CONTROL ALGORITHM-   PARAM OZA

1. Turn off the power to the plc.
2. Turn on the Compressed Air valve by first draining the current air and then turn the main Air valve in the direction of the pipe to Allow the compressed air to pressurize the workstation.
3. Compressed air is on and the green lights for the plc modules are lit, now we can start with the programming of the plc.
4. Open Logix Designer to start connecting the pc with the workstation.
5. There are 3 modes, program, run and test mode, which we will use as need arises.
6. To send your code to the machine, you will need to download the code and to get the code which is currently running on the machine to your software, you select upload option.
7. To edit the variables, go to logic and there you can monitor and update or create new variables for the workspace.
8. To start programming we will stay in offline mode until we have made parts of our ladder rung and then we will test them and move forward to ensure proper functioning of the system.
9. To do this, we will add test bits in our system which we will enable to test individual rungs.

    MAIN ROUTINE

10. First, in the main routine we will call all the subroutines that we need to jump to when a certain button is pressed.
11. We start by adding our flasher routine to the top since we will need to keep scanning it to allow flashing of our lights.
12. We then add a system holding circuit that will hold our production routine when the start button is pressed.
13. The next rung is the jump to production routine which will check whether our holding circuit is on and whether the stop button is pressed or not in order to jump to our routine, it will also check whether our system is resetting in order to avoid the production clash with the reset routine.
14. The next rung is our jump to reset routine which will check the resetting flag that is based on the holding circuit with a logic like the production routine holding circuit.
15. Next is our home position light which will show a green light when our system is at home, the home light will be lit when our system flags resetting and production_running are not on.
16. The Stop lights rung will flicker the red light when the stop button is pressed and when our vacuum head is not homed.
17. Reset Routine returns a flag I when a reset routine is successfully complete which will unlatch the resetting flag.

18. The final rung is a stop condition which will unlatch the main production unit when stop button is pressed.

Reset Routine

19. Turn off red and green lights if the production run condition is true, Latch resetting and I flag, flash the amber light.
20. Unlatch all production steps if Resetting is on.
21. Turn off the Vacuum if resetting is on.
22. If resetting is on and vacuum sensor is not on, retract box eject.
23. IF the previous condition + the box is not extended, Retract vacuum head.
24. If the previous condition + the vacuum head is not extended + the sequence1 is not on, Rotate vacuum head clockwise.
25. If the vacuum head is rotated, latch sequence1.
26. If the previous conditions + vacuum head is rotated Clockwise, raise vacuum head.
27. If the previous conditions + vacuum head is raised, move vacuum head to magazine.
28. If the previous conditions + vacuum head is at magazine, rotate vacuum head Counterclockwise, and set the home flag.
29. If the home flag is set, turn on green light, unlatch resetting, latch, and return home flag I, unlatch sequence1.

Production Routine.

30.   IF production running is on and system is not resetting, latch production step0 and blink the green light, unlatch the home flag.
31.   If production is running and step0 is on, step 1 is not on, then power box ejector.
32.   If the box ejector is extended, latch step1.
33.   If the vacuum head is at magazine and the step1 is on and step4 is not on, then lower vacuum head.
34.   If vacuum head is lowered, latch step2, unlatch step0.
35.   If step2 is on and step9 is not on, turn on vacuum and latch production step3.
36.   If step3 is on or step8 is on and vacuum is raised, and step 9 is not on, extend vacuum head and set a timer[0] .
37.   If vacuum is on and timer is done, latch step4.
38.   If step4 is on and vacuum head raised, latch step5.
39.   If step5 is on and step8 is not on, extend vacuum head.
40.   If step5 is on and vacuum head is retracted, latch step 6.
41.   If step 6 is on, then rotate vacuum head clockwise.
42.   If step 6 is on and vacuum head is rotated, then latch step7.
43.   If step 7 is on and vacuum head is raised, move vacuum head to conveyer.
44.   If step 7 is on and vacuum is at conveyer, latch step8.
45.   If step 8 is on and vacuum head is extended, latch step9.
46.   If step 9 is on, then turn off the vacuum and latch step10 and retract the vacuum head.

47.	If step10 is on and step11 is not on, turn on the conveyer belt and raise the barcode stop raise.
48.	If step10 is on and the conveyer proximity sensor is on, turn off the conveyor, reset the timer, latch step11.

Once the program is completed, turn to the test mode and check whether the variables are acting the way they should using the monitor variables.

And then turn to run mode to run the program on the workstation.