

AIO-3315/AIO-3315A

Analog I/O Card

User's Manual (V1.0)

健昇科技股份有限公司

JS AUTOMATION CORP.

台北縣汐止市中興路 100 號 6 樓

6F,No.100,Chungshin Rd.

Shitsu, Taipei, Taiwan, R.O.C.

TEL : 886-2-2647-6936

FAX : 886-2-2647-6940

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

E-mail : control.cards@automation.com.tw

Correction record

Version	Record
1.0	New

Contents

1. Forward.....	4
2. Features.....	5
2.1 Main card.....	5
3. Specifications.....	6
3.1 AIO-3315/A Main card.....	6
4. Layout and dimensions.....	8
4.1 AIO-3315/A Main card.....	8
4.2 JS51026 37P Din rail mounted dummy wiring board.....	9
4.3 JS51050 25P Din rail mounted dummy wiring board.....	9
5. PIN definitions.....	10
5.1 JF1 AIO connector.....	10
5.2 JM1 digital IO connector.....	11
6. Hardware settings.....	12
6.1 CARD ID setting.....	12
7. Ordering information.....	13

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 AIO-3315/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:

AIO-3310/1/2 8/16/24 single/differential 12 bit analog input, 16 TTL I/O card (PCI bus)

AIO-3320/3321 isolated 8 12 bit A/D, isolated 8/16 16 bit D/A with 16 isolated digital I/O (PCI bus)

AIO-3322/3323 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)

AIO-3382 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)

AIO-3382A/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)

AIO-3384 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)

AIO-3384AA/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)

AIO-3384AB 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)

AIO-6328/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.com.tw) 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 AIO-3315/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

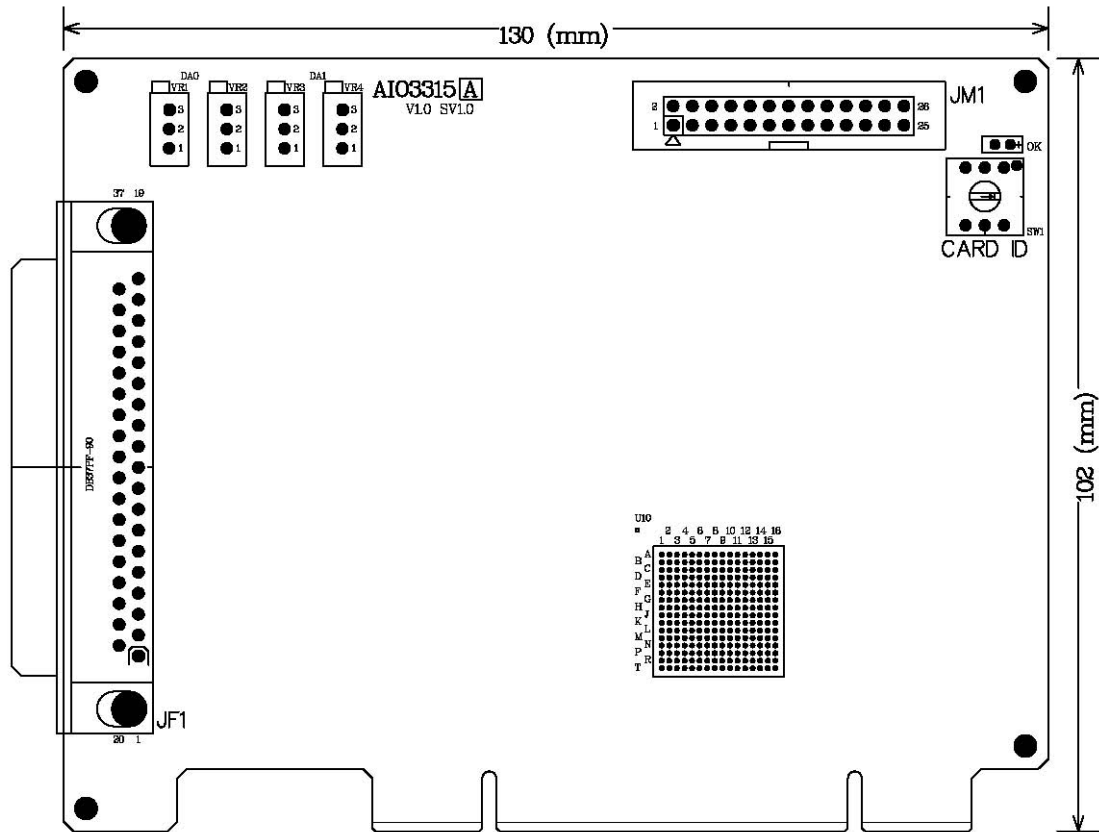
- 3.1.19 IO Channels : 16(max) TTL level
- 3.1.20 Interrupt at IO00 ~IO07
- 3.1.21 On board input protection: 24V 50mA
- 3.1.22 Output source : 35mA(peak) per channel
- 3.1.23 Output Sink : 35mA(peak) per channel
- 3.1.24 On board IO channel protection: -24V ~ +24V 50mA

Main Card General

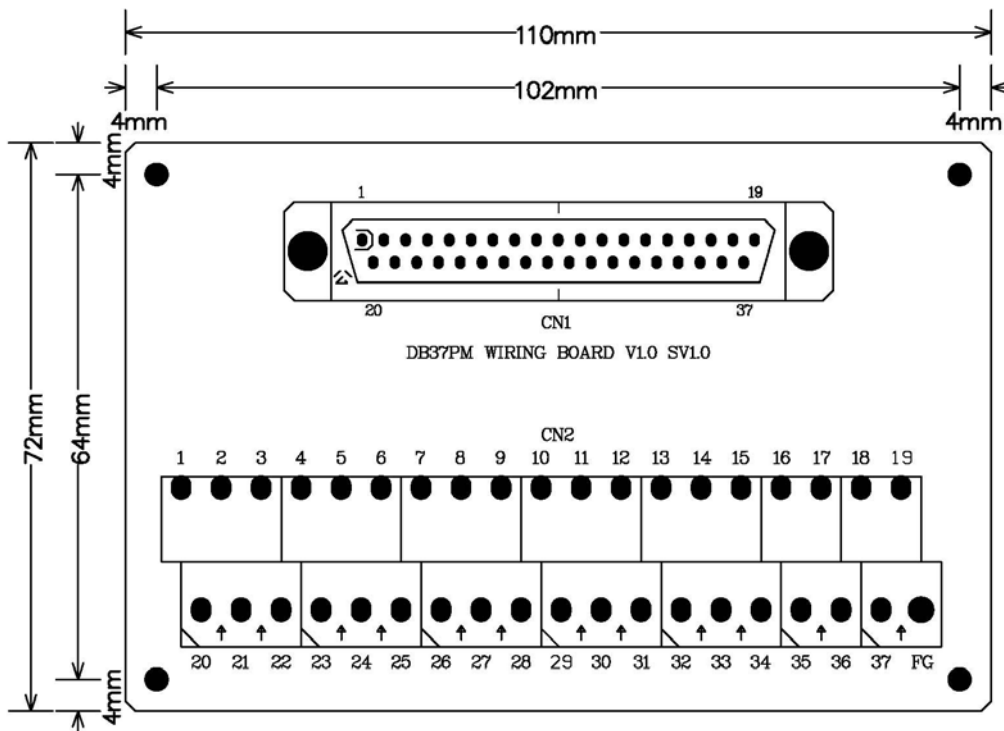
- 3.1.25 Card ID : 4 bits
- 3.1.26 Connector : 37 pin D type connector for analog I/O
25 pin D type connector for TTL I/O
- 3.1.27 Operation temperature : 0 to +70 degree C
- 3.1.28 Storage temperature : -20 to +80 degree C
- 3.1.29 Operation humidity : 5~95% RH, non-condensing
- 3.1.30 Dimensions : 130(W) * 102(H) mm , 5.12(W) * 4.02(H)in

4. Layout and dimensions

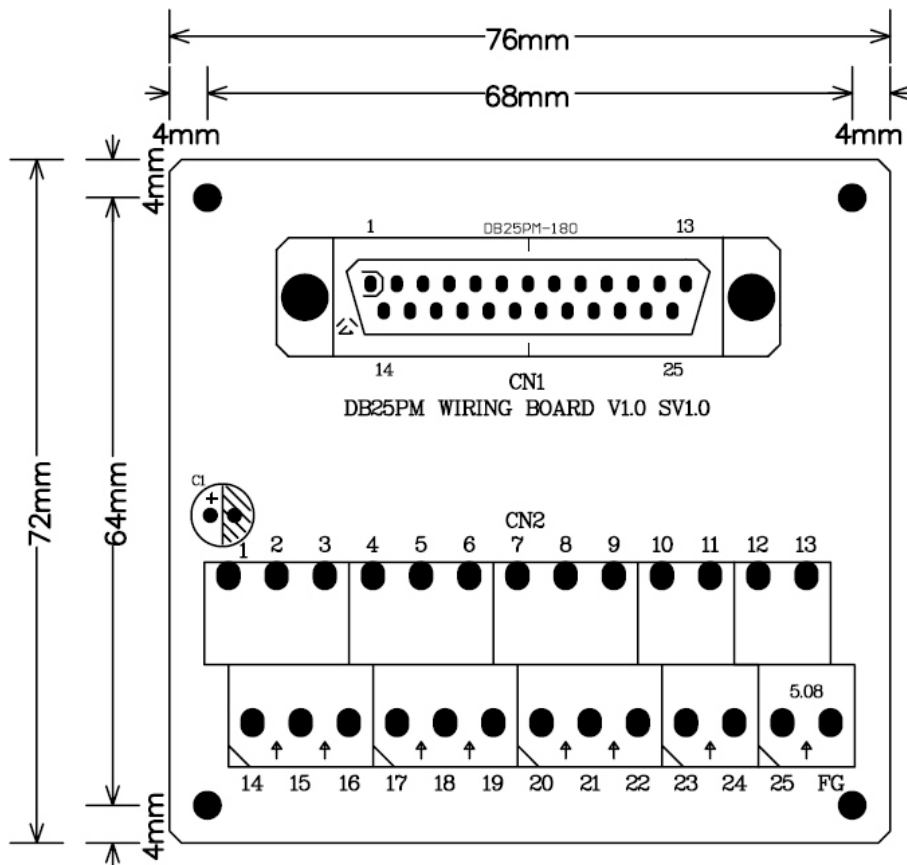
4.1 AIO-3315/A Main card



4.2 JS51026 37P Din rail mounted dummy wiring board



4.3 JS51050 25P Din rail mounted dummy wiring board



5. PIN definitions

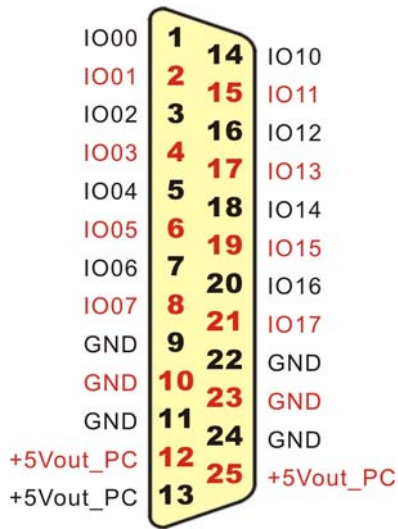
5.1 JF1 AIO connector

PIN	DESCRIPTIONS		PIN	DESCRIPTIONS
1	AI00:port0 ai0	AI00	20	AI01: port0 ai1
2	AI02: port0 ai2	AI02	21	AI03: port0 ai3
3	AI04: port0 ai4	AI04	22	AI05: port0 ai5
4	AI06: port0 ai6	AI06	23	AI07: port0 ai7
5	AI10: port1 ai0	AI10	24	AI11: port1 ai1
6	AI12: port1 ai2	AI12	25	AI13: port1 ai3
7	AI14: port1 ai4	AI14	26	AI15: port1 ai5
8	AI16: port1 ai6	AI16	27	AI17: port1 ai7
9	AI20: port2 ai0	AI20	28	AI21: port2 ai1
10	AI22: port2 ai2	AI22	29	AI23: port2 ai3
11	AI24: port2 ai4	AI24	30	AI25: port2 ai5
12	AI26: port2 ai6	AI26	31	AI27: port2 ai7
13	AI30: port3 ai0	AI30	32	AI31: port3 ai1
14	AI32: port3 ai2	AI32	33	AI33: port3 ai3
15	AI34: port3 ai4	AI34	34	AI35: port3 ai5
16	AI36: port3 ai6	AI36	35	AI37: port3 ai7
17	GND	GND	36	GND
18	GND	GND	37	DA1: analog out1
19	DA0: analog out0	DA0		



5.2 JM1 digital IO connector

PIN	DESCRIPTIONS		PIN	DESCRIPTIONS
1	IO00:port0 IO0	IO00	14	IO10: port0 IO0
2	IO01: port0 IO1	IO01	15	IO11: port0 IO1
3	IO02: port0 IO2	IO02	16	IO12: port0 IO2
4	IO03: port0 IO3	IO03	17	IO13: port0 IO3
5	IO14: port1 IO4	IO04	18	IO14: port1 IO4
6	IO15: port1 IO5	IO05	19	IO15: port1 IO5
7	IO16: port1 IO6	IO06	20	IO16: port1 IO6
8	IO17: port1 IO7	IO07	21	IO17: 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		



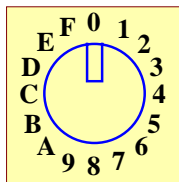
6. Hardware settings

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**

<u>PRODUCT</u>	<u>DESCRIPTIONS</u>
AIO-3315	12 bit Analog I/O and Digital I/O Card
AIO-3315A	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)