M221 as the output is already on.
- iv. Display the **Conv 2** rung in the Control **POU**.



Notice that the display shows the letter F in front of the value indicating that the output is forced.

- v. Select the **STOP_BUTTON** object and force it to 1.

As before, the stop sequence will operate but one output will remain on. This will be the forced output %Q0.3.

- vi. Start the process again in the same way, then force the **C3_FLT** object to 1.

This should stop the faulty conveyor (conveyor 3) and all conveyors feeding it. Note that the output for conveyor 2 stays on.



Note:

This shows how an object can be forced with no visible effect outside the programming software and leave equipment in a dangerous state unable to stop when required.

