

Main [OB1]

Main Properties

General

Name	Main	Number	1	Type	OB
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Language	LAD	Numbering	Manual		
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Information

Title	SP14-2	Author		Comment	
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Family		Version	0.1	User-defined ID	
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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: SP14-2

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SP14-2 Case Erector Control Using S7-GRAPH With Simulation

Additional internal memory:

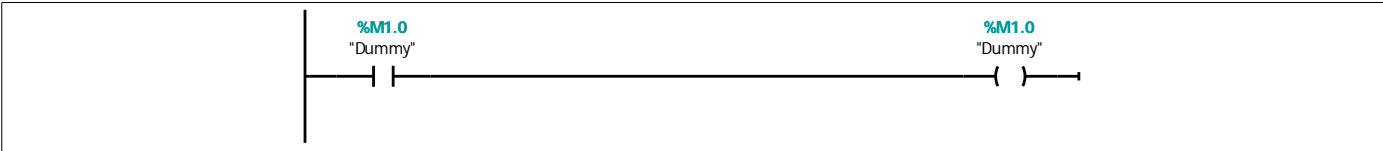
Tag Address

SRun_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

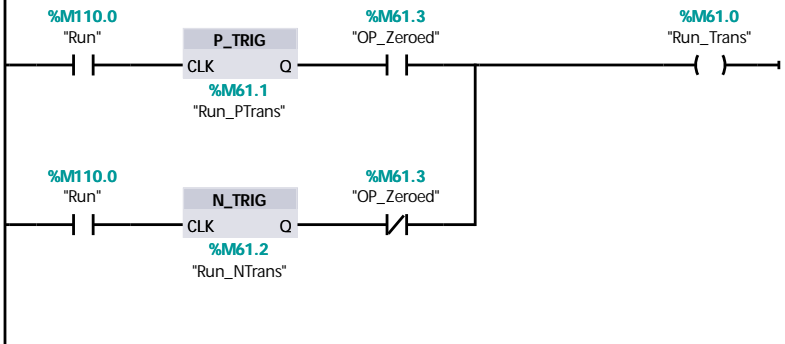
OP_Zeroed %M61.3 BOOL Operation paused



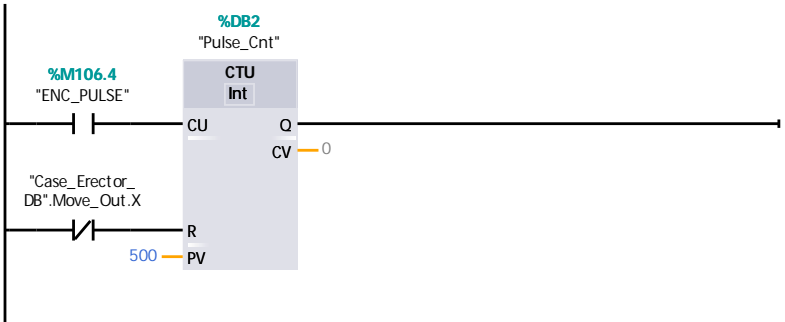
Network 2: Generate pulse to toggle pause for SFC.

Positive transition on Run used only

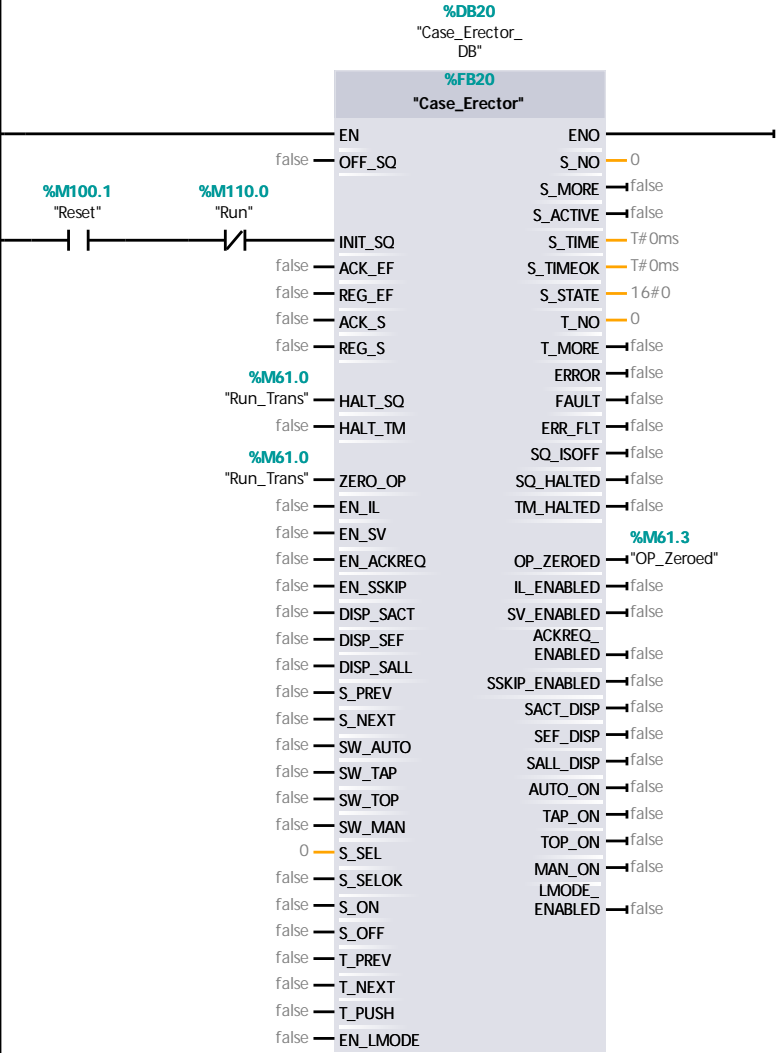
when already paused. Negative transition on Run used when not paused.



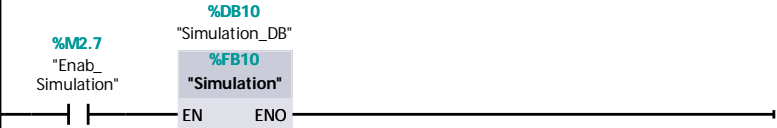
Network 3: Counts encoder pulses



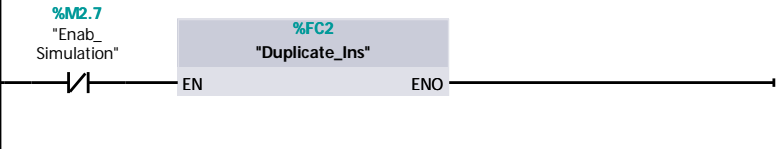
Network 4: Case Erector in S7-GRAPH



Network 5: Simulation



Network 6: Copy real inputs to input image if not simulating



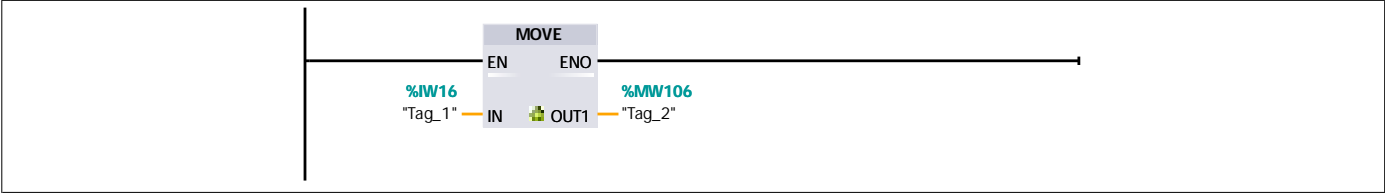
Duplicate_Ins [FC2]

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:



Case_Erector [FB20]

Case_Erector Properties

General

Name	Case_Erector	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
Initial	G7_StepPlus_V2		Non-retain
Move_In	G7_StepPlus_V2		Non-retain
Open_Up	G7_StepPlus_V2		Non-retain
Close_Sides	G7_StepPlus_V2		Non-retain
Close_Bottom	G7_StepPlus_V2		Non-retain
Move_Out	G7_StepPlus_V2		Non-retain
Let_BOT_CYL_Fall	G7_StepPlus_V2		Non-retain
Temp			
Constant			

Totally Integrated Automation Portal		
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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	
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	

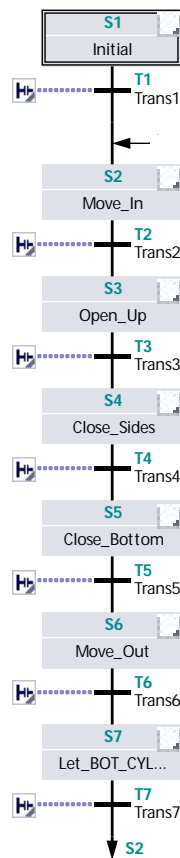
Permanent pre-instructions

1:

Sequences (1)

1:

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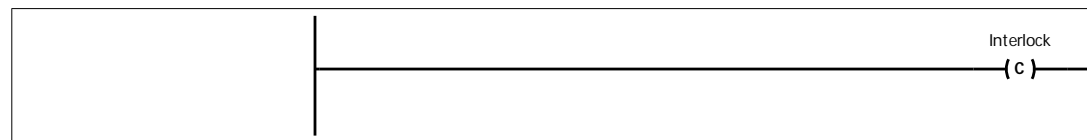


S1 - [Initial step]:Initial

Interlock -(c)-:

Interlock alarm

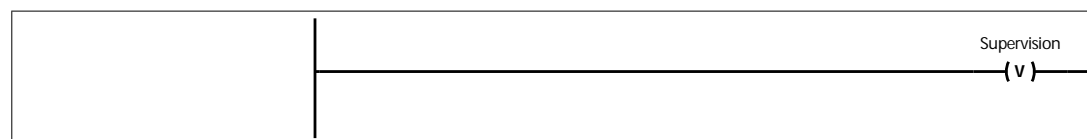
Alarm text



Supervision -(v)-:

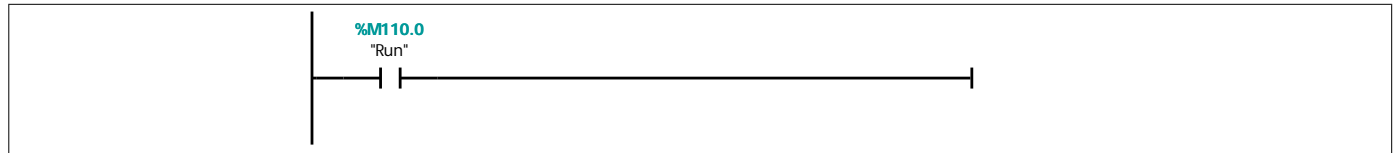
Supervision alarm

Alarm text



Actions:**Actions:**

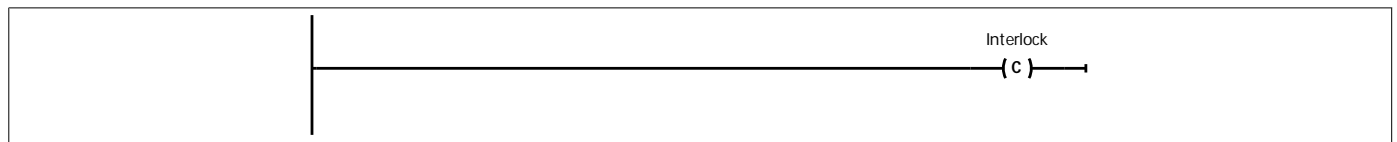
Interlock	Event	Qualifier	Action

T1:Trans1**S2:Move_In**

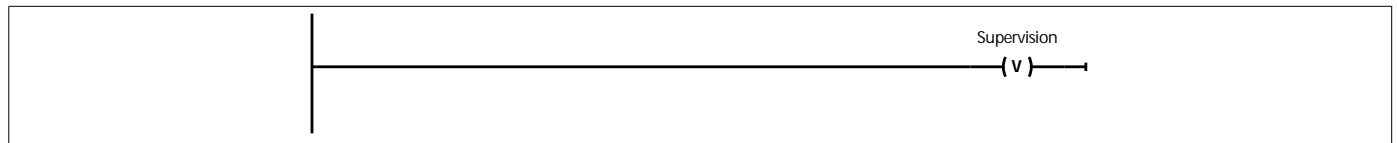
Step comment

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

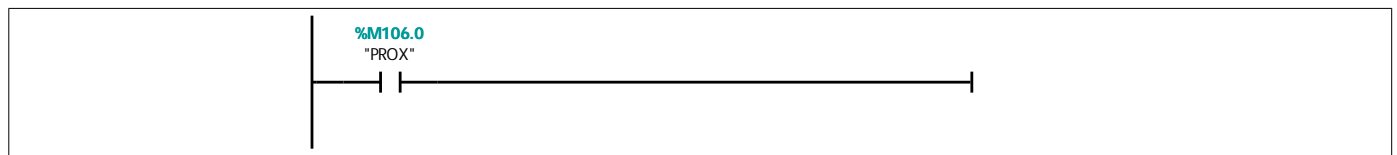
Alarm text	Move_In
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**Supervision -(v)-:****Supervision alarm**

Alarm text	Move_In
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**Actions:****Actions:**

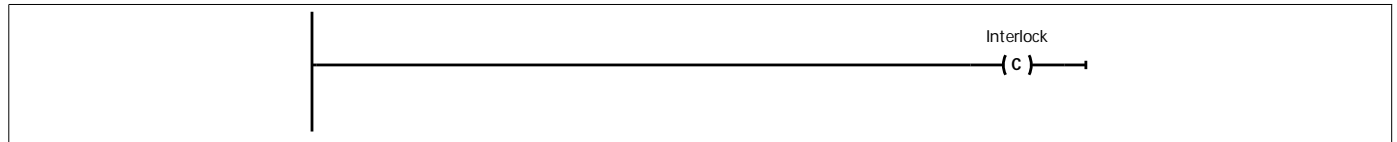
Interlock	Event	Qualifier	Action
		N	"INFEED_MTR"

T2:Trans2**S3:Open_Up**

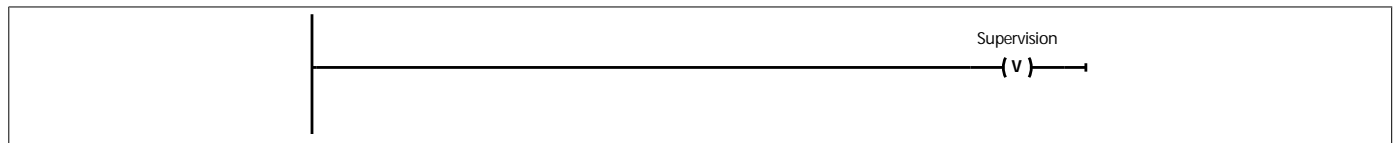
Step comment

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

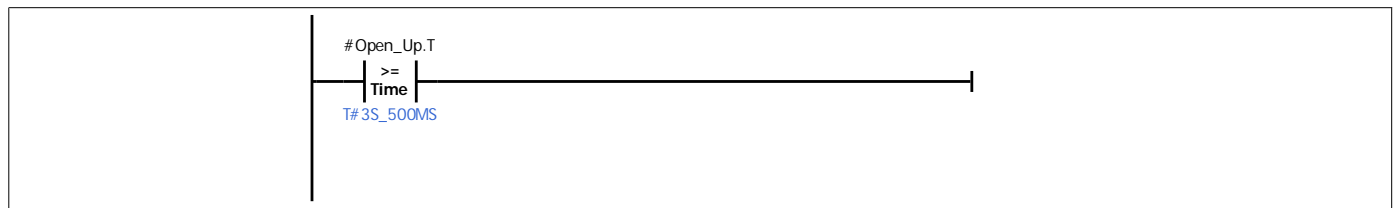
Alarm text Open_Up

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

Alarm text Open_Up

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

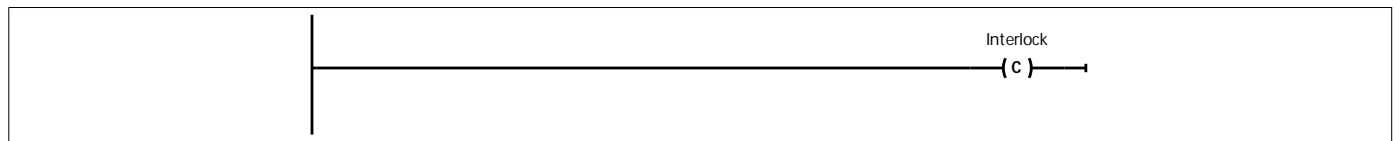
Interlock	Event	Qualifier	Action
		S	"END_CYL"
		S	"GATE1"

T3:Trans3**S4:Close_Sides**

Step comment

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

Alarm text Close_Sides

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

Alarm text Close_Sides

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Supervision

(v)

Actions:

Actions:

Interlock	Event	Qualifier	Action
		S	"LEFT_CYL"
		S	"RIGHT_CYL"

T4:Trans4

%M106.1
"LEFT_LS"

%M106.2
"RIGHT_LS"

S5:Close_Bottom

Step comment

Interlock -(c)-:

Interlock alarm

Alarm text Close_Bottom

Interlock

(c)

Supervision -(v)-:

Supervision alarm

Alarm text Close_Bottom

Supervision

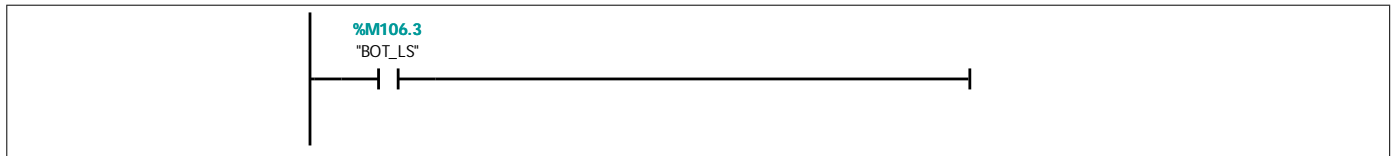
(v)

Actions:

Actions:

Interlock	Event	Qualifier	Action
		R	"END_CYL"
		R	"GATE1"
		S	"BOT_CYL"

T5:Trans5

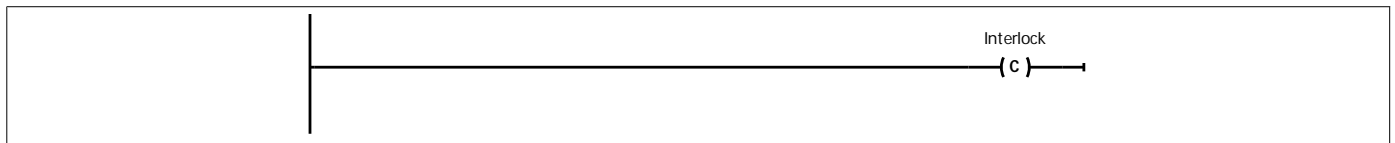


S6:Move_Out

Step comment

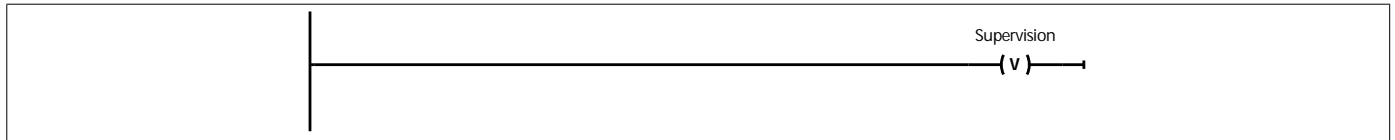
Interlock -(c)-:

Interlock alarm	
Alarm text	Move_Out



Supervision -(v)-:

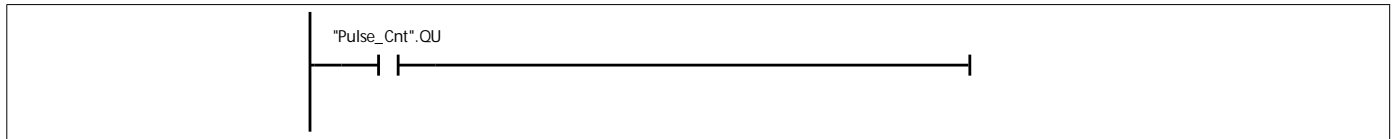
Supervision alarm	
Alarm text	Move_Out



Actions:

Actions:			
Interlock	Event	Qualifier	Action
		R	"LEFT_CYL"
		R	"RIGHT_CYL"
		N	"CHAIN_CONV"

T6:Trans6



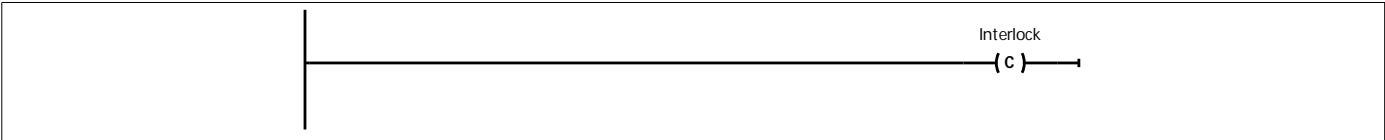
S7:Let_BOT_CYL_Fall

Step comment

Interlock -(c)-:

Interlock alarm

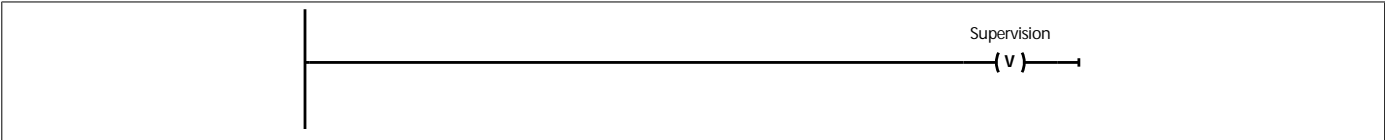
Alarm text Let_BOT_CYL_Fall



Supervision -(v)-:

Supervision alarm

Alarm text Let_BOT_CYL_Fall

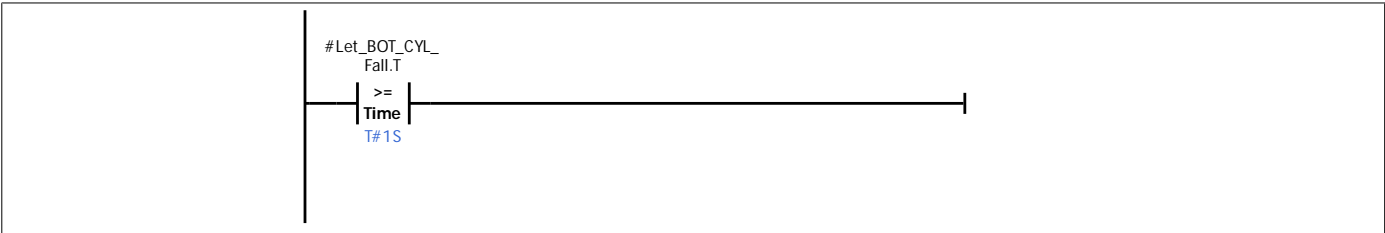


Actions:

Actions:

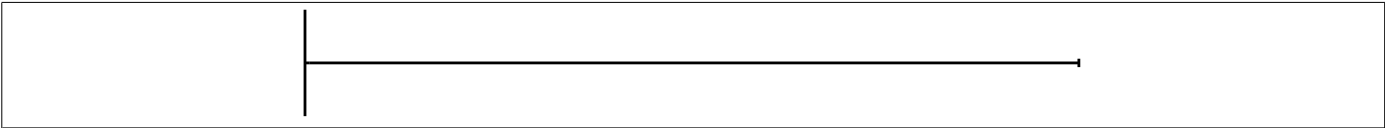
Interlock	Event	Qualifier	Action
		R	"BOT_CYL"

T7:Trans7



Permanent post-instructions

1:



Simulation [FB10]

Simulation Properties

General

Name	Simulation	Number	10	Type	FB
Language	LAD	Numbering	Manual		

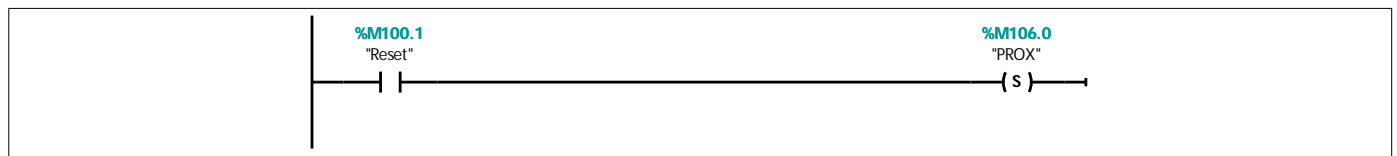
Information

Title	Simulation	Author		Comment	Copyright (c) 2011-2023 Dogwood Valley Press, LLC SIMULATION LOGIC
Family		Version	0.1	User-defined ID	

Name	Data type	Default value
Input		
Output		
InOut		
▼ Static		
Prox_On_Tmr	TON_TIME	
Prox_Off_Tmr	TON_TIME	
Left_Tmr	TON_TIME	
Right_Tmr	TON_TIME	
Bot_Tmr	TON_TIME	
Enc_Tic	TON_TIME	
Temp		
Constant		

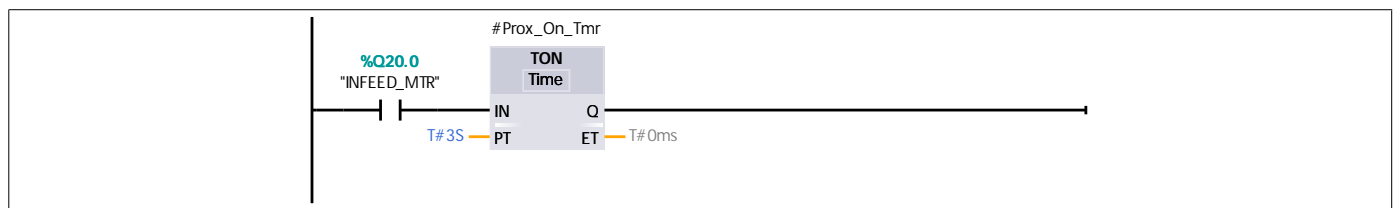
Network 1: Proximity sensor, on when flat carton in position to be erected

On reset, reset PROX

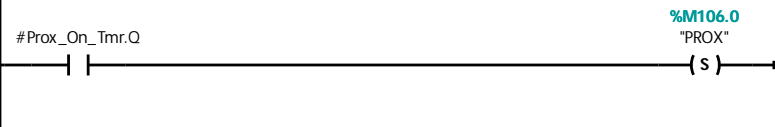


Network 2: Proximity sensor, on when flat carton in position to be erected

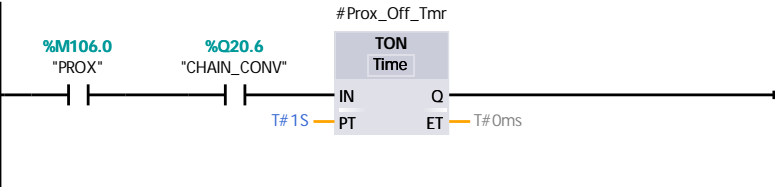
PROX simulation: Set when INFEED running for 3 secs.
Reset when PROX on and CHAIN_CONV runs for one sec



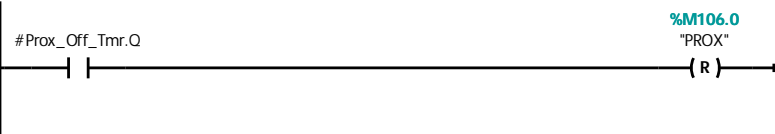
Network 3: Proximity sensor, on when flat carton in position to be erected



Network 4: Proximity sensor, on when flat carton in position to be erected



Network 5: Proximity sensor, on when flat carton in position to be erected

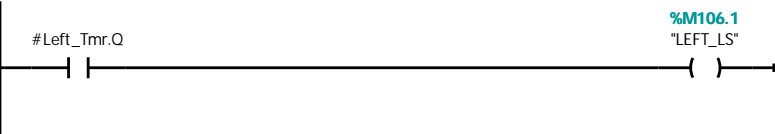


Network 6: Limit switch, on (closed) when left flap is folded in position

LEFT_LS simulation: Turn on when LEFT_CYL on for 3 sec

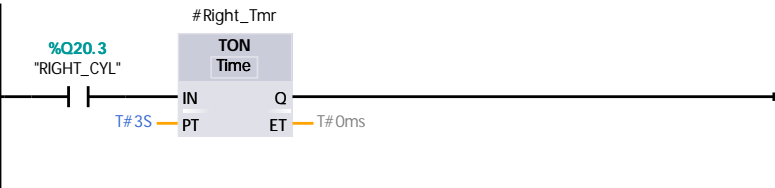


Network 7: Limit switch, on (closed) when left flap is folded in position



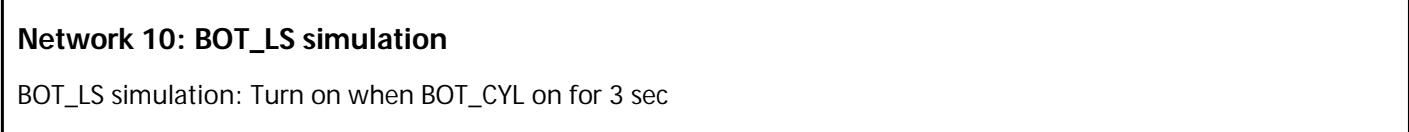
Network 8: Limit switch, on (closed) when right flap is folded in position

RIGHT_LS simulation: Turn on when RIGHT_CYL on for 3 sec



Network 9: Limit switch, on (closed) when right flap is folded in position

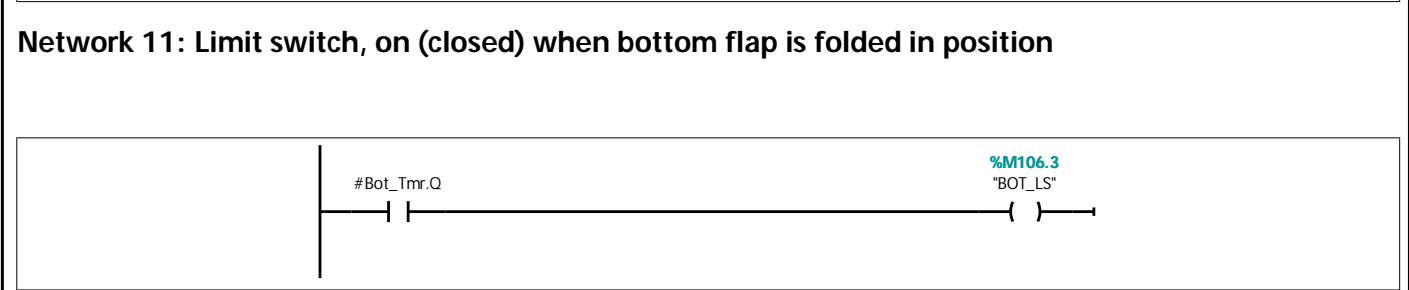
```
graph LR; A["#Right_Tmr.Q"] --- B["(M106.2)"]; B --- C["RIGHT_LS"]
```



Network 10: BOT_LS simulation

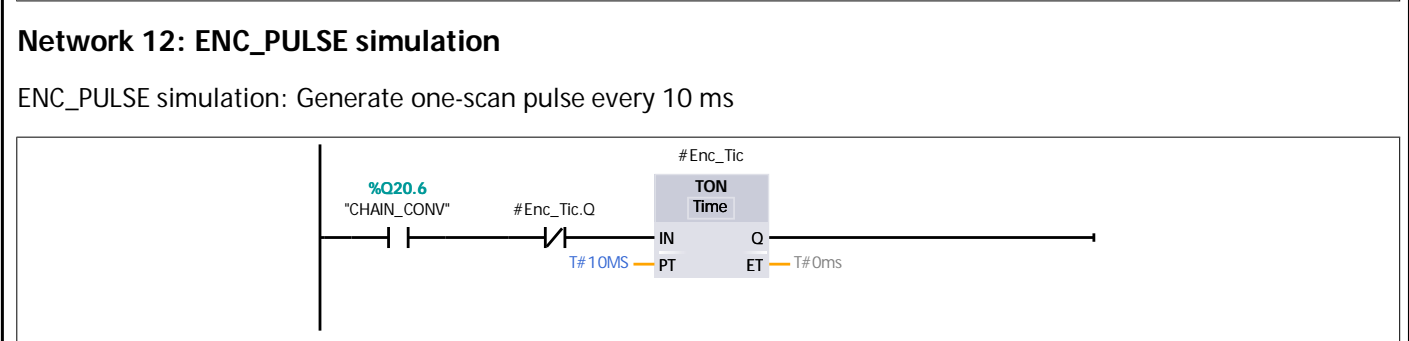
BOT_LS simulation: Turn on when BOT_CYL on for 3 sec

The diagram shows a single rungs of a ladder logic circuit. It begins with a normally open contact (represented by two parallel vertical lines) labeled with the variable `%Q20.4` and the string `"BOT_CVL"`. This contact is connected to the `IN` input of a `TON` (Timer On Delay) block. The block is titled `# Bot_Tmr` and `TON Time`. The `PT` (preset time) input of the block is set to `T# 3S`. The `Q` output of the block is connected to a coil (represented by a short horizontal line) labeled `Q`. The `ET` (elapsed time) output of the block is labeled `T# 0ms`.



Network 11: Limit switch, on (closed) when bottom flap is folded in position

```
graph LR; A["#Bot_Tmr.Q"] --- B["( %M106.3 \"BOT_LS\" )"]
```



Network 12: ENC_PULSE simulation

ENC_PULSE simulation: Generate one-scan pulse every 10 ms

```

graph LR
    Start(( )) --- C1["%Q20.6  
\"CHAIN_CONV\""]
    C1 --- C2["#Enc_Tic.Q"]
    C2 --- TON["TON Time  
# Enc_Tic"]
    TON -- PT --> PT["T#10MS"]
    TON -- Q --> Q["Q  
T#0ms"]
    Q --- End(( ))
  
```

Network 13: Pulses to count for position of chain conveyor used to move erected carton out

The diagram shows two digital signals over time. The first signal, labeled #Enc_Tic.Q, is a single narrow pulse. The second signal, labeled %M106.4 'ENC_PULSE', is a long pulse that starts at the same time as the first pulse and ends much later. The pulse for %M106.4 is colored cyan.

