

2225872

by Ellis Dickeson

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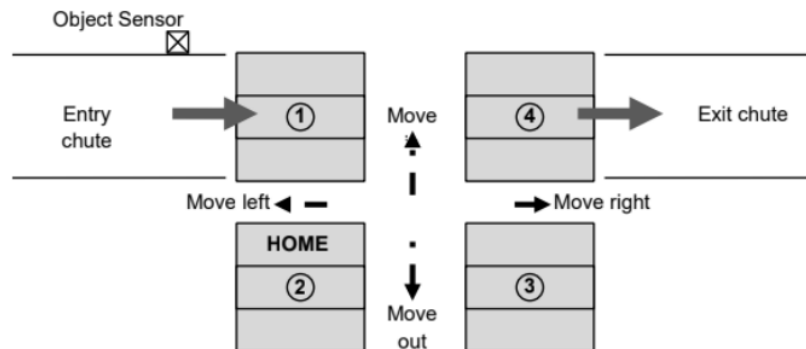
1. Work Plan for Lifelong Learning

This is supposed to be a plan not a journal

Plans should always be written in the future tense

Firstly, research will be done in order to gather valuable information. Over the last few weeks, a PLC programme has been created to then be introduced to an industrial like design involving a pick and place robot. In the PLC program is an input and output device list, basic programme design, testing and documentation. The program created should be able to move the robot UP and DOWN, LEFT and RIGHT, PICK and PLACE the object and eventually move back to its home station carefully without causing any damage to the system. The robot has pistons, gripper, valves, solenoids and sensors which all work together to help move the robot safely. Here is an overview diagram of the actions the system should be able to do.

This reads like a system investigation which belongs in the next task.



The whole focus of this task is to be able to program a robot in order to get an object from the entry chute to the exit chute safely, whilst there are already objects in position 2 and 3.

2. Research

In electrical engineering there are multiple different brands and models of PLCs. The brand of PLC that has been chosen to do research on is Allen Bradley. Allen Bradley have three separate types of PLC that can be used. These are, MicroLogix, CompactLogix and ControlLogix. The MicroLogix advantages are it provides a 24 or 28 built in basic I/O system, a built in AC or DC power supply and a processor module that slides into the base unit. Users can add memory to the system and real time clock module or optional Data Access Tool. The Allen Bradley MicroLogix even with the slowly rising prices from the more recent and the less expensive Micro800, the MicroLogix1000 very low price and similarity in programming still make it a very valuable PLC to gain knowledge on. The disadvantages of Allen Bradley MicroLogix are compared to [PLC](#) as the [MicroLogix](#) can only be used for reasonably low I/O machinery. (Cartiman, n.d.) (Automation & control engineering forum n.d.)

The advantages of the Allen Bradley CompactLogix are It provides a wider variety of consistent features and tools, allowing users to cut down on engineering investment costs (installation and operation costs), and it can ease diagnostics and troubleshooting. The disadvantages of the CompactLogix is that it's a lot smaller than other systems meaning that it is only useful for the smaller applications. The CompactLogix system is a Logix controller system that is used in many medium and small industrial applications. These systems can be used to control applications on the machine level. Generally, a CompactLogix system is built by using a controller equipped with many I/O modules and the Device Net communication network. The Allen Bradley CompactLogix controllers provide a lot higher performance, higher capacity, better productivity and stronger security to help meet the demands of modern smart machines and equipment used in industry. These specific controllers are very useful for applications that require high-performance communications, Input and output modules and motion control for up to 32 axes. (www.pdfsupply.com, n.d.)

This is not the Harvard method of citation. Do not put URL links in your report text. (https://www.rockwellautomation.com/en-gb/products/hardware/allen-bradley/programmable-controllers/small-controllers/compactlogix-family/compactlogix-5380-controllers.html, n.d.)

Allen Bradley PLC's are very user friendly and very simple to program, unlike Siemens which requires a lot extra programming knowledge. Also Allen Bradley PLC's are considered a lot simpler and quicker to debug than Siemens PLC's. (https://www.dosupply.com/tech/2020/10/16/hardware-comparison-allen-bradley-vs-siemens-plcs/, n.d.) *This is not the Harvard method of citation. Do not put URL links in your report text.*

The difference between Allen Bradley and Siemens is that when installing Allen Bradley PLC, you also are needed to connect the specific Allen Bradley power supply, rack and any other cards for safety communication ports. Unlike Allen Bradley PLC's, Siemens can be plugged into most standard 24V DC power supplies and they normally come with an already built in communication ports (<https://www.plctechnician.com/news-blog/allen-bradley-vs-siemens-whats-difference-between-these-plc-tools>, n.d.)

Where is your hardware and system explanation?

3. Hardware Investigation and I/O List

Inputs	Address	Outputs	Address
UP sensor	%IO.0	DOWN solenoid	%Q0.0
DOWN sensor	%IO.1	UP solenoid	%Q0.1
OPEN sensor	%IO.2	CLOSE solenoid	%Q0.2
CLOSE sensor	%IO.3	OPEN solenoid	%Q0.3
IN sensor	%IO.4	OUT solenoid	%Q0.4
OUT sensor	%IO.5	IN solenoid	%Q0.5
RIGHT sensor	%IO.6	LEFT solenoid	%Q0.6
LEFT sensor	%IO.7	RIGHT solenoid	%Q0.7
X10 pushbutton	%I1.0		
X11 pushbutton	%I1.1		
X12 pushbutton	%I1.2		
X13 pushbutton	%I1.3		
X14 pushbutton	%I1.4		

This is my input and output list; these are all used in the program that has been created.

4. Program Design and Explanation

A program was created on TIA portal (CPU 1214C DC/DC/DC). The program that was created has 3 program blocks. The main which is the program built in ladder form, there are 12 networks that have been created in order for the robot to function correctly. There is an auto sequence which is the program written out in code form in each individual step and the last block is simulate inputs which is a project which shows exactly what should happen once the robot moves to its designated place for example if the robot moves up, then the up sensor and the up solenoid should have come on. There are 2 HMI screens that have been created, first is the engineers screen which is the screen that will be used to operate the robot either in manual or for it to run in auto mode. The other screen is the operators screen. There is a button at the bottom of each screen which enables you to be able to switch between each screen easily. There is a PLC tag list that's been created with all the tags that have been used in all of the programming steps either in ladder or on code form. There are interlocks that have been put into the program in order to prevent the robot from moving left, right, in or out unless its in the up position, this will prevent the robot from getting damaged

This is a good explanation. However, you could have referred to your SFC chart as a figure in the appendix.

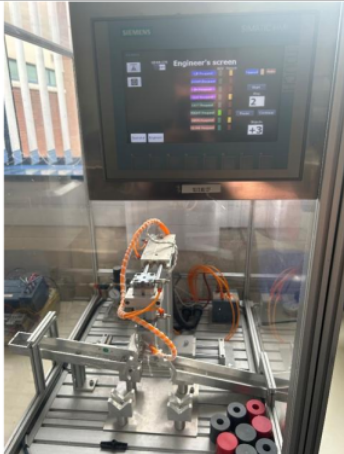
5. Simulation Testing

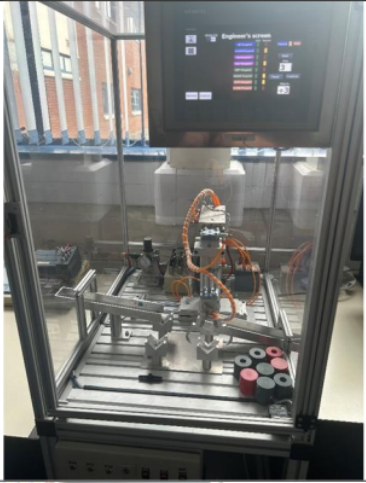
Where is your explanation of your testing?

No testing table, no evidence that anything worked!

Where is your explanation?

6. Practical Testing

Test description	Expected results	Actual results	Decision	Evidence
AUTO MODE				
Step 0	Should move up	Moved up	Passed	
Step 1, press start with auto mode on If counter = 1 If counter = 2 If counter = 3	Should move through all the steps Move to step 18 Move to step 9 Move to step 2			
Step 2	Move right	Moved right	Passed	

Step 3	Move down	Moved down	Passed	
Step 4	Close gripper	Gripper closed	Passed	
Step 5	Move up	Moved up	Passed	

Step 6	Move in	Moved in	Passed	
Step 7	Move down	Moved down	Passed	

Step 8	Open gripper	Gripper opened	Passed	
Step 9	Move up	Moved up	Passed	

Step 10	Move left	Moved left	Passed	
Step 11	Move out	Moved out	Passed	
Step 12	Move down	Moved down	Passed	

Step 13	Close gripper	Gripper closed	Passed	
Step 14	Move up	Moved up	Passed	
Step 15	Move right	Moved right	Passed	

Step 16	Move down	Moved down	Passed	
Step 17	Open gripper	Gripper opened	Passed	

Step 18	Move up	Moved up	Passed	
Step 19	Move left	Moved left	Passed	

Step 20	Move in	Moved in	Passed	
Step 21	Move down	Moved down	Passed	

Step 22	Close gripper	Gripper closed	Passed	
Step 23	Move up	Moved up	Passed	

Step 24	Move out	Moved out	Passed	
Step 25	Move down	Moved down	Passed	

Step 26	Open gripper	Gripper opened	Passed	
---------	--------------	----------------	--------	--

Writing in the third person means that you don't use "I, me, my, you, your, we, our " etc

7. Discussion and Recommendations

Write in the third person

To conclude I realised that all of the results were proven successful. The way to prove this was by using a testing table with each individual step and photo evidence of the robot doing what the step had been programmed to do.

Write in the third person

During the research task, I researched into 3 separate PLC types and discussed the advantages and disadvantages of each type. I came to the conclusion that the MicroLogix was the most comparable to the Siemens 1214C DC/DC/DC as it provides a 24 or 28 built in basic I/O system, a built in AC or DC power supply and a processor module that slides into the base unit. Users can add memory to the system and real time clock module or optional Data Access Tool. This is built very similar to the PLC that was used to program the Pick and Place robot.

There is no evidence of simulation testing. The program tested practically is not yours so there is no way of knowing that anything you have programmed actually works.

When the coding was being done for the auto sequence there were errors that arose in the sequence. It became clear that after the END IF statement was shown that I hadn't use a semi colon which is used to conclude a step, but after placing the semi colons after the END IF statement, my program was working correctly.

Write in the third person

If this task was to be completed again, I would give myself more time to write out my auto sequence and check over it several times to ensure it was all written correctly before inputting it into my SCL. This would be better as it would cause less confusion as there would be no problems with simulation which would be a less stressful approach to completing the auto sequence as this is where I had most of my problems. Another thing that I would do differently is to write out my flow chart because the flow chart is another way of writing the auto sequence but in simpler form. This would also give me a better understanding of the process and steps which the robot needs to go through.

The SFC chart should have helped you but you have not included one in your report.

8. Team Working

For team working we worked in a group of 2. We compared both of our programs to see which of them were ready to be tested, this was done by putting our PLC's into simulation mode and to wait and see if any errors came up, thankfully my group mates program worked correctly, mine had a couple of errors. We found that in my program my safety interlocks were not working correctly, this was because I had input the interlock incorrectly into my program, the interlocks were placed in the incorrect networks hence why they didn't work. With the help of one of my classmates it got my system working correctly. I felt that working in a team sped up how much that I could change to my program easily. Without the help of my classmate I wouldn't have been able to correct my simulation as I had no idea where I had gone wrong in the sequence. When we worked as a group I would listen to his advice very carefully and he did the same to me. We both valued one another's opinions massively and were not quick to judge one another if we had said something that was incorrect.

Good evidence of team working

9. Citation List

(Cartiman, n.d.) can be found at

(<https://program-plc.blogspot.com/2015/09/take-advantages-allen-bradley.html>, n.d.)

(Automation & control engineering forum n.d) can be found at:

(<https://control.com/forums/threads/allen-bradley-micrologix-1000-versus-plc-500.16808/>, n.d.)

(www.pdfsupply.com, n.d.) can be found at:

(<https://www.pdfsupply.com/blog/index.php/2022/02/01/compactlogix-5371-vs-5380/#:~:text=It%20provides%20a%20wider%20variety>, n.d.)

(<https://www.rockwellautomation.com/en-gb/products/hardware/allen-bradley/programmable-controllers/small-controllers/compactlogix-family/compactlogix-5380-controllers.html>, n.d.)

Unfortunately, you have not used the Harvard method of citing your sources. These are just URL links

It is good to see that some of your SCL code has inline comments //

10. Appendix

```

1 IF ("Auto Mode" = 0) OR ("FirstScan" = 1) THEN
2   "Step" := 0;
3   "next_step" := 0;
4 END_IF;
5 CASE "Step" OF
6
7   0:
8     "UP Auto Request" := 1;
9     IF "UP sensor" = 1 THEN //move up
10      "next_step" := 1;
11      "UP Auto Request" := 0;
12    END_IF;
13   1:
14     "LEFT AUTO request" := 1; //move left
15     "OUT AUTO request" := 1; //move out
16     "OPEN AUTO request" := 1; //open gripper
17     IF ("LEFT sensor" = 1) AND ("OUT sensor" = 1) AND ("OPEN sensor" = 1) AND ("Start sequence" = 1) THEN
18      "next_step" := 2;
19      "LEFT AUTO request" := 0;
20      "OUT AUTO request" := 0;
21      "OPEN AUTO request" := 0;
22    END_IF;
23   2:
24     "RIGHT AUTO request" := 1; //move right
25     IF ("RIGHT sensor" = 1) THEN
26      "next_step" := 3;
27      "RIGHT AUTO request" := 0;
28    END_IF;
29   3:
30     "DOWN Auto Request" := 1; //move down
31     IF ("IN sensor" = 1) THEN
32      "next_step" := 4;
33      "DOWN Auto Request" := 0;
34    END_IF;
35   4:
36     "CLOSE AUTO request" := 1; //close gripper
37     IF ("CLOSED sensor" = 1) THEN
38      "next_step" := 5;
39      "CLOSE AUTO request" := 0;

```

Figure 1

```

39     "CLOSE AUTO request" := 0;
40     END_IF;
41   5:
42     "UP Auto Request" := 1; //move up
43     IF ("UP sensor" = 1) THEN
44      "next_step" := 6;
45      "UP Auto Request" := 0;
46     END_IF;
47   6:
48     "IN AUTO request" := 1; //move in
49     IF ("IN sensor" = 1) THEN
50      "next_step" := 7;
51      "IN AUTO request" := 0;
52     END_IF;
53   7:
54     "DOWN Auto Request" := 1; //move down
55     IF ("DOWN sensor" = 1) THEN
56      "next_step" := 8;
57      "DOWN Auto Request" := 0;
58     END_IF;
59   8:
60     "OPEN AUTO request" := 1; //open gripper
61     IF ("OPEN sensor" = 1) THEN
62      "next_step" := 9;
63      "OPEN AUTO request" := 0;
64     END_IF;
65   9:
66     "UP Auto Request" := 1; //move up
67     IF ("UP sensor" = 1) THEN
68      "next_step" := 10;
69      "UP Auto Request" := 0;
70     END_IF;
71   10:
72     "LEFT AUTO request" := 1; //move left
73     IF ("DOWN sensor" = 1) THEN
74      "next_step" := 11;

```

Figure 2

```

74     "next_step" := 11;
75     "LEFT AUTO request" := 0;
76     END_IF;
77
78 11: "OUT AUTO request" := 1;                                //move out
79 IF ("OUT sensor" = 1) THEN
80     "next_step" := 12;
81     "OUT AUTO request" := 0;
82     END_IF;
83
84 12: "DOWN Auto Request" := 1;                                //move down
85 IF ("DOWN sensor" = 1) THEN
86     "next_step" := 13;
87     "DOWN Auto Request" := 0;
88     END_IF;
89
90 13: "CLOSE AUTO request" := 1;                                //close gripper
91 IF ("CLOSED sensor" = 1) THEN
92     "next_step" := 14;
93     "CLOSE AUTO request" := 0;
94     END_IF;
95
96 14: "UP Auto Request" := 1;                                    //move up
97 IF ("UP sensor" = 1) THEN
98     "next_step" := 15;
99     "UP Auto Request" := 0;
100    END_IF;
101
102 15: "RIGHT AUTO request" := 1;                                //move right
103 IF ("RIGHT AUTO request" = 1) THEN
104     "next_step" := 16;
105     "RIGHT AUTO request" := 0;
106     END_IF;
107
108 16: "DOWN Auto Request" := 1;                                //move down
109 IF ("DOWN sensor" = 1) THEN
110     "next_step" := 17;

```

Figure 3

```

110     "next_step" := 17;
111     "DOWN Auto Request" := 0;
112     END_IF;
113
114 17: "OPEN AUTO request" := 1;                                //open gripper
115 IF ("OPEN sensor" = 1) THEN
116     "next_step" := 18;
117     "OPEN AUTO request" := 0;
118     END_IF;
119
120 18: "UP Auto Request" := 1;                                    //move up
121 IF ("UP sensor" = 1) THEN
122     "next_step" := 19;
123     "UP Auto Request" := 0;
124     END_IF;
125
126 19: "LEFT AUTO request" := 1;                                //move left
127 IF ("LEFT sensor" = 1) THEN
128     "next_step" := 20;
129     "LEFT AUTO request" := 0;
130     END_IF;
131
132 20: "IN AUTO request" := 1;                                    //move in
133 IF ("IN sensor" = 1) THEN
134     "next_step" := 21;
135     "IN AUTO request" := 0;
136     END_IF;
137
138 21: "DOWN Auto Request" := 1;                                //move down
139 IF ("DOWN sensor" = 1) THEN
140     "next_step" := 22;
141     "DOWN Auto Request" := 0;
142     END_IF;
143
144 22: "CLOSE AUTO request" := 1;                                //close gripper
145 IF ("CLOSED sensor" = 1) THEN

```

Figure 4

```

145 IF ("CLOSED sensor" = 1) THEN
146   "next_step" := 23;
147   "CLOSE AUTO request" := 1;
148 END_IF;
149
150 23: "UP Auto Request" := 1; //move up
151 IF ("UP sensor" = 1) THEN
152   "next_step" := 24;
153   "UP Auto Request" := 0;
154 END_IF;
155
156 24: "OUT AUTO request" := 1; //move out
157 IF ("OUT sensor" = 1) THEN
158   "next_step" := 25;
159   "OUT AUTO request" := 0;
160 END_IF;
161
162 25: "DOWN Auto Request" := 1; //move down
163 IF ("DOWN sensor" = 1) THEN
164   "next_step" := 26;
165   "DOWN Auto Request" := 1;
166 END_IF;
167
168 26: "OPEN AUTO request" := 1; //open gripper
169 IF ("OPEN sensor" = 1) THEN
170   "next_step" := 0;
171   "OPEN AUTO request" := 0;
172 END_IF;
173 END_CASE;
174 "Step" := "next_step";
175

```

Figure 5

This is my Auto sequence (coding)

UP sensor	Bool	%I0.0	☐	☒	☒	☒
DOWN sensor	Bool	%I0.1	☐	☒	☒	☒
OPEN sensor	Bool	%I0.2	☐	☒	☒	☒
CLOSED sensor	Bool	%I0.3	☐	☒	☒	☒
IN sensor	Bool	%I0.4	☐	☒	☒	☒
OUT sensor	Bool	%I0.5	☐	☒	☒	☒
RIGHT sensor	Bool	%I0.6	☐	☒	☒	☒
LEFT sensor	Bool	%I0.7	☐	☒	☒	☒
X10 Pushbutton	Bool	%I1.0	☐	☒	☒	☒
X11 Pushbutton	Bool	%I1.1	☐	☒	☒	☒
X12 Pushbutton	Bool	%I1.2	☐	☒	☒	☒
X13 toggle switch	Bool	%I1.3	☐	☒	☒	☒
X14 toggle switch	Bool	%I1.4	☐	☒	☒	☒
OBJECT sensor	Bool	%I1.5	☐	☒	☒	☒
DOWN solenoid	Bool	%Q0.0	☐	☒	☒	☒
UP solenoid	Bool	%Q0.1	☐	☒	☒	☒
CLOSE solenoid	Bool	%Q0.2	☐	☒	☒	☒
OPEN solenoid	Bool	%Q0.3	☐	☒	☒	☒
OUT solenoid	Bool	%Q0.4	☐	☒	☒	☒
IN solenoid	Bool	%Q0.5	☐	☒	☒	☒
LEFT solenoid	Bool	%Q0.6	☐	☒	☒	☒
RIGHT solenoid	Bool	%Q0.7	☐	☒	☒	☒

Figure 6

I/O tags

UP HMI Request	Bool	%M100.0		☒	☒	☒
DOWN HMI Request	Bool	%M100.1		☒	☒	☒
Simulate	Bool	%M100.2		☒	☒	☒
IN HMI Request	Bool	%M100.3		☒	☒	☒
OUT HMI Request	Bool	%M100.4		☒	☒	☒
Auto Mode	Bool	%M100.5		☒	☒	☒
UP Auto Request	Bool	%M110.0		☒	☒	☒
DOWN Auto Request	Bool	%M110.1		☒	☒	☒
LEFT HMI request	Bool	%M100.6		☒	☒	☒
RIGHT HMI request	Bool	%M100.7		☒	☒	☒
OPEN HMI request	Bool	%M101.0		☒	☒	☒
CLOSE HMI request	Bool	%M101.1		☒	☒	☒
OUT AUTO request	Bool	%M110.2		☒	☒	☒
IN AUTO request	Bool	%M110.3		☒	☒	☒
LEFT AUTO request	Bool	%M110.4		☒	☒	☒
RIGHT AUTO request	Bool	%M110.5		☒	☒	☒
OPEN AUTO request	Bool	%M110.6		☒	☒	☒
CLOSE AUTO request	Bool	%M110.7		☒	☒	☒
Start sequence	Bool	%M111.0		☒	☒	☒
Step	UInt	%MW11		☒	☒	☒
next_step	Int	%MW202		☒	☒	☒
Start HMI request	Bool	%M111.2		☒	☒	☒
Start memory	Bool	%M111.4		☒	☒	☒
HMI start request	Bool	%M111.5		☒	☒	☒
pause	Bool	%M111.6		☒	☒	☒
Counter	Bool	%M113.0		☒	☒	☒

Figure 7

My Tags

Auto Mode	Bool	HM_Conne...	PLC 126 Pick and Place Robot	"Auto Mode"
Counter	Bool	HM_Conne...	PLC 126 Pick and Place Robot	Counter
DOWN HMI Request	Bool	HM_Conne...	PLC 126 Pick and Place Robot	"DOWN HMI Request"
DOWN sensor	Bool	HM_Conne...	PLC 126 Pick and Place Robot	"DOWN sensor"
DOWN solenoid	Bool	HM_Conne...	PLC 126 Pick and Place Robot	"DOWN solenoid"
IN HMI Request	Bool	HM_Conne...	PLC 126 Pick and Place Robot	"IN HMI Request"
IN sensor	Bool	HM_Conne...	PLC 126 Pick and Place Robot	"IN sensor"
IN solenoid	Bool	HM_Conne...	PLC 126 Pick and Place Robot	"IN solenoid"
OUT HMI Request	Bool	HM_Conne...	PLC 126 Pick and Place Robot	"OUT HMI Request"
OUT sensor	Bool	HM_Conne...	PLC 126 Pick and Place Robot	"OUT sensor"
OUT solenoid	Bool	HM_Conne...	PLC 126 Pick and Place Robot	"OUT solenoid"
Simulate	Bool	HM_Conne...	PLC 126 Pick and Place Robot	Simulate
Start HMI request	Bool	HM_Conne...	PLC 126 Pick and Place Robot	"Start HMI request"
Start sequence	Bool	HM_Conne...	PLC 126 Pick and Place Robot	"Start sequence"
Step	UInt	HM_Conne...	PLC 126 Pick and Place Robot	Step
UP HMI Request	Bool	HM_Conne...	PLC 126 Pick and Place Robot	"UP HMI Request"
UP sensor	Bool	HM_Conne...	PLC 126 Pick and Place Robot	"UP sensor"
UP solenoid	Bool	HM_Conne...	PLC 126 Pick and Place Robot	"UP solenoid"

Figure 8

Default tag table

Network 1 contains a title and some comments which is good but it is a shame that none of the network have any so you have provided very little explanation of your program.

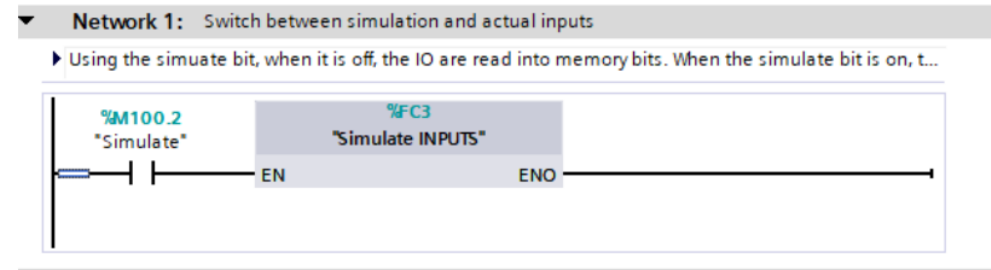


Figure 9

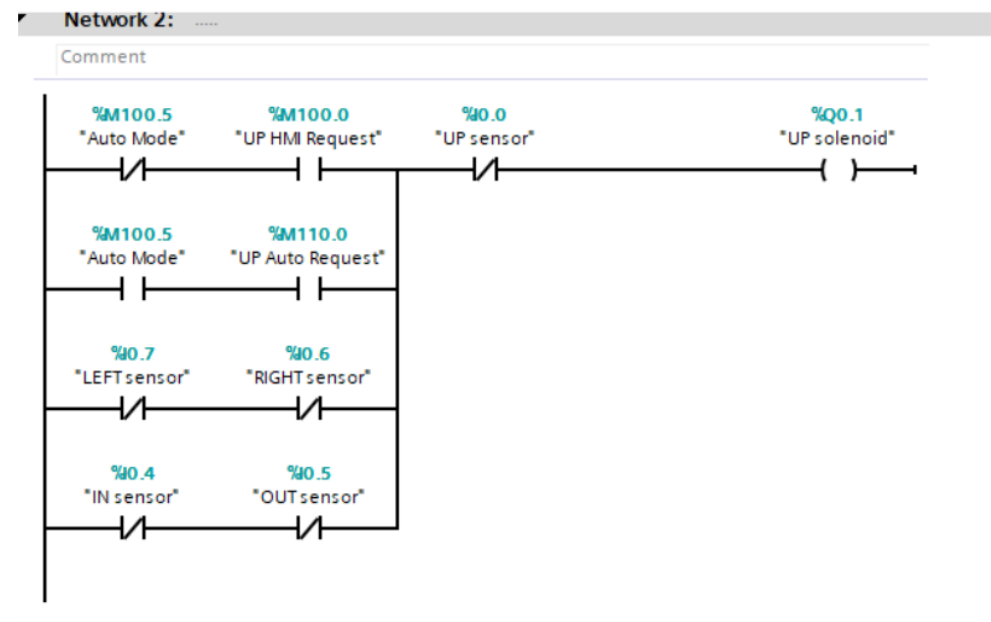


Figure 10

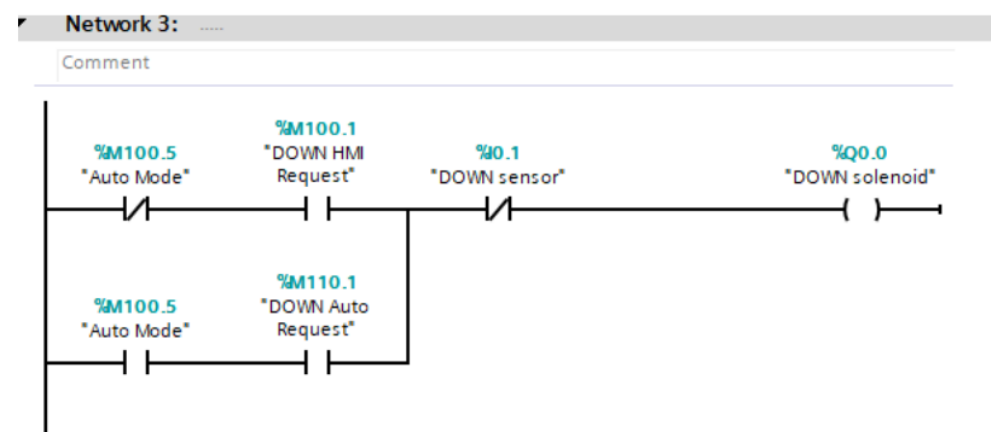


Figure 11

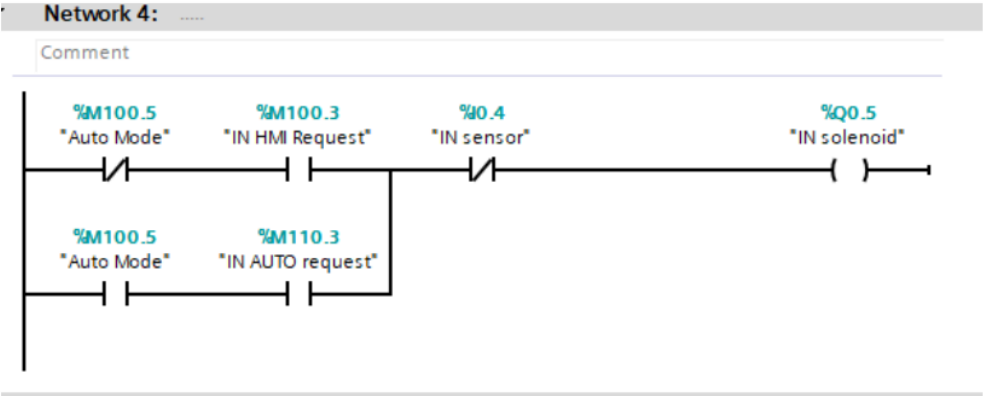


Figure 12

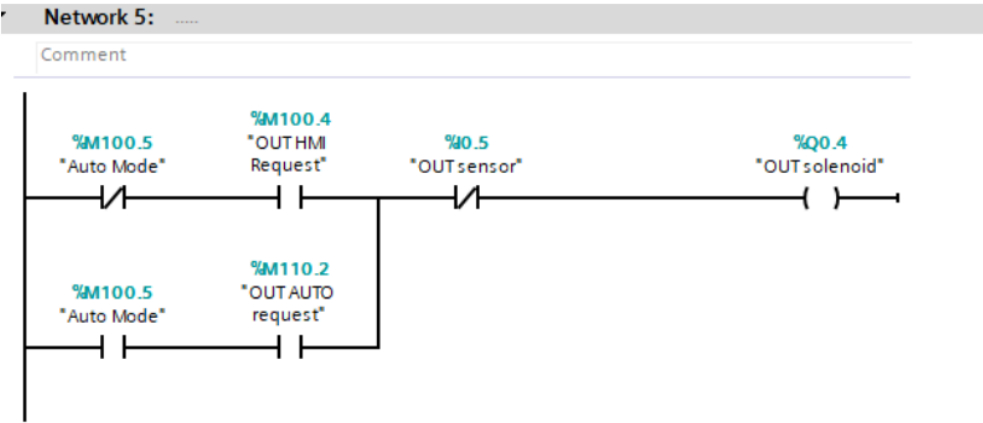


Figure 13

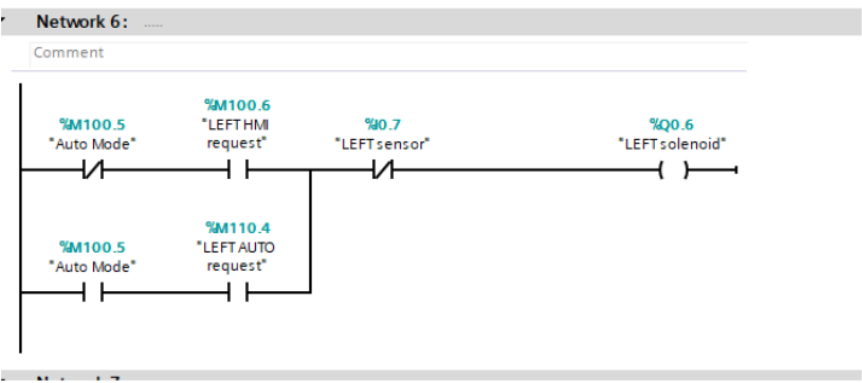


Figure 14

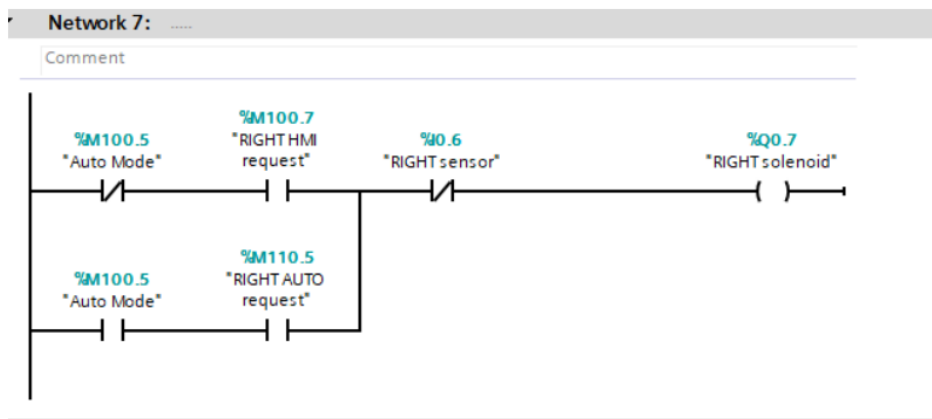


Figure 15

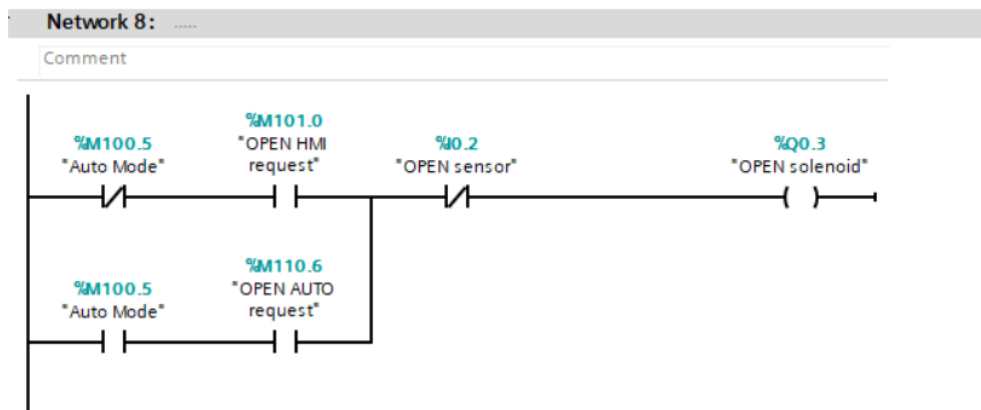


Figure 16

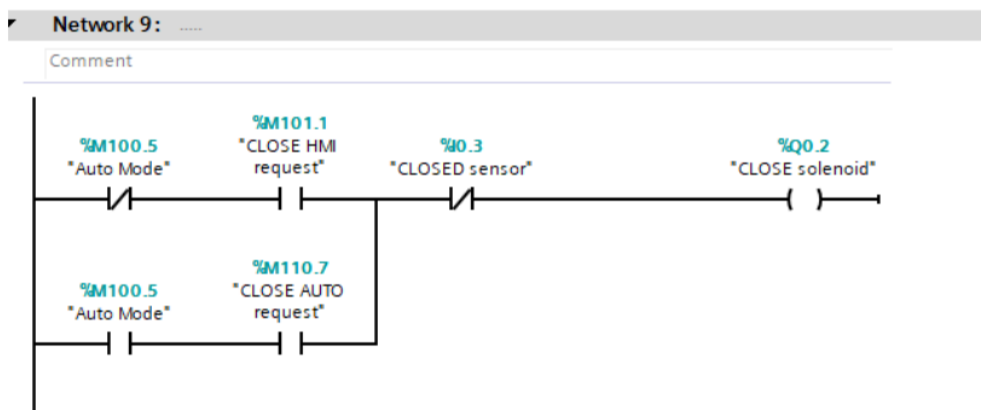


Figure 17

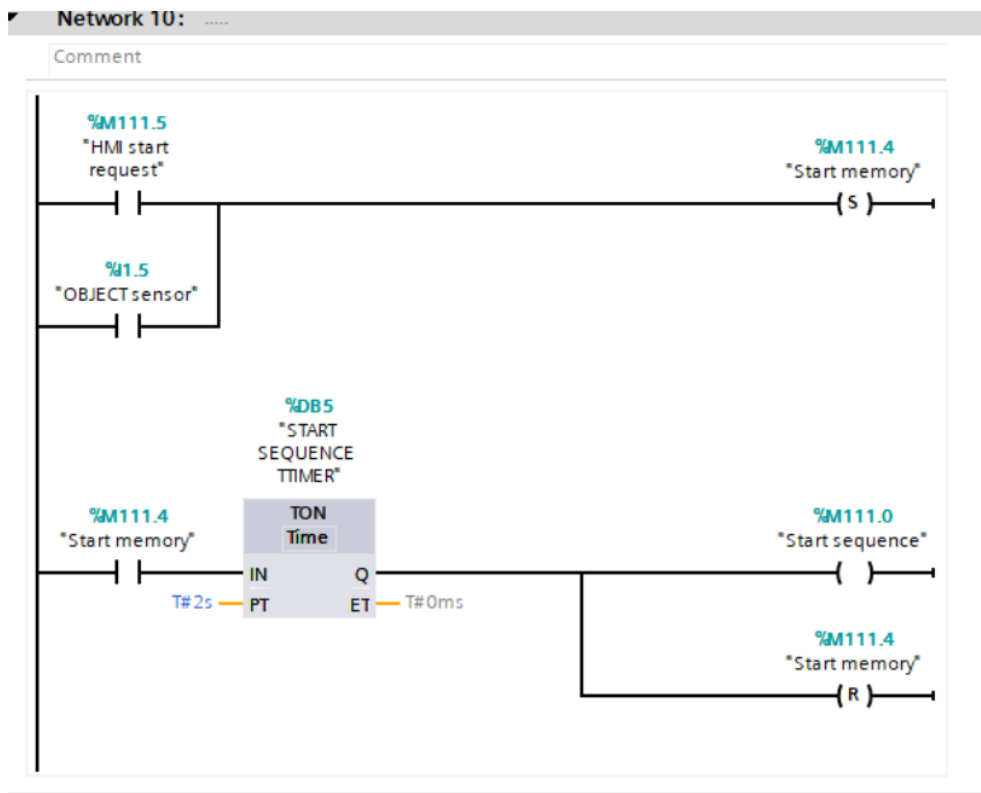


Figure 18

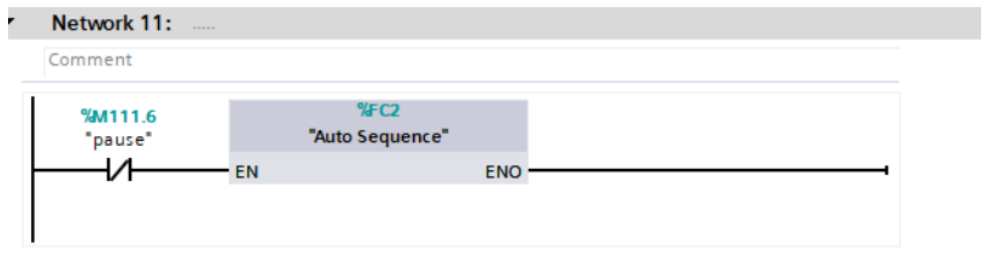


Figure 19

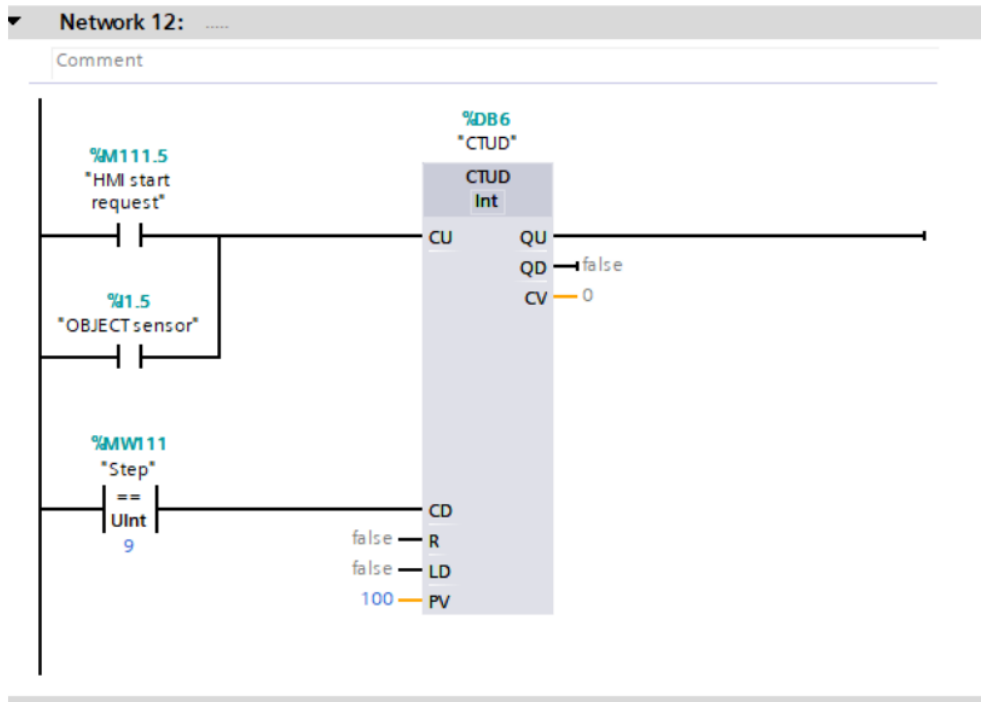


Figure 20

FINAL GRADE

GENERAL COMMENTS

Instructor

42

/100

PAGE 1

PAGE 2

QM

Good Structure

Report is structured exactly as stated in the assignment brief.

PAGE 3

Text Comment. This is supposed to be a plan not a journal

Text Comment. Plans should always be written in the future tense

Text Comment. This reads like a system investigation which belongs in the next task.

PAGE 4

QM

Separate your citations

Cite your source next to the information being used. Don't combine citations as your reader will not know which information is from which source.

QM

Separate your citations

Cite your source next to the information being used. Don't combine citations as your reader will not know which information is from which source.

Text Comment. This is not the Harvard method of citation. Do not put URL links in your report text.

Text Comment. This is not the Harvard method of citation. Do not put URL links in your report text.

PAGE 5

QM

Write in the third person

Don't refer to your self as I, me, my or others as you etc. Avoid personal references. If absolutely necessary, refer to self as "the author".

QM

Incorrectly cited, this is not the Harvard Method

PAGE 6

Text Comment. Where is your hardware and system explanation?

PAGE 7

QM

Punctuation Error

Punctuation error

QM

Punctuation Error

Punctuation error

Text Comment. This is a good explanation. However, you could have referred to your SFC chart as a figure in the appendix.

PAGE 8

Text Comment. Where is your explanation of your testing?

Text Comment. No testing table, no evidence that anything worked!

PAGE 9

Text Comment. Where is your explanation?

PAGE 10

PAGE 11

PAGE 12

PAGE 13

Text Comment. Writing in the third person means that you don't use "I, me, my, you, your, we, our " etc

QM

Write in the third person

Don't refer to your self as I, me, my or others as you etc. Avoid personal references. If absolutely necessary, refer to self as "the author".

QM

Write in the third person

Don't refer to your self as I, me, my or others as you etc. Avoid personal references. If absolutely necessary, refer to self as "the author".

Text Comment. There is no evidence of simulation testing. The program tested practically is not yours so there is no way of knowing that anything you have programmed actually works.

QM

Write in the third person

Don't refer to your self as I, me, my or others as you etc. Avoid personal references. If absolutely necessary, refer to self as "the author".

Text Comment. The SFC chart should have helped you but you have not included one in your report.

QM

Grocer's apostrophe

If you meant this as a plural word, don't use an apostrophe. This also applies to acronyms and initialisms such as PLCs

Text Comment. no evidence provided !

Text Comment. Good evidence of team working

PAGE 23

Text Comment. Unfortunately, you have not used the Harvard method of citing your sources. These are just URL links

PAGE 24

Text Comment. It is good to see that some of your SCL code has inline comments //

PAGE 25

PAGE 26

PAGE 27

PAGE 28

Text Comment. Network 1 contains a title and some comments which is good but it is a shame that none of the network have any so you have provided very little explanation of your program.

PAGE 29

PAGE 30

PAGE 31

PAGE 32

GRADING FORM: NEW CSG-RUBRIC

ELLIS DICKESON

42

1. ENGAGEMENT WITH LITERATURE



Your research section contains some evidence of reading from a small range of sources. However you have not cited and listed correctly using the Harvard method. 6/20

6

2. KNOWLEDGE AND UNDERSTANDING



Adequate knowledge and understanding demonstrated in your research findings, hardware investigation, IO list but no program design explanations given, no SFC chart. However, some of your SCL code has inline comments as does 1 of your ladder networks. 8/20

8

3. COGNITIVE AND INTELLECTUAL



No simulation to prove your code work. However, your report does contain test results analysis, for the practical team work task and you have provided conclusions and recommendations. 8/20

8

4. PRACTICAL APPLICATION



Good program design for SCL and ladder. However, no simulation testing found in your report. The practical testing methods and presentation of results are good. 10/20

10

5. TRANSFERABLE SKILLS



Work plan reads more like a summary but your have included a good explanation of team working.

10

Report is well structured and presented with clear diagrams. Word count not exceeded. However, you must learn to write in the third person, avoiding the use of I, me, my, you, your, we, our. 10/20