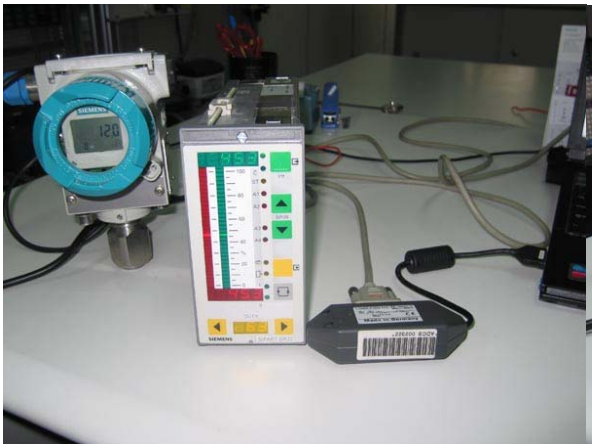
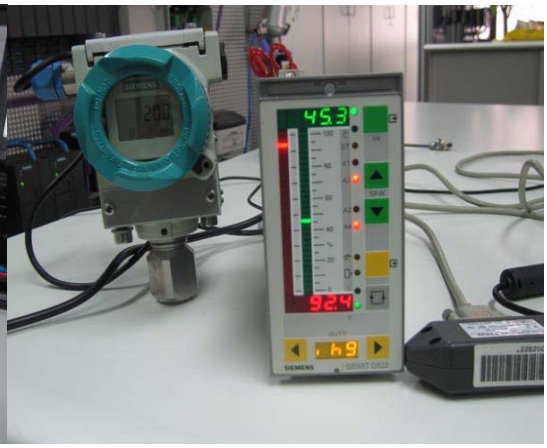
问：DR22 双回路调节器如何实现分程控制？
答：工艺要求如下：
当设定值 W>X（过程测量值）时，调节阀 V1 打开，V2 关闭；当设定值 W=X 时，调节阀 V1 关闭，V2 打开；当设定值 W<X 时，调节阀 V1 关闭，V2 打开；实现分程调节
以下图表表示本操作所设定的参数，红色表示通过 PROFIBUS DP 通讯时需要设置的参数，且设置地址为 5，如果未包含总线通讯，请保持默认值。

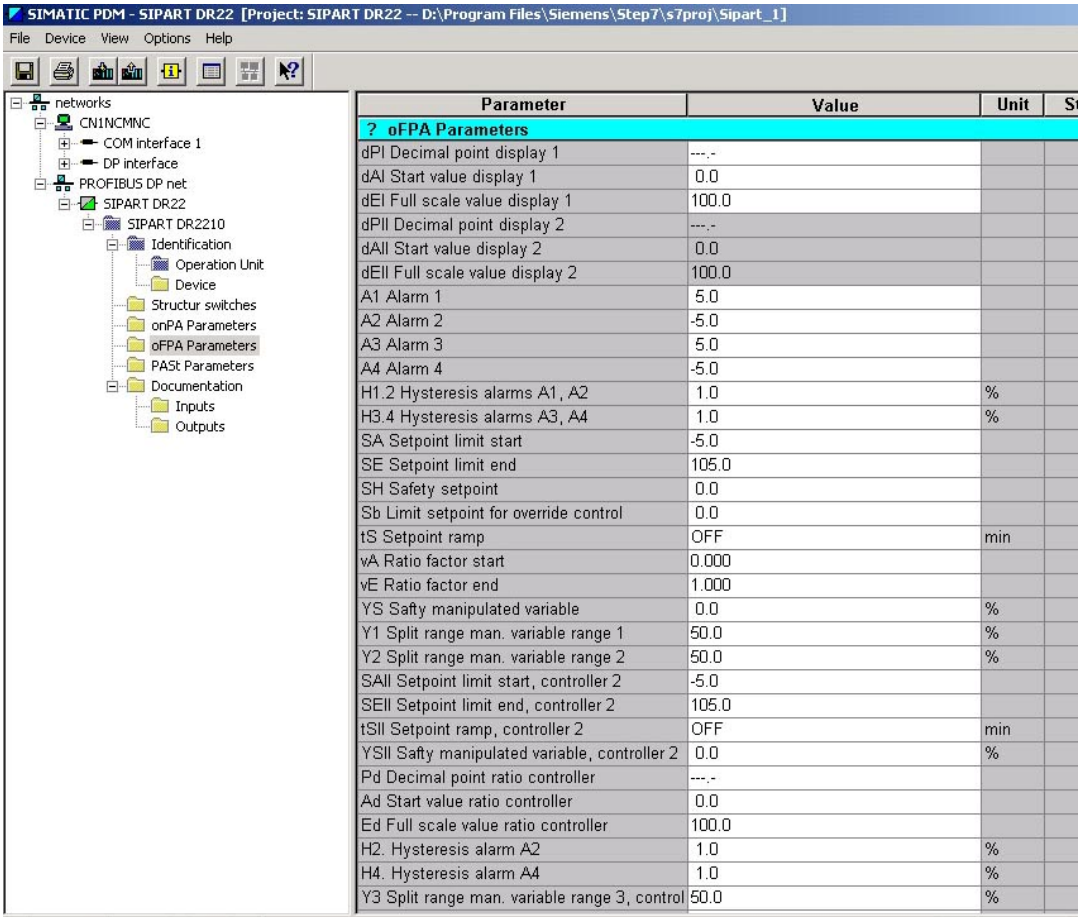
StrS 开关设定				onPA 设定值		oFPA 设定值	
名称	设定值	名称	设定值	名称	设定值	名称	设定值
S0	1	S101	2	TF1	1	Y1	50
S1	0	S102	0	VV1	5.0	Y2	50
S5	2	S103	0	CP1	0.5		
S62	1	S104	0	TN1	100		
S65	0	S105	0	TV1	10.0		
S67	1	S106	5	AH1	2		
S69	1	S107	0	YO1	AUTO		
S70	2			YA1	0		
S73	2			YE1	100		
S74	3			TFII	1		

通过本地按键操作，请参照 FAQ(如何通过面板按键操作 SIPART DR22 调节器?)，本 FAQ 是通过 SIMATIC PDM 软件进行参数设置。
所需硬件如下：SIPART DR22 调节器,SITRANS P 压力变送器（可以仿真电流输出，以模拟信号源），CP5512 通讯卡（实现 PROFIBUS DP 通讯），6DR2803-8 Profibus DP 通讯模块。所需软件 SIMATIC PDM V6.0 软件



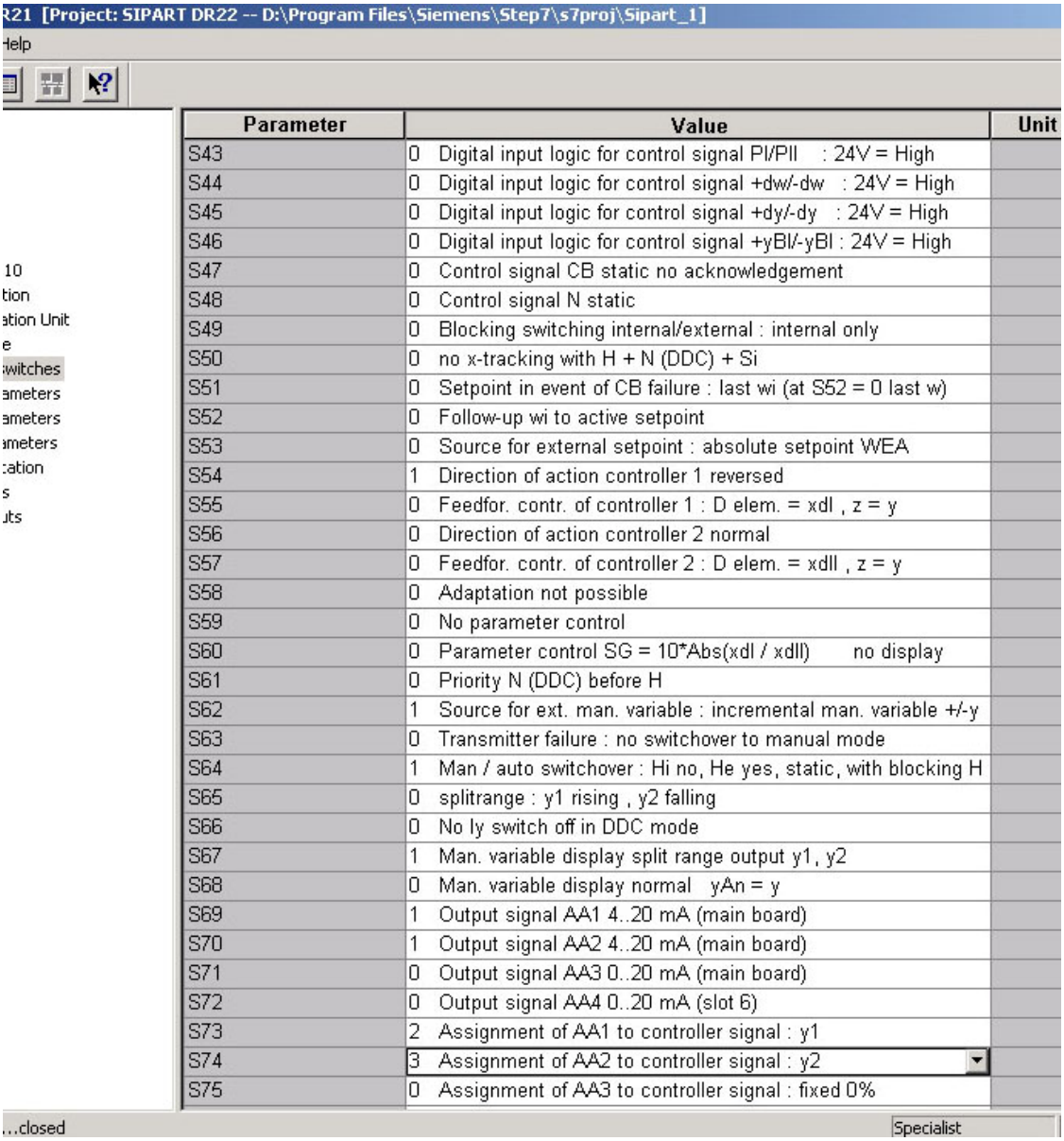


通过 SIMATIC PDM 软件通讯后，画面如下（关于如何建立通讯，请查看相应 FAQ）：

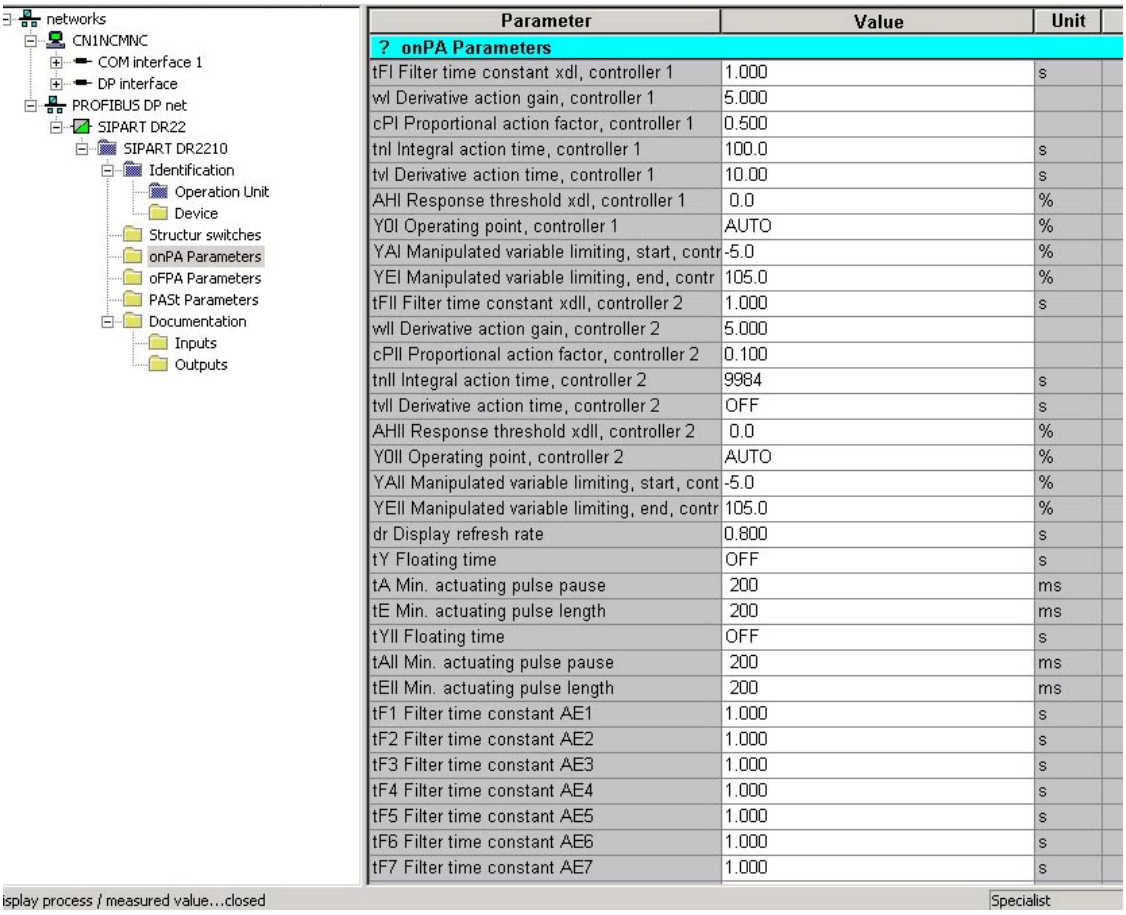


Parameter	Value	Unit
? oFPA Parameters		
dPI Decimal point display 1	---.-	
dAI Start value display 1	0.0	
dEI Full scale value display 1	100.0	
dPII Decimal point display 2	---.-	
dAII Start value display 2	0.0	
dEII Full scale value display 2	100.0	
A1 Alarm 1	5.0	
A2 Alarm 2	-5.0	
A3 Alarm 3	5.0	
A4 Alarm 4	-5.0	
H1.2 Hysteresis alarms A1, A2	1.0	%
H3.4 Hysteresis alarms A3, A4	1.0	%
SA Setpoint limit start	-5.0	
SE Setpoint limit end	105.0	
SH Safety setpoint	0.0	
Sb Limit setpoint for override control	0.0	
tS Setpoint ramp	OFF	min
vA Ratio factor start	0.000	
vE Ratio factor end	1.000	
YS Safty manipulated variable	0.0	%
Y1 Split range man. variable range 1	50.0	%
Y2 Split range man. variable range 2	50.0	%
SAII Setpoint limit start, controller 2	-5.0	
SEII Setpoint limit end, controller 2	105.0	
tSII Setpoint ramp, controller 2	OFF	min
YSII Safty manipulated variable, controller 2	0.0	%
Pd Decimal point ratio controller	---.-	
Ad Start value ratio controller	0.0	
Ed Full scale value ratio controller	100.0	
H2. Hysteresis alarm A2	1.0	%
H4. Hysteresis alarm A4	1.0	%
Y3 Split range man. variable range 3, control	50.0	%

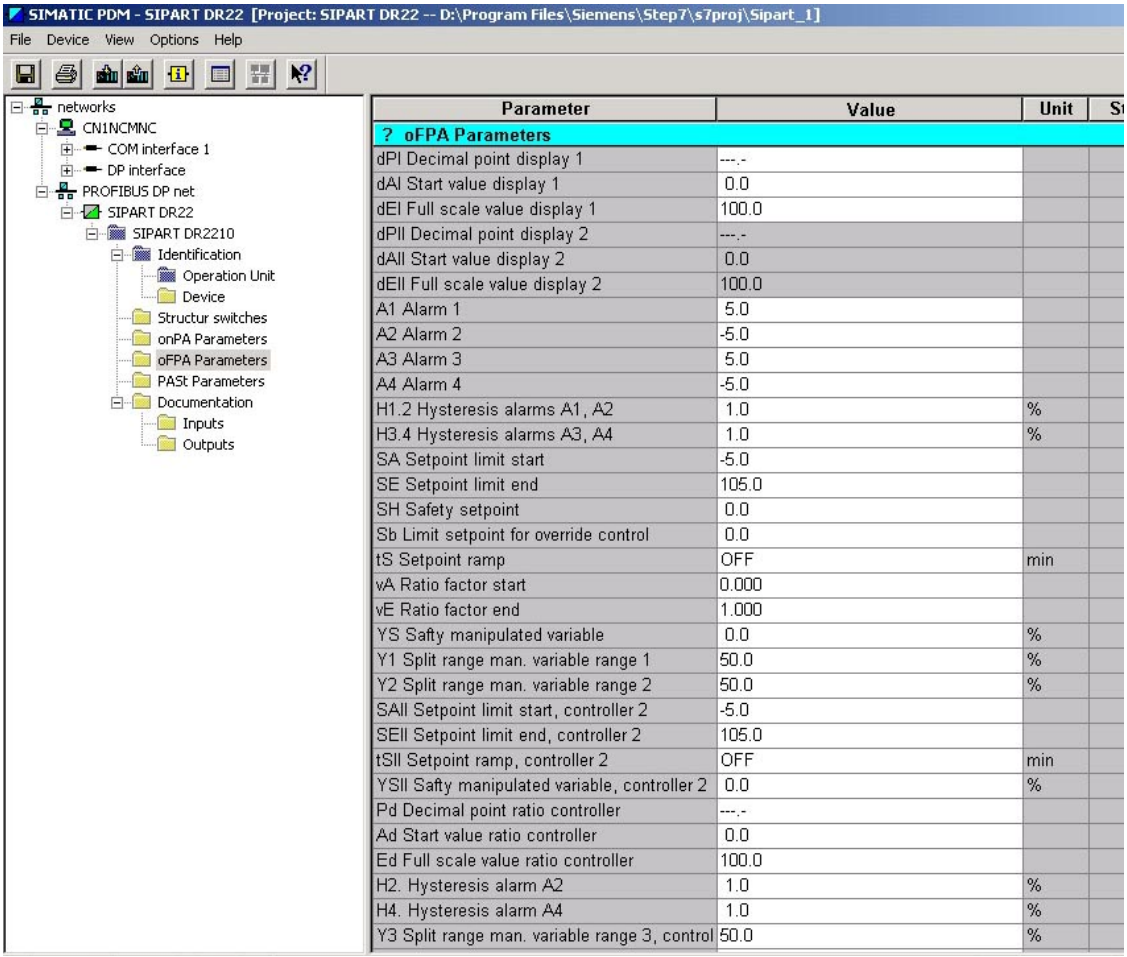
通过 SIMATIC PDM 软件修改相应的开关参数，在线参数和离线参数，画面如下：



Parameter	Value	Unit
S43	0 Digital input logic for control signal PI/PII : 24V = High	
S44	0 Digital input logic for control signal +dw/-dw : 24V = High	
S45	0 Digital input logic for control signal +dy/-dy : 24V = High	
S46	0 Digital input logic for control signal +yBI/-yBI : 24V = High	
S47	0 Control signal CB static no acknowledgement	
S48	0 Control signal N static	
S49	0 Blocking switching internal/external : internal only	
S50	0 no x-tracking with H + N (DDC) + Si	
S51	0 Setpoint in event of CB failure : last wi (at S52 = 0 last w)	
S52	0 Follow-up wi to active setpoint	
S53	0 Source for external setpoint : absolute setpoint WEA	
S54	1 Direction of action controller 1 reversed	
S55	0 Feedfor. contr. of controller 1 : D elem. = xdI , z = y	
S56	0 Direction of action controller 2 normal	
S57	0 Feedfor. contr. of controller 2 : D elem. = xdII , z = y	
S58	0 Adaptation not possible	
S59	0 No parameter control	
S60	0 Parameter control SG = 10*Abs(xdI / xdII) no display	
S61	0 Priority N (DDC) before H	
S62	1 Source for ext. man. variable : incremental man. variable +/-y	
S63	0 Transmitter failure : no switchover to manual mode	
S64	1 Man / auto switchover : Hi no, He yes, static, with blocking H	
S65	0 splitrange : y1 rising , y2 falling	
S66	0 No Iy switch off in DDC mode	
S67	1 Man. variable display split range output y1, y2	
S68	0 Man. variable display normal yAn = y	
S69	1 Output signal AA1 4..20 mA (main board)	
S70	1 Output signal AA2 4..20 mA (main board)	
S71	0 Output signal AA3 0..20 mA (main board)	
S72	0 Output signal AA4 0..20 mA (slot 6)	
S73	2 Assignment of AA1 to controller signal : y1	
S74	3 Assignment of AA2 to controller signal : y2	
S75	0 Assignment of AA3 to controller signal : fixed 0%	

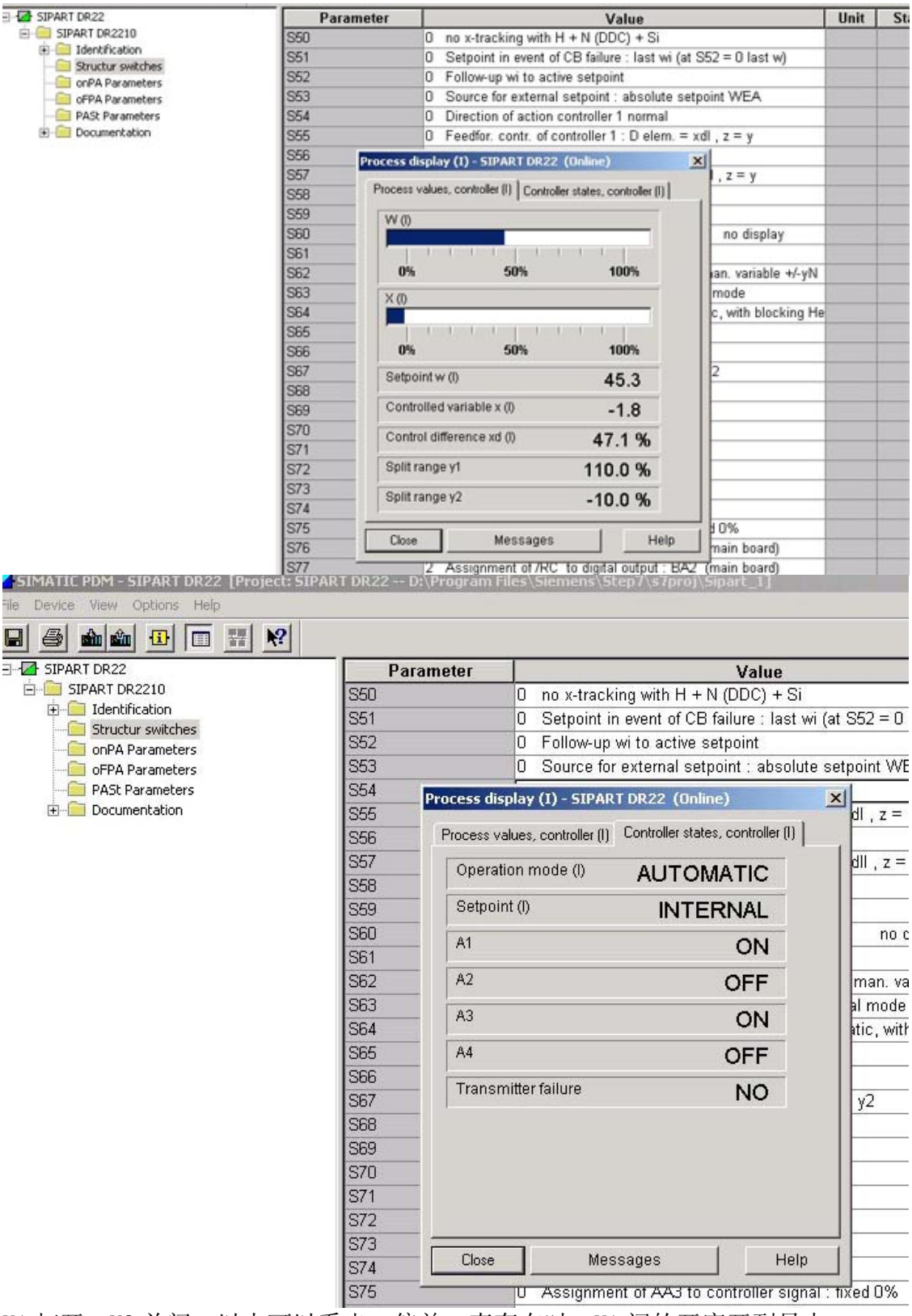


Parameter	Value	Unit
? onPA Parameters		
tFI Filter time constant xdI, controller 1	1.000	s
wI Derivative action gain, controller 1	5.000	
cPI Proportional action factor, controller 1	0.500	
tnI Integral action time, controller 1	100.0	s
tvI Derivative action time, controller 1	10.00	s
AHI Response threshold xdI, controller 1	0.0	%
Y0I Operating point, controller 1	AUTO	%
YAI Manipulated variable limiting, start, contr	-5.0	%
YEI Manipulated variable limiting, end, contr	105.0	%
tFII Filter time constant xdII, controller 2	1.000	s
wII Derivative action gain, controller 2	5.000	
cPII Proportional action factor, controller 2	0.100	
tnII Integral action time, controller 2	9984	s
tvII Derivative action time, controller 2	OFF	s
AHII Response threshold xdII, controller 2	0.0	%
Y0II Operating point, controller 2	AUTO	%
YAII Manipulated variable limiting, start, cont	-5.0	%
YEII Manipulated variable limiting, end, contr	105.0	%
dr Display refresh rate	0.800	s
tY Floating time	OFF	s
tA Min. actuating pulse pause	200	ms
tE Min. actuating pulse length	200	ms
tYII Floating time	OFF	s
tAII Min. actuating pulse pause	200	ms
tEII Min. actuating pulse length	200	ms
tF1 Filter time constant AE1	1.000	s
tF2 Filter time constant AE2	1.000	s
tF3 Filter time constant AE3	1.000	s
tF4 Filter time constant AE4	1.000	s
tF5 Filter time constant AE5	1.000	s
tF6 Filter time constant AE6	1.000	s
tF7 Filter time constant AE7	1.000	s



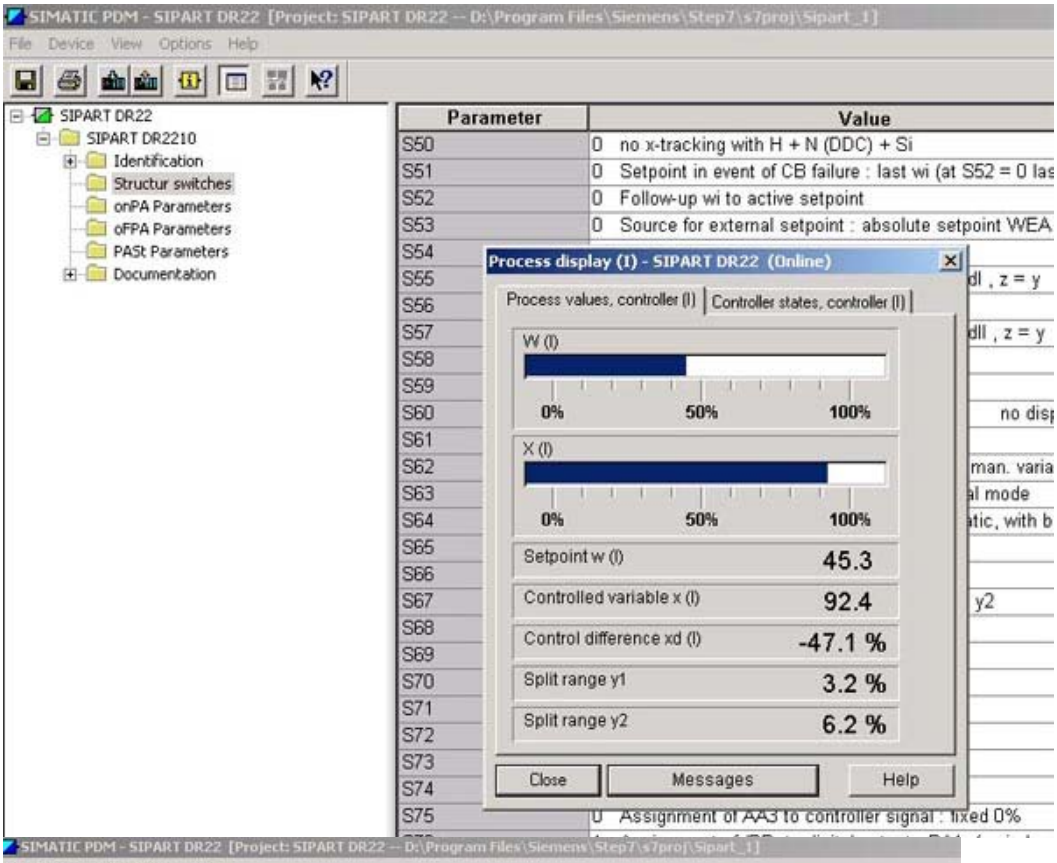
Parameter	Value	Unit
? oFPA Parameters		
dPI Decimal point display 1	---.-	
dAI Start value display 1	0.0	
dEI Full scale value display 1	100.0	
dPII Decimal point display 2	---.-	
dAII Start value display 2	0.0	
dEII Full scale value display 2	100.0	
A1 Alarm 1	5.0	
A2 Alarm 2	-5.0	
A3 Alarm 3	5.0	
A4 Alarm 4	-5.0	
H1.2 Hysteresis alarms A1, A2	1.0	%
H3.4 Hysteresis alarms A3, A4	1.0	%
SA Setpoint limit start	-5.0	
SE Setpoint limit end	105.0	
SH Safety setpoint	0.0	
Sb Limit setpoint for override control	0.0	
tS Setpoint ramp	OFF	min
vA Ratio factor start	0.000	
vE Ratio factor end	1.000	
YS Safty manipulated variable	0.0	%
Y1 Split range man. variable range 1	50.0	%
Y2 Split range man. variable range 2	50.0	%
SAII Setpoint limit start, controller 2	-5.0	
SEII Setpoint limit end, controller 2	105.0	
tSII Setpoint ramp, controller 2	OFF	min
YSII Safty manipulated variable, controller 2	0.0	%
Pd Decimal point ratio controller	---.-	
Ad Start value ratio controller	0.0	
Ed Full scale value ratio controller	100.0	
H2. Hysteresis alarm A2	1.0	%
H4. Hysteresis alarm A4	1.0	%
Y3 Split range man. variable range 3, control	50.0	%

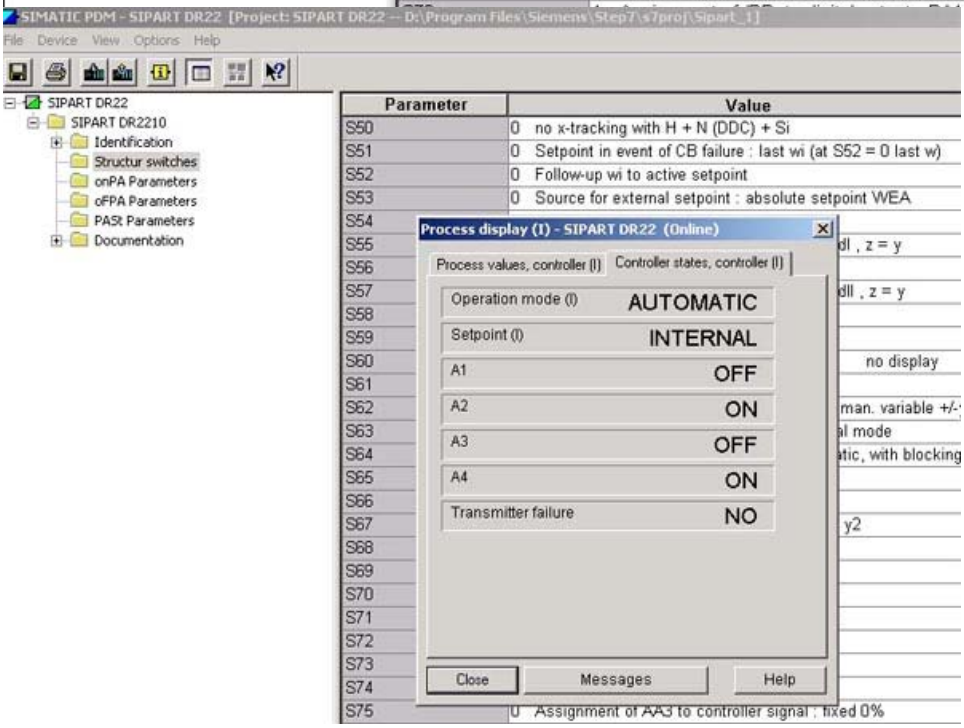
当输入信号小于设定值时，通过 SIMATIC PDM 软件观察如下：



V1 打开，V2 关闭。以上可以看出，偏差一直存在时，V1 阀的开度开到最大。

当实际值大于设定值时，V2 打开，V1 关闭，在偏差起始阶段，V2 阀打开，V1 阀关闭，画面如下：





由以上可以看到，完成工艺调节要求。

此 FAQ 由西门子自动化与驱动集团客户支持部门过程仪表技术支持工程师总结
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