

DIO3248B

Digital I/O Card

User's Manual (V1.1)

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Correction record

Version	Record
V1.0	New
V1.0->V1.1	DIO3248DIN(N)→ADP3248DIN(N)

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Notes on hardware installation

Please follow step by step as you are installing the control cards.

1. Be sure your system is power off.
2. Be sure your external power supply for the wiring board is power off.
3. Plug your control card in slot, and make sure the golden fingers are put in right contacts.
4. Fasten the screw to fix the card.
5. Connect the cable between the card and wiring board.
6. Connect the external power supply for the wiring board.
7. Recheck everything is OK before system power on.
8. External power on.

Congratulation! You have it.

For more detail of step by step installation guide, please refer the file “installation.pdf” on the CD come with the product or register as a member of our user’s club at:

<http://automation.com.tw/>

to download the complementary documents.

1. **Difference between the DIO3248B and DIO3248A**

DIO3248B is the upgrade version of DIO3248A. If you have use the DIO3248A with new driver, you can upgrade seamlessly. The function convention is the same but DIO3248B with more functions such as 2 TTL IO port and more useful IO functions (refer Chapt.3 Features)

2. **Forward**

Thank you for your selection of DIO3248 a 48 inputs and 16 outputs DIGITAL I/O card for IBM compatible industrial PC. In the field of industrial control, digital I/O is generally controlled under a microprocessor and owing to their specific consideration of industrial environment, it is quite different from the laboratory requirement.

This card is a FPGA based design and our experience in the noise immunity makes this card very stable in the noisy environment and you don't worry about computer down by external noise. We wish the card that will be helpful to your project.

Other DIO series products:

- DIO9201 16 channel input and 16 channel output isolated digital I/O card (ISA bus)
- DIO2232 32 channel input and 32 channel output isolated digital I/O card (ISA bus)
- DIO3206 48 channel TTL digital I/O Card (PCI bus)
- DIO3208B 8 channel input and 8 channel relay output isolated digital I/O card (PCI bus)
- DIO3216B 16 channel input and 16 channel output isolated digital I/O card (PCI bus)
- DIO3217 16 channel input and 16 channel output isolated digital I/O card (PCI bus)
with multifunction timer/counter
- DIO3232A 32 channel input and 32 channel output isolated digital I/O card (PCI bus)
- DIO3232B Advanced 32 channel input and 32 channel output isolated digital I/O card (PCI bus)
- DIO3248A 48 channel input and 16 channel output isolated digital I/O card (PCI bus)
- DIO3264A 64 channel input isolated digital I/O card (PCI bus)
- DIO3264B Advanced 64 channel input isolated digital I/O card (PCI bus)
- DIO3265 64 channel output isolated digital I/O card (PCI bus) with 16 TTL IO
- DIO4264 64 TTL digital I/O PC-104 Module
- DIO6208 8 channel input and 8 channel relay output isolated digital I/O PCI-104 Module
- DIO6216 16 channel input and 16 channel relay output isolated digital I/O PCI-104 Module

Any comment is welcome,

please visit our website

<http://www.automation.com.tw/>

<http://www.automation-js.com/> for the up to date information.

3. Features

- 2.1 PCI plug and play function with card ID for 16 identical cards
- 2.2 48 inputs and 16 outputs are photo-coupler isolated
- 2.3 2 TTL input/output*
- 2.4 Build-in input programmable digital de-bounce circuit*
- 2.5 Accept external interrupt at IN15~ IN0*
- 2.6 8 input with counter function*
- 2.7 32 bit timer on 1us time base*
- 2.8 watch dog timer with default output at OUT7~OUT0*

wiring board

- 2.9 LEDs for corresponding status indication
- 2.10 8 digits per I/O group with Green LED at first digit
- 2.11 Power MOS type output for high speed DC load

*superset functions differ from DIO3248A

4. Specifications

4.1 DIO3248B Main card

Digital input

- 4.1.1 Input channel — 48 ea of ON/OFF switching
- 4.1.2 Rated input voltage — DC 24V
- 4.1.3 Input “ON” state — 2.8V(max) 4.5mA(min)
- 4.1.4 Input “OFF” state — 8V(min) 3mA(max)
- 4.1.5 Switching speed — 10K (limit by photo-coupler speed or by debounce circuit)
- 4.1.6 Debounce — software programmable @ 100,200,1K,2K Hz and no debounce
- 4.1.7 Input counter — 16 bit (IN7 ~ IN0)

Digital output

- 4.1.8 Output channel — 16 ea of ON/OFF switching
- 4.1.9 Output capacity — POWER MOS output:
 - 1A continuous@120Vdc(NMOS max), @ 24Vdc (PMOS max)
 - Relay output: 3A continuous@250Vac(max)

TTL IO

- 4.1.10 Port — 2
- 4.1.11 Direction — software programmable on port base

Timer

- 4.1.12 Length — 32 bit @1us
- 4.1.13 Interrupt — time up interrupt

General

- 4.1.14 Card ID — 4 bits
- 4.1.15 Insulation resistance — 100M Ohm (min) at 1000Vdc
- 4.1.16 Isolation voltage — 2500Vac 1Min
- 4.1.17 PCI bus data width — 32 bits
- 4.1.18 I/O connector — 68 pin female SCSI II connector
- 4.1.19 Wiring board — 1 with round cable hook to main card
- 4.1.20 External supply — DC 24±4V
- 4.1.21 Operation temperature — 0 to 70° C
- 4.1.22 Storage temperature — -20° to 80° C
- 4.1.23 Operation humidity — RH5~95%, non-condensed
- 4.1.24 Dimension — 159(W) * 106(H) mm, 6.3(W) * 4.2(H)in

4.2 ADP3248DIN Din rail mounted wiring board

ADP3248DIN DIN rail mounted wiring board

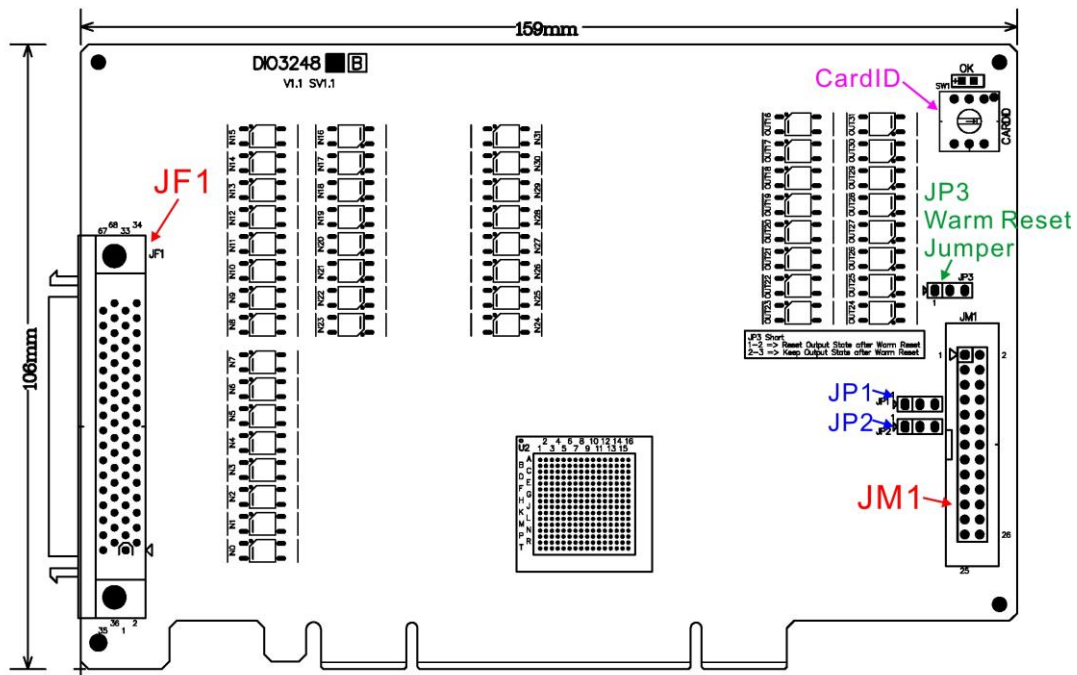
- 4.2.1 External supply —DC 24V±4V
- 4.2.2 Input status indicator — 48LED, 8 digit per group with Green LED at first digit
- 4.2.3 Output status indicator — 16 LED, 8 digit per group with Green LED at first digit
- 4.2.4 Power indicator — Red LED
- 4.2.5 Terminal — every 4 has one common terminal.
(Different “common” for different positive power terminal)
- 4.2.6 Output capacity —NMOS : 1A continuous@120Vdc
PMOS: 1A continuous@24Vdc
Relay : 3A continuous@250Vac(max)
- 4.2.7 Operation temperature — 0 to 70° C
- 4.2.8 Operation humidity — RH5~95%, non-condensed
- 4.2.9 Dimension — ADP3248DIN(N) : 121(W) * 159(L) * 47(H)mm
4.8(W)*6.3(L)*1.9(H)in
DIO3248DIN(R) / (P) : 121(W) * 159(L) * 45(H)mm
4.8(W)*6.3(L)*1.8(H)in

JS51050 25PM Din rail mounted dummy wiring board for TTL I/O

- 4.2.10 Connection cable — D-type 25P cable to connect main and wiring board
- 4.2.11 Dimension — 86(W)*79(L)*52(H)mm , 3.4(W)*3.2(L)*2.1(H)in

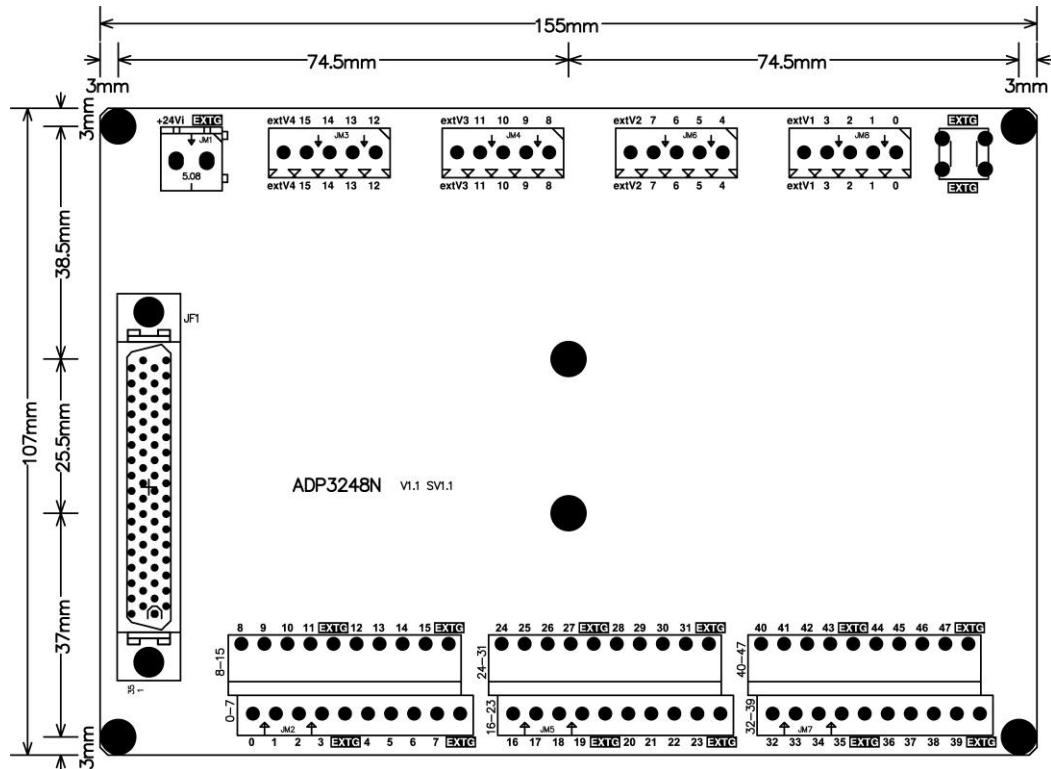
5. Layout and dimensions

5.1 DIO3248B Main card



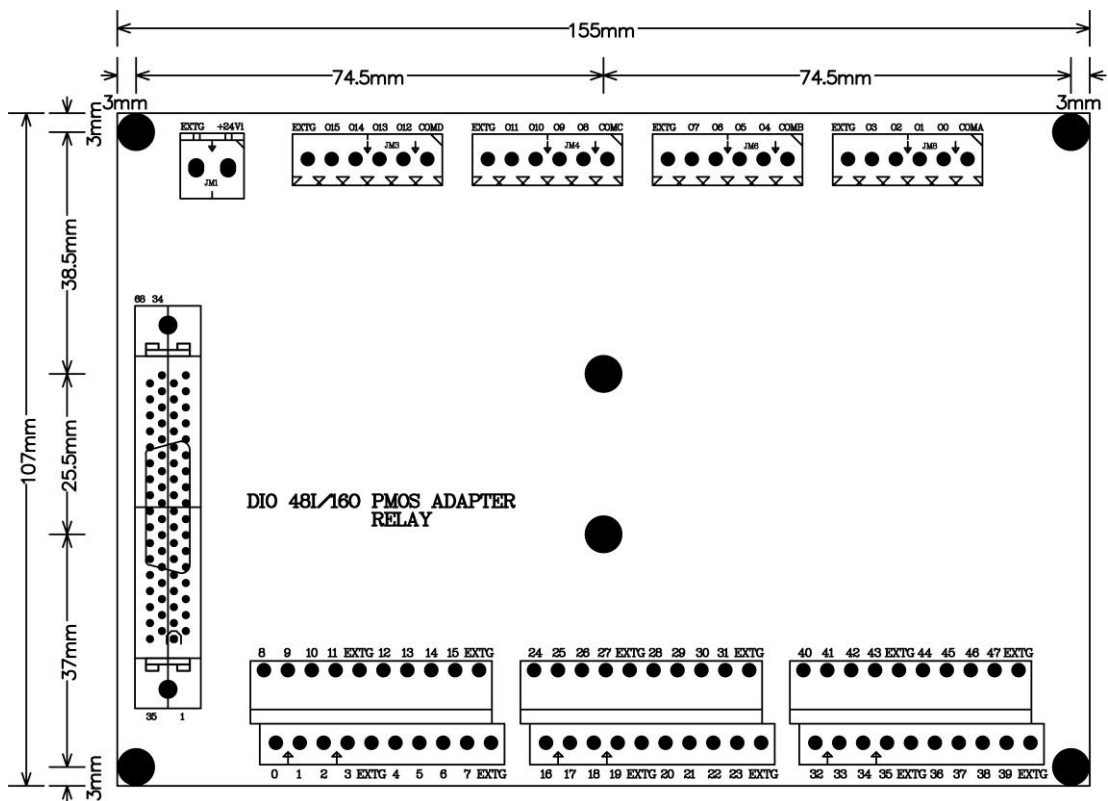
*dimension in bare board

5.2 ADP3248DIN(N) Din rail mounted wiring board



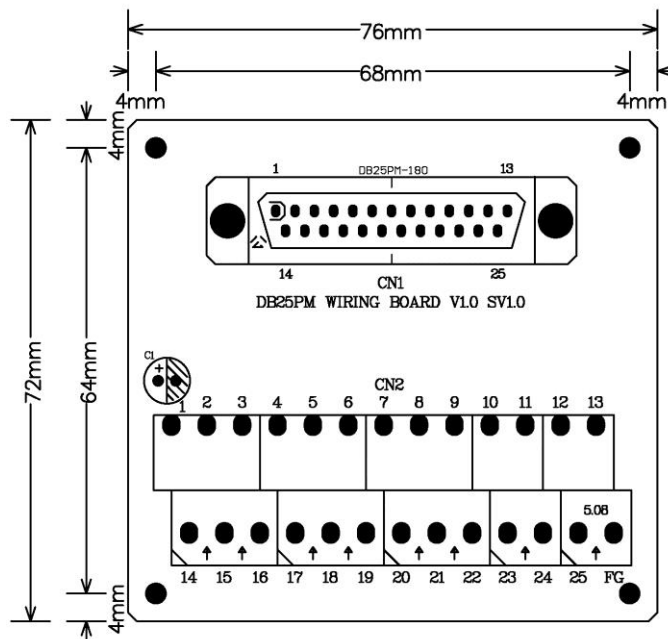
*dimension in bare board

5.3 DIO3248DIN(P)/(R)Din rail mounted wiring board



*dimension in bare board

5.4 JS51050 for JM1 25PM Din rail mounted dummy wiring board



*dimension in bare board

6. Pin definitions

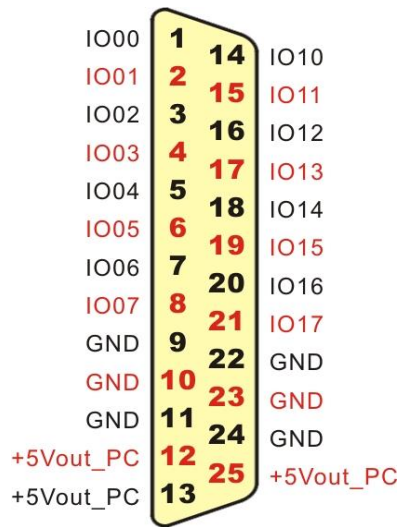
6.1 JF1 Assignment / Definitions

PIN	Descriptions		PIN	Descriptions
1	IN0[External Input 0]		35	IN1[External Input 1]
2	IN2[External Input 2]		36	IN3[External Input 3]
3	IN4[External Input 4]		37	IN5[External Input 5]
4	IN6[External Input 6]		38	IN7[External Input 7]
5	IN8[External Input 8]		39	IN9[External Input 9]
6	IN10[External Input 10]		40	IN11[External Input 11]
7	IN12[External Input 12]		41	IN13[External Input 13]
8	IN14[External Input 14]		42	IN15[External Input 15]
9	IN16[External Input 16]		43	IN17[External Input 17]
10	IN18[External Input 18]		44	IN19[External Input 19]
11	IN20[External Input 20]		45	IN21[External Input 21]
12	IN22[External Input 22]		46	IN23[External Input 23]
13	IN24[External Input 24]		47	IN25[External Input 25]
14	IN26[External Input 26]		48	IN27[External Input 27]
15	IN28[External Input 28]		49	IN29[External Input 29]
16	IN30[External Input 30]		50	IN31[External Input 31]
17	IN32[External Input 32]		51	IN33[External Input 33]
18	IN34[External Input 34]		52	IN35[External Input 35]
19	IN36[External Input 36]		53	IN37[External Input 37]
20	IN38[External Input 38]		54	IN39[External Input 39]
21	IN40[External Input 40]		55	IN41[External Input 41]
22	IN42[External Input 42]		56	IN43[External Input 43]
23	IN44[External Input 44]		57	IN45[External Input 45]
24	IN46[External Input 46]		58	IN47[External Input 47]
25	OUT0[External Output 0]		59	OUT1[External Output 1]
26	OUT2[External Output 2]		60	OUT3[External Output 3]
27	OUT4[External Output 4]		61	OUT5[External Output 5]
28	OUT6[External Output 6]		62	OUT7[External Output 7]
29	OUT8[External Output 8]		63	OUT9[External Output 9]
30	OUT10[External Output 10]		64	OUT11[External Output 11]
31	OUT12[External Output 12]		65	OUT13[External Output 13]
32	OUT14[External Output 14]		66	OUT15[External Output 15]
33	+24V[External DC24V power]		67	+24V[External DC24V power]
34	+24V[External DC24V power]		68	+24V[External DC24V power]

IN0	1	35	IN1
IN2	2	36	IN3
IN4	3	37	IN5
IN6	4	38	IN7
IN8	5	39	IN9
IN10	6	40	IN11
IN12	7	41	IN13
IN14	8	42	IN15
IN16	9	43	IN17
IN18	10	44	IN19
IN20	11	45	IN21
IN22	12	46	IN23
IN24	13	47	IN25
IN26	14	48	IN27
IN28	15	49	IN29
IN30	16	50	IN31
IN32	17	51	IN33
IN34	18	52	IN35
IN36	19	53	IN37
IN38	20	54	IN39
IN40	21	55	IN41
IN42	22	56	IN43
IN44	23	57	IN45
IN46	24	58	IN47
OUT0	25	59	OUT1
OUT2	26	60	OUT3
OUT4	27	61	OUT5
OUT6	28	62	OUT7
OUT8	29	63	OUT9
OUT10	30	64	OUT11
OUT12	31	65	OUT13
OUT14	32	66	OUT15
+24Vin	33	67	+24Vin
+24Vin	34	68	+24Vin

6.2 JM1 Assignment / Definitions

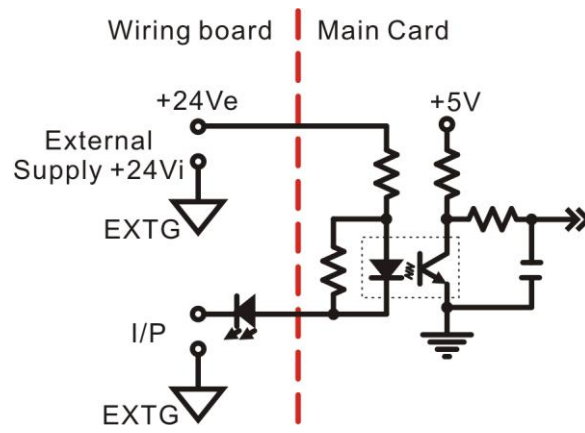
PIN	Description		PIN	Description
1	IO00: TTL port0 IO0	IO00	14	IO10: TTL port1 IO0
2	IO01: TTL port0 IO1	IO01	15	IO11: TTL port1 IO1
3	IO02: TTL port0 IO2	IO02	16	IO12: TTL port1 IO2
4	IO03: TTL port0 IO3	IO03	17	IO13: TTL port1 IO3
5	IO04: TTL port0 IO4	IO04	18	IO14: TTL port1 IO4
6	IO05: TTL port0 IO5	IO05	19	IO15: TTL port1 IO5
7	IO06: TTL port0 IO6	IO06	20	IO16: TTL port1 IO6
8	IO07: TTL port0 IO7	IO07	21	IO17: TTL port1 IO7
9	GND	GND	22	GND
10	GND	GND	23	GND
11	GND	GND	24	GND
12	+5Vout_PC: 5V out from PC	+5Vout_PC	25	+5Vout_PC: 5V out from PC
13	+5Vout_PC: 5V out from PC	+5Vout_PC		



7. I/O interface diagram

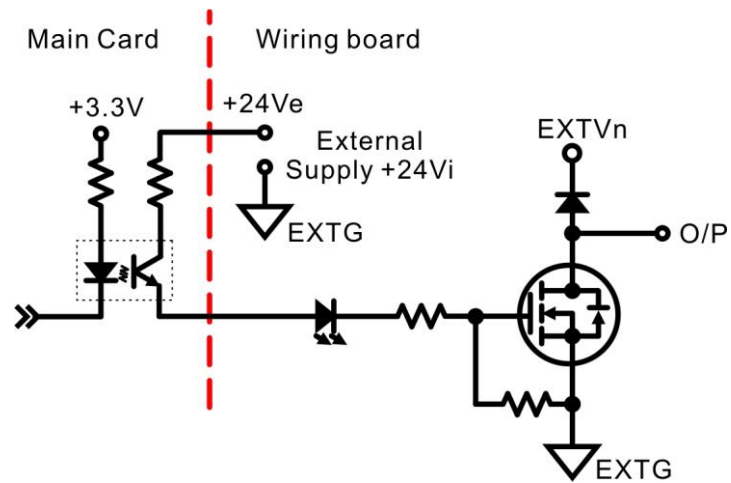
7.1 JF1 DIO3248DIN

7.1.1 Input diagram

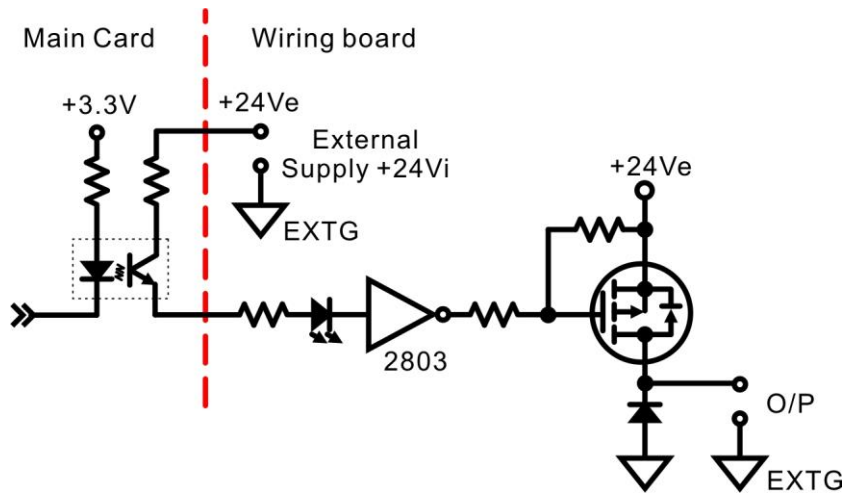


7.1.2 Output diagram

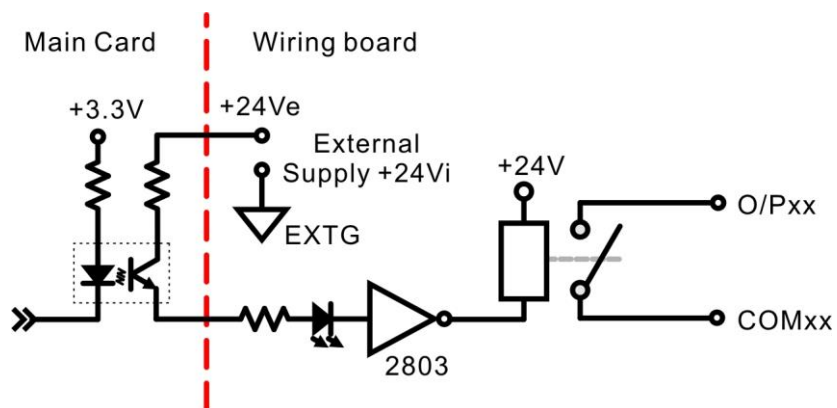
Type 1 output : NMOS



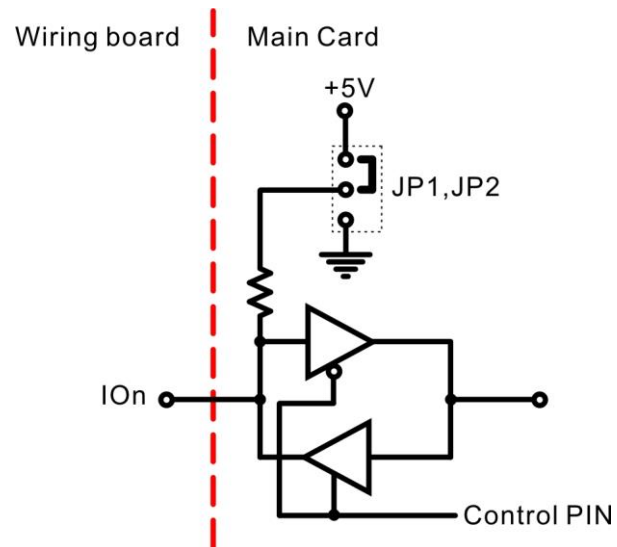
Type 2 output : PMOS



Type 3 output : RELAY

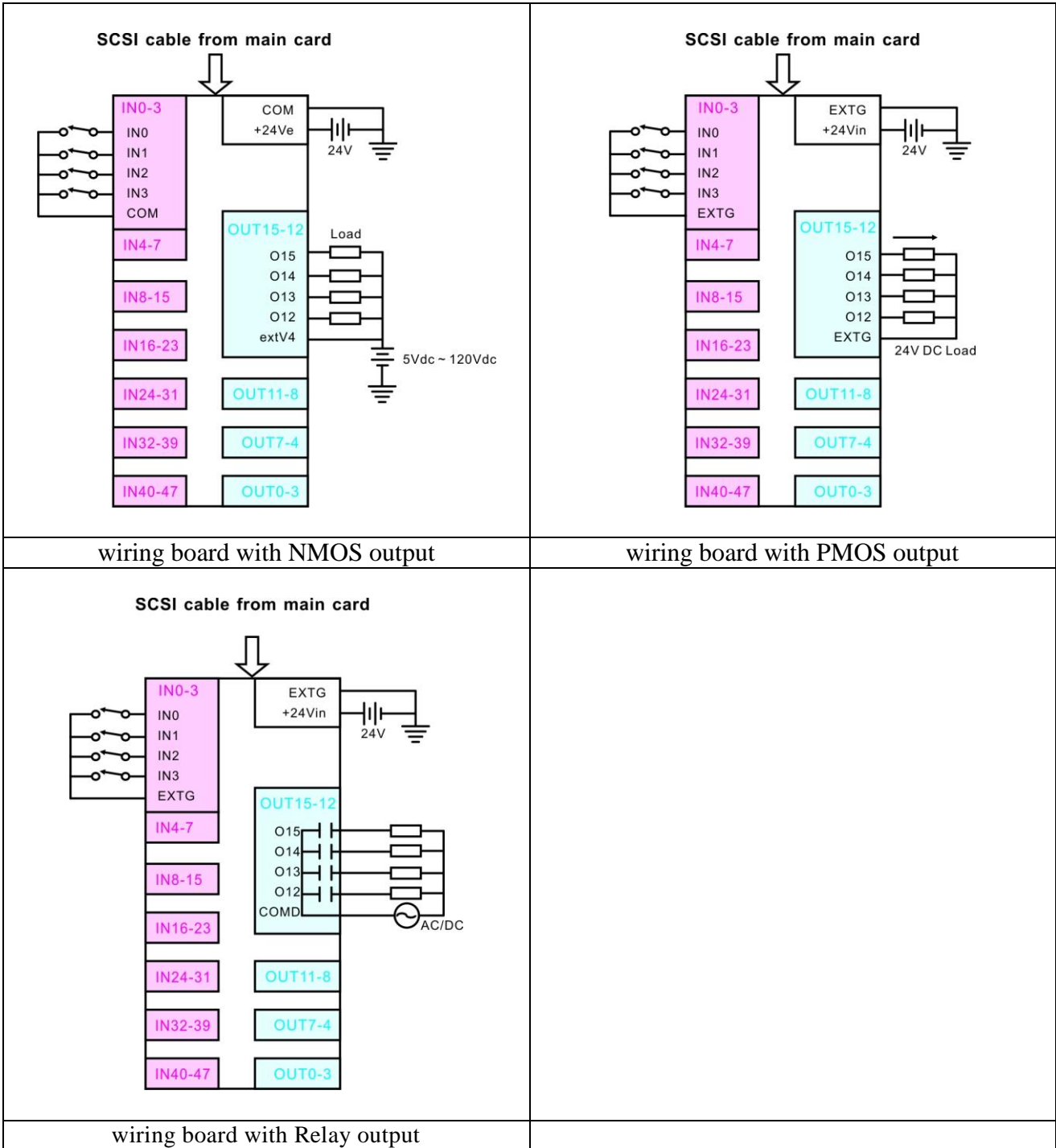


7.2 JM1 JS51050



For byte-programmable TTL I/O IO00 ~ IO07, IO10 ~ IO17 to configured as pull high or pull low. JP1,JP2 are used for output state of power on. (refer 9.2 JP1,JP2 Jumper setting)

8. External wiring diagram

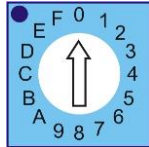


9. Hardware settings

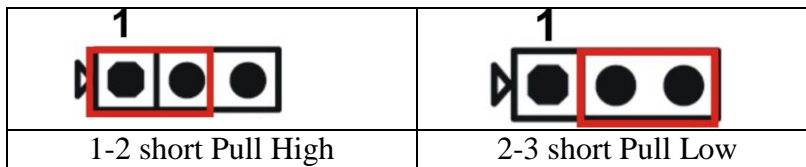
9.1 Card ID setting

Since PCI cards have plug and play function, the card ID is required for programmer to identify which card he/she will control without knowing the physical address assigned by the Windows. A 4 bits DIP switch for distinguishing the 16 identical card.

The following example sets the card ID at 0.



9.2 JP1, JP2 Jumper setting



Jumper JP1 and JP2 is used for the TTL output default state, if you disable the TTL port or at computer start-up period, the default state will be output. Select the one to match with the succeeding circuit.

9.3 JP3 Jumper setting



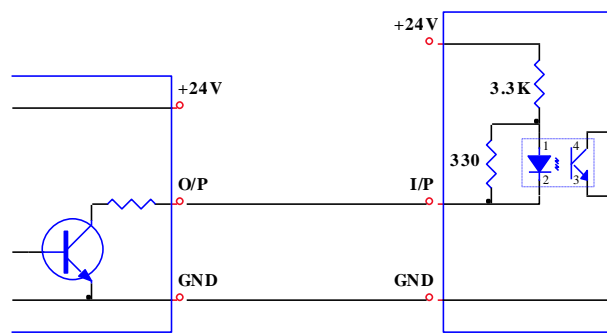
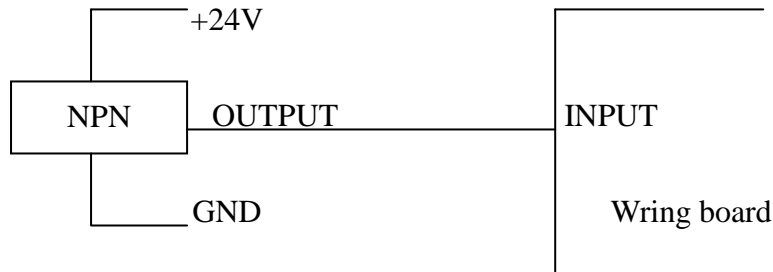
10. Applications

- Accept : -- P.B./M.S./EMG./Contact- Start/Stop/Limit switch/sensor
 - Interlock/selective Switch; Proximity switch
 - Aux. contact of transducer/detector
- As I/O of software PLC Controller
 - Power MOS type output: drive high speed DC load
- As multi-channel low speed counter

11. Application note

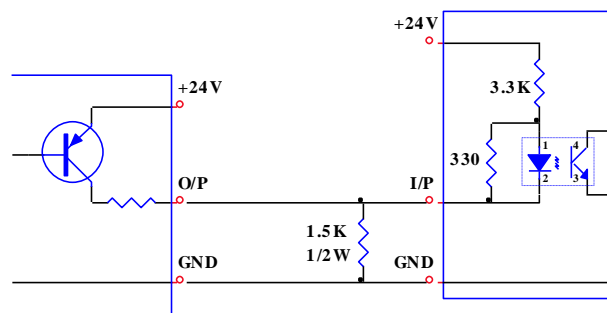
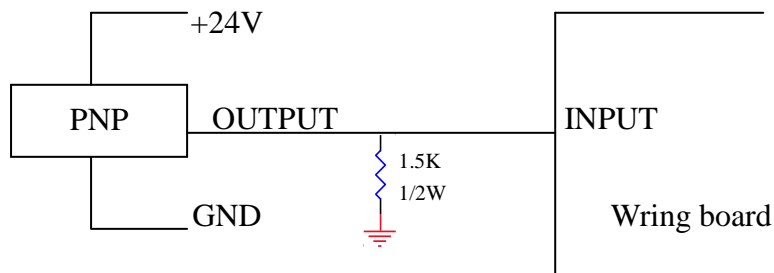
11.1 Tip for using NPN type proximity Switch

The NPN type proximity sensor can directly connect to input of wring board.



11.2 Tip for using PNP type proximity Switch

The PNP type proximity sensor need extra pull down resister connect to input of wring board.



12. Ordering information

<u>PRODUCT</u>	<u>DESCRIPTIONS</u>
DIO3248B	advanced 64-channel Digital I/O Card for 48 DI and 16 DO Photo-coupler isolated
ADP3248DIN(N)	DIN rail mounted wiring board for 48 input and 16 power NMOS output
DIO3248DIN(P)	DIN rail mounted wiring board for 48 input and 16 power PMOS output
DIO3248DIN(R)	DIN rail mounted wiring board for 48 input and 16 Relay output
JS51050	DIN rail mounted dummy wiring board (D type 25P male to terminals) for JM1 TTL I/O
M266868150	68-pin SCSI II cable 1.5M
M266868300	68-pin SCSI II cable 3.0M
M270325X4	D type 25p male-female cable 1.5M
M270325X4S	D type 25p male-female cable 1.5M, shielding
M270325X0	D type 25p male-female cable 3.0M
M270325X0S	D type 25p male-female cable 3.0M, shielding
SM23404	Extension kit for JM1 (bracket and flat cable for 25P female D type connector)