Totally Integrated
Automation Portal

Program blocks

MHJ-PLC-Lab-Function-S71500 [FC9000]

MHJ-PLC-Lab-Fui	nction-S71500 Properties							
General								
Name	MHJ-PLC-Lab-Function- S71500	Number	9000	Туре	FC	Language	SCL	
Numbering	Manual							
Information								
Title		Author		Comment		Family		
Version	0.1	User-defined ID						
Version	0.1	User-defined ID						

Name	Data type	Default value	
Input			
Output			
InOut			
▼ Temp			
Value	Byte		
ForCounter	Int		
▼ Constant			
Value_01_DW	DWord	16#1223_5486	
Value_02_DW	DWord	16#A6C9_D1F5	
▼ Return			
MHJ-PLC-Lab-Function-S71500	Void		

```
0001
0002 #Value:=PEEK(area := 16#82,
0003
        dbNumber := 0,
0004
       byteOffset := 511);
0005 #Value := #Value + 1;
0006
0007 POKE (area := 16#82,
8000
       dbNumber := 0,
0009
        byteOffset := 511,
0010
        value := #Value);
0011
0012 POKE (area := 16#82,
0013
       dbNumber := 0,
0014
        byteOffset := 1016,
0015
        value := #Value_01_DW);
0016 POKE (area := 16#82,
0017
        dbNumber := 0,
0018
        byteOffset := 1020,
0019
        value := #Value_02_DW);
0020
0021 FOR #ForCounter := 0 TO 63 DO
0022
      #Value:=PEEK(area := 16#1,
0023
          dbNumber := 0,
0024
         byteOffset := #ForCounter);
0025
      POKE(area := 16#81,
0026
         dbNumber := 0,
0027
          byteOffset := #ForCounter,
0028
         value := #Value);
0029 END FOR;
0030 #Value := PEEK(area := 16#1,
              dbNumber := 0,
0031
0032
             byteOffset := 512);
0033 POKE (area := 16#82,
0034
        dbNumber := 0,
0035
        byteOffset := 512,
        value := #Value);
0036
0037
0038
```

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Program	blocks							
Main [OB1]								
Main Properties General Name	Main	Number 1		Туре	ОВ		Languago	LAD
Numbering Information	Automatic	Number		Туре	ОВ		Language	LAD
Title	"Main Program Sweep (Cy- cle)"			Comment			Family	
Version Name	0.1	User-defined ID	Data t	ype		Default value		
▼ Input Initial_Cal	II		Bool	•				
Remanen			Bool					
Temp Constant								
Network 1: 0	Call: MHJ-PLC-Lab-Fun	ction-S71500						
		"AALL L. DI	%FC9000 C-Lab-Function-S71500"					
		— EN	ENO —					
Network 2: 0	Call: VisuClass	1						
		%FCt						
			ENO -					
Network 3: 0	Call: ConvertClass	<u>'</u>						
		— EN	%FC3 "ConvertClass" ENO					
Network 4: 0	Call: ControllerClass	<u> </u>						
		— EN	%FC2 'ControllerClass"					
Network 5: 0	Call: DistrubanceClass							
		EN	%FC5 DisturbanceClass" ENO					

ONVO	blocks								
ogram artup [O	blocks B1001								
rtup Proper									
neral me	Startup	Number	100	Туре	ОВ		Language	LAD	
mbering ormation	Automatic								
le rsion	"Complete Restart" 0.1	Author User-defined ID		Comment			Family		
me Input				Data type		Default value			
LostRete				Bool					
LostRTC Temp				Bool					
Constant	Call: StartupValue	<u> </u>							
			%FC1 "StartupValues"						
		— EN	EN	10					
twork 2	Call: ValueAssigmo	ent							
	Talac/1551gilli	.							
			%FC9 "ValueAssignment"						
		— EN	EN	0		-			
		·							

|--|--|

ControllerClass [FC2]

ControllerClass F	Properties						
General							
Name	Controller Class	Number	2	Туре	FC	Language	LAD
Numbering	Automatic						
Information							
Title	Controller Class	Author		Comment		Family	
Version	0.1	User-defined ID					

Name	Data type	Default value	
Input			
Output			
InOut			
▼ Temp			
MV	Real		
SP	Real		
Constant			
▼ Return			
ControllerClass	Void		

Network 1: Call: Ramp

```
%DB6
"RAMP_DB"
                                                                                  %FB8
                      Real
                                                                                  "RAMP"
                  EN - ENO
                                                                                               ENO
           0.0 — MN
                                                               #SP — SetPoint
                         OUT —#SP
                                                                                                      "VisuData".Set
                                                                                               OUT
                                                                                                     PointShow
   "VisuData".Set
                                                     "ControllerData".
          Point — IN
                                                                      Rate
         300.0 — MX
"StartStop_DB".Q
```

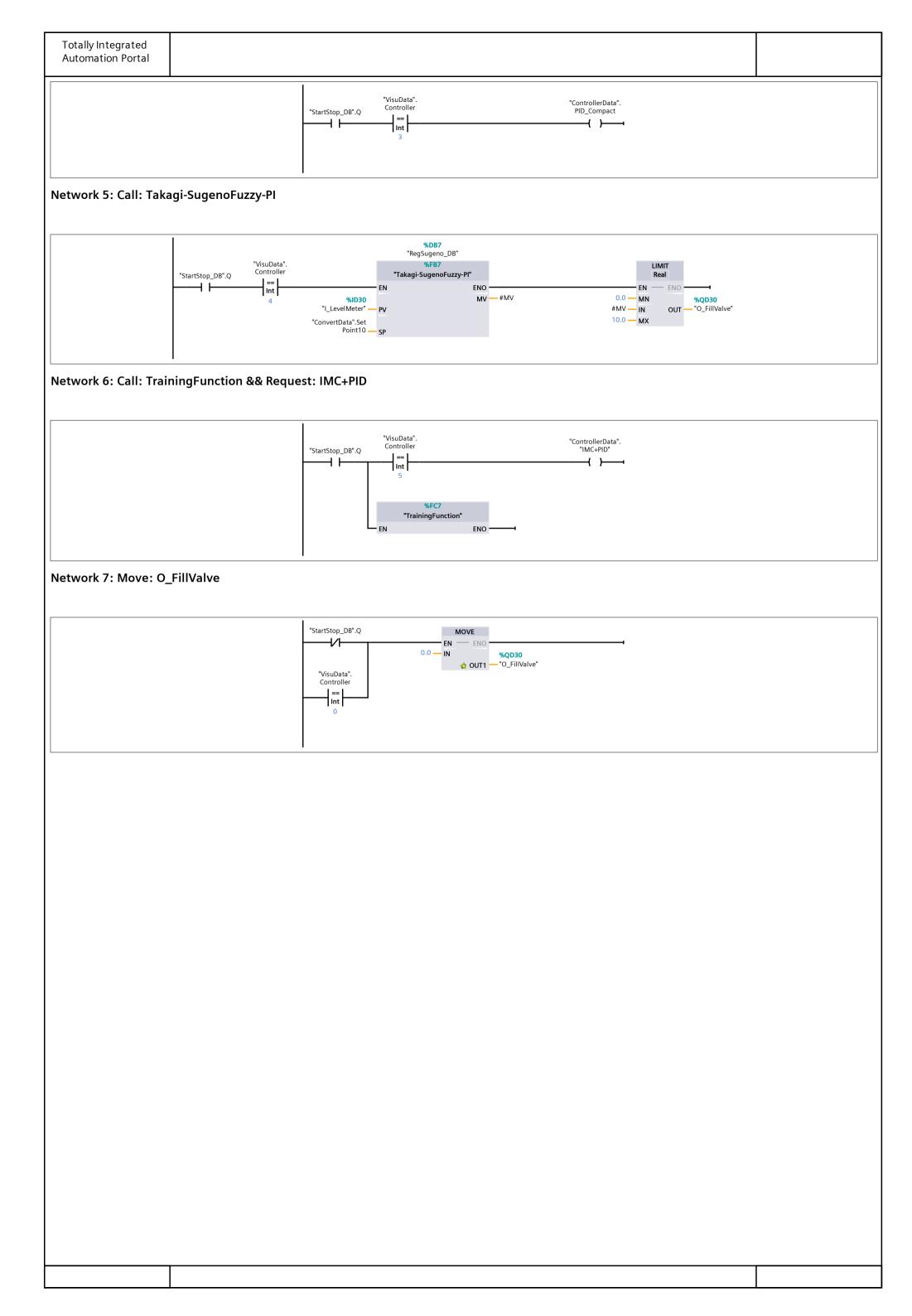
Network 2: Call: On-Off

```
%DB20
"On-Off_DB"
                    "VisuData".
                                                                    %FB12
"StartStop_DB".Q
                                                                   "On-Off"
                                                                                                                                      Real
                       ==
Int
                                                                                  ENO
                                                                                                                                  EN - ENO
                                                                                                                           0.0 — MN
                                                                                   MV — #MV
                                                                                                                                                 %QD30
                                     "ConvertData".Set
                                             Point10 -
                                                                                                                          #MV — IN
                                                                                                                                          OUT — "O_FillValve"
                                                        SetPoint
                                                                                                                          10.0 — MX
                                      "Controller Data".\\
                                            hysteresis _
                                              %ID30
                                        "I_LevelMeter" -
```

Network 3: Call: PID

```
%DB2
"PID_DB"
                        "VisuData".
Controller
                                                                     %FB9
                                                                                                                                     LIMIT
Real
                                                                     "PID"
"StartStop\_DB".Q
                          | == |
|Int |
                                                                          ENO ·
                                                                                                                                 - EN
                                           "ConvertData".Set
Point10 — SP
                                                                       MV_PID — #MV
                                                                                                                         0.0 — MN
                                                                                                                                                   %QD30
                                                                                                                        #MV — IN
                                                                                                                                          OUT — "O_FillValve"
                                                                                                                        10.0 — MX
                                                      %ID30
                                               %QD30
"O_FillValve" — MV
                                            "Controller Data".\\
                                           "ControllerData".
ki — ki
                                           "ControllerData".
kd — kd
```

Network 4: Request: PID_C



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Takagi-SugenoFuzzy-PI [FB7]

Takagi-SugenoFuzzy-PI Properties							
General							
Name	Takagi-SugenoFuzzy-Pl	Number	7	Туре	FB	Language	SCL
Numbering	Automatic						
Information							
Title		Author		Comment		Family	
Version	0.1	User-defined ID					

Name	Data type	Default value	Retain
▼ Input	2212 3, 20		
PV	Real	0.0	Non-retain
SP	Real	0.0	Non-retain
▼ Output			
MV	Real	0.0	Non-retain
InOut			
▼ Static			
n_e	Real	0.0	Non-retain
i_e	Real	0.0	Non-retain
ni_e	Real	0.0	Non-retain
▼ Temp			
е	Real		
u	Real		
sp_M_e	Real		
sp_S_e	Real		
sp_D_e	Real		
sp_M_ie	Real		
sp_S_ie	Real		
sp_D_ie	Real		
pz1	Real		
pz2	Real		
pz3	Real		
pz4	Real		
pz5	Real		
pz6	Real		
pz7	Real		
pz8	Real		
pz9	Real		
Constant			

```
0001 #n_e:=5.0;
0002 #ni_e:=0.25;
0003
0004 #e:=#SP-#PV;
0005 #e:=#n_e*#e;
0006 IF #e>10.0 THEN
0007 #e := 10.0;
0008 ELSIF #e<-10.0 THEN
0009 #e:=-10.0;
0010 END_IF;
0011
0012 #i_e:=#i_e+#e;
0013 #i_e:=#ni_e*#i_e;
0014 IF #i_e>10.0 THEN
0015 #i_e:=10.0;
0016 ELSIF #i_e<-10.0 THEN
0017 #i_e:=-10.0;
0018 END_IF;
0019
0020 IF #e<0.0 THEN
0021
     \#sp_M_e:=(\#e)/-10.0;
     #sp_S_e:=(#e)/10.0+1.0;
0022
0023 #sp_D_e:=0.0;
0024 ELSIF #e>0.0 THEN
0025
      \#sp_D_e:=(\#e)/10.0;
      \# sp_S_e := (\#e) / -10.0 + 1.0;
0026
0027
     #sp_M_e:=0.0;
0028 ELSE
0029 #sp_M_e:=0.0;
0030
     #sp_D_e:=0.0;
0031 #sp_S_e:=1.0;
0032 END_IF;
0033
0034 IF #i_e<0.0 THEN
0035 \#sp M ie:=(\#i e)/-10.0;
     #sp_S_ie:=(#i_e)/10.0+1.0; //jw.
0036
     #sp_D_ie:=0.0;
0037
0038 ELSIF #i_e>0.0 THEN
0039
      #sp_D_ie:=(#i_e)/10.0;
0040
      \#sp_S_{ie}:=(\#i_e)/-10.0+1.0;//jw.
```

```
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0041
       #sp_M_ie:=0.0;
0042 ELSE
0043
     #sp_M_ie:=0.0;
0044
      #sp_D_ie:=0.0;
0045 #sp_S_ie:=1.0;
0046 END IF;
0047
0048 #pz1:=MIN(IN1:=#sp_M_e, IN2:=#sp_M_ie);
0049 #pz2:=MIN(IN1:=#sp_S_e, IN2:=#sp_M_ie);
0050 #pz3:=MIN(IN1:=#sp_D_e, IN2:=#sp_M_ie);
0051 #pz4:=MIN(IN1:=#sp M e, IN2:=#sp S ie);
0052 #pz5:=MIN(IN1:=#sp_S_e, IN2:=#sp_S_ie);
0053 #pz6:=MIN(IN1:=#sp_D_e, IN2:=#sp_S_ie);
0054 #pz7:=MIN(IN1:=#sp_M_e, IN2:=#sp_D_ie);
0055 #pz8:=MIN(IN1:=#sp_S_e, IN2:=#sp_D_ie);
0056 #pz9:=MIN(IN1:=#sp D e, IN2:=#sp D ie);
0057
0058 #u:=(#pz1*0.0+#pz2*0.0+#pz3*5.0+#pz4*0.0+#pz5*5.0
0059
               +#pz6*10.0+#pz7*5.0++#pz8*10.0++#pz9*10.0)
0060
               /(#pz1+#pz2+#pz3+#pz4+#pz5+#pz6+#pz7+#pz8+#pz9);
0061
0062 IF #u>10.0 THEN
0063 #u:=10.0;
0064 END_IF;
0065
0066 IF \#u < 5.0 AND \#u > -5.0 THEN
0067 #u := 0;
0068 END_IF;
0069
0070 IF #u < -10.0 THEN
0071 #u := -10.0;
0072 END IF;
0073
0074 #MV := #u;
```

•

RAMP [FB8]

RAMP Properties	RAMP Properties							
General	General							
Name	RAMP	Number	8	Туре	FB	Language	LAD	
Numbering	Automatic							
Information								
Title	RAMP	Author		Comment		Family		
Version	0.1	User-defined ID						

Name	Data type	Default value	Retain
▼ Input			
SetPoint	Real	0.0	Non-retain
Rate	Real	0.0	Non-retain
Reset	Bool	false	Non-retain
▼ Output			
OUT	Real	0.0	Non-retain
InOut			
▼ Static			
TON_1	TON_TIME		Non-retain
RateDIV	Real	0.0	Non-retain
Q	Bool	false	Non-retain
Temp			
Constant			

Network 1: DIV: Rate/10

Network 2: TON 100ms

Network 3: SetPoint > OUT ++

```
#SetPoint #Q ADD Auto (Real)
#OUT #N1 OUT #OUT
#RateDIV IN2 **

#SetPoint #OUT
#SetPoint #SetPoint #SetPoint #SetPoint #OUT
#OUT #SetPoint #SetPoint #OUT
```

Network 4: SetPoint < OUT - -

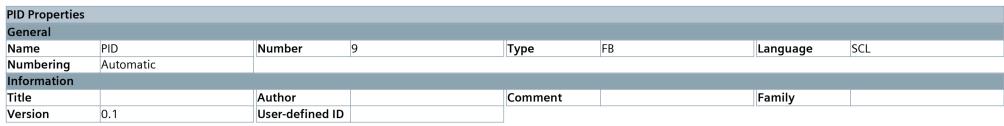
```
#SetPoint #Q
Auto (Real)
#OUT #NUT | #OUT | #OUT |
#SetPoint | #OUT | #OUT |
#OUT | #OUT |
#OUT | #OUT |
#OUT | #OUT |
#OUT | #OUT |
#OUT | #OUT |
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```

Network 5: MOVE: Reset -> OUT = 0.0

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	#Reset MOVE EN ENO O.0 IN OUT1 #OUT	

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PID [FB9]



lame	Data type	Default value	
▼ Input			
SP	Real	0.0	
PV	Real	0.0	
MV	Real	0.0	
kp	Real	0.0	
ki	Real	0.0	
kd	Real	0.0	
▼ Output			
MV_PID	Real	0.0	
InOut			
▼ Static			
ер	Array[01] of Real		
de	Real	0.0	
suma_ep	Real	0.0	
Temp			
Constant			

```
0001 #ep[0]:=#SP-#PV;
0002
0003 IF (ABS(#ep[0]))<(ABS(#SP)) THEN
0004
       #de:=#ep[0]-#ep[1];
0005
0006
       IF #MV<10.0 THEN
0007
       IF #MV>-10.0 THEN
0008
         #suma ep:=#suma ep+#ep[0];
0009
       END_IF;
0010
       END_IF;
0011
0012
       #MV_PID:=#kp*#ep[0] + #ki*#suma_ep + #kd*#de;
0013
0014
       IF #MV_PID > 10.0 THEN
0015
         #MV_{PID} := 10.0;
0016
       END_IF;
0017
0018
       IF #MV_PID < -10.0 THEN
0019
         \#MV_{PID} := -10.0;
0020
       END_IF;
0021
0022
       #ep[1]:=#ep[0];
0023
0024 ELSE
0025
       #ep[1]:=0.0;
0026
       #suma_ep:=0.0;
0027
0028 END_IF;
```

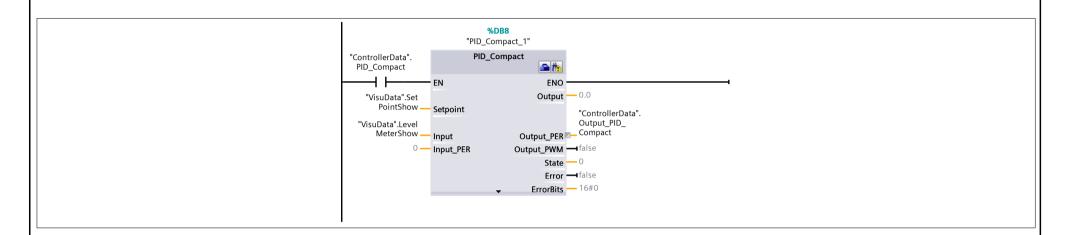
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PID_C [OB30]

PID_C Properties								
General								
Name	PID_C	Number	30	Туре	OB	Language	LAD	
Numbering	Automatic							
Information								
Title		Author		Comment		Family		
Version	0.1	User-defined ID						

Name ▼ Input	Data type	Default value
▼ Input		
Initial_Call	Bool	
Event_Count	Int	
Temp		
Constant		

Network 1: PID_Compact



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ControllerData [DB1]

ControllerData Properties							
General							
Name	ControllerData	Number	1	Type	DB	Language	DB
Numbering	Automatic						
Information							
Title		Author		Comment		Family	
Version	0.1	User-defined ID					

Name	Data type	Start value	Retain
▼ Static			
PID_Compact	Bool	false	False
Output_PID_Compact	Real	0.0	False
IMC+PID	Bool	false	False
rate	Real	0.0	False
hysteresis	Real	0.0	False
kp	Real	0.0	False
ki	Real	0.0	False
kd	Real	0.0	False

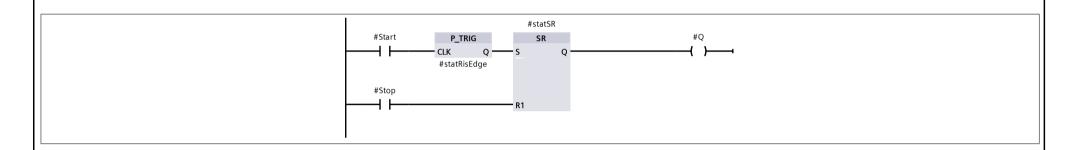
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tomation Portal	

StartStop [FB11]

StartStop Prope	rties						
General							
Name	StartStop	Number	11	Туре	FB	Language	LAD
Numbering	Automatic						
Information							
Title	StartStop	Author		Comment		Family	
Version	0.1	User-defined ID					

Name	Data type	Default value	Retain
▼ Input			
Start	Bool	false	Non-retain
Stop	Bool	false	Non-retain
▼ Output			
Q	Bool	false	Non-retain
InOut			
▼ Static			
statSR	Bool	false	Non-retain
stat Ris Edge	Bool	false	Non-retain
Temp			
Constant			

Network 1: P_Trig && SR



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Program	blocks	/ 02_Contr	oller							•
ValueAssi	gnment	[FC9]								
ValueAssignm General				-						
Name Numbering Information	ValueAssi Automatic		Number	9		Туре	FC		Language	LAD
Title Version	ValueAssi	gnment	Author User-defined II	D		Comment			Family	
Name	·				Data type	9		Default value		
Input Output InOut										
Temp Constant										
▼ Return ValueAs	signment				Void					
Network 1:		e								
				5.0 — IN	"Controlle	rData"				
					Tate	ivata .				
Network 2:	Move: hys	steresis	ı							
				MOVE EN — ENC						
				2.0 — IN	"Controlle 1 — hysteresis	rData".				
Network 3:	Move: kn	& ki & kd								
Network 5.	wove. Kp	a ki a ka								
			MOVE EN — ENO			DVE ENO		MOVE EN E		
		1.0 —		oller Data".	0.1 — IN	"ControllerD OUT1 — ki	ata".	0.2 — IN	"ControllerData". UT1 — kd	
Network 4:	Move: ne	uralNetwork p	arameters							
				MOVE			MOVE			
			2000	EN - ENO	roData". a_i	1000.0 —	EN — ENO	"NeuroData". epoka_m		
				MOVE EN ENO			MOVE EN — ENO			
					roData". _stop_i	5.0 —	IN	"NeuroData". — error_stop_m		
	1									
										l

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On-Off [FB12]

On-Off Propertie	On-Off Properties						
General							
Name	On-Off	Number	12	Туре	FB	Language	SCL
Numbering	Automatic						
Information							
Title		Author		Comment		Family	
Version	0.1	User-defined ID					

lame	Data type	Default value	Retain
▼ Input			
SetPoint	Real	0.0	Non-retain
Hysteresis	Real	0.0	Non-retain
PV	Real	0.0	Non-retain
✓ Output			
MV	Real	0.0	Non-retain
InOut			
▼ Static			
UpperLimit	Real	0.0	Non-retain
LowerLimit	Real	0.0	Non-retain
Temp			
Constant			

```
0001 #UpperLimit := #SetPoint + #Hysteresis / 2;
0002 #LowerLimit := #SetPoint - #Hysteresis / 2;
0003
0004 IF #PV > #UpperLimit THEN
0005 \#MV := -10.0;
0006 IF #PV = #LowerLimit THEN
0007
       #MV := 0.0;
0008 END_IF;
0009 END_IF;
0010
0011
0012 IF #PV < #LowerLimit THEN
0013 #MV := 10.0;
0014
     IF #PV = #UpperLimit THEN
0015
0016
      #MV := 0.0;
0017 END_IF;
0018 END_IF;
```

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StartupValues [FC1]

Startup Values Properties							
General							
Name	StartupValues	Number	1	Туре	FC	Language	SCL
Numbering	Manual						
Information							
Title		Author		Comment		Family	
Version	0.1	User-defined ID					

```
NameData typeDefault valueInput...Output...InOut...Temp...Constant...▼ Return...StartupValuesVoid
```

```
0001 "Model_DB".N:=8;
0002 "Inversion_DB".N:=8;
0003
0004 "Model_DB".w1_1[0]:=0.0947; "Model_DB".w1_1[1]:=-0.0755; "Model_DB".w1_1[2]:=-0.0989; "Model_DB".w1_1[3]:=-0.0972; "Model_DB".w1_1[0]:=0.0947; "Model_DB".w1_1[0]:=0.
                           el_DB".w1_1[4]:=0.0946; "Model_DB".w1_1[5]:=-0.0280; "Model_DB".w1_1[6]:=-0.0111; "Model_DB".w1_1[7]:=-0.0137;
0005 "Model_DB".w1_2[0]:=-0.0590; "Model_DB".w1_2[1]:=-0.0059; "Model_DB".w1_2[2]:=0.0382; "Model_DB".w1_2[3]:=-0.0107; "Model_DB".w1_2[0]:=-0.0590; "Model_DB".w1_2[0]:=-0.0107; "Model_DB".w1_2[0]:=-0.0590; "Model_DB".w1_2[0]:=-0.0107; "Model_DB".w
                           el_DB".w1_2[4]:=-0.0165; "Model_DB".w1_2[5]:=-0.0539; "Model_DB".w1_2[6]:=0.0721; "Model_DB".w1_2[7]:=0.0880;
0006 "Model_DB".w1_3[0]:=-0.0367; "Model_DB".w1_3[1]:=0.0941; "Model_DB".w1_3[2]:=0.0776; "Model_DB".w1_3[3]:=0.0644; "Model_DB".w1_3[0]:=0.0776; "Model_DB".w1_3[0]:=0.0644; "Model_DB".w1_3[0]:=0.0776; "Model_DB".w1_3[0]:=0.0644; "Model_DB".w1_3[0]:=0.0776; "Model_DB".w1_3[0]:=0.0644; "Model_DB".w1_3[0]:=0.0776; "Model_DB".w1_3[0]:=0.0644; "Model_DB".w1_3[0]:=0.0776; "Model_DB".w1_3[0]:=0.0644; "Model_DB".w1_3[0]:=0.0776; "Model_DB".w1_3[0]:=0.0644; "Model_DB".w1_3[0]:=0.06
                           el DB".w1 3[4]:=0.0289; "Model DB".w1 3[5]:=0.0670; "Model DB".w1 3[6]:=-0.0905; "Model DB".w1 3[7]:=0.0183;
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Totally Integrated Automation Portal

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                       ray[202]:=9.1822; "Measurement_DB".r_array[203]:=-0.0265; "Measurement_DB".r_array[204]:=4.7722;
                       "Measurement_DB".r_array[205]:=-9.7449; "Measurement_DB".r_array[206]:=2.1071; "Measurement_DB".
                        ray[207]:=1.5290; "Measurement_DB".r_array[208]:=6.1476; "Measurement_DB".r_array[209]:=3.0994;
0070 "Measurement_DB".r_array[210]:=7.5646; "Measurement_DB".r_array[211]:=8.0475; "Measurement_DB".r_ar-
                        ray[212]:=-6.9553; "Measurement DB".r array[213]:=-6.1484; "Measurement DB".r array[214]:=5.8195;
0071 "Measurement_DB".r_array[215]:=-8.7859; "Measurement_DB".r_array[216]:=-2.2035; "Measurement_DB".r_ar-
                        ray[217]:=-4.0007; "Measurement_DB".r_array[218]:=4.6836; "Measurement_DB".r_array[219]:=-7.9158;
0072 "Measurement_DB".r_array[220]:=5.8515; "Measurement_DB".r_array[221]:=5.6546; "Measurement_DB".r_ar-
                        ray[222]:=0.6480; "Measurement_DB".r_array[223]:=-4.9330; "Measurement_DB".r_array[224]:=-8.5809;
0073 "Measurement_DB".r_array[225]:=2.5161; "Measurement_DB".r_array[226]:=-9.5064; "Measurement_DB".r_ar-
                        ray[227]:=-8.7592; "Measurement_DB".r_array[228]:=-7.4078; "Measurement_DB".r_array[229]:=-0.9877;
0074 "Measurement_DB".r_array[230]:=3.4467; "Measurement_DB".r_array[231]:=7.1222; "Measurement_DB".r_ar-
                        ray[232]:=-0.0311; "Measurement_DB".r_array[233]:=-9.0243; "Measurement_DB".r_array[234]:=-3.7234;
0075 "Measurement_DB".r_array[235]:=2.8326; "Measurement_DB".r_array[236]:=5.7277; "Measurement_DB".r_ar-
                        ray[237]:=-4.2170; "Measurement_DB".r_array[238]:=-0.0426; "Measurement_DB".r_array[239]:=6.3687;
0076 "Measurement_DB".r_array[240]:=1.9026; "Measurement_DB".r_array[241]:=0.7285; "Measurement_DB".r_ar-
                        ray[242]:=-3.3825; "Measurement_DB".r_array[243]:=-1.7662; "Measurement_DB".r_array[244]:=5.8801;
0077 "Measurement_DB".r_array[245]:=-3.1358; "Measurement_DB".r_array[246]:=-0.7479; "Measurement_DB".r_ar-
                        ray[247]:=-2.6435; "Measurement_DB".r_array[248]:=3.5914; "Measurement_DB".r_array[249]:=1.3556;
```

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Measurement [FB1]

Measurement Pr	Measurement Properties						
General							
Name	Measurement	Number	1	Туре	FB	Language	SCL
Numbering	Manual						
Information							
Title		Author		Comment		Family	
Version	0.1	User-defined ID					

Name	Data type	Default value
▼ Input		
у	Real	0.0
▼ Output		
r	Real	0.0
finish	Bool	false
InOut		
▼ Static		
r_array	Array[0249] of Real Array[0249] of Real	
y_array	Array[0249] of Real	
i	Int	0
Temp		
Constant		

```
0001 IF #i=0 THEN
0002 #r:=#r_array[#i];
0003 END_IF;
0004
0005 IF #i>0 THEN
0006 IF #i<250 THEN
0007
      #y_array[#i-1]:=#y;
#r:=#r_array[#i];
0008
0009 END_IF;
0010 END_IF;
0011
0012 IF #i=250 THEN
0013 #y_array[#i-1]:=#y;
0014 #finish:=true;
0015 #r:=0.0;
0016 END_IF;
0017
0018 #i:=#i+1;
```

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Object [FB30]

Object Properties								
General	General							
Name	Object	Number	30	Туре	FB	Language	SCL	
Numbering	Manual							
Information								
Title		Author		Comment		Family		
Version	0.1	User-defined ID						

Name	Data type	Default value	
▼ Input			
r	Real	0.0	
disruption	Real	0.0	
▼ Output			
у	Real	0.0	
InOut			
▼ Static			
x_array	Array[02] of Real Array[02] of Real		
y_array	Array[02] of Real		
Temp			
Constant			

```
0001 #x_array[2]:=#x_array[1];
0002 #x_array[1]:=#x_array[0];
0003 #x_array[0]:=#r;
0004
0005 #y_array[2]:=#y_array[1];
0006 #y_array[1]:=#y_array[0];
0007
0008
ray[2] + #disruption;
0010
0011
0012 IF ABS(#y_array[0])<0.0001 THEN
0013 #y_array[0]:=0.0;
0014 END_IF;
0015
0016 #y:=#y_array[0];
0017
0018
0019
0020
0021
```

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Generator [FB15]

Generator Properties								
General Control of the Control of th								
Name	Name Generator Number 15 Type FB Language SCL							
Numbering								
Information								
Title		Author		Comment		Family		
Version	0.1	User-defined ID						

Name	Data type	Default value	
Input			
▼ Output			
wartosc_zaklocenia	Real	0.0	
u	LReal	0.0	
InOut			
▼ Static			
k	Real	0.0	
i	Int	0	
Temp			
Constant			

```
0001 (*SV*)
0002 IF #k<=25.0 THEN
0003 #u:=0.0;
0004 END IF;
0005 IF #k>25.0 THEN
0006 #u:=2.0;
0007 END IF;
0008 IF #k>175.0 THEN
0009 \#u:=-2.0;
0010 END IF;
0011 IF #k>250.0 THEN
0012 \#u:=2.0*SIN(2.0*3.1416*\#k/50.0);
0013 END IF;
0014 IF #k>400.0 THEN
0015 #u:=0.0;
0016 END_IF;
0017
0018 (*ZAKLOCENIE*)
0019 IF #k<=100.0 THEN
0020 #wartosc_zaklocenia:=0.0;
0021 END IF;
0022 IF #k>75.0 THEN
0023 #wartosc_zaklocenia:=-1.0;
0024 END_IF;
0025 IF \#k>125.0 THEN
0026 #wartosc_zaklocenia:=0.0;
0027 END_IF;
0028 IF #k>300.0 THEN
0029 #wartosc_zaklocenia:=-1.0;
0030 END_IF;
0031 IF #k>400.0 THEN
0032 #wartosc_zaklocenia:=0.0;
0033 END_IF;
0034
0035 \#k := \#k+1.0;
```

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IMC+PID [FB5]

IMC+PID Properties								
General	General							
Name	IMC+PID	Number	5	Type	FB	Language	SCL	
Numbering	Manual							
Information								
Title		Author		Comment		Family		
Version	0.1	User-defined ID						

Name	Data type	Default value
▼ Input		
SP	Real	0.0
PV	Real	0.0
▼ Output		
MV	Real	0.0
InOut		
▼ Static		
PV_model	Real	0.0
e_ob_mo	Real	0.0
е	Real	0.0
ef	Array[01] of Real	
MV1	Real	0.0
MV2	Real	0.0
Temp		
Constant		

```
0001 "Model DB" (wejscie:=#MV,
            wyjscie=>#PV model);
0002
0003
0004
0005 #e_ob_mo:=#PV-#PV_model;
0006 #e:=#SP-#e_ob_mo;
0007
0008 #ef[1]:=#ef[0];
0009 #ef[0]:=0.2835*#e+0.7165*#ef[1];
0010
0011
0012 "Inversion_DB"(wejscie:=#ef[0],
0013
             wyjscie=>#MV1);
0014
0015 "PID_DB_1"(SP:=#SP,
0016
            PV := #PV
0017
            MV := #MV,
0018
            kp := 0.2,
0019
            ki:=0.8,
            kd := 0.1,
0020
0021
            MV_PID=>#MV2);
0022
0023
0024 \#MV := \#MV1 + \#MV2;
0025
0026 IF #MV>10.0 THEN
0027 \#MV := 10.0;
0028 END_IF;
0029
0030 IF #MV<-10.0 THEN
0031 \#MV := -10.0;
0032 END_IF;
```

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Training [FB2]

Training Properties								
General	General							
Name	Training	Number	2	Туре	FB	Language	SCL	
Numbering	Manual							
Information								
Title		Author		Comment		Family		
Version	0.1	User-defined ID						

Name	Data type	Default value	
▼ Input			
error_stop_m	Real	0.0	
error_stop_i	Real	0.0	
epoch_stop_m	Real	0.0	
epoch_stop_i	Real	0.0	
training_m	Bool	false	
training_i	Bool	false	
▼ Output			
error_ep_m	Real	0.0	
error_ep_i	Real	0.0	
stop_m	Bool	false	
stop_i	Bool	false	
▼ InOut			
epoch	Real	0.0	
▼ Static			
i	Int	0	
long	Int	0	
S	Array[07] of Real		
0	Array[07] of Real		
s2	Real	0.0	
e2	Real	0.0	
е	Array[07] of Real		
x_m	Array[05] of Real		
x_i	Array[05] of Real		
n_m	Real	0.0	
n_i	Real	0.0	
Temp			
Constant			

```
0001 \#n m:=0.005;
0002 #n_i:=0.001;
0003
0004 IF #training_m=true THEN
0005 FOR #long:=0 TO 249 DO
               IF #long=0 THEN
0006
0007
                       \#x_m[2]:=0.0;
                                                                                 // x(k-2)
                       #x_m[1]:=0.0;
8000
                                                                                // \times (k-1)
0009
                        #x_m[0]:="Measurement_DB".r_array[#long]; // x(k)
                        \#x_m[5] := 0.0; // y(k-3)
0010
0011
                        \#x_m[4]:=0.0;
                                                                                 // y(k-2)
                        \#x_m[3] := 0.0;
0012
                                                                                 // y(k-1)
0013
                  ELSE
0014
                        \#x_m[2] := \#x_m[1];
                                                                                 // x(k-2)
0015
                        \#x_m[1] := \#x_m[0];
                                                                                 // \times (k-1)
0016
                        #x_m[0]:="Measurement_DB".r_array[#long]; // x(k)
0017
                        \#x_m[5] := \#x_m[4];
                                                                                 // y(k-3)
0018
                        \#x m[4] := \#x m[3];
                                                                                 // y(k-2)
                        #x_m[3]:="Measurement_DB".y_array[#long-1]; // y(k-1)
0019
0020
                  END_IF;
0021
0022
                   FOR #i:=0 TO "Model_DB".N-1 DO
0023
                         \#s[\#i]:=\#x_m[0]*"Model_DB".w1_1[\#i] + \#x_m[1]*"Model_DB".w1_2[\#i] + \#x_m[2]*"Model_DB".w1_3[\#i] + \#x_m[3]*"Model_DB".w1_3[\#i] + \#x_m[3]*"Model_DB".w1_3[\#i
            el DB".w1_4[#i];
0024
                          #s[#i]:=#s[#i] + #x_m[4]*"Model_DB".w1_5[#i] + #x_m[5]*"Model_DB".w1_6[#i] + "Model_DB".bias[#i];
0025
                          \#o[\#i] := (1.0-EXP(-\#s[\#i]))/(1.0+EXP(-\#s[\#i]));
0026
0027
0028
                 #s2:=0.0;
0029
                FOR #i:=0 TO "Model_DB".N-1 DO
0030
                    #s2:=#s2+#o[#i]*"Model_DB".w_2[#i];
0031
                END FOR;
                #s2:=#s2+"Model_DB".bias2;
0032
0033
0034
                #e2:="Measurement_DB".y_array[#long]-#s2;
0035
0036
                FOR #i:=0 TO "Model DB".N-1 DO
0037
                      #e[#i]:=#e2*"Model_DB".w_2[#i]*(1.0-(#o[#i]*#o[#i]));
0038
0039
0040
                 FOR #i:=0 TO "Model_DB".N-1 DO
```

```
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0041
          "Model DB".w1 1[#i]:="Model DB".w1 1[#i]+#n m*#e[#i]*#x m[0];
0042
          "Model DB".w1 2[#i]:="Model DB".w1 2[#i]+#n m*#e[#i]*#x m[1];
0043
          "Model DB".w1 3[#i]:="Model DB".w1 3[#i]+#n m*#e[#i]*#x m[2];
0044
          "Model DB".w1 4[#i]:="Model DB".w1 4[#i]+#n m*#e[#i]*#x m[3];
0045
         "Model DB".w1 5[#i]:="Model DB".w1 5[#i]+#n m*#e[#i]*#x m[4];
0046
         "Model DB".w1 6[#i]:="Model DB".w1 6[#i]+#n m*#e[#i]*#x m[5];
0047
         "Model DB".bias[#i]:="Model DB".bias[#i]+#n m*#e[#i];
0048
       END FOR;
0049
0050
       FOR #i:=0 TO "Model DB".N-1 DO
         "Model DB".w 2[#i]:="Model_DB".w_2[#i]+#n_m*#e2*#o[#i];
0051
0052
       END FOR;
         "Model DB".bias2:="Model_DB".bias2+#n_m*#e2;
0053
0054
       END_FOR;
0055
0056
       #error ep m:=0.0;
0057
       #s2:=0.0;
0058
       FOR #long:=0 TO 249 DO
0059
0060
       IF #long=0 THEN
0061
         \#x_m[2] := 0.0;
                                 // x(k-2)
0062
         \#x m[1] := 0.0;
                                 // \times (k-1)
0063
          #x_m[0]:="Measurement_DB".r_array[#long]; // x(k)
0064
          \#x_m[5] := 0.0;
                                 // y(k-3)
0065
          \#x_m[4]:=0.0;
                                 // y(k-2)
0066
          \#x_m[3] := 0.0;
                                 // y(k-1)
0067
       ELSE
0068
          \#x_m[2] := \#x_m[1];
                                 // x(k-2)
          \#x m[1] := \#x m[0];
0069
                                 // \times (k-1)
0070
          #x m[0]:="Measurement DB".r array[#long]; // x(k)
0071
                                 // y(k-3)
          \#x m[5] := \#x m[4];
          \#x m[4] := \#x m[3];
0072
                                 // y(k-2)
0073
          \#x m[3] := \#s2;
                                 // y(k-1)
0074
       END IF;
0075
0076
       FOR #i:=0 TO "Model DB".N-1 DO
0077
           #s[#i]:=#x_m[0]*"Model_DB".w1_1[#i] + #x_m[1]*"Model_DB".w1_2[#i] + #x_m[2]*"Model_DB".w1_3[#i] + #x_m[3]*"Mod
     el DB".w1 4[#i];
0078
           #s[#i]:=#s[#i] + #x m[4]*"Model DB".w1 5[#i] + #x m[5]*"Model DB".w1 6[#i] + "Model DB".bias[#i];
0079
           \#o[\#i] := (1.0-EXP(-\#s[\#i]))/(1.0+EXP(-\#s[\#i]));
0080
       END FOR;
0081
0082
       #s2:=0.0;
0083
       FOR #i:=0 TO "Model DB".N-1 DO
0084
         #s2:=#s2+#o[#i] * "Model DB".w 2[#i];
       END FOR;
0085
0086
       #s2:=#s2+"Model DB".bias2;
0087
0088
       #e2:="Measurement DB".y array[#long]-#s2;
0089
       #error_ep_m:=#error_ep_m+ABS(#e2);
0090
       END FOR;
0091
0092
       IF #error_ep_m<#error_stop_m</pre>
0093
       THEN #stop m:=true;
0094
       ELSE #stop m:=false;
0095
       END IF;
0096
0097 END_IF;
0098
0099 IF #training_i=true THEN
       FOR #long := 0 TO 249 DO
0100
0101
       IF #long=0 THEN
0102
         \#x i[2] := 0.0;
                                     // y(k-2)
         #x i[1] := 0.0;
0103
                                     // y(k-1)
0104
         #x i[0]:="Measurement DB".y array[#long]; // y(k)
0105
         #x i[5] := 0.0;
                                     // x (k-3)
0106
         \#x i[4] := 0.0;
                                     // x (k-2)
0107
          \#x_i[3] := 0.0;
                                     // \times (k-1)
0108
         #x i[2]:=#x i[1];
0109
                                      // y(k-2)
         #x i[1]:=#x_i[0];
                                     // y(k-1)
0110
0111
         #x i[0]:="Measurement_DB".y_array[#long]; // y(k)
0112
         #x i[5]:=#x i[4];
                                     // x (k-3)
                                     // x(k-2)
0113
         \#x_i[4] := \#x_i[3];
0114
         #x_i[3]:="Measurement_DB".r_array[#long-1];  // x(k-1)
0115
       END IF;
0116
0117
       FOR #i:=0 TO "Inversion DB".N-1 DO
0118
0119
          #s[#i]:=#x_i[0]*"Inversion_DB".w1_1[#i] + #x_i[1]*"Inversion_DB".w1_2[#i] + #x_i[2]*"Inver-
     sion_DB".w1_3[#i] + #x_i[3]*"Inversion_DB".w1_4[#i];
0120
          #s[#i]:=#s[#i] + #x i[4]*"Inversion DB".w1 5[#i] + #x i[5]*"Inversion DB".w1 6[#i] + "Inversion DB".bias[#i];
          \#o[\#i] := (1.0-EXP(-\#s[\#i]))/(1.0+EXP(-\#s[\#i]));
0121
0122
       END_FOR;
```

01230124

0125

0126

#s2:=0.0;

FOR #i:=0 TO "Inversion_DB".N-1 DO

#s2:=#s2+#o[#i] *"Inversion_DB".w_2[#i];

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```
0127
       END FOR;
0128
       #s2:=#s2+"Inversion DB".bias2;
0129
0130
       #e2:="Measurement DB".r array[#long]-#s2;
0131
0132
       FOR #i:=0 TO "Inversion DB".N-1 DO
0133
         \#e[\#i]:=\#e2*"Inversion DB".w 2[\#i]*(1.0-\#o[\#i])*\#o[\#i]);// gdzie f'(s)=1-o(i)*o(i)
0134
      END FOR;
0135
0136
       FOR #i:=0 TO "Inversion DB".N-1 DO
         "Inversion DB".w1_1[#i]:="Inversion_DB".w1_1[#i]+#n_i*#e[#i]*#x_i[0];
0137
         "Inversion DB".w1_2[#i]:="Inversion_DB".w1_2[#i]+#n_i*#e[#i]*#x_i[1];
0138
         "Inversion DB".w1_3[#i]:="Inversion_DB".w1_3[#i]+#n_i*#e[#i]*#x_i[2];
0139
0140
         "Inversion DB".w1_4[#i]:="Inversion_DB".w1_4[#i]+#n_i*#e[#i]*#x_i[3];
         "Inversion_DB".w1_5[#i]:="Inversion_DB".w1_5[#i]+#n_i*#e[#i]*#x_i[4];
0141
0142
         "Inversion DB".w1_6[#i]:="Inversion_DB".w1_6[#i]+#n_i*#e[#i]*#x_i[5];
         "Inversion DB".bias[#i]:="Inversion_DB".bias[#i]+#n_i*#e[#i];
0143
0144
       END_FOR;
0145
0146
       FOR #i:=0 TO "Inversion DB".N-1 DO
         "Inversion DB".w_2[#i]:="Inversion_DB".w_2[#i]+#n_i*#e2*#o[#i];
0147
0148
0149
         "Inversion_DB".bias2:="Inversion_DB".bias2+#n_i*#e2;
0150
       END_FOR;
0151
0152
       #error_ep_i:=0.0;
0153
       #s2:=0.0;
0154
      FOR #long := 0 TO 249 DO
0155
0156
      IF #long=0 THEN
                                    // y(k-2)
0157
        #x i[2] := 0.0;
0158
         #x i[1] := 0.0;
                                    // y(k-1)
0159
         #x i[0]:="Measurement DB".y array[#long]; // y(k)
0160
         #x i[5] := 0.0;
                                    // x (k-3)
         #x i[4]:=0.0;
0161
                                    // x(k-2)
0162
         #x i[3] := 0.0;
                                    // \times (k-1)
0163
       ELSE
0164
         #x i[2]:=#x i[1];
                                    // y(k-2)
0165
         #x i[1]:=#x i[0];
                                    // y(k-1)
0166
         #x i[0]:="Measurement DB".y array[#long]; // y(k)
0167
         #x i[5]:=#x i[4];
                                    // x(k-3)
0168
         #x i[4] := #x i[3];
                                    // x(k-2)
0169
         #x i[3]:=#s2;
                                    // \times (k-1)
0170
       END IF;
0171
0172
       FOR #i:=0 TO "Inversion DB".N-1 DO
0173
          #s[#i]:=#x i[0]*"Inversion DB".w1 1[#i] + #x i[1]*"Inversion DB".w1 2[#i] + #x i[2]*"Inver-
     sion DB".w1 3[#i] + #x i[3]*"Inversion DB".w1 4[#i] + #x i[4]*"Inversion DB".w1 5[#i] + #x i[5]*"Inver-
     sion DB".w1 6[#i] + "Inversion DB".bias[#i];
0174
          \#o[\#i] := (1.0-EXP(-\#s[\#i]))/(1.0+EXP(-\#s[\#i]));
0175
       END FOR;
0176
0177
       #s2:=0.0;
0178
      FOR #i:=0 TO "Inversion DB".N-1 DO
0179
        #s2:=#s2+#o[#i]*"Inversion DB".w 2[#i];
0180
      END FOR;
       #s2:=#s2+"Inversion_DB".bias2;
0181
0182
0183
       #e2:="Measurement DB".r array[#long]-#s2;
0184
       #error ep i:=#error ep i+ABS(#e2);
0185
       END FOR;
0186
0187
       IF #error_ep_i<#error_stop_i</pre>
0188
      THEN #stop i:=true;
0189
      ELSE #stop i:=false;
0190
      END IF;
0191
0192 END IF;
0193
0194
0195 IF #epoch=(#epoch_stop_m-1)
0196 THEN #stop m:=true;
0197 END IF;
0198 IF #epoch=(#epoch_stop_i-1)
0199 THEN #stop_i:=true;
0200 END IF;
0201 #epoch:=#epoch+1.0;
```

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Model [FB3]

Model Propertie	S						
General							
Name	Model	Number	3	Type	FB	Language	SCL
Numbering	Manual						
Information							
Title		Author		Comment		Family	
Version	0.1	User-defined ID					

Name	Data type	Default value	
▼ Input			
wejscie	Real	0.0	
▼ Output			
wyjscie	Real	0.0	
InOut			
▼ Static			
х	Array[05] of Real		
S	Array[07] of Real		
0	Array[07] of Real		
s2	Real	0.0	
i	Int	0	
w1_1	Array[07] of Real		
w1_2	Array[07] of Real		
w1_3	Array[07] of Real		
w1_4	Array[07] of Real		
w1_5	Array[07] of Real		
w1_6	Array[07] of Real		
w_2	Array[07] of Real		
bias	Array[07] of Real		
bias2	Real	0.0	
N	Int	0	
Temp			
Constant			

```
0001 #x[2]:=#x[1];
                                // x(k-2)
0002 \#x[1] := \#x[0];
                                // \times (k-1)
0003 #x[0]:=#wejscie;
                                // x(k)
0004 \#x[5] := \#x[4];
                                // y(k-3)
0005 \#x[4] := \#x[3];
                                // y(k-2)
0006 \#x[3] := \#s2;
                                // y(k-1)
0007
0008 FOR #i:=0 TO #N-1 DO
0009 #s[#i]:=#x[0]*#w1_1[#i] + #x[1]*#w1_2[#i] + #x[2]*#w1_3[#i];
0010
        \#s[\#i]:=\#s[\#i] + \#x[3]*\#w1_4[\#i] + \#x[4]*\#w1_5[\#i] + \#x[5]*\#w1_6[\#i] + \#bias[\#i]; // jw, + bias
0011
        \#o[\#i] := (1.0-EXP(-\#s[\#i]))/(1.0+EXP(-\#s[\#i])); //f. activation sigmoidalna
0012 END_FOR;
0013
0014 #s2:=0.0;
0015 FOR #i:=0 TO #N-1 DO
0016 #s2:=#s2+#o[#i]*#w_2[#i];
0017 END_FOR;
0018
0019 #s2:=#s2+#bias2;
0020 #wyjscie:=#s2;
```

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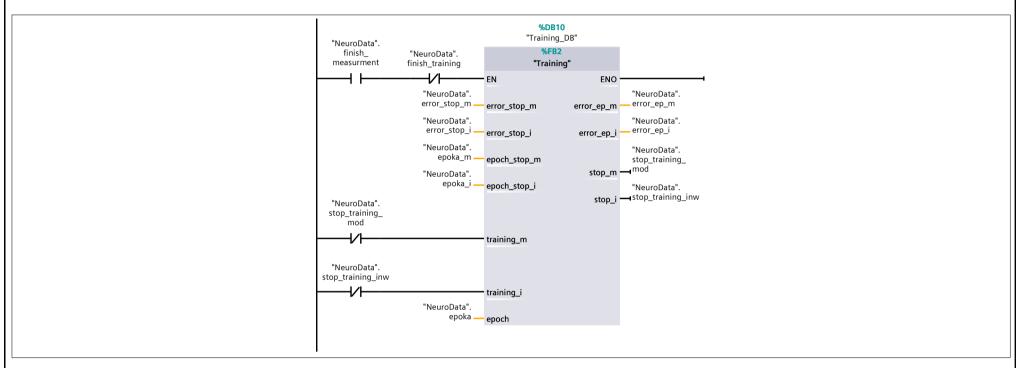
Inversion [FB4]

Inversion Proper	ties						
General							
Name	Inversion	Number	4	Туре	FB	Language	SCL
Numbering	Manual						
Information							
Title		Author		Comment		Family	
Version	0.1	User-defined ID					

Name	Data type	Default value	
▼ Input			
wejscie	Real	0.0	
▼ Output			
wyjscie	Real	0.0	
InOut			
▼ Static			
Х	Array[05] of Real		
S	Array[07] of Real		
0	Array[07] of Real		
s2	Real	0.0	
i	Int	0	
w1_1	Array[07] of Real		
w1_2	Array[07] of Real		
w1_3	Array[07] of Real		
w1_4	Array[07] of Real		
w1_5	Array[07] of Real		
w1_6	Array[07] of Real		
w_2	Array[07] of Real		
bias	Array[07] of Real		
bias2	Real	0.0	
N	Int	0	
Temp			
Constant			

```
0001 \#x[2] := \#x[1];
                                 // x(k-2)
0002 \#x[1] := \#x[0];
                                 // \times (k-1)
0003 #x[0]:=#wejscie;
                                 // x(k)
0004 \#x[5] := \#x[4];
                                 // y(k-3)
0005 \#x[4] := \#x[3];
                                 // y(k-2)
0006 \#x[3] := \#s2;
                                 // y(k-1)
0007
0008 FOR #i:=0 TO #N-1 DO
0009 #s[#i]:=#x[0]*#w1_1[#i] + #x[1]*#w1_2[#i] + #x[2]*#w1_3[#i];
        \#s[\#i]:=\#s[\#i] + \#x[3]*\#w1_4[\#i] + \#x[4]*\#w1_5[\#i] + \#x[5]*\#w1_6[\#i] + \#bias[\#i]; // jw, + bias
0010
0011
        \#o[\#i] := (1.0-EXP(-\#s[\#i]))/(1.0+EXP(-\#s[\#i])); // f. sigmoidalna
0012 END_FOR;
0013
0014 #s2:=0.0;
0015 FOR #i:=0 TO #N-1 DO
0016 #s2:=#s2+#o[#i]*#w_2[#i];
0017 END_FOR;
0018
0019 #s2:=#s2+#bias2;
0020 #wyjscie:=#s2;
```

Totally Int Automatio									
	n blocks / 02_Co Function [FC7]	ontroller / Neu	ralNetw	ork/					
TrainingFund	tion Properties								
General	·								
Name	TrainingFunction	Number	7		Туре	FC		Language	LAD
Numbering	Automatic								
Information									
Title	TrainingFunction	Author			Comment			Family	
Version	0.1	User-defined ID							
Name				Data type	е		Default value		
Input									
Output									
InOut									
Temp									
Constant									
▼ Return									
				Void					



Network 2: Show finish_training



Totally Inte									
	blocks / 02_Con work [OB31]	troller / Neu	ralNetwork						
Name	NeuralNetwork	Number	31		Туре	ОВ		Language	LAD
Numbering	Automatic				J.	-			
Information									
Title	NeuralNetwork	Author			Comment			Family	
Version	0.1	User-defined ID				:			
Name				Data type	!		Default value		
▼ Input									

Bool

Int

Real

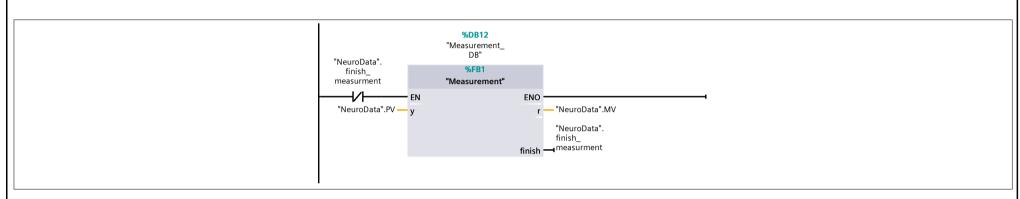
Network 1: Call: Measurement

Initial_Call

▼ Temp
MV

Constant

Event_Count



Network 2: Call: Object

```
"NeuroData".MV r y "NeuroData".PV

"NeuroData". disturbance disruption
```

Network 3: Call: Generator

```
"NeuroData".
finish_training

EN

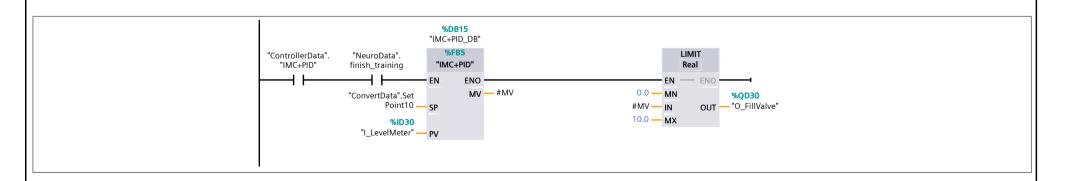
EN

Wartosc
zaklocenia

"NeuroData".
disturbance

"NeuroData".SP
```

Network 4: Call: IMC+PID



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NeuroData [DB18]

NeuroData Prop	erties						
General							
Name	NeuroData	Number	18	Туре	DB	Language	DB
Numbering	Automatic						
Information							
Title		Author		Comment		Family	
Version	0.1	User-defined ID					

Name	Data type	Start value	Retain
▼ Static			
finish_measurment	Bool	false	False
disturbance	Real	0.0	False
PV	Real	0.0	False
MV	Real	0.0	False
SP	Real	0.0	False
stop_training_inw	Bool	false	False
stop_training_mod	Bool	false	False
epoka	Real	0.0	False
error_ep_m	Real	0.0	False
error_ep_i	Real	0.0	False
error_stop_m	Real	0.0	False
error_stop_i	Real	0.0	False
epoka_m	Real	0.0	False
epoka_i	Real	0.0	False
move	Bool	false	False
p_move	Bool	false	False
finish_training	Bool	false	False

Totally Integ									
Automation									
ConvertCla		vert							•
ConvertClass P	roperties								
General	S	No				FC			LAD
lame lumbering	ConvertClass Automatic	Number	3		Туре	FC		Language	LAD
nformation	Automatic								
itle	ConvertClass	Author			Comment			Family	
ersion	0.1	User-defined ID)						
Name				Data ty	pe		Default value		
Input									
Output									
InOut									
▼ Temp									
Output_F	PID_Real			Real					
PV				Real					
SP				Real					
SPRamp				Real					
Constant									
	lass			Void					
▼ Return ConvertC	Convert SetPoint: 0-30	NC	DRM_X to Real ENO OUT —#SP		#SP	R — EN — MIN — VALUE — MAX		"ConvertData".Set Point10	

0.0 — MIN

10.0 — MAX

0.0 — MIN

27648.0 — MAX

"ControllerData". Output_PID_ Compact ___ NORM_X Real to Real

%ID30
"I_LevelMeter" — VALUE

Network 3: Convert Output_PID_Compact: 0-27648 -> 0-10

OUT —#PV

ENO

OUT — #Output_PID_Real

"VisuData".Level
— MeterShow

0.0 — MIN #PV — VALUE

300.0 — MAX

EN -

0.0 — MIN #Output_PID_Real — VALUE

10.0 — MAX

SCALE_X Real to Real

ENO -

%QD30 OUT — "O_FillValve"

	blocks / 01_Cd	onvert				
onvertData P	ata [DB4]					
eneral						
ame umbering	ConvertData Automatic	Number 4		Type DB	Language	DB
formation	, tatolilatie					
itle ersion	0.1	Author User-defined ID		Comment	Family	
ame][000: 00:::::00:::0	Data type	Start value		Retain
▼ Static			Data type	Start value		Netaili
SetPoint	10		Real	0.0		False

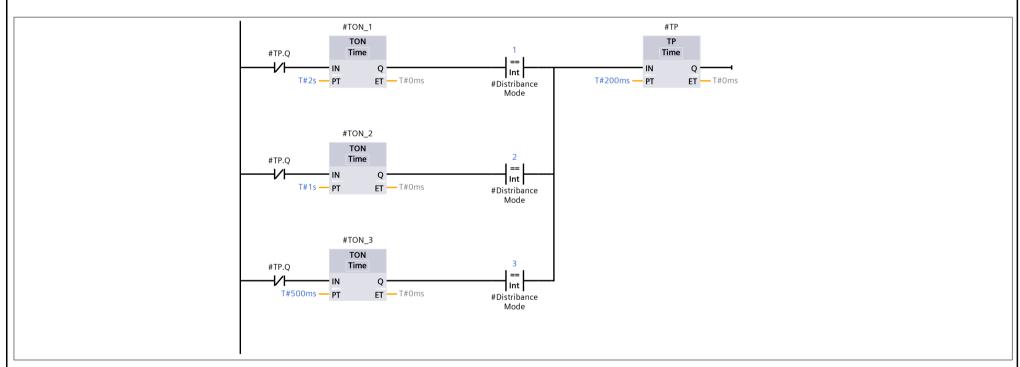
Program blocks / 03_Disturbance

RandomDisturbance [FB10]

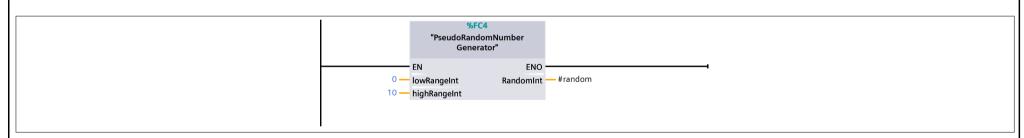
RandomDisturbance Properties								
General								
NameRandomDisturbanceNumber10TypeFBLanguageLAD								
Numbering	Automatic							
Information								
Title	RandomDisturbance	Author		Comment		Family		
Version	0.1	User-defined ID						

Name	Data type	Default value	Retain
▼ Input			
Distribance Mode	Int	0	Non-retain
Outflow	Int	0	Non-retain
▼ Output			
DischargeValve	Int	0	Non-retain
InOut			
▼ Static			
TON_1	TON_TIME		Non-retain
TON_2	TON_TIME		Non-retain
ТР	TP_TIME		Non-retain
TON_3	TON_TIME		Non-retain
random	Int	0	Non-retain
p_Q	Bool	false	Non-retain
Temp			
Constant			

Network 1: Disturbance



Network 2: Call: PseudoRandomNumerGenerator



Network 3: Move: Discharge

```
#TP.Q #random IN OUT1 #DischargeValve

#TP.Q #OUtflow IN OUT1 #DischargeValve
```

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Program blocks / 03_Disturbance

PseudoRandomNumberGenerator [FC4]

PseudoRandomNumberGenerator Properties									
General									
Name	Name PseudoRandomNumberGen- Number 4 Type FC Language SCL								
	erator								
Numbering	Automatic								
Information									
Title		Author		Comment		Family			
Version	0.1	User-defined ID							
		1	-	1					

Name	Data type	Default value	
▼ Input			
lowRangeInt	Int		
highRangeInt	Int		
▼ Output			
RandomInt	Int		
InOut			
▼ Temp			
diTime	DInt		
rTime	Real		
timeTck	Time		
rTemp	Real		
Constant			
▼ Return			
PseudoRandomNumberGenerator	Void		

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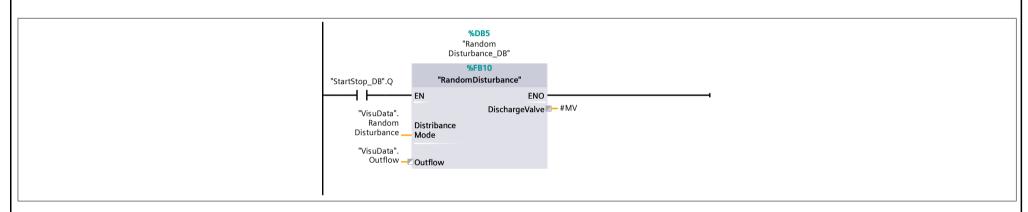
Program blocks / 03_Disturbance

DisturbanceClass [FC5]

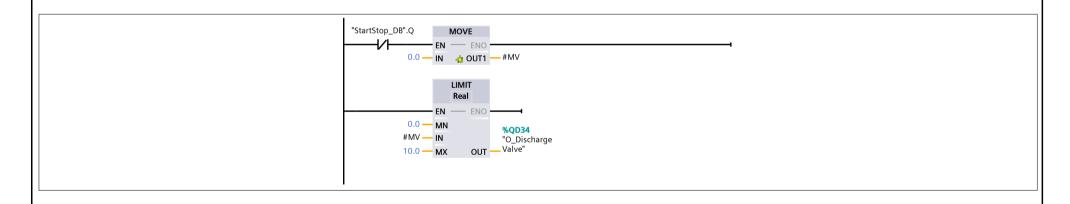
DisturbanceClass Properties								
General								
Name	Disturbance Class	Number	5	Туре	FC	Language	LAD	
Numbering	Automatic							
Information								
Title	Disturbance Class	Author		Comment		Family		
Version	0.1	User-defined ID						

Name	Data type	Default value
Input		
Output		
InOut		
▼ Temp		
MV	Real	
Constant		
▼ Return		
DisturbanceClass	Void	

Network 1: Call: RandomDisturbance



Network 2: Move: O_DischargeValve



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Program blocks / System blocks / Program resources

PID_Compact [FB1130]

PID_Compact Properties								
General Control of the Control of th								
Name	PID_Compact	Number	1130	Туре	FB	Language	SCL	
Numbering	Automatic							
Information								
Title	Compact PID_Controller with self-tuning	Author	SIMATIC	Comment		Family	COMPPID	
Version	2.2	User-defined ID	PID_Cmpt					

ersion 2.2	User-defined ID PID_Cmpt		
ame	Data type	Default value	Retain
r Input			
Setpoint	Real	0.0	Non-retain
Input	Real	0.0	Non-retain
Input_PER	Int	0	Non-retain
Disturbance	Real	0.0	Non-retain
ManualEnable	Bool	false	Non-retain
ManualValue	Real	0.0	Non-retain
ErrorAck	Bool	false	Non-retain
Reset	Bool	false	Non-retain
ModeActivate	Bool	false	Non-retain
Output			
ScaledInput	Real	0.0	Non-retain
Output	Real	0.0	Non-retain
Output_PER	Int	0	Non-retain
Output_PWM	Bool	false	Non-retain
SetpointLimit_H	Bool	false	Non-retain
SetpointLimit_L	Bool	false	Non-retain
	Bool	false	Non-retain
InputWarning_H	Bool	false	Non-retain
InputWarning_L			
State	Int	0	Non-retain
Error	Bool	false	Non-retain
ErrorBits	DWord	16#0	Retain
InOut			
Mode	Int	4	Retain
Static			
Internal Diagnostic	DWord	0	Non-retain
InternalVersion	DWord	DW#16#02020001	Non-retain
InternalRTVersion	DWord	0	Non-retain
IntegralResetMode	Int	1	Non-retain
OverwriteInitialOutputVa	lue Real	0.0	Non-retain
RunModeByStartup	Bool	true	Non-retain
LoadBackUp	Bool	false	Non-retain
SetSubstituteOutput	Bool	true	Non-retain
PhysicalUnit	Int	0	Non-retain
PhysicalQuantity	Int	0	Non-retain
ActivateRecoverMode	Bool	true	Non-retain
Warning	DWord	16#0	Retain
WarningInternal	DWord	16#0	Retain
Progress	Real	0.0	Non-retain
CurrentSetpoint	Real	0.0	Non-retain
CancelTuningLevel	Real	10.0	Non-retain
	Real	0.0	Non-retain
SubstituteOutput			Non-retain
Config	PID_Compact	_	
CycleTime	PID_CycleTim		Non-retain
CtrlParamsBackUp	·	ControlParams	Non-retain
PIDSelfTune	PID_Compac		Non-retain
PIDCtrl	PID_Compac		Non-retain
Retain	PID_Compac	Retain	Retain

Comment Family Retain
Start value Retain 0.0 False 0.0 False 0.0 False 0.0 False 0.0 False 0.0 False 0.0 False
Start value Retain 0.0 False 0.0 False 0.0 False 0.0 False 0.0 False 0.0 False 0.0 False
0.0 False
0.0 False
0.0 False 0.0 False 0.0 False 0.0 False 0.0 False 0.0 False
0.0 False 0.0 False 0.0 False 0.0 False 0.0 False 0.0 False
0.0 False 0.0 False 0.0 False 0.0 False
0.0 False 0.0 False 0.0 False
0.0 False 0.0 False
0.0 False
0.0 False
False
0.0 False
0.0

_DB Properties al RAMP_DB		6	Ture a DD	1	DD
RAMP_DB ering Automatic nation	Number	6	Type DB	Language	DB
n 0.1	Author User-defined	d ID	Comment	Family	
ut		Data type	Start value		Retain
SetPoint		Real	0.0		False
Rate		Real	0.0		False
Reset tput		Bool	false		False
OUT		Real	0.0		False
ut					
tic					
TON_1		TON_TIME			False
RateDIV Q		Real Bool	0.0 false		False False

eneral ame RegSugeno_DB Number 7 Type DB Language DB umbering Automatic Information title Author Comment Family ersion 0.1 User-defined ID Start value Reain PV Real 0.0 False SP Real 0.0 False Output Real 0.0 False InOut Real 0.0 False	RegSugeno_DB	Authoration Author Comment Family							DB [DB7]	
rime RegSugeno_DB Number 7 Type DB Language DB Imbering Automatic Imbering Automatic Imbering Automatic Imbering Author Comment Family Imbering Summer Semily Imbering Summer Start value Retain PV Real 0.0 False Sp Real 0.0 False MV Real 0.0 False InOut Real 0.0 False Static Real 0.0 False False False	Author Comment Family	me RegSugeno_DB Number 7 Type DB Language Imbering Automatic Formation Ide Seal Author User-defined ID Comment Family Imput PV Real 0.0 SP Real 0.0 Output MV Real 0.0 InOut Static Real 0.0 n_e Real 0.0							perties	
Multiple	Author User-defined ID Data type Real 0.0 Real 0.0 False	mbering ormation Author User-defined ID Comment Family me Data type Start value Input Real 0.0 SP Real 0.0 Output Real 0.0 MV Real 0.0 Static Real 0.0	DB	Language	Type DB		7	Number	gSugeno_DB	
Author User-defined ID U	Data type Start value Retain Real 0.0 False False Real 0.0 False	Author User-defined ID User-defined ID Family Family Family Family Family Family Family Family Family Family Family Family Family Family Family Family Family Family Family Family								nbering
No.	O.1 User-defined ID Data type Start value Retain	Data type Start value PV		_ 						
ne Data type Start value Retain PV Real 0.0 False SP Real 0.0 False Output	Data typeStart valueRetainReal0.0FalseReal0.0FalseReal0.0FalseReal0.0FalseReal0.0FalseReal0.0FalseReal0.0False	Me Data type Start value Input Real 0.0 PV Real 0.0 SP Real 0.0 Output Real 0.0 InOut Real 0.0 Static Real 0.0 i_e Real 0.0		Family	Comment		4 ID		1	
Input Real 0.0 False SP Real 0.0 False Output 0.0 False MV Real 0.0 False InOut 0.0 False Static 0.0 False n_e Real 0.0 False i_e Real 0.0 False	Real 0.0 False	Input Real 0.0 SP Real 0.0 Output Coulons Coulons MV Real 0.0 InOut Coulons Coulons Static Coulons Coulons n_e Real 0.0 i_e Real 0.0					מוט	oser-defined	I	olori
PV Real 0.0 False SP Real 0.0 False Output MV Real 0.0 False InOut Static n_e Real 0.0 O.0 False Real 0.0 False Output Output Real 0.0 False Output O	Real 0.0 False	PV Real 0.0 SP Real 0.0 Output Real 0.0 MV Real 0.0 InOut Static	Retain		Start value	Data type				
SPReal0.0FalseOutputCCCMVReal0.0FalseInOutCCCStaticCCCn_eReal0.0Falsei_eReal0.0False	Real 0.0 False	SP Real 0.0 Output Real 0.0 MV Real 0.0 InOut Static - n_e Real 0.0 i_e Real 0.0								nput
Output Real 0.0 False InOut	Real 0.0 False Real 0.0 False Real 0.0 False Real 0.0 False	Output Real 0.0 InOut InOut InOut Static Inout Inout In_e Real 0.0 i_e Real 0.0								
MV Real 0.0 False InOut - - - Static - - - n_e Real 0.0 False i_e Real 0.0 False	Real 0.0 False Real 0.0 False	MV Real 0.0 InOut Static n_e Real 0.0 i_e Real 0.0	False		0.0	Real				
InOut Static CREAT Static CREAT Static CREAT Static	Real 0.0 False Real 0.0 False	InOut								
Static Real 0.0 False i_e Real 0.0 False	Real 0.0 False	Static Real 0.0 i_e Real 0.0	False		0.0	Real				
n_e Real 0.0 False i_e Real 0.0 False	Real 0.0 False	n_e Real 0.0 i_e Real 0.0								
i_e Real 0.0 False	Real 0.0 False	i_e Real 0.0								
-		_								
ni_e Real 0.0 False	Real 0.0 Halse	ni_e Real 0.0								

RandomDisturbance_DB Properties General Name RandomDisturbance_DB Number 5 Type DB Language DB Numbering Automatic Title Author User-defined ID Name DistribanceMode Int O DischargeValve Int O DischargeValve InTON_11ME TON_11ME False TON_1 TON_11ME TON_3 TON_11ME TON_3 False TON_3 TON_11ME False Palse	Number N	eneral ame Ra umbering Au formation tile ersion 0. ame Input DistribanceMo Outflow Output DischargeValv InOut Static TON_1 TON_2 TP TON_3 random	andomDisturbance_DB utomatic .1	Author	Data type Int Int		Start value 0 0		Retain False
Numbering Automatic Numbering Automatic Number	Mutomatic	umbering Au formation tle ersion 0. ame Input DistribanceMo Outflow Output DischargeValv InOut Static TON_1 TON_2 TP TON_3 random	.1 Mode	Author	Data type Int Int		Start value 0 0		Retain False
Author User-defined ID	Author User-defined ID	tile ersion 0. ame Input DistribanceMo Outflow Output DischargeValv InOut Static TON_1 TON_2 TP TON_3 random	1 ode		Int Int	Comment	0	Family	False
Version 0.1 User-defined ID User-defined ID Vame	Data type Start value Retain	ersion 0. ame Input DistribanceMo Outflow Output DischargeValv InOut Static TON_1 TON_2 TP TON_3 random	1 ode		Int Int		0	cumy	False
▶ InputDistribanceModeInt0FalseOutflowInt0False✔ OutputInt0FalseDischargeValveInt0FalseInOutInt0False▼ StaticTON_1FalseTON_1TON_TIMEFalseTON_2TON_TIMEFalseTPTP_TIMEFalseTON_3TON_TIMEFalserandomInt0False	DistribanceMode Int 0 0 False Outflow Int 0 0 False Output 0 0 0 False	DistribanceMonopole Outflow Output DischargeValue InOut Static TON_1 TON_2 TP TON_3 random			Int Int		0		False
▶ InputDistribanceModeInt0FalseOutflowInt0FalseOutputInt0FalseDischargeValveInt0FalseInOutInt0False▼ StaticTON_1FalseTON_1TON_TIMEFalseTON_2TON_TIMEFalseTPTP_TIMEFalseTON_3TON_TIMEFalserandomInt0False	DistribanceMode Int 0 0 False Outflow Int 0 0 False Output 0 0 0 False	DistribanceMonopole Outflow Output DischargeValue InOut Static TON_1 TON_2 TP TON_3 random			Int Int		0		False
DistribanceMode Int 0 False Outflow Int 0 False Output Int 0 False DischargeValve Int 0 False InOut 0 False InOut False Inon_1 Ton_TIME False Inon_2 Ton_TIME False Inon_2 Ton_TIME False Inon_3 Ton_TIME False Inon_3 Ton_TIME False Inon_3 Ton_TIME False Inon_3 Ton_TIME False Int 0 False	DistribanceMode Int 0 False Outflow Int 0 False Output Couput Int 0 False DischargeValve Int 0 False InOut False	DistribanceMo Outflow Output DischargeValv InOut Static TON_1 TON_2 TP TON_3 random			Int		0		
Outflow Int 0 False Output DischargeValve Int 0 False InOut Static TON_1 TON_1 TON_2 TON_TIME TON_2 TON_3 TON_3 TON_TIME TON_3 TON_TIME TON_T	Outflow Output 0 Int 0 O False Output	Outflow Output DischargeValv InOut Static TON_1 TON_2 TP TON_3 random			Int		0		
✓ OutputInt0FalseDischargeValveInt0FalseInOutIntIntInt✓ StaticIntIntIntTON_1TON_TIMETON_TIMEIntTON_2TON_TIMEIntIntTON_3TON_TIMEIntInt	OutputInt0FalseInOutInt0FalseInoutIntIntIntStaticIntIntIntTON_1TON_TIMEIntIntTON_2TON_TIMEIntIntTON_3TON_TIMEIntInt	DischargeValve InOut Static TON_1 TON_2 TP TON_3 random	lve						
DischargeValveInt0FalseInOut➤ StaticTON_1TON_TIMEFalseTON_2TON_TIMEFalseTPTP_TIMEFalseTON_3TON_TIMEFalserandomInt0False	DischargeValve Int 0 False InOut	DischargeValve InOut Static TON_1 TON_2 TP TON_3 random	lve		Int		0		
InOutInOut✓ StaticTON_TIMETON_1TON_TIMETON_2TON_TIMETPTP_TIMETON_3TON_TIMETON_1MEFalseTON_3TON_TIMETon_TIMEFalseTalseFalse	InOut Static TON_1 TON_TIME False TP_TIME False TON_3 TON_TIME TON_TIME False TON_3 TON_TIME False TON_TIME False TON_3 TON_TIME False TON_TIME False TON_TIME False TON_TIME False False TON_TIME False False TON_TIME False False TON_TIME False False False TON_TIME False	InOut Static TON_1 TON_2 TP TON_3 random					The second secon		False
▼ StaticTON_1TON_TIMEFalseTON_2TON_TIMEFalseTPTP_TIMEFalseTON_3TON_TIMEFalserandomInt0False	TON_1 TON_TIME False TON_2 TON_TIME False TP TP_TIME False TON_3 TON_TIME False TON_3 TON_TIME False TON_1 TON_TIME False TON_2 TON_TIME False TON_3 TON_TIME False TON_3 TON_TIME False TON_TIME False	TON_1 TON_2 TP TON_3 random							
TON_2TON_TIMEFalseTPTP_TIMEFalseTON_3TON_TIMEFalserandomInt0False	TON_2TON_TIMEFalseTPTP_TIMEFalseTON_3TON_TIMEFalserandomInt0False	TON_2 TP TON_3 random							
TON_2TON_TIMEFalseTPTP_TIMEFalseTON_3TON_TIMEFalserandomInt0False	TON_2TON_TIMEFalseTPTP_TIMEFalseTON_3TON_TIMEFalserandomInt0False	TON_2 TP TON_3 random			TON_TIME				False
TPTP_TIMEFalseTON_3TON_TIMEFalserandomInt0False	TPTP_TIMEFalseTON_3TON_TIMEFalserandomInt0False	TP TON_3 random							
random Int 0 False	random Int 0 False	random			TP_TIME				False
					TON_TIME				False
p_Q Bool false False	p_Q Bool false False	p_Q							
					Bool		false		False

top_DB I al	CtartCtan DD	Number	10	Trune DD	Langu	DD.
ering nation	StartStop_DB Automatic	Number	19	Type DB	Langu	
n	0.1	Author User-defined	ID	Comment	Family	
ut			Data type	Start value		Retain
Start Stop			Bool Bool	false false		False False
tput			5001	luise		ruise
Q out			Bool	false		False
tic						
statSR statRisEc	Igo		Bool Bool	false false		False False
_						<u> </u>

Number 14 Type 100 Language DS Data Type Data Type										
Common C										
Mathor M	ral e	Generator_DB	Number	14		Туре	DB	Language	DB	
Put utput Put Put Put Put Put Put Put Put Put P	mation					Comment		Family		
put utput		0.1	oser defined it	-	a type	St	art value		ı	Retain
wartosc_zakloceniaReal0.0FalseuLReal0.0FalseOutCountCountCountCountaticReal0.0False	put				, , , , , , , , , , , , , , , , , , ,					
uLReal0.0FalseOutatickReal0.0False		_zaklocenia		Rea	l	0.	0		I	alse
k Real 0.0 False	u			LRe	al	0.	0		I	alse
	1			IIIC		U				aise

ame	IMC+PID_DB	Number 1	5	Туре	DB	Language	DB
umbering	Automatic						
formation :le		Author		Comment		Family	
rsion	0.1	User-defined ID		Comment		railliy	
me	<u> </u>		Data type	Ctord	t value		Retain
Input			Data type	Start	value		Netalli
SP			Real	0.0			False
PV			Real	0.0			False
output				-10			
MV			Real	0.0			False
Out			illedi	0.0			i dise
atic							
PV_mode	ol		Real	0.0			False
e_ob_m			Real	0.0			False
e_0b_iii	<u> </u>		Real	0.0			False
ef			Array[01] c				False
MV1			Real	0.0			False
MV2			Real	0.0			False
MV1			Real	0.0			False

	Totally Integrated Automation Portal		
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Program blocks / System blocks / Program resources

Inversion_DB [DB17]

Inversion_DB Pr	operties						
General							
Name	Inversion_DB	Number	17	Туре	DB	Language	DB
Numbering	Automatic						
Information							
Title		Author		Comment		Family	
Version	0.1	User-defined ID					

Name	Data type	Start value	Retain
▼ Input			
wejscie	Real	0.0	False
▼ Output			
wyjscie	Real	0.0	False
InOut			
▼ Static			
Х	Array[05] of Real		False
S	Array[07] of Real		False
0	Array[07] of Real		False
s2	Real	0.0	False
i	Int	0	False
w1_1	Array[07] of Real		False
w1_2	Array[07] of Real		False
w1_3	Array[07] of Real		False
w1_4	Array[07] of Real		False
w1_5	Array[07] of Real		False
w1_6	Array[07] of Real		False
w_2	Array[07] of Real		False
bias	Array[07] of Real		False
bias2	Real	0.0	False
N	Int	0	False

Program blocks / System blocks / Program resources Measurement DB [DB12] Teacurement DB Typestra Teacurement DB Typest	Totally Integ Automation	Portal									
Reasurement_DB [DB12] reasurement_DB Properties rearial Measurement_DB Number 12 Type DB Language D											
Number 12				blocks / Pro	ogram r	esources					
Number Number Number 12											
formation tile Author Comment Family carsion 0.1 User-defined ID Start value Retain ame Data type Start value Retain y Real 0.0 False r Real 0.0 False finish Bool false False InOut False False r_array Array[0249] of Real False False False False False	eneral ame	Measurem	ent_DB	Number	12		Туре	DB	Language	DB	
	formation	Automatic		Author			Comment		Family		
r Input y Real 0.0 Coutput r Real 0.0 Real 0.0 False r Output r Real 0.0 False False finish Bool false InOut r Static r_array Array[0249] of Real Array[0249] of Real Array[0249] of Real False False False False		0.1		User-defined I		Data tama		Charteralisa	,	D-4-:	
r Real 0.0 False finish Bool false InOut Static T_array Array[0249] of Real Array[0249] of Real False False											
finishBoolfalseInOutControlControlStaticControlControlr_arrayArray[0249] of RealControly_arrayArray[0249] of RealControl						Real		0.0		False	
InOutInOutInOutStaticInoutr_arrayArray[0249] of RealInouty_arrayArray[0249] of RealInoutArray[0249] of RealInoutY_arrayInoutInoutY											
r_array Array[0249] of Real False y_array Array[0249] of Real False	InOut					5001		Taise		T disc	
							Real	0			

Totally Integrated Automation Portal	

Program blocks / System blocks / Program resources

Model_DB [DB16]

Model_DB Prop	Model_DB Properties											
General												
Name	Model_DB	Number	16	Туре	DB	Language	DB					
Numbering	Automatic											
Information												
Title		Author		Comment		Family						
Version	0.1	User-defined ID										

lame	Data type	Start value	Retain
▼ Input			
wejscie	Real	0.0	False
▼ Output			
wyjscie	Real	0.0	False
InOut			
▼ Static			
X	Array[05] of Real		False
S	Array[07] of Real		False
0	Array[07] of Real		False
s2	Real	0.0	False
i	Int	0	False
w1_1	Array[07] of Real		False
w1_2	Array[07] of Real		False
w1_3	Array[07] of Real		False
w1_4	Array[07] of Real		False
w1_5	Array[07] of Real		False
w1_6	Array[07] of Real		False
w_2	Array[07] of Real		False
bias	Array[07] of Real		False
bias2	Real	0.0	False
N	Int	0	False

ree Object_DB Number respond Number respond Number respond Number Respond Number Author User-defined respond Number Respond Number Author User-defined Respond Number Author User-defined Respond Number	d ID Data type Real Real Array[02] of Array[02] of		Family	Retain False False False False False False False
mation Author User-defined e nput r disruption output y nOut tatic x_array	Real Real Real Array[02] of	0.0 0.0 0.0 0.0	Family	False False False False
ion 0.1 User-defined The comput comp	Real Real Real Array[02] of	0.0 0.0 0.0 0.0	ramily	False False False False
r disruption Output y nOut tatic x_array	Real Real Real Array[02] o	0.0 0.0 0.0		False False False False
r disruption utput y nOut tatic x_array	Real Real Array[02] o	0.0 0.0 of Real		False False False
utput y Out atic x_array	Real Array[02] o	0.0		False False
Out atic x_array	Array[02] o	of Real		False
atic x_array				

Totally Inte	grated 1 Portal						
Program	blocks / Syste	m blocks / Prog	ıram resources				
PID_DB_1	[DB11]						
PID_DB_1 Pro	perties						
General							
Name	PID_DB_1	Number	11	Туре	DB	Language	DB
Numbering	Automatic						·
Information							
Title		Author		Comment		Family	
Version	0.1	User-defined ID					
Name			Data type		Start value		Retain
▼ Input							
SP			Real		0.0		False
PV			Real		0.0		False
MV			Real		0.0		False
kp			Real		0.0		False
ki			Real		0.0		False
kd			Real		0.0		False
▼ Output							
MV_PID			Real		0.0		False
InOut							-
▼ Static							

0.0

0.0

False

False

False

Array[0..1] of Real

Real

Real

ер

de

suma_ep

Totally Integrated Automation Portal	

Program blocks / System blocks / Program resources

Training_DB [DB10]

Training_DB Properties								
General								
Name	Training_DB	Number	10	Type	DB	Language	DB	
Numbering	Automatic							
Information								
Title		Author		Comment		Family		
Version	0.1	User-defined ID						

ne	Data type	Start value	Retain
Input			
error_stop_m	Real	0.0	False
error_stop_i	Real	0.0	False
epoch_stop_m	Real	0.0	False
epoch_stop_i	Real	0.0	False
training_m	Bool	false	False
training_i	Bool	false	False
Output			
error_ep_m	Real	0.0	False
error_ep_i	Real	0.0	False
stop_m	Bool	false	False
stop_i	Bool	false	False
InOut			
epoch	Real	0.0	False
Static			
i	Int	0	False
long	Int	0	False
S	Array[07] of Real		False
0	Array[07] of Real		False
s2	Real	0.0	False
e2	Real	0.0	False
е	Array[07] of Real		False
x_m	Array[05] of Real		False
x_i	Array[05] of Real		False
n_m	Real	0.0	False
n_i	Real	0.0	False

ering	On-Off_DB Automatic	Number 20		Туре	DB	Language	DB
nation		Author		Comment		Family	
on	0.1	User-defined ID	Data type	Star	rt value		Retain
out SetPoint			Real	0.0			False
Hysteres			Real	0.0			False
PV			Real	0.0			False
itput							
MV Out			Real	0.0			False
itic							
UpperLi	mit		Real	0.0			False
LowerLi	mit		Real	0.0			False

Totally Inte Automation	grated n Portal									
Program	Program blocks / 00_Visu									
VisuClass [FC8]										
VisuClass Prop General	perties									
Name Numbering	VisuClass Automati		Number	8		Туре	FC		Language	LAD
Information Title	VisuClass		Author			Comment			Family	
Version	0.1		User-defined ID				'			
Name Input					Data ty	pe		Default value		
Output InOut										
Temp										
Constant ▼ Return										
VisuClas	S				Void					
Network 1:	Call: Start	tStop								
			1							
				%DB19 "StartStop_DB %FB11	3"					
				"StartStop" EN ENC						
			"Visu		→ "VisuDa	ta".Status				
Network 2:	Call: Show	wPompOn								
				%FC6 "ShowPompOn"						
			— EN	ENC	·					
Network 3:	Output: F	illValveShow								
				MUL						
				Auto (Real) EN — ENC						
			"0	%QD30 D_FillValve" — IN1 OUT 10.0 — IN2 ♣	"VisuDa T — ValveSh	ta".Fill low				
Network 4:	Output: E	mpty								
				ta".Empty			"C	%Q0.0)_Empty"		
								()		
	6.11.1.1	-10 34 2								
vetwork 5:	Call: defa	ult -> ValueAss	igment							
			l "r.c	.Data!!	%FC9					
				Data". fault "Value EN	eAssignmen	t" ENO				
Network 6:	Show fini	sh training neu	ral network							
		-								
			"Neur	oData".	_					
			finish_	training MOVE EN ENC		to" finish				
					"VisuDa training"	ta".finish_ 				
Network 7:	Show Fac	torylO connecti	ion status							

Totally Integrated Automation Portal			
	%I0.0 "I_FactoryRuning"	"VisuData". factoryio_connect	

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Program blocks / 00_Visu

VisuData [DB9]

VisuData Properties							
General							
Name	VisuData	Number	9	Туре	DB	Language	DB
Numbering	Automatic						
Information							
Title		Author		Comment		Family	
Version	0.1	User-defined ID					

Name	Data type	Start value	Retain
▼ Static			
Start	Bool	false	False
Stop	Bool	false	False
Empty	Bool	false	False
Controller	Int	0	False
Random Disturbance	Int	0	False
SetPoint	Real	0.0	False
Outflow	Real	0.0	False
LevelMeterShow	Real	0.0	False
SetPointShow	Real	0.0	False
FillValveShow	Real	0.0	False
TopPump	Int	0	False
LowPump	Int	0	False
Status	Bool	false	False
default	Bool	false	False
finish_training	Int	0	False
factoryio_connect	Bool	false	False

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	Automation Portal

Program blocks / 00_Visu

ShowPompOn [FC6]

ShowPompOn Properties									
General									
Name	ShowPompOn	Number	6	Туре	FC	Language	LAD		
Numbering	Automatic								
Information									
Title	ShowPompOn	Author		Comment		Family			
Version	0.1	User-defined ID							

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

Network 1: Move: TopPump

Network 2: Move: LowPump