

Totally Integrated Automation Portal

Program blocks

Temp_Analog_In [FB1]

Temp_Analog_In Properties									
General									
Name	Temp_Analog_In	Number	1	Type	FB	Language	LAD		
Numbering	Automatic								
Information									
Title		Author		Comment	Function Block: Temperature (Analogue Signal In). The Temperature signal is read, normalised and then put to scale.			Family	
Version	0.1	User-defined ID							

Name	Data type	Default value	Retain	Accessible from HMI/OPC UA	Writable from HMI/OPC UA	Visible in HMI engineering	Setpoint	Supervision	Comment
▼ Input									
ChannelAddress	Int	0	Non-retain	True	True	True	False		
HR	Real	0.0	Non-retain	True	True	True	False		
LR	Real	0.0	Non-retain	True	True	True	False		
Output									
▼ InOut									
PV	Real	0.0	Non-retain	True	True	True	False		Input reading
Static									
▼ Temp									
Normalised	Real								Normalise Temperature Value
Constant									

Network 1: Value Normalising.

Normalising reading values (Scale 0 to 27648).

NORM_X

Int to Real

EN

0

#ChannelAddress

27648

MIN

VALUE

MAX

ENO

OUT

#Normalised

Network 2: Value Scaling.

Scaling Values from the Norm operation.

SCALE_X

Real to Real

EN

#LR

#Normalised

#HR

MIN

VALUE

MAX

ENO

OUT

#PV

Program blocks

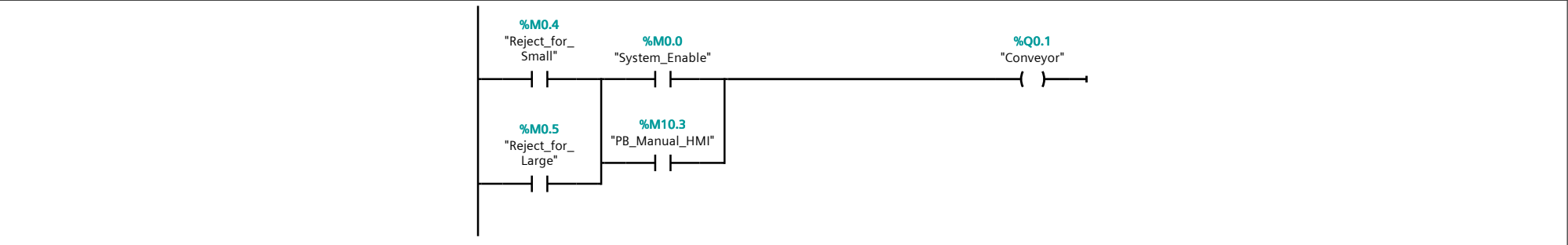
Conveyor Belt [FC1]

Conveyor Belt Properties							
General							
Name	Conveyor Belt	Number	1	Type	FC	Language	LAD
Numbering	Automatic						
Information							
Title		Author		Comment	Conveyor Related Operations: Conveyor Run. Piece Size Detection. Piece size Confirmation. Rejection Solenoid. Enable Furnace Operation. Furnace in Operation. Basket Size Reset.	Family	
Version	0.1	User-defined ID					

Name	Data type	Default value	Comment
Input			
Output			
InOut			
Temp			
Constant			
▼ Return			
Conveyor Belt	Void		

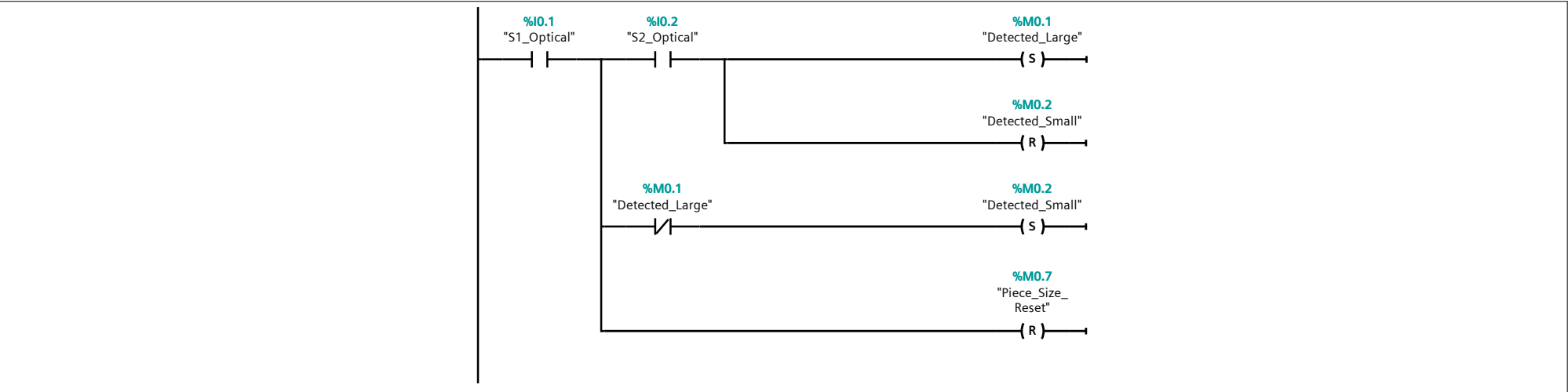
Network 1: Conveyor Run

Once size is selected AND System is Enabled (Automatic mode) OR Manual == Conveyor ON



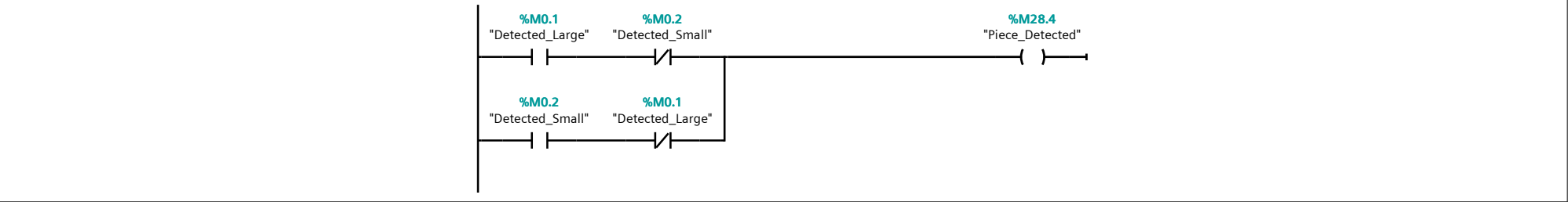
Network 2: Piece Size detection

Detection of Large OR Small for Selected Programme == SET {Detect_Large OR Detected_Small} AND Reset {Detect_Large OR Detected_Small} AND
New piece detected S1 == Reset basket size memory bit.



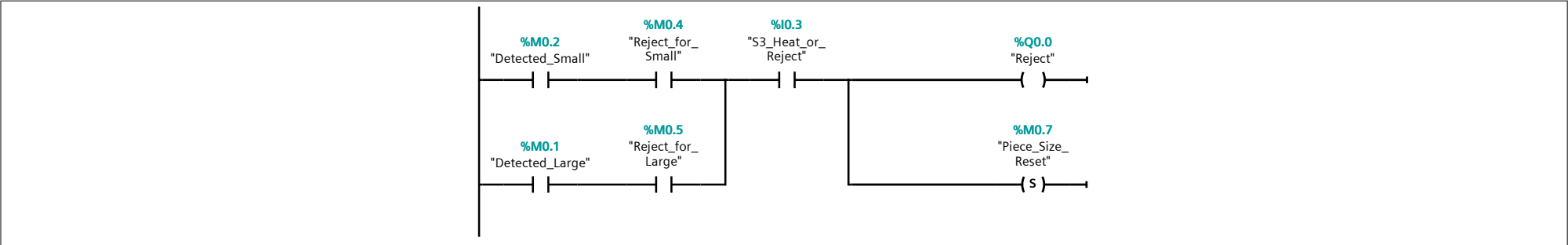
Network 3: Confirms a piece has been detected.

Detected_Large AND NOT Detected_Small == Piece_Detected
OR
Detected_Small AND NOT Detected_Large == Piece_Detected



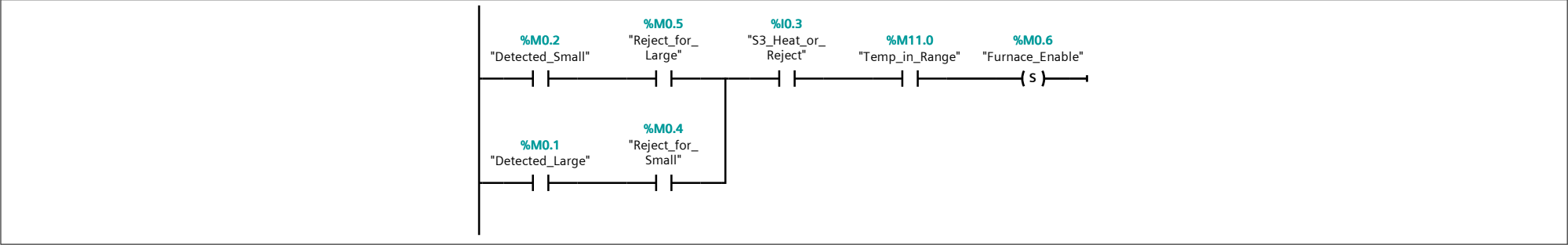
Network 4: Rejection Solenoid

IF (Detected_Small AND Reject_For_Small) = 1 AND S3 Detects Piece == Reject Small piece AND Piece size reset.
OR
IF (Detected_Large AND Reject_For_Large) = 1 AND S3 Detects Piece == Reject Large piece AND Piece Size reset



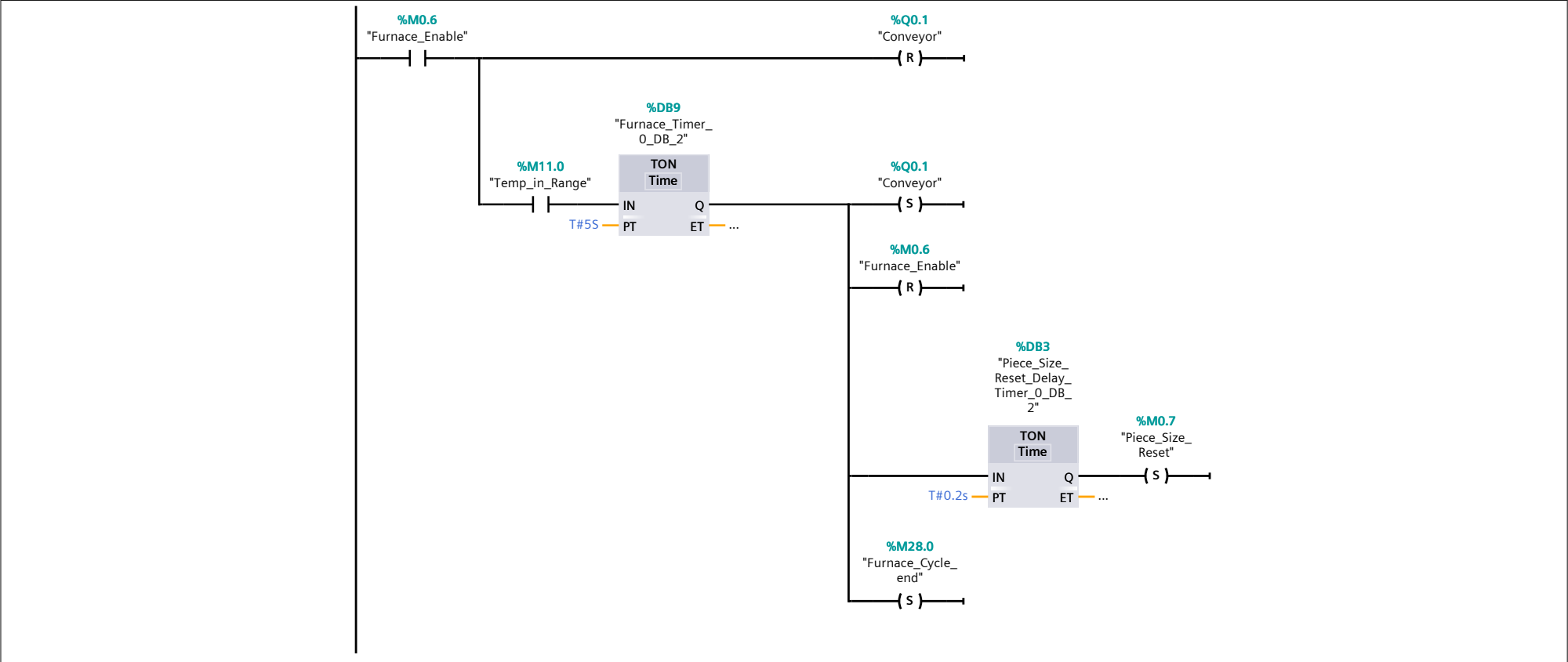
Network 5: Enable Furnace operation

If (Detected_small AND Reject_for_Large) = 1 AND Heat_or_Reject == Reset Conveyor AND Timer 5s (Furnace On)
OR
If (Detected_Large AND Reject_for_Small) = 1 AND Heat_or_Reject == Reset Conveyor AND Timer 5s (Furnace On)
Then 5s passed == Conveyor Set



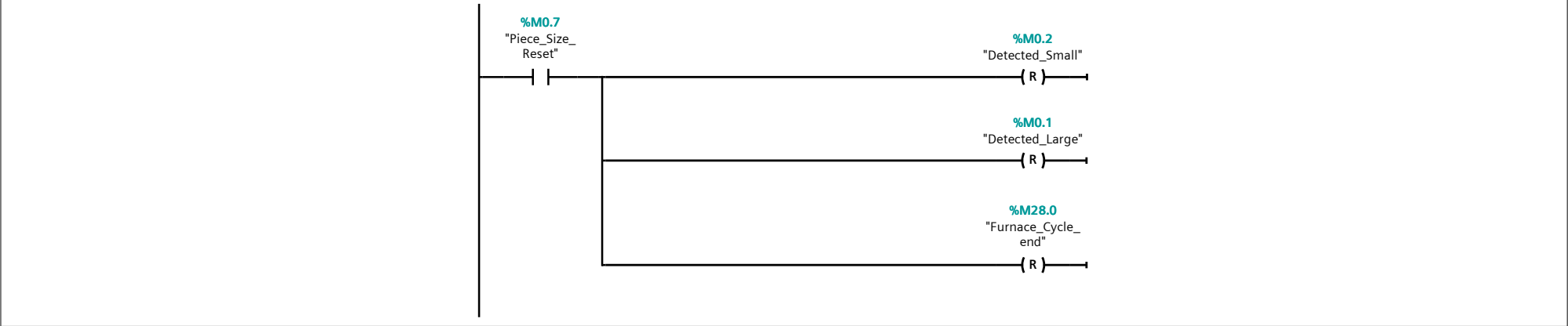
Network 6: Furnace in Operation

IF Furnace enabled == stop Conveyor
THEN Temp_in_Range == start 5s Timer
AND THEN at 5s == reset Conveyor AND Reset_Piece_Size AND SET Furnace_Cycle_end
Note: Timer delay on piece size reset to allow and of cycle tasks before new cycle.



Network 7: Basket Size Reset

Basket_Size_Reset set == Reset {Detected_Small ; Detected_Large ; Furnace_Cycle_end}



Program blocks

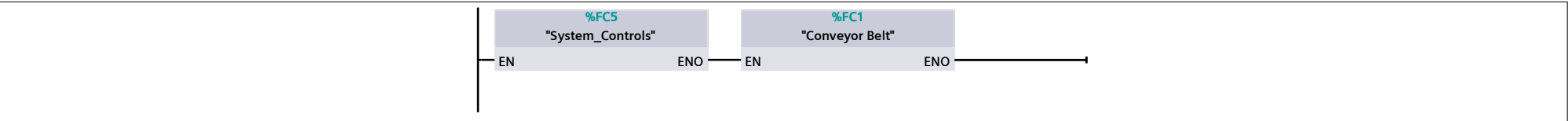
Main [OB1]

Main Properties							
General							
Name	Main	Number	1	Type	OB	Language	LAD
Numbering	Automatic						
Information							
Title	"Main Program Sweep (Cycle)"	Author		Comment	Main loop of the Programme. It contains: The System Controls and Conveyor Belt operation The read in value from the analogue temperature sensor. The Counter function.	Family	
Version	0.1	User-defined ID					

Name	Data type	Default value	Comment
▼ Input			
Initial_Call	Bool		Initial call of this OB
Remanence	Bool		=True, if remanent data are available
Temp			
Constant			

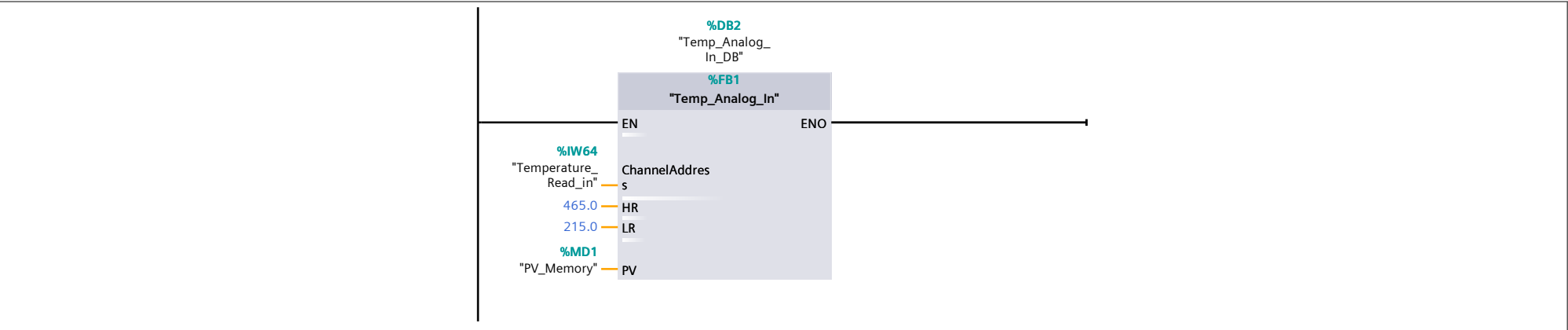
Network 1: Programme main functions

System_Controls: Link with the HMI interface. Allows piece sizes selection and programme selection (Automatic or Manual)
Conveyor Belt: Conveyor belt, piece rejection and furnace operation.



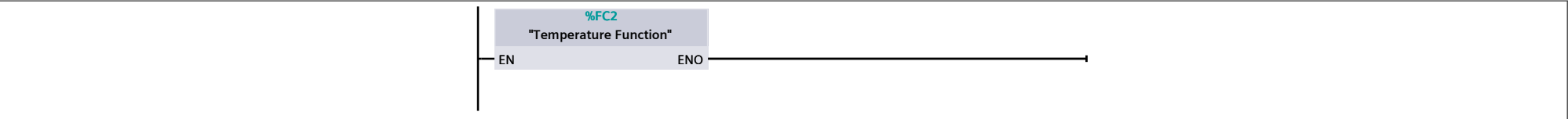
Network 2: Temperature read IN Function Block

Temperature Analogue Reading in:
Reads analogue signal from Temperature sensor (Temperature_Read_in) then Normalises and Scales the value to be stored in PV_Memory.



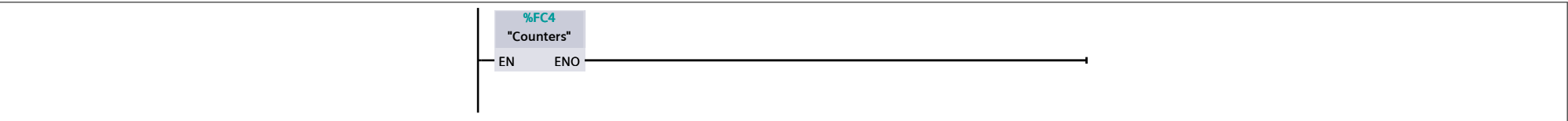
Network 3:

Temperature Functions:
Set PID Controlling Furnace ON/OFF.
Temperature within range confirmation.



Network 4: Counters

Counters:
Large pieces manufactured counter.
Small pieces manufactured counter.
Rejected pieces counter.
Errors counter.



Totally Integrated Automation Portal

Program blocks

Temp_Analog_In_DB [DB2]

Temp_Analog_In_DB Properties

General

Name	Temp_Analog_In_DB	Number	2	Type	DB	Language	DB
Numbering	Automatic						

Information

Title		Author		Comment		Family	
Version	0.1	User-defined ID					

Name	Data type	Start value	Retain	Accessible from HMI/OPC UA	Writ-able from HMI/OPC UA	Visible in HMI engi-neering	Setpoint	Supervi-sion	Comment
▼ Input									
ChannelAddress	Int	0	False	True	True	True	False		
HR	Real	0.0	False	True	True	True	False		
LR	Real	0.0	False	True	True	True	False		
Output									
▼ InOut									
PV	Real	0.0	False	True	True	True	False		Input reading
Static									

Program blocks

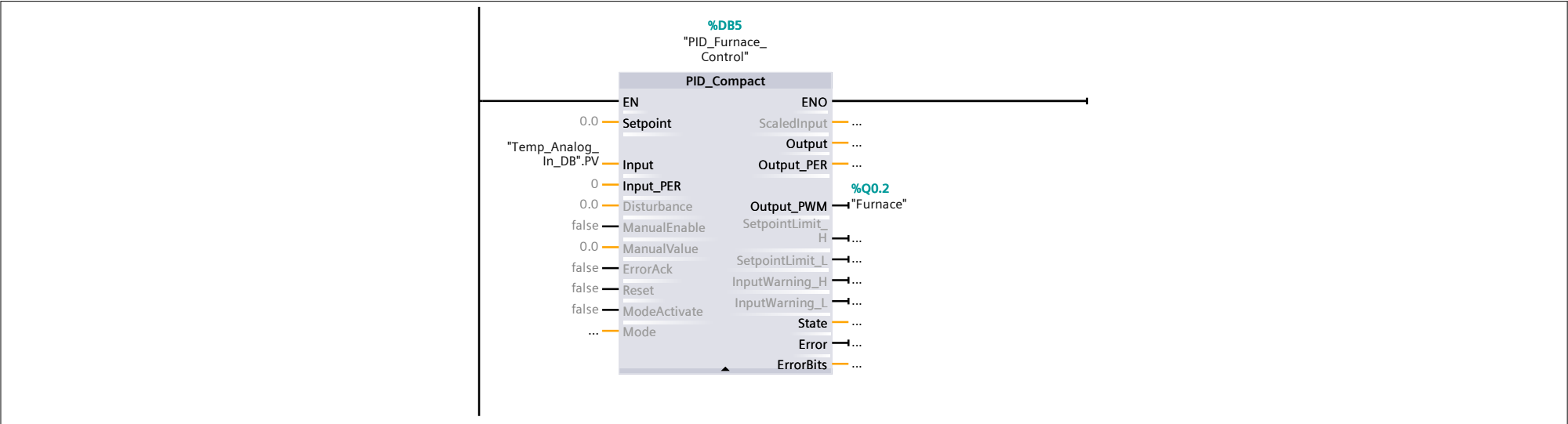
Cyclic interrupt [OB30]

Cyclic interrupt Properties							
General							
Name	Cyclic interrupt	Number	30	Type	OB	Language	LAD
Numbering	Automatic						
Information							
Title		Author		Comment	OB30 allows for background tasks to run at the same time time as the main programme: Furnace PID Control. Error Handling function.	Family	
Version	0.1	User-defined ID					

Name	Data type	Default value	Comment
▼ Input			
Initial_Call	Bool		Initial call of this OB
Event_Count	Int		Events discarded
Temp			
Constant			

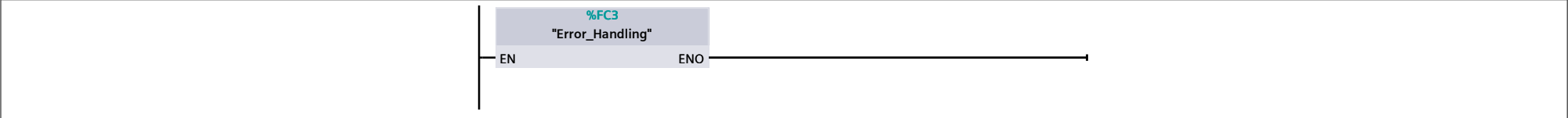
Network 1: PID Furnace Control

PID is set ON by PB_Funace_Activation_HMI on ManualEnable.
PID is set OFF by PB_Furnace_Deactivation_HMI on Reset.



Network 2: Error Handling function

Error Handling Function:
New Piece inserted before end of cycle
Temperature too LOW or too HIGH



Program blocks

Temperature Function [FC2]

Temperature Function Properties							
General							
Name	Temperature Function	Number	2	Type	FC	Language	LAD
Numbering	Automatic						
Information							
Title		Author		Comment		Family	
Version	0.1	User-defined ID					
Name		Data type	Default value		Comment		
Input							
Output							
InOut							
Temp							
Constant							
▼ Return							
Temperature Function		Void					

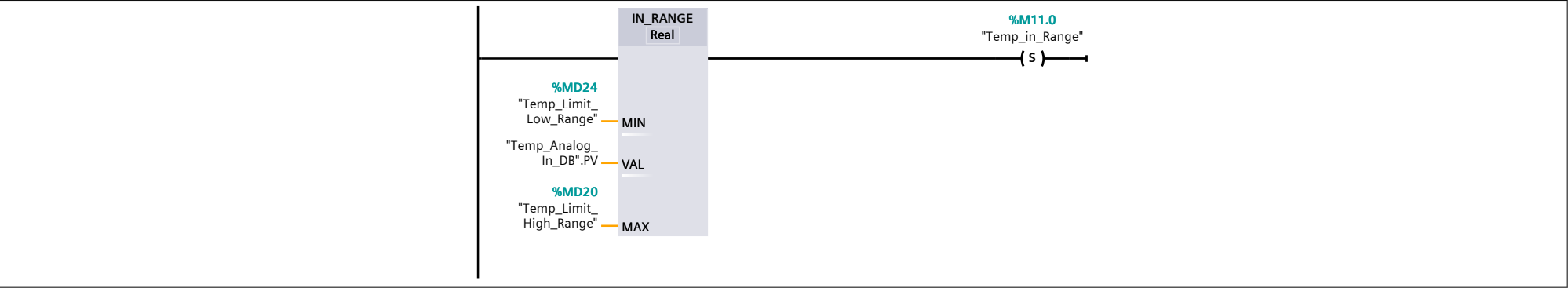
Network 1: PID Control of the Furnace Activation/Deactivation

IF Button "Funace Activation" pressed == PID Control ON
OR
IF Button "Stop Furnace" pressed == PID Control OFF



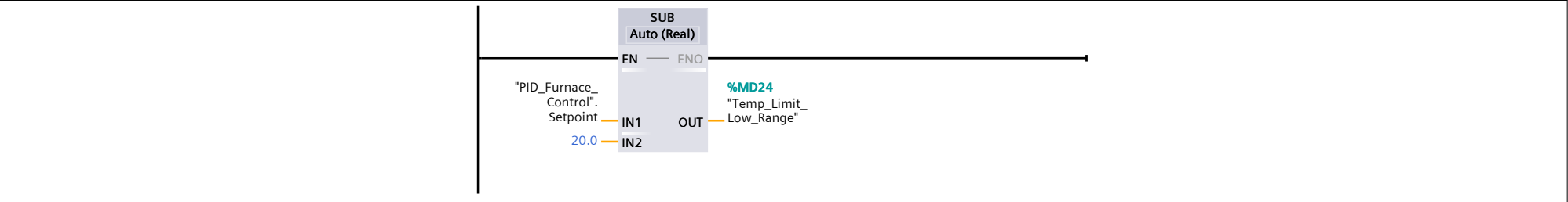
Network 2: Temperature in Range Confirmation

IF PV (Temp Reading in) (SetPoint-20°C) < Temperature IN < (SetPoint+20°C) == Temperature is in range in



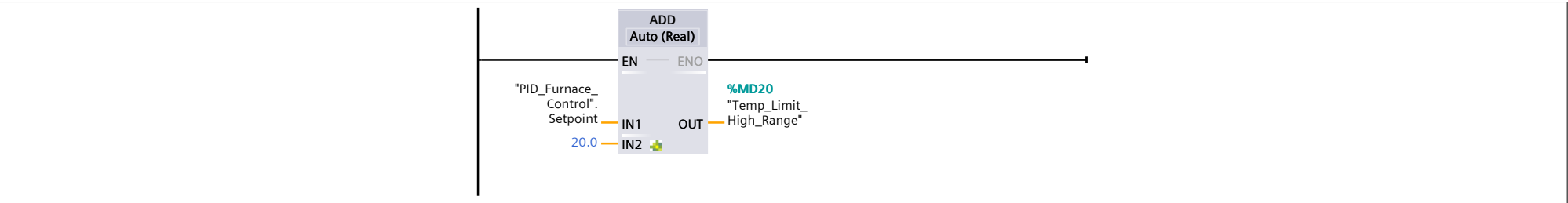
Network 3:

Temperature Min calculation == SetPoint - 2



Network 4:

Temperature Max Calculation == SetPoint + 2



Program blocks

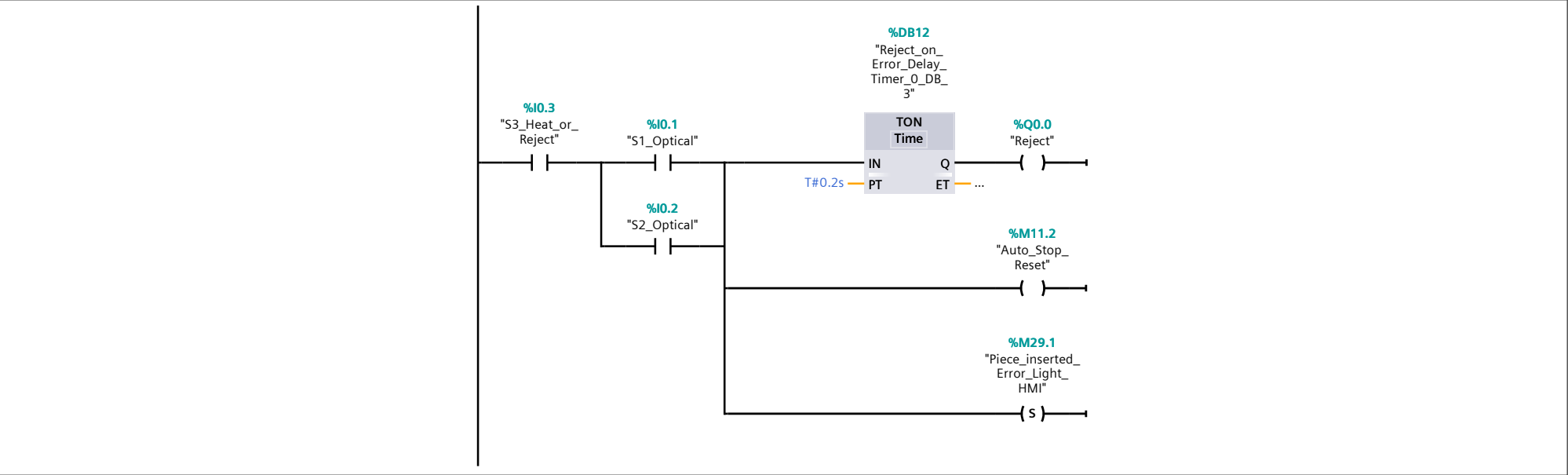
Error_Handling [FC3]

Error_Handling Properties							
General							
Name	Error_Handling	Number	3	Type	FC	Language	LAD
Numbering	Automatic						
Information							
Title		Author		Comment	Error Handling Function: Piece inserted before end of previous cycle Temperature is Too HIGH or too LOW.	Family	
Version	0.1	User-defined ID					

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

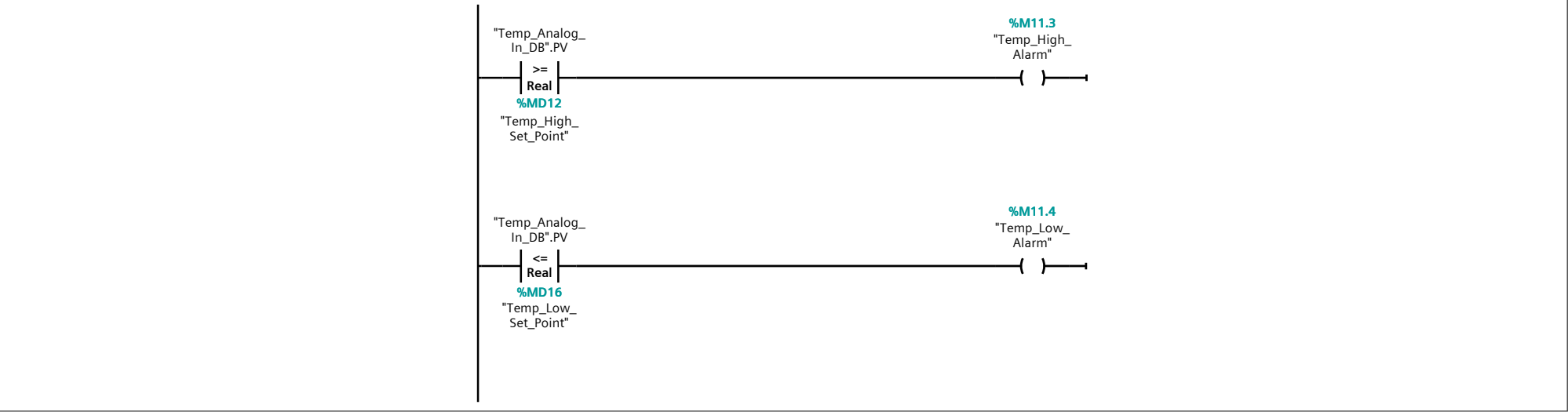
Network 1: Rejection Solenoid

Piece inserted before end of previous cycle:
Piece detected at Heating/Rejection point AND (S1 OR S2) triggered == Reject Part AND Stop/Reset Cycle AND Sets the Error Light ON on the HMI.
Note: The Timer delays the reject to leave time for Auto_Stop_Reset and the Error Light to set ON.



Network 2: Furnace Alarm Temperature too High bit

IF Temp reading IN (HIGHER or EQUAL) to Temp High Set Point == Temp Alarm High
OR
IF Temp reading IN (LOWER or EQUAL) to Temp LOW Set Point == Temp Alarm Low



Program blocks

Counters [FC4]

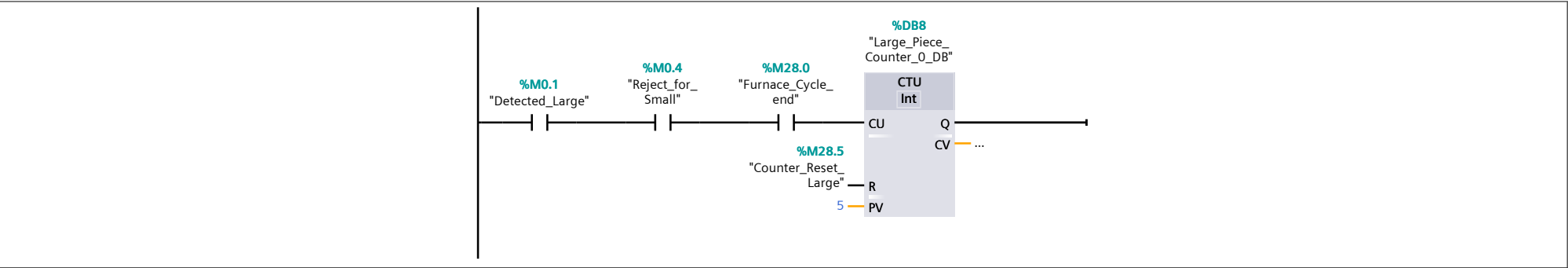
Counters Properties

General							
Name	Counters	Number	4	Type	FC	Language	LAD
Numbering	Automatic						
Information							
Title		Author		Comment	Counters in the process for each manufactured parts and for the number of errors.	Family	
Version	0.1	User-defined ID					

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

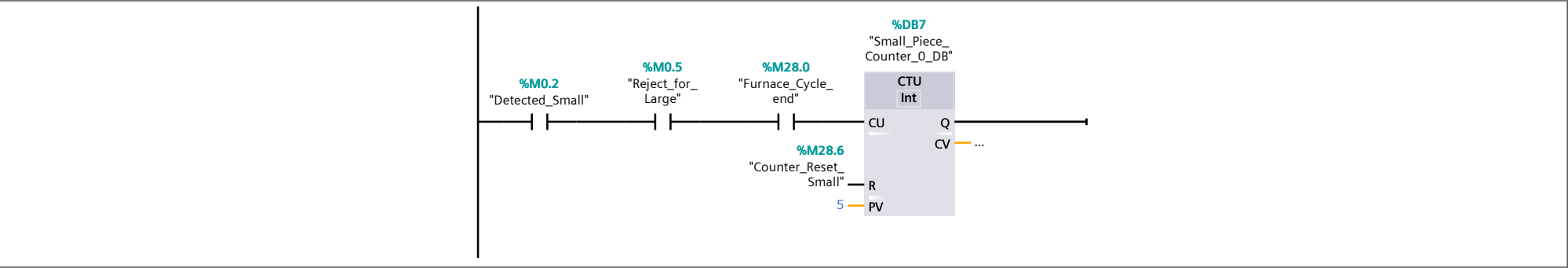
Network 1: Large part manufactured counter.

IF Detected_Large AND Reject_for_small AND Furnace_Cycle_end == Counter +1



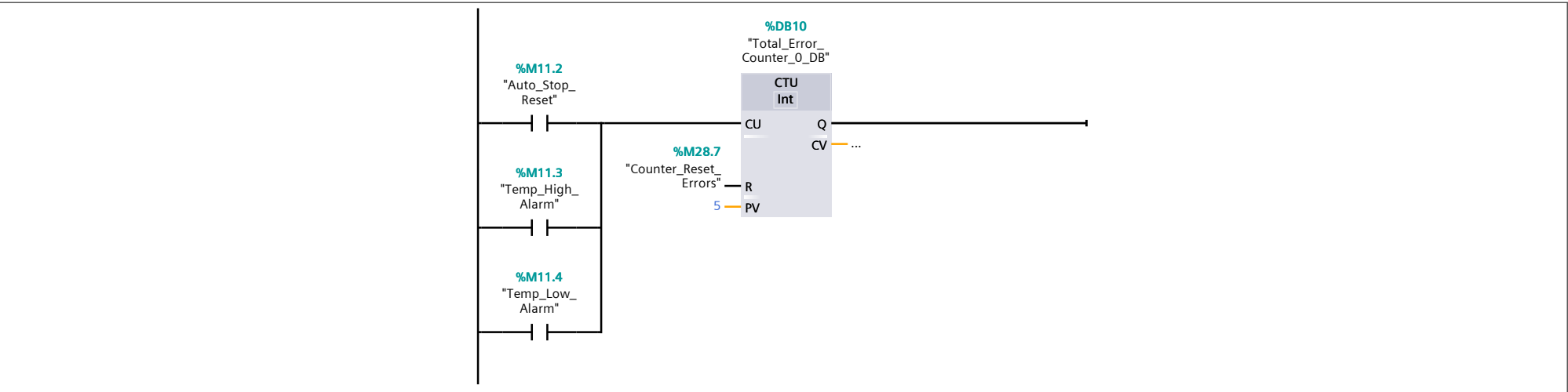
Network 2: Small part manufactured counter.

IF Detected_Small AND Reject_for_Large AND Furnace_Cycle_end == Counter +1



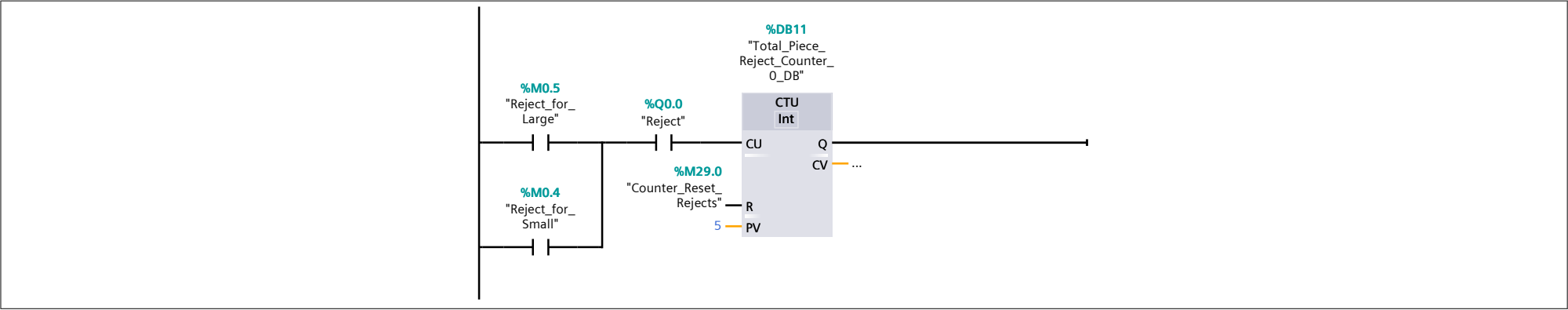
Network 3: Global Error Counter

Temperature High + Temperature Low + New piece inserted before end of cycle == Global error count +1



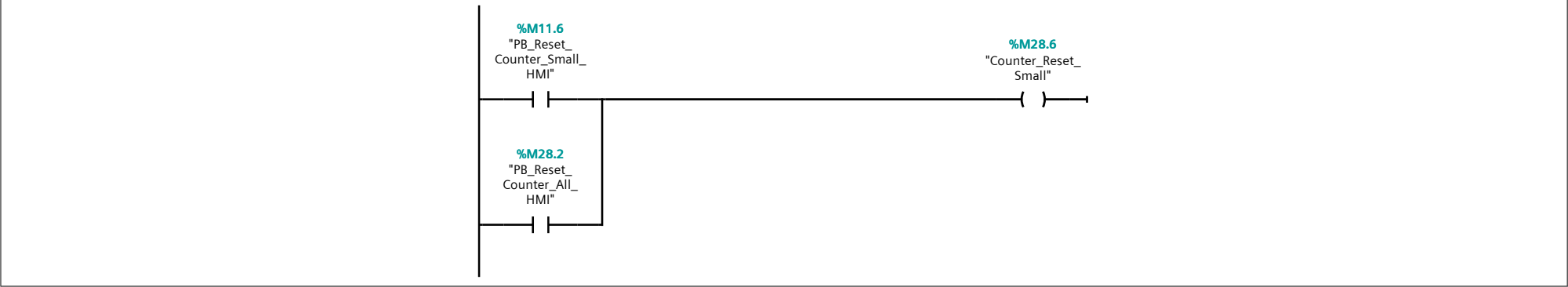
Network 4: Counter for Total Pieces Rejected.

Reject_for_Large OR Reject_for_Small AND Reject (solenoid activated) == counter +1



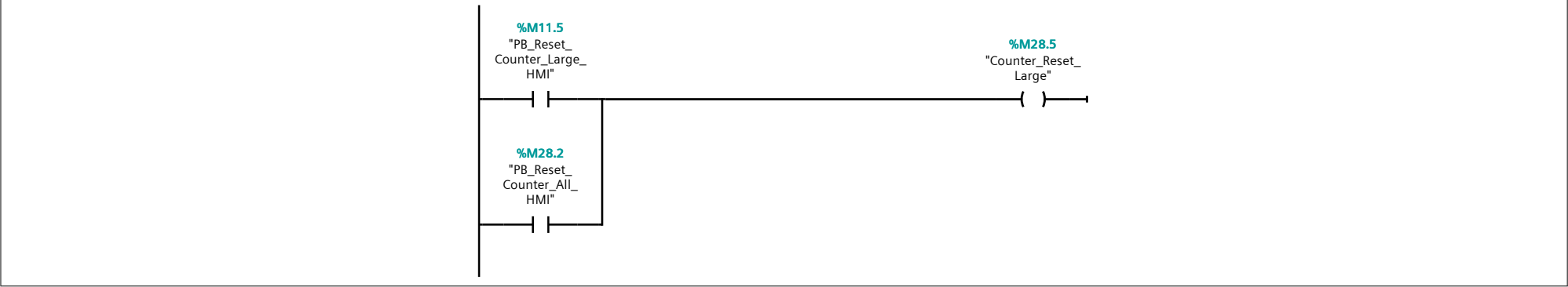
Network 5: Reset Small Piece Counter

IF PB_Reset_Counter_Small OR PB_Reset_Counter_All == Small Piece Counter Reset



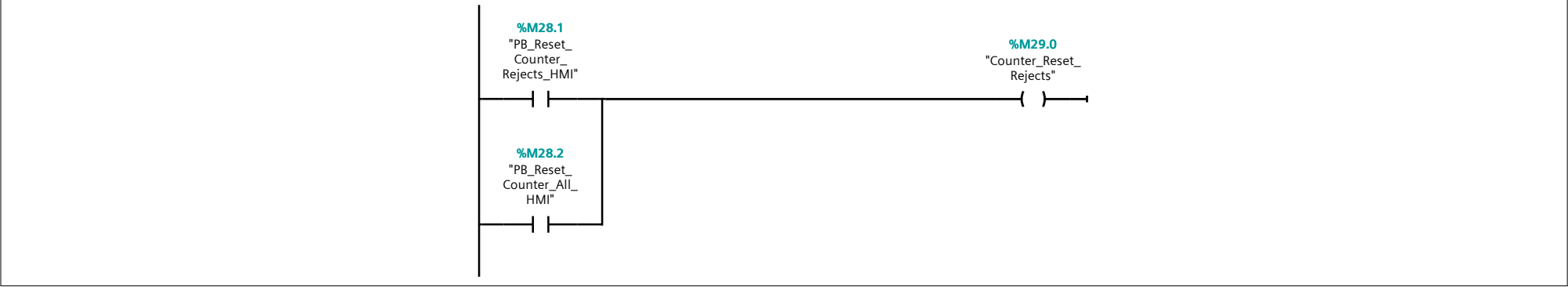
Network 6: Reset Large Piece Counter

IF PB_Reset_Counter_Large OR PB_Reset_Counter_All == Large Piece Counter Reset



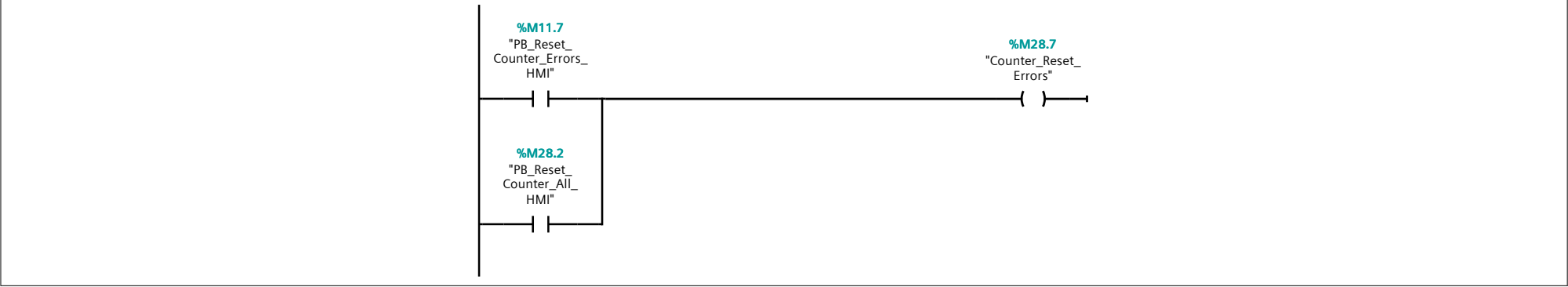
Network 7: Reset Rejected Piece Counter

IF PB_Reset_Counter_Reject OR PB_Reset_Counter_All == Total Piece Rejects Counter Reset



Network 8: Reset Error Counter

IF PB_Reset_Counter_Errors OR PB_Reset_Counter_All == Total Error Counter Reset



Program blocks

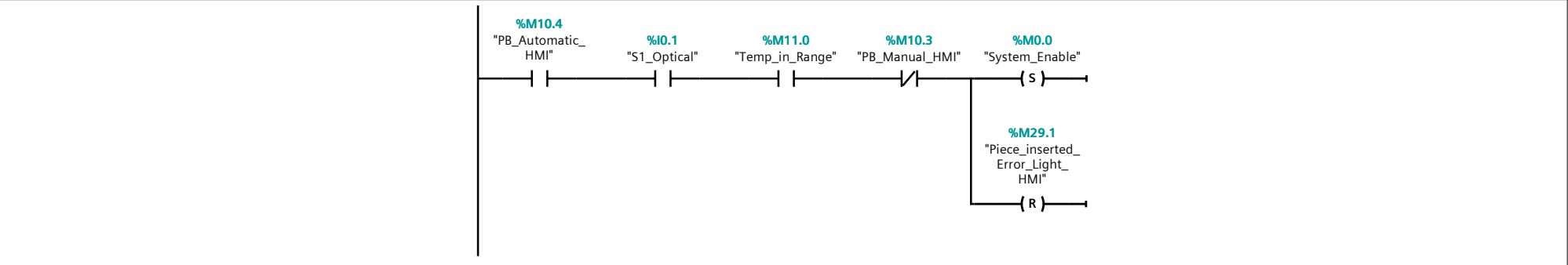
System_Controls [FC5]

System_Controls Properties							
General							
Name	System_Controls	Number	5	Type	FC	Language	LAD
Numbering	Automatic						
Information							
Title	Systems_Controls	Author		Comment	Interface controls to enable the automatic mode. Stop/Reset on HMI and auto Reset operations. Piece size selection and confirmation operation.	Family	
Version	0.1	User-defined ID					

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

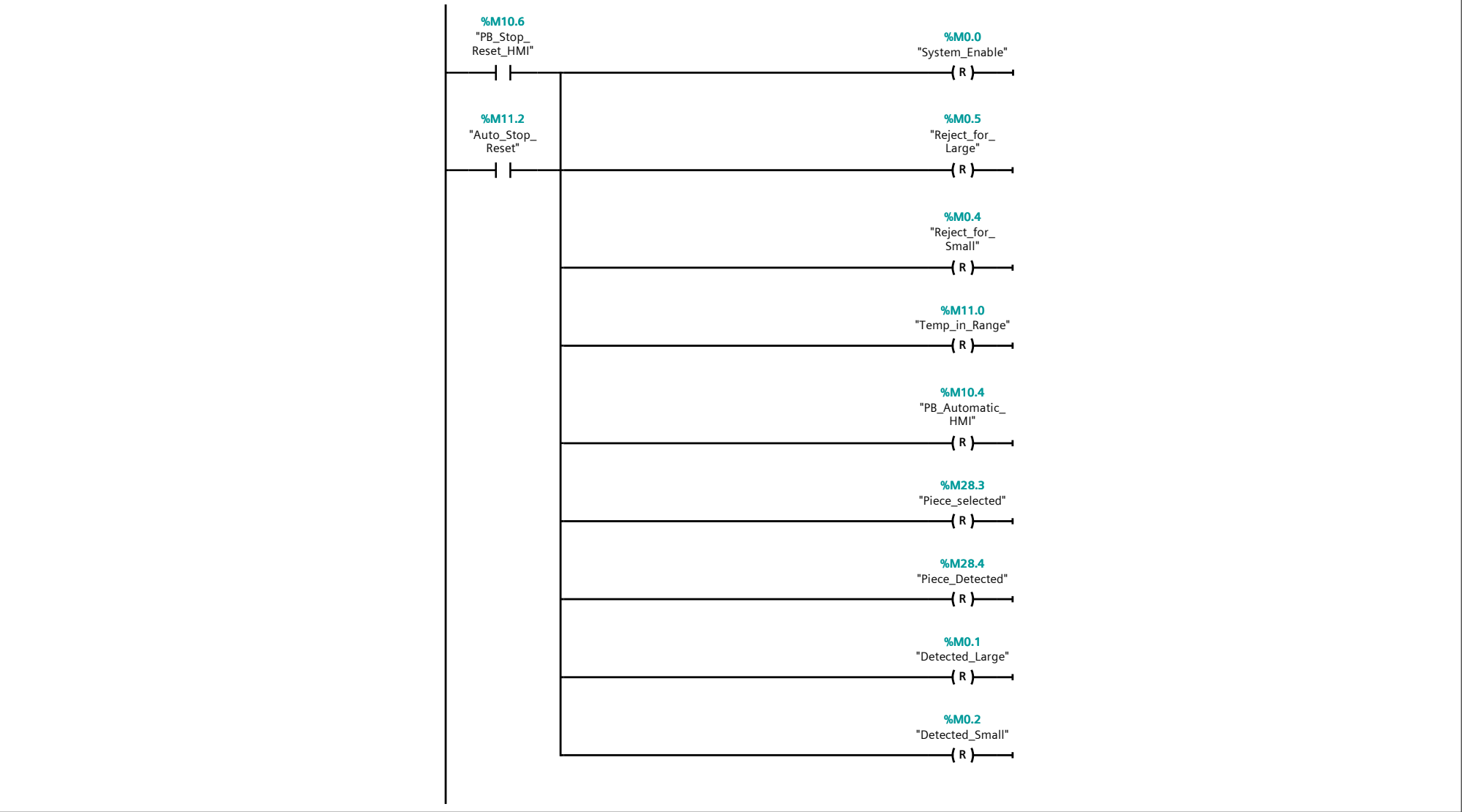
Network 1: Automatic Mode System Enable

Automatic Mode && Part Detected AND Temp in Range AND NOT Manual mode == System enabled AND Error_Light for piece inserted reset.



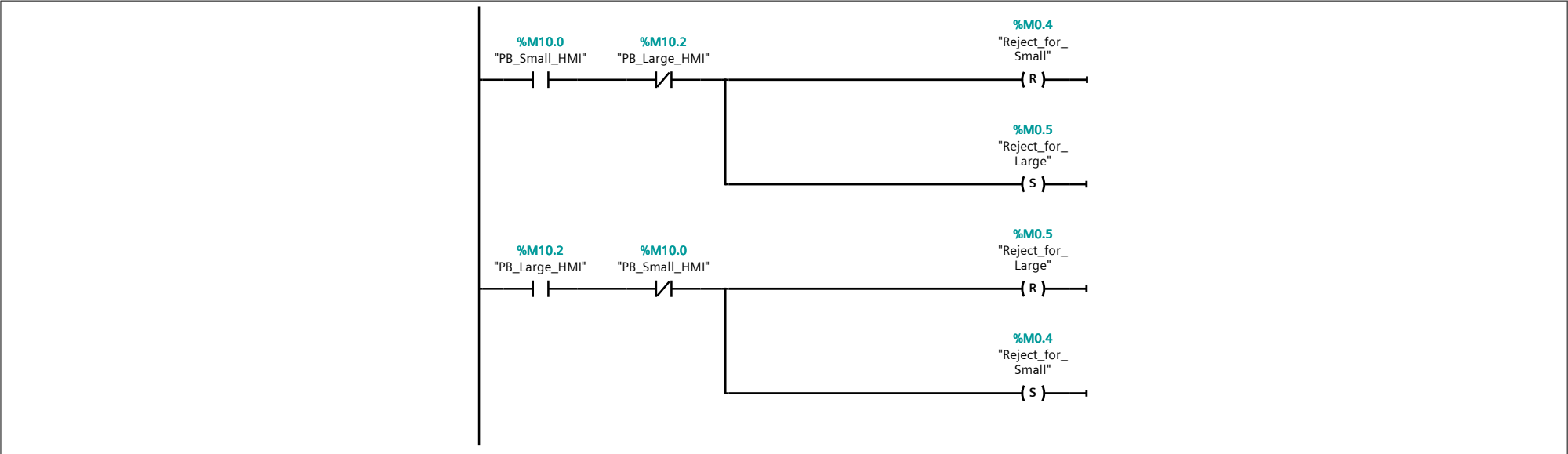
Network 2: Stop and Resets

PB_Stop_Reset_HMI OR Auto_Stop_Reset == Reset {System Enable ; Reject_for_Large ; Reject_for_Small ; Temp_in_Range ; PB_Automatic_HMI ; Piece_selected ; Piece_De- tected ; Detected_Large ; Detected_Small}



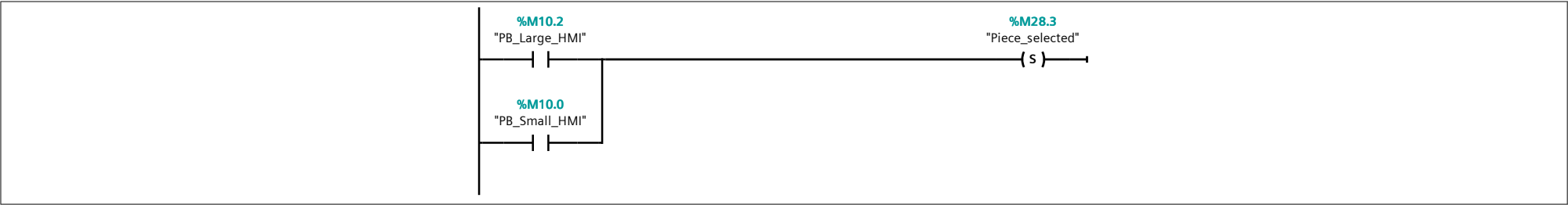
Network 3: Piece Selection Rejection

Selection of piece to keep and locking to avoid double selection.
IF Small AND NOT Large == Set Reject_for_Large AND Reset Reject_for_Small
OR
IF Large AND NOT Small == Set Reject_for_Small AND Reset Reject_for_Large



Network 4: Part selected confirmation

IF Large OR Small piece selected == Piece_Selected



PID_Compact [FB1130]

Name	Data type	Default value	Retain	Accessible from HMI/OPC UA	Writ-able from HMI/OPC UA	Visible in HMI engi-neering	Setpoint	Supervi-sion	Comment
▼ Input									
Setpoint	Real	0.0	Non-retain	True	True	True	False		controller setpoint input
Input	Real	0.0	Non-retain	True	True	True	False		actual value of process as REAL
Input_PER	Int	0	Non-retain	True	True	True	False		actual value of process from periphery
Disturbance	Real	0.0	Non-retain	True	True	True	False		disturbance intrusion
ManualEnable	Bool	false	Non-retain	True	True	True	False		activate manual input to overwrite output
ManualValue	Real	0.0	Non-retain	True	True	True	False		input for manual value
ErrorAck	Bool	false	Non-retain	True	True	True	False		reset error message
Reset	Bool	false	Non-retain	True	True	True	False		reset the controller
ModeActivate	Bool	false	Non-retain	True	True	True	False		enable mode
▼ Output									
ScaledInput	Real	0.0	Non-retain	True	True	True	False		scaled peripheral input value from process
Output	Real	0.0	Non-retain	True	True	True	False		output value in REAL format
Output_PER	Int	0	Non-retain	True	True	True	False		output value in peripheral format
Output_PWM	Bool	false	Non-retain	True	True	True	False		pulse width modulated out-put value
SetpointLimit_H	Bool	false	Non-retain	True	True	True	False		setpoint is limited at highest level
SetpointLimit_L	Bool	false	Non-retain	True	True	True	False		setpoint is limited at lowest level
InputWarning_H	Bool	false	Non-retain	True	True	True	False		input value exceeded high warning level
InputWarning_L	Bool	false	Non-retain	True	True	True	False		input value exceeded low warning level
State	Int	0	Non-retain	True	True	True	False		status of controller (0=INACTIVE,1=SUT,2=TIR,3=AUTO-MATIC,4=HAND)
Error	Bool	false	Non-retain	True	True	True	False		error flag
ErrorBits	DWord	16#0	Retain	True	True	True	False		error message
▼ InOut									
Mode	Int	4	Retain	True	True	True	False		mode selection
▼ Static									
InternalDiagnostic	DWord	0	Non-retain	False	False	False	False		internal diagnostic and version handling
InternalVersion	DWord	DW#16#02020001	Non-retain	True	True	True	False		version of controller
InternalRTVersion	DWord	0	Non-retain	False	False	False	False		version of runtime
IntegralResetMode	Int	1	Non-retain	True	True	True	True		0 smooth, 1 clear, 2 keep, 3 overwrite initial output
OverwriteInitialOutputValue	Real	0.0	Non-retain	True	True	True	False		initialisation output value for override control
RunModeByStartup	Bool	true	Non-retain	True	True	True	True		go to last active state before reset or power cycle
LoadBackUp	Bool	false	Non-retain	True	True	True	False		restore last parameter set
SetSubstituteOutput	Bool	true	Non-retain	True	True	True	True		set output to last valid out-put value in Replacement Output state
PhysicalUnit	Int	0	Non-retain	True	True	True	True		unit of input and setpoint
PhysicalQuantity	Int	0	Non-retain	True	True	True	True		physical entity of input and setpoint
ActivateRecoverMode	Bool	true	Non-retain	True	True	True	True		FALSE - go to inactive by error, TRUE - activate error treatment
Warning	DWord	16#0	Retain	True	True	True	False		warning message
WarningInternal	DWord	16#0	Retain	True	True	True	False		warning message
Progress	Real	0.0	Non-retain	True	True	True	False		current progress in percent
CurrentSetpoint	Real	0.0	Non-retain	True	True	True	False		current active setpoint value
CancelTuningLevel	Real	10.0	Non-retain	True	True	True	True		cancel level for setpoint change during tuning
SubstituteOutput	Real	0.0	Non-retain	True	True	True	True		substitute output value in case of error
▼ Config	PID_Compact-Config		Non-retain	True	True	True	False		configuration data set

Totally Integrated Automation Portal									
Name	Data type	Default value	Retain	Accessible from HMI/OPC UA	Writ-able from HMI/ OPC UA	Visible in HMI engi-neering	Setpoint	Supervi-sion	Comment
InputPerOn	Bool	true	Non-retain	True	True	True	True		activate peripheral input
InvertControl	Bool	false	Non-retain	True	True	True	True		invert control direction
InputUpperLimit	Real	120.0	Non-retain	True	True	True	True		input (Process Value) upper limit
InputLowerLimit	Real	0.0	Non-retain	True	True	True	True		input (Process Value) lower limit
InputUpperWarning	Real	3.402822e+38	Non-retain	True	True	True	True		input (Process Value) upper level warning
InputLowerWarning	Real	-3.402822e+38	Non-retain	True	True	True	True		input (Process Value) lower level warning
OutputUpperLimit	Real	100.0	Non-retain	True	True	True	True		output value upper limit
OutputLowerLimit	Real	0.0	Non-retain	True	True	True	True		output value lower limit
SetpointUpperLimit	Real	3.402822e+38	Non-retain	True	True	True	True		setpoint upper limit value
SetpointLowerLimit	Real	-3.402822e+38	Non-retain	True	True	True	True		setpoint lower limit value
MinimumOnTime	Real	0.0	Non-retain	True	True	True	True		PWM minimum on time
MinimumOffTime	Real	0.0	Non-retain	True	True	True	True		PWM minimum off time
▼ InputScaling	PID_Scaling		Non-retain	True	True	True	False		input scaling
UpperPointIn	Real	27648.0	Non-retain	True	True	True	True		high value (input range of scaling)
LowerPointIn	Real	0.0	Non-retain	True	True	True	True		low value (input range of scaling)
UpperPointOut	Real	100.0	Non-retain	True	True	True	True		high value (output range of scaling)
LowerPointOut	Real	0.0	Non-retain	True	True	True	True		low value (output range of scaling)
▼ CycleTime	PID_CycleTime		Non-retain	True	True	True	False		data set for cycle time esti-mation
StartEstimation	Bool	true	Non-retain	True	True	True	False		start automatic estimation of call cycle time
EnEstimation	Bool	true	Non-retain	True	True	True	True		enable estimation of call cy- cle time
EnMonitoring	Bool	true	Non-retain	True	True	True	True		enable monitoring of call cy- cle time
Value	Real	0.1	Non-retain	True	True	True	True		call cycle time
▼ CtrlParamsBackUp	PID_Compact-ControlParams		Non-retain	True	True	True	False		saved parameter set
Gain	Real	1.0	Non-retain	True	True	True	True		proportional gain
Ti	Real	20.0	Non-retain	True	True	True	True		reset time
Td	Real	0.0	Non-retain	True	True	True	True		derivative time
TdFiltRatio	Real	0.2	Non-retain	True	True	True	True		filter coefficient for deriva- tive part
PWeighting	Real	1.0	Non-retain	True	True	True	True		weigthing of proportional part in direct, feedback path
DWeighting	Real	1.0	Non-retain	True	True	True	True		weigthing of derivative part in direct, feedback path
Cycle	Real	1.0	Non-retain	True	True	True	True		PID Controller cycle time
▼ PIDSelfTune	PID_Compact-SelfTune		Non-retain	True	True	True	False		data set for self tuning
▼ SUT	PID_Com- pact_SUT		Non-retain	True	True	True	False		data set for start up tuning
CalculateParams	Bool	false	Non-retain	True	True	True	False		recalculate control paramet- ers with parameters of startup tuning
TuneRule	Int	0	Non-retain	True	True	True	True		tuning rule for SUT (0-CHR PID,1-CHR PI)
State	Int	0	Non-retain	True	True	True	False		current phase of start up tuning
▼ TIR	PID_Com- pact_TIR		Non-retain	True	True	True	False		data set for tuning in run
RunIn	Bool	false	Non-retain	True	True	True	False		activate run in setpoint with- out controlling
CalculateParams	Bool	false	Non-retain	True	True	True	False		recalculate control paramet- ers with parameters of tun- ing in run
TuneRule	Int	0	Non-retain	True	True	True	True		tuning rule for TIR (0-2-A PID auto,fast,slow;3-ZN PID;4- ZN PI;5-ZN P)
State	Int	0	Non-retain	True	True	True	False		current phase of tuning in run
▼ PIDCtrl	PID_Compact-Control		Non-retain	True	True	True	False		data for controlling part
IntegralSum	Real	0.0	Non-retain	True	True	True	False		signal of integral part
▼ Retain	PID_Compac- tRetain		Retain	True	True	True	False		retain data
▼ CtrlParams	PID_Compact-ControlParams		Retain	True	True	True	False		actual parameter set
Gain	Real	1.0	Retain	True	True	True	True		proportional gain
Ti	Real	20.0	Retain	True	True	True	True		reset time
Td	Real	0.0	Retain	True	True	True	True		derivative time
TdFiltRatio	Real	0.2	Retain	True	True	True	True		filter coefficient for deriva- tive part
PWeighting	Real	1.0	Retain	True	True	True	True		weigthing of proportional part in direct, feedback path

Totally Integrated Automation Portal									
Name	Data type	Default value	Retain	Accessible from HMI/OPC UA	Writ-able from HMI/OPC UA	Visible in HMI engi-neering	Setpoint	Supervi-sion	Comment
DWeighting	Real	1.0	Retain	True	True	True	True		weigthing of derivative part in direct, feedback path
Cycle	Real	1.0	Retain	True	True	True	True		PID Controller cycle time

Totally Integrated Automation Portal

Program blocks / System blocks / Program resources

Large_Piece_Counter_0_DB [DB8]

Large_Piece_Counter_0_DB Properties

General

Name	Large_Piece_Counter_0_DB	Number	8	Type	DB	Language	DB
Numbering	Automatic						

Information

Title		Author	Simatic	Comment		Family	IEC
Version	1.0	User-defined ID	CNTR				

Name	Data type	Start value	Retain	Accessible from HMI/OPC UA	Writ-able from HMI/OPC UA	Visible in HMI engi-neering	Setpoint	Supervi-sion	Comment
▼ Static									
CU	Bool	false	True	True	True	True	False		
CD	Bool	false	True	True	True	True	False		
R	Bool	false	True	True	True	True	False		
LD	Bool	false	True	True	True	True	False		
QU	Bool	false	True	True	True	True	False		
QD	Bool	false	True	True	True	True	False		
PV	Int	0	True	True	True	True	False		
CV	Int	0	True	True	True	True	False		

Totally Integrated Automation Portal

Program blocks / System blocks / Program resources

Furnace_Timer_0_DB_2 [DB9]

Furnace_Timer_0_DB_2 Properties

General

Name	Furnace_Timer_0_DB_2	Number	9	Type	DB	Language	DB
Numbering	Automatic						

Information

Title		Author	Simatic	Comment		Family	IEC
Version	1.0	User-defined ID	IEC_TMR				

Name	Data type	Start value	Retain	Accessible from HMI/OPC UA	Writ-able from HMI/OPC UA	Visible in HMI engi-neering	Setpoint	Supervi-sion	Comment
▼ Static									
PT	Time	T#0ms	False	True	True	True	False		
ET	Time	T#0ms	False	True	False	True	False		
IN	Bool	false	False	True	True	True	False		
Q	Bool	false	False	True	False	True	False		

Totally Integrated Automation Portal

Program blocks / System blocks / Program resources

Piece_Size_Reset_Delay_Timer_0_DB_2 [DB3]

Piece_Size_Reset_Delay_Timer_0_DB_2 Properties

General

Name	Piece_Size_Reset_De- lay_Timer_0_DB_2	Number	3	Type	DB	Language	DB
Numbering	Automatic						

Information

Title		Author	Simatic	Comment		Family	IEC
Version	1.0	User-defined ID	IEC_TMR				

Name	Data type	Start value	Retain	Accessible from HMI/OPC UA	Writ-able from HMI/OPC UA	Visible in HMI engi-neering	Setpoint	Supervi-sion	Comment
▼ Static									
PT	Time	T#0ms	False	True	True	True	False		
ET	Time	T#0ms	False	True	False	True	False		
IN	Bool	false	False	True	True	True	False		
Q	Bool	false	False	True	False	True	False		

Program blocks / System blocks / Program resources

Small_Piece_Counter_0_DB [DB7]

Small_Piece_Counter_0_DB Properties							
General							
Name	Small_Piece_Counter_0_DB	Number	7	Type	DB	Language	DB
Numbering	Automatic						
Information							
Title		Author	Simatic	Comment		Family	IEC
Version	1.0	User-defined ID	CNTR				

Name	Data type	Start value	Retain	Accessible from HMI/OPC UA	Writ-able from HMI/ OPC UA	Visible in HMI engi-neering	Setpoint	Supervi-sion	Comment
▼ Static									
CU	Bool	false	True	True	True	True	False		
CD	Bool	false	True	True	True	True	False		
R	Bool	false	True	True	True	True	False		
LD	Bool	false	True	True	True	True	False		
QU	Bool	false	True	True	True	True	False		
QD	Bool	false	True	True	True	True	False		
PV	Int	0	True	True	True	True	False		
CV	Int	0	True	True	True	True	False		

Program blocks / System blocks / Program resources

Total_Error_Counter_0_DB [DB10]

Total_Error_Counter_0_DB Properties										
General										
Name	Total_Error_Counter_0_DB	Number	10	Type	DB			Language	DB	
Numbering	Automatic									
Information										
Title		Author	Simatic	Comment				Family	IEC	
Version	1.0	User-defined ID	CNTR							
Name		Data type	Start value	Retain	Accessible from HMI/OPC UA	Writ-able from HMI/ OPC UA	Visible in HMI engi-neering	Setpoint	Supervi-sion	Comment
▼ Static										
CU		Bool	false	True	True	True	True	False		
CD		Bool	false	True	True	True	True	False		
R		Bool	false	True	True	True	True	False		
LD		Bool	false	True	True	True	True	False		
QU		Bool	false	True	True	True	True	False		
QD		Bool	false	True	True	True	True	False		
PV		Int	0	True	True	True	True	False		
CV		Int	0	True	True	True	True	False		

Totally Integrated Automation Portal

Program blocks / System blocks / Program resources

Total_Piece_Reject_Counter_0_DB [DB11]

Total_Piece_Reject_Counter_0_DB Properties

General

Name	Total_Piece_Reject_Counter_0_DB	Number	11	Type	DB	Language	DB
Numbering	Automatic						

Information

Title		Author	Simatic	Comment		Family	IEC
Version	1.0	User-defined ID	CNTR				

Name	Data type	Start value	Retain	Accessible from HMI/OPC UA	Writ-able from HMI/OPC UA	Visible in HMI engi-neering	Setpoint	Supervi-sion	Comment
▼ Static									
CU	Bool	false	True	True	True	True	False		
CD	Bool	false	True	True	True	True	False		
R	Bool	false	True	True	True	True	False		
LD	Bool	false	True	True	True	True	False		
QU	Bool	false	True	True	True	True	False		
QD	Bool	false	True	True	True	True	False		
PV	Int	0	True	True	True	True	False		
CV	Int	0	True	True	True	True	False		

Totally Integrated Automation Portal

Program blocks / System blocks / Program resources

Reject_on_Error_Delay_Timer_0_DB_3 [DB12]

Reject_on_Error_Delay_Timer_0_DB_3 Properties








































General

Name	Reject_on_Error_Delay_Timer_0_DB_3	Number	12	Type	DB	Language	DB
Numbering	Automatic						

Information

Title		Author	Simatic	Comment		Family	IEC
Version	1.0	User-defined ID	IEC_TMR				

Name	Data type	Start value	Retain	Accessible from HMI/OPC UA	Writ-able from HMI/OPC UA	Visible in HMI engi-neering	Setpoint	Supervi-sion	Comment
▼ Static									
PT	Time	T#0ms	False	True	True	True	False		
ET	Time	T#0ms	False	True	False	True	False		
IN	Bool	false	False	True	True	True	False		
Q	Bool	false	False	True	False	True	False		

Totally Integrated Automation Portal																																																																																																																																																										
<div>HMI Control Tag Table [14]</div> <div>PLC tags</div> <div><div>PLC tags</div><table><tr><th></th><th>Name</th><th>Data type</th><th>Address</th><th>Retain</th><th>Accessi-ble from HMI/OPC UA</th><th>Writable from HMI/OPC UA</th><th>Visible in HMI engi-neering</th><th>Supervision</th><th>Comment</th></tr><tr><td></td><td>PB_Furnace_Activation_HMI</td><td>Bool</td><td>%M10.7</td><td>False</td><td>True</td><td>True</td><td>True</td><td></td><td>Push Button: to Activate PID control of Furnace NO (Input)</td></tr><tr><td></td><td>PB_Small_HMI</td><td>Bool</td><td>%M10.0</td><td>False</td><td>True</td><td>True</td><td>True</td><td></td><td>Push Button: Small Size reject NO (In-put)</td></tr><tr><td></td><td>PB_Large_HMI</td><td>Bool</td><td>%M10.2</td><td>False</td><td>True</td><td>True</td><td>True</td><td></td><td>Push Button: Large Size reject NO (In-put)</td></tr><tr><td></td><td>PB_Manual_HMI</td><td>Bool</td><td>%M10.3</td><td>False</td><td>True</td><td>True</td><td>True</td><td></td><td>Push Button: Mode Manual Selected NO (Input)</td></tr><tr><td></td><td>PB_Automatic_HMI</td><td>Bool</td><td>%M10.4</td><td>False</td><td>True</td><td>True</td><td>True</td><td></td><td>Push Button: Mode Automatic Selec-ted NO (Input)</td></tr><tr><td></td><td>PB_Reject_All_HMI</td><td>Bool</td><td>%M10.5</td><td>False</td><td>True</td><td>True</td><td>True</td><td></td><td>Push Button: Reject All Size of Pieces NO (Input)</td></tr><tr><td></td><td>PB_Stop_Reset_HMI</td><td>Bool</td><td>%M10.6</td><td>False</td><td>True</td><td>True</td><td>True</td><td></td><td>Push Button: Stop/Reset process cycle NO (Input)</td></tr><tr><td></td><td>PB_Furnace_Deactivation_HMI</td><td>Bool</td><td>%M11.1</td><td>False</td><td>True</td><td>True</td><td>True</td><td></td><td>Push Button: to deactivate PID control of Furnace NO (Input)</td></tr><tr><td></td><td>PB_Reset_Counter_Large_HMI</td><td>Bool</td><td>%M11.5</td><td>False</td><td>True</td><td>True</td><td>True</td><td></td><td>Push Button: to reset the large piece counter NO (Input)</td></tr><tr><td></td><td>PB_Reset_Counter_Small_HMI</td><td>Bool</td><td>%M11.6</td><td>False</td><td>True</td><td>True</td><td>True</td><td></td><td>Push Button: to reset the small piece counter NO (Input)</td></tr><tr><td></td><td>PB_Reset_Counter_Errors_HMI</td><td>Bool</td><td>%M11.7</td><td>False</td><td>True</td><td>True</td><td>True</td><td></td><td>Push Button: to reset the error coun-ter NO (Input)</td></tr><tr><td></td><td>PB_Reset_Counter_Rejects_HMI</td><td>Bool</td><td>%M28.1</td><td>False</td><td>True</td><td>True</td><td>True</td><td></td><td>Push Button: to reset the rejects coun-ter NO (Input)</td></tr><tr><td></td><td>PB_Reset_Counter_All_HMI</td><td>Bool</td><td>%M28.2</td><td>False</td><td>True</td><td>True</td><td>True</td><td></td><td>Push Button: to reset all the counters NO (Input)</td></tr><tr><td></td><td>Piece_inserted_Error_Light_HMI</td><td>Bool</td><td>%M29.1</td><td>False</td><td>True</td><td>True</td><td>True</td><td></td><td>Error Light on HMI for Piece inserted before end the of cycle (Output)</td></tr></table></div>				Name	Data type	Address	Retain	Accessi-ble from HMI/OPC UA	Writable from HMI/OPC UA	Visible in HMI engi-neering	Supervision	Comment		PB_Furnace_Activation_HMI	Bool	%M10.7	False	True	True	True		Push Button: to Activate PID control of Furnace NO (Input)		PB_Small_HMI	Bool	%M10.0	False	True	True	True		Push Button: Small Size reject NO (In-put)		PB_Large_HMI	Bool	%M10.2	False	True	True	True		Push Button: Large Size reject NO (In-put)		PB_Manual_HMI	Bool	%M10.3	False	True	True	True		Push Button: Mode Manual Selected NO (Input)		PB_Automatic_HMI	Bool	%M10.4	False	True	True	True		Push Button: Mode Automatic Selec-ted NO (Input)		PB_Reject_All_HMI	Bool	%M10.5	False	True	True	True		Push Button: Reject All Size of Pieces NO (Input)		PB_Stop_Reset_HMI	Bool	%M10.6	False	True	True	True		Push Button: Stop/Reset process cycle NO (Input)		PB_Furnace_Deactivation_HMI	Bool	%M11.1	False	True	True	True		Push Button: to deactivate PID control of Furnace NO (Input)		PB_Reset_Counter_Large_HMI	Bool	%M11.5	False	True	True	True		Push Button: to reset the large piece counter NO (Input)		PB_Reset_Counter_Small_HMI	Bool	%M11.6	False	True	True	True		Push Button: to reset the small piece counter NO (Input)		PB_Reset_Counter_Errors_HMI	Bool	%M11.7	False	True	True	True		Push Button: to reset the error coun-ter NO (Input)		PB_Reset_Counter_Rejects_HMI	Bool	%M28.1	False	True	True	True		Push Button: to reset the rejects coun-ter NO (Input)		PB_Reset_Counter_All_HMI	Bool	%M28.2	False	True	True	True		Push Button: to reset all the counters NO (Input)		Piece_inserted_Error_Light_HMI	Bool	%M29.1	False	True	True	True		Error Light on HMI for Piece inserted before end the of cycle (Output)		
	Name	Data type	Address	Retain	Accessi-ble from HMI/OPC UA	Writable from HMI/OPC UA	Visible in HMI engi-neering	Supervision	Comment																																																																																																																																																	
	PB_Furnace_Activation_HMI	Bool	%M10.7	False	True	True	True		Push Button: to Activate PID control of Furnace NO (Input)																																																																																																																																																	
	PB_Small_HMI	Bool	%M10.0	False	True	True	True		Push Button: Small Size reject NO (In-put)																																																																																																																																																	
	PB_Large_HMI	Bool	%M10.2	False	True	True	True		Push Button: Large Size reject NO (In-put)																																																																																																																																																	
	PB_Manual_HMI	Bool	%M10.3	False	True	True	True		Push Button: Mode Manual Selected NO (Input)																																																																																																																																																	
	PB_Automatic_HMI	Bool	%M10.4	False	True	True	True		Push Button: Mode Automatic Selec-ted NO (Input)																																																																																																																																																	
	PB_Reject_All_HMI	Bool	%M10.5	False	True	True	True		Push Button: Reject All Size of Pieces NO (Input)																																																																																																																																																	
	PB_Stop_Reset_HMI	Bool	%M10.6	False	True	True	True		Push Button: Stop/Reset process cycle NO (Input)																																																																																																																																																	
	PB_Furnace_Deactivation_HMI	Bool	%M11.1	False	True	True	True		Push Button: to deactivate PID control of Furnace NO (Input)																																																																																																																																																	
	PB_Reset_Counter_Large_HMI	Bool	%M11.5	False	True	True	True		Push Button: to reset the large piece counter NO (Input)																																																																																																																																																	
	PB_Reset_Counter_Small_HMI	Bool	%M11.6	False	True	True	True		Push Button: to reset the small piece counter NO (Input)																																																																																																																																																	
	PB_Reset_Counter_Errors_HMI	Bool	%M11.7	False	True	True	True		Push Button: to reset the error coun-ter NO (Input)																																																																																																																																																	
	PB_Reset_Counter_Rejects_HMI	Bool	%M28.1	False	True	True	True		Push Button: to reset the rejects coun-ter NO (Input)																																																																																																																																																	
	PB_Reset_Counter_All_HMI	Bool	%M28.2	False	True	True	True		Push Button: to reset all the counters NO (Input)																																																																																																																																																	
	Piece_inserted_Error_Light_HMI	Bool	%M29.1	False	True	True	True		Error Light on HMI for Piece inserted before end the of cycle (Output)																																																																																																																																																	
































HMI Control Tag Table [14]

User constants

User constants				
	Name	Data type	Value	Comment

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PLC tags

PLC tags									
	Name	Data type	Address	Retain	Access- ible from HMI/OPC UA	Writable from HMI/OPC UA	Visible in HMI engi- neering	Supervision	Comment
	EMS	Bool	%I0.0	False	True	True	True		Emergency Stop Button NC (Input)
	S1_Optical	Bool	%I0.1	False	True	True	True		Optical Start Conveyor Sensor - NO (Input)
	S2_Optical	Bool	%I0.2	False	True	True	True		Optical Check Size Sensor NO (Input)
	S3_Heat_or_Reject	Bool	%I0.3	False	True	True	True		Optical Heat or Reject position Sensor NO (Input)
	Temperature_Read_in	Int	%IW64	False	True	True	True		Analogue Temperature (Input)
	Reject	Bool	%Q0.0	False	True	True	True		Rejection Solenoid (Output)
	Conveyor	Bool	%Q0.1	False	True	True	True		Conveyor Run (Output)
	Furnace	Bool	%Q0.2	False	True	True	True		Furnace Heater (Output)
	System_Enable	Bool	%M0.0	False	True	True	True		System Enable (Bit)
	Detected_Large	Bool	%M0.1	False	True	True	True		Large piece (Detected) (Bit)
	Detected_Small	Bool	%M0.2	False	True	True	True		Small piece (Detected) (Bit)
	Reject_for_Large	Bool	%M0.5	False	True	True	True		Large Rejection (Selected) (Bit)
	Reject_for_Small	Bool	%M0.4	False	True	True	True		Small Rejection (Selected) (Bit)
	Furnace_Enable	Bool	%M0.6	False	True	True	True		Furnace conditions met (Bit)
	Piece_Size_Reset	Bool	%M0.7	False	True	True	True		Reset the basket size (Bit)
	PV_Memory	Real	%MD1	False	True	True	True		Present Value reading word (Word byte)
	Temp_in_Range	Bool	%M11.0	False	True	True	True		Temperature in Range Confirmation (Bit)
	Auto_Stop_Reset	Bool	%M11.2	False	True	True	True		Automatic Stop and Reset for errors (Bit)
	Temp_High_Alarm	Bool	%M11.3	False	True	True	True		Furnace Alarm Temperature too High (Bit)
	Temp_Low_Alarm	Bool	%M11.4	False	True	True	True		Furnace Alarm Temperature too Low (Bit)
	Temp_High_Set_Point	Real	%MD12	False	True	True	True		High Temperature Setpoint (Bit)
	Temp_Low_Set_Point	Real	%MD16	False	True	True	True		Low Temperature Setpoint (Bit)
	Temp_Limit_High_Range	Real	%MD20	False	True	True	True		Temperature range confirmation High (Bit)
	Temp_Limit_Low_Range	Real	%MD24	False	True	True	True		Temperature range confirmation Low (Bit)
	Furnace_Cycle_end	Bool	%M28.0	False	True	True	True		End of Furnace cycle (Bit)
	Piece_selected	Bool	%M28.3	False	True	True	True		Confirms a piece size has been selected. (Bit)
	Piece_Detected	Bool	%M28.4	False	True	True	True		Confirms a piece has been detected. (Bit)
	Counter_Reset_Large	Bool	%M28.5	False	True	True	True		Large Piece Counter Reset (Bit)
	Counter_Reset_Small	Bool	%M28.6	False	True	True	True		Small Piece Counter Reset (Bit)
	Counter_Reset_Errors	Bool	%M28.7	False	True	True	True		Error Counter Reset (Bit)
	Counter_Reset_Rejects	Bool	%M29.0	False	True	True	True		Piece Reject Counter Reset (Bit)

Input/Output/Bit Tag Table [59]

User constants

User constants				
	Name	Data type	Value	Comment

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Totally Integrated Automation Portal

HMI tag table [37]

Tag_ScreenNumber

General					
Name	Tag_ScreenNumber	Connection	<Internal tag>	Data type	UInt
Array elements	0	Length	2	Address	
Access mode	<symbolic access>	PLC tag		Coding	Binary
PLC name					
Settings					
Acquisition cycle	1 s	Acquisition mode	Cyclic in operation		
Limits					
Upper 2		Lower 2			
Linear scaling					
Linear scaling	Unchecked	PLC value range end value	10	PLC value range start value	0
HMI device value range end value	100	HMI device value range start value	0		
Values					
ID tag		Start value			
Comment					
Comment		Source comment			
Multiplexing					
Multiplexing	Unchecked	Index tag			

PB_Large_HMI

General					
Name	PB_Large_HMI	Connection	HMI_Connection_1	Data type	Bool
Array elements	0	Length	1	Address	
Access mode	<symbolic access>	Coding	Binary	PLC name	PLC_1
Settings					
Acquisition cycle	1 s	Acquisition mode	Cyclic in operation		
Limits					
Upper 2		Lower 2			
Linear scaling					
Linear scaling	Unchecked	PLC value range end value	10	PLC value range start value	0
HMI device value range end value	100	HMI device value range start value	0		
Values					
ID tag		Start value			
Comment					
Comment	Push Button: Large Size reject NO (Input)	Source comment	Push Button: Large Size reject NO (Input)		
Multiplexing					
Multiplexing	Unchecked	Index tag			

PB_Large_HMI

PB_Small_HMI

General					
Name	PB_Small_HMI	Connection	HMI_Connection_1	Data type	Bool
Array elements	0	Length	1	Address	
Access mode	<symbolic access>	Coding	Binary	PLC name	PLC_1
Settings					
Acquisition cycle	1 s	Acquisition mode	Cyclic in operation		
Limits					
Upper 2		Lower 2			
Linear scaling					
Linear scaling	Unchecked	PLC value range end value	10	PLC value range start value	0
HMI device value range end value	100	HMI device value range start value	0		
Values					
ID tag		Start value			
Comment					
Comment	Push Button: Small Size reject NO (Input)	Source comment	Push Button: Small Size reject NO (Input)		
Multiplexing					
Multiplexing	Unchecked	Index tag			

PB_Small_HMI

PB_Automatic_HMI

General					
Name	PB_Automatic_HMI	Connection	HMI_Connection_1	Data type	Bool
Array elements	0	Length	1	Address	
Access mode	<symbolic access>	Coding	Binary	PLC name	PLC_1
Settings					
Acquisition cycle	1 s	Acquisition mode	Cyclic in operation		
Limits					
Upper 2		Lower 2			

Totally Integrated Automation Portal

Linear scaling

Linear scaling

Unchecked

PLC value range end value

10

PLC value range start value

0

HMI device value range end value

100

HMI device value range start value

0

Values

ID tag

Start value

Comment

Comment

Push Button: Mode Automatic Selected NO (Input)

Source comment

Push Button: Mode Automatic Selected NO (Input)

Multiplexing

Multiplexing

Unchecked

Index tag

PB_Automatic_HMI

PB_Stop_HMI

General

Name

PB_Stop_HMI

Connection

HMI_Connection_1

Data type

Bool

Array elements

0

Length

1

Address

Access mode

<symbolic access>

Coding

Binary

PLC name

PLC_1

Settings

Acquisition cycle

1 s

Acquisition mode

Cyclic in operation

Limits

Upper 2

Lower 2

Linear scaling

Linear scaling

Unchecked

PLC value range end value

10

PLC value range start value

0

HMI device value range end value

100

HMI device value range start value

0

Values

ID tag

Start value

Comment

Comment

Push Button: Stop/Reset process cycle NO (Input)

Source comment

Push Button: Stop/Reset process cycle NO (Input)

Multiplexing

Multiplexing

Unchecked

Index tag

PB_Stop_Reset_HMI

PB_Manual_HMI

General

Name

PB_Manual_HMI

Connection

HMI_Connection_1

Data type

Bool

Array elements

0

Length

1

Address

Access mode

<symbolic access>

Coding

Binary

PLC name

PLC_1

Settings

Acquisition cycle

1 s

Acquisition mode

Cyclic in operation

Limits

Upper 2

Lower 2

Linear scaling

Linear scaling

Unchecked

PLC value range end value

10

PLC value range start value

0

HMI device value range end value

100

HMI device value range start value

0

Values

ID tag

Start value

Comment

Comment

Push Button: Mode Manual Selected NO (Input)

Source comment

Push Button: Mode Manual Selected NO (Input)

Multiplexing

Multiplexing

Unchecked

Index tag

PB_Manual_HMI

PID_Furnace_Control_Setpoint

General

Name

PID_Furnace_Control_Setpoint

Connection

HMI_Connection_1

Data type

Real

Array elements

0

Length

4

Address

Access mode

<symbolic access>

PLC tag

PID_Furnace_Control.Setpoint

Coding

IEEE754

PLC name

PLC_1

Settings

Acquisition cycle

1 s

Acquisition mode

Cyclic in operation

Limits

Upper 2

Lower 2

Linear scaling

Linear scaling

Unchecked

PLC value range end value

10

PLC value range start value

0

HMI device value range end value

100

HMI device value range start value

0

Values

ID tag

Start value

Comment

Comment

controller setpoint input

Source comment

controller setpoint input

Multiplexing

Multiplexing

Unchecked

Index tag

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PID_Furnace_Control_ManualEnable

General					
Name	PID_Furnace_Control_ManualEnable	Connection	HMI_Connection_1	Data type	Bool
Array elements	0	Length	1	Address	
Access mode	<symbolic access>	PLC tag	PID_Furnace_Control.ManualEnable	Coding	Binary
PLC name	PLC_1				
Settings					
Acquisition cycle	1 s	Acquisition mode	Cyclic in operation		
Limits					
Upper 2		Lower 2			
Linear scaling					
Linear scaling	Unchecked	PLC value range end value	10	PLC value range start value	0
HMI device value range end value	100	HMI device value range start value	0		
Values					
ID tag		Start value			
Comment					
Comment	activate manual input to overwrite output	Source comment	activate manual input to overwrite output		
Multiplexing					
Multiplexing	Unchecked	Index tag			

PB_Furnace_Activation

General					
Name	PB_Furnace_Activation	Connection	HMI_Connection_1	Data type	Bool
Array elements	0	Length	1	Address	
Access mode	<symbolic access>	Coding	Binary	PLC name	PLC_1
Settings					
Acquisition cycle	1 s	Acquisition mode	Cyclic in operation		
Limits					
Upper 2		Lower 2			
Linear scaling					
Linear scaling	Unchecked	PLC value range end value	10	PLC value range start value	0
HMI device value range end value	100	HMI device value range start value	0		
Values					
ID tag		Start value			
Comment					
Comment	Push Button: to Activate PID control of Furnace NO (Input)	Source comment	Push Button: to Activate PID control of Furnace NO (Input)		
Multiplexing					
Multiplexing	Unchecked	Index tag			

PB_Furnace_Activation_HMI

PB_Furnace_Deactivation

General					
Name	PB_Furnace_Deactivation	Connection	HMI_Connection_1	Data type	Bool
Array elements	0	Length	1	Address	
Access mode	<symbolic access>	Coding	Binary	PLC name	PLC_1
Settings					
Acquisition cycle	1 s	Acquisition mode	Cyclic in operation		
Limits					
Upper 2		Lower 2			
Linear scaling					
Linear scaling	Unchecked	PLC value range end value	10	PLC value range start value	0
HMI device value range end value	100	HMI device value range start value	0		
Values					
ID tag		Start value			
Comment					
Comment	Push Button: to deactivate PID control of Furnace NO (Input)	Source comment	Push Button: to deactivate PID control of Furnace NO (Input)		
Multiplexing					
Multiplexing	Unchecked	Index tag			

PB_Furnace_Deactivation_HMI

PV_Memory

General					
Name	PV_Memory	Connection	HMI_Connection_1	Data type	Real
Array elements	0	Length	4	Address	
Access mode	<symbolic access>	Coding	IEEE754	PLC name	PLC_1
Settings					
Acquisition cycle	1 s	Acquisition mode	Cyclic in operation		
Limits					
Upper 2	Temp_High_Set_Point	Lower 2	Temp_Low_Set_Point		
Linear scaling					
Linear scaling	Unchecked	PLC value range end value	10	PLC value range start value	0
HMI device value range end value	100	HMI device value range start value	0		

Totally Integrated Automation Portal						
Values						
ID tag			Start value			
Comment						
Comment		Present Value reading word (Word byte)	Source comment		Present Value reading word (Word byte)	
Multiplexing						
Multiplexing		Unchecked	Index tag			
PV_Memory						
Temp_Low_Set_Point						
Temp_High_Set_Point						
Temp_High_Set_Point						
General						
Name		Temp_High_Set_Point	Connection		HMI_Connection_1	Data type Real
Array elements		0	Length		4	Address
Access mode		<symbolic access>	Coding		IEEE754	PLC name PLC_1
Settings						
Acquisition cycle		1 s	Acquisition mode		Cyclic in operation	
Limits						
Upper 2			Lower 2			
Linear scaling						
Linear scaling		Unchecked	PLC value range end value		10	PLC value range start value 0
HMI device value range end value		100	HMI device value range start value		0	
Values						
ID tag			Start value			
Comment						
Comment		High Temperature Setpoint (Bit)	Source comment		High Temperature Setpoint (Bit)	
Multiplexing						
Multiplexing		Unchecked	Index tag			
Temp_High_Set_Point						
Temp_Low_Set_Point						
General						
Name		Temp_Low_Set_Point	Connection		HMI_Connection_1	Data type Real
Array elements		0	Length		4	Address
Access mode		<symbolic access>	Coding		IEEE754	PLC name PLC_1
Settings						
Acquisition cycle		1 s	Acquisition mode		Cyclic in operation	
Limits						
Upper 2			Lower 2			
Linear scaling						
Linear scaling		Unchecked	PLC value range end value		10	PLC value range start value 0
HMI device value range end value		100	HMI device value range start value		0	
Values						
ID tag			Start value			
Comment						
Comment		Low Temperature Setpoint (Bit)	Source comment		Low Temperature Setpoint (Bit)	
Multiplexing						
Multiplexing		Unchecked	Index tag			
Temp_Low_Set_Point						
LargePart_Counter_0_DB_CV						
General						
Name		LargePart_Counter_0_DB_CV	Connection		HMI_Connection_1	Data type Int
Array elements		0	Length		2	Address
Access mode		<symbolic access>	PLC tag		Large_Piece_Counter_0_DB.CV	Coding Binary
PLC name		PLC_1				
Settings						
Acquisition cycle		1 s	Acquisition mode		Cyclic in operation	
Limits						
Upper 2			Lower 2			
Linear scaling						
Linear scaling		Unchecked	PLC value range end value		10	PLC value range start value 0
HMI device value range end value		100	HMI device value range start value		0	
Values						
ID tag			Start value			
Comment						
Comment			Source comment			
Multiplexing						
Multiplexing		Unchecked	Index tag			
SmallPart_Counter_0_DB_CV						
General						
Name		SmallPart_Counter_0_DB_CV	Connection		HMI_Connection_1	Data type Int
Array elements		0	Length		2	Address

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Access mode	<symbolic access>	PLC tag	Small_Piece_Counter_0_DB.CV	Coding	Binary
PLC name	PLC_1				
Settings					
Acquisition cycle	1 s	Acquisition mode	Cyclic in operation		
Limits					
Upper 2		Lower 2			
Linear scaling					
Linear scaling	Unchecked	PLC value range end value	10	PLC value range start value	0
HMI device value range end value	100	HMI device value range start value	0		
Values					
ID tag		Start value			
Comment					
Comment		Source comment			
Multiplexing					
Multiplexing	Unchecked	Index tag			

IEC_Total_Piece_Reject_Counter_0_DB_CV

General					
Name	IEC_Total_Piece_Reject_Counter_0_DB_CV	Connection	HMI_Connection_1	Data type	Int
Array elements	0	Length	2	Address	
Access mode	<symbolic access>	PLC tag	Total_Piece_Reject_Counter_0_DB.CV	Coding	Binary
PLC name	PLC_1				
Settings					
Acquisition cycle	1 s	Acquisition mode	Cyclic in operation		
Limits					
Upper 2		Lower 2			
Linear scaling					
Linear scaling	Unchecked	PLC value range end value	10	PLC value range start value	0
HMI device value range end value	100	HMI device value range start value	0		
Values					
ID tag		Start value			
Comment					
Comment		Source comment			
Multiplexing					
Multiplexing	Unchecked	Index tag			

IEC_Total_Error_Counter_0_DB_CV

General					
Name	IEC_Total_Error_Counter_0_DB_CV	Connection	HMI_Connection_1	Data type	Int
Array elements	0	Length	2	Address	
Access mode	<symbolic access>	PLC tag	Total_Error_Counter_0_DB.CV	Coding	Binary
PLC name	PLC_1				
Settings					
Acquisition cycle	1 s	Acquisition mode	Cyclic in operation		
Limits					
Upper 2		Lower 2			
Linear scaling					
Linear scaling	Unchecked	PLC value range end value	10	PLC value range start value	0
HMI device value range end value	100	HMI device value range start value	0		
Values					
ID tag		Start value			
Comment					
Comment	Total Error counter Block (+1 for each error)	Source comment			
Multiplexing					
Multiplexing	Unchecked	Index tag			

PB_Reset_Counter_Large

General					
Name	PB_Reset_Counter_Large	Connection	HMI_Connection_1	Data type	Bool
Array elements	0	Length	1	Address	
Access mode	<symbolic access>	Coding	Binary	PLC name	PLC_1
Settings					
Acquisition cycle	1 s	Acquisition mode	Cyclic in operation		
Limits					
Upper 2		Lower 2			
Linear scaling					
Linear scaling	Unchecked	PLC value range end value	10	PLC value range start value	0
HMI device value range end value	100	HMI device value range start value	0		
Values					
ID tag		Start value			
Comment					
Comment		Source comment	Push Button: to reset the large piece counter NO (Input)		
Multiplexing					
Multiplexing	Unchecked	Index tag			

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PB_Reset_Counter_Large_HMI

PB_Reset_Counter_Small

General					
Name	PB_Reset_Counter_Small	Connection	HMI_Connection_1	Data type	Bool
Array elements	0	Length	1	Address	
Access mode	<symbolic access>	Coding	Binary	PLC name	PLC_1
Settings					
Acquisition cycle	1 s	Acquisition mode	Cyclic in operation		
Limits					
Upper 2		Lower 2			
Linear scaling					
Linear scaling	Unchecked	PLC value range end value	10	PLC value range start value	0
HMI device value range end value	100	HMI device value range start value	0		
Values					
ID tag		Start value			
Comment					
Comment	Push Button: to reset the small piece counter NO (Input)	Source comment	Push Button: to reset the small piece counter NO (Input)		
Multiplexing					
Multiplexing	Unchecked	Index tag			

PB_Reset_Counter_Small_HMI

PB_Reset_Counter_Rejects

General					
Name	PB_Reset_Counter_Rejects	Connection	HMI_Connection_1	Data type	Bool
Array elements	0	Length	1	Address	
Access mode	<symbolic access>	Coding	Binary	PLC name	PLC_1
Settings					
Acquisition cycle	1 s	Acquisition mode	Cyclic in operation		
Limits					
Upper 2		Lower 2			
Linear scaling					
Linear scaling	Unchecked	PLC value range end value	10	PLC value range start value	0
HMI device value range end value	100	HMI device value range start value	0		
Values					
ID tag		Start value			
Comment					
Comment	Push Button: to reset the rejects counter NO (Input)	Source comment	Push Button: to reset the rejects counter NO (Input)		
Multiplexing					
Multiplexing	Unchecked	Index tag			

PB_Reset_Counter_Rejects_HMI

PB_Reset_Counter_Errors

General					
Name	PB_Reset_Counter_Errors	Connection	HMI_Connection_1	Data type	Bool
Array elements	0	Length	1	Address	
Access mode	<symbolic access>	Coding	Binary	PLC name	PLC_1
Settings					
Acquisition cycle	1 s	Acquisition mode	Cyclic in operation		
Limits					
Upper 2		Lower 2			
Linear scaling					
Linear scaling	Unchecked	PLC value range end value	10	PLC value range start value	0
HMI device value range end value	100	HMI device value range start value	0		
Values					
ID tag		Start value			
Comment					
Comment	Push Button: to reset the error counter NO (Input)	Source comment	Push Button: to reset the error counter NO (Input)		
Multiplexing					
Multiplexing	Unchecked	Index tag			

PB_Reset_Counter_Errors_HMI

PB_Reset_Counter_All

General					
Name	PB_Reset_Counter_All	Connection	HMI_Connection_1	Data type	Bool
Array elements	0	Length	1	Address	
Access mode	<symbolic access>	Coding	Binary	PLC name	PLC_1
Settings					
Acquisition cycle	1 s	Acquisition mode	Cyclic in operation		
Limits					
Upper 2		Lower 2			
Linear scaling					
Linear scaling	Unchecked	PLC value range end value	10	PLC value range start value	0

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HMI device value range end value	100	HMI device value range start value	0		
Values					
ID tag		Start value			
Comment					
Comment	Push Button: to reset all the counters NO (Input)	Source comment	Push Button: to reset all the counters NO (Input)		
Multiplexing					
Multiplexing	Unchecked	Index tag			

PB_Reset_Counter_All_HMI

System Enable

General					
Name	System Enable	Connection	HMI_Connection_1	Data type	Bool
Array elements	0	Length	1	Address	
Access mode	<symbolic access>	Coding	Binary	PLC name	PLC_1
Settings					
Acquisition cycle	1 s	Acquisition mode	Cyclic in operation		
Limits					
Upper 2		Lower 2			
Linear scaling					
Linear scaling	Unchecked	PLC value range end value	10	PLC value range start value	0
HMI device value range end value	100	HMI device value range start value	0		
Values					
ID tag		Start value			
Comment					
Comment	System Enable (Bit)	Source comment	System Enable (Bit)		
Multiplexing					
Multiplexing	Unchecked	Index tag			

System_Enable

Temp_High_Alarm

General					
Name	Temp_High_Alarm	Connection	HMI_Connection_1	Data type	Bool
Array elements	0	Length	1	Address	
Access mode	<symbolic access>	Coding	Binary	PLC name	PLC_1
Settings					
Acquisition cycle	1 s	Acquisition mode	Cyclic in operation		
Limits					
Upper 2		Lower 2			
Linear scaling					
Linear scaling	Unchecked	PLC value range end value	10	PLC value range start value	0
HMI device value range end value	100	HMI device value range start value	0		
Values					
ID tag		Start value			
Comment					
Comment	Furnace Alarm Temperature too High (Bit)	Source comment	Furnace Alarm Temperature too High (Bit)		
Multiplexing					
Multiplexing	Unchecked	Index tag			

Temp_High_Alarm

Temp_Low_Alarm

General					
Name	Temp_Low_Alarm	Connection	HMI_Connection_1	Data type	Bool
Array elements	0	Length	1	Address	
Access mode	<symbolic access>	Coding	Binary	PLC name	PLC_1
Settings					
Acquisition cycle	1 s	Acquisition mode	Cyclic in operation		
Limits					
Upper 2		Lower 2			
Linear scaling					
Linear scaling	Unchecked	PLC value range end value	10	PLC value range start value	0
HMI device value range end value	100	HMI device value range start value	0		
Values					
ID tag		Start value			
Comment					
Comment	Furnace Alarm Temperature too Low (Bit)	Source comment	Furnace Alarm Temperature too Low (Bit)		
Multiplexing					
Multiplexing	Unchecked	Index tag			

Temp_Low_Alarm

Temp_in_Range

General					
Name	Temp_in_Range	Connection	HMI_Connection_1	Data type	Bool

Totally Integrated Automation Portal

Array elements	0	Length	1	Address	
Access mode	<symbolic access>	Coding	Binary	PLC name	PLC_1
Settings					
Acquisition cycle	1 s	Acquisition mode	Cyclic in operation		
Limits					
Upper 2		Lower 2			
Linear scaling					
Linear scaling	Unchecked	PLC value range end value	10	PLC value range start value	0
HMI device value range end value	100	HMI device value range start value	0		
Values					
ID tag		Start value			
Comment					
Comment	Temperature in Range Confirmation (Bit)	Source comment	Temperature in Range Confirmation (Bit)		
Multiplexing					
Multiplexing	Unchecked	Index tag			

Temp_in_Range

Furnace_Enable

General					
Name	Furnace_Enable	Connection	HMI_Connection_1	Data type	Bool
Array elements	0	Length	1	Address	
Access mode	<symbolic access>	Coding	Binary	PLC name	PLC_1
Settings					
Acquisition cycle	1 s	Acquisition mode	Cyclic in operation		
Limits					
Upper 2		Lower 2			
Linear scaling					
Linear scaling	Unchecked	PLC value range end value	10	PLC value range start value	0
HMI device value range end value	100	HMI device value range start value	0		
Values					
ID tag		Start value			
Comment					
Comment	Furnace conditions met (Bit)	Source comment	Furnace conditions met (Bit)		
Multiplexing					
Multiplexing	Unchecked	Index tag			

Furnace_Enable

Piece_selected

General					
Name	Piece_selected	Connection	HMI_Connection_1	Data type	Bool
Array elements	0	Length	1	Address	
Access mode	<symbolic access>	Coding	Binary	PLC name	PLC_1
Settings					
Acquisition cycle	1 s	Acquisition mode	Cyclic in operation		
Limits					
Upper 2		Lower 2			
Linear scaling					
Linear scaling	Unchecked	PLC value range end value	10	PLC value range start value	0
HMI device value range end value	100	HMI device value range start value	0		
Values					
ID tag		Start value			
Comment					
Comment	Confirms a piece size has been selected. (Bit)	Source comment	Confirms a piece size has been selected. (Bit)		
Multiplexing					
Multiplexing	Unchecked	Index tag			

Piece_selected

Furnace_Timer_0_DB_2_IN

General					
Name	Furnace_Timer_0_DB_2_IN	Connection	HMI_Connection_1	Data type	Bool
Array elements	0	Length	1	Address	
Access mode	<symbolic access>	PLC tag	Furnace_Timer_0_DB_2.IN	Coding	Binary
PLC name	PLC_1				
Settings					
Acquisition cycle	1 s	Acquisition mode	Cyclic in operation		
Limits					
Upper 2		Lower 2			
Linear scaling					
Linear scaling	Unchecked	PLC value range end value	10	PLC value range start value	0
HMI device value range end value	100	HMI device value range start value	0		
Values					
ID tag		Start value			

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Comment

Comment	Furnace timer (TON) block at 5s (timer)	Source comment		
Multiplexing				
Multiplexing	Unchecked	Index tag		

Furnace_Cycle_end

General

Name	Furnace_Cycle_end	Connection	HMI_Connection_1	Data type	Bool
Array elements	0	Length	1	Address	
Access mode	<symbolic access>	Coding	Binary	PLC name	PLC_1
Settings					
Acquisition cycle	1 s	Acquisition mode	Cyclic in operation		
Limits					
Upper 2		Lower 2			
Linear scaling					
Linear scaling	Unchecked	PLC value range end value	10	PLC value range start value	0
HMI device value range end value	100	HMI device value range start value	0		
Values					
ID tag		Start value			
Comment					
Comment	End of Furnace cycle (Bit)	Source comment	End of Furnace cycle (Bit)		
Multiplexing					
Multiplexing	Unchecked	Index tag			

Furnace_Cycle_end

Piece_Detected

General

Name	Piece_Detected	Connection	HMI_Connection_1	Data type	Bool
Array elements	0	Length	1	Address	
Access mode	<symbolic access>	Coding	Binary	PLC name	PLC_1
Settings					
Acquisition cycle	1 s	Acquisition mode	Cyclic in operation		
Limits					
Upper 2		Lower 2			
Linear scaling					
Linear scaling	Unchecked	PLC value range end value	10	PLC value range start value	0
HMI device value range end value	100	HMI device value range start value	0		
Values					
ID tag		Start value			
Comment					
Comment	Confirms a piece has been detected. (Bit)	Source comment	Confirms a piece has been detected. (Bit)		
Multiplexing					
Multiplexing	Unchecked	Index tag			

Piece_Detected

Reject

General

Name	Reject	Connection	HMI_Connection_1	Data type	Bool
Array elements	0	Length	1	Address	
Access mode	<symbolic access>	Coding	Binary	PLC name	PLC_1
Settings					
Acquisition cycle	1 s	Acquisition mode	Cyclic in operation		
Limits					
Upper 2		Lower 2			
Linear scaling					
Linear scaling	Unchecked	PLC value range end value	10	PLC value range start value	0
HMI device value range end value	100	HMI device value range start value	0		
Values					
ID tag		Start value			
Comment					
Comment	Rejection Solenoid (Output)	Source comment	Rejection Solenoid (Output)		
Multiplexing					
Multiplexing	Unchecked	Index tag			

Reject

Temp_Analog_In_DB_PV

General

Name	Temp_Analog_In_DB_PV	Connection	HMI_Connection_1	Data type	Real
Array elements	0	Length	4	Address	
Access mode	<symbolic access>	PLC tag	Temp_Analog_In_DB.PV	Coding	IEEE754
PLC name	PLC_1				
Settings					
Acquisition cycle	1 s	Acquisition mode	Cyclic in operation		
Limits					
Upper 2		Lower 2			

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Linear scaling

Linear scaling	Unchecked	PLC value range end value	10	PLC value range start value	0
HMI device value range end value	100	HMI device value range start value	0		
Values					
ID tag		Start value			
Comment					
Comment	Input reading Block from temperature probe (Input)	Source comment	Input reading		
Multiplexing					
Multiplexing	Unchecked	Index tag			

S1 Optical

General

Name	S1 Optical	Connection	HMI_Connection_1	Data type	Bool
Array elements	0	Length	1	Address	
Access mode	<symbolic access>	Coding	Binary	PLC name	PLC_1
Settings					
Acquisition cycle	1 s	Acquisition mode	Cyclic in operation		
Limits					
Upper 2		Lower 2			
Linear scaling					
Linear scaling	Unchecked	PLC value range end value	10	PLC value range start value	0
HMI device value range end value	100	HMI device value range start value	0		
Values					
ID tag		Start value			
Comment					
Comment	Optical Start Conveyor Sensor - NO (Input)	Source comment	Optical Start Conveyor Sensor - NO (Input)		
Multiplexing					
Multiplexing	Unchecked	Index tag			

S1_Optical

General

Name	S2 Optical	Connection	HMI_Connection_1	Data type	Bool
Array elements	0	Length	1	Address	
Access mode	<symbolic access>	Coding	Binary	PLC name	PLC_1
Settings					
Acquisition cycle	1 s	Acquisition mode	Cyclic in operation		
Limits					
Upper 2		Lower 2			
Linear scaling					
Linear scaling	Unchecked	PLC value range end value	10	PLC value range start value	0
HMI device value range end value	100	HMI device value range start value	0		
Values					
ID tag		Start value			
Comment					
Comment	Optical Check Size Sensor NO (Input)	Source comment	Optical Check Size Sensor NO (Input)		
Multiplexing					
Multiplexing	Unchecked	Index tag			

S2_Optical

General

Name	S3 Heat or Reject	Connection	HMI_Connection_1	Data type	Bool
Array elements	0	Length	1	Address	
Access mode	<symbolic access>	Coding	Binary	PLC name	PLC_1
Settings					
Acquisition cycle	1 s	Acquisition mode	Cyclic in operation		
Limits					
Upper 2		Lower 2			
Linear scaling					
Linear scaling	Unchecked	PLC value range end value	10	PLC value range start value	0
HMI device value range end value	100	HMI device value range start value	0		
Values					
ID tag		Start value			
Comment					
Comment	Optical Heat or Reject position Sensor NO (Input)	Source comment	Optical Heat or Reject position Sensor NO (Input)		
Multiplexing					
Multiplexing	Unchecked	Index tag			

Totally Integrated Automation Portal		
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S3_Heat_or_Reject

Piece_inserted_Error_Light_HMI

General					
Name	Piece_inserted_Error_Light_HMI	Connection	HMI_Connection_1	Data type	Bool
Array elements	0	Length	1	Address	
Access mode	<symbolic access>	Coding	Binary	PLC name	PLC_1
Settings					
Acquisition cycle	1 s	Acquisition mode	Cyclic in operation		
Limits					
Upper 2		Lower 2			
Linear scaling					
Linear scaling	Unchecked	PLC value range end value	10	PLC value range start value	0
HMI device value range end value	100	HMI device value range start value	0		
Values					
ID tag		Start value			
Comment					
Comment		Source comment	Error Light on HMI for Piece inserted before end the of cycle (Output)		
Multiplexing					
Multiplexing	Unchecked	Index tag			

Piece_inserted_Error_Light_HMI

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Course Work Conveyor / PLC_1 [CPU 1214C DC/DC/DC] / Watch and force tables

Force table

Name	Address	Display format	Force value	Comment
"Reject_for_Small"	%M0.4	Bool		To check right size selected and in memory.
"Reject_for_Large"	%M0.5	Bool		To check right size selected and in memory.
"Detected_Large"	%M0.1	Bool		To check right size detected.
"Detected_Small"	%M0.2	Bool		To check right size detected.
"System_Enable"	%M0.0	Bool		To check system is enabled at the same time as size selected.
"PB_Large_HMI"	%M10.2	Bool		To check piece selection from HMI.
"PB_Small_HMI"	%M10.0	Bool		To check piece selection from HMI.
"PB_Manual_HMI"	%M10.3	Bool		To check manual mode selection from HMI.
"PB_Automatic_HMI"	%M10.4	Bool		To check automatic mode selection from HMI.
"Temp_High_Alarm"	%M11.3	Bool		To check Alarm.
"Temp_Low_Alarm"	%M11.4	Bool		To check Alarm.
"Temp_in_Range"	%M11.0	Bool		To check Temperature is within range.