

# ECT464 - Programmable Logic Controllers

## Lab 2: Intro to RSLogix500 and Basic State Machines

**Objective:** To introduce the student to ladder logic programming and simulation software, specifically RSLogix 500. To practice creating basic inputs and outputs and implementing them on a real PLC in the form of a basic state machine.

### **Procedures:**

Using the RSLOGIX software, build the following state machine for a trash compactor:

**Inputs:** Door, Far, Near

**Outputs:** Out1, Out2, Out3, Out4, Motor On, and Direction.

States:

State0 (Home): Initial Startup state. Out1 is asserted, when door is closed (asserted), go to next state.

State1 (Smashing): Out2 and Motor On are asserted, when Far sensor is triggered, go to next state.

State2 (Retracting): Out3, Direction, and Motor On are asserted, when Near sensor is triggered, go to next state.

State3 (RESET): Out4 is asserted, when door is open (de-asserted), go to Home state.

1. Start up RSLinx Lite:

**Start>Programs>Rockwell Software>RSLinx>RSLinx Launch Control Panel**

Press Start.

Minimize the RSLinx Lite window once it opens.

Close the RSLinx Launch Control Panel.

2. Start up RSLogix 500:

**Start>Programs>Rockwell Software>RSLogix 500>RSLogix 500**

Start a new file.

3. Select your Processor type:

SLC500: 1747-L524 5/02 CPU-4KMEM

M1000: Micrologix 1000

M1500: Micrologix 1500 LSP series C

Select OK

4. For SLC500 and M1500: Change I/O configuration as follows:

SLC500 only: Change Rack 1 to 1746-A4 4 slot rack.

Card 0: Should say something already about the processor.

SLC500 only: Card 1: Make sure it is highlighted and then double click on 1746IB16

SLC500 only: Card 2: Double click on 1746OB16.

M1500 only: Card 1: Something about the analog card IF4OX2

Close window

5. Insert Ladder logic.

Click once on the 0000 in the Ladder logic rung area. It should turn red. If it doesn't, click it until it does.

Click on the ] [ (examine if closed) symbol. A normally open input will appear on the first rung.

Click on the ( ) (output energize) symbol. A full output will appear on the end of the first rung.

Double click on the new output symbol. The name on top, the question mark should be highlighted. Type O for Output. An output will appear below where you are typing.

Double click on the Output. Now a DC 2.0/0 will appear below. Double click on it and press enter. Type in the description and press OK.

Double click on the new input symbol. The name on top, the question mark should be highlighted. Type I for Input. An Input will appear below where you are typing.

Double click on the Input. Now a DC 1.0/0 will appear below. Double click on it and press enter. Type in the description and press OK.

6. Download to PLC:

Go to Menu **Edit** and select **Verify File**. You will notice the names below the input and output will change.

Go to Menu **Edit** and select **Verify Project**.

Go to Menu **Comms** and select **Download**.

Save your program to a floppy disk or to the student Z drive.

When asked to proceed with download, select YES.

When asked to switch to Program mode, select YES.

Change back into RUN mode and then go online.

7. Program manipulation and observation.

If you manipulate the input switch, you will notice that the input and output are highlighted on the screen as well.

8. Close RSLogix 500.

Close RSLinx Lite.

**Analysis/Conclusions:** What can be said of the ease of using the windows interface in programming the PLC? All of our features such as drag and drop, cut, paste are available to us. What did you learn as a result of this lab? What have you learned about state machines and the programming of digital systems using ladder logic programming?

