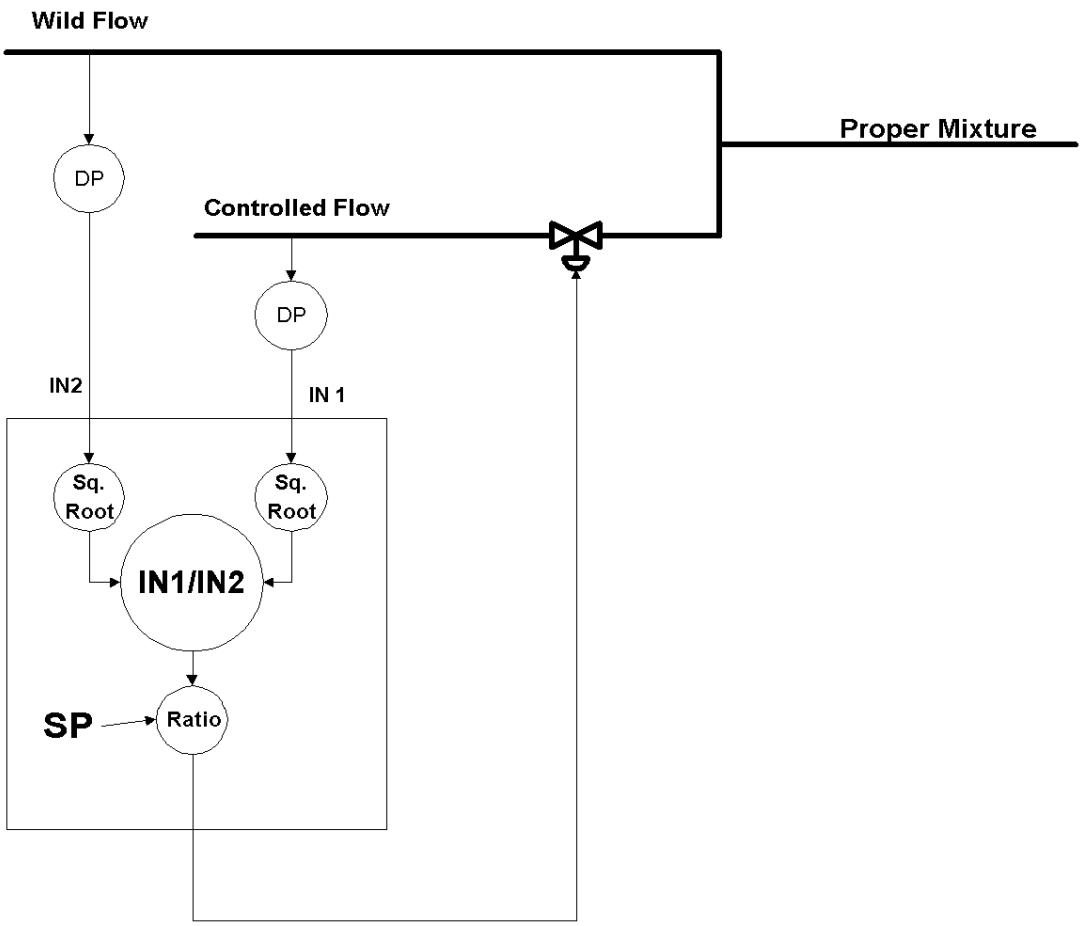
UDC5000 TAC TIP
Ratio Control

Problem

Provide a controller which allows the user to continually enter and maintain any desired ratio between a wild flow and a controlled flow.

Solution

Specify a UDC 5000 with the math algorithm configured as "Multiply - Divider" to calculate the ratio of one flow divided by the other. The result of the math algorithm calculation is used as the process variable, and the ***desired ratio is entered as the setpoint***. The controller output then modulates the flow of the controlled variable to continuously maintain the correct ratio value.



PV = IN 1 / IN 2= Ratio
SP = Ratio Setting

UDC 5000 Configuration Record Sheet

Group Prompt	Function Prompt	Value	Factory Setting	Group Prompt	Function Prompt	Value	Factory Setting
TUNING	PROP BD		1.0	**ALGORITM**	CONTR ALG	PIDA	PIDA
	OR				INPUT 2	ENABLE	DISABLE
	GAIN		1.0		INPUT3	DISABLE	DISABLE
	RATE MIN		0.00		PID LOOPS	1	1 or 2
	RSET MIN		1.0		CONT2ALG		PIDA
	OR				OUT OVRD		DISABLE
	RSET RPM		1.0		INP2 ALG	MULT DIV	NONE
	OR				ATM PRES		760.0
	MAN RSET		0		PC CO		0.2
	PROP BD2		1.0		MATH K	1.0	1.0
	OR				INP3 ALG		NONE
	GAIN2		1.0		PV HI	1.0	1000
	RATE2 MIN		0.00		PV LO	0	0
	RSET2 MIN		1.0				
	OR			**OUT ALG**	OUT ALG		CURRENT
	RSET2 RPM		1.0		4-20 RNG		100 PCT
	CYCSEC		20		OUT ALG2		CURRENT
	CYC2SEC		20		RLY STATE		3OFF 4ON
	SECURITY		0				
	LOCKOUT		CALIB	**INPUT 1**	IN1TYPE	4-20MA	0-10MV
					XMITTER	LINEAR	LINEAR
TUNING2	PROP BD3		1.0		IN1 HI	500	1000
	OR				IN1 LO	0	0
	GAIN3		1.0		RATIO 1	1.0	1.0
	RATE MIN3		0.00		BIAS 1	0	0
	RSET MIN3		1.0		FILTER 1	2	0
	OR				BURNOUT1		NONE
	RSET RPM3		1.0		EMMISSIV1		1.00
	OR						
	MAN RSET3		0	**INPUT 2**	IN2TYPE	4-20MA	0-10MV
	PROP BD4		1.0		XMITTER2	LINEAR	LINEAR
	OR				IN2 HI	500	1000
	GAIN4		1.0		IN2 LO	0	0
	RATE4 MIN		0.00		RATIO 2	1.0	1.0
	RSET4MIN		1.0		BIAS 2	0	0
	OR				FILTER 2	2	0
	RSET4 RPM		1.0		BURNOUT2		NONE
	CYC3SEC		20		EMMISSIV2		1.00
	CYC4SEC		20				
				INPUT 3	XMITTER3		LINEAR
SP RAMP	SP RAMP	DISABL	DISABL		IN3 HI		1000
	TIME MIN		3		IN3 LO		0
	FINAL SP		---		RATIO 3		1.0
	SP PROG	DISABL	DISABL		BIAS 3		0
					FILTER3		0
AUTOTUNE	TUNETYPE		ATUNE				
	ADAPT	DISABLE	DISABLE				
	A TUNE	DISABLE	DISABLE				
	OUTSTEP		20				
	AT EROR	READ ONLY	10				

UDC 5000 Configuration Record Sheet

Group Prompt	Function Prompt	Value	Factory Setting	Group Prompt	Function Prompt	Value	Factory Setting
CONTROL	PID SETS	1 ONLY	1 ONLY	**COM**	ComSTATE		DISABL
	SW VALUE		0.00		COMADDR		3
	LSP's	1 ONLY	NONE		SHEDTIME		30
	RSPSRC		NONE		PARITY		ODD
	AT BIAS	DISABLE	DISABLE		BAUD		19200
	SP TRACK	NONE	NONE		SHEDMODE		LAST
	PWR MODE	ALSP	AM SP		SHED SP		TO LAST
	PWR OUT	F'SAFE	F'SAFE		UNITS		PERCENT
	SP HILIM	1	1000		CSP RATIO		1
	SP LOLIM	0	0		CSP BAIS		0
	ACTION	REVERSE	REVERSE		CSP2 RATIO		1
	OUT HILIM	100	100.0		CSP2 BAIS		0
	OUT LOLIM	0	0.0		DMCS SW		5000
	I HILIM	100	100		LOOPBACK		DISABL
	I LOLIM	0	0				
	DROPOFF	0	0.0	**ALARMS**	A1S1 VAL		90
	DEADBAND		2.0		A1S2 VAL		10
	OUT HYST		0.5		A2S1 VAL		95
	FAILSAFE	0	0.0		A2S2 VAL		5
	PBorGAIN	GAIN	GAIN		A1S1TYPE	NONE	NONE
	MINorRPM	MIN	MIN		A1S2TYPE	NONE	NONE
					A2S1TYPE	NONE	NONE
CONTROL2	PV2 SRC		IN2		A2S2TYPE	NONE	NONE
	PID SETS		1 ONLY		A1SI HL		HI
	SW VALUE		0.00		A1S2 HL		LO
	LSP's		NONE		A2S1 HL		HI
	RSPSRC		NONE		A2S2 HL		LO
	AT BIAS	DISABLE	DISABLE		AL HYST		0.1
	SP TRACK		NONE		ALM ACT		RLY ON
	PWR MODE		AM SP				
	SP HILIM		1000	**DISPLAY**	DECIMAL	X.XXX	XXXX
	SP LOLIM		0		DECIMAL2		XXXX
	ACTION		REVERSE		BARGRAPH		DEV
	OUT HILIM		100.0		UNITS	NONE	DEGF
	OUT LOLIM		0.0		UNITS2		DEGF
	I HILIM		100		PWR FREQ	60	60
	I LOLIM		0				
	DROPOFF		0.0				
	DEADBAND		2.0				
	FAILSAFE		0.0				
OPTIONS	AUXOUT		OUTPUT				
	4ma VAL		0				
	20ma VAL		100.0				
	REMSW1		NONE				
	REMSW1		DISABLE				