

4034A Series  
Noise and Timing  
Analyzer Module  
Operation Manual



## EC DECLARATION OF CONFORMITY

We **Prodigit Electronics Co., Ltd.** declares under our own responsibility that the product

Noise and Timing Analyzer Module

(Model No.: 4034A)

Satisfies all the technical relations application to the product within the scope of council:

**Directive: 2014/30/EU; 2014/35/EU; 2015/863/EU; 2012/19/EU**

The above product is in conformity with the following standards or other normative documents

### Harmonized Standard :

EN 61010-1: 2010+A1:2019

EN IEC 61010-2-030:2021+A11:2021

EN 61326-1:2013

EN 61326-2-1:2013

### Reference Basic Standards :

#### Emission:

EN 55011: 2016+A1: 2020 Class A

EN 55032: 2015+A1:2020

EN 61000-3-2: 2014

EN 61000-3-3: 2013

#### Immunity:

EN 61000-4-2: 2009

EN 61000-4-3: 2006+A2:2010

EN 61000-4-4: 2012

EN 61000-4-5: 2014+A1:2017

EN 61000-4-6: 2014

EN 61000-4-8: 2010

EN 61000-4-11: 2020

**Company Name : Prodigit Electronics Co., Ltd.**

**Company Address : 8F, No.88, Baojhong Rd., Sindian District, New Taipei City,  
Taiwan.**

Person is responsible for marking this declaration:



**Manufacturer/Importer**

Signature:

Date: 2022/10/20 Name:

*Dean Wang*

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Dean Wang  
R&D Assistant Manager

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## UK Declaration of Conformity

We Prodigit Electronics Co., Ltd. declares under our own responsibility that the product

Noise and Timing Analyzer Module

(ModelNo.: 4034A)

Satisfies all the technical relations application to the product within the scope of council:

**Directive:** Electromagnetic Compatibility Regulations 2016; Electrical Equipment (Safety) Regulations 2016; the Restriction of the Use of Certain Hazardous Substances in Electrical and Electronic Equipment Regulations 2012

The above product is in conformity with the following standards or other normative documents

### Harmonized Standard :

BS EN 61010-1:2010+A1:2019 ;BS EN IEC 61010-2-030:2021+A11:2021

BS EN 61326-1: 2013 ; BS EN 61326-2-1: 2013

### Reference Basic Standards :

#### Emission:

BS EN 55011: 2016+A1: 2020 Class A

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BS EN 61000-4-5: 2014+A1:2017

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BS EN 61000-4-8: 2010

BS EN 61000-4-11: 2020

**Company Name** : Prodigit Electronics Co., Ltd

**Company Address** : 8F, No.88, Baojhong Rd., Sindian District, New Taipei City, Taiwan

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**Manufacturer/Importer**  
Signature:

*Dean Wang*

Date: 2022/10/20

Name: Dean Wang  
R&D Assistant Manager

**SAFETY SYMBOLS****Direct current (DC)****Alternating current (AC)****Both direct and alternating current****Three-phase alternating current****Protective earth (ground)****On (Supply)****Off (Supply)****Fuse****Caution ! Refer to this manual before using the meter.****Caution, risk of electric shock**

**CAT IV** – Is for measurements performed at the source of the low-voltage installation.

**CAT III** – Is for measurements performed in the building installation.

**CAT II** – Is for measurements performed on circuits directly connected to the low-voltage installation.

**CAT I** – Is for measurements performed on circuits not directly connected to Mains.

This equipment is not for measurements performed for CAT II, III, and IV.



## Material Contents Declaration

(材料含量宣稱)

(Part Name) 零件名稱	Hazardous Substance (有毒有害物質或元素)					
	鉛 (Pb)	汞 (Hg)	鎘 (Cd)	六價鉻 (Cr6+)	多溴 聯苯 (PBB)	多溴 二苯醚 (PBDE)
PCBA (印刷電路裝配件)	X	○	X	○	○	○
Electrical part not on PCBA's 未在PCBA上的電子零件	X	○	X	○	○	○
Metal parts 金屬零件	○	○	○	X	○	○
Plastic parts 塑膠零件	○	○	○	○	X	X
Wiring 電線	X	○	○	○	○	○
Package 封裝	X	○	○	○	○	○

對銷售之日的所售產品,本表顯示, PRODIGIT 供應鏈的電子資訊產品可能包含這些物質。注意:在所售產品中可能會也可能不會含有所有所列的部件。This table shows where these substances may be found in the supply chain of Prodigit electronic information products, as of the date of sale of the enclosed product. Note that some of the component types listed above may or may not be a part of the enclosed product. ○: 表示該有毒有害物質在該部件所有均質材料中的含量均在SJ/T 11363-2006 標準規定的限量要求以下。○: Indicates that the concentration of the hazardous substance in all homogeneous materials in the parts is below the relevant threshold of the SJ/T 11363-2006 standard. x: 表示該有毒有害物質至少在該部件的某一均質材料中的含量超出SJ/T 11363-2006 標準規定的限量要求。x: Indicates that the concentration of the hazardous substance of at least one of all homogeneous materials in the parts is above the relevant threshold of the SJ/T 11363-2006 standard.

Note(注釋):

1. Prodigit has not fully transitioned to lead-free solder assembly at this moment ; However, most of the components used are RoHS compliant.

(此刻, Prodigit 並非完全過渡到無鉛焊料組裝;但是大部份的元器件一至於RoHS的規定。)

2. The product is labeled with an environment-friendly usage period in years.

The marked period is assumed under the operating environment specified in the product specifications.

(產品標注了環境友好的使用期限(年)。所標注的環境使用期限假定是在此產品定義的使用環境之下。)



Example of a marking for a 10 year period:

(例如此標制環境使用期限為10年)

## **SAFETY SUMMARY**

The following general safety precautions must be observed during all phases of operation, service, And repair of this instrument. Failure to comply with these precautions or with specific warnings Elsewhere in this manual violates safety standards of design, manufacture, and intended use of the Instrument. PRODIGIT assumes no liability for the *customer's failure to comply with these Requirements.*

### **GENERAL**

This product is a Safety Class 1 instrument (provided with a protective earth terminal). The protective Features of this product may be impaired if it is used in a manner not specified in the operation Instructions.

### **ENVIRONMENTAL CONDITIONS**

This instrument is intended for indoor use in an installation category I, pollution degree 2 environments. It is designed to operate at a maximum relative humidity of 80% and at altitudes of up to 2000 meters. Refer to the specifications tables for the ac mains voltage requirements and ambient operating temperature range.

### **BEFORE APPLYING POWER**

Verify that the product is set to match the available line voltage and the correct fuse is installed.

### **GROUND THE INSTRUMENT**

This product is a Safety Class 1 instrument (provided with a protective earth terminal). To minimize Shock hazard, the instrument chassis and cabinet must be connected to an electrical ground. The Instrument must be connected to the ac power supply mains through a three conductor power cable, With the third wire firmly connected to an electrical ground (safety ground) at the power outlet. Any Interruption of the protective (grounding) conductor or disconnection of the protective earth terminal Will cause a potential shock hazard that could result in personal injury.

### **FUSES**

Only fuses with the required rated current, voltage, and specified type (normal blow, time delay, etc.) should be used. Do not use repaired

Fuses or short circuited fuse holder. To do so could cause a shock or fire hazard.

### **DO NOT OPERATE IN AN EXPLOSIVE ATMOSPHERE.**

Do not operate the instrument in the presence of flammable gases or fumes.

### **KEEP AWAY FROM LIVE CIRCUITS.**

Operating personnel must not remove instrument covers. Component replacement and internal Adjustments must be made by qualified service personnel. Do not replace components with power Cable connected. Under certain conditions, dangerous voltages may exist even with the power cable Removed. To avoid injuries, always disconnect power, discharge circuits and remove external voltage sources before touching components.

### **DO NOT SERVICE OR ADJUST ALONE.**

Do not attempt internal service or adjustment unless another person, capable of rendering first aid and resuscitation, is present.

### **DO NOT EXCEED INPUT RATINGS.**

This instrument may be equipped with a line filter to reduce electromagnetic interference and must be Connected to a properly grounded receptacle to minimize electric shock hazard. Operation at line Voltages or frequencies in excess of those stated on the data plate may cause leakage currents in excess of 5.0 mA peak.

### **DO NOT SUBSTITUTE PARTS OR MODIFY INSTRUMENT.**

Because of the danger of introducing additional hazards, do not install substitute parts or perform any unauthorized modification to the instrument. Return the instrument to a PRODIGIT ELECTRONICS Sales and Service Office for service and repair to ensure that safety features are maintained.

*Instruments which appear damaged or defective should be made inoperative and secured against unintended operation until they can be repaired by qualified service personnel.*

## 4034A Noise and Timing Analyzer Module operation manual Table of Contents

CHAPTER 1 INTRODUCTION .....	9
1-1. GENERAL DESCRIPTION .....	9
1-2. SPECIFICATIONS .....	10
1-3. STANDARD ACCESSORIES .....	11
1-4. OPTION.....	11
CHAPTER 2 INSTALLATION .....	12
2-1. INSPECTION.....	12
2-2. CHECK LINE VOLTAGE .....	12
2-3. FUSE EXCHANGE .....	12
2-4. GROUNDING REQUIREMENTS .....	13
2-5. ENVIRONMENTAL REQUIREMENTS .....	14
2-6. REPAIR .....	14
2-7. CLEANING .....	14
2-8. POWER UP.....	14
2-9. CONNECTION OF INPUT TERMINAL .....	14
2-10. RS232 INTERFACE .....	15
2-11. GPIB INTERFACE .....	15
2-12. USB INTERFACE .....	15
2-13. LAN INTERFACE.....	16
CHAPTER 3 OPERATION .....	17
3-1. 4034A DIMENSION DESCRIPTION .....	17
3-2. 4034A PANEL DIAGRAM .....	18
3-3. OPERATING INSTRUCTIONS .....	19
CHAPTER 4 COMMUNICATION INTERFACE PROGRAMMING OPERATION .....	24
4-1. INTRODUCTION .....	24
4-2. THE SUMMARY OF RS232 INTERFACE AND COMMAND.....	24
4-3. 4034A COMMUNICATION INTERFACE PROGRAMMING COMMAND LIST .....	25
4-4. THE DESCRIPTION OF ABBREVIATION .....	27
4-5. COMMUNICATION LNTERFACE PROGRAMMING COMMAND SYNTAX DESCRIPTION .....	27
4-6. COMMUNICATION LNTERFACE PROGRAMMING COMMAND DESCRIPTION .....	27
APPENDIX A 4034A USB INSTRUCTION.....	34
APPENDIX B 4034A LAN INSTRUCTION .....	37
FIGURE 1-1 4034A BASIC OPERATION SEQUENCE DIAGRAM .....	9
FIGURE 2-14034A SERIES AC INPUT CONNECTION .....	12
FIGURE 2-2 FUSE HOLDER .....	13
FIGURE 2-3 4034A RS232 INTERFACE.....	15
FIGURE 2-4 4034A GPIB INTERFACE .....	15
FIGURE 2-5 4034A USB INTERFACE.....	15

FIGURE 2-6 4034A LAN INTERFACE .....16

FIGURE 3-1 4034A DIMENSIONS .....17

FIGURE 4-1 PC RS232 INTERFACE CONNECTION DIAGRAM.....24

TABLE 1-1 4034A SPECIFICATION TABLE.....10

TABLE 4-1 4034A COMMAND LIST .....26

TABLE 4-2 GPIB COMMAND TERMINATOR .....27

# Chapter 1 Introduction

## 1-1. General description

The 4034A noise/timing analyzer has 4 Channel input terminals, which can test DC-type DUTs. The main body does not have a control panel. It must communicate with the PC Through the communication interface. After the power is turned on, the user can send Commands or settings through the PC. You can read the current measured value.

After the power is turned on, the Timing Function and Overshoot Function start to detect the AC\_ON trigger signal. After detecting the trigger signal, they start to measure Set-up time, Rise Time and V- Overshoot, I-Overshoot (Sampling Times, VL, VH is set by the User).

The user can send a command through the PC, after reading the current measurement value, change the MODE from Overshoot to Ripple (or Dimming Current or Peak), and then start to Measure V-Ripple rms & pp, I-Ripple rms & pp, the user can send commands through the PC to read the measured values of Ripple and Noise (you must first set Noise input to On when Measuring Noise).

After the Timing Function detects the trigger signal, it starts to Measure Hold-up time and Fall Time. The user can send commands through the PC Read The current measured value.

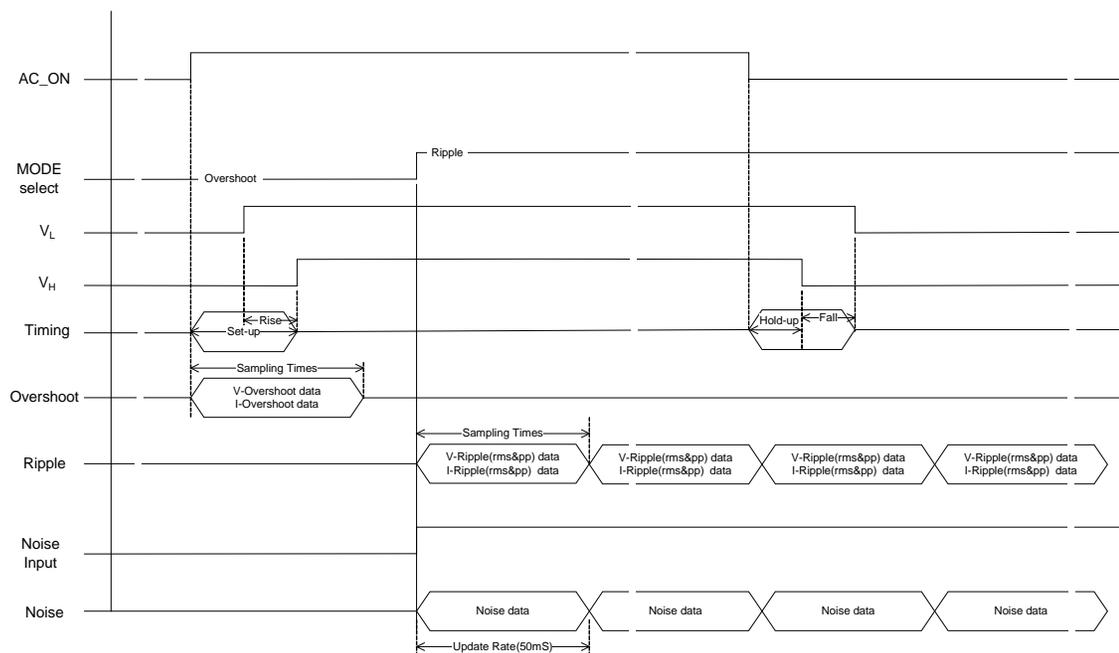


Figure 1-1 4034A basic operation sequence diagram

## 1-2. Specifications

Model	4034A		
No. of input channel	4		
Timing Measurement		Ripple Measurement	
Set-up/Hold-up/Rise/Fall Time		Band Width	0 ~ 100 KHz
Voltage range	0 ~ 80/600 Vdc	Voltage range	0 ~ 80/600 Vdc
Current range	*(1/4F.S.)/(F.S.) Adc	Measurement range	0 ~ 3.2/20 Vp-p
Timing range	1 Sec/2 Sec/4 Sec/8 Sec/16 Sec	Resolution	0.001/0.01V
Resolution	1 uS/2uS/4uS/8uS/16uS	Current range	*(1/4F.S.)/(F.S.) Adc
Vth1/Vth2		Measurement range	*(1/8F.S.)/(1/2F.S.) Ap-p
Voltage range	5% ~ 95% of reading	Resolution	0.001/0.01A
Resolution	0.1 V/1V, 0.001A/0.01A	Accuracy	±5% of (Reading + Range)
Accuracy	2% of (Reading + Range)	Sampling Rate	100KHz
Noise Measurement		Update Rate	50~1000 mS
Low Pass Filter	up to 20 MHz	Resolution	1mS
Voltage range	0.6/3Vp-p	Dimming Measurement	
Resolution	1mV	Band Width	100KHz
Accuracy	±2% OF reading + 5mV	Current range	*(1/8F.S.)/(1/2F.S.) Adc
Over Shoot Measurement		Resolution	0.001/0.01A
Band Width	0 ~ 100 KHz	Accuracy	±5% of (Reading + Range)
Voltage range	0 ~ 80/600 Vdc	Sampling Rate	100KHz
Measurement range	0 ~ 80/600 Vdc	Update Rate	50~1000 mS
Resolution	0.1/1Vdc	Resolution	1mS
Current range	*(1/4F.S.)/(F.S.) Adc	Frequency range	10Hz~35KHz
Measurement range	*(1/4F.S.)/(F.S.) Adc	Resolution	1Hz
Resolution	0.001/0.01A	Accuracy	±1% of (Reading + Range)
Accuracy	±5% of (Reading + Range)	Duty(Ton) Range	3uS~90mS
Sampling Rate	100KHz	Resolution	1uS
Update Rate	50~1000 mS	Accuracy	±1% of (Reading + Range)
Resolution	1mS		
Vpeak Measurement			
Vpeak+/Vpeak-			
Band Width	0 ~ 100 KHz		
Voltage range	0 ~ 80/600 Vdc		
Measurement range	0 ~ 80/600 Vdc		
Resolution	0.1/1Vdc		
Accuracy	±1% of (Reading + Range)		
Sampling Rate	100KHz		
Update Rate	50~1000 mS		
Resolution	1mS		

Note\*: F.S.: is the current range of the selected electronic load

AC INPUT	LINE	115Vac/ 230Vac ± 10%
	FREQUENCY	50/60 Hz
	PROTECT	FUSE T1A
	MAX. POWER CONSUMPTION	150VA

Model	Dimension(HxWxD)	WEIGHT
4034A	88.9 mm x 440 mm x 450 mm	9.5Kg

Table 1-1 4034A specification table

### 1-3. Standard Accessories

1. 4034A operation manual..... 1PCs
2. R8-25A RED;BANANA PLUG 4mm RED ....4 PCs
3. R8-25A BLK;BANANA PLUG 4mm BLK .....4 PCs
4. Y type terminal (SVM1-4) .....8 PCs
5. SMA CABLE RRG174 180cm.....8 PCs
6. RS232 Interface.....1 PCs
7. Power Cord.....1 PCs

### 1-4. Option

- 1.4.1. GPIB Interface.
- 1.4.2. USB Interface + USB DRIVER CD ◦
- 1.4.3. LAN Interface + LAN DRIVER CD ◦
- 1.4.4. GPIB cable 1 M
- 1.4.5. GPIB cable 2 M
- 1.4.6. USB TYPE A TO TYPE B cable 1.8 M.
- 1.4.7. Handle accessories

## Chapter 2 Installation

### 2-1. Inspection

The 4034A noise/timing analyzer was carefully inspected before shipment. If instrument damage has occurred during transport, please inform Prodigit's sales and service office or Representative.

Your 4034A noise/timing analyzer shipped with a power cord for the type of Terminal blocks used at your location. If the appropriated cord was not included, please contact your nearest Prodigit sales office to obtain the correct cord. Refer to "check line voltage "to check The line voltage is 100V~230Vac.

### 2-2. Check line voltage

The 4034A noise/timing analyzer can operation with 100 Vac ~230Vac input as indicated on the label on the rear panel.

Make sure that the factory check mark corresponds to your nominal line voltage. Skip this Procedure if the label is corrected marked.

- 2.2.1. With the 4034A power OFF, disconnect the power cord.
- 2.2.2. Refer the drawing on the rear panel of 4034A high power load in Fig 2-1.

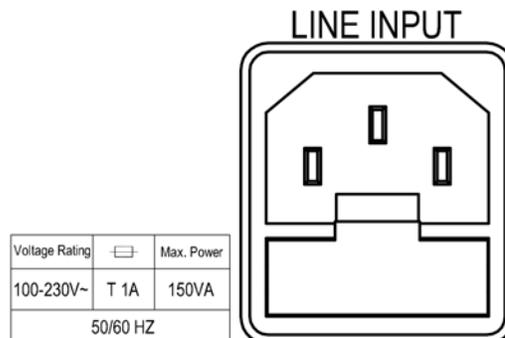


Figure 2-1 4034A series AC Input Connection

### 2-3. Fuse Exchange

This product has the power fuse, and exchanges it according to the following procedure.



Never fail to turn off the power of this product, and disconnect the plug of the AC Power Cable.



- To avoid the fire or electronic shock, the Fuse that will be used in the product should have the safety standard in the area of the region you use. Any use of improper Fuse or shorting the Fuse holder would be extremely dangerous and would be strictly prohibited.
- Before exchanging the Fuse, if there are abnormal odor or abnormal noise,
- Please stop using immediately and ask for the repair.

2.3.1. Check the rating of the line fuse and replace it with the correct fuse if necessary.  
100V~230V use T1A/250V (5\*20mm).

2.3.2. The AC line fuse is located below the AC line receptacle see Fig 2-2. Use a small Screwdriver to extract the fuse holder, to change a new one. Change an appropriate Specifications fuse which indicated in Table 1-1.

2.3.3. Reinstall fuse holder and connect the power cord.

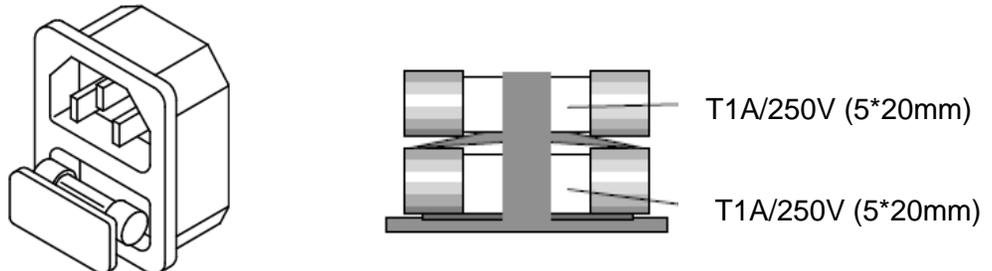


Figure 2-2 Fuse holder

## 2-4. Grounding requirements



### SHOCK HAZARD

1. It is requested to use the 3Pin plug connector only for 4034A to out of danger when electric leakage. And the complete and proper grounded is necessary.
2. The 4034A noise/timing analyzer is equipped with three conductor cable which plugs in an appropriate receptacle to ground the instrument's cover.

## 2-5.Environmental requirements

- Indoor use.
- Measurement Category I.
- Pollution Degree 2.
- Relative Humidity 80% Max.
- Ambient Temperature 0 to +40°C
- Altitude up to 2000m.
- The equipment is not for measurements performed for CAT II, III and IV.
- Transient Overvoltage on the mains supply can be 2500V.

## 2-6.Repair

If the 4034A noise/timing analyzer fails or needs calibration, please put a label on the frame with the owner (company line number department staff) and indicate it as calibration service or repair service, and then notify PRODIGIT Electronics Dealer or directly with this Company contact.

## 2-7.Cleaning

Use a soft or slightly damp cloth to clean this product.



- BEFORE you clean the unit, switch the mains power off and disconnect the input lead.
- Please do NOT use any organic solvent capable of changing the nature of the plastic Such as benzene or acetone.
- Please ensure that no liquid is allowed to penetrate this product.

## 2-8.Power Up

The following procedure should be followed before applying mains power:

- 2.8.1. Turn off (O) the 4034A POWER switch
- 2.8.2. Check that the power cord is corrected.
- 2.8.3. Check that nothing is connected to the DC INPUT on the rear panels.
- 2.8.4. Turn on the 4034A POWER switch.

## 2-9.Connection of input terminal

- 2.9.1. Turn off the power of the DUT.
- 2.9.2. Confirm that the DUT has no output power.
- 2.9.3. Confirm whether the polarity of the test object is correctly connected.

## 2-10. RS232 Interface

The 4034A noise/timing analyzer provides a female RS232 (FEMALE) connection device on the back panel. This connection device is connected to the RS232 port of the computer in a one-to-one manner.



Figure 2-3 4034A RS232 Interface

## 2-11. GPIB Interface

The GPIB connector is located on the rear panel of the 4034A noise/timing analyzer and is used to connect to a GPIB controller (CONTROLL) or other devices (DEVICES).

There are two more important restrictions when connecting to GPIB, as described later:

2.11.1 The maximum number of devices including the controller is no more than 15.

2.11.2 The maximum length of all cable is no more than 2 meters times the number of devices connected together, up to 20 meters maximum.



Figure 2-4 4034A GPIB Interface

## 2-12. USB Interface

4034A noise/timing analyzer provides a USB port that can be connected to the rear panel; please refer to appendix 1 for instructions



Figure 2-5 4034A USB Interface

## 2-13. LAN Interface

4034A noise/timing analyzer provides a LAN port on the rear panel; please refer to appendix 2 for instructions



Figure 2-6 4034A LAN Interface

### Chapter 3 Operation

This chapter describes the front panel function and operation of each 4034A, The Communication Interface is described in Chapter 4.

#### 3-1. 4034A dimension description

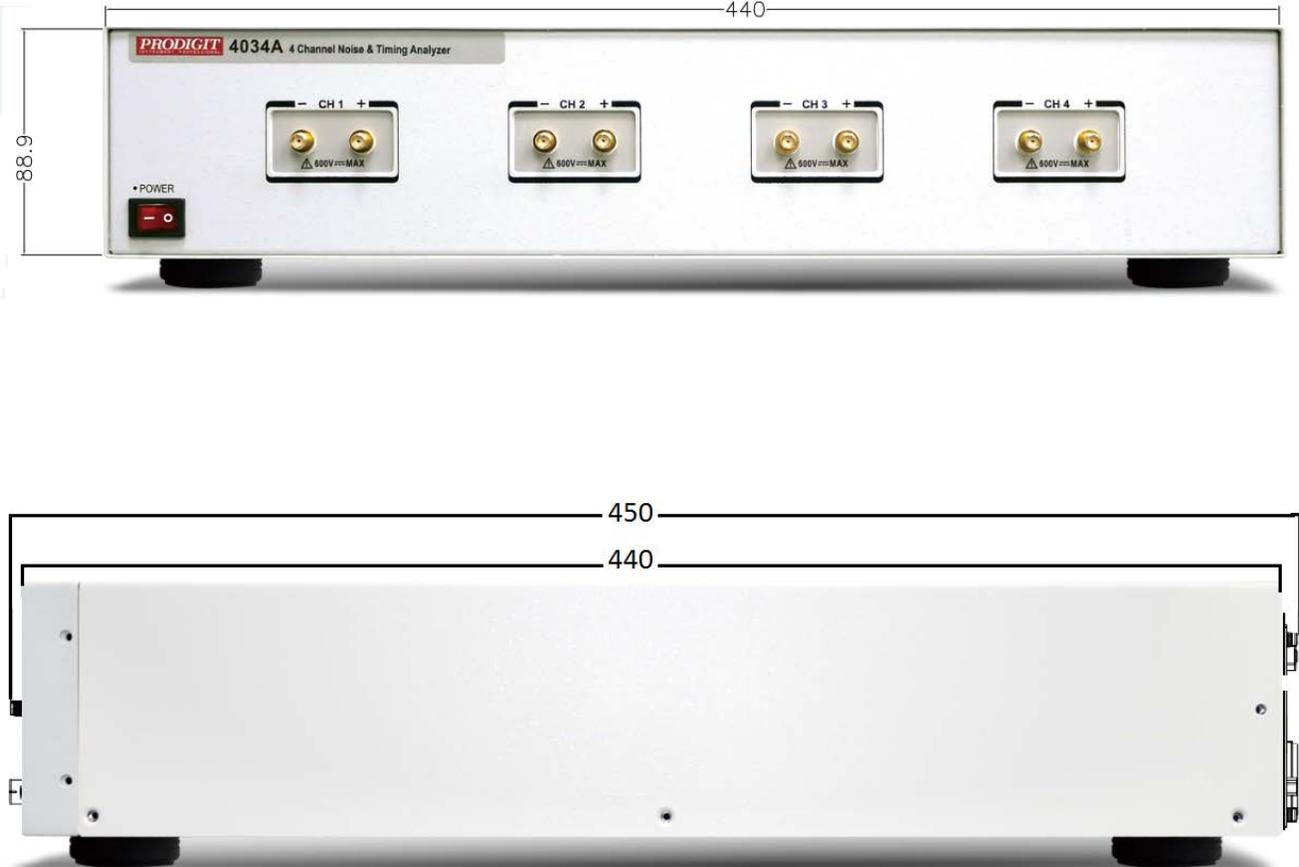
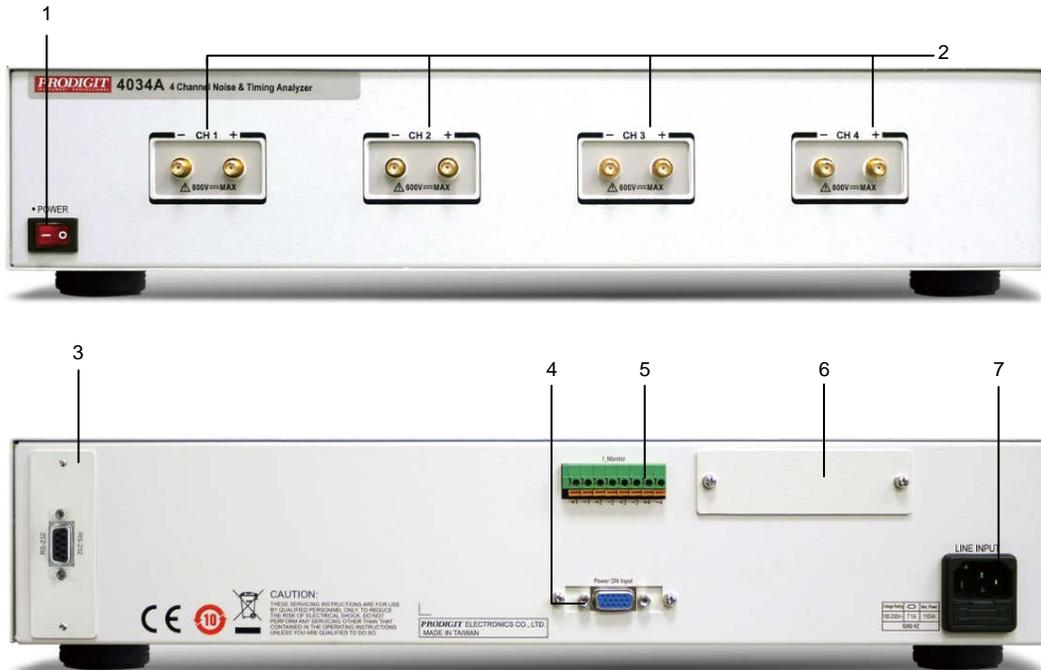


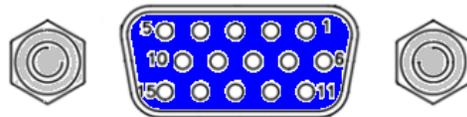
Figure 3-1 4034A Dimensions

### 3-2. 4034A panel diagram



1. Power switch
2. Input terminals for measuring voltage of channels 1~4
3. Interface card (RS232,GPIB, USB, LAN)
4. Power On signal and select input terminal

#### POWER ON INPUT



Pin01: N/A	Pin06: N/A	Pin11: CH1 AC_ON (-)
Pin02: N/A	Pin07: N/A	Pin12: CH2 AC_ON (-)
Pin03: N/A	Pin08: N/A	Pin13: CH3 AC_ON (-)
Pin04: N/A	Pin09: N/A	Pin14: CH4 AC_ON (-)
Pin05: CH1 AC_ON(+)	Pin10: CH2 AC_ON (+)	Pin15: CH3, CH4 AC_ON (+)

Note:

AC ON(+): +5V

AC ON Signal: Low -> AC ON,High -> AC OFF

5. Channel 1~4 I-monitor input terminal (connected to the selected electronic load, input Range 0~10V).
6. Reserve terminal holes.
7. AC power input connector.

### 3-3. Operating Instructions

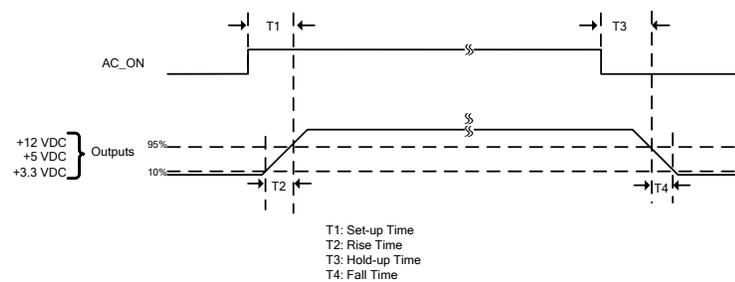
4034A noise/timing analyzer has Timing Measurement, Overshoot Measurement, Ripple Measurement, Noise Measurement, Vpeak Measurement, Dimming Measurement and other functions. The following will explain each function.

#### 3.3.1.CHANNEL selection

When CHANNEL is set to "0", it means that all CHANNELs are selected. 4034A will Synchronously issue the same command to CH1~CH4. When reading the value, CH1~CH4 will be read once, and the middle of CHANNEL will be separated by ",". When set to "1" or "2" or "3" or "4", it means to select a separate CHANNEL (ex. CHAN 1)Each time the power is turned on, it will return to the default "0".

#### 3.3.2.Timing Measurement

Timing measurement function can measure Setup Time, Hold-up Time, Rise Time, Fall Time.



#### ● Test steps

- a. Set Timing Source (choose the measurement source as voltage or current)  
ex. TIM: SOU V
- b. Set V Range (select voltage Range; Low: 0.0~80.0V, High: 0~600V)  
ex. VOLT: RANG LOW
- c. Set VH, VL  
ex. TIM:VTL 1  
TIM:VTH 4
- d. Set the Timing Range (Timing Range is the maximum measurement time for rising or falling. Different Ranges have different Resolutions. After the Timing Range setting command is issued, the system restarts to detect the On trigger signal)  
  
ex. TIM:RANG 1
- e. Make the DUT output voltage  
After the system detects the On trigger signal, it clears the measured value to 0 and starts counting again. After the voltage of the object under test rises to VH, the Setup Time and Rise Time can be read. At this time, the system starts to detect the Off trigger signal.
- f. Read Set-up Time 、 Rise Time  
ex. MEAS:TIM:SETU?  
MEAS:TIM:RISE?

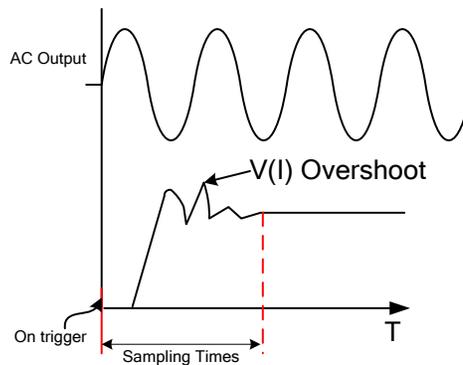
g. After the system detects the Off trigger signal, it starts counting. After the voltage of the DUT drops to VL, the Hold-up Time and Fall Time can be read.

ex. MEAS:TIM:HOLD?  
MEAS:TIM:FALL?

Note: If the measurement source is current, you must set Timing Source to current (TIM: SOU I), Range to I Range (CURR: RANG LOW), VH, VL to IH, IL (TIM: ITH 0.6, TIM: ITH 2.2)

### 3.3.3. Overshoot Measurement

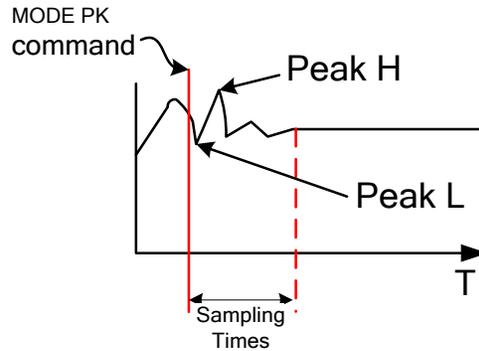
Selecting Overshoot Mode, it starts to detect the on trigger signal. After detecting the on Trigger signal, it starts to sample the value (Sampling Times is set by the user). The highest Point of the sampling value is V (I) Overshoot. The Overshoot Function can measure at the Same time V-Overshoot and I-Overshoot.



- Test steps
  - a. Set Range
    - ex. VOLT:RANG LOW
    - CURR: RANG LOW ((I- Overshoot not measured can be omitted).
  - b. Set Sampling Times
    - ex. STIME 10000
  - c. Set Mode to Overshoot mode
    - ex. MODE OV
  - d. Make the DUT output voltage. After the system detects the on trigger signal, it will start to Detect the highest value during the sampling times period.
  - e. Read Overshoot value
    - ex. MEAS:OVERSHOOT:VOLT?
    - MEAS: OVERSHOOT: CURR? (I- Overshoot not measured can be omitted)

### 3.3.4. Vpeak Measurement

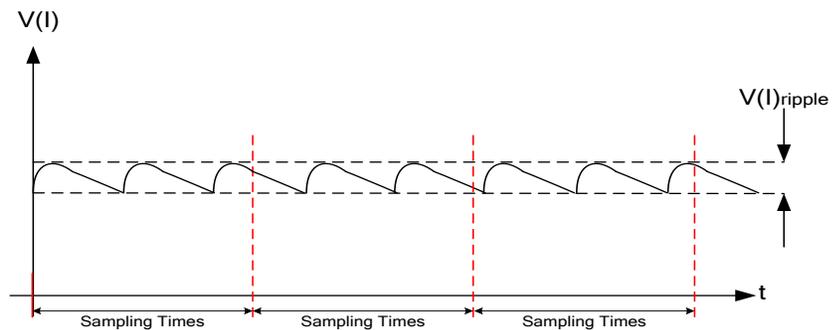
Selecting Peak Mode, it starts to detect the highest and lowest values (Sampling Times is set by the user). After each MODE PK command, the peak value can be detected again.



- Test steps
  - a. Set Range  
ex. VOLT:RANG LOW
  - b. Set Sampling Times  
ex. STIME 10000
  - c. Set Mode is Peak mode  
ex. MODE PK
  - d. waiting time > Sampling Times
  - e. Read Vpeak value  
ex. MEAS:VPKH?  
MEAS: VPKL?

### 3.3.5. Ripple Measurement

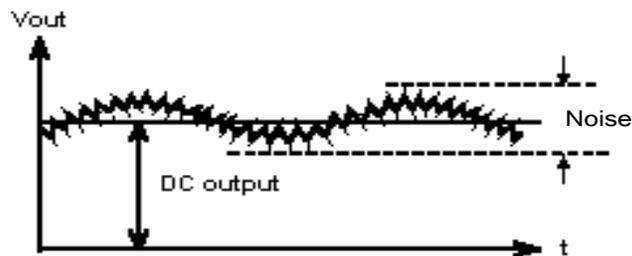
Select Ripple Mode to start continuous measurement of V-Ripple rms & p-p, I-Ripple Rms & p-p, and the update time is Sample Times set by the user. Ripple Function can measure V-Ripple and I-Ripple at the same time, Band Width: 100 KHz.



- Test steps
  - a. Set Range
    - ex. VOLT:RANG LOW
    - CURR: RANG LOW (Unmeasured I- Ripple can be omitted)
  - b. Set Sampling Times
    - ex. STIME 10000
  - c. Set Mode is Ripple mode
    - ex. MODE RI
  - d. Read Ripple value
    - ex. MEAS:RIPPLE: VRMS?
    - MEAS: RIPPLE: VPP?
    - MEAS: RIPPLE: IRMS? (Unmeasured I- Ripple can be omitted)
    - MEAS: RIPPLE: IPP? (Unmeasured I- Ripple can be omitted)

### 3.3.6. Noise Measurement

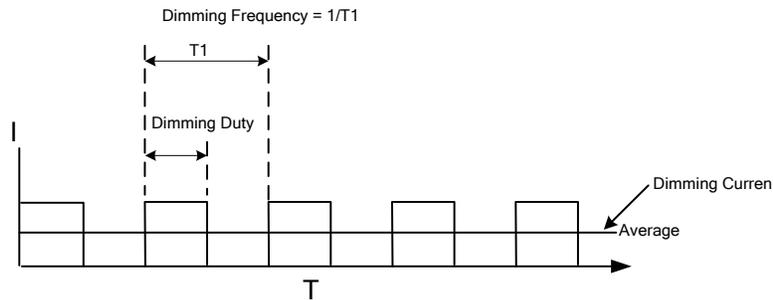
Selecting Noise Mode and setting Noise input to on, the noise will be continuously Measured Noise Function can measure higher frequency noise, Band Width: 20MHz.



- Test steps
  - a. Set Range
    - ex. NOIS:RANG LOW
  - b. Set Noise Input
    - ex. NOIS:INP ON
  - c. Read Noise value
    - ex. MEAS:NOIS?
  - e. Set Noise Input
    - ex. NOIS:INP OFF

### 3.3.7. Dimming Measurement

Select Dimming Mode to measure the dimming value, Dimming Current, Dimming Frequency and Dimming Duty.



#### • Test steps

- a. Set Timing Source (Select the measurement source as current)  
ex. TIM: SOU I
- b. Set CURR Range  
ex. CURR:RANG HIGH
- c. Set Sampling Times  
ex. STIME 10000
- d. Set Mode is Dimming mode  
ex. MODE DI
- e. waiting time > Sampling Times
- f. Read Dimming Current value  
ex. MEAS:DIM:CURR?
- g. Set IL (Set to be the same as reading Dimming Current)  
ex. TIM:ITL 5
- i. Read Dimming Frequency value  
ex. MEAS:DIM:FREQ?
- j. Read Dimming Duty value  
ex. MEAS:DIM:DUTY?

## Chapter 4 COMMUNICATION INTERFACE PROGRAMMING OPERATION

### 4-1. Introduction

The communication interface programming on the rear panel of the 4034A noise/timing Analyzer can be connected to the remote control interface of a personal computer (PC) or a Notebook Computer (Note Book PC), and can use high-level language C and VB Applications, constitute an automatic control system.

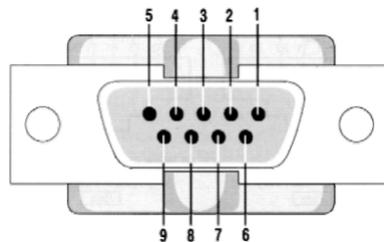
Note 1: When using the USB/LAN interface to control the 4034A, the USB/LAN interface will be converted to an RS232 interface.

### 4-2. The summary of RS232 Interface and command

The following RS232 commands are same as GPIB commands. The RS232 protocol in 4034A noise/timing Analyzer is listing below:

Baud-rate	: 115200 bps
Parity	: NO
Data bit	: 8 bit
Stop bit	: 1 bit
Handshaking	: NO

Users only need to use the general one-to-one RS232 cable.



PIN	Abbreviation	Description
Pin1	CD	Carrier Detect
Pin2	RXD	Receive
Pin3	TXD	Transmit
Pin4	DTR	Data Terminal Ready
Pin5	GND	Ground
Pin6	DSR	Data Set Ready
Pin7	RTS	Request To Send
Pin8	CTS	Clear To Send
Pin9	RI	Ring Indicator

Figure 4-1 PC RS232 interface connection diagram

## 4-3.4034A COMMUNICATION INTERFACE PROGRAMMING COMMAND LIST

When the PC sets the CHANnel command parameter to "0" for the 4034A, it means that all channels are selected. The 4034A will synchronously issue the same commands to CH1~CH4. When reading the value, CH1~CH4 will be read once, and the middle of CHANNEL will be separated by "," .

Select a separate CHANNEL, ex: "1" stands for "CH1", "3" stands for "CH3"

SETTING PRESET NUMERIC COMMAND	NOTE	RETURN
[PRESet : ] STIME {SP} {n} ( ;   NL)	n=50 ~1000(mS) Measuring time	
[PRESet : ] TIMing : VTL {SP} {n} ( ;   NL)	Low Rang: n=0.0~80.0(V) High Rang: n=0~600(V)	
[PRESet : ] TIMing : VTH {SP} {n} ( ;   NL)	Low Rang: n=0.0~80.0(V) High Rang: n=0~600(V)	
[PRESet : ] TIMing : ITL {SP} {n} ( ;   NL)	Low Rang: n=0.000~2.500 High Rang :n=0.00~10.00	
[PRESet : ] TIMing : ITH {SP} {n} ( ;   NL)	Low Rang: n=0.000~2.500 High Rang :n=0.00~10.00	

QUERY PRESET NUMERIC COMMAND	NOTE	RETURN
[PRESet : ] STIME {?} ( ;   NL)	The unit is (mS)	50 ~1000
[PRESet : ] TIMing : VTL {?} {n} ( ;   NL)	The unit is (V)	0.0~80.0   0~600
[PRESet : ] TIMing : VTH {?} {n} ( ;   NL)	The unit is (V)	0.0~80.0   0~600
[PRESet : ] TIMing : ITL {?} {n} ( ;   NL)	The unit is (V)	0.000~2.500   0.00~10.00
[PRESet : ] TIMing : ITH {?} {n} ( ;   NL120)	The unit is (V)	0.000~2.500   0.00~10.00

STATE COMMAND	NOTE	RETURN
[STATe : ] VOLT : RANGE {SP} { LOW   HIGH   0   1 } ( ;   NL)		
[STATe : ] VOLT : RANGE {?} ( ;   NL)	0: LOW 1: HIGH default is HIGH	0   1
[STATe : ] CURR : RANGE {SP} { LOW   HIGH   0   1 } ( ;   NL)		
[STATe : ] CURR : RANGE {?} ( ;   NL)	0: LOW 1: HIGH default is HIGH	0   1
[STATe : ] NOISe : RANGE {SP} { LOW   HIGH   0   1 } ( ;   NL)		
[STATe : ] NOISe : RANGE {?} ( ;   NL)	0: LOW 1: HIGH default is HIGH	0   1
[STATe : ] NOISe : INPut {SP} {OFF   ON   0   1} ( ;   NL)	Noise Input Switch ON/OFF	
[STATe : ] NOISe : INPut {?} ( ;   NL)	0:OFF 1:ON default is 0	0   1
[STATe : ] MODE{SP} {OV   RI   DI   PD   PK   0   1   2   4} ( ;   NL)	OV: Overshoot mode RI: Ripple mode DI: Dimming Current PK: Peak mode	
[STATe:] MODE{SP} {?} ( ;   NL)	0: Overshoot 1: Ripple 2: Dimming Current 4: Peak mode default is Overshoot	0   1   2   4
[STATe:] TIMing:SOUrce {SP} {V   I   0   1} ( ;   NL)	V: Measuring Voltage sequence I: Measuring current sequence	

[STATe:] TIMing: SOUrcE {?} (;   NL)	0:VOLT 1:CURR default is VOLT	0   1
[STATe:] TIMing:RANGe {SP} {1   2   4   8   16} (;   NL)	Select the maximum measurement time 1Sec/2Sec/4Sec/8Sec/16Sec default is 2Sec	
[STATe:] TIMing:RANGe {?} (;   NL)	default is 2Sec	1   2   4   8   16

System command:	NOTE	RETURN
[ SYStem : ] CHANnel{SP}{0   1   2   3   4} ( ;   NL)	0 All Channel 1 CH 1 2 CH 2 3 CH 3 4 CH 4	
[ SYStem : ] NAME {?} ( ;   NL)		"PRODIGIT_ 4034A"
[ SYStem : ] ADDRess {SP} {n}( ;   NL)	n=1 ~30 GPIB Assress default is 7	
[ SYStem : ] REMOTE( ;   NL)	Only RS232cmd	
[ SYStem : ] LOCAL( ;   NL)	Only RS232cmd	
[ SYStem : ] BAUDrate{SP}{0   1} ( ;   NL)	Select UART baud rate	
[ SYStem : ] BAUDrate{?} ( ;   NL)	0: 115200 1: 921000 default is 0	0   1

Measurement command	NOTE	RETURN
MEASure : TIMing : SETUptime {?}( ;   NL)	The unit is (uS)	0~1000000
MEASure : TIMing : RISEtime {?}( ;   NL)	The unit is (uS)	0~1000000
MEASure : TIMing : HOLDuptime {?}( ;   NL)	The unit is (uS)	0~1000000
MEASure : TIMing : FALLtime {?}( ;   NL)	The unit is (uS)	0~1000000
MEASure : OVERSHOOT : VOLT {?}( ;   NL)	The unit is (V)	0.0~80.0   0~600
MEASure : OVERSHOOT : CURR {?}( ;   NL)	The unit is (V)	0.000~2.500   0.00~10.00
MEASure : RIPPLE : VRMS {?}( ;   NL)	The unit is (V)	0.000~3.200   0.00~20.00
MEASure : RIPPLE : IRMS {?}( ;   NL)	The unit is (V)	0.000~1.250   0.00~5.00
MEASure : RIPPLE : VPP {?}( ;   NL)	The unit is (V)	0.000~3.200   0.00~20.00
MEASure : RIPPLE : IPP {?}( ;   NL)	The unit is (V)	0.000~1.250   0.00~5.00
MEASure : NOISe{?}( ;   NL)	The unit is (V)	0.000~0.600   0.000~3.000
MEASure : DIMming : CURR {?}( ;   NL)	The unit is (V)	0.000~1.250   0.00~5.00
MEASure : DIMming : FREQuency {?}( ;   NL)	The unit is (uS)	10~35000
MEASure : DIMming : DUTY {?}( ;   NL)	The unit is (Hz)	3~90000
MEASure : VPKH{?}( ;   NL)	The unit is (V)	0.0~80.0   0~600
MEASure : VPKL{?}( ;   NL)	The unit is (V)	0.0~80.0   0~600

Table 4-1 4034A Command List

#### 4-4. The description of abbreviation

SP: Space, the ASCII code is 20 Hexadecimal.

:: Semicolon, Program line terminator, the ASCII code is 0A Hexadecimal.

NL: New line, Program line terminator, the ASCII code is 0A Hexadecimal.

NR2: Digits with decimal point. It can be accepted in the range and format of ###.#####.

**For Example:**

30.12345, 5.0

#### 4-5. COMMUNICATION INTERFACE PROGRAMMING COMMAND SYNTAX DESCRIPTION

{ } : The contents of the { } symbol must be used as a part or data of the GPIB command, it cannot be omitted.

[ ] : The contents of the [ ] symbol indicates the command can be used or not. It depends on the testing application.

| : This symbol means option. For example "LOW|HIGH" means it can only use LOW or HIGH as the command, it can choose only one as the setting command.

Terminator: You have to send the program line terminator character after send the GPIB command, the available command terminator characters which can be accepted in 4034A is listed in Table 4-2.

LF
LF WITH EOI
CR,LF
CR,LF WITH EOI

Table 4-2 GPIB COMMAND TERMINATOR

#### 4-6. COMMUNICATION INTERFACE PROGRAMMING COMMAND DESCRIPTION

##### 4-6-1 PRESET Set and read preset values

##### **STIME**

Syntax: [PRESet:] STIME {SP}{NR2}{ ; | NL}  
[PRESet:] STIME? { ; | NL}

Purpose: Set and read Sampling Times.

Description: Sampling Times can be set from 50 ~ 1000 (ms).

**VTL**

Syntax: [PRESet : ] TIMing : VTL {SP} {n} (; | NL)  
[PRESet : ] TIMing : VTL {?} (; | NL)

Purpose: Set and read the Timing Function parameter VTL.

Description: VTL can be set range n: Low Rang: 0.0~80.0, High Rang: 0~600.

**VTH**

Syntax: [PRESet : ] TIMing : VTH {SP} {n} (; | NL)  
[PRESet : ] TIMing : VTH {?} (; | NL)

Purpose: Set and read the Timing Function parameter VTH.

Description: VTH can set range n: Low Rang: 0.0~80.0, High Rang: 0~600.

**ITL**

Syntax: [PRESet : ] TIMing : ITL {SP} {n} (; | NL)  
[PRESet : ] TIMing : ITL {?} (; | NL)

Purpose: Set and read the Timing Function parameter ITL.

Description: ITL can set range n: Low Rang: 0.000~2.500, High Rang: 0.00~10.00.

**ITH**

Syntax: [PRESet : ] TIMing : ITH {SP} {n} (; | NL)  
[PRESet : ] TIMing : ITH {?} (; | NL)

Purpose: Set and read the Timing Function parameter ITH.

Description: ITH can set range n: Low Rang: 0.000~2.500, High Rang: 0.00~10.00.

**4-6-2 · STAGE Set and read working status****VOLT : RANGE {SP} { LOW | HIGH | 0 | 1 }**

Syntax: [STATE : ] VOLT : RANGE {SP} { LOW | HIGH | 0 | 1 } (; | NL)  
[STATE : ] VOLT : RANGE {?} (; | NL)

Purpose: Set and read the voltage range.

Description: Set and read the voltage high & low range, the return value 0 means the voltage low range, and the return value 1 means the voltage high range.

**CURR : RANGE {SP} { LOW | HIGH | 0 | 1 }**

Syntax: [STATE : ] CURR : RANGE {SP} { LOW | HIGH | 0 | 1 } (; | NL)  
[STATE : ] CURR : RANGE {?} (; | NL)

Purpose: Set and read the current high & low range, the return value 0 means the voltage low range, and the return value 1 means the current high range.

**NOISe : RANGE {SP} { LOW | HIGH | 0 | 1 }**

Syntax: [STATe : ] NOISe : RANGE {SP} { LOW | HIGH | 0 | 1 } (; | NL)  
 [STATe : ] NOISe : RANGE {?} (; | NL)

Purpose: Set and read the Noise range.

Description: Set and read the noise high & low range, the return value 0 means the noise low range, and the return value 1 means the noise high range.

**NOISe : INPut {SP} { OFF | ON | 0 | 1 }**

Syntax: [STATe : ] NOISe : INPut {SP} { OFF | ON | 0 | 1 } (; | NL)  
 [STATe : ] NOISe : INPut {?} (; | NL)

Purpose: Set and read whether the voltage input is connected to the Noise Measurement circuit.

Description: Set and read the Noise INPut status. A return value of 0 means that the voltage input is not connected to the Noise measurement circuit, and a return value of 1 means that the current voltage input has been connected to the Noise measurement circuit.

**MODE{SP} {OV | RI | DI | PD | PK | 0 | 1 | 2 | 4}**

Syntax: [STATe : ] MODE{SP} {OV | RI | DI | PD | PK | 0 | 1 | 2 | 4} (; | NL)  
 [STATe : ] MODE{SP} {?} (; | NL)

Purpose: Set and read 4034A operating mode.

Description: 4034A can work in Overshoot, Ripple, Dimming, Peak. When reading 4034A operation mode, the return value 0 | 1 | 2 | 4 represents Overshoot | Ripple | Dimming | Peak mode respectively.

**TIMing : SOURce {SP} {V | I | 0 | 1}**

Syntax: [STATe : ] TIMing : SOURce {SP} {V | I | 0 | 1} (; | NL)  
 [STATe : ] TIMing : SOURce {?} (; | NL)

Purpose: Set and read the input source of the Timing Function.

Description: The input source to be selected by the Timing Function is voltage or current. When reading the input source of the Timing Function, the return value 0 | 1 represents the voltage | current input source respectively.

**TIMing : RANGE {SP} {1 | 2 | 4 | 8 | 16}**

Syntax: [STATe : ] TIMing: RANGE {SP} {1 | 2 | 4 | 8 | 16} (; | NL)  
 [STATe : ] TIMing : RANGE {?} (; | NL)

Purpose: Set and read the maximum measurement time for the rising or falling of the Timing Function.

Description: Timing Function can select the maximum measurement time. Different Ranges will have different Resolutions. When reading the Timing Range, the return value 1 | 2 | 4 | 8 | 16 represents 1 second | 2 seconds | 4 seconds | 8 seconds | 16 seconds .

4-6-3 · SYSTEM Set and read system status

**CHANnel{SP}{0 | 1 | 2 | 3 | 4}**

Syntax: [ SYStem : ] CHANnel{SP}{0 | 1 | 2 | 3 | 4} (; | NL)

Purpose: Select the Channel to be commanded.

Description: CHAN 0 Select all CHANNELs, and the same commands will be given to CH1~CH4 synchronously.

When reading the value, CH1~CH4 will be read once, and the middle of CHANNEL will be separated by ",".

ex. STIME? The return value is "1000,1000,1000,1000"

CHAN 1 Select CHANNEL 1.

CHAN 2 Select CHANNEL 2.

CHAN 3 Select CHANNEL 3.

CHAN 4 Select CHANNEL 4.

**ADDRess {SP} {n}**

Syntax: [ SYStem : ] ADDRess {SP} {n} ( ; | NL)

Purpose: Set the GPIB address.

Description: The GPIB address is preset to 7, and the range n =1~30 can be set. After the address is modified, the device needs to be searched again.

**REMOTE**

Syntax: [ SYStem : ] REMOTE(; | NL)

Purpose:Command the machine to enter the REMOTE state (RS232/USB/LAdedicated command).

Description: This command must be issued first when using RS232/USB/LAN to control the machine.

**LOCAL**

Syntax: [ SYStem : ] LOCAL (; | NL)

Purpose: Command the machine to leave the REMOTE state (RS232/USB/LAN dedicated command).

Description: You must issue this command when you want to end RS232/USB/LAN control of the machine.

**BAUDrate{SP}{0 | 1}**

Syntax: [ SYStem : ] BAUDrate{SP}{0 | 1} (; | NL)

[ SYStem : ] BAUDrate{?} (; | NL)

Purpose: Select UART baud rate.

Description: The UART baud rate is preset to 115200, and the baud rate 115200 or 921000 can be selected. When reading BAUDrate, the return value 0 | 1 represents the baud rate 115200 | 921000 respectively.

## 4-6-4 · MEASURE Read the measured value

**MEASure : TIMing : SETUptime ?**

Syntax: MEASure : TIMing : SETUptime {?}( ; | NL)

Purpose: Read the Set-up time.

Description: Read back the measured Set-up time value, the unit is (uS).

**MEASure : TIMing : RISEtime ?**

Syntax: MEASure : TIMing : RISEtime {?}( ; | NL)

Purpose: Read the rise time.

Description: Read back the measured Rise time value, the unit is (uS).

**MEASure : TIMing : HOLDuptime ?**

Syntax: MEASure : TIMing : HOLDuptime {?}( ; | NL)

Purpose: Read the Hold time.

Description: Read back the measured Hold time value, the unit is (uS).

**MEASure:TIMing : FALLtime ?**

Syntax: MEASure : TIMing : FALLtime {?}( ; | NL)

Purpose: Read the Fall time.

Description: Read back the measured Fall time value, the unit is (uS).

**MEASure : OVERSHOOT : VOLT ?**

Syntax: MEASure : OVERSHOOT : VOLT {?}( ; | NL)

Purpose: Read the voltage OVERSHOOT.

Description: Read back the measured voltage OVERSHOOT value, the unit is (V).

**MEASure : OVERSHOOT : CURR ?**

Syntax: MEASure : OVERSHOOT : CURR {?}( ; | NL)

Purpose: Read the current OVERSHOOT.

Description: Read back the measured current OVERSHOOT value, the unit is (V).

**MEASure : RIPPLE : VRMS ?**

Syntax: MEASure : RIPPLE : VRMS {?}( ; | NL)

Purpose: Read V-Ripple rms.

Description: Read back the measured V-Ripple rms value, the unit is (V).

**MEASure : RIPPLE : IRMS?**

Syntax: MEASure : RIPPLE : IRMS {?}( ; | NL)

Purpose: Read I-Ripple rms.

Description: Read back the measured I-Ripple rms value, the unit is (V).

**MEASure : RIPPLE : VPP?**

Syntax: MEASure : RIPPLE : VPP {?}( ; | NL)

Purpose: Read V-Ripple p-p.

Description: Read back the measured V-Ripple p-p value, the unit is (V).

**MEASure : RIPPLE : IPP?**

Syntax: MEASure : RIPPLE : IPP {?}( ; | NL)

Purpose: Read I-Ripple p-p.

Description: Read back the measured I-Ripple p-p value, the unit is (V).

**MEASure : NOISe?**

Syntax: MEASure : NOISe{?}( ; | NL)

Purpose: Read Noise.

Description: Read back the measured noise value, the unit is (V).

**MEASure : DIMming : CURR?**

Syntax: MEASure : DIMming : CURR {?}( ; | NL)

Purpose: Read Dimming Current.

Description: Read back the measured Dimming Current value, the unit is (V).

**MEASure : DIMming : FREQuency?**

Syntax: MEASure : DIMming : FREQuency {?}( ; | NL)

Purpose: Read the Dimming Frequency.

Description: Read back the measured Dimming Frequency value in (V).

**MEASure:DIMming: DUTY?**

Syntax: MEASure: DIMming : DUTY {?}{; | NL)

Purpose: Read Dimming Duty.

Description: Read back the measured Dimming Duty value, the unit is (V).

**MEASure : VPKH?**

Syntax: MEASure : VPKH{?}{; | NL)

Purpose: Read Vpeak High.

Description: Read back the measured Vpeak High value, the unit is (V).

**MEASure : VPKL?**

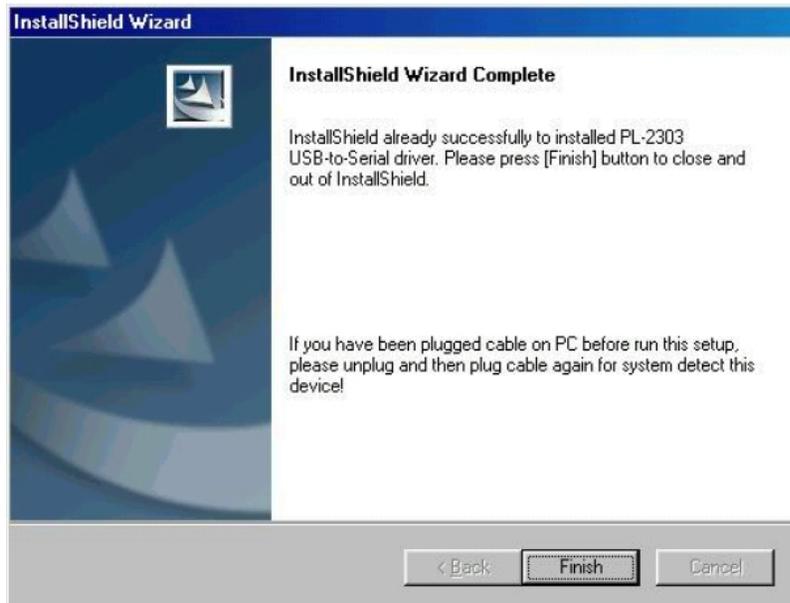
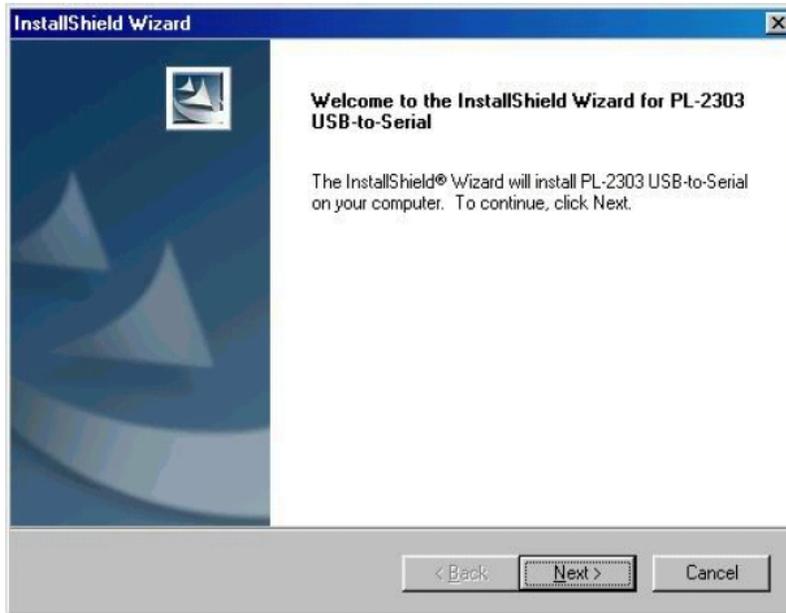
Syntax: MEASure : VPKL{?}{; | NL)

Purpose: Read Vpeak Low.

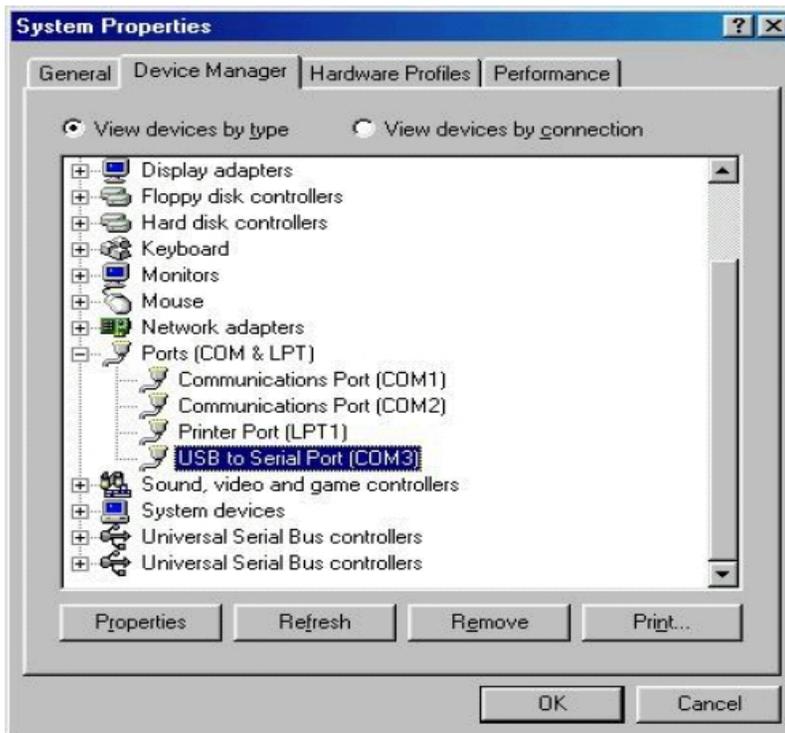
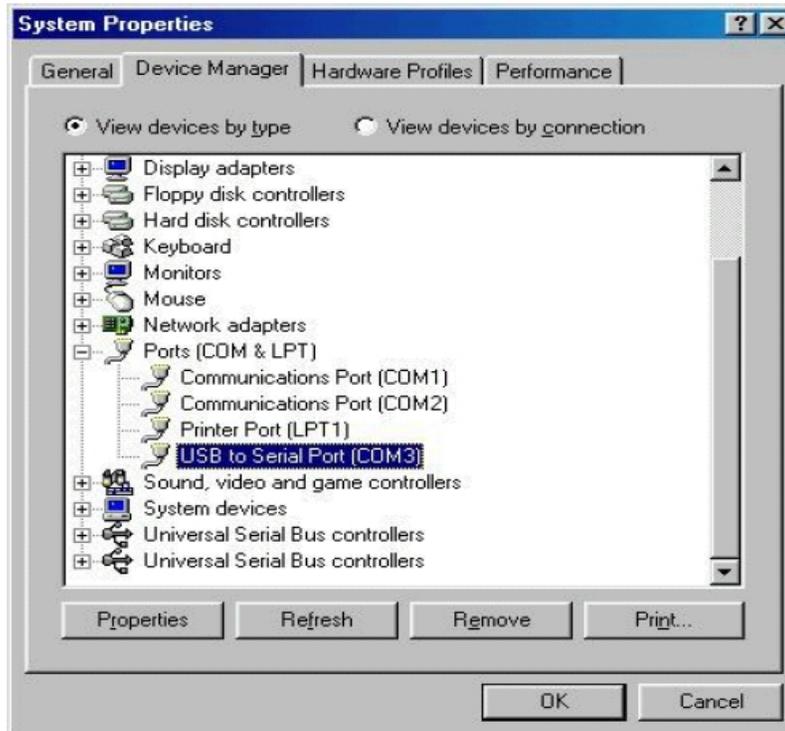
Description: Read back the measured Vpeak Low value, the unit is (V).

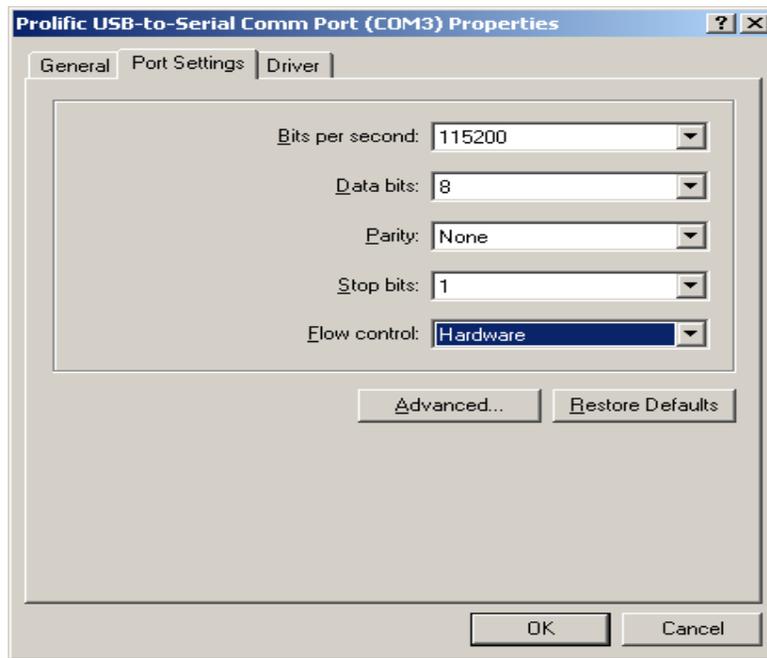
## Appendix A 4034A USB Instruction

1. Install the USB DRIVER select USB\SETUP\PL-2303 Driver Installer.exe



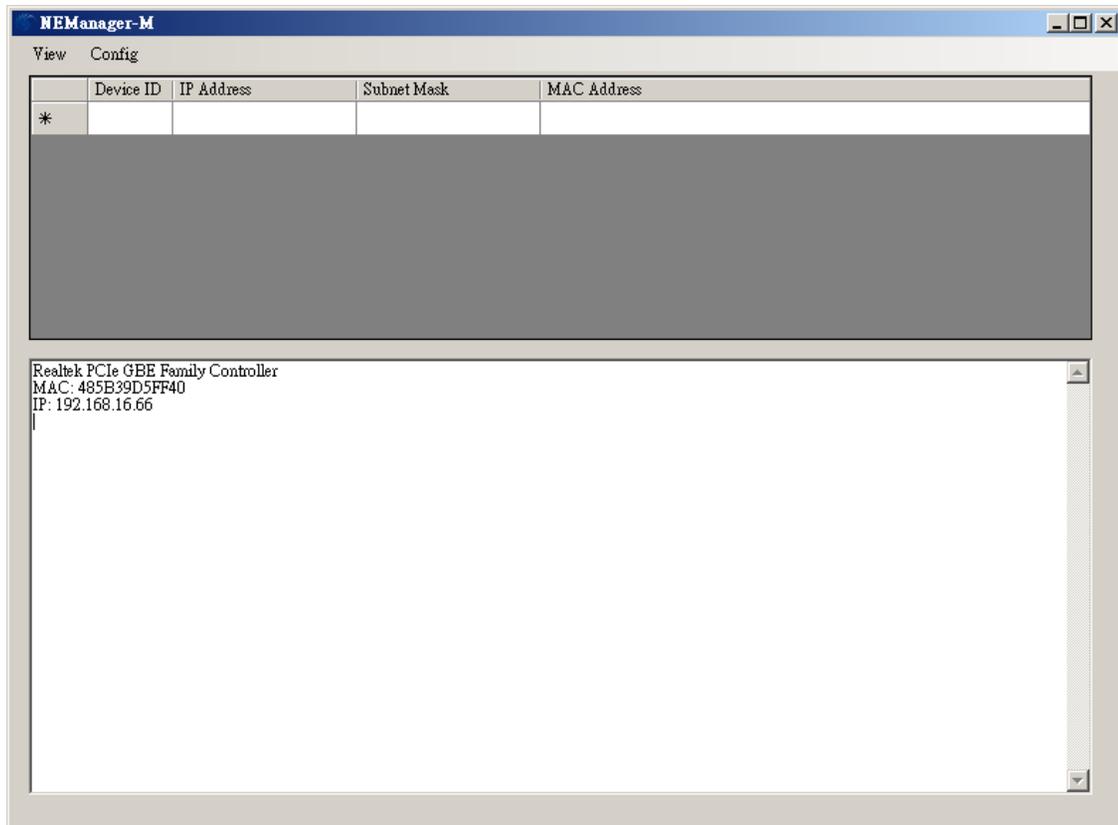
2. After the installation, connect the 4034A and PC with USB. Then select the item USB to Serial Port (COM3), set the BAUD-RATE and Flow control to 115200bps and Hardware to control 4034A with COM3.





## Appendix B 4034A LAN Instruction

1. Connect the 4034A to the power supply, connect to the lan cable, and connect the other end of the network route to the HUB hub.
2. Please execute IPScanner.EXE in the LAN directory on the CD. Windows security alert will appear first. Please select the public network and press [Access].  
The following screen appears: If no device appears, press F5 to re-detect, or check if the First step is completed normally.



3. The currently detected device will be displayed on the screen. Please press the IP Address under Config. The following screen will appear:



4. Please set an available network IP Address and Subnet Mask. (You can ask the network administrator to get the correct available network settings)
5. Please press Device Setting, the following screen will appear.

The screenshot shows a web browser window titled 'Windows Internet Explorer' with the address bar displaying 'http://192.168.16.186/Setup.htm'. The main content area is titled 'Controller Setup' and contains a table of configuration parameters. The 'Interface of serial I/O' row is circled in red.

IP address	192.168.16.186
Subnet mask	255.255.255.0
Gateway address	192.168.16.11
Network link speed	Auto
DHCP client	Disable
Socket port of HTTP setup	80
Socket port of serial I/O	4001 TCP Server
Socket port of digital I/O	5001 TCP Server
Destination IP address / socket port (TCP client and UDP)	0.0.0.0 0
Connection	Auto
TCP socket inactive timeout (minutes)	0
Serial I/O settings (baud rate, parity, data bits, stop bits)	115200 N 8 1
Interface of serial I/O	RS 232 (RTS/CTS)
Packet mode of serial input	Disable
Device ID	5
Report device ID when connected	Disable
Setup password	

Update

6. Please enter the relevant settings :
  - 6.1. IP Address :
  - 6.2. Subnet Mask :
  - 6.3. Gateway Address :
  - 6.4. Network link speed : (AUTO)
  - 6.5. DHCP client : Dynamic IP setting, the default value is Disable, unless the DHCP Server can change the setting to Enable
  - 6.6. Socket port of HTTP setup : The default is 80, no need to set
  - 6.7. Socket port of serial I/O : Please set to 4001
  - 6.8. Socket port of digital I/O : Please set to 5001
  - 6.9. Destination IP address / socket port (TCP client and UDP) Connection : no need to set
  - 6.10. Serial I/O settings (baud rate, parity, data, bits, stop bits) :
  - 6.11. Please set to 115200, N, 8, 1
  - 6.12. Interface of serial I/O : Please set to RS-232
  - 6.13. Packet mode of serial input : The default value is Disable, no need to set
  - 6.14. Device ID : Default value 5, no need to set
  - 6.15. Setup password :
  - 6.16. Access password :