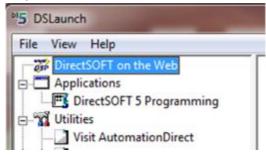# Starting up the DirectSOFT PLC Programming Software

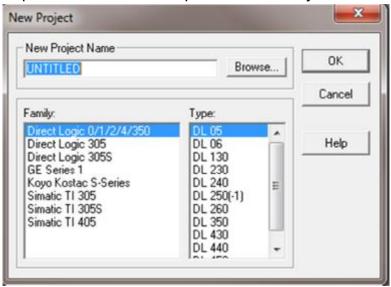Step 1: Double Click on the DS5 Icon.

Step 2: Double Click on the DirectSOFT 5 Programming icon (located under applications)
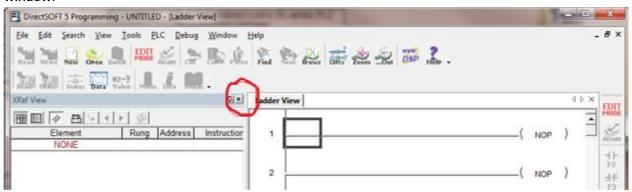

Step 3: When DirectSOFT 5 starts up it checks to see if you have a licensed copy, if not it asks you if you want to run a demo version. Click on "Run DirectSOFT100" button.
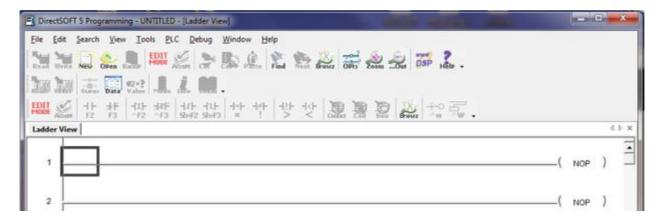
Step 4: Click on "OK" to start up a new Untitled Project

Step 5: This opens up the programming application that has 2 windows. One is the Ladder View and the other is a XREF window. Close down the XREF window by clicking on the little x in the upper right of that window.
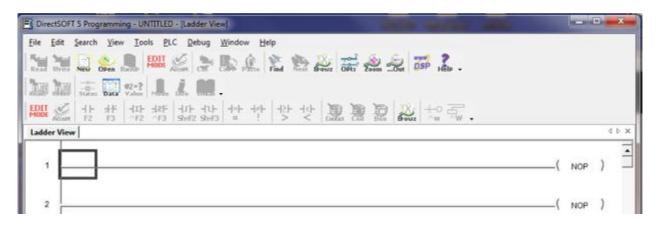

This now gives you a blank slate like shown below

You are now all set to Create, Download, and Debug (test) programs !!!!

Here is the sequence of steps you will be doing to enter and test each lab exercise.
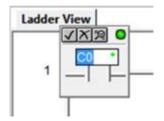
Begin with a blank project as shown below:

Turn on Edit Mode by clicking on this icon

Notice how the icons to the right are now clickable

To enter a N.O. contact: click on the NO Contact icon above or press F2.
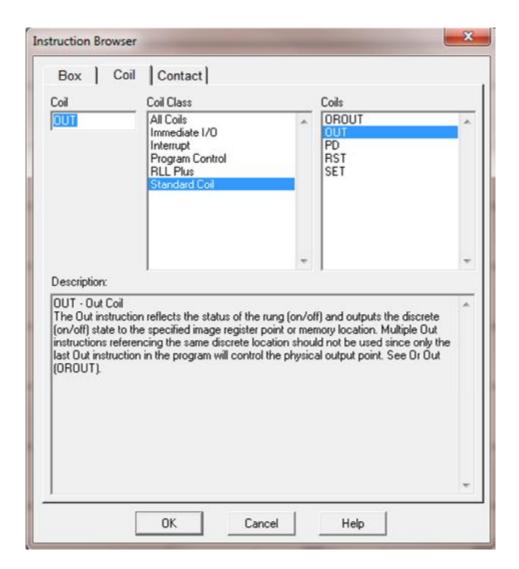

Then type in X0 and click on the checkmark or hit enter.

Then click on the Coil icon or hit F5.

This brings up a dialog box as show below

Make sure that Standard Coil is selected as well as "OUT" and click okay.
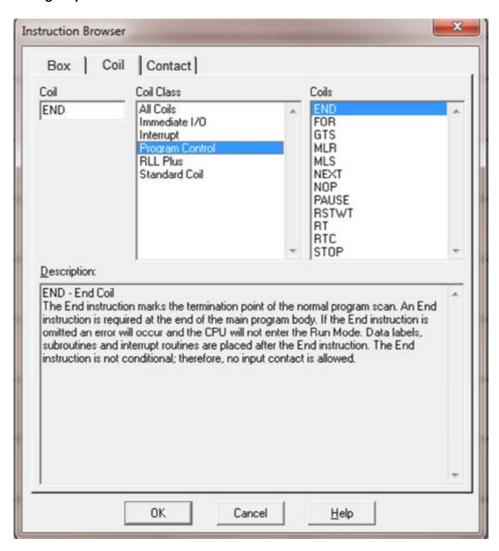
This will create a rung that looks like this:

Type in Y0 for the address and hit enter.
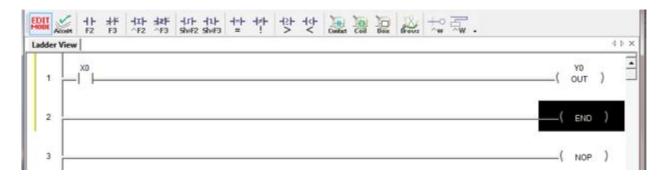
The last rung in the program has to be the END statement.

So we move our cursor (big black box) to the next rung and hit F5 again. This brings up the Instruction Browser window.

Make sure Program Control is selected in the Coil Class and END is highlighted.

Then hit enter to put this instruction in the rung. Your program should now look like this:

Notice the yellow bar on the left. That means there have been edits to the program. We now need to "Accept" the edits/changes by hitting the Accept Icon.
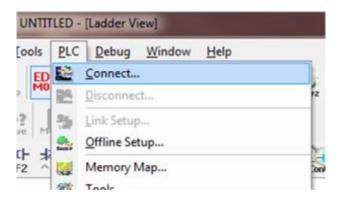
Doing so changes the bar from Yellow to Green.
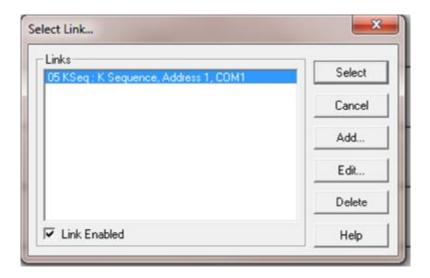
We now need to download this program into the PLC. But first we must establish a connection to the PLC.

Make sure PLC is powered up and that the RS232 cable is connected from the PC to the PLC.
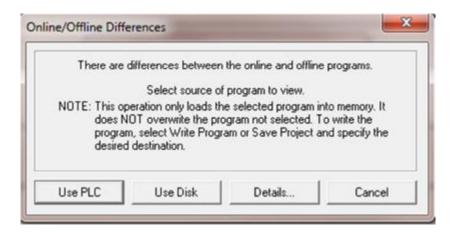
We do so by clicking on PLC from the menu tree and then clicking on Connect.

A window showing possible connections appears.

Select the on in the list (should only be 1) and hit select.   If the PLC has a program in it – you are given the option to use it (PLC) or the one on the PC (Disk). Click on "Use Disk" as that is the program you just created and what you want to download.

To verify that you have a proper connect – it should say "Online" in the status bar on the bottom of the window (similar to below)

Next we will "Write" (download) to the PLC. Click on the "WriteP" icon. This is not a disk type of icon.

 This lower right icon.

To test our program we will put the PLC into the "Run" mode by clicking on the traffic light type of icon.

Click on Run and then click OK.

We can use the programming software to show us the logic flow. Click on the Status icon.

As you press on and off the push button, it's status will be shown by the contacting highlighted in Blue.

Once your program has been entered and you are testing it out. You can answer the questions for each lab.
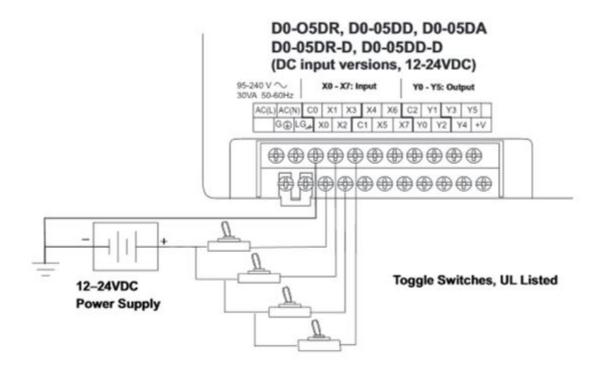
To get ready for the next lab:

1) Put the PLC in the "Program" Mode
2) Disconnect from the PLC
3) Delete each rung by
   a. Going into the edit mode
   b. Click on the first location of a rung and hit the delete key twice
   c. Hit okay to the confirmation box
   d. Repeat for all rungs

Lab Exercise 00 – PLC Wiring

Use the following steps to wire up the PLC.

Step 1 – wire up 2 Push Buttons using the following diagram as an example:

(wire to X0 and X1 terminals)

D0-O5DR, D0-05DD, D0-05DA
D0-05DR-D, D0-05DD-D
(DC input versions, 12-24VDC)

95-240 V ~ | X0 - X7: Input | Y0 - Y5: Output
30VA 50-60Hz

| AC(L) | AC(N) | C0 | X1 | X3 | X4 | X6 | C2 | Y1 | Y3 | Y5 |
| G⊕ | LG | X0 | X2 | C1 | X5 | X7 | Y0 | Y2 | Y4 | +V |

12–24VDC
Power Supply

Toggle Switches, UL Listed

Step 2 – wire up 1 LED using the following diagram:

(wire to Y0 terminal)

More on next page ….

Step 3 – wire up the power for the System using the following diagram:

110/220 VAC Power Input

Lab Exercise 01 – Simple Logic Circuit

Create the following program and download it into the PLC.

Ladder View

```
        X0                                                    Y0
 1    ─┤ ├─────────────────────────────────────────────────( OUT )

 2    ──────────────────────────────────────────────────────( END )

 3    ──────────────────────────────────────────────────────( NOP )
```
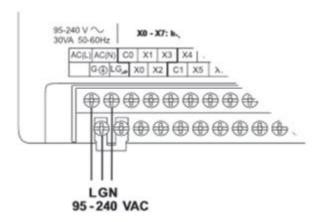
Put the PLC into the Run mode.

Turn on the Status mode and answer the following questions.

1) Press the Push Button and observe the Input Status light on the PLC. What happens to it?

2) As you press the Push Button – what happens to the contact on the screen?

3) Press the PB on and off as fast as you can. Does the Input Status light on the PLC keep up to you?

4) Does the contact on the screen keep pace?

Lab Exercise 02 – Duplicate Output

Create the following program and download it into the PLC.

Ladder View

```
        X0                                                              Y0
1      ─┤ ├──────────────────────────────────────────────────────────( OUT )

        X1                                                              Y0
2      ─┤ ├──────────────────────────────────────────────────────────( OUT )


3      ────────────────────────────────────────────────────────────( END )
```

Put the PLC into the Run mode.

Turn on the Status mode and answer the following questions.

1) Press Push Button (PB) X0 and observe the Input Status light on the PLC. What happens to it?

2) Does Output Y0 turn on when you press PB X0?

3) What happens when you press PB X1?

4) How come PB X0 doesn't turn on Output Y0?

More on next page …

In PLCs – Each unique output should only be programmed once – otherwise the last rung to control the output wins. Use parallel rungs if you have multiple conditions that need to control the output.

```
        X0                                                          Y0
1     ──┤ ├──┬─────────────────────────────────────────────────(  OUT  )
        X1   │
      ──┤ ├──┘
```

Lab Exercise 03 – Seal-In Circuit

Create the following program and download it into the PLC.

Put the PLC into the Run mode.

Turn on the Status mode and answer the following questions.

1) Give a quick press on PB X0 and release the PB. What happens to output C0?

2) What happens to Output Y0?

3) Now quickly press and release PB X1. What happens to Output C0?
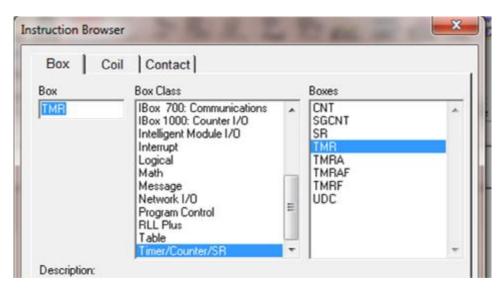

4) What happens to Output Y0?

This circuit is called a "Seal-In" circuit. It allows a signal to be maintained even though the input signal was momentary.

Lab Exercise 04 – Timer Circuit

Create the following program and download it into the PLC.

Timers are Box Instructions and are accessed by hitting the Box Icon in the Edit bar or by hitting F7.

Put the PLC into the Run mode.

Turn on the Status mode and answer the following questions.

1) What happens when you press and hold PB X0?
2) What happens when you press PB X0 for just a brief moment?
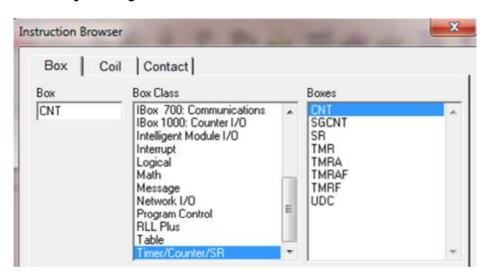3) When does Output Y0 turn on?

See next page ….

Challenge:

Have an output turn on 1 second after a button is pressed (and held) and then a second output turns on 1second later if the button is still being pressed.

Lab Exercise 05 – Simple Counter

Create the following program and download it into the PLC.

Counters are Box Instructions and are accessed by hitting the Box Icon in the Edit bar or by hitting F7 while in the edit Mode.

Put the PLC into the Run mode.

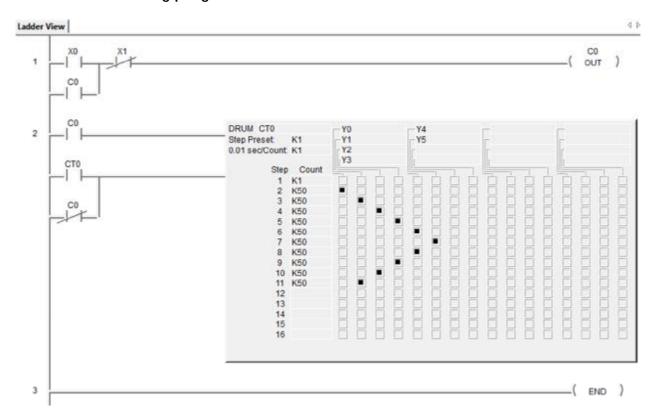Turn on the Status mode and answer the following questions.

1) What is the status of output Y0 when you go into the Run Mode?
2) Push button X0 3 times, what is the status of YO?
3) Push button X1 once, what is the status of Y0?
4) Push button X0 5 times, what is the status of YO?
5) Push button X0 a few more times, what is the status of Y0?
6) Now push button X1 once, what is the status of Y0?

Lab Exercise 06 – DRUM Sequencer

Drum instructions are best suited for repetitive processes that consist of a finite number of steps. They can do the work of many rungs of ladder logic with elegant simplicity. Therefore, drums can save a lot of programming and debugging time.

Please review the help file at: [PLC Instruction List/DirectLOGIC.../Drum Instructions]

Create the following program and download it into the PLC.

Put the PLC into the Run mode.

Turn on the Status mode and answer the following questions.

1) When you press PB0 (X0) what happens?
2) After pressing PB0 (X0) and then press PB1 (X1), what happens?