

AIO-3382/3384 Analog I/O and Digital I/O Card

User's Manual (V1.2)

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Correction record

| Version | Record |
|---------|--------------------------------|
| 1.1 | fix time base 4/16M error |
| 1.2 | add CHAPTER 8 WIRING REFERENCE |

Contents

| | | |
|------|--|----|
| 1. | Forward..... | 4 |
| 2. | Features..... | 5 |
| 2.1 | Main card..... | 5 |
| 2.2 | Din rail mounted wiring board..... | 5 |
| 3. | Specifications..... | 6 |
| 3.1 | Main card..... | 6 |
| 3.2 | Din rail mounted wiring board..... | 7 |
| 4. | Layout and dimensions..... | 8 |
| 4.1 | AIO338X 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 | Pin definitions for on card 37P connector..... | 10 |
| 5.2 | Pin definitions for extension 25P connector..... | 11 |
| 6. | Hardware descriptions..... | 12 |
| 6.1 | Card ID setting..... | 12 |
| 6.2 | Timer/Counter..... | 12 |
| 6.3 | Analog input..... | 12 |
| 6.4 | Analog output..... | 12 |
| 7. | Applications..... | 13 |
| 7.1 | Analog input section:..... | 13 |
| 7.2 | Analog output section:..... | 13 |
| 7.3 | Digital section:..... | 13 |
| 7.4 | Counter/Timer section:..... | 13 |
| 8. | Wiring reference..... | 14 |
| 9. | Ordering information..... | 15 |

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. Forward

Thank you for your selection of our PCI bus AIO-338x an analog I/O, digital I/O and multi-function timer/counter card.

The 12bit analog input range of AIO-338x series, covers $-10V \sim +10V$, $-5V \sim +5V$, $0 \sim 10V$, $0 \sim 5V$ (software configurable), $0 \sim 20mA$, $4 \sim 20mA$ (hardware selectable). The 16bit analog output ranges from $-10V$ to $+10V$ and $0 \sim 20mA$, $4 \sim 20mA$ current source or sink is hardware option. The extra 2 32bit timer/counter ports also provide you versatile functions such as: programmable one-shot, rate generator, square wave generator, software/hardware triggered strobe, event timer/counter, triggered timer/counter, PWM generator, A small card with abundant functions.

We divide into 7 types for your convenience:

AIO-3382 Analog I/O Card, 8 AI 2 AO, 16 TTL, 2 multi-function timer/counter card

AIO-3382A Analog I/O Card, 8 AI 2 AO, 16 TTL, 2 multi-function timer/counter card
(2 current source AO)

AIO-3382B Analog I/O Card, 8 AI 2 AO, 16 TTL, 2 multi-function timer/counter card
(2 current sink AO)

AIO-3384 Analog I/O Card, 8 AI 4 AO, 16 TTL, 2 multi-function timer/counter card

AIO-3384AA Analog I/O Card, 8 AI 4 AO, 16 TTL, 2 multi-function timer/counter card
(4 current source AO)

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)

AIO-3384BB Analog I/O Card, 8 AI 4 AO, 16 TTL, 2 multi-function timer/counter card
(4 current sink AO)

AIO-338x also has 8 bit TTL input and 8 bit TTL output.

Wish you would enjoy this card!

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-3315/A 12/16 bit Analog I/O and Digital 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-6328/A 12/16 bit Analog I/O and Digital I/O PCI-104 Module

Any comment is welcome,

please visit our website: www.automation.com.tw for the up to date information.

2. Features

2.1 Main card

General:

2.1.1 PCI plug and play function with card ID for 16 identical cards

2.1.2 Security password blocks illegal copy of software

Analog input function:

2.1.3 8-channel 12bit analog inputs (differential or single end)

2.1.4 Input range: -10V~ +10V, -5V~ +5V, 0~10V, 0~5V, 0~20mA, 4~20mA

Analog output function:

2.1.5 2/4-channel 16bit analog output

2.1.6 Output range: -10V~ +10V, 0~20mA, 4~20mA source/sink

Digital I/O function:

2.1.7 16 TTL I/O

Timer/Counter function:

2.1.8 2 32bit multifunction counters with 4/16 MHz multi-clock input.

2.1.9 multi-function:

-- programmable one-shot

-- square wave generator

-- event counter

-- PWM generator

2.1.10 2 trigger/counter in, 2 trigger out of timer/counter function

2.2 Din rail mounted wiring board

2.2.1 37 pin dummy wiring board for AI0~AI7, DA0~DA3

2.2.2 25 pin dummy wiring board for TTL I/O

3. **Specifications**

3.1 Main card

General:

- 3.1.1 PCI data width — 32 Bits
- 3.1.2 Card ID — 0-15 selectable.
- 3.1.3 Security password — 10 bytes, user configurable
- 3.1.4 Interrupt — software disable/enable
- 3.1.5 Dimension — 167(W)*115(H)mm , 6.57(W) * 4.53(H)in

Analog input block:

- 3.1.6 input channels — 8 channel single end or differential.
- 3.1.7 resolution — 12bit
- 3.1.8 input range — -10V~ +10V, -5V~ +5V , 0~10V, 0~5V (software selectable)
0~20mA, 4~20mA (hardware selectable)
- 3.1.9 conversion speed — 5us per channel

Analog output block:

- 3.1.10 output channels — 2/4 channel
- 3.1.11 resolution — 16bit
- 3.1.12 output range — -10V~ +10V
0~20mA, 4~20mA source or sink (option)

Digital I/O block:

- 3.1.13 i/o channels — 2 byte configurable TTL

Timer/Counter block:

3.1.14 channels — 2

3.1.15 data length — 32 bit

3.1.16 specific input — trigger in/ counter in via digital port0

3.1.17 specific output — trigger out / counter out via digital port1

3.1.18 time base — 4/16MHz

3.1.19 functions —

-- programmable one-shot

-- square wave generator

-- event counter

-- PWM generator

3.2 Din rail mounted wiring board

JS51026 For AI0~AI7 and DA0~DA3

3.2.1 Connection cable — D-type 37P cable to connect main and wiring board

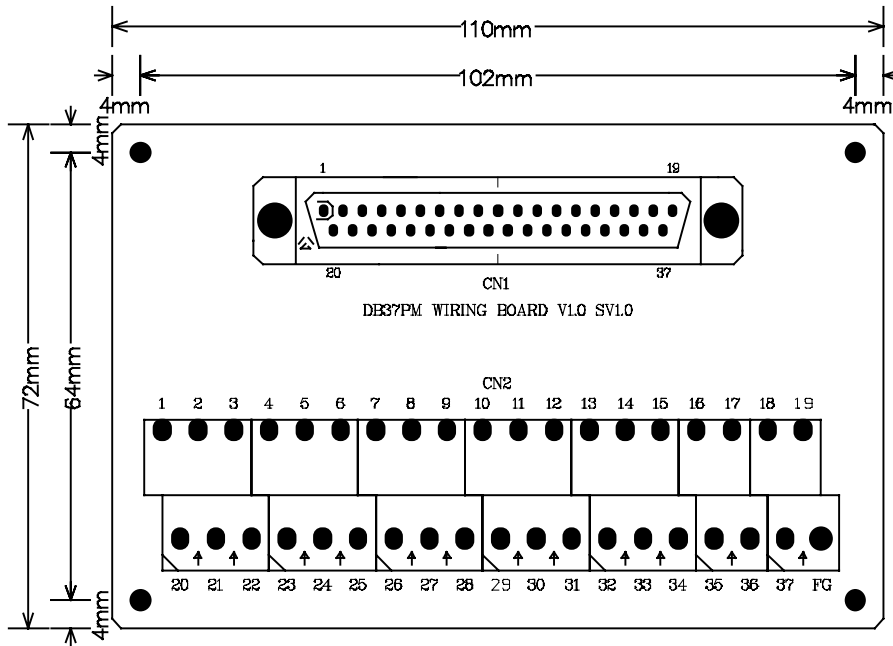
3.2.2 Dimension — 86(W)*113(L)*52(H)mm , 3.39(W)*4.45(L)*2.05(H)in

JS51050 For TTL I/O

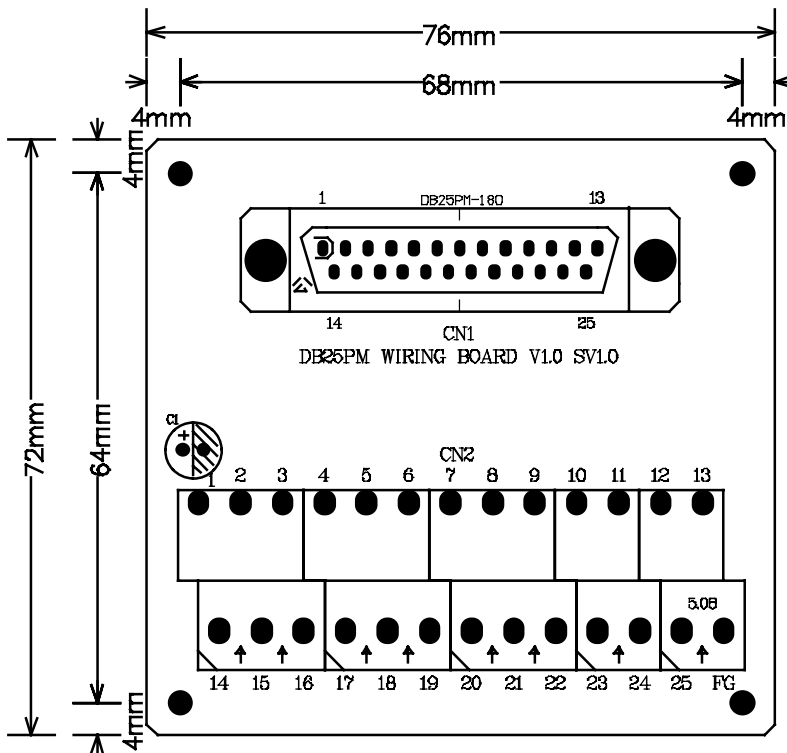
3.2.3 Connection cable — D-type 25P cable to connect main and wiring board

3.2.4 Dimension — 86(W)*79(L)*52(H)mm , 3.39(W)*3.11(L)*2.05(H)in

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 Pin definitions for on card 37P connector

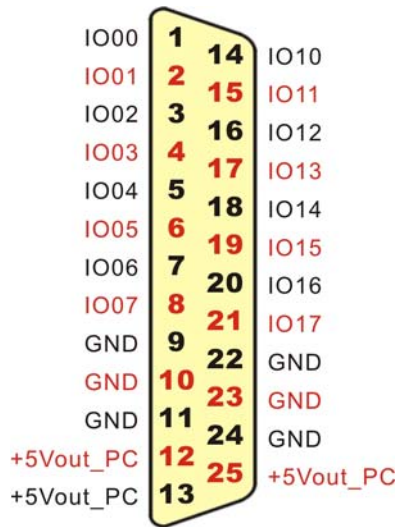
| PIN | DESCRIPTIONS | | PIN | DESCRIPTIONS |
|-----|-------------------------------------|--|-----|---|
| 1 | 24Ve:external 24V input | | 20 | 24Ve:external 24V input |
| 2 | GND:ground | | 21 | GND:ground |
| 3 | DA_I_sink0: DA0 current sink output | | 22 | DA_I_source0: DA0 current source output |
| 4 | DA_I_sink1: DA1 current sink output | | 23 | DA_I_source1: DA1 current source output |
| 5 | DA_I_sink2: DA2 current sink output | | 24 | DA_I_source2: DA2 current source output |
| 6 | DA_I_sink3: DA3 current sink output | | 25 | DA_I_source3: DA3 current source output |
| 7 | DA_V0: DA0 output | | 26 | DA_V1: DA1 output |
| 8 | DA_V2: DA2 output | | 27 | DA_V3: DA3 output |
| 9 | AI0+: AD0 + input | | 28 | AI0-: AD0 - input |
| 10 | AI1+: AD1 + input | | 29 | AI1-: AD1 - input |
| 11 | AI2+: AD2 + input | | 30 | AI2-: AD2 - input |
| 12 | AI3+: AD3 + input | | 31 | AI3-: AD3 - input |
| 13 | AI4+: AD4 + input | | 32 | AI4-: AD4 - input |
| 14 | AI5+: AD5 + input | | 33 | AI5-: AD5 - input |
| 15 | AI6+: AD6 + input | | 34 | AI6-: AD6 - input |
| 16 | AI7+: AD7 + input | | 35 | AI7-: AD7 - input |
| 17 | +5V_PC: PC 5V out | | 36 | GND: ground |
| 18 | GND: ground | | 37 | -15Ve:-15V output* |
| 19 | +15Ve:+15V output* | | | |

***NOTE:**

1. +15Ve, -15Ve are on card DC/DC converter output, it is for reference purpose only not suit for working as power supply. Any load from them should be less than 5mA.
2. The external 24V input only required at current mode (sink/source) application.

5.2 Pin definitions for extension 25P connector

| PIN | DESCRIPTIONS | | PIN | DESCRIPTIONS |
|-----|----------------------|-----------|-----|----------------------|
| 1 | IO00: TTL port0 bit0 | IO00 | 14 | IO10: TTL port1 bit0 |
| 2 | IO01: TTL port0 bit1 | IO01 | 15 | IO11: TTL port1 bit1 |
| 3 | IO02: TTL port0 bit2 | IO02 | 16 | IO12: TTL port1 bit2 |
| 4 | IO03: TTL port0 bit3 | IO03 | 17 | IO13: TTL port1 bit3 |
| 5 | IO04: TTL port0 bit4 | IO04 | 18 | IO14: TTL port1 bit4 |
| 6 | IO05: TTL port0 bit5 | IO05 | 19 | IO15: TTL port1 bit5 |
| 7 | IO06: TTL port0 bit6 | IO06 | 20 | IO16: TTL port1 bit6 |
| 8 | IO07: TTL port0 bit7 | IO07 | 21 | IO17: TTL port1 bit7 |
| 9 | GND: ground | GND | 22 | GND: ground |
| 10 | GND: ground | GND | 23 | GND: ground |
| 11 | GND: ground | GND | 24 | GND: ground |
| 12 | +5V_PC: PC 5V out | +5Vout_PC | 25 | +5V_PC: PC 5V out |
| 13 | +5V_PC: PC 5V out | +5Vout_PC | | |



6. Hardware descriptions

6.1 Card ID setting

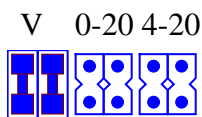
Since PCI cards have plug and play function, the card ID is required for programmer to identify which card he/she will control without knowing the physical address assigned by the Windows (OS). There is a 16 position rotary switch for extinguishing the 16 identical cards. Please set the card ID as you need and note that no two cards (of the same type) are in the same ID.

6.2 Timer/Counter

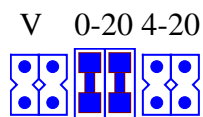
There are 2 timer/counters on board. Each one has 32 bit register length, if you program as PWM mode, the register is divided as 2 16 bit width, the upper 16 bit work as the pulse high width and the lower 16 bit work as PWM frequency register. The card also provide end of count interrupt function of both the timer/counters.

6.3 Analog input

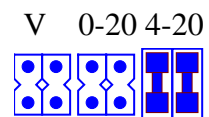
There are 8 channels of analog input on card, the hardware may accept 0~5V, 0~10V, -5V~+5V, -10V ~ +10V range according you software configuration. If you want to use in current input mode, configure the jumpers each channel.



Voltage input mode



0~20mA current input mode



4~20mA current input mode

Since the voltage/current analog input has AI+ and AI- input, for Voltage single end mode, please connect AI- to ground (analog input reference).

6.4 Analog output

There are 2/4 channels of analog output on card, the output of DA is 16 bit width and -10V ~+10V range only. If you want to use in current output mode, the hardware option card should be selected and the wiring change from DA_Vn (for voltage output mode) to DA_I_sinkn (for current sink mode) or DA_I_sourcen(for current source mode) respectively.

7. Applications

7.1 Analog input section:

For measurement of analog signal such as:

- temperature
- voltage
- current
- flow
- light
-

Note: The analog signal should be pre-processed to the acceptable range of the card.

7.2 Analog output section:

For control or signal generation such as:

- inverter speed
- servo motor speed
- wave generation
- valve control
- light control
-

7.3 Digital section:

For the control of digital i/o:

- switch input
- relay control
- trigger output
- ...

7.4 Counter/Timer section:

- event counting
- periodic interrupt source
- PWM generator (can work as D/A with external low pass filter)
- counter/timer with trigger out
- duration counter

8. Wiring reference

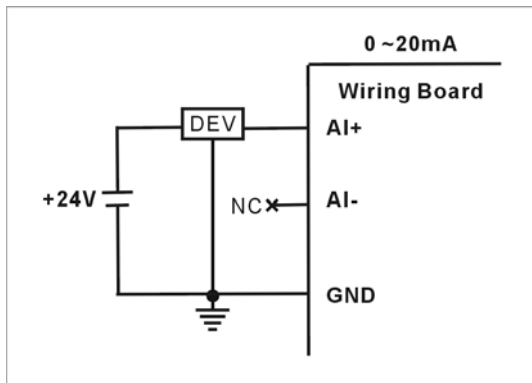


fig 8.1 connection while card setting 0~20ma analog input

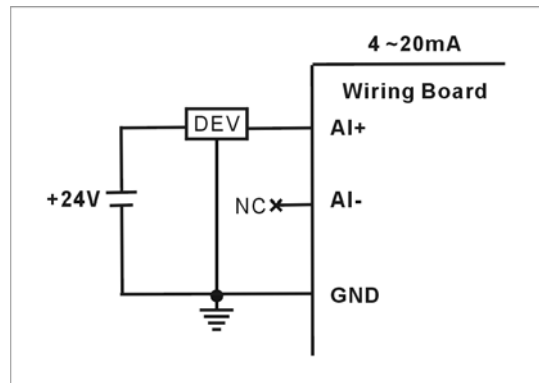


fig 8.2 connection while card setting 4~20ma analog input

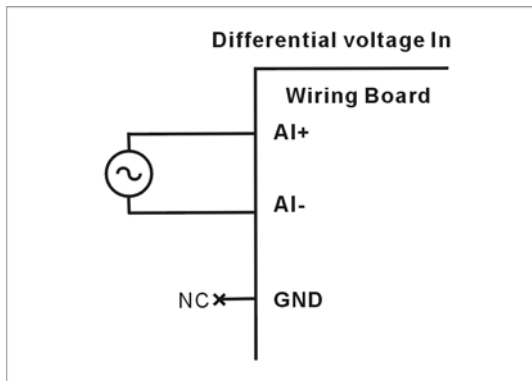


fig 8.3 connection while card setting voltage input

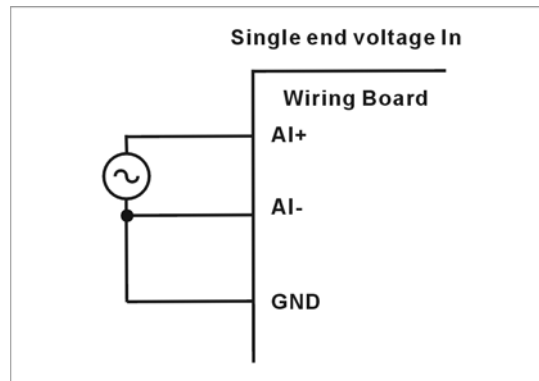


fig 8.4 connection while card setting voltage input

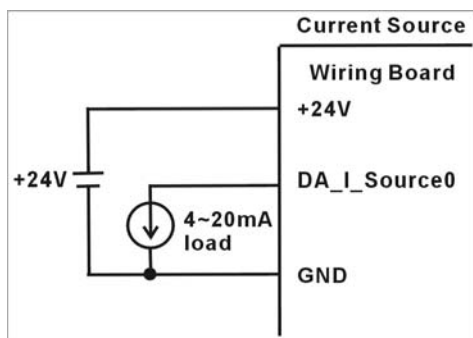


fig 8.5 connection while current source option (A option)

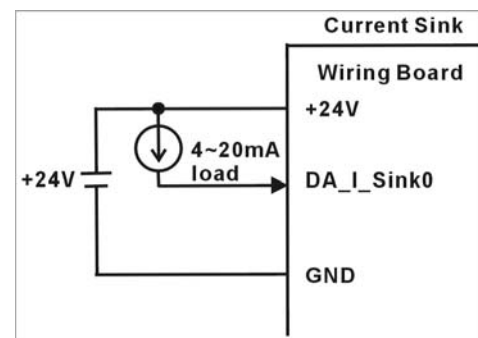


fig 8.6 connection while current sink option (B option)

9. Ordering information

| <u>PRODUCT</u> | <u>DESCRIPTIONS</u> |
|----------------|---|
| 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) |
| AIO-3382A | Analog I/O Card, 8 AI 2 AO, 16 TTL , 2 multi- function timer/counter card (2 current source AO) (include bracket kit for TTL I/O) |
| AIO-3382B | Analog I/O Card, 8 AI 2 AO, 16 TTL , 2 multi- function timer/counter card (2 current sink AO) (include bracket kit for TTL I/O) |
| 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) |
| AIO-3384AA | Analog I/O Card, 8 AI 4 AO, 16 TTL , 2 multi- function timer/counter card (4 current source AO) (include bracket kit for TTL I/O) |
| 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) |
| AIO-3384BB | Analog I/O Card, 8 AI 4 AO, 16 TTL , 2 multi-function timer/counter card (4 current sink AO) (include bracket kit for TTL I/O) |
| 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 JM5 (bracket for 25p D-type connector , 26p flat cable) |