

Main Properties

General	
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100	General

Name	Main	Number	1	Type	OB
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Language	LAD	Numbering	Manual	
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Information									
1	2	3	4	5	6	7	8	9	10

Title	SP14-3	Author		Comment	
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: SP14-3

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SP14-3 Erbia Can Tipper/Rotator Control Using S7-GRAPH with simulation

Additional internal memory:

Tag Address	
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Run % M5.0 BOOL On while station running

Int_Reset %M5.1 BOOL Internal reset	
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Run_Trans %M61.0 BOOL Run has changed

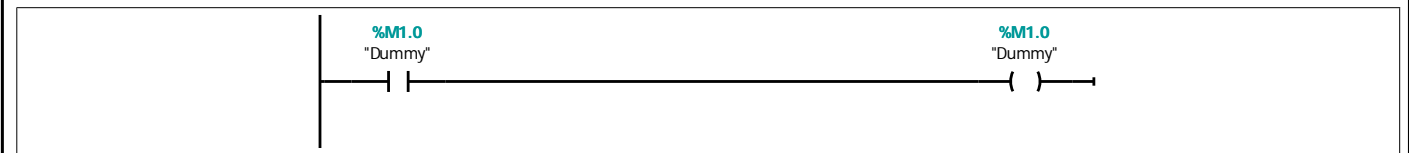
Run_PTrans %M61.1 BOOL Bit for Run neg transition

Run_NTrans %M61.2 BOOL Bit for Run pos transition

OP_Zeroed %M61.3 BOOL Operation paused

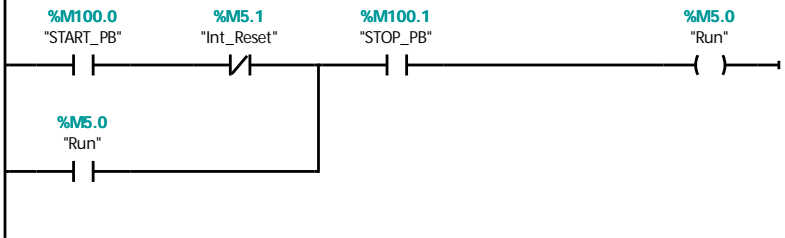
Reset_Trans %M61.4 BOOL Reset_PB transition to start-kick SFC

ResetPB_PTrans %M61.5 BOOL Bit for Reset_PB pos trans



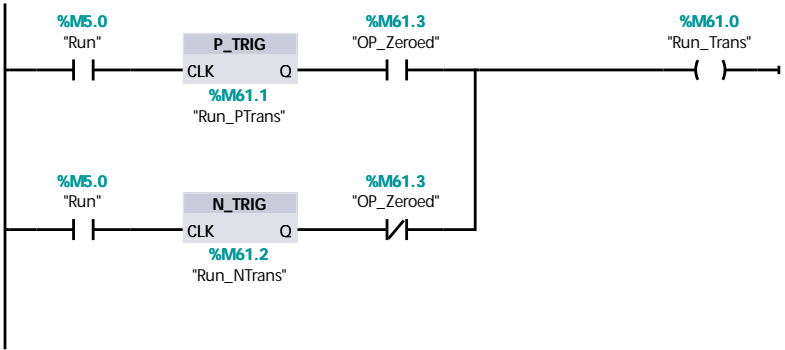
Network 2: Start/stop

During reset prevent start

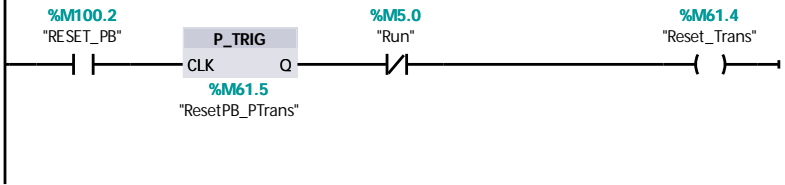


Network 3: Generate pulse to toggle pause for SFC.

Positive transition on Run used only when already paused. Negative transition on Run used when not paused.

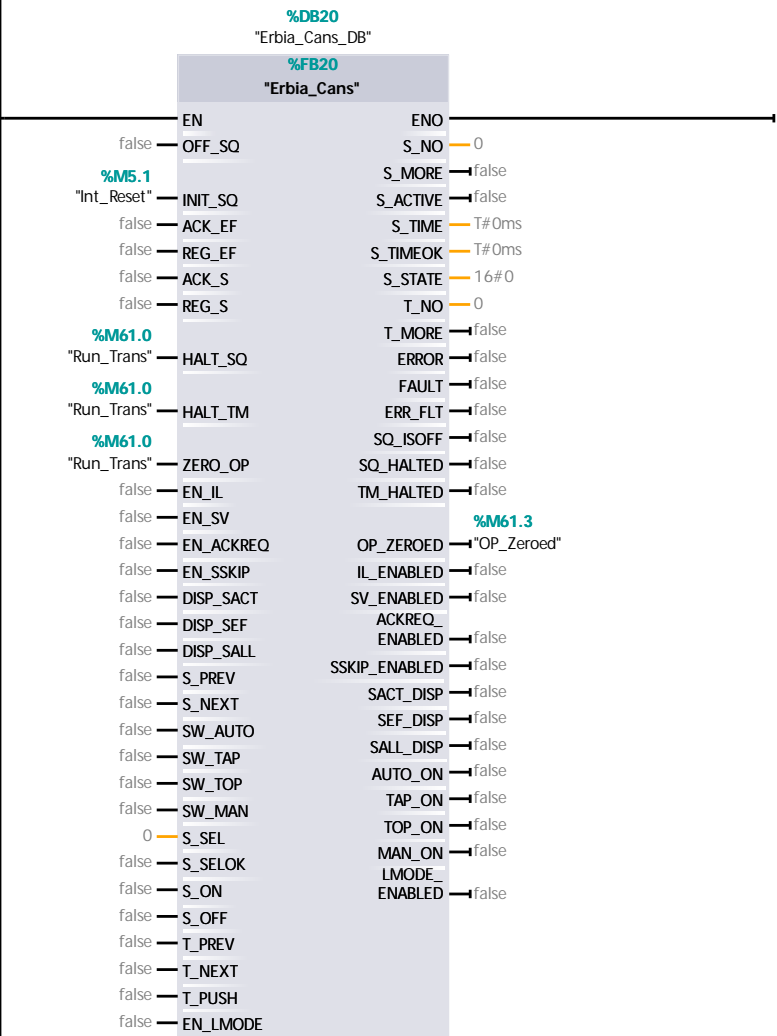


Network 4: Positive transition for reset PB to start reset operation.



Network 5: Erbia Cans blending SFC

Pause timers went paused for Blend step



Network 6:



Network 7: Simulation



Network 8: Copy real inputs to input image if not simulating



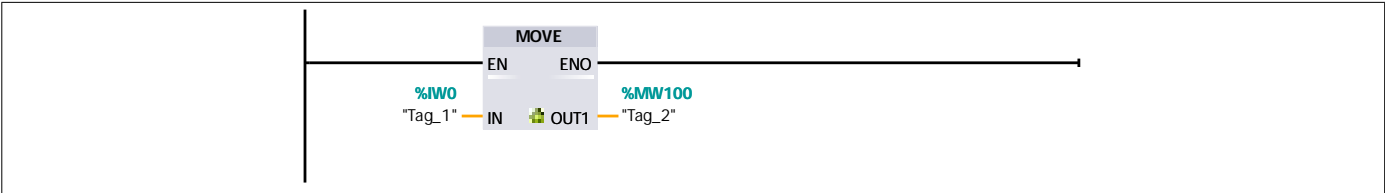
Duplicate_Ins [FC2]

Duplicate_Ins Properties

General					
Name	Duplicate_Ins	Number	2	Type	FC
Language	LAD	Numbering	Manual		
Information					
Title		Author		Comment	
Family		Version	0.1	User-defined ID	

Name	Data type	Default value
Input		
Output		
InOut		
Temp		
Constant		
▼ Return		
Duplicate_Ins	Void	

Network 1:



Erbia_Cans [FB20]

Erbia_Cans Properties

General

Name	Erbia_Cans	Number	20	Type	FB
Language	GRAPH	Numbering	Manual	Network language	LAD
Block version	V2.0				

Information

Title		Author		Comment	
Family		Version	0.1	User-defined ID	

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
Trans1	G7_Transition-Plus_V2		Non-retain
Trans2	G7_Transition-Plus_V2		Non-retain
Trans3	G7_Transition-Plus_V2		Non-retain
Trans4	G7_Transition-Plus_V2		Non-retain
Trans5	G7_Transition-Plus_V2		Non-retain
Trans6	G7_Transition-Plus_V2		Non-retain
Trans7	G7_Transition-Plus_V2		Non-retain
Trans8	G7_Transition-Plus_V2		Non-retain
Trans9	G7_Transition-Plus_V2		Non-retain
Trans10	G7_Transition-Plus_V2		Non-retain
Initial	G7_StepPlus_V2		Non-retain
Wait_For_New_Can	G7_StepPlus_V2		Non-retain
Push_Can_Into_Tipper	G7_StepPlus_V2		Non-retain
Retract_CYL4	G7_StepPlus_V2		Non-retain

Totally Integrated Automation Portal		
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Name	Data type	Default value	Retain
Clamp_Can	G7_StepPlus_V2		Non-retain
Tip_Rotator	G7_StepPlus_V2		Non-retain
Blend	G7_StepPlus_V2		Non-retain
Untip	G7_StepPlus_V2		Non-retain
Unclamp	G7_StepPlus_V2		Non-retain
Push_Out	G7_StepPlus_V2		Non-retain
Temp			
Constant			

Alarms

Enable alarms	True
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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	
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Category for supervisions	Error	Subcategory 1 for supervisions		Subcategory 2 for supervisions	
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Category for GRAPH warnings	Warning	Subcategory 1 for GRAPH warnings		Subcategory 2 for GRAPH warnings	
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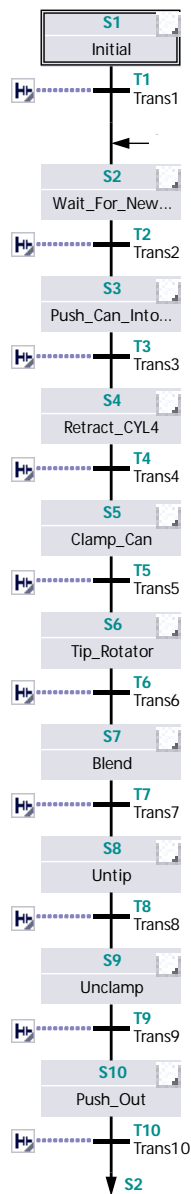
Permanent pre-instructions

1:

Sequences (1)

1:

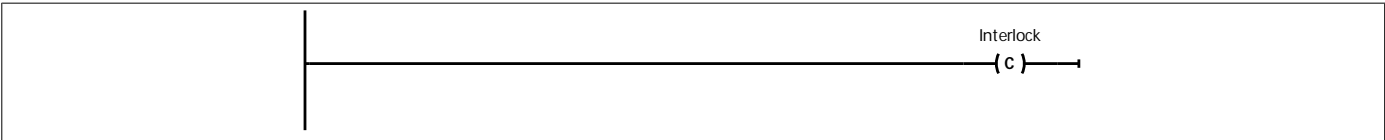
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S1 - [Initial step]:Initial

Interlock -(c)-:

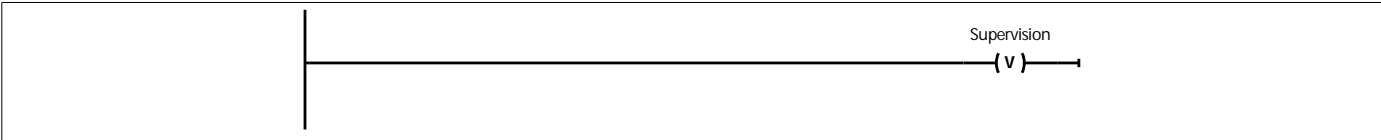
Interlock alarm	
Alarm text	



Supervision -(v)-:

Supervision alarm

Alarm text



Actions:

Actions:

Interlock	Event	Qualifier	Action

T1:Trans1



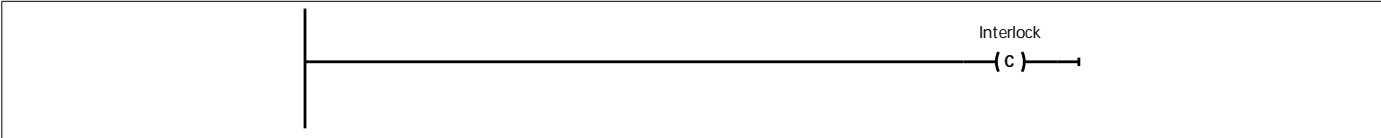
S2:Wait_For_New_Can

Step comment

Interlock -(c)-:

Interlock alarm

Alarm text Wait_For_New_Can



Supervision -(v)-:

Supervision alarm

Alarm text Wait_For_New_Can

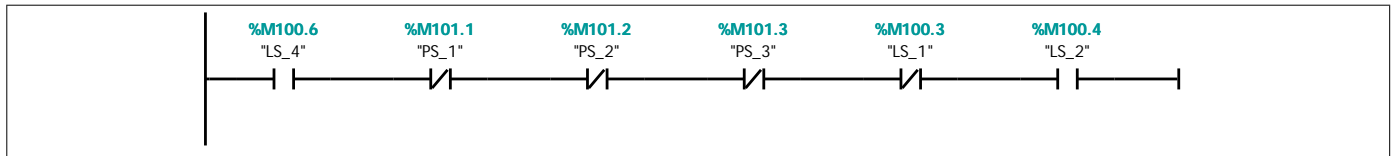


Actions:

Actions:

Interlock	Event	Qualifier	Action

T2:Trans2



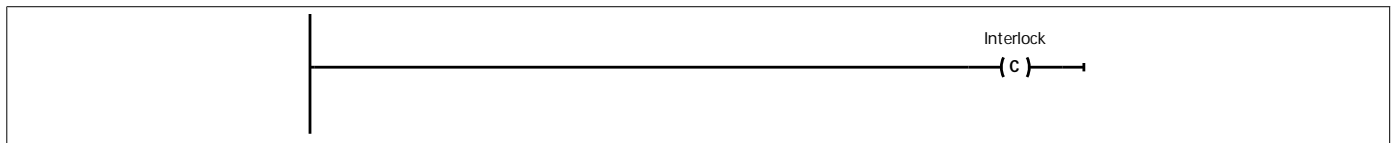
S3:Push_Can_Into_Tipper

Step comment

Interlock -(c)-:

Interlock alarm

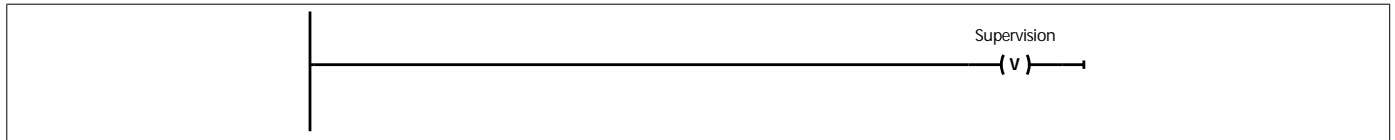
Alarm text Push_Can_Into_Tipper



Supervision -(v)-:

Supervision alarm

Alarm text Push_Can_Into_Tipper

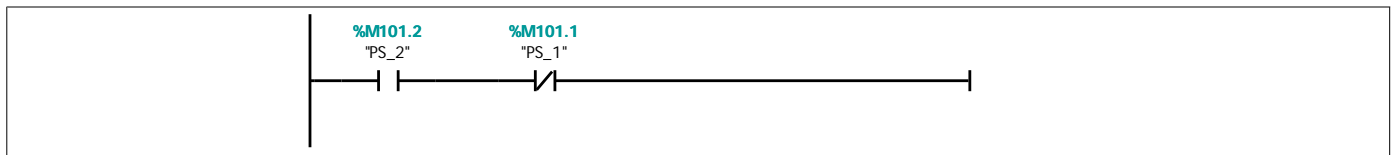


Actions:

Actions:

Interlock	Event	Qualifier	Action
		S	"CYL_3"
		N	"CYL_4"

T3:Trans3



S4:Retract_CYL4

Step comment

Interlock -(c)-:

Interlock alarm

Alarm text Retract_CYL4

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Totally Integrated Automation Portal		
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Interlock
(c)

Supervision -(v)-:

Supervision alarm

Alarm textRetract_CYL4

Supervision
(v)

Actions:

Actions:

Interlock	Event	Qualifier	Action

T4:Trans4

#Retract_CYL4.T

>=

Time

T#2S

S5:Clamp_Can

Step comment

Interlock -(c)-:

Interlock alarm

Alarm textClamp_Can

Interlock
(c)

Supervision -(v)-:

Supervision alarm

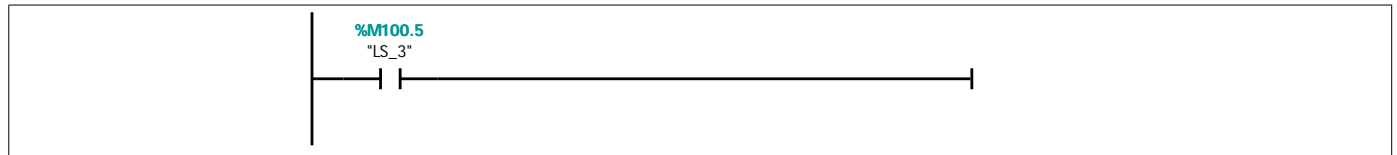
Alarm textClamp_Can

Supervision
(v)

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Actions:**Actions:**

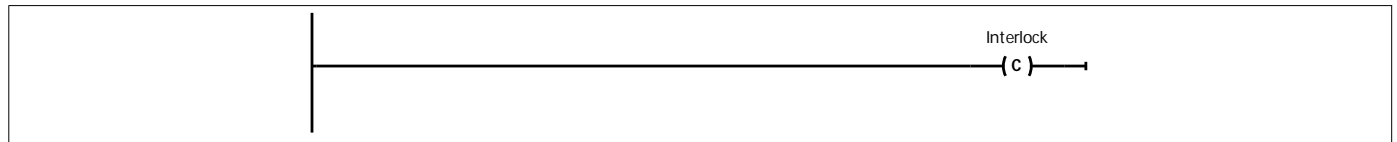
Interlock	Event	Qualifier	Action
		S	"CYL_1"

T5:Trans5**S6:Tip_Rotator**

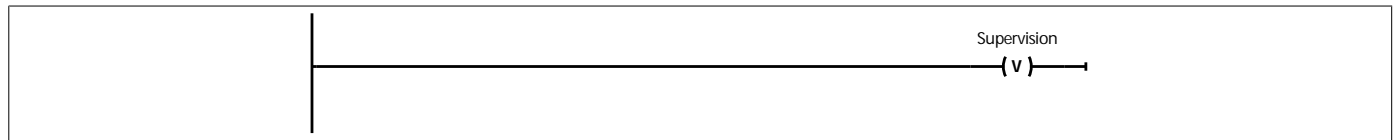
Step comment

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

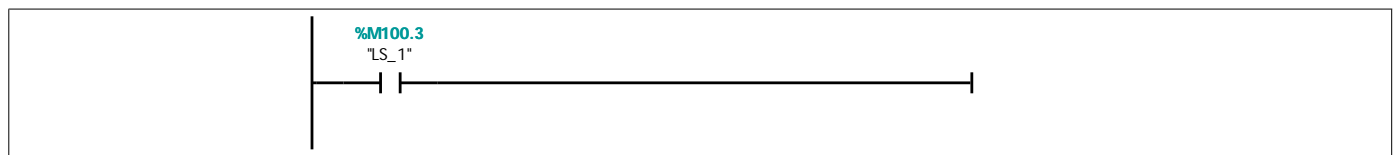
Alarm text	Tip_Rotator
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**Supervision -(v)-:****Supervision alarm**

Alarm text	Tip_Rotator
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**Actions:****Actions:**

Interlock	Event	Qualifier	Action
		S	"CYL_2"

T6:Trans6**S7:Blend**

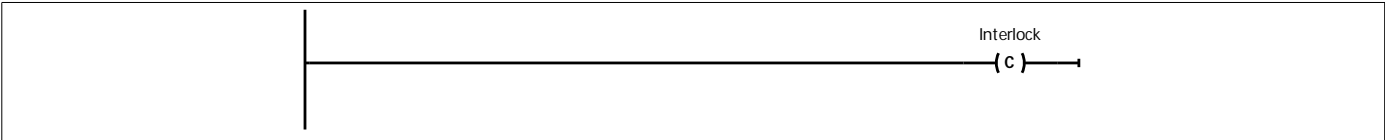
Step comment

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Interlock -(c)-:

Interlock alarm

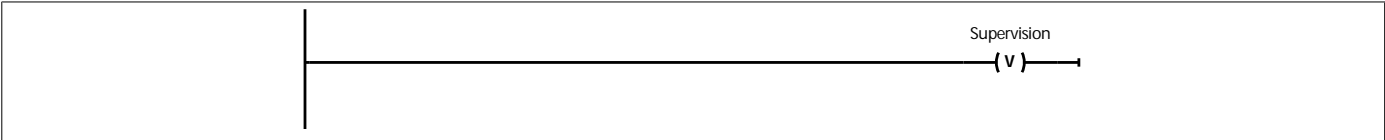
Alarm text Blend



Supervision -(v)-:

Supervision alarm

Alarm text Blend

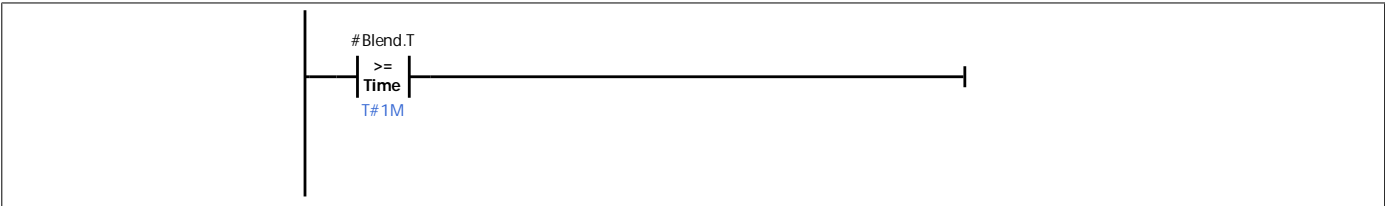


Actions:

Actions:

Interlock	Event	Qualifier	Action
		N	"MOTOR_1"

T7:Trans7



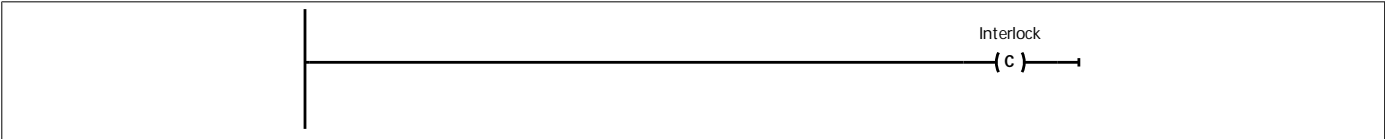
S8:Untip

Step comment

Interlock -(c)-:

Interlock alarm

Alarm text Untip



Supervision -(v)-:

Supervision alarm

Alarm text Untip



Totally Integrated Automation Portal		
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Supervision
(v)

Actions:

Actions:

Interlock	Event	Qualifier	Action
		R	"CYL_2"

T8:Trans8

%M100.7
"LS_5"

S9:Unclamp

Step comment

Interlock -(c)-:

Interlock alarm

Alarm text	Unclamp
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Interlock
(c)

Supervision -(v)-:

Supervision alarm

Alarm text	Unclamp
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Supervision
(v)

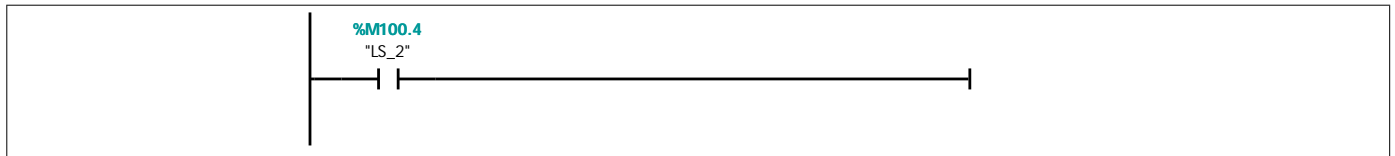
Actions:

Actions:

Interlock	Event	Qualifier	Action
		R	"CYL_1"

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T9:Trans9

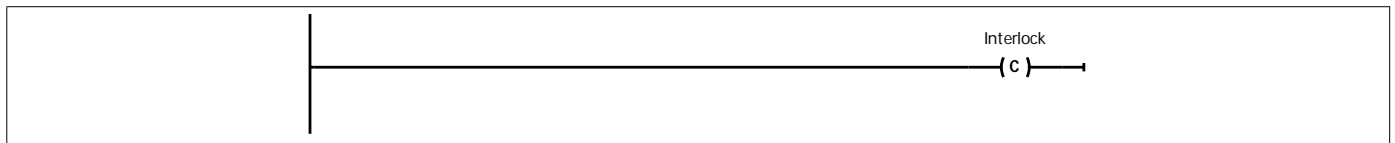


S10:Push_Out

Step comment

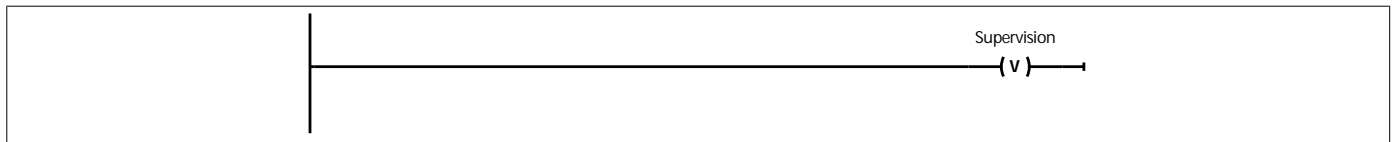
Interlock -(c)-:

Interlock alarm	
Alarm text	Push_Out



Supervision -(v)-:

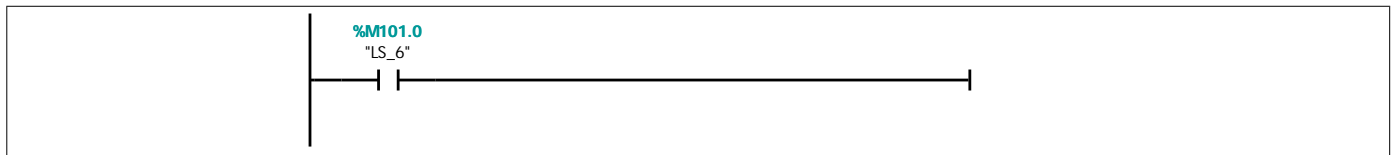
Supervision alarm	
Alarm text	Push_Out



Actions:

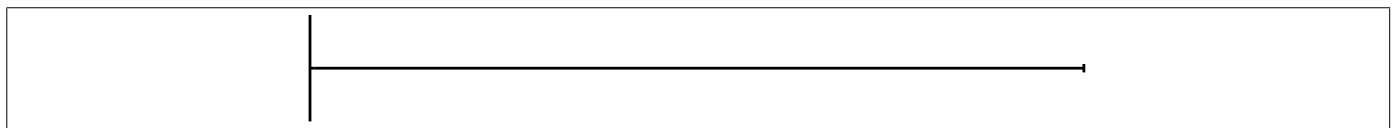
Actions:			
Interlock	Event	Qualifier	Action
		N	"CYL_4"

T10:Trans10



Permanent post-instructions

1:



Erbia_Cans_Reset [FB21]

Erbia_Cans_Reset Properties

General

Name	Erbia_Cans_Reset	Number	21	Type	FB
Language	GRAPH	Numbering	Manual	Network language	LAD
Block version	V2.0				

Information

Title		Author		Comment	
Family		Version	0.1	User-defined ID	

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			
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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
Trans1	G7_Transition-Plus_V2		Non-retain
Trans2	G7_Transition-Plus_V2		Non-retain
Trans3	G7_Transition-Plus_V2		Non-retain
Trans4	G7_Transition-Plus_V2		Non-retain
Trans5	G7_Transition-Plus_V2		Non-retain
Reset_Initial	G7_StepPlus_V2		Non-retain
Reset_Untip	G7_StepPlus_V2		Non-retain
Reset_Unclamp	G7_StepPlus_V2		Non-retain
Reset_Push_Out	G7_StepPlus_V2		Non-retain
Unlatch_Reset	G7_StepPlus_V2		Non-retain
Temp			
Constant			

Alarms

Enable alarms	True
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Category	Category enabler	Display class
Error		0

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Totally Integrated Automation Portal

Category	Category enabler		Display class	
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:

```
graph TD; S1[Reset_Initial] --> T1[Trans1]; T1 --> S2[Reset_Untip]; S2 --> T2[Trans2]; T2 --> S3[Reset_Unclamp]; S3 --> T3[Trans3]; T3 --> S4[Reset_Push_O...]; S4 --> T4[Trans4]; T4 --> S5[Unlatch_Reset]; S5 --> T5[Trans5]; T5 --> S1;
```

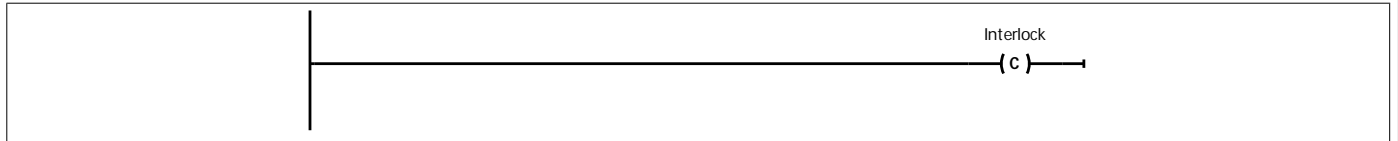
The diagram illustrates a sequence of states and transitions for a reset process. It begins with state S1 (Reset_Initial), which transitions to S2 (Reset_Untip) via T1 (Trans1). From S2, it transitions to S3 (Reset_Unclamp) via T2 (Trans2). S3 transitions to S4 (Reset_Push_O...) via T3 (Trans3). S4 transitions to S5 (Unlatch_Reset) via T4 (Trans4). Finally, S5 transitions back to S1 via T5 (Trans5), completing the cycle. Each transition is marked with a small icon on the left.

S1 - [Initial step]:Reset_Initial

Interlock -(c)-:

Interlock alarm

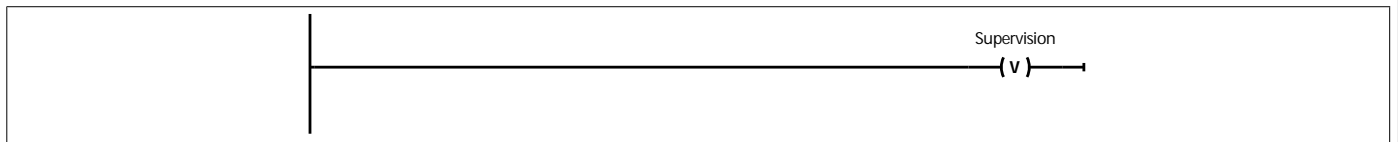
Alarm text



Supervision -(v)-:

Supervision alarm

Alarm text

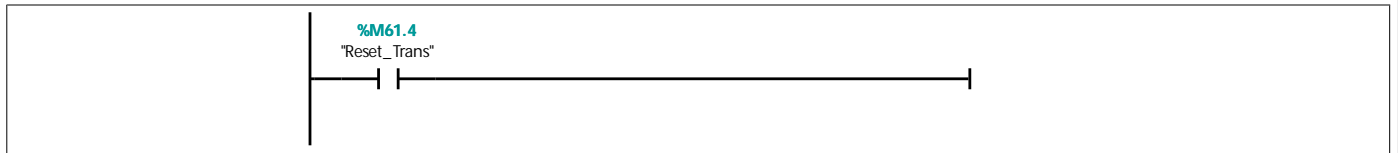


Actions:

Actions:

Interlock	Event	Qualifier	Action

T1:Trans1



S2:Reset_Untip

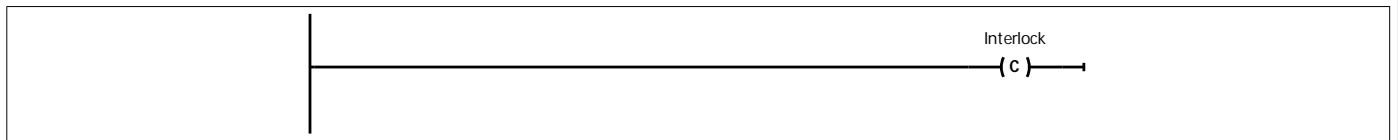
Step comment

Interlock -(c)-:

Interlock alarm

Alarm text

Reset_Untip



Supervision -(v)-:

Supervision alarm

Alarm text

Reset_Untip

Totally Integrated Automation Portal

Supervision
(v)

Actions:

Actions:

Interlock	Event	Qualifier	Action
		S	"CYL_3"
		S	"Int_Reset"
		R	"CYL_2"
		N	"CYL_1"

T2:Trans2

%M100.7
"LS_5"

S3:Reset_Unclamp

Step comment

Interlock -(c)-:

Interlock alarm

Alarm text	Reset_Unclamp
------------	---------------

Interlock
(c)

Supervision -(v)-:

Supervision alarm

Alarm text	Reset_Unclamp
------------	---------------

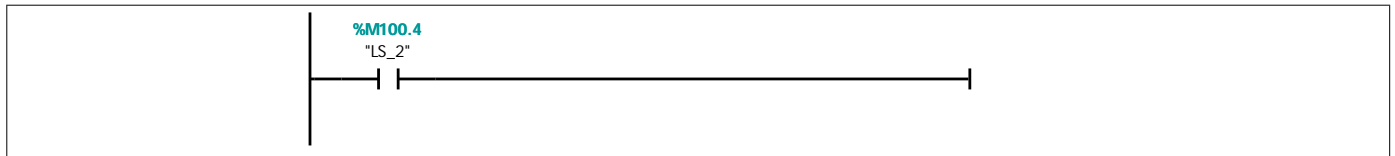
Supervision
(v)

Actions:

Actions:

Interlock	Event	Qualifier	Action

T3:Trans3

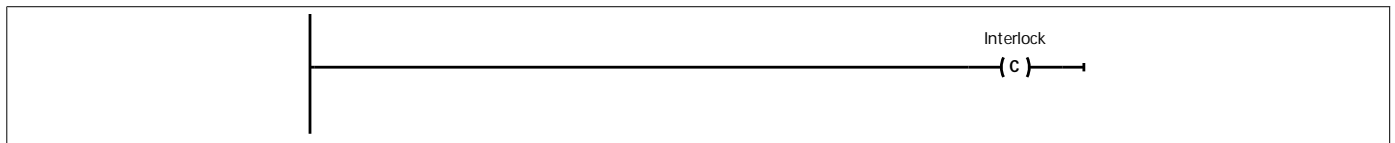


S4:Reset_Push_Out

Step comment

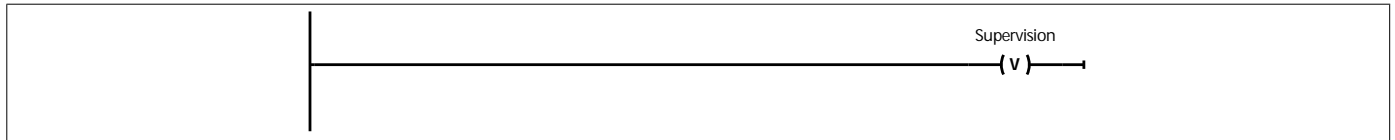
Interlock -(c)-:

Interlock alarm	
Alarm text	Reset_Push_Out



Supervision -(v)-:

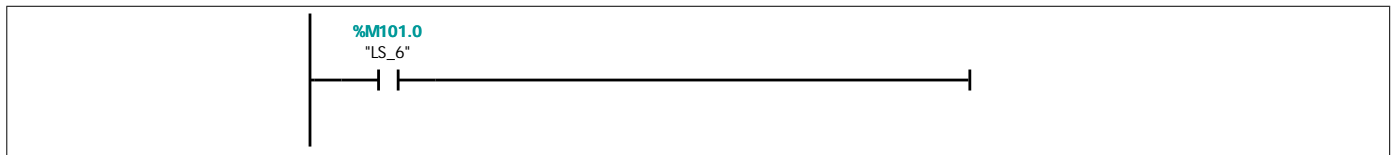
Supervision alarm	
Alarm text	Reset_Push_Out



Actions:

Actions:			
Interlock	Event	Qualifier	Action
		N	"CYL_4"

T4:Trans4



S5:Unlatch_Reset

Step comment

Interlock -(c)-:

Interlock alarm	
Alarm text	Unlatch_Reset

Totally Integrated Automation Portal			
<div><div></div><div>Interlock (c)</div></div>			
Supervision -(v)-:			
Supervision alarm			
Alarm text		Unlatch_Reset	
<div><div></div><div>Supervision (v)</div></div>			
Actions:			
Actions:			
Interlock	Event	Qualifier	Action
		R	"Int_Reset"
		R	"CYL_3"
T5:Trans5			
<div><div></div><div><div>%M100.2 "RESET_PB"</div><div></div></div></div>			
Permanent post-instructions			
1:			
<div><div></div><div></div></div>			

Simulation [FB10]

Simulation Properties

General

Name	Simulation	Number	10	Type	FB
Language	LAD	Numbering	Manual		

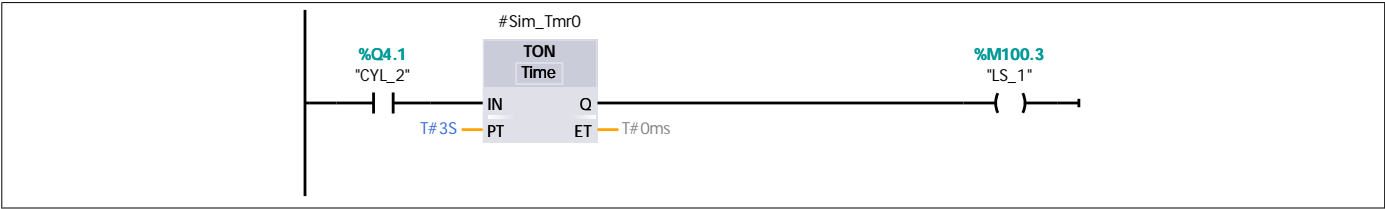
Information

Title	Simulation	Author		Comment	Copyright (c) 2023 Dog-wood Valley Press, LLC SIMULATION LOGIC
Family		Version	0.1	User-defined ID	

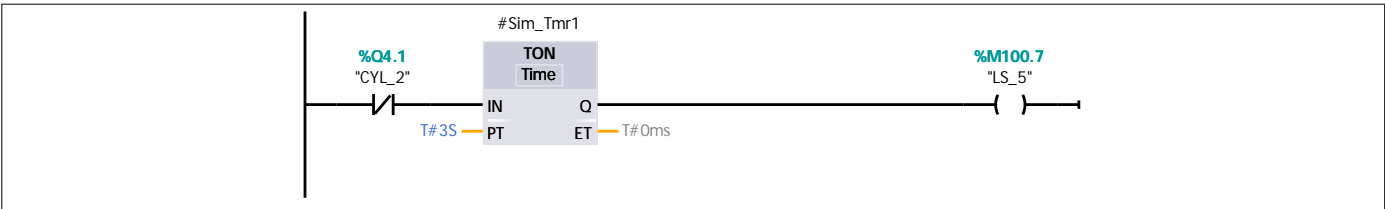
Name	Data type	Default value
Input		
Output		
InOut		
▼ Static		
Sim_Tmr0	TON_TIME	
Sim_Tmr1	TON_TIME	
Sim_Tmr2	TON_TIME	
Sim_Tmr3	TON_TIME	
Sim_Tmr4	TON_TIME	
Sim_Tmr5	TON_TIME	
Sim_Tmr_4_ET	DInt	0
Sim_Tmr_5_IN	Bool	false
Temp		
Constant		

Network 1: Limit switch that closes when feeder ram is retracted.

Horizontal/vertical limit switch simulation: Turn on LS_1 when CYL_2 on for 3 secs. Turn on LS_5 when CYL_2 off for 3 secs.

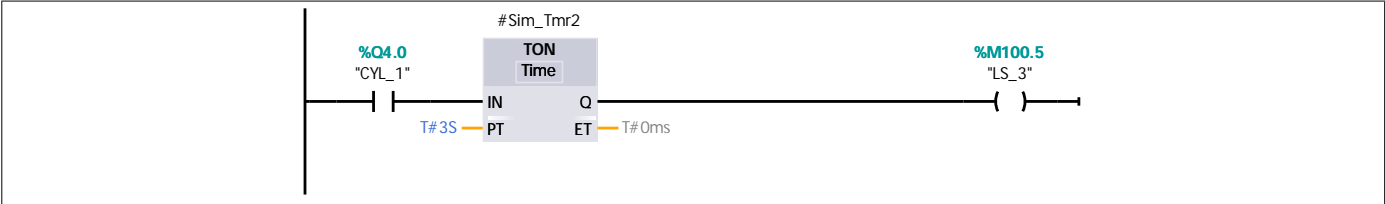


Network 2: Vertical position limit switch



Network 3: Holder clear limit switch

Tieback for clamped can limit switches
Clamped can limit switch simulation: Turn on LS_3 when CYL_1 on for 3 secs.
Turn on LS_2 when CYL_1 off for 3 secs.

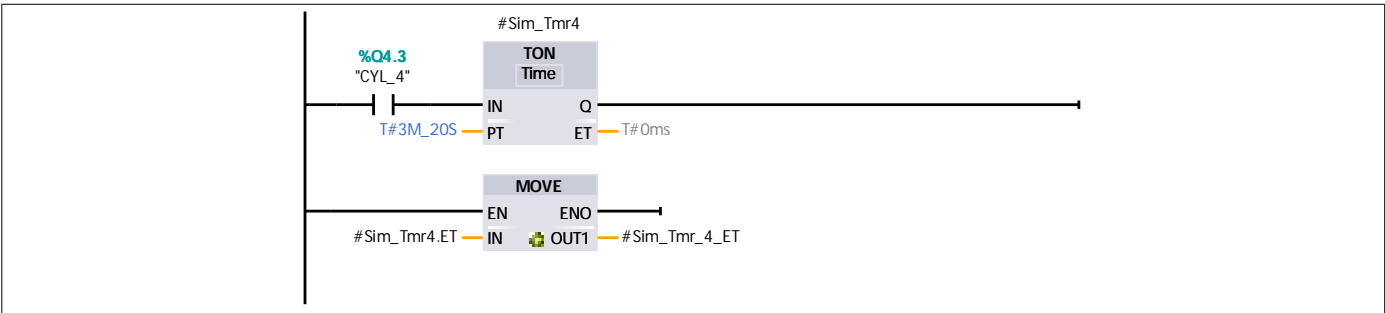


Network 4: Holder clear limit switch

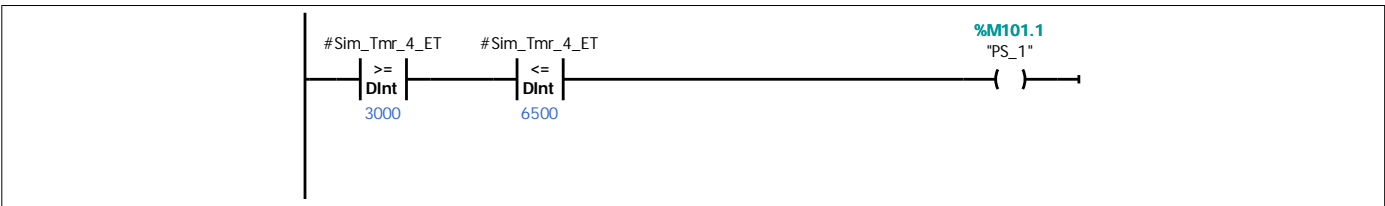


Network 5:

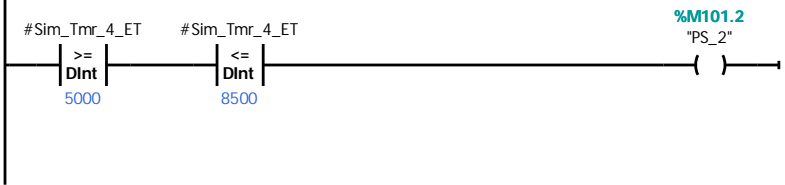
Switches that change because of CYL_4 extension are driven based on time that
CYL_4 control is on.



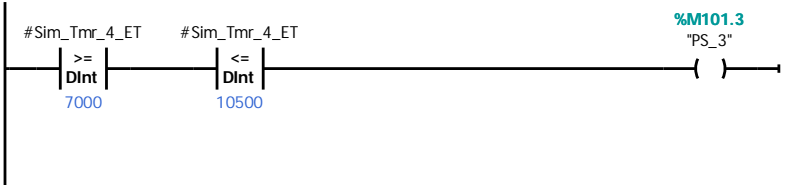
Network 6: Left can photoelectric switch



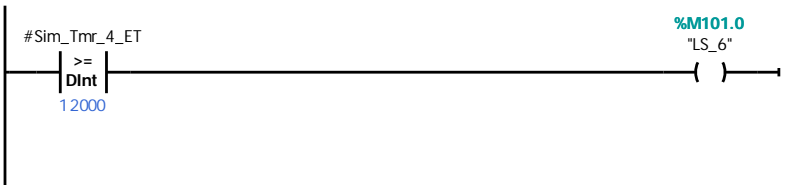
Network 7: Middle can photoelectric switch



Network 8: Right can photoelectric switch



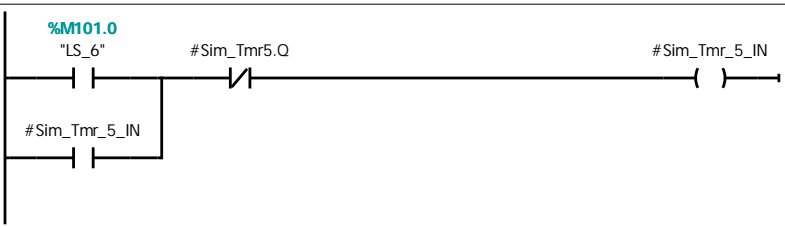
Network 9: Cylinder CYL_4 fully extended limit switch



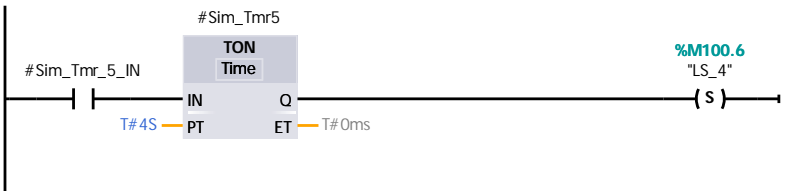
Network 10:

Simulate next one in 4 sec after LS_6 is activated.
Reset 2 seconds after CYL_4 activated.

This will also generate first one in after reset since LS_6 is always activated to push one out.



Network 11: Can present on input conveyor limit switch



Network 12: Can present on input conveyor limit switch

