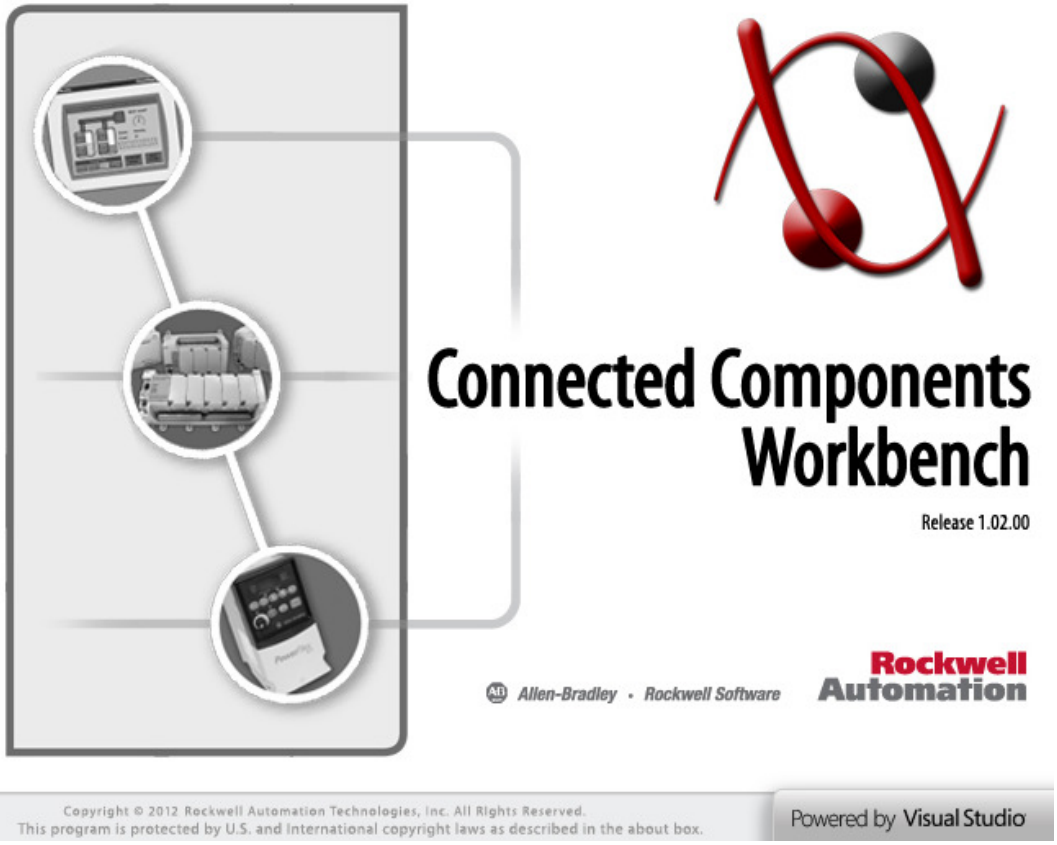
Micro800™ and Connected Components Workbench™

Getting Started Guide



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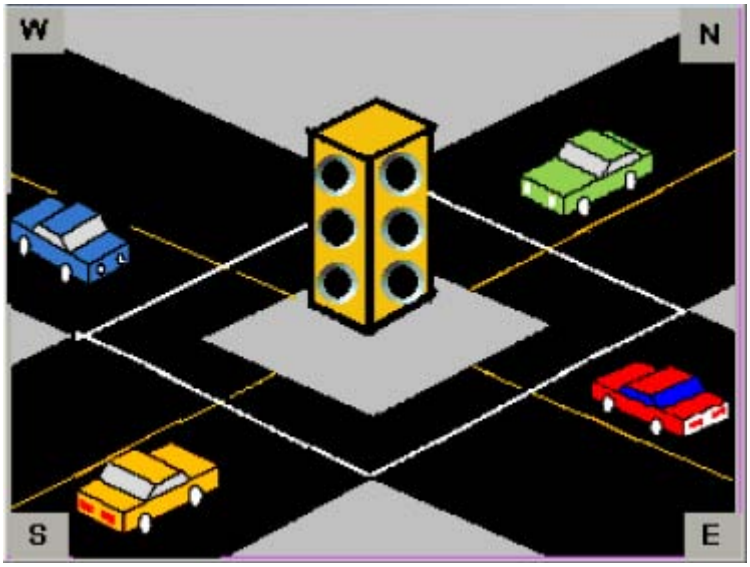
Introduction

In this document you will learn the basic Micro800 and CCW functions by creating a working “Traffic Light” project. The Traffic Light project is a four way intersection control program that monitors traffic flow with car sensors. You will need the software and hardware specified below.



Requirements

Hardware Requirements:

Micro810, 2080-LC10-12QWB.

Micro830, 2080-LC30-16QWB

Standard USB Cable

Software Requirements:

Connected Components Workbench (CCW), Release 1.01 and higher

RSLinx, v 2.57 and higher

Chapter 1 –
CCW Software Requirements and Installing the Software

Hardware & Software Versions Used

Software Requirements

Connected Components Workbench software has been successfully tested with the following operating systems versions and service packs:

Operating system compatibility
Microsoft® Windows® XP® SP3 or later (except Home editions)
Microsoft Windows Vista® SP2 or later
Microsoft Windows 7®

Hardware requirements

To use Connected Components Workbench effectively, your personal computer must meet the following hardware requirements:

Component	Minimum requirement	Recommended
Processor	Pentium 3 or better	Pentium 4 or better
RAM Memory	512 MB	1.0 GB
Hard Disk Space	3.0 GB free	4.0 GB free
Optical Drive	DVD-ROM	DVD-ROM
Pointing Device	Any Windows-compatible pointing device	Any Windows-compatible pointing device

Installing the CCW Software (Standard Version)

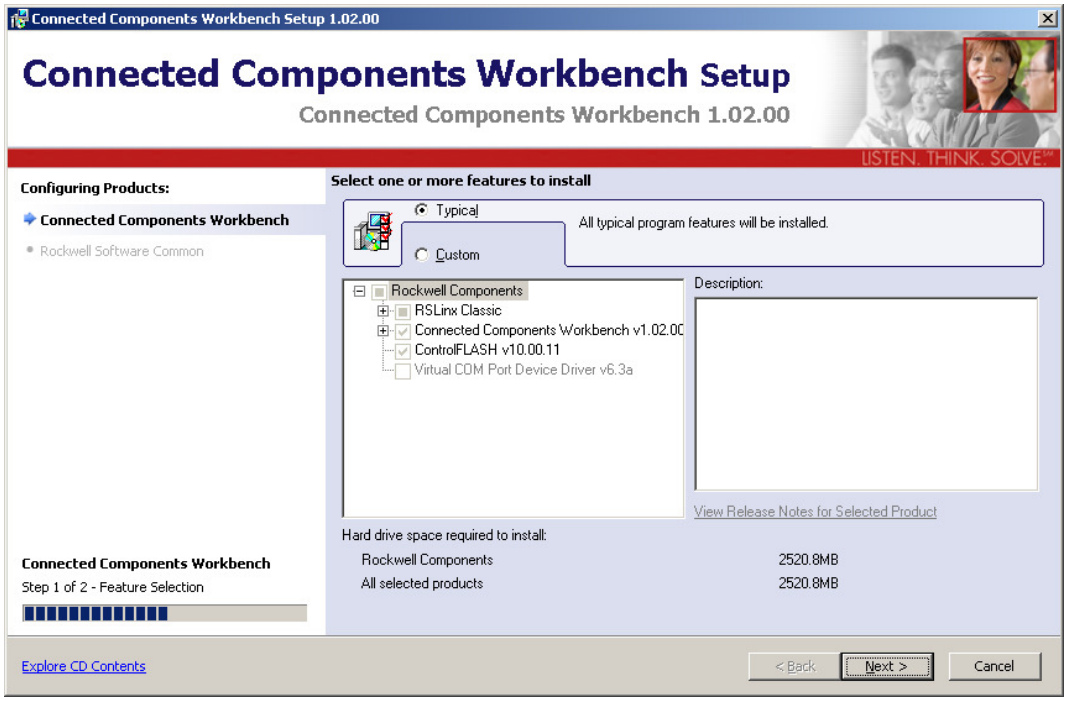
This chapter will show you how to install the CCW software standard version.

1. Insert the Connected Component Workbench (CCW) DVD-ROM.
   In case the software doesn't launch automatically. Explore the content of the CD and double click on the **Connected Components Workbench Setup** icon 

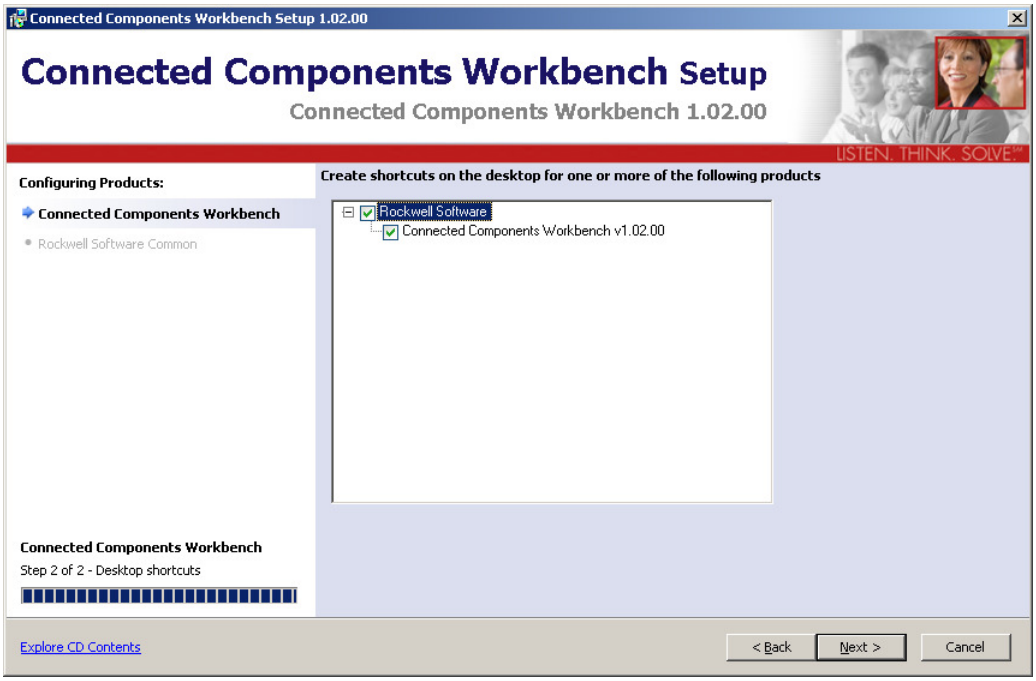
   .

2. Once CCW setup wizard is launched, follow through the setup instruction. Select setup language and click **Continue.**.

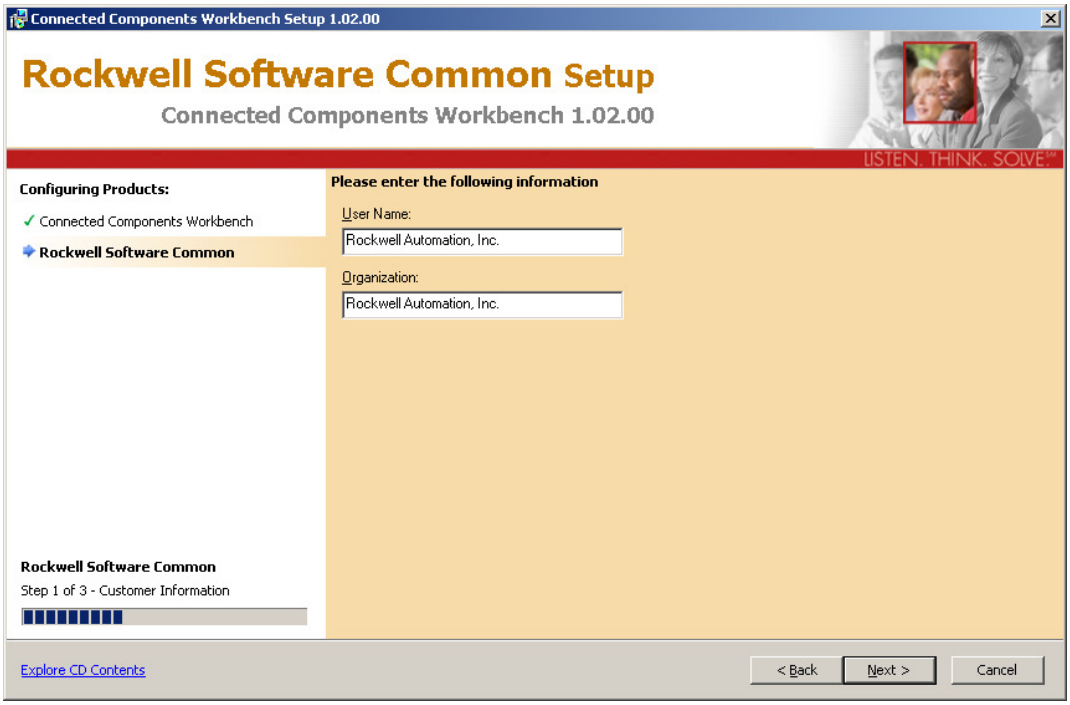
3. Select the type of installation (typical installation recommended) and click **Next.**



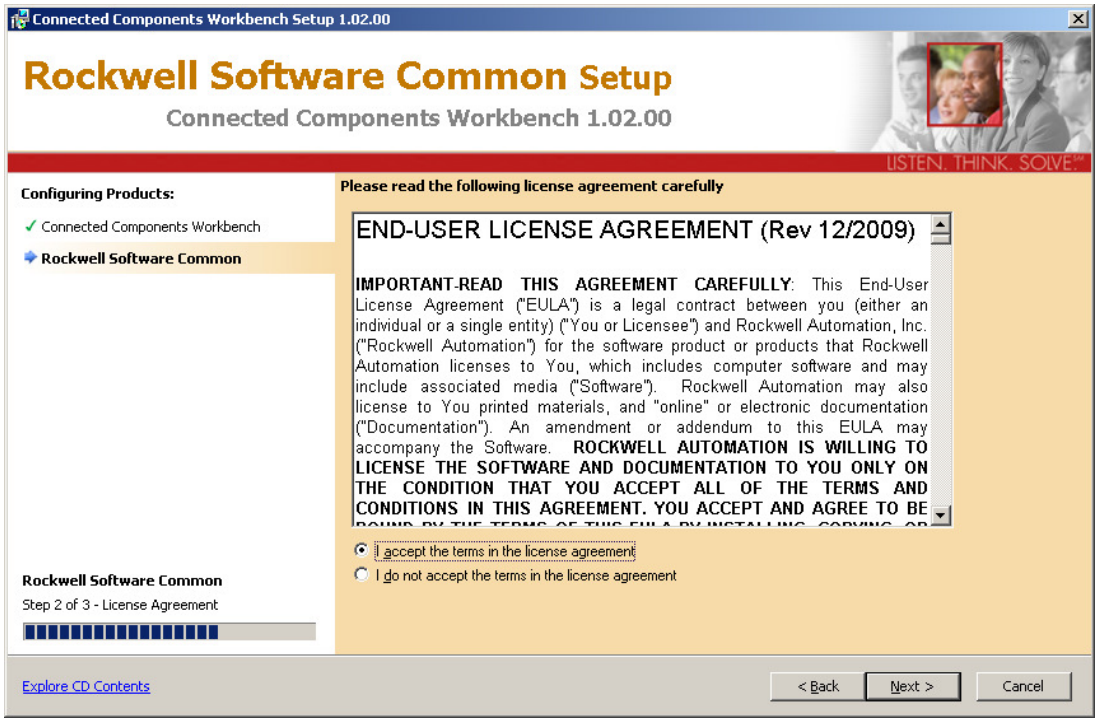
4. Check the boxes to create shortcuts on desktop and then click **Next.**



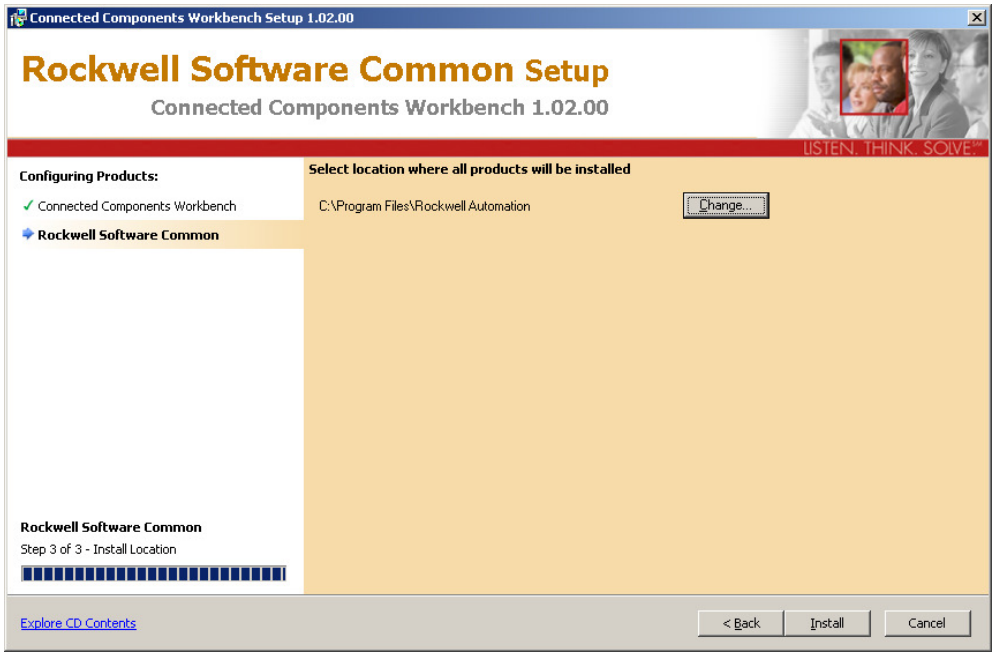
5. Enter customer information in the fields and then click **Next.**



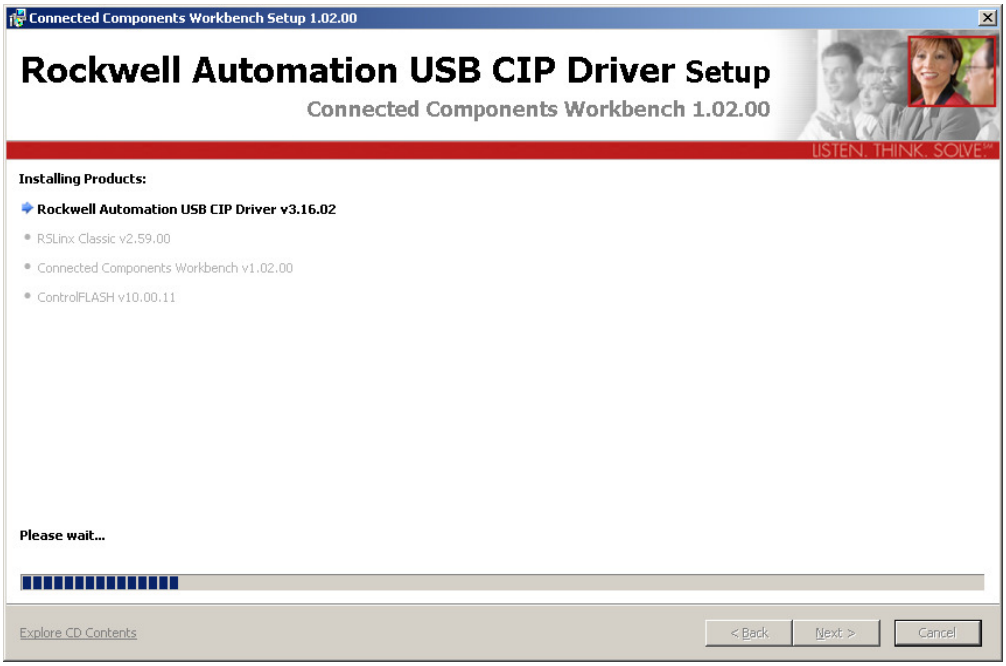
6. Review the terms in the license agreement. Accept and click **Next.**



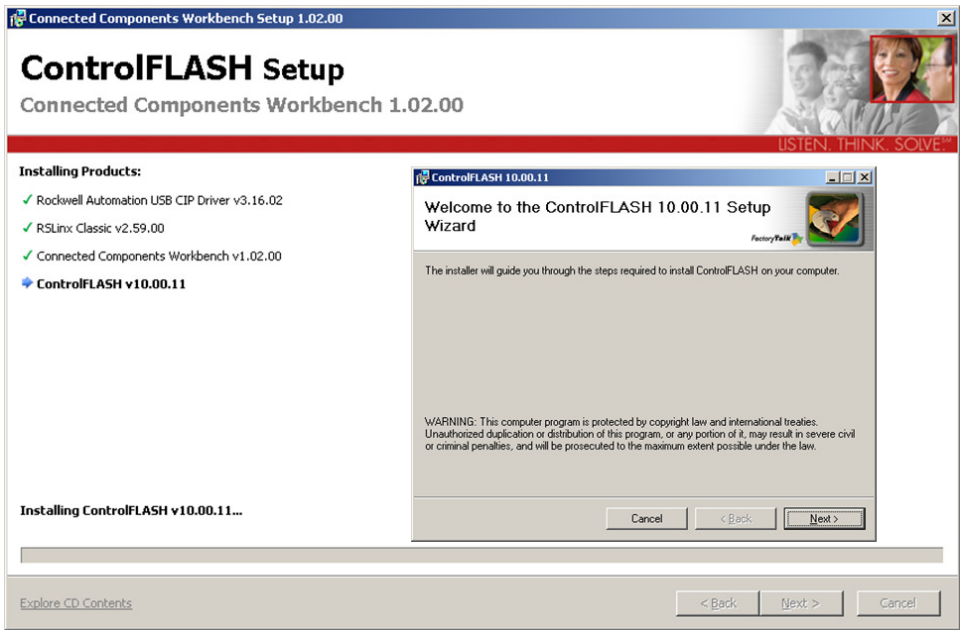
7. Use default installation location or change it by clicking **Change.** Once installation location is defined, click **Install.** Full installation process may take up to 2 hours.



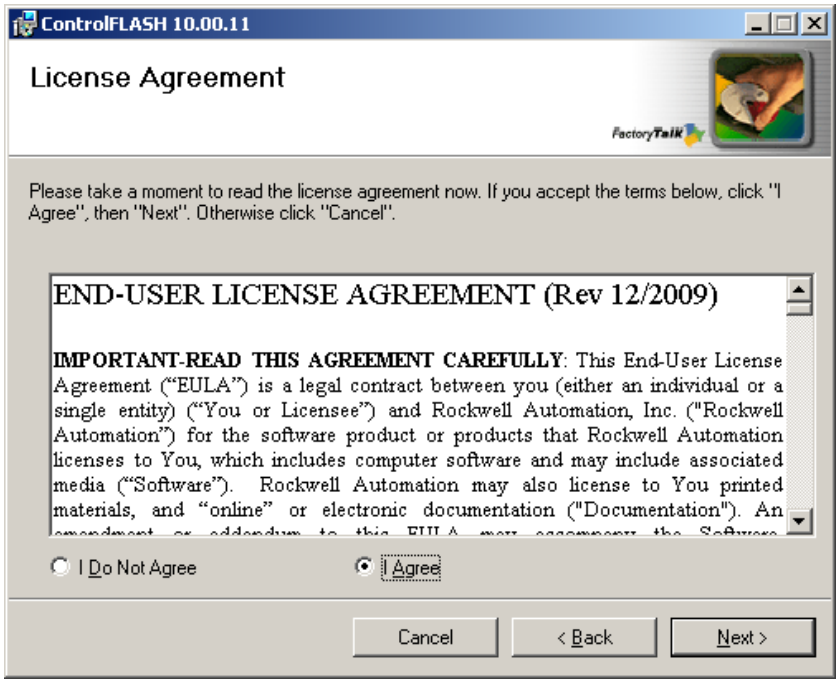
8. Installation in progress, the whole process may take up to 2 hours. If this is a new installation, it will go through all four sections shown below.



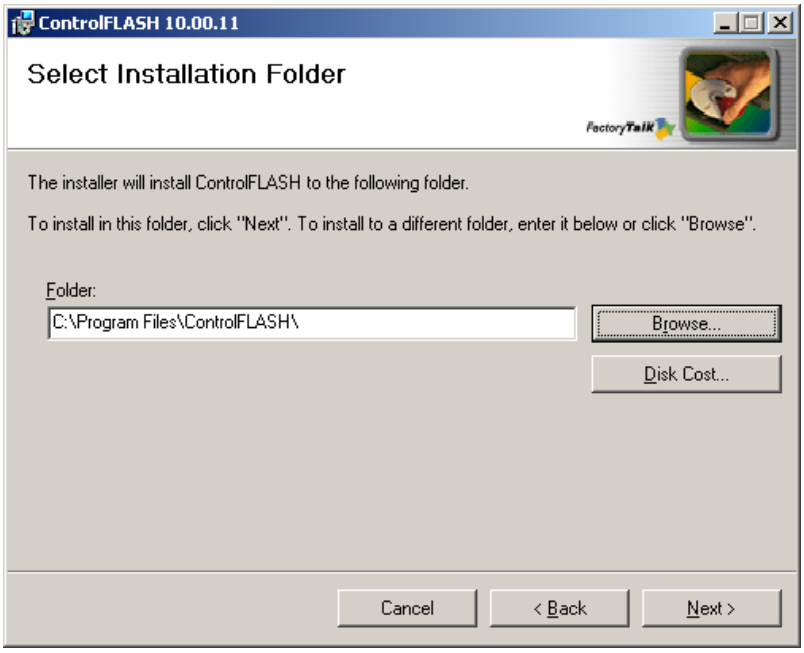
9. It is recommended to install ControlFLASH v10.00.11. This is necessary for downloading firmware. To install ControlFLASH, click **Next.**



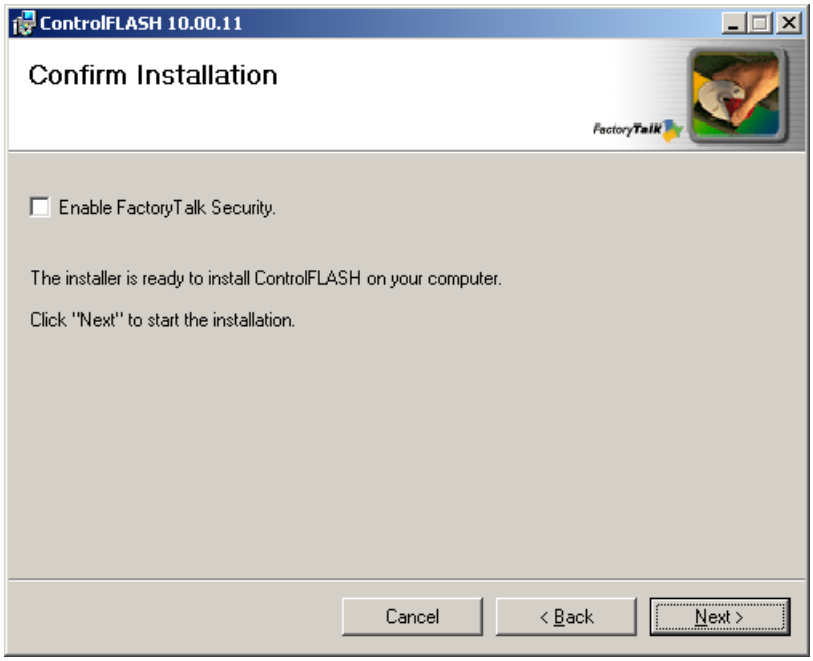
10. Review terms in the license agreement. **Select** “I Agree” and click **Next.**



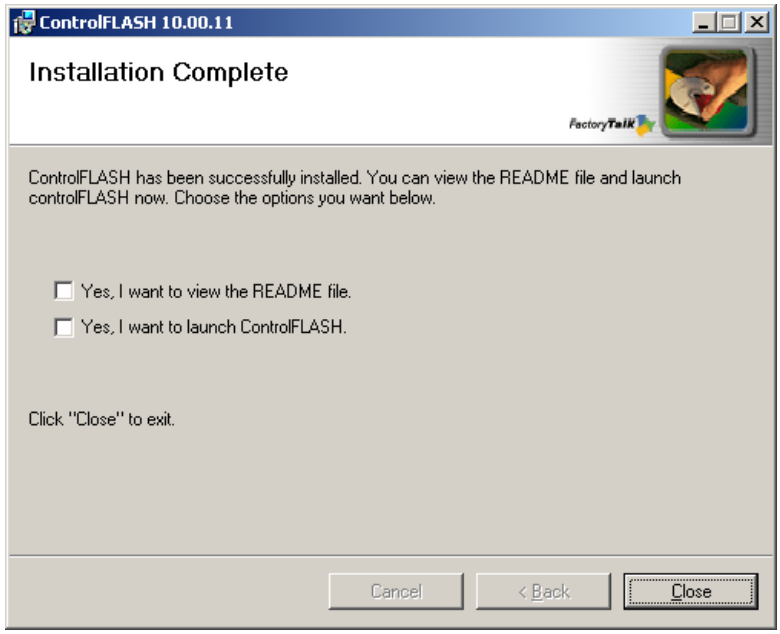
11. Use default installation location or change it by clicking **Browse**. Click **Next** to continue.



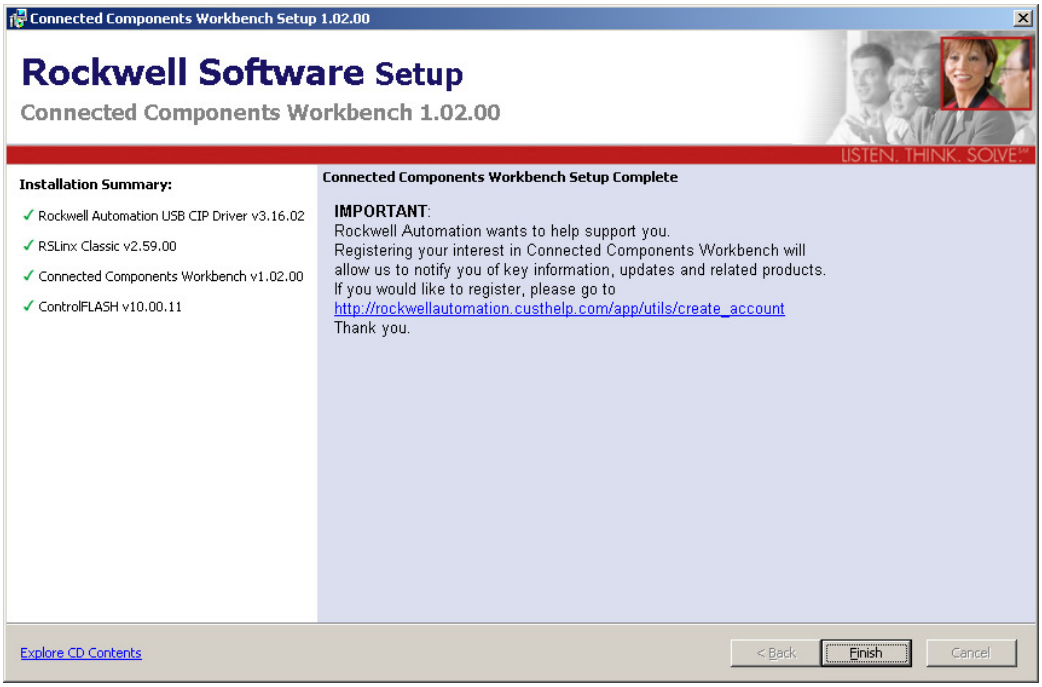
12. For new users, it is not recommended to check “Enable FactoryTalk Security”. Click **Next** to continue installation.



13. Once Installation is complete, click **Close.** It is not necessary to launch ControlFLASH at the moment.



14. Installation is now complete for CCW (V1.02). Click **Finish.**



Chapter 2 –
Creating a New CCW Project

Creating a New CCW Project

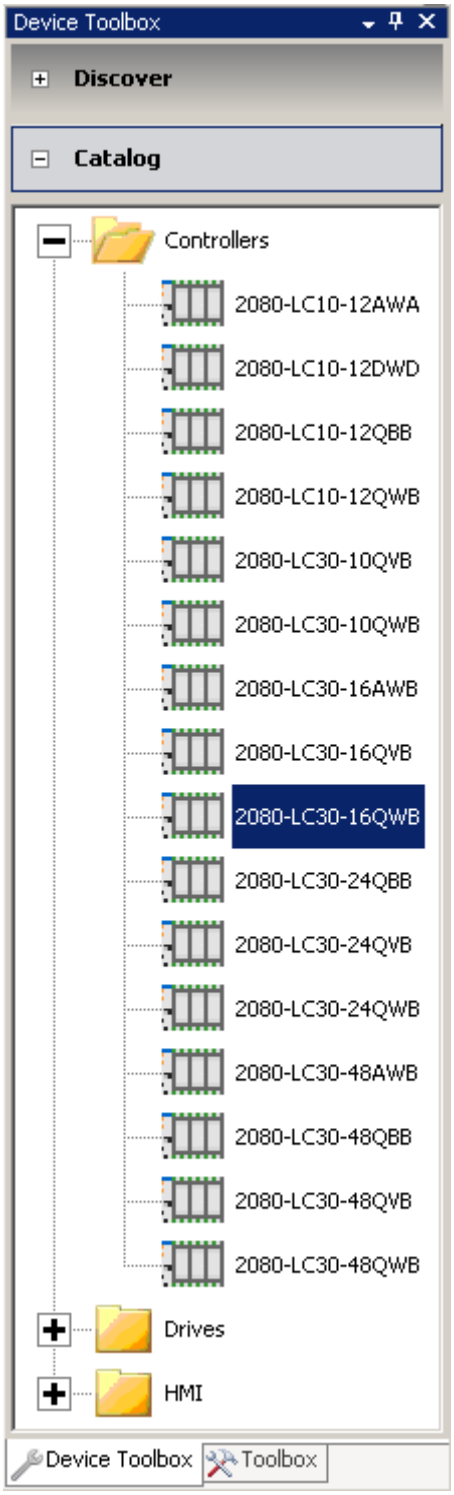
This chapter will show you how to create a new CCW project.

1. Start by opening the Connected Components Workbench software.

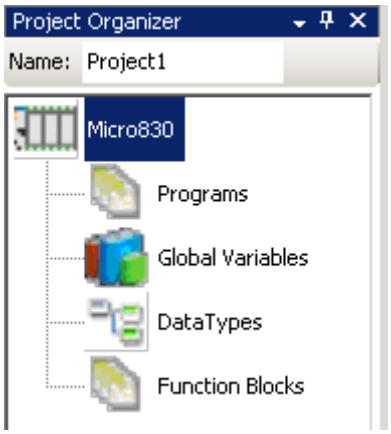
   Double click on the **Connected Components Workbench** icon 

   or from the **Start** menu, select **Programs > Rockwell Automation > CCW > Connected Components Workbench.**

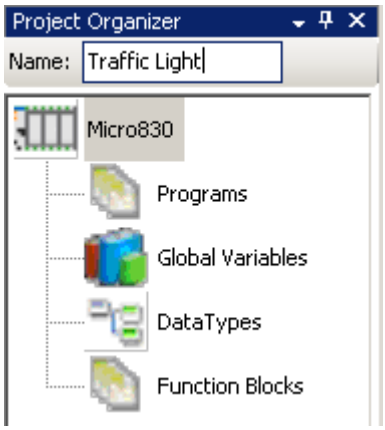
2. Begin a new project by clicking on **Catalog** and expanding the **Controllers** folder in the **Device Toolbox**, which is located on the right-hand side of the Workbench screen. Double click on a Controller. For this example we will select the **2080-LC30-16QWB**.



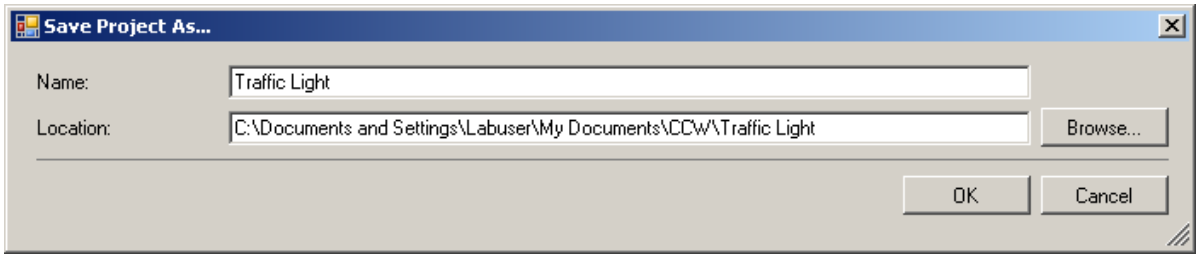
3. A new Micro830 project based on this controller has now been created. The Micro830 should show up in the **Project Organizer** on the left-hand side of the Workbench screen.



4. You can Change the **Name** for the project on top of the **Project Organizer.** For this example we will use, Traffic Light.



5. Select **File→Save Project as....** In the “Save Project As…” box, type in the **Name** and **define** save location then click **OK.** A file with the assigned name will be created at the defined location.

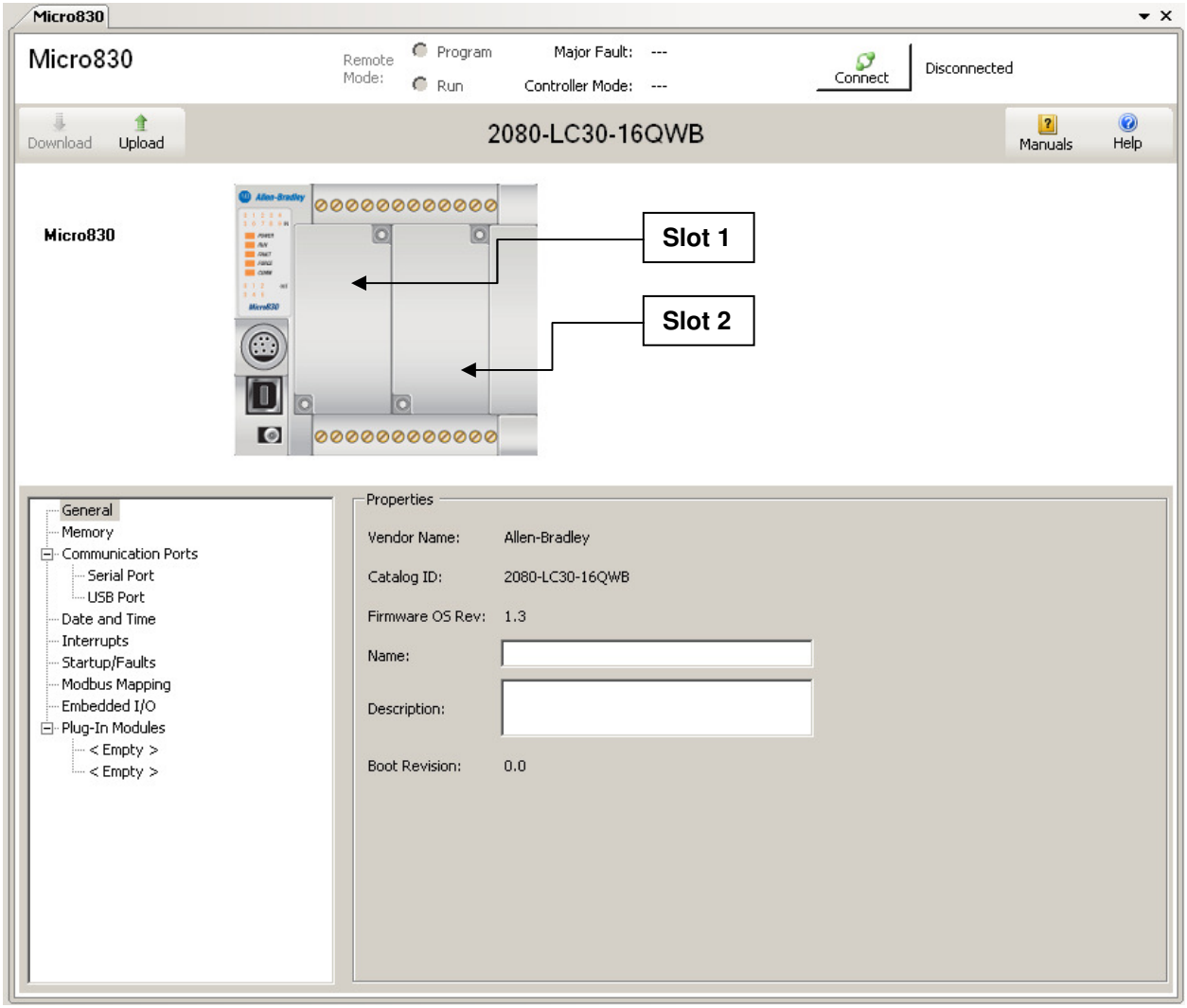


Chapter 3 –
Configuring Controller Plug-in Modules

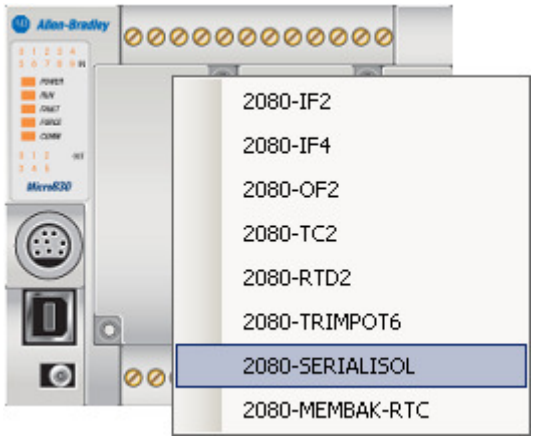
Configuring Controller Plug-ins

This chapter will show you two examples of plug-ins and how they are configured in the controller.

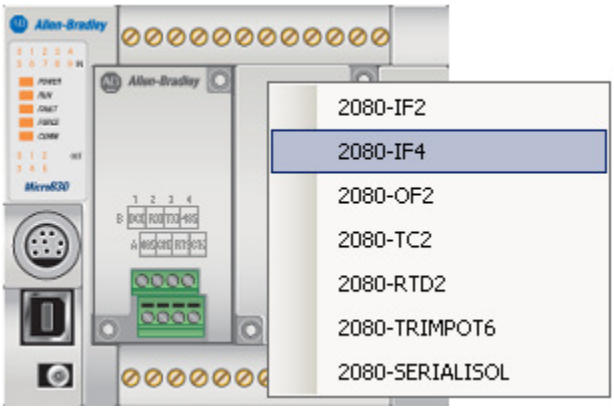
1. To configure the controller plug-ins, double click on the Micro830 icon in the **Project Organizer** to bring up the following screen:



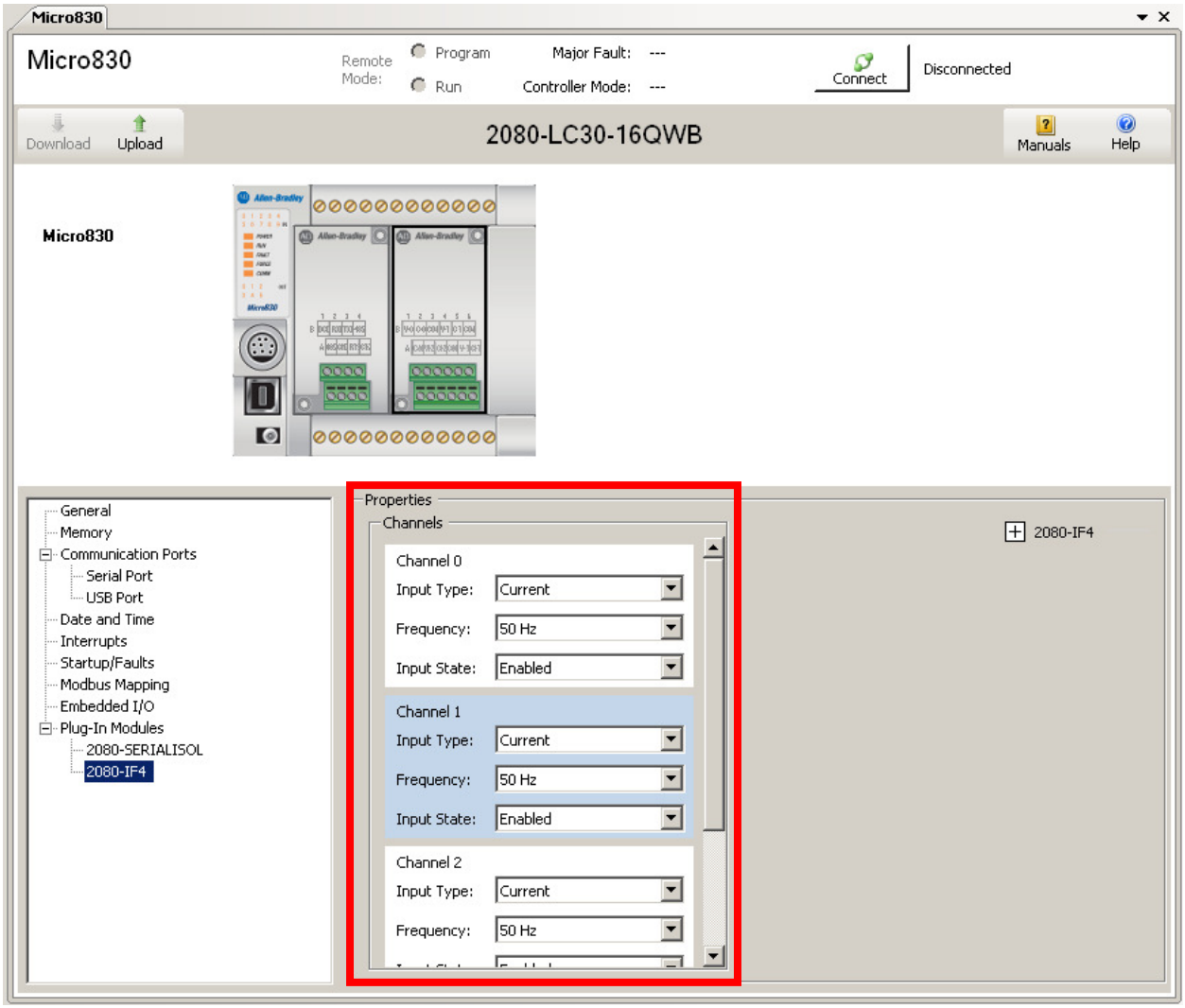
2. Assuming Plug-in slot 1 has an isolated serial port module installed in it. Right click on the graphic of the first plug-in slot and select **2080-SERIALISOL**.



3. Assuming Plug-in slot 2 has 4-channel analog input module installed in it. Right click on the graphic of the second plug-in slot and select **2080-IF4**.

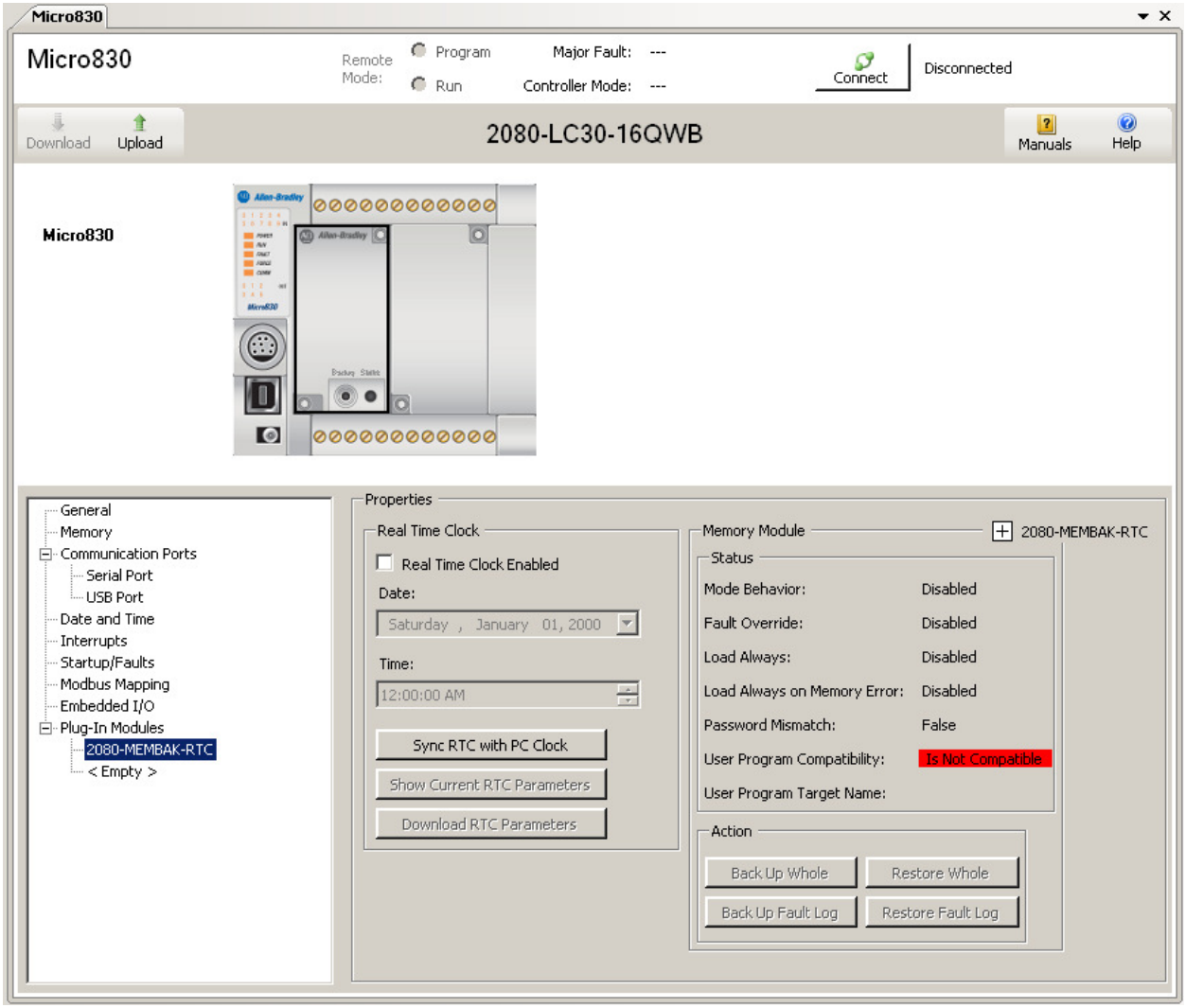


4. Notice that the Micro830 graphic changes to show the installed plug-ins. Now, if you needed to change the **Channel 0 Input Type** for the analog input module, just select under **Properties** from either **Current** or **Voltage** as well as the ability to change the **Frequency** and **Input State**.



5. In the event that an RTC module needs to be configured, repeat step 2, but select the **2080-MEMBAK-RTC** and the screen should look similar to the following.

   Note: RTC Plug-ins *2080-MEMBAK-RTC* can ONLY be in slot 1 of the Micro830.



6. For more information on available plug-ins refer to:

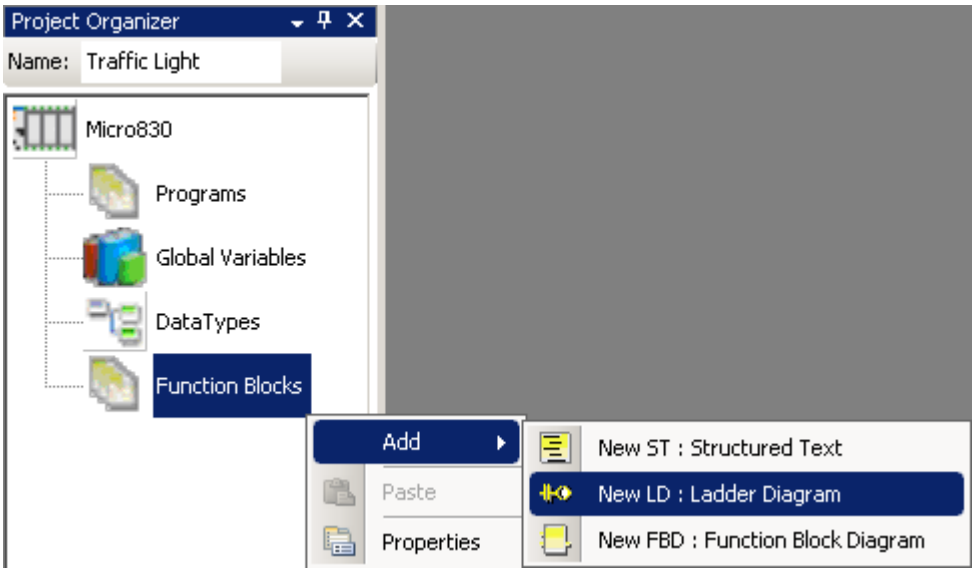
   http://ab.rockwellautomation.com/Programmable-Controllers/Micro800-Plugin-Modules

Chapter 4 –
Creating a User Defined Function Block (UDFB)

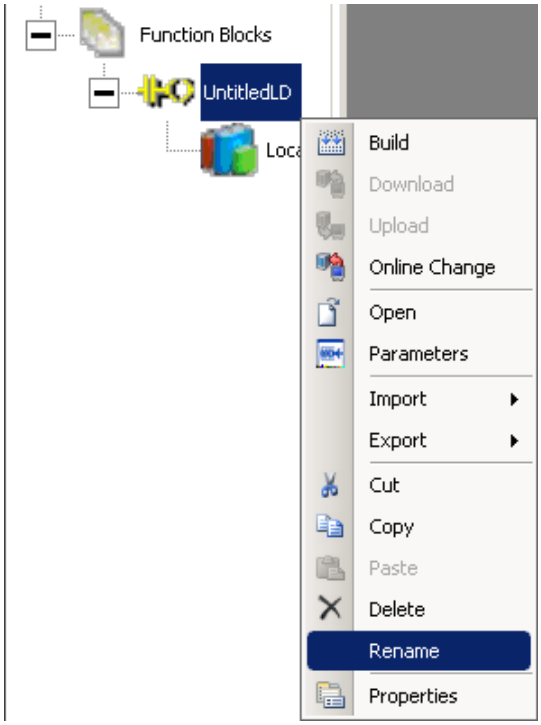
Creating a User Defined Function Block (UDFB)

This chapter will show you how to create a User Defined Function Block for controlling a Traffic Light. User Defined Function Blocks are not required for every project but can be used to capture repetitive code for easy re-use throughout your project.

1. Under **Project Organizer**, right click on **Function Blocks**, select **Add** and select **New LD : Ladder Diagram**.



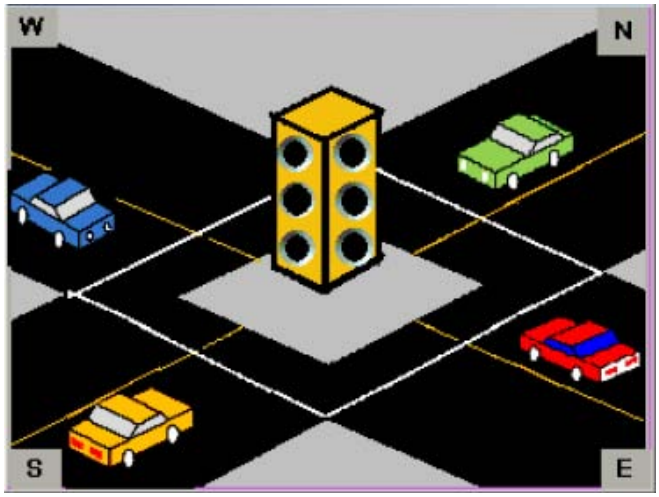
2. Right click on **UntitledLD** and select **Rename**.



3. Type **TRAFFIC_CONTROLLER_FB** (the name given to the Ladder Diagram file will be the name of the UDFB) and Enter.

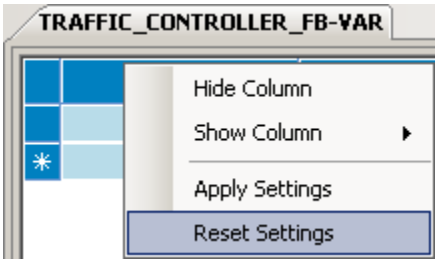
4. The general Traffic Controller algorithm for the function block to be implemented in the ladder diagram program is as follows:

   If the traffic light over at **North (N)** and **South (S)** is **red** and a car is waiting at **either side** of the road for **5 seconds**, the lights over at **East (E)** and **West (W)** change from **green to yellow**, **hold for 2 seconds** and then it change from **yellow to red**. As the lights at **East (E)** and **West (W)** change to **red**, lights over at **North (N)** and **South (S)** change to **green**.



5. The most important thing to define up front when creating a UDFB is what inputs are required, and what outputs will be produced, by this function block. These inputs and outputs are defined in the function block's **Local Variables**. Therefore, under **TRAFFIC_CONTROLLER_FB**, double click on **Local Variables**.

6. Right click on the top row and select **Reset Settings** so all of the necessary columns are displayed.

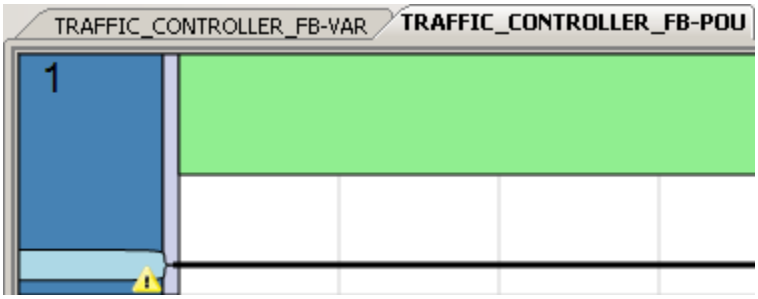


7. For this UDFB, we need four Boolean inputs (for a car sensor in each of the four positions in the intersection) and six Boolean outputs (for red, yellow and green lights in each of the two directions). The inputs are entered in with **Direction VarInput** and the outputs are entered in with **Direction VarOutput**. Enter in the variables with the **Names**, **Data Types** and **Directions** as shown.

TRAFFIC_CONTROLLER_FB-VAR

Name	Data Type	Dimension	Alias	Comment	Initial Value	Direction
N_CAR_SENSOR	BOOL					VarInput
S_CAR_SENSOR	BOOL					VarInput
E_CAR_SENSOR	BOOL					VarInput
W_CAR_SENSOR	BOOL					VarInput
NS_RED_LIGHTS	BOOL					VarOutput
NS_YELLOW_LIGHTS	BOOL					VarOutput
NS_GREEN_LIGHTS	BOOL					VarOutput
EW_RED_LIGHTS	BOOL					VarOutput
EW_YELLOW_LIGHTS	BOOL					VarOutput
EW_GREEN_LIGHTS	BOOL					VarOutput

8. Double click on **TRAFFIC_CONTROLLER_FB** to begin editing the ladder logic program.



9. We want the first rung to work as follows:

   If:

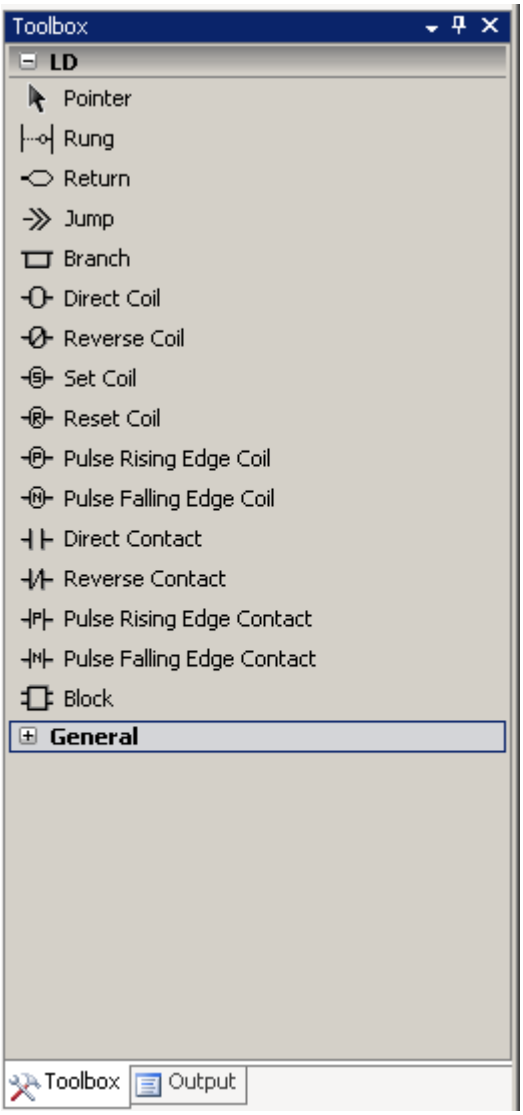
   the North/South Red Lights and East/West Green Lights are on, and

   a car trips either the North Sensor or the South Sensor for at least five seconds,

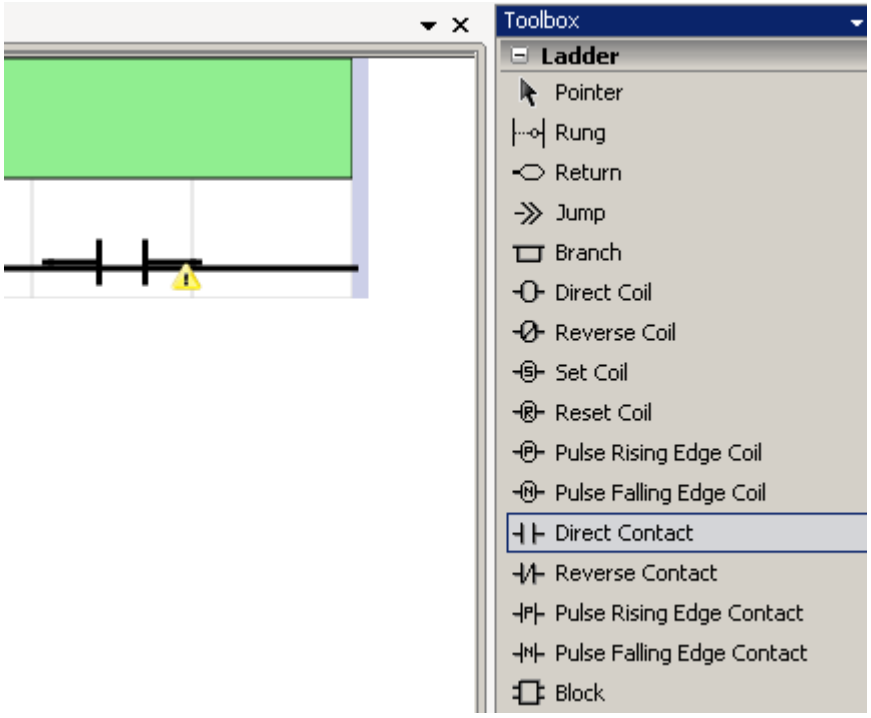
   Then:

   change the East/West Lights from Green to Yellow.

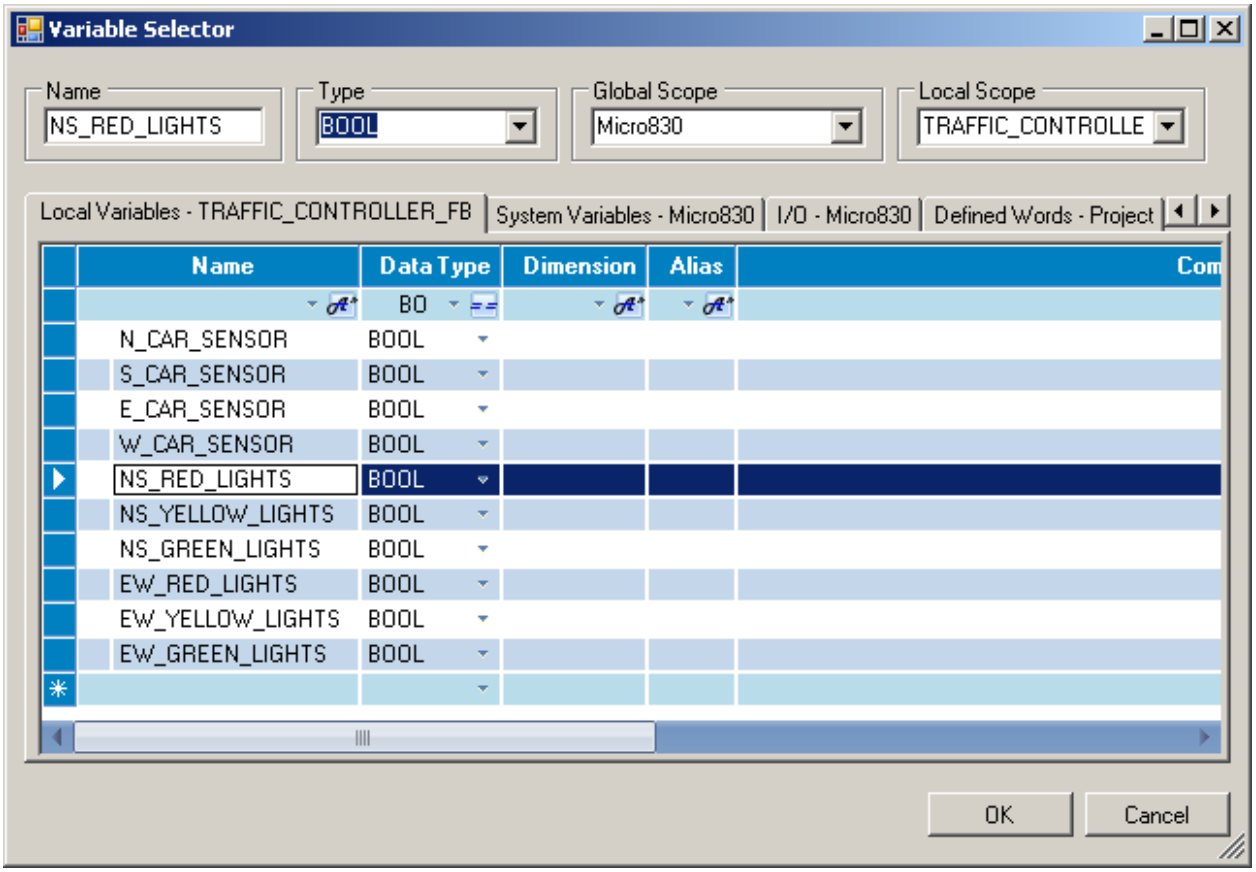
10. Click on the **Toolbox** tab in the lower right-hand corner and click on the **+** in front of **LD** to list the available ladder instructions.



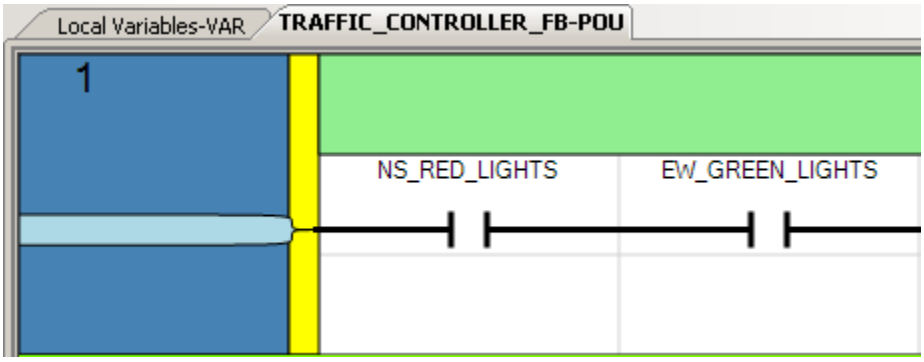
11. To implement the first bullet, we need two **Direct Contacts** in series (since the logic is North/South Red Lights *AND* East/West Green Lights). Click and drag a **Direct Contact** instruction from the **Toolbox** to the rung and release.



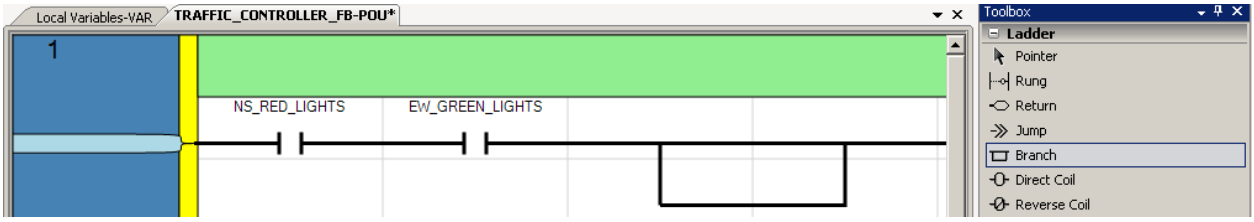
12. When you release the mouse button, the **Variable Selector** screen appears. Select **NS_RED_LIGHTS** and click **OK**.



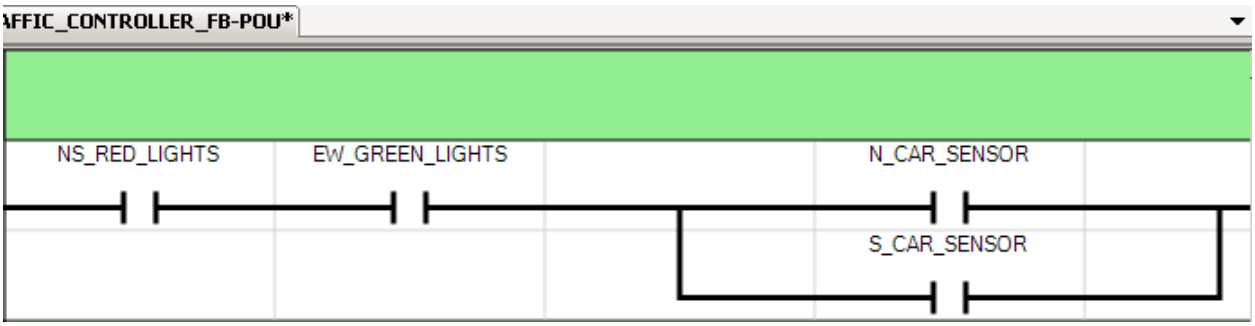
13. Similarly, add a second **Direct Contact** and assign **EW_GREEN_LIGHTS** to this contact. So far, your rung should look like this.



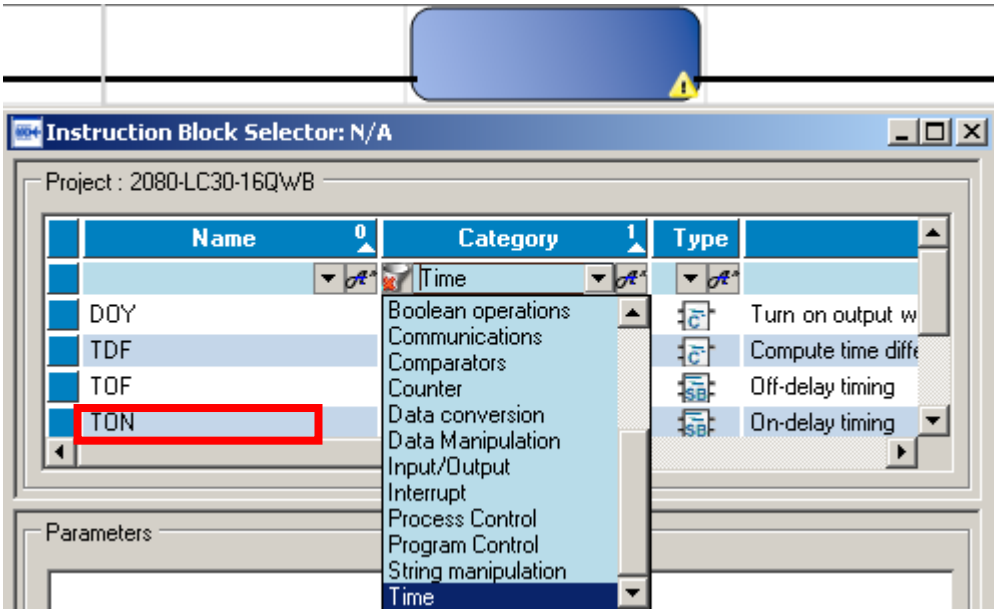
14. To implement the second bullet, we need two **Direct Contacts** in parallel (since it's North Car Sensor *OR* South Car Sensor). First, click and drag a **Branch** from the **Toolbox** to the end of the rung and release.



15. Click and drag a **Direct Contact** instruction from the **Toolbox** to the upper branch and release. Assign variable **N_CAR_SENSOR** to this contact. Then, click and drag a **Direct Contact** instruction from the **Toolbox** to the lower branch and release. Assign variable **S_CAR_SENSOR** to this contact. Now your rung should look like this.



16. Next we need a 5 sec delay, so click and drag a **Block** instruction from the Toolbox to the right of the branch and release. The **Instruction Block Selector** screen appears. Under the **Category** column, select **Time** to list all the Time-based instructions. Select TON for On-delay timing and click OK.

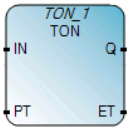


17. Click on the **TON** block and hit the **F1** key to bring up context-sensitive help in order to get an explanation of the block inputs and outputs.

TON

Description:

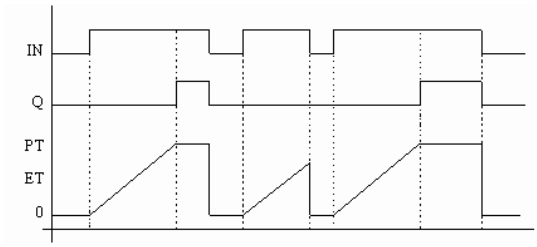
Increase an internal timer up to a given value.



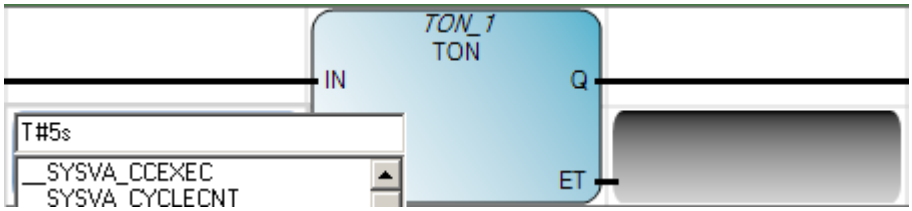
Arguments:

Parameter	Parameter Type	Data Type	Description
IN	Input	BOOL	If rising edge, starts increasing internal timer. If falling edge, stops and resets internal timer.
PT	Input	TIME	Maximum programmed time. See Time data type.
Q	Output	BOOL	If TRUE, programmed time is elapsed.
ET	Output	TIME	Current elapsed time. Possible values range from 0ms to 1193h2m47s294ms. **Note:** If you use the EN parameter with this block, the timer starts incrementing when EN is set to TRUE, and continues to increment even if EN is set to FALSE. See Time data type.

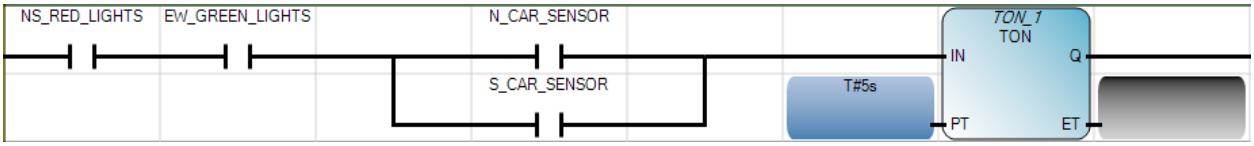
Timing diagram:



18. Click on the top of the **PT** input block and enter in a programmed/preset time of “T#5s” (for a time format of 5 seconds) as shown below and press enter key.

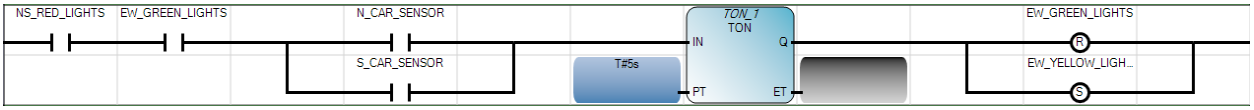


Now your rung should look like this:



19. To implement the last bullet, we need two **Coils** in parallel (since we need to turn off the East/West green lights *AND* turn on the East/West yellow lights). First, click and drag a **Branch** from the **Toolbox** to the end of the rung and release.

20. Click and drag a **Reset Coil** instruction from the **Toolbox** to the upper branch and release. Assign variable **EW_GREEN_LIGHTS** to this coil (this will turn off the East/West green lights). Then, click and drag a **Set Coil** instruction from the **Toolbox** to the lower branch and release. Assign variable **EW_YELLOW_LIGHTS** to this coil (this will turn on the East/West yellow lights). Now your completed rung should look like this.



21. Now document the rung by double clicking in the green block above the rung and entering in "If the North/South red lights and East/West green lights are on and a car trips either the North sensor or the South sensor for at least five seconds, then change the East/West lights from green to yellow."

22. We want the second rung to work as follows:

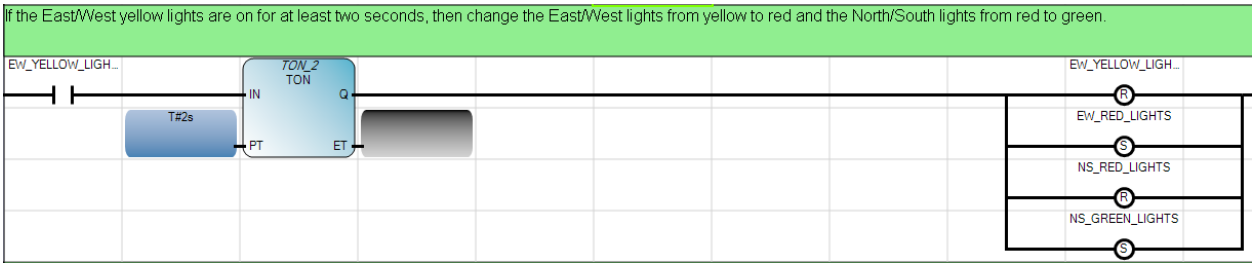
    If:

    the East/West Yellow Lights are on for at least two seconds,

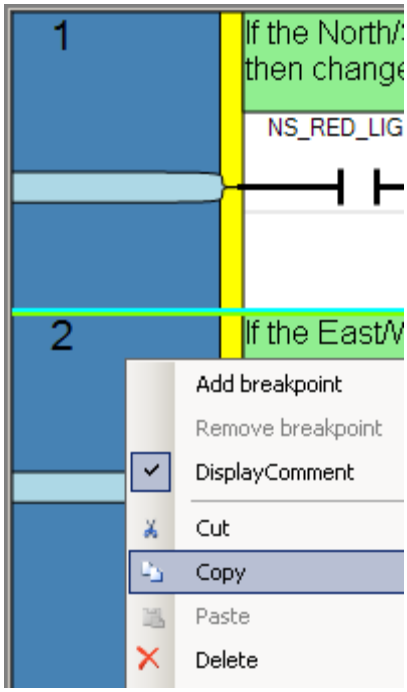
    Then:

    change the East/West Lights from Yellow to Red and the North/South Lights from Red to Green.

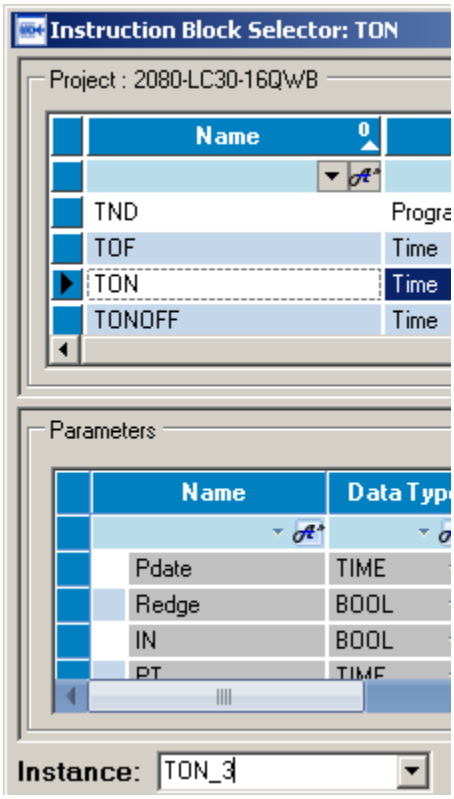
23. Enter in the second rung to look like the following.



24. The next two rungs have the same form as the first two rungs, so we will take advantage of cut and paste, then just edit the variable assignments for each instruction. Select the two rungs by clicking in the dark blue region to the left of rung 1, then hold the **Shift** key down and click in the dark blue region to the left of rung 2. Right click and select **Copy**.

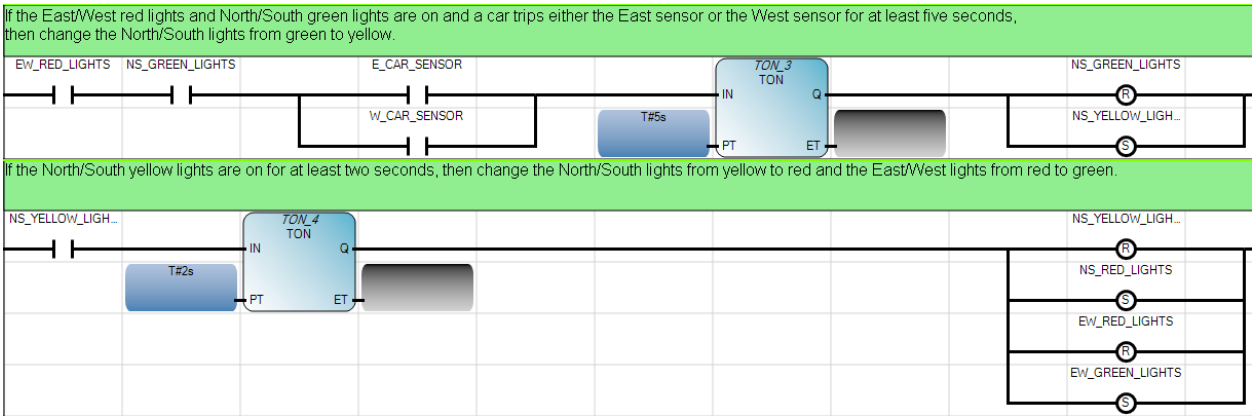


25. Now select just rung 1, then right click and **Paste**. The two rungs are inserted prior to the original two rungs. Double click on the **TON** in rung 3 and within the **Instruction Block Selector** screen, edit the **Instance** from **TON_1** to **TON_3** and click **OK**.



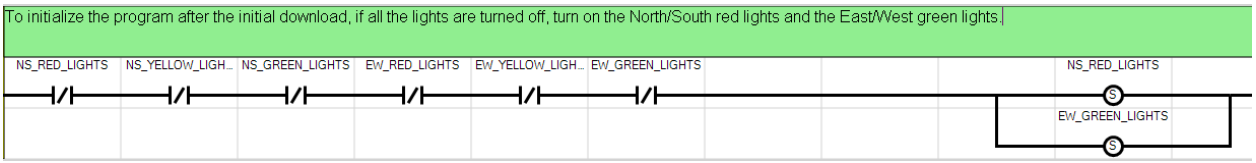
Similarly, change the **Instance** of the **TON** in rung 4 from **TON_2** to **TON_4**.

26. In rungs 3 and 4, change each **EW** variable to **NS** and each **NS** variable to **EW**, so that the rungs appear as follows (don't forget to modify the rung comments to match!).

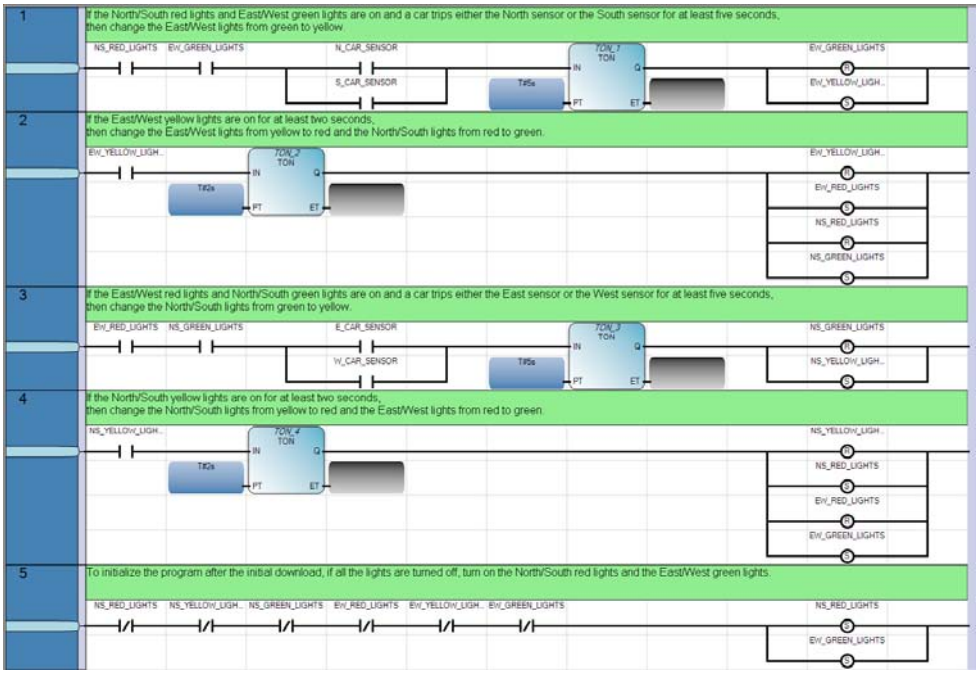


27. We need to add one more rung to handle “initial conditions”. When the program is first downloaded to the controller and run, none of the lights are initially turned on. This last rung will check for this condition (all lights off) and turn on the North/South red lights and the East/West green lights. Click and drag a **Rung** from the **Toolbox** to the white space below rung 4 and release. Click and drag six **Reverse Contacts** from the **Toolbox** onto the new rung and assign one **…LIGHTS** variable to each contact.

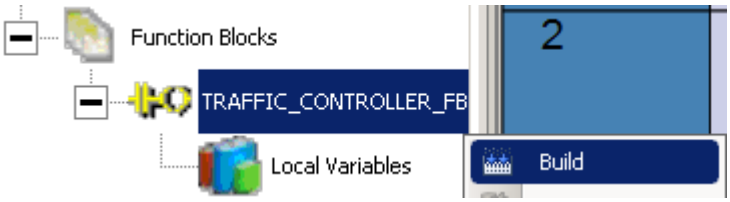
28. Next, add two **Set Coils** in parallel to turn on **NS_RED_LIGHTS** and **EW_GREEN_LIGHTS**. Complete rung 5 by documenting its operation.



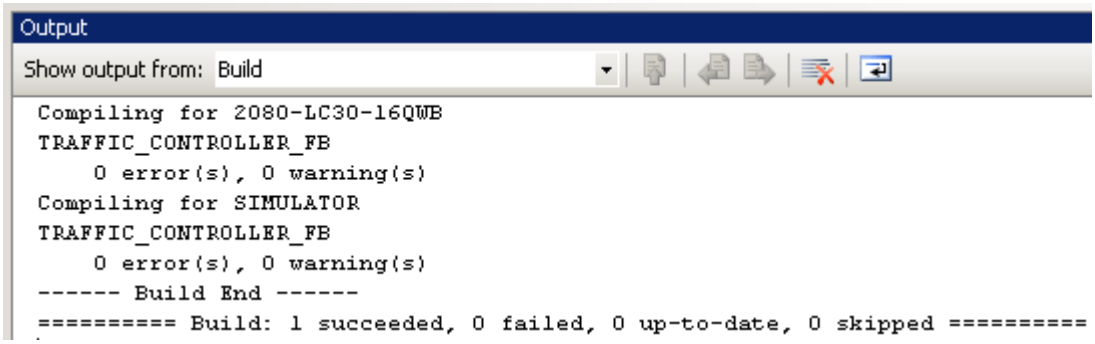
29. Finally, build and save the five-rung program.



Right click on **TRAFFIC_CONTROLLER_FB** in **Project Organizer** and select **Build**.



30. You should get verification in the **Output** window at the bottom center of the screen that the build succeeded.



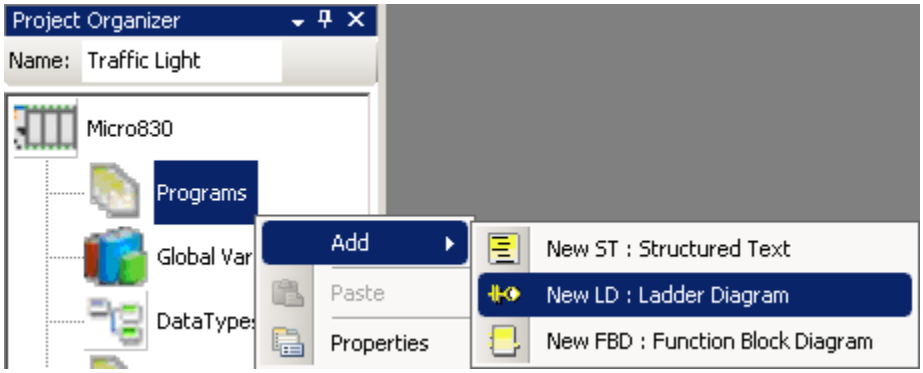
Click the Save icon to save your work.

Chapter 5 –
Creating a New Ladder Diagram Program

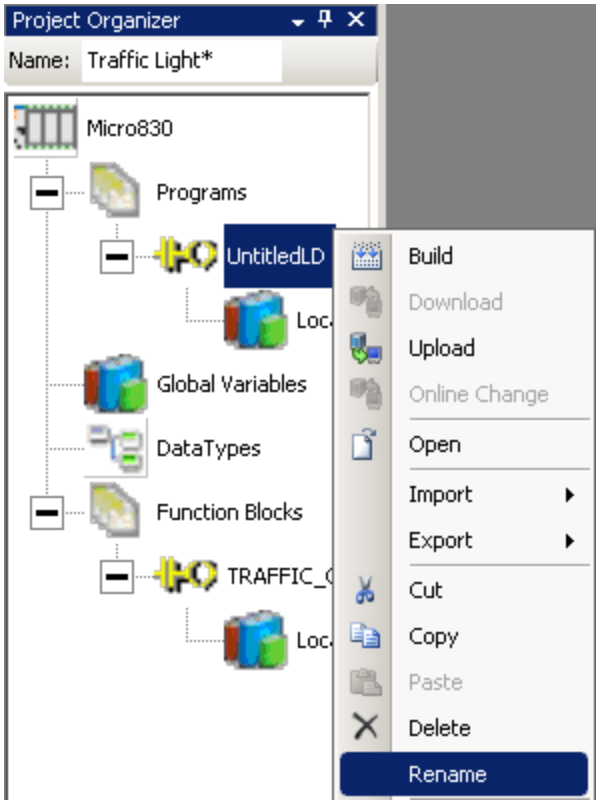
Creating a New Ladder Diagram Program

This chapter will show you how to create a new Ladder Diagram Program that uses the **TRAFFIC_CONTROLLER_FB** User Defined Function Block created in the previous chapter.

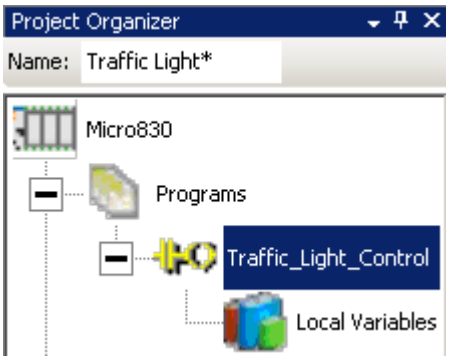
1. Under **Project Organizer**, right click on **Programs** select **Add** and select **New LD : Ladder Diagram**.



2. Right click on **UntitledLD** and select **Rename**.

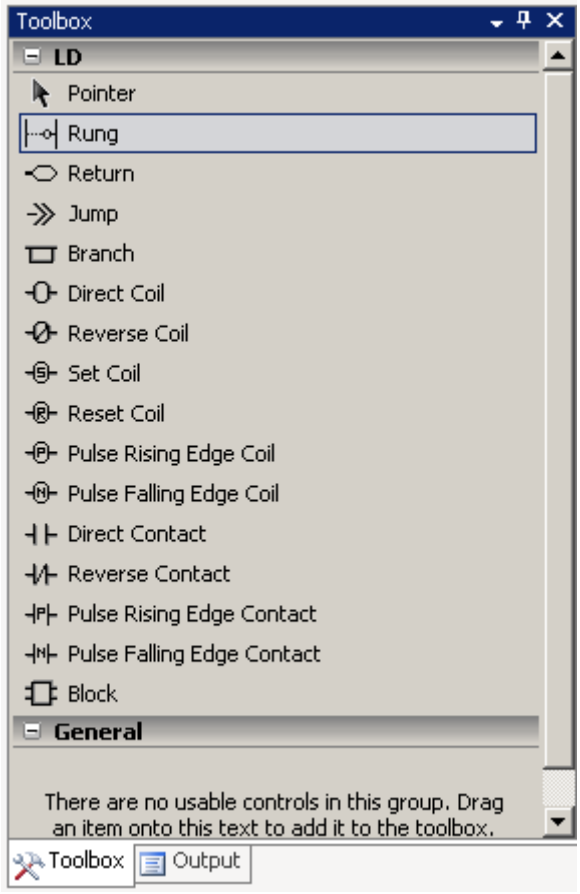


3. Type **Traffic_Light_Control** and Enter.

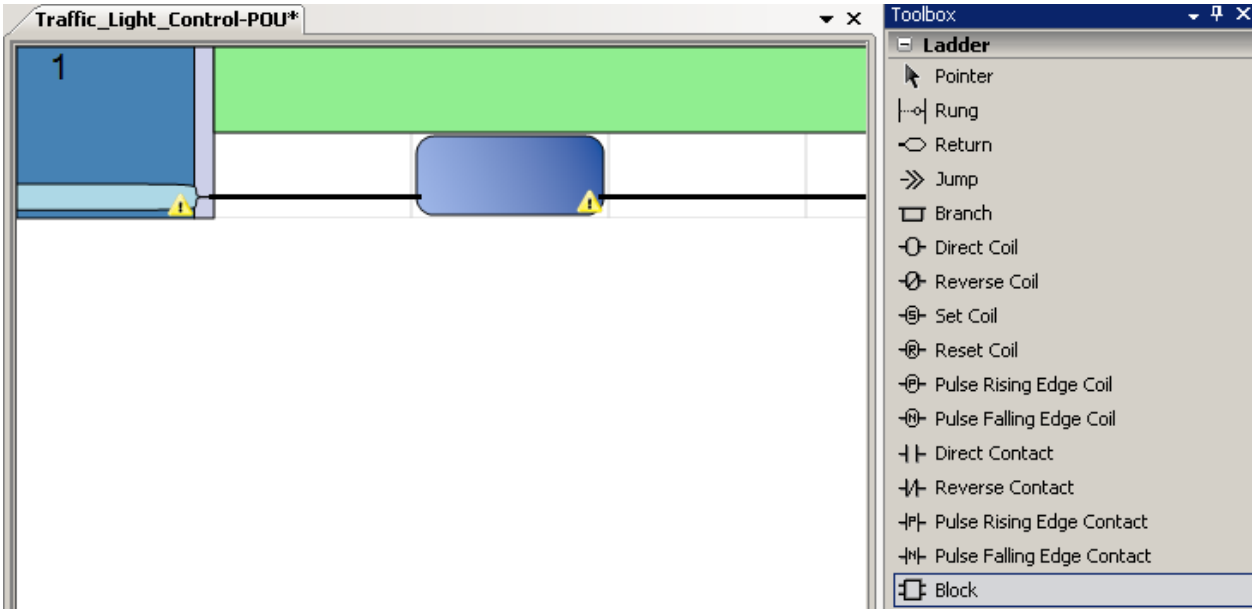


4. Double click on **Traffic_Light_Control** within **Project Organizer** to start editing the ladder logic program.

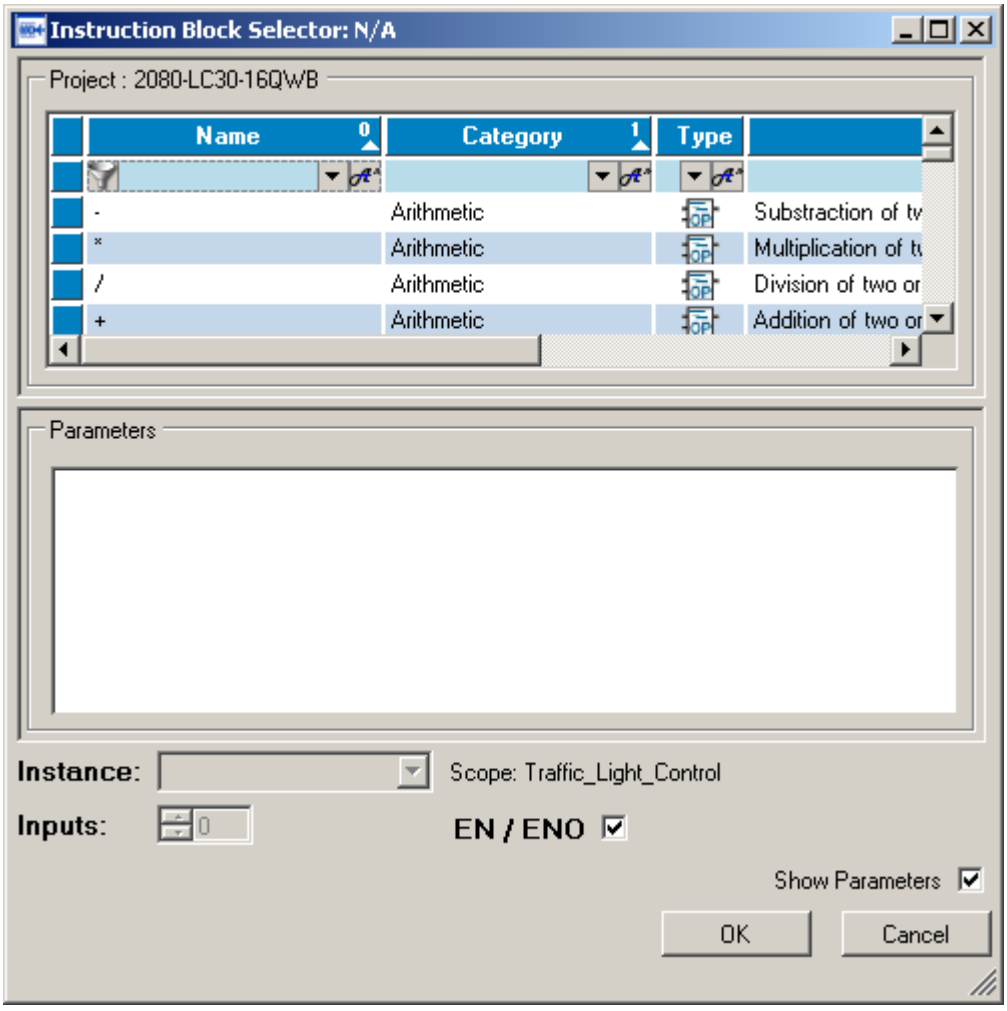
5. Click on the **Toolbox** tab in the lower right-hand corner and click on the **+** in front of **LD** to list the available ladder instructions



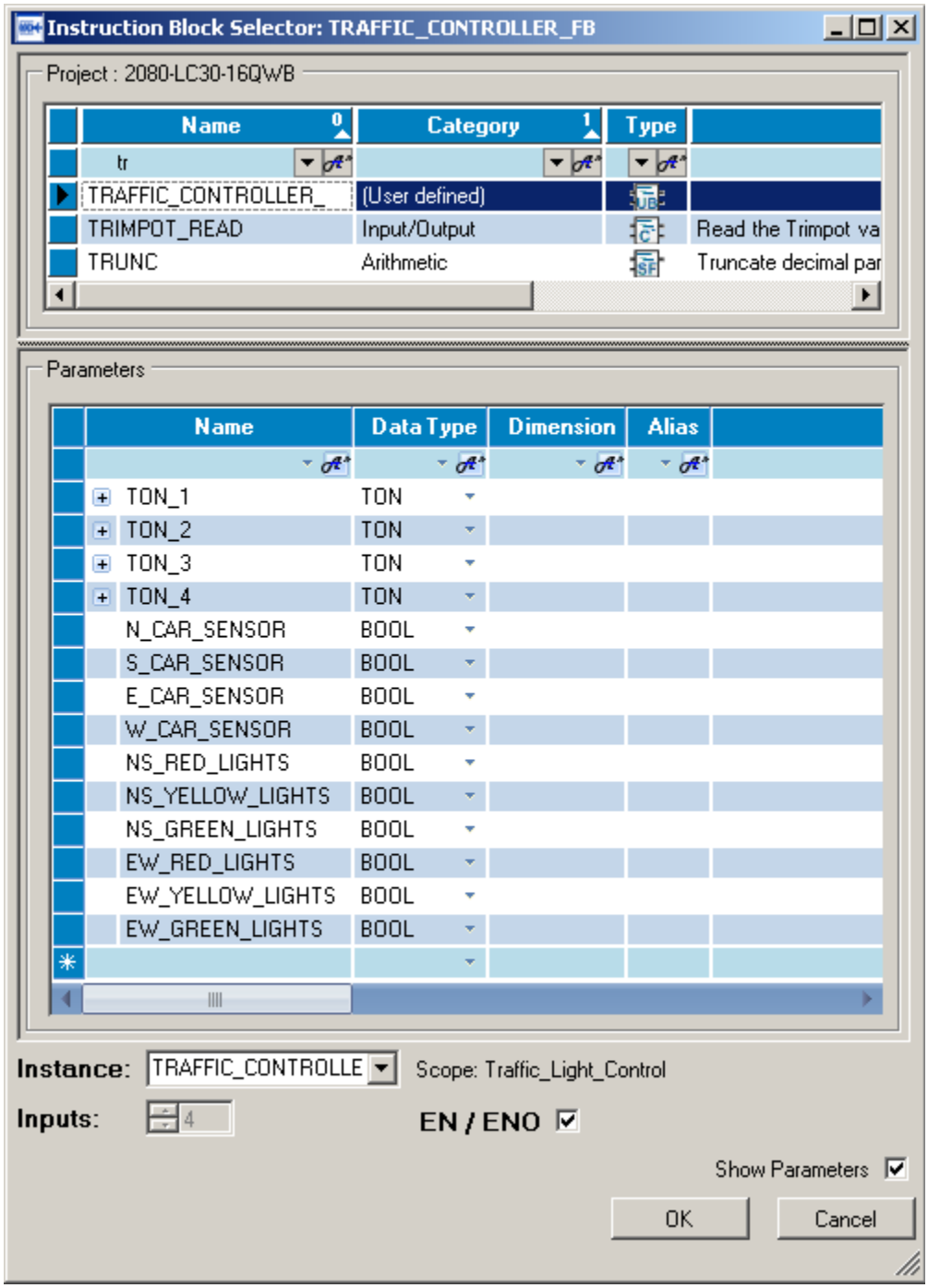
6. Click and hold on the **Block** instruction within the **Toolbox** and drag a Block onto the rung as shown.



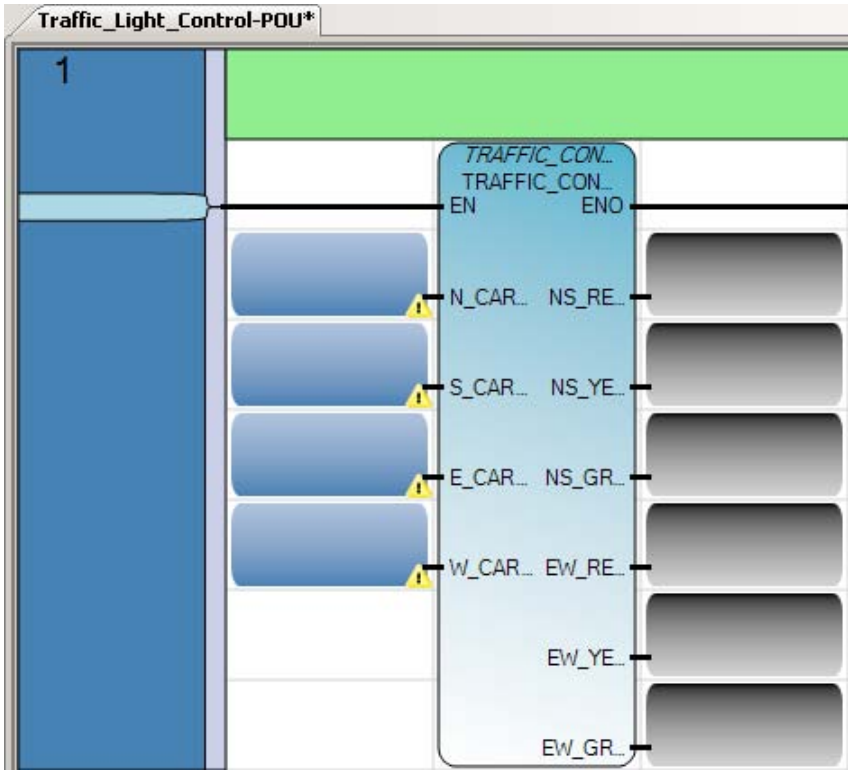
7. When you release the mouse button, the **Instruction Block Selector** screen appears.



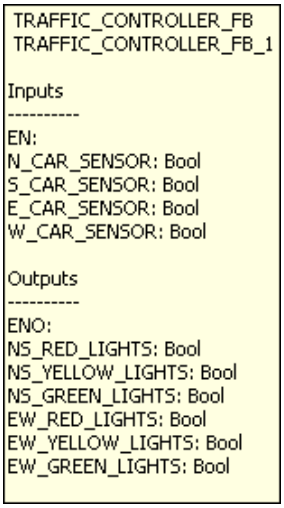
8. Under **Name**, type **tr** and note that only the instructions starting with **tr** are listed. Click on **TRAFFIC_CONTROLLER_FB** and notice that all of the **Parameters** associated with this function block are listed below it.



9. Make sure that EN/ENO is checked and then click **OK**. The Traffic Controller function block should be displayed on the rung as shown below.

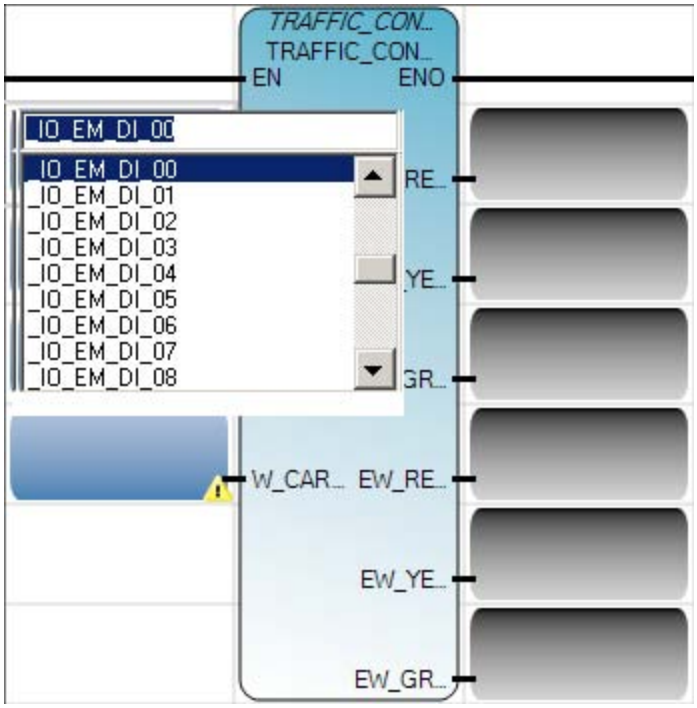


10. By convention, function blocks list inputs on the left-hand side of the block and outputs on the right-hand side of the block. In order to see the full names and data types of the variables that these inputs and outputs are associated with, move your cursor over the block - you should get the following listing.

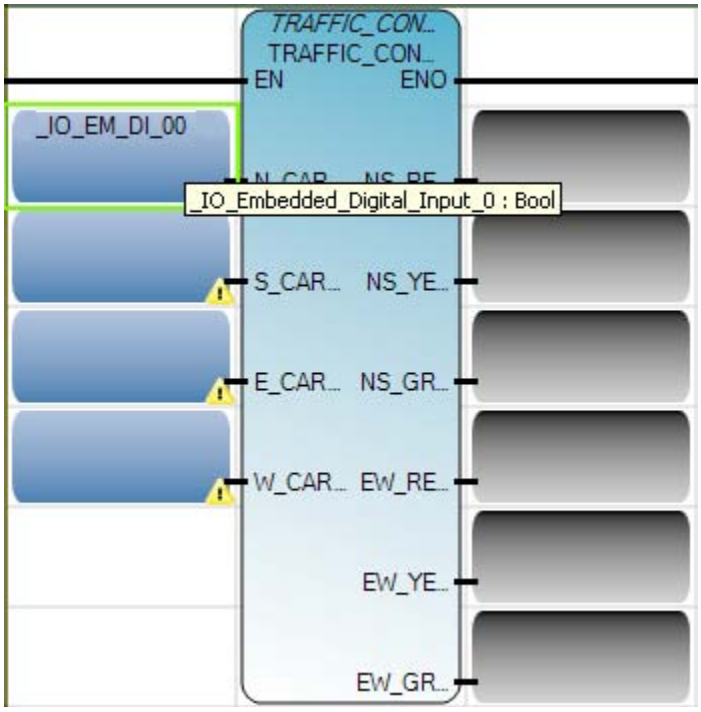


11. The first function block input that connects directly to the ladder rung is the function block enable (**EN**) bit. The remaining four function block inputs are “real world” inputs that indicate whether a car is waiting at a red light in any of the four possible directions – North, South, East and West. These inputs get mapped to four Boolean input variables local to the function block: **N_CAR_SENSOR, S_CAR_SENSOR, E_CAR_SENSOR** and **W_CAR_SENSOR**. You are going to assign four Micro830 controller inputs to these function block inputs.

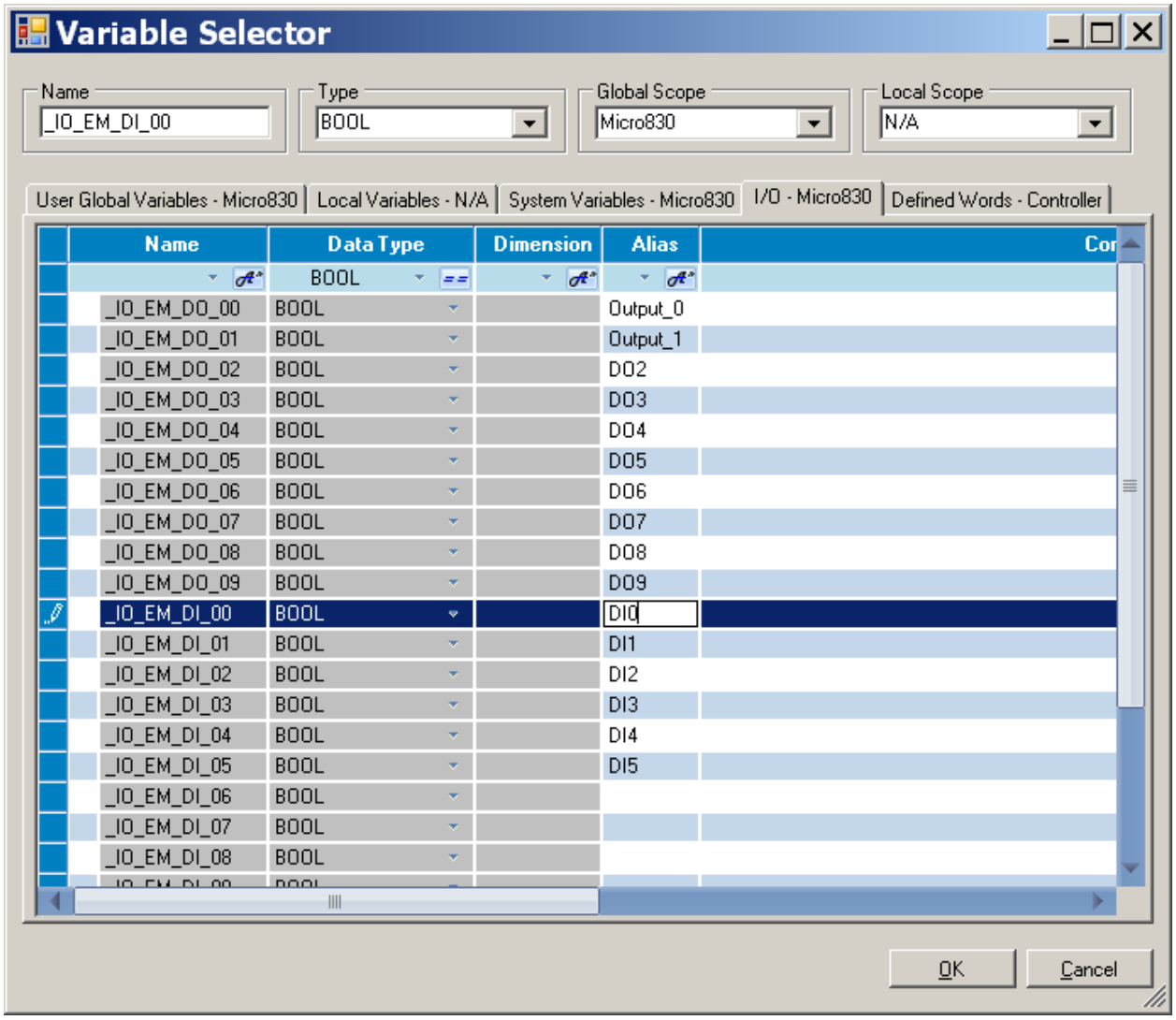
12. Click on the top of the input variable block that connects to **N_CAR…** and you will get a dropdown menu of all the existing variable names that could be assigned to **N_CAR_SENSOR**. Scroll down and select **_IO_EM_DI_00** and enter.



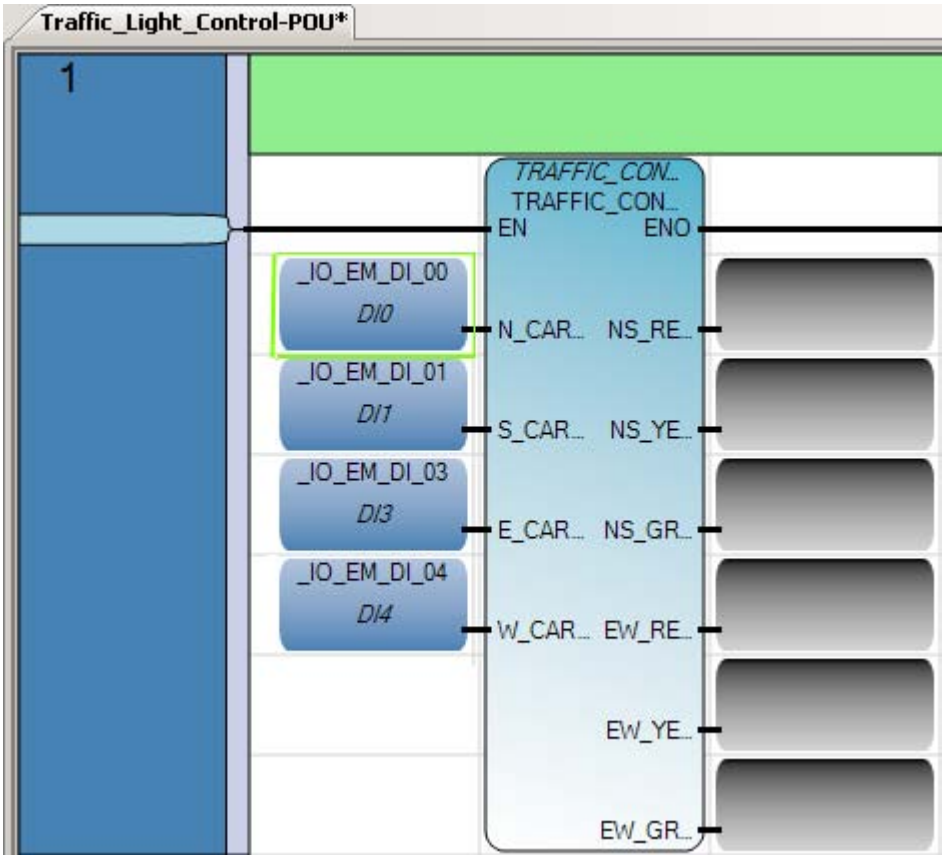
13. Notice that because of the length of embedded input 0 variable name, it is hard to tell what input is actually assigned to **N_CAR_SENSOR** when viewing the function block. One way to tell is to position your cursor over the block as shown below.



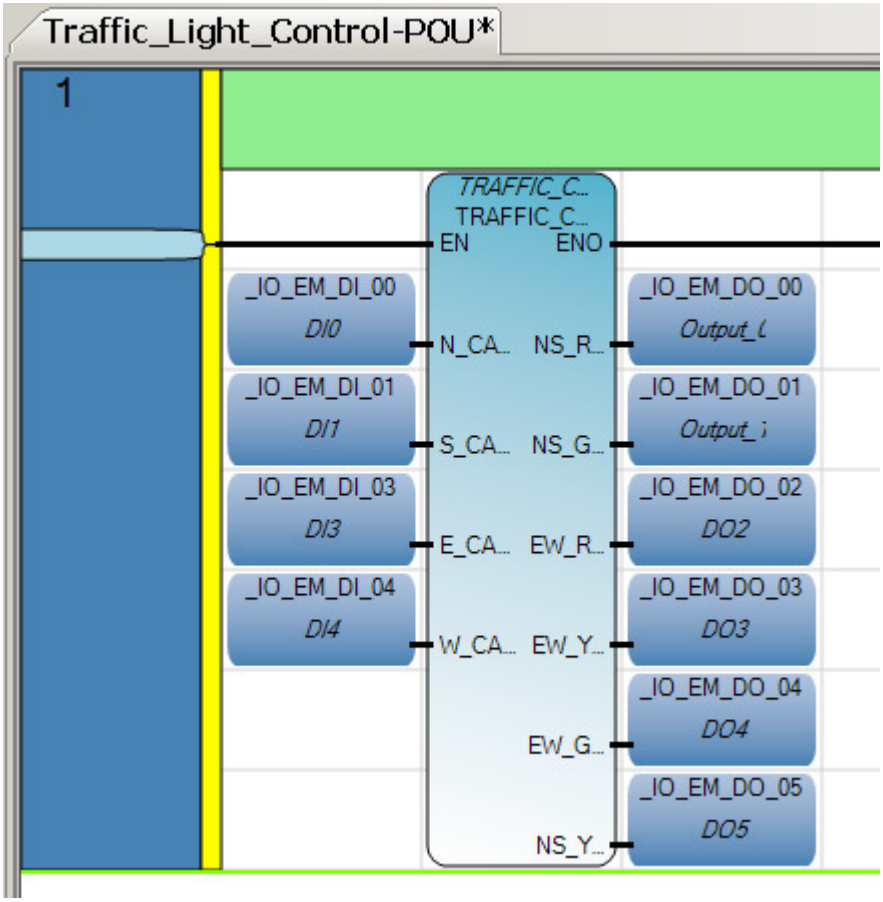
14. Another way is to assign shorter Alias names to these variables. Double click on the first input block – this brings up the **Variable Selector** screen. Go ahead and type in Alias names for the six outputs (**DO0-DO5**) and the first six inputs (**DI0-DI5**).



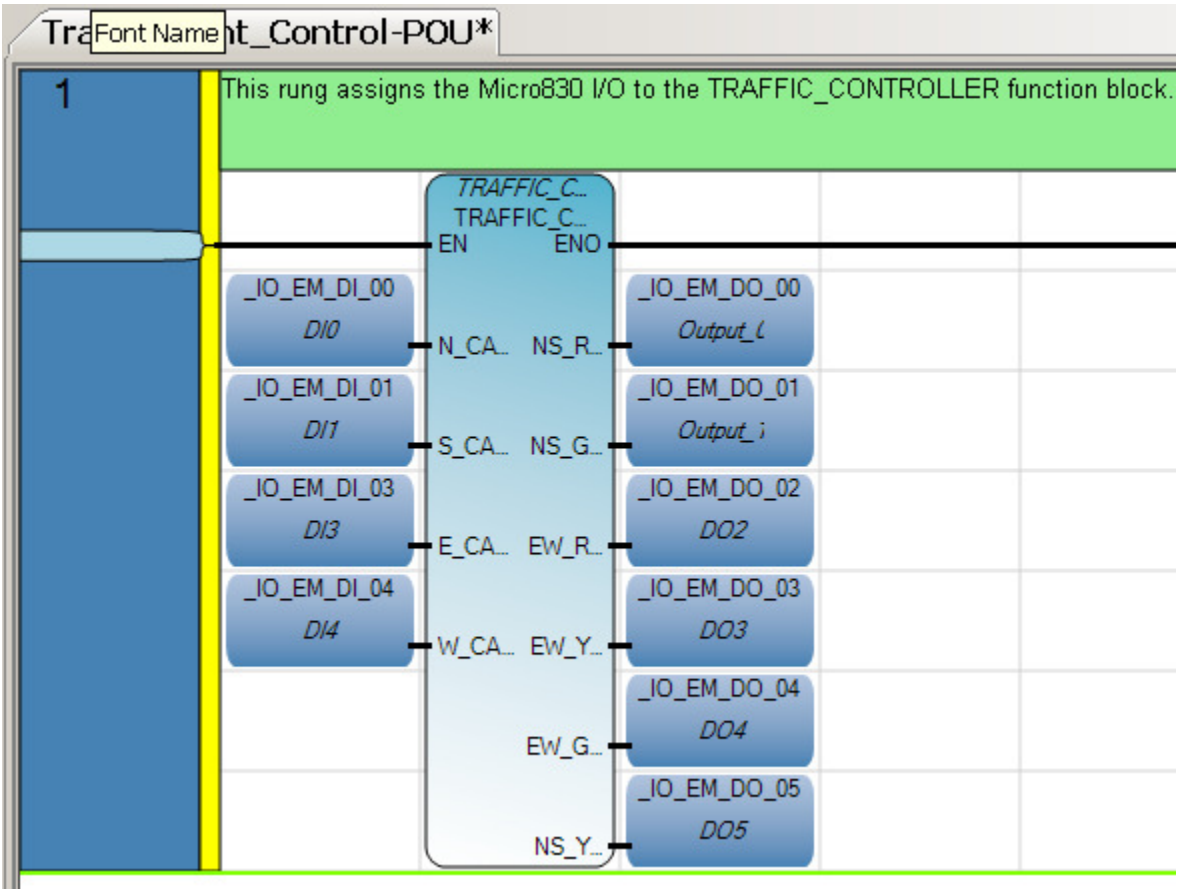
15. Assign the remaining three input variable blocks as follows: **_IO_EM_DI_01** to **S_Car…**, **_IO_EM_DI_03** to **E_Car…**, and **_IO_EM_DI_04** to **W_Car…** (note that we skipped using Input 2!).



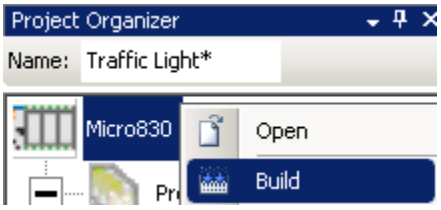
16. The first function block output that connects directly to the ladder rung is the function block output enabled (**ENO**) bit – it reflects the status of the input enable (**EN**) bit. The remaining six function block outputs are “real world” outputs that connect to the red, yellow and green traffic signal lights for each direction. These outputs get mapped to six Boolean output variables local to the function block: **NS_GREEN_LIGHTS, NS_YELLOW_LIGHTS, NS_RED_LIGHTS, EW_ GREEN_LIGHTS, EW_ YELLOW_LIGHTS, and EW_ RED_LIGHTS**. Assign the first six Micro830 digital outputs to the output variable blocks starting with **_IO_EM_DO_00** to **NS_R…** and ending with **_IO_EM_DO_05** to **EW_G…**.



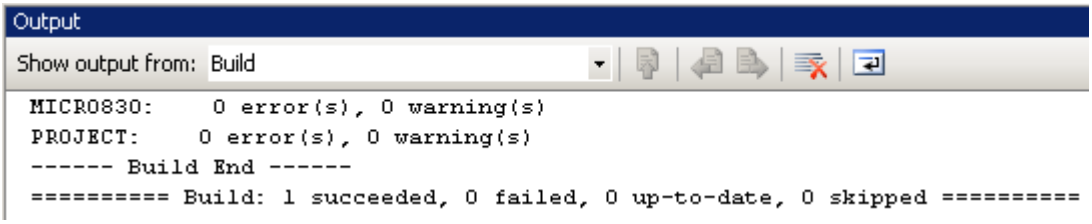
17. The rung is now complete except for a description of what the rung does. Double click on the green area just above the rung and type in "**This rung assigns the Micro830 I/O to the TRAFFIC_CONTROLLER function block.**"



18. Finally, build and save the one-rung program. Right click on the Micro830 icon in **Project Organizer** and select **Build**.



19. You should get verification in the **Output** window at the bottom center of the screen that the build succeeded.



Click the Save icon to save your work.

Chapter 6 –
Downloading a Project and Troubleshooting Faults

Establishing a Connection Between Your Computer and a Micro830 via USB

This section will show you how to configure USB drivers on your computer the first time you connect to any Micro800 controller.

1. Normally RSLinx Classic is installed as part of the Connected Components Workbench software installation process.

2. Power up the Micro830 controller.

3. Plug USB A/B cable directly between your PC and the Micro830.

4. Windows should discover the new hardware. Click ***No, not this time*** and ***Next.***

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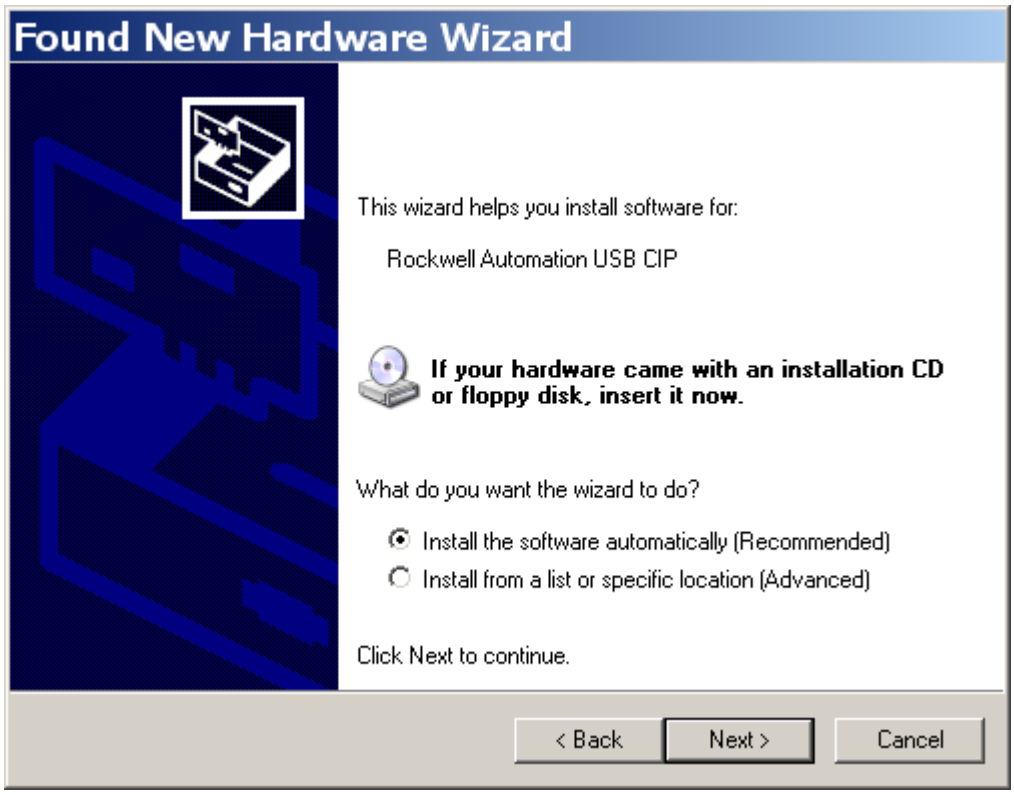
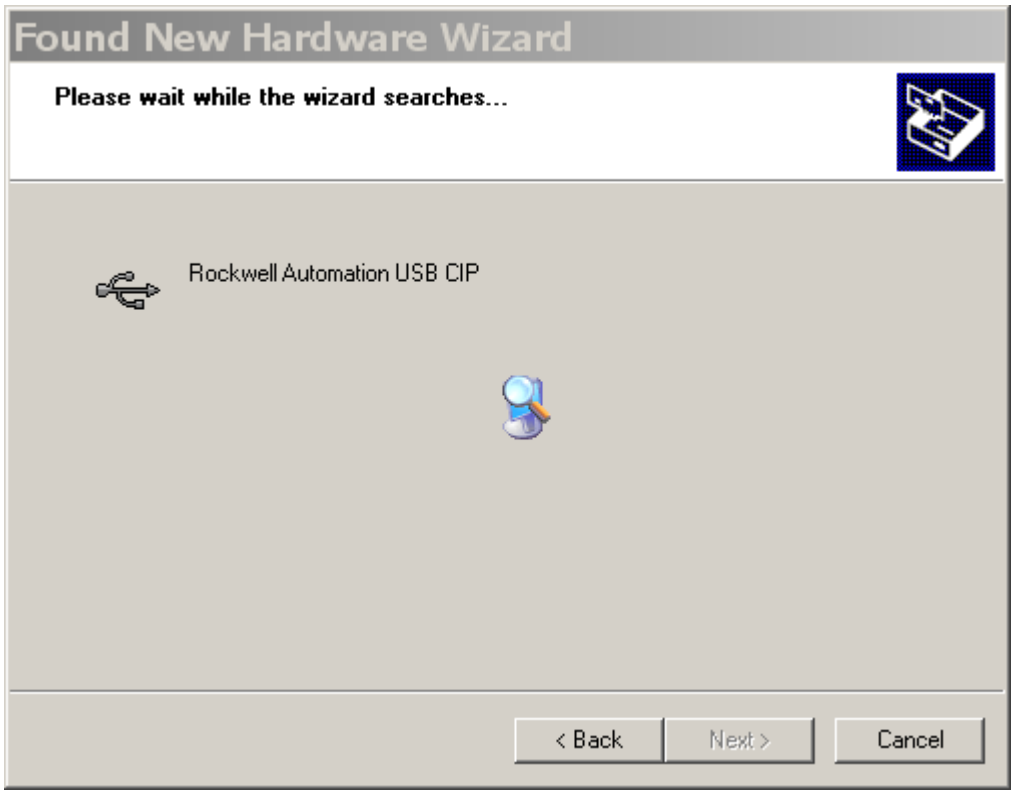
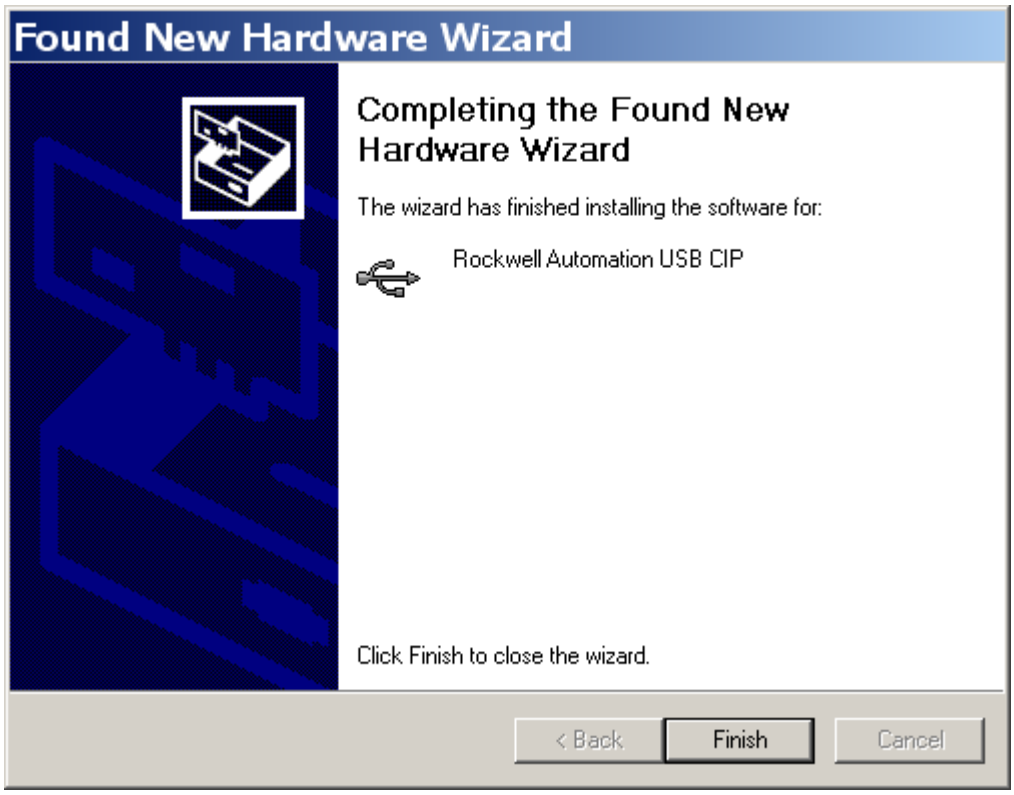
5. Click ***Install the software automatically (Recommended)*** and ***Next.***



6. Wizard will search.



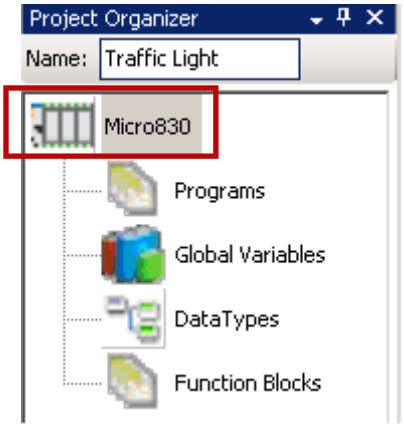
7. Wizard should complete in less than a minute. Click ***Finish.***



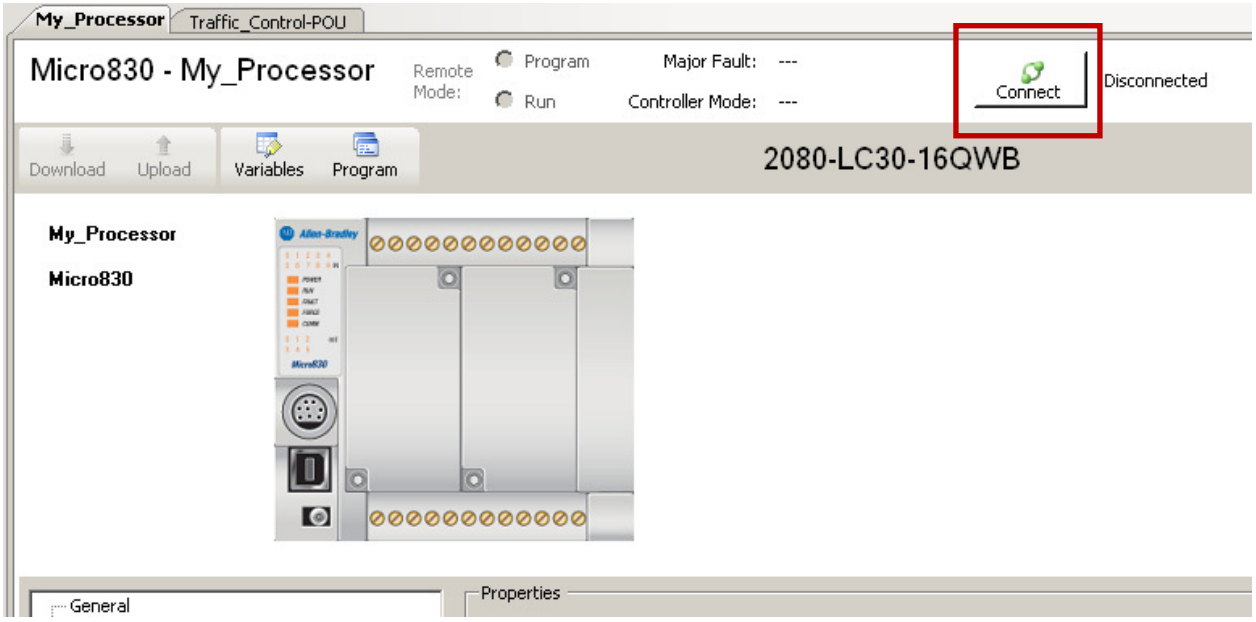
Connecting to a Micro830 Controller

In this section you will learn how to connect to a Micro830 controller. You must establish communications with the controller before you can download your project to it.

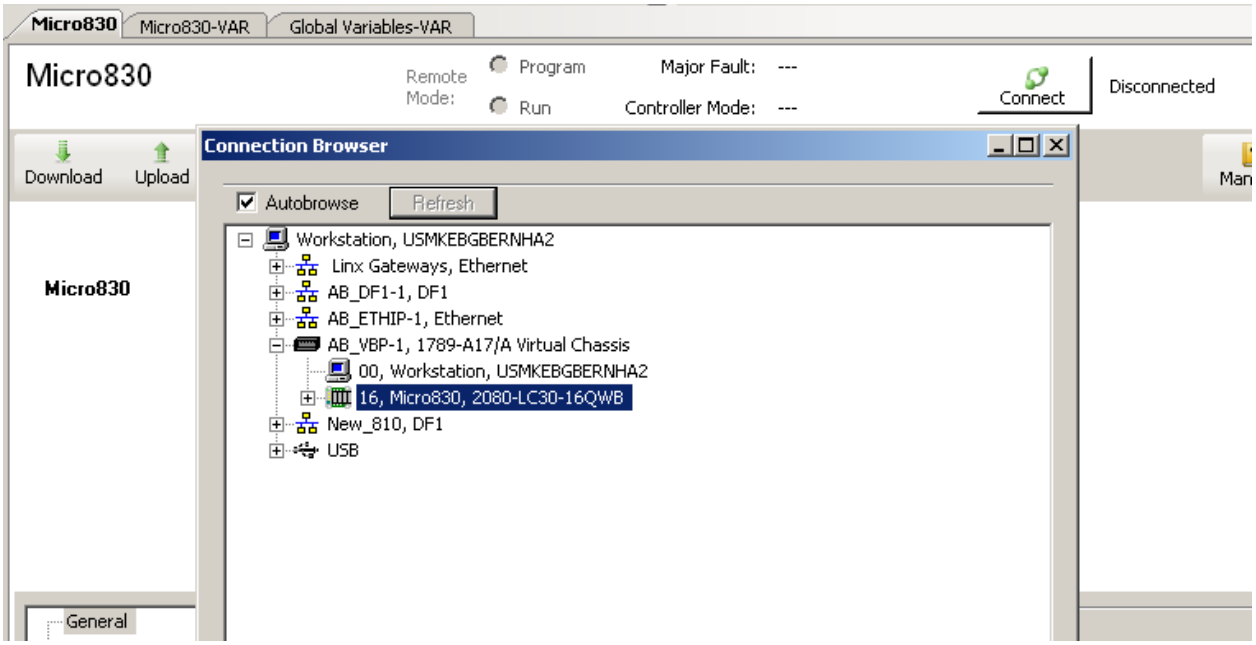
1. Double click on the **Micro830** under Project Organizer to open the controller's property tab.



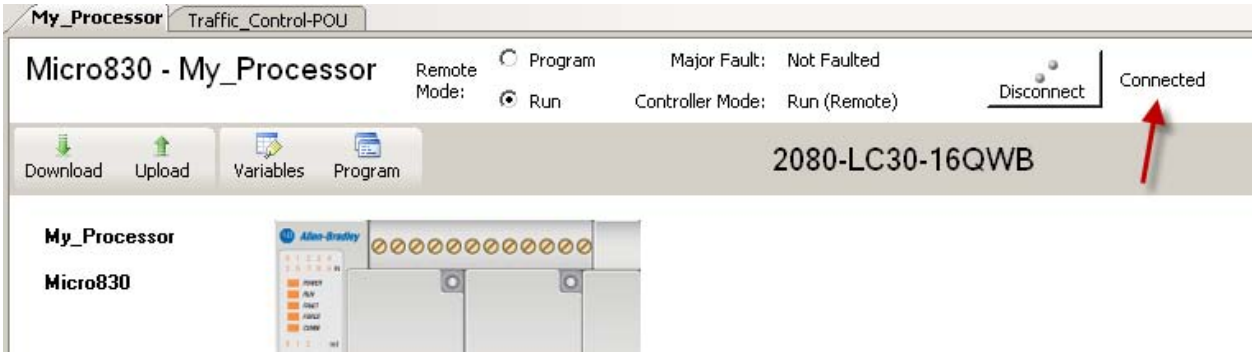
2. Click on the **Connect** button.



3. Browse and Select the controller from the **Connection Browser** screen.



4. Click OK and the status on the device toolbar will indicate Connected. If successfully connected, the button changes to Disconnect and the Controller Mode is displayed. Being Connected means the Connected Components Workbench (CCW) is now connected and/or communicating with the Micro830.

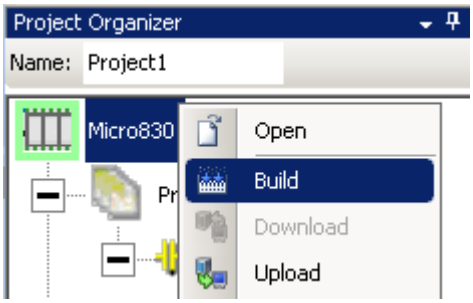


Downloading a Project and Troubleshooting Faults

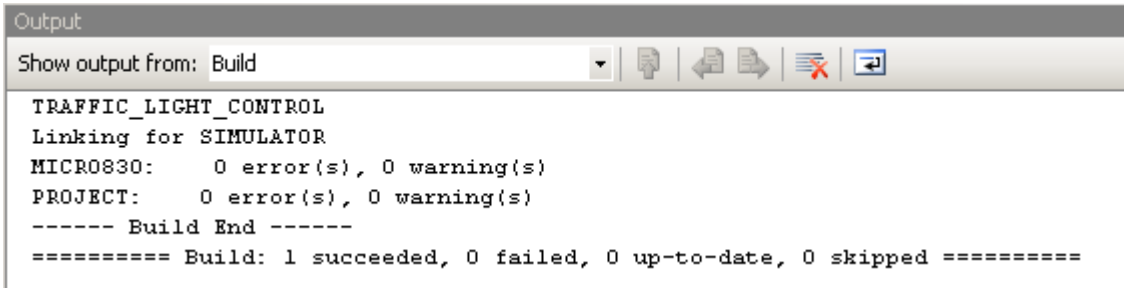
This section will show you how to download a project to a controller and how to troubleshoot faults that may appear after downloading a project. Prior to downloading a project you must connect to the controller, refer to the previous section for more details on how to connect to the Micro830 controller.

1. Follow the instructions below to build, save, and download your project.

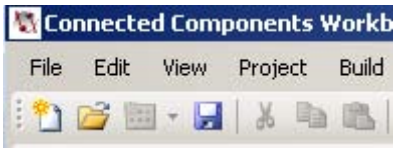
   Right click on the Micro830 icon in the **Project Organizer** and select **Build**.



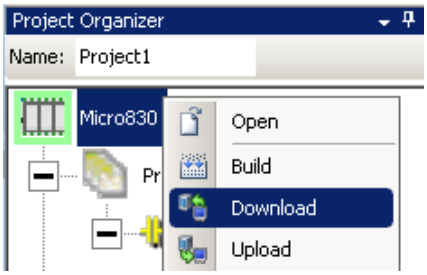
2. You should get verification in the Output window at the bottom center of the screen that the build succeeded. If you have errors you must go back to your program and fix the error before it will allow you to download.



3. After verifying you don't have errors, click **Save**.

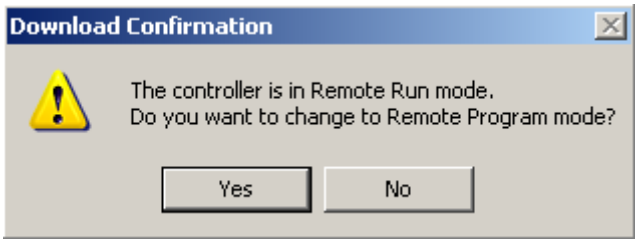


4. Right click on the Micro830 icon in the **Project Organizer** and select **Download**.

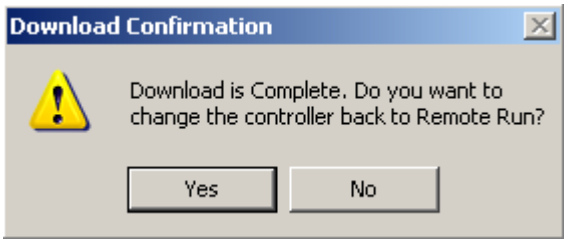


Note: If you don't have the plug-ins configured in Chapter 3 your controller will fault when attempting to download. Modify your controller configuration to match your hardware and attempt downloading again.

5. If your controller is in Remote Run mode you will see the following message. Click **Yes** to continue.



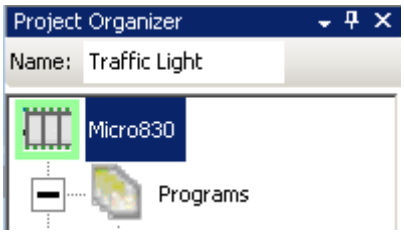
6. After the download is complete you will see a message asking if you want to change to Run mode. Click Yes to begin running your program or No if you need to make further modifications.



Troubleshooting Faults

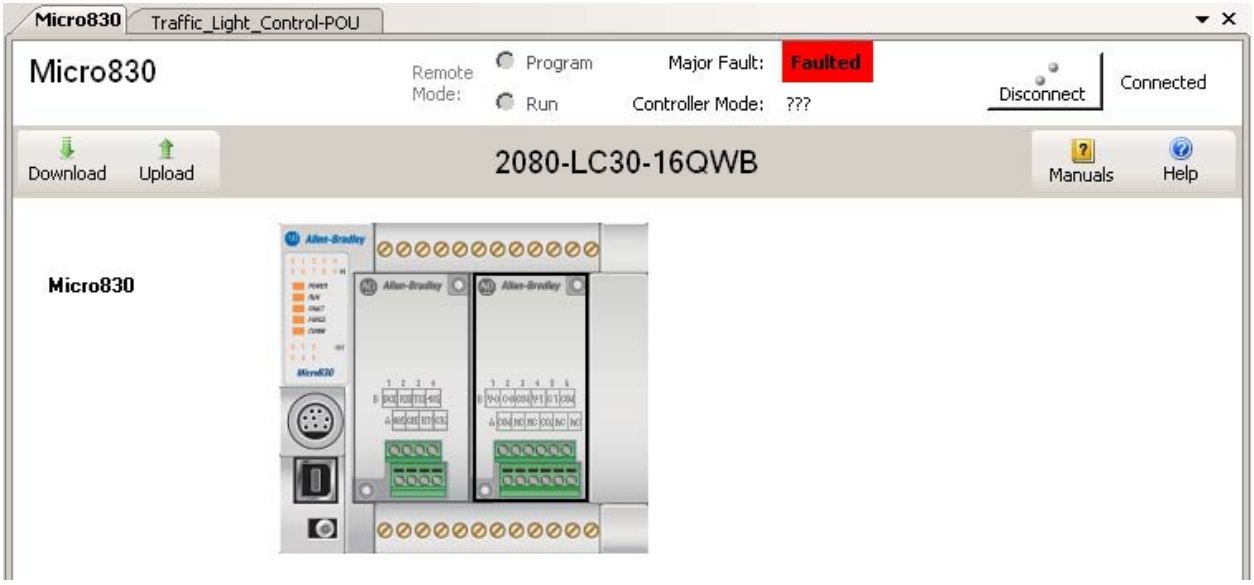
In this section you will learn how to troubleshoot faults that may appear after you download a project. One of the common faults you may see is a configuration mismatch between your project and the controller. In this section you will learn how to troubleshoot that fault and how to fix it.

1. Double click on the **Micro830** icon ion the **Project Organizer**.

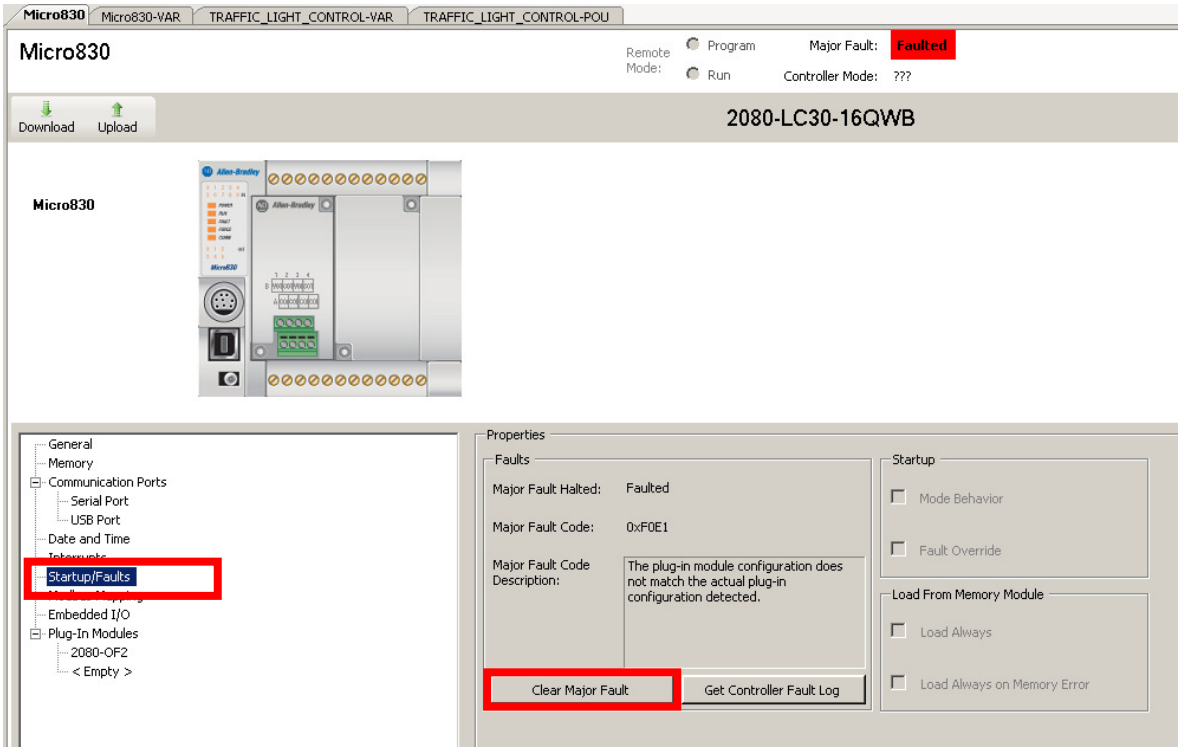


You should see a window with Micro830 information. This window gives you status information for your controller and allows you to configure the plug-ins and other parameters.

2. Below is a screen shot of a faulted Micro830, notice how there is a red icon that displays **Faulted**. This indicates a fault occurred after the project was downloaded.



3. To troubleshoot faults, click on **Startup/Faults** under the **Controller Configuration** tree. The detail of the fault is shown; in this case you will notice there is a plug-in configuration mismatch. To resolve it, click **Clear Major Fault** and match physical plug-ins with configured plug-ins.



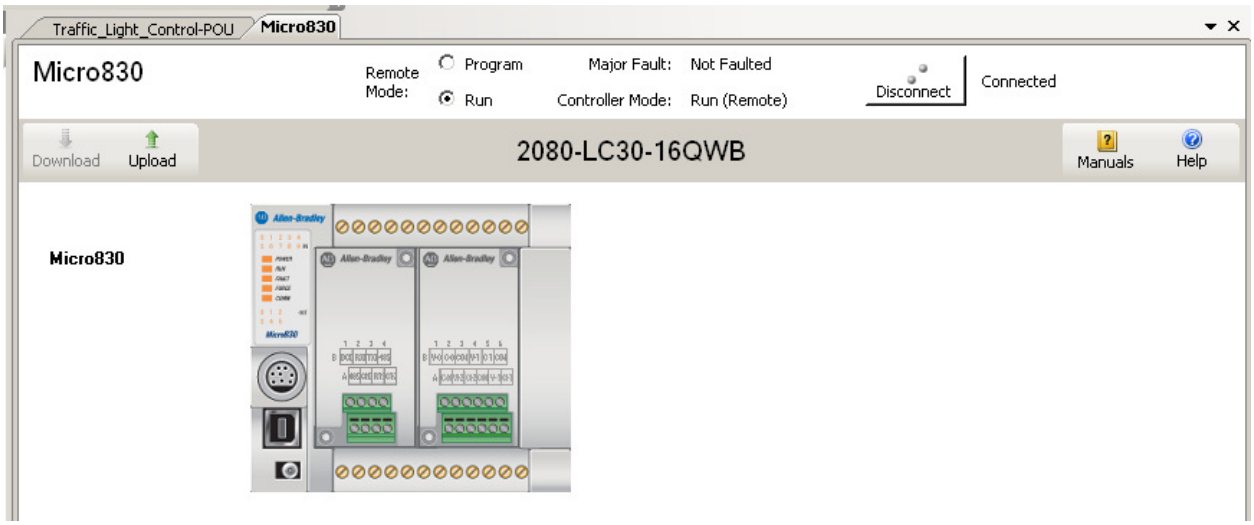
Chapter 7 –
Testing a Running Program

Testing a Running Program

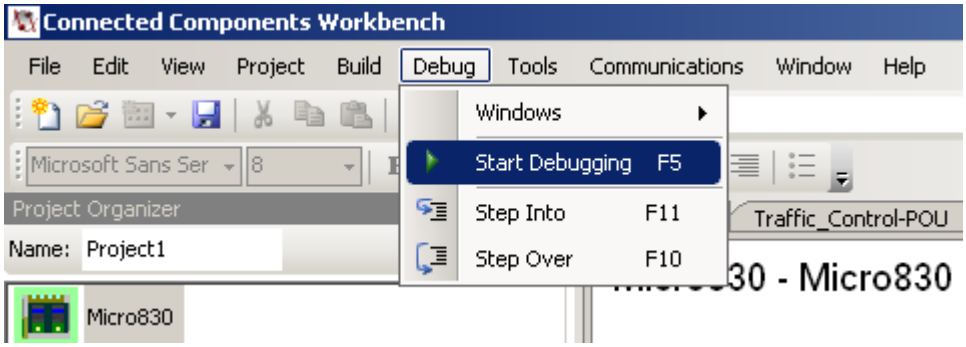
This chapter will show you how to debug and force a command in a running program.

1. This chapter assumes you have a running program. For details on how to create, build, and download a program, refer to earlier chapters.

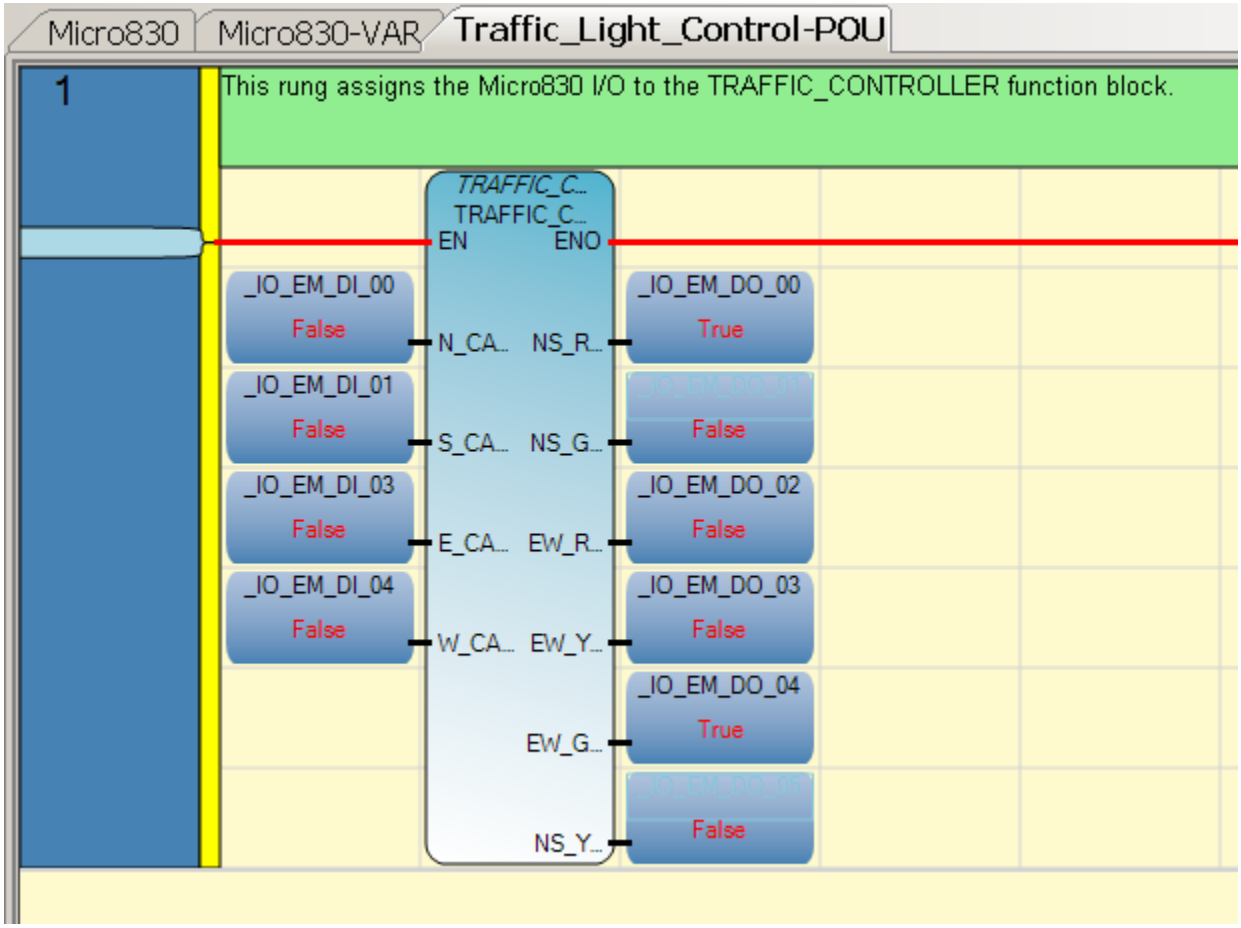
2. Verify you are in Run mode. If you are not in Run mode, you must select the Run radio button.



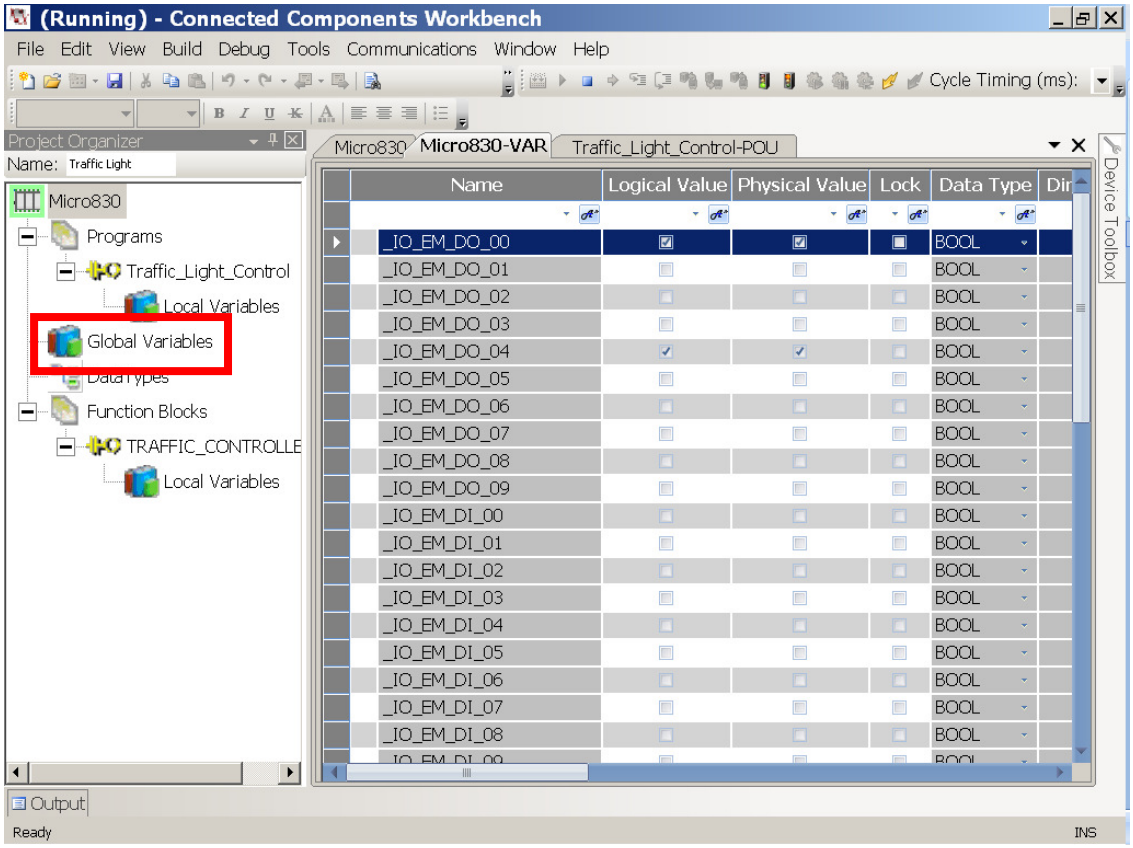
3. Select Start Debugging from the Debug menu.



4. The following screen will then appear under the Traffic_Control_POU tab.

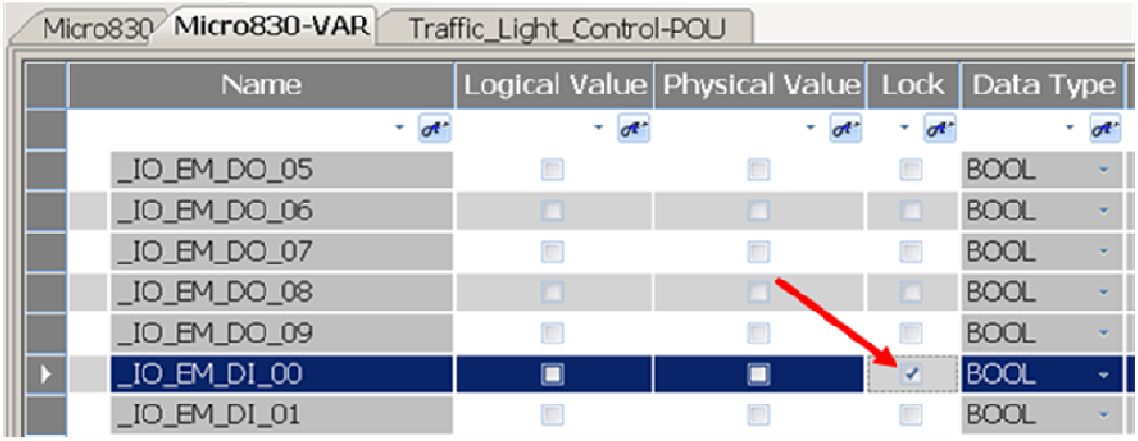


5. To **Force the value of a variable**, left mouse click on global variables.

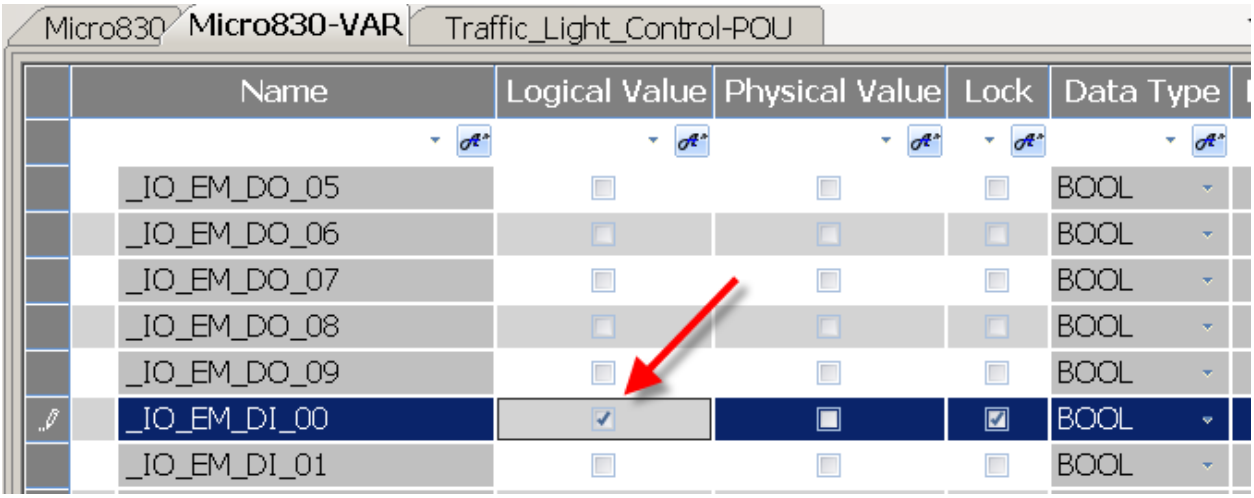


6. Left mouse click on variable you desire to force. For this example, we are illustrating forcing _IO_EM_DI_00.

7. Click on the Lock box for the _IO_EM_DI_00.

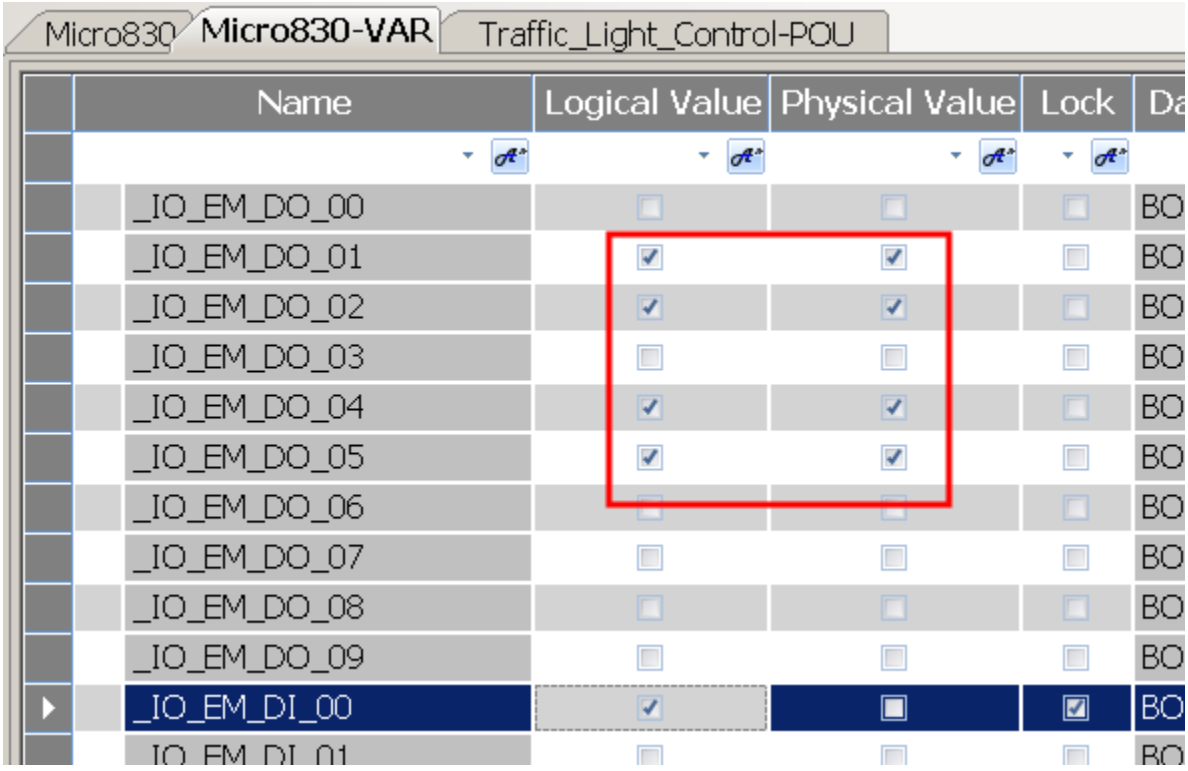


8. Click on Logical Value on the _IO_EM_DI_00.



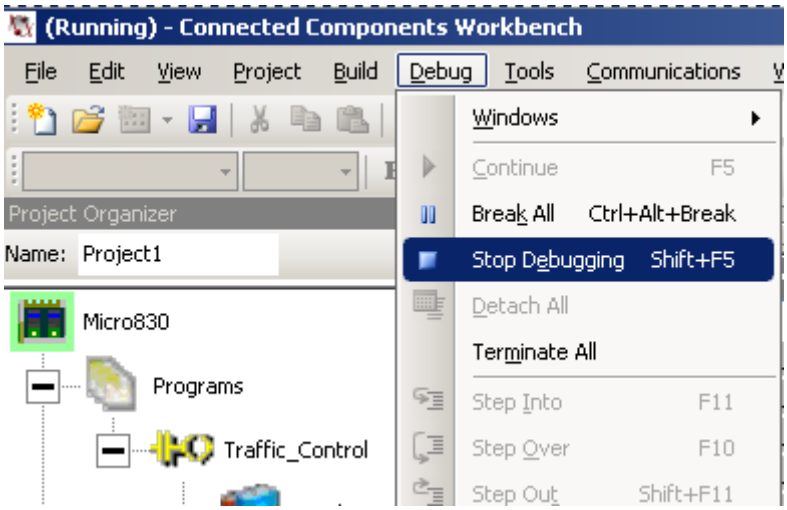
9. You should now see the output LEDs on the Micro830 changing state (if using the same program).

   You will also see the outputs change state by the ☑ under the Logical Value column and the Physical Value column under the global variable tab.



10. To stop forcing the value, **uncheck** Logical Value. To allow the program or external sources to change the value, **uncheck** Lock.

11. To stop debugging, click Debug in the toolbar and select Stop Debugging.



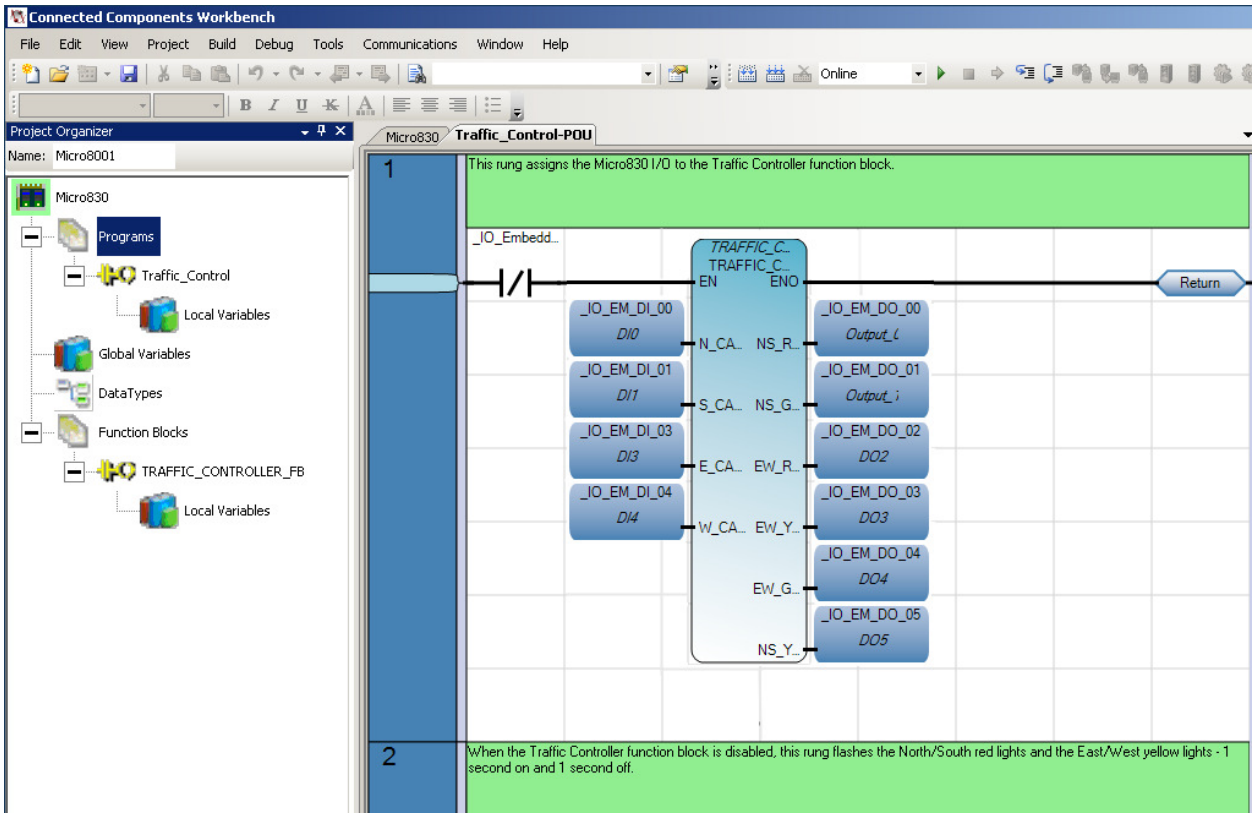
12. You can now leave the Micro830 in remote run mode, can select program mode, or disconnect from the Micro830 by opening the Micro830 tab and selecting the radio dial for your preference.

Chapter 8 –
Saving and Closing a Project

Saving and Closing a Project

This chapter will show you how to save and close a CCW Micro830 project.

1. From an open project.



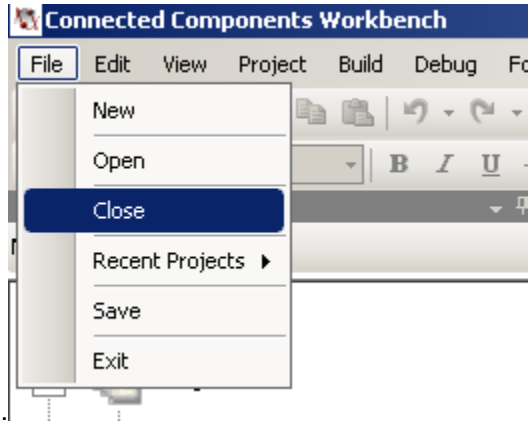
2. To save, click on File in the tool bar.

3. Select and click Save. The project is now saved. The project file will be saved in the project folder, under the CCW folder under My Documents.

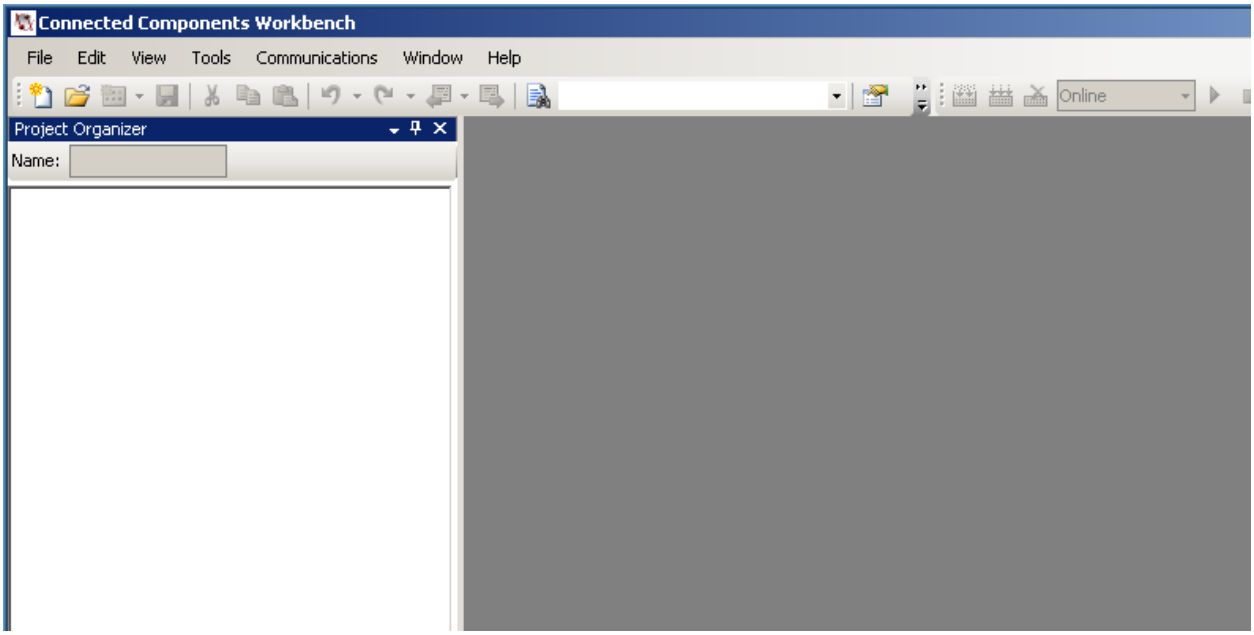
```
C:\Documents and Settings\Labuser\My Documents\CCW\Micro8001\Micro8001.ccwsln
```

Note: Please know where your project is saved to. Under My Documents/CCW/…

4. To close, click on File and select Close.



5. The Connected Components Workbench will now look like this.



Chapter 9 –

Connecting to Existing Controllers

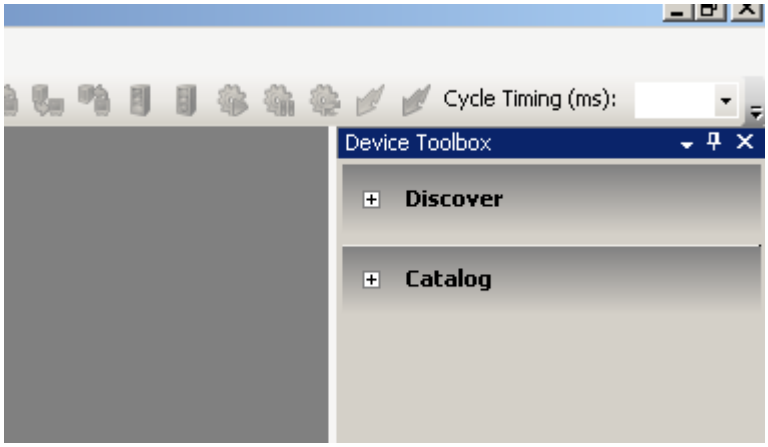
Connecting to an Existing Controller

This chapter will show you how to connect to an existing controller.

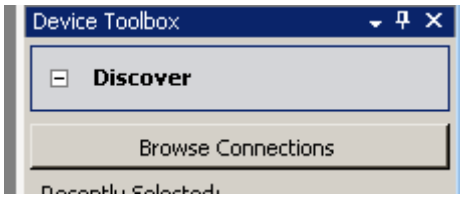
To upload and connect a project from a controller to a blank project

1. Open CCW software.

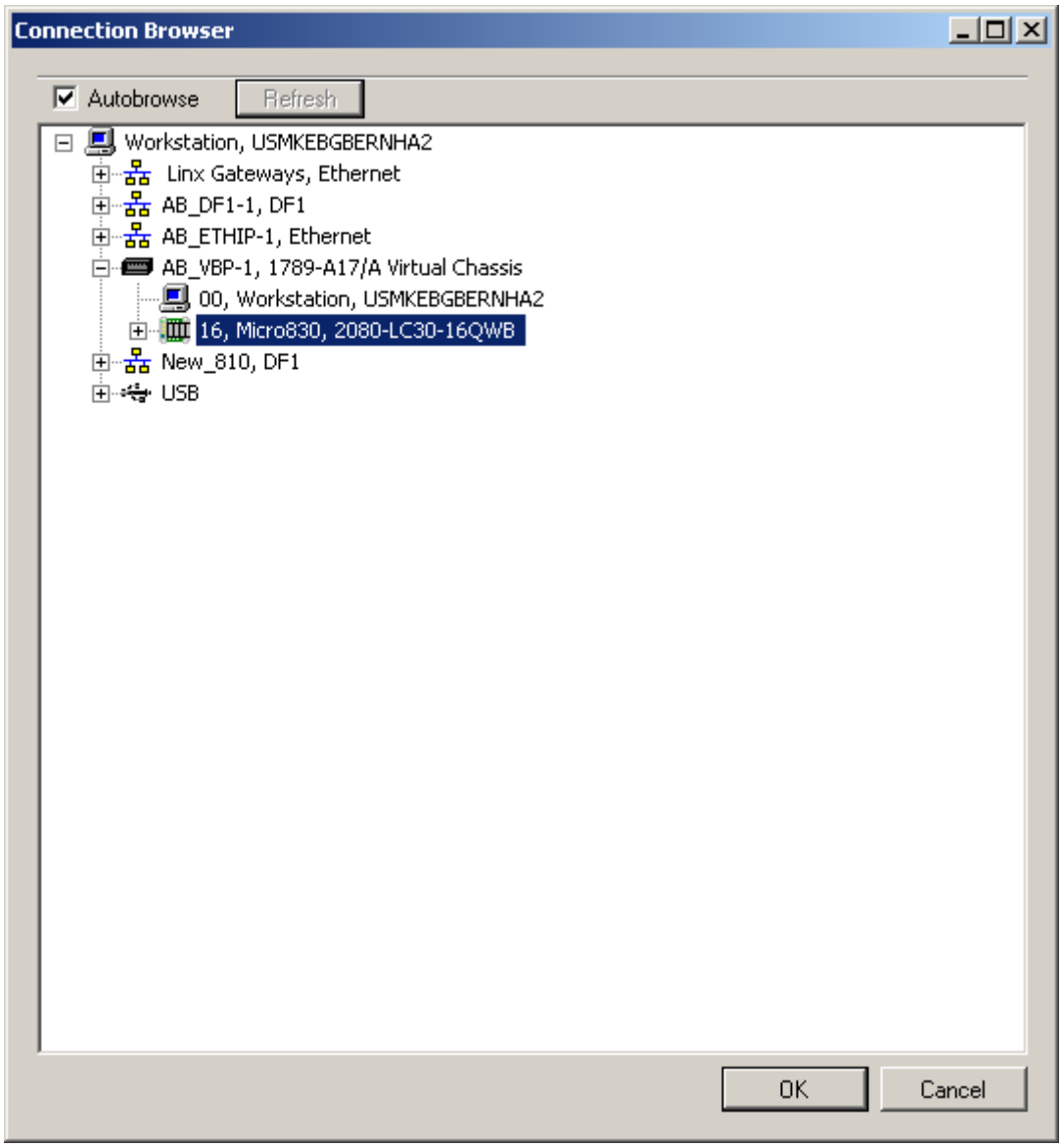
2. Under Device Toolbox, click on the '+' to open Discover.



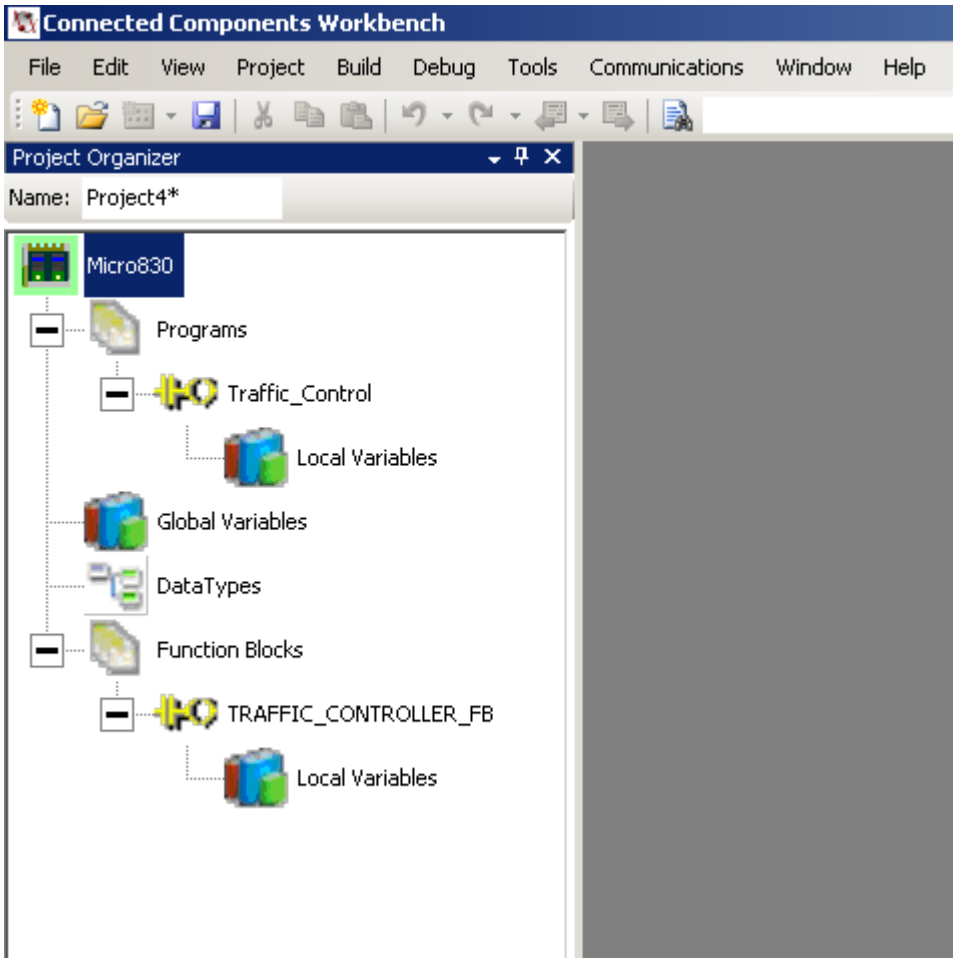
3. Click on Browse Connections.



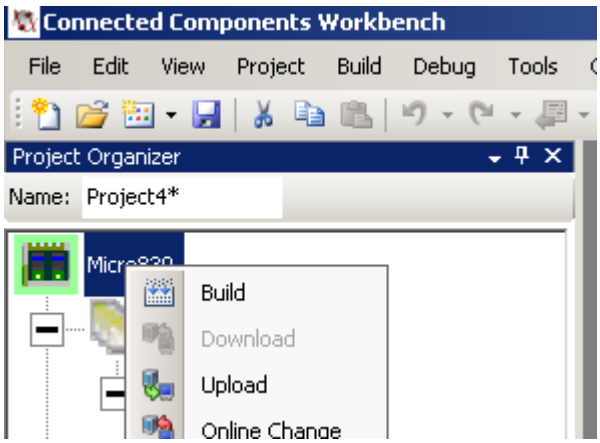
4. The following will appear if it is connected to the network, select the controller and click **OK**.



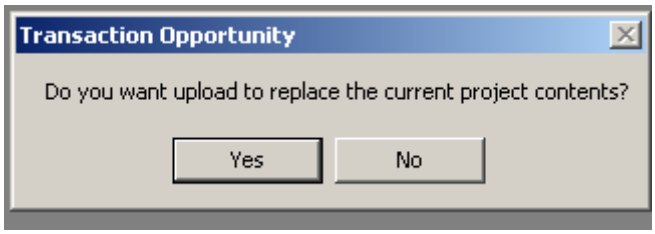
5. The project organizer will then populate with information on the program.



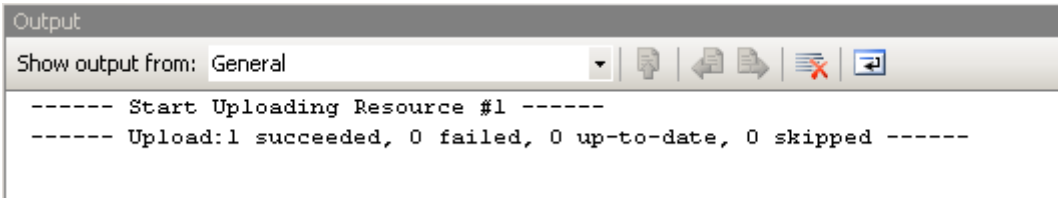
6. If you select your own controller from the Device Toolbox Catalog, and place it in the Project Organizer, click Upload.



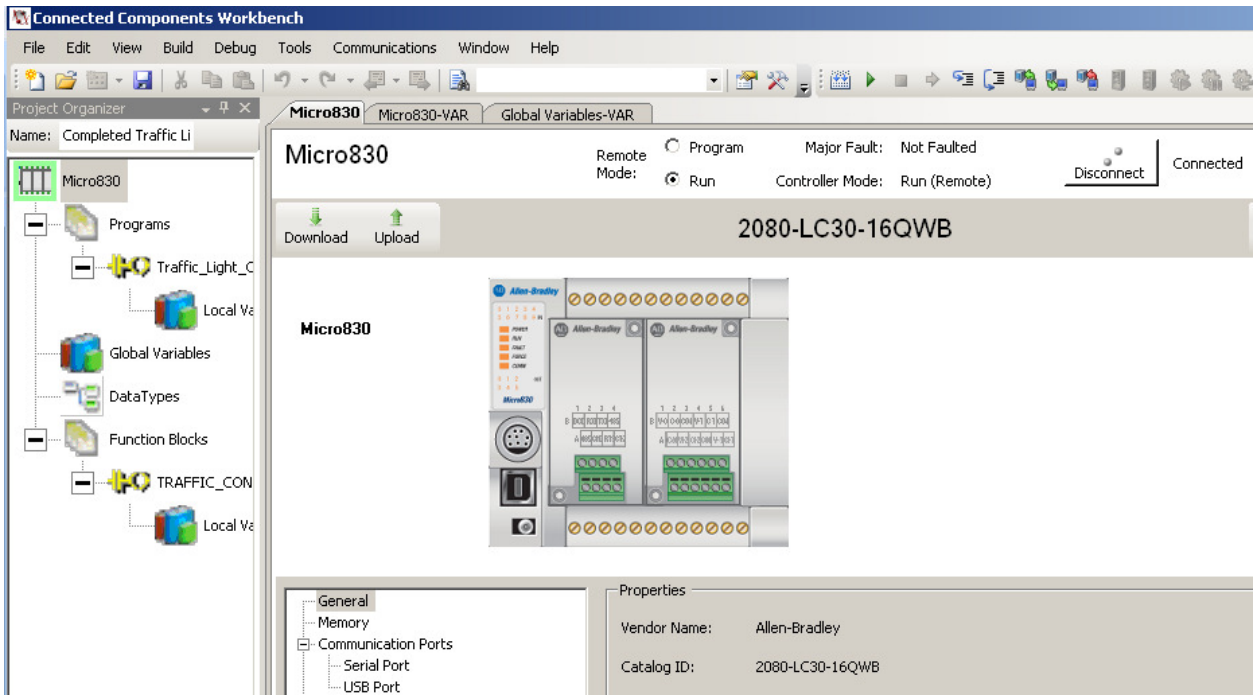
7. The following may appear, click yes.



8. After upload is complete, you will see the following in the output window at the bottom of the program tab.



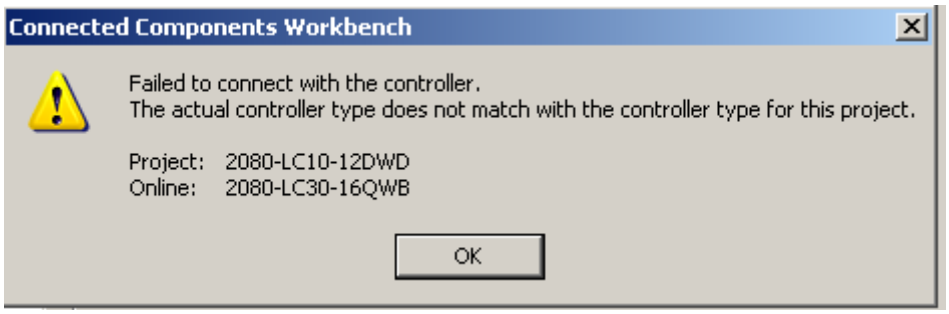
9. Double click on the Micro830, and the following will appear. Double clicking on the program tab will enable the user to view the upload code.



10. You can now work with your uploaded project.

Connecting to a Controller that has a Different Processor in the Project

1. If trying to connect to a different controller than the one in the project, the following will appear.



2. The recommendation would be to abort, and either change the controller in the project, or change the controller you are connected to.

Chapter 10 –
Using Micro810 Smart Relay Functionality (no software)

Using Micro810 Preprogrammed Features

The Micro810 12-point (8 Inputs & 4 Outputs) controller comes with eight Smart Relay function blocks built-in that can be configured using the optional LCD Display and pushbuttons to control the four relay outputs, without using any software! These built-in function blocks are:

- **TON** – On-delay Timing
- **CTU** – Count Up
- **DOY** – Turning on an output if the value of real-time clock is in the range of Year Time setting.
- **TOW** – Turning on an output if the value of real-time clock is in the range of Day Time setting.
- **CTD** – Count Down
- **TONOF** – On-delay timing on a true rung, and then Off-delay timing on the false rung.
- **TP** – Pulse Timing
- **TOF** – Off-delay Timing

This chapter will show you how to configure the Count Up (CTU) function block.

1. Power up the Micro810 controller.
   - Upon power – up, the Micro810 splash screen is briefly displayed.

2. The Status display should be showing the PROG status, the day and time, and the I/O Status. Press ESC and OK at the same time to navigate to the Main Menu.

3. Press 

to enter the SR (Smart-Relay) function block program. The function block for controlling Output 0 is displayed.

4. Press 
once to navigate to the function block controlling Output 1.

5. Press  once. The instruction parameter field will be selected.

6. The instruction parameter field shows the CTU (Count Up) instruction.

7. Press  once to select the CLK parameter field. This is the trigger for counting.

8. Press  twice to select I04.

9. Press  once to select the RESET parameter field. This input will force a counter reset.

10. Press  twice to select I05.

11. Press  three times to move to the first non-zero entry in the PV (Preset Value for the counter) parameter field.

12. Press  twice to make this digit a zero.

13. Press  once to position to the next non-zero digit in the PV field and repeat step 12.

- Repeat the same step for the second to last non-zero digit.
- For the last digit, press  five times to make this last digit to a value of 3.

14. Press  once to position to the screen selection parameter.

15. Press 

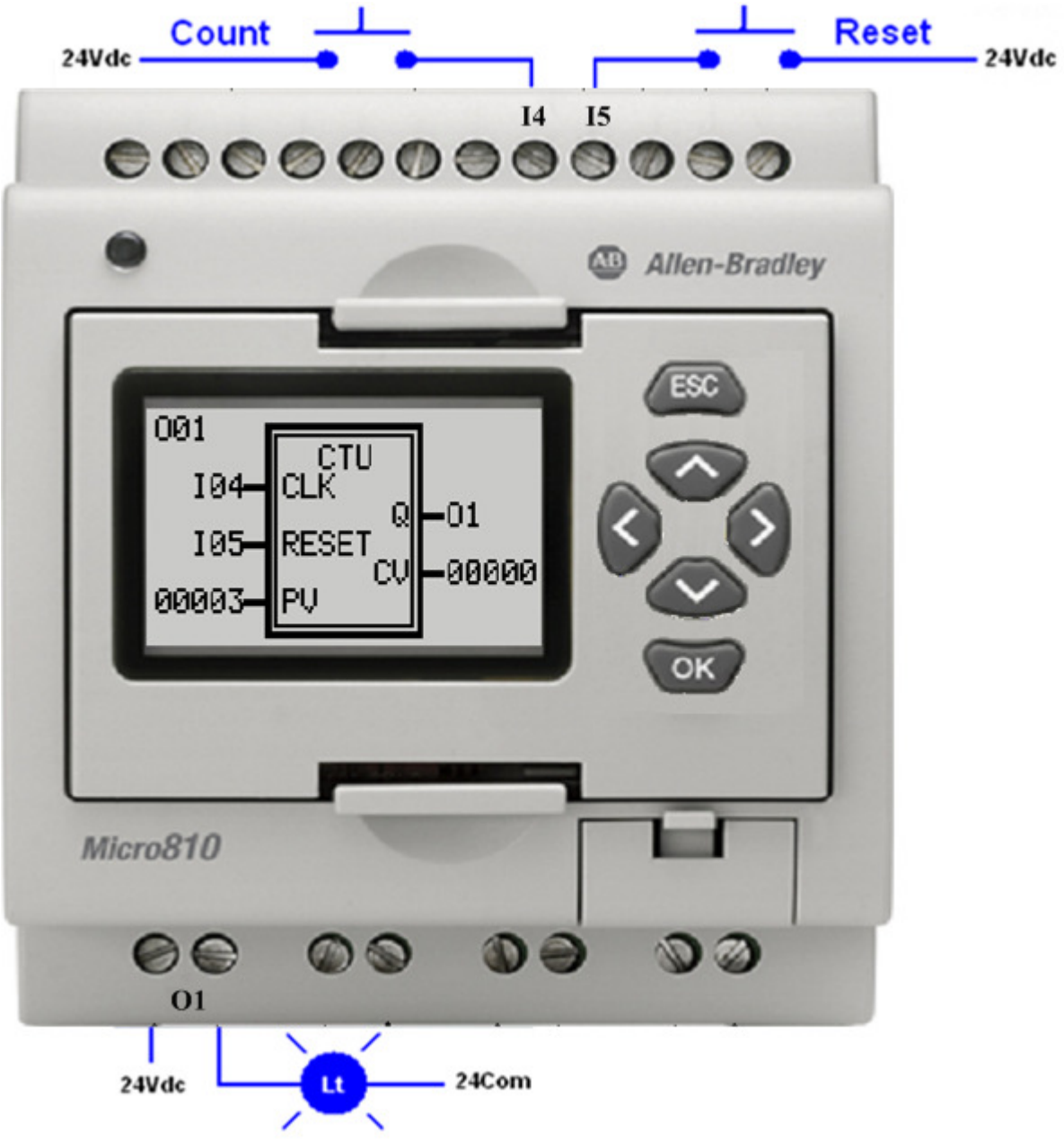
to submit the parameter changes.

- A screen will confirm your request to save the parameter changes.
- Press 

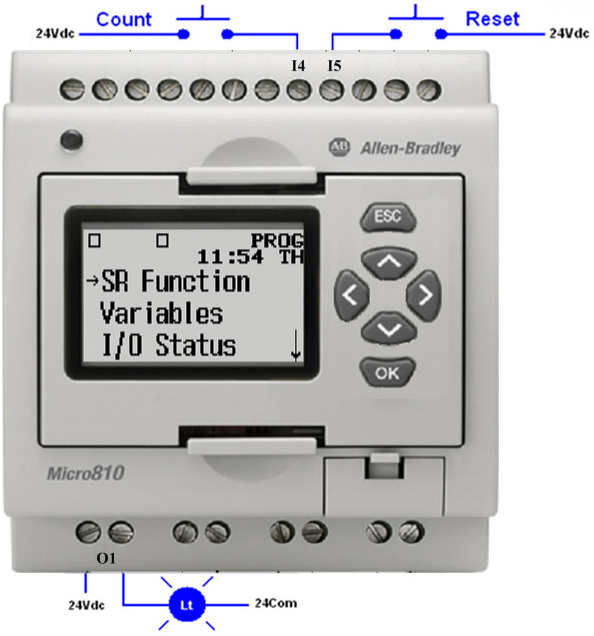
to save the changes.

Testing the Count-Up (CTU) Predefined Function

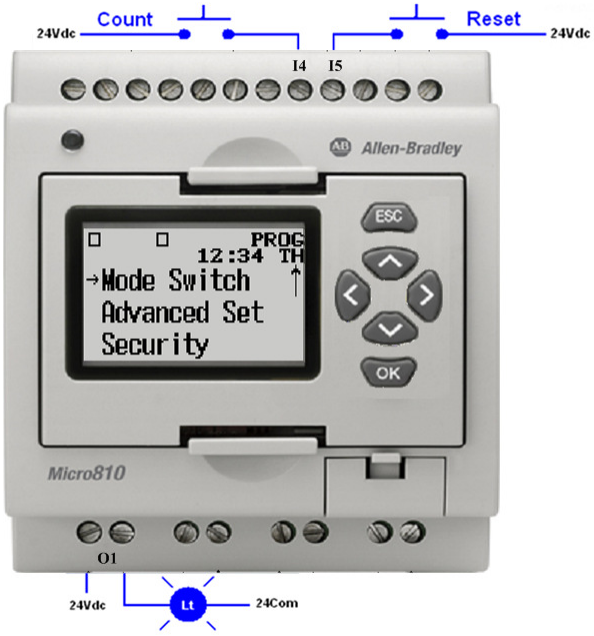
The count-up (CTU) instruction increments the counter whenever input CLK makes a transition from low to high. The instruction will compare the current value CV with the preset value PV, and energize output O1 when CV ≥ PV. To simulate the operation, we connect a count pushbutton to I4, a reset pushbutton to I5, and a lamp to output O1.



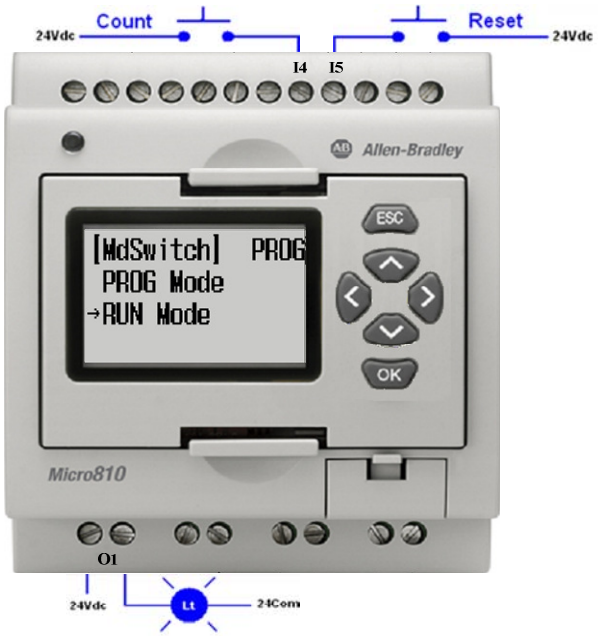
1. Press  to return to the Main Menu.



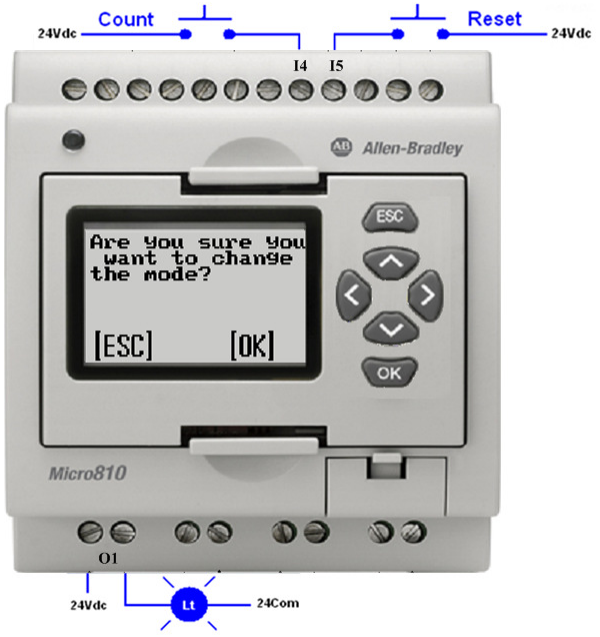
2. Press  three times to get to select Mode Switch and press  .



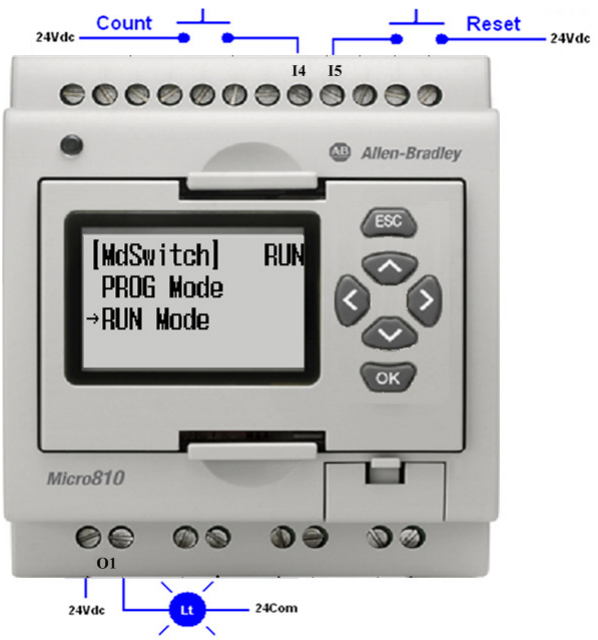
3. Press  once and press  to select RUN mode.

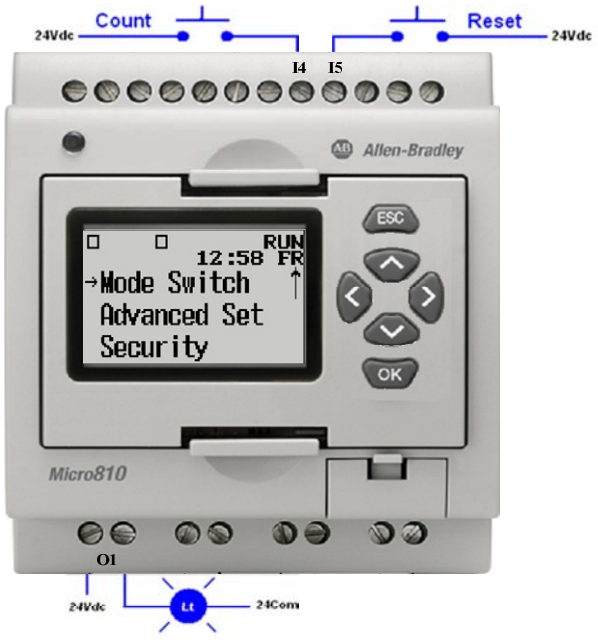


4. Press  to confirm the RUN mode selection.

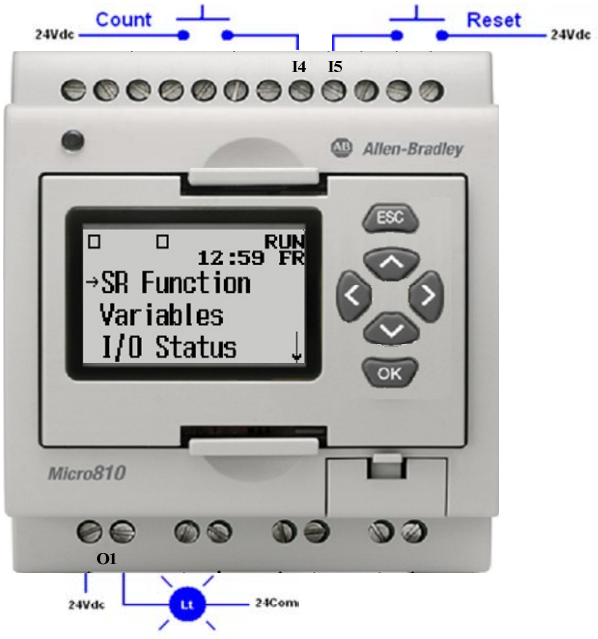


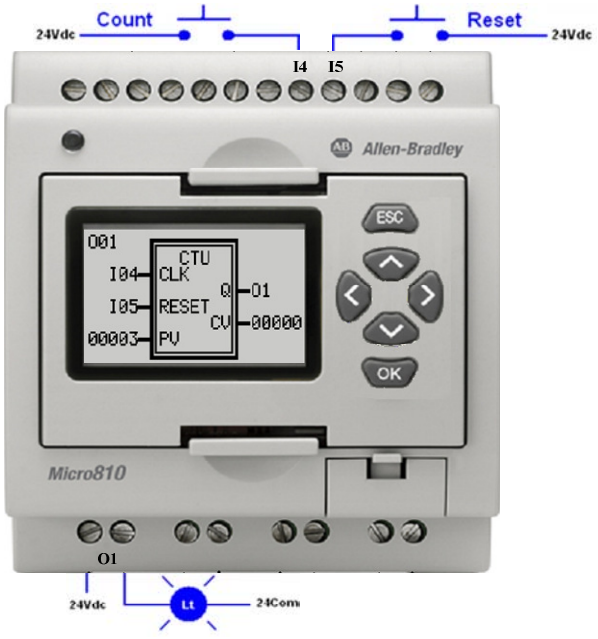
5. The Screen will indicate that the controller is in RUN mode. Press ESC to return to the Main Menu



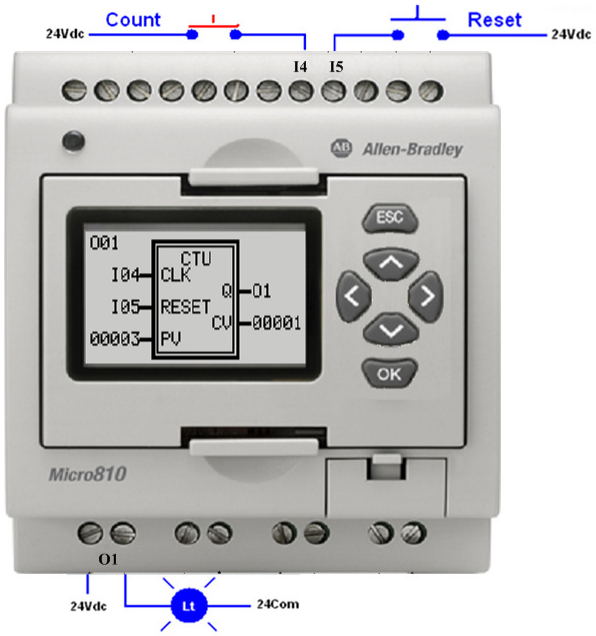


6. Press ^ three times and select SR FUNCTION by pressing OK . Press ^ once for Output1.

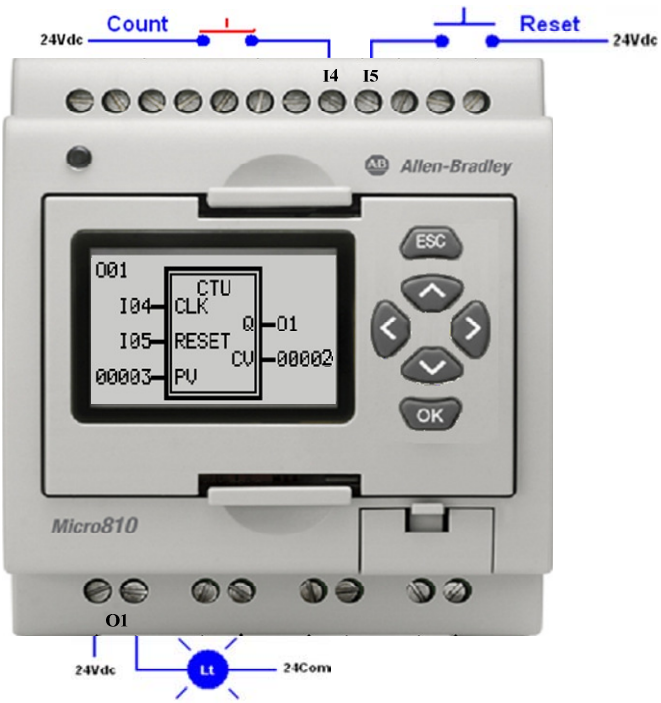




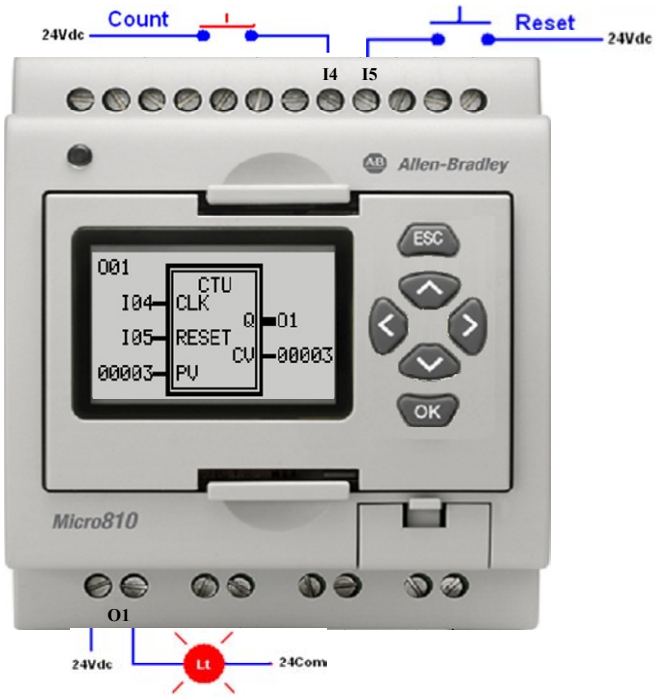
7. Press and release the count pushbutton. The current value CV increments to 00001.



8. Press and release the count pushbutton. The current value CV increments to 00002.



9. Press and release the count pushbutton. The current value CV increments to 00003. Since the current value CV = present value PV, the output O1 is energized, and the lamp is iluminated.



10. Press and release the Reset pushbutton. The current value CV is reset to zero, and output O1 is deenergized. The lamp is no longer iluminated.