DIO8217
Digital I/O Card

User's Manual (V1.0)

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Correction record

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V1.0	New

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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.

Warning:

Some computer BIOS has “Auto detect DIMM/PCI clock” option, be sure to switch to “DISABLE” else in some cases the PCI add on cards will not be detected by windows at cold start.

1. Forward

Thank you for your selection of JAC's product DIO8217 16 inputs and 16 outputs DIGITAL I/O card with multi-function timer/counter for 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.

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)
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/B 32 channel input and 32 channel output isolated digital I/O card (PCI bus)
DIO3248A/B 48 channel input and 16 channel output isolated digital I/O card (PCI bus)
DIO3264A/B 64 channel input isolated digital I/O card (PCI bus)
DIO3265 64 channel output isolated digital I/O card (PCI bus)

DIO8216 16 channel input and 16 channel output isolated digital I/O card (PCIe bus)
DIO8232 32 channel input and 32 channel output isolated digital I/O card (PCIe bus)
DIO8264 64 channel input isolated digital I/O card (PCIe bus)
DIO8265 64 channel output isolated digital I/O card (PCIe bus)

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.

2. Features

2.1 Main card

- 2.1.1 PCIe plug and play function with card ID for 16 identical cards
- 2.1.2 16 isolated DI and 16 isolated DO channels
- 2.1.3 High voltage isolation on all isolated channel (2500 Vac)
- 2.1.4 0-48Vdc universal wide range sink or source input
- 2.1.5 Programmable debounce at 50,100,200, 1K Hz and no de-bounce for input
- 2.1.6 On board NMOS output at 2A@ 5-48V (10ms) capacity
- 2.1.7 No output transition during start-up
- 2.1.8 Output status readback
- 2.1.9 External triggered interrupt (on IN07~IN00 and TTL IO07~IO00)
- 2.1.10 Input counter / frequency counter (on IN07~IN00 and TTL IO07~IO00)
- 2.1.11 Keep output state after hot reset (jumper selectable)
- 2.1.12 Watch dog timer with default output on OUT07~OUT00
- 2.1.13 32bit timer with time up interrupt

2.2 DIN rail mounted wiring board

- 2.2.1 Dummy wiring board

3. Specifications

3.1 DIO8217 Main card

Input Section

3.1.1 Input : 16 photo-isolated

3.1.2 ON state : 8Vdc(max), 4mA(min)

3.1.3 OFF state : 12Vdc(min), 3mA(max)

3.1.4 Software debounce : No debounce, 50Hz, 100Hz, 200Hz, 1KHz

3.1.5 Switching speed : 10KHz max. (limit by photo coupler speed and debounce filter)

3.1.6 Interrupt : at IN07 ~ IN00, TTL IO07~IO00

3.1.7 Frequency counter : 16 bit at IN07~IN00, TTL IO07~IO00

3.1.8 Input counter : 16 bit at IN07~IN00, TTL IO07~IO00

Output Section

3.1.9 Output : 16 photo-isolated NMOS

3.1.10 Output rating : NMOS sink

continuous : 0.125A @5~48Vdc (all output 'on' per port)

50% duty : 0.5A@5~48Vdc (all output 'on' per port)

Instaneous (10ms) : 2A@5~48Vdc (one output 'on' per port)

TTL IO

3.1.11 Port : 2

3.1.12 Direction : software programmable on port base

3.1.13 Software debounce : No debounce, up to 8MHz

Timer/Counter/PWM

3.1.14 Timer time base : 1us

3.1.15 Timer/counter length : 32 bit

3.1.16 Counter frequency(max) : 8MHz

3.1.17 PWM time base : 33MHz

3.1.18 PWM frequency: 16 bit

3.1.19 PWM duty : 16 bit

Quadrature counter

3.1.20 Input multiple rate : x1, x2, x4 programmable (quadrature signal only)

3.1.21 counter length : 32 bit

Main Card General

3.1.22 Card ID : 4 bits

3.1.23 Insulation resistance : 100M Ohm (min) at 1000Vdc

3.1.24 Isolation voltage : 2500Vac 1Min

3.1.25 Connector : 68pin female Centronic type connector

3.1.26 Operation temperature : 0 to +70 degree C

3.1.27 Storage temperature : -20 to +80 degree C

3.1.28 Operation humidity : 5~95% RH, non-condensing

3.1.29 Dimensions : 144(W) * 96(H) mm , 5.7(W) * 3.8(H)in

3.2 DIN rail mounted wiring board

JS510681 rail mounted dummy wiring board

3.2.1 Connection cable : 68pin female Centronic type connector to connect main and wiring board

3.2.2 Dimension : 86(W) * 204(L) * 52(H)mm
3.4(W) * 8.1(L) * 2.1(H)in

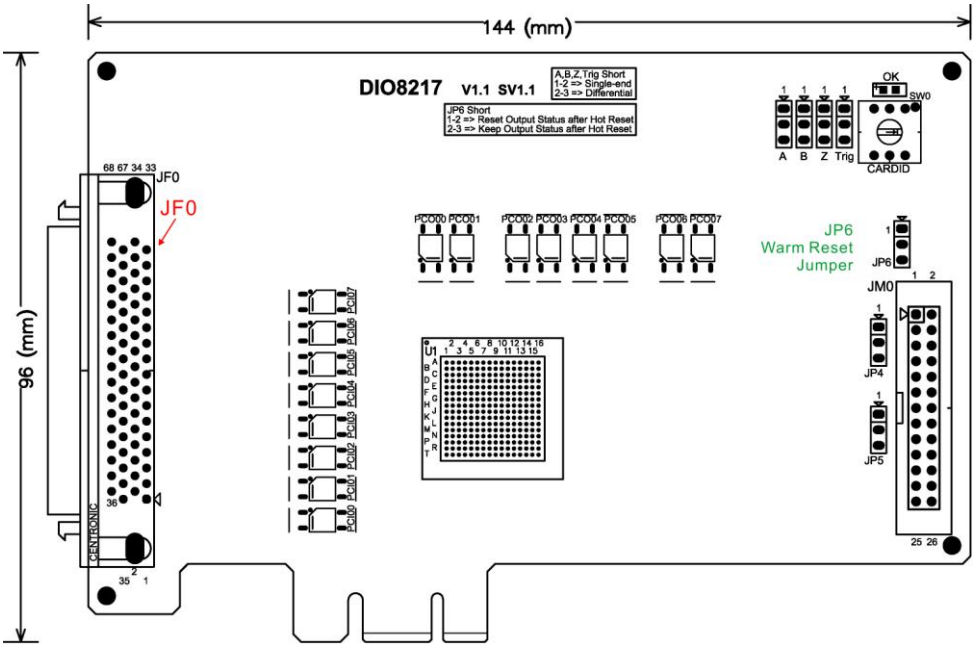
JS51050 25PM DIN rail mounted dummy wiring board for TTL I/O

3.2.3 Connection cable : D-type 25P cable to connect main and wiring board

3.2.4 Dimension : 86(W)*79(L)*52(H)mm
3.4(W)*3.2(L)*2.1(H)in

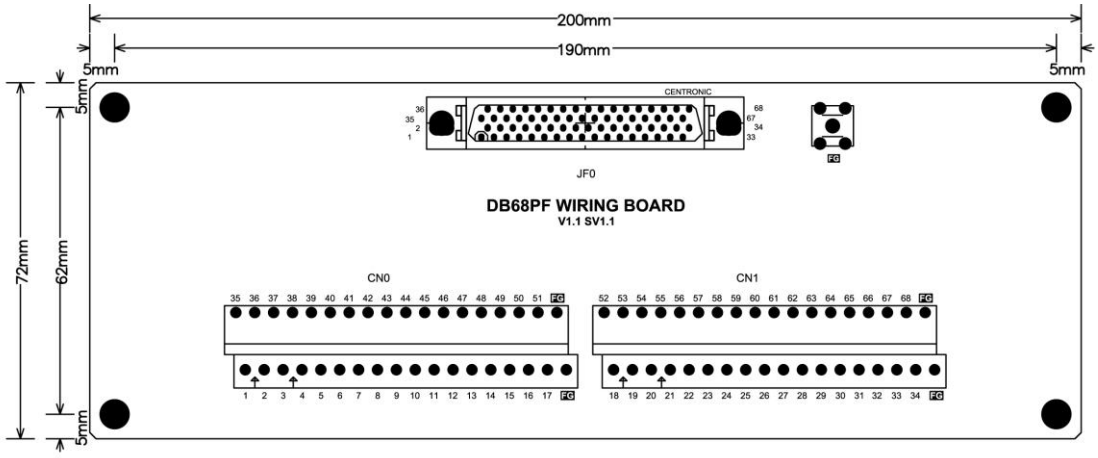
4. Layout and dimensions

4.1 DIO8217 Main card



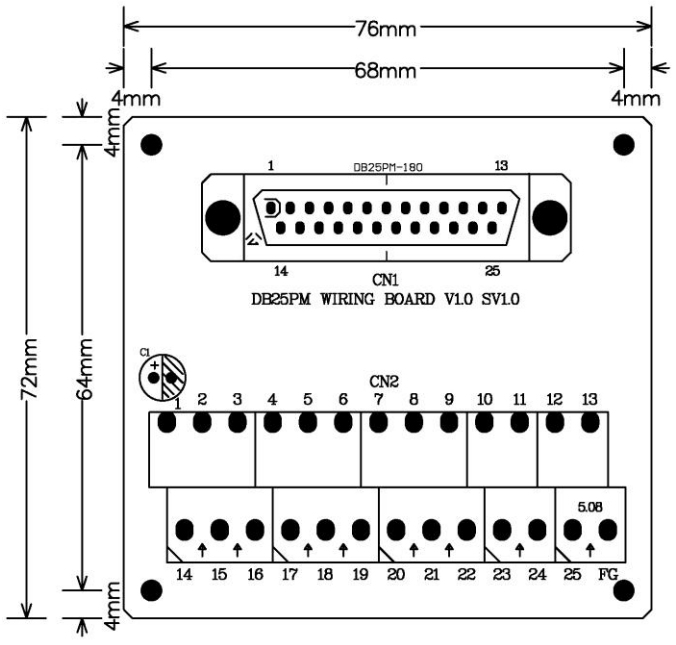
*dimension in bare board

4.2 JS510681 DIN rail mounted dummy wiring board



*dimension in bare board

4.3 JS51050 for JM0 25PM Din rail mounted dummy wiring board

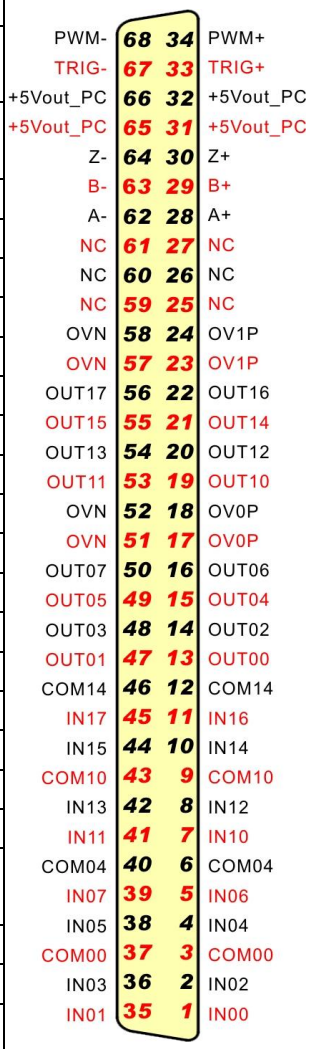


*dimension in bare board

5. PIN definitions

5.1 Pin definitions for DIO8217_JF0 connector

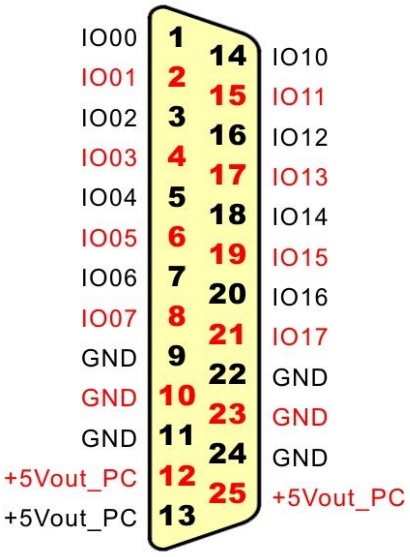
PIN	Descriptions
68	PWM- : PWM output (differential -)
67	TRIG- : NA (for future expansion)
66	+5Vout_PC : 5V output from PC
65	+5Vout_PC : 5V output from PC
64	Z- : NA (for future expansion)
63	B- : B phase input differential -
62	A- : A phase input differential -
61	NC
60	NC
59	NC
58	OVN : outport power common
57	OVN : outport power common
56	OUT17 : outport1 bit 7 output
55	OUT15 : outport1 bit 5 output
54	OUT13 : outport1 bit 3 output
53	OUT11 : outport1 bit 1 output
52	OVN : outport power common
51	OVN : outport power common
50	OUT07 : outport0 bit 7 output
49	OUT05 : outport0 bit 5 output
48	OUT03 : outport0 bit 3 output
47	OUT00 : outport0 bit 0 output
46	COM14 : common for IN17 ~ IN14
45	IN17 : inport1 bit 7 input
44	IN15 : inport1 bit 5 input
43	COM10 : common for IN13 ~ IN10
42	IN13 : inport1 bit 3 input
41	IN11 : inport1 bit 1 input
40	COM04 : common for IN07 ~ IN04
39	IN07 : inport0 bit 7 input
38	IN05 : inport0 bit 5 input
37	COM00 : common for IN03 ~ IN00
36	IN03 : inport0 bit 3 input
35	IN01 : inport0 bit 1 input



PIN	Descriptions
34	PWM+ : PWM output (differential +)
33	TRIG+ : NA (for future expansion)
32	+5Vout_PC : 5V output from PC
31	+5Vout_PC : 5V output from PC
30	Z+ : NA (for future expansion)
29	B+ : B phase input differential +
28	A+ : A phase input differential +
27	NC
26	NC
25	NC
24	OV1P : outport1 power supply +
23	OV1P : outport1 power supply +
22	OUT16 : outport1 bit 6 output
21	OUT14 : outport1 bit 4 output
20	OUT12 : outport1 bit 2 output
19	OUT10 : outport1 bit 0 output
18	OV0P : outport0 power supply +
17	OV0P : outport0 power supply +
16	OUT06 : outport0 bit 6 output
15	OUT04 : outport0 bit 4 output
14	OUT02 : outport0 bit 2 output
13	OUT00 : outport0 bit 0 output
12	COM14 : common for IN17 ~ IN14
11	IN16 : inport1 bit 6 input
10	IN14 : inport1 bit 4 input
12	COM10 : common for IN13 ~ IN10
11	IN12 : inport1 bit 2 input
10	IN10 : inport1 bit 0 input
6	COM04 : common for IN07 ~ IN04
5	IN06 : inport0 bit 6 input
4	IN04 : inport0 bit 4 input
3	COM00 : common for IN03 ~ IN00
2	IN02 : inport0 bit 2 input
1	IN00 : inport0 bit 0 input

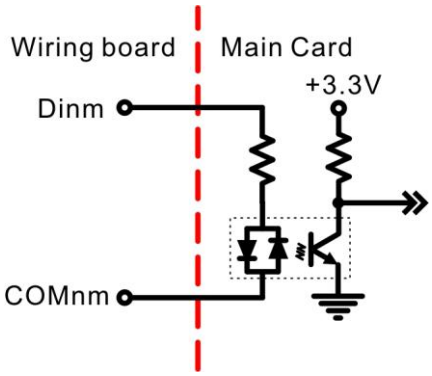
5.2 Pin definitions for DIO8217_JM0 connector

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



6. I/O interface diagram

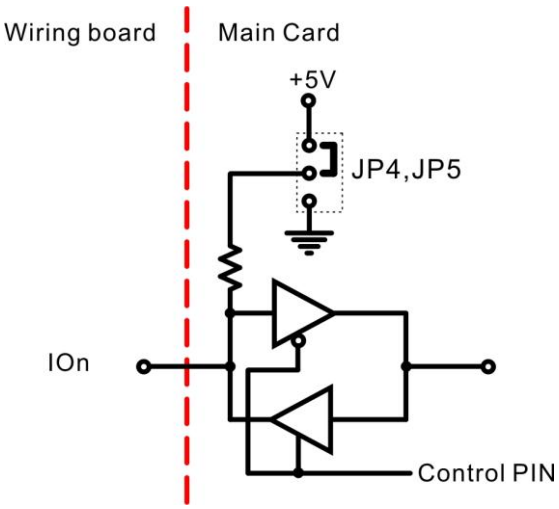
6.1 Input diagram



Note:

The input photo coupler is bi-directional, the COM can be connected to + or – of power supply depends on the input device's ability is sink or source type.

6.2 TTL IO

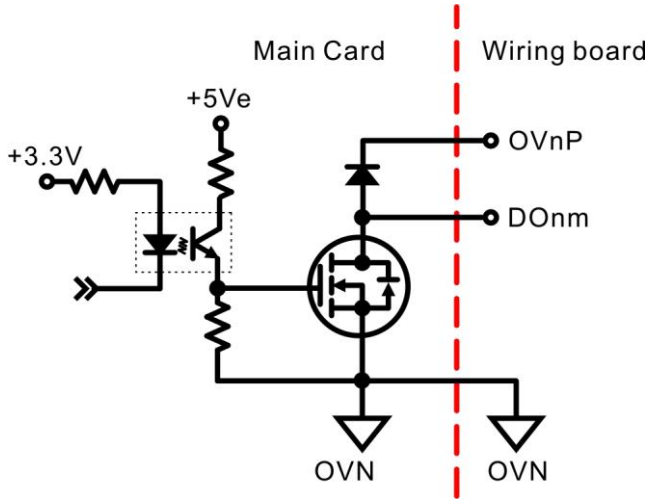


For byte-programmable TTL I/O IO07 ~ IO00, IO17 ~ IO10 to configured as pull high or pull low. JP4,JP5 are used for output state of power on. (refer 8.2

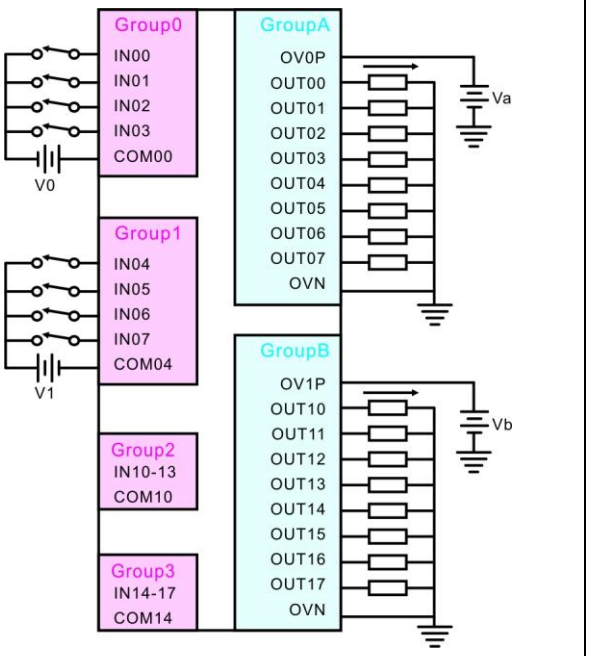
Jumper setting

)

6.3 Isolated output diagram



7. External wiring diagram



wiring board with NMOS output

Note:

Input can be supplied with different power without common reference but output must connect to same reference ground. The example connection group0 is sink type input and group1 is source type input.

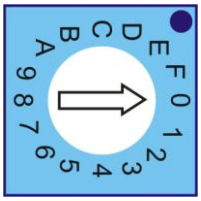
8. Hardware settings

8.1 CARD ID setting

Since PCIe 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 or rotary switch for distinguishing the 16 identical cards.

The following example sets the card ID at 12.

Example for card ID setting



Rotary switch set at ID=0

8.2 Jumper setting

JP4,JP5

	
1-2 short Pull High	2-3 short Pull Low

Jumper JP4 and JP5 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.

JP6

Warm reset jumper (JP6)	
	
Reset output after hot reset	Keep output after hot reset

JPA,JPB,JPZ,JPTRig

Single end / Differential jumper	
	
Single end	Differential

JPA: for A phase input type selection

JPB: for B phase input type selection

JPZ: for Z phase input type selection (NA, for future expansion)

JPTRig: for TRig input type selection (NA, for future expansion)

9. Applications

- Accept： -- P.B./M.S./EMG./Contact- Start/Stop/Limit switch/sensor
  -- Interlock/selective Sw.- Proximity switch
  -- Aux. contact of transducer/detector
- As I/O of S/W PLC Controller
- Industrial ON/OFF control
- Low speed counter
- Frequency counter, encoder counter
- Hardware event capture

10. Ordering information

PRODUCT	DESCRIPTIONS
DIO8217	32-channel Photo isolated Digital I/O Card for 16 DI and 16 DO with multi-function timer/counter
JS510681	DIN rail mounted dummy wiring board
JS51050	DIN rail mounted dummy wiring board (D type 25P male to terminals) for JM0 TTL I/O
M26J68681M5F	68 pin Centronic SCSI II cable 1.5M
M26J68683M0F	68 pin Centronic 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 JM0 (bracket and flat cable for 25P female D type connector)