Timers

Stop Control

Stop control will perform a controlled stop of the conveyors.

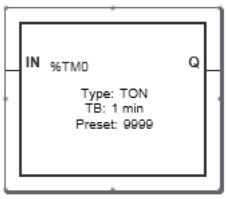
Timers will be used to ensure product has travelled down the conveyor before each is stopped. This approach ensures that the conveyor stops and no product is left on the conveyor.

Each conveyor will have a separate timer which will accommodate different conveyor lengths and speeds.

How to Create a Timer

Clicking the **Functions** button on the Ladder Editor menu will open a drop-down menu of special functions. The first of these is the Timer function.

Select the Timer object and when the cursor is moved over the ladder rung a timer will be displayed underneath it.



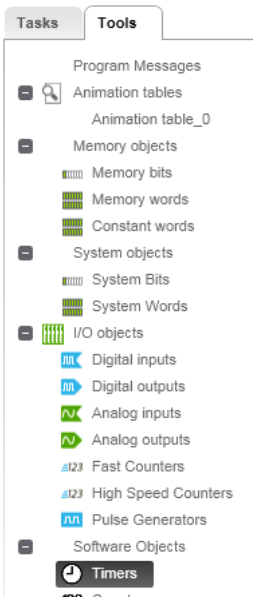
Place the timer at the desired location.

Timers (cont.)

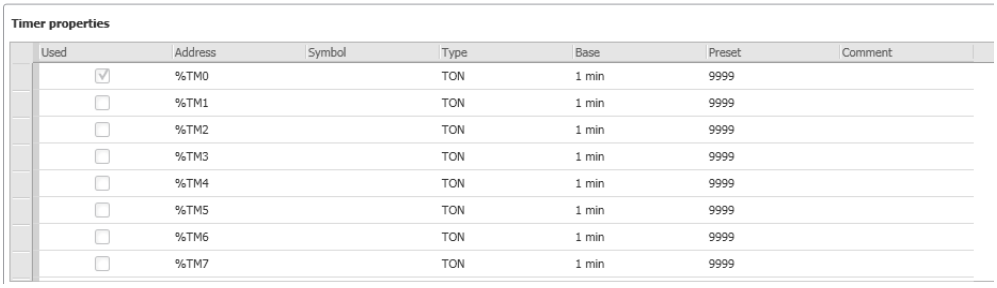
How to Configure Timer Parameters

Parameters must also be configured for the timer to set the type of timer and time value. This is done in the Timer Properties section.

Either double-click the timer function block in the ladder editor or go to the **Module Programming Tree,** select the **Tools** tab then under **Software Objects** select **Timers**.



The Timer Parameter configuration will be displayed at the bottom of the page.



Used	Address	Symbol	Type	Base	Preset	Comment
☑	%TM0		TON	1 min	9999	
☐	%TM1		TON	1 min	9999	
☐	%TM2		TON	1 min	9999	
☐	%TM3		TON	1 min	9999	
☐	%TM4		TON	1 min	9999	
☐	%TM5		TON	1 min	9999	
☐	%TM6		TON	1 min	9999	
☐	%TM7		TON	1 min	9999	

To change the type or base, double-click the column on the row containing the required timer. A drop-down box will appear allowing the type or timebase to be selected.

To change the symbol or preset, double-click the column on the row containing the required timer. A dialog box will open allowing the required information to be entered.

Exercise - Create the Stop Control Program

Learning Outcomes

By the completion of this exercise you will:

- Be able to create and configure timers in the program

1 Create the stop sequence ladder rung.

i. Add the following objects to the Stop Control rung:

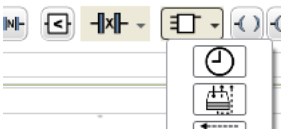
2 Create timer for the first conveyor.

i. In the Stop 1 ladder rung, place a normally open contact at the start of the rung. Click the Symbol text above the contact and enter `Stop`. A list of the previously entered symbols that contain "STOP" will appear.

ii. Select the "STOP_RELAY" symbol.

This is an alternative way of assigning an address to an object.

iii. In the functions menu bar, drop down the functions sub-menu and select the timer object.

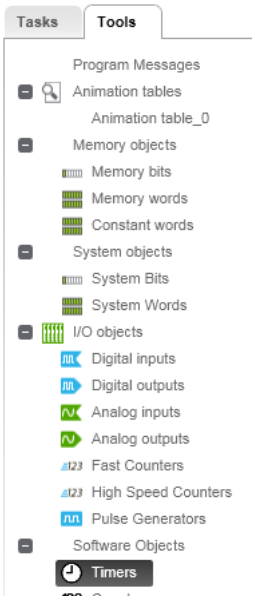


iv. Place the timer next to the contact

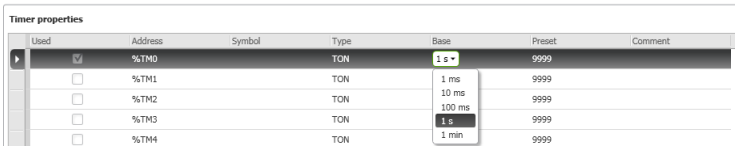
Exercise - Create the Stop Control Program (cont.)

3 Modify the parameters for the timer.

i. In the **Module Programming Tree**, select the **Tools** tab. Under **Software Objects**, select **Timers**.



ii. Double-click the **base** column on the row containing **%TM0**. A drop-down box will appear allowing the timebase to be selected. Choose the **1s** (1 second) timebase.



iii. Double-click the **Preset** column on the row containing **%TM0** and enter a preset value of `2`. This will set the timer to 2 seconds.

iv. Apply the changes.

4 Complete the rung.

i. Add a contact to the end of the rung and assign it to address **%M101**.

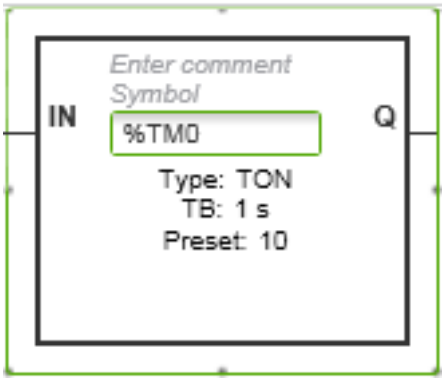
Exercise - Create the Stop Control Program (cont.)

5 Create the code to stop the other conveyors.

i. Copy the objects from the Stop 1 rung and paste them into the Stop 2 rung.

ii. Change the address of the coil to **%M102**.

iii. Double-click the timer address to change the timer number.



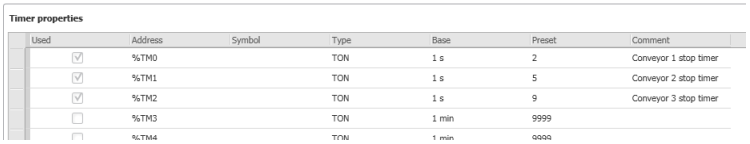
iv. Change the address of the timer to `%TM1`.

v. Paste the objects into the Stop 3 rung.

vi. Change the timer to **%TM3** and the output coil to address **%M103**.

6 Modify the parameters for the other timers.

i. Open the timer configuration and enter the following parameters for the timers.



ii. Accept the changes.

Exercise - Create the Stop Control Program (cont.)

7 Complete the stop control.

i. On the Conv 1 ladder rung add a normally closed contact and assign it to address **%M101**.

ii. On the Conv 1 ladder rung add a normally closed contact and assign it to address **%M102**.

iii. On the Conv 1 ladder rung add a normally closed contact and assign it to address **%M103**.

8 Save the application.

9 Download the application to the controller and test it.

i. When the start input, %I0.7, is operated. All the conveyor outputs will come on at the same time; %Q0.2, %Q0.3 and %Q0.4.

ii. When the Stop input is operated, the outputs will turn off in a timed sequence:

%Q0.2 will turn off after two seconds.

%Q0.3 will turn off after five seconds

%Q0.4 will turn off after nine seconds.

If the program does not work as expected, carefully check the programming for any mistakes, resolve them and try again.

Note:

If the program still does not work after checking, complete the rest of the exercises in this chapter. Diagnostic tools to help find programming problems are described in *Chapter 4 - Getting it all Working*.