Program blocks / 02_Controller

Takagi-SugenoFuzzy-PI [FB7]

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

Name	Data type	Default value	Retain
▼ Input			
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			
e	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;
0022     #sp_S_e:=(#e)/10.0+1.0;
0023     #sp_D_e:=0.0;
0024 ELSIF #e>0.0 THEN
0025     #sp_D_e:=(#e)/10.0;
0026     #sp_S_e:=(#e)/-10.0+1.0;
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;
0036     #sp_S_ie:=(#i_e)/10.0+1.0; //jw.
0037     #sp_D_ie:=0.0;
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.
```

```
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;
```