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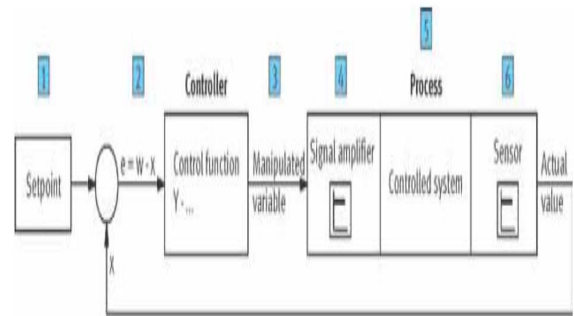
-4

-5

.2

PLC

6 2



(1)

(1)

.PID

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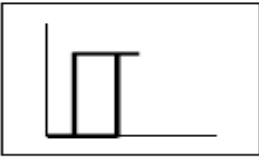
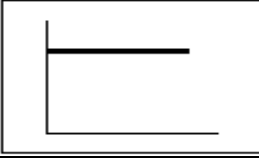
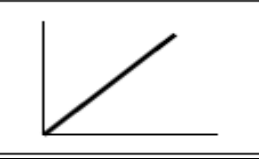

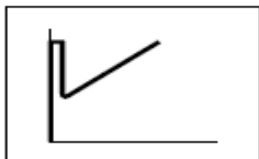
[1] ((1)) =

-1

.(3)

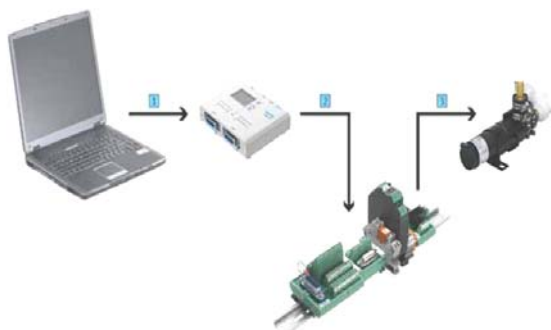
-2

(1)

		
		P
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I P		PI
D		PID

[1]

(2)



(2)

[4] FluidLab PA

(RS-232)

.EasyPort PC

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(2)

3	2	1	
24V	Easy Port 0-24V ()	.Easy Port Bit3	on/off
.0-24V	Easy Port 0-10V) 0-10V (

(I/O)



(3)

PLC EasyPort

.()



(3)

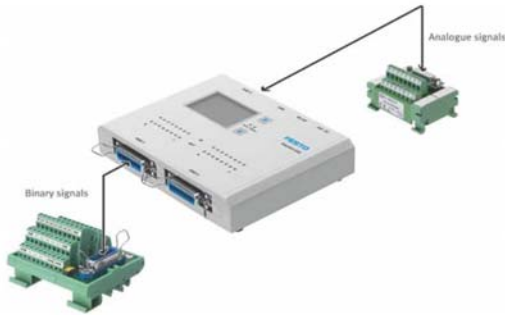
(3)

.[3] I/O



(3)

. 40-1200 Hz .F-U	1-10V		F-U
0-10V 0-PLC	Easy Port 24V		



(5)
FluidLab PA



(4)

24V-DC

.USB

5 USB

I/O – EasyPort

“Setup”

(5 4)

:I/O

:(4)

Name	Device	Abbreviation	Note
Digital output 0	2-way ball valve with pneumatic actuation	A0	Spring return
Digital output 2	Changeover relay	A2	Relay = 0: pump is binary controlled Relay = 1: pump is analogue controlled (0 to 10 V)
Digital output 3	Pump	A3	
Analogue output 0	Pump	AOUT 1	
Analogue input 0	Fill level (ultrasonic)	AIN 0	
Analogue input 1	Flow sensor	AIN 1	
Analogue input 2	Pressure sensor	AIN 2	

B102

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[1] (7)

(6)

B101

B102

V101,V105

B101

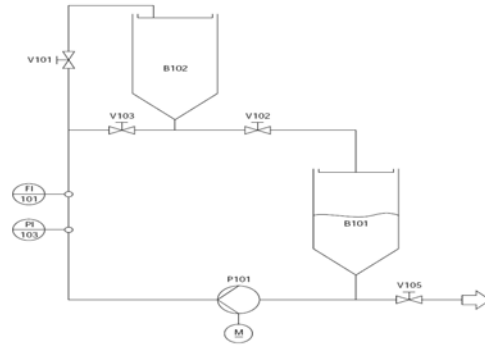
.V102, V103

24V

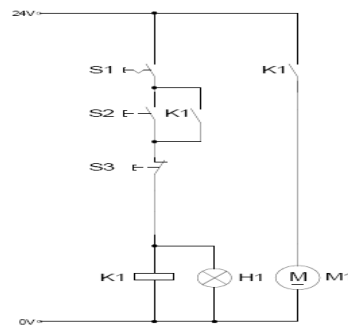
“Setup”

.(8)

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(6)



(7)

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(5)

No.	Digital outputs		Analogue outputs (set at sliders)	Pump (observe)
1	A3 = on	A2 = off	0 V	Pump runs at high speed
2	A3 = on	A2 = on	0 V	Pump off
3	A3 = off	A2 = on	4 V	Pump runs at low speed
4	A3 = off	A2 = on	8 V	Pump runs at high speed
5	A3 = off	A2 = on	10 V	Pump runs at max. power

V101, V105 :

V102, V103

B102

."Setup"

24V DC

0-10V

(1) . + × = .[2,3]

0-10V

.0-10V

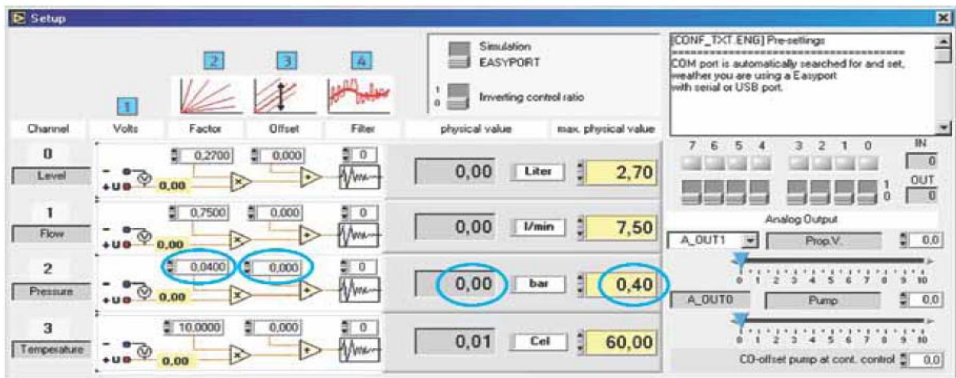
0-0.4bar

.[6,5] 0-400mbar

0.04 = 0.4bar/(10V-0V) = .V105

0.04 = : ()

.(9)) 0.0 =



- 1 Voltage read out by the sensor 2 Factor 3 Offset
 4 The signal can be filtered (attenuated). The higher the number, the greater the attenuation.

(9)

$$\begin{aligned}
 & - \quad) / \quad = \\
 & 1.25 = 10 / (10 - 2) = (\\
 & - = - 1.25 * 2 = \quad \times \quad - = \quad) \\
 & \quad) \quad 2.5 \quad 0- \quad .(\\
 & \quad - \quad)
 \end{aligned}$$

((6)

10bar

. [5,6] 2-10V

:(6)

No.	Digital outputs	Analogue outputs (set at sliders)	Pressure display (observe)
1	A3 = on A2 = off	0V	0.3 bar
2	A3 = off A2 = on	5V	0.1 bar
3	A3 = off A2 = on	10V	0.27 bar

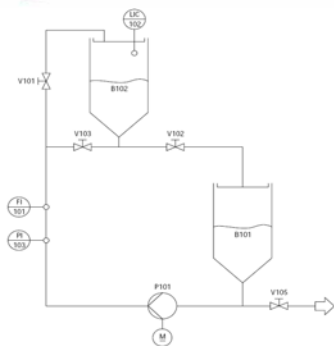
.F/U

0.75 = I/min [[5,6 I/min 0-7.5
 .0 = .[2,3] 0-10V
 (7)) .V105
 ."Setup"
 :
 (1)
 :(7)

No.	Digital outputs		Analogue outputs (set at sliders)	Flow rate display (observe)
1	A3 = on	A2 = off	0V	4.4 l/min.
2	A3 = off	A2 = on	5V	1.1 l/min.
3	A3 = off	A2 = on	10V	4.3 l/min.



50-270 mm



(10)

.[5,6] 0-10V

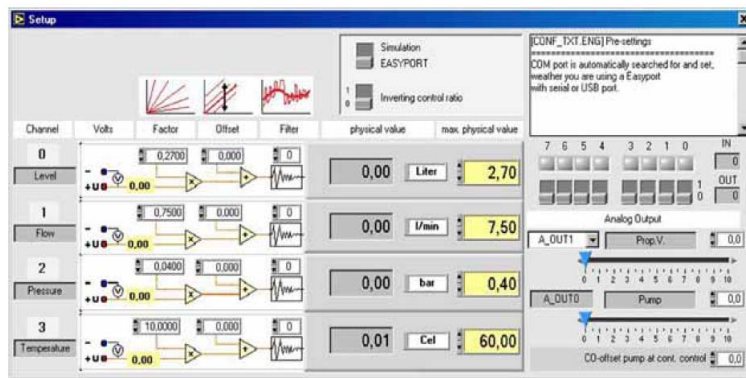
.(10)

B102

.[2,3]

0.0 = 0.27 = (11)

0.0 = 22 = (1)



(11)

0 – 2.7 l

.0-10V

B102

(8)

(8)

No.	Column 1	Column 2	Tank B102, fill level sensor (litres)	Observation
1	A3 = off	A2 = off	Empty = 0.05	B102 is empty.
2	A3 = on	A2 = off	Value increases. Approx. 50% full = 1.5 litres 100% full = 2.95 litres	The tank fills up.
3	A3 = off	A2 = off	The value drops.	The tank empties. Drain valve open: water flows back via the pump.

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PLC

FluidLab Labview Matlab SCADA)

(PA

.[1]

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2- **Schilmann**, Bernhard. Kaufman, Hans. 2009, Process Automation, Workbook. Translated by Dr. Mahmoud BaniMarjeh. FESTO-Didactic, Esslingen, 2009, 366p.

3- Festo Didactic Gmbh& Co.KG. 2009- Esslingen rechbergstrabe 3, Denkendorf, Germany, 342P.

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