ART7001
User's Manual

Beijing ART Technology Development Co., Ltd.

Contents

Chapter 1 Overview

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.

➢ ART7001 Card
➢ ART Disk
   a) user's manual (pdf)
   b) drive
   c) catalog
➢ Warranty Card

FEATURES

➢ Max. Display: 3999, that is $3\frac{3}{4}$ digits
➢ AD Conversion Frequency: 20Hz
➢ Over-range direction
➢ Automatically set-up under test target
➢ GND level and OFFSET automatic calibration
➢ With full range protection function
➢ PC104 Bus
➢ Operating Temperature Range: 0℃~55℃
➢ Storage Temperature Range: -20℃~70℃

Voltage

➢ DC Voltage Range: 400mV, 4V, 40V, 400V, 1000V
➢ DC Voltage Resolution: 100uV, 1mV, 10mV, 100mV, 1V
➢ AC Voltage Range: 400mV, 4V, 40V, 400V, 1000V
➢ AC Voltage Resolution: 100uV, 1mV, 10mV, 100mV, 1V
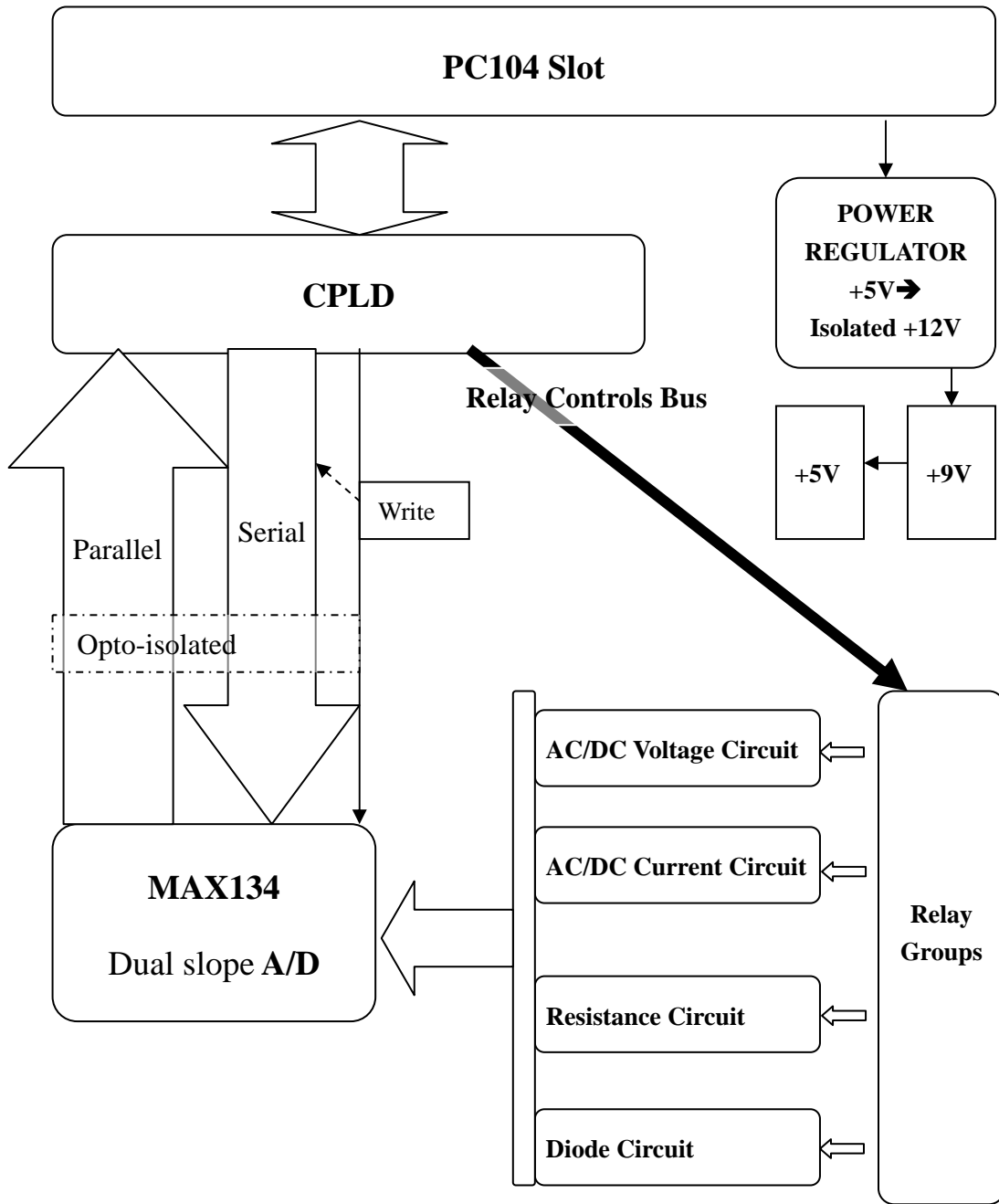➢ Maximum Input Voltage: DC 1000V, AC 1000Vrms

Current

➢ DC Current Range: 400mA
➢ AC Current Range: 400mA
➢ Current Resolution: 100mA
➢ Max Input Voltage: 400mA

Resistance

➢ Resistance Range: 400Ohm, 4KOhm, 40KOhm, 400KOhm, 4MOhm, 20Mohm
➢ Resistance Resolution: 0.1Ohm, 1Ohm, 10Ohm, 100Ohm, 1KOhm, 10KOhm

Chapter 2 Hardware Structure

PC104 Slot

CPLD

POWER REGULATOR
+5V➔
Isolated +12V

Relay Controls Bus

+5V

+9V

Parallel

Serial

Write

Opto-isolated

MAX134

Dual slope **A/D**

AC/DC Voltage Circuit

AC/DC Current Circuit

Resistance Circuit

Diode Circuit

Relay Groups

Chapter 3 Software Development

Measurement Operation: software (including the CPLD logic and the upper software)

1. Select relay switch, sent the measuring signal to A/D chip for data acquisition.
2. Write configuration and read data.

The instruction of relay selects control signal:

1. AC/DC Voltage Measurement: relay group does not it.
2. Resistance Measurement: relays K2, K3 closed, the others reset.
3. Diode: relays K2, K3, K4 closed, the others reset.
4. AC/DC Current Measurement: Relay K1 closed, the others reset.

MAX134 Description: MAX134 has 3 separate address lines and a 4 bit bidirectional data bus.

Register Map of Output Data

Register Number	Register Name	Register Contents
0	Ones	Conversion Result, BCD data for least significant digit (the undisplayed digit used for digital autozero)
1	Tens	BCD data of Conversion Result Least significant displayed digit)
2	Hundreds	BCD data of Conversion Result
3	Thousands	BCD data of Conversion Result
4	10 Thousands	BCD data of Conversion Result
5	Status	D3: Always 1, D2: Latched Continuity, D1: Holding, D0: Low Battery

Register Map of Input Data

Register Number	D3	D2	D1	D0
0	Hold	High Frequency	Beeper On	Sleep
1	10-0	Filter Short	÷5	50Hz
2	10-4	10-3	10-2	10-1
3	DC	Ext AC	Divider Sense	Ohms R/2
4	Current	×2	Read Zero	Filter On

Bit set	Voltage Range	Ohms Range
10-0	400mV	4M&40M
10-1	4V	400K
10-2	40V	40K
10-3	400V	4K
10-4	4000V	400R

Note: The driver sense bit must also be set to enable the 10-0 through 10-4 bits.

Other Register Description

DC Voltage Measurement:

Register Number	D3	D2	D1	D0
0	1/0	0	0	1/0
1	1/0	1	1/0	0
2	1/0	1/0	1/0	1/0
3	1	0	1	0
4	0	1/0	1/0	0

AC Voltage Measurement:

Register Number	D3	D2	D1	D0
0	1/0	0	0	1/0
1	1/0	1	1/0	1/0
2	1/0	1/0	1/0	1/0
3	0	1	1	0
4	0	1/0	1/0	0

Ohms Measurement:

Register Number	D3	D2	D1	D0
0	1/0	0	0	1/0
1	1/0	1	1/0	1/0
2	1/0	1/0	1/0	1/0
3	1	0	1	1
4	0	1/0	1/0	0

Current Measurement:

Register Number	D3	D2	D1	D0
0	1/0	0	0	1/0
1	0	1	1/0	1/0
2	0	0	0	0
3	1	0	0	0
4	1	1/0	1/0	0

Chapter4 Notes, Calibration and Warranty Policy

4.1 Notes

In our products' packing, user can find a user manual, an ART7001 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 ART7001, in order to prevent the IC (chip) from electrostatic harm, please do not touch IC (chip) in the front panel of ART7001 module.

4.2 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.

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.