

Totally Integrated Automation Portal

Main [OB1]

Main Properties

General

Name	Main	Number	1	Type	OB
Language	LAD	Numbering	Manual		

Information

Title	"Main Program Sweep (Cycle)"	Author		Comment	Example 14.1 Parts Tub Loader with S7-Graph sequence.  Copyright (c) 2022, Dogwood Valley Press, LLC
Family		Version	0.1	User-defined ID	

Name	Data type	Default value
▼ Temp		
OB1_EV_CLASS	Byte	
OB1_SCAN_1	Byte	
OB1_PRIORITY	Byte	
OB1_OB_NUMBR	Byte	
OB1_RESERVED_1	Byte	
OB1_RESERVED_2	Byte	
OB1_PREV_CYCLE	Int	
OB1_MIN_CYCLE	Int	
OB1_MAX_CYCLE	Int	
OB1_DATE_TIME	Date_And_Time	
Constant		

Network 1: Toggle Run\_Trans

Generate pulse to toggle pause for SFC. Positive transition on Run used only when already paused. Negative transition on Run used when not paused.

%M62.0  
"Run"

P

%M61.1  
"Run\_PTrans"

%M62.0  
"Run"

N

%M61.2  
"Run\_NTrans"

%M61.3  
"OP\_Zeroed"

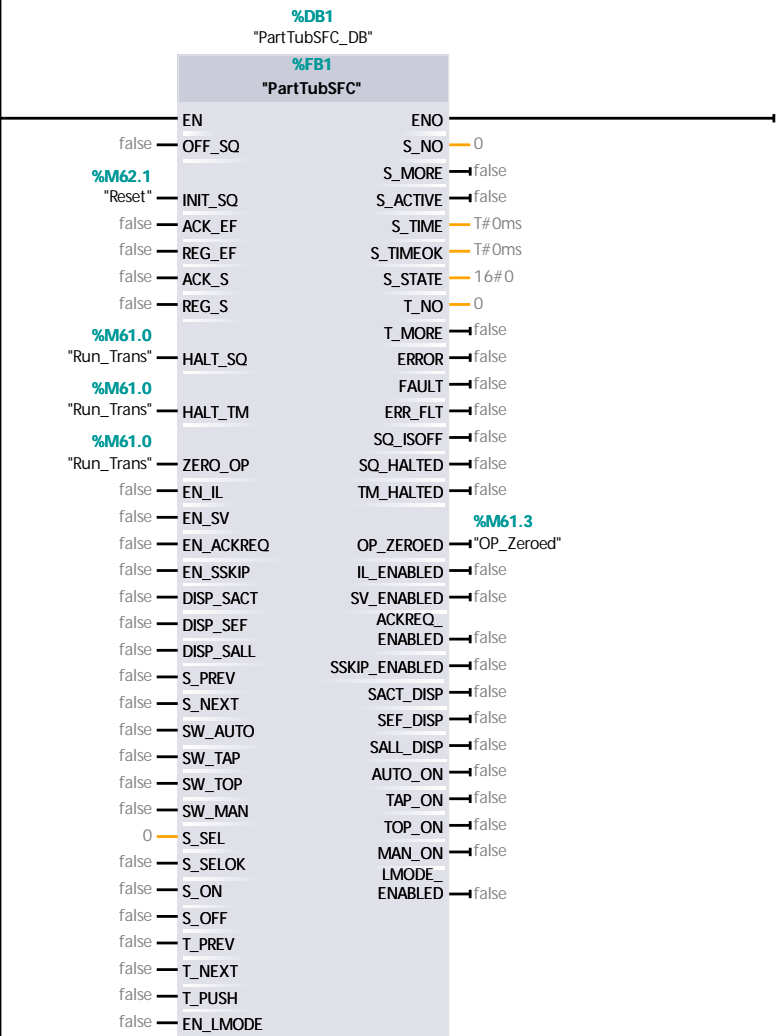
%M61.3  
"OP\_Zeroed"

/

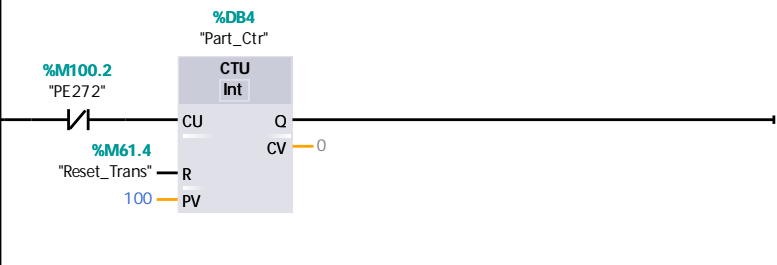
%M61.0  
"Run\_Trans"

)

Network 2: Tub loader SFC



Network 3: Count Parts



Network 4: Reset of S actions

Reset of "S" actions in SFC since initialize of SFC does not do it

Totally Integrated Automation Portal		
<div><div></div><div><div><div>%M62.1 "Reset"</div><div>%M110.2 "GATE1_RET"</div><div>%M110.3 "GATE2_RET"</div></div><div><div></div><div>( R )</div><div></div></div></div></div>		
Network 5: Simulation		
<div><div></div><div><div><div>%DB10 "Simulation_DB"</div><div>%FB10 "Simulation"</div></div><div><div>EN</div><div>ENO</div></div></div><div></div></div>		

## PartTubSFC [FB1]

### PartTubSFC Properties

#### General

<b>Name</b>	PartTubSFC	<b>Number</b>	1	<b>Type</b>	FB
<b>Language</b>	GRAPH	<b>Numbering</b>	Automatic	<b>Network language</b>	LAD
<b>Block version</b>	V2.0				

#### Information

<b>Title</b>		<b>Author</b>		<b>Comment</b>	
<b>Family</b>		<b>Version</b>	0.1	<b>User-defined ID</b>	

Name	Data type	Default value	Retain
▼ Input			
OFF_SQ	Bool	false	Non-retain
INIT_SQ	Bool	false	Non-retain
ACK_EF	Bool	false	Non-retain
REG_EF	Bool	false	Non-retain
ACK_S	Bool	false	Non-retain
REG_S	Bool	false	Non-retain
HALT_SQ	Bool	false	Non-retain
HALT_TM	Bool	false	Non-retain
ZERO_OP	Bool	false	Non-retain
EN_IL	Bool	false	Non-retain
EN_SV	Bool	false	Non-retain
EN_ACKREQ	Bool	false	Non-retain
EN_SSKIP	Bool	false	Non-retain
DISP_SACT	Bool	false	Non-retain
DISP_SEF	Bool	false	Non-retain
DISP_SALL	Bool	false	Non-retain
S_PREV	Bool	false	Non-retain
S_NEXT	Bool	false	Non-retain
SW_AUTO	Bool	false	Non-retain
SW_TAP	Bool	false	Non-retain
SW_TOP	Bool	false	Non-retain
SW_MAN	Bool	false	Non-retain
S_SEL	Int	0	Non-retain
S_SELOK	Bool	false	Non-retain
S_ON	Bool	false	Non-retain
S_OFF	Bool	false	Non-retain
T_PREV	Bool	false	Non-retain
T_NEXT	Bool	false	Non-retain
T_PUSH	Bool	false	Non-retain
EN_LMODE	Bool	false	Non-retain
▼ Output			
S_NO	Int	0	Non-retain
S_MORE	Bool	false	Non-retain
S_ACTIVE	Bool	false	Non-retain

Totally Integrated Automation Portal			
Name	Data type	Default value	Retain
S_TIME	Time	T#0ms	Non-retain
S_TIMEOK	Time	T#0ms	Non-retain
S_STATE	Word	16#0	Non-retain
T_NO	Int	0	Non-retain
T_MORE	Bool	false	Non-retain
ERROR	Bool	false	Non-retain
FAULT	Bool	false	Non-retain
ERR_FLT	Bool	false	Non-retain
SQ_ISOFF	Bool	false	Non-retain
SQ_HALTED	Bool	false	Non-retain
TM_HALTED	Bool	false	Non-retain
OP_ZEROED	Bool	false	Non-retain
IL_ENABLED	Bool	false	Non-retain
SV_ENABLED	Bool	false	Non-retain
ACKREQ_ENABLED	Bool	false	Non-retain
SSKIP_ENABLED	Bool	false	Non-retain
SACT_DISP	Bool	false	Non-retain
SEF_DISP	Bool	false	Non-retain
SALL_DISP	Bool	false	Non-retain
AUTO_ON	Bool	false	Non-retain
TAP_ON	Bool	false	Non-retain
TOP_ON	Bool	false	Non-retain
MAN_ON	Bool	false	Non-retain
LMODE_ENABLED	Bool	false	Non-retain
InOut			
▼ Static			
RT_DATA	G7_RTDataPlus_V2		Non-retain
Start_Trans	G7_Transition-Plus_V2		Non-retain
Initial	G7_StepPlus_V2		Non-retain
Parts_Into_Tub	G7_StepPlus_V2		Non-retain
Open_Gate_1	G7_StepPlus_V2		Non-retain
Wait_Tub_Out	G7_StepPlus_V2		Non-retain
Hold_Gate_1	G7_StepPlus_V2		Non-retain
Close_Gate_1	G7_StepPlus_V2		Non-retain
Open_Gate_2	G7_StepPlus_V2		Non-retain
Wait_Tub_In	G7_StepPlus_V2		Non-retain
Hold_Gate_2	G7_StepPlus_V2		Non-retain
Close_Gate_2	G7_StepPlus_V2		Non-retain
Part_Ctr_Trans	G7_Transition-Plus_V2		Non-retain
Opn_G1_Trans	G7_Transition-Plus_V2		Non-retain
Pall_Up_Trans	G7_Transition-Plus_V2		Non-retain
Hld_G1_Trans	G7_Transition-Plus_V2		Non-retain
Cls_G1_Trans	G7_Transition-Plus_V2		Non-retain

Totally Integrated Automation Portal		
--------------------------------------	--	--

Name	Data type	Default value	Retain
Opn_G2_Trans	G7_Transition-Plus_V2		Non-retain
Tub_In_Trans	G7_Transition-Plus_V2		Non-retain
Hld_G2_Trans	G7_Transition-Plus_V2		Non-retain
Cls_G2_Trans	G7_Transition-Plus_V2		Non-retain
Temp			
Constant			

Alarms

Enable alarms	True
---------------	------

Category	Category enabler	Display class
Error		0
Warning		0
Info		0
Category 4		0
Category 5		0
Category 6		0
Category 7		0
Category 8		0

Category for interlocks	Error	Subcategory 1 for interlocks		Subcategory 2 for interlocks	
-------------------------	-------	------------------------------	--	------------------------------	--

Category for supervisions	Error	Subcategory 1 for supervisions		Subcategory 2 for supervisions	
---------------------------	-------	--------------------------------	--	--------------------------------	--

Category for GRAPH warnings	Warning	Subcategory 1 for GRAPH warnings		Subcategory 2 for GRAPH warnings	
-----------------------------	---------	----------------------------------	--	----------------------------------	--

Permanent pre-instructions

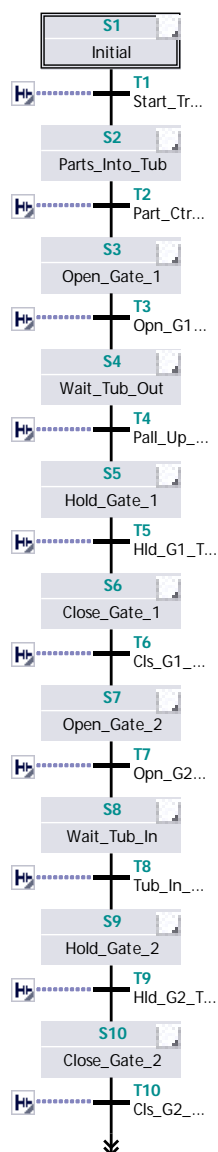
1:

--	--

Sequences (1)

1:

--	--	--



S1 - [Initial step]:Initial

Interlock -(c)-:

Interlock alarm

Alarm text

Interlock

( c )

Supervision -(v)-:

Supervision alarm

Alarm text

Supervision

( v )

Actions:

Actions:

Interlock	Event	Qualifier	Action
-----------	-------	-----------	--------

T1:Start\_Trans

%M62.0

"Run"

S2:Parts\_Into\_Tub

Step comment

Interlock -(c)-:

Interlock alarm

Alarm text	Parts_Into_Tub
------------	----------------

Interlock

( c )

Supervision -(v)-:

Supervision alarm

Alarm text	Parts_Into_Tub
------------	----------------

Supervision

( v )

Actions:

Actions:

Interlock	Event	Qualifier	Action
-----------	-------	-----------	--------

N

"BELT\_RUN"

N

"Tub\_Permissive"

S1

N

"Reset\_Trans"



T2:Part\_Ctr\_Trans



S3:Open\_Gate\_1

Step comment

Interlock -(c)-:

Interlock alarm

Alarm text	Open_Gate_1
------------	-------------

Supervision -(v)-:

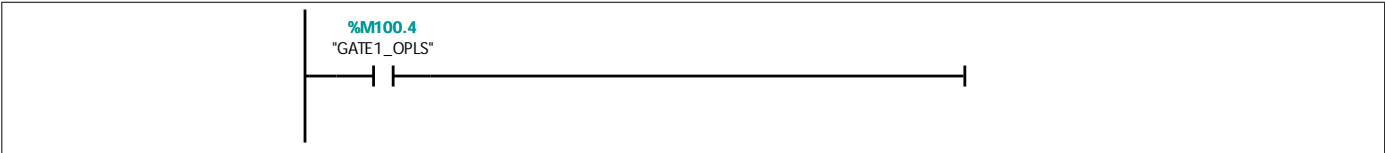
Supervision alarm

Alarm text	Open_Gate_1
------------	-------------

Actions:

Actions:			
Interlock	Event	Qualifier	Action
		S	"GATE1_RET"

T3:Opn\_G1\_Trans



S4:Wait\_Tub\_Out

Step comment

Interlock -(c)-:

Interlock alarm

Alarm text	Wait_Tub_Out
------------	--------------

Totally Integrated Automation Portal		
--------------------------------------	--	--

Interlock  
( c )

Supervision -(v)-:

Supervision alarm

Alarm textWait\_Tub\_Out

Supervision  
( v )

Actions:

Actions:

Interlock	Event	Qualifier	Action
		N	"TROLL_RUN"

T4:Pall\_Up\_Trans

%M100.3  
"TUB\_PROX"

S5:Hold\_Gate\_1

Step comment

Interlock -(c)-:

Interlock alarm

Alarm textHold\_Gate\_1

Interlock  
( c )

Supervision -(v)-:

Supervision alarm

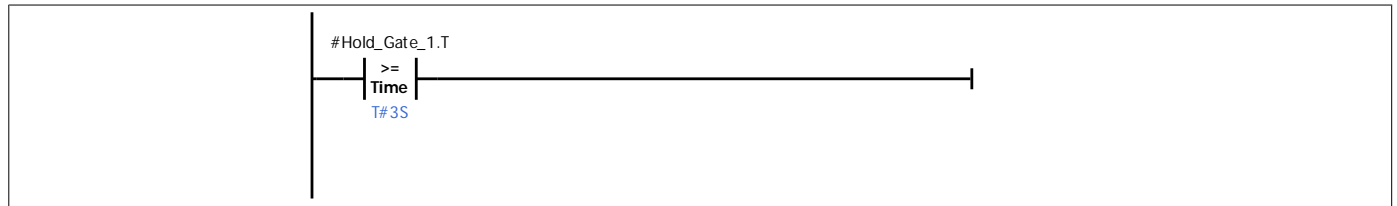
Alarm textHold\_Gate\_1

Supervision  
( v )

--	--	--

**Actions:****Actions:**

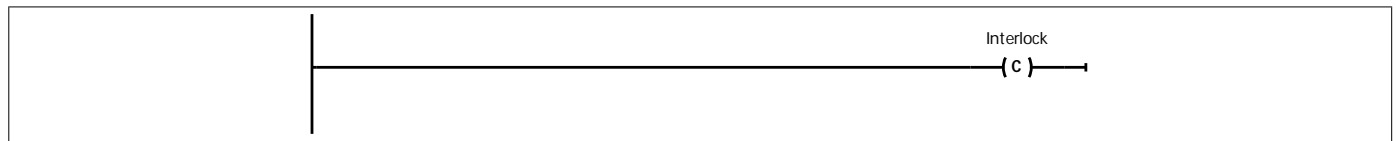
Interlock	Event	Qualifier	Action
		N	"TROLL_RUN"

**T5:Hld\_G1\_Trans****S6:Close\_Gate\_1**

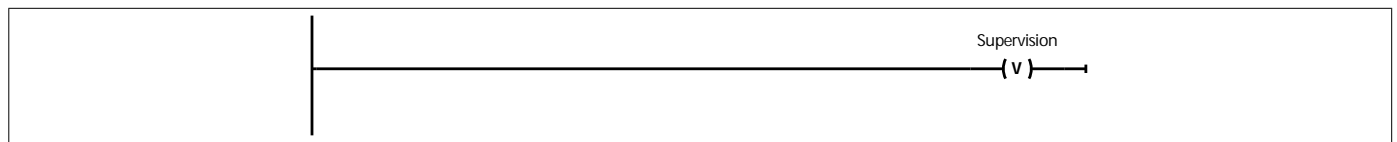
Step comment

**Interlock -(c)-:****Interlock alarm**

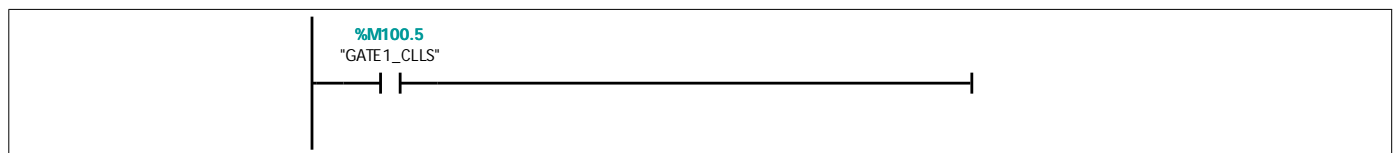
Alarm text	Close_Gate_1
------------	--------------

**Supervision -(v)-:****Supervision alarm**

Alarm text	Close_Gate_1
------------	--------------

**Actions:****Actions:**

Interlock	Event	Qualifier	Action
		R	"GATE1_RET"

**T6:Cls\_G1\_Trans**

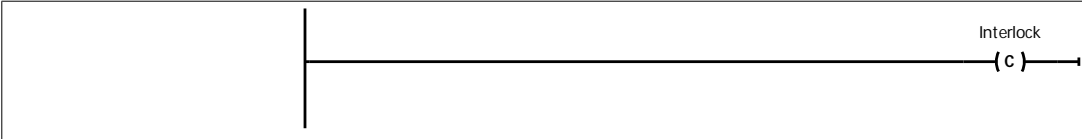
**S7:Open\_Gate\_2**

Step comment

**Interlock -(c)-:**

**Interlock alarm**

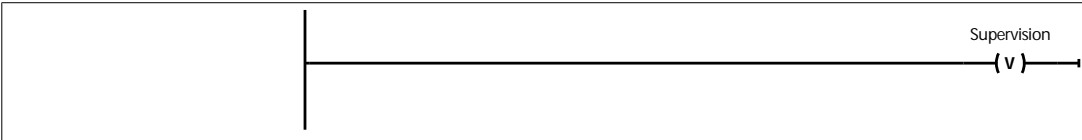
Alarm text Open\_Gate\_2



**Supervision -(v)-:**

**Supervision alarm**

Alarm text Open\_Gate\_2



**Actions:**

**Actions:**

Interlock	Event	Qualifier	Action
		S	"GATE2_RET"

**T7:Opn\_G2\_Trans**



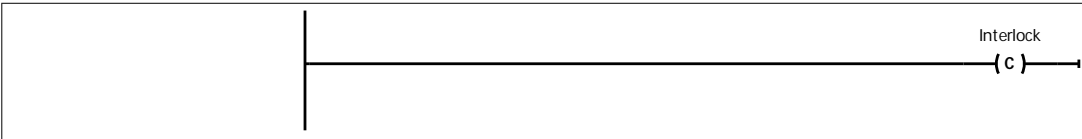
**S8:Wait\_Tub\_In**

Step comment

**Interlock -(c)-:**

**Interlock alarm**

Alarm text Wait\_Tub\_In



**Supervision -(v)-:**

**Supervision alarm**

Alarm text Wait\_Tub\_In

Supervision

( v )

**Actions:**

**Actions:**

Interlock	Event	Qualifier	Action
		N	"TROLL_RUN"

**T8:Tub\_In\_Trans**

%M100.3  
"TUB\_PROX"

**S9:Hold\_Gate\_2**

Step comment

**Interlock -(c)-:**

**Interlock alarm**

Alarm text	Hold_Gate_2
------------	-------------

Interlock

( c )

**Supervision -(v)-:**

**Supervision alarm**

Alarm text	Hold_Gate_2
------------	-------------

Supervision

( v )

**Actions:**

**Actions:**

Interlock	Event	Qualifier	Action
		N	"TROLL_RUN"

Totally Integrated Automation Portal			
T9:Hld_G2_Trans			
	<div>#Hold_Gate_2.T Time T#3S</div>		
S10:Close_Gate_2			
Step comment			
Interlock -(c)-:			
Interlock alarm			
Alarm text		Close_Gate_2	
	<div>Interlock ( c )</div>		
Supervision -(v)-:			
Supervision alarm			
Alarm text		Close_Gate_2	
	<div>Supervision ( v )</div>		
Actions:			
Actions:			
Interlock	Event	Qualifier	Action
		R	"GATE2_RET"
T10:Cls_G2_Trans			
	<div>%M100.7 "GATE2_CLLS"</div>		
Permanent post-instructions			
1:			

# Simulation [FB10]

## Simulation Properties

### General

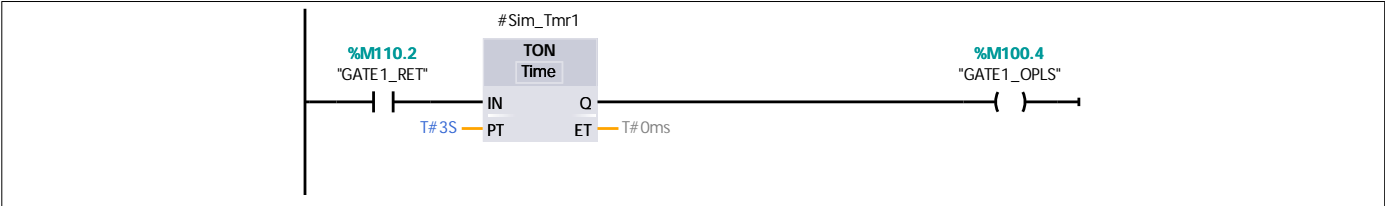
Name	Simulation	Number	10	Type	FB
Language	LAD	Numbering	Manual		

### Information

Title	Simulaton	Author		Comment	
Family		Version	0.1	User-defined ID	

Name	Data type	Default value
Input		
Output		
InOut		
▼ Static		
Sim_Tmr1	TON_TIME	
Sim_Tmr2	TON_TIME	
Sim_Tmr3	TON_TIME	
Sim_Tmr4	TON_TIME	
Sim_Tmr5	TON_TIME	
Sim_Tmr6	TON_TIME	
Sim_Tmr7	TON_TIME	
Temp		
Constant		

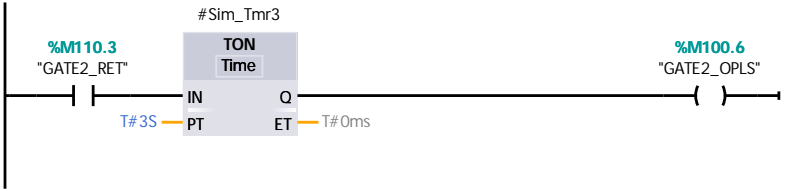
## Network 1: Simulate gate 1 LS's



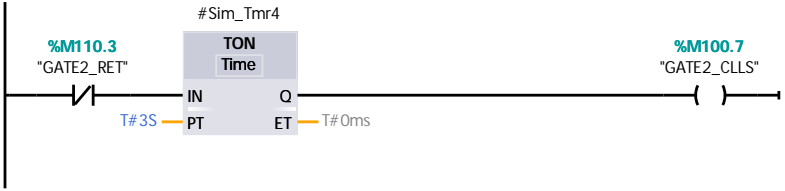
## Network 2:



## Network 3: Simulate gate 2 LS's

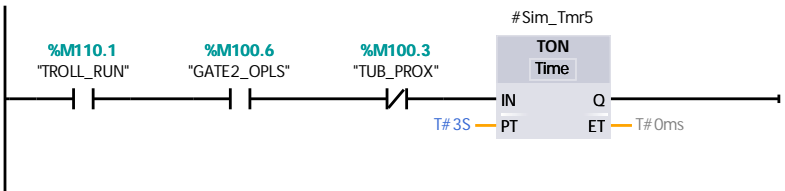


**Network 4:**

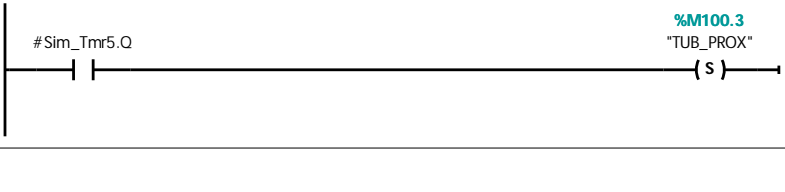


**Network 5: Simulate TUB\_PROX**

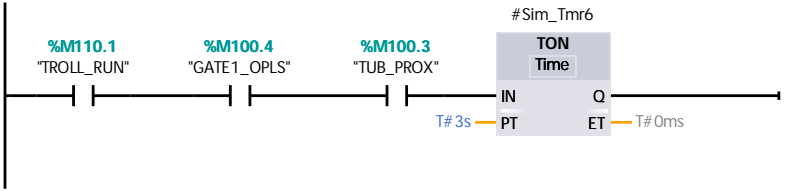
Simulate TUB\_PROX for roller conveyor



**Network 6:**

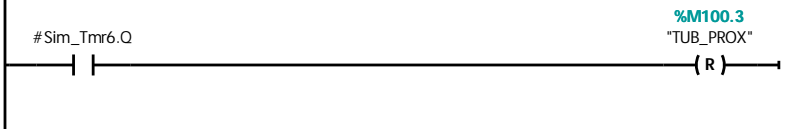


**Network 7:**



**Network 8:**





**Network 9: Simulate PE272**

Simulate PE272 by turning it off every 0.15 seconds

