# PLC_1 [CPU 312C]

| | | | | | |
|---|---|---|---|---|---|
| **PLC_1** | | | | | |
| **General** | | | | | |
| **Name** | PLC_1 | **Author** | Enrique | **Comment** | |
| **Rack** | 0 | **Slot** | 2 | | |
| **General\Catalog information** | | | | | |
| **Short designation** | CPU 312C | **Description** | Work memory 64KB; 0.1ms/1000 instructions; DI10/DO6 integrated; 2 pulse outputs (2.5kHz); 2 channels counting and measuring with 24V (10kHz) incremental encoders; MPI interface; single-tier configuration up to 8 modules | **Article number** | 6ES7 312-5BF04-0AB0 |
| **Firmware version** | V3.3 | | | | |
| **General\Identification & Maintenance** | | | | | |
| **Plant designation** | | **Location identifier** | | | |
| **MPI interface\General** | | | | | |
| **Name** | MPI interface_1 | **Comment** | | | |
| **MPI interface\MPI address\Interface networked with** | | | | | |
| **Subnet:** | MPI_1 | | | | |
| **MPI interface\MPI address\Parameters** | | | | | |
| **Address:** | 2 | **Highest address:** | 31 | **Transmission speed:** | 187.5 kbps |
| **DI 10/DO 6\General** | | | | | |
| **Name** | DI 10/DO 6_1 | **Comment** | | | |
| **DI 10/DO 6\General\Catalog information** | | | | | |
| **Short designation** | DI 10/DO 6 | **Description** | Digital input/output DI10 + DO6 | | |
| **DI 10/DO 6\Inputs\Channel group 0 - 3** | | | | | |
| **Input delay** | 3ms | | | | |
| **DI 10/DO 6\Inputs\Channel group 0 - 3\Hardware interrupt channel 0\Rising (positive) edge** | | | | | |
| **Rising (positive) edge** | False | | | | |
| **DI 10/DO 6\Inputs\Channel group 0 - 3\Hardware interrupt channel 0\Falling (negative) edge** | | | | | |
| **Falling (negative) edge** | False | | | | |
| **DI 10/DO 6\Inputs\Channel group 0 - 3\Hardware interrupt channel 1\Rising (positive) edge** | | | | | |
| **Rising (positive) edge** | False | | | | |
| **DI 10/DO 6\Inputs\Channel group 0 - 3\Hardware interrupt channel 1\Falling (negative) edge** | | | | | |
| **Falling (negative) edge** | False | | | | |
| **DI 10/DO 6\Inputs\Channel group 0 - 3\Hardware interrupt channel 2\Rising (positive) edge** | | | | | |
| **Rising (positive) edge** | False | | | | |
| **DI 10/DO 6\Inputs\Channel group 0 - 3\Hardware interrupt channel 2\Falling (negative) edge** | | | | | |
| **Falling (negative) edge** | False | | | | |
| **DI 10/DO 6\Inputs\Channel group 0 - 3\Hardware interrupt channel 3\Rising (positive) edge** | | | | | |
| **Rising (positive) edge** | False | | | | |
| **DI 10/DO 6\Inputs\Channel group 0 - 3\Hardware interrupt channel 3\Falling (negative) edge** | | | | | |
| **Falling (negative) edge** | False | | | | |
| **DI 10/DO 6\Inputs\Channel group 4 - 7** | | | | | |
| **Input delay** | 3ms | | | | |
| **DI 10/DO 6\Inputs\Channel group 4 - 7\Hardware interrupt channel 4\Rising (positive) edge** | | | | | |
| **Rising (positive) edge** | False | | | | |
| **DI 10/DO 6\Inputs\Channel group 4 - 7\Hardware interrupt channel 4\Falling (negative) edge** | | | | | |
| **Falling (negative) edge** | False | | | | |
| **DI 10/DO 6\Inputs\Channel group 4 - 7\Hardware interrupt channel 5\Rising (positive) edge** | | | | | |
| **Rising (positive) edge** | False | | | | |
| **DI 10/DO 6\Inputs\Channel group 4 - 7\Hardware interrupt channel 5\Falling (negative) edge** | | | | | |
| **Falling (negative) edge** | False | | | | |
| **DI 10/DO 6\Inputs\Channel group 4 - 7\Hardware interrupt channel 6\Rising (positive) edge** | | | | | |
| **Rising (positive) edge** | False | | | | |
| **DI 10/DO 6\Inputs\Channel group 4 - 7\Hardware interrupt channel 6\Falling (negative) edge** | | | | | |
| **Falling (negative) edge** | False | | | | |
| **DI 10/DO 6\Inputs\Channel group 4 - 7\Hardware interrupt channel 7\Rising (positive) edge** | | | | | |
| **Rising (positive) edge** | False | | | | |
| **DI 10/DO 6\Inputs\Channel group 4 - 7\Hardware interrupt channel 7\Falling (negative) edge** | | | | | |
| **Falling (negative) edge** | False | | | | |
| **DI 10/DO 6\Inputs\Channel group 8 - 9** | | | | | |
| **Input delay** | 3ms | | | | |
| **DI 10/DO 6\Inputs\Channel group 8 - 9\Hardware interrupt channel 8\Rising (positive) edge** | | | | | |
| **Rising (positive) edge** | False | | | | |
| **DI 10/DO 6\Inputs\Channel group 8 - 9\Hardware interrupt channel 8\Falling (negative) edge** | | | | | |
| **Falling (negative) edge** | False | | | | |
| **DI 10/DO 6\Inputs\Channel group 8 - 9\Hardware interrupt channel 9\Rising (positive) edge** | | | | | |
| **Rising (positive) edge** | False | | | | |
| **DI 10/DO 6\Inputs\Channel group 8 - 9\Hardware interrupt channel 9\Falling (negative) edge** | | | | | |
| **Falling (negative) edge** | False | | | | |
| **DI 10/DO 6\I/O addresses\Input addresses** | | | | | |
| **Start address** | 124.0 | **End address** | 125.7 | **Process image** | OB1-PI |
| **Interrupt OB number** | 40 | | | | |

| | | | | | |
|---|---|---|---|---|---|
| **DI 10/DO 6\I/O addresses\Output addresses** | | | | | |
| **Start address** | 124.0 | **End address** | 124.7 | **Process image** | OB1-PI |
| **Count\General** | | | | | |
| **Name** | Count_1 | **Comment** | | | |
| **Count\General\Catalog information** | | | | | |
| **Short designation** | Count | **Description** | 2 channels; counting and frequency measurement at 10 kHz, pulse width modulation at 2.5 kHz switching frequency | | |
| **Count\Interrupt selection** | | | | | |
| **Interrupt selection** | None | | | | |
| **Count\Channel 0** | | | | | |
| **Operating mode** | Not configured | | | | |
| **Count\Channel 1** | | | | | |
| **Operating mode** | Not configured | | | | |
| **Count\I/O addresses\Input addresses** | | | | | |
| **Start address** | 768 | **End address** | 783 | **Process image** | None |
| **Interrupt OB number** | 40 | | | | |
| **Count\I/O addresses\Output addresses** | | | | | |
| **Start address** | 768 | **End address** | 783 | **Process image** | None |
| **Startup** | | | | | |
| **Startup if preset configuration does not match actual configuration** | True | **Startup after POWER ON** | Warm restart | | |
| **Startup\Monitoring time for** | | | | | |
| **Ready message from modules** | 650x 100 ms | **Parameter transfer to modules** | 100x 100 ms | | |
| **Cycle** | | | | | |
| **Cycle monitoring time** | 150ms | **Cycle load due to communication** | 20% | **Size of the process image input:** | 128 |
| **Size of the process image output:** | 128 | **OB85 call if I/O access error occurs** | No OB85 call | | |
| **Clock memory** | | | | | |
| **Clock memory** | False | **Memory byte** | 0 | | |

| **Interrupts\Time-of-day interrupts** | | | | |
|---|---|---|---|---|
| **OB number** | **Priority** | **Active** | **Execution** | **Start time** |
| OB 10: | 2 | True | Every minute | 1994-01-01 00:00:00.000 |

| **Interrupts\Time-delay interrupts** | | |
|---|---|---|
| **OB number** | **Priority** | **Process image partition(s)** |
| OB 20: | 3 | None |
| OB 21: | 4 | None |

| **Interrupts\Cyclic interrupts** | | | | |
|---|---|---|---|---|
| **OB number** | **Priority** | **Execution** | **Phase offset** | **Unit** |
| OB 32: | 9 | 1000 | 0 | ms |
| OB 33: | 10 | 500 | 0 | ms |
| OB 34: | 11 | 200 | 0 | ms |
| OB 35: | 12 | 100 | 0 | ms |

| **Interrupts\Hardware interrupts** | | |
|---|---|---|
| **OB number** | **Priority** | **Process image partition(s)** |
| OB 40: | 16 | None |

| **Interrupts\Asynchronous error interrupts** | |
|---|---|
| **OB number** | **Priority** |
| OB 82: | 26 |
| OB 85: | 26 |
| OB 87: | 26 |

| | | | | | |
|---|---|---|---|---|---|
| **Diagnostics system** | | | | | |
| **Number of alarms in the diagnostics buffer** | 10 | | | | |
| **Diagnostics system\Report cause of STOP** | | | | | |
| **Report cause of STOP** | True | | | | |
| **System diagnostics\General** | | | | | |
| **Activate system diagnostics for this device** | False | | | | |
| **Time of day** | | | | | |
| **Correction factor** | 0ms | | | | |
| **Time of day\Synchronization on PLC** | | | | | |
| **Type of synchronization** | None | **Time interval** | None | | |
| **Time of day\Synchronization on MPI** | | | | | |
| **Type of synchronization** | None | **Time interval** | None | | |
| **Retentive memory** | | | | | |
| **Number of memory bytes starting at MB 0** | 16 | **Number of S7 timers starting at T 0** | 0 | **Number of S7 counters starting at C 0** | 8 |
| **Protection** | | | | | |
| **Password** | | **Confirm password** | | | |
| **Protection** | | | | | |
| **Level of protection** | No protection | | | | |
| **Protection\ \Can be canceled with password** | | | | | |
| **Can be canceled with password** | False | | | | |
| **Connection resources** | | | | | |
| **PG communication:** | 1 | **OP communication:** | 1 | **S7 basic communication:** | 0 |
| **S7 communication:** | 0 | **Maximum number of S7 connection resources:** | 6 | | |

**Overview of addresses\Overview of addresses\Overview of addresses**

| | | | | | |
|---|---|---|---|---|---|
| **Inputs** | True | **Outputs** | True | **Address gaps** | False |
| **Slot** | True | | | | |

| Type | Addr. from | Addr. to | Module | PIP | Device name | Device number | Size | Master / IO system | Rack | Slot |
|---|---|---|---|---|---|---|---|---|---|---|
| I | 124 | 125 | DI 10/DO 6_1 | OB1-PI | PLC_1 [CPU 312C] | - | 2 Bytes | - | 0 | 2 2 |
| O | 124 | 124 | DI 10/DO 6_1 | OB1-PI | PLC_1 [CPU 312C] | - | 1 Bytes | - | 0 | 2 2 |
| I | 768 | 783 | Count_1 | OB1-PI | PLC_1 [CPU 312C] | - | 16 Bytes | - | 0 | 2 4 |
| O | 768 | 783 | Count_1 | OB1-PI | PLC_1 [CPU 312C] | - | 16 Bytes | - | 0 | 2 4 |
| I | 256 | 263 | AI 4/AO 2x8BIT_1 | OB1-PI | PLC_1 [CPU 312C] | - | 8 Bytes | - | 0 | 4 |
| O | 256 | 259 | AI 4/AO 2x8BIT_1 | OB1-PI | PLC_1 [CPU 312C] | - | 4 Bytes | - | 0 | 4 |

# PLC_1 [CPU 312C] / Program blocks

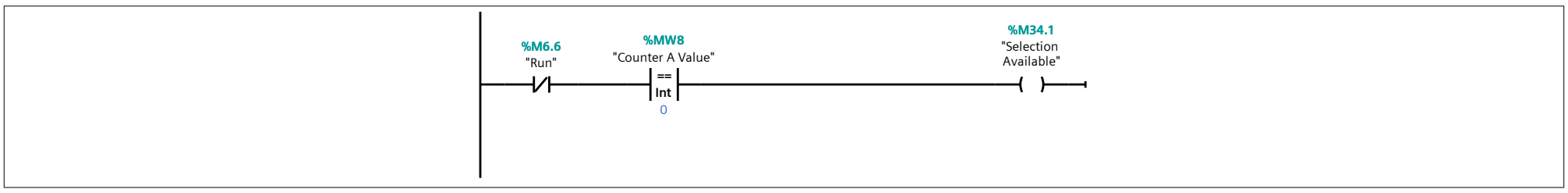
## Main [OB1]

| Main Properties | | | | | | | |
|---|---|---|---|---|---|---|---|
| **General** | | | | | | | |
| **Name** | Main | **Number** | 1 | **Type** | OB | **Language** | LAD |
| **Numbering** | Manual | | | | | | |
| **Information** | | | | | | | |
| **Title** | "Main Program Sweep (Cycle)" | **Author** | | **Comment** | | **Family** | |
| **Version** | 0.1 | **User-defined ID** | | | | | |

| Name | Data type | Offset | Default value | Comment |
|---|---|---|---|---|
| ▼ Temp | | | | |
| OB1_EV_CLASS | Byte | 0.0 | | Bits 0-3 = 1 (Coming event), Bits 4-7 = 1 (Event class 1) |
| OB1_SCAN_1 | Byte | 1.0 | | 1 (Cold restart scan 1 of OB 1), 3 (Scan 2-n of OB 1) |
| OB1_PRIORITY | Byte | 2.0 | | Priority of OB Execution |
| OB1_OB_NUMBR | Byte | 3.0 | | 1 (Organization block 1, OB1) |
| OB1_RESERVED_1 | Byte | 4.0 | | Reserved for system |
| OB1_RESERVED_2 | Byte | 5.0 | | Reserved for system |
| OB1_PREV_CYCLE | Int | 6.0 | | Cycle time of previous OB1 scan (milliseconds) |
| OB1_MIN_CYCLE | Int | 8.0 | | Minimum cycle time of OB1 (milliseconds) |
| OB1_MAX_CYCLE | Int | 10.0 | | Maximum cycle time of OB1 (milliseconds) |
| OB1_DATE_TIME | Date_And_Time | 12.0 | | Date and time OB1 started |
| Constant | | | | |

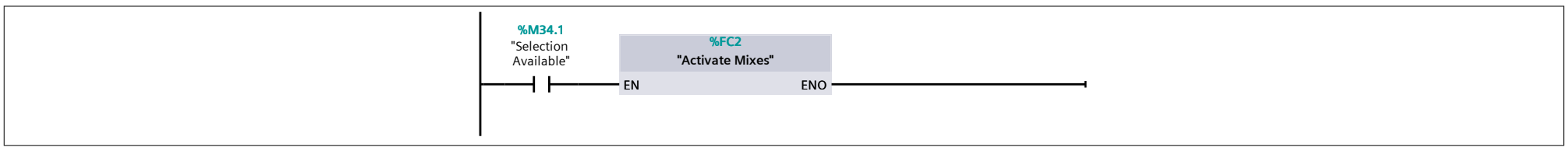
### Network 1: Available Mix Selection Network

This network enables the selection of a new mix. It can onlyh be activated while the process isn't working and no liquid from the ingredient A has been poured into the reactor tank.



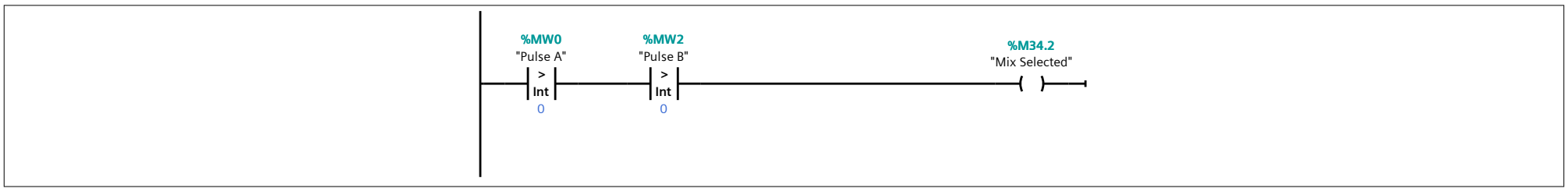

### Network 2: Funcion FC2 Call Network

This network calls the function FC2 (Activate Mix). This network indicates that a mix has been selected. It requires the selection available memory to be on.



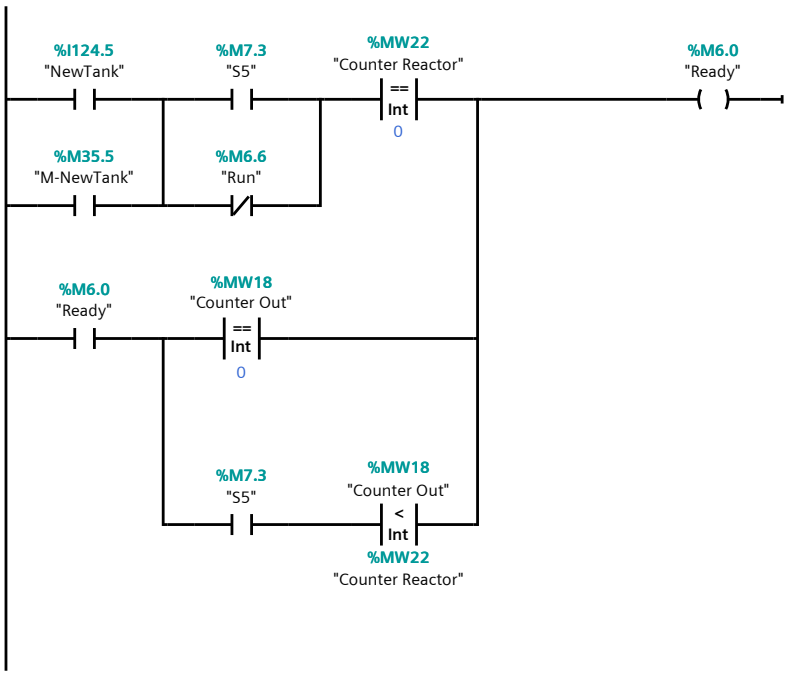

### Network 3: Mix Selected Network

This network indicates that a mix has been selected at least one time, the value for the memories Pulse A and Pulse B are 0 the first time the program is debugging.



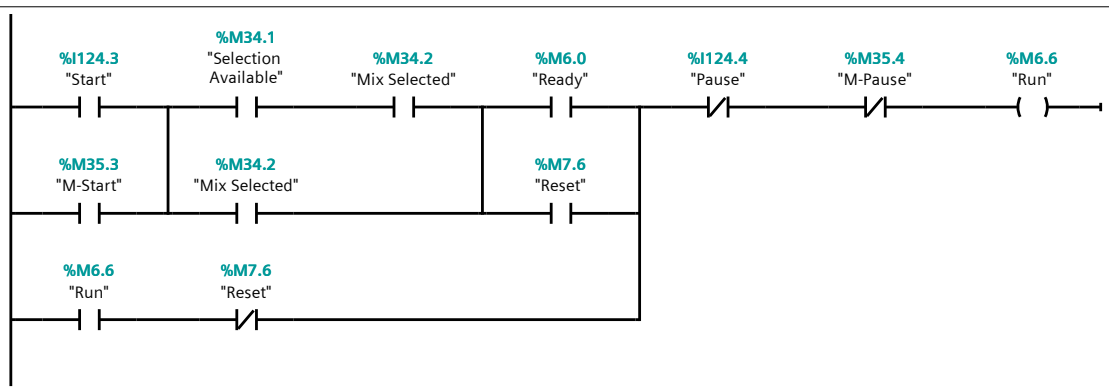

### Network 4: Ready Network

This Network describes how to set the Ready memory . To do it, first you have to push the Input I124.5 (NewTank). This "empties" the filled QA tank and puts a new one. Then, the either the state 5 must be active or the process must be stopped (Run deactivated). Finally, the value of the Counter Reactor must be equal to 0, meaning that the process has already begun or being restarted. The ready memory keeps on while the value of the Output counter (Counter Out) is equal to zero or while the State 05 is on but liters at the QA tank are less than the liters at the reactor tank.



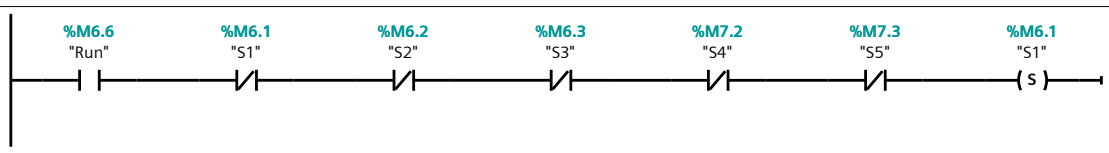

### Network 5: Run Network

This network describes how to activate the Run memory. To activate it, first you have to push the input I124.3 (Start button), while the memories "Selection Avalable" and "Mix Selected" are on. The second branch will always be active once a mix has been selected for the first time. As you can see, you can not activate the Run memory if the input I124.4 is on (Pause). The reset memory under the ready memory closes whenever the Reset signal has been triggered. Finally, the Run memory will keep working until the Reset signal (M7.6) has been activated.



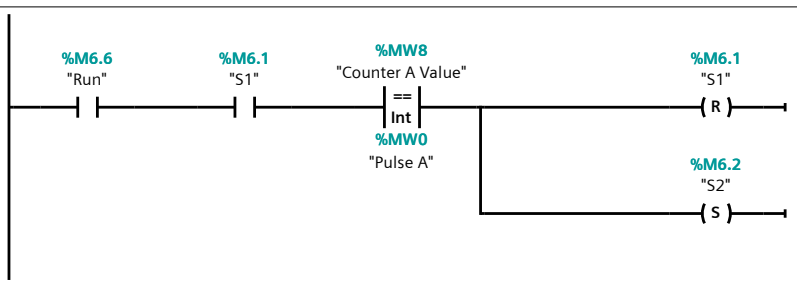

### Network 6: Activate state 01 Network

This network describes how to active the state 01. To activate it, the process must be running (run memory on), and all the States must be deactivated.



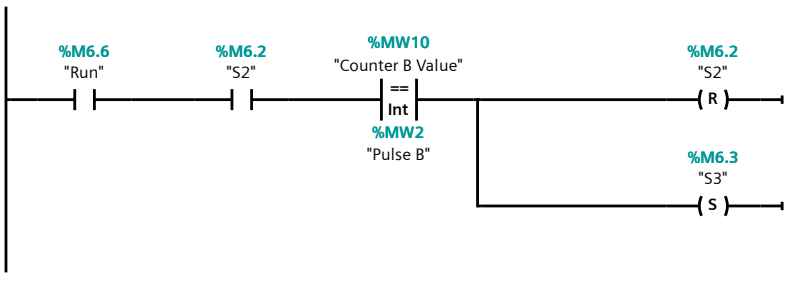

### Network 7: Reset State 01 and Set State 02 Network

This network describes how to set the state 02 and reset the sate 01. To do it, both the State 01 and the process must be active (Run memory on), and the value of Counter A Value must be equal to the value in the memory Pulse A.



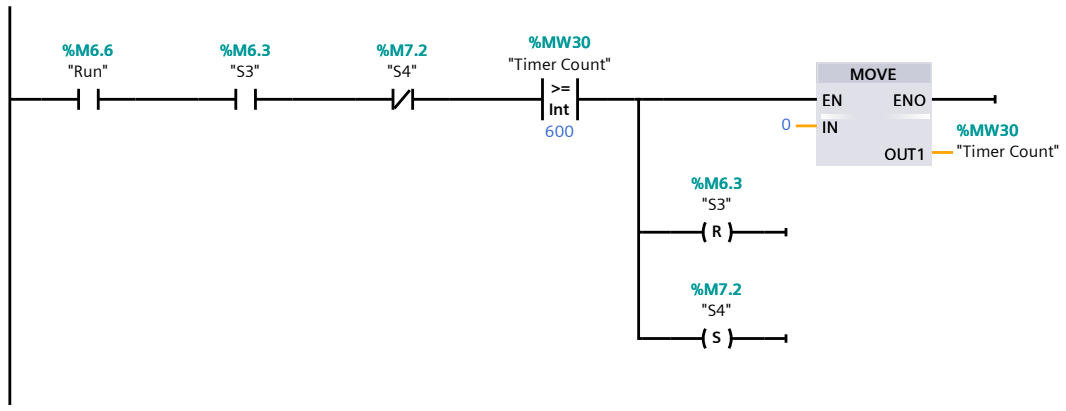

### Network 8: Reset State 02 and Set State 03 Network

This network describes how to set the state 03 and reset the sate 02. To do it, both the State 02 and the process must be active (Run memory on), and the value of Counter B Value must be equal to the value in the memory Pulse B.



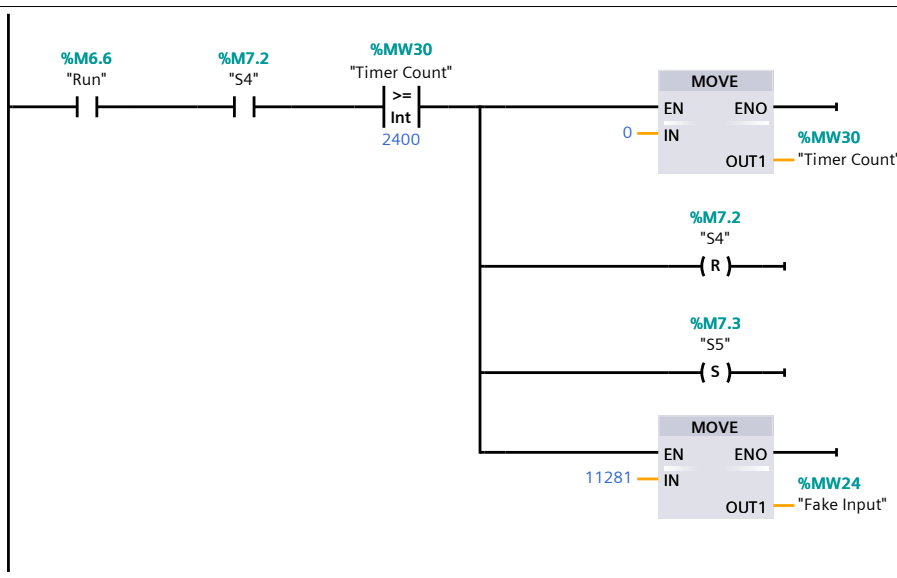

### Network 9: Reset State 03 and Set State 04 Network

This network describes how to set the state 04 and reset the sate 03. To do it, both the State 03 and the process must be active (Run memory on), the State 4 must be deactivated, and the value of Timer Count must be greater or equal to 6000. When the conditions are achieved, a 0 passes to the Timer Count memory in order to restart its value (count start from 0 again).



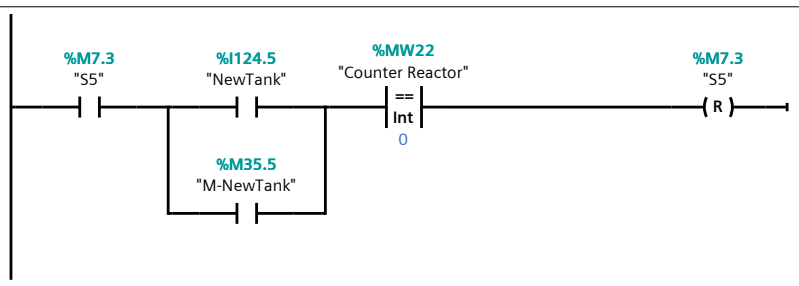

### Network 10: Reset State 04 and Set State 05 Network

This network describes how to set the state 04 and reset the sate 05. To do it, both the State 04 and the process must be active (Run memory on), , and the value of Timer Count must be greater or equal to 24000. When the conditions are achieved, a 0 passes to the Timer Count memory in order to restart its value (count start from 0 again), and a value of 11281 passes to the Fake Input (equivalent to 260 RPM) so it can be converted to RPM and sent to the analog output Q256.




### Network 11: Reset State 05 Network

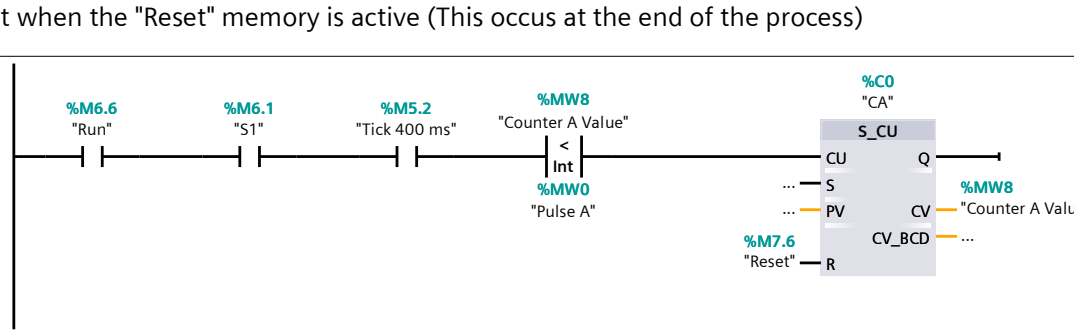
This network shows how to reset the State 05. In order to reset this network, the state 05 must be active, the liters at the Reactor container must be 0 and the input I124.5 (New Tank) must be pressed.




### Network 12: State 01 Actions: Increase the Counter A Value - Network

This network describes how the pulses from the the A Valve are increasing ( the ingredient A is being poured into the reactor container). To do it so, first the process must be running, the State 01 must be active, and the counter "Counter A Value" must be less than the value in form the "Pulse A" memory. Also, to create the pulses effect, the 400 ms Tick is added into this branch.

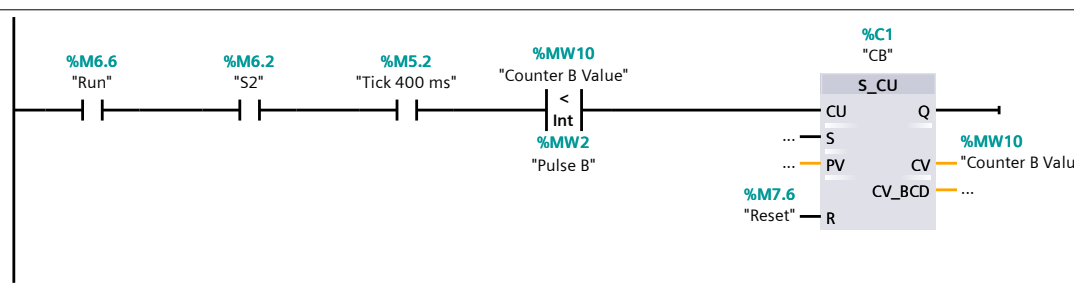
Note: The value of the counter is reset when the "Reset" memory is active (This occus at the end of the process)




### Network 13: State 02 Action: Increase the Counter B Value - Network

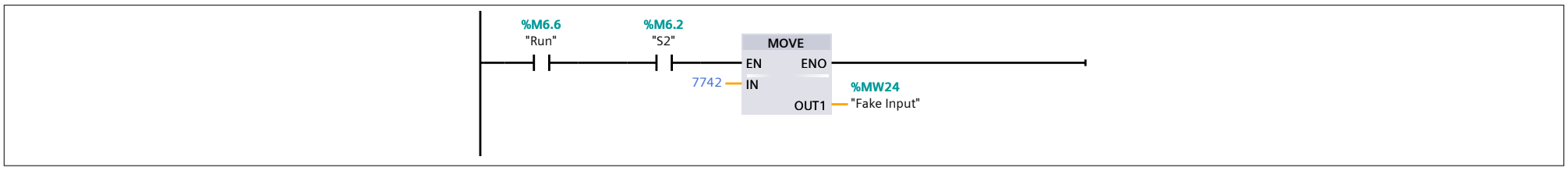
This network describes how the pulses from the the B Valve are increasing ( the ingredient B is being poured into the reactor container). To do it so, first the process must be running, the State 02 must be active, and the counter "Counter B Value" must be less than the value in form the "Pulse B" memory. Also, to create the pulses effect, the 400 ms Tick is added into this branch.

Note: The value of the counter is reset when the "Reset" memory is active (This occus at the end of the process)



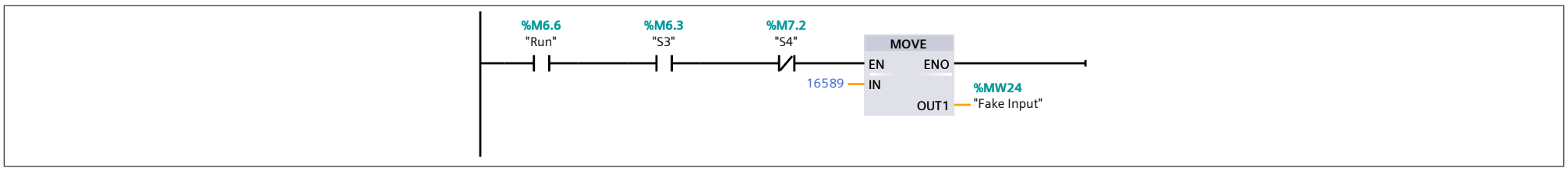
### Network 14: State 02 Action: 100 RPM Network

This network accoomplishes the requirement for the consrant 100 RPM measured from the motor while the ingredient B is being poured into the reactor container. A fake input was created because the real analog measurement could not be modified as desired. The analog value for the 100 RPM is 7742.



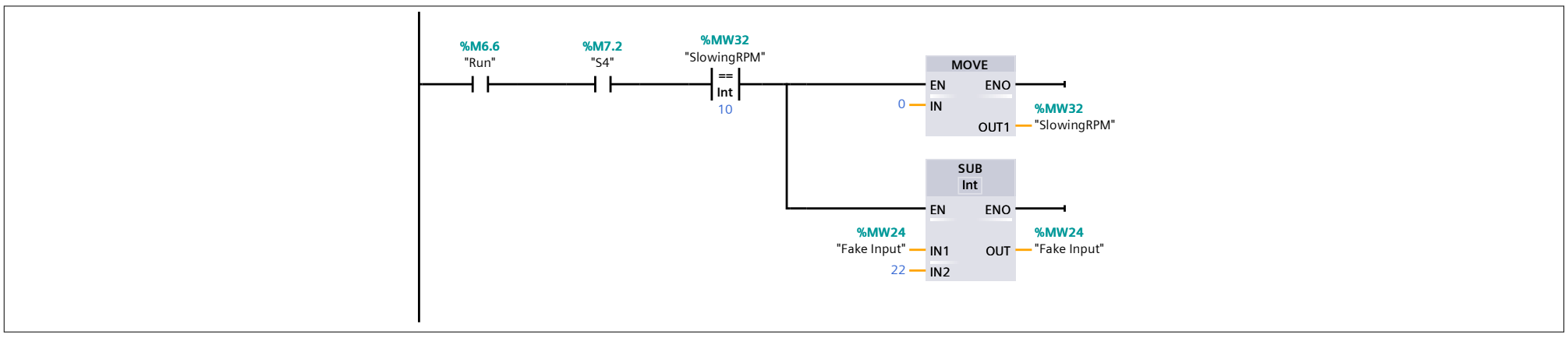

### Network 15: State 03 Action: 500 RPM Network

This network accoomplishes the requirement for the consrant 500 RPM measured from the motor for 10 minutes when the ingredient B has already been poured into the reactor container. A fake input was created because the real analog measurement could not be modified as desired. The analog value for the 500 RPM is 16589.



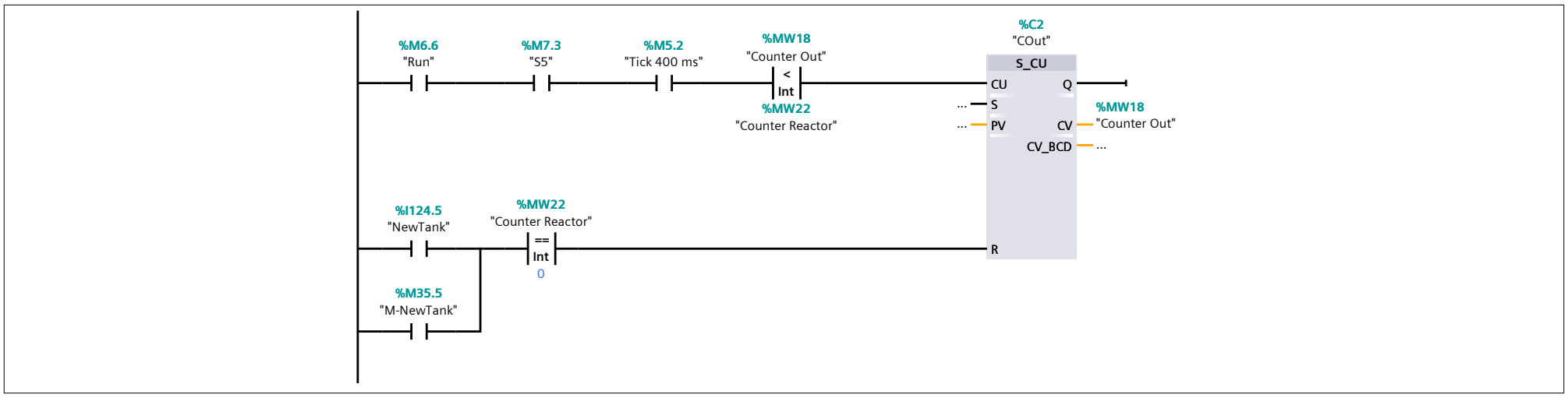

### Network 16: State 04 Action: Slowing the RPM from 500 down to 260 - Network

This Network shows how to decreases the RPM value from 500 down to 260. In order to accomplish this goal, the process should be working (Run memory on), while the State 04 is active. The memory "Slowing RPM" increases its value every 100 ms and when it reaches the value of 100 (10 seconds elapsed) it resets its value while decreases the Fake Input's value. This allows to decrease the RPM by 10 every second.




### Network 17: State 05 Action: Pouring the reactor mix into the QA Tank - Network

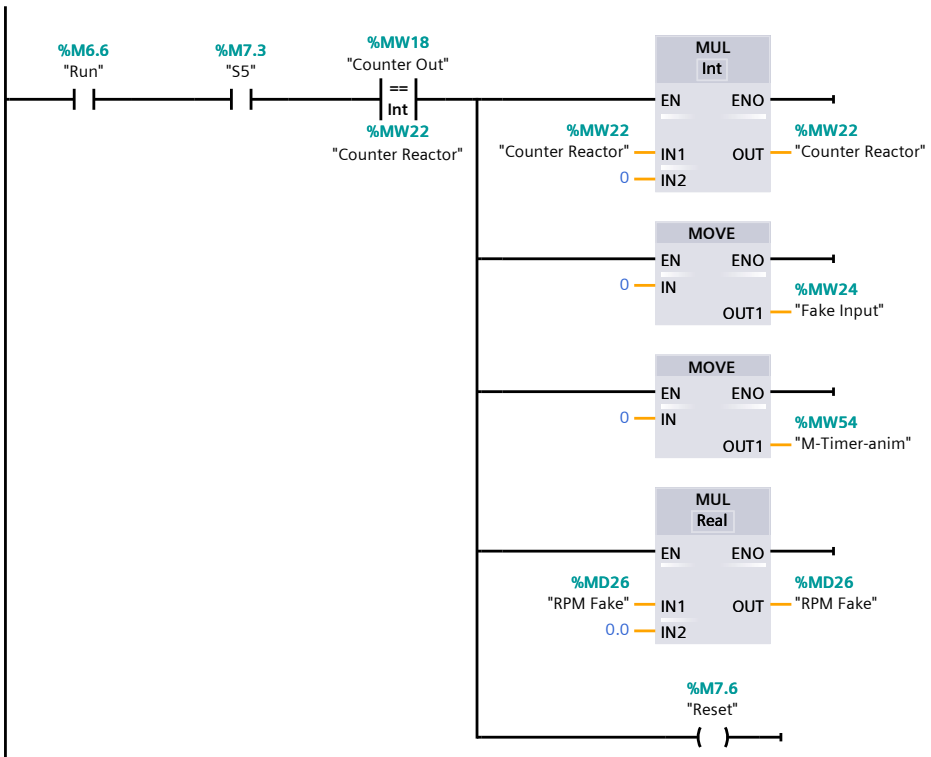
This network indicates how the pouring process from the reactor tank into the WA tank is done. First, the process must be active (Run memory on), the State 05 must be on, and the value of the counter "Counter Out" must be less that the value of "Counter Reactor". The value of Counter Out will increases each 400 ms thanks to the programmed Tick. This thick indicates the pulses or the liters that are being poured into the WA tank. To reset its count the liters in the reactor (Counter Reactor) must be 0 and the the input I124.5 must be pressed, indicating that a Nwe QA tank is ready.




### Network 18: State 05 Action: Reset the values - Network

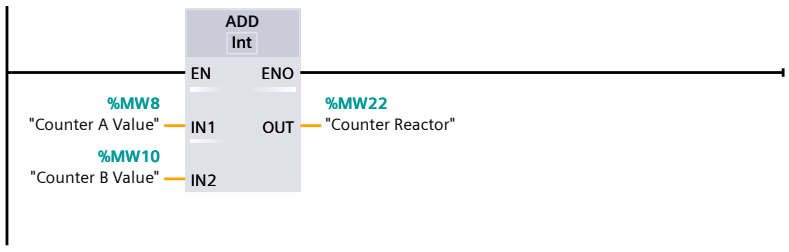
When the liters at the QA tank are already the ones that were at the reactor tank (200 liters), this branch resets the values from several counters by passing the value of 0 or by turning on the Reset memory.

Note: this branch will be activated only once because it requieres to both counters have the same value, and this branch does not turn to 0 the value of the Counter Out (the mix is at the QA tank).




**Network 19: Liters at the reactor -Network**

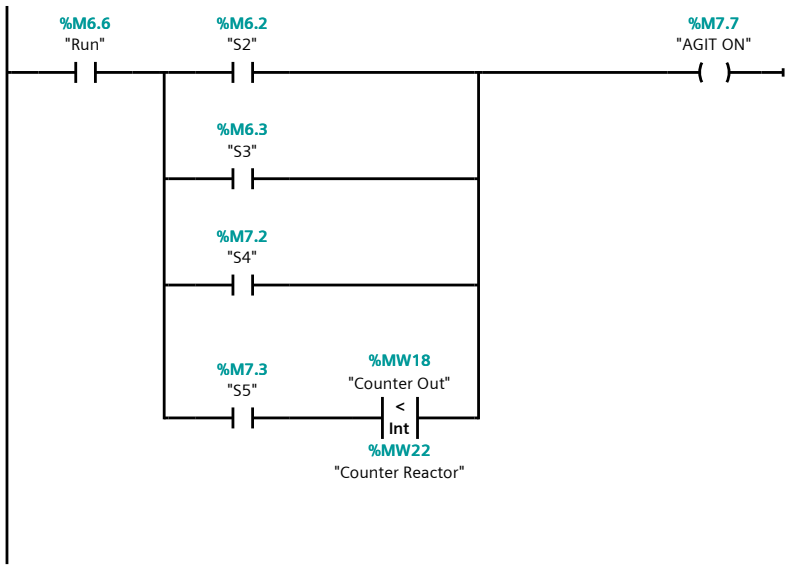
This network indicates how many liters of both ingredients have already been poured into the reactor container. This network adds the value from both counters ( poured ingredient A and the poured ingredient B).



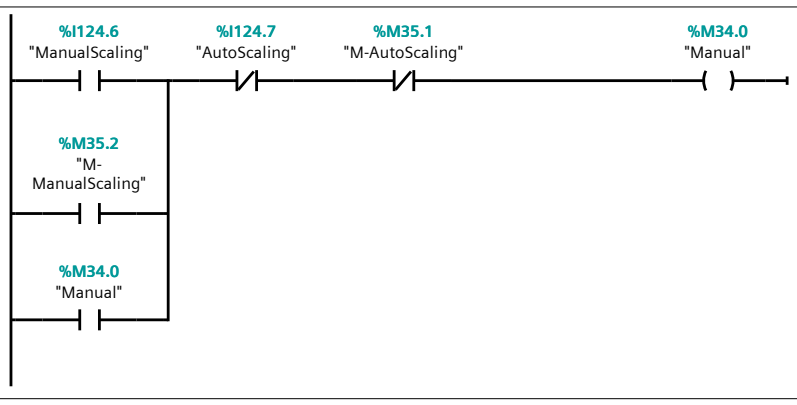

**Network 20: AGIT ON Network**

This Network describes when the AGIT ON signal is active. This is while the following conditions and the run memory are active:

State 02: Puring the ingredient B and shaking.
State 03: 10 min shake.
State 04: 40 min shake.
State 05 and Counter Out < Counter Reactor: Pouring the mix into the QA tank

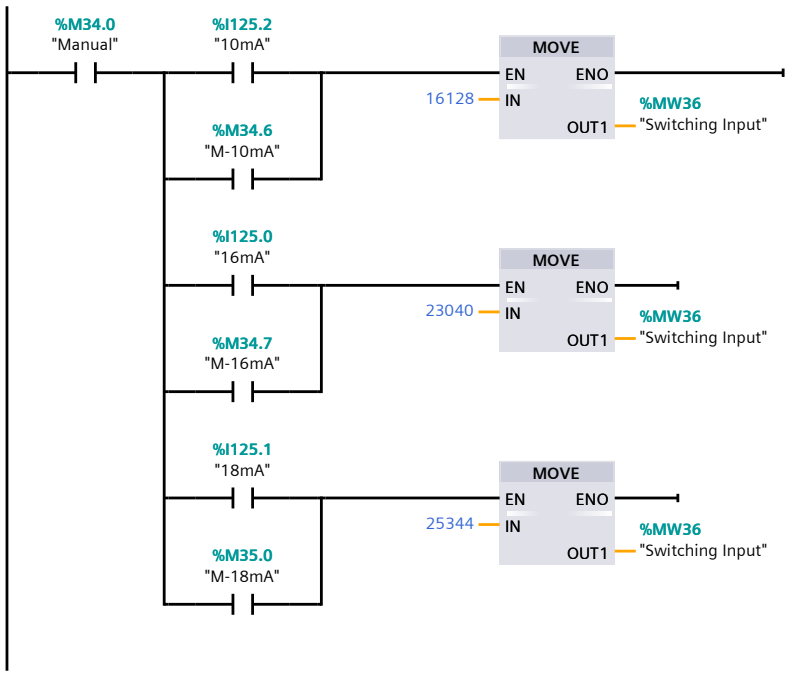



**Network 21: Manual Scaling Network**



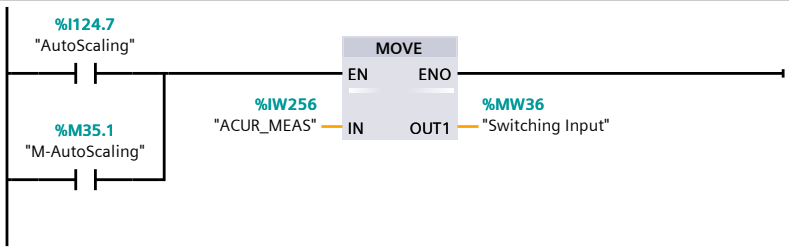

**Network 22: Manualy Scaling Values**

This Network describes the 3 puttons I125.0, I125.1, and I125.2 corresponding to three different current values: 10mA, 16mA, and 18 mA. These swtiches send the analog input value requires to obtain those current outputs.



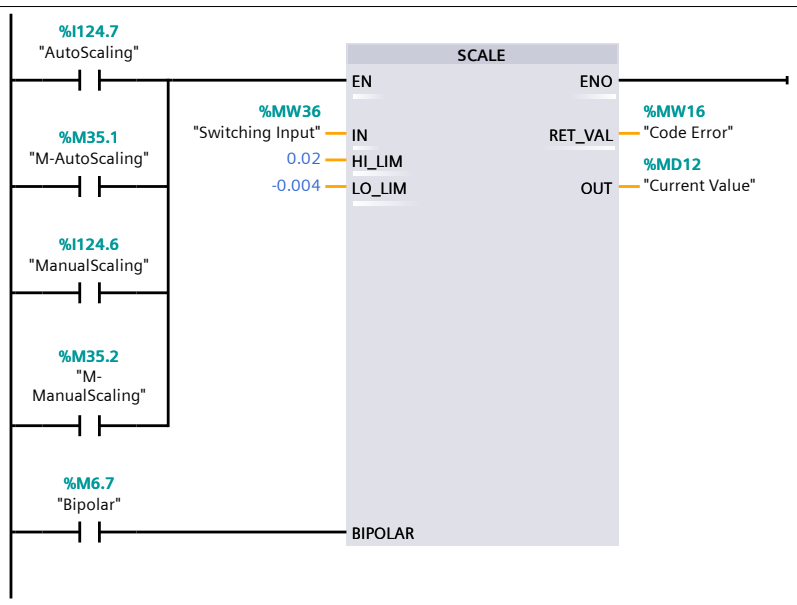

### Network 23: Auto Scaling Network

This network moves the value from the analog input !W256 to the memory M@36 (Switching Input) as long as the AutoScaling button is on.




### Network 24: Scale with Real Input (ACUR_MEAS) -Network

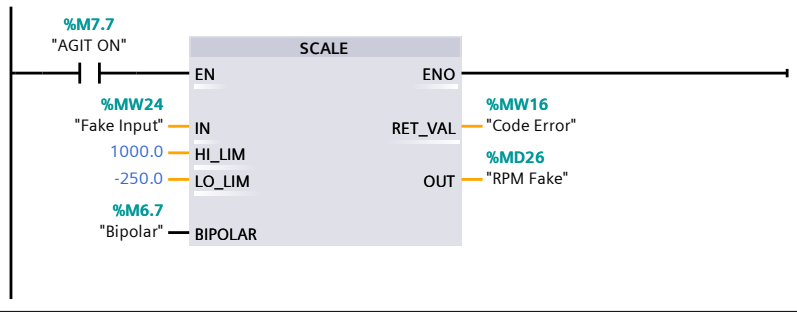
This network scales the input from either the IB125 inputs or the IW256 to obtain range of values that vary from 0.8 mA (the 8u ampers is due to conversion) up to 20 mA.




### Network 25: Scale with Fake Input - Network

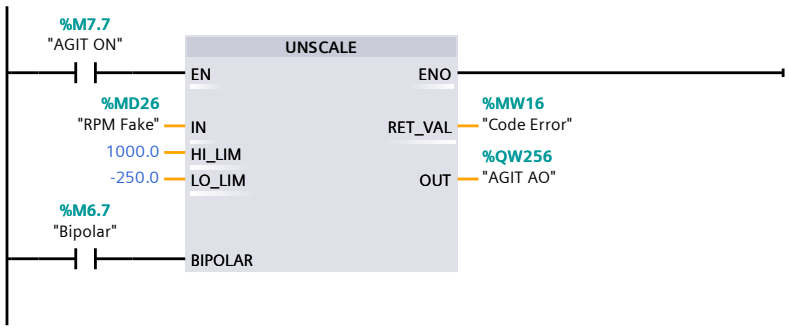
This network describes the parameters required to scale the input to have a RPM value that goes from 0 up to 1000 RPM within a range that goes from 5530 to 27648. The parameters were obtained from the straight line equation. The lowest limit is -250 and the highsest limit is 1000.

This network imitates the analog samplig procedure. The real analog input is used as a alarm detector.



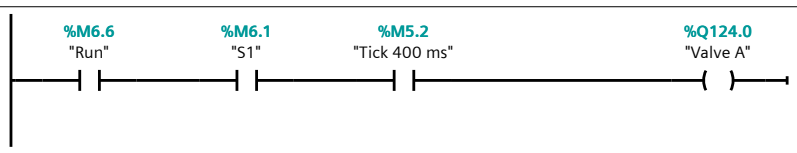

### Network 26: Unscale with Fake RPM - Network

This network describes the parameters required to scale the fake RPM input to have an analog value that goes from 0 up to 1000 RPM within a range that goes from 5530 to 27648. The parameters were obtained from the straight line equation. The lowest limit is -250 and the highsest limit is 1000.



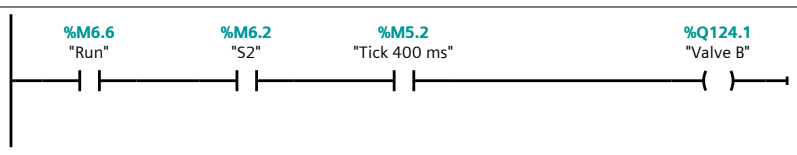

### Network 27: Output Valve A - Network

This network indicates how to activate the Valve A output.



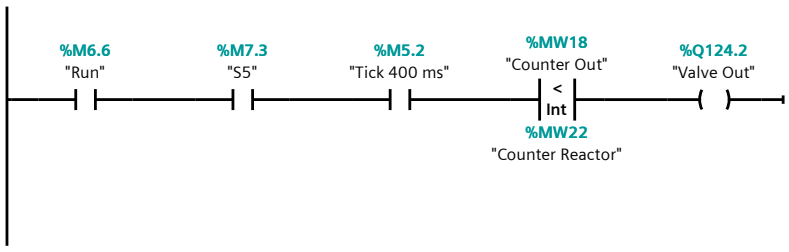

### Network 28: Output Valve B - Network

This network indicates how to activate the Valve B output.



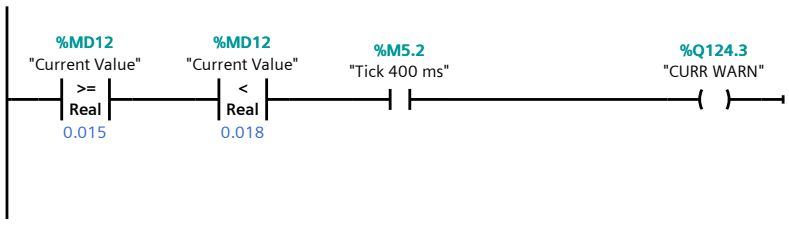

### Network 29: Output Valve Out - Network

This network indicates how to activate the Valve Out output.



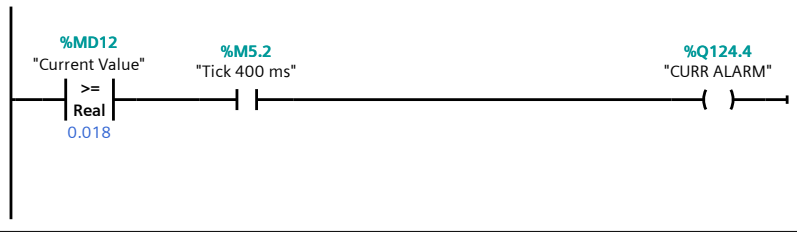

### Network 30: 15 mA Warning Network

This Neworks turns on a visual alarm indicating a warning signal. This warning signal is turned on whenever the Current value is grater than 15mA but less than 18mA. This warning signal turns on and off every 400 ms due to the 400 ms Tick.



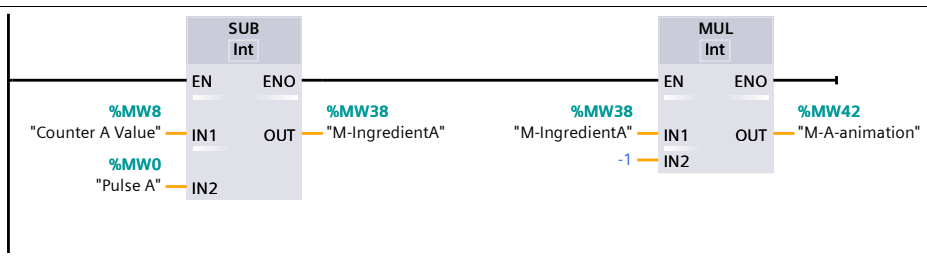

### Network 31: 18 mA Alarm Network

This Neworks turns on a visual alarm indicating an alarm signal. This alarm signal is turned on whenever the Current value is grater than 18mA. This alarm signal turns on and off every 400 ms due to the 400 ms Tick.



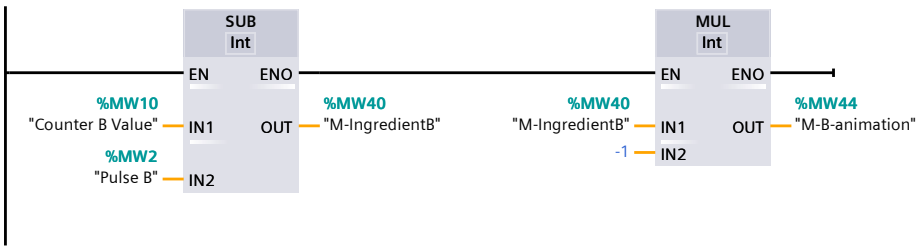

### Network 32: Animation: Pouring Ingredient A - Network

This network describes how to animate the pouring process of the ingredient A into the Reactor Tank.




### Network 33: Animation: Pouring Ingredient B - Network

This network describes how to animate the pouring process of the ingredient B into the Reactor Tank.

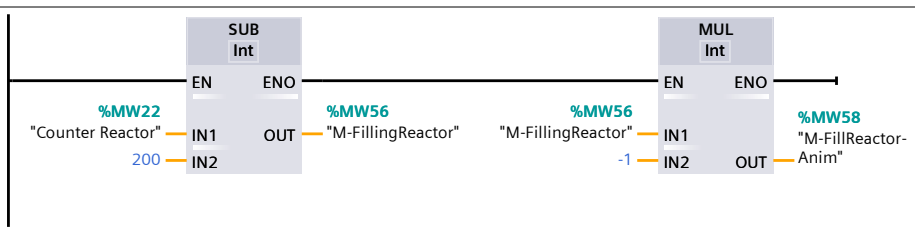



### Network 34: Animation: Pouring the Reactor Tank into the QA tank - Network

This network describes how to animate the pouring process of the Reactor Tank into the QA Tank.

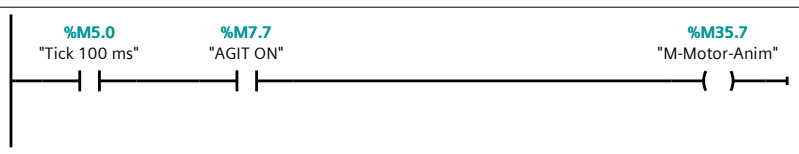

### Network 35: Animation: Pouring Ingredient A and Ingredient B into the Reactor Tank - Network

This network describes how to animate the pouring process from both ingredients into the Reactor Tank.



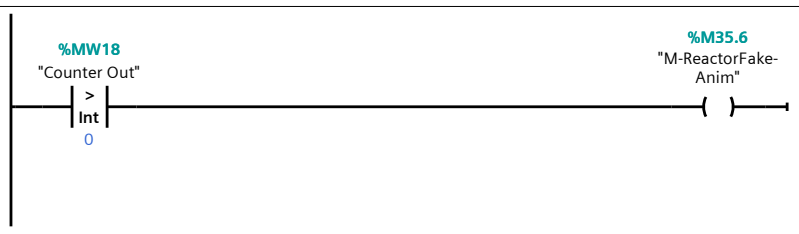

### Network 36: Animation: Motor spinning - Network

This network describes how to animate the rorational movement of the motor.



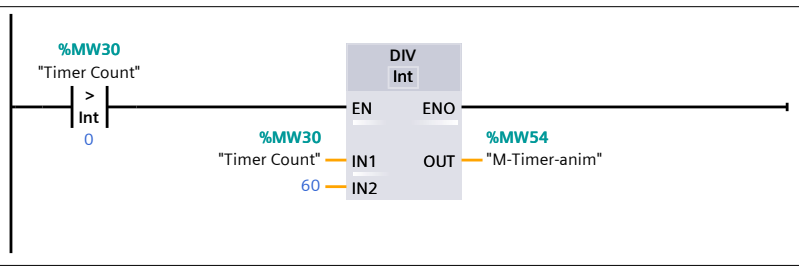

### Network 37: Animation: Appear/Disappear Reactor - Network

This network describes when to appear and disappear the reactor Tank in the HMI for two different visual effects.




### Network 38: Animation: Elapsed Minutes - Network

This netowork show the elapsed time in minutes in the HMI



# PLC_1 [CPU 312C] / Program blocks

## Mezcla A [DB1]

| Mezcla A Properties | | | | | | | |
|---|---|---|---|---|---|---|---|
| **General** | | | | | | | |
| **Name** | Mezcla A | **Number** | 1 | **Type** | DB | **Language** | DB |
| **Numbering** | Automatic | | | | | | |
| **Information** | | | | | | | |
| **Title** | | **Author** | | **Comment** | | **Family** | |
| **Version** | 0.1 | **User-defined ID** | | | | | |

| Name | Data type | Offset | Start value | Retain | Accessible from HMI/OPC UA | Writable from HMI/OPC UA | Visible in HMI engineering | Setpoint | Supervision | Comment |
|---|---|---|---|---|---|---|---|---|---|---|
| ▼ Static | | | | | | | | | | |
| Pulso A | Int | 0.0 | 180 | True | True | True | True | False | | |
| Pulso B | Int | 2.0 | 20 | True | True | True | True | False | | |

# PLC_1 [CPU 312C] / Program blocks

## Mezcla B [DB2]

| Mezcla B Properties | | | | | | | |
|---|---|---|---|---|---|---|---|
| **General** | | | | | | | |
| **Name** | Mezcla B | **Number** | 2 | **Type** | DB | **Language** | DB |
| **Numbering** | Automatic | | | | | | |
| **Information** | | | | | | | |
| **Title** | | **Author** | | **Comment** | | **Family** | |
| **Version** | 0.1 | **User-defined ID** | | | | | |

| Name | Data type | Offset | Start value | Retain | Accessible from HMI/OPC UA | Writable from HMI/OPC UA | Visible in HMI engineering | Setpoint | Supervision | Comment |
|---|---|---|---|---|---|---|---|---|---|---|
| ▼ Static | | | | | | | | | | |
| Pulso A | Int | 0.0 | 160 | True | True | True | True | False | | |
| Pulso B | Int | 2.0 | 40 | True | True | True | True | False | | |

# PLC_1 [CPU 312C] / Program blocks

## Mezcla C [DB3]

| Mezcla C Properties | | | | | | | |
|---|---|---|---|---|---|---|---|
| **General** | | | | | | | |
| **Name** | Mezcla C | **Number** | 3 | **Type** | DB | **Language** | DB |
| **Numbering** | Automatic | | | | | | |
| **Information** | | | | | | | |
| **Title** | | **Author** | | **Comment** | | **Family** | |
| **Version** | 0.1 | **User-defined ID** | | | | | |

| Name | Data type | Offset | Start value | Retain | Accessible from HMI/OPC UA | Writable from HMI/OPC UA | Visible in HMI engineering | Setpoint | Supervision | Comment |
|---|---|---|---|---|---|---|---|---|---|---|
| ▼ Static | | | | | | | | | | |
| Pulso A | Int | 0.0 | 140 | True | True | True | True | False | | |
| Pulso B | Int | 2.0 | 60 | True | True | True | True | False | | |

# PLC_1 [CPU 312C] / Program blocks

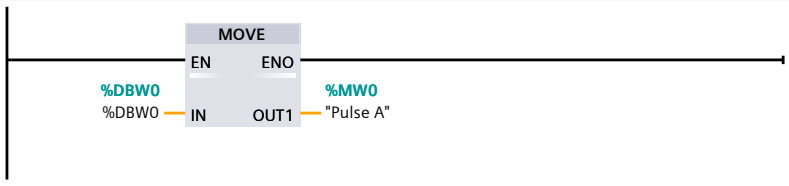
## Move Mix Times [FC1]

| Move Mix Times Properties | | | | | | | |
|---|---|---|---|---|---|---|---|
| **General** | | | | | | | |
| **Name** | Move Mix Times | **Number** | 1 | **Type** | FC | **Language** | LAD |
| **Numbering** | Automatic | | | | | | |
| **Information** | | | | | | | |
| **Title** | | **Author** | | **Comment** | | **Family** | |
| **Version** | 0.1 | **User-defined ID** | | | | | |

| Name | Data type | Offset | Default value | Comment |
|---|---|---|---|---|
| Input | | | | |
| Output | | | | |
| InOut | | | | |
| Temp | | | | |
| Constant | | | | |
| ▼ Return | | | | |
| Move Mix Times | Void | | | |

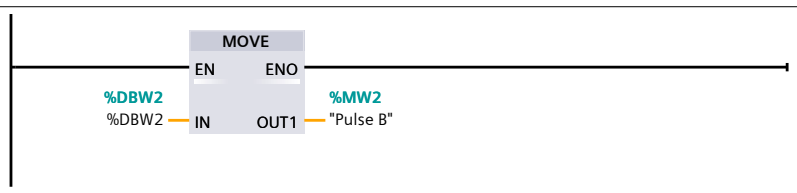
### Network 1: Pulse A Move Network

This network moves the value stored from the selected Data Block to the memory Pulse A.




### Network 2: Pulse B Move Network

This network moves the value stored from the selected Data Block to the memory Pulse B.



# PLC_1 [CPU 312C] / Program blocks

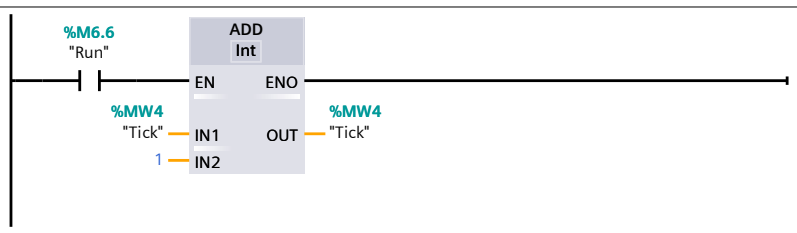
## CYC_INT5 [OB35]

| CYC_INT5 Properties | | | | | | | |
|---|---|---|---|---|---|---|---|
| **General** | | | | | | | |
| **Name** | CYC_INT5 | **Number** | 35 | **Type** | OB | **Language** | LAD |
| **Numbering** | Manual | | | | | | |
| **Information** | | | | | | | |
| **Title** | "Cyclic Interrupt" | **Author** | | **Comment** | | **Family** | |
| **Version** | 0.1 | **User-defined ID** | | | | | |

| Name | Data type | Offset | Default value | Comment |
|---|---|---|---|---|
| ▼ Temp | | | | |
| OB35_EV_CLASS | Byte | 0.0 | | Bits 0-3 = 1 (Coming event), Bits 4-7 = 1 (Event class 1) |
| OB35_STRT_INF | Byte | 1.0 | | 16#36 (OB 35 has started) |
| OB35_PRIORITY | Byte | 2.0 | | Priority of OB Execution |
| OB35_OB_NUMBR | Byte | 3.0 | | 35 (Organization block 35, OB35) |
| OB35_RESERVED_1 | Byte | 4.0 | | Reserved for system |
| OB35_RESERVED_2 | Byte | 5.0 | | Reserved for system |
| OB35_PHASE_OFFSET | Word | 6.0 | | Phase offset (msec) |
| OB35_RESERVED_3 | Int | 8.0 | | Reserved for system |
| OB35_EXC_FREQ | Int | 10.0 | | Frequency of execution (msec) |
| OB35_DATE_TIME | Date_And_Time | 12.0 | | Date and time OB35 started |
| Constant | | | | |

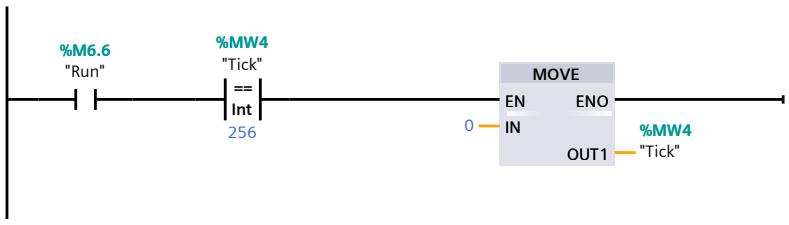
### Network 1: Tick Network

This network generates a tick every 100 ms, the value of tick is increased by 1.



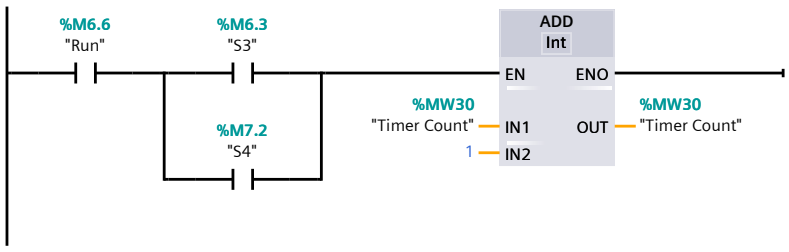

### Network 2: Reset Tick Network

This network resets the value of the tick. If Tick has reached 256, its moves a 0 o the memory that stores the Tick.



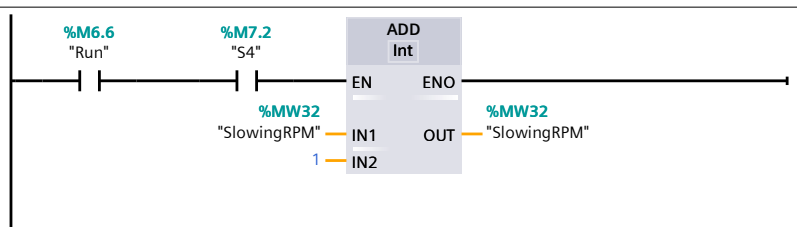

### Network 3: Timer Count Network

This network work as a timer for the time elapsed within the State 03 and the State 04. It's required that the process is working (Run memory on).




### Network 4: Slowing RPM network

This network increases the value of the memory "SlowingRPM" by 1 each 100 ms. It is required that the process is working (Run memory on)



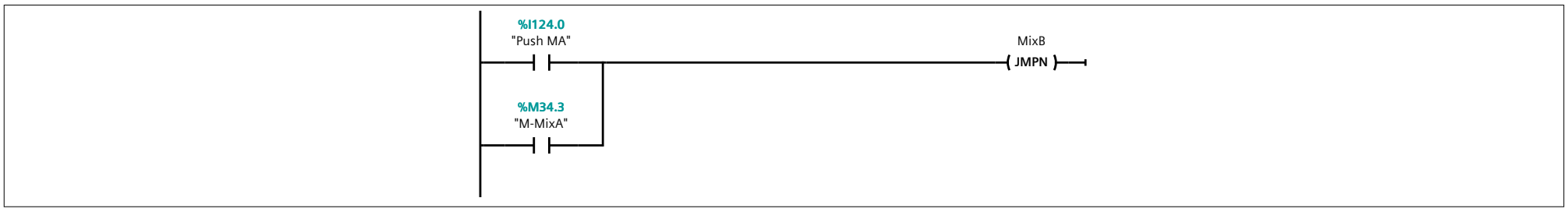
# PLC_1 [CPU 312C] / Program blocks

## Activate Mixes [FC2]

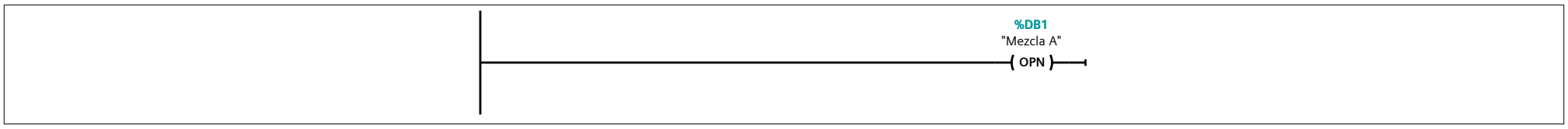
| Activate Mixes Properties | | | | | | | |
|---|---|---|---|---|---|---|---|
| **General** | | | | | | | |
| **Name** | Activate Mixes | **Number** | 2 | **Type** | FC | **Language** | LAD |
| **Numbering** | Automatic | | | | | | |
| **Information** | | | | | | | |
| **Title** | | **Author** | | **Comment** | | **Family** | |
| **Version** | 0.1 | **User-defined ID** | | | | | |

| Name | Data type | Offset | Default value | Comment |
|---|---|---|---|---|
| Input | | | | |
| Output | | | | |
| InOut | | | | |
| Temp | | | | |
| Constant | | | | |
| ▼ Return | | | | |
| Activate Mixes | Void | | | |

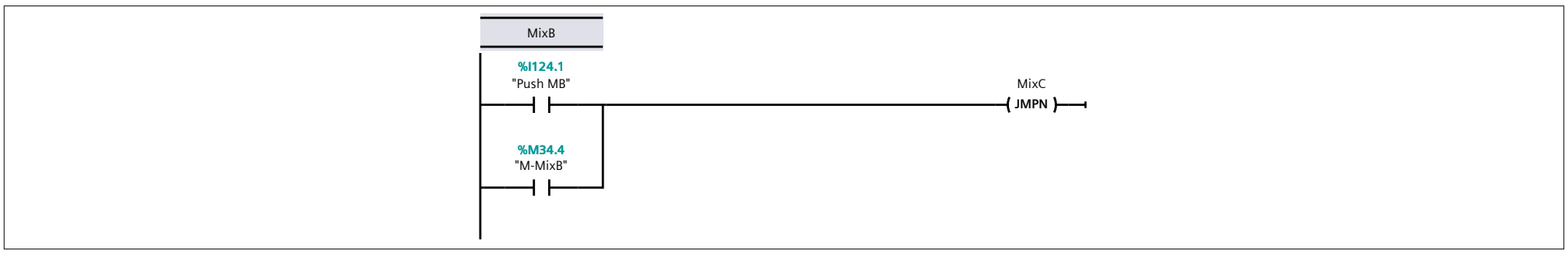
### Network 1:



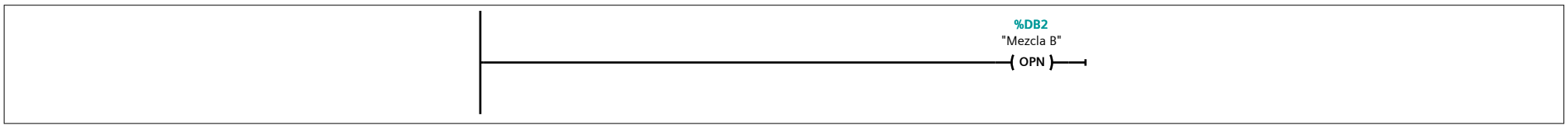

### Network 2:



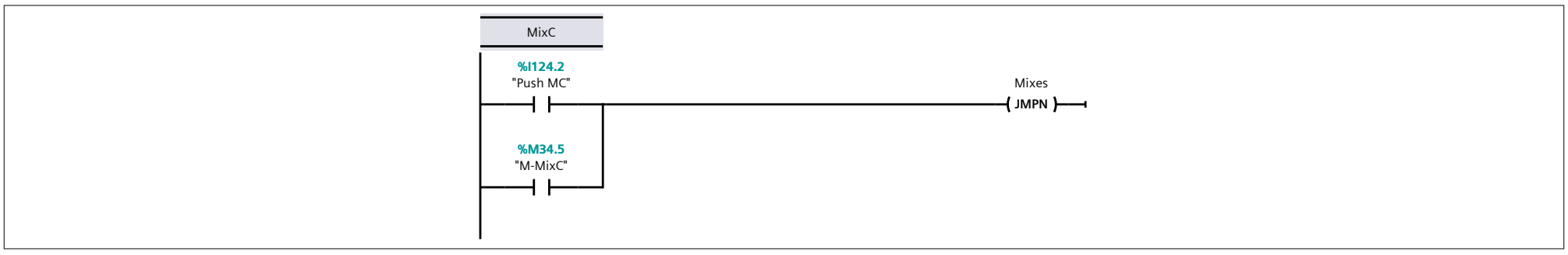

### Network 3:



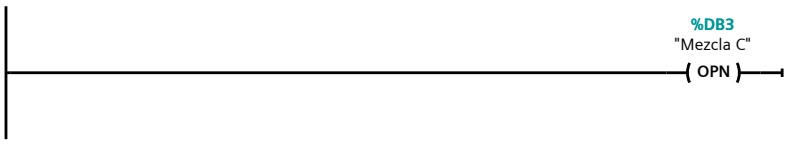

### Network 4:



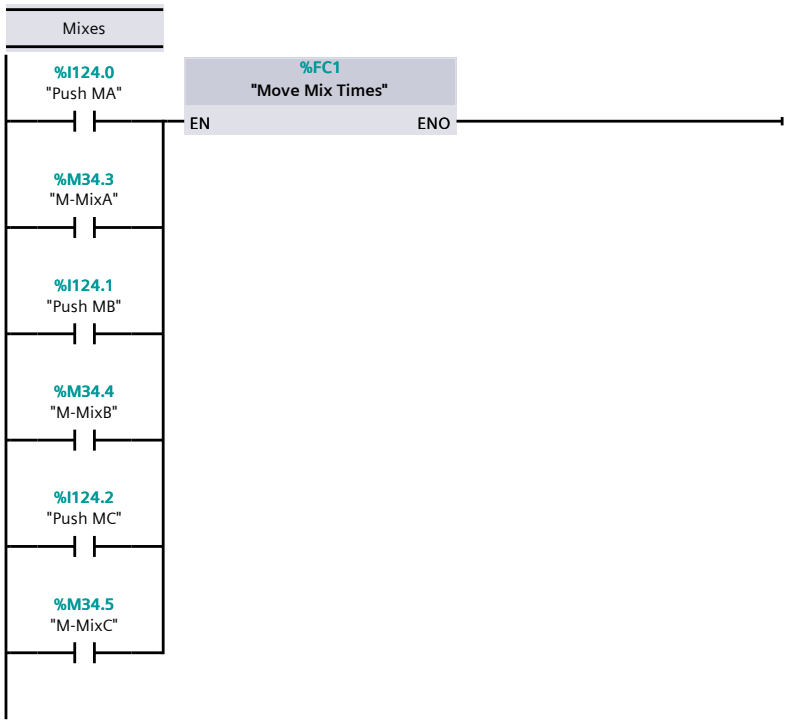

### Network 5:




### Network 6:


%DB3
"Mezcla C"
OPN

**Network 7:**


Mixes
%I124.0
"Push MA"
%FC1
"Move Mix Times"
EN
ENO
%M34.3
"M-MixA"
%I124.1
"Push MB"
%M34.4
"M-MixB"
%I124.2
"Push MC"
%M34.5
"M-MixC"

# PLC_1 [CPU 312C] / Program blocks / System blocks / Program resources

## SCALE [FC105]

| SCALE Properties | | | | | | | |
|---|---|---|---|---|---|---|---|
| **General** | | | | | | | |
| **Name** | SCALE | **Number** | 105 | **Type** | FC | **Language** | STL |
| **Numbering** | Automatic | | | | | | |
| **Information** | | | | | | | |
| **Title** | SCALING VALUES | **Author** | SEA | **Comment** | | **Family** | CONVERT |
| **Version** | 2.1 | **User-defined ID** | SCALE | | | | |

| Name | Data type | Offset | Default value | Comment |
|---|---|---|---|---|
| ▼ Input | | | | |
| IN | Int | | | input value to be scaled |
| HI_LIM | Real | | | upper limit in engineering units |
| LO_LIM | Real | | | lower limit in engineering units |
| BIPOLAR | Bool | | | 1=bipolar; 0=unipolar |
| ▼ Output | | | | |
| OUT | Real | | | result of the scale conversion |
| InOut | | | | |
| ▼ Return | | | | |
| Ret_Val | Word | | | |

# PLC_1 [CPU 312C] / Program blocks / System blocks / Program resources

## UNSCALE [FC106]

| UNSCALE Properties | | | | | | | |
|---|---|---|---|---|---|---|---|
| **General** | | | | | | | |
| **Name** | UNSCALE | **Number** | 106 | **Type** | FC | **Language** | STL |
| **Numbering** | Automatic | | | | | | |
| **Information** | | | | | | | |
| **Title** | UNSCALING VALUES | **Author** | SEA | **Comment** | | **Family** | CONVERT |
| **Version** | 2.0 | **User-defined ID** | UNSCALE | | | | |

| Name | Data type | Offset | Default value | Comment |
|---|---|---|---|---|
| ▼ Input | | | | |
| IN | Real | | | input value to be unscaled |
| HI_LIM | Real | | | upper limit in engineering units |
| LO_LIM | Real | | | lower limit in engineering units |
| BIPOLAR | Bool | | | 1=bipolar; 0=unipolar |
| ▼ Output | | | | |
| OUT | Int | | | result of the unscale conversion |
| InOut | | | | |
| ▼ Return | | | | |
| Ret_Val | Word | | | |

# PLC_1 [CPU 312C]

## Technology objects

This folder is empty.

# PLC_1 [CPU 312C] / PLC tags / Default tag table [79]

## PLC tags

**PLC tags**

| | Name | Data type | Address | Retain | Accessible from HMI/OPC UA | Writable from HMI/OPC UA | Visible in HMI engineering | Supervision | Comment |
|---|---|---|---|---|---|---|---|---|---|
| | Pulse A | Int | %MW0 | | True | True | True | | |
| | Pulse B | Int | %MW2 | | True | True | True | | |
| | Tick | Int | %MW4 | | True | True | True | | |
| | Push MA | Bool | %I124.0 | | True | True | True | | |
| | Push MB | Bool | %I124.1 | | True | True | True | | |
| | Push MC | Bool | %I124.2 | | True | True | True | | |
| | Start | Bool | %I124.3 | | True | True | True | | |
| | Ready | Bool | %M6.0 | | True | True | True | | |
| | CA | Counter | %C0 | | True | True | True | | |
| | Counter A Value | Int | %MW8 | | True | True | True | | |
| | Tick 400 ms | Bool | %M5.2 | | True | True | True | | |
| | S1 | Bool | %M6.1 | | True | True | True | | |
| | Pause | Bool | %I124.4 | | True | True | True | | |
| | Counter B Value | Int | %MW10 | | True | True | True | | |
| | CB | Counter | %C1 | | True | True | True | | |
| | S2 | Bool | %M6.2 | | True | True | True | | |
| | S3 | Bool | %M6.3 | | True | True | True | | |
| | Mem Valv A | Bool | %M6.4 | | True | True | True | | |
| | Mem Valv B | Bool | %M6.5 | | True | True | True | | |
| | Valve A | Bool | %Q124.0 | | True | True | True | | |
| | Valve B | Bool | %Q124.1 | | True | True | True | | |
| | Valve Out | Bool | %Q124.2 | | True | True | True | | |
| | NewTank | Bool | %I124.5 | | True | True | True | | |
| | Run | Bool | %M6.6 | | True | True | True | | |
| | ACUR_MEAS | Int | %IW256 | | True | True | True | | |
| | Current Value | Real | %MD12 | | True | True | True | | |
| | Code Error | Word | %MW16 | | True | True | True | | |
| | Bipolar | Bool | %M6.7 | | True | True | True | | |
| | AGIT AO | Int | %QW256 | | True | True | True | | |
| | Fake Input | Int | %MW24 | | True | True | True | | |
| | Pulse Out | Int | %MW20 | | True | True | True | | |
| | COut | Counter | %C2 | | True | True | True | | |
| | Counter Reactor | Int | %MW22 | | True | True | True | | |
| | RPM Fake | Real | %MD26 | | True | True | True | | |
| | Tick 100 ms | Bool | %M5.0 | | True | True | True | | |
| | Timer Count | Int | %MW30 | | True | True | True | | |
| | S4 | Bool | %M7.2 | | True | True | True | | |
| | S5 | Bool | %M7.3 | | True | True | True | | |
| | 10MinDone | Bool | %M7.4 | | True | True | True | | |
| | 40MinDone | Bool | %M7.5 | | True | True | True | | |
| | SlowingRPM | Int | %MW32 | | True | True | True | | |
| | Counter Out | Int | %MW18 | | True | True | True | | |
| | Reset | Bool | %M7.6 | | True | True | True | | |
| | AGIT ON | Bool | %M7.7 | | True | True | True | | |
| | CURR WARN | Bool | %Q124.3 | | True | True | True | | |
| | CURR ALARM | Bool | %Q124.4 | | True | True | True | | |
| | ManualScaling | Bool | %I124.6 | | True | True | True | | |
| | Manual | Bool | %M34.0 | | True | True | True | | |
| | AutoScaling | Bool | %I124.7 | | True | True | True | | |
| | Switching Input | Int | %MW36 | | True | True | True | | |
| | 16mA | Bool | %I125.0 | | True | True | True | | |
| | 18mA | Bool | %I125.1 | | True | True | True | | |
| | 10mA | Bool | %I125.2 | | True | True | True | | |
| | Selection Available | Bool | %M34.1 | | True | True | True | | |
| | Mix Selected | Bool | %M34.2 | | True | True | True | | |
| | M-MixA | Bool | %M34.3 | | True | True | True | | |

| | Name | Data type | Address | Retain | Accessible from HMI/OPC UA | Writable from HMI/OPC UA | Visible in HMI engineering | Supervision | Comment |
|---|---|---|---|---|---|---|---|---|---|
| | M-MixB | Bool | %M34.4 | | True | True | True | | |
| | M-MixC | Bool | %M34.5 | | True | True | True | | |
| | M-10mA | Bool | %M34.6 | | True | True | True | | |
| | M-16mA | Bool | %M34.7 | | True | True | True | | |
| | M-18mA | Bool | %M35.0 | | True | True | True | | |
| | M-AutoScaling | Bool | %M35.1 | | True | True | True | | |
| | M-ManualScaling | Bool | %M35.2 | | True | True | True | | |
| | M-Start | Bool | %M35.3 | | True | True | True | | |
| | M-Pause | Bool | %M35.4 | | True | True | True | | |
| | M-NewTank | Bool | %M35.5 | | True | True | True | | |
| | M-IngredientA | Int | %MW38 | | True | True | True | | |
| | M-IngredientB | Int | %MW40 | | True | True | True | | |
| | M-A-animation | Int | %MW42 | | True | True | True | | |
| | M-B-animation | Int | %MW44 | | True | True | True | | |
| | M-ReactorFake-Anim | Bool | %M35.6 | | True | True | True | | |
| | M-Motor-Anim | Bool | %M35.7 | | True | True | True | | |
| | M-QA | Int | %MW46 | | True | True | True | | |
| | M-QA-Animation | Int | %MW48 | | True | True | True | | |
| | M-Reactor | Int | %MW50 | | True | True | True | | |
| | M-Reactor-Animation | Int | %MW52 | | True | True | True | | |
| | M-Timer-anim | Int | %MW54 | | True | True | True | | |
| | M-FillingReactor | Int | %MW56 | | True | True | True | | |
| | M-FillReactor-Anim | Int | %MW58 | | True | True | True | | |

# PLC_1 [CPU 312C] / PLC tags / Default tag table [79]

## User constants

| User constants | | | | |
|---|---|---|---|---|
| | Name | Data type | Value | Comment |

# PLC_1 [CPU 312C]

## PLC data types

This folder is empty.

# PLC_1 [CPU 312C] / Watch and force tables

## Force table

| Name | Address | Display format | Force value | Comment |
|---|---|---|---|---|

# PLC_1 [CPU 312C] / PLC supervisions & alarms

## PLC alarms

| PLC alarms |
| --- |
| No entries |

# PLC_1 [CPU 312C] / PLC supervisions & alarms

## User diagnostics alarms

| User diagnostics alarms |
| --- |
| No entries |

# PLC_1 [CPU 312C] / PLC supervisions & alarms

## System alarms

| System alarms |
| --- |
| No entries |

# PLC_1 [CPU 312C]

## PLC alarm text lists

This folder is empty.

# PLC_1 [CPU 312C] / Local modules

## AI 4/AO 2x8BIT_1

| AI 4/AO 2x8BIT_1 | | | | | |
|---|---|---|---|---|---|
| **General** | | | | | |
| **Name** | AI 4/AO 2x8BIT_1 | **Author** | Enrique | **Comment** | |
| **Rack** | 0 | **Slot** | 4 | | |
| **General\Catalog information** | | | | | |
| **Short designation** | AI 4/AO 2x8BIT | **Description** | Analog input/output module AI4/AO2 x U/I 8bits of resolution; accuracy appr. 1%; AI grouping 4; AO-grouping 2; 20-pin front connector | **Article number** | 6ES7 334-0CE01-0AA0 |
| **Firmware version** | | | | | |
| **I/O addresses\Input addresses** | | | | | |
| **Start address** | 256 | **End address** | 263 | **Process image** | None |
| **Interrupt OB number** | 40 | | | | |
| **I/O addresses\Output addresses** | | | | | |
| **Start address** | 256 | **End address** | 259 | **Process image** | None |