

Building an Example Program

What You Will Learn

The pages that follow will explain how to do the following:

- create a project
- use the tool palette to enter instructions and build a ladder program
- use “hot keys” to work faster
- enter nicknames and add comments
- setup an internal timer
- setup a self-resetting internal counter
- cut and paste rungs of logic
- save your program to disk
- communicate with your PLC
- load your program into PLC memory
- monitor your program with the Data View



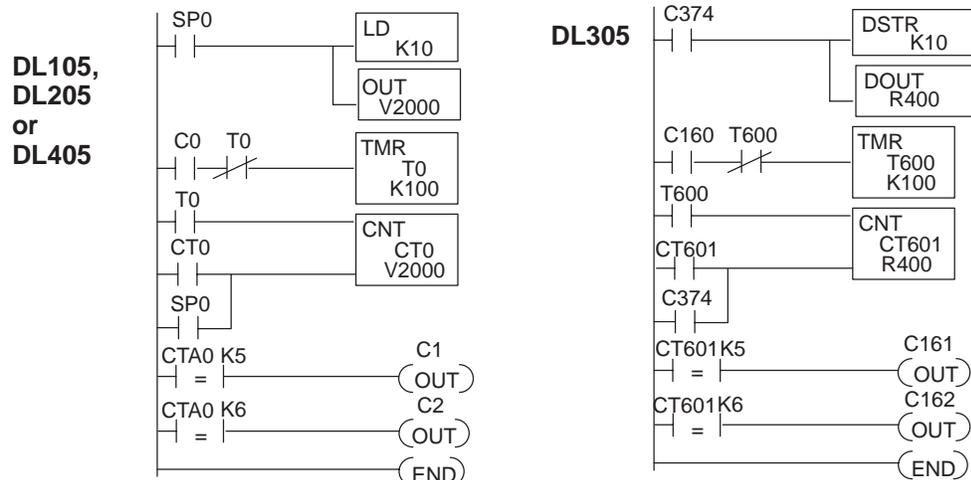
Example

This example has four basic tasks:

1. Load a value into memory of your PLC that can be used as a preset for a timer.
2. Setup a self-resetting timer.
3. Use a counter to count the number of times the timer reaches the preset value and resets.
4. Use Comparative Boolean relays to turn ON an internal coil when the counter current value equals 5, and turn ON a second internal coil when the counter current value equals 6.

Ladder Logic Example

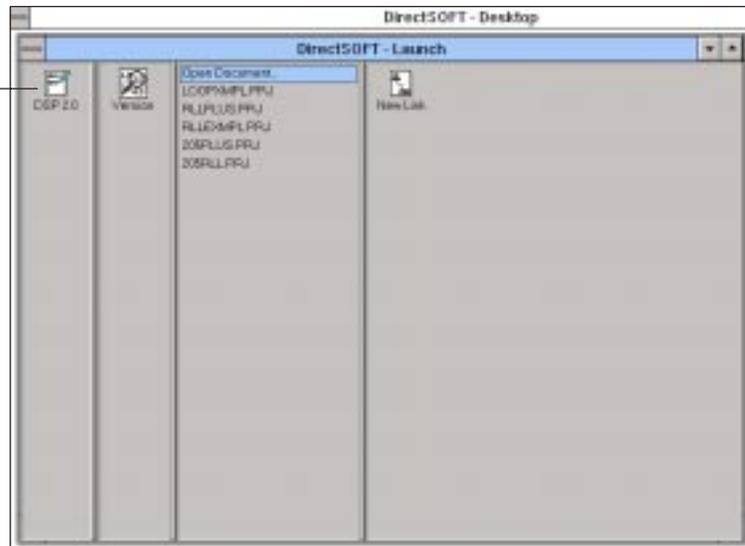
The ladder logic shown below is the same program for the DL105/DL205/DL405 and DL305 families. As you work through the **DirectSOFT** screens to enter this program in the pages that follow, the DL105/DL205/DL405 will be shown. If you have a DL305 family PLC, substitute the proper elements and memory locations. For example instead of entering **SP0**, you would enter **C374**.



Step 1: Enter the Programming Mode

When you click on the **DirectSOFT** icon from the **DirectSOFT Windows Group**, a screen similar to the one shown below appears. You will notice a programming icon in the upper left-hand corner. Click on this icon to enter your new project.

Click here to start programming



Step 2: Start a New Project

You should now see the **New Project** window. You can name your project using any combination of 8 characters (no spaces). Use **“EXAMPLE1”** for this example. Move the selection bar to the **PLC Family** and **CPU Type**. For this example, use a PLC belonging to the DL105/DL205/DL405 families. Click on **OK** after you have made your Family and Type selections. If you have a DL305 type PLC, be sure and select it instead from the choices. Keep in mind the available mnemonics, processing rules and even the tool bar characteristics are tailored to the Family and Type selections that you make.

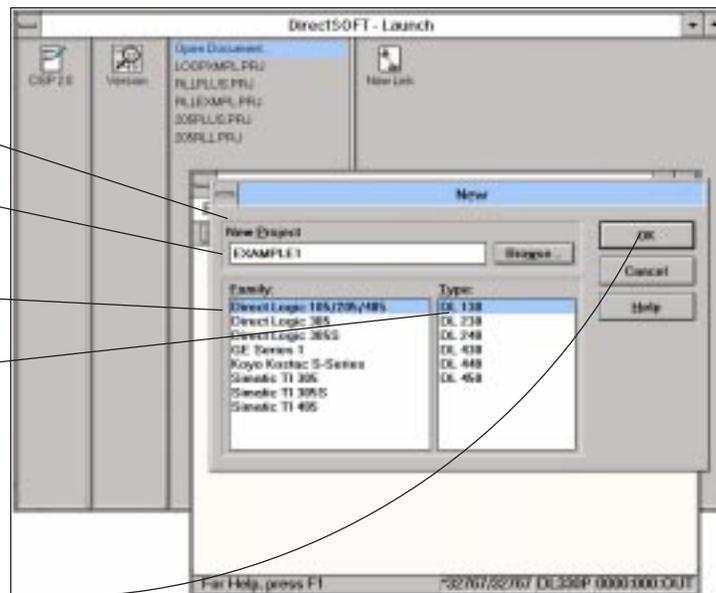
New Project Window

Type in a name for your project

Select the PLC Family..

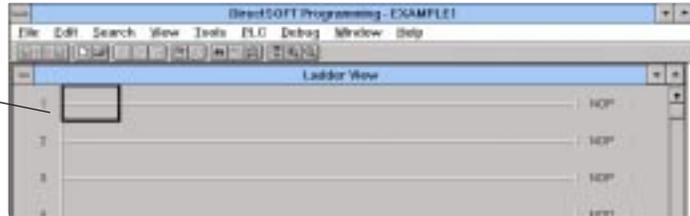
Select the CPU Type..

..then click on OK



After clicking **OK** to enter your project name, PLC family and CPU type, you will see the skeleton ladder logic template. You are in the **View Only Mode** at this point. In this mode, the cursor is always hollow and all you can do is browse.

View Only Mode
(cursor is hollow)



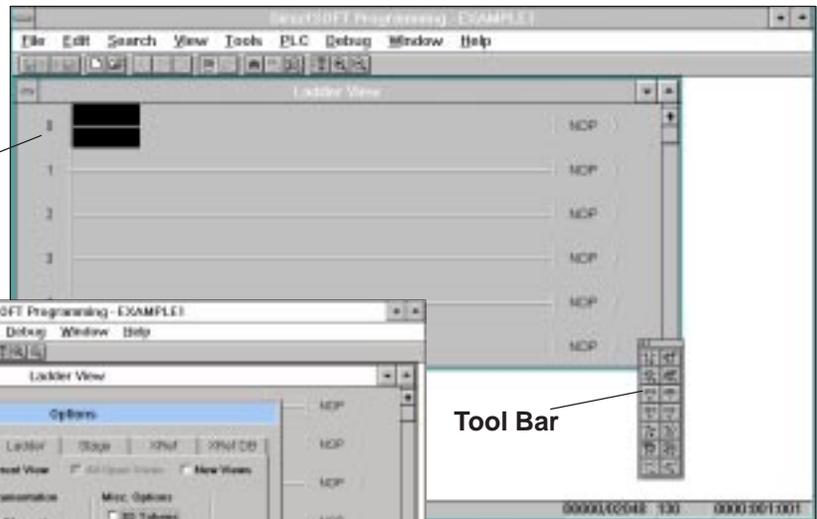
Step 3: Switch to the Edit Mode

You will want to use the **Edit Mode** for entering programs. This is accomplished by holding down the control key and simultaneously pressing the letter E key (**CTRL + E**). You could also click **Edit** on the top menu bar and then selected **Edit Mode**.

DirectSoft indicates the **Edit Mode** is active when the cursor becomes solid and a **Tool Palette** appears in the lower right portion of the screen.

In order to facilitate clear printing reproduction in this manual, you will also at this time turn off the default 3-D Token for the ladder logic. You do this by clicking on **View** and then **Options**. This is followed by clicking on the box labeled **3-D Token**. This removes the **X** in the box. To exit and record your selections, click on **OK**.

Edit Mode
(cursor is solid)



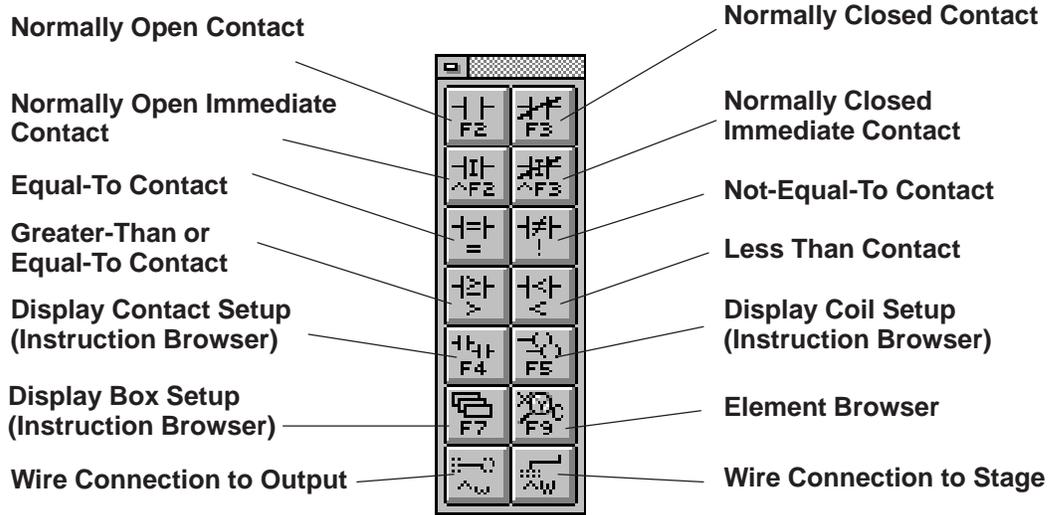
Tool Bar



Deselect this feature
to turn off the 3-D
ladder view look.

The Tool Palette

The **Tool Palette** can be very helpful, especially in the beginning while learning to program in **DirectSOFT**. Later, you may prefer to use the faster **Hot Keys** instead of clicking on the tool buttons themselves. The Hot Keys are shown below each element symbol on the icon button. The expanded list is provided in the main **DirectSOFT** User Manual. *The Tool Palette shown below may not be exactly like the one you have on your computer screen.* The tool palette shown depends on which CPU your PLC is using. In this example, you will be using only the elements common to all CPUs, therefore this will not be a problem.

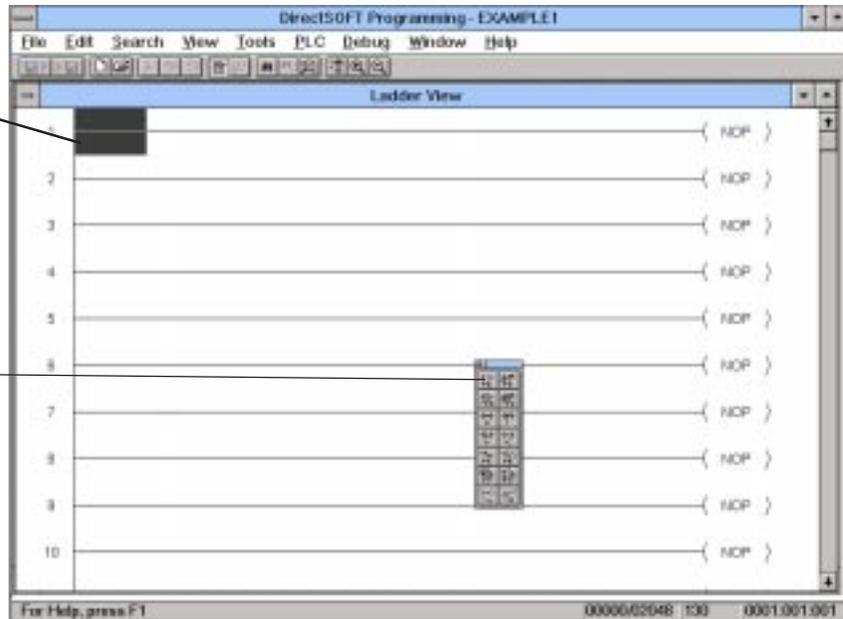


**Step 4:
Using the Tool
Palette to Enter
the First Element**

Use the **Tool Palette** to enter the first instruction of the program. First move the cursor to the desired location of the first element. A normally open contact needs to be placed in the selected position to load the preset on the first scan. To do this, click on the button that shows the normally open symbol. This will open a small input window for setting up the contact.

Move cursor to where you want the instruction positioned.

Click here to open input window for Normally Open Contact

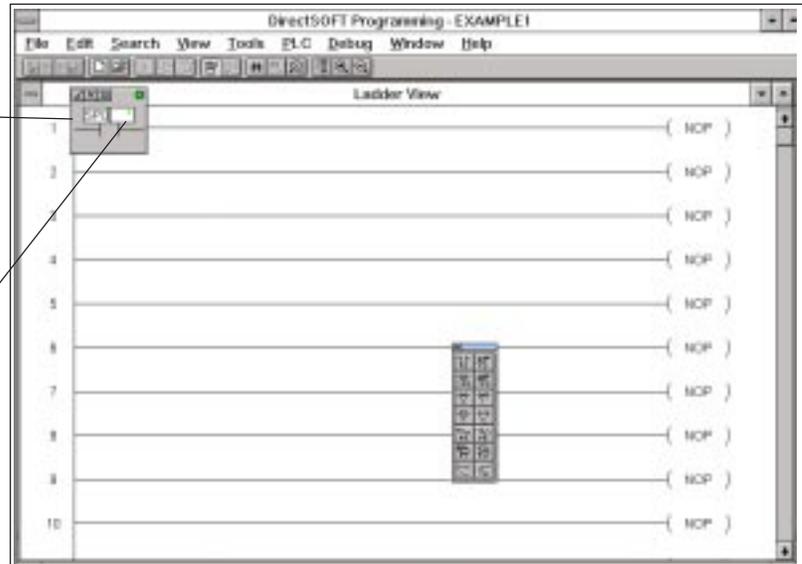


Step 5: Using the SP0 Relay in Our Program.

Use contact **SP0** as the first element to load a preset into the PLC memory. **SP0** is used because you only need this rung to execute once, i.e. the first scan. Notice the green/red indicator in the box. It will display the validation of each input. For example, if you typed the letter **O** instead of the digit **0**, the indicator would turn red and stay red until you correct your mistake.

Enter SP0 to have a contact that will close on the first scan only

Notice the Error Indicator will glow green if you enter a valid contact



Click on the check mark (✓) in the upper part of the input box when you have finished typing in the element and have the green light. At that point, the instruction will be entered. Notice the yellow vertical bar that appears next to the rung. *Since this is not a color manual, you see a light gray vertical bar in the screen example shown below.* The yellow bar indicates you have entered an Instruction or instructions, but that you have not compiled the rung yet by selecting **Accept** from the **E**dit menu. Rungs that have already been accepted into compiled memory will have a green bar instead. Without being compiled, you will not see the icons for **Save to Disk** or **Save to PLC** enabled. This means in order to save your program anywhere you will have to **Accept** your editing first. For example, if you wanted to stop working with **DirectSOFT** right now, you would first want to accept all the edited rungs so that you could save the revised program to disk.

The Save to Disk icon is not available because you have not accepted your editing yet

Yellow color coded bar indicates the rung has not been accepted yet

