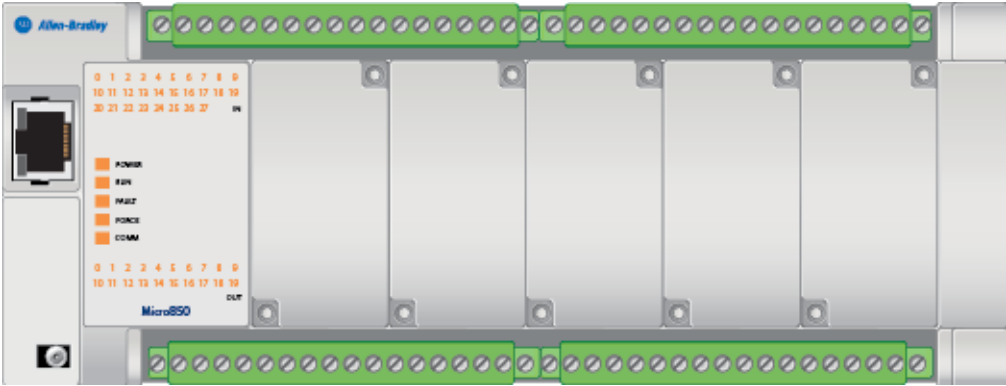


Micro850

Device Configuration

Controller

Overview

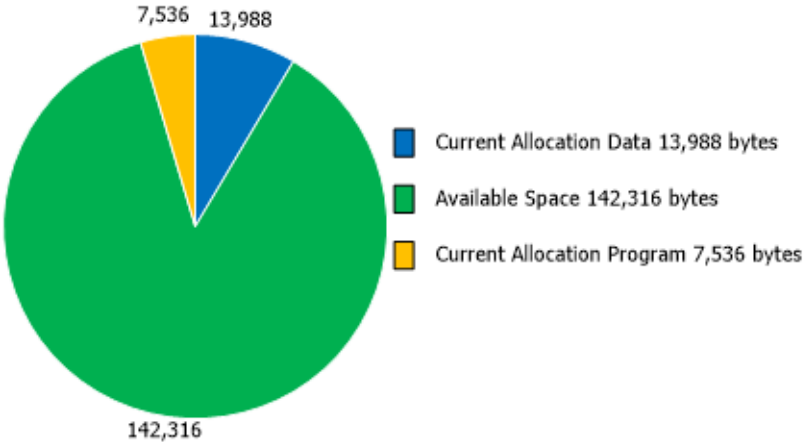


General

| Name     | Description | Vendor Name   | Catalog ID          | Controller Project Version | Download Source Code |
|----------|-------------|---------------|---------------------|----------------------------|----------------------|
| Micro850 |             | Allen-Bradley | 2080-LC50-48QWB-SIM | 12                         | Yes                  |

Memory

Memory Statistics



| Name                | Allocated     | Used         | Free          |
|---------------------|---------------|--------------|---------------|
| Embedded Project    | 348,160 bytes | 51,530 bytes | 296,630 bytes |
| Temporary Variables | 8,456 bytes   | 264 bytes    | 8,192 bytes   |

Startup/Faults

| Mode Behavior                   | Fault Override     |
|---------------------------------|--------------------|
| Retain previous power-down mode | Do not clear fault |

Embedded I/O

Input Filter

| Inputs       | 0-1     | 2-3     | 4-5     | 6-7     | 8-9     | 10-11   | 12-13   | 14-15   | 16-23   | 24-27   |
|--------------|---------|---------|---------|---------|---------|---------|---------|---------|---------|---------|
| Input Filter | Default | Default | Default | Default | Default | Default | Default | Default | Default | Default |

Input Latch and EII Edge

| Input | 0 | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 | 11 | 12 | 13 | 14 | 15 |
|-------|---|---|---|---|---|---|---|---|---|---|----|----|----|----|----|----|
|-------|---|---|---|---|---|---|---|---|---|---|----|----|----|----|----|----|

# Document Generator

|                     |          |          |          |          |          |          |          |          |          |          |          |          |          |          |          |          |
|---------------------|----------|----------|----------|----------|----------|----------|----------|----------|----------|----------|----------|----------|----------|----------|----------|----------|
| <b>Enable Latch</b> | Disabled | Disabled | Disabled | Disabled | Disabled | Disabled | Disabled | Disabled | Disabled | Disabled | Disabled | Disabled | Disabled | Disabled | Disabled | Disabled |
| <b>Latch Edge</b>   | Falling  | Falling  | Falling  | Falling  | Falling  | Falling  | Falling  | Falling  | Falling  | Falling  | Falling  | Falling  | Falling  | Falling  | Falling  | Falling  |
| <b>Edge</b>         | Falling  | Falling  | Falling  | Falling  | Falling  | Falling  | Falling  | Falling  | Falling  | Falling  | Falling  | Falling  | Falling  | Falling  | Falling  | Falling  |

## Global Variables

| Name         | Alias                | Data Type | Dimension | Initial Value | Project Value | Comment   | Direction              | String Size |
|--------------|----------------------|-----------|-----------|---------------|---------------|---|------------------------|-------------|
| _IO_EM_DO_00 | DO_Butter_Dispenser  | BOOL      |           |               |               | Dispenses on high pulses                          | VarDirectlyRepresented |             |
| _IO_EM_DO_01 | DO_Sugar_Dispenser   | BOOL      |           |               |               | Dispenses while high                              | VarDirectlyRepresented |             |
| _IO_EM_DO_02 | DO_Mixer             | BOOL      |           |               |               | Dispenses drops while high                        | VarDirectlyRepresented |             |
| _IO_EM_DO_03 | DO_Egg_Dispenser     | BOOL      |           |               |               | Dispenses on high pulses                          | VarDirectlyRepresented |             |
| _IO_EM_DO_04 | DO_Vanilla_Dispenser | BOOL      |           |               |               |   | VarDirectlyRepresented |             |
| _IO_EM_DO_05 | DO_Flour_Dispenser   | BOOL      |           |               |               |   | VarDirectlyRepresented |             |
| _IO_EM_DO_06 | DO_Salt_Dispenser    | BOOL      |           |               |               |   | VarDirectlyRepresented |             |
| _IO_EM_DO_07 | DO_Soda_Dispenser    | BOOL      |           |               |               |   | VarDirectlyRepresented |             |
| _IO_EM_DO_08 | DO_Ball_Roller       | BOOL      |           |               |               |   | VarDirectlyRepresented |             |
| _IO_EM_DO_09 | DO_Bowl_Cleaner      | BOOL      |           |               |               |   | VarDirectlyRepresented |             |
| _IO_EM_DO_10 | DO_Conveyor_Fwd      | BOOL      |           |               |               |   | VarDirectlyRepresented |             |
| _IO_EM_DO_11 | DO_Conveyor_Rev      | BOOL      |           |               |               |   | VarDirectlyRepresented |             |
| _IO_EM_DO_12 | DO_Oven              | BOOL      |           |               |               |   | VarDirectlyRepresented |             |
| _IO_EM_DO_13 | DO_Door              | BOOL      |           |               |               | Door opens when true, closes when false           | VarDirectlyRepresented |             |
| _IO_EM_DO_14 | DO_Piston            | BOOL      |           |               |               | Pushes cookies out the door to user on high pulse | VarDirectlyRepresented |             |
| _IO_EM_DO_15 |                      | BOOL      |           |               |               |   | VarDirectlyRepresented |             |
| _IO_EM_DO_16 |                      | BOOL      |           |               |               |   | VarDirectlyRepresented |             |
| _IO_EM_DO_17 | DO_Ready             | BOOL      |           |               |               |   | VarDirectlyRepresented |             |
| _IO_EM_DO_18 | DO_Warning           | BOOL      |           |               |               |   | VarDirectlyRepresented |             |

# Document Generator

| Name         | Alias        | Data Type | Dimension | Initial Value | Project Value | Comment  | Direction              | String Size |
|--------------|--------------|-----------|-----------|---------------|---------------|--|------------------------|-------------|
| _IO_EM_DO_19 | DO_Error     | BOOL      |           |               |               |  | VarDirectlyRepresented |             |
| _IO_EM_DI_00 | DI_Start_PB  | BOOL      |           |               |               |  | VarDirectlyRepresented |             |
| _IO_EM_DI_01 | DI_Stop_PB   | BOOL      |           |               |               |  | VarDirectlyRepresented |             |
| _IO_EM_DI_02 | DI_Restocked | BOOL      |           |               |               | Pressed by user when restocked ingredients to clear errors               | VarDirectlyRepresented |             |
| _IO_EM_DI_03 | DI_Butter_PE | BOOL      |           |               |               | Photoelectric sensor at bottom of butter stack, true when stack is empty | VarDirectlyRepresented |             |
| _IO_EM_DI_04 |              | BOOL      |           |               |               |  | VarDirectlyRepresented |             |
| _IO_EM_DI_05 |              | BOOL      |           |               |               |  | VarDirectlyRepresented |             |
| _IO_EM_DI_06 |              | BOOL      |           |               |               |  | VarDirectlyRepresented |             |
| _IO_EM_DI_07 |              | BOOL      |           |               |               |  | VarDirectlyRepresented |             |
| _IO_EM_DI_08 |              | BOOL      |           |               |               |  | VarDirectlyRepresented |             |
| _IO_EM_DI_09 |              | BOOL      |           |               |               |  | VarDirectlyRepresented |             |
| _IO_EM_DI_10 |              | BOOL      |           |               |               |  | VarDirectlyRepresented |             |
| _IO_EM_DI_11 |              | BOOL      |           |               |               |  | VarDirectlyRepresented |             |
| _IO_EM_DI_12 |              | BOOL      |           |               |               |  | VarDirectlyRepresented |             |
| _IO_EM_DI_13 |              | BOOL      |           |               |               |  | VarDirectlyRepresented |             |
| _IO_EM_DI_14 |              | BOOL      |           |               |               |  | VarDirectlyRepresented |             |
| _IO_EM_DI_15 |              | BOOL      |           |               |               |  | VarDirectlyRepresented |             |
| _IO_EM_DI_16 |              | BOOL      |           |               |               |  | VarDirectlyRepresented |             |
| _IO_EM_DI_17 |              | BOOL      |           |               |               |  | VarDirectlyRepresented |             |
| _IO_EM_DI_18 |              | BOOL      |           |               |               |  | VarDirectlyRepresented |             |
| _IO_EM_DI_19 |              | BOOL      |           |               |               |  | VarDirectlyRepresented |             |
| _IO_EM_DI_20 |              | BOOL      |           |               |               |  | VarDirectlyRepresented |             |
| _IO_EM_DI_21 |              | BOOL      |           |               |               |  | VarDirectlyRepresented |             |
| _IO_EM_DI_22 |              | BOOL      |           |               |               |  | VarDirectlyRepresented |             |
| _IO_EM_DI_23 |              | BOOL      |           |               |               |  | VarDirectlyRepresented |             |
| _IO_EM_DI_24 |              | BOOL      |           |               |               |  | VarDirectlyRepresented |             |
| _IO_EM_DI_25 |              | BOOL      |           |               |               |  | VarDirectlyRepresented |             |
| _IO_EM_DI_26 |              | BOOL      |           |               |               |  | VarDirectlyRepresented |             |

# Document Generator

| Name                | Alias       | Data Type | Dimension | Initial Value | Project Value | Comment   | Direction              | String Size |
|---------------------|-------------|-----------|-----------|---------------|---------------|---|------------------------|-------------|
| _IO_EM_DI_27        | DI_Reset_PB | BOOL      |           |               |               |   | VarDirectlyRepresented |             |
| Flour_Tank_Capacity |             | REAL      |           | 0.0           |               |   | Var                    |             |
| Flour_Tank_Full     |             | BOOL      |           |               |               |   | Var                    |             |
| Flour_Tank_Minimum  |             | REAL      |           |               |               |   | Var                    |             |
| Flour_Tank_Low      |             | BOOL      |           |               |               |   | Var                    |             |
| Running             |             | BOOL      |           |               |               |   | Var                    |             |
| Flour_Needed        |             | REAL      |           |               |               |   | Var                    |             |
| Flour_Weight        |             | REAL      |           |               |               |   | Var                    |             |
| Process_Index       |             | INT       |           | 0             |               |   | Var                    |             |
| Next_Step           |             | BOOL      |           |               |               |   | Var                    |             |
| Initialize          |             | BOOL      |           |               |               |   | Var                    |             |
| DI_Bowl_Weight      |             | REAL      |           |               |               | Simulated weight [g] measurement  | Var                    |             |
| Recipe_Flour        |             | REAL      |           | 180.0         |               | Weight [g]  | Var                    |             |
| Recipe_Eggs         |             | INT       |           | 2             |               | Number of eggs  | Var                    |             |
| Tare_Weight         |             | REAL      |           |               |               | Weight [g]  | Var                    |             |
| Relative_Weight     |             | REAL      |           |               |               | (DI_Bowl_Weight) - (Tare_Weight) [g]  | Var                    |             |
| Tare                |             | BOOL      |           |               |               |   | Var                    |             |
| Recipe_Sugar        |             | REAL      |           | 100.0         |               | Weight [g]  | Var                    |             |
| Butter_Weight       |             | REAL      |           |               |               |   | Var                    |             |
| Sugar_Dispensed     |             | BOOL      |           |               |               |   | Var                    |             |
| Butter_Dispensed    |             | BOOL      |           |               |               |   | Var                    |             |
| Vanilla_Dispensed   |             | BOOL      |           |               |               |   | Var                    |             |
| Recipe_Vanilla      |             | INT       |           | 70            |               | Number of drops   | Var                    |             |
| Dispense_Butter     |             | BOOL      |           |               |               |   | Var                    |             |
| Dispense_Sugar      |             | BOOL      |           |               |               |   | Var                    |             |
| DI_Vanilla_Drop     |             | BOOL      |           |               |               | Simulated output from vanilla dispenser - high pulse for every drop dispensed | Var                    |             |
| Clean_Bowl          |             | BOOL      |           |               |               |   | Var                    |             |

# Document Generator

| Name               | Alias | Data Type | Dimension | Initial Value | Project Value | Comment | Direction | String Size |
|--------------------|-------|-----------|-----------|---------------|---------------|---------|-----------|-------------|
| Cleaning_Complete  |       | BOOL      |           |               |               |         | Var       |             |
| C_Bowl_Weight      |       | REAL      |           |               |               |         | Var       |             |
| C_Butter_Weight    |       | REAL      |           |               |               |         | Var       |             |
| IDX_Butter         |       | INT       |           |               |               |         | Var       |             |
| IDX_Sugar          |       | INT       |           |               |               |         | Var       |             |
| IDX_Clean          |       | INT       |           |               |               |         | Var       |             |
| IDX_End            |       | INT       |           |               |               |         | Var       |             |
| IDX_Mix_1          |       | INT       |           |               |               |         | Var       |             |
| Mix_Complete       |       | BOOL      |           |               |               |         | Var       |             |
| C_Butter_Max       |       | INT       |           |               |               |         | Var       |             |
| C_Eggs_Max         |       | INT       |           |               |               |         | Var       |             |
| Warn_Butter_Low    |       | BOOL      |           |               |               |         | Var       |             |
| Error_Butter_Empty |       | BOOL      |           |               |               |         | Var       |             |
| Error              |       | BOOL      |           |               |               |         | Var       |             |
| Warn               |       | BOOL      |           |               |               |         | Var       |             |
| Warn_Sugar_Low     |       | BOOL      |           |               |               |         | Var       |             |
| Error_Sugar_Empty  |       | BOOL      |           |               |               |         | Var       |             |
| Ready              |       | BOOL      |           |               |               |         | Var       |             |
| C_Sugar_Max        |       | REAL      |           |               |               |         | Var       |             |
| C_Flour_Max        |       | REAL      |           |               |               |         | Var       |             |
| C_Sugar_Low        |       | REAL      |           |               |               |         | Var       |             |
| C_Sugar_Empty      |       | REAL      |           |               |               |         | Var       |             |
| DI_Sugar_Low_PE    |       | BOOL      |           |               |               |         | Var       |             |
| DI_Sugar_Empty_PE  |       | BOOL      |           |               |               |         | Var       |             |
| Dispense_Vanilla   |       | BOOL      |           |               |               |         | Var       |             |
| IDX_Eggs_Vanilla   |       | INT       |           |               |               |         | Var       |             |
| IDX_Mix_2          |       | INT       |           |               |               |         | Var       |             |
| IDX_Flour          |       | INT       |           |               |               |         | Var       |             |
| Warn_Eggs_Low      |       | BOOL      |           |               |               |         | Var       |             |
| Error_Eggs_Empty   |       | BOOL      |           |               |               |         | Var       |             |
| Dispense_Eggs      |       | BOOL      |           |               |               |         | Var       |             |

# Document Generator

| Name                | Alias | Data Type | Dimension | Initial Value | Project Value | Comment                               | Direction | String Size |
|---------------------|-------|-----------|-----------|---------------|---------------|---------------------------------------|-----------|-------------|
| Eggs_Dispensed      |       | BOOL      |           |               |               |                                       | Var       |             |
| C_Egg_Weight        |       | REAL      |           |               |               |                                       | Var       |             |
| C_Egg_Dispense_Time |       | TIME      |           |               |               |                                       | Var       |             |
| Egg_Dispense_Delay  |       | TIME      |           |               |               | Time [s] to wait for eggs to dispense | Var       |             |
| Mix                 |       | BOOL      |           |               |               |                                       | Var       |             |
| Recipe_Mix_1        |       | TIME      |           | T#3s          |               |                                       | Var       |             |
| Recipe_Mix_2        |       | TIME      |           | T#3s          |               |                                       | Var       |             |
| Mix_Time            |       | TIME      |           |               |               |                                       | Var       |             |
| C_Clean_Bowl_Time   |       | TIME      |           |               |               |                                       | Var       |             |
| Dispense_Flour      |       | BOOL      |           |               |               |                                       | Var       |             |
| Flour_Dispensed     |       | BOOL      |           |               |               |                                       | Var       |             |
| DI_Flour_Low_PE     |       | BOOL      |           |               |               |                                       | Var       |             |
| DI_Flour_Empty_PE   |       | BOOL      |           |               |               |                                       | Var       |             |
| C_Flour_Low         |       | REAL      |           |               |               |                                       | Var       |             |
| C_Flour_Empty       |       | REAL      |           |               |               |                                       | Var       |             |
| Error_Flour_Empty   |       | BOOL      |           |               |               |                                       | Var       |             |
| Warn_Flour_Low      |       | BOOL      |           |               |               |                                       | Var       |             |
| Dispense_Salt       |       | BOOL      |           |               |               |                                       | Var       |             |
| Salt_Dispensed      |       | BOOL      |           |               |               |                                       | Var       |             |
| Dispense_Soda       |       | BOOL      |           |               |               |                                       | Var       |             |
| Soda_Dispensed      |       | BOOL      |           |               |               |                                       | Var       |             |
| IDX_Salt_Soda       |       | INT       |           |               |               |                                       | Var       |             |
| IDX_Mix_3           |       | INT       |           |               |               |                                       | Var       |             |
| Recipe_Mix_3        |       | TIME      |           | T#5s          |               |                                       | Var       |             |
| Recipe_Cook_Time    |       | TIME      |           | T#10s         |               |                                       | Var       |             |
| Recipe_Cool_Time    |       | TIME      |           | T#10s         |               |                                       | Var       |             |
| IDX_Roll            |       | INT       |           |               |               |                                       | Var       |             |
| IDX_Bake            |       | INT       |           |               |               |                                       | Var       |             |
| IDX_Present         |       | INT       |           |               |               |                                       | Var       |             |
| Roll                |       | BOOL      |           |               |               |                                       | Var       |             |

# Document Generator

| Name                 | Alias | Data Type | Dimension | Initial Value | Project Value | Comment  | Direction | String Size |
|----------------------|-------|-----------|-----------|---------------|---------------|--|-----------|-------------|
| Rolling_Complete     |       | BOOL      |           |               |               |  | Var       |             |
| Bake                 |       | BOOL      |           |               |               |  | Var       |             |
| Baking_Complete      |       | BOOL      |           |               |               |  | Var       |             |
| DI_Conveyor_Oven_PE  |       | BOOL      |           |               |               |  | Var       |             |
| DI_Conveyor_Start_PE |       | BOOL      |           |               |               |  | Var       |             |
| Present              |       | BOOL      |           |               |               |  | Var       |             |
| Presenting_Complete  |       | BOOL      |           |               |               |  | Var       |             |
| DI_Piston_Extended   |       | BOOL      |           |               |               |  | Var       |             |
| Start_PB             |       | BOOL      |           |               |               |  | Var       |             |
| __SYSVA_CYCLECNT     |       | DINT      |           |               |               | Cycle counter  | VarGlobal |             |
| __SYSVA_CYCLEDATE    |       | TIME      |           |               |               | Timestamp of the beginning of the cycle in milliseconds (ms) | VarGlobal |             |
| __SYSVA_KVBPERR      |       | BOOL      |           |               |               | Kernel variable binding producing error (production error)   | VarGlobal |             |
| __SYSVA_KVBCERR      |       | BOOL      |           |               |               | Kernel variable binding consuming error (consumption error)  | VarGlobal |             |
| __SYSVA_RESNAME      |       | STRING    |           |               |               | Resource name (max length=255)                               | VarGlobal |             |
| __SYSVA_SCANCNT      |       | DINT      |           |               |               | Input scan counter   | VarGlobal |             |
| __SYSVA_TCYCYCTIME   |       | TIME      |           |               |               | Programmed cycle time  | VarGlobal |             |
| __SYSVA_TCYCURRENT   |       | TIME      |           |               |               | Current cycle time   | VarGlobal |             |
| __SYSVA_TCYMAXIMUM   |       | TIME      |           |               |               | Maximum cycle time since last start                          | VarGlobal |             |
| __SYSVA_TCYOVERFLOW  |       | DINT      |           |               |               | Number of cycle overflows                                    | VarGlobal |             |
| __SYSVA_RESMODE      |       | SINT      |           |               |               | Resource execution mode                                      | VarGlobal |             |
| __SYSVA_CCEXEC       |       | BOOL      |           |               |               | Execute one cycle when application is in cycle to cycle mode | VarGlobal |             |
| __SYSVA_REMOTE       |       | BOOL      |           | FALSE         |               | Remote status  | VarGlobal |             |



| Name                    | Alias | Data Type | Dimension | Initial Value | Project Value | Comment                   | Direction | String Size |
|-------------------------|-------|-----------|-----------|---------------|---------------|---------------------------|-----------|-------------|
| __SYSVA_SUSPEND_ID      |       | UINT      |           | 0             |               | Last Suspend ID           | VarGlobal |             |
| __SYSVA_TCYWDG          |       | UDINT     |           | 2000          |               | Software Watchdog         | VarGlobal |             |
| __SYSVA_MAJ_ERR_HALT    |       | BOOL      |           | FALSE         |               | Major Error Halted status | VarGlobal |             |
| __SYSVA_ABORT_CYCLE     |       | BOOL      |           | FALSE         |               | Aborting Cycle            | VarGlobal |             |
| __SYSVA_FIRST_SCAN      |       | BOOL      |           | TRUE          |               | First scan bit            | VarGlobal |             |
| __SYSVA_USER_DATA_LOST  |       | BOOL      |           | FALSE         |               | User data lost            | VarGlobal |             |
| __SYSVA_POWERUP_BIT     |       | BOOL      |           | TRUE          |               | Power-up bit              | VarGlobal |             |
| __SYSVA_PROJ_INCOMPLETE |       | UDINT     |           | 0             |               | Project Incomplete        | VarGlobal |             |

Programs

Constants

Programs

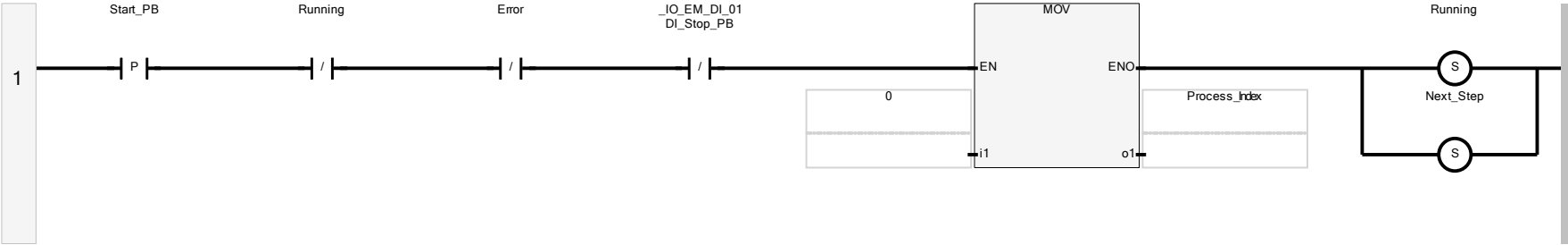
Equations

Programs

Process

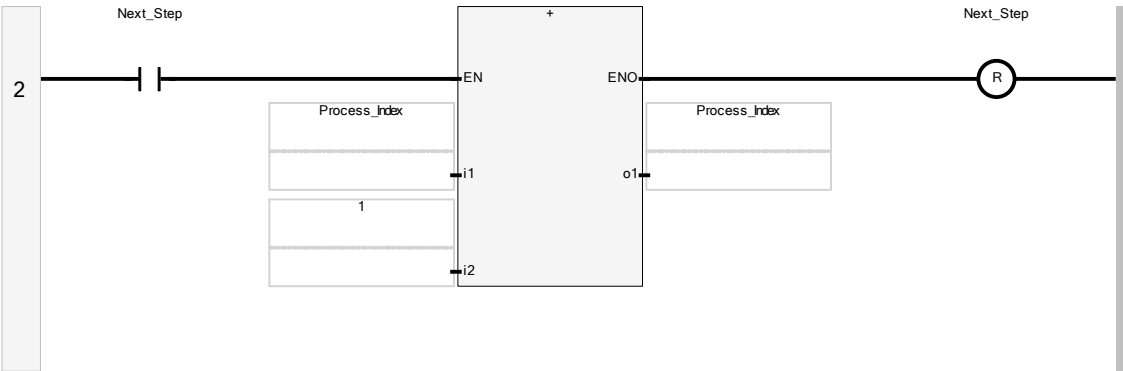
Rung1 Diagram

Start new process



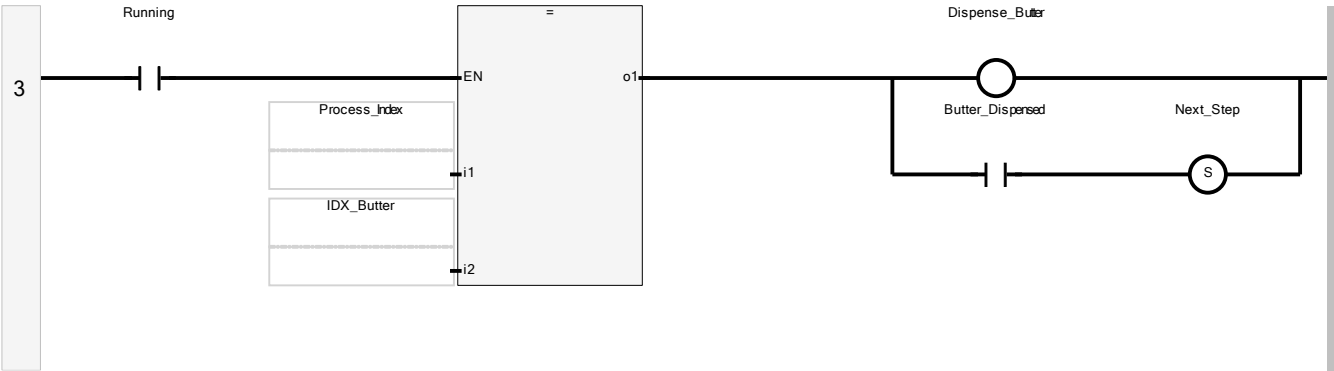
Rung2 Diagram

Increment process index



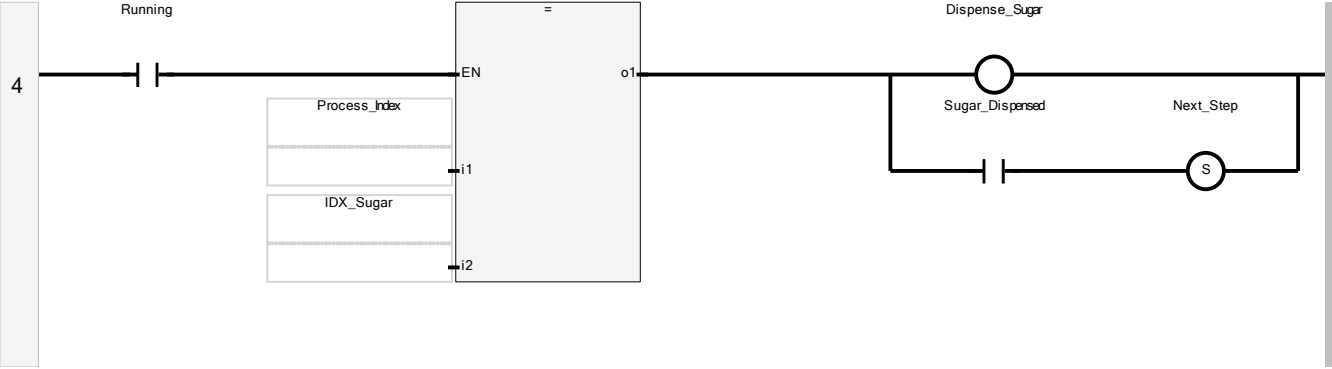
Rung3 Diagram

Dispense butter



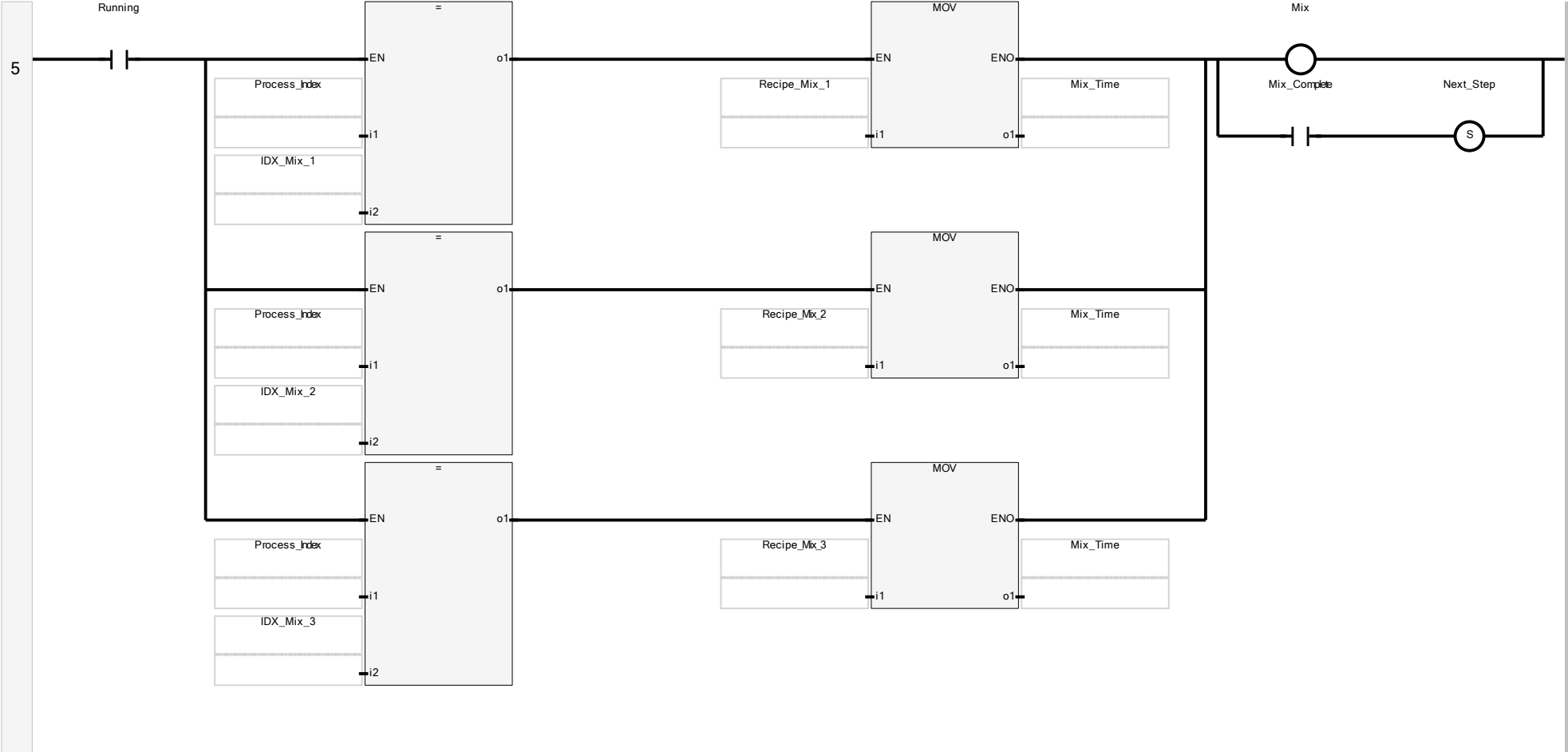
Rung4 Diagram

Dispense sugar

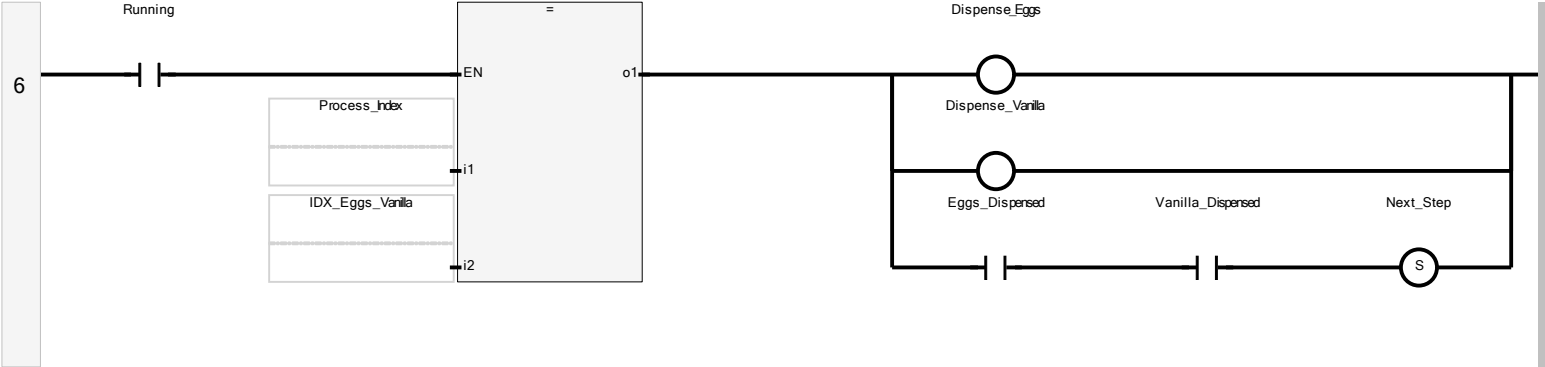


Rung5 Diagram

Mix\_1

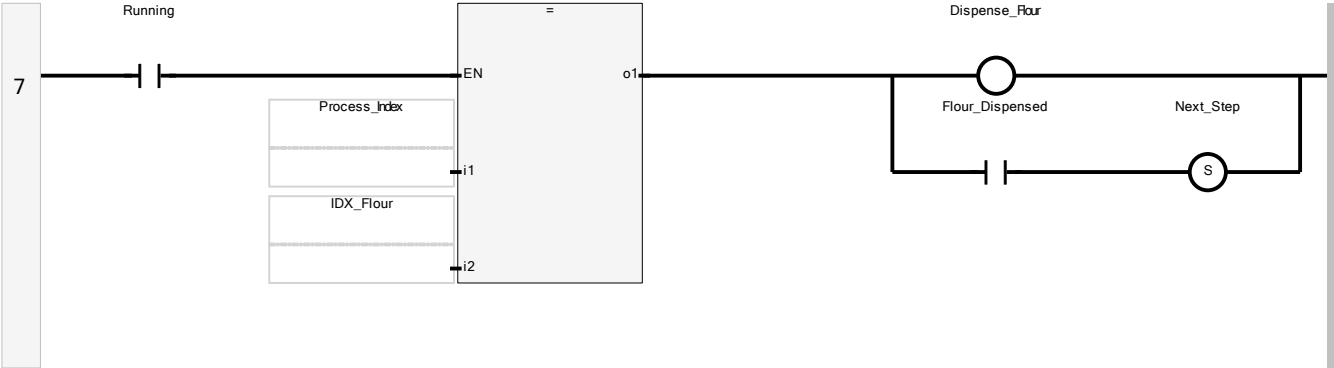


Rung6 Diagram  
Dispense eggs, vanilla



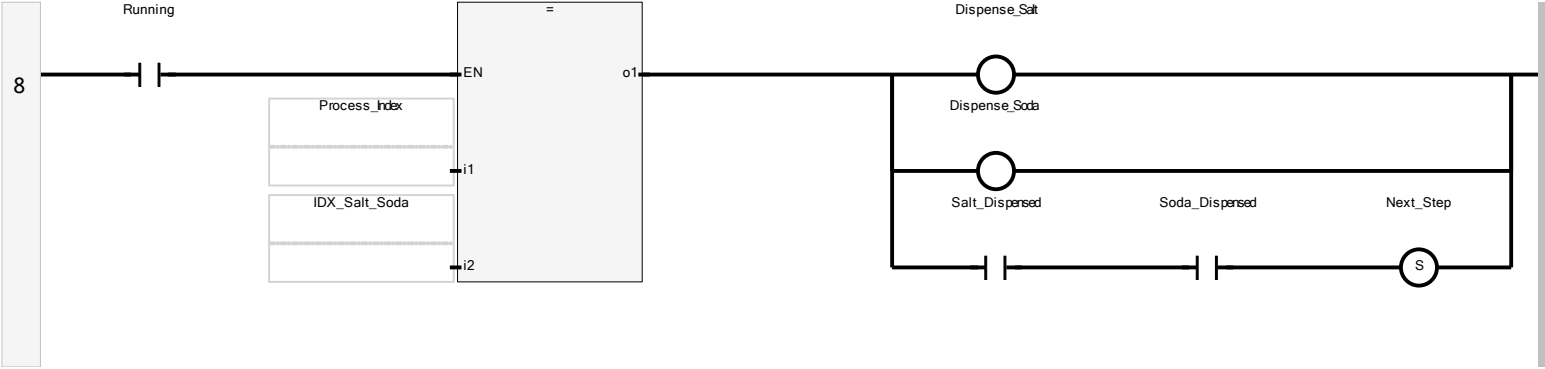
Rung7 Diagram

Dispense flour



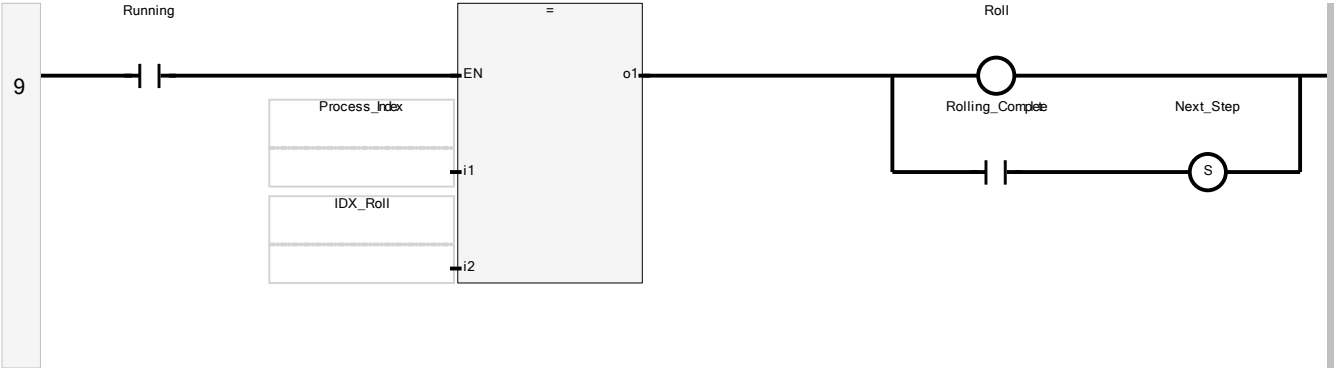
Rung8 Diagram

Dispense salt, baking soda



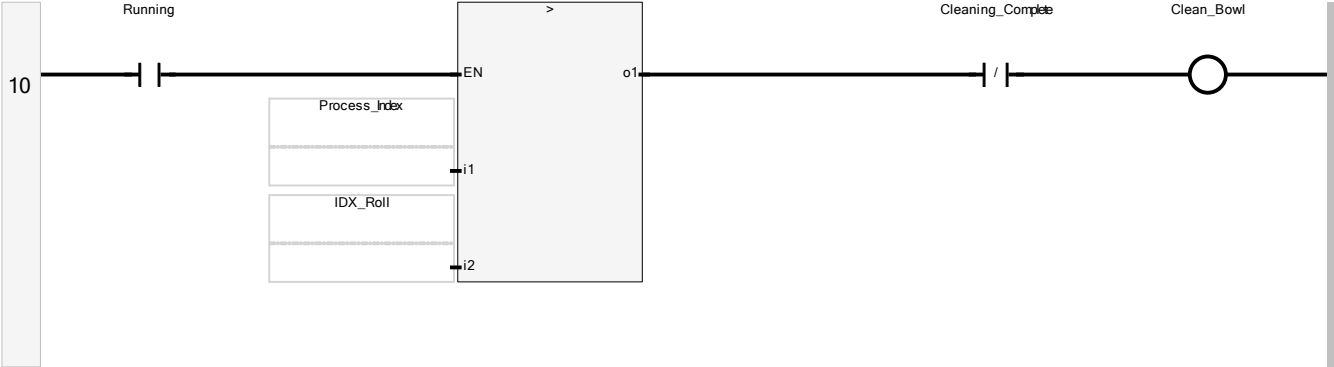
Rung9 Diagram

Roll into balls on tray



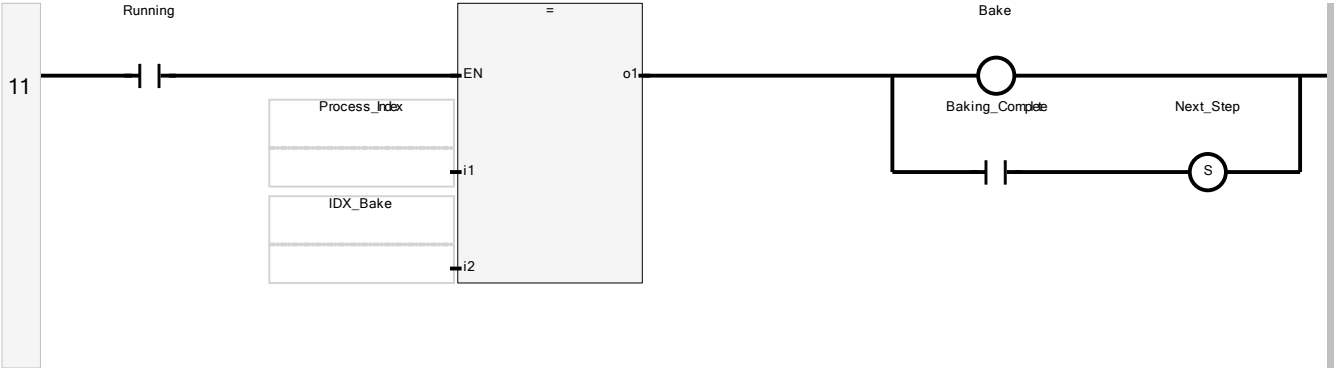
Rung10 Diagram

Clean



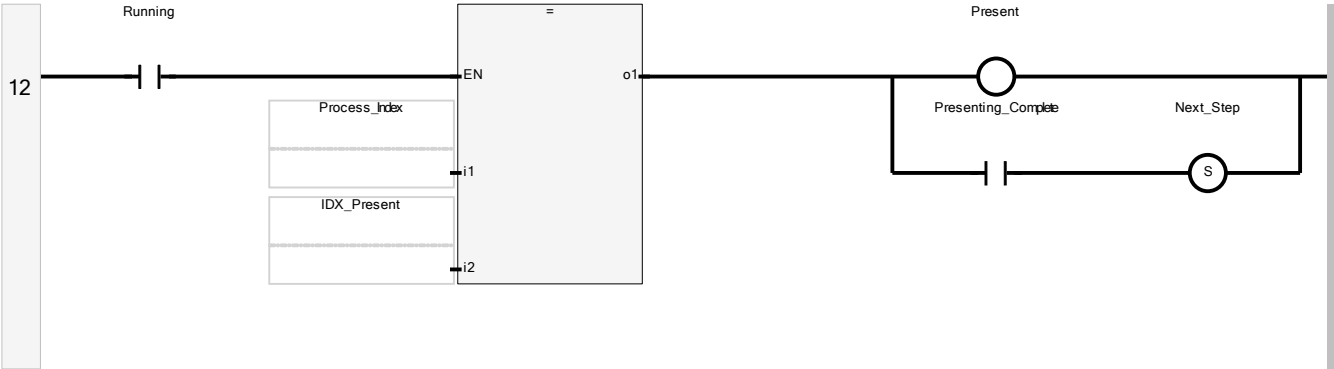
Rung11 Diagram

Bake



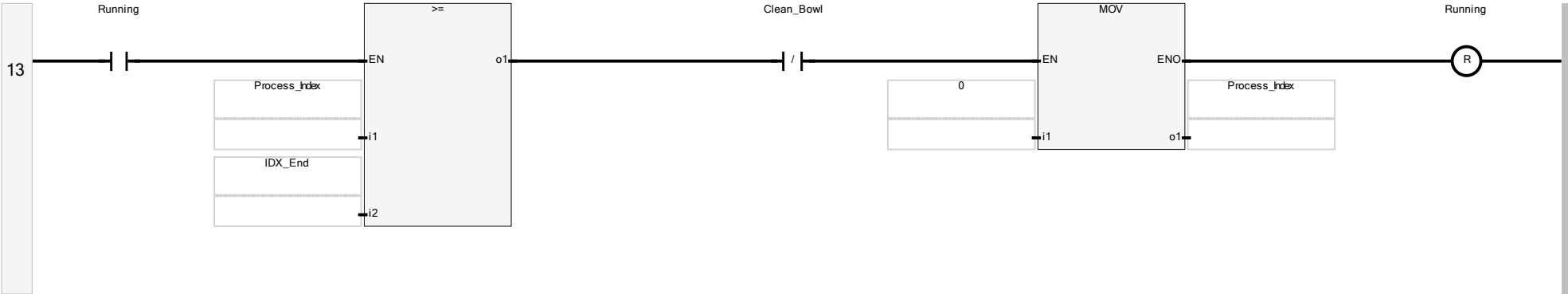
Rung12 Diagram

Present



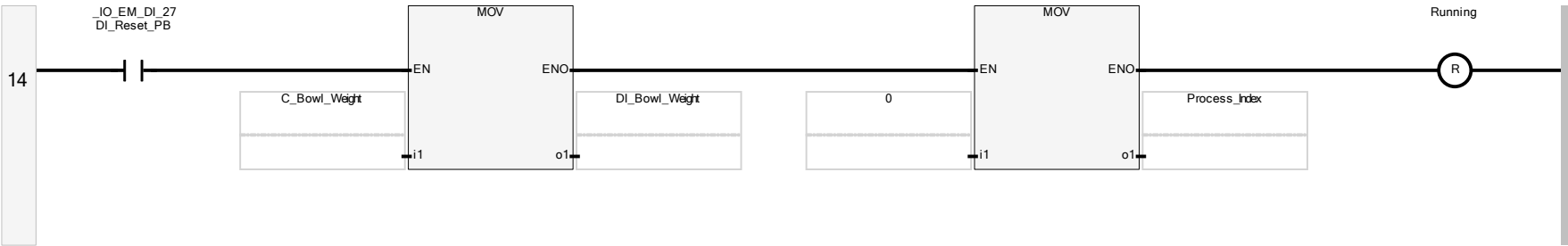
Rung13 Diagram

End process once cleaning is finished



Rung14 Diagram

Reset





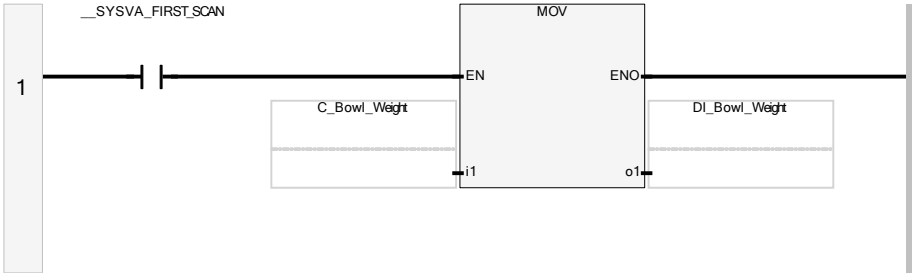
Mixing\_Bowl

Local Variables

| Name  | Alias | Data Type | Dimension | Initial Value | Project Value | Comment | Direction | String Size |
|-------|-------|-----------|-----------|---------------|---------------|---------|-----------|-------------|
| TON_1 |       | TON       |           | ...           | ...           |         | Var       |             |
| TON_2 |       | TON       |           | ...           | ...           |         | Var       |             |
| TON_4 |       | TON       |           | ...           | ...           |         | Var       |             |
| TON_3 |       | TON       |           | ...           | ...           |         | Var       |             |

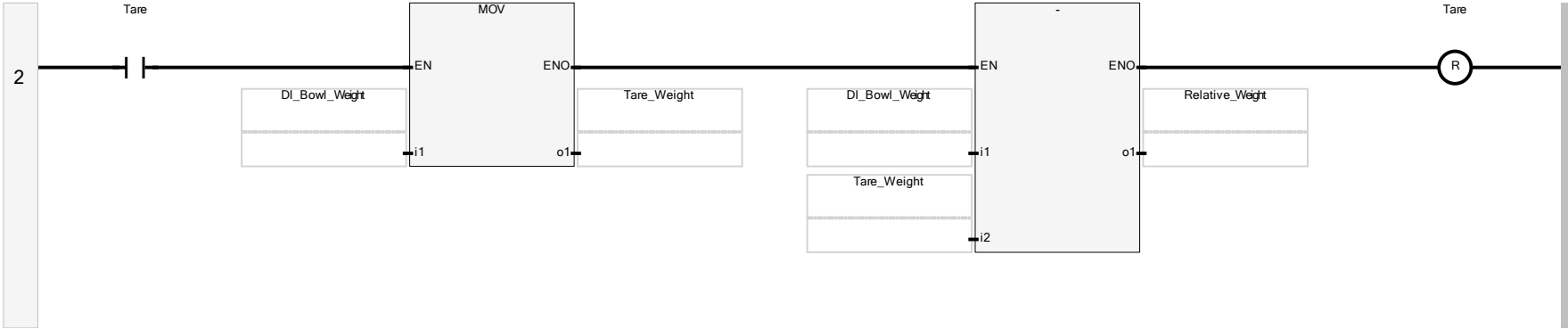
Rung1 Diagram

Initialize bowl weight



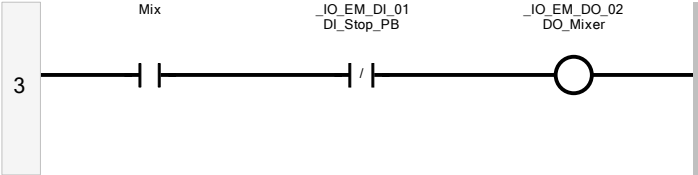
Rung2 Diagram

Tare - store bowl weight measurement



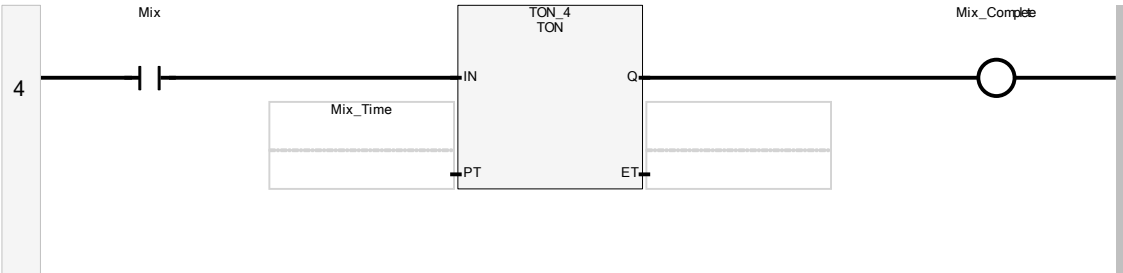
Rung3 Diagram

Mix output



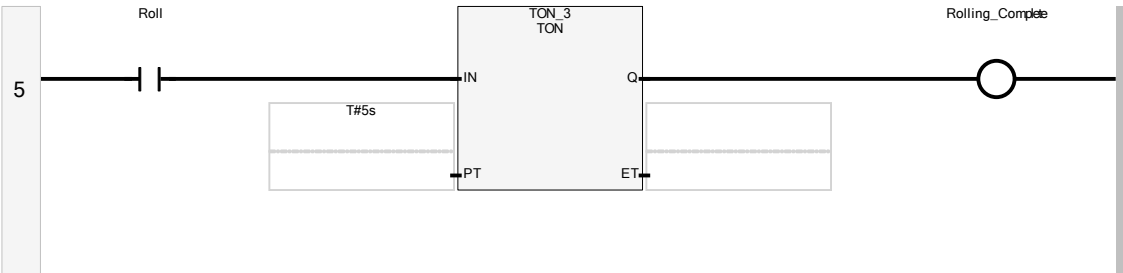
Rung4 Diagram

Mix timer



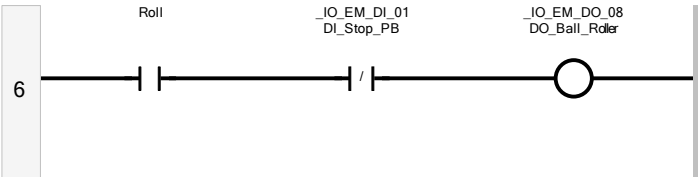
Rung5 Diagram

Roll dough balls



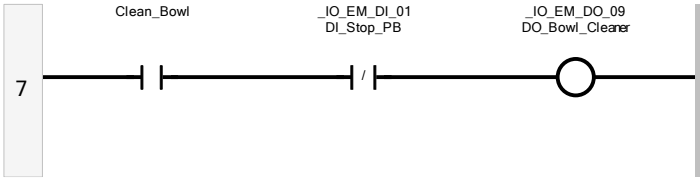
Rung6 Diagram

Send signal to ball roller



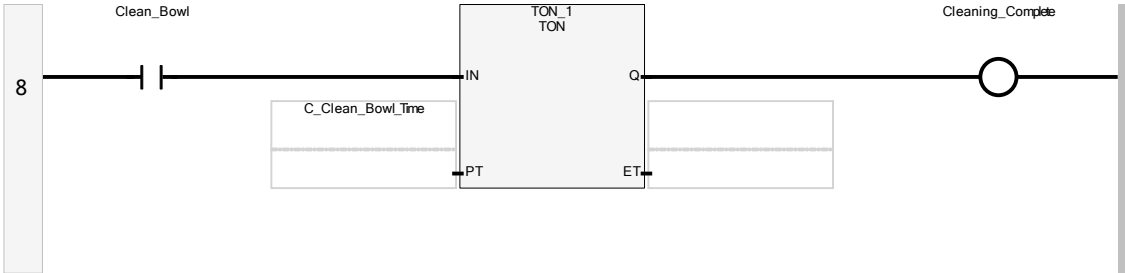
Rung7 Diagram

Clean bowl



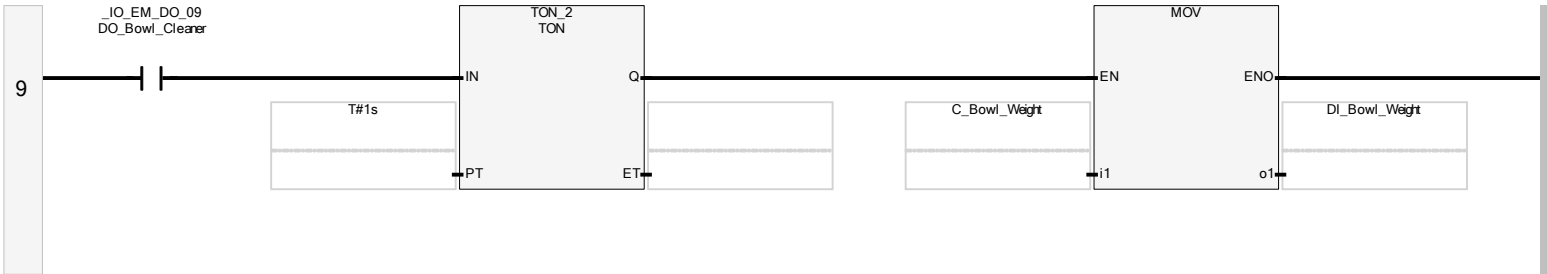
Rung8 Diagram

Clean bowl for 5s



Rung9 Diagram

Simulate emptying bowl - set weight to bowl weight after 1s



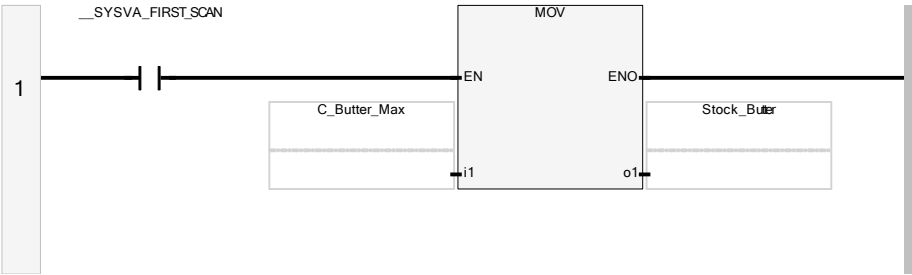
Butter\_Dispenser

Local Variables

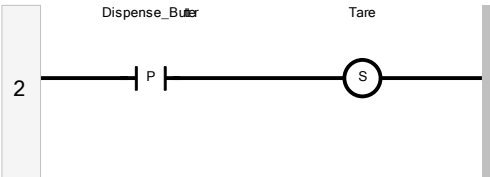
| Name              | Alias | Data Type | Dimension | Initial Value | Project Value | Comment | Direction | String Size |
|-------------------|-------|-----------|-----------|---------------|---------------|---------|-----------|-------------|
| Stock_Butter      |       | INT       |           |               |               |         | Var       |             |
| TON_7             |       | TON       |           | ...           | ...           |         | Var       |             |
| Dispensing_Butter |       | BOOL      |           |               |               |         | Var       |             |

Rung1 Diagram

Initialize to full stack

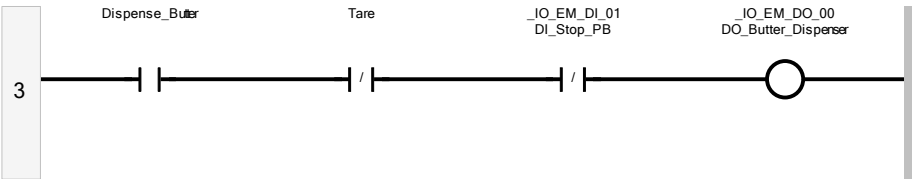


Rung2 Diagram



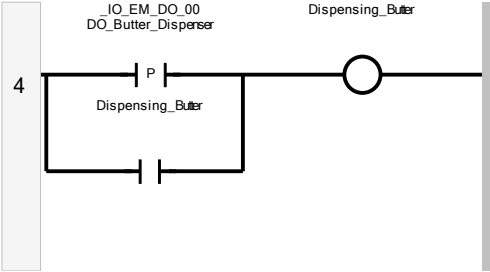
Rung3 Diagram

Wait for taring to dispense butter



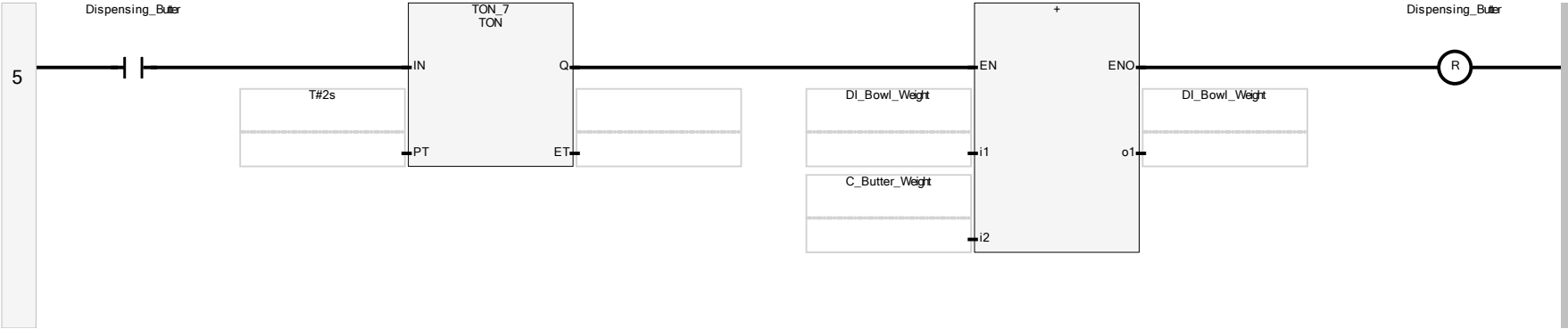
Rung4 Diagram

Begin dispensing butter when signal received



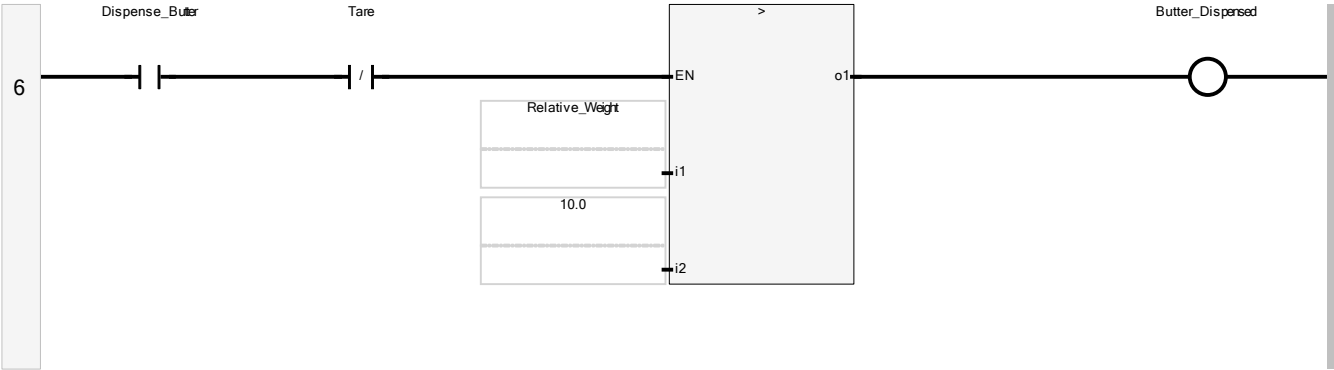
Rung5 Diagram

Simulate butter dispensing - increase bowl weight after 2 seconds



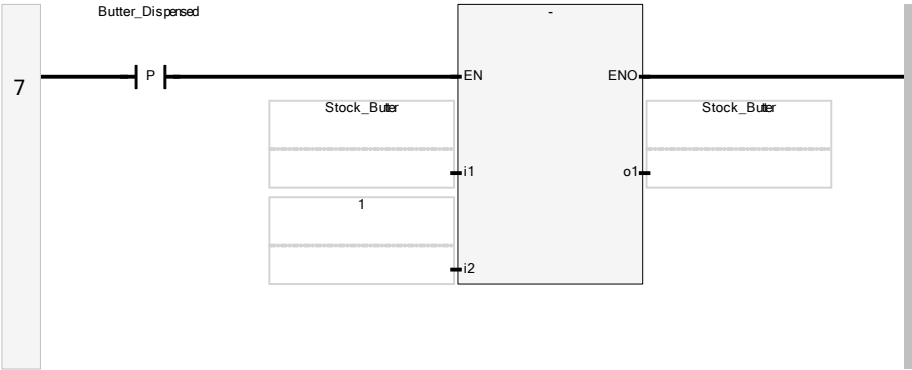
Rung6 Diagram

Detect butter dispensed by weight - at least 10g increase



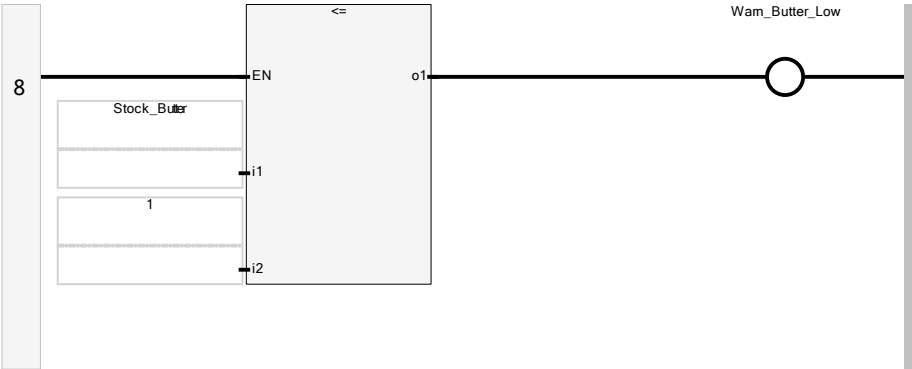
Rung7 Diagram

Decrease stock when dispensed



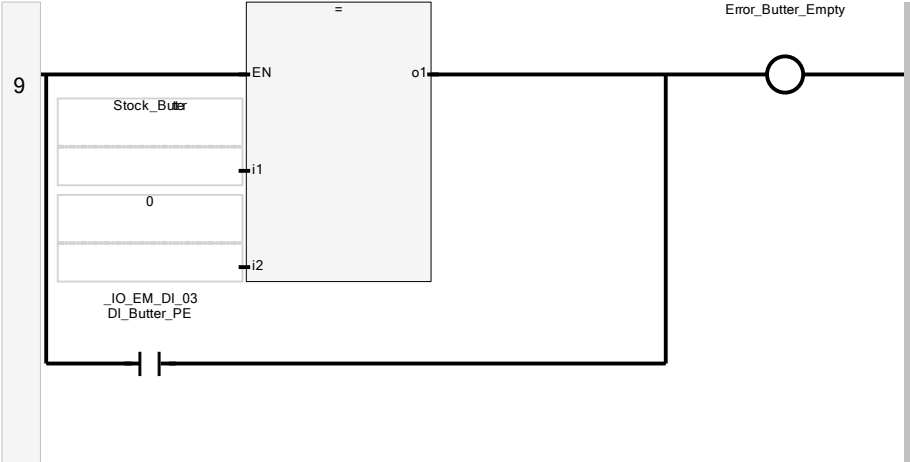
Rung8 Diagram

Low count warning



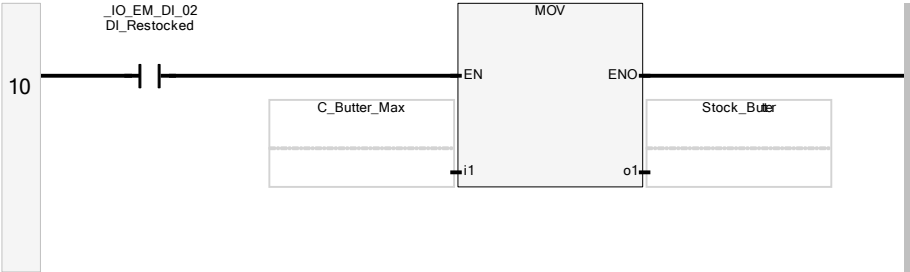
Rung9 Diagram

Out of stock error



Rung10 Diagram

Restock to max

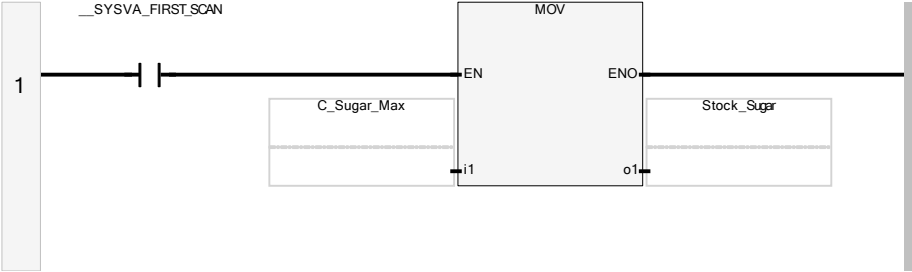


Sugar\_Dispenser

Local Variables

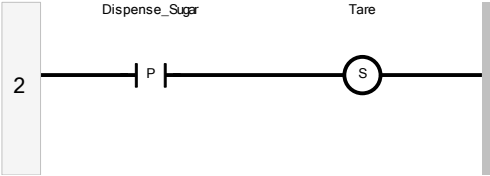
| Name              | Alias | Data Type | Dimension | Initial Value | Project Value | Comment                               | Direction | String Size |
|-------------------|-------|-----------|-----------|---------------|---------------|---------------------------------------|-----------|-------------|
| TON_2             |       | TON       |           | ...           | ...           |                                       | Var       |             |
| TON_3             |       | TON       |           | ...           | ...           |                                       | Var       |             |
| Sugar_Pulse_State |       | BOOL      |           |               |               |                                       | Var       |             |
| Stock_Sugar       |       | REAL      |           |               |               | Simulated amount of sugar in tank [g] | Var       |             |

Rung1 Diagram



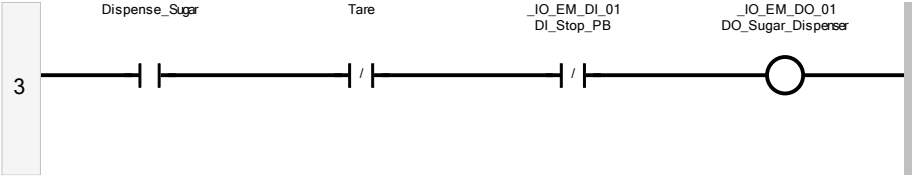
Rung2 Diagram

Initialize dispense sugar



Rung3 Diagram

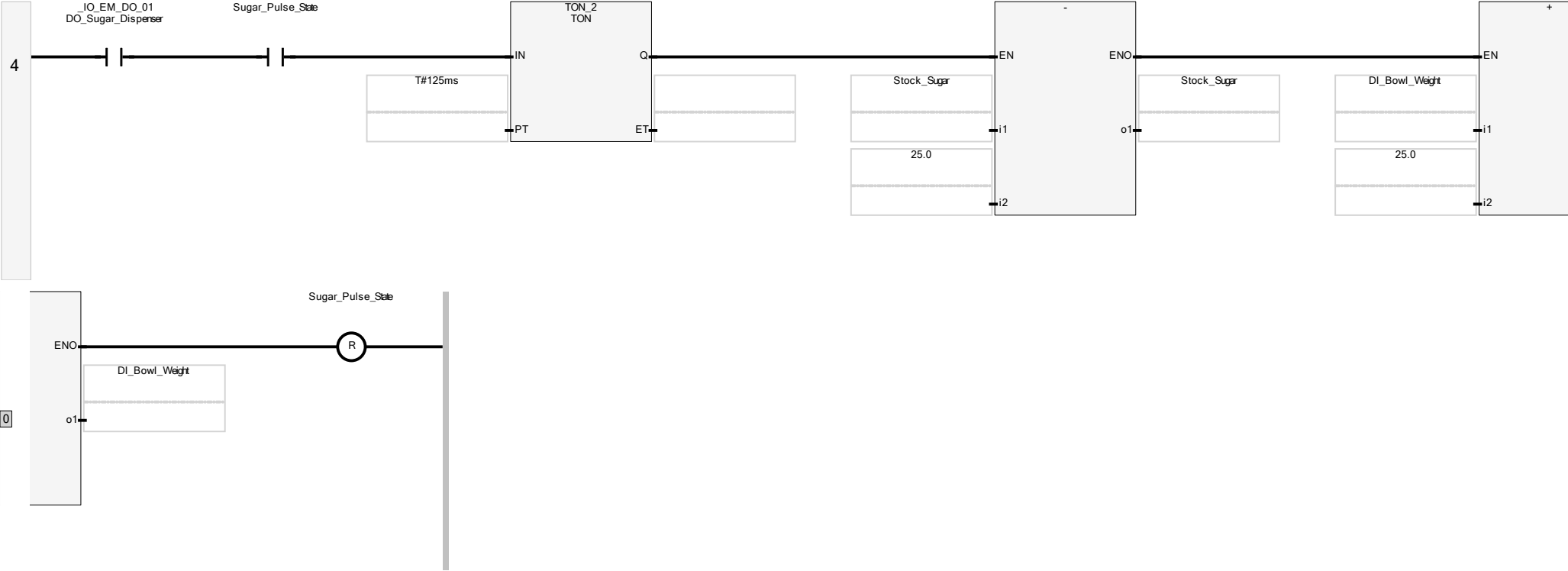
Wait for taring to dispense sugar



Rung4 Diagram

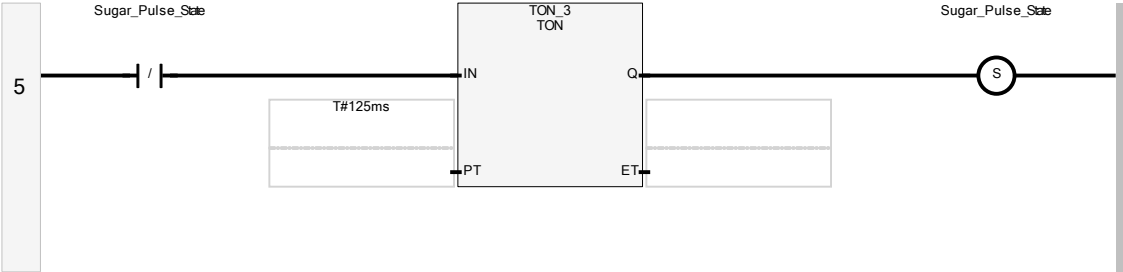
Simulate dispensing sugar at 100g/s = 25g/250ms, pulse high to low





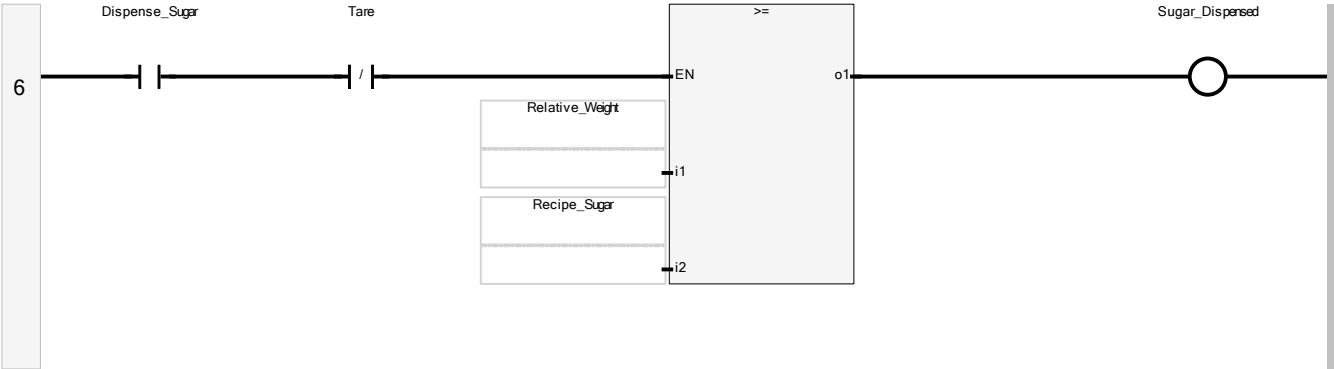
Rung5 Diagram

Sugar pulse low to high



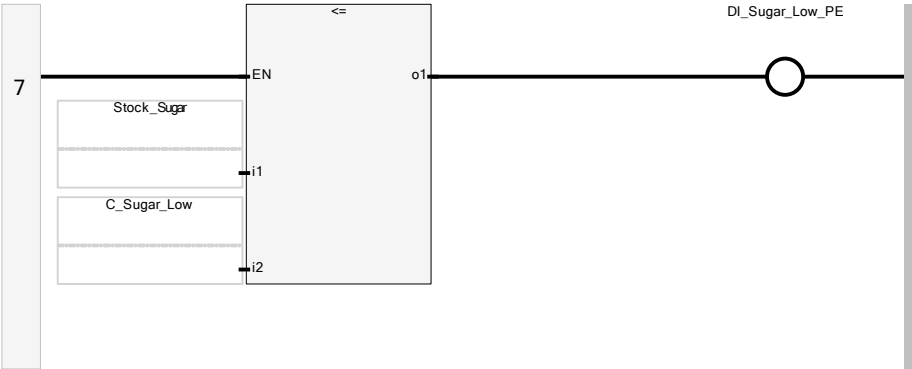
Rung6 Diagram

Detect sugar dispensed by weight



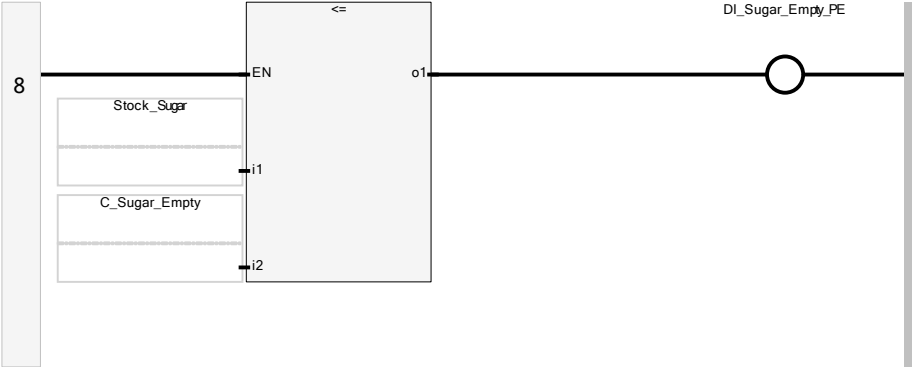
Rung7 Diagram

Simulate low level photoelectric sensor



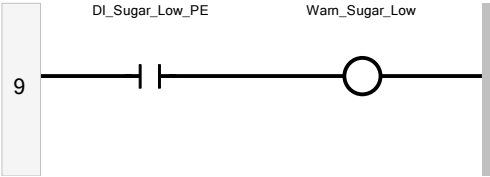
Rung8 Diagram

Simulate empty level photoelectric sensor



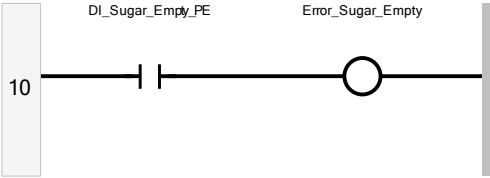
Rung9 Diagram

Low level warning



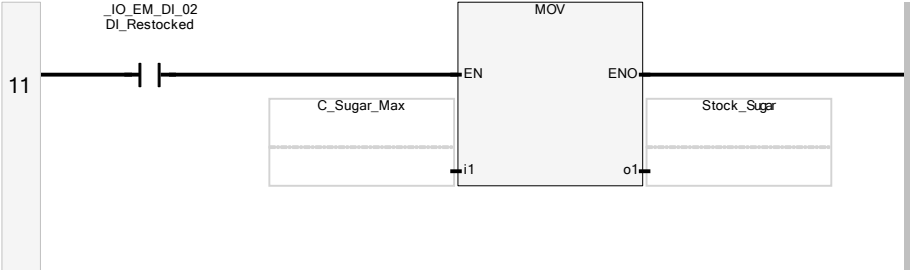
Rung10 Diagram

Empty error



Rung11 Diagram

Restock to max



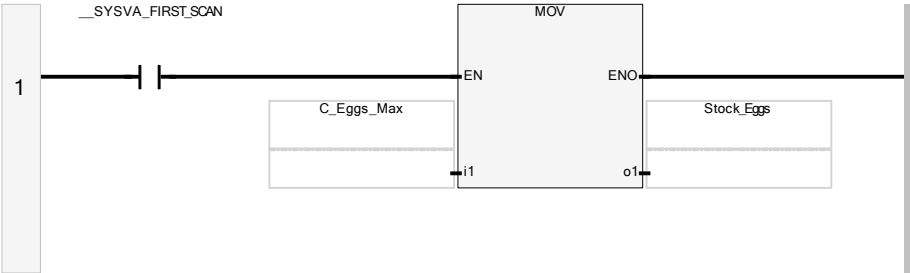
Egg\_Dispenser

Local Variables

| Name            | Alias | Data Type | Dimension | Initial Value | Project Value | Comment  | Direction | String Size |
|-----------------|-------|-----------|-----------|---------------|---------------|--|-----------|-------------|
| Stock_Eggs      |       | INT       |           |               |               |  | Var       |             |
| TON_1           |       | TON       |           | ...           | ...           |  | Var       |             |
| Egg_Pulse_State |       | BOOL      |           |               |               |  | Var       |             |
| TON_2           |       | TON       |           | ...           | ...           |  | Var       |             |
| Pulse_In_Count  |       | INT       |           |               |               | Counter for egg dispenser input signal                   | Var       |             |
| Dispensing_Egg  |       | BOOL      |           |               |               |  | Var       |             |
| TON_3           |       | TON       |           | ...           | ...           |  | Var       |             |
| Pulse_Out_Count |       | INT       |           |               |               | Counter for generating the output pulse to egg dispenser | Var       |             |
| TON_4           |       | TON       |           | ...           | ...           |  | Var       |             |

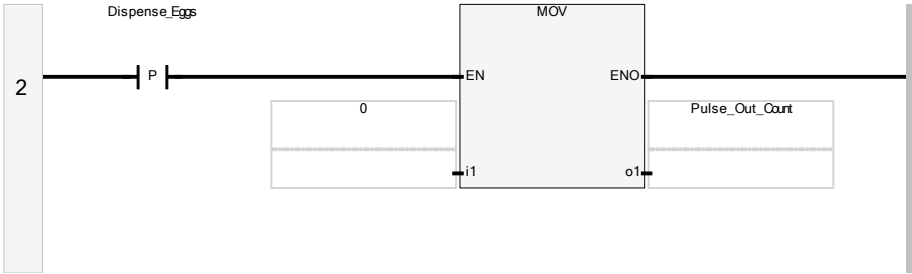
Rung1 Diagram

Initialize full egg carton



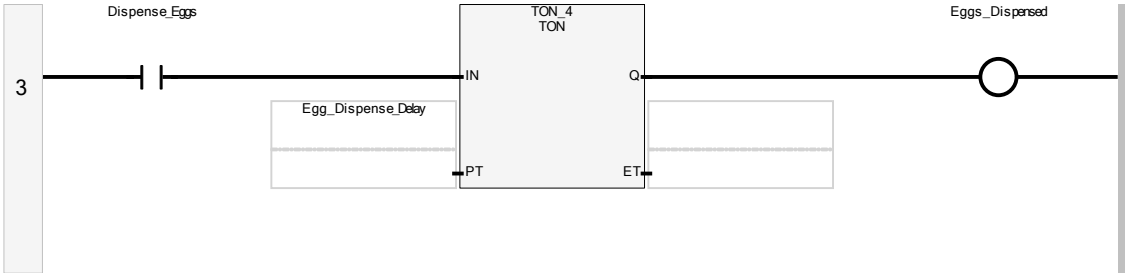
Rung2 Diagram

Initialize dispense eggs



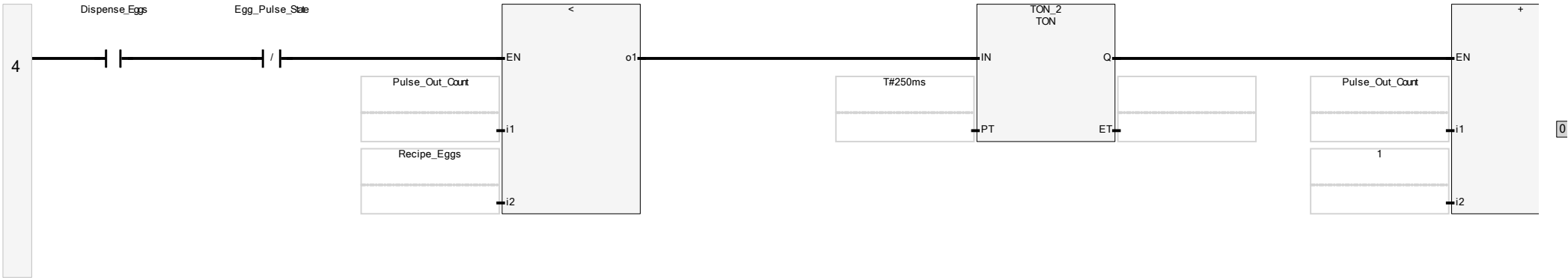
Rung3 Diagram

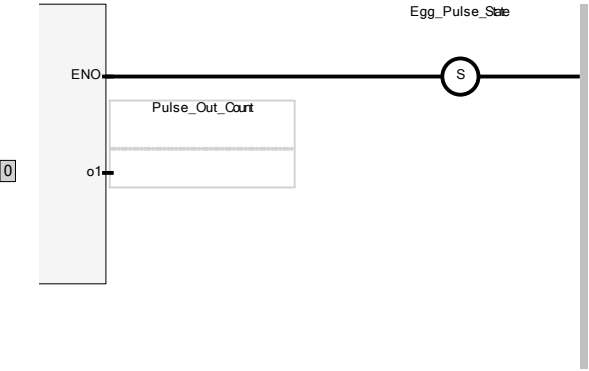
Delay timer waiting for eggs to dispense



Rung4 Diagram

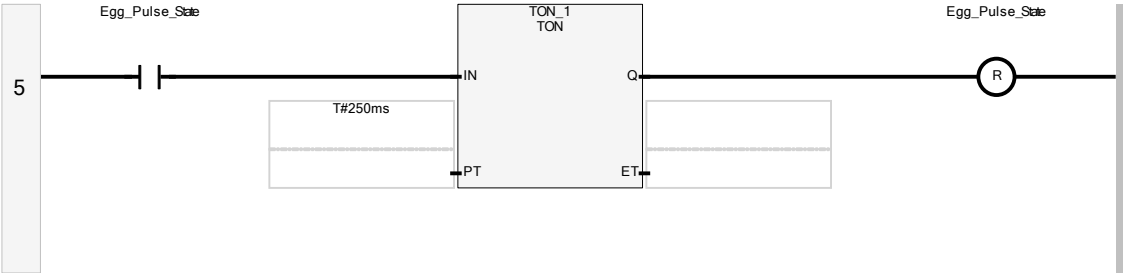
Generate a pulse with a high per number of eggs needed, low to high





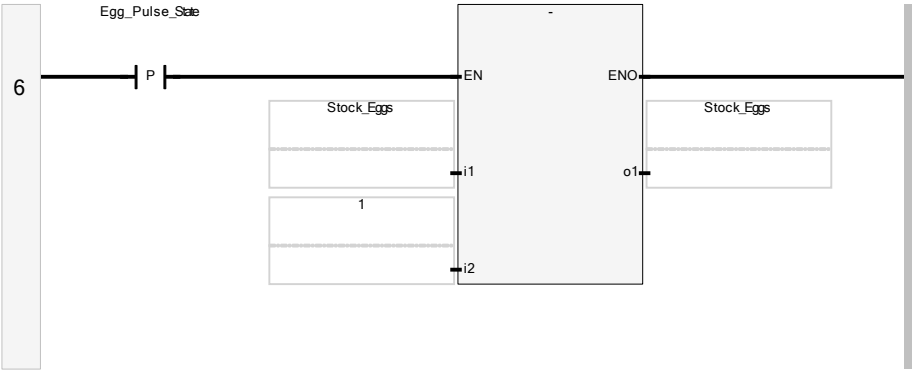
Rung5 Diagram

Pulse high to low



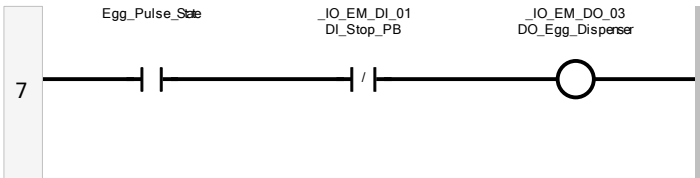
Rung6 Diagram

Reduce egg stock for every pulse sent



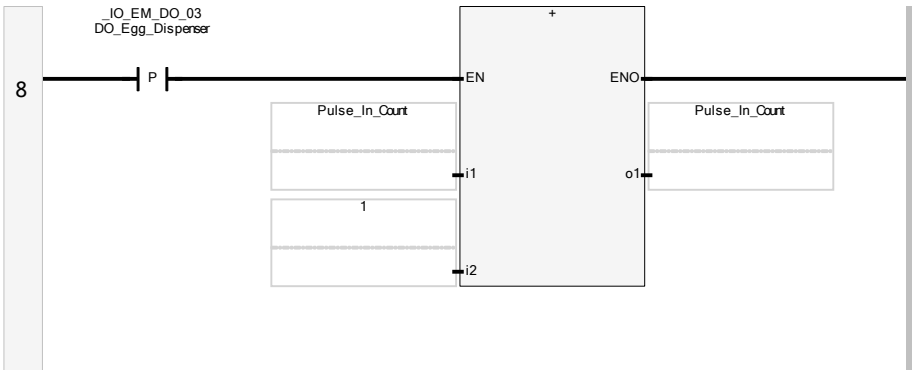
Rung7 Diagram

Send pulse to dispenser



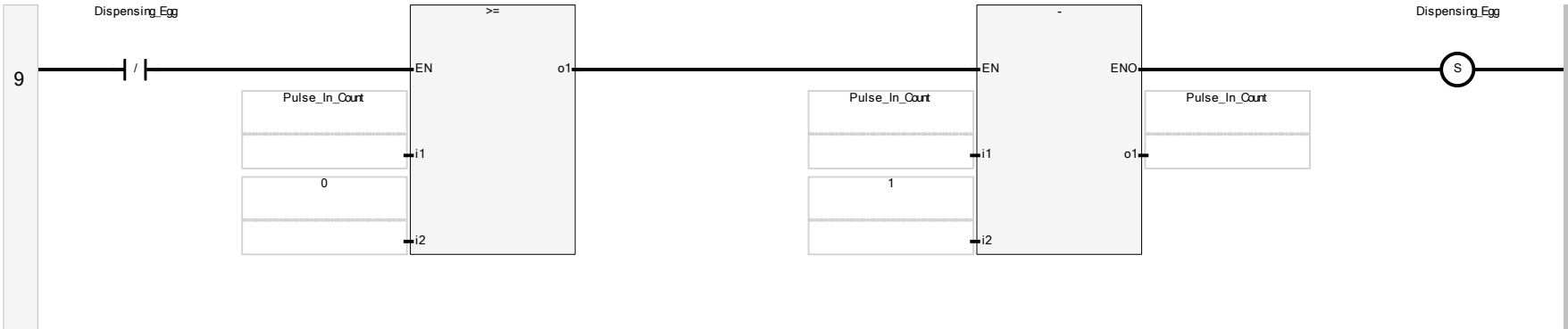
Rung8 Diagram

Count number of pulses received



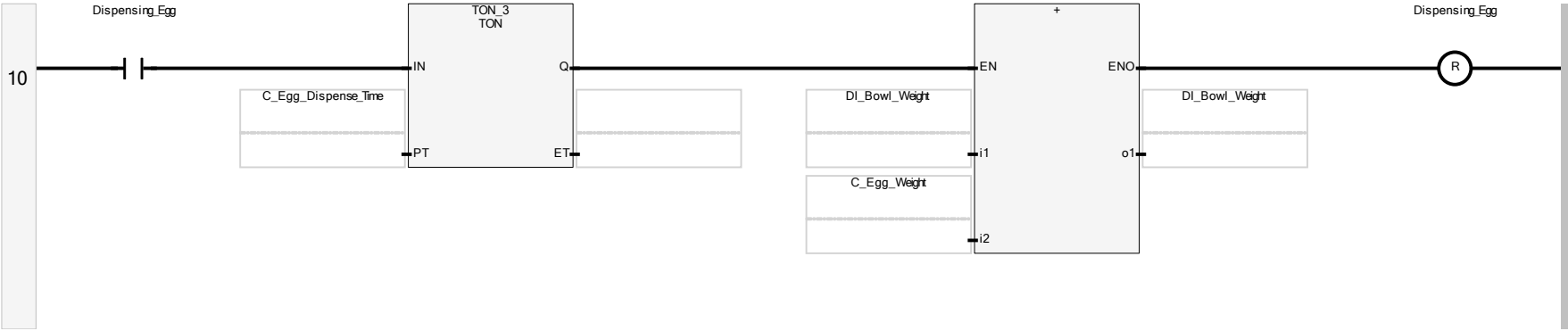
Rung9 Diagram

Dispense egg if pulse count >0



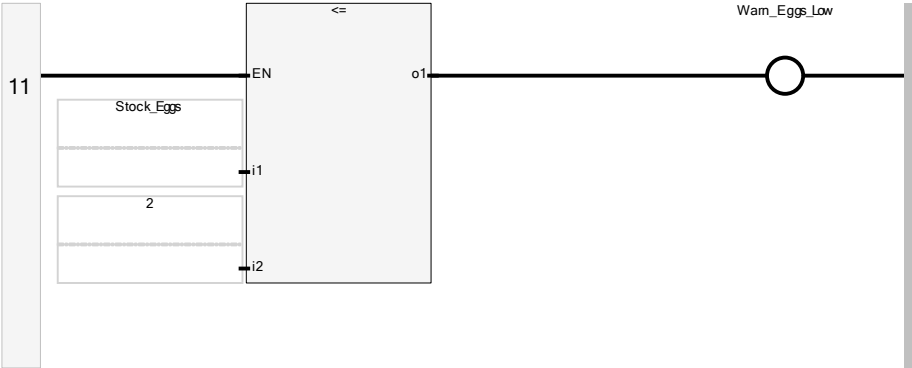
Rung10 Diagram

Simulate dispensing egg over 2s



Rung11 Diagram

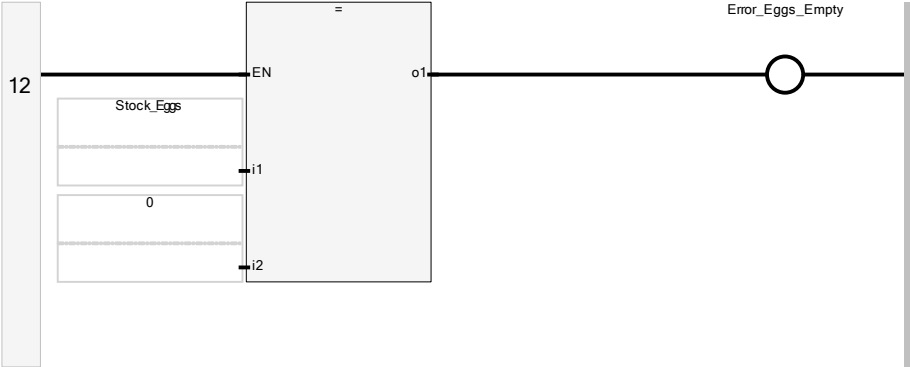
Low eggs warning



Rung12 Diagram

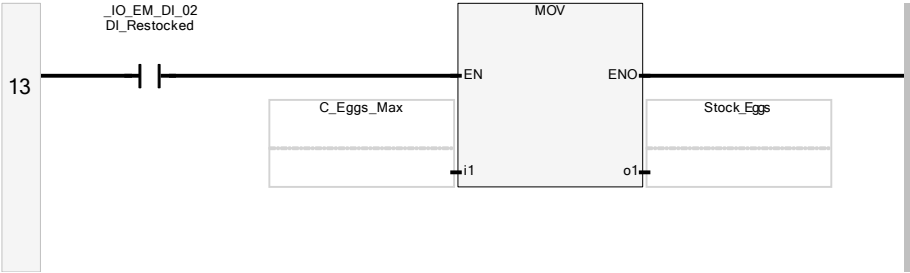
Empty eggs error





Rung13 Diagram

Restock eggs to full



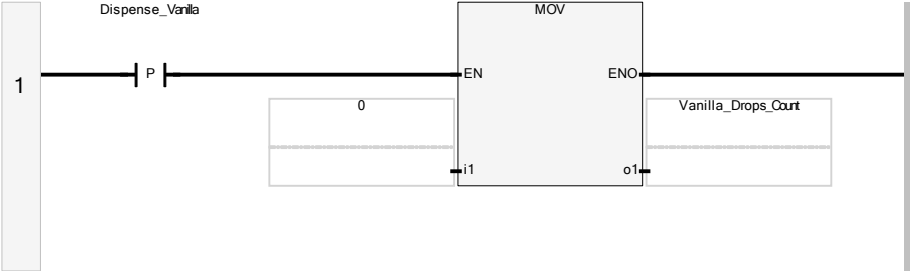
Vanilla\_Dispenser

Local Variables

| Name                | Alias | Data Type | Dimension | Initial Value | Project Value | Comment | Direction | String Size |
|---------------------|-------|-----------|-----------|---------------|---------------|---------|-----------|-------------|
| TON_4               |       | TON       |           | ...           | ...           |         | Var       |             |
| Vanilla_Pulse_State |       | BOOL      |           |               |               |         | Var       |             |
| TON_1               |       | TON       |           | ...           | ...           |         | Var       |             |
| Vanilla_Drops_Count |       | INT       |           |               |               |         | Var       |             |

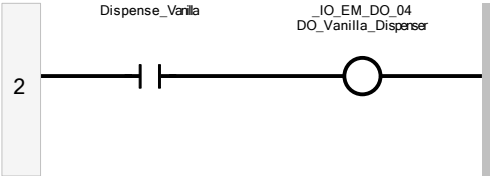
Rung1 Diagram

Initialize dispense - set drop count to 0



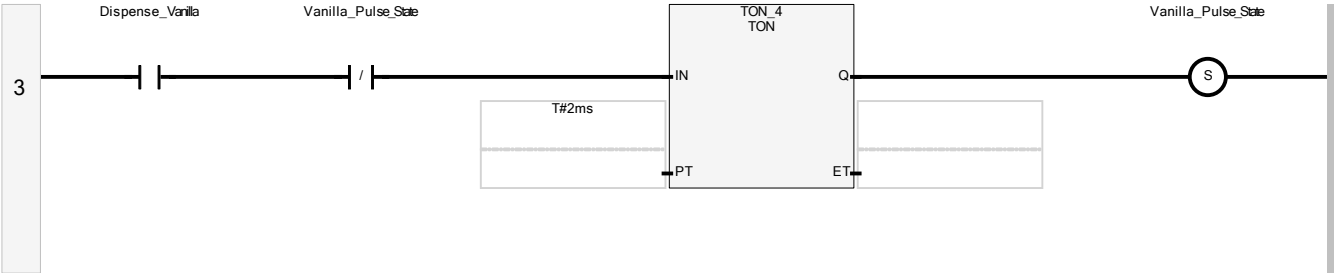
Rung2 Diagram

Send signal to dropper



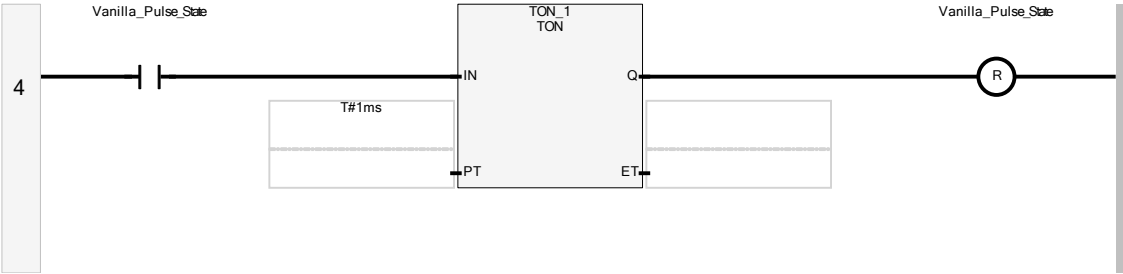
Rung3 Diagram

Generate pulse with 3ms period



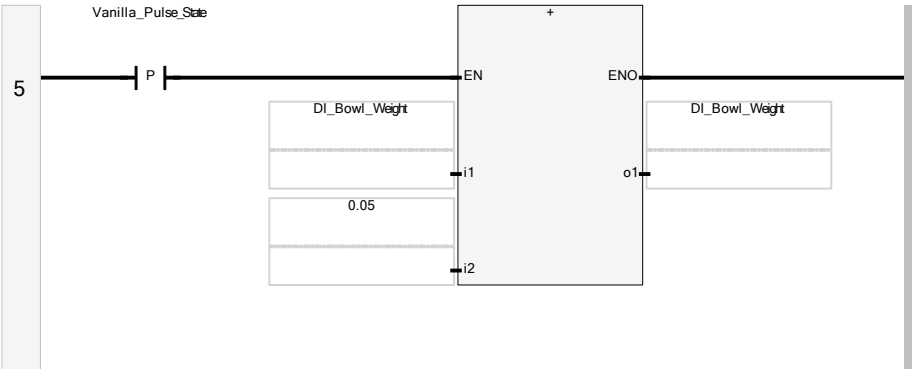
Rung4 Diagram

Pulse high to low



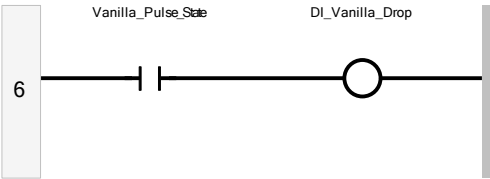
Rung5 Diagram

Simulate dispensing drop on pulse high - increase bowl weight by 0.05g



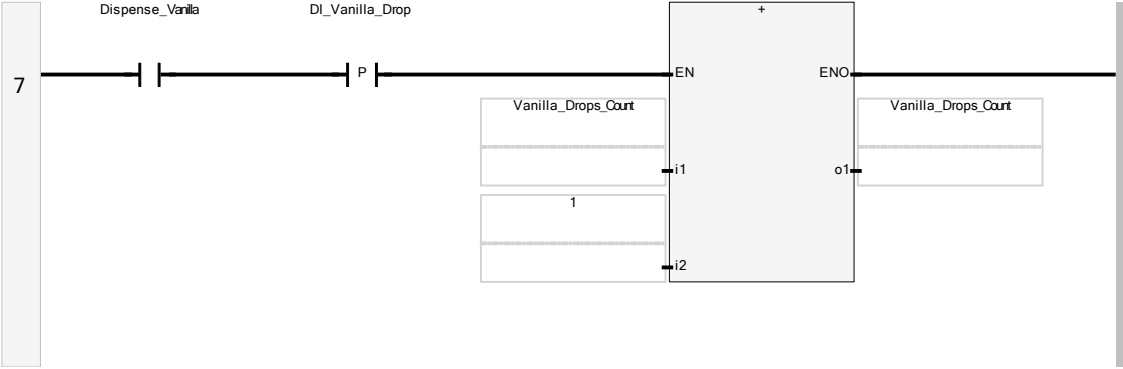
Rung6 Diagram

Simulate dropper output signal with a high pulse for every drop dispensed



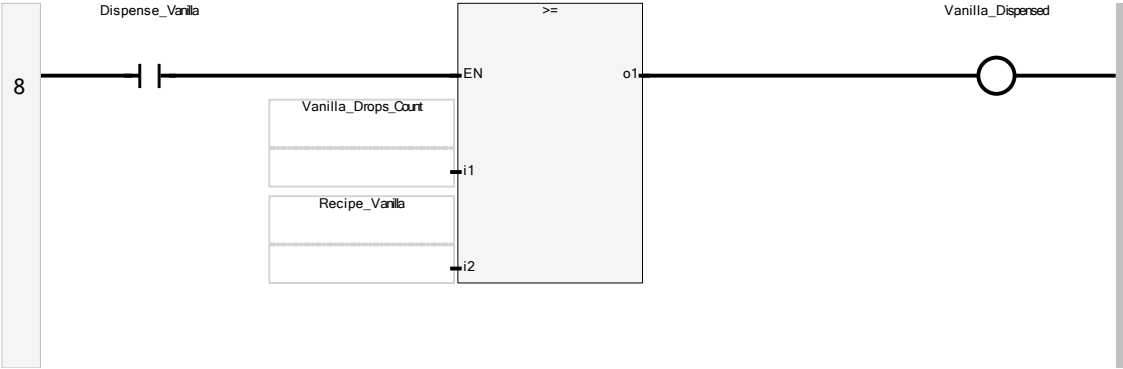
Rung7 Diagram

Count number of vanilla drops dispensed based on dropper output signal

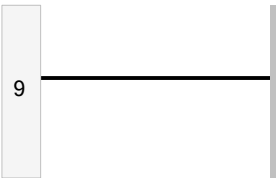


Rung8 Diagram

Stop dispensing vanilla when recipe drop count reached



Rung9 Diagram

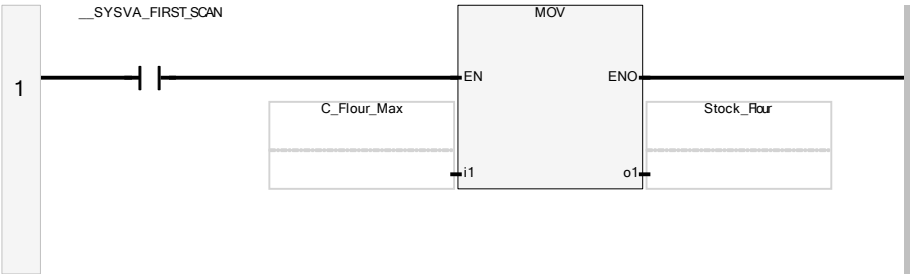


Flour\_Dispenser

Local Variables

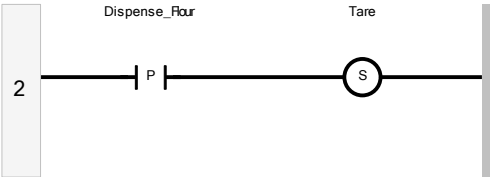
| Name              | Alias | Data Type | Dimension | Initial Value | Project Value | Comment | Direction | String Size |
|-------------------|-------|-----------|-----------|---------------|---------------|---------|-----------|-------------|
| Stock_Flour       |       | REAL      |           |               |               |         | Var       |             |
| TON_2             |       | TON       |           | ...           | ...           |         | Var       |             |
| Flour_Pulse_State |       | BOOL      |           |               |               |         | Var       |             |
| TON_3             |       | TON       |           | ...           | ...           |         | Var       |             |

Rung1 Diagram



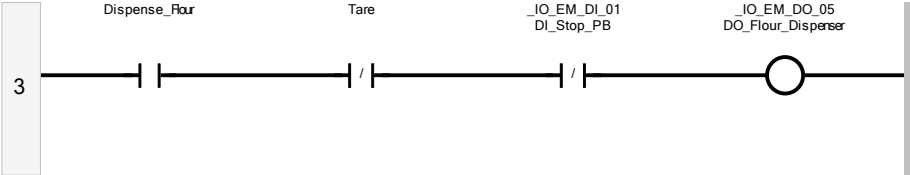
Rung2 Diagram

Initialize dispense sugar



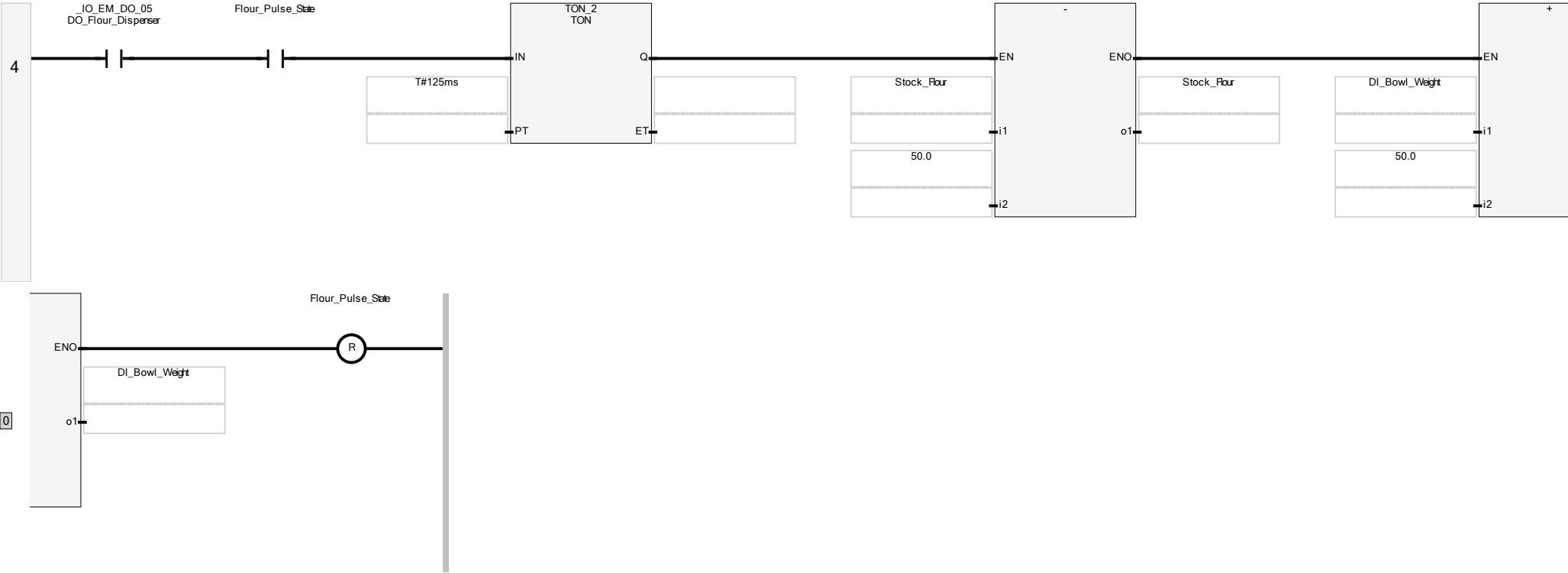
Rung3 Diagram

Wait for taring to dispense



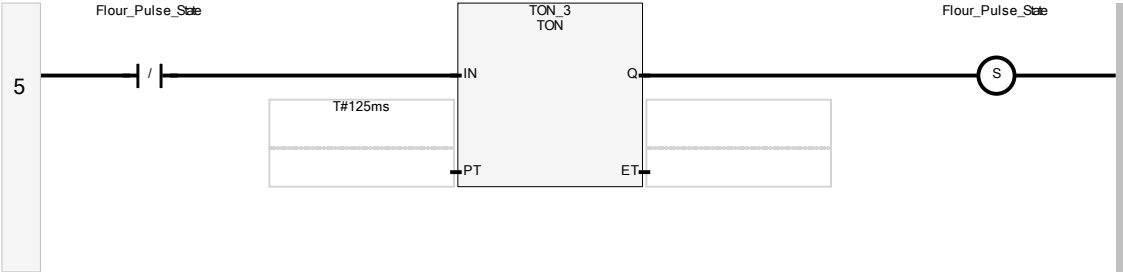
Rung4 Diagram

Simulate dispensing flour at 200g/s = 50g/250ms, pulse high to low



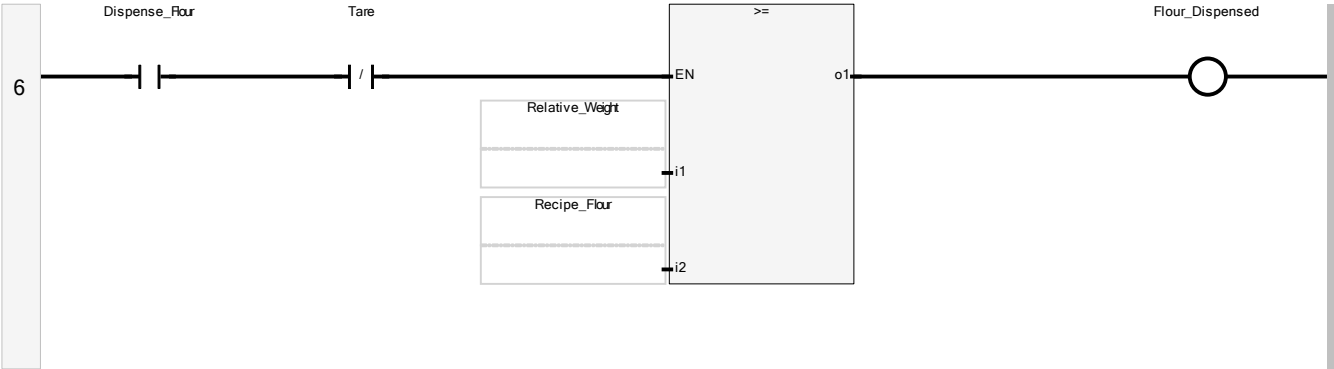
Rung5 Diagram

Flour pulse low to high



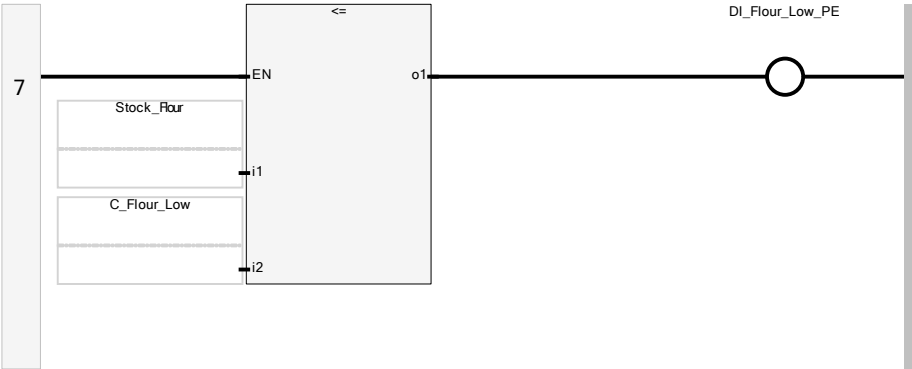
Rung6 Diagram

Detect flour dispensed by weight



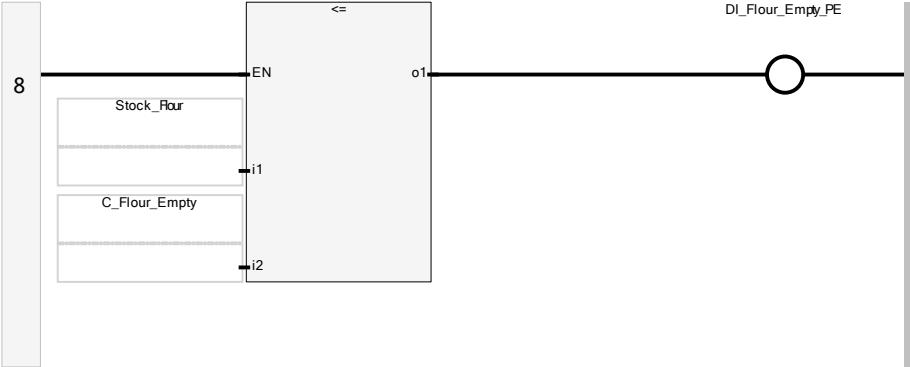
Rung7 Diagram

Simulate low level photoelectric sensor



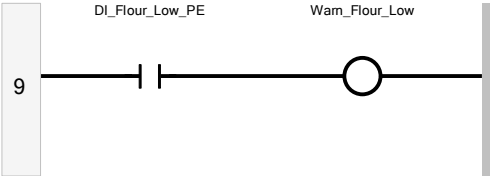
Rung8 Diagram

Simulate empty level photoelectric sensor



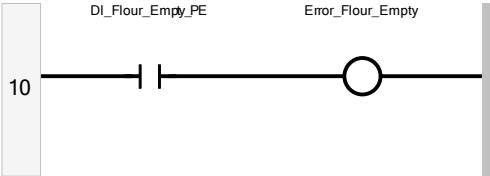
Rung9 Diagram

Low level warning



Rung10 Diagram

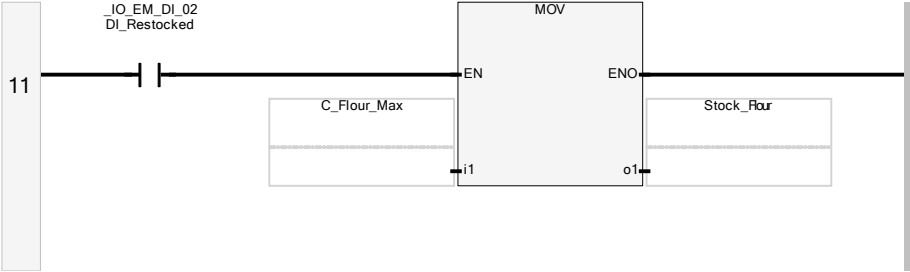
Empty error



Rung11 Diagram

Restock to max





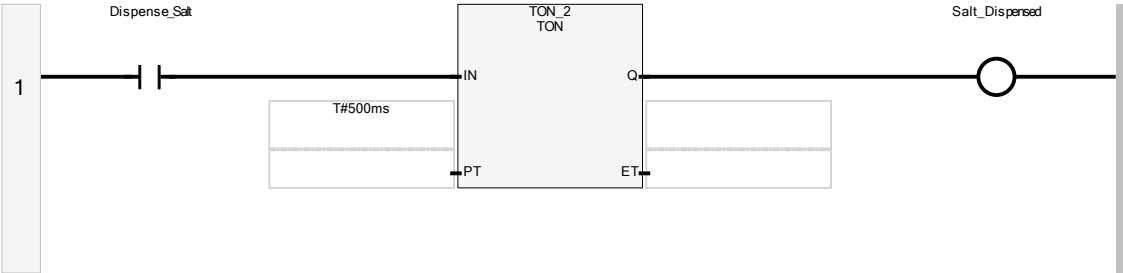
Salt\_Dispenser

Local Variables

| Name  | Alias | Data Type | Dimension | Initial Value | Project Value | Comment | Direction | String Size |
|-------|-------|-----------|-----------|---------------|---------------|---------|-----------|-------------|
| TON_1 |       | TON       |           | ...           | ...           |         | Var       |             |
| TON_2 |       | TON       |           | ...           | ...           |         | Var       |             |

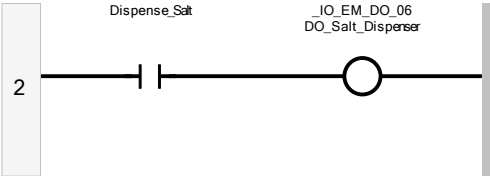
Rung1 Diagram

Salt timer



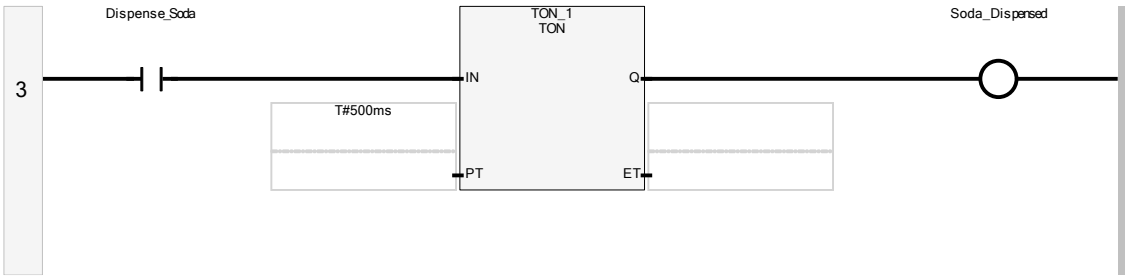
Rung2 Diagram

Salt output



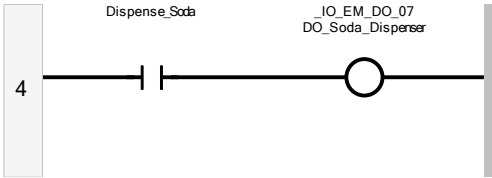
Rung3 Diagram

Soda timer



Rung4 Diagram

Soda output



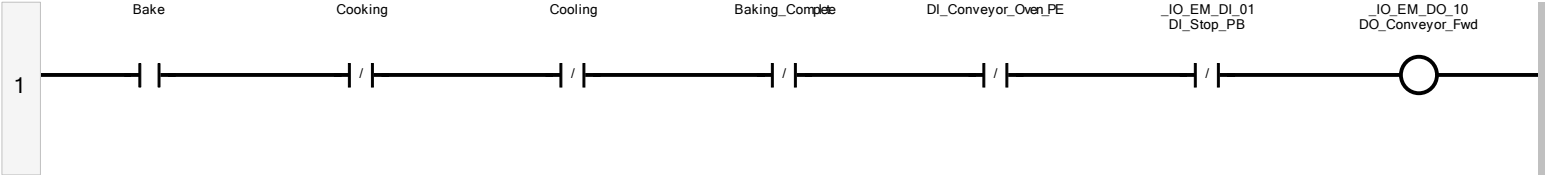
Oven

Local Variables

| Name    | Alias | Data Type | Dimension | Initial Value | Project Value | Comment | Direction | String Size |
|---------|-------|-----------|-----------|---------------|---------------|---------|-----------|-------------|
| Cooking |       | BOOL      |           |               |               |         | Var       |             |
| Cooling |       | BOOL      |           |               |               |         | Var       |             |
| TON_4   |       | TON       |           | ...           | ...           |         | Var       |             |
| TON_5   |       | TON       |           | ...           | ...           |         | Var       |             |
| TON_2   |       | TON       |           | ...           | ...           |         | Var       |             |
| TON_1   |       | TON       |           | ...           | ...           |         | Var       |             |

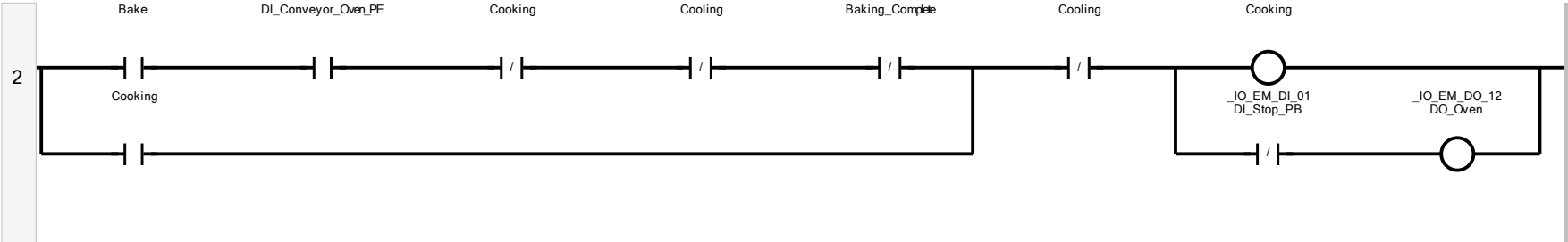
Rung1 Diagram

Move tray into oven on conveyor



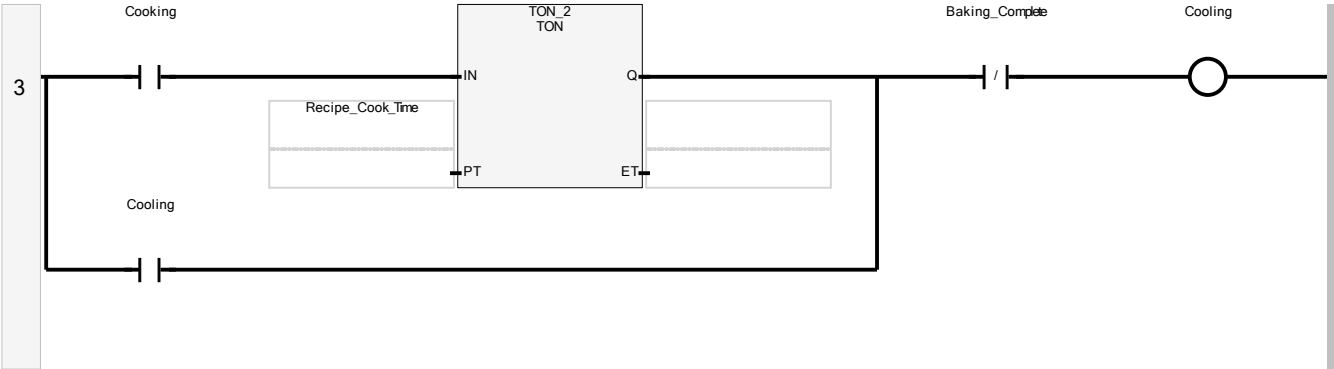
Rung2 Diagram

Cook



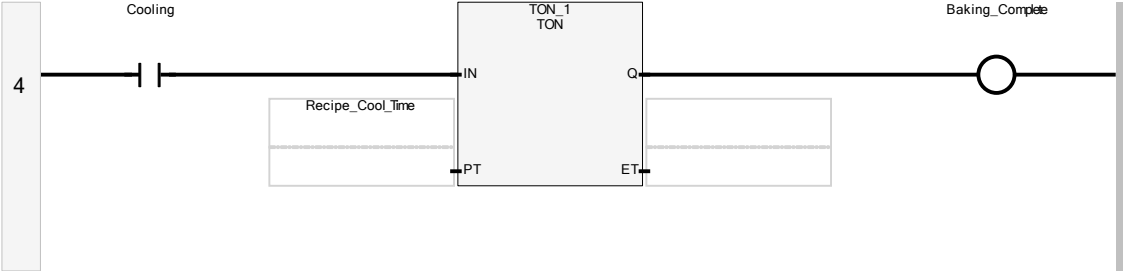
Rung3 Diagram

Cool



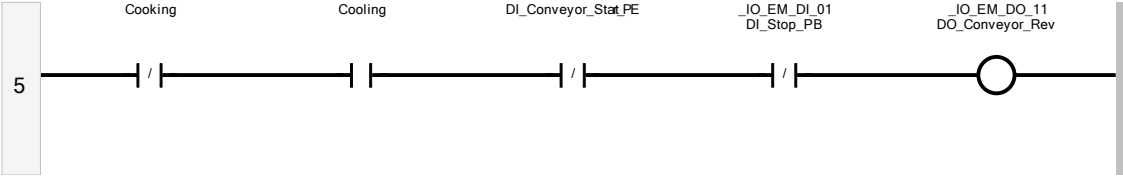
Rung4 Diagram

End of cooling



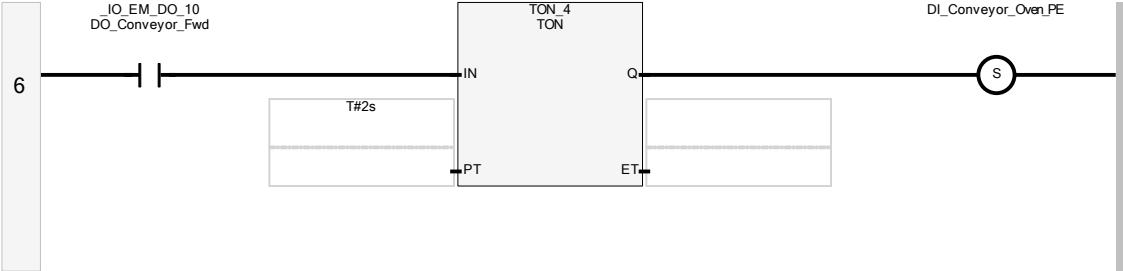
Rung5 Diagram

Move tray out of oven on conveyor



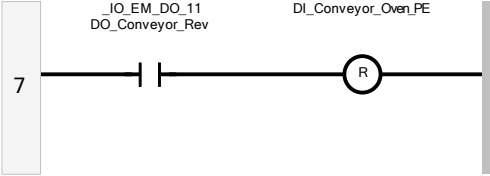
Rung6 Diagram

Simulate oven PE on



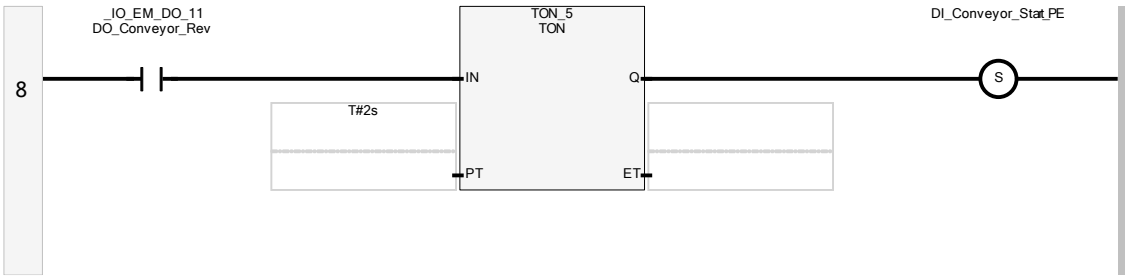
Rung7 Diagram

Simulate oven PE off



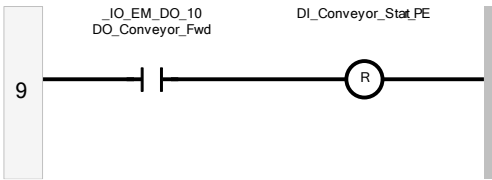
Rung8 Diagram

Simulate start PE on



Rung9 Diagram

Simulate start PE off



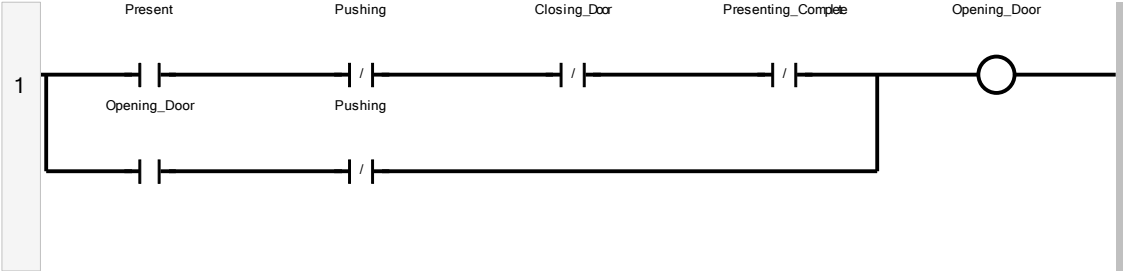
Presenting\_Window

Local Variables

| Name         | Alias | Data Type | Dimension | Initial Value | Project Value | Comment | Direction | String Size |
|--------------|-------|-----------|-----------|---------------|---------------|---------|-----------|-------------|
| TON_1        |       | TON       |           | ...           | ...           |         | Var       |             |
| DI_Door_Open |       | BOOL      |           |               |               |         | Var       |             |
| TON_2        |       | TON       |           | ...           | ...           |         | Var       |             |
| TON_3        |       | TON       |           | ...           | ...           |         | Var       |             |
| Opening_Door |       | BOOL      |           |               |               |         | Var       |             |
| Pushing      |       | BOOL      |           |               |               |         | Var       |             |
| Closing_Door |       | BOOL      |           |               |               |         | Var       |             |
| TOF_1        |       | TOF       |           | ...           | ...           |         | Var       |             |

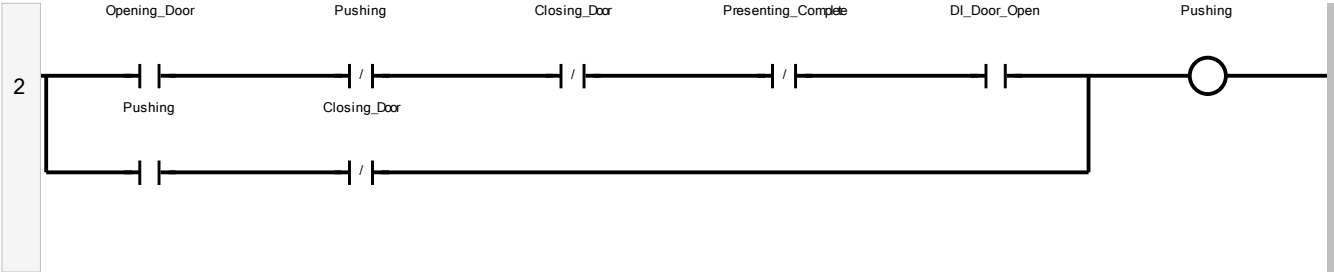
Rung1 Diagram

Open door



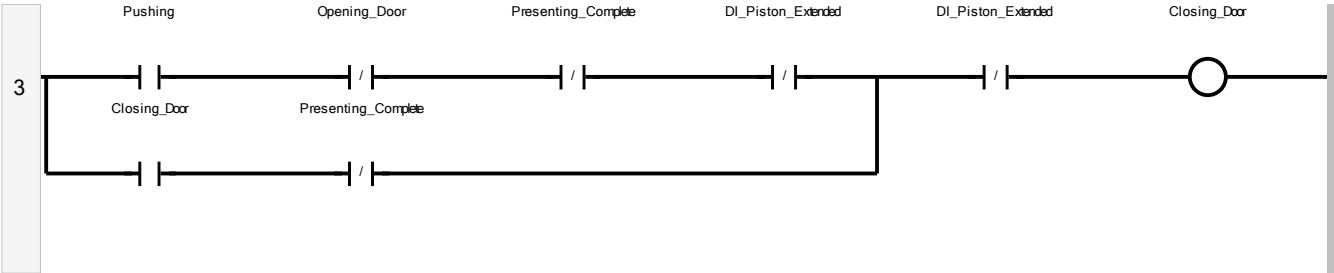
Rung2 Diagram

Push cookies out



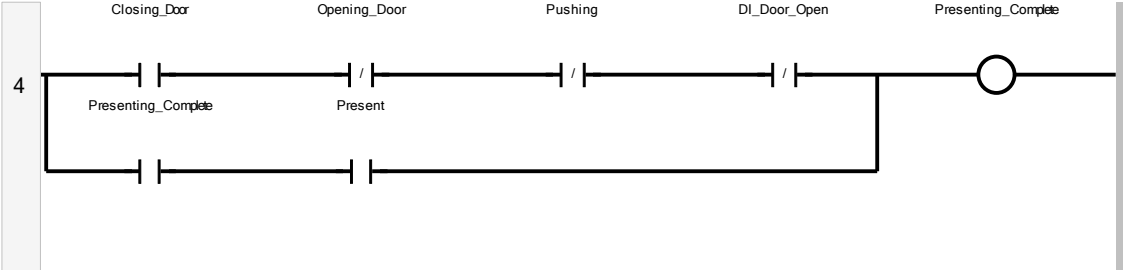
Rung3 Diagram

Close door



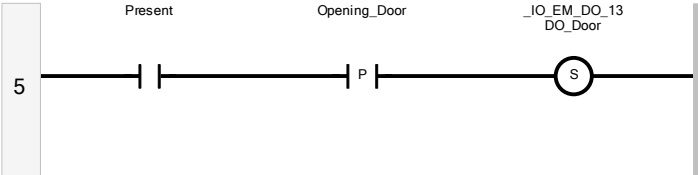
Rung4 Diagram

Complete presentation



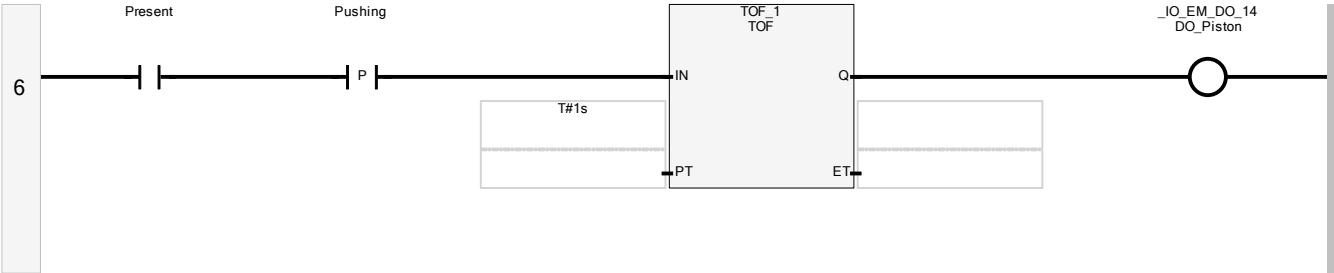
Rung5 Diagram

Open door output



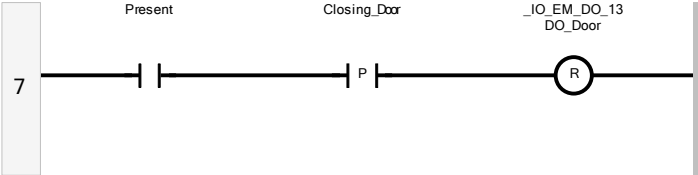
Rung6 Diagram

Piston output



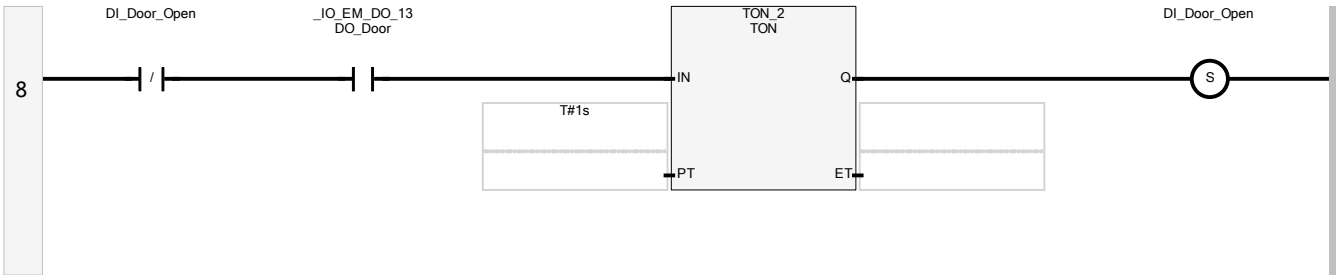
Rung7 Diagram

Close door output



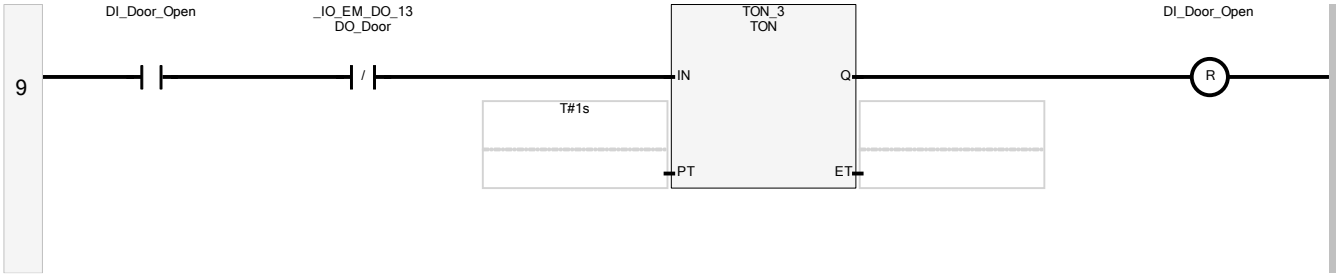
Rung8 Diagram

Simulate door opening



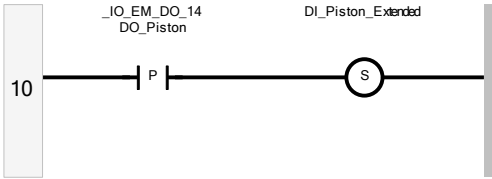
Rung9 Diagram

Simulate door closing



Rung10 Diagram

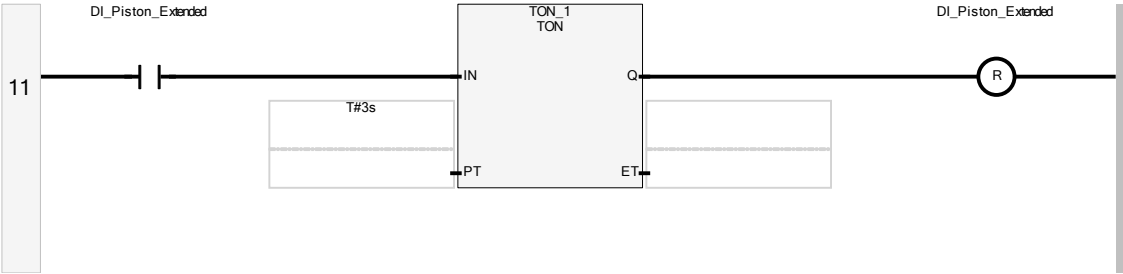
Simulate piston extending



Rung11 Diagram

Simulate piston retracting





Indicators

Programs

