# DIO3264B
# Digital I/O Card

# User's Manual (V1.1)


健昇科技股份有限公司

**JS AUTOMATION CORP.**

新北市汐止區中興路 100 號 6 樓

6F., No.100, Zhongxing Rd.,

Xizhi Dist., New Taipei City, Taiwan

TEL：+886-2-2647-6936

FAX：+886-2-2647-6940

http://www.automation.com.tw

http://www.automation-js.com/

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

# Correction record

| Version | Record |
|---|---|
| 1.0 | New |
| 1.0->1.1 | adopt new point naming convention based on port number |
| | 1. Modify 4.2 DIN rail mounted wiring board |
| | 2. Modify 5.2 ADP3264DIN Din rail mounted wiring board |
| | 3. Add 5.3 ADP3264ADIN Din rail mounted wiring board (V1.3) |
| | 4. Modify 6.1 JF1 Assignment / Definitions |
| | 5. Modify 8 External wiring diagram |
| | 6. Modify 12 Ordering information |

# 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.

# 1. Difference between the DIO3264B and DIO3264A

DIO3264B is the upgrade version of DIO3264A. If you have use the DIO3264A with new driver, you can upgrade seamlessly**.** The function convention is the same but DIO3264B with more functions such as 2 TTL IO port and more useful IO functions (refer Chapt.3 Features)

## 2. Forward

Thank you for your selection of DIO3264 64 DIGITAL INPUT card for IBM compatible 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.

This card is a FPGA based design and 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)
DIO2232 32 channel input and 32 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 32 channel input and 32 channel output isolated digital I/O card (PCI bus)
DIO3232B Advanced 32 channel input and 32 channel output isolated digital I/O card (PCI bus)
DIO3248A 48 channel input and 16 channel output isolated digital I/O card (PCI bus)
DIO3248B Advanced 48 channel input and 16 channel output isolated digital I/O card (PCI bus)
DIO3264A 64 channel input isolated digital I/O card (PCI bus)
DIO3265 64 channel output isolated digital I/O card (PCI bus) with 16 TTL IO
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.

# 3. Features

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

2.2 64 inputs are photo-coupler isolated

2.3 2 TTL input/output*

2.4 Build-in input programmable digital de-bounce circuit*

2.5 Accept external interrupt at IN15~ IN0* (IN17~IN10 and IN07~IN00)**

2.6 8 input with counter function*

2.7 32 bit timer on 1us time base*

**wiring board**

2.8 LEDs for corresponding status indication

2.9 8 digits per I/O group with Green LED at first digit

*superset functions differ from DIO3264A

**In DIO3264B and wiring board version A use new convention of point number, it is named under port number, the first digit is port number and the second digit is the point number of the port. In this convention, the point number will be 0~7 (eight points).

# 4. Specifications

4.1 DIO3264B Main card

**Digital input**

4.1.1 Input channel — 64 ea of ON/OFF switching

4.1.2 Rated input voltage — DC 24V

4.1.3 Input "ON" state — 2.8V(max) 4.5mA(min)

4.1.4 Input "OFF" state — 8V(min) 3mA(max)

4.1.5 Switching speed — 10K (limit by photo-coupler speed or by debounce circuit)

**TTL IO**

4.1.6 Port — 2

4.1.7 Direction — software programmable on port base

**Timer**

4.1.8 Length — 32 bit @1us

4.1.9 Interrupt — time up interrupt

**General**

4.1.10 Card ID — 4 bits

4.1.11 Insulation resistance — 100M Ohm (min) at 1000Vdc

4.1.12 Isolation voltage — 2500Vac 1Min

4.1.13 PCI bus data width — 32 bits

4.1.14 I/O connector — 68 pin female SCSI II connector

4.1.15 Wiring board — 1 with round cable hook to main card

4.1.16 External supply — DC 24±4V

4.1.17 Operation temperature — 0 to 70° C

4.1.18 Storage temperature — -20° to 80° C

4.1.19 Operation humidity — RH5~95%, non-condensed

4.1.20 Dimension — 159(W) * 106(H) mm, 6.3(W) * 4.2(H)in

4.2 DIN rail mounted wiring board

**ADP3264DIN/ADP3264ADIN DIN rail mounted wiring board**

4.2.1 External supply — DC 24V±4V

4.2.2 Input status indicator — 64 LED, 8 digit per group with Green LED at first digit

4.2.3 Power indicator — Red LED

4.2.4 Terminal — every 4 has one common terminal.
(Different "common" for different positive power terminal)

4.2.5 Operation temperature — 0 to 70° C

4.2.6 Operation humidity — RH5~95%, non-condensed

4.2.7 Dimension — ADP3264DIN/ADP3264ADIN : 121(W) * 159(L) * 45(H)mm
4.8(W) * 6.3(L) * 1.8(H)in

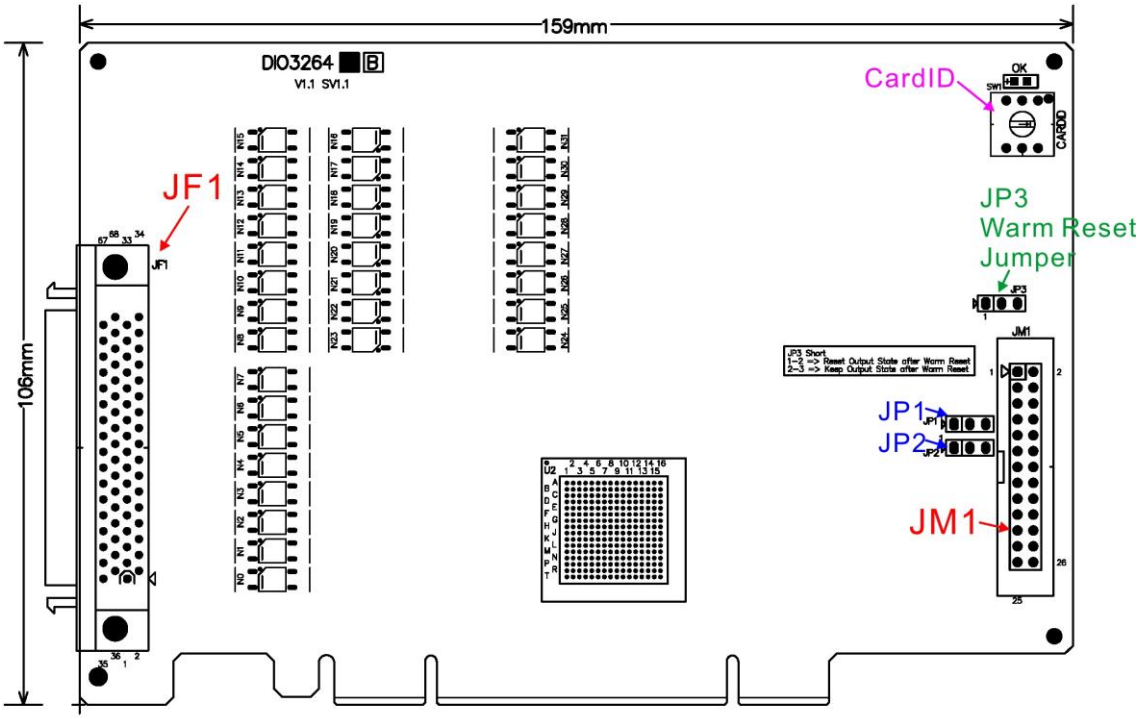
**JS51050 25PM Din rail mounted dummy wiring board for TTL I/O**

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

4.2.9 Dimension — 86(W)*79(L)*52(H)mm , 3.4(W)*3.2(L)*2.1(H)in

# 5. Layout and dimensions

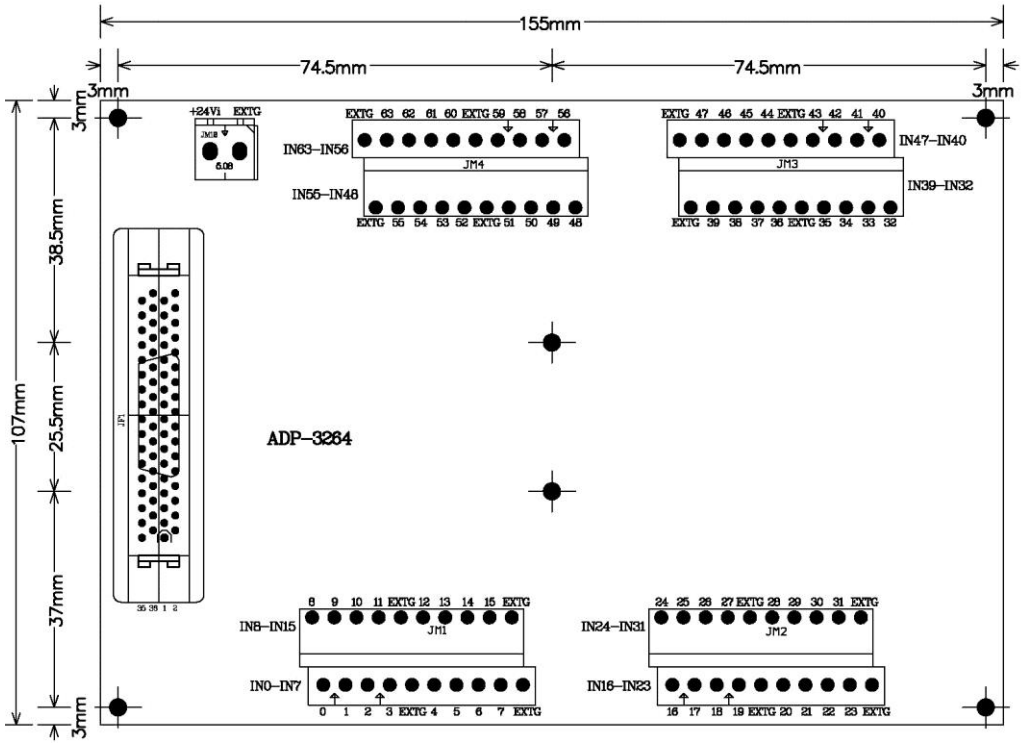
## 5.1 DIO3264B Main card




*dimension in bare board

## 5.2 ADP3264DIN Din rail mounted wiring board

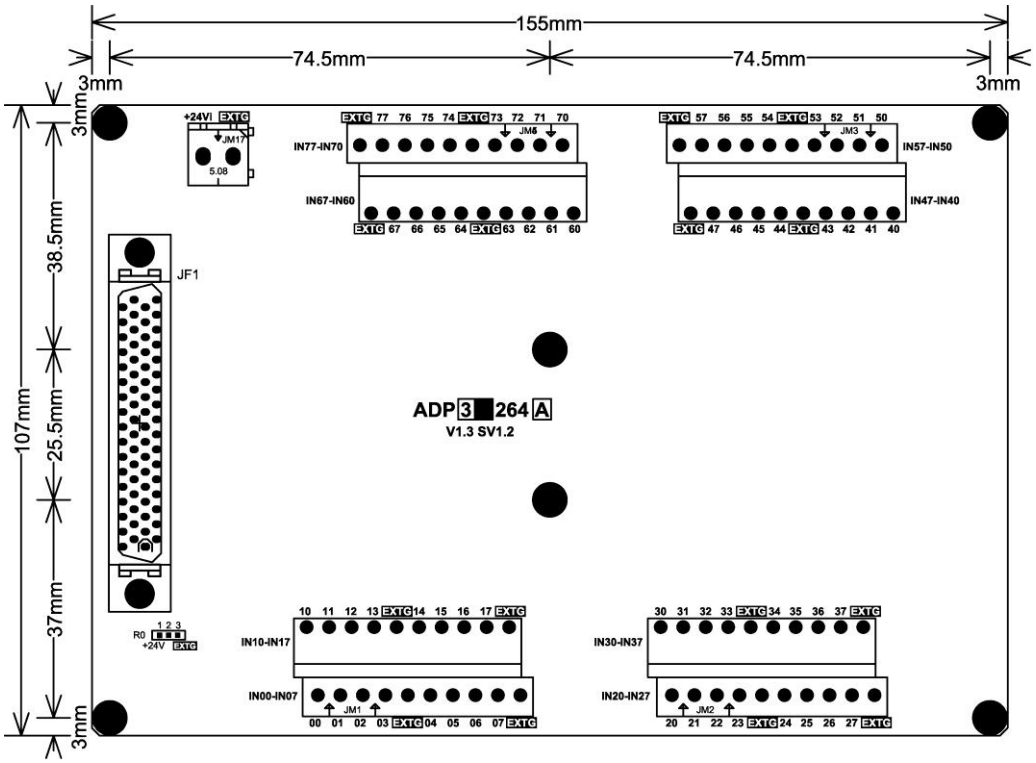
**Note: The input pints are enumerated from 0 to 63 without port designation.**




*dimension in bare board

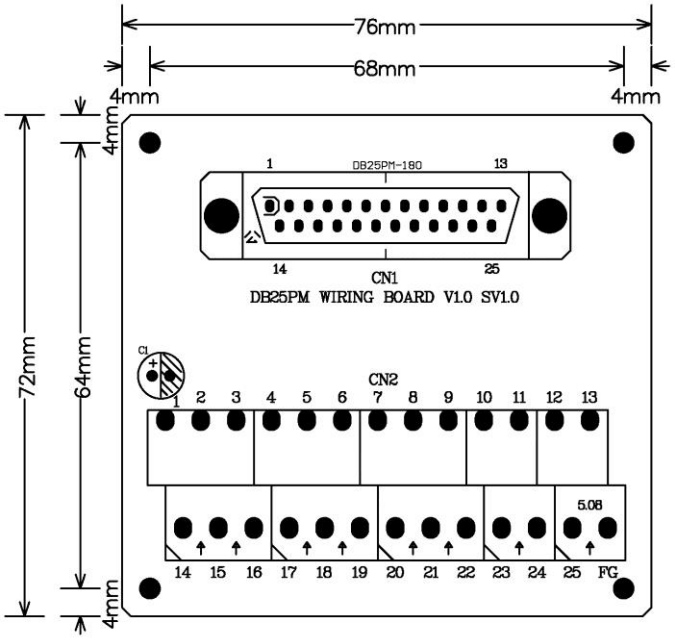
## 5.3 ADP3264ADIN Din rail mounted wiring board (V1.3)

**Note: The input pints are enumerated from 00 to 77 with first digit as port designation.**




*dimension in bare board

## 5.4 JS51050 for JM1 25PM Din rail mounted dummy wiring board




*dimension in bare board

# 6. Pin definitions

## 6.1 JF1 Assignment / Definitions

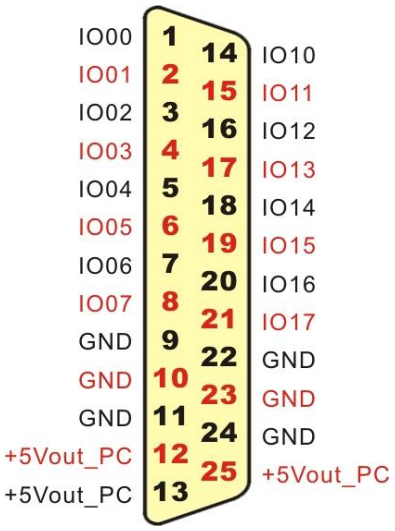
| PIN | Descriptions | | PIN | Descriptions |
|---|---|---|---|---|
| 68 | +24V[External DC24V power] | | 34 | +24V[External DC24V power] |
| 67 | +24V[External DC24V power] | | 33 | +24V[External DC24V power] |
| 66 | IN77[External Input 77] | | 32 | IN76[External Input 76] |
| 65 | IN75[External Input 75] | | 31 | IN74[External Input 74] |
| 64 | IN73[External Input 73] | | 30 | IN72[External Input 72] |
| 63 | IN71[External Input 71] | | 29 | IN70[External Input 70] |
| 62 | IN67[External Input 67] | | 28 | IN66[External Input 66] |
| 61 | IN65[External Input 65] | | 27 | IN64[External Input 64] |
| 60 | IN63[External Input 63] | | 26 | IN62[External Input 62] |
| 59 | IN61[External Input 61] | | 25 | IN60[External Input 60] |
| 58 | IN57[External Input 57] | | 24 | IN56[External Input 56] |
| 57 | IN55[External Input 55] | | 23 | IN54[External Input 54] |
| 56 | IN53[External Input 53] | | 22 | IN52[External Input 52] |
| 55 | IN51[External Input 51] | | 21 | IN50[External Input 50] |
| 54 | IN47[External Input 47] | | 20 | IN46[External Input 46] |
| 53 | IN45[External Input 45] | | 19 | IN44[External Input 44] |
| 52 | IN43[External Input 43] | | 18 | IN42[External Input 42] |
| 51 | IN41[External Input 41] | | 17 | IN40[External Input 40] |
| 50 | IN37[External Input 37] | | 16 | IN36[External Input 36] |
| 49 | IN35[External Input 35] | | 15 | IN34[External Input 34] |
| 48 | IN33[External Input 33] | | 14 | IN32[External Input 32] |
| 47 | IN31[External Input 31] | | 13 | IN30[External Input 30] |
| 46 | IN27[External Input 27] | | 12 | IN26[External Input 26] |
| 45 | IN25[External Input 25] | | 11 | IN24[External Input 24] |
| 44 | IN23[External Input 23] | | 10 | IN22[External Input 22] |
| 43 | IN21[External Input 21] | | 9 | IN20[External Input 20] |
| 42 | IN17[External Input 17] | | 8 | IN16[External Input 16] |
| 41 | IN15[External Input 15] | | 7 | IN14[External Input 14] |
| 40 | IN13[External Input 13] | | 6 | IN12[External Input 12] |
| 39 | IN11[External Input 11] | | 5 | IN10[External Input 10] |
| 38 | IN07[External Input 07] | | 4 | IN06[External Input 06] |
| 37 | IN05[External Input 05] | | 3 | IN04[External Input 04] |
| 36 | IN03[External Input 03] | | 2 | IN02[External Input 02] |
| 35 | IN01[External Input 01] | | 1 | IN00[External Input 00] |

## 6.2 Wiring board Input point designation cross reference

| port | wiring board (ADP3264DIN) | wiring board (ADP3264ADIN) |
|---|---|---|
| 0 | 0 ~ 7 | 00 ~ 07 |
| 1 | 8 ~ 15 | 10 ~ 17 |
| 2 | 16 ~ 23 | 20 ~ 27 |
| 3 | 23 ~ 31 | 30 ~ 37 |
| 4 | 32 ~ 39 | 40 ~ 47 |
| 5 | 40 ~ 47 | 50 ~ 57 |
| 6 | 48 ~ 55 | 60 ~ 67 |
| 7 | 56 ~ 63 | 70 ~ 77 |

## 6.3 JM1 Assignment / Definitions

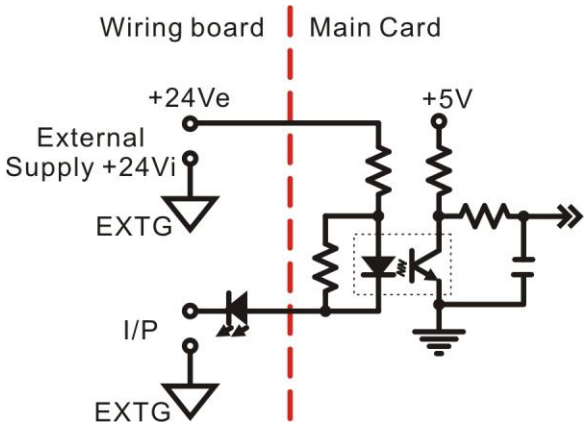
| PIN | Description | | PIN | Description |
|---|---|---|---|---|
| 1 | IO00: TTL port0 IO0 | | 14 | IO10: TTL port1 IO0 |
| 2 | IO01: TTL port0 IO1 | | 15 | IO11: TTL port1 IO1 |
| 3 | IO02: TTL port0 IO2 | | 16 | IO12: TTL port1 IO2 |
| 4 | IO03: TTL port0 IO3 | | 17 | IO13: TTL port1 IO3 |
| 5 | IO04: 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:<br>5V out from PC | | 25 | +5Vout_PC:<br>5V out from PC |
| 13 | +5Vout_PC:<br>5V out from PC | | | |



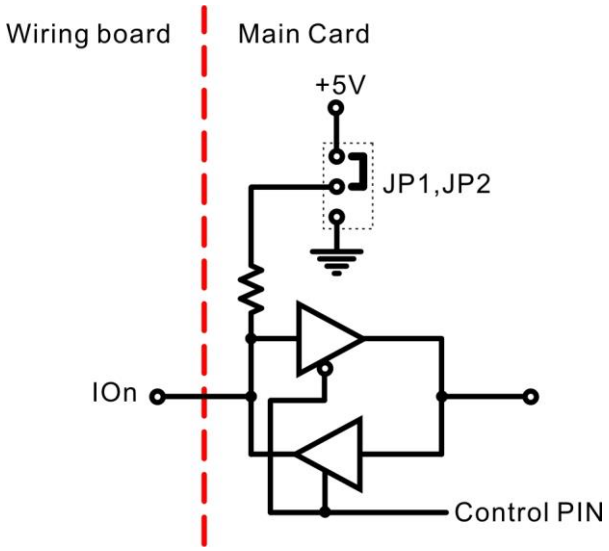
# 7. I/O interface diagram

## 7.1 JF1 ADP3264DIN

### 7.1.1 Input diagram

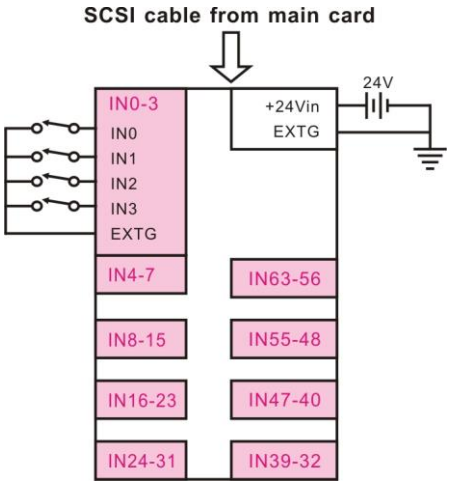



## 7.2 JM1 JS51050

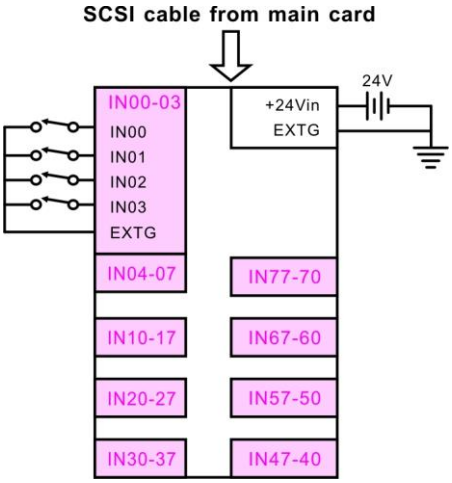



For byte-programmable TTL I/O IO00 ~ IO07, IO10 ~ IO17 to configured as pull high or pull low. JP1,JP2 are used for output state of power on. (refer 9.2 JP1,JP2 Jumper setting)

# 8. External wiring diagram




ADP3264DIN wiring board




ADP3264ADIN wiring board

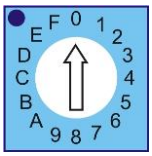
Note: The ADP3264ADIN wiring board Input points are enumerated from 00 to 77 with first digit as port designation.

# 9. Hardware settings

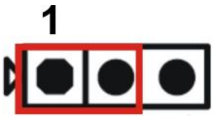
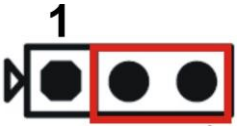
## 9.1 Card ID setting

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 rotary switch for distinguishing the 16 identical cards.

The following example sets the card ID at 0.

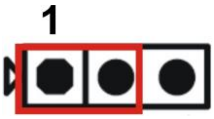
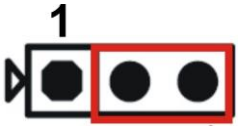



## 9.2 JP1,JP2 Jumper setting

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

Jumper JP1 and JP2 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.

## 9.3 JP3 Jumper setting

| | |
|---|---|
|  |  |
| Reset output after warm reset | Keep output after warm reset |

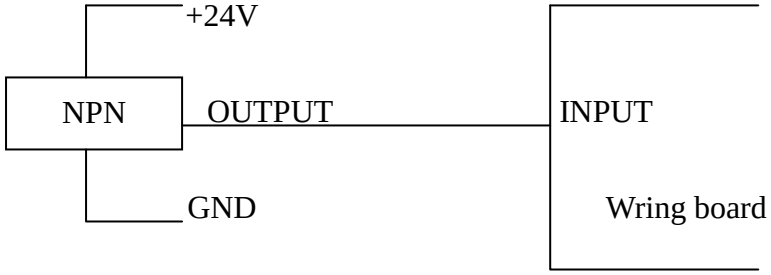
# 10. Applications

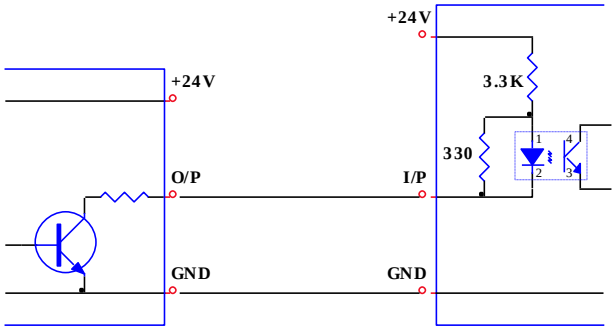
- Accept：- P.B./M.S./EMG./Contact- Start/Stop/Limit switch/sensor
  Interlock/selective Switch; Proximity switch
- Aux. contact of transducer/detector
- As I/O of software PLC Controller
- As multi-channel low speed counter

# 11. Application note

## 11.1 Tip for using NPN type proximity Switch

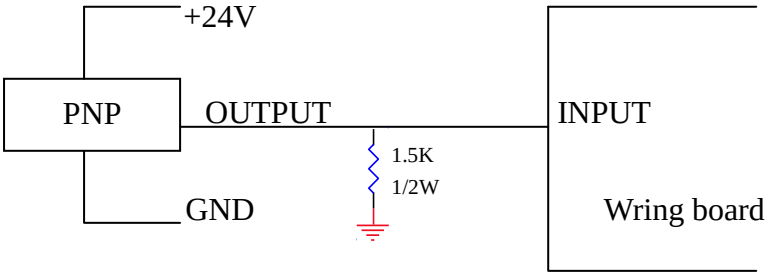
The NPN type proximity sensor can directly connect to input of wring board.

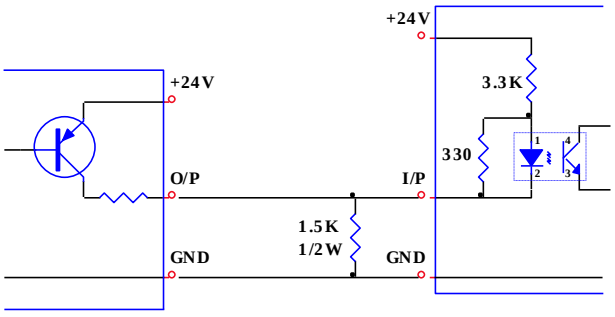



## 11.2 Tip for using PNP type proximity Switch

The PNP type proximity sensor need extra pull down resister connect to input of wring board.



# 12. Ordering information

| PRODUCT | DESCRIPTIONS |
|---|---|
| DIO3264B | advanced 64-channel Digital Input Card for 64 DI Photo-coupler isolated |
| ADP3264DIN | DIN rail mounted wiring board for 64 input<br>(To be phase out, please select new model ADP3264ADIN) |
| ADP3264ADIN | DIN rail mounted wiring board for 64 input |
| JS51050 | DIN rail mounted dummy wiring board (D type 25P male to terminals) for JM1 TTL I/O |
| M266868150 | 68-pin SCSI II cable 1.5M |
| M266868300 | 68-pin 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 JM1 (bracket and flat cable for 25P female D type connector) |