PCI8201
User's Manual

Beijing ART Technology Development Co., Ltd.

Contents

Chapter 1 Overview

ART PCI8201 is based on PCI bus. It can be directly inserted into IBM-PC/AT or a computer which is compatible with PCI8201.

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.

- ➢ PCI8201 Data Acquisition Board
- ➢ ART Disk
  - a) user's manual (pdf)
  - b) drive
  - c) catalog
- ➢ Warranty Card

FEATURES

Analog Output

- ➢ Converter Type: AD5724
- ➢ Output Range: ±10.8V, ±10V, ±5V, 0~10.8V,0~10V, 0~5V, 0~10mA, 4~20mA
- ➢ 12-bit resolution
- ➢ Output channels: 8 channel voltage outputs or 8 channel current outputs
- ➢ Power-on is automatically cleared
- ➢ Isolated voltage:$2500V_{DC}$
- ➢ Data transfer mode: programmed
- ➢ Set-up Time: $\leq 10\mu s$
- ➢ Nonlinearity: ± 0.5LSB (max)
- ➢ Operating Temperature Range:0℃~50℃
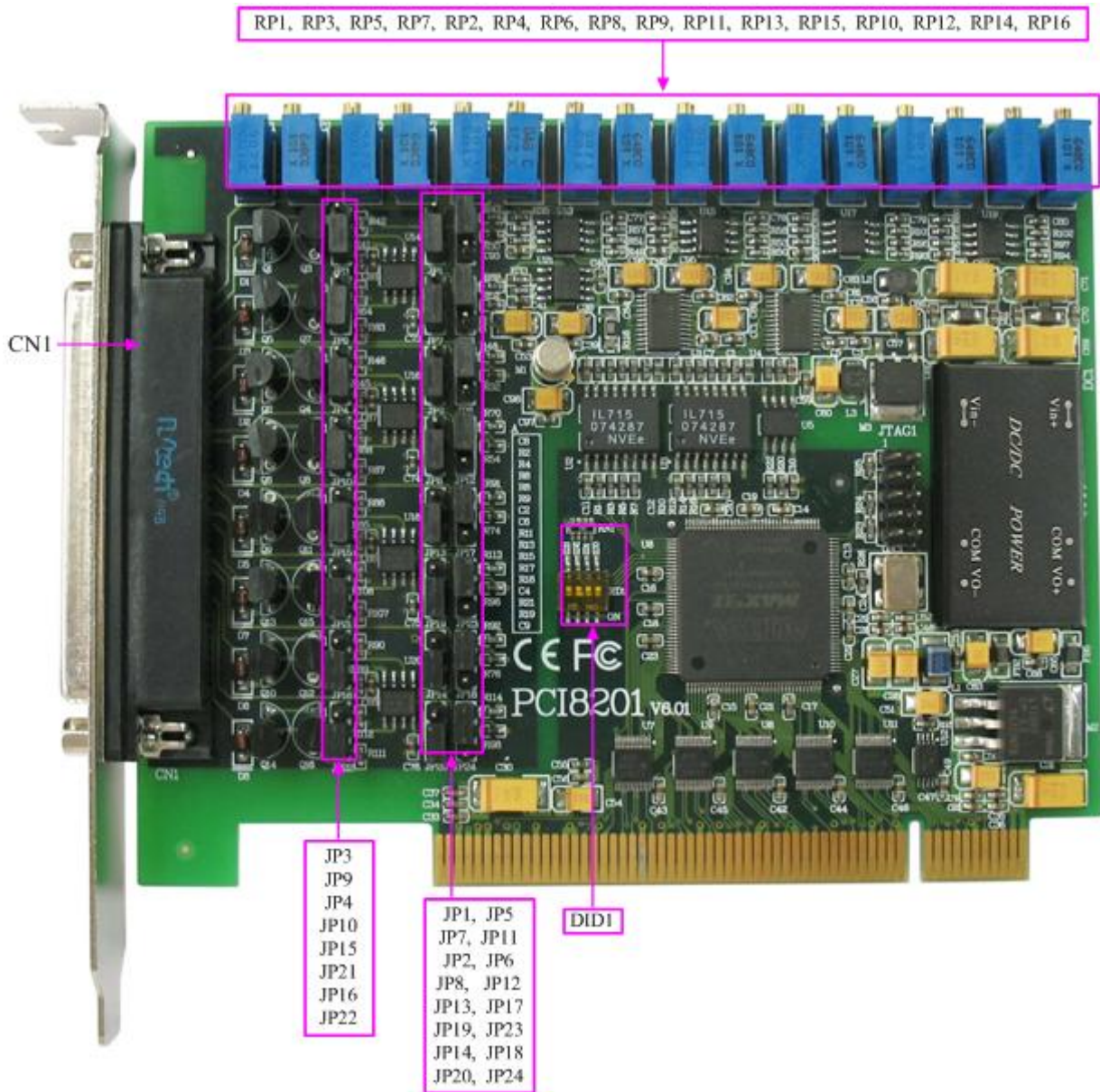- ➢ Storage Temperature Range: -20℃~70℃

Other Feature

- ➢ On-board Clock Oscillator: 40MHz

- ➢ Dimension:128mm (length)* 102mm (W)* 15mm (H)

Chapter 2 Components Layout Diagram and a Brief Description

2.1 The Main Component Layout Diagram:

CN1:   analog signal output connector

2.2 Potentiometer

RP1: channel 0 analog output zero-point adjustment potentiometer

RP3: channel 0 analog output full-scale adjustment potentiometer

RP5: channel 1 analog output zero-point adjustment potentiometer

RP7: channel 1 analog output full-scale adjustment potentiometer

RP2: channel 2 analog output zero-point adjustment potentiometer

RP4: channel 2 analog output full-scale adjustment potentiometer

RP6: channel 3 analog output zero-point adjustment potentiometer

RP8: channel 3 analog output full-scale adjustment potentiometer

RP9: channel 4 analog output zero-point adjustment potentiometer

RP11: channel 4 analog output full-scale adjustment potentiometer

RP13: channel 5 analog output zero-point adjustment potentiometer

RP15: channel 5 analog output full-scale adjustment potentiometer

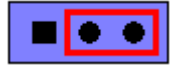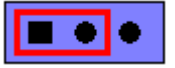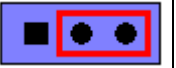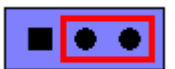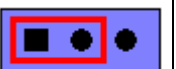RP10: channel 6 analog output zero-point adjustment potentiometer

RP12: channel 6 analog output full-scale adjustment potentiometer

RP14: channel 7 analog output zero-point adjustment potentiometer

RP16: channel 7 analog output full-scale adjustment potentiometer

2.3 Jumper

We can select 0~10mA or 4~20mA by the jumper. However, the voltage output has nothing to do with the jumper.

When the pins 2-3 of the JP1, JP7, JP2, JP8, JP13, JP19, JP14, JP20 are shorted, the IOU0 ~ IOUT7 can output current signals, the rest of the jumpers corresponding to the current range.

Output range selected.

IOUT0	JP1	JP3	JP5
IOUT1	JP7	JP9	JP11
IOUT2	JP2	JP4	JP6
IOUT3	JP8	JP10	JP12
IOUT4	JP13	JP15	JP17
IOUT5	JP19	JP21	JP23
IOUT6	JP14	JP16	JP18
IOUT7	JP20	JP22	JP24
0～10mA	■ ● ●	■ ● ●	■ ● ●
4～20mA	■ ● ●	■ ● ●	■ ● ●

2.4 Physical ID of DIP Switch

DID1: Set physical ID number. When the PC is installed more than one PCI8201 , you can use the DIP switch to set a physical ID number for each board, which makes it very convenient for users to distinguish and visit each board in the progress of the hardware configuration and software programming. The following four-place numbers are expressed by the binary system: When DIP switch points to "ON", that means "1", and when it points to the other side, that means "0." As they are shown in the following diagrams: place "ID3" is the high bit."ID0" is the low bit, and the black part in the diagram represents the location of the switch. (Test softwares of the company often use the logic ID management equipments and at this moment the physical ID DIP switch is invalid. If you want to use more than one kind of the equipments in one and the same system at the same time, please use the physical ID as much as possible.).

ID3 ID2 ID1 ID0

| 4 | 3 | 2 | 1 |

DID1

ON
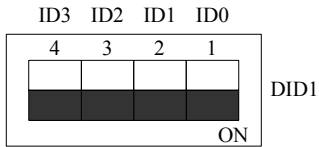
The above chart shows"1111", so it means that the physical ID is 15.

ID3 ID2 ID1 ID0

| 4 | 3 | 2 | 1 |

DID1

ON
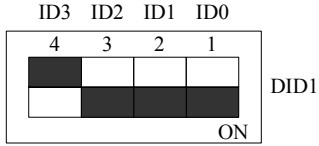
The above chart shows"0111", so it means that the physical ID is 7.

ID3 ID2 ID1 ID0

| 4 | 3 | 2 | 1 |

DID1

ON

The above chart shows"0101", so it means that the physical ID is 5.

ID3	ID2	ID1	ID0	Physical ID（Hex）	Physical ID（Dec）
OFF（0）	OFF（0）	OFF（0）	OFF（0）	0	0
OFF（0）	OFF（0）	OFF（0）	ON（1）	1	1
OFF（0）	OFF（0）	ON（1）	OFF（0）	2	2
OFF（0）	OFF（0）	ON（1）	ON（1）	3	3
OFF（0）	ON（1）	OFF（0）	OFF（0）	4	4
OFF（0）	ON（1）	OFF（0）	ON（1）	5	5
OFF（0）	ON（1）	ON（1）	OFF（0）	6	6
OFF（0）	ON（1）	ON（1）	ON（1）	7	7
ON（1）	OFF（0）	OFF（0）	OFF（0）	8	8
ON（1）	OFF（0）	OFF（0）	ON（1）	9	9
ON（1）	OFF（0）	ON（1）	OFF（0）	A	10
ON（1）	OFF（0）	ON（1）	ON（1）	B	11
ON（1）	ON（1）	OFF（0）	OFF（0）	C	12
ON（1）	ON（1）	OFF（0）	ON（1）	D	13
ON（1）	ON（1）	ON（1）	OFF（0）	E	14
ON（1）	ON（1）	ON（1）	ON（1）	F	15

Chapter 3 Signal Connectors

3.1 The Definition of Signal Output Connector

37 core plug on the CN1 pin definition
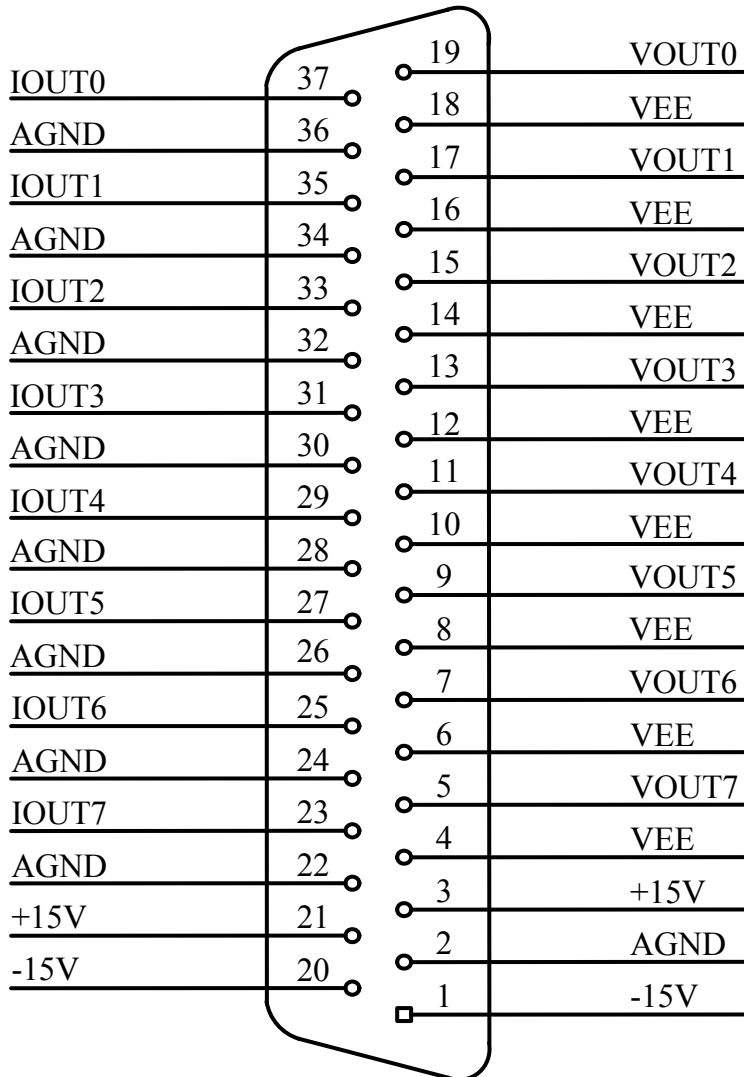
Pin name	Type	Pin function definition
VOUT0~VOUT7	Output	Voltage output channels.
IOUT0~IOUT7	Output	Current output channels.
VEE	Output	External power supply input, when use "current output", it should connect with the external power.
+15V	PWR	Internal +15V power output, external user max can use 100mA.
-15V	PWR	Internal -15V power output, external user max can use 100mA.
AGND	GND	Analog ground.

3.2 Voltage Output Connection

When the board is used for voltage output, one end of the load connects with the voltage output (VOUT0 ~ VOUT7), the other end connects with analog ground (AGND), the maximum current is provided to the load is 10mA, the voltage output does not need external power supply.
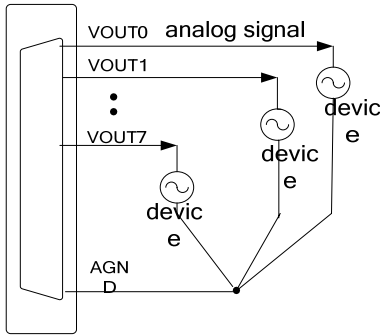
3.3 Current Output Connection
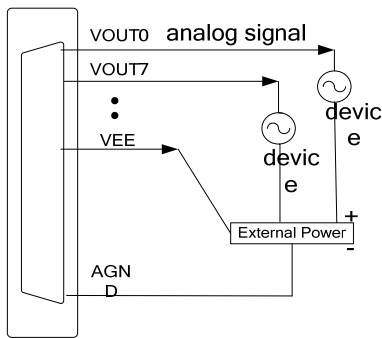
External power supply: Vpwr; Vpwr range: $RL \cdot I_{max} + 7V \leq Vpwr \leq 36V$, connect the external power supply ground to the board's ground.

Note: R_L is load for on-site equipment, and $0 \leq RL \leq 1k\Omega$

    I_{max} =20mA when the output range is 4~20mA, I_{max}=10mA when the output range is 0~10mA.

    External power supply ground and the analog ground of the board are common ground.

We can not suspend the load when using current output. Set the unused channels' output mode to voltage output. When $RL<400\Omega$ (4~20mA range) or $RL<800\Omega$ (0~10mA range), internal VDD power supply can be used.

Chapter 4 Notes, Calibration and Warranty Policy

4.1 Notes

In our products' packing, user can find a user manual, a PCI8201 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 PCI8201, in order to prevent the IC (chip) from electrostatic harm, please do not touch IC (chip) in the front panel of PCI8201 module.

4.2 Analog Signal Output Calibration

In the manual, we introduce how to calibrate PCI8201 in ±5V range; calibrations of other ranges are similar.

1. Connect the ground of the digital voltage meter to any analog AGND of the D-type plug. Connect the input side of the voltage meter to the output channel which needs calibration. Run PCI8201 test procedure under Windows, select the 0-ch output detection.

2. To set 0-ch output is 2048，adjust potentiometer RP1 in order to make VOUT0 output 0.000V (current output is the same).

3. To set 0-ch output is 4095, adjust potentiometer RP3 in order to make VOUT0 output 4997.55mV (current output is the same).

4. Repeat steps above until meet the requirement.

4.3 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.

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.