

TECO

SG2 Series Programmable Logic Relay



QUICK START GUIDE

SG2 Client - Programming Software
SG2 Series Programmable Logic Relay

SG2 Client Programming Software

The SG2 Client software is the program editor for the SG2 Series Programmable Logic Relay (PLR). The SG2 instruction set is fully adequate to satisfy the needs of many industrial control applications and it is easy to use.

In this Guide, we will show the necessary steps to:

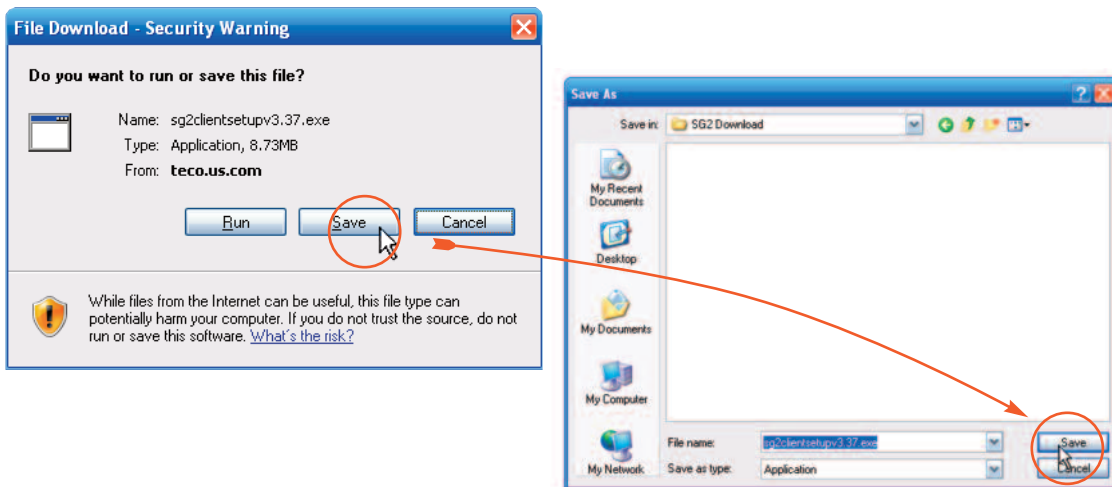
- Download the SG2 Client programming software
- Install the software on a Windows XP system
- Create a simple ladder logic program in the program editor
- Test the program in Simulation Mode
- Test the program in a running SG2 using Monitor Mode

System Requirements

- Pentium III processor at 500 MHz or higher
- 256 MB RAM
- 200 MB available hard disk space
- Broadband internet connection for software download
- Available USB port to connect SG2-ULINK programming cable

Step 1: Download the SG2 Client Software

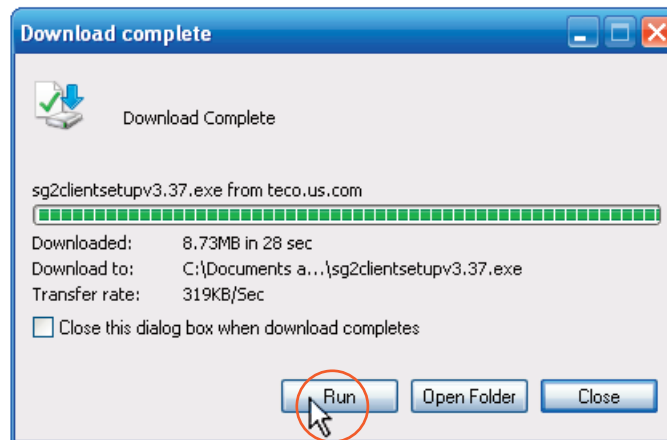
- 1.1 Select the Download link below.
www.teco.us.com/downloads/sg2clientsetupv3.37.exe
- 1.2 Select **SAVE** and choose a folder location on your PC to save the installation/setup software.





Step 2: Install the SG2 Client Software

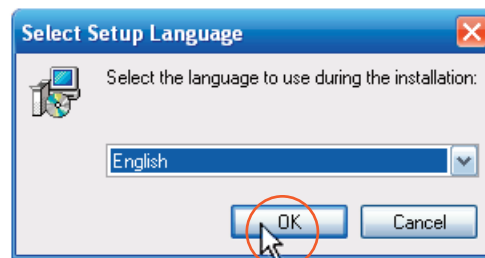
- 2.1 Close all other applications before beginning the SG2 Client installation.
- 2.2 Run the setup software by clicking **RUN** on the Download dialog or by double clicking the Setup file icon at the location where you saved the SG2 Client software file.



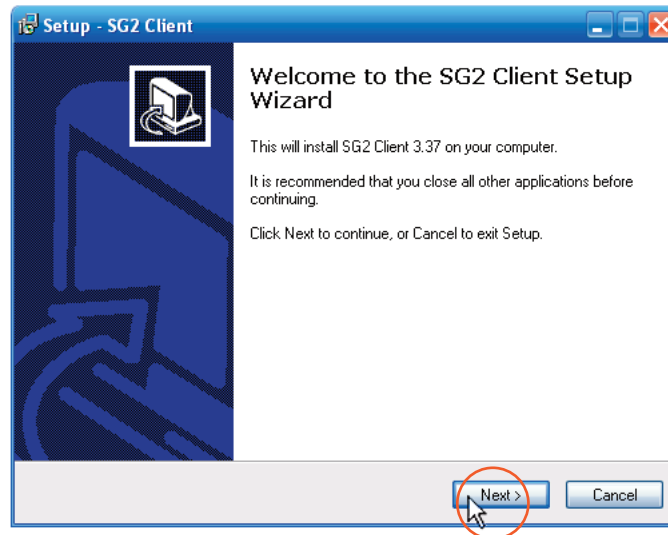
- 2.2a You may encounter a message similar to the one below. If you do, click **RUN**.



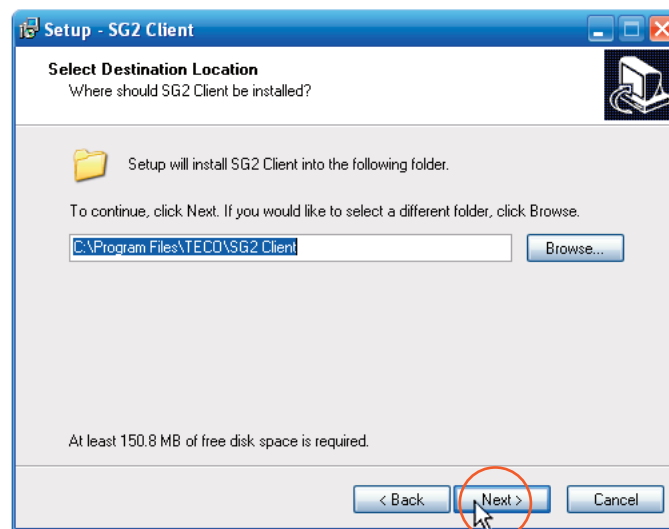
- 2.3 Select the language to be used during the software installation process and click **OK**.



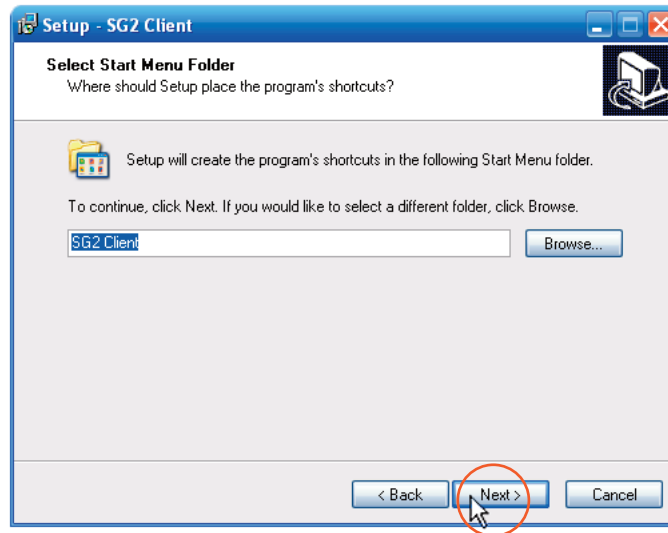
- 2.4 After the Setup Language is selected, the Setup Wizard will open. Click **NEXT** to begin stepping through the installation process. If you have not done so already, close all other applications before proceeding.



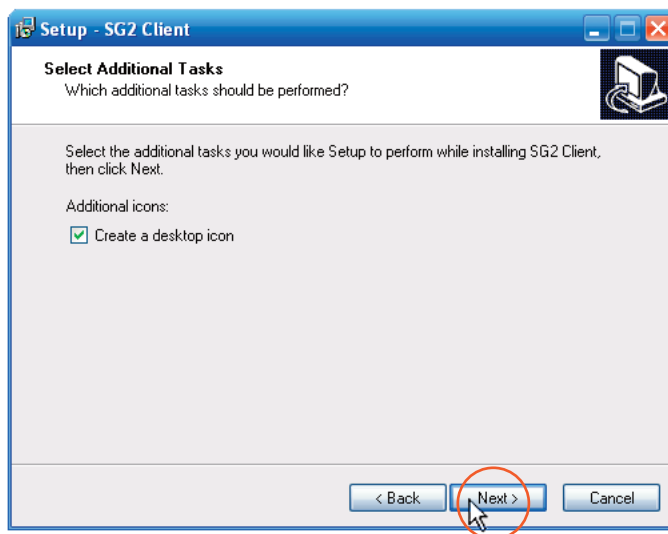
- 2.5 Choose the installation destination for the SG2 Client software and click **NEXT**.



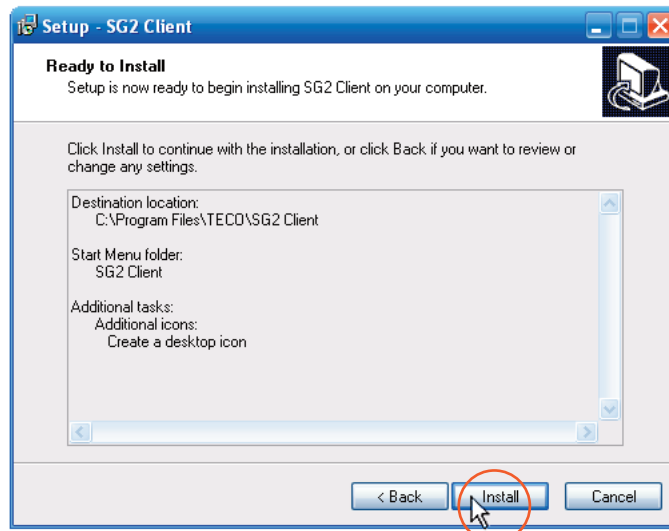
- 2.6 Add a shortcut to the Windows Start Menu by selecting **NEXT**.



- 2.7 Create a desktop icon (recommended), by checking the "Create a desktop icon" box and clicking **NEXT**.

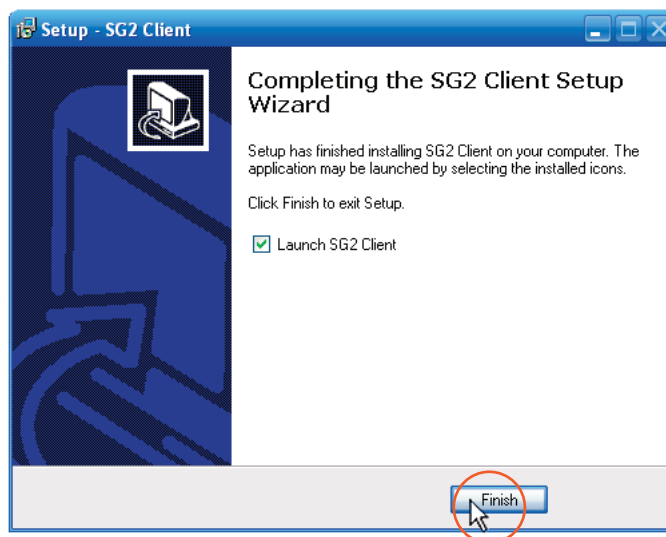



2.8 Review your installation preferences and choose **INSTALL**.



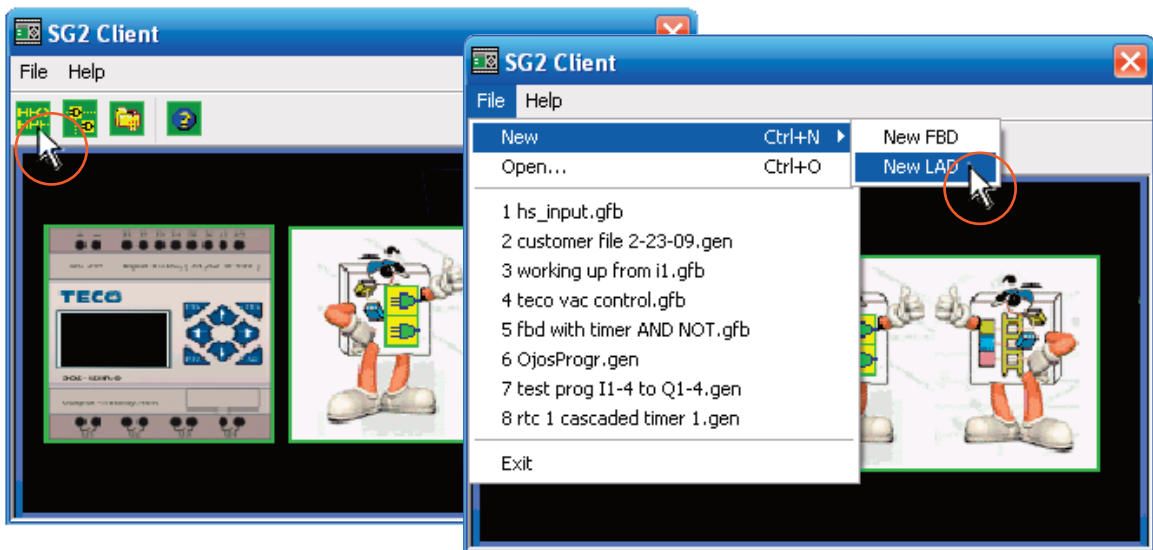
Step 3: Launch the SG2 Client Software

3.1 At the end of the installation process select Launch SG2 Client and click **FINISH**.

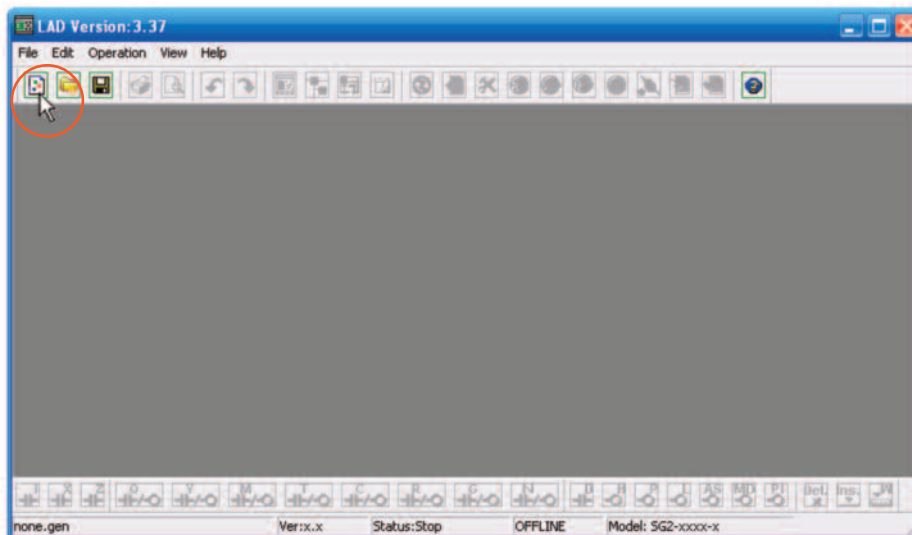


3.2 The SG2 Client can also be launched by double clicking the Desktop icon  or by choosing the Start Menu selection depending on the preferences you chose during installation.

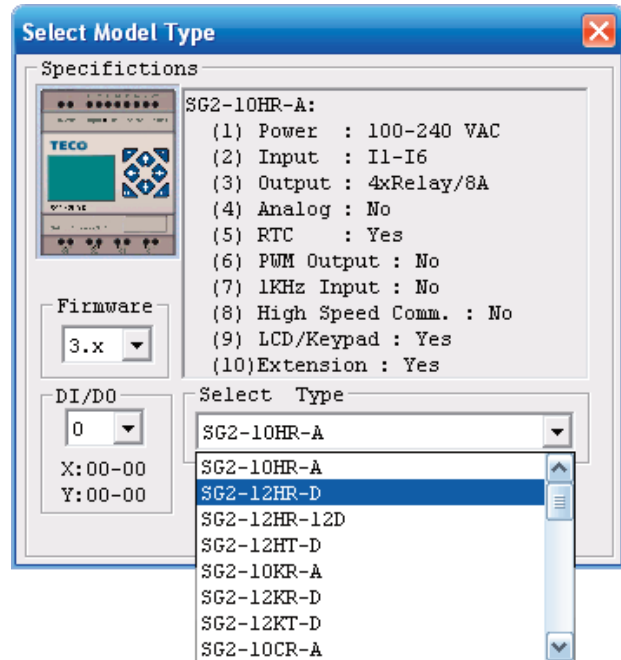
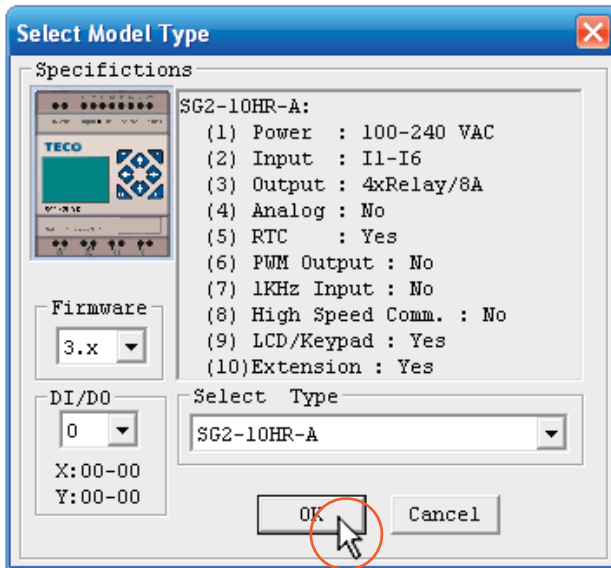
3.3 From the startup screen, select the **New Ladder Document** icon at the top left of the window or select File >> New >> New LAD.



3.4 Click the **NEW** icon or select **NEW** from the File menu to open a new blank ladder logic project.



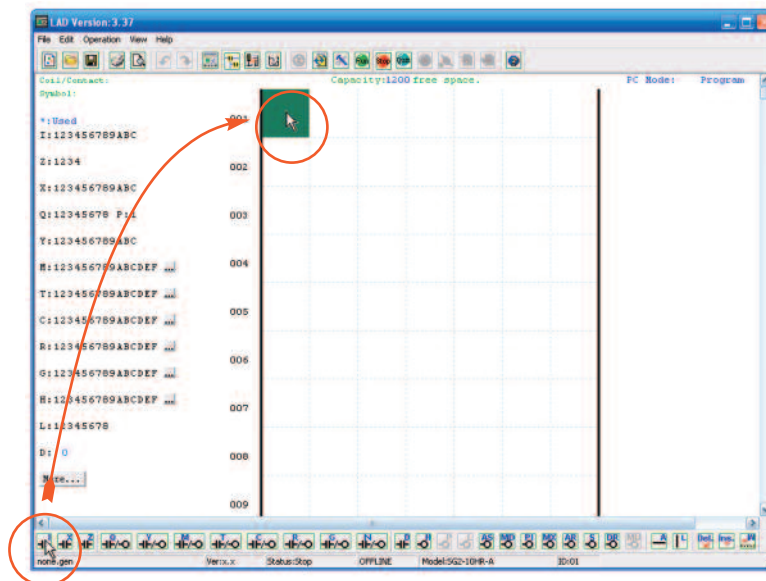
- 3.5 On the dialog box below, you can select the SG2 Model you want to program and click **OK**. If you are only using the software in Simulator Mode, click **OK** to accept the default SG2-10HR-A model. If you are programming an actual SG2, it is important to select the exact model from the drop-down menu.



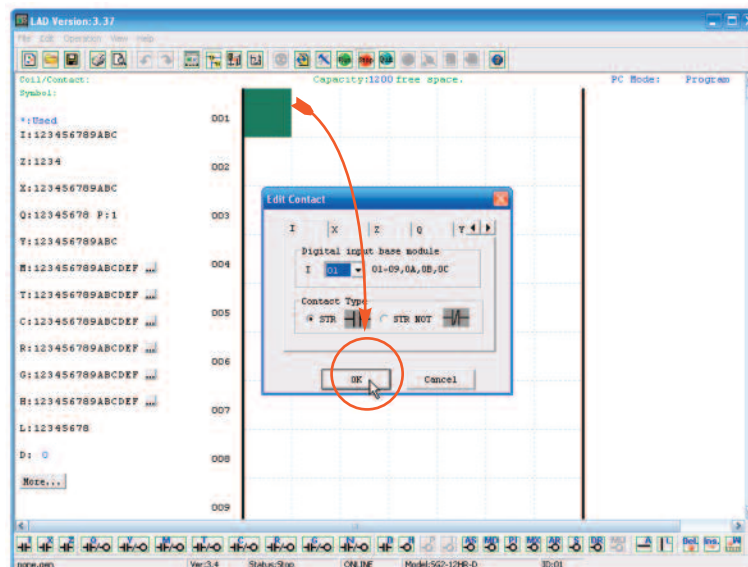


Step 4: Create a Simple Program

- 4.1 In the program editor, click on the Normally Open “I” contact icon located near the lower left corner of the screen. Move the cursor to the leftmost grid location on Rung 001 as shown below. The top left grid square should have a green square covering it. As you move the cursor, the cursor will change appearance to resemble the “I” contact. Click the **green square** to drop the contact in the first position on Rung 001.

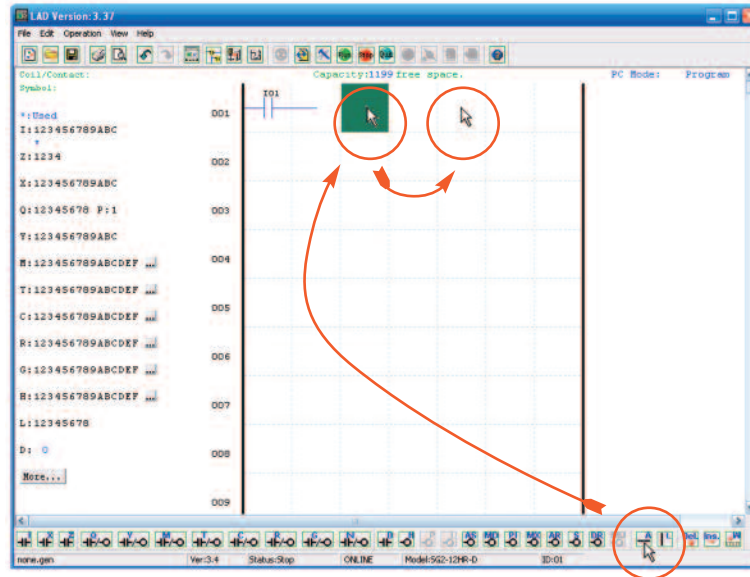


- 4.2 The Edit Contact dialog box will open. For the purpose of this exercise, click **OK** to select the normally open version of contact I1. Note that you could have changed to a different type of contact, a different number contact, or a normally closed contact.

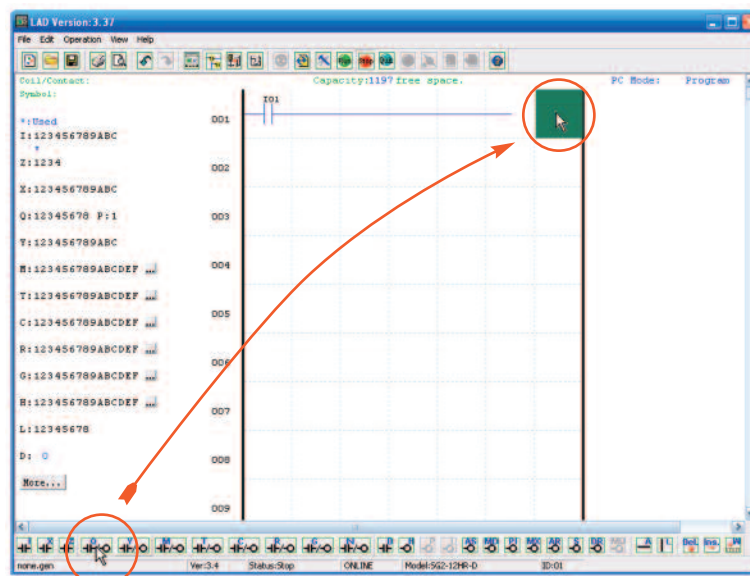


NOTE: In the Ladder program, Contacts and Coils are numbered in a two digit hexadecimal format. The SG2 module is numbered in a one digit hexadecimal format to make the numbers easy to read. In this Quick Start Guide, I1 and I01 refer to the same input.

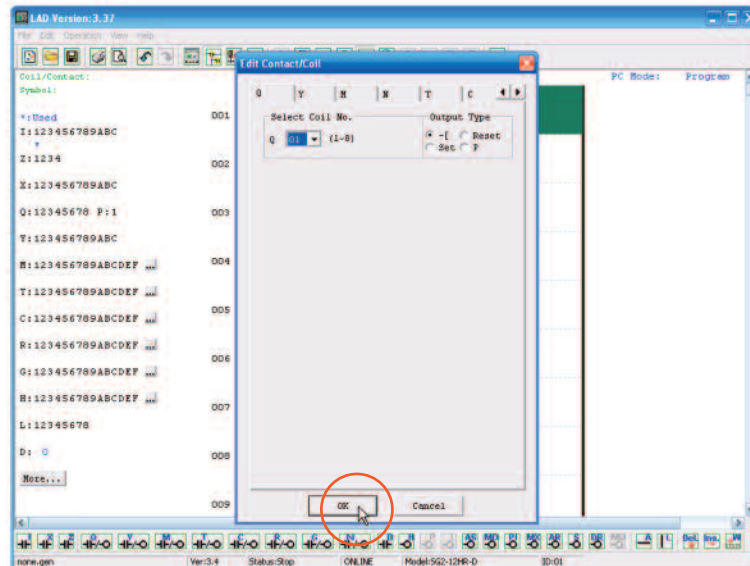
- 4.3 The normally open I1 Contact should appear in the first grid position on Rung 001. Notice also that the green square has advanced to the next eligible rung position. Another contact could be placed here, but we will use the rung continuation icon instead to advance the rung to the far right coil position. Click on the “A” icon to grab the rung continuation element and click in the green square. The green square should move to the right. Click again in the **green square** to continue the rung to the coil position.



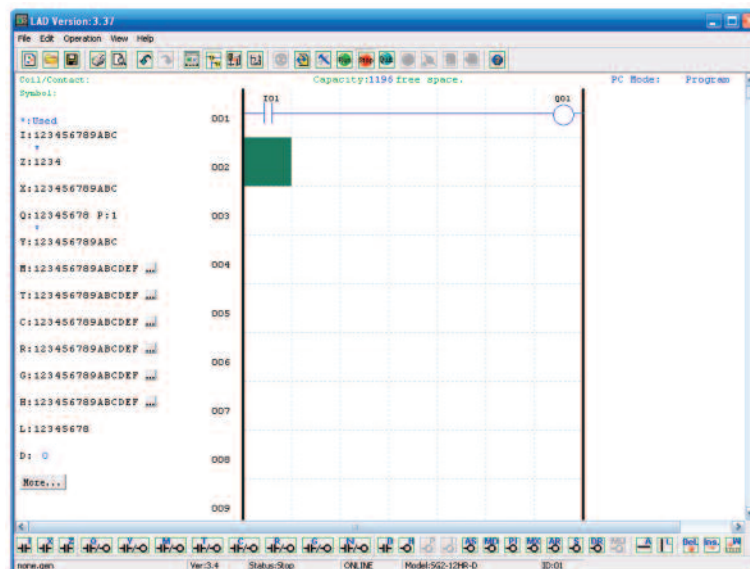
- 4.4 Click on the “Q” Contact/Coil icon near the bottom left of the screen. (Q’s are real world outputs but they also have an associated contact that changes state when the coil is turned on.) Click in the far right grid square of Rung 001 to place the coil in that location.



- 4.5 The Edit Contact/Coil dialog box will open. For the purpose of this exercise, click **OK** to select the default version of coil Q1. Note that you could have changed to a different type of coil, a different number coil, or you could have modified the function of this coil.



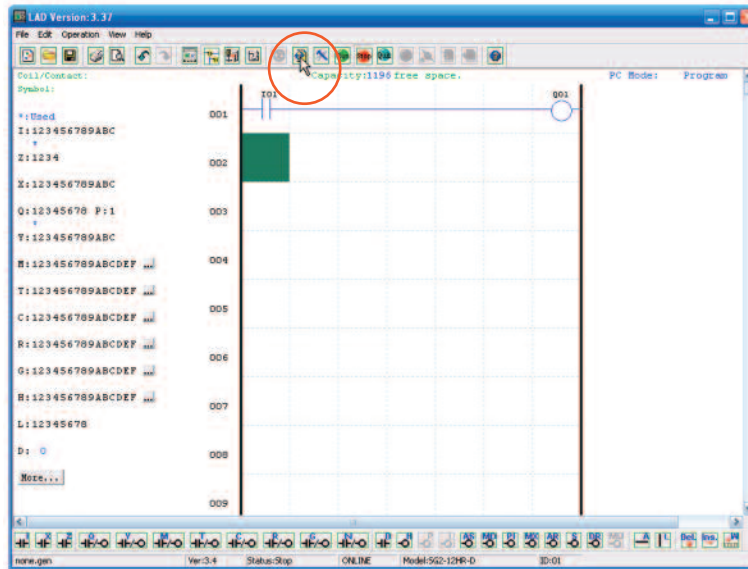
- 4.6 You have completed a rung of ladder logic. If you loaded this program into an SG2, the actual device wired to I1 would turn on the output at Q1 for as long as the I1 contact remained closed. Next, we will run this program in Simulation Mode where you can see the appearance of the rung when I1 is turned on. You can save this program at File >> Save, but it is not necessary to do so.



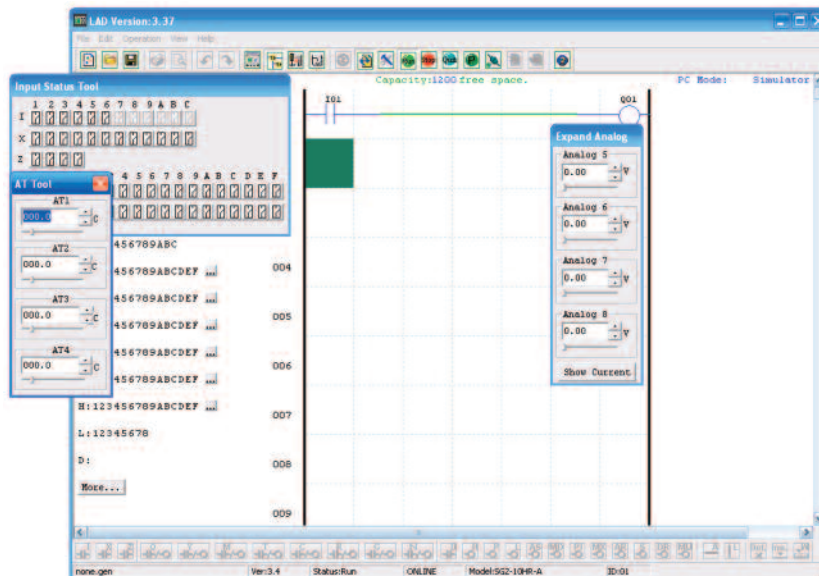


Step 5: Run the Program in Simulator Mode

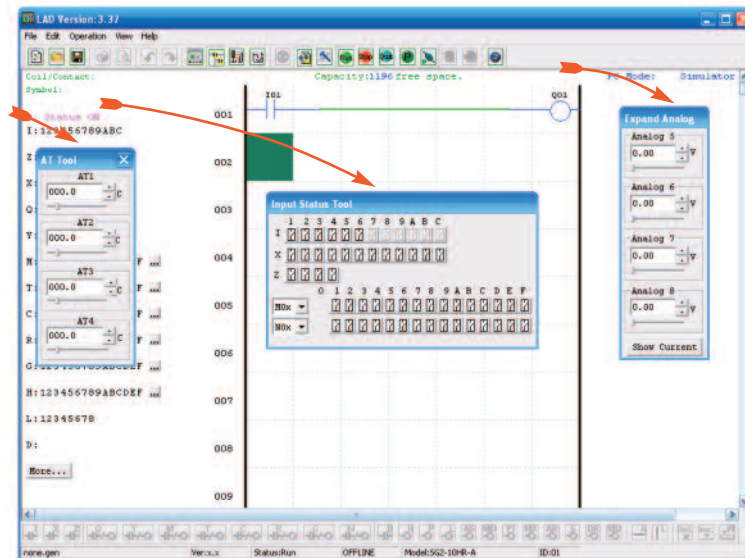
- 5.1 Click on the **Simulator** icon near the center top of the screen or go to the menu bar and select Operation >> Simulator.



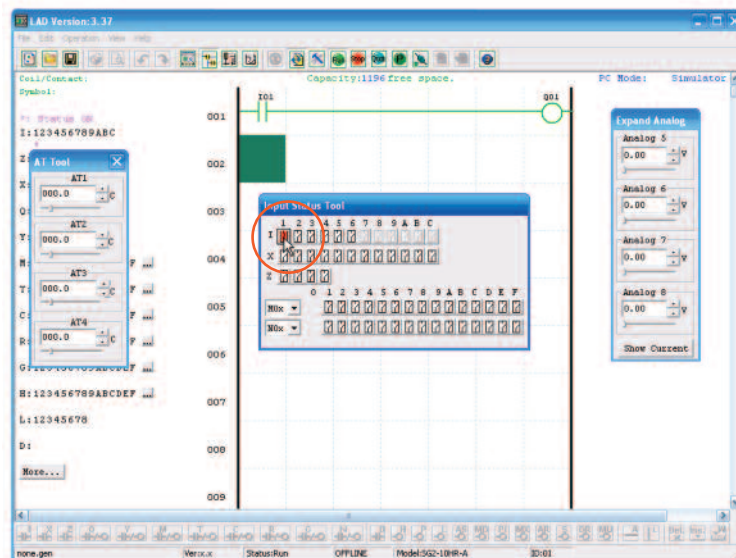
- 5.2 The center of the rung of logic should have turned green and several small windows should have popped up to allow you to manipulate the inputs.



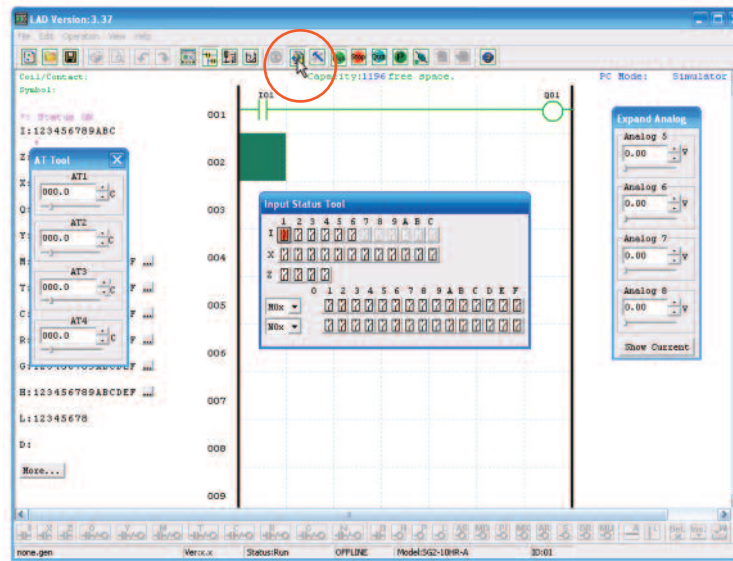
- 5.3 Move the AT Tool window and the Expand Analog window out of the way and position the **Input Status Tool** window in a convenient location.



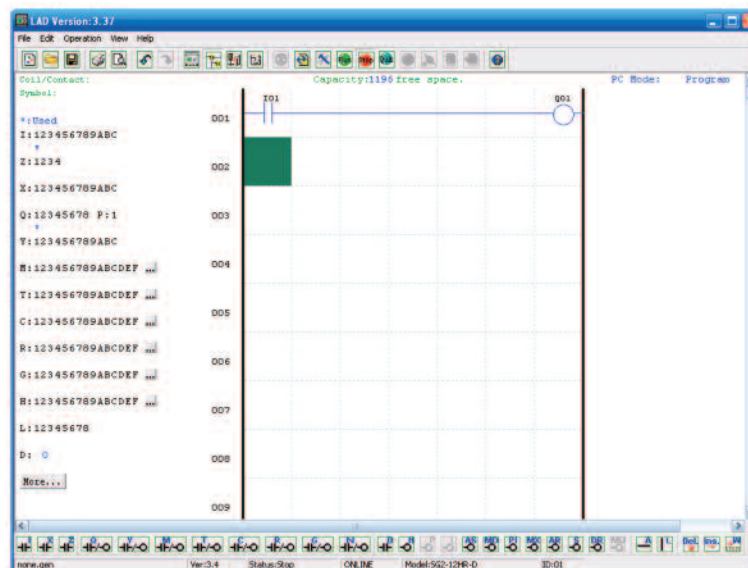
- 5.4 Locate the “I1” button on the **Input Status Tool** and click it one time to turn it on. The button will turn red and the rung of logic will turn completely green. The green color on the I1 input of Rung 001 indicates that it is “passing current” and the green Q1 output indicates that it is on.



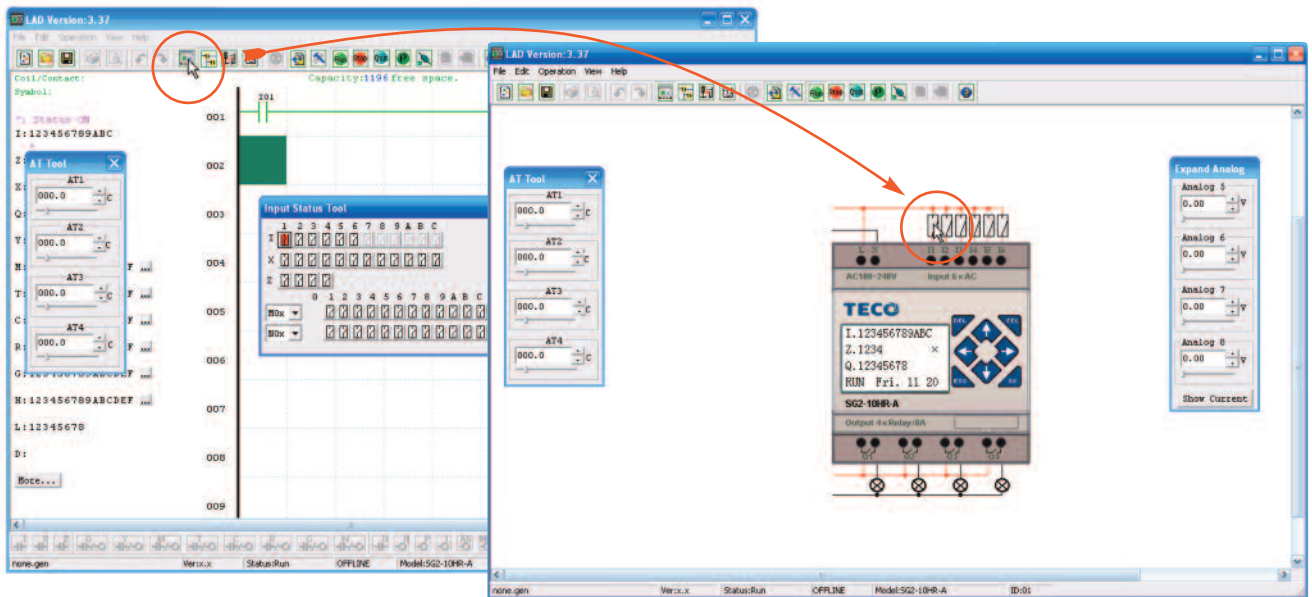
5.5 You can turn off the Simulator Mode by clicking the **Simulator** icon or the Stop icon.



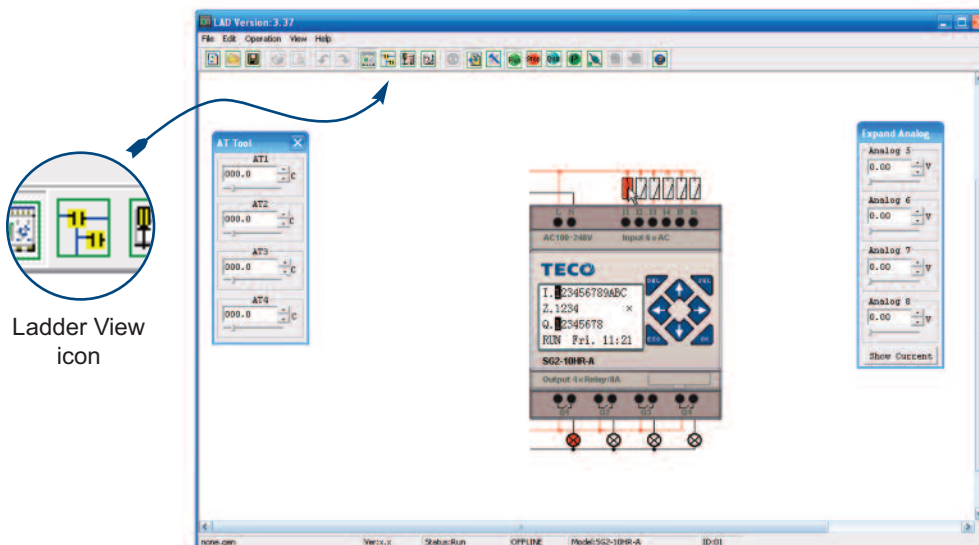
5.6 If you have reached this point, you have successfully written a ladder logic program that would run in an actual SG2.



- 5.7 Another helpful feature of the SG2 Simulator is that you can select **Keypad View** and see how the program would operate as though you were looking at the controller face. Click on the Keypad View icon and I1 to turn on the output Q1.



- 5.8 You can toggle I1 on and off to turn on and off Q1, but the other inputs are not programmed to outputs so turning them on does not turn on outputs. Return to the **Ladder View** by clicking on the **Ladder** icon.

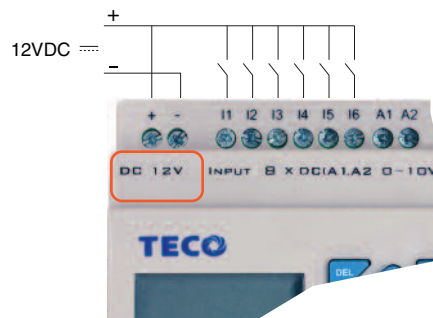
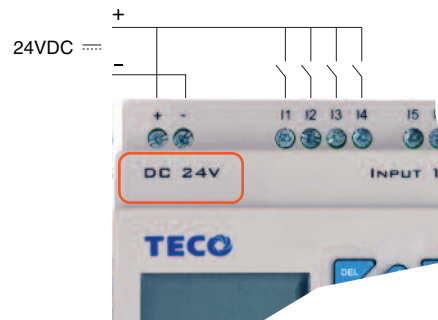
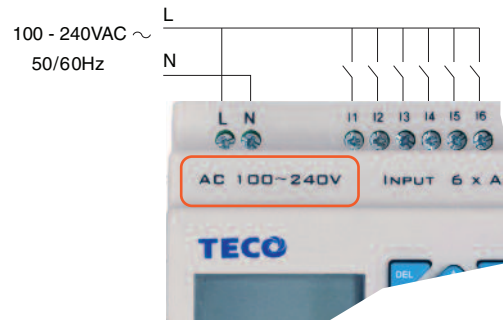




Step 6: Connect Power to the SG2 Programmable Relay

Refer to the instruction sheet that ships with the product for additional circuit protection recommendations!

- 6.1** Connect power to the SG2 following the instructions that ship with the product. Apply AC power ONLY to modules clearly marked “AC” with terminals labeled L (for AC Line) and N (for AC Neutral). Apply DC power ONLY to modules clearly marked DC 24V or DC 12V with terminals labeled “+” and “-”. Connect the normally open contacts of a momentary pushbutton to I1 to make it convenient to test the program you will be uploading to the CPU.





Step 7: Install the Programming Cable Device Driver

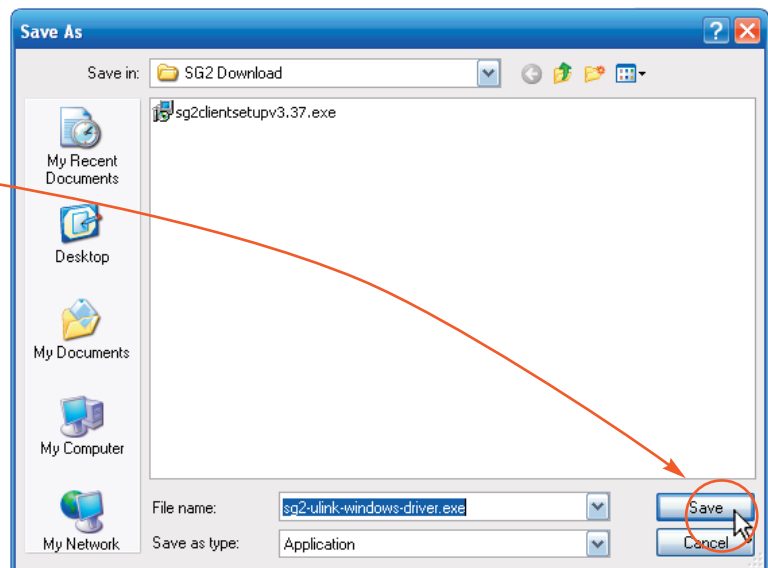
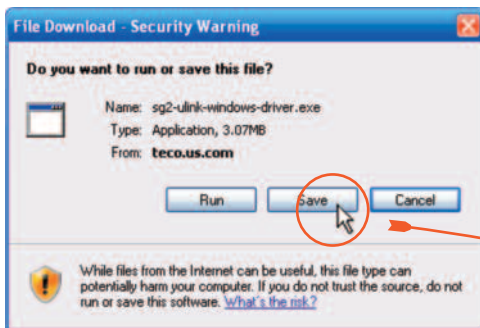
NOTE: These device driver instructions are written for users of Windows XP, but the same driver is also used for Windows 7. Windows 7 usually loads the driver automatically when the programming cable is first inserted into a USB port. If Windows 7 fails to load the driver automatically, use this procedure to load the driver manually.

7.1 To prepare for your first use of the **SG2-ULINK** programming cable, you will need to load the appropriate device driver onto your Windows PC.

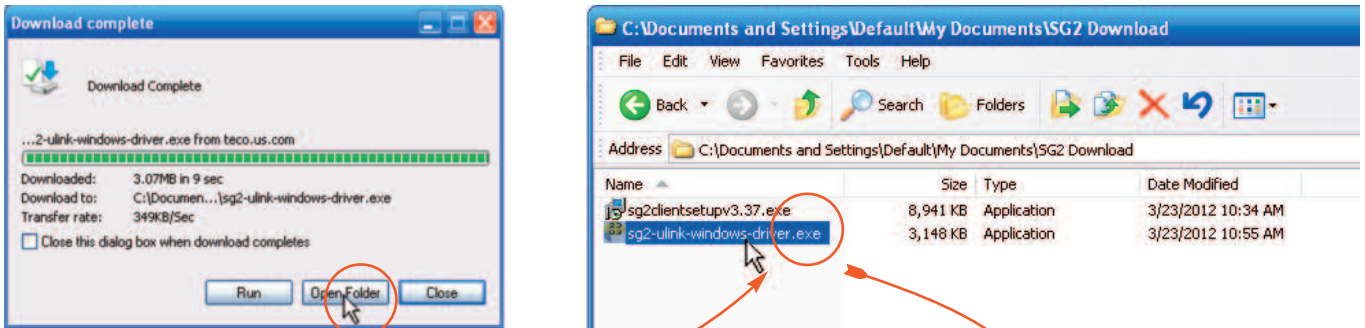
7.2 You can download the **SG2-ULINK** device driver at the link below:

www.teco.us.com/downloads/sg2-ulink-windows-driver.exe
(for Windows XP and Windows 7 systems)

7.3 On the File Download dialog, click **SAVE...** and choose a folder location on your PC to save the installation/setup software and click the **SAVE** button.



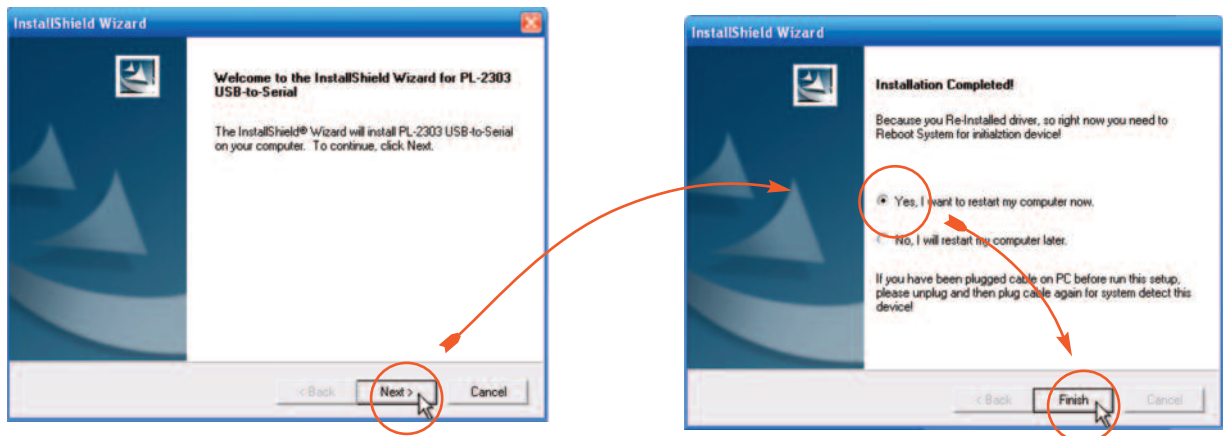
7.4 When the download is complete, click **Open Folder** and then double click the driver install file.



7.5 You may encounter a message similar to the one below. If you do, click **RUN**.



7.6 When the InstallShield Wizard opens, click **Next**. You have completed the driver installation and you will need to restart your system before using the programming cable. If it is convenient at this time, select the "Yes" button and click **Finish**.





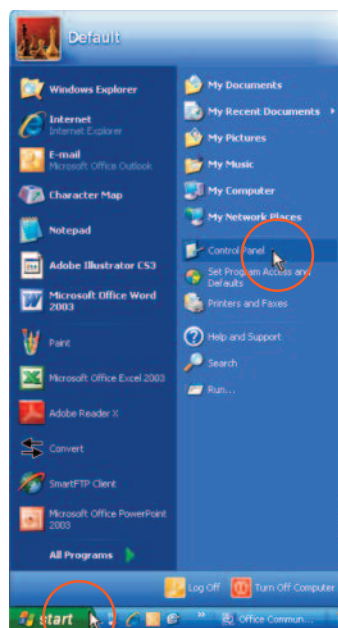
Step 8: Connect Programming Cable

- 8.1 Carefully remove the protective plastic cover from the SG2 programming port using a flathead screwdriver or similar tool as shown below.
- 8.2 The SG2-ULINK programming cable connects from a USB port on your PC to the programming port of the SG2 as shown below.

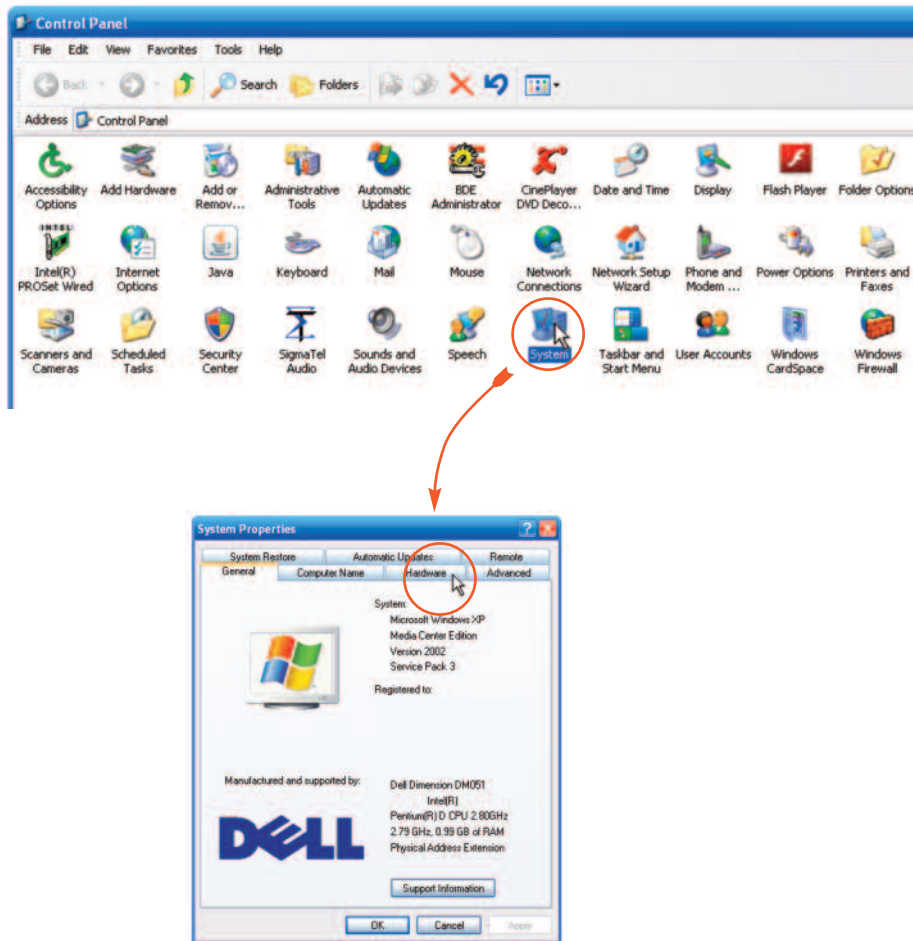


Step 9: Linking your Windows PC to the SG2 CPU

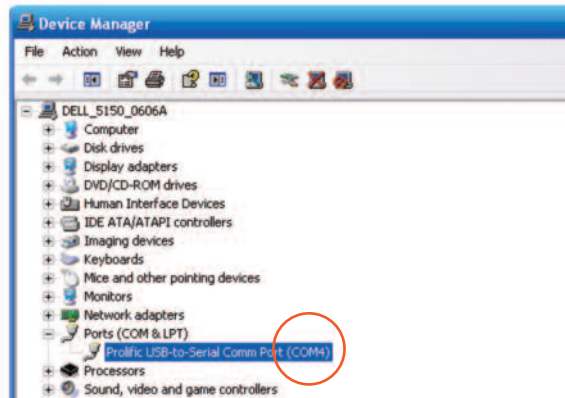
- 9.1 With the device driver loaded for the **SG2-ULINK** programming cable, you are almost ready to **Link** your Windows PC to your SG2 CPU. First, you will need to determine which COM Port number Windows has assigned to the USB port.
- 9.2 To determine the COM Port number, do the following:
 - Insert the SG2-ULINK programming cable into one of the USB ports on your Windows computer
 - Click the **Windows Start button** and select **Control Panel**



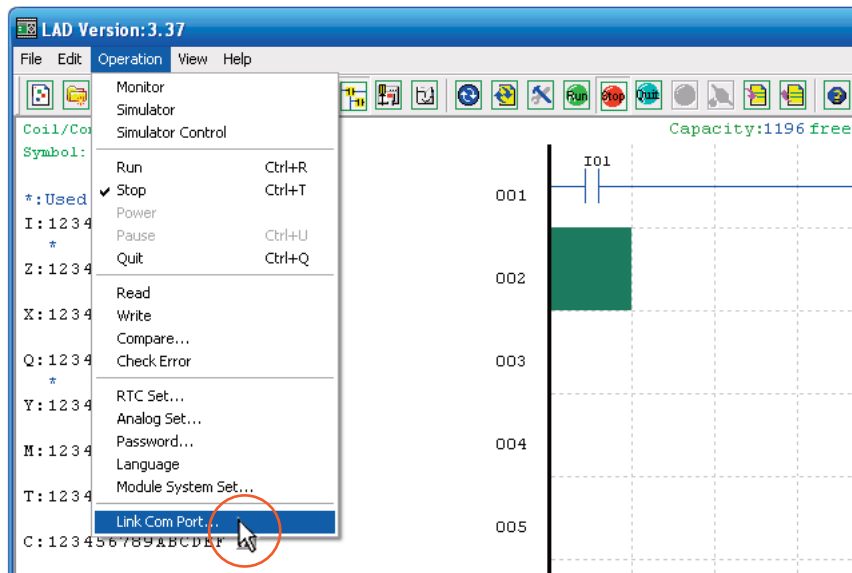
- 9.3 Your Control Panel window may have a different appearance from the one below, but locate the **SYSTEM** icon or file name and double click it to open the **System Properties** dialog box.



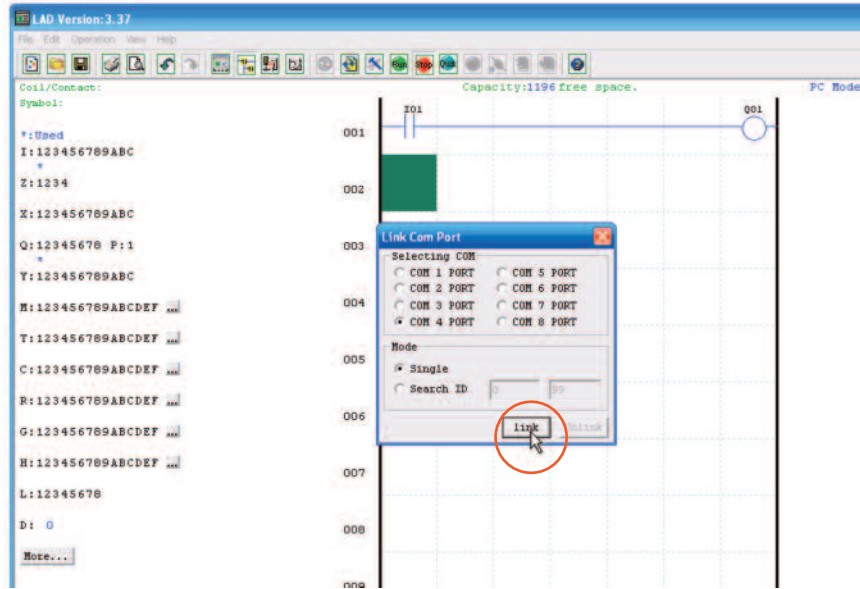
- 9.4 Look for “Ports (COM & LPT)” on the list. Click the “+” to the left of Ports (COM & LPT) to expand that selection. You should see something similar to “Prolific USB-to-Serial Com Port (COM4)”. The COM port number could be any integer from 1 to 8. You will need to know the COM Port number to select the COM Port on the “Link Com Port” dialog in the SG2 programming software.



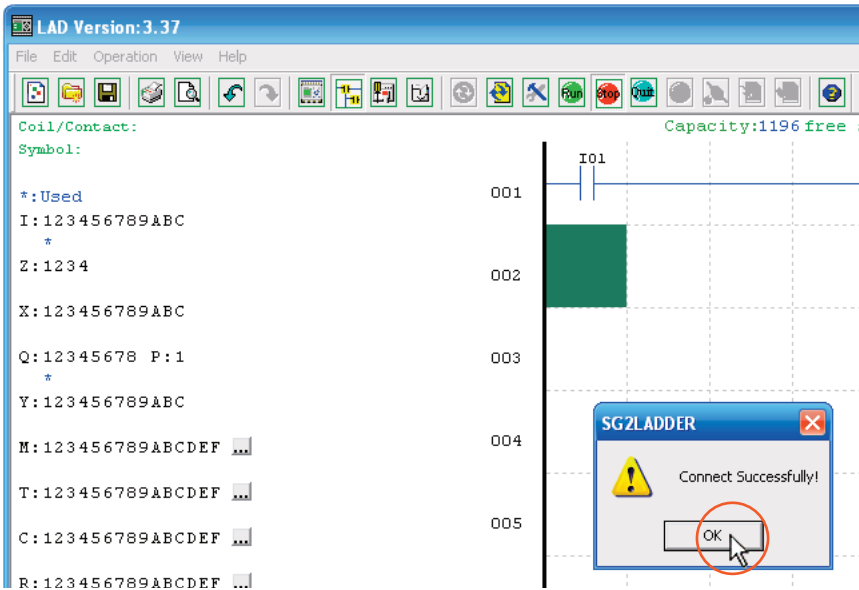
- 9.5 From an open SG2 program, select the Operation menu and then select “Link Com Port...”



- 9.6 The SG2 Client software allows the use of any of COM Port from number 1 to 8. Match the **COM Port** number in the dialog box shown below to the COM Port number Windows has assigned to the USB port that your programming cable is connected to.



- 9.7 If you are connected to a powered-up SG2, you should see the “Connect Successfully” message as shown below. Click **OK** to acknowledge.



TROUBLESHOOTING A COMMUNICATION ERROR



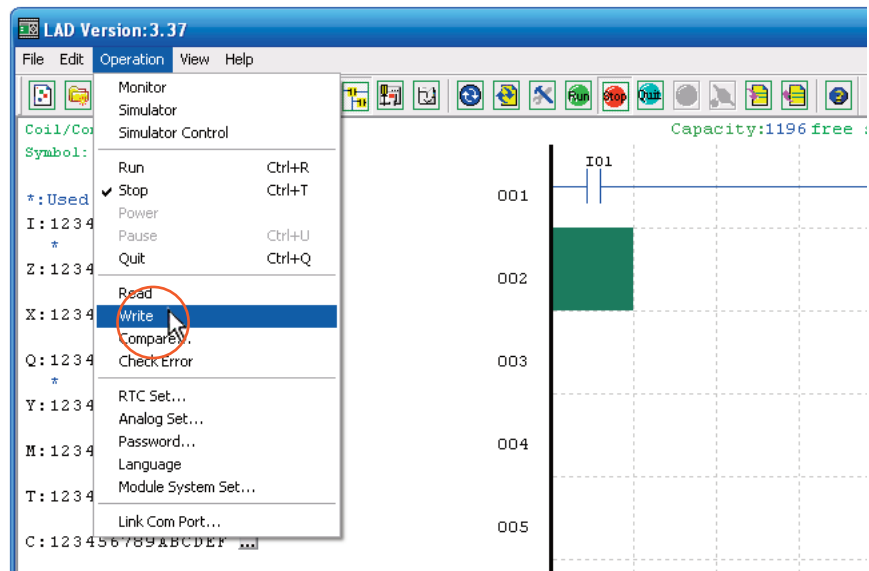
The most likely causes of a Communication Error are:

1. The SG2 is not powered up
2. The SG2-ULINK programming cable is not plugged securely into the programming port on the SG2 or the USB port on your PC
3. The wrong COM Port was selected on the “Link COM Port” dialog box (see Step 9.6)

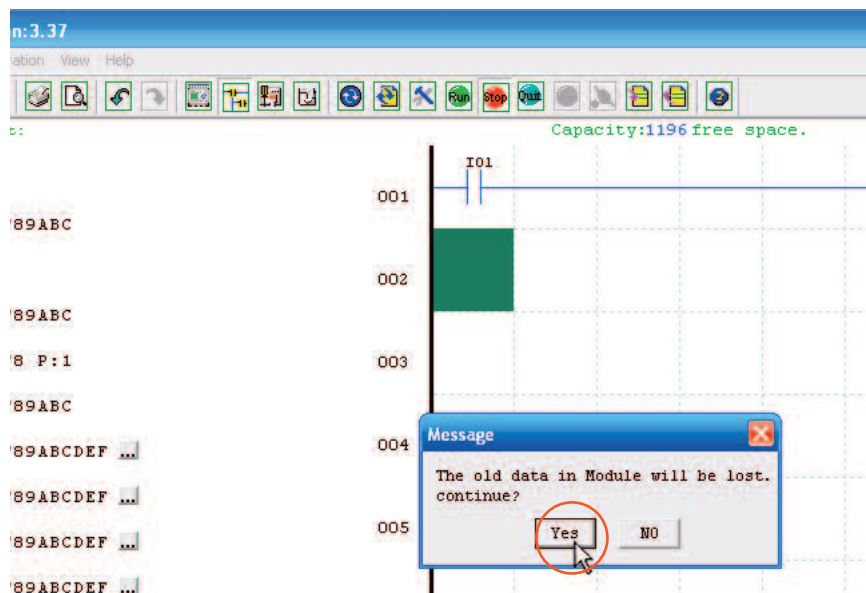


Step 10: Write the Program to the SG2

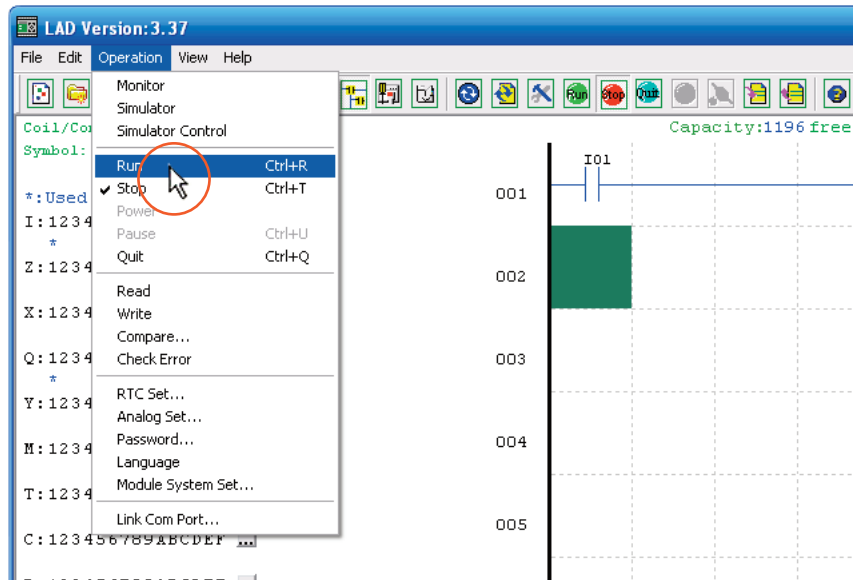
- 10.1 You will need to be linked to the SG2 to Write the program to the CPU.
- 10.2 Using the ladder program you wrote earlier using this Quick Start Guide, select the Operation menu and then click **Write**.



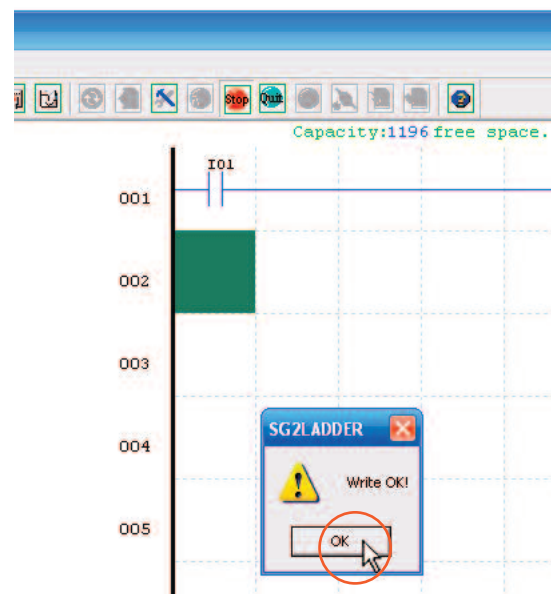
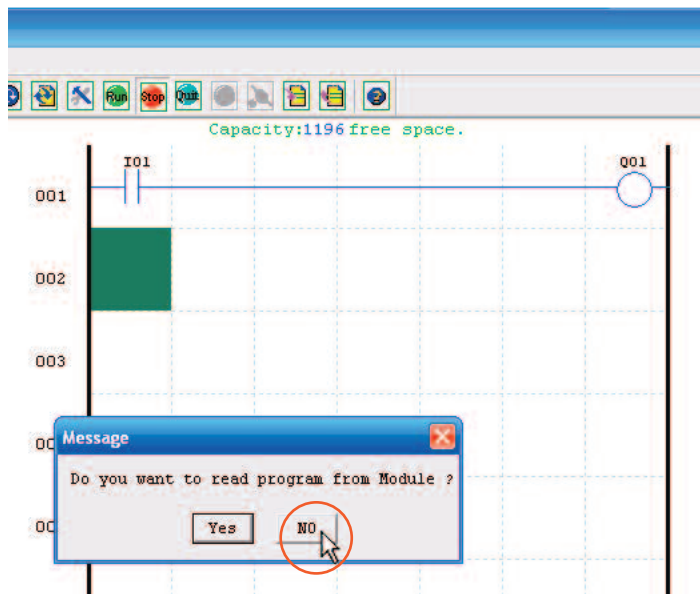
- 10.3 The SG2 software will warn you that Writing your program to the CPU will cause you to lose any program that is currently in the CPU memory. Do not proceed with this step unless you are sure that overwriting the existing program is what you intend to do. If you are sure you want to Write the program to the CPU, click **Yes**.



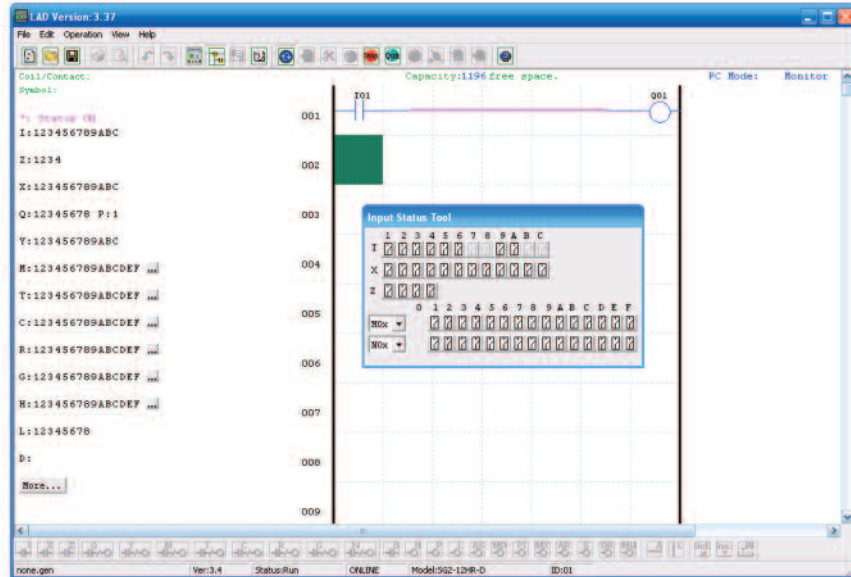
10.4 After writing the program to the CPU, select the Operation menu and **Run**.



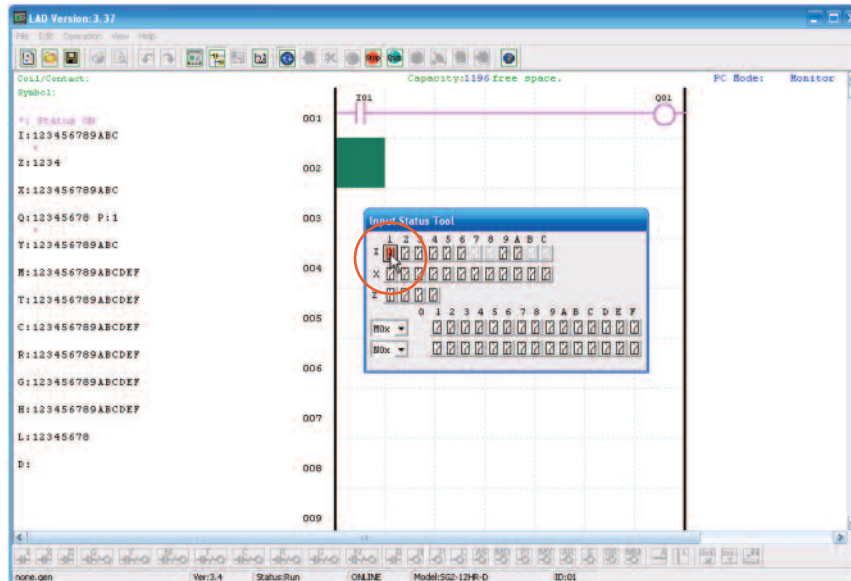
10.5 Before entering Run Mode, the SG2 software will ask if you want to read the program from the CPU module. Since you just wrote the new program to the CPU, it is not necessary to read the program from the CPU. Click **No**. You should see a “Write OK” notification. Click **OK** to acknowledge.



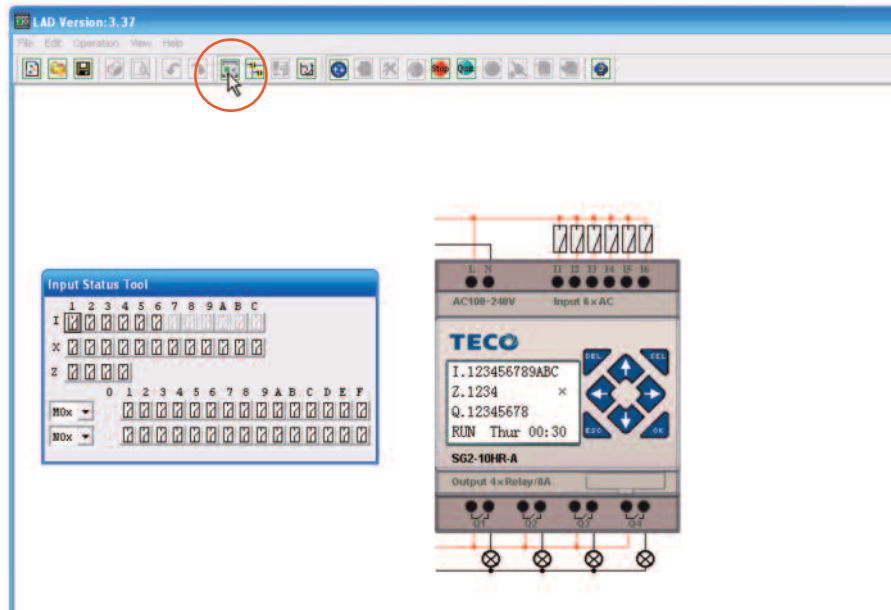
- 10.6 If you have followed the Steps in this Guide, the SG2 CPU will be in **Run Mode** and the SG2 software will automatically enter **Monitor Mode**. The program will be highlighted in pink where current is allowed to flow. Contacts and coils that are blue are not energized. A contact that is highlighted in pink is turned **ON** and a coil that is highlighted in pink is **energized**.



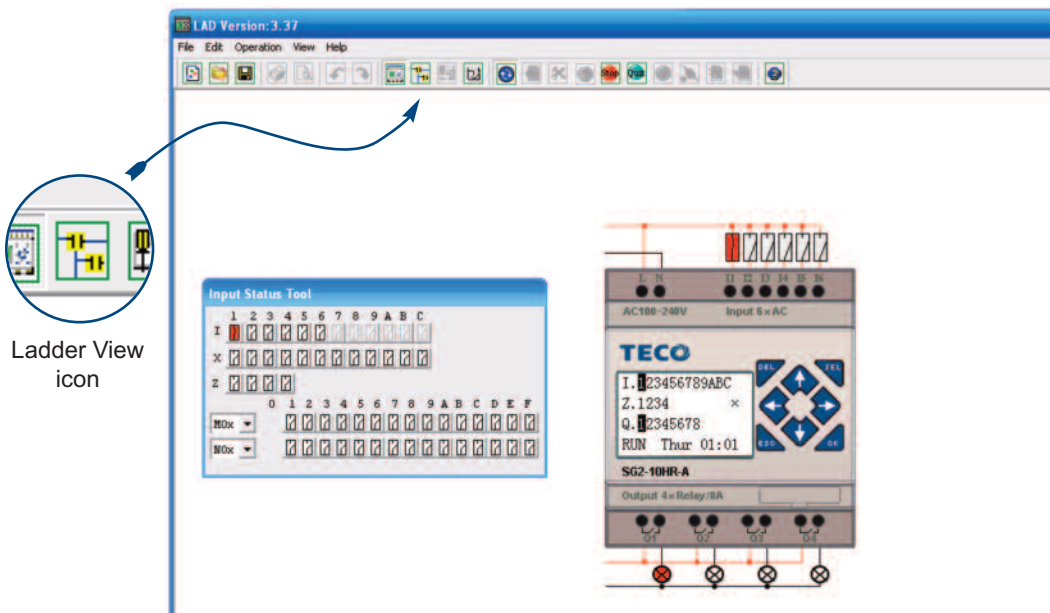
- 10.7 This Step requires a momentary pushbutton or equivalent device to be wired to input I1. (See Step 6.1) Press and hold the momentary pushbutton that is physically wired to input I1. In your program, I1 should turn pink to indicate that it is passing current and the output coil Q1 should turn pink to indicate that it is energized. You will also notice on the **Input Status Tool** dialog that I1 has turned red to indicate that it is ON.



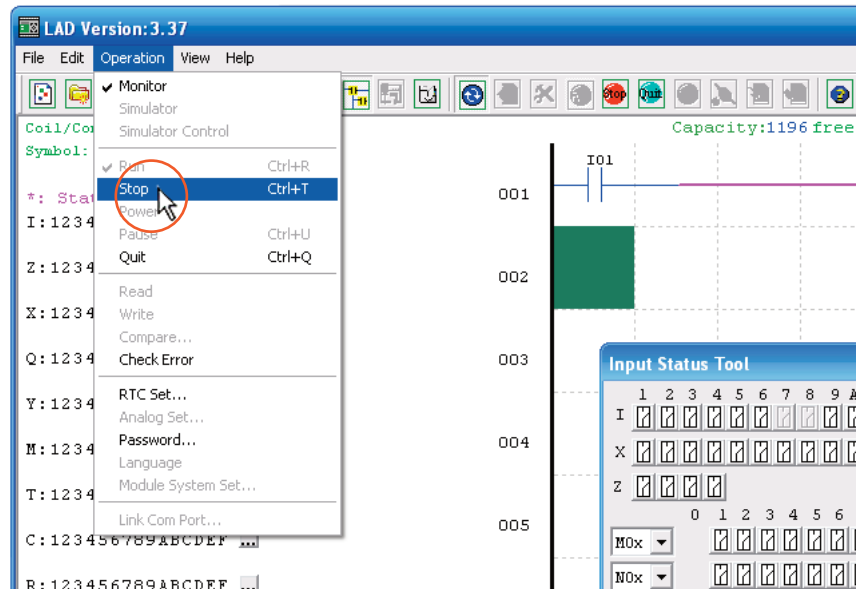
- 10.8 An alternative way to view the running program is in Keypad View. Click the **Keypad View** button on the toolbar.



- 10.9 Press the momentary pushbutton wired to input I1 to see the program respond in **Monitor Mode**. The input I1 and the output Q1 will turn red on the module diagram and the Input Status Tool will also show red at input I1. Return to Ladder View by clicking the Ladder View icon on the Tool Bar.



10.10 Stop the CPU by selecting the Operation menu and **Stop**.



At this point you should have created a Ladder Logic program, written it to the SG2 CPU, and tested it in Monitor Mode using Ladder View and Keypad View.

Congratulations!

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