

# PCI2303

## User's Manual

 **Beijing ART Technology Development Co., Ltd.**

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## ***Chapter 1 Overview***

ART PCI2303 is based on PCI bus. It can be directly inserted into IBM-PC/AT or a computer which is compatible with PCI2303.

PCI2303 is a PCI bus, 4-channel isolated high-speed 16-bit universal D / A conversion board, which provides 4-channel voltage output or current output. It also has the function to power-on into zero or mid-value in order to avoid wrong operation.

PCI2303 board with optical isolation, thus eliminate interference caused by the bus-powered and the ground, so that the board has high precision, multi-range, conversion speed, low noise characteristics.

### **Unpacking Checklist**

Check the shipping carton for any damage. If the shipping carton and contents are damaged, notify the local dealer or sales for a replacement. Retain the shipping carton and packing material for inspection by the dealer.

Check for the following items in the package. If there are any missing items, contact your local dealer or sales.

- PCI2303 Data Acquisition Board
- ART Disk
  - a) user's manual (pdf)
  - b) drive
  - c) catalog
- Warranty Card

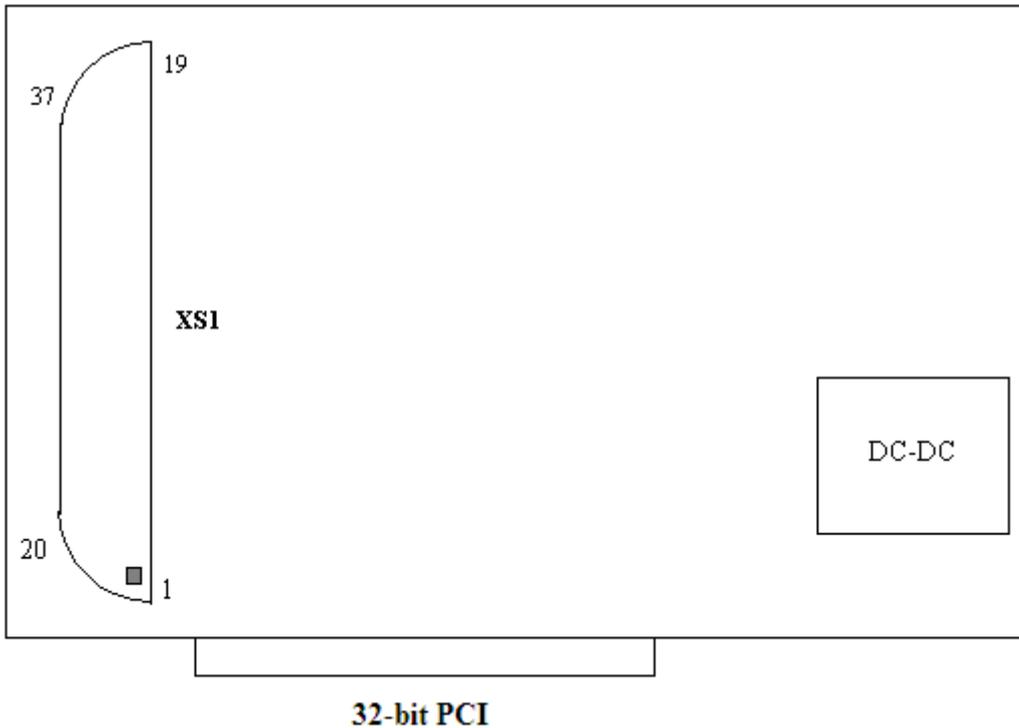
### **FEATURES**

#### **Analog Output**

- Output Range:  $\pm 10V$ ,  $\pm 5V$ ,  $0\sim 10V$ ,  $0\sim 5V$ ,  $0\sim 10mA$ ,  $4\sim 20mA$
- 16-bit resolution
- Output channels: 4
- Isolated voltage:  $1500V_{DC}$
- Setup time:  $\leq 10\mu s$
- Voltage output drive current:  $10mA$
- Current output driving voltage: min  $8V$ , max  $36V$
- Data transfer mode: programmed
- Precision:  $0.1\%$  FSR
- Initial status: least value or mid-value
- Operating Temperature Range:  $0^{\circ}C\sim 55^{\circ}C$
- Storage Temperature Range:  $-20^{\circ}C\sim 70^{\circ}C$
- Humidity:  $40\%\sim 90\%$
- Power Consumption :  $+5V @ 400mA$

## Chapter 2 Components Layout Diagram and a Brief Description

### 2.1 The Main Component Layout Diagram:



CN1: analog signal output connector

### 2.2 Jumper

Output range selected.

Channel	XF15	XF16	XF1	XF5	XF9
Channel 0	XF15	XF16	XF1	XF5	XF9
Channel 1	XF13	XF14	XF2	XF6	XF10
Channel 2	XF19	XF20	XF3	XF7	XF11
Channel 3	XF17	XF18	XF4	XF8	XF12
0~5V			--		--
0~10V			--		--
±5V(default)			--		--
±10V			--		--
0~10mA					
4~20mA					

## 2.3 Potentiometer

RP1: channel 0 analog output zero-point adjustment potentiometer

RP2: channel 0 analog output gain adjustment potentiometer

RP3: channel 1 analog output zero-point adjustment potentiometer

RP4: channel 1 analog output gain adjustment potentiometer

RP5: channel 2 analog output zero-point adjustment potentiometer

RP6: channel 2 analog output gain adjustment potentiometer

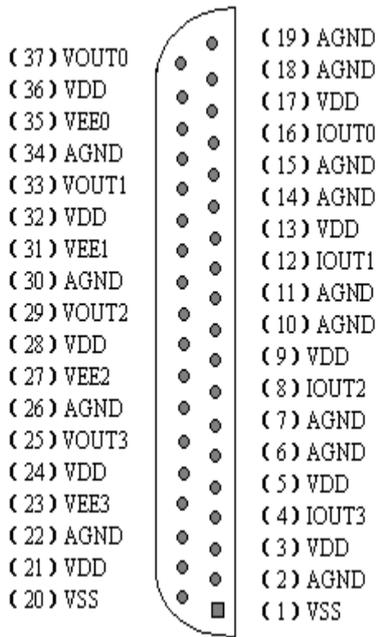
RP7: channel 3 analog output zero-point adjustment potentiometer

RP8: channel 3 analog output gain adjustment potentiometer

## Chapter 3 Signal Connectors

### 3.1 The Definition of Signal Output Connector

37 core plug on the CN1 pin definition



VOUT0~VOUT3: Voltage output channels.

IOUT0~IOUT3: Current output channels.

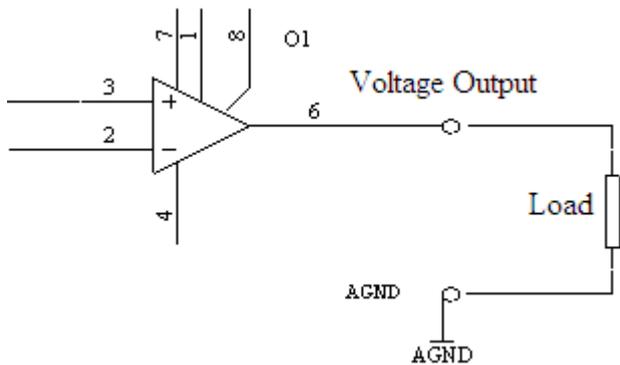
VEE0~VEE2: External power supply input

AGND: Analog ground.

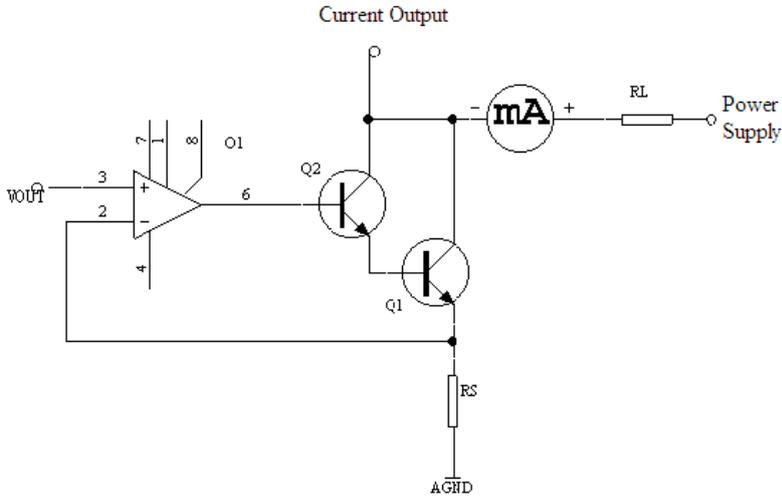
VDD: Internal +16V power supply, external user max can use 100mA.

VSS: Internal -15V power supply, external user max can use 100mA.

### 3.2 Voltage Output



### 3.3 Current Output



External power supply:  $V_{pwr}$ ;  $V_{pwr}$  range:  $R_L \cdot I_{Out\_max} + 7V \leq V_{pwr} \leq 36V$ , connect the external power supply ground to the board's ground.  $I_{Out\_max} = 20mA$  when the output range is 4~20mA,  $I_{Out\_max} = 10mA$  when the output range is 0~10mA.

Note: Can not suspend the load when using current output. Set the unused channels' output mode to voltage output.

$V_{OUT}$  is D/A's voltage output,  $R_S = 250\Omega$  or  $125\Omega$ .  $R_L \leq 1K\Omega$ .

When  $R_L < 400\Omega$  (4~20mA range) or  $R_L < 800\Omega$  (0~10mA range), internal VDD power supply can be used.

Connect the second and the third pin of XF21, the output voltage is 0V when power-on.

## Chapter 4 Address Assignment

Address 0: 128 bytes MEMORY

Address 1: 128 bytes I/O

Address 2: 16 bytes I/O

Offset Address	Function Description	
	Write	Read
0x0	DA channel number+DA 16 bit data	DA conversion status
0x4	Output Enable	Output Enable Status

“Write” data format when offset address is 0:

D31~D19	D18	D17~D16	D15~D0
Invalid	=0 single channel(default) =1 all channels	Channel number	DA data

“Read” data format when offset address is 0:

D32~D1	D0
Invalid	DA: conversion status 0: DA is converted. 1: DA conversion is finished.

Software Process:

1. Inquire DA conversion status; wait when the DA is converted.
2. Output new value when the DA conversion is finished.

“Write” data format when offset address is 4:

D32~D1	D0
Invalid	Output enabled: 1: Off, all the voltage output is high resistance (>1M)(default) 0: On, outputs are normal

“Read” data format when offset address is 4:

D32~D1	D0
Invalid	Read back output enabled status

## ***Chapter 5 Notes and Warranty Policy***

### **5.1 Notes**

In our products' packing, user can find a user manual, a PCI2303 module and a quality guarantee card. Users must keep quality guarantee card carefully, if the products have some problems and need repairing, please send products together with quality guarantee card to ART, we will provide good after-sale service and solve the problem as quickly as we can.

When using PCI2303, in order to prevent the IC (chip) from electrostatic harm, please do not touch IC (chip) in the front panel of PCI2303 module.

Set the jumper before use the board.

The ground of the analog output signal connects to the analog of the board, and isolated with logic ground.

Power off before insert and extract the board.

### **5.2 Warranty Policy**

Thank you for choosing ART. To understand your rights and enjoy all the after-sales services we offer, please read the following carefully.

1. Before using ART's products please read the user manual and follow the instructions exactly. When sending in damaged products for repair, please attach an RMA application form which can be downloaded from: [www.art-control.com](http://www.art-control.com).
2. All ART products come with a limited two-year warranty:
  - The warranty period starts on the day the product is shipped from ART's factory
  - For products containing storage devices (hard drives, flash cards, etc.), please back up your data before sending them for repair. ART is not responsible for any loss of data.
  - Please ensure the use of properly licensed software with our systems. ART does not condone the use of pirated software and will not service systems using such software. ART will not be held legally responsible for products shipped with unlicensed software installed by the user.
3. Our repair service is not covered by ART's guarantee in the following situations:
  - Damage caused by not following instructions in the User's Manual.
  - Damage caused by carelessness on the user's part during product transportation.
  - Damage caused by unsuitable storage environments (i.e. high temperatures, high humidity, or volatile chemicals).
  - Damage from improper repair by unauthorized ART technicians.
  - Products with altered and/or damaged serial numbers are not entitled to our service.
4. Customers are responsible for shipping costs to transport damaged products to our company or sales office.
5. To ensure the speed and quality of product repair, please download an RMA application form from our company website.

# Products Rapid Installation and Self-check

## Rapid Installation

Product-driven procedure is the operating system adaptive installation mode. After inserting the disc, you can select the appropriate board type on the pop-up interface, click the button **【driver installation】** ; or select CD-ROM drive in Resource Explorer, locate the product catalog and enter into the APP folder, and implement Setup.exe file. After the installation, pop-up CD-ROM, shut off your computer, insert the PCI card. If it is a USB product, it can be directly inserted into the device. When the system prompts that it finds a new hardware, you do not specify a drive path, the operating system can automatically look up it from the system directory, and then you can complete the installation.

## Self-check

At this moment, there should be installation information of the installed device in the Device Manager (when the device does not work, you can check this item.). Open "Start -> Programs -> ART Demonstration Monitoring and Control System -> Corresponding Board -> Advanced Testing Presentation System", the program is a standard testing procedure. Based on the specification of Pin definition, connect the signal acquisition data and test whether AD is normal or not. Connect the input pins to the corresponding output pins and use the testing procedure to test whether the switch is normal or not.

## Delete Wrong Installation

When you select the wrong drive, or viruses lead to driver error, you can carry out the following operations: In Resource Explorer, open CD-ROM drive, run Others-> SUPPORT-> PCI.bat procedures, and delete the hardware information that relevant to our boards, and then carry out the process of section I all over again, we can complete the new installation.