ADAM-5511
Quick Start

Support Firmware 1.01 or above

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Chapter 0

Quick Start

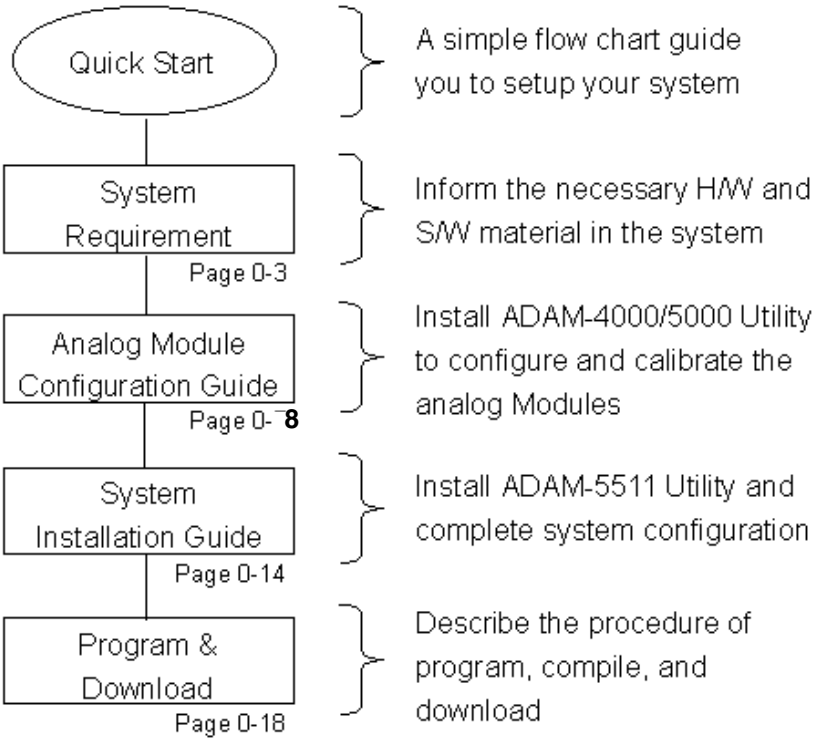
Quick Start

Welcome & Preview

Welcome to the Advantech ADAM-5511 user's guide. This chapter was written to provide users with a fast and easy installation guide and with the basic operating skills necessary to use the ADAM-5511's core capabilities.

This Quick Start chapter contains the following sections:

- **System Requirements**
- **Analog Module Configuration Guide**
- **System Network Setting**
- **Program and Download**



0.1 System Requirements

0.1.1 Host Computer Requirements

1. IBM PC compatible computer with 486 CPU (Pentium is recommended).
2. Microsoft 95/98/NT 4.0 (SP3 or SP4) or higher versions.
3. Borland Turbo C for DOS (V2.0 or above)
4. At least 32 MB RAM.
5. 20 MB of hard disk space available.
6. VGA color monitor.
7. 2x or higher speed CD-ROM.
8. Mouse or other pointing devices.
9. At least one standard RS-232 port (e.g. COM1, COM2).
10. One RS-485 card or RS-232 to RS-485 converter (e. g. ADAM-4520) for system communication.

Note: Users can visit the website of Borland Co. to apply as a member of Borland Community.

community.borland.com

Then you can free download the Turbo C version 2.01 from the website.

community.borland.com/museum

0.1.2 ADAM-5511 Requirement

1. One ADAM-5511 main unit with two blank slot covers.
2. One ADAM-5511 Quick Start Book
3. One core clamp for power supply connection.

4. One ADAM-4000/5000 Products Utilities CD.

5. Power supply for ADAM-5511 (+10 to +30 VDC unregulated)

6. One RS-232 crossover DB-9 cable

7. One RS-232 straight through DB-9 cable

0.1.3 I/O Modules

At least one I/O module is needed to use the system. A variety of I/O modules are available to meet different application requirements. Table 0-1 gives a current listing of these modules as of this printing:

Module	Name	Specification	Reference
Analog I/O	ADAM-5013	3-ch. RTD Input	Isolated
	ADAM-5017	8-ch. Analog Input	Isolated
	ADAM-5017H	8-ch. High speed AL	Isolated
	ADAM-5018	7-ch. Thermocouple Input	Isolated
	ADAM-5024	4-ch. Analog Output	Isolated
Digital I/O	ADAM-5050	16-ch. Digital I/O	Non-isolated
	ADAM-5051	16-ch. Digital Input	Non-isolated
	ADAM-5051D	16-ch. DI w/LED	Non-isolated
	ADAM-5051S	16-ch. DI w/ LED	Isolated
	ADAM-5052	8-ch. Digital Input	Isolated
	ADAM-5055S	16-ch. Digital I/O	Isolated
	ADAM-5056	16-ch. Digital Output	Non-isolated
	ADAM-5056D	16-ch. DO w/LED	Non-isolated
	ADAM-5056S	16-ch. DO w/LED	Isolated
Relay Output	ADAM-5060	6-ch. Relay Output	Isolated
	ADAM-5068	8-ch. Relay Output	Isolated
Counter/Frequency	ADAM-5080	4-ch. Counter/Frequency	Isolated
Serial I/O	ADAM-5090	4 port RS232	Non-isolated

Table 0-1: ADAM 5000 I/O Modules

0.1.4 Remote I/O Function for ADAM-4000 Modules

ADAM-5511 provides additional Remote I/O Function applicable to ADAM-4000 modules (except ADAM-4016 and ADAM-4018M). You can select among different ADAM-4000 modules according to their application purposes. Refer to Table 0-2 for the ADAM-4000 modules that can be used for ADAM-5511 Remote I/O function.

Module	Name	Specification	Reference
	ADAM-4011	Thermocouple Input	Isolated
	ADAM-4011D	Thermocouple Input w/LED	Isolated
	ADAM-4012	Analog Input	Isolated
	ADAM-4013	RTD Input	Isolated
	ADAM-4015	6-ch. RTD Input	Isolated
	ADAM-4017	8-ch. Analog Input	Isolated
	ADAM-4018	8-ch. Thermocouple Input	Isolated
	ADAM-4019	8-ch. Universal Input	Isolated
	ADAM-4021	Analog Output	Isolated
Digital I/O	ADAM-4050	7-ch. Digital I/O	Non-isolated
	ADAM-4052	8-ch. Digital Output	Isolated
	ADAM-4053	16-ch. Digital Input	Non-isolated
Relay Output	ADAM-4060	6-ch. Relay Output	Isolated
Counter/Frequency	ADAM-4080	2-ch. Counter/ Frequency	Isolated
	ADAM-4080D	2-ch. Counter/Frequency	Isolated

Table 0-2: Remote I/O function of ADAM-4000 modules

0.1.5 Assigning Address for I/O Modules

Basing on Modbus standard, the addresses of the I/O modules you place into the ADAM-5511 system are defined by a simple rule. Please refer the Figures 0-1 to map the I/O address.

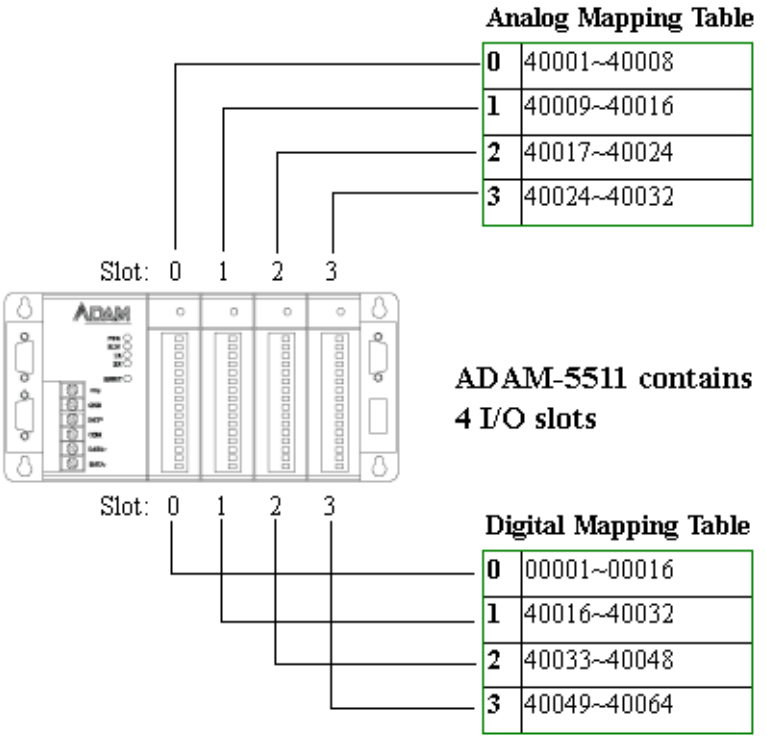


Figure 0-1 I/O Module Address Mapping

For example, if there is a ADAM-5024 (4-channel AO Module) in slot 2, the address of this module should be 40017~40020.

Note: ADAM-5080 is a special 4-channel counter module. Each channel consists of two words. To read the actual value in HMI software or user's AP, you can follow this formula:

*Counter Value= Low Word + High Word * 65536*

For Example, when you insert an ADAM-5080 in slot 0, the value of channel 0 in the module should be:

*(value of address 40001) + (value of address 40002)*65536*

0.2 Analog Module Configuration Guide

Before setup ADAM-5511 system, users need to configure the Analog module first, and ADAM-4000/5000 Utility Software provides a graphical user interface for configuring and calibrating Advantech ADAM-4000/5000 Modules.

0.2.1 Hardware Setting for Analog Module Configuration

1. Open the ADAM-5511 package and make sure that everything described in **Chapter 0.1** is ready.
2. Set all the DIP switches off on ADAM-5511 back plant. See Figure 0-2.

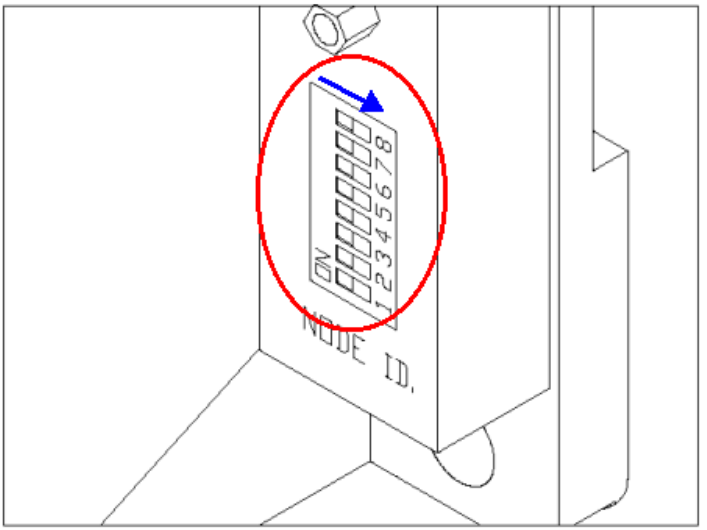


Figure 0-2: ADAM-5511 network address & baud rate DIP switch

3. Connect the ADAM-5511 power cable between the power supply and the ADAM-5511 screw terminals (+Vs and GND). Please make sure that the power source is between +10 to +30 V_{DC}.

4. Connect the straight through cable between the host computer and the ADAM-5511 COM3 for I/O modules configuration. Refer to Figure 0-3.

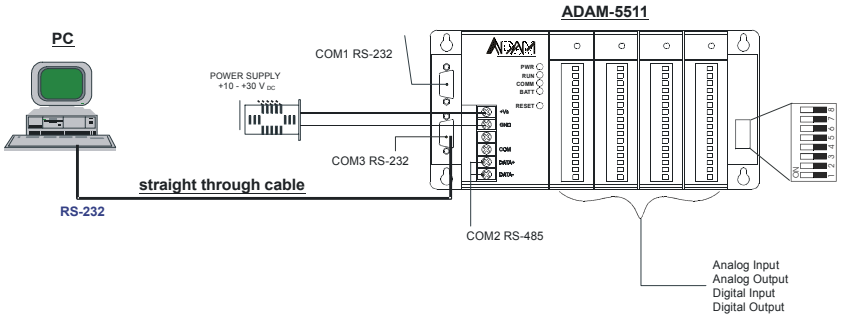


Figure 0-3: Cable connection for I/O Module Configuration

0.2.2 Software Setting for Analog Module Configuration

1. Insert ADAM-4000/5000 Products Utilities CD into the CD drive (e.g. D:) of the host PC. When the installation menu appears, select "Install ADAM-4K5K Utility".

2. When the installation is completed, there will be a shortcut icon of ADAM Utility on the Windows' Desktop.

3. Double click the ADAM Utility icon on your Desktop, and the Utility screen will pop up as below.

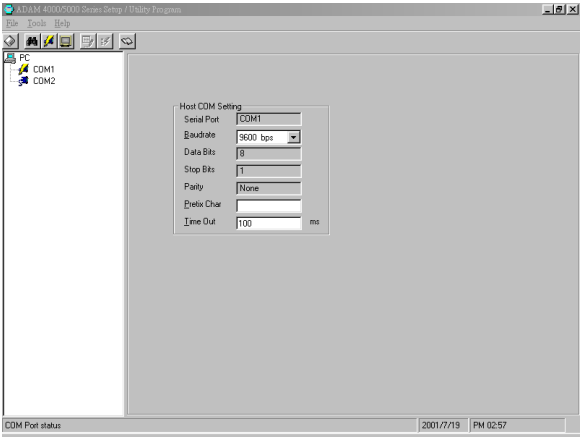


Figure 0-4: ADAM-4000/5000 Windows Utility

Attention: Please be aware of setting all the DIP switches to off position before you use ADAM-4000/5000 Utility software.

0.2.3 Analog Module Configuring by ADAM-4000/5000 Utility

Sets the input/output range, data format, integration time, and high/low alarm for each module in your ADAM-5511 system.

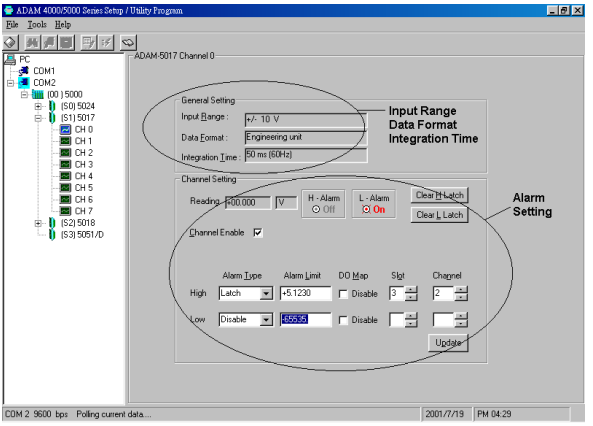


Figure 0-5: I/O Module Configuration

Input Range: represents the type of input signal. Please refer to **Chapter 4** for further detail of individual ADAM-5000 modules.

Data Format: represents the data format. Please refer to Chapter 4 for further detail of individual ADAM-5000 modules.

Integration Time: the data scan rate of specific channels or modules.

Alarm Setting: The alarm setting is only effective against to ADAM-5000/485 and ADAM-5000E. Users can skip this portion when apply to ADAM-5511.

0.2.4 Analog Module Calibrating by ADAM-4000/5000 Utility

Analog input/output modules are calibrated when you receive them. However, calibration is sometimes required. If you do not need to calibrate the modules right now, please skip to **Chapter 0.3** for System installation.

No screwdriver is necessary because calibration is done in software with calibration parameters stored in the ADAM-5000 analog I/O module's onboard EEPROM.

Note: The calibrating function supports ADAM-5013/5017/5017H/ 5018/5024.

Zero Calibration:

(1). Apply power to the module and let it warm up for about 30 minutes.

(2). Make sure that the module is correctly installed and is properly configured for the input range you want to calibrate.

(3). Use a precision voltage source to apply a calibration voltage to the modules' terminals of the specific channel.

(4). Click the "Zero Calibration" button. See Figure 0-6

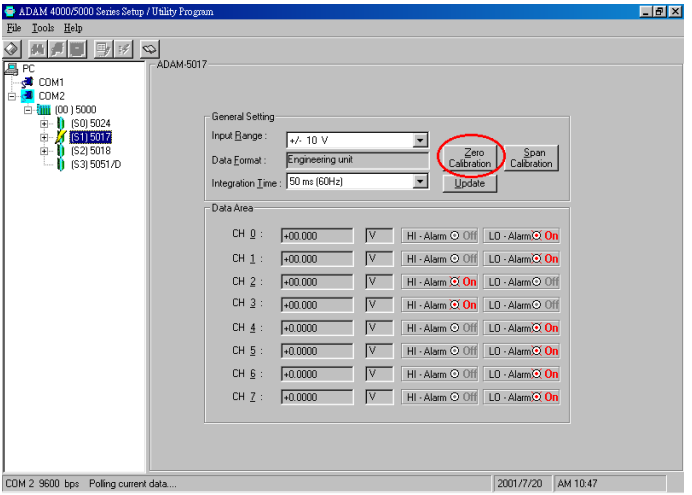


Figure 0-6: Zero Calibration

(5). Click the Execute button to begin the calibration

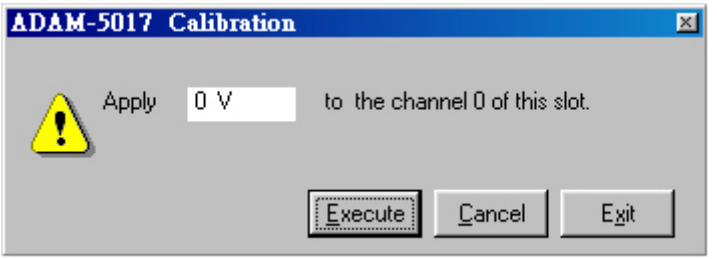


Figure 0-7: Execute Zero Calibration

Span Calibration:

(1). Use a precision voltage source to apply a calibration voltage to the modules' terminals of the specific channel.

(2). Click the "Span Calibration" button. See Figure 0-8

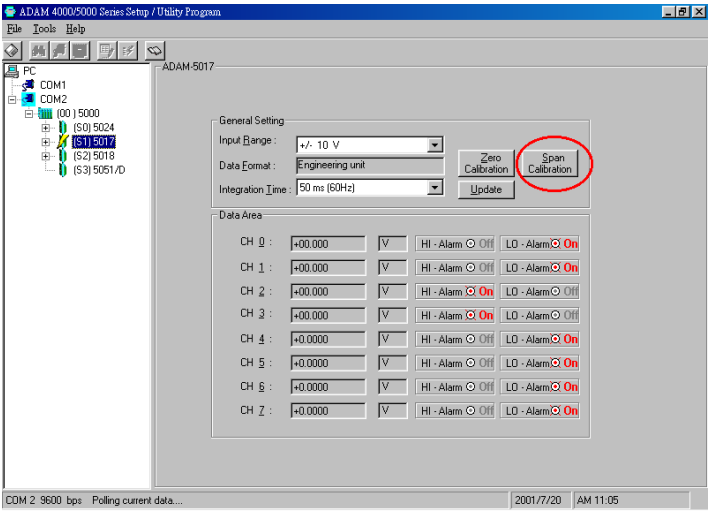


Figure 0-8: Span Calibration

(3). Click the Execute button to begin the calibration

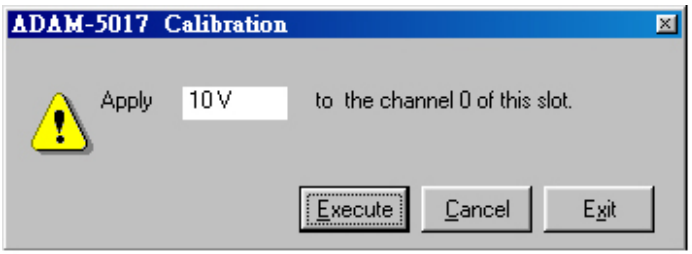


Figure 0-9: Execute Span Calibratio

CJC Calibration:

CJC (cold junction sensor) calibration only applies to the ADAM-5018

(1). Prepare a voltage source which is accurate to the mV level.

(2). Run the zero calibration and span calibration function.

(3). Use a temperature emulation device (such as Micro-10) to send a temperature signal to the ADAM module and then compare this signal with the reading from the ADAM module. If the reading value is different from the signal, adjust the CJC value to improve it.

(4). Click the "CJC Calibration" button. See Figure 0-10.

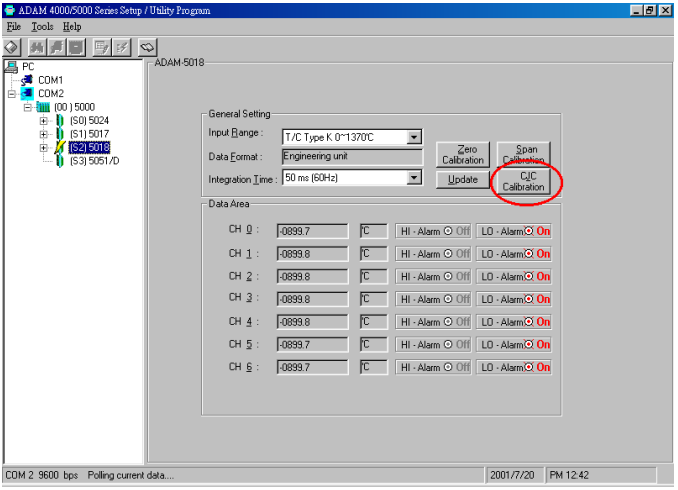


Figure 0-10: CJC Calibration

(5). Click the Execute button to begin the calibration

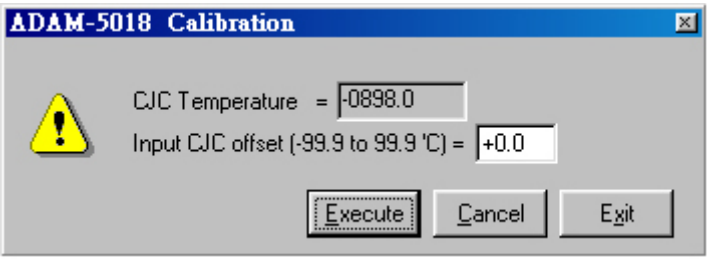


Figure 0-11: Execute CJC Calibration

Analog Input Resistance Calibration:

RTD sensor calibration only applies to the ADAM-5013

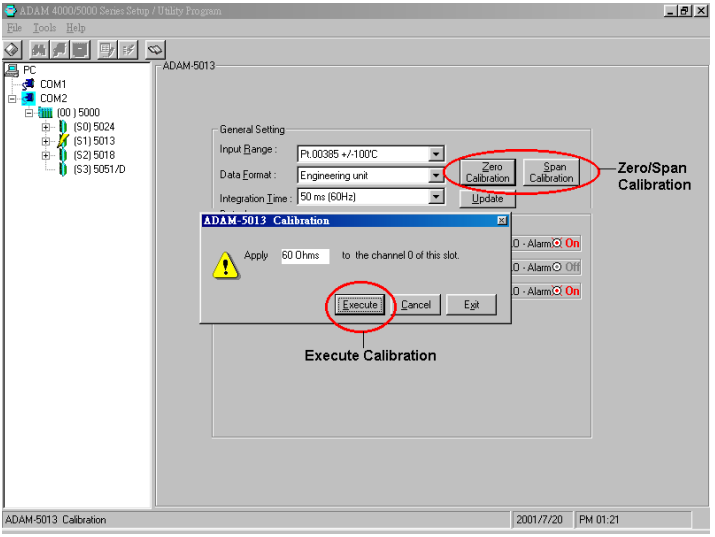


Figure 0-12: RTD Module Calibration

Analog Output Calibration:

4~20 mA: ADAM 5024

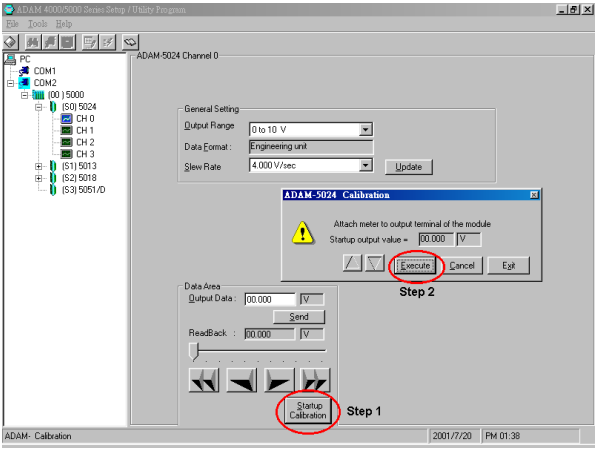


Figure 0-13: Analog Output Calibration

0.3 System Installation Guide

After completing the I/O modules configuration, user can setup ADAM-5511 as a dummy I/O system or a programmable stand-alone controller. This section will guide you to complete your system configuration.

0.3.1 Hardware setup

Connect the network between the host computer and the ADAM-5511.

Host Computer Setting (Windows Utility Setting, refer to **Chapter 0.3.2):**

1) Port Number: assign a specific COM port in your computer to communicate with the ADAM-5511

2) Baud Rate: set a communication rate between host PC and ADAM-5511

3) Time Out: set a time out period for network diagnostic

Network Cable Connection:

There are two kind of connecting methods for system linkage. One is connected via RS-232 DB9 cross over cable to COM1 of ADAM-5511 (see Figure 0-14), and the other one is connected via ADAM-4520 to COM2 of ADAM-5511 (see Figure 0-15).

1)

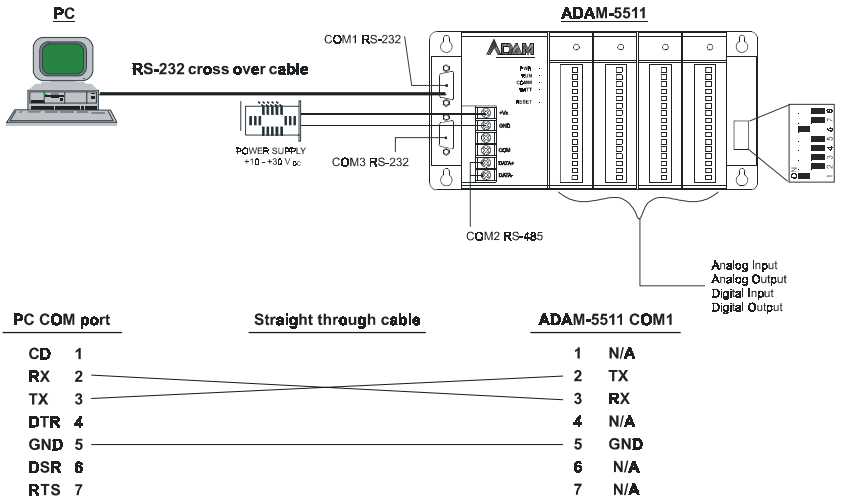


Figure 0-14: COM1 RS-232 Connection

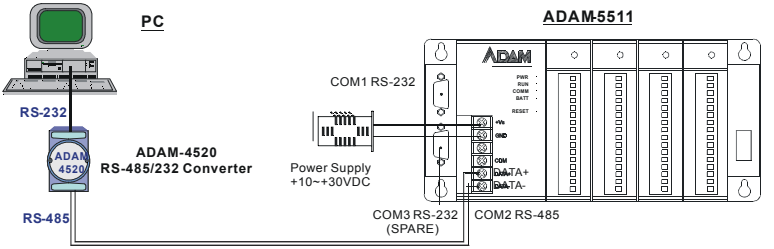


Figure 0-15: COM2 RS-485 Connection

ADAM-5511 Setting:

1) ID Address: Node ID of Modbus network

2) COM1 Enable/Disable: set enable when you use COM1

3) Baud Rate: set a communication rate the same as the host PC's setting

Refer these tables below to adjust the DIP switches in ADAM-5511.

NODE ID:

Dip	1	2	3	4	5
ON	2^0	2^1	2^2	2^3	2^4
OFF	0	0	0	0	0

Port Select:

DIP	6
ON	COM 1 reserve for Modbus communication
OFF	Default COM port

Baud Rate

Dip 7	Dip 8	Baud Rate (bps)
OFF	OFF	9600
ON	OFF	19200
OFF	ON	38400
ON	ON	115200

0.3.2 ADAM-5511 Windows Utility Software Setup

1. Insert ADAM-4000/5000 Products Utilities CD into the CD drive (e.g. D:) of the host PC. When the installation menu appears, select "Install ADAM-5511 Utility".
2. When the installation is completed, there will be a shortcut icon of ADAM-5511 Utility on the Windows' Desktop.

3. Double click the ADAM-5511 Utility icon on your Desktop, and the Utility screen will pop up as below.

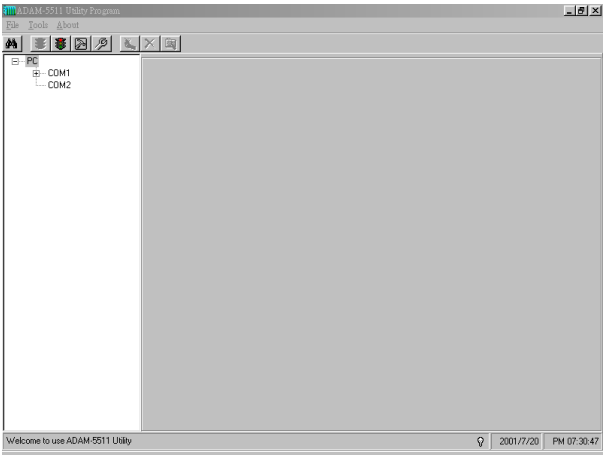


Figure 0-16: Opening screen

4. Select the specific COM port, then setting the baud rate and time out parameter.

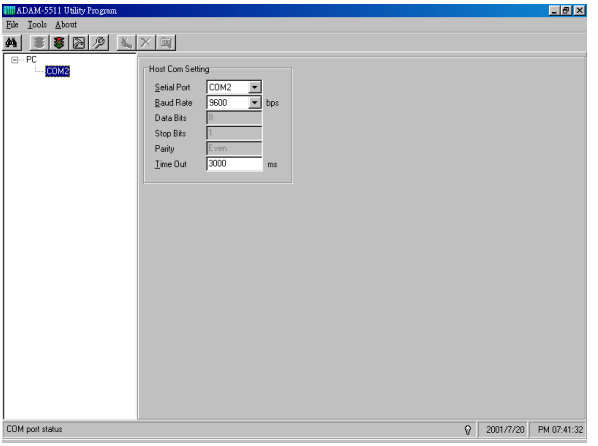


Figure 0-17: Setting the parameter of Com port

5. Click the “Search device” icon on tool bar to detect all devices on network

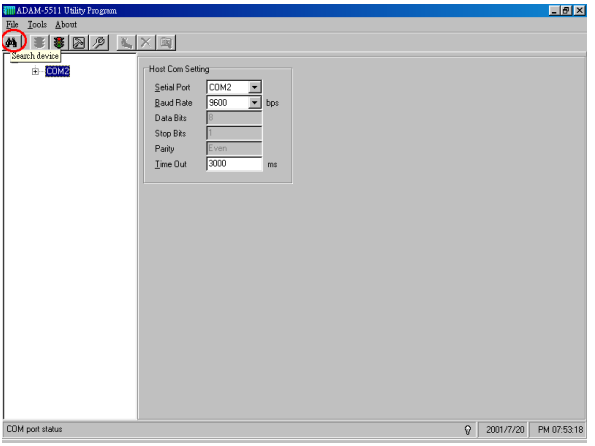


Figure 0-18: Click the “Search device” icon

The current status of system will show on the display.

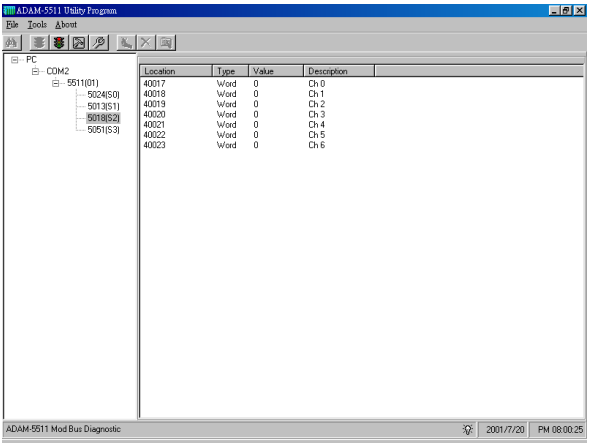


Figure 0-19: ADAM-5511 has been detected

0.4 Program and Download

0.4.1 Develop ADAM-5511 Executive Program

As we mentioned in **Chapter 0.1**, users will need Turbo C or Microsoft C as the program editing tools. Mean while, there are many easy-to-use function libraries (refer to **Chapter 6**) which can be implemented to your programs for various applications.

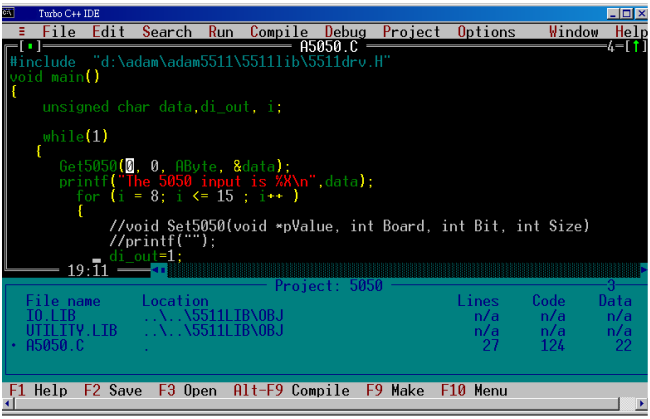


Figure 0-20: Using Turbo C as your programming Tool

0.4.2 Download Program into ADAM-5511 System

Right after compiling and saving the executive program from Turbo C, you can go to the download process as follow steps:

1) Start up the ADAM-5511 Utility, then select the specific file for download.

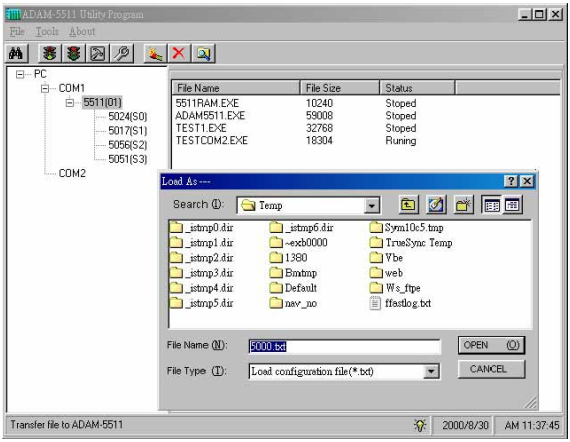


Figure 0-21: Select the specific file for download

Note: When you download the program into ADAM-5511, you have to make sure that the memory capacity will not exceed 128K bytes.

2) After completing the download procedure, select the specific program and click the “Run” icon.

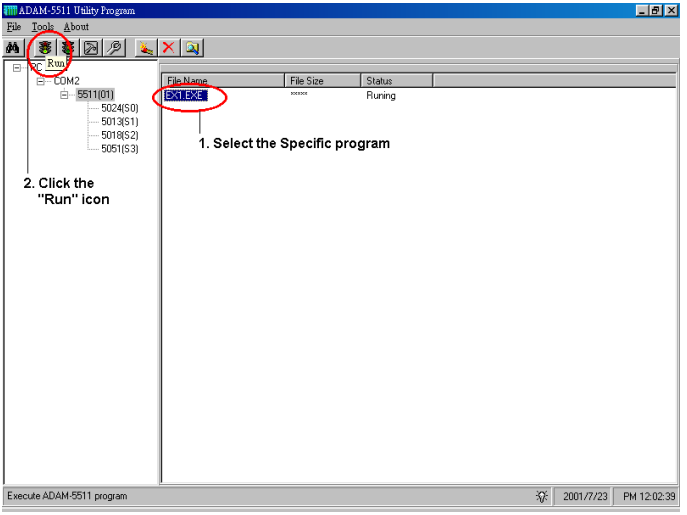


Figure 0-22: Run the program downloaded in ADAM-5511

3) Check the “Run” indicator in the ADAM-5511 main unit. If the green indicator is regularly blanking, it means you have success down loaded and started up the executive program.

4) Usually, you may need a debug tool to simulate and improve your program. To learn more information about the procedure of program debugging, please refer to **Chapter 5.3.8.**

0.5 Conclusion

By carefully walking through all the installation and operating instructions described above, you should have experienced most of the usual procedures for using ADAM-5511. For further sophisticated utilization or programming skills, please refer to following chapters.