

# TECHNICAL DOCUMENTATION

## Example 14.2

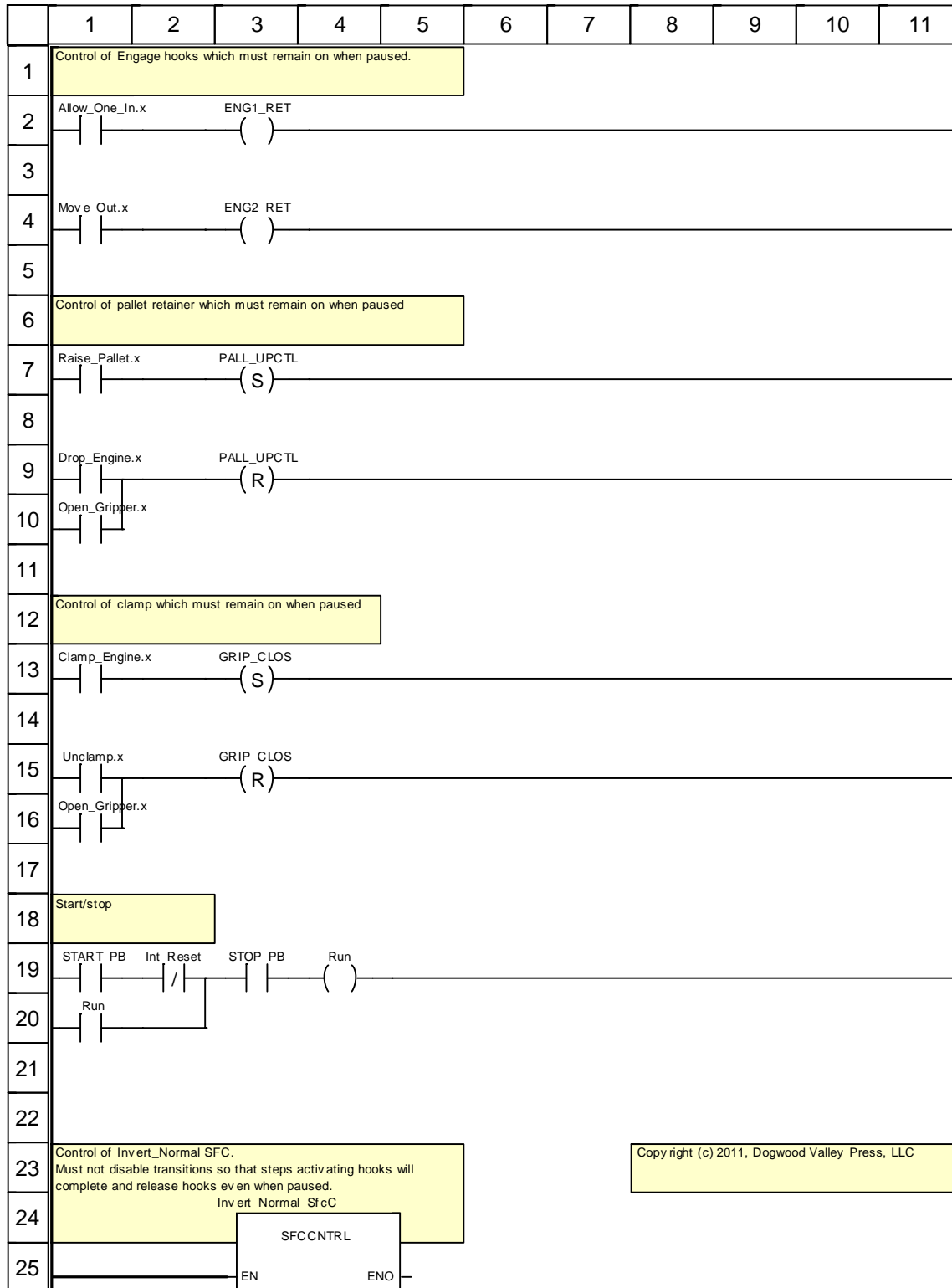
Project	Example 14.2
Designer	
Application	example_14_2.stu
Software Version	ControlExpert V15.0-SP1
Creation Date	12/23/2022 3:13:46 PM
Last Modification Date	6/16/2023 2:21:36 PM
Target PLC	BMX P34 1000 02.00CPU 340-10 Modbus

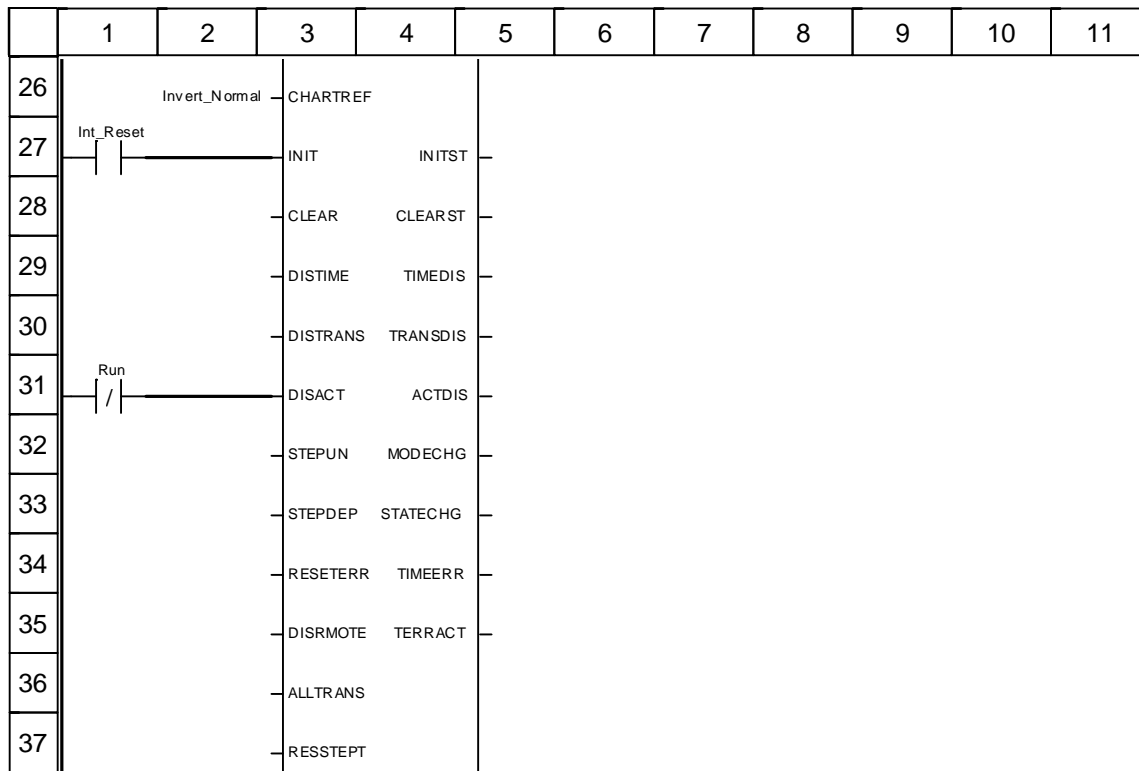
# MAST

**Specific properties**

Configuration	Cyclic
Task period configuration	0
Watchdog time configuration	250

# MainLad : [MAST]





# Invert\_Normal : [MAST]

Comment

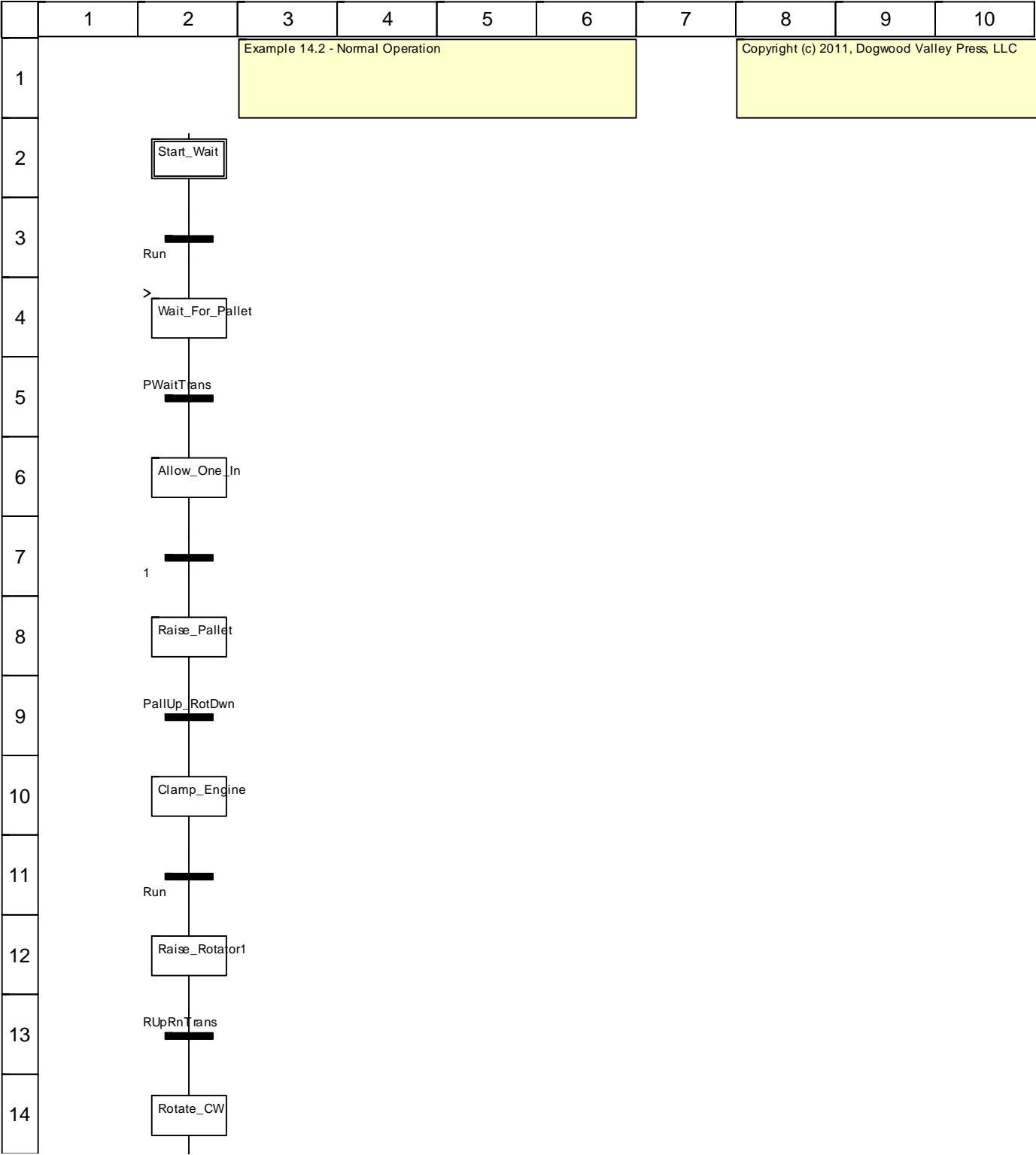
Common properties

Functional module	
Condition name	

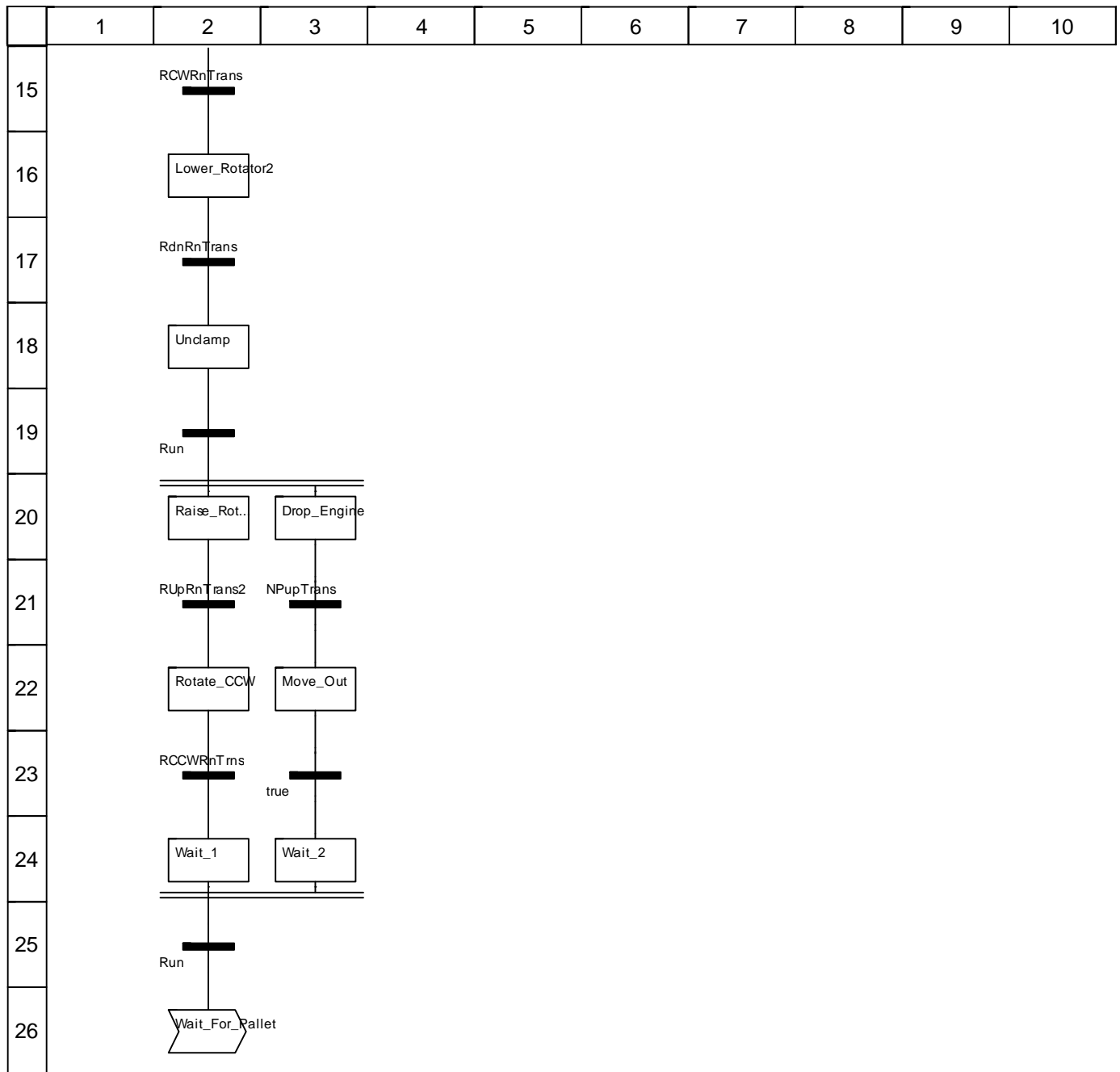
Specific properties

Operator control	No
Area number	0

# Chart : [MAST - Invert\_Normal]



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## Object description

### Steps:

Allow_One_In	(2, 6)
Min./Max. supervision time: T#0s / T#0s	Step delay time: t#2s
Comment:	

Clamp_Engine	(2, 10)
Min./Max. supervision time: T#0s / T#0s	Step delay time: T#1.5s
Comment:	

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	Dept.:		
	Project: Example 14.2		Page: 9/31

Drop_Engine		(3, 20)
Min./Max. supervision time: T#0s / T#0s		Step delay time: T#0s
Comment:		
Lower_Rotator2		(2, 16)
Min./Max. supervision time: T#0s / T#0s		Step delay time: T#0s
Comment:		
Actions:		
Qualifier:	Time: T#0s	Variable: ROTR_DOWN
None		
Move_Out		(3, 22)
Min./Max. supervision time: T#0s / T#0s		Step delay time: T#3s
Comment:		
Raise_Pallet		(2, 8)
Min./Max. supervision time: T#0s / T#0s		Step delay time: T#0s
Comment:		
Actions:		
Qualifier:	Time: T#0s	Variable: ROTR_DOWN
None		
Raise_Rotator1		(2, 12)
Min./Max. supervision time: T#0s / T#0s		Step delay time: T#0s
Comment:		
Actions:		
Qualifier:	Time: T#0s	Variable: ROTR_UP
None		
Raise_Rotator2		(2, 20)
Min./Max. supervision time: T#0s / T#0s		Step delay time: T#0s
Comment:		
Actions:		
Qualifier:	Time: T#0s	Variable: ROTR_UP
None		
Rotate_CCW		(2, 22)
Min./Max. supervision time: T#0s / T#0s		Step delay time: T#0s
Comment:		
Actions:		
Qualifier:	Time: T#0s	Variable: ROTAT_CCW
None		
Rotate_CW		(2, 14)
Min./Max. supervision time: T#0s / T#0s		Step delay time: T#0s
Comment:		
Actions:		
Qualifier:	Time: T#0s	Variable: ROTAT_CW
None		
Start_Wait (Initial Step)		(2, 2)
Min./Max. supervision time: T#0s / T#0s		Step delay time: T#0s
Comment:		
Unclamp		(2, 18)
Min./Max. supervision time: T#0s / T#0s		Step delay time: t#1s
Comment:		

Wait_1	(2, 24)
Min./Max. supervision time: T#0s / T#0s	Step delay time: T#0s
Comment:	

Wait_2	(3, 24)
Min./Max. supervision time: T#0s / T#0s	Step delay time: T#0s
Comment:	

Wait_For_Pallet	(2, 4)
Min./Max. supervision time: T#0s / T#0s	Step delay time: T#0s
Comment:	

## Transitions:

Name	Type of Condition	Position	Comment
1	Constant	(2, 7)	
ST :: NPupTrans	Section	(3, 21)	
IL :: PWaitTrans	Section	(2, 5)	
ST :: PallUp_RotDwn	Section	(2, 9)	
ST :: RCCWRnTrns	Section	(2, 23)	
ST :: RCWRnTrans	Section	(2, 15)	
ST :: RUprnTrans	Section	(2, 13)	
ST :: RUprnTrans2	Section	(2, 21)	
ST :: RdnRnTrans	Section	(2, 17)	
Run	Variable	(2, 3)	
Run	Variable	(2, 11)	
Run	Variable	(2, 19)	
Run	Variable	(2, 25)	
true	Constant	(3, 23)	

## Jumps:

Name	Position	Comment
Wait_For_Pallet	(2, 26)	

# PallUp\_RotDwn <Transition> : [MAST - Invert\_Normal]

120 | 1 | 10 | 20 | 30 | 40 | 50 | 60 | 70 | 80 | 90 | 100 | 110 |

134 |

1    PALL\_UPLS    AND    ROTR\_DNLS    AND    Run

# RUpRnTrans <Transition> : [MAST - Invert\_Normal]

120 | 1 | 10 | 20 | 30 | 40 | 50 | 60 | 70 | 80 | 90 | 100 | 110 |

134 |

1 ROTR\_UPLS AND RUN

# RCWRnTrans <Transition> : [MAST - Invert\_Normal]

120 | 1 | 10 | 20 | 30 | 40 | 50 | 60 | 70 | 80 | 90 | 100 | 110 |  
134 |  
1 ROTR\_CWLS AND Run

# RdnRnTrans <Transition> : [MAST - Invert\_Normal]

120 | 1 | 10 | 20 | 30 | 40 | 50 | 60 | 70 | 80 | 90 | 100 | 110 |  
134 |  
1 ROTR\_DNLS AND Run

# RUpRnTrans2 <Transition> : [MAST - Invert\_Normal]

120 | 1 | 10 | 20 | 30 | 40 | 50 | 60 | 70 | 80 | 90 | 100 | 110 |  
134 |  
1 ROTR\_UPLS AND Run



# RCCWRnTrns <Transition> : [MAST - Invert\_Normal]

120 | 1 | 10 | 20 | 30 | 40 | 50 | 60 | 70 | 80 | 90 | 100 | 110 |  
134 |  
1 ROTR\_CCWLS AND Run

# NPupTrans <Transition> : [MAST - Invert\_Normal]

120 | 1 | 10 | 20 | 30 | 40 | 50 | 60 | 70 | 80 | 90 | 100 | 110 |  
134 |  
1 ( NOT PALL\_UPLS ) AND Run

# PWaitTrans <Transition> : [MAST - Invert\_Normal]

120|1|10|20|30|40|50|60|70|80|90|100|110|

134|

1 LD PROX1

2 AND Run

# Invert\_Reset : [MAST]

Comment

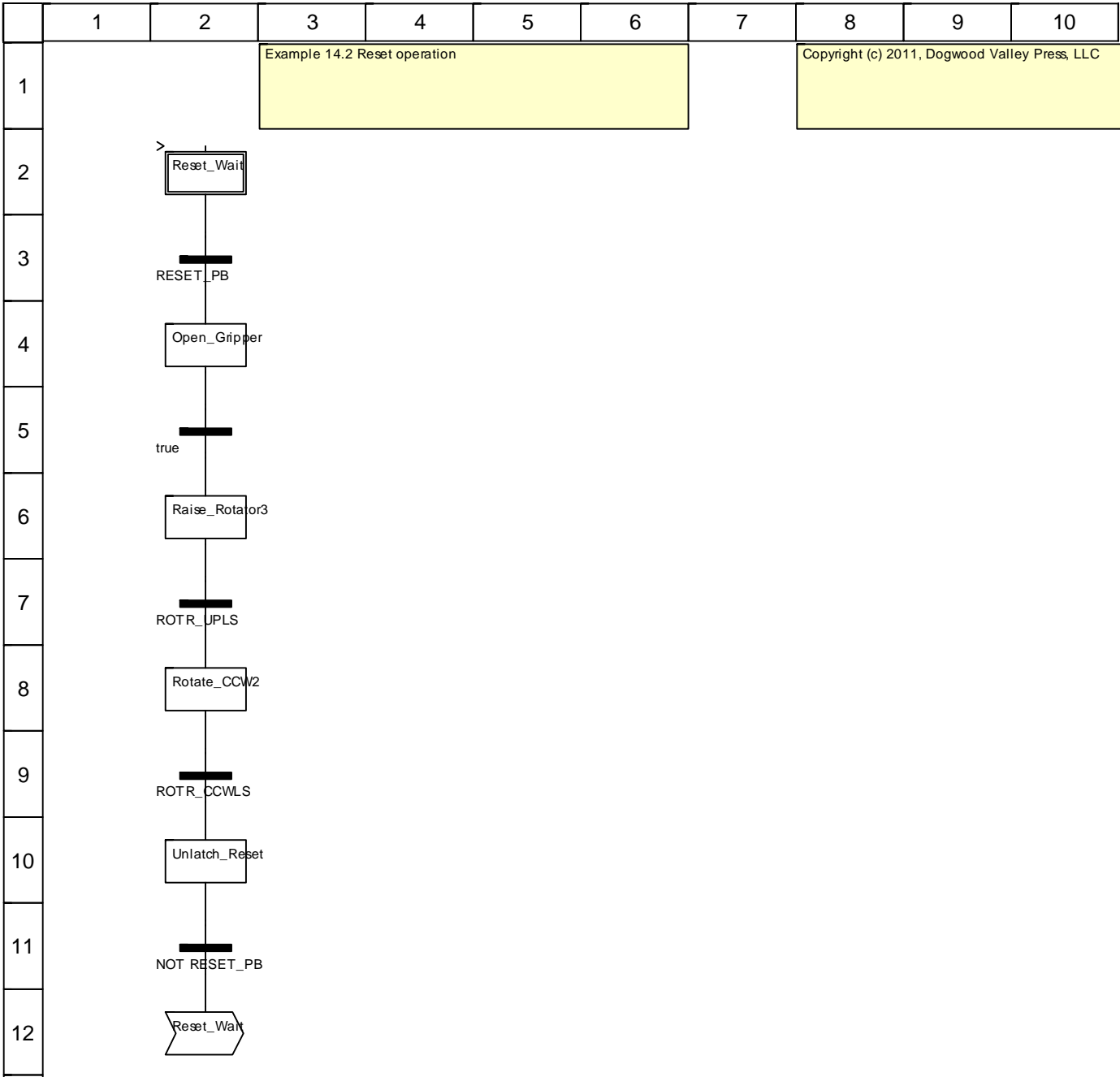
Common properties

Functional module	
Condition name	

Specific properties

Operator control	No
Area number	0

# Chart : [MAST - Invert\_Reset]



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# Object description

## Steps:

Open_Gripper	(2, 4)
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	Dept.:		
	Project: Example 14.2		Page: 22/31

Min./Max. supervision time: T#0s / T#0s		Step delay time: T#1s
Comment:		
Actions:		
Qualifier: S	Time: T#0s	Variable: Int_Reset

Raise_Rotator3		(2, 6)
Min./Max. supervision time: T#0s / T#0s		Step delay time: T#0s
Comment:		
Actions:		
Qualifier: None	Time: T#0s	Variable: ROTR_UP

Reset_Wait (Initial Step)		(2, 2)
Min./Max. supervision time: T#0s / T#0s		Step delay time: T#0s
Comment:		

Rotate_CCW2		(2, 8)
Min./Max. supervision time: T#0s / T#0s		Step delay time: T#0s
Comment:		
Actions:		
Qualifier: None	Time: T#0s	Variable: ROTAT_CCW

Unlatch_Reset		(2, 10)
Min./Max. supervision time: T#0s / T#0s		Step delay time: T#0s
Comment:		
Actions:		
Qualifier: R	Time: T#0s	Variable: Int_Reset

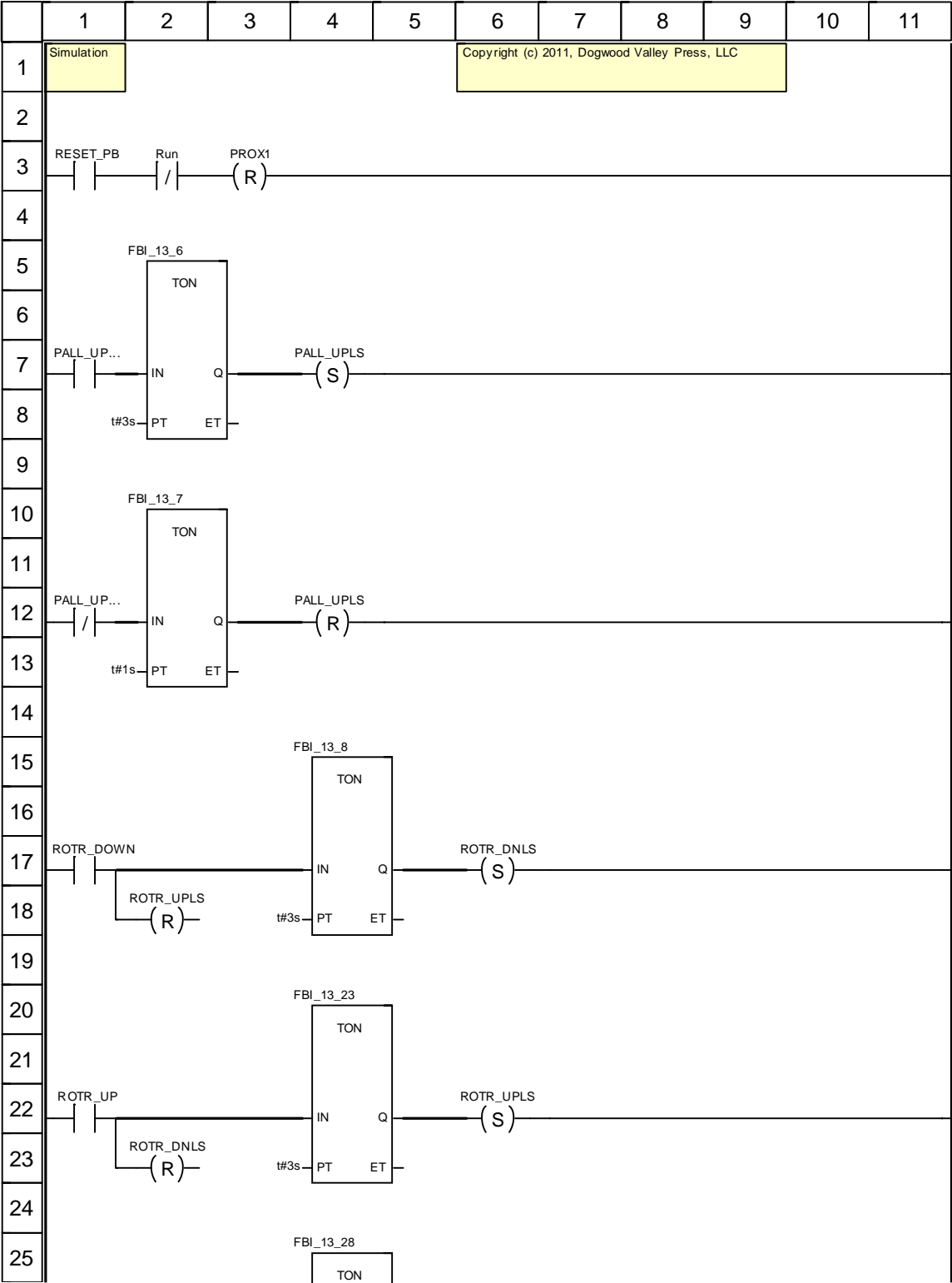
## Transitions:

Name	Type of Condition	Position	Comment
NOT RESET_PB	Variable	(2, 11)	
RESET_PB	Variable	(2, 3)	
ROTR_CCWLS	Variable	(2, 9)	
ROTR_UPLS	Variable	(2, 7)	
true	Constant	(2, 5)	

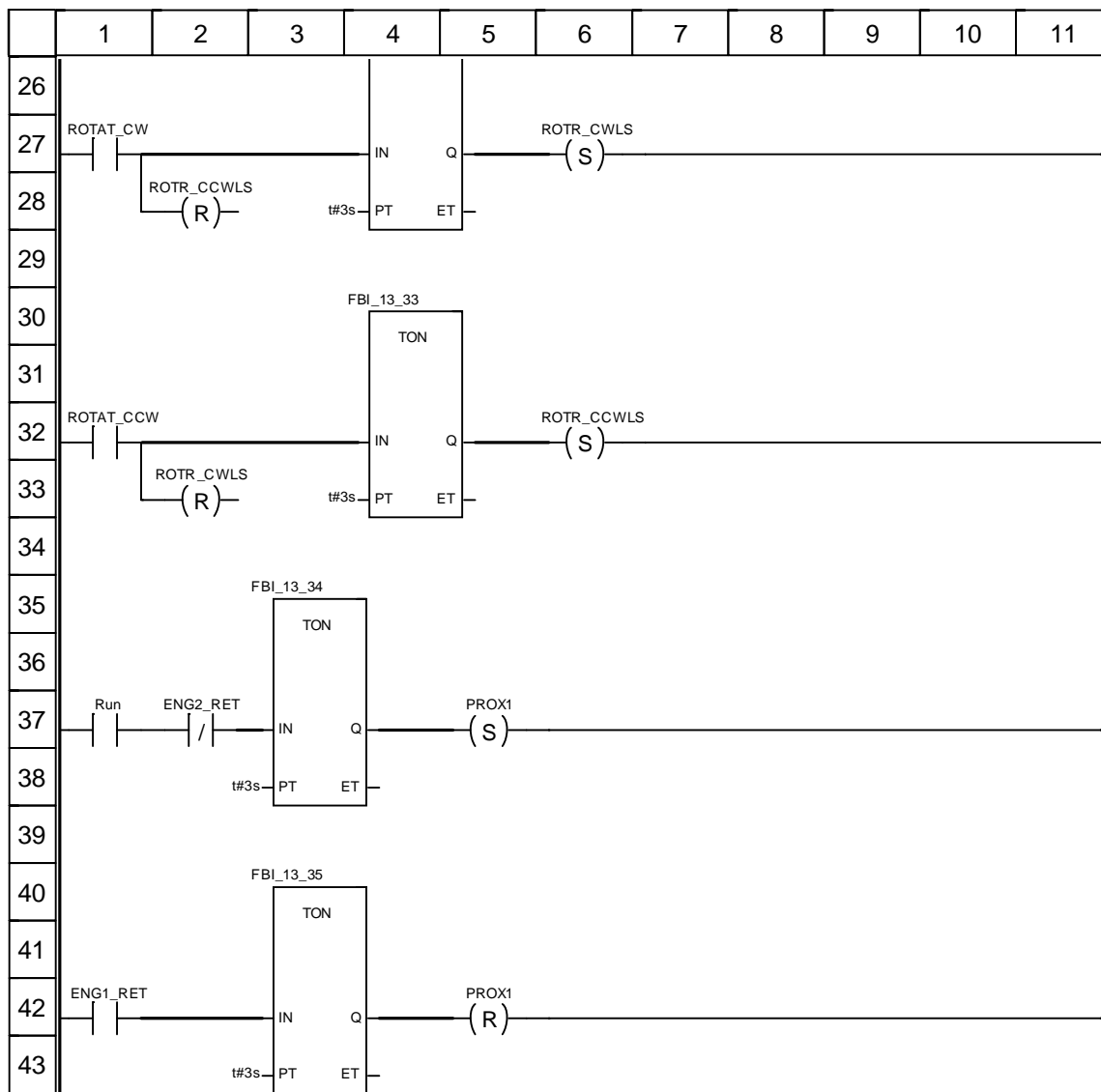
## Jumps:

Name	Position	Comment
Reset_Wait	(2, 12)	

# Simulation : [MAST]







## Truncated labels:

Label	Position(s)
PALL_UPCTL	(1, 7) (1, 12)

# FAST

**Specific properties**

Configuration	Periodic
Task period configuration	5
Watchdog time configuration	100

# Cross References

## Application:

### Addresses

Object	Referred into	Location	Usage
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### Variables or FB instances

Object	Referred into	Location	Usage
Allow_One_In	Chart : [MAST - Invert_Normal]	(L 6, c: 2)	W
	MainLad : [MAST]	(L 2, c: 1)	R
Clamp_Engine	Chart : [MAST - Invert_Normal]	(L 10, c: 2)	W
	MainLad : [MAST]	(L 13, c: 1)	R
Drop_Engine	Chart : [MAST - Invert_Normal]	(L 20, c: 3)	W
	MainLad : [MAST]	(L 9, c: 1)	R
ENG1_RET	Simulation : [MAST]	(L 42, c: 1)	R
	MainLad : [MAST]	(L 2, c: 3)	W
ENG2_RET	Simulation : [MAST]	(L 37, c: 2)	R
	MainLad : [MAST]	(L 4, c: 3)	W
FBI_13_6	Simulation : [MAST]	(L 5, c: 2)	FC
FBI_13_7	Simulation : [MAST]	(L 10, c: 2)	FC
FBI_13_8	Simulation : [MAST]	(L 15, c: 4)	FC
FBI_13_23	Simulation : [MAST]	(L 20, c: 4)	FC
FBI_13_28	Simulation : [MAST]	(L 25, c: 4)	FC
FBI_13_33	Simulation : [MAST]	(L 30, c: 4)	FC
FBI_13_34	Simulation : [MAST]	(L 35, c: 3)	FC
FBI_13_35	Simulation : [MAST]	(L 40, c: 3)	FC
GRIP_CLOS	MainLad : [MAST]	(L 13, c: 3)	W
		(L 15, c: 3)	W
Int_Reset	Chart : [MAST - Invert_Reset]	(L 4, c: 2)	W
		(L 10, c: 2)	W
	MainLad : [MAST]	(L 19, c: 2)	R
		(L 27, c: 1)	R
Invert_Normal	MainLad : [MAST]	(L 24, c: 3)	R
Invert_Normal_SfcC	MainLad : [MAST]	(L 24, c: 3)	FC
Lower_Rotator2	Chart : [MAST - Invert_Normal]	(L 16, c: 2)	W
Move_Out	Chart : [MAST - Invert_Normal]	(L 22, c: 3)	W
	MainLad : [MAST]	(L 4, c: 1)	R
NPupTrans	Chart : [MAST - Invert_Normal]	(L 21, c: 3)	R
	NPupTrans <Transition> : [MAST - Invert_Normal]	(L 1, c: 1)	W
Open_Gripper	Chart : [MAST - Invert_Reset]	(L 4, c: 2)	W
	MainLad : [MAST]	(L 10, c: 1)	R
		(L 16, c: 1)	R
PALL_UPCTL	Simulation : [MAST]	(L 7, c: 1)	R
		(L 12, c: 1)	R
	MainLad : [MAST]	(L 7, c: 3)	W
		(L 9, c: 3)	W
PALL_UPLS	Simulation : [MAST]	(L 7, c: 4)	W
		(L 12, c: 4)	W
	PallUp_RotDwn <Transition> : [MAST - Invert_Normal]	(L 1, c: 1)	R
	NPupTrans <Transition> : [MAST - Invert_Normal]	(L 1, c: 6)	R

## Cross References

Object	Referred into	Location	Usage
PallUp_RotDwn	Chart : [MAST - Invert_Normal]	(l 9, c: 2)	R
	PallUp_RotDwn <Transition> : [MAST - Invert_Normal]	(l 1, c: 1)	W
PROX1	Simulation : [MAST]	(l 3, c: 3)	W
		(l 37, c: 5)	W
		(l 42, c: 5)	W
	PWaitTrans <Transition> : [MAST - Invert_Normal]	(l 1, c: 5)	R
PWaitTrans	Chart : [MAST - Invert_Normal]	(l 5, c: 2)	R
	PWaitTrans <Transition> : [MAST - Invert_Normal]	(l 1, c: 1)	W
Raise_Pallet	Chart : [MAST - Invert_Normal]	(l 8, c: 2)	W
	MainLad : [MAST]	(l 7, c: 1)	R
Raise_Rotator1	Chart : [MAST - Invert_Normal]	(l 12, c: 2)	W
Raise_Rotator2	Chart : [MAST - Invert_Normal]	(l 20, c: 2)	W
Raise_Rotator3	Chart : [MAST - Invert_Reset]	(l 6, c: 2)	W
RCCWRnTrns	Chart : [MAST - Invert_Normal]	(l 23, c: 2)	R
	RCCWRnTrns <Transition> : [MAST - Invert_Normal]	(l 1, c: 1)	W
RCWRnTrans	Chart : [MAST - Invert_Normal]	(l 15, c: 2)	R
	RCWRnTrans <Transition> : [MAST - Invert_Normal]	(l 1, c: 1)	W
RdnRnTrans	Chart : [MAST - Invert_Normal]	(l 17, c: 2)	R
	RdnRnTrans <Transition> : [MAST - Invert_Normal]	(l 1, c: 1)	W
RESET_PB	Simulation : [MAST]	(l 3, c: 1)	R
	Chart : [MAST - Invert_Reset]	(l 3, c: 2)	R
		(l 11, c: 2)	R
Reset_Wait	Chart : [MAST - Invert_Reset]	(l 2, c: 2)	W
		(l 12, c: 2)	L REF
ROTAT_CCW	Chart : [MAST - Invert_Normal]	(l 22, c: 2)	W
	Simulation : [MAST]	(l 32, c: 1)	R
	Chart : [MAST - Invert_Reset]	(l 8, c: 2)	W
ROTAT_CW	Chart : [MAST - Invert_Normal]	(l 14, c: 2)	W
	Simulation : [MAST]	(l 27, c: 1)	R
Rotate_CCW	Chart : [MAST - Invert_Normal]	(l 22, c: 2)	W
Rotate_CCW2	Chart : [MAST - Invert_Reset]	(l 8, c: 2)	W
Rotate_CW	Chart : [MAST - Invert_Normal]	(l 14, c: 2)	W
ROTR_CCWLS	RCCWRnTrns <Transition> : [MAST - Invert_Normal]	(l 1, c: 1)	R
	Simulation : [MAST]	(l 28, c: 2)	W
		(l 32, c: 6)	W
	Chart : [MAST - Invert_Reset]	(l 9, c: 2)	R
ROTR_CWLS	RCWRnTrans <Transition> : [MAST - Invert_Normal]	(l 1, c: 1)	R
	Simulation : [MAST]	(l 27, c: 6)	W
		(l 33, c: 2)	W
ROTR_DNLS	Simulation : [MAST]	(l 17, c: 6)	W
		(l 23, c: 2)	W
	RdnRnTrans <Transition> : [MAST - Invert_Normal]	(l 1, c: 1)	R
	PallUp_RotDwn <Transition> : [MAST - Invert_Normal]	(l 1, c: 15)	R
ROTR_DOWN	Chart : [MAST - Invert_Normal]	(l 8, c: 2)	W
		(l 16, c: 2)	W

## Cross References

Object	Referred into	Location	Usage
	Simulation : [MAST]	(l 17, c: 1)	R
ROTR_UP	Chart : [MAST - Invert_Normal]	(l 12, c: 2)	W
		(l 20, c: 2)	W
	Simulation : [MAST]	(l 22, c: 1)	R
	Chart : [MAST - Invert_Reset]	(l 6, c: 2)	W
ROTR_UPLS	Simulation : [MAST]	(l 18, c: 2)	W
		(l 22, c: 6)	W
	Chart : [MAST - Invert_Reset]	(l 7, c: 2)	R
	RUpRnTrans2 <Transition> : [MAST - Invert_Normal]	(l 1, c: 1)	R
	RUpRnTrans <Transition> : [MAST - Invert_Normal]	(l 1, c: 1)	R
Run	PWaitTrans <Transition> : [MAST - Invert_Normal]	(l 2, c: 5)	R
	Chart : [MAST - Invert_Normal]	(l 3, c: 2)	R
		(l 11, c: 2)	R
		(l 19, c: 2)	R
		(l 25, c: 2)	R
	RUpRnTrans <Transition> : [MAST - Invert_Normal]	(l 1, c: 15)	R
	RUpRnTrans2 <Transition> : [MAST - Invert_Normal]	(l 1, c: 15)	R
	RdnRnTrans <Transition> : [MAST - Invert_Normal]	(l 1, c: 15)	R
	NPupTrans <Transition> : [MAST - Invert_Normal]	(l 1, c: 21)	R
	RCCWRnTrms <Transition> : [MAST - Invert_Normal]	(l 1, c: 16)	R
	MainLad : [MAST]	(l 19, c: 4)	W
		(l 20, c: 1)	R
		(l 31, c: 1)	R
	Simulation : [MAST]	(l 3, c: 2)	R
		(l 37, c: 1)	R
	RCWRnTrans <Transition> : [MAST - Invert_Normal]	(l 1, c: 15)	R
	PallUp_RotDwn <Transition> : [MAST - Invert_Normal]	(l 1, c: 29)	R
RUpRnTrans	Chart : [MAST - Invert_Normal]	(l 13, c: 2)	R
	RUpRnTrans <Transition> : [MAST - Invert_Normal]	(l 1, c: 1)	W
RUpRnTrans2	Chart : [MAST - Invert_Normal]	(l 21, c: 2)	R
	RUpRnTrans2 <Transition> : [MAST - Invert_Normal]	(l 1, c: 1)	W
START_PB	MainLad : [MAST]	(l 19, c: 1)	R
Start_Wait	Chart : [MAST - Invert_Normal]	(l 2, c: 2)	W
STOP_PB	MainLad : [MAST]	(l 19, c: 3)	R
Unclamp	Chart : [MAST - Invert_Normal]	(l 18, c: 2)	W
	MainLad : [MAST]	(l 15, c: 1)	R
Unlatch_Reset	Chart : [MAST - Invert_Reset]	(l 10, c: 2)	W
Wait_1	Chart : [MAST - Invert_Normal]	(l 24, c: 2)	W
Wait_2	Chart : [MAST - Invert_Normal]	(l 24, c: 3)	W
Wait_For_Pallet	Chart : [MAST - Invert_Normal]	(l 4, c: 2)	W
		(l 26, c: 2)	L REF

### Subroutines

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	Dept.:		
	Project: Example 14.2		Page: 29/31

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# Cross References

Object	Referred into	Location	Usage
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# Cross References

New\_DFB:

Variables or FB instances

Object	Referred into	Location	Usage
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