AIO3315/AIO3315A
Analog I/O Card

User's Manual (V1.0)

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Correction record

Version	Record
1.0	New

Contents

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 AIO3315/A analog I/O card for industrial PC. Integrating in one card, there 2 channels analog outputs, 32 channel inputs and 2 TTL digital I/O port. This card is a FPGA based design and almost all the function configuration work can be done by software. At each output (digital or analog), we have put a PTC (positive temperature coefficient resistance) to prevent damage from instantaneous mal-connection.

Other analog i/o card:

AIO3310/1/2 8/16/24 single/differential 12 bit analog input, 16 TTL I/O card (PCI bus)

AIO3320/3321 isolated 8 12 bit A/D, isolated 8/16 16 bit D/A with 16 isolated digital I/O (PCI bus)

AIO3322/3323 Isolated Analog I/O Card, 12bit AI x8 with triggered data acquisition, 16 bit AO x 8/16 and 16 isolated digital I/O and 2 32bit multi function timer/counter (include bracket kit for digital I/O and AO) (PCI bus)

AIO3382 Analog I/O Card, 8 AI 2 AO, 16 TTL , 2 multi- function timer/counter card (Include bracket kit for TTL I/O) (PCI bus)

AIO3382A/B Analog I/O Card, 8 AI 2 AO, 16 TTL , 2 multi- function timer/counter card (2 current source/ sink AO)(Include bracket kit for TTL I/O) (PCI bus)

AIO3384 Analog I/O Card, 8 AI 4 AO, 16 TTL , 2 multi- function timer/counter card (Include bracket kit for TTL I/O) (PCI bus)

AIO3384AA/BB Analog I/O Card, 8 AI 4 AO, 16 TTL , 2 multi- function timer/counter card (4 current source / sink AO)(Include bracket kit for TTL I/O) (PCI bus)

AIO3384AB Analog I/O Card, 8 AI 4 AO, 16 TTL , 2 multi-function timer/counter card (2 current source AO , 2 current sink AO)(Include bracket kit for TTL I/O) (PCI bus)

AIO6328/A 12/16 bit Analog I/O and 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

AD block

2.1.1 32 channels AD input

2.1.2 Multi-range: 0~5V,0~10V, -5~+5V, -10~+10V

2.1.3 Programmable input type: single end or differential

2.1.4 End of conversion interrupt

DA block

2.1.5 2 channel 12 bit resolution, (option 16 bit, AIO3315A)

2.1.6 Output range: –10 ~ +10V

DIO block

2.1.7 2 port TTL digital I/O channels

2.1.8 Programmable digital filter at 100Hz,200Hz,1KHz and no de-bounce for input

2.1.9 No output transition during start-up

2.1.10 Output status read back

2.1.11 External triggered interrupt (on IO00~IO07)

Timer block

2.1.12 32-bit timer with cross zero interrupt

3. Specifications

3.1 AIO3315/A Main card

AD Block

3.1.1 Resolution: 12 bit, (option 16 bit, AIO3315A)

3.1.2 Range: 0~5V,0~10V, -5~+5V, -10~+10V

3.1.3 Acquisition time: 100K sample per second

3.1.4 Integral linearity error: -1 ~ +1 LSB(max)

3.1.5 Differential linearity error: -1 ~ +1 LSB(max)

3.1.6 Zero error: Bipolar -9 ~ +9 LSB(max)
Unipolar -6 ~ +6 LSB(max)

3.1.7 Full scale error: Bipolar -0.35% ~ +0.35%(max)
Unipolar -0.45% ~ +0.45%(max)

3.1.8 Input impedance: channel to ground
Bipolar: 31K ohm
Unipolar: 42K ohm

3.1.9 On board analog input protection: -24V~ +24V 50mA

DA Block

3.1.10 Resolution: 12 bit, (option 16 bit, AIO3315A)

3.1.11 Range: -10~+10V

3.1.12 Conversion time: < 1us

3.1.13 Integral linearity error: -4 ~ +4 LSB(max)

3.1.14 Differential linearity error: -0.5 ~ +0.5 LSB(max)

3.1.15 Zero error: 9 LSB(max)

3.1.16 Offset error: 9 LSB(max)

3.1.17 Full scale error: -0.7% ~ +0.7%(max)

3.1.18 On board analog output protection: 50mA

DIO Block

3.1.19 IO Channels : 16(max) TTL level

3.1.20 Interrupt at IO00 ~IO07

3.1.21 On board input protection: 24V 50mA

3.1.22 Output source : 35mA(peak) per channel

3.1.23 Output Sink : 35mA(peak) per channel

3.1.24 On board IO channel protection: -24V ~ +24V 50mA

Main Card General

3.1.25 Card ID : 4 bits

3.1.26 Connector : 37 pin D type connector for analog I/O
25 pin D type connector for TTL I/O

3.1.27 Operation temperature : 0 to +70 degree C

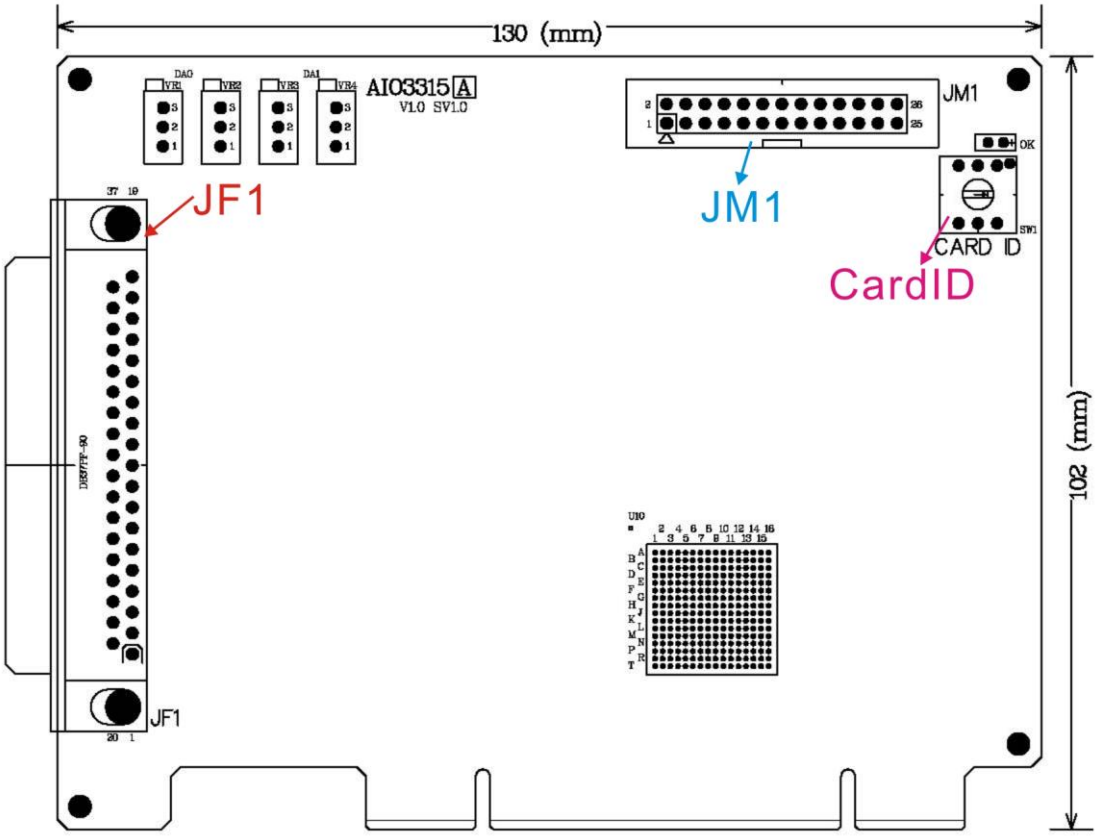
3.1.28 Storage temperature : -20 to +80 degree C

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

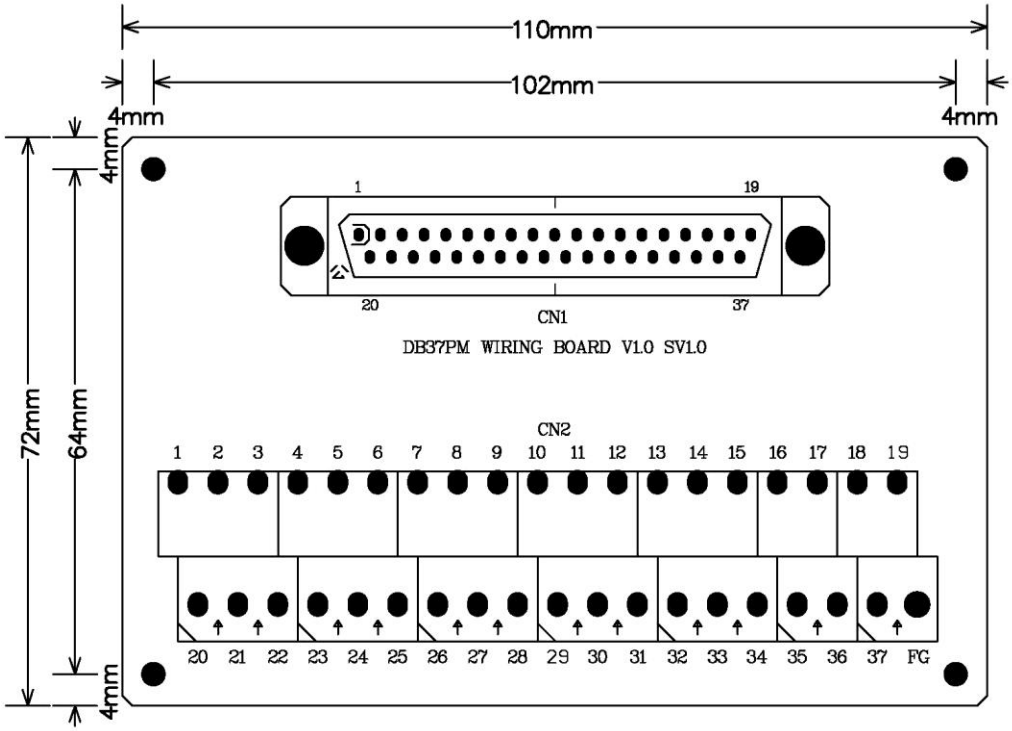
3.1.30 Dimensions : 130(W) * 102(H) mm , 5.2(W) * 4.1(H)in

4. Layout and dimensions

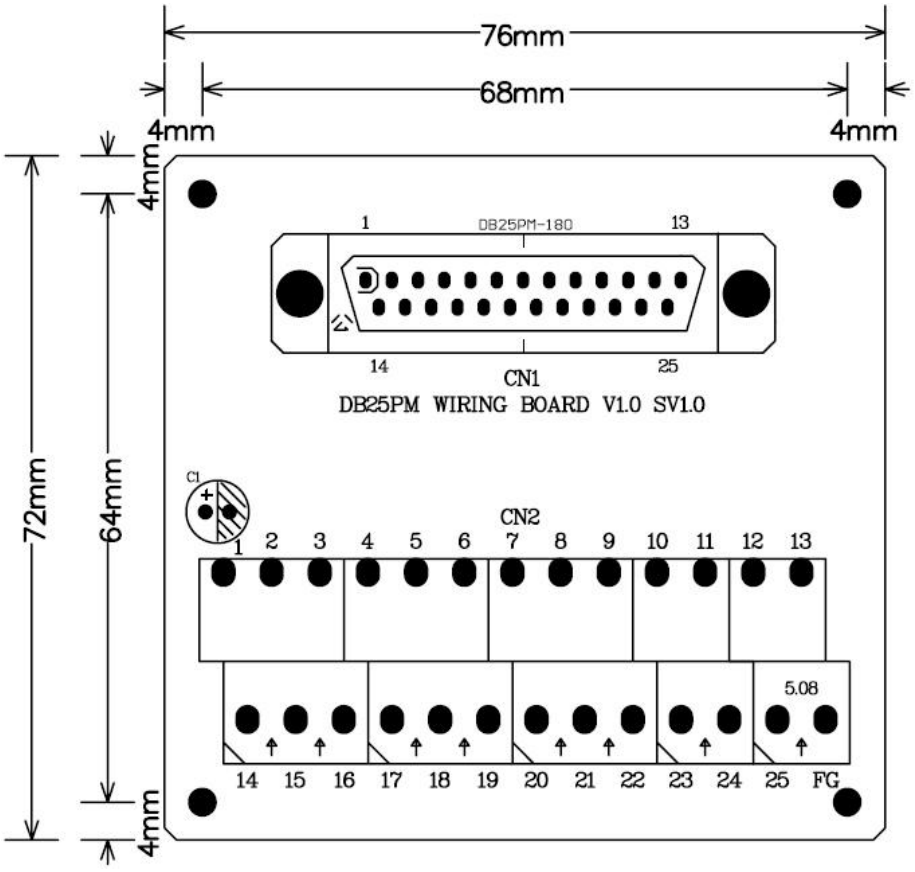
4.1 AIO3315/A Main card



4.2 JS51026 37P Din rail mounted dummy wiring board



4.3 JS51050 25P Din rail mounted dummy wiring board



5. PIN definitions

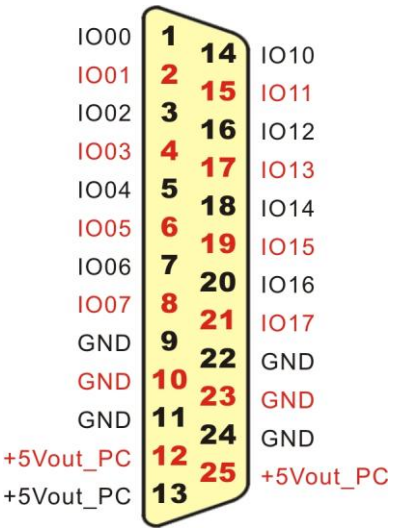
5.1 JF1 AIO connector

PIN	DESCRIPTIONS
1	AI00:port0 ai0
2	AI02: port0 ai2
3	AI04: port0 ai4
4	AI06: port0 ai6
5	AI10: port1 ai0
6	AI12: port1 ai2
7	AI14: port1 ai4
8	AI16: port1 ai6
9	AI20: port2 ai0
10	AI22: port2 ai2
11	AI24: port2 ai4
12	AI26: port2 ai6
13	AI30: port3 ai0
14	AI32: port3 ai2
15	AI34: port3 ai4
16	AI36: port3 ai6
17	GND
18	GND
19	DA0: analog out0

PIN	DESCRIPTIONS
20	AI01: port0 ai1
21	AI03: port0 ai3
22	AI05: port0 ai5
23	AI07: port0 ai7
24	AI11: port1 ai1
25	AI13: port1 ai3
26	AI15: port1 ai5
27	AI17: port1 ai7
28	AI21: port2 ai1
29	AI23: port2 ai3
30	AI25: port2 ai5
31	AI27: port2 ai7
32	AI31: port3 ai1
33	AI33: port3 ai3
34	AI35: port3 ai5
35	AI37: port3 ai7
36	GND
37	DA1: analog out1

5.2 JM1 TTL IO connector

PIN	DESCRIPTIONS
1	IO00: TTL port0 bit0
2	IO01: TTL port0 bit1
3	IO02: TTL port0 bit2
4	IO03: TTL port0 bit3
5	IO04: TTL port0 bit4
6	IO05: TTL port0 bit5
7	IO06: TTL port0 bit6
8	IO07: TTL port0 bit7
9	GND: ground
10	GND: ground
11	GND: ground
12	+5Vout_PC: 5V out from PC
13	+5Vout_PC: 5V out from PC



PIN	DESCRIPTIONS
14	IO10: TTL port1 bit0
15	IO11: TTL port1 bit1
16	IO12: TTL port1 bit2
17	IO13: TTL port1 bit3
18	IO14: TTL port1 bit4
19	IO15: TTL port1 bit5
20	IO16: TTL port1 bit6
21	IO17: TTL port1 bit7
22	GND: ground
23	GND: ground
24	GND: ground
25	+5Vout_PC: 5V out from PC

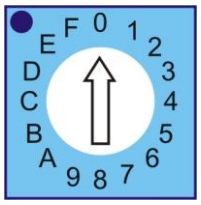
6. Hardware settings

6.1 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-bit DIP switch or rotary switch for distinguishing the 16 identical card.

The following example sets the card ID at 0.

Example for card ID setting



Rotary switch set at ID=0

7. Ordering information

PRODUCT	DESCRIPTIONS
AIO3315	12 bit Analog I/O and Digital I/O Card
AIO3315A	16 bit Analog I/O and Digital I/O Card
JS51026	Dummy DIN rail mounted wiring board (D-type 37P to terminals)
JS51050	Dummy DIN rail mounted wiring board (D-type 25P to terminals)
M270337X0	D type 37p male-female cable 1.5M
M270337X0S	D type 37p male-female cable 1.5M, shielding
M270337X2	D type 37p male-female cable 3.0M
M270337X2S	D type 37p male-female cable 3.0M, shielding
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 for 25p D-type connector , 26p flat cable)