ME576 NUM Ladder Logic Diagram Tutorial
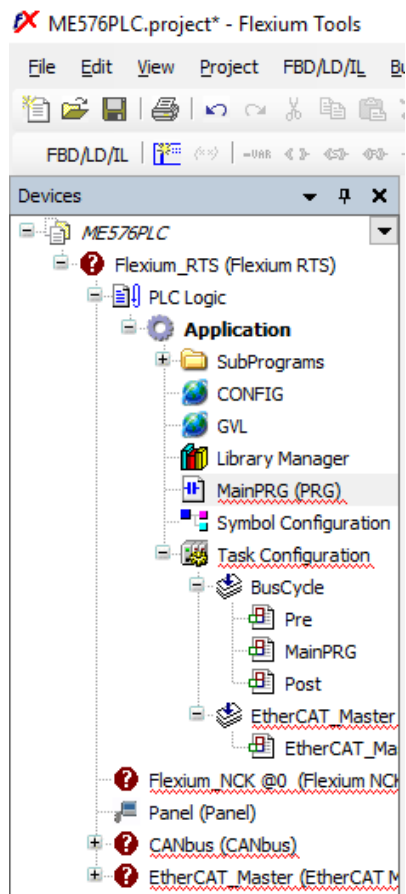
Programming the NUM Flexium 68 with Flexium tools

1. Project file

Use the project file distributed by the Teaching Assistant. The project file contains the necessary setting that enables communication with the I/O ports.

2. Main program

Double click on the MainPRG (PRG). The PLC logic will be defined here.

Figure 1. Main PLC logic block

3. View ladder logic diagram

View the logic as ladder logic. You can use the keyboard shortcuts to alternate between function block diagram (CTRL+1), ladder logic (CTRL+2), Instruction list (CTRL+3).
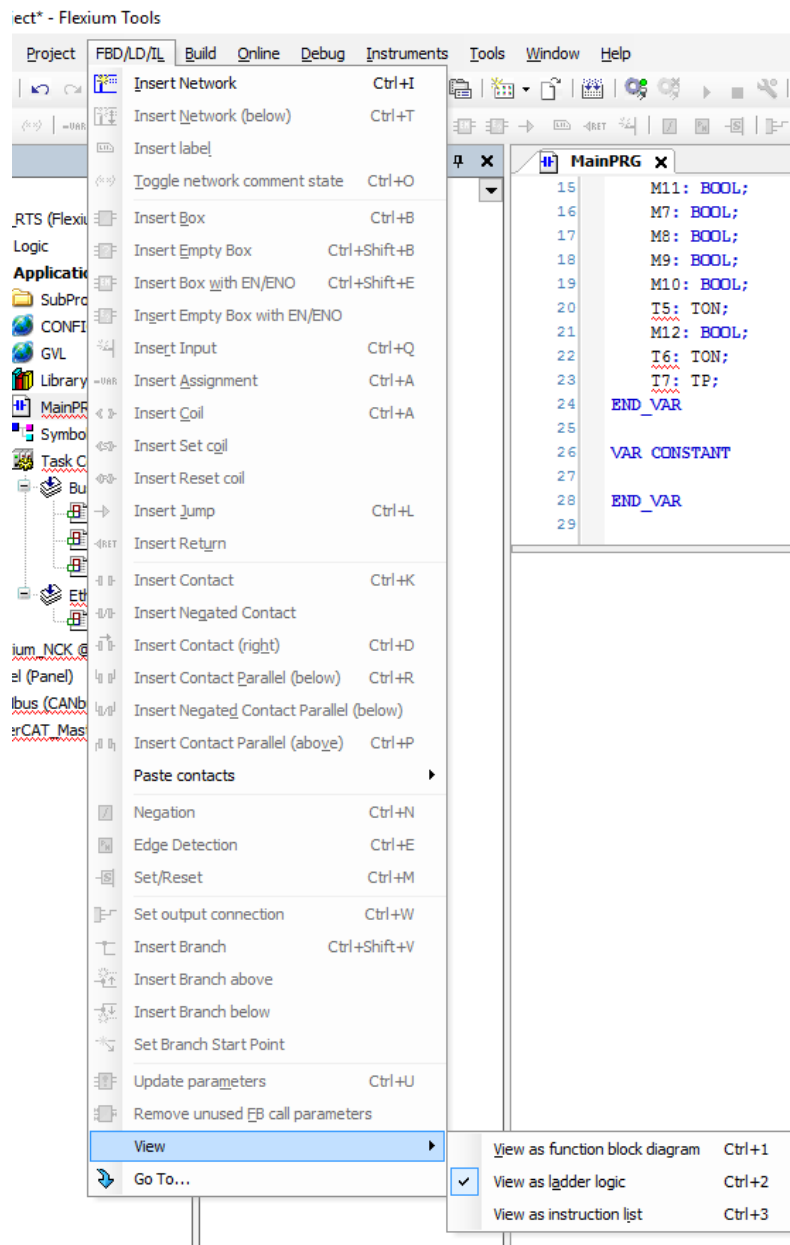

Figure 2. View as ladder logic diagram

4. Create a new network

The PLC logic is defined in networks. Insert a new network by clicking the Insert Network icon. You can also use (CTRL+I)
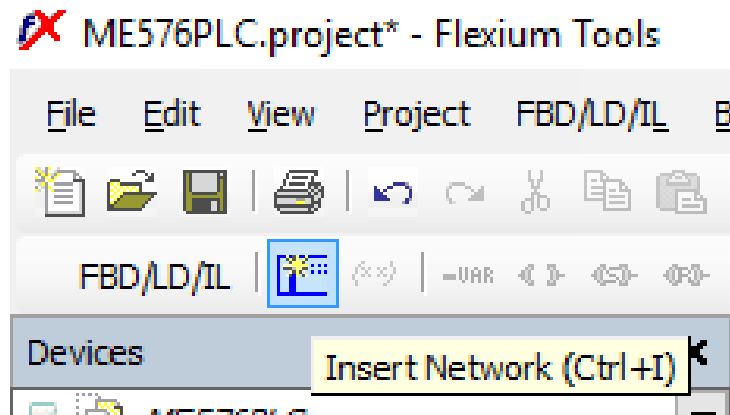

Figure 3. Insert a new network

5. Input the logic operations for controlling the opening of the garage door in network 1

The ladder diagram can be edited by adding contacts, negated contacts, coils, and boxes as shown in Figure 4.
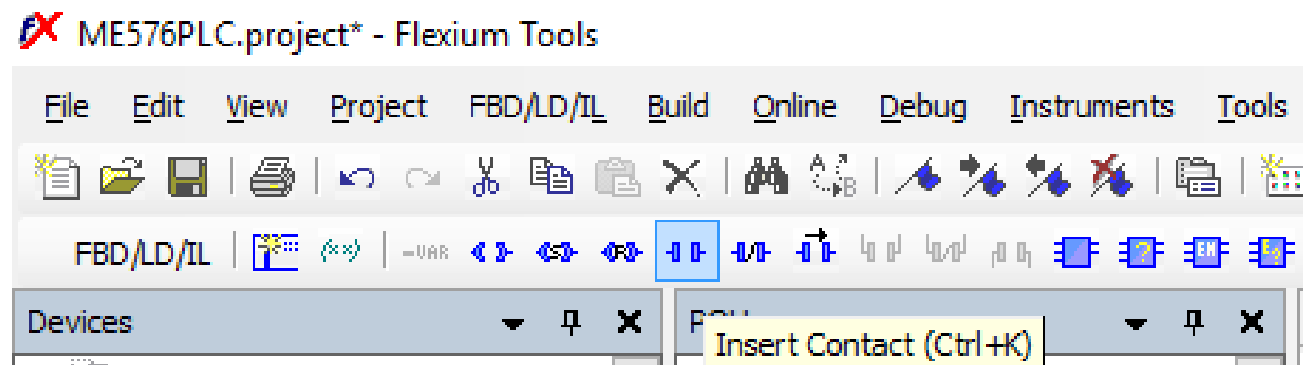

Figure 4. Insert a Contact

Create the ladder diagram shown in Figure 5 using the ladder elements from the tool bar and the I/O labels shown in Table 1. Use the Insert Contact Parallel icon to make the parallel ladder. As shown in Figure 6 It is possible to create a parallel contact with multiple contacts by first selecting the contacts while pushing (CTRL) on the keyboard and then using the Insert Contact Parallel.
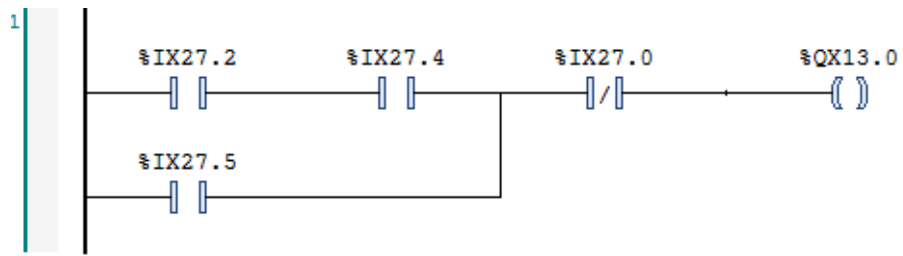
Figure 5. Ladder diagram representation of network 1.

Figure 6. Insert a parallel ladder

Table 1. Inputs and outputs for segment 1.

Input/Output	Label
Upper limit switch	%IX27.0
Open button (outside)	%IX27.2
Key switch	%IX27.4
Open button (inside)	%IX27.5
Motor up	%QX13.0

6. Input the logic operations for controlling the closing of the garage door in network2

Add a second network to the program block by clicking Insert Network icon. Create the ladder diagram shown in Figure 7 using the I/O labels shown in Table 2.
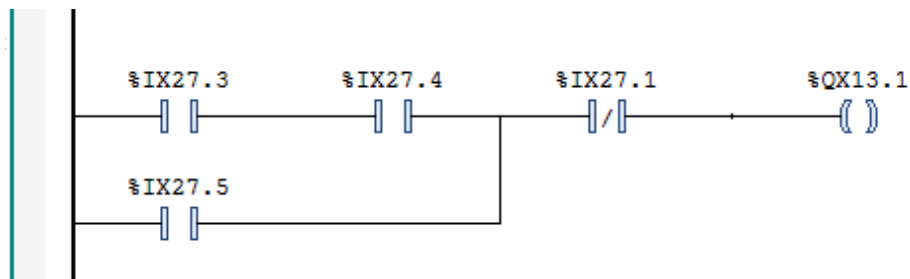

Figure 7. Ladder diagram representation of network 2.

Table 2. Inputs and outputs for segment 2.

Input/Output	Label
Lower limit switch	%IX27.1
Close button (outside)	%IX27.3
Key switch	%IX27.4
Close button (inside)	%IX27.6
Motor Down	%QX13.1

7. Save the project file

Click the Save Project menu.