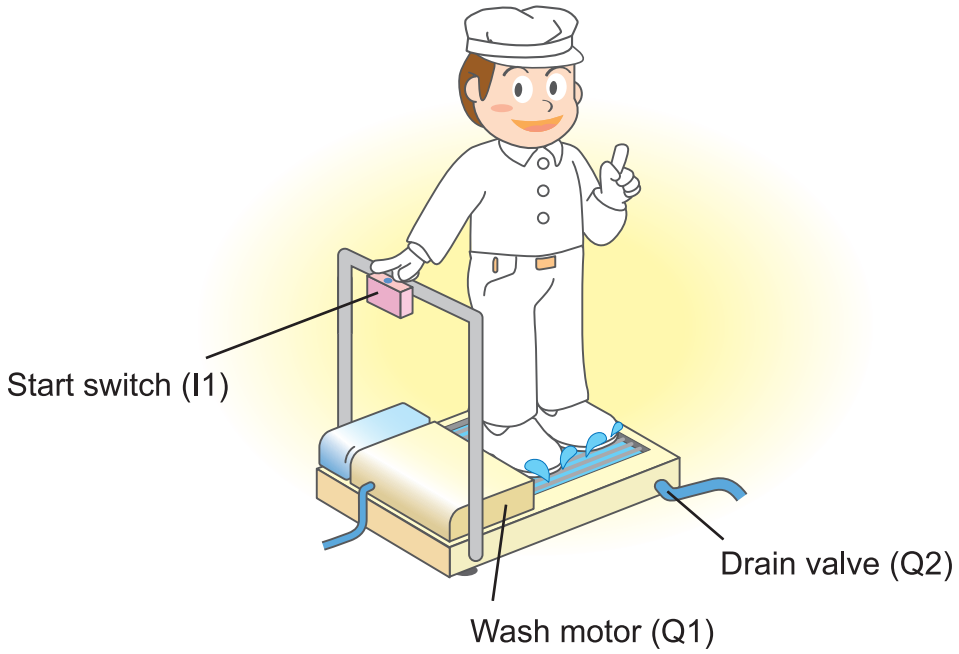
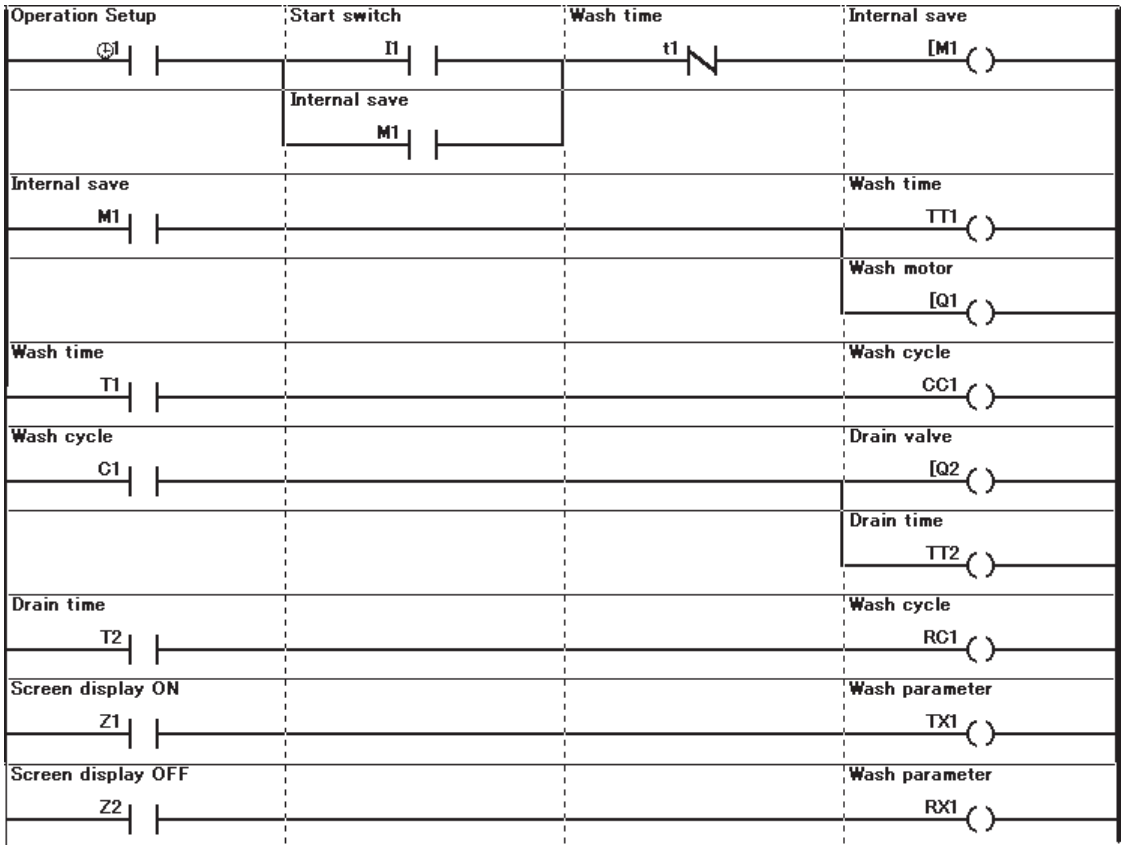
Program Example

Automatic Shoe Cleaner



■ Logic Program



■ Program Overview

The Automatic Shoe Cleaner performs the following four functions:

(1) Operates only on the specified date and for the specified time period.

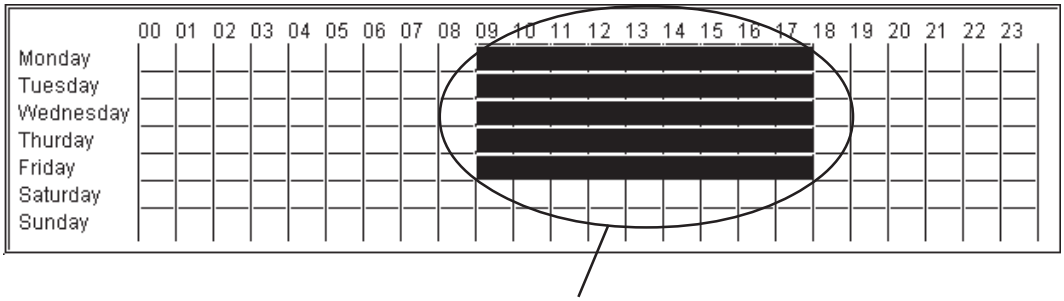
(2) Automatically washes shoe soles for a fixed length of time.

(3) Automatically drains wash water after the specified number of wash cycles is completed.

(4) The wash time and the number of wash cycles completed can be seen on the PRO-iO screen.

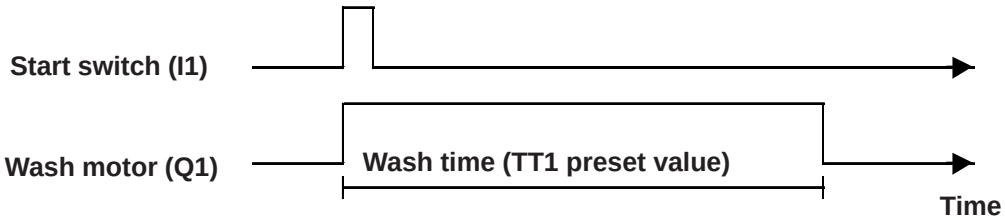
(1) Operates only on the specified date and for the specified time period

The automatic shoe cleaner is set to operate from Monday to Friday, from 9:00 to 18:00 (via calendar feature).

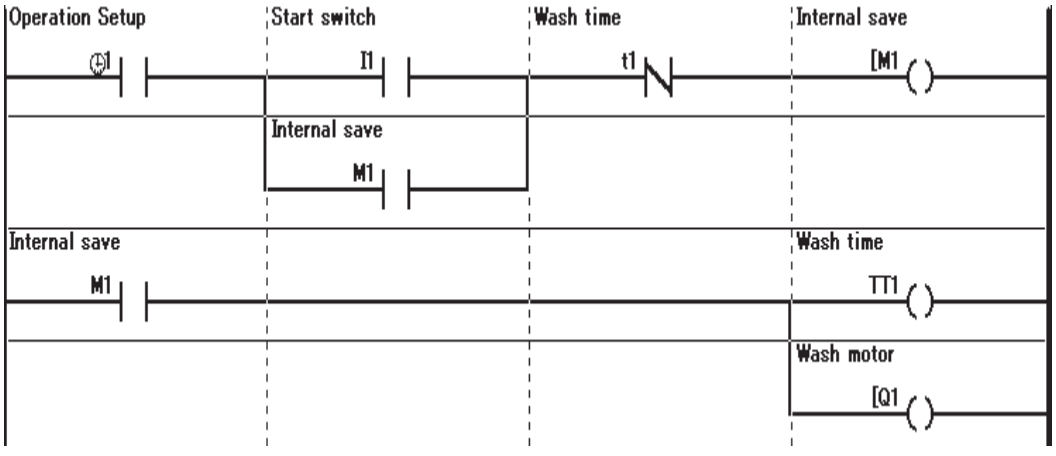


(2) Automatically washes shoe soles for a fixed length of time

The wash motor (Q1) operates when the start button (I1) is pressed. The wash motor then stops automatically when the wash time (TT1) elapses.

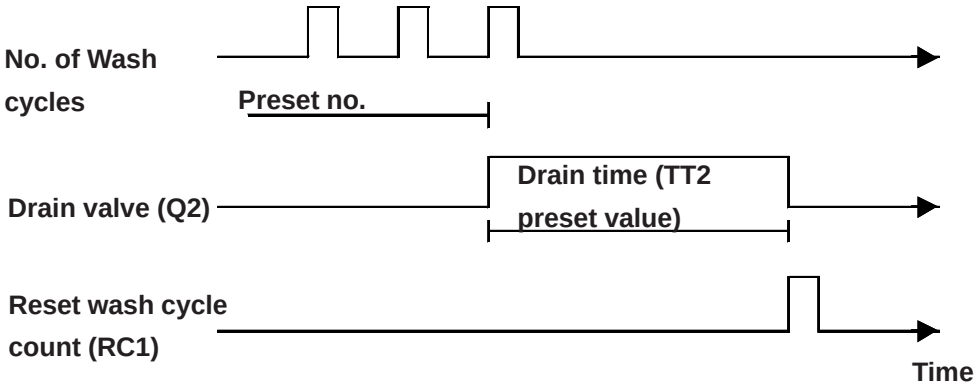


<Start-switch-based automatic wash program>

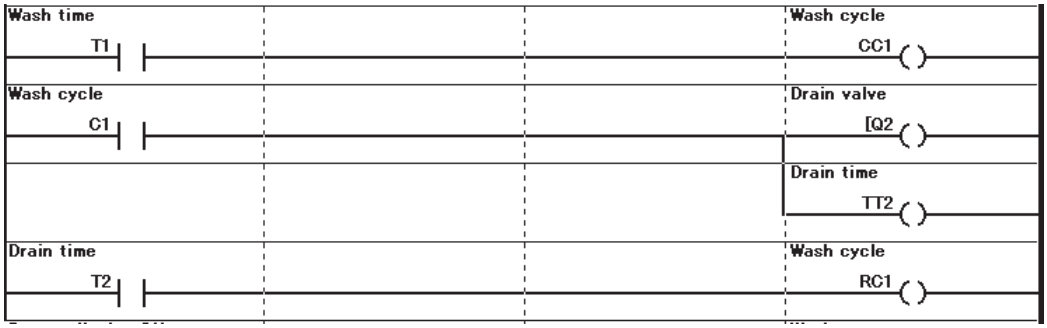


(3) Automatically drains wash water after the specified number of wash cycles is completed

When the wash cycle (CC1) value approaches the preset value, the drain valve (Q2) opens and remains so for the time period specified for the drain time (TT2), after which the water is drained.

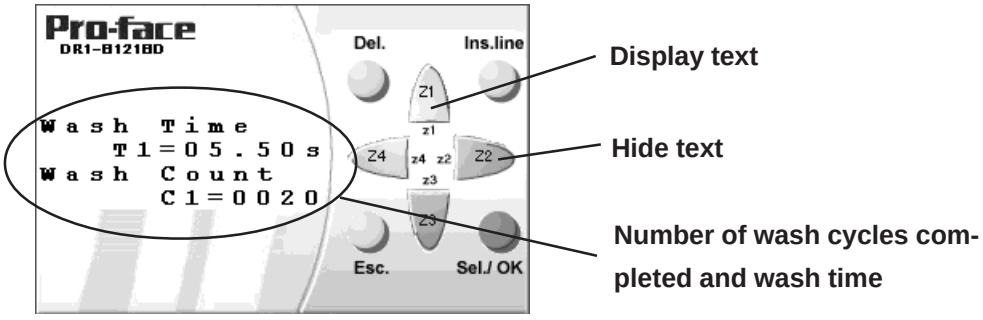


<Automatic drain control logic program>

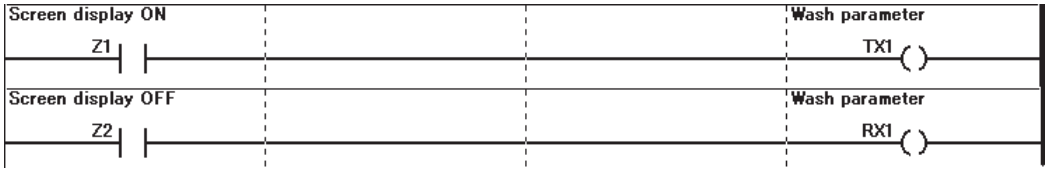


(4) The wash time and the number of wash cycles completed can be seen on the PRO-iO screen

You can display the number of wash cycles completed (CC1) and the wash time (TT1) on the PRO-iO screen using the Text feature. Clicking Z1 displays the number of wash cycles completed and the wash time. Clicking Z2 takes you back to the main PRO-iO screen.



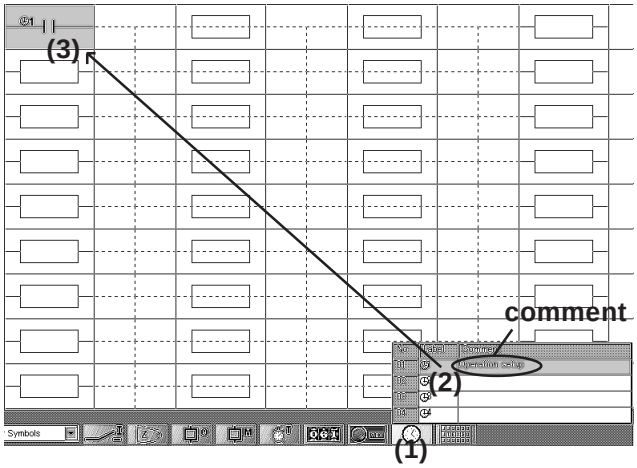
<Z-key-based text display logic program>



■ Creating the program

(1) Operates only on the specified date and for the specified time period

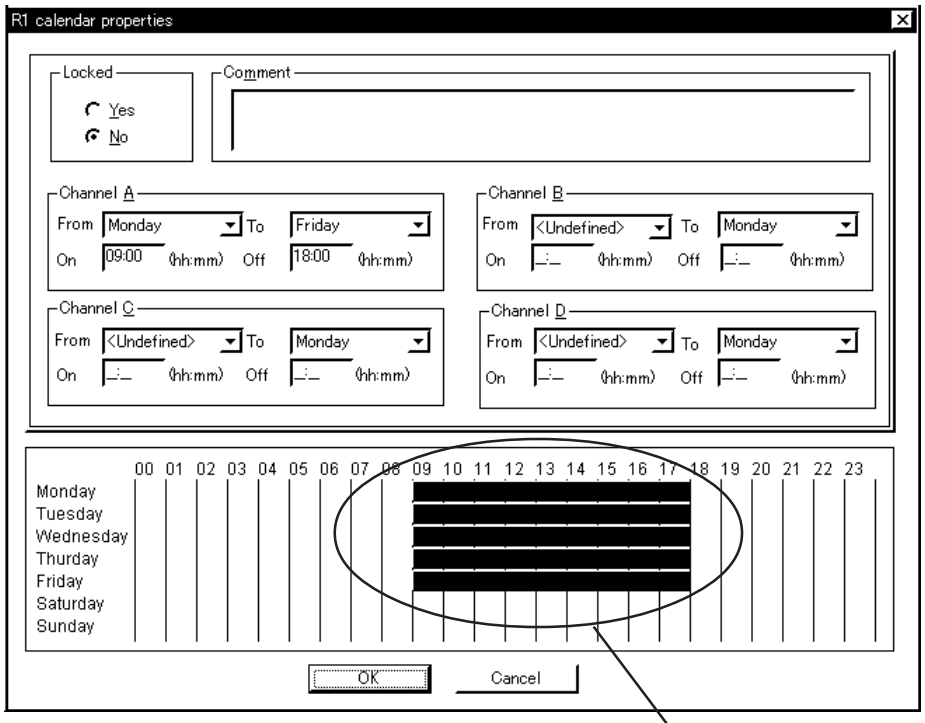
1. Position the mouse pointer on the calendar icon (1).
2. Click on ⏱1 (2), drag to the desired position (3) and release to place it in the ladder program.



Note: **Entering comments in the I/O "Comment" area (2) can be helpful during debugging. Comment data can also be collected in a "Text Data" screen.**

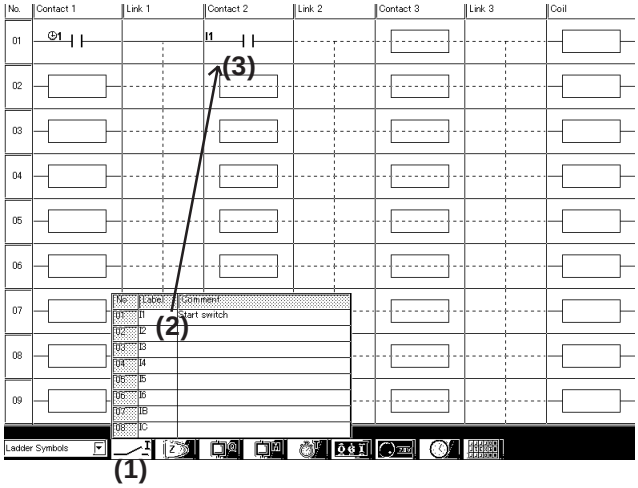
3. Designate the ON date and time for the calendar contact. Double-click on the contact, or right-click on the calendar contact and select [Properties]. The following dialog box will appear.

   Enter Channel A settings as follows:
   Channel A:
   From Monday To Friday
   On 09:00 (hh:mm) Off 18:00 (hh:mm)



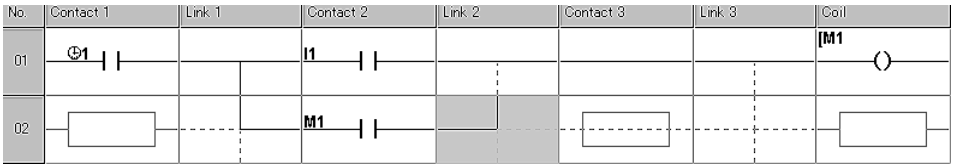
Red section indicates time when ⏱1 contact turns ON

(2) Automatically washes shoe soles for a fixed length of time

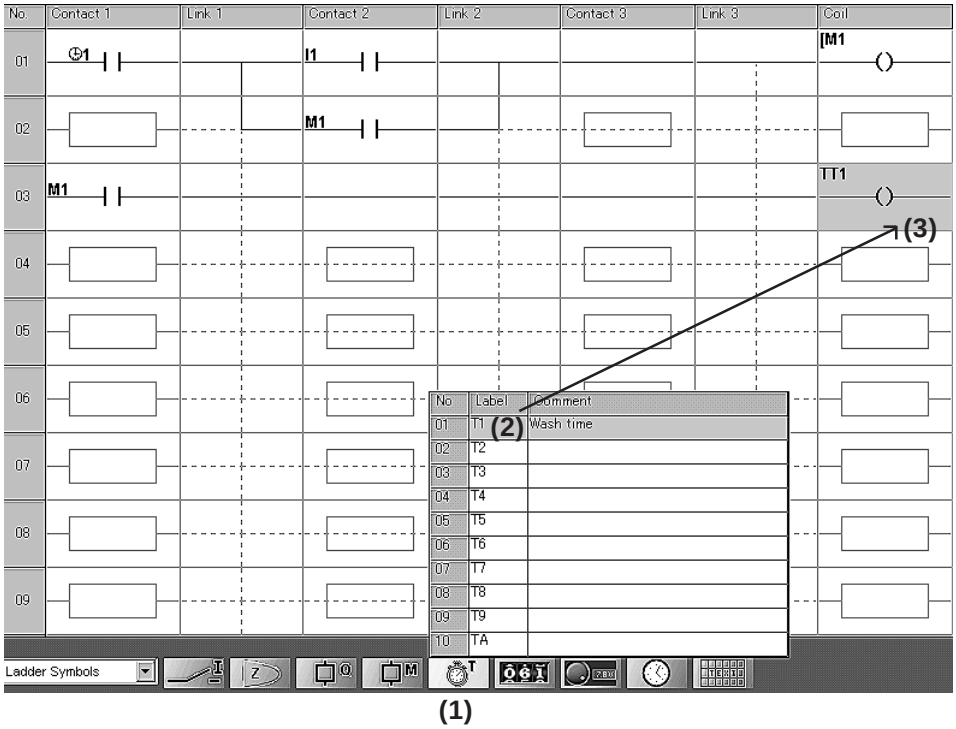


1. Position the mouse pointer on the icon (1).
2. Click on I1 (2), drag to the desired position ((3)) and release to place it in the ladder program.
3. Repeat steps 1 and 2 for auxiliary coil M1.

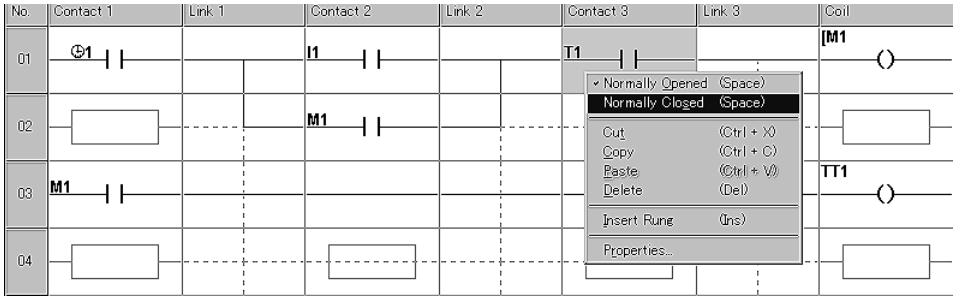
4. Next, click on the dotted lines to create connecting lines.



5. Repeat steps 1 and 2 to insert the auxiliary coil M1 and the timer coil TT1 in rung no.3 (see below).



6. Place the timer coil contact T1 you created in step 5, in rung no.1. Right-click on the contact and select [Normally Closed].

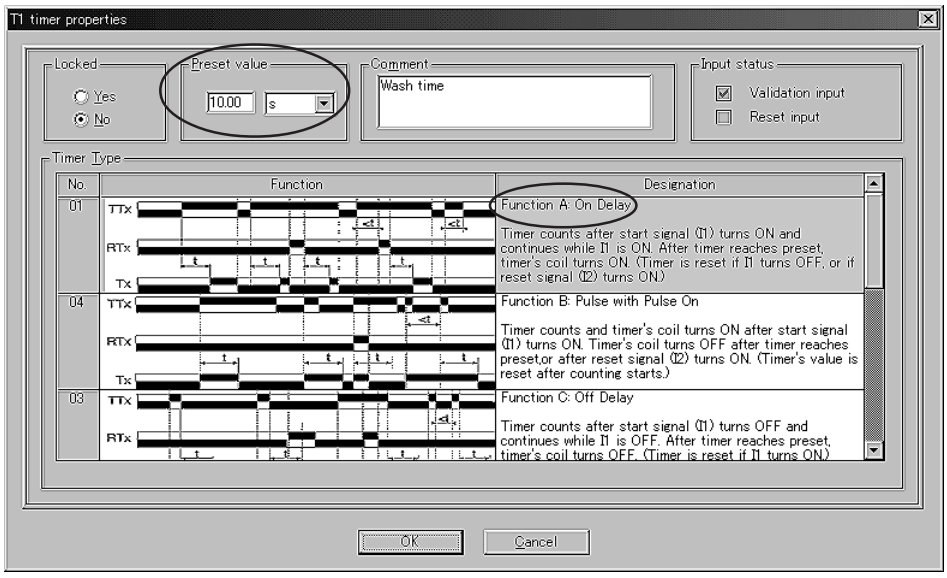


7. Designate when the timer coil starts. To do this, double-click on the timer coil, or right-click the timer coil and select [Properties].

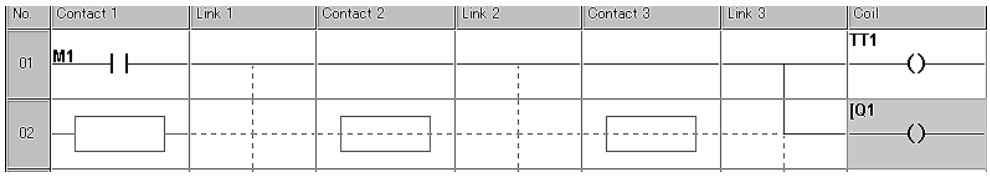
   Set the Preset value and Designation, as shown below:

   Preset value: 10.00s

   Designation: Function A: On Delay



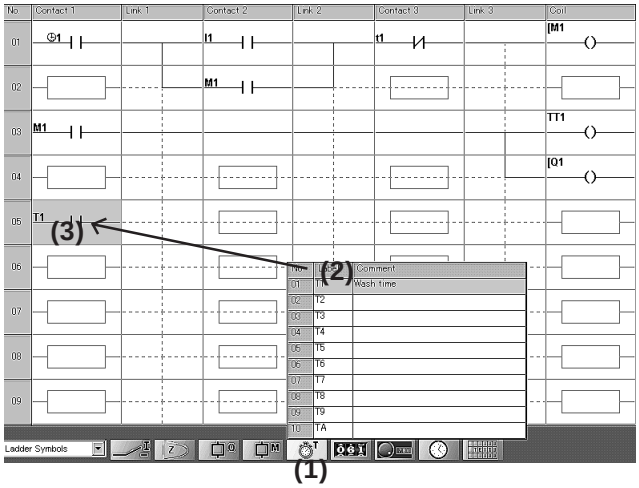
8. Next, click on the dotted lines to create connecting lines, and place the discrete output Q1.



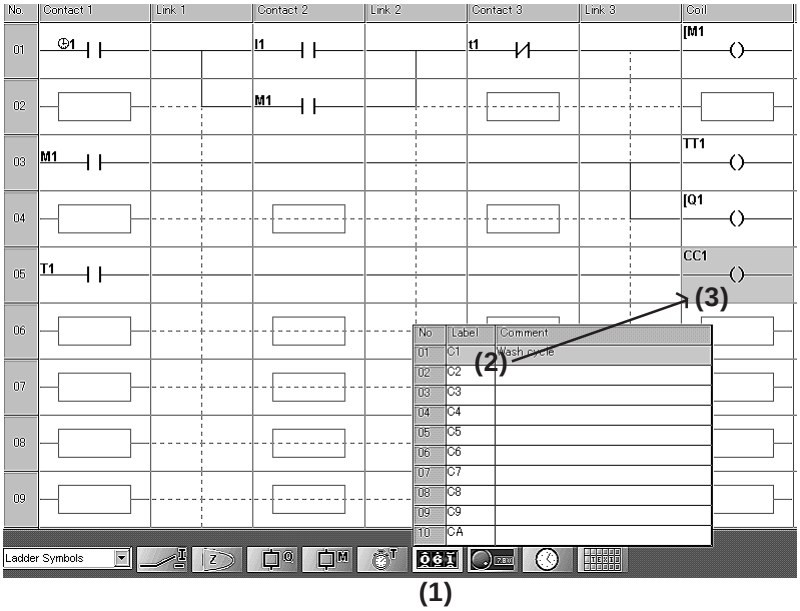
(3) Automatically drains wash water after the specified number of wash cycles is completed

1. Position the mouse pointer on the icon (1).

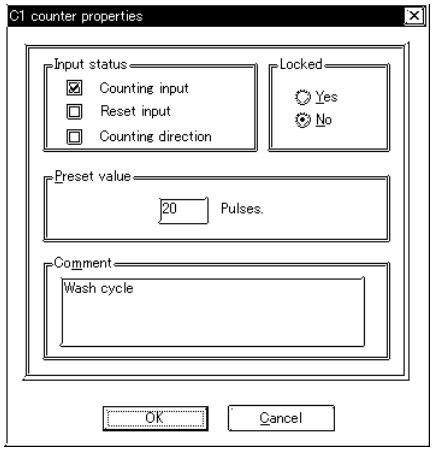
2. Click on T1 (2), drag to the desired position (3) and release to place it in the ladder program.



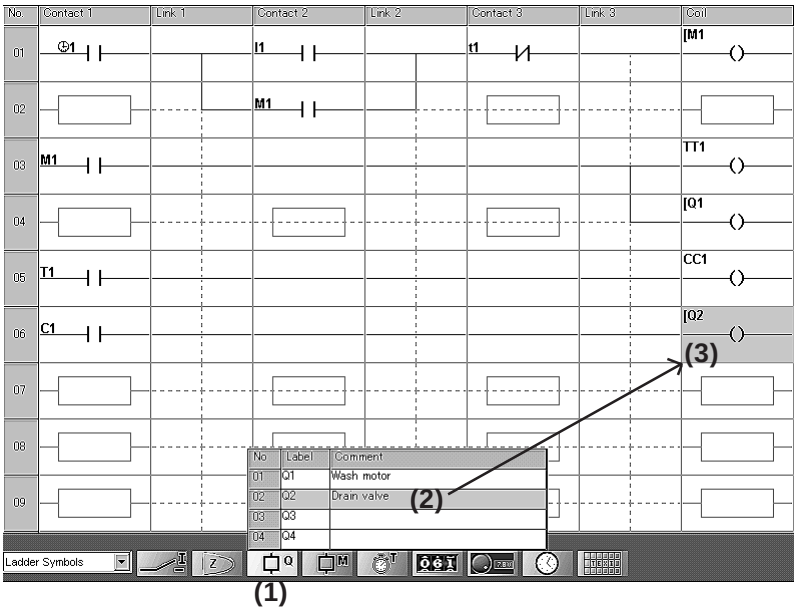
3. Repeat steps 1 and 2 to insert the counter coil CC1.



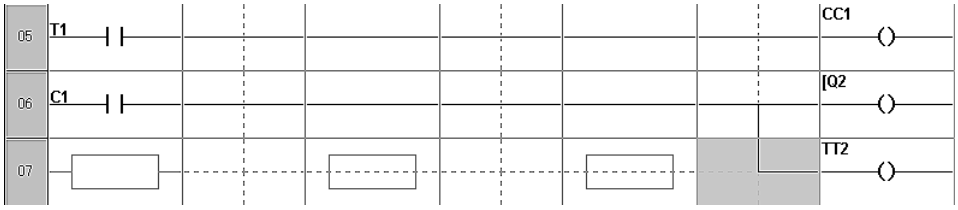
4. Designate the counter pulse count. To do this, double-click on the counter coil, or right-click on the counter coil and select [Properties]. The following dialog box will appear.
   Set the preset value as follows:
   Preset value: 20 Pulses (Wash cycle)



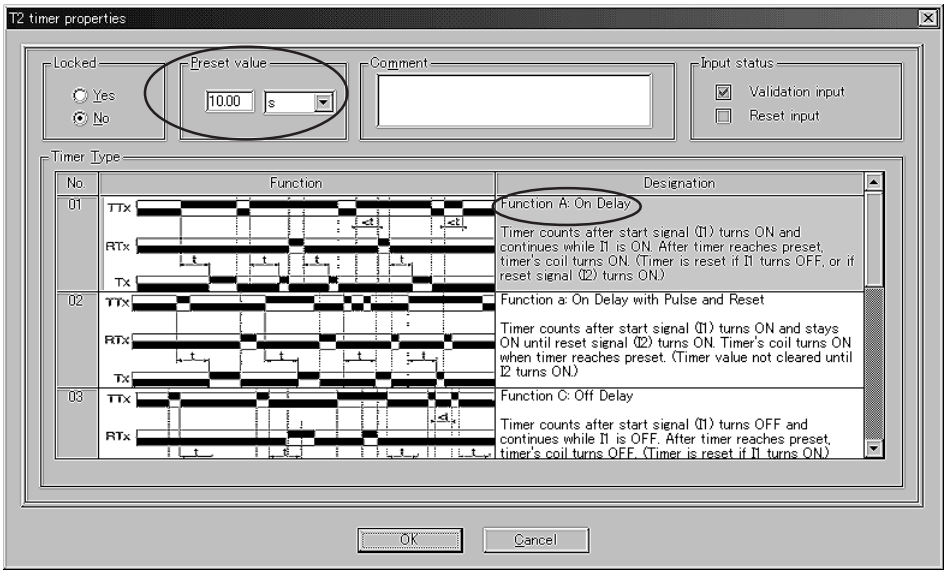
5. Repeat steps 1 and 2 to insert the counter contact C1 and the discrete output coil Q2 in rung no. 6.



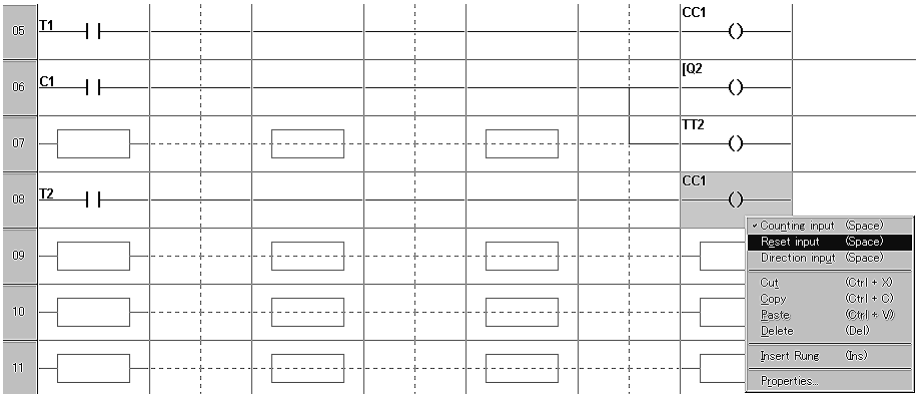
6. Next, click on the dotted lines to create connecting lines, and place the timer coil TT2.



7. Designate when the timer coil starts. To do this, double-click on the timer coil, or right-click on the timer coil and select [Properties].
   Set the Preset value and designation as shown below:
   Preset value: 10.00s (Wash time)
   Designation: Function A: On Delay



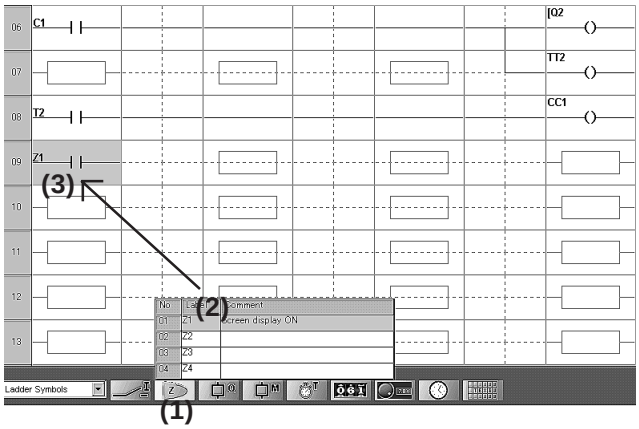
8. Place the timer coil contact T2 and the counter coil CC1 you created in step 6, in rung no. 8. Right-click on the counter coil CC1, and select [Reset input].



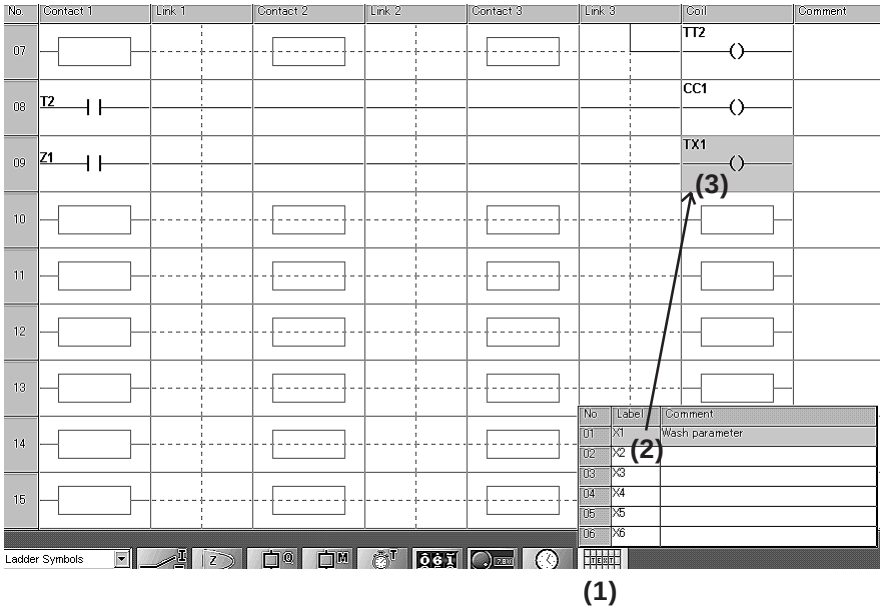
(4) The wash time and the number of wash cycles completed can be seen on the PRO-iO screen

1. Position the mouse pointer on the icon (1).

2. Click on Z1 (2), drag to the desired position (3) and release to place it in the ladder program.



3. Repeat steps 1 and 2 to insert the text coil TX1.



4. When the text coil starts, designate the parameter to be displayed on the PRO-iO screen. To do this, double-click the text coil, or right-click on the text coil and select [Properties]. The following dialog box will appear.

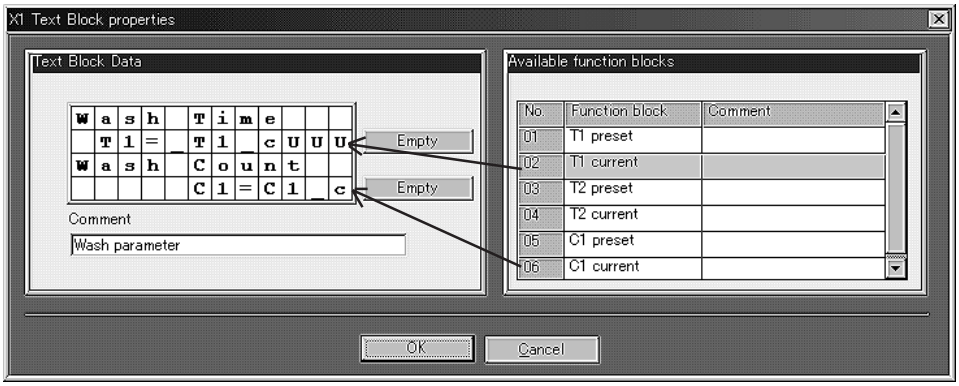
   Enter the text in rows 1 and 3. Then, select the necessary parameter from the “Available function blocks” window on the right, and drag and drop it into row 2. Similarly, select the necessary parameter from the “Available function blocks” window on the right, and drag and drop it into row 4.

   Row 1: Enter “Wash Time” via the keyboard.

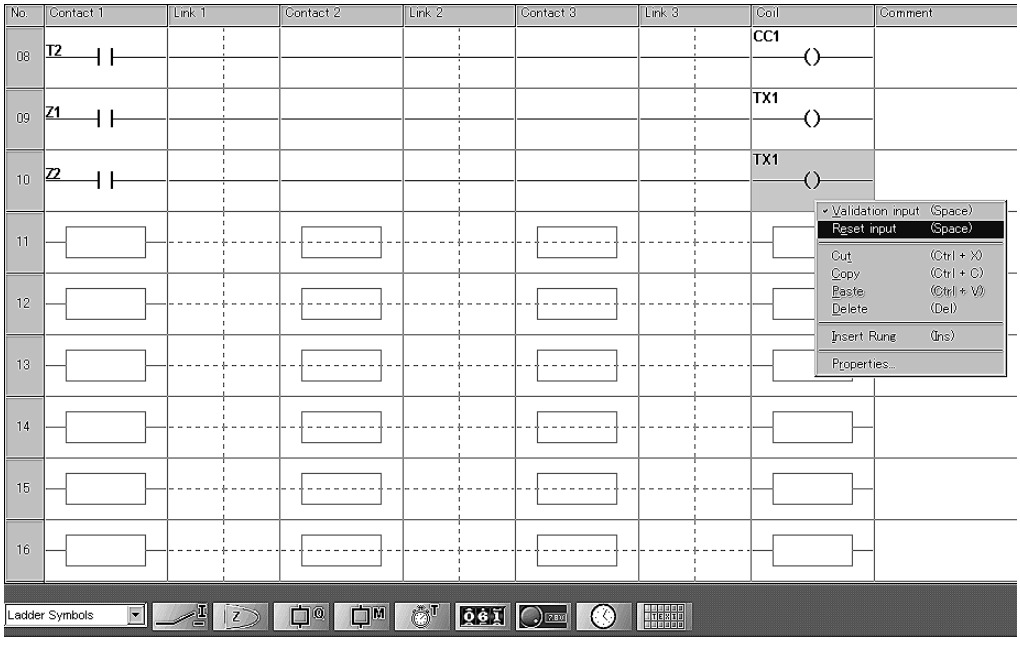
   Row 2: Select “T1 current” from the “Available function blocks” window, and drag and drop it into row 2.

   Row 3: Enter “Wash Count” via the keyboard.

   Row 4: Select “C1 current” from the “Available function blocks” window, and drag and drop it into row 4.

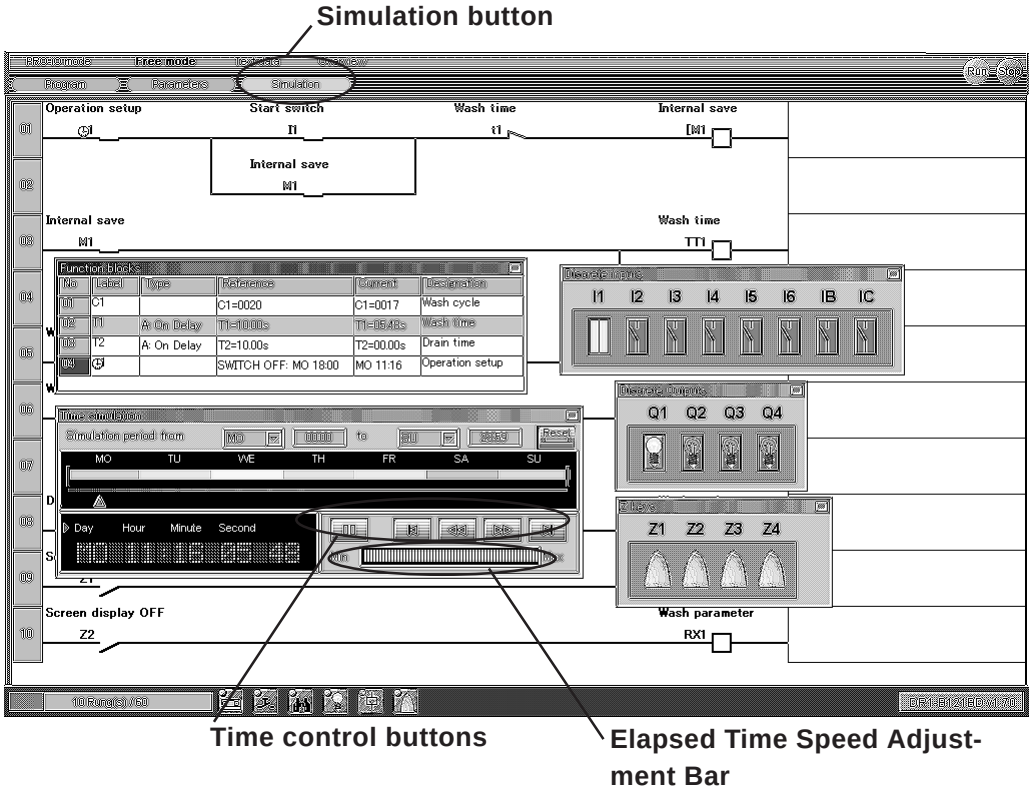


5. Repeat steps 1 and 2 to insert the Z-key contact Z2 and the text coil TX1 in rung no.10. Right-click on the text coil TX1, and select [Reset input].



■ Using the Simulation Feature

1. The Simulation feature allows you to check that your logic program operates as expected. Click on the Simulation button at the top of the screen to call up the Simulation screen.



2. Click on the Run button in the screen's upper-right corner to start the simulation. Follow the steps below to check your logic program's operation.

   (1) When the time displayed in the "Time simulation" dialog box's time zone is between Monday to Friday, 09:00 to 18:00, clicking the "Discrete inputs" show/hide dialog box's I1 contact turns the wash motor Q1 ON. The wash motor Q1 turns OFF automatically after 10 seconds.

Note: **The rate (speed) at which time elapses can be controlled via the time control buttons and the elapsed time speed adjustment bar.**

   (2) The drain valve Q2 turns ON when the number of wash cycles com pleted reaches 20. Drain valve Q2 turns OFF automatically after 10 seconds.

   (3) Note that the above operation check was performed in the [Free mode | Simulation] mode. However, to check the PRO-iO screen wash time and number of wash cycles completed display, it will be necessary to switch to [PRO-iO mode | Simulation] mode.

   To switch to [PRO-iO mode | Simulation] mode, click on **PRO-iO mode** in the screen's upper-left corner, and click on the Run button in the screen's upper-right corner. Doing so will check your logic program in PRO-iO mode.

Click on the “Z keys” show/hide dialog box’s Z1 key. The PRO-iO screen image now displays the wash time and number of wash cycles completed.

Click on the Z2 key to return to the main PRO-iO screen.

PRO-iO mode / Simulation