

TRILOGI

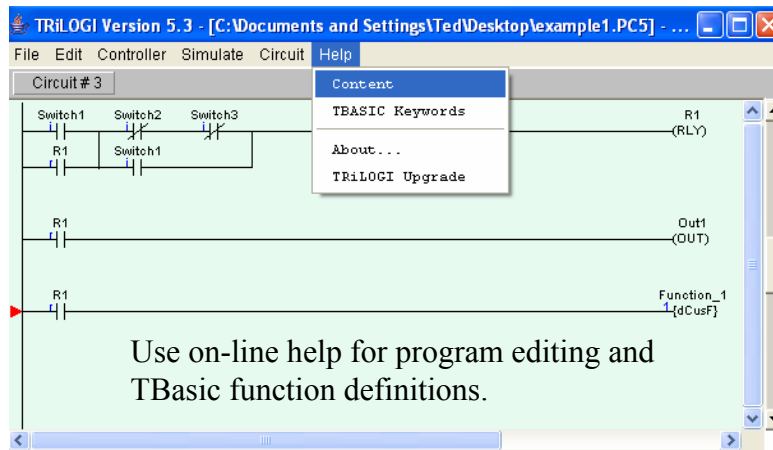
5.3

PLC Ladder Diagram Programmer and Simulator

A tutorial prepared for IE 575 by
Dr. T.C. Chang

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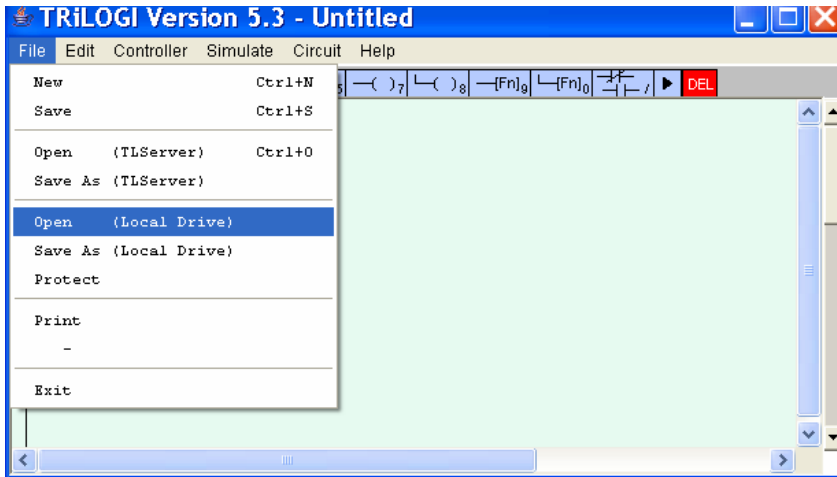
Use On-Line Help



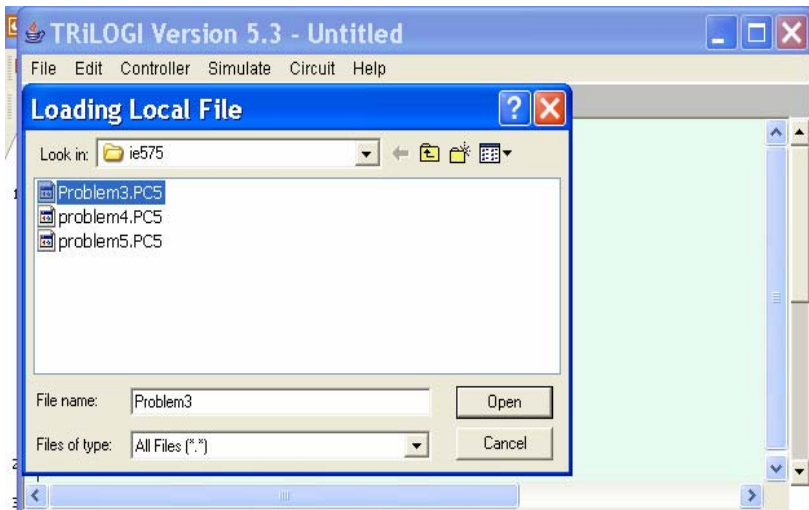
2

Open File

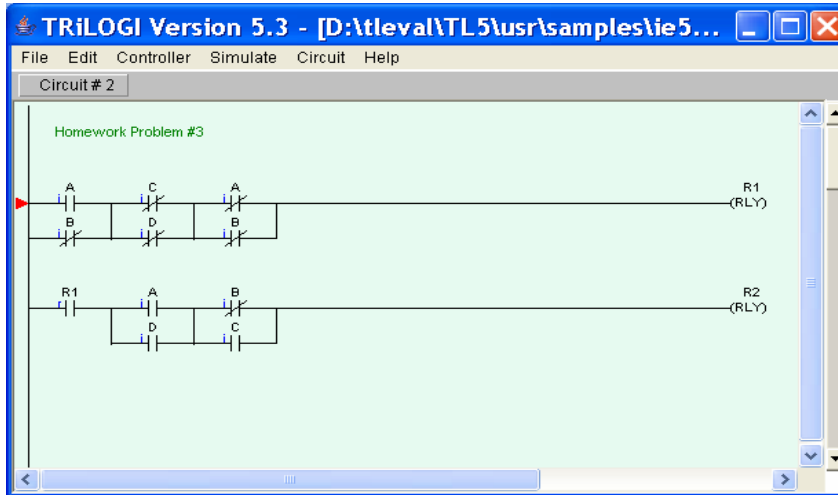
Open from local drive (file on your disk).



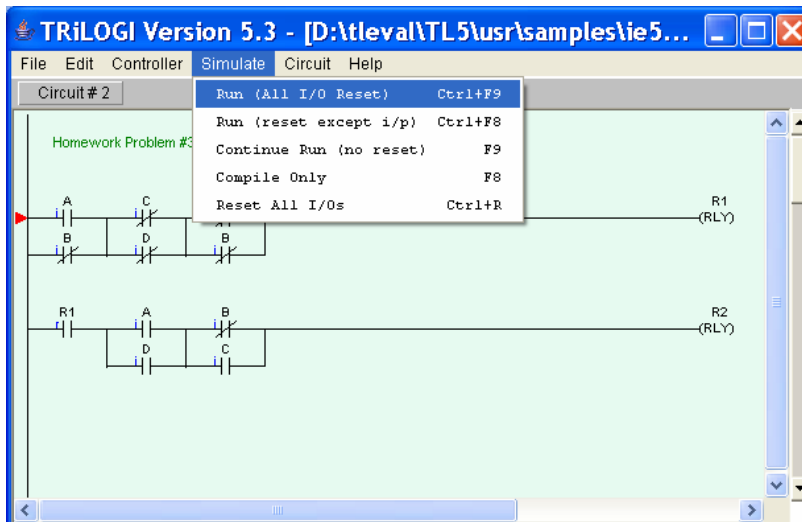
Select the desired file



File Open



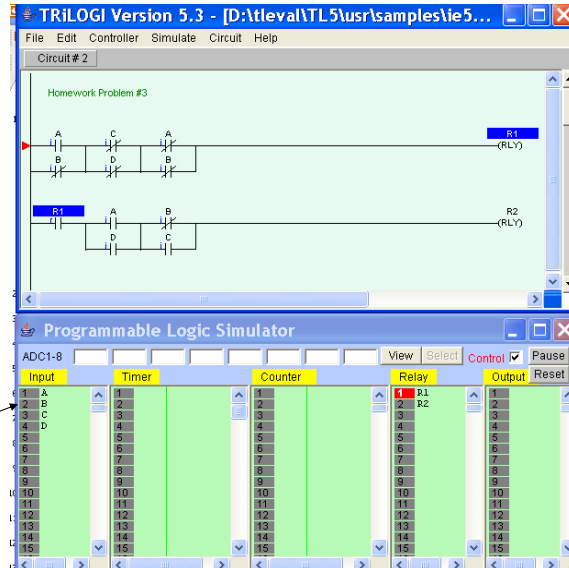
Simulate the Program



Simulation

Use left button to select an input (push button).

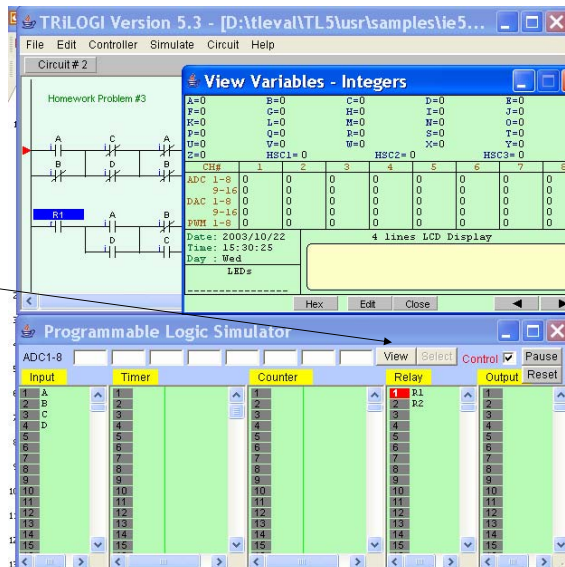
Right button to toggle an input.



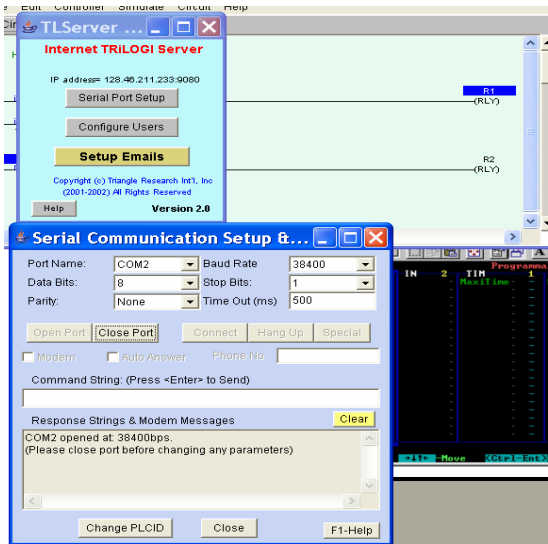
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Simulation

Click "View" to show variables.



Start Server



The screenshot shows the TLServer application window with the 'Serial Communication Setup' dialog box open. The dialog box has the following fields and options:

- Port Name: COM2
- Baud Rate: 38400
- Data Bits: 8
- Stop Bits: 1
- Parity: None
- Time Out (ms): 500
- Buttons: Open Port, Close Port, Connect, Hang Up, Special
- Modem: Modem, Auto Answer, Phone No.:
- Command String: (Press <Enter> to Send)
- Response Strings & Modem Messages: Clear
- Status: COM2 opened at 38400bps (Please close port before changing any parameters)
- Buttons: Change PLCID, Close, F1-Help

Text on the right side of the slide:

Need server to connect to a PLC.

Set the correct COM port. In networked PLCs use “Change PLCID” to set PLC ID number. The PLC ID will be saved in the EEPROM of the PLC.

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Configure Users



The screenshot shows the TLServer application window with the 'Administrator Login' dialog box open. The dialog box has the following fields and options:

- Username: Administrator
- Password: [Empty field]
- Buttons: Cancel

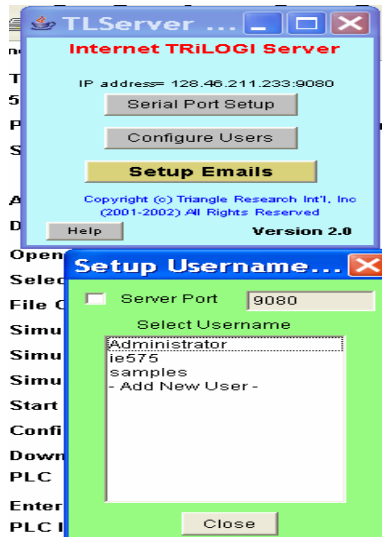
Text on the right side of the slide:

Click Configure Users. You must be an administrator to enter a new user.

This is not for IE 575 students.

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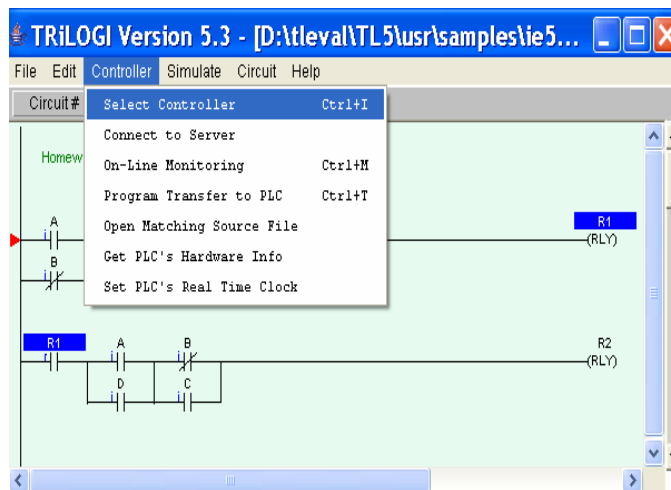
Enter New User



Click –Add New User-
to add new user.

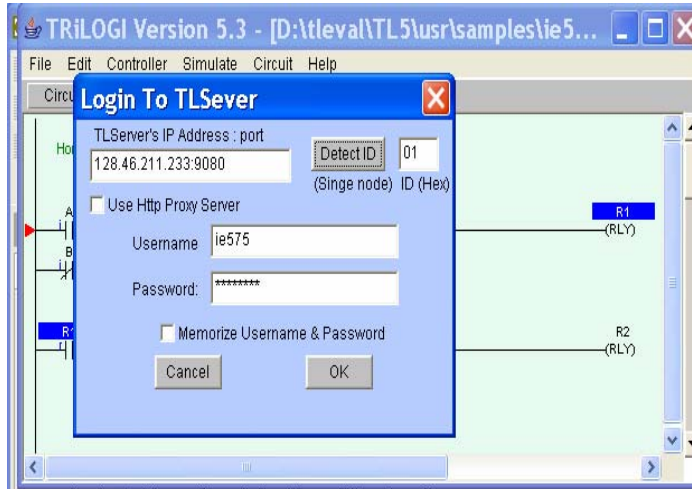
11

Download program to PLC – select PLC



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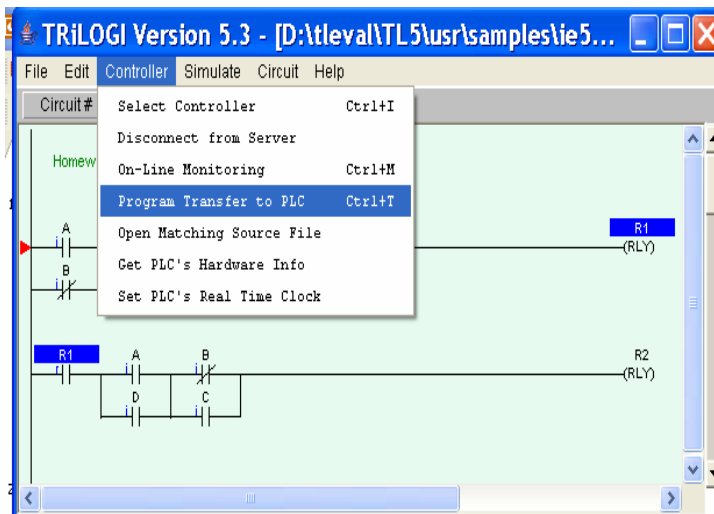
Enter Username, Password and Select PLC ID



IE 575
students use
ie575 and
camclass as
username and
password.

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Program Transfer to PLC



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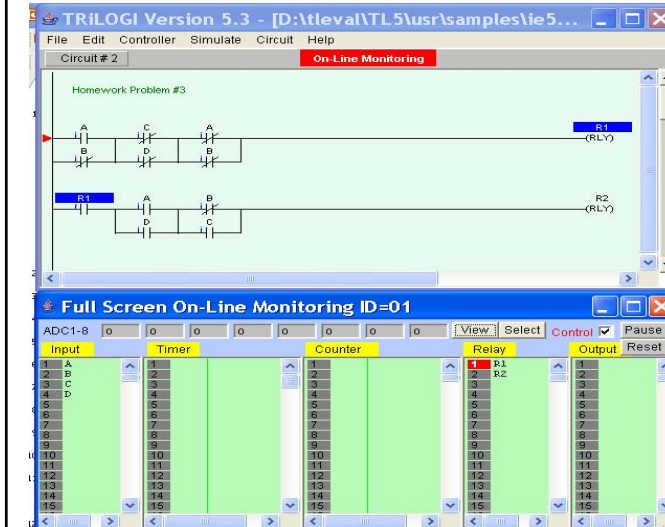
Program Transfer

Click “Yes” on several questions and the program will be transferred. “Yes” on Reset PLC. 15

On-Line Monitoring

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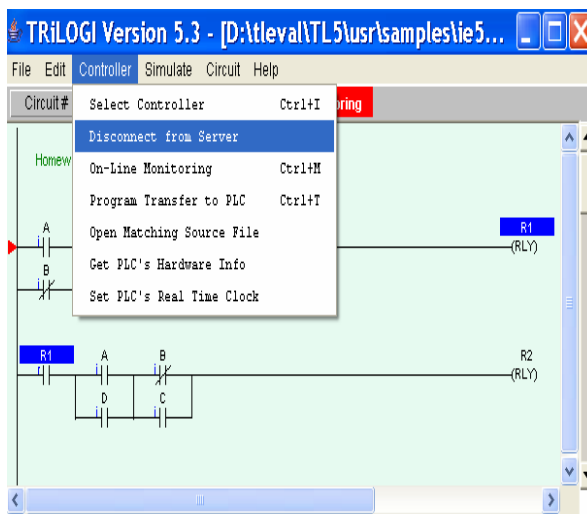
On-Line Monitoring Window



You may not click on the input to change it. Only input at the PLC will be shown.

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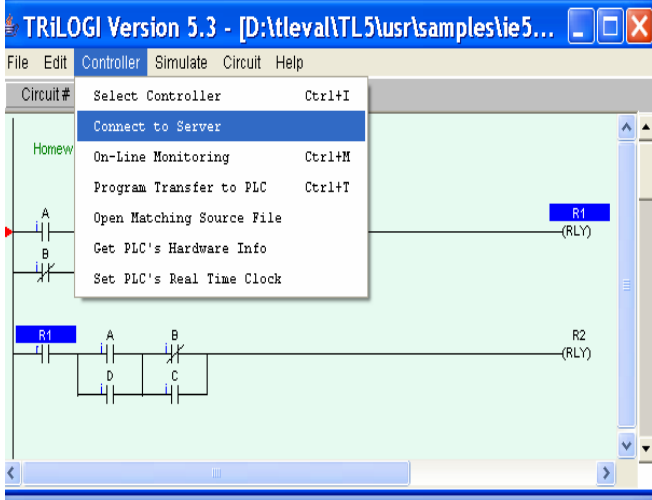
Disconnect from Server



In order to link your TRILOGI window to a different PLC, you must disconnect it from the current PLC.

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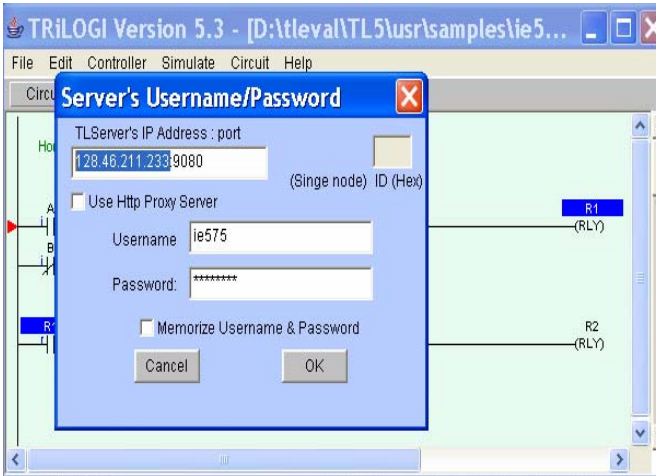
Connect to Server



The screenshot shows the TRILOGI Version 5.3 interface. The 'Controller' menu is open, and the 'Connect to Server' option is highlighted. The menu items are: Select Controller (Ctrl+I), Connect to Server, On-Line Monitoring (Ctrl+M), Program Transfer to PLC (Ctrl+T), Open Matching Source File, Get PLC's Hardware Info, and Set PLC's Real Time Clock. The background shows a ladder logic diagram with relays R1 and R2.

In the previous example, the server was running on the local PC. You may connect to a server running on a remote PC (anywhere), as long as you have the username and password for the PLC and the IP address of the PC.

New Server



The screenshot shows the TRILOGI Version 5.3 interface with a dialog box titled 'Server's Username/Password'. The dialog box contains the following fields and options: 'TLServer's IP Address : port' with the value '128.46.211.233:9080' and '(Single node) ID (Hex)' next to it; a checkbox for 'Use Http Proxy Server'; 'Username' field with 'ie575'; 'Password' field with '*****'; and a checkbox for 'Memorize Username & Password'. There are 'Cancel' and 'OK' buttons at the bottom.

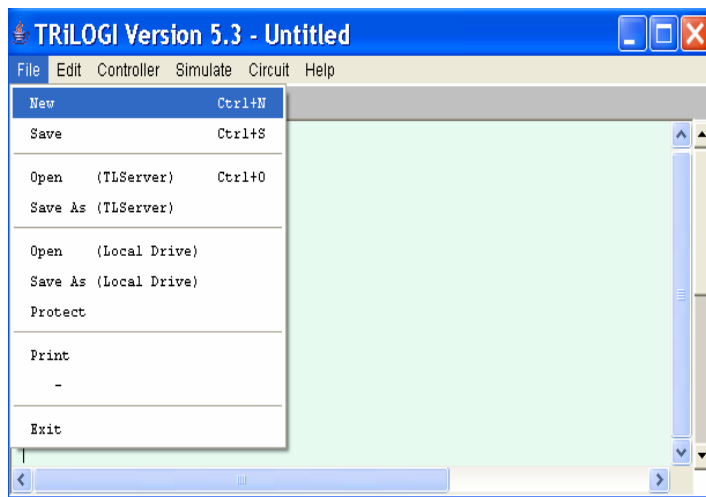
Change the server IP address.

User New Server

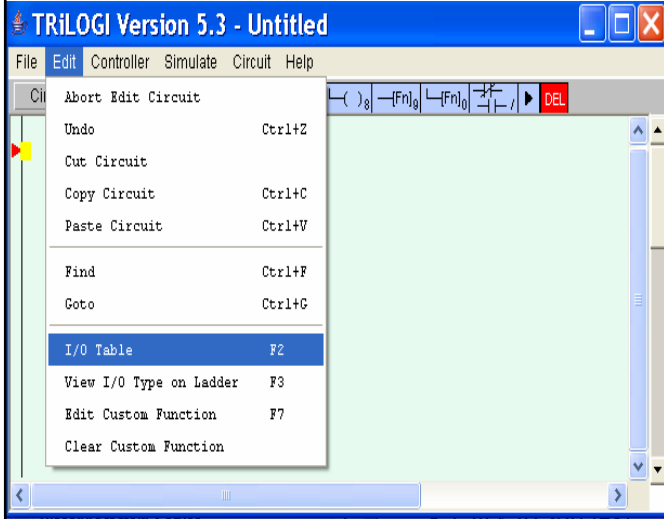
- After the new server has been connected, treat it the same as the local server. No extra example will be given here.

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Input New Program



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TRILOGI Version 5.3 - Untitled

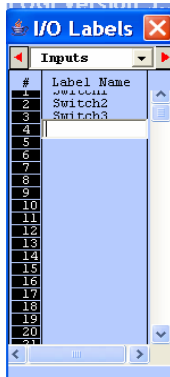
File Edit Controller Simulate Circuit Help

Abort Edit Circuit
 Undo Ctrl+Z
 Cut Circuit
 Copy Circuit Ctrl+C
 Paste Circuit Ctrl+V
 Find Ctrl+F
 Goto Ctrl+G
I/O Table F2
 View I/O Type on Ladder F3
 Edit Custom Function F7
 Clear Custom Function

You must define I/O table before you may insert new circuit (rung).

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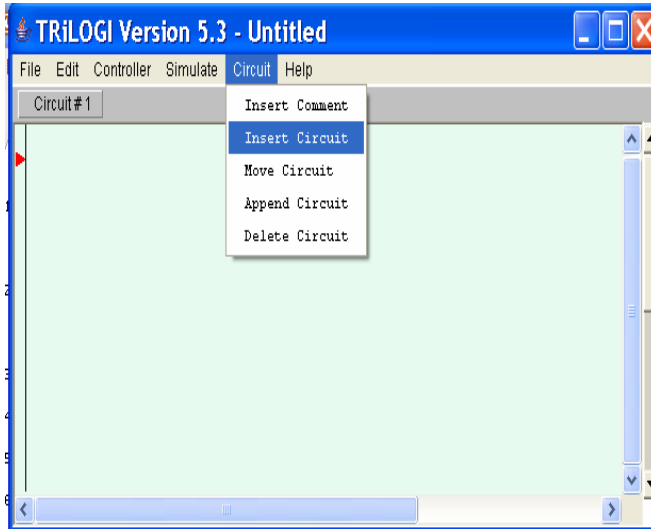
I/O Table



Click the label name for Input # 1 to enter “Switch1”. Press “enter” to enter the name.

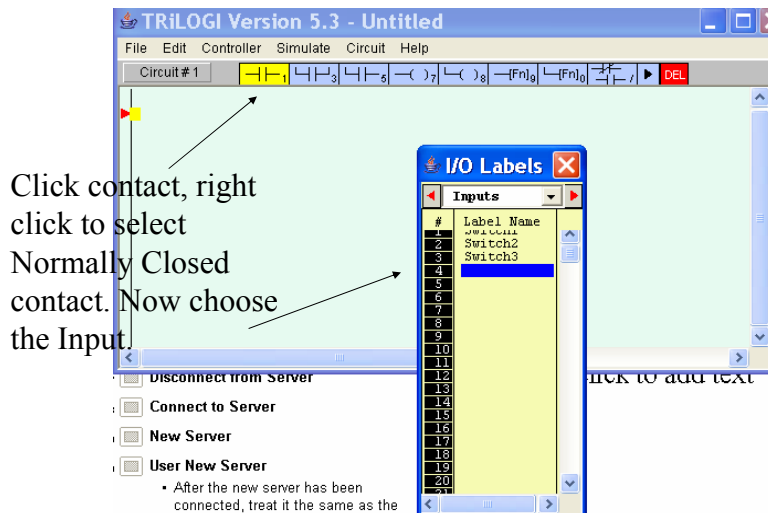
Click the > button to advance to “Output”, “Relay”, “Timer”, etc.

Insert Circuit



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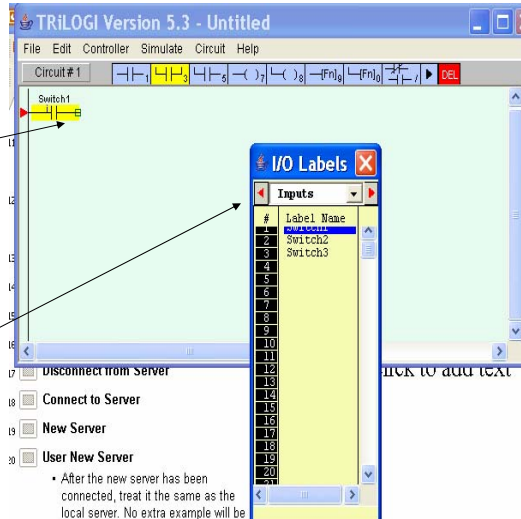
Insert a Contact



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“OR” and Contact

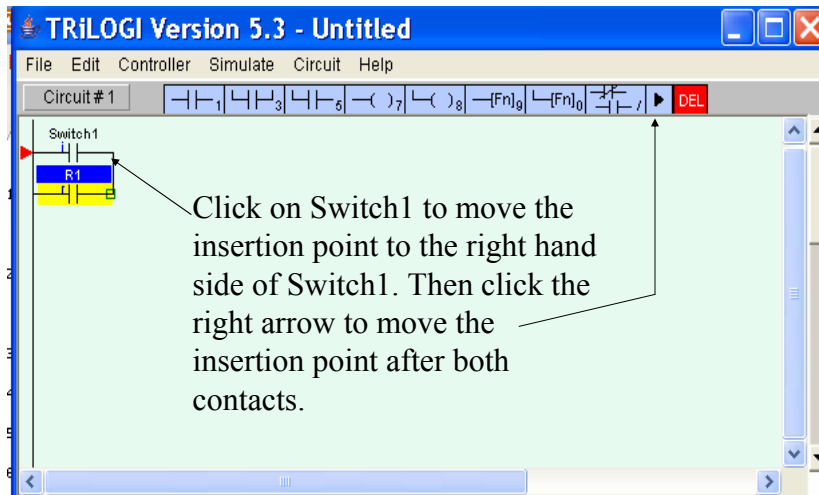
Insertion point is shown in a green box. After the “OR” contact is selected, choose a relay from the I/O table. Use the “>” or the pull down menu to select Relay.



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Choose a Relay Contact

Click on Switch1 to move the insertion point to the right hand side of Switch1. Then click the right arrow to move the insertion point after both contacts.



New Insertion Point

TRILOGI Version 5.3 - [C:\Documents and Settings\Ted\Desktop\example1.PC5] - ...

File Edit Controller Simulate Circuit Help

Circuit # 1

Switch1
R1

If the insertion point is not moved here the logic will be $(\text{Switch1} * \text{Switch2}) + R1$. When the insertion point is moved outside (solid yellow box) the logic becomes $(\text{Switch1} + R1) * \text{Switch2}$

Insert a Normally Closed Contact

TRILOGI Version 5.3 - [C:\Documents and Settings\Ted\Desktop\example1.PC5] - ...

File Edit Controller Simulate Circuit Help

Circuit # 1

Switch1
R1
Switch2

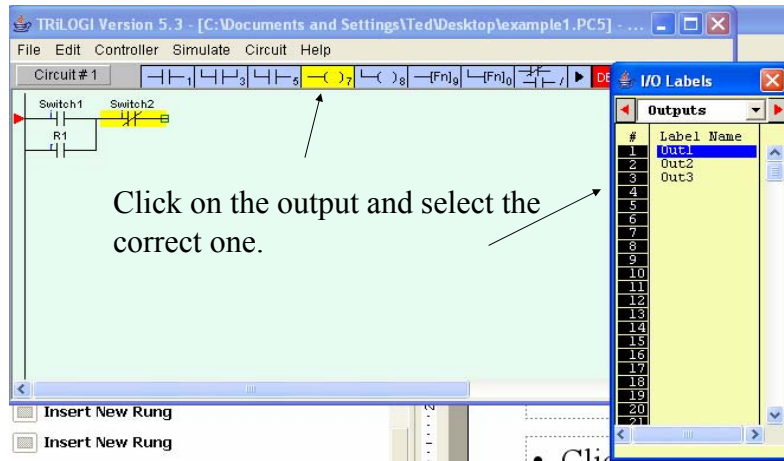
Right click contact and select the input.

I/O Labels

#	Label Name
1	Switch1
2	Switch2
3	Switch3
4	
5	
6	
7	
8	
9	
10	
11	
12	
13	
14	
15	
16	
17	
18	
19	
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21	

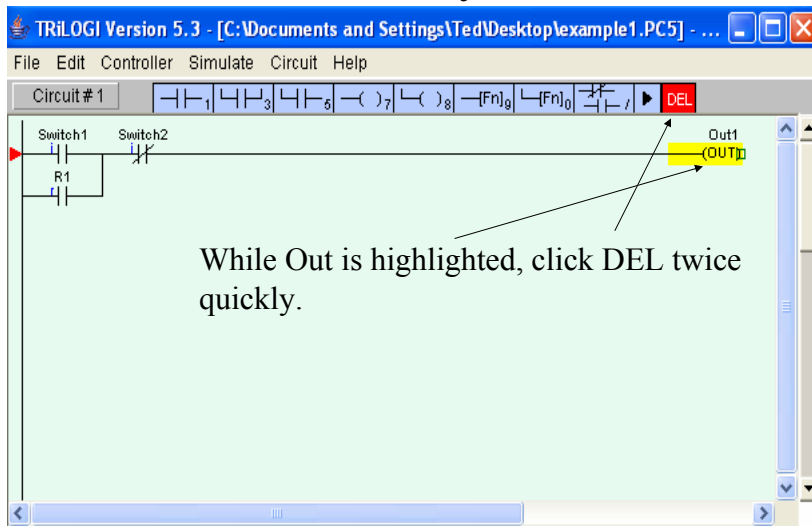
Insert New Rung
Insert New Rung

Add an Output

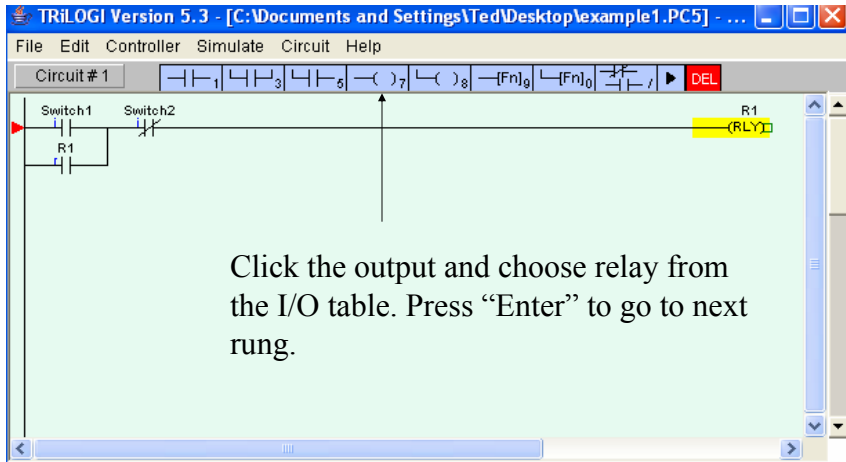


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Delete the Output and Change to Relay

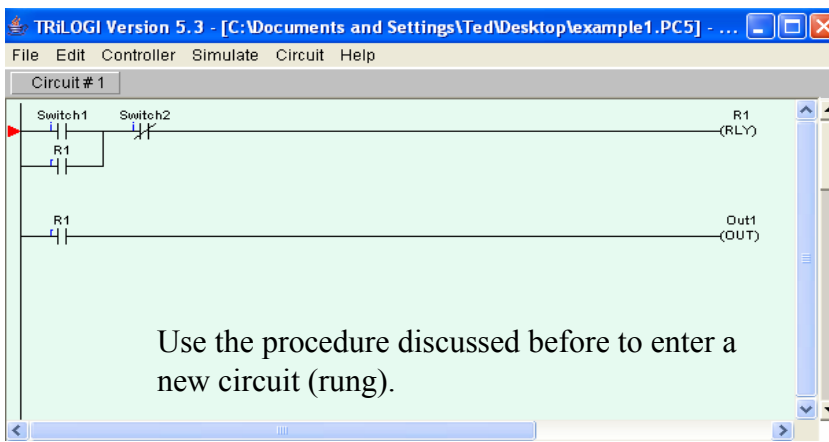


Replace with Relay



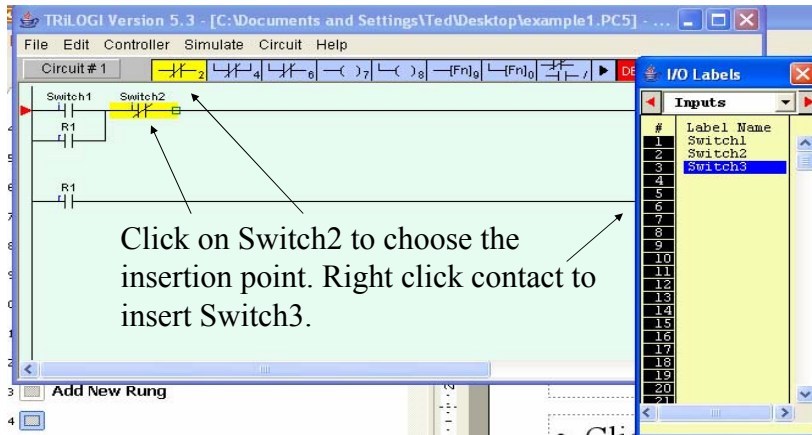
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Add New Rung



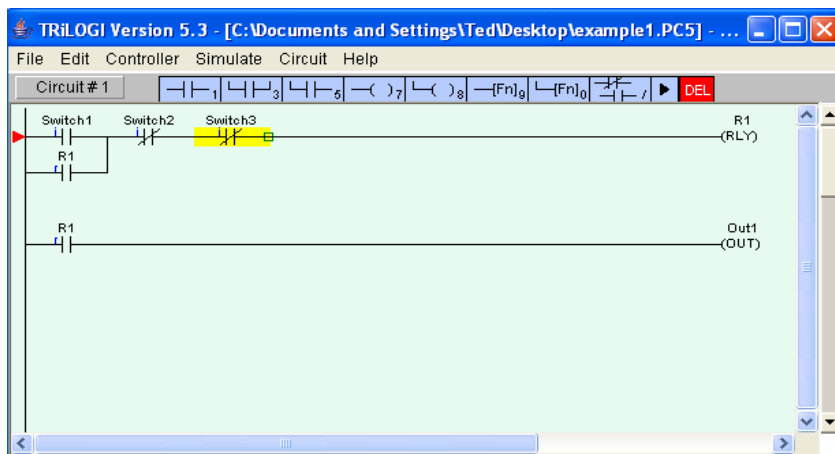
34

Insert a Contact



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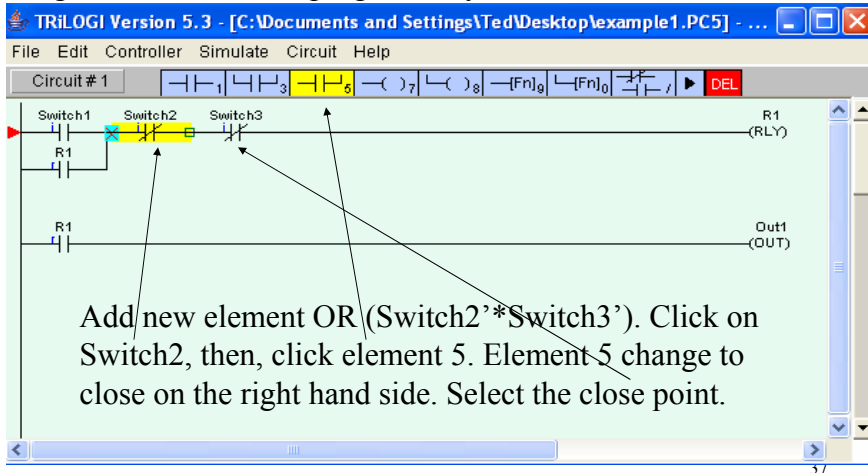
Completed Ladder Diagram



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Add OR Condition

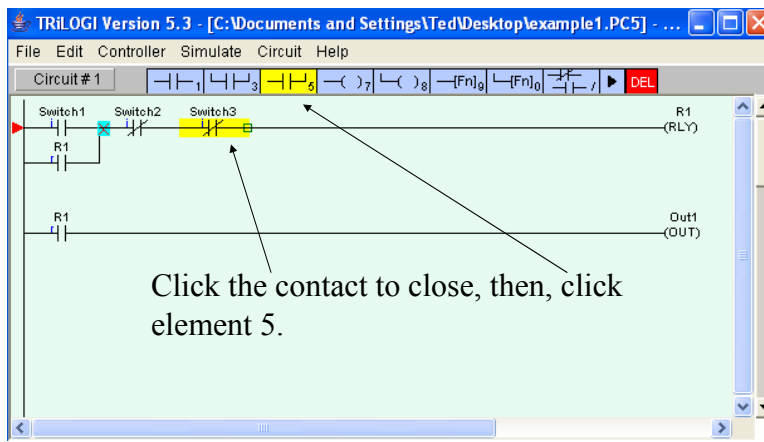
Following example is used to show how to edit the ladder diagram. The resultant program may not be correct.



The screenshot shows the TRILOGI software interface. The main workspace displays a ladder diagram with three rungs. The top rung contains three switches in series: Switch1, Switch2, and Switch3. Switch2 and Switch3 are highlighted in yellow. A red 'X' is visible on Switch2. The bottom rung contains a single switch labeled R1. The right side of the diagram shows a coil labeled R1 (RLY) and a coil labeled Out1 (OUT). The software's menu bar includes File, Edit, Controller, Simulate, Circuit, and Help. The status bar at the bottom right shows the page number 37.

Add new element OR (Switch2'*Switch3'). Click on Switch2, then, click element 5. Element 5 change to close on the right hand side. Select the close point.

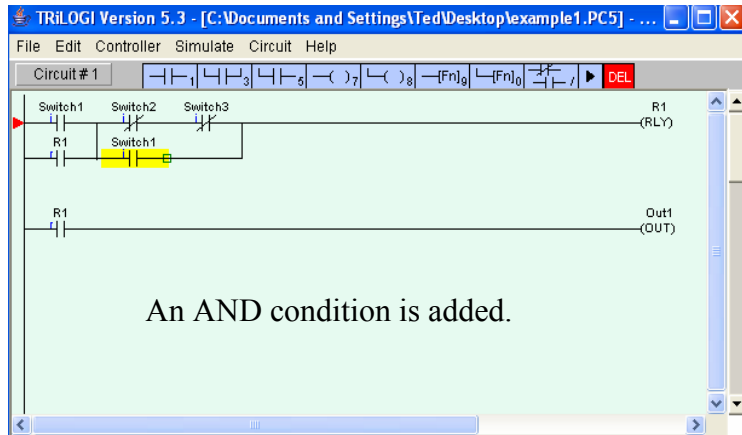
Close the OR Logic



The screenshot shows the same TRILOGI software interface as the previous slide. The ladder diagram is identical, but the OR logic between Switch2 and Switch3 is now closed. The software's menu bar and status bar are the same as in the previous slide. The status bar at the bottom right shows the page number 38.

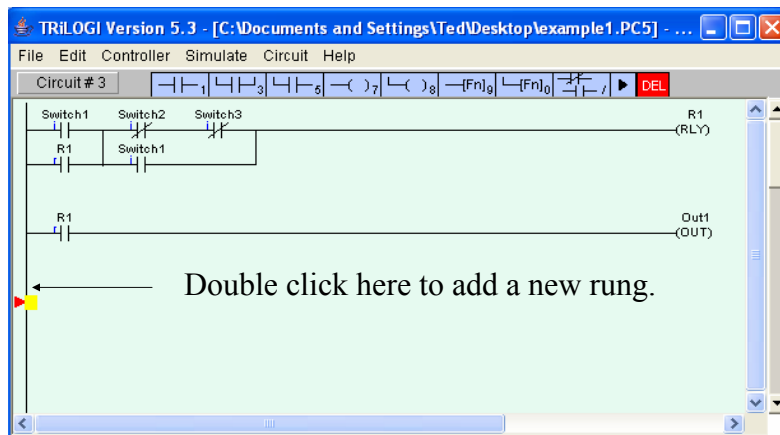
Click the contact to close, then, click element 5.

New Element Complete



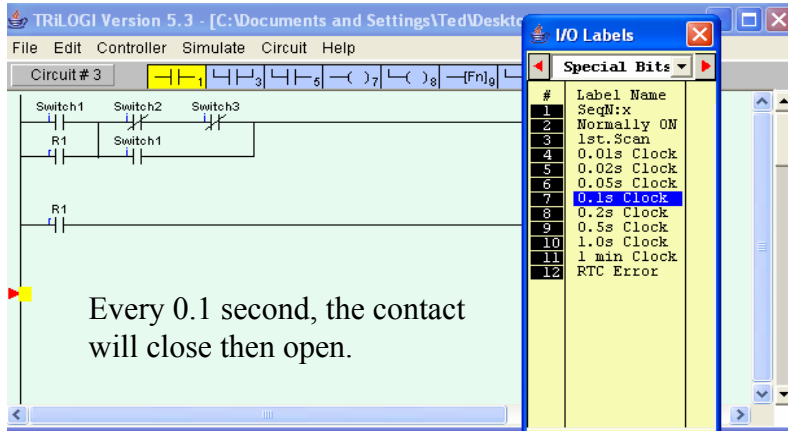
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Insert Custom Function



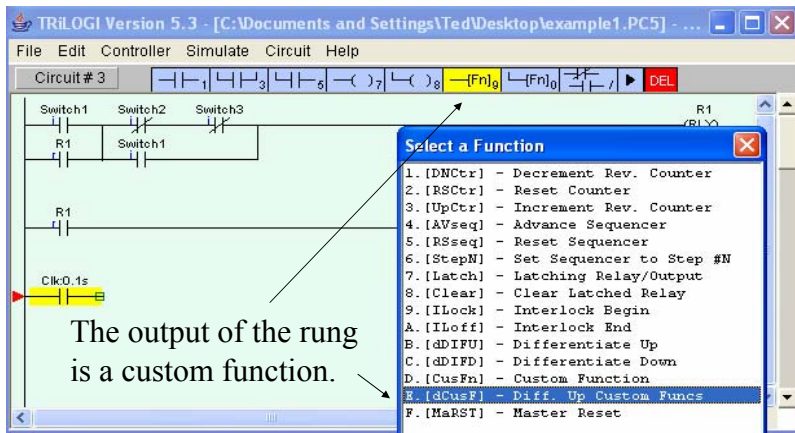
40

Add a Special Bit 0.1s Pulse



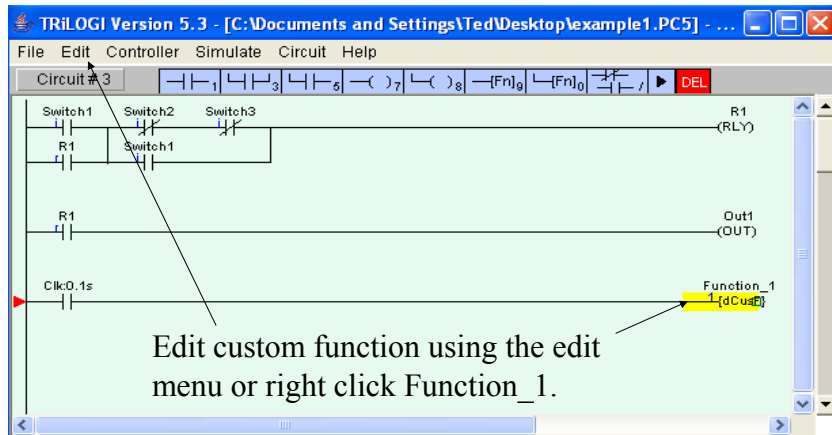
41

Select Custom Function



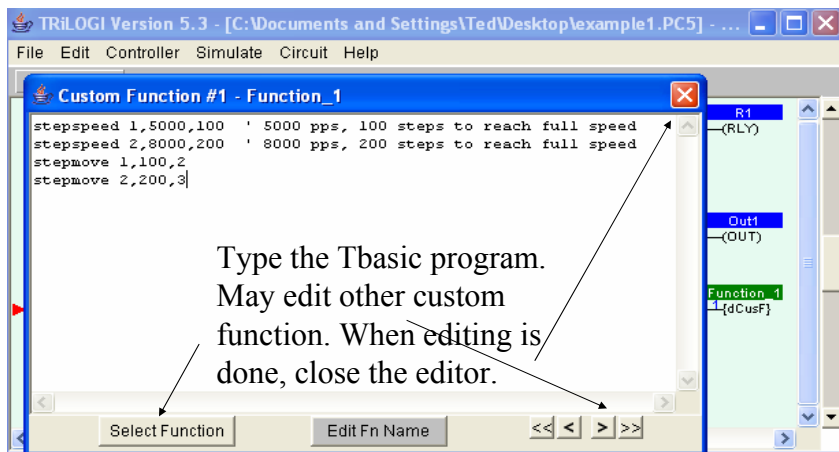
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Select Delta Custom Function 1



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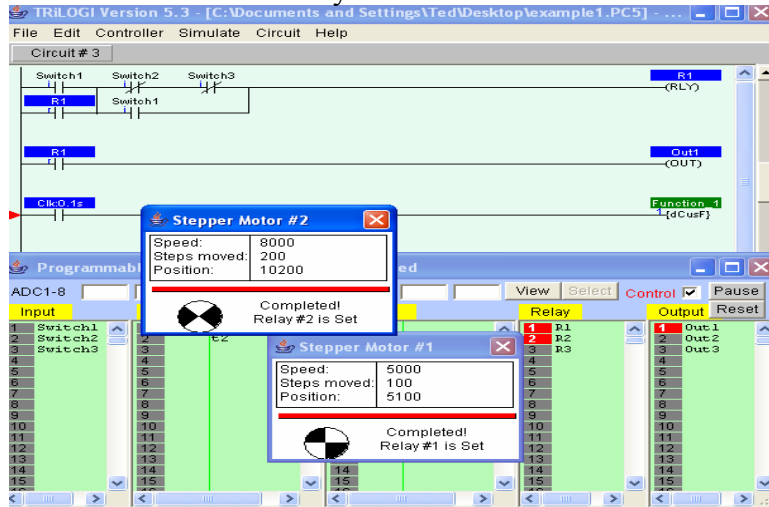
Edit Custom Function



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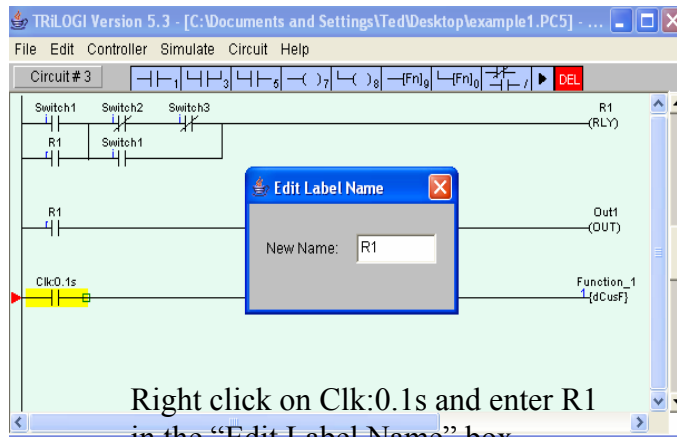
Simulate the Program

This program will run two stepper motors continuously. Since the function is called every 0.1 second.



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Replace the Clock with R1



Right click on Clk:0.1s and enter R1 in the "Edit Label Name" box.

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Simulate the Modified Program

TRILOGI Version 5.3 - [C:\Documents and Settings\Ted\Desktop\example1.PC5] - ...

File Edit Controller Simulate Circuit Help

Circuit # 3

Stepper Motor #2

Speed:	8000
Steps moved:	200
Position:	200

Completed! Relay #3 is Set

Stepper Motor #1

Speed:	5000
Steps moved:	100
Position:	100

Completed! Relay #2 is Set

Programmable Logic Simulator Fn #1 Executed

ADC1-8	Input	Timer	Counter	Relay	Output	Reset
1	Switch1	T1		1 R1	1 Out 1	
2	Switch2	t2		2 R2	2 Out 2	
3	Switch3			3 R3	3 Out 3	
4				4	4	
5				5	5	
6				6	6	
7				7	7	
8				8	8	
9				9	9	
10				10	10	
11				11	11	
12				12	12	
13				13	13	
14				14	14	
15				15	15	