

Fig.1 The PCI6 module.

APPLICATION

Digital expansion module for monitoring six digital inputs with a single analog input of the controller. Applied in current loops and long lines.

DESCRIPTION

The PCI6 module is a digital to analog converter, transforming a logical combination of six digital inputs to one current signal 0...20mA or 4...20mA. Using an ultra-precision electronic components, output current is stable in time, temperature, and precisely maps the input states. Connecting discrete inputs (DI1 ÷ DI6) to the GND (\perp), output current is generated by the formulas:

$$\text{For } 0...20\text{mA: } I_{\text{OUT}} = \left[\left(\frac{20}{63} \right) * DI1 + \left(\frac{40}{63} \right) * DI2 + \left(\frac{80}{63} \right) * DI3 + \left(\frac{160}{63} \right) * DI4 + \left(\frac{320}{63} \right) * DI5 + \left(\frac{640}{63} \right) * DI6 \right] [\text{mA}]$$

$$\text{For } 4...20\text{mA: } I_{\text{OUT}} = \left[4 + \left(\frac{16}{63} \right) * DI1 + \left(\frac{32}{63} \right) * DI2 + \left(\frac{64}{63} \right) * DI3 + \left(\frac{128}{63} \right) * DI4 + \left(\frac{256}{63} \right) * DI5 + \left(\frac{512}{63} \right) * DI6 \right] [\text{mA}]$$

where: DI1...5 = 0 for opened terminals
DI1...5 = 1 for closed terminals

TECHNICAL DATA

Power supply	24 V AC/DC
Current consumption	max. 72mA
Input current for $R_{\text{IN}} = 0\Omega$	0,3mA
Max. resistance for input terminals	20k Ω
Output signal	0... 20 mA or 4... 20 mA
Max. load resistance	$\leq 500 \Omega$
Protection class of the case	IP-40
Protections	against reverse polarisation of power supply
Compliance with EU standards	2004/108/EC
Ambient temperature range	-10...+55°C
Diameter of terminals	2,5 mm ²
Mounting	DIN-35 rail
Dimensions (L x W x H)	90mm x 17,5mm x 56mm
Weight	55 g

PCI6

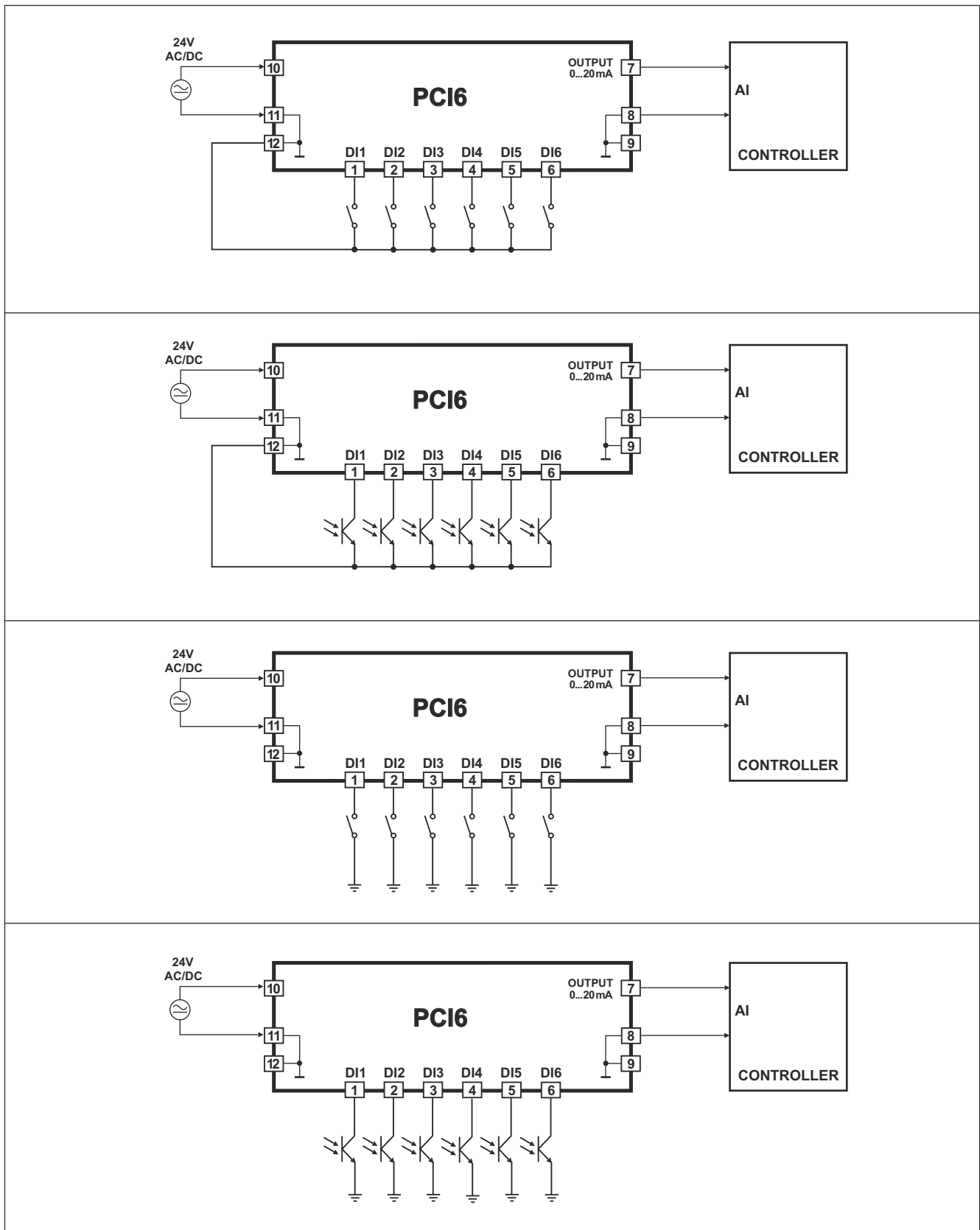


Fig.2 Connection methods examples of the PCI6.

TABLE OF STATE FOR 0...20mA MODEL

State	Digital inputs						I _{OUT} [mA]	State	Digital inputs						I _{OUT} [mA]
	DI1	DI2	DI3	DI4	DI5	DI6			DI1	DI2	DI3	DI4	DI5	DI6	
0	0	0	0	0	0	0	0,000	32	0	0	0	0	0	1	10,159
1	1	0	0	0	0	0	0,317	33	1	0	0	0	0	1	10,476
2	0	1	0	0	0	0	0,635	34	0	1	0	0	0	1	10,794
3	1	1	0	0	0	0	0,952	35	1	1	0	0	0	1	11,111
4	0	0	1	0	0	0	1,270	36	0	0	1	0	0	1	11,429
5	1	0	1	0	0	0	1,587	37	1	0	1	0	0	1	11,746
6	0	1	1	0	0	0	1,905	38	0	1	1	0	0	1	12,063
7	1	1	1	0	0	0	2,222	39	1	1	1	0	0	1	12,381
8	0	0	0	1	0	0	2,540	40	0	0	0	1	0	1	12,698
9	1	0	0	1	0	0	2,857	41	1	0	0	1	0	1	13,016
10	0	1	0	1	0	0	3,175	42	0	1	0	1	0	1	13,333
11	1	1	0	1	0	0	3,492	43	1	1	0	1	0	1	13,651
12	0	0	1	1	0	0	3,810	44	0	0	1	1	0	1	13,968
13	1	0	1	1	0	0	4,127	45	1	0	1	1	0	1	14,286
14	0	1	1	1	0	0	4,444	46	0	1	1	1	0	1	14,603
15	1	1	1	1	0	0	4,762	47	1	1	1	1	0	1	14,921
16	0	0	0	0	1	0	5,079	48	0	0	0	0	1	1	15,238
17	1	0	0	0	1	0	5,397	49	1	0	0	0	1	1	15,556
18	0	1	0	0	1	0	5,714	50	0	1	0	0	1	1	15,873
19	1	1	0	0	1	0	6,032	51	1	1	0	0	1	1	16,190
20	0	0	1	0	1	0	6,349	52	0	0	1	0	1	1	16,508
21	1	0	1	0	1	0	6,667	53	1	0	1	0	1	1	16,825
22	0	1	1	0	1	0	6,984	54	0	1	1	0	1	1	17,143
23	1	1	1	0	1	0	7,302	55	1	1	1	0	1	1	17,460
24	0	0	0	1	1	0	7,619	56	0	0	0	1	1	1	17,778
25	1	0	0	1	1	0	7,937	57	1	0	0	1	1	1	18,095
26	0	1	0	1	1	0	8,254	58	0	1	0	1	1	1	18,413
27	1	1	0	1	1	0	8,571	59	1	1	0	1	1	1	18,730
28	0	0	1	1	1	0	8,889	60	0	0	1	1	1	1	19,048
29	1	0	1	1	1	0	9,206	61	1	0	1	1	1	1	19,365
30	0	1	1	1	1	0	9,524	62	0	1	1	1	1	1	19,683
31	1	1	1	1	1	0	9,841	63	1	1	1	1	1	1	20,000

0 - opened contacts, 1 - closed contacts

Possible compensation of the controller should be made for the state no. 63.

TABLE OF STATE FOR 4...20mA MODEL

State	Digital inputs						I _{OUT} [mA]	State	Digital inputs						I _{OUT} [mA]
	DI1	DI2	DI3	DI4	DI5	DI6			DI1	DI2	DI3	DI4	DI5	DI6	
0	0	0	0	0	0	0	4,000	32	0	0	0	0	0	1	12,127
1	1	0	0	0	0	0	4,254	33	1	0	0	0	0	1	12,381
2	0	1	0	0	0	0	4,508	34	0	1	0	0	0	1	12,635
3	1	1	0	0	0	0	4,762	35	1	1	0	0	0	1	12,889
4	0	0	1	0	0	0	5,016	36	0	0	1	0	0	1	13,143
5	1	0	1	0	0	0	5,270	37	1	0	1	0	0	1	13,397
6	0	1	1	0	0	0	5,524	38	0	1	1	0	0	1	13,651
7	1	1	1	0	0	0	5,778	39	1	1	1	0	0	1	13,905
8	0	0	0	1	0	0	6,032	40	0	0	0	1	0	1	14,159
9	1	0	0	1	0	0	6,286	41	1	0	0	1	0	1	14,413
10	0	1	0	1	0	0	6,540	42	0	1	0	1	0	1	14,667
11	1	1	0	1	0	0	6,794	43	1	1	0	1	0	1	14,921
12	0	0	1	1	0	0	7,048	44	0	0	1	1	0	1	15,175
13	1	0	1	1	0	0	7,302	45	1	0	1	1	0	1	15,429
14	0	1	1	1	0	0	7,556	46	0	1	1	1	0	1	15,683
15	1	1	1	1	0	0	7,810	47	1	1	1	1	0	1	15,937
16	0	0	0	0	1	0	8,063	48	0	0	0	0	1	1	16,190
17	1	0	0	0	1	0	8,317	49	1	0	0	0	1	1	16,444
18	0	1	0	0	1	0	8,571	50	0	1	0	0	1	1	16,698
19	1	1	0	0	1	0	8,825	51	1	1	0	0	1	1	16,952
20	0	0	1	0	1	0	9,079	52	0	0	1	0	1	1	17,206
21	1	0	1	0	1	0	9,333	53	1	0	1	0	1	1	17,460
22	0	1	1	0	1	0	9,587	54	0	1	1	0	1	1	17,714
23	1	1	1	0	1	0	9,841	55	1	1	1	0	1	1	17,968
24	0	0	0	1	1	0	10,095	56	0	0	0	1	1	1	18,222
25	1	0	0	1	1	0	10,349	57	1	0	0	1	1	1	18,476
26	0	1	0	1	1	0	10,603	58	0	1	0	1	1	1	18,730
27	1	1	0	1	1	0	10,857	59	1	1	0	1	1	1	18,984
28	0	0	1	1	1	0	11,111	60	0	0	1	1	1	1	19,238
29	1	0	1	1	1	0	11,365	61	1	0	1	1	1	1	19,492
30	0	1	1	1	1	0	11,619	62	0	1	1	1	1	1	19,746
31	1	1	1	1	1	0	11,873	63	1	1	1	1	1	1	20,000

0 - opened contacts, 1 - closed contacts

Possible compensation of the controller should be made for the state no. 63.

Updated: January 2018