

APCON100 series Operation Manual

RS-232 to Ethernet Converter



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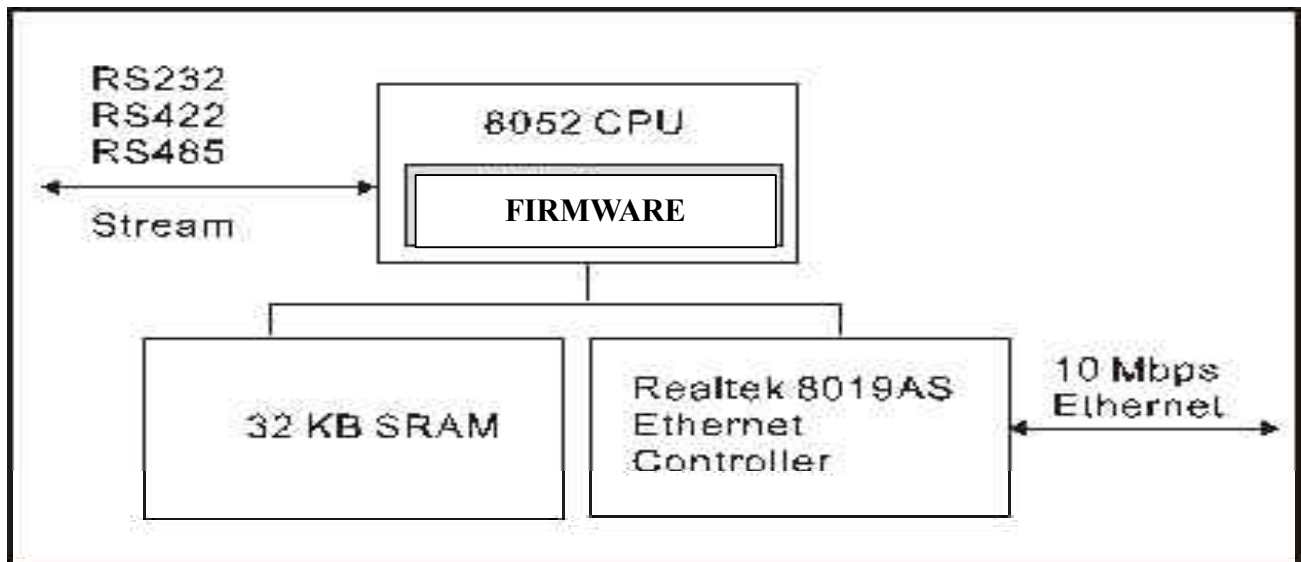
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Chapter I. Specifications

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CPU : Winbond 78E58 36.864 MHz
 Memory : 32KB SRAM
 Ethernet Controller : Realtek 8019AS
 Protocol : ARP, UDP, TCP, ICMP, HTTP, DHCP
 Interface : 10 M Ethernet Interface
 300 – 57600 bps asynchronous stream
 (RS232/RS422/RS485)
 Throughput : 5K bytes per second

(Diagram)



Power Supply

	<i>APCON132/432</i>	<i>APCON100</i>
Power Adaptor	110V or 220V AC Adaptor	Not Included
Voltage	9V DC Regulated	5V~12V DC Regulated
Power Consumption	500mA~1A	500mA~1A
VCC at RS-232 connector	N/A	Min. 5V / Max. 12V at Pin 9
Remarks	---	CAUTION: DO NOT use 2 adaptors at the same time if the serial device can supply power through pin 9 of the RS-232 connector.

Chapter 2. Introductions

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Ethernet is one of the most popular way of communication on the Internet, through it, we can connect up with PC's, LAN and WAN. However nowadays, most devices running on the network are Personal Computers, which cannot fulfill the needs for low-level automatic control and remote data collecting applications.

APCON100 series have overcome the problems mentioned above, it transforms serial or automatic control's I/O data into Ethernet DataStream, which could easily transfer the signals to the remote destination via the Internet, as well as utilizing APCON100 series as the standard PC, configure and transfer data by HTTP, TCP/IP or UDP protocols.

Implementing automatic control and remote data control into high bandwidth is one of the latest technologies. APCON100 is using single chip to transmit Ethernet DataStream, the advantages of using single chip are not only because it has wide ranges of supporting products, but also its stability that explains why x86 systems still cannot replace it.

Generally, APCON100 series provides following functions:

1. Converts Serial data to TCP/IP data.
2. Converts the equipments' serial (RS232, RS485, RS422) data into the TCP/IP package data and send out by the Ethernet DataStream (*e-COV* hardware must indicate the IP Add. and Com Port)
3. Converts TCP/IP package data into the serial data (Remote WinSock must indicate the APCON100 hardware).

Chapter 3. Easy Installation

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1. Power on by plugging the [power adapter](#) into APCON100.
1. The “SYS” LED indicator (red) should be on and flash
2. Insert the RJ-45 phone jack of standard CAT-5 cable into the RJ45 outlet.
3. The “LAN” LED indicator (green) should be on.
4. Attach any serial device to the serial port of APCON100 and ready for receiving data.
5. Both “Rx” LED indicator (green) and “Tx” LED indicator (red) should be flash whenever the data is sent or received via the APCON100 Ethernet converter.

Chapter 4. The LED Indicator

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SYS - “Red LED” : Indicates power on (flashes when the power is on)

Rx - “Green LED” : Indicates receiving of data (flashes when receiving any signal form network)

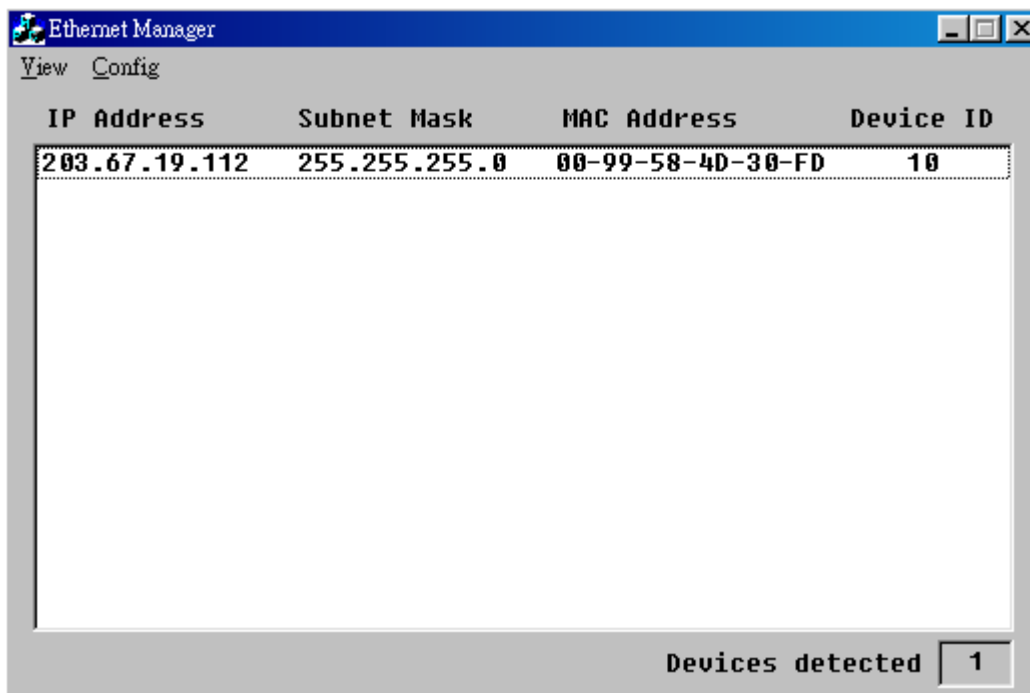
Tx - “Red LED” : Indicates sending of data (flashes when sending any signal into network)

LAN - “Green LED”: Online indicator. Indicates the APCON100 is whether connected properly to an Ethernet adapter (or a hub) or not.

Chapter 5 Ethernet Manager - APCON100.exe [\[Back to Index\]](#)

ECOV.exe is a simple tool for user to detect and configure the installed APCON100 Ethernet Converter. The APCON100.exe will automatically detect one working APCON100 within your domain on LAN upon executing.

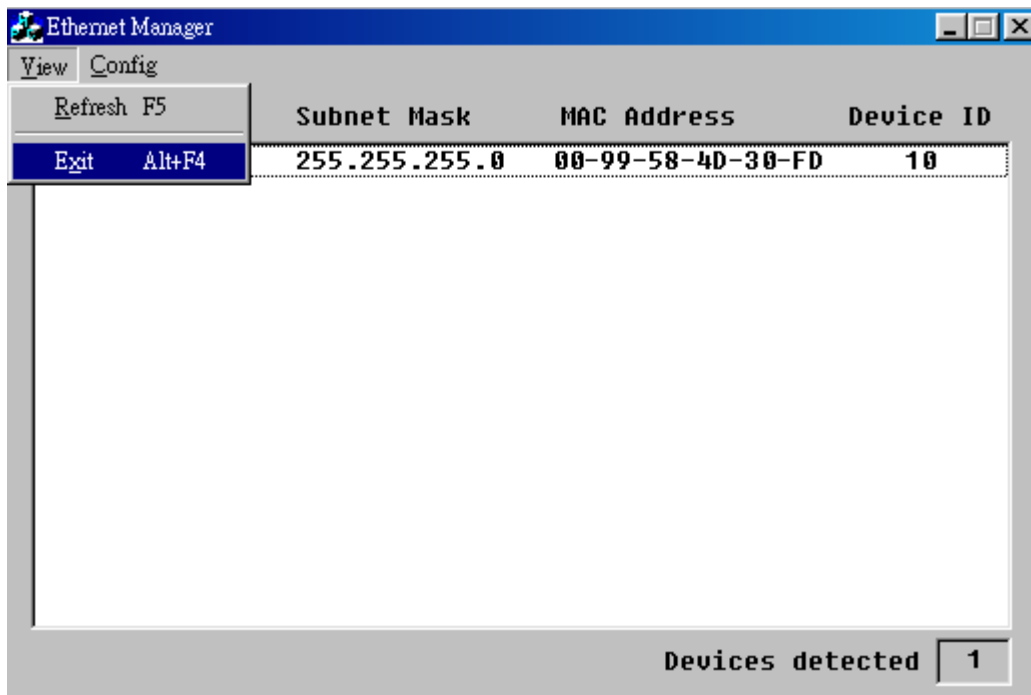
APCON100.exe will display the hardware information as shown in “Figure 1”.
Please note that APCON100.exe can only detect one APCON100 device at a time, thus if you are going to setup multiple APCON100 Ethernet Converters, please first remove all other APCON100 devices which are running on your network, new otherwise the device would not be detected by APCON100.exe



(Figure 1)

APCON100.exe Options

1. View -> Refresh (Figure 2): Re-detect APCON100 hardware on LAN
2. View -> Exit (Figure 2) : Exit Program



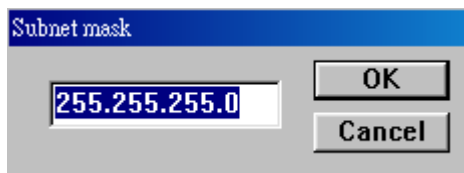
(Figure 2)

3. Config -> IP Address setup (Figure 3) : IP configuration



(Figure 3)

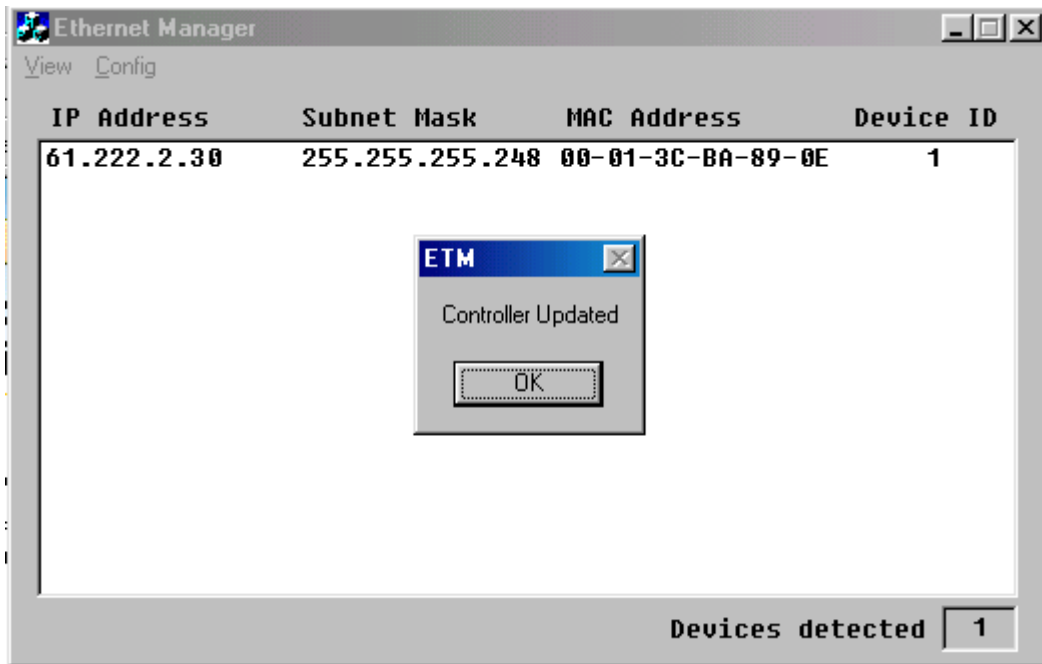
4. Config -> Subnet Mask setup (Figure 4) : Subnet Mask configuration



(Figure 4)

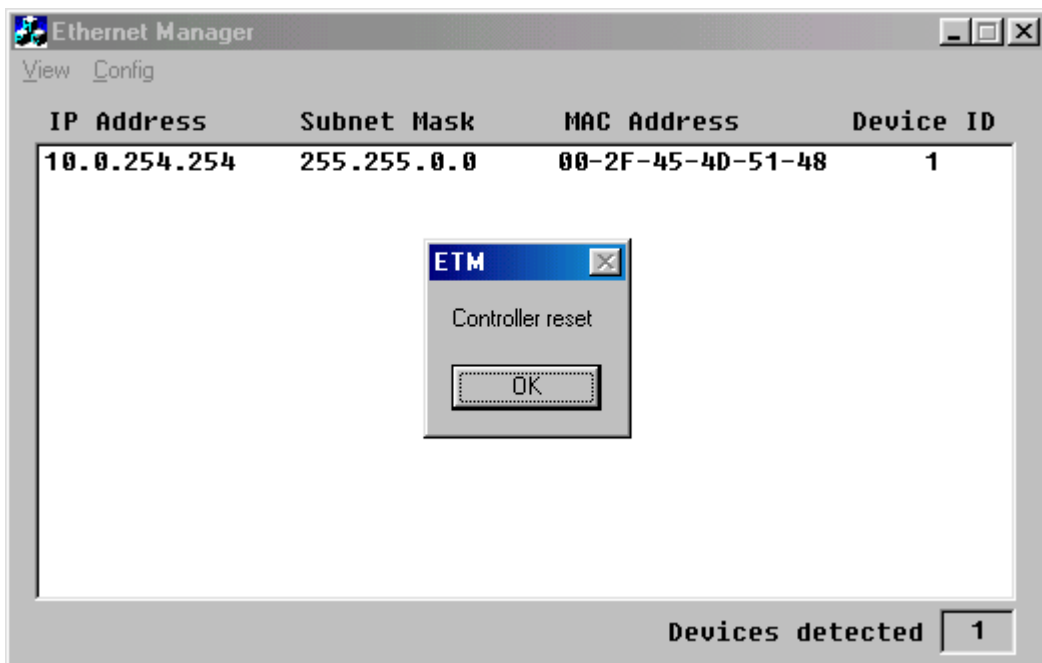
6. Config -> MAC Address setup

7. Confirmation dialogue box displays once the configuration is completed (Figure 5)



(Figure 5)

7.Config -> Reset Data : Set Factory Default Value. It will show the confirming message as below: (Figure 6)



(Figure 6)

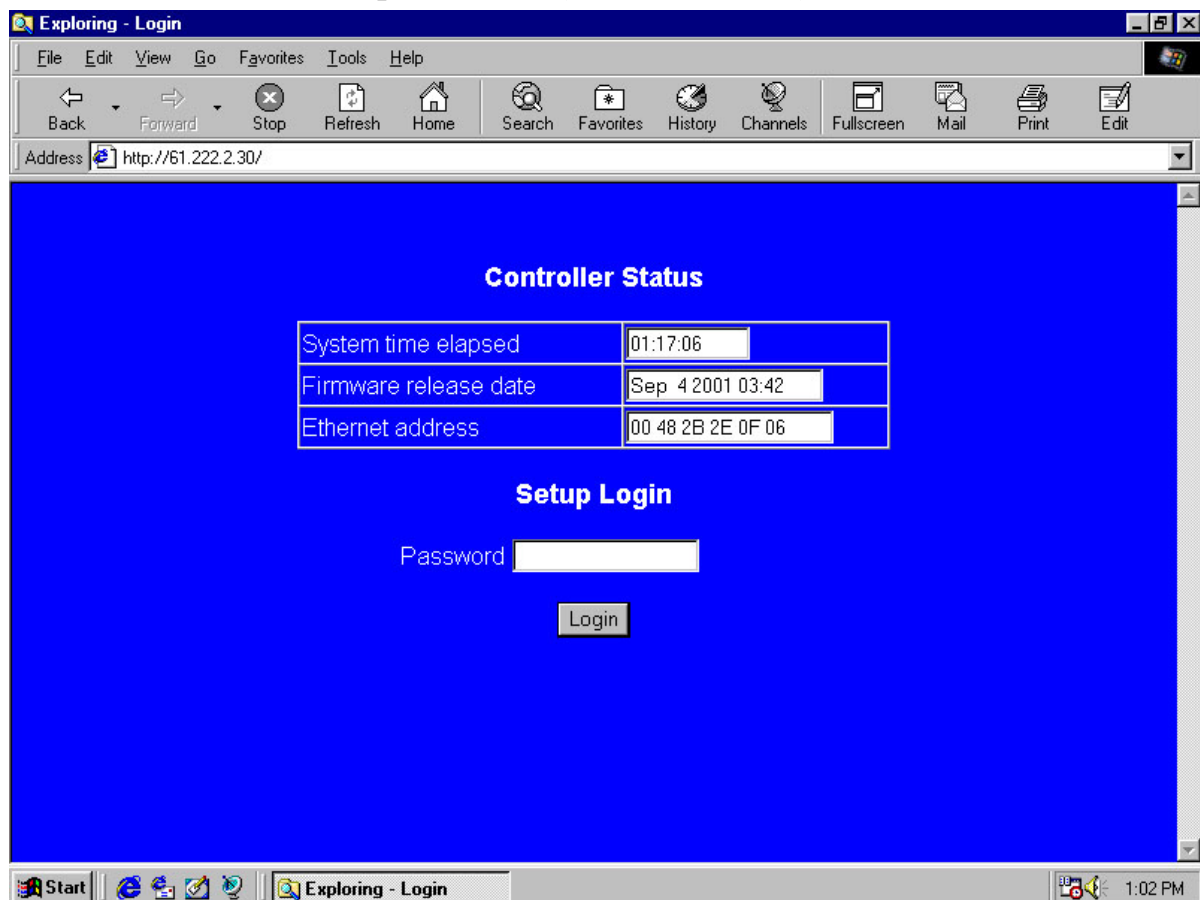
Important: please always run "Refresh" from the menu once made any changes.

Chapter 6 Controller Setup by Internet Browsers

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Users can use Internet Explorer or other Internet browsers to configure the advanced settings of APCON100 hardware such as Baud rate, socket port, serial I/O and etc.

1. Open Internet Browser.
2. **Type in the IP address** of the APCON100 Ethernet adapter in the browser's "address" box and press enter. (i.e. 61.222.2.30)



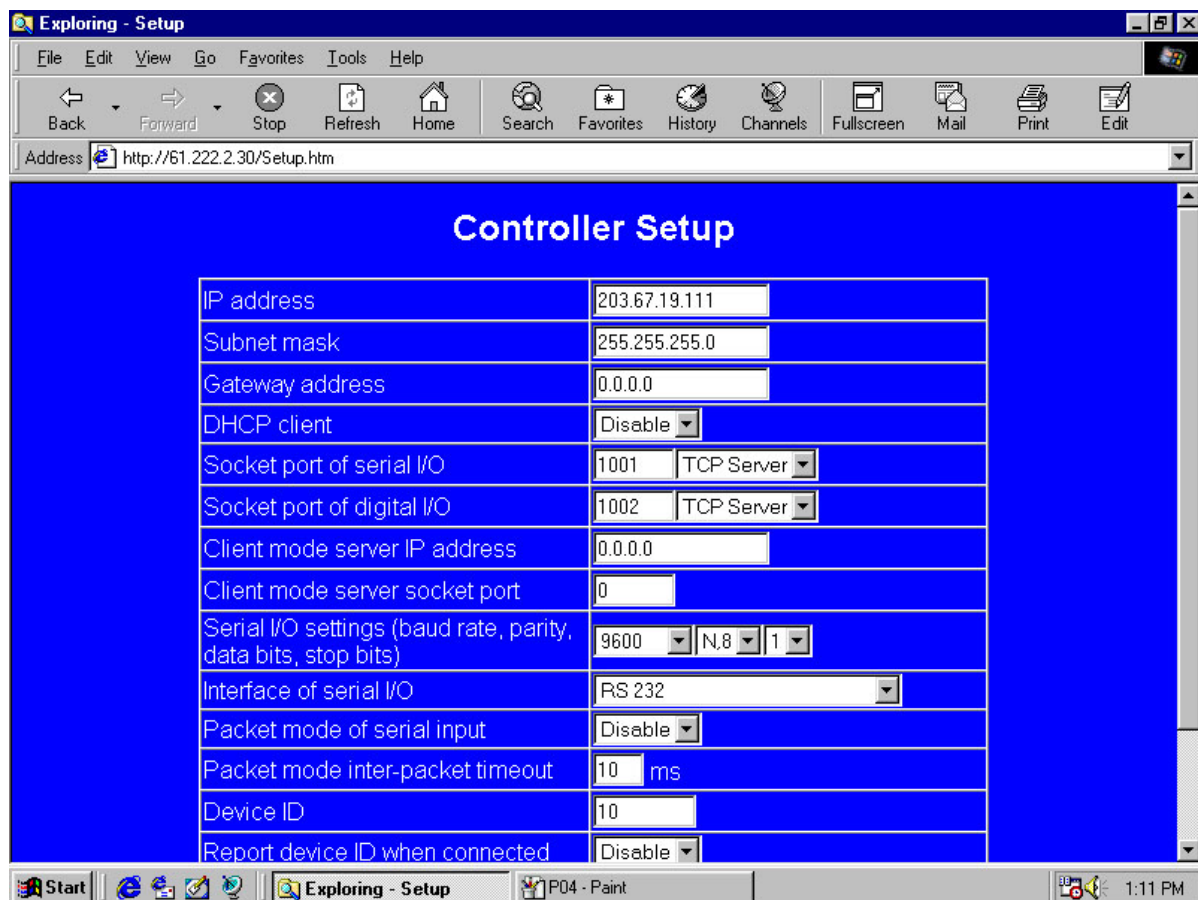
(Figure 7)

3. The first Controller Status window will display, you may simply skip the password, just click "Login" and it will lead you to the next page of advanced controller setup. If you failed to login, it is probably because of the password has wrongly entered at the beginning. If you do not have the password, please run APCON100.exe and proceed "Reset" to set all factory default. (Figure 6)

Controller Status (Figure7):

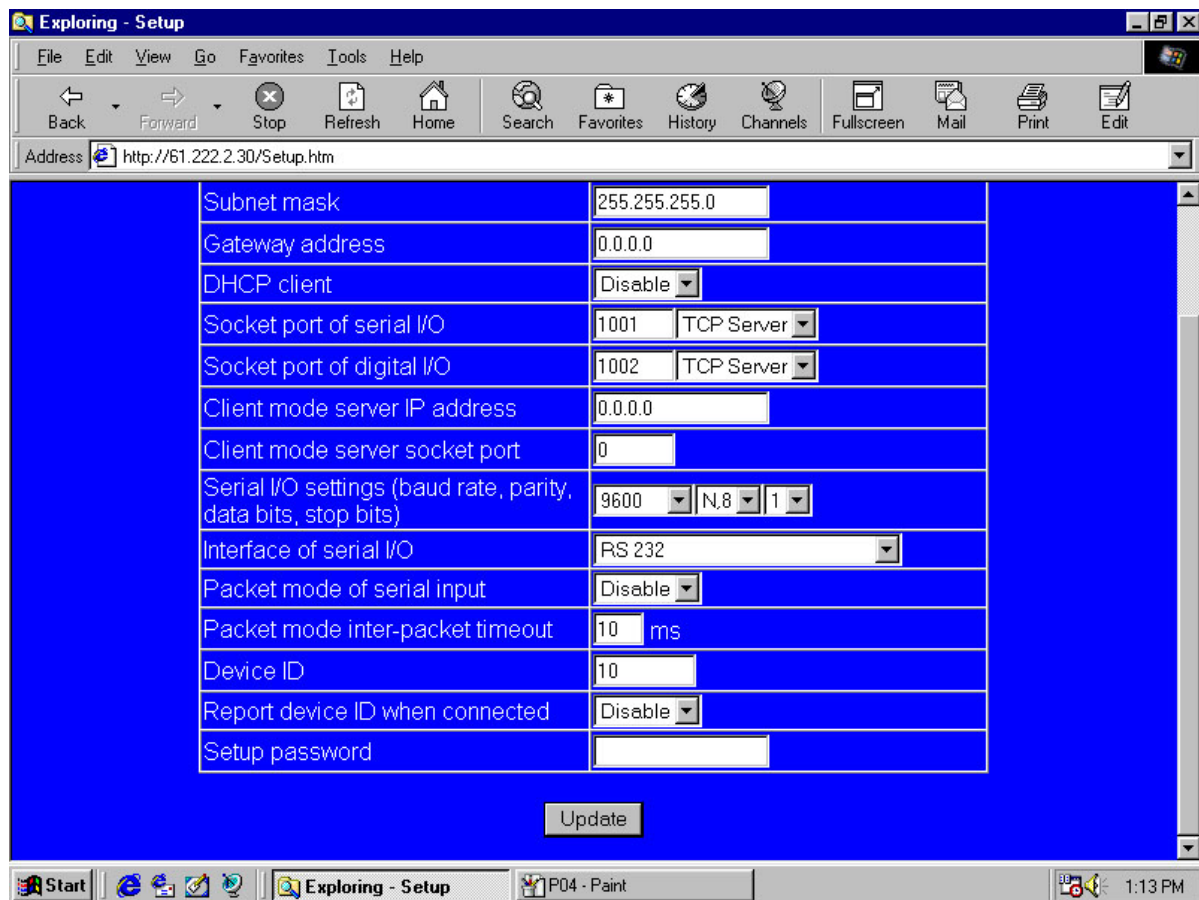
1. System time elapsed
Information of connection time
2. Firmware release date
Release date of APCON100 firmware
3. Ethernet address
MAC address for APCON100 device
4. Password
Login password (Not necessary)

Controller Setup (After Login):



Controller Setup	
IP address	203.67.19.111
Subnet mask	255.255.255.0
Gateway address	0.0.0.0
DHCP client	Disable
Socket port of serial I/O	1001 TCP Server
Socket port of digital I/O	1002 TCP Server
Client mode server IP address	0.0.0.0
Client mode server socket port	0
Serial I/O settings (baud rate, parity, data bits, stop bits)	9600 N.8 1
Interface of serial I/O	RS 232
Packet mode of serial input	Disable
Packet mode inter-packet timeout	10 ms
Device ID	10
Report device ID when connected	Disable

(Figure 8)



(Figure 9)

Controller Setup Options(Figure 8 & 9):

1. IP address:

Indicates the IP address of APCON100 device on LAN. You may change this address accordingly to your LAN or WAN to avoid conflict. If there is DHCP server up and running in your network, the APCON100 should automatically assign a unique IP from the server.

2. Subnet mask:

TCP/IP subnet mask address without sub setting should be "255.255.255.0"

3. Gateway Address:

Default value: 0.0.0.0

4. DHCP client: DHCP IP address option ON/OFF

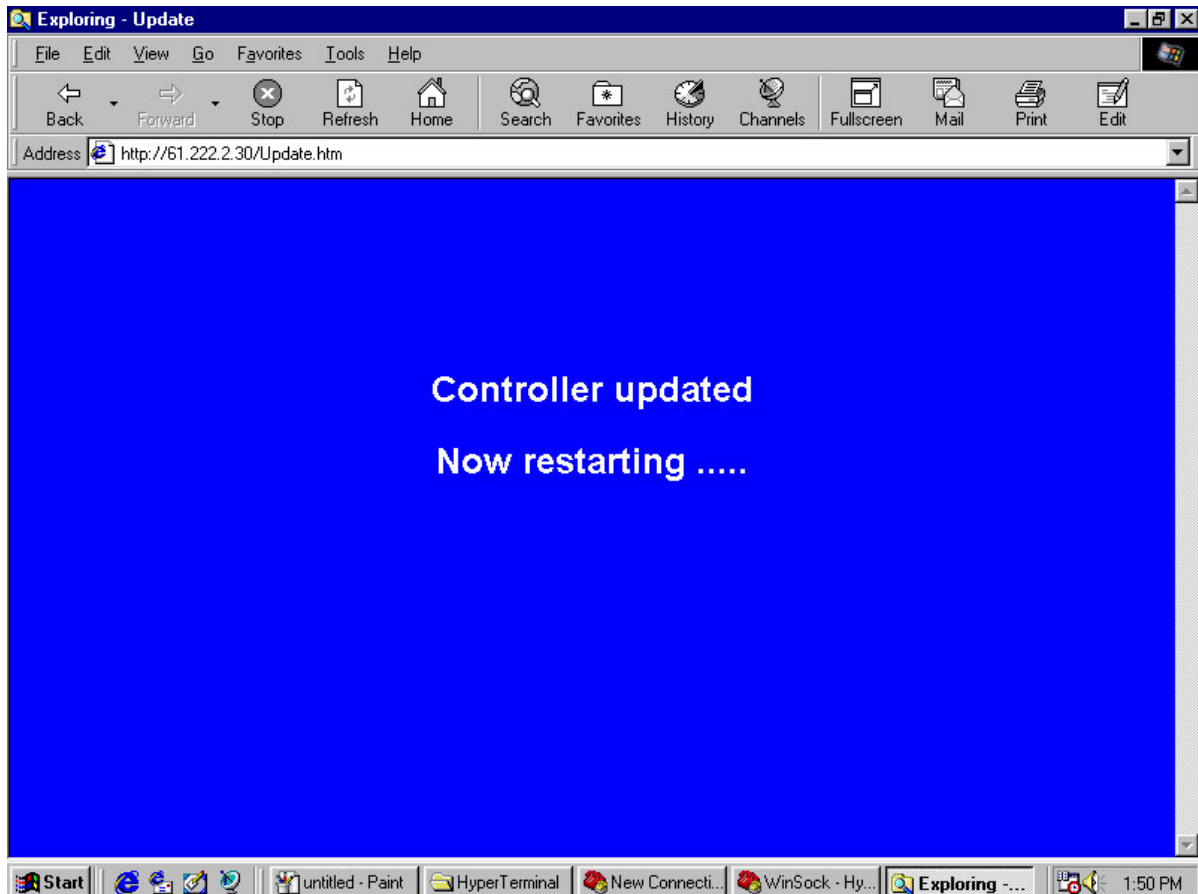
You may also disable it if you wish to assign your preferred IP for your APCON100 device

5. Socket port of serial I/O:
Win socket has 65535 ports available for applications to use; you may need to assign a unique port for the APCON100 Ethernet Converter. Please note that some common port numbers were preserved by certain Windows applications such as HTTP uses port 80, and Telnet uses port 23. Therefore, the recommended port number for the APCON100 Ethernet converter is better to be above port number 2000.
6. Socket port of digital I/O: reserve
7. Client mode server IP address:
Should the APCON100 Ethernet Converter is set to client mode, the server's IP address should be entered here. (Default 0.0.0.0)
8. Client mode server socket port:
Should the APCON100 Ethernet Converter is set to client mode, the server's socket port number should be entered here. (Default 0)
9. Serial I/O settings:
Baud Rate, Parity, Data bit, Stop bit.
10. Interface of serial I/O:
Choose the serial communication modes here.
11. Packet mode of serial input:
Serial Com port input timer ON/OFF.
12. Packet mode inter-packet timeout:
Setup communication packet delay time. (to assure that the packets were transferred completely)
13. Device ID: The hardware ID. (Set this ID to manage multiple APCON100 devices)
14. Report device ID when connected: ON/OFF
Function for log or analysis purposes. Within this function enabled, The device will report whether the serial ports connection were successfully established or not.

15. Setup password: Set this password for the Controller Setup.

Caution! The password is case sensitive, and there is no way to recover or make query for it once you have forgotten your password.

When advance setup is completed, please click “Update”, then the configuration window should show the following message:



(Figure 10)

It will go back to the first “Login” page after “Update” has processed. You can now close the browser.

Very Important!

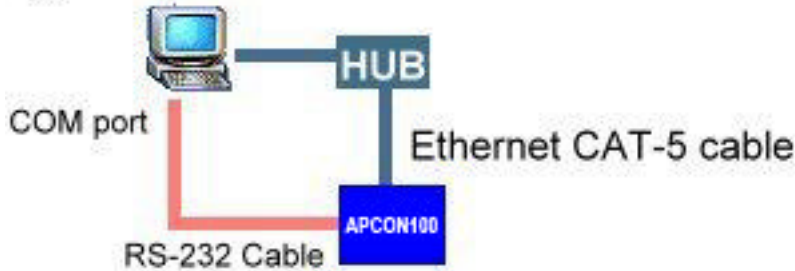
In order to include the APCON100 device to your local network, the first 3 sets of IP address of APCON100 series Ethernet Converter must be changed to the same network address of your domain as the device connects to, the IP of APCON100 devices can be changed by going through the “Config” option in the APCON100.exe tool.

Chapter 7. Easy Testing

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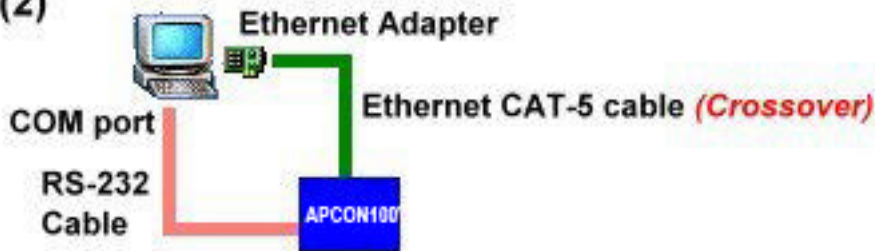
Here is a quick way to test if the devices are correctly configured. Please setup the APCON100 connection accordingly to any of the following options for easy testing:

(1)



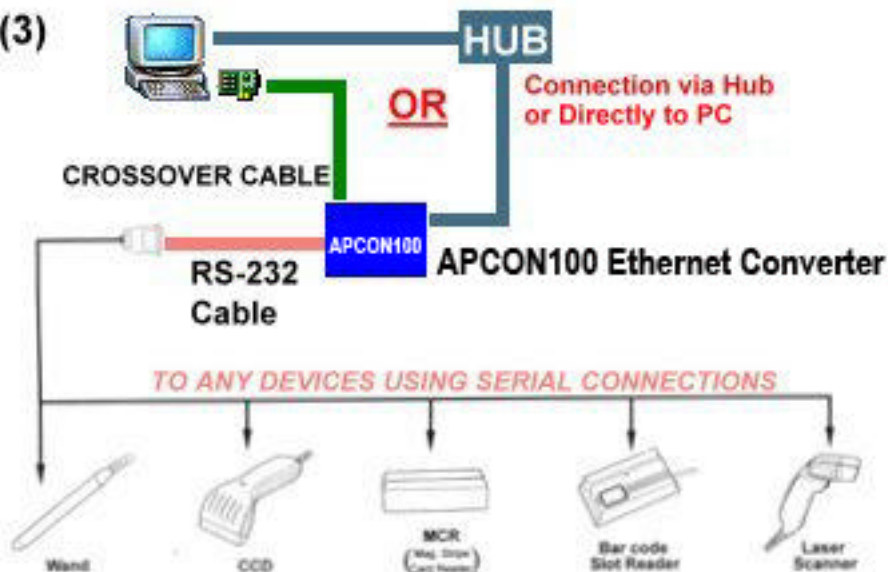
APCON100 Ethernet Converter

(2)



APCON100 Ethernet Converter

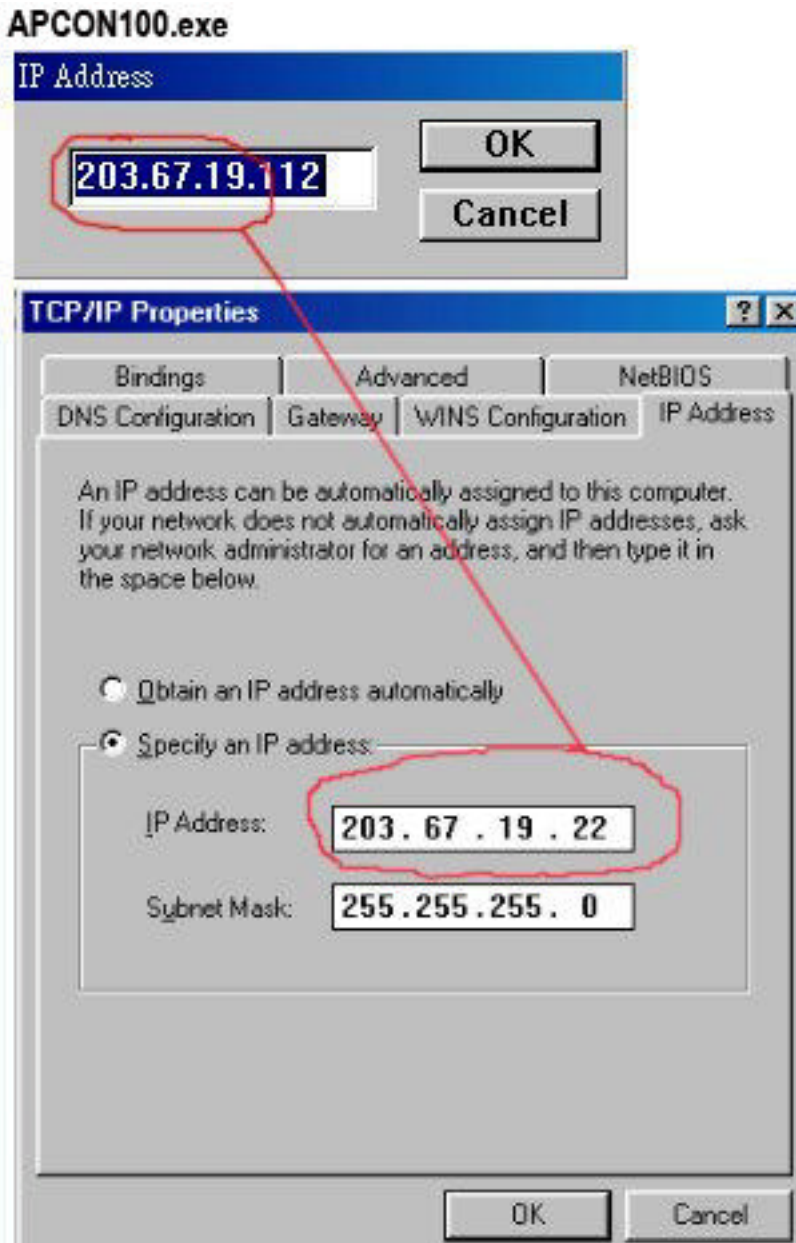
(3)



TO ANY DEVICES USING SERIAL CONNECTIONS

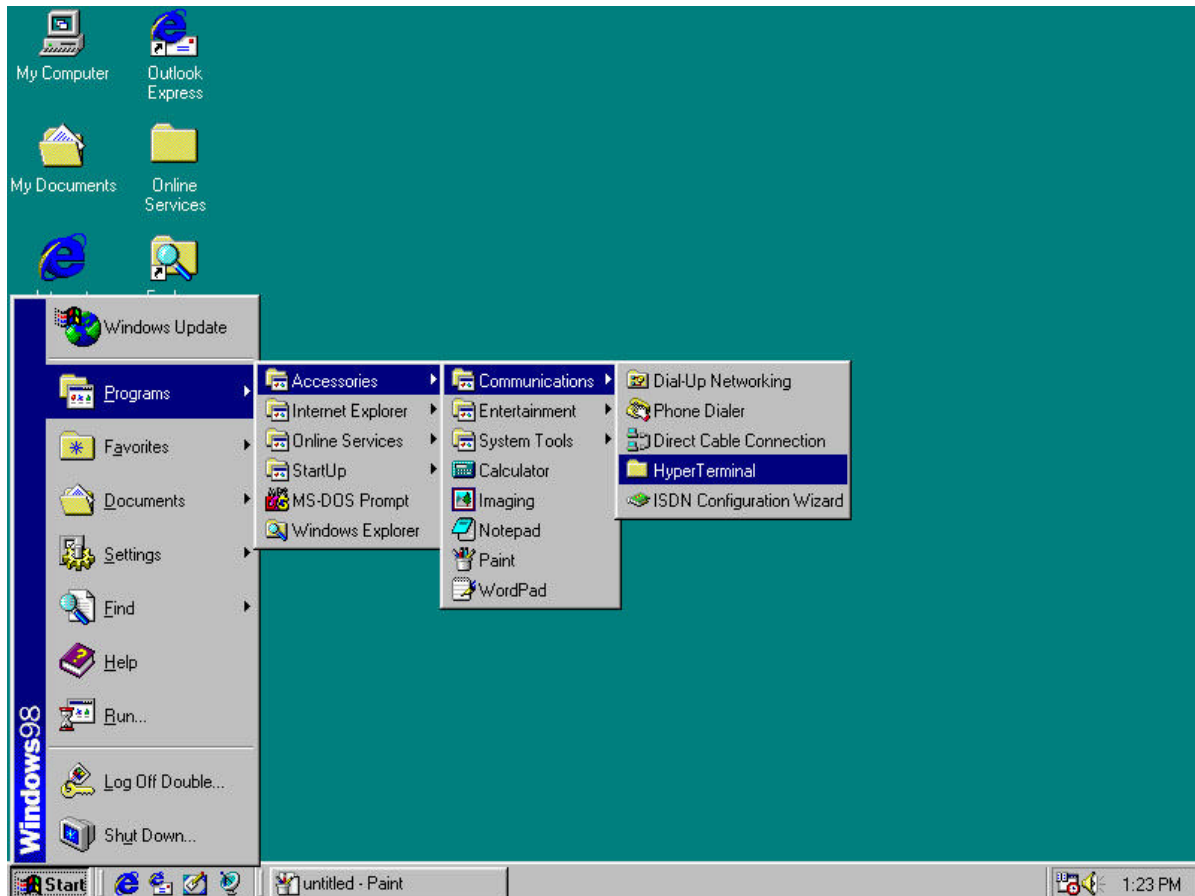
7(A) Double-check the IP Address

Please make sure the first 3 numbers of IP address of your APCON100 Ethernet converter must match to your network IP address:



7(B) Test by Windows HyperTerminal

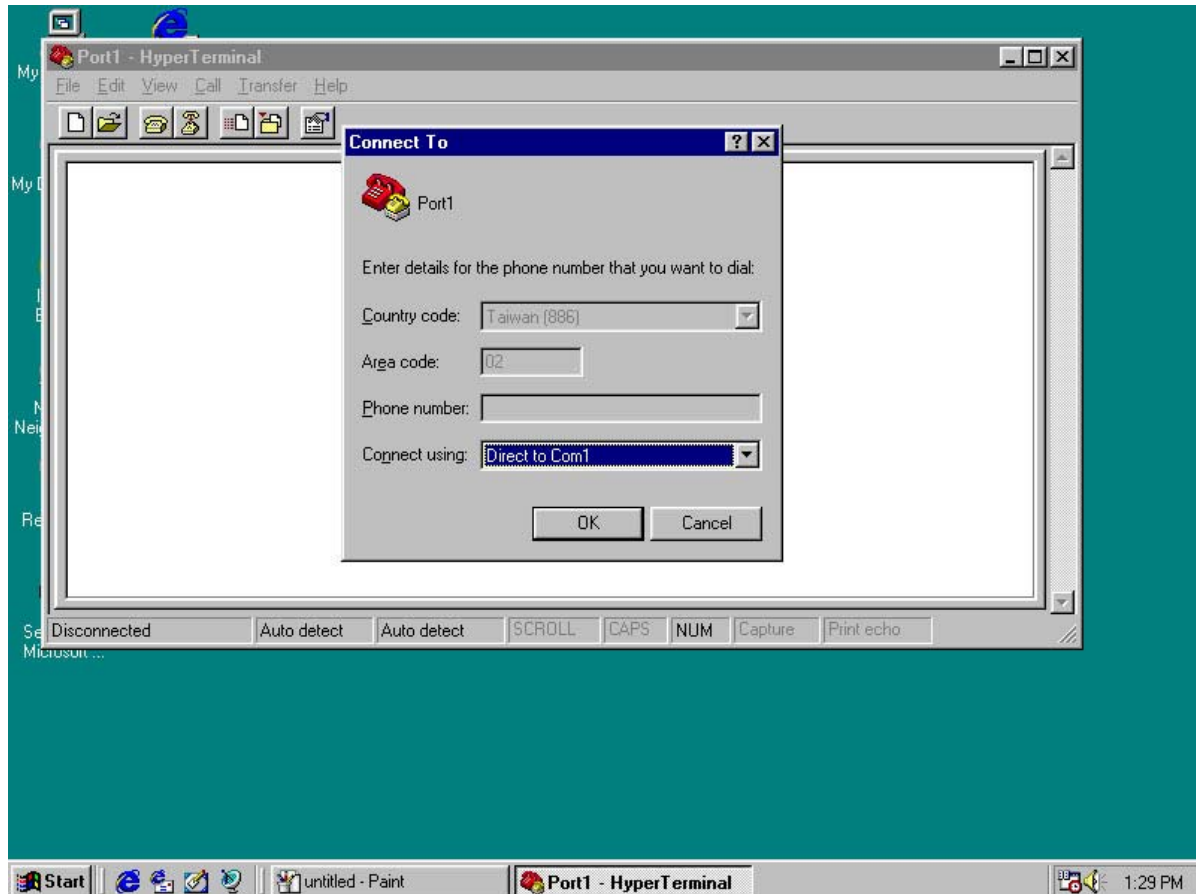
Note: The Windows HyperTerminal must be pre-installed.



(Figure 11)

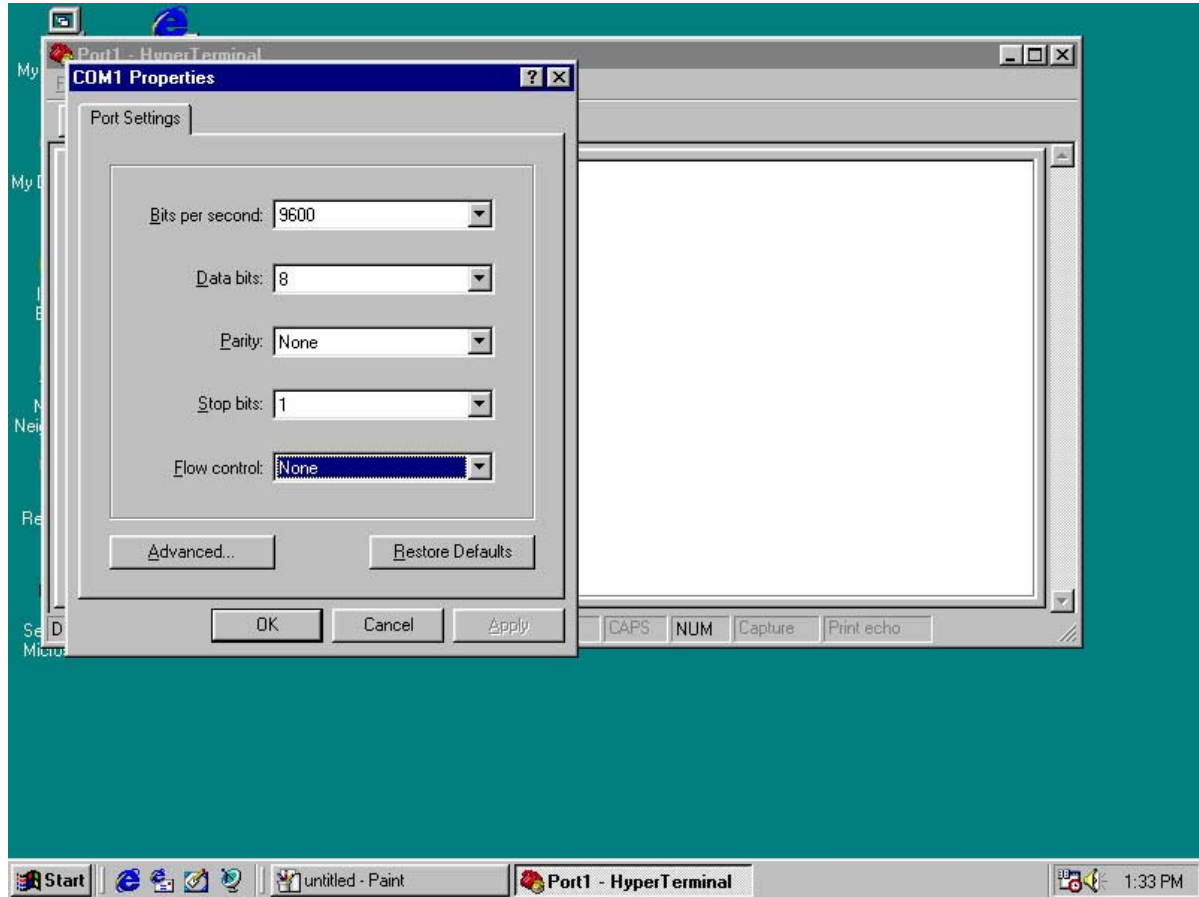
Open two HyperTerminal windows, make one connection using COM port (Figure 12) and another by TCP/IP Winsock. (Figure 14)

First HyperTerminal Window: Connect using COM



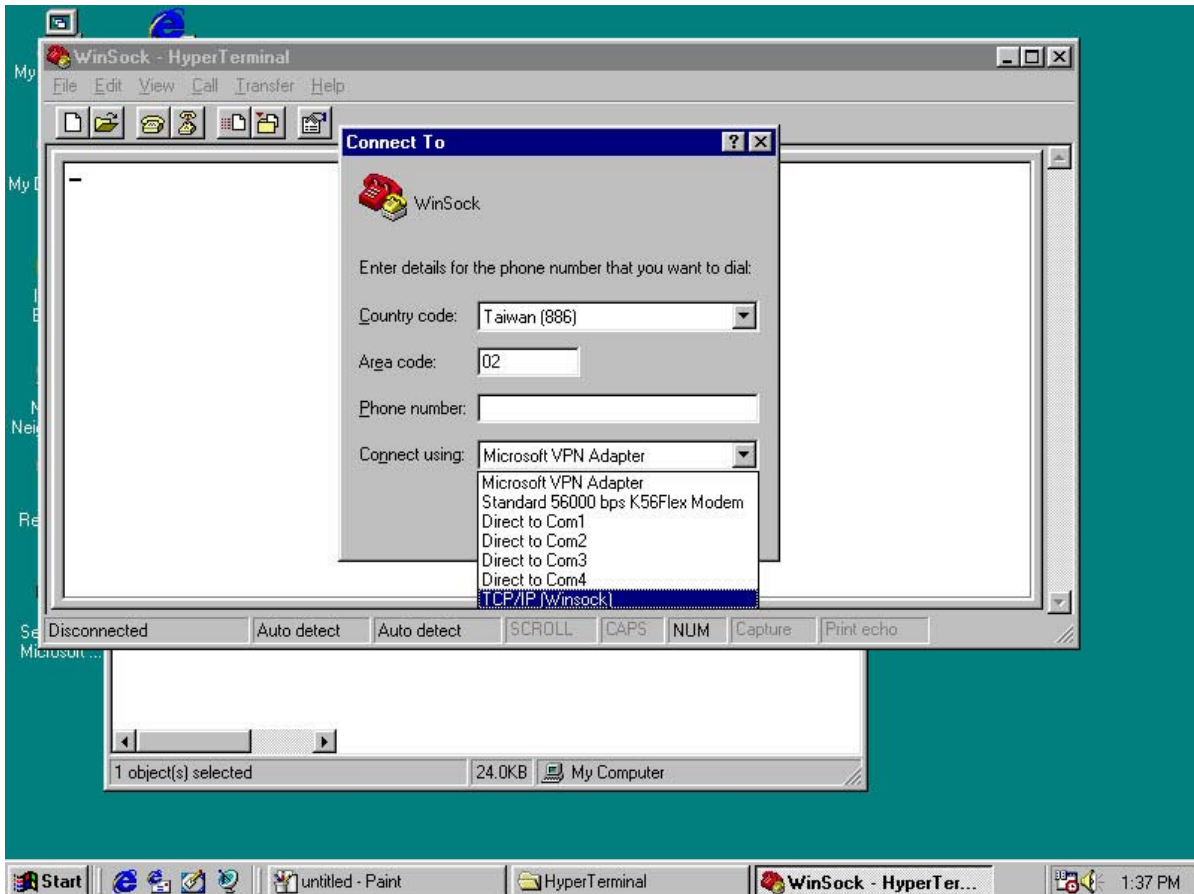
(Figure 12)

First HyperTerminal Window: Double-Check Port Settings: 9600, N, 8, 1.



(Figure 13)

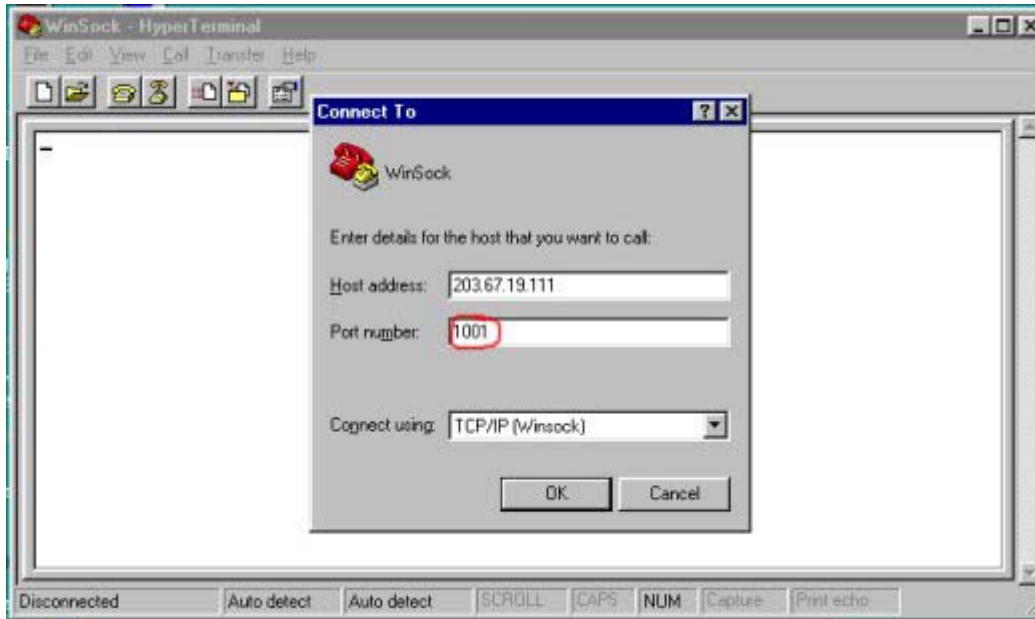
Second HyperTerminal window: make the connection using **TCP/IP [Winsock]** and give it a name “Winsock” or any other names as you wish:



(Figure 14)

Before continue, please make sure that the “Port Number” must has the same value as the “**Socket Port of Serial Port I/O**” in the [Controller Setup](#). The “Socket Port of Serial Port I/O” is user definable. Please refer to [Chapter 6](#): “Controller Setup by Internet Browsers”

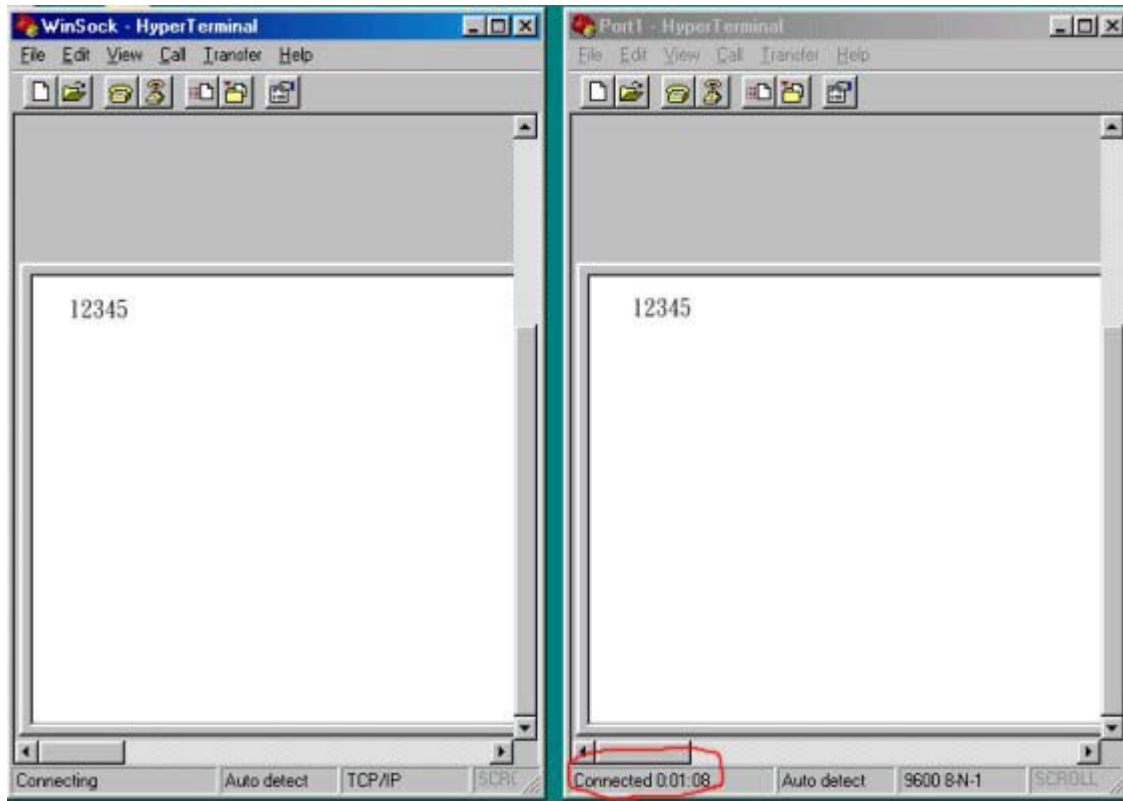
Click OK



DHCP client	Disable
Socket port of serial I/O	1001 TCP Server
Socket port of digital I/O	1002 TCP Server
Client mode server IP address	0.0.0.0
Client mode server socket port	0

(Figure 15)

If the devices are connected and configured properly, The HyperTerminal should show “**Connected: H/MM/SS**” at its status bar as shown in Figure 16. You may now simply enter any data at the first RS-232 HyperTerminal window or sending any data from your serial devices to see if the communication comes out correctly.



(Figure 16)

Chapter 8. Pin Assignments

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RS-232 pins description:

PIN 1: vacant	PIN 2: RXD	PIN 3: TXD	PIN 4: vacant
PIN 5: GND	PIN 6: vacant	PIN 7: RTS	PIN 8: CTS
PIN 9: vacant			

RS-232 Wiring Diagram

Serial Port	APCON132/432
2 RX	3 TX
3 TX	2 RX
5 GND	5 GND
7 RTS	8 CTS
8 CTS	7 RTS
	APCON100
9 VCC	9 VCC

RS-422 pin properties:

PIN 1: R- PIN 2: R+ PIN 3 : T- PIN 4 : T+

RS-422 Wiring Diagram

Serial COM Port	APCON132
R-	3 T-
R+	4 T+
T-	1 R-
T+	2 R+

RS-485 Wiring Diagram

Serial COM Port	APCON132
R- T-	1 R- 3 T-
R+ T+	2 R+ 4 T+

Chapter 9. Q & A

Q: Why APCON100.exe detects nothing on the network?

A: Please check if the power is on and the RJ45 phone jack are properly attached to the both ends of the RJ-45 outlets (refer to the Chapter 2. LED indicators) and if the proper cables are being used for connection (regular CAT-5 cable or crossover cable for UPLINK)

Q: Why my Internet Browser cannot find the Controller Setup screen?

A: Please make sure the device IP matches the IP of your local area network. (Please refer to Chapter 7 Easy Testing)

Q: “LAN” LED indicator flashes normally, but my APCON100 still not online?

A: Please make sure you PC or HUB supports 100M Ethernet.

Q: Why RS-232 connection is not working?

A: Please inspect the serial cable, The RX/TX has to be crossed if the APCON100 Ethernet converter is directly connected to a P.C. Should your APCON100 connection goes to another serial device, please also check the serial cable and make sure that its RX/TX must not be crossed. Also, some of the RS-232 devices requires determination of CTS/RTS cross or DTR HIGH.

Q: What is IP setup in APCON100 series? Even though, I enter a real IP but it still failed to connect up to the network?

A: The first 3 numbers of IP address of the APCON100 hardware must be the same as the first 3 numbers of your network IP address. But when the device is connected via a router, since router provides gateway and mapping IP function, you should then be able to connect up your device within different LAN. Therefore, even the IP you have assigned to the APCON100 is real, you still cannot make the device up and running without a router or NAT to translating the network addresses.