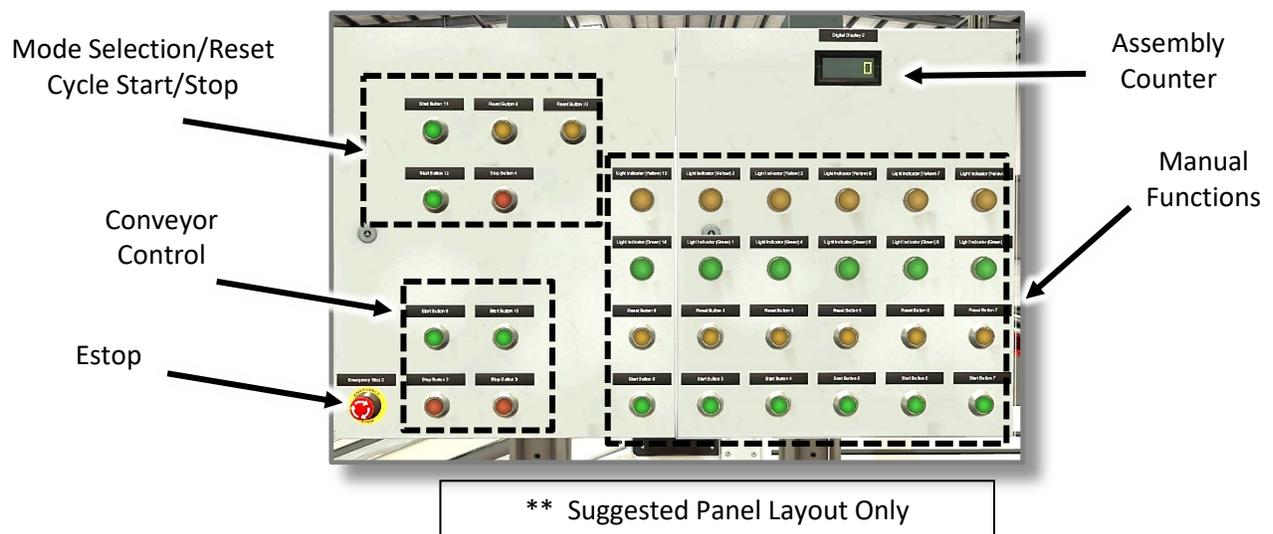


Name: _____

Date: ____ / ____ / ____
Year Month Day

Assembler LAB 2 – Purposes: The student will learn to:

1. Edit an existing Scene in Factoryio to create a unique layout with a new Pushbutton panel as shown below.
2. Become familiar with the concepts of Manual and Automatic Operation.
3. Connect the Simulation to a Rockwell PLC.
4. Edit the PLC program from Lab 1 to create the addition functions outlined in the Specifications (this will include expanding the Input and Outputs).
5. Design while keeping in mind that there will be more future additions to equipment and functionality for Lab 3.



Required:

Deliverables:

- Sketch of your design and create any notes required to implement these changes.
- Successful demonstration of Automatic Operation (can be the same code as used in Lab 1).
- Successful demonstration of the basic **Manual** Operation
- Successful demonstration of End of Cycle Stop (successful restart is not required).
- Copy of PLC Code AND Factoryio Scene Uploaded to Blackboard

Other Specifications:

- Watch video if needed
- Load Scene from Lab 1 and then save as Lab 2
- Create Manual Function and Position Indication for each available motion.
- Manual Function must take into account the potential of damaging a real machine (for instance, you should not be able to move the Gantry horizontally while in the Lowered Position).
- Add sensors as needed to detect positions on start-up (as a minimum, detect: X-Axis Returned, Z-Axis Raised, Clamp Opened and Positioner Lowered).
- Fully document your code.
- Manual and Auto Mode Buttons must be Lighted Pushbuttons
- Light and Buttons for Manual Operation Must be Separate even though the buttons have the ability to be backlit (suggest changing tag names in the Scene for un-used I/O to “-“).
- Conveyor Motor Controls must be Lighted Pushbuttons

Notes:

- You may remove the guarding to make it easy to work with the simulation.
- The sample pushbutton panel replaces the exiting panel
- ** The example panel shown here may not have the correct number of Pushbuttons and Lights ... is it **AN EXAMPLE ONLY**

Future Considerations:

- This will be followed up in subsequent labs so you should keep in mind what it will take to add Cameras for Part Detection and Interlocking to Transfer parts from one Simulation to Another via a PLC to PLC Network Connection.
- Adding Detection to only Assemble Matched Pairs

Assembler Lab 2 - Suggested IO Configuration

SENSORS		Host: 192.168.1.45		ACTUATORS	
-	Bool	Moving X	BOOL_IN_0	BOOL_OUT_0	Move X
-	Bool	Moving Z	BOOL_IN_1	BOOL_OUT_1	Move Z
Advance X PB	Bool	Item detected	BOOL_IN_2	BOOL_OUT_2	Grab
Auto PB	Bool	Lid at place	BOOL_IN_3	BOOL_OUT_3	Lids conveyor
Base at place	Bool	Lid clamped	BOOL_IN_4	BOOL_OUT_4	Clamp lid
Base clamped	Bool	Pos. at limit (lids)	BOOL_IN_5	BOOL_OUT_5	Pos. raise (lids)
Bases Pos. Low'd Prox.	Bool	Base at place	BOOL_IN_6	BOOL_OUT_6	Bases conveyor
Bases Unclamped Prox.	Bool	Base clamped	BOOL_IN_7	BOOL_OUT_7	Clamp base
Clamp Base PB	Bool	Pos. at limit (bases)	BOOL_IN_8	BOOL_OUT_8	Pos. raise (bases)
Clamp Lid PB	Bool	Part leaving	BOOL_IN_9	BOOL_OUT_9	Cycle Running Lt.
Cycle Start	Bool	Cycle Start	BOOL_IN_10	BOOL_OUT_10	Cycle Stop Request Lt
Cycle Stop	Bool	Man / Auto Reset	BOOL_IN_11	BOOL_OUT_11	Auto Mode Lt.
Emergency Stop	Bool	Cycle Stop	BOOL_IN_12	BOOL_OUT_12	Auto Mode Lt.
FACTORY I/O (Paused)	Bool	Emergency Stop	BOOL_IN_13	BOOL_OUT_13	Manual Mode Lt.
FACTORY I/O (Reset)	Bool	Auto PB	BOOL_IN_14	BOOL_OUT_14	Manual Mode Lt.
FACTORY I/O (Running)	Bool	FACTORY I/O (Running)	BOOL_IN_15	BOOL_OUT_15	
FACTORY I/O (Time Scale)	Float	Manual PB	BOOL_IN_16	BOOL_OUT_16	
Item detected	Bool	Start Lid Conveyor	BOOL_IN_17	BOOL_OUT_17	Lids Conveyor Running
Lid at place	Bool	Stop Lid Conveyor	BOOL_IN_18	BOOL_OUT_18	Lids Conveyor Running
Lid clamped	Bool	Start Base Conveyor	BOOL_IN_19	BOOL_OUT_19	Bases Conveyor Running
Lids Pos. Low'd Prox.	Bool	Stop Base Conveyor	BOOL_IN_20	BOOL_OUT_20	Bases Conveyor Running
Lids Unclamped Prox.	Bool	Advance X PB	BOOL_IN_21	BOOL_OUT_21	X - Adv'd Lt
Lower Pos. Bases PB	Bool	Return X PB	BOOL_IN_22	BOOL_OUT_22	X - Ret'd Lt.
Lower Pos. Lids PB	Bool	Raise Z PB	BOOL_IN_23	BOOL_OUT_23	Z - Raised Lt.
Lower Z PB	Bool	Lower Z PB	BOOL_IN_24	BOOL_OUT_24	Z - Lowered Lt.
Man / Auto Reset	Bool	Clamp Lid PB	BOOL_IN_25	BOOL_OUT_25	Lid Clamped Lt.
Manual PB	Bool	Unclamp Lid PB	BOOL_IN_26	BOOL_OUT_26	Lid Unclamped Lt.
Moving X	Bool	Clamp Base PB	BOOL_IN_27	BOOL_OUT_27	Base Clamped Lt.
Moving Z	Bool	Unclamp Base PB	BOOL_IN_28	BOOL_OUT_28	Base Unclamped Lt.
Part leaving	Bool	Raise Pos. Lids PB	BOOL_IN_29	BOOL_OUT_29	Lid Pos. Raised Lt.
Pos. at limit (bases)	Bool	Lower Pos. Lids PB	BOOL_IN_30	BOOL_OUT_30	Lid Pos. Low'd Lt.
Pos. at limit (lids)	Bool	Raise Pos. Bases PB	BOOL_IN_31	BOOL_OUT_31	Base Pos. Raised Lt.
Raise Pos. Bases PB	Bool	Lower Pos. Bases PB	BOOL_IN_32	BOOL_OUT_32	Base Pos. Low'd Lt.
Raise Pos. Lids PB	Bool	X - Returned Prox.	BOOL_IN_33	BOOL_OUT_33	
Raise Z PB	Bool	Lids Pos. Low'd Prox.	BOOL_IN_34	BOOL_OUT_34	
Return X PB	Bool	Lids Unclamped Prox.	BOOL_IN_35	BOOL_OUT_35	
Start Base Conveyor	Bool	Pos. at limit (lids)	BOOL_IN_36	BOOL_OUT_36	
Start Lid Conveyor	Bool	Bases Pos. Low'd Prox.	BOOL_IN_37	BOOL_OUT_37	
Stop Base Conveyor	Bool	Bases Unclamped Prox.	BOOL_IN_38	BOOL_OUT_38	
Stop Lid Conveyor	Bool	Pos. at limit (bases)	BOOL_IN_39	BOOL_OUT_39	
Unclamp Base PB	Bool	Z - Raised Prox	BOOL_IN_40	BOOL_OUT_40	
Unclamp Lid PB	Bool		BOOL_IN_41	BOOL_OUT_41	
X - Returned Prox.	Bool			INT_OUT_0	Digital Display 2
Z - Raised Prox	Bool				

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Legend: Bool (Green), Float (Blue), Int (Orange), Any (Black)

Report is Due _____