EX-94421/A
Analog Input and
Multi-Function Digital I/O Card

User's Manual (V1.0)

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Correction record

Version	Record

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.

1. Forward

Thank you for your selection of our PCI bus EX-94421A a multi-channel analog input card.

An analog input card maybe as simply as just signal conversion but the long-term stable is most concerned; we provide it for industrial environment application.

2. Features

General:

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

Analog function:

2.1.2 8 channel 12bit analog inputs (standard:8 channels)

2.1.3 Software selectable input range: -10V~ +10V, -5V~ +5V , 0~10V, 0~5V

Digital I/O function:

2.1.4 2 byte-wide programmable TTL I/O

2.1.5 IO00, IO01 as trigger/counter in, IO10,IO11 as trigger out of timer/counter function

Timer/Counter function:

2.1.6 2 32bit multifunction counters up to 33MHz

2.1.7 multi-function:
-- programmable one-shot
-- square wave generator
-- event counter
-- PWM generator

3. Specifications

3.1 EX-94421A Main card

General:

3.1.1 PCI data width — 32 Bits

3.1.2 Card ID — 4 bits

3.1.3 Interrupt — software disable/enable

3.1.4 Dimension — 156(W)*112(H)mm , 6.2(W) * 4.5(H)in

Analog block:

3.1.5 input channels — 8 channel single end or differential (standard:8 channels)

3.1.6 resolution — 12bit

3.1.7 input range — -10V~ +10V, -5V~ +5V , 0~10V, 0~5V

3.1.8 range selection — software selectable

3.1.9 conversion speed — 6us per channel

3.1.10 accuracy — full range within 9mV

Digital I/O block:

3.1.11 i/o channels — 16 TTL (port0,port1)

3.1.12 configuration — byte input /output

Timer/Counter block:

3.1.13 channels — 2

3.1.14 data length — 32 bit

3.1.15 specific input — trigger in/ counter in via digital I/O port0

3.1.16 specific output — trigger out / counter out via digital I/O port 1

3.1.17 time base — PCI system clock (33/66MH)

3.1.18 functions —

-- programmable one-shot
-- square wave generator
-- event counter
-- PWM generator

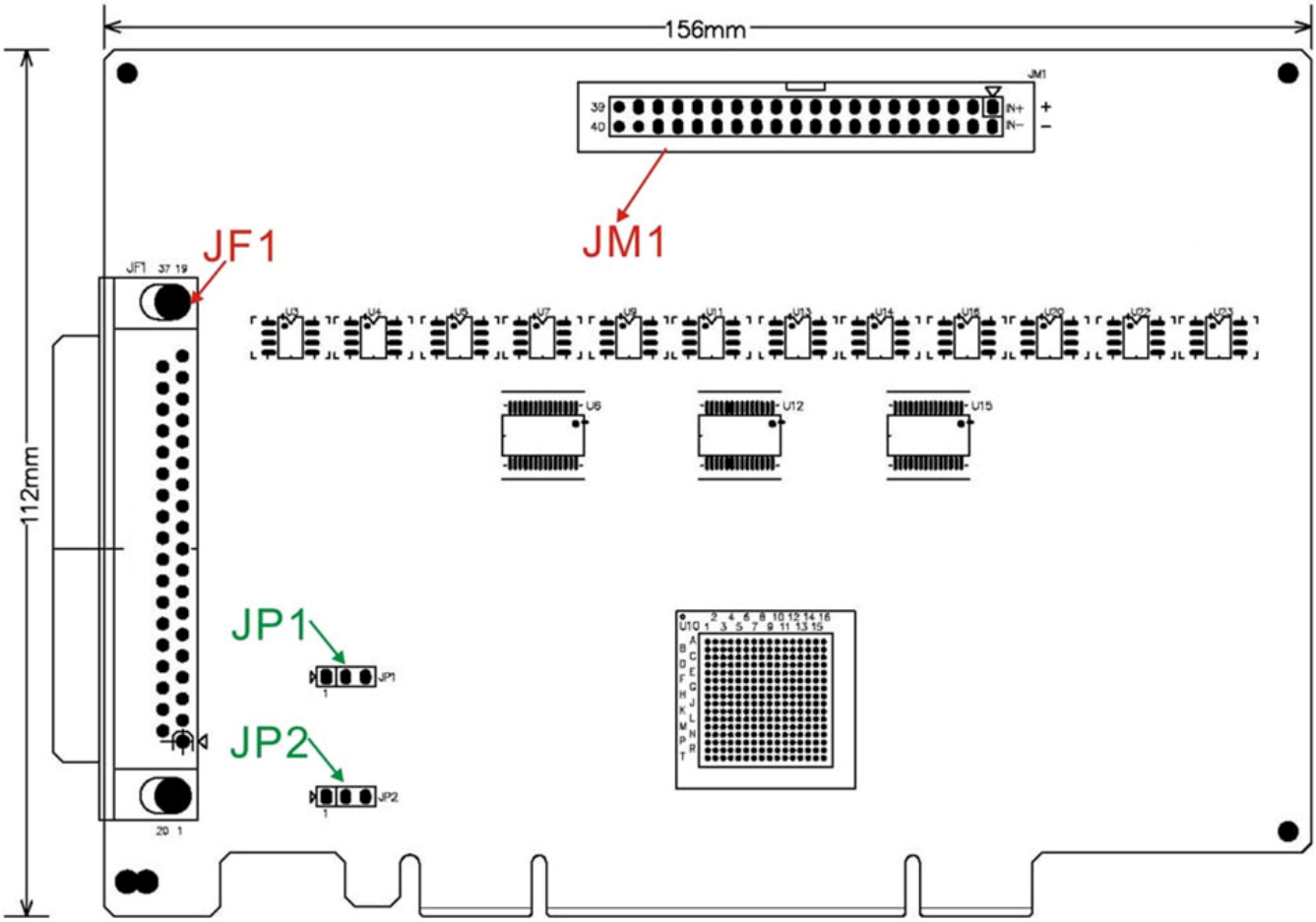
3.2 EX-962137 37P Din rail mounted dummy wiring board

3.2.1 Connection cable — D-type EX-962137 37P cable to connect main and wiring board

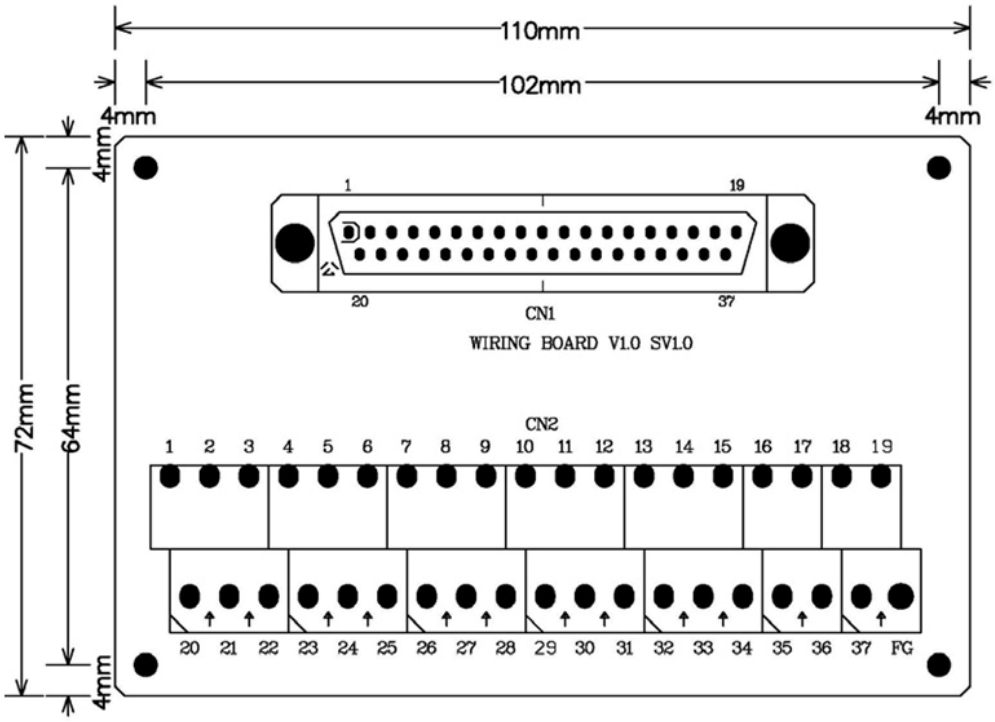
3.2.2 Dimension — 90(W)*113(L)*60(H)mm , 3.6(W)*4.5(L)*2.4(H)in

4. Layout and dimensions

4.1 EX-94421A Main card



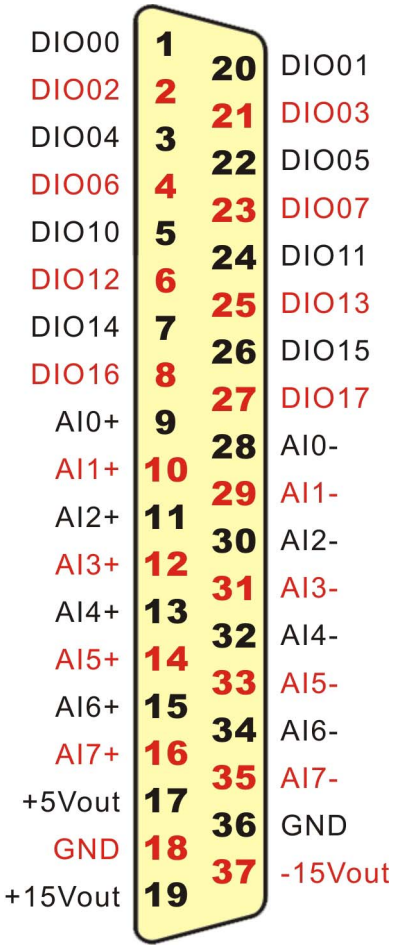
4.2 EX-962137 37PM Din rail mounted dummy wiring board



5. Pin definitions

5.1 Pin definitions for JF1 (on card EX-962137 37P) connector

PIN	DESCRIPTIONS
1	DIO00: dio port0 bit0 trigger in of counter0
2	DIO02: dio port0 bit2
3	DIO04: dio port0 bit4
4	DIO06: dio port0 bit6
5	DIO10: dio port1 bit0 trigger out of counter0/timer0
6	DIO12: dio port1 bit2
7	DIO14: dio port1 bit4
8	DIO16: dio port1 bit6
9	AI0+: analog in0+
10	AI1+: analog in1+
11	AI2+: analog in2+
12	AI3+: analog in3+
13	AI4+: analog in4+
14	AI5+: analog in5+
15	AI6+: analog in6+
16	AI7+: analog in7+
17	+5V (out)
18	GND
19	+15Ve (out)

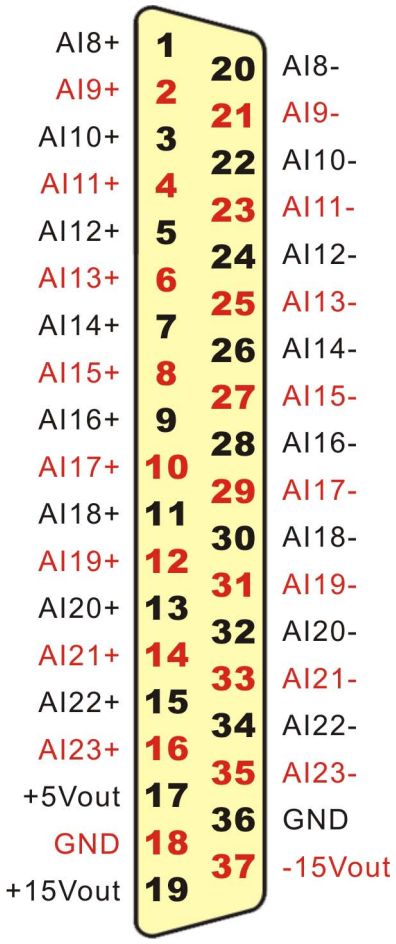


PIN	DESCRIPTIONS
20	DIO01: dio port0 bit1 trigger in of counter1
21	DIO03: dio port0 bit3
22	DIO05: dio port0 bit5
23	DIO07: dio port0 bit7
24	DIO11: dio port1 bit1 trigger out of counter1/timer1
25	DIO13: dio port1 bit3
26	DIO15: dio port1 bit5
27	DIO17: dio port1 bit7
28	AI0-: analog in0-
29	AI1-: analog in1-
30	AI2-: analog in2-
31	AI3-: analog in3-
32	AI4-: analog in4-
33	AI5-: analog in5-
34	AI6-: analog in6-
35	AI7-: analog in7-
36	GND
37	-15Ve (out)

NOTE: For single end input application, one end of differential input terminal should wire to ground, Say AI0 for example, AI0- should wire to ground for single end input application.

5.2 Pin definitions for JM1 (extension EX-962137 37P) connector

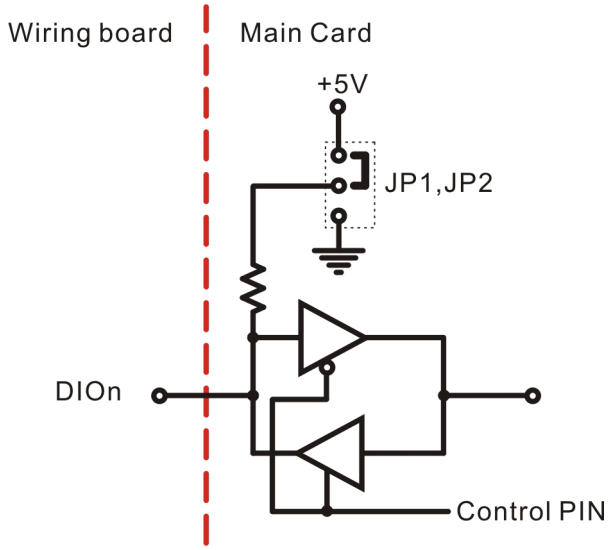
PIN	DESCRIPTIONS
1	AI8+: analog in8+
2	AI9+: analog in9+
3	AI10+: analog in10+
4	AI11+: analog in11+
5	AI12+: analog in12+
6	AI13+: analog in13+
7	AI14+: analog in14+
8	AI15+: analog in15+
9	AI16+: analog in16+
10	AI17+: analog in17+
11	AI18+: analog in18+
12	AI19+: analog in19+
13	AI20+: analog in20+
14	AI21+: analog in21+
15	AI22+: analog in22+
16	AI23+: analog in23+
17	+5V (out)
18	GND
19	+15Ve (out)



PIN	DESCRIPTIONS
20	AI8-: analog in8-
21	AI9-: analog in9-
22	AI10-: analog in10-
23	AI11-: analog in11-
24	AI12-: analog in12-
25	AI13-: analog in13-
26	AI14-: analog in14-
27	AI15-: analog in15-
28	AI16-: analog in16-
29	AI17-: analog in17-
30	AI18-: analog in18-
31	AI19-: analog in19-
32	AI20-: analog in20-
33	AI21-: analog in21-
34	AI22-: analog in22-
35	AI23-: analog in23-
36	GND
37	-15Ve (out)

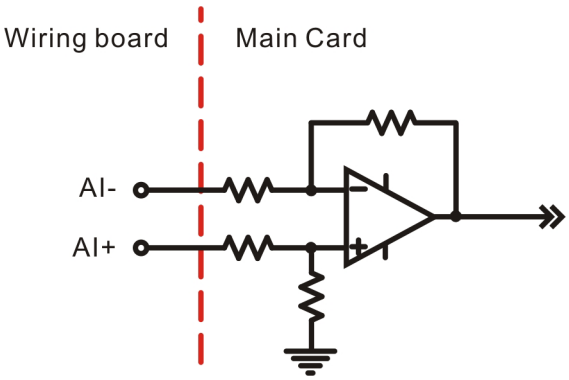
6. I/O interface diagram

6.1 Digital I/O diagram

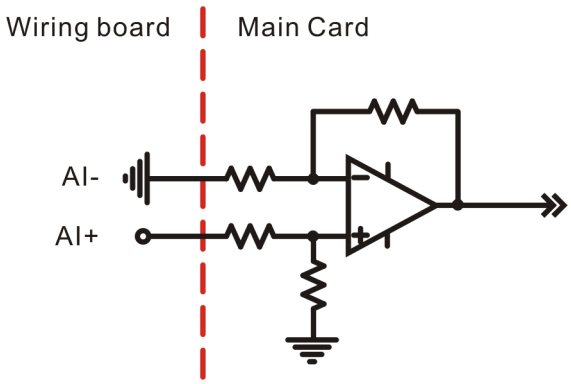


For byte-programmable TTL I/O DIO00 ~ DIO07, DIO10 ~ DIO17

6.2 Analog I/O diagram



Differential Analog Input

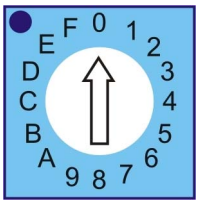


Single end Analog Input

7. Hardware descriptions

7.1 Card ID setting

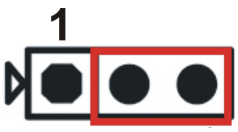
Since PCI cards have plug and play function, the card ID is required for programmer to identify which card he/she will control without knowing the physical address assigned by the Windows (OS). A 16 position rotary switch is used for extinguishing the 16 identical cards.



7.2 Digital I/O

The 2 byte-programmable TTL I/O can be used as input or output depending on your configuration. But when you use the timer / counter trigger output mode the port1 is must configure as output and bit0 is timer0/counter0 trigger out, bit1 is timer1/counter1 trigger out.
If you use trigger input mode of counter the port0 must configure as input port and bit0 as counter0 input, bit1 as counter1 input.

7.3 JP1,JP2 Jumper setting

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

7.4 Timer/Counter

There 2 timer/counter's 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.

7.5 Analog input

There are 8 channels of analog input on card, the hardware may accept 0-5V, 0-10V, -5V-+5V, -10V - +10V range on chip basis.

8. Applications

8.1 Analog 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.

8.2 Digital section:

For the control of digital i/o:

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

Note: The digital signal should be pre-processed to the TTL level

8.3 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