

WS - 1 2 1

Serial to Ethernet Converter

User Manual

Version 1.1

Infosystem Technology Corporation, Ltd.

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Product Information

A. Introduction

WS is Web-Server product and it can provide an ideal solution to customized embedded system. By using WS Products into your systems, you can easily achieve any Serial to Ethernet Converting affairs.

WS-121 products use 8051's family microprocessor for implementing RS232 to Ethernet functions. It uses the state machine to handle TCP/IP stack and brings the user a lower cost TCP/IP stack with limited functions because of the limited resources. Basically it supports ARP, ICMP, TCP, UDP, IP, DHCP-Client and even HTTP protocols. 8 socket is available on WS-121

WS-121 products are small size and low cost solutions. It is easy to convert serial port data to Ethernet in IA, Factory Automation, Security or any other low data rate data transmission by using it as the intermediate converter. You can use any browsers to set the parameters, or just use the commands in console mode. With no doubt, WS-121 will bring you the easiest management in your applications.

B. Features

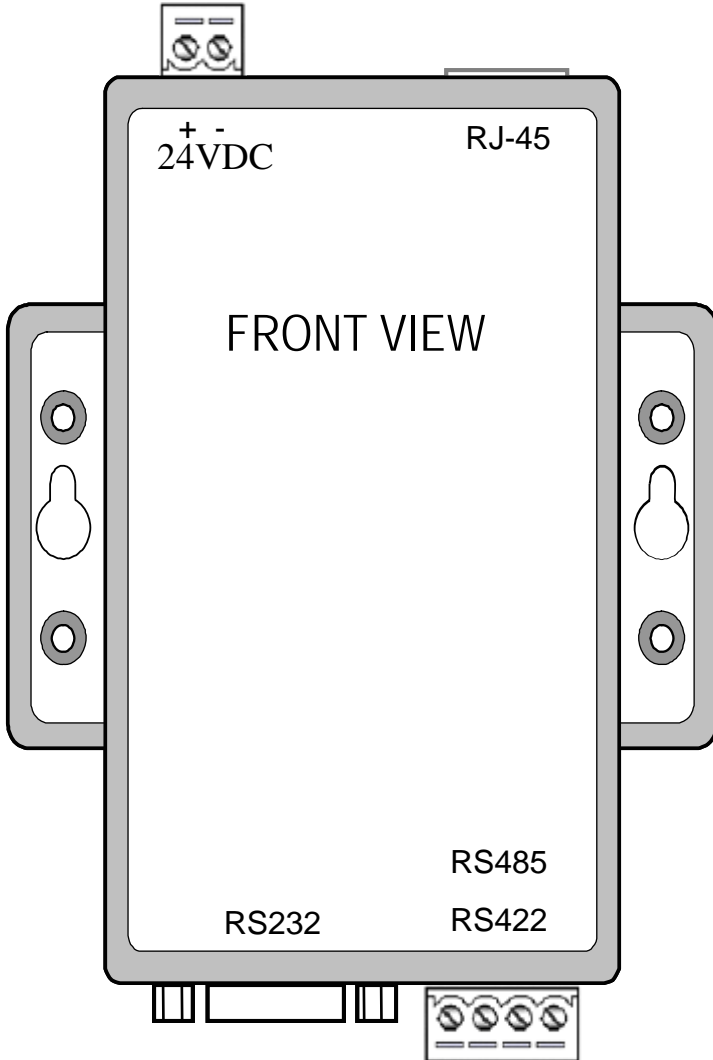
- Easy Configuration Setting
 - ✓ *Use HTTP, IE/Netscape Browser for Setting*
- Good Security Concerned
 - ✓ *Setup Login in Password Protect*
 - ✓ *Access Password Protect*
 - ✓ *Firmware Upgradeable*
 - ✓ *Support New Version Firmware Upgradeable*
- Low cost and High Reliability
 - ✓ *Cheap and stable*
 - ✓ *Working 24Hours per day*
- Low Power Consumption
 - ✓ *Less than 1W Power Consumption*
- Support Necessary Network Protocols
 - ✓ *ARP, ICMP, TCP, UDP, IP, DHCP Client, HTTP*
- Support Various Interfaces
 - ✓ *RJ-45 x1*
 - ✧ *10/100Mbps, Automatic MDI/MDIX*
 - ✓ *RS-232 x1*
 - ✧ *Up to 115.2Kbps, RTS/CTS H/W flow control*
 - ✓ *RS-485/RS-422 x1*
 - ✧ *Half Duplex for RS485*
 - ✧ *Full Duplex for RS-422*
- Eight Independent Sockets
 - ✓ *Support at most eight independent sockets for SIO, Digital I/O and HTTP*
 - ✓ *All protocol working independent and concurrently*

C. Applications

- Data collection & security terminals:
- Access Control Terminals
- Security Devices
- Time Recorders
- Warehouse Terminals
- Shop floor automation Terminals
- Remote Sensors & Meters:
- Power monitors
- Power meters
- Environmental monitors
- Temperature monitors
- Data loggers
- Auto-ID Scanners:
- Barcode Scanners
- Magnetic Card Readers

Exterior

A. Front View



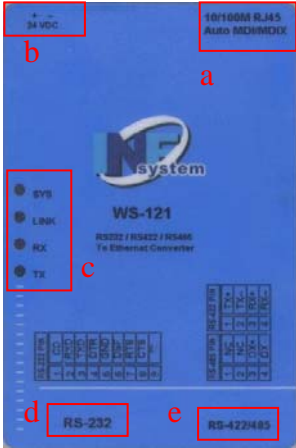
Exterior

B. Top View



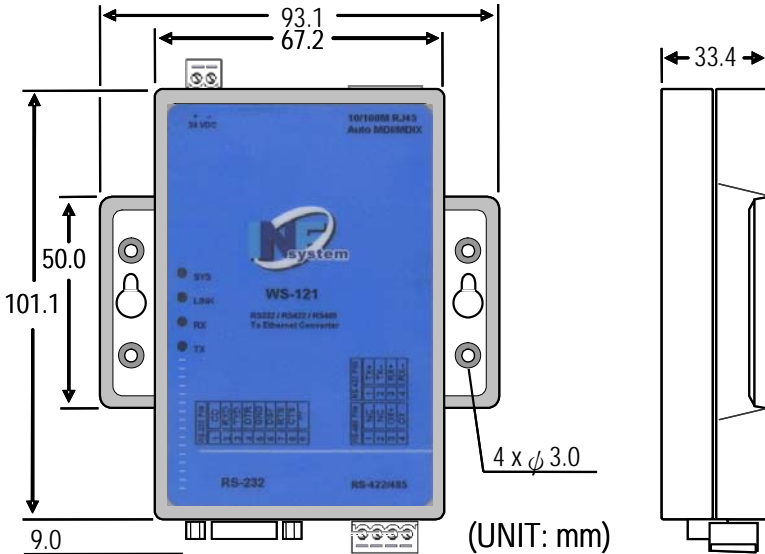
Exterior

C. Front Panel



- a. 10/100M Ethernet Port
- b. 24VDC Power
- c. System LED Indicator
- d. D-Sub RS232 Connector
- e. RS485/RS422 Connector

D. Dimension



Specification

A. Basic Specification

- General list -

LED indication:	SYS: Red high bright round LED
	LINK: Green high bright round LED
	RX: Green high bright round LED
	TX: Red high bright round LED

- Power -

Power Supply:	24VDC
---------------	-------

- Environment -

Operating temperature:	0~55 °C, non-condensing
Operating relative humidity:	20~95 %RH
Storage temperature:	-10~70 °C

- Mechanics -

Case Materiel:	ABS fire-protection
Mounting:	Surface mount, wall mount
Terminal block:	Plastic NYLON 66
Weight:	150g

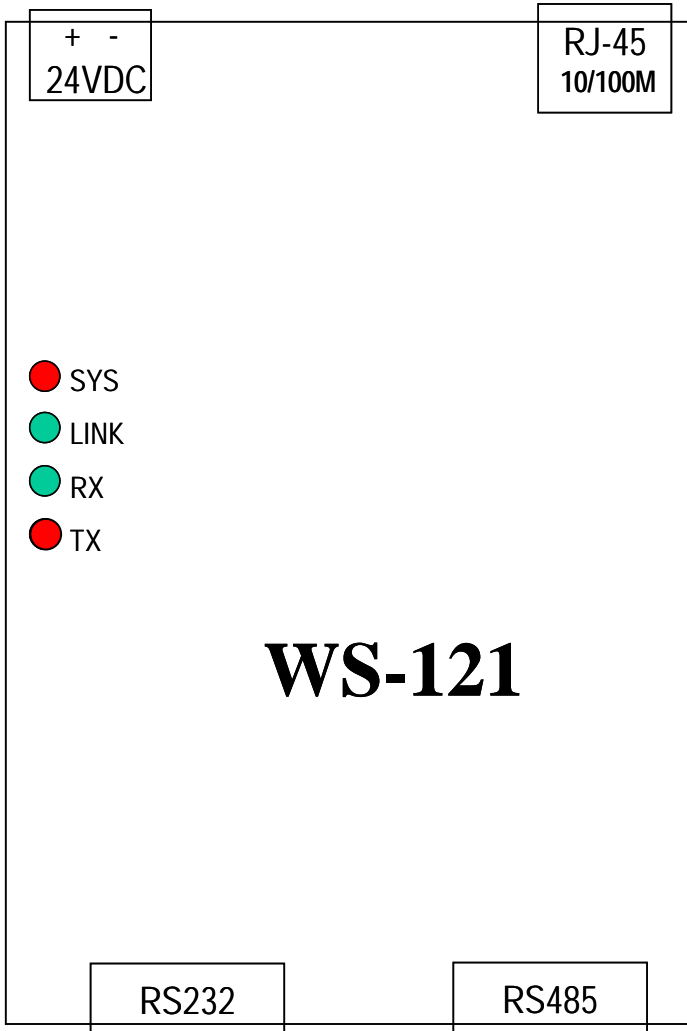
- Multi Sockets -

Socket:	At most 8 sockets concurrently
---------	--------------------------------

Specification

B. PIN Definition

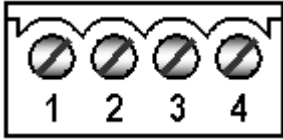
- Top View -



Specification

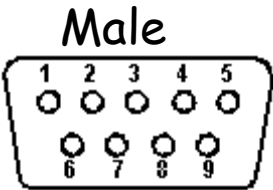
B. PIN Definition

- Terminal Block (RS485) -



PIN	RS-422	RS-485
1	RX+	NC
2	RX-	NC
3	TX+	D+
4	TX-	D-

- D-sub (RS232) -



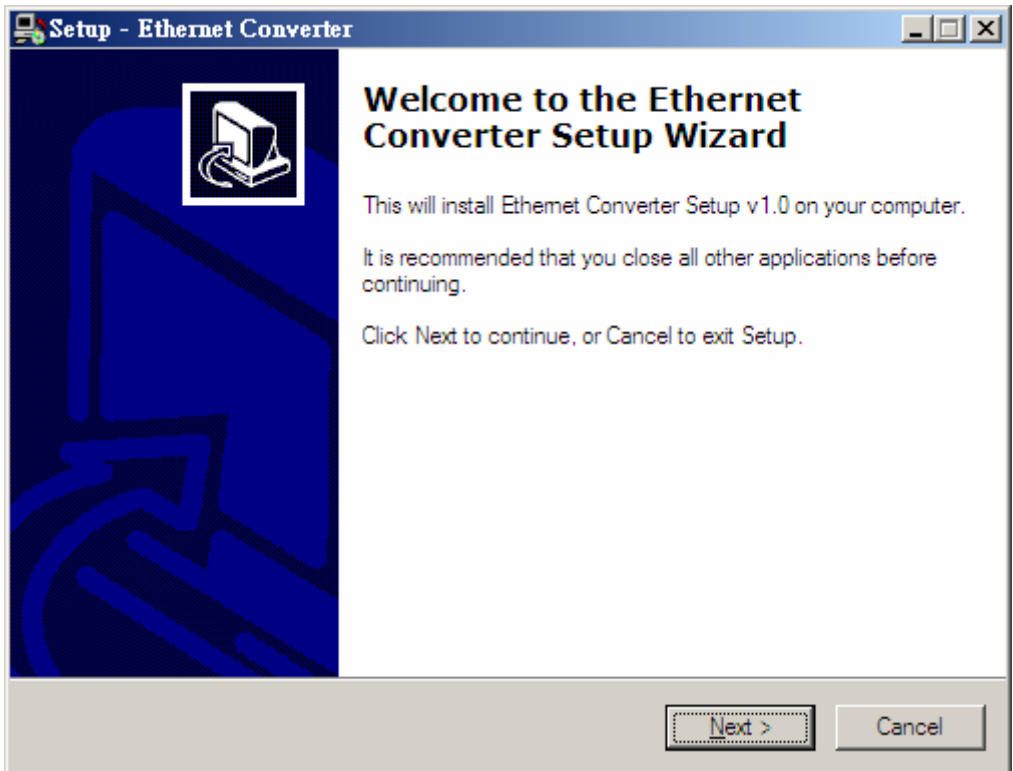
PIN	RS-232
1	CD
2	RXD
3	TXD
4	DTR
5	GND
6	DSR
7	RTS
8	CTS
9	RI

Install and Uninstall

A. Install

Step 1: Execute the Setup.exe file

Execute the Setup.exe file and you will get the following screen. Press “Next”.



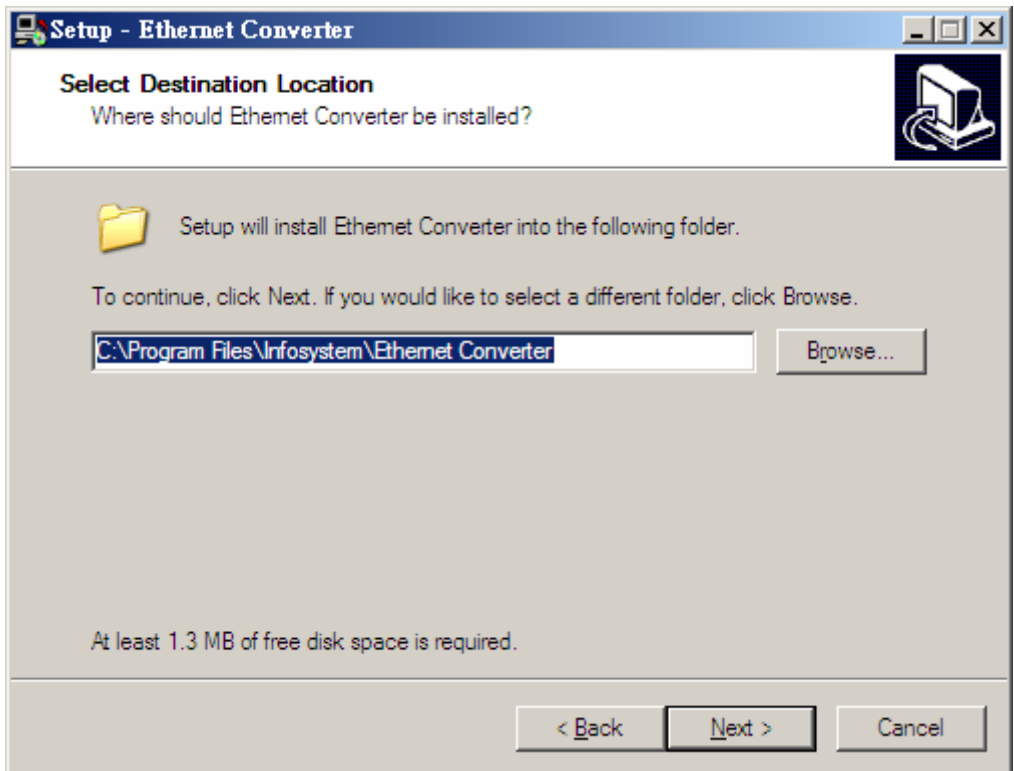
PS: Press “Ethernet Converter Setup Utilities” button while using the installation cd.

Install and Uninstall

A. Install

Step 2: Select Destination Location

Select which directory you want to install the program. Press “Next”.

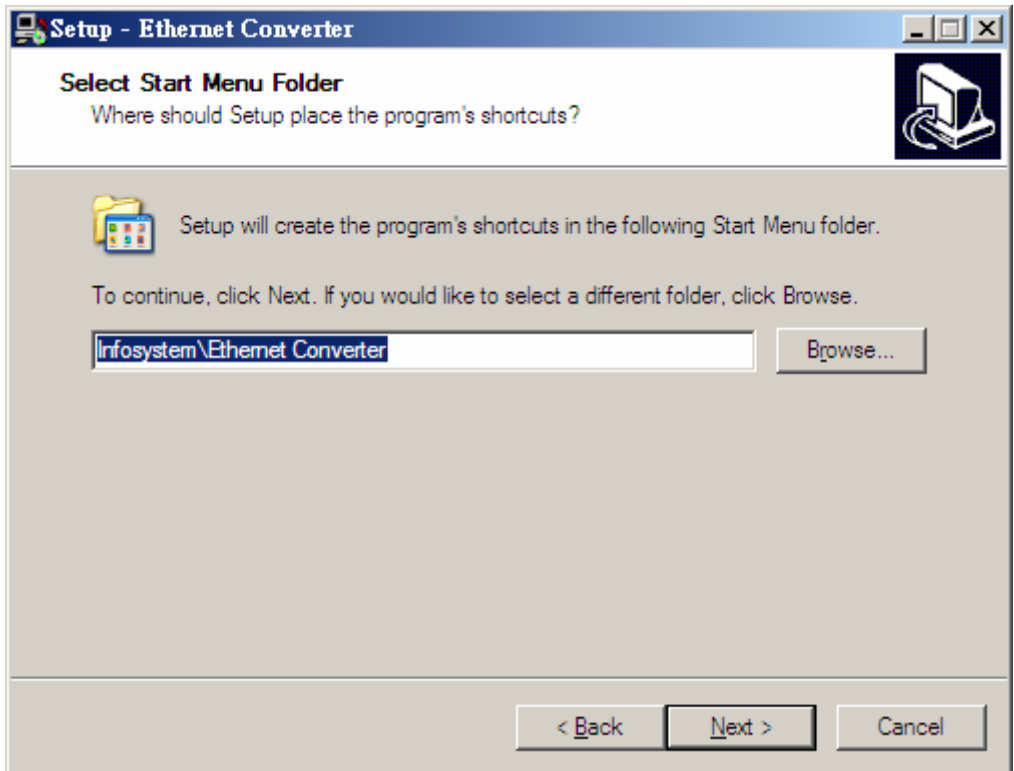


Install and Uninstall

A. Install

Step 3: Select Start Menu Folder

Select which folder you want the program to belong to of Start Menu. Press “Next”.

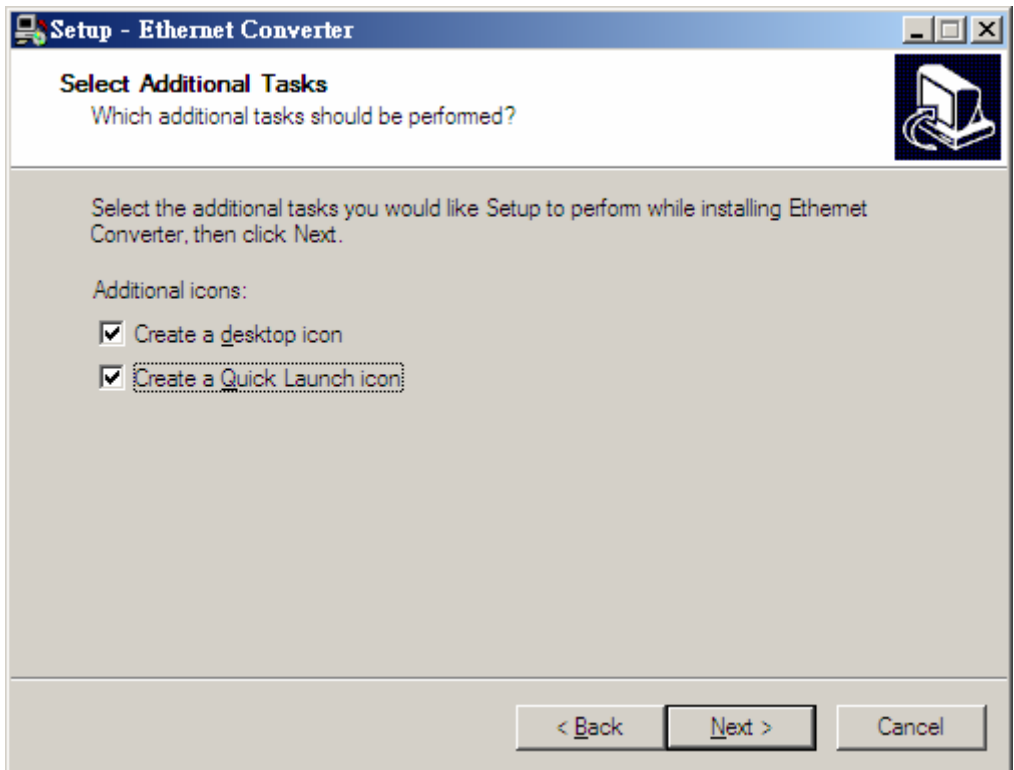


Install and Uninstall

A. Install

Step 4: Select Additional Tasks

Create or not the extra icons. Press “Next”.

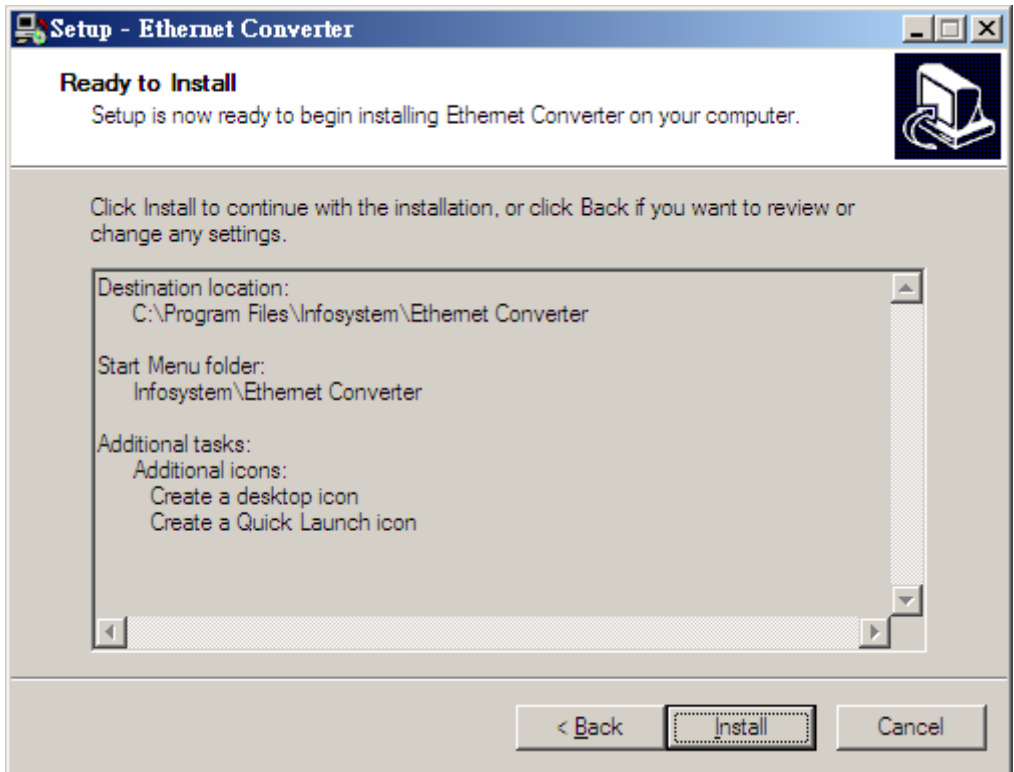


Install and Uninstall

A. Install

Step 5: Processing

To start installation process, press “Install”.

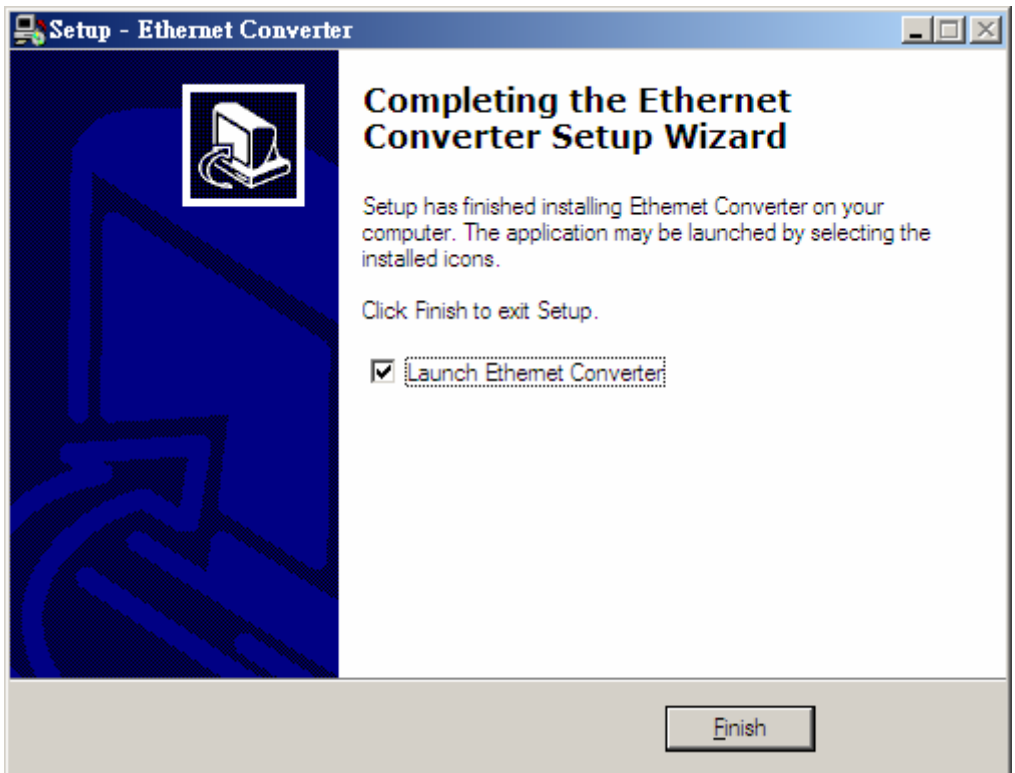


Install and Uninstall

A. Install

Step 6: Finished

Press **Button** to finish installation.

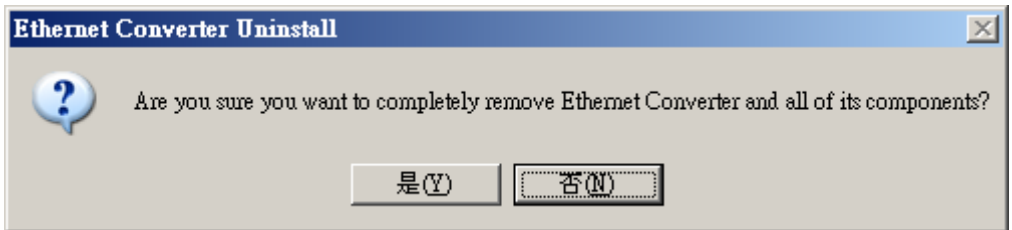


Install and Uninstall

B. Uninstall

Step 1: Uninstall Ethernet Converter

Execute “Uninstall Ethernet Converter” in the folder of where you have installed the program. And then get the message as the following.

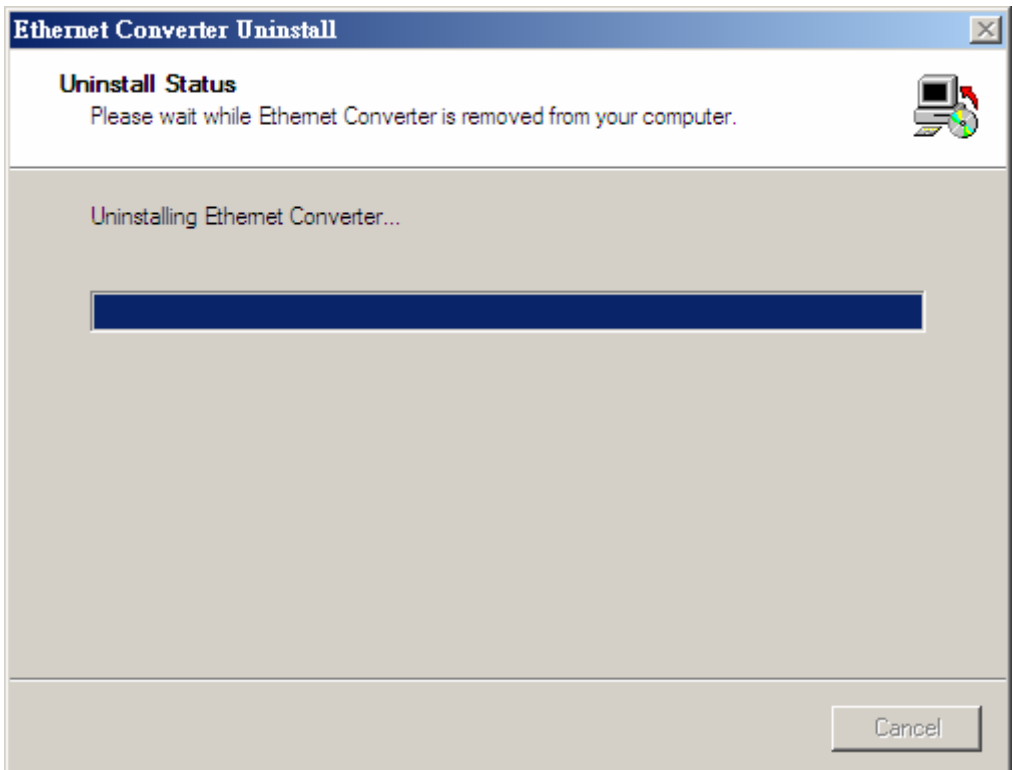


Install and Uninstall

B. Uninstall

Step 2: Processing

Choose “YES” only when you are sure to uninstall the Ethernet Converter Setup Tools.

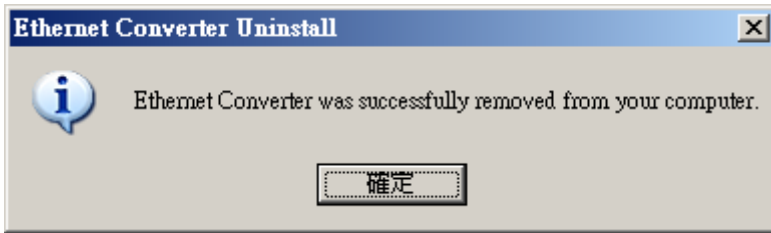


Install and Uninstall

B. Uninstall

Step 3: Finished

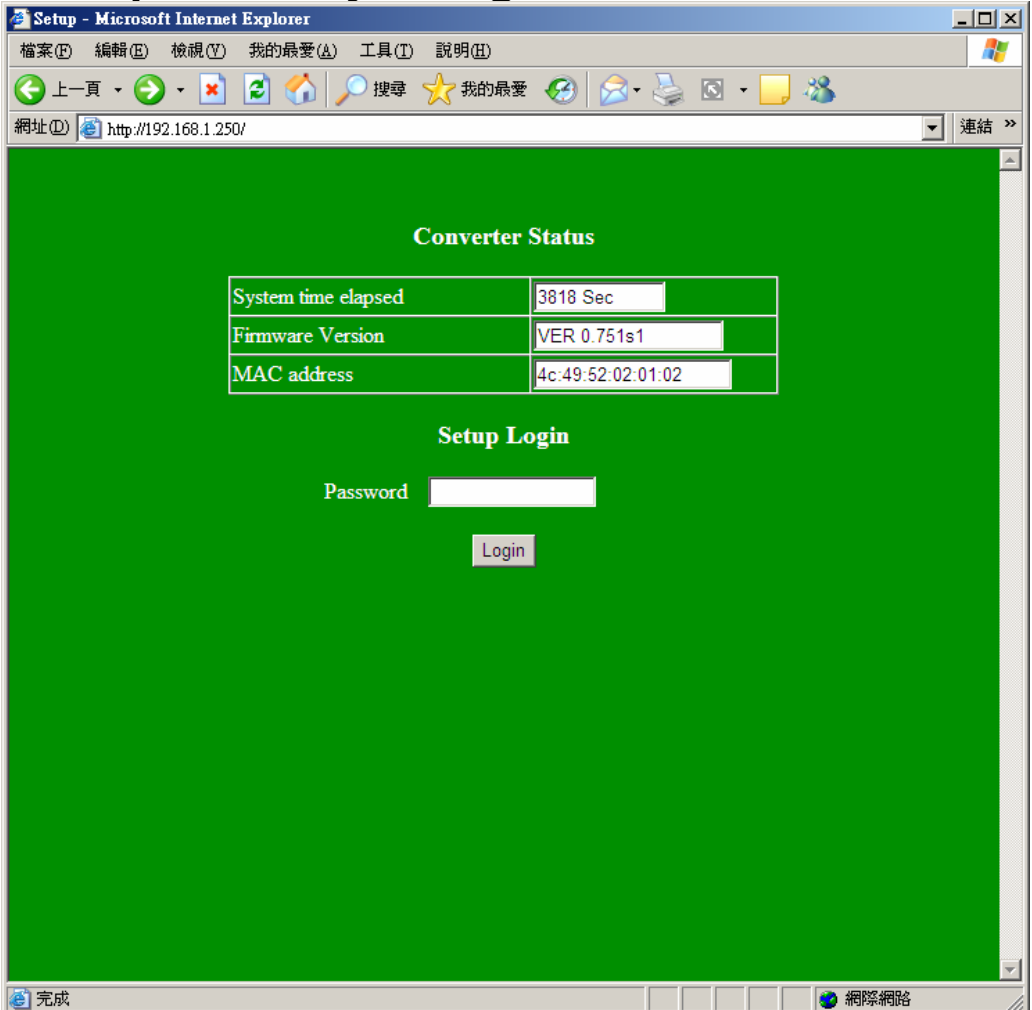
Choose “OK” button to finish uninstall Ethernet Converter Setup Tools.



Configuration

A. By Browser

Step 1: Ready to login.



Configuration

A. By Browser

Step 2: Configure your parameters.

Setup - Microsoft Internet Explorer

檔案(F) 編輯(E) 檢視(V) 我的最愛(A) 工具(T) 說明(H)

← 上一頁 → 地址(AD) http://192.168.1.250/Setup.htm 連結 >>

Converter Setup

Local IP	<input type="text" value="192.168.1.250"/>
Subnet mask	<input type="text" value="255.255.255.0"/>
Gateway IP	<input type="text" value="192.168.1.254"/>
DHCP client	<input type="text" value="Disable"/>
Remote Host IP	<input type="text" value="0.0.0.0"/>
Remote Host port	<input type="text" value="0"/>
SIO Port, Type	<input type="text" value="9925"/> <input type="text" value="TCP Server"/>
SIO BandRate	<input type="text" value="9600"/> <input type="text" value="N"/> <input type="text" value="8"/> <input type="text" value="1"/>
SIO Type	<input type="text" value="RS232"/>
SIO Packets Gap	<input type="text" value="2"/> ms
Slave Response Time out	<input type="text" value="600"/> ms
Device ID	<input type="text"/>
Setup password	<input type="text"/>
Access password	<input type="text"/>
Multi Sockets Arbitration Time	<input type="text" value="0"/> ms

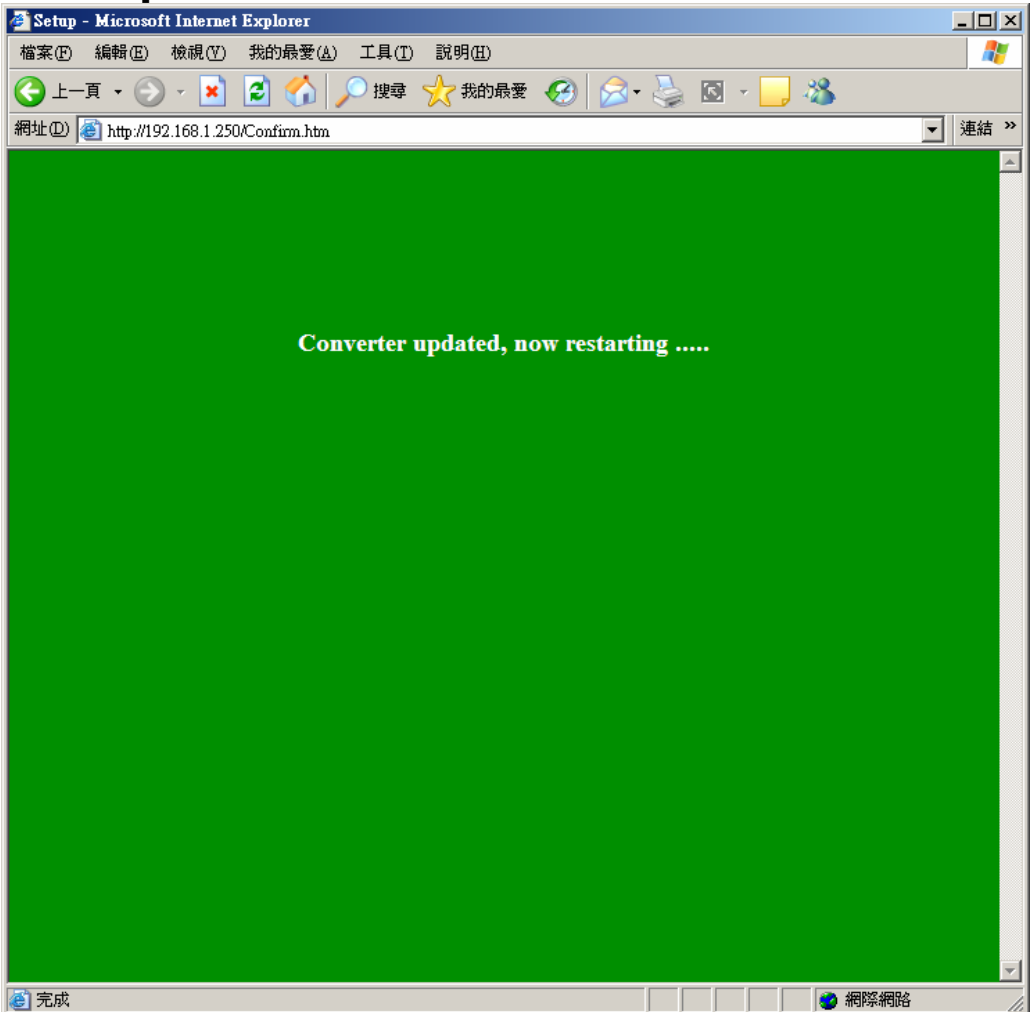
Note: SIO Port 502 is Reserved for the MODBUS/TCP.

完成 網際網路

Configuration

A. By Browser

Step 3: Finish and reboot.

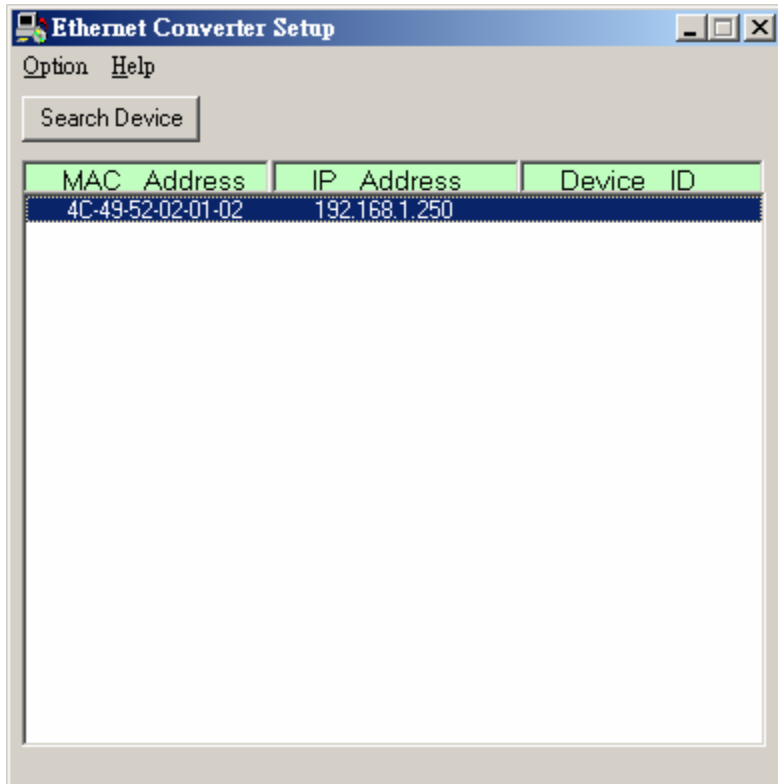


Configuration

B. By Setup Tools

Step 1: Searching the devices.

Step 2: Double click the selected item.



Configuration

B. By Setup Tools

Step 3:

Configure and update your parameters.

WS-110A Setup (MAC: 4C-49-52-02-01-02) (VER 0.751s1)	
IP address	192.168.1.250
Subnet mask	255.255.255.0
Gateway IP address	192.168.1.254
DHCP client	Disable
Host IP address	0.0.0.0
Host socket port	0
Socket port of serial I/O, Type	9925 TCP Server
Serial I/O settings (baud rate, parity, data bits, stop bits)	9600 N 8 1
Type of serial I/O	RS232
SIO InterCharacter Gap	2
Slave Response Time Out	600 ms
Device ID	
Setup password	
Access password	
Multi Socket Arbitration Time Period	0 ms

Note: SIO Port 502 is Reserved for the MODBUS/TCP.

Update Cancel

Configuration

C. By Direct Broadcast Commands

It needs broadcasting to handle all the configurations and it allows users to code their own application software.

- Command List A – User Level -

Command	Description	Notes	
X or x	Purpose	<i>For Broadcast search</i>	
	Syntax	<i>X <magic code></i>	
	Magic code	<i>99.130.83.99</i>	
	Return	<i>AX <MAC>/<IP>/<Device ID></i>	
	Example	Send	<i>X 99.130.83.99</i>
Back		<i>AX 0.128.200.255.251.242/192.168.1.1/1</i>	
G or g	Purpose	<i>Get all the parameters of the WS-121</i>	
	Syntax	<i>G <MAC>/<IP>/<Setup Password></i>	
	Return	<i>All the parameters of the WS-121</i>	
	Example	Send	<i>G 0.128.200.255.251.242/192.168.1.1/123</i>
		Back	<i>CG for cancel</i>
	<i>AG<All Messages></i>		

Configuration

C. By Direct Broadcast Commands

User Level: For General Users

Admin Level: For Factory Default Setting

- Command List B – User Level –

Command	Description	Notes	
S	Purpose	<i>Set the parameters of WS-121</i>	
	Syntax	<i>S <MAC>/<IP>/<Password>/<Parameter>/<Value></i>	
	Return	<i>A for accept</i>	
		<i>C for cancel</i>	
	Example	<i>Send</i>	<i>S 0.128.200.255.251.242/192.168.1.1/123/IP/192.168.1.2</i>
<i>Back</i>		<i>A or C</i>	
R	Purpose	<i>Reboot WS-121</i>	
	Syntax	<i>R <MAC>/<IP>/<Setup Password></i>	
	Return	<i>AR for accept</i>	
		<i>CR for cancel</i>	
	Example	<i>Send</i>	<i>R 0.128.200.255.251.242/192.168.1.1/123</i>
<i>Back</i>		<i>AR or CR</i>	

Configuration

C. By Direct Broadcast Commands

User Level: For General Users

Admin Level: For Factory Default Setting

- Command List C – Admin Level –

Command	Description	Notes	
M	Purpose	Set MAC address of WS-121 then reboot automatically	
	Syntax	M <Old MAC>/<New MAC>/<Factory Password>	
	Return	AM for accept	
		CM for cancel	
	Example	Send	S 0.128.200.255.251.242/0.128.200.255.251.243/123
Back		'A' or 'C'	
I	Purpose	Set IP for Factory settings	
	Syntax	I <MAC>/<New IP>/<Factory Password>	
	Return	AI for accept	
		CI for cancel	
	Example	Send	I 0.128.200.255.251.242/192.168.1.1/123'
Back		AR or CR	

Application Notes

A. Description:

Firewall will make the program off normal, so one might choose the following solutions to Firewall program, “Disable” or “Exception”.

B. Disable Firewall of Windows XP SP2.

Step 1: Execute "Windows Firewall"

Execute “Windows Firewall” in Control Panel.

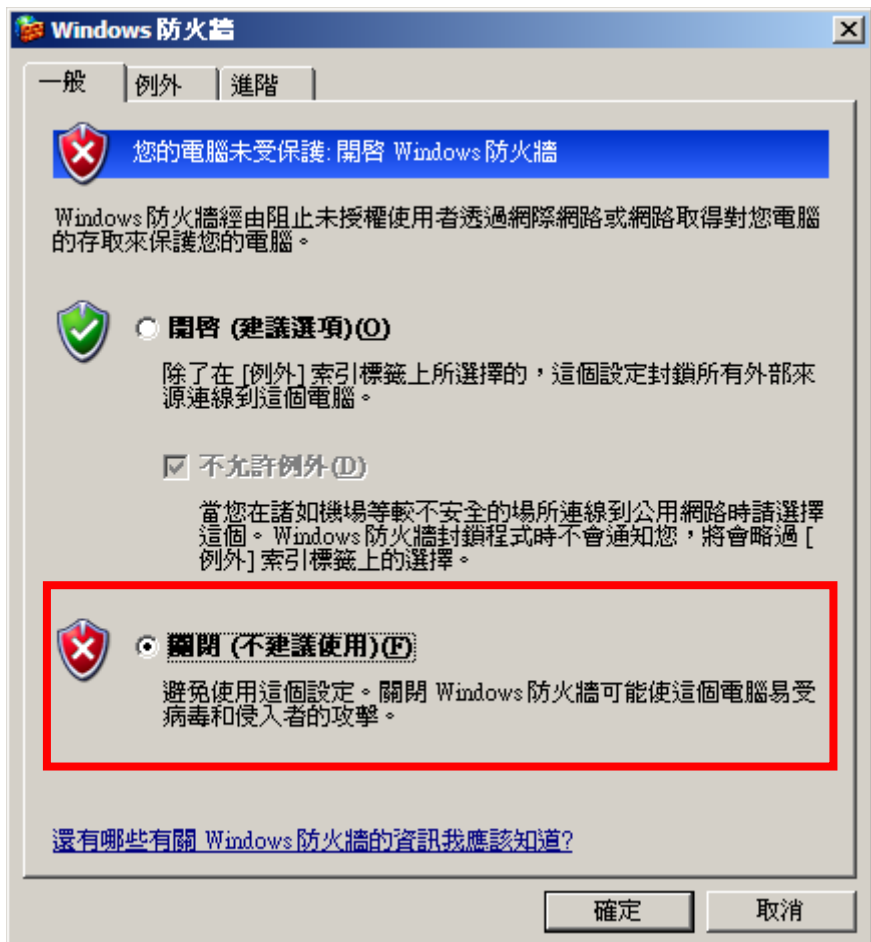


Application Notes

B. Disable Firewall of Windows XP SP2.

Step 2: Close the Firewall

Choose “Close” to close firewall.



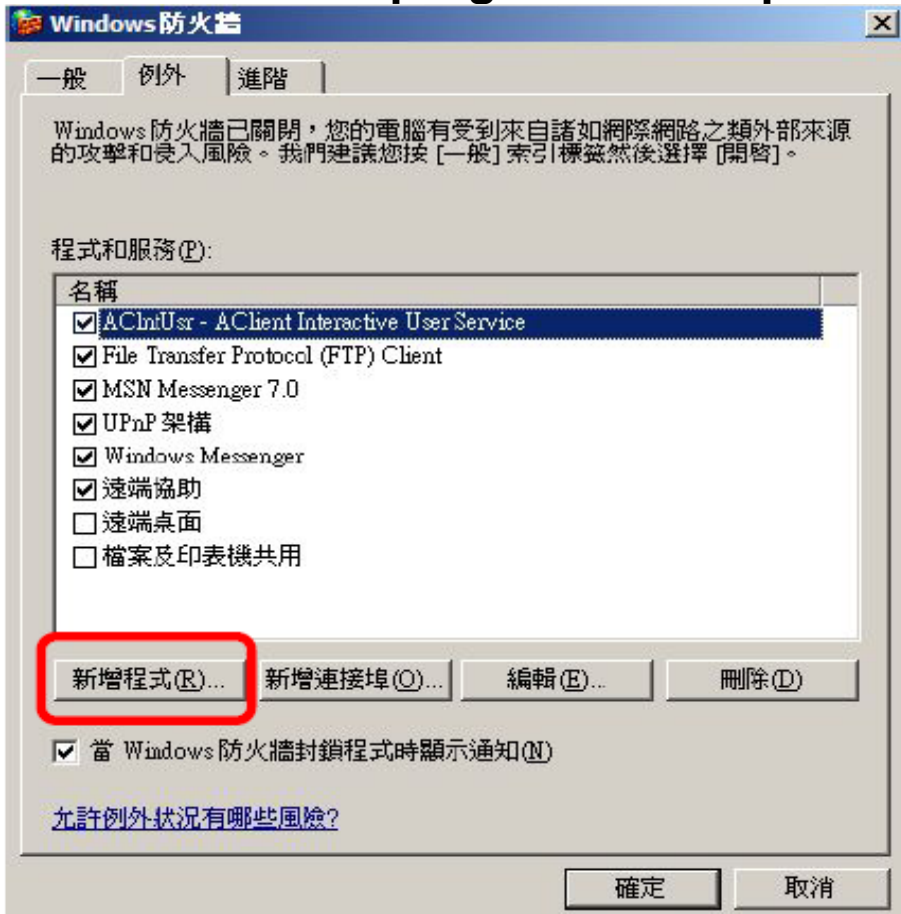
Application Notes

C. Make Program exception for Firewall

Step 1: Choose "Exception"

Choose "Exception" in Firewall Program.

And add on new program of Setup Tools.



Application Notes

C. Make Program exception for Firewall

Step 2: Add on New Program and Selection
Choose “Setup Tools” to make it as an exception.

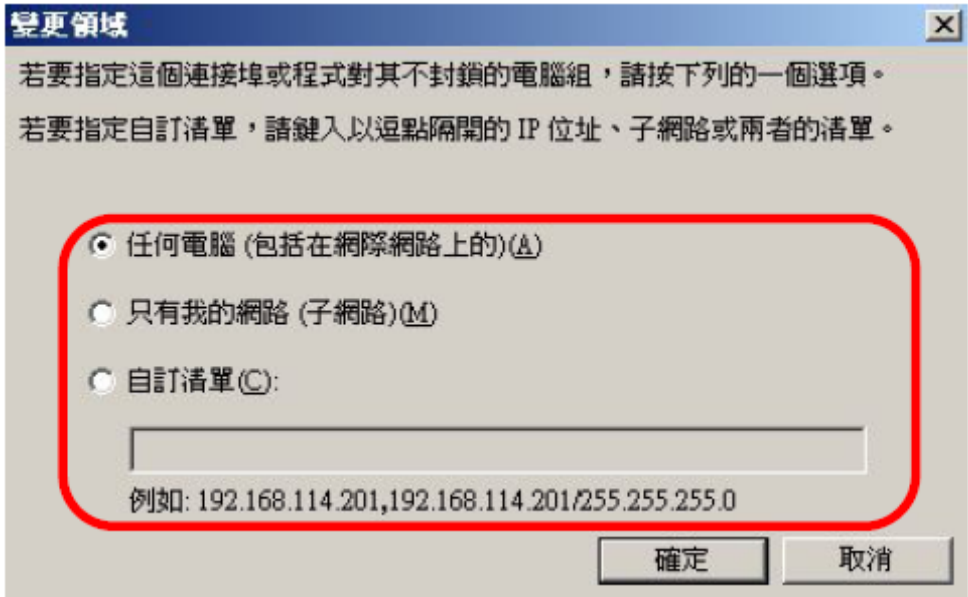


Application Notes

C. Make Program exception for Firewall

Step 3: Allow "Accept Any Computer"

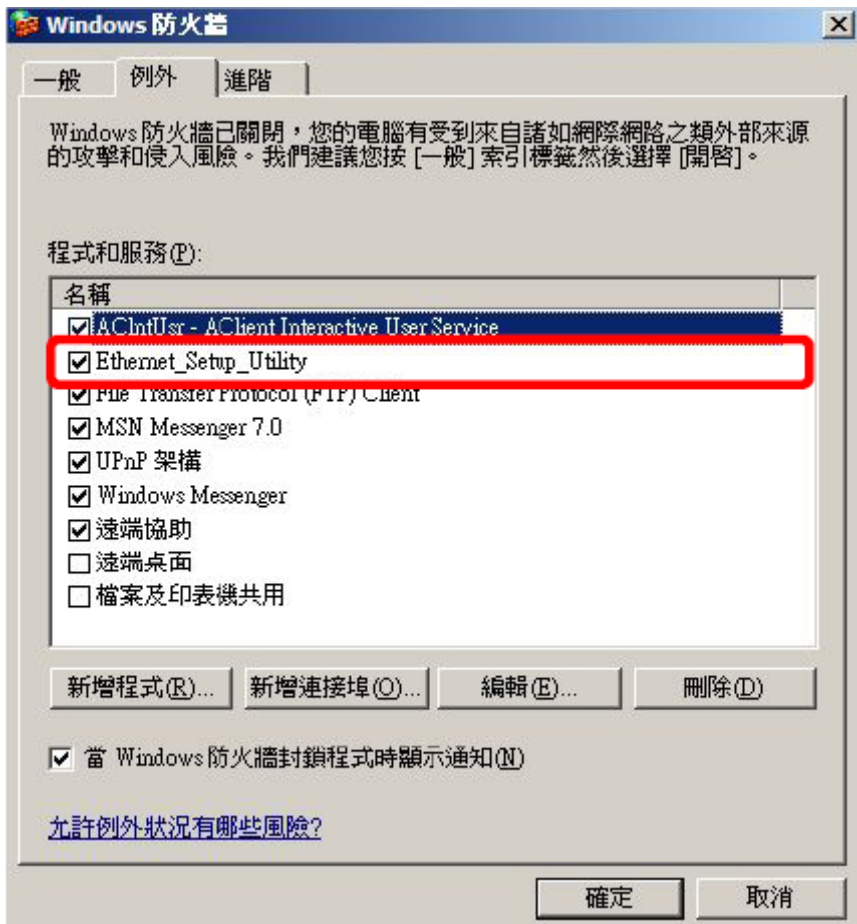
Allow "Accept Any Computer" to finish exception.



Application Notes

C. Make Program exception for Firewall

Step 4: Finished Finish Exception.



Parameter Description

Parameter	Description
Local IP	The IP address of the WS-121 converter on the TCP/IP network. The default Local IP address is 192.168.1.250. This address should be unique. Ask your network administrator for assistance, if in doubt.
Subnet Mask	Identifying the network class which the WS-121 converter belongs to. The default Subnet mask is: 255.255.255.0 for Class C IP. Ask your network administrator for assistance, if in doubt.
Gateway IP	The IP address of the router. The default Gateway IP address is: 192.168.1.254, Ask your network administrator for assistance, if in doubt.
DHCP Client	If this option is enabled, that means the IP address, Subnet mask and Gateway IP address of the WS-121 converter are set dynamically by the DHCP Server. If the setting cannot be got from the DHCP server successfully, the WS-121 converter will use the last setup parameters for its configuration. The possible reason of this case is that the DHCP server is shutdown or not available. Ask your network administrator for assistance, if in doubt.

Parameter Description

Parameter	Description
SIO Port, Type	<ul style="list-style-type: none"> ➤ The local port number of the WS-121 converter to be contacted by other devices. The default value is 9925. And users need to choose one communication mode for the WS-100 converter. There are four different communication modes can be selected. They are TCP Server, TCP Client, UDP Server and UDP Client. ➤ TCP Server – The WS-121 converter will operate at the Passive or the TCP listen mode to receive TCP connection requests from the remote client device. ➤ TCP Client – The WS-121 converter will operate at the Active or the TCP Active mode to request establishing a TCP connection with the remote server device.
Socket port of serial I/O, Type	<ul style="list-style-type: none"> ➤ UDP Server – The WS-121 converter will operate at the UDP Server mode to send and receive UDP datagram to/from the remote device. ➤ UDP Client – The WS-121 converter will operate at the UDP Client mode to send and receive UDP datagram to/from the remote device specified in Remote Host IP address and Remote Host Port. ➤ NOTE: SIO port number 502 is reserved for the Modbus/TCP protocol. When user connects the serial Modbus device running in Modbus/RTU Slave mode, the WS-100 converter can receive connection requests from Modbus/TCP Master device. Also when user connects the serial Modbus device running in Modbus/RTU Master mode, the WS-121 converter can connect to Modbus/TCP Slave device.

Parameter Description

Parameter	Description
DIO Port, Type	Reserved
SIO Baud Rate	The serial parameter settings: <ul style="list-style-type: none"> ➤ Baud Rate: 300 bps to 115200 ➤ Parity: None, Even, or odd ➤ Data Bits: 7, or 8 ➤ Stop Bit: 1, or 2
Socket I/O settings(baud rate, parity, data bits, stop bits)	
SIO Type	The serial interface types: <ul style="list-style-type: none"> ➤ RS232 ➤ RS232 with RTS/CTS control ➤ RS232 with RTS/CTS/DSR/DTR control ➤ RS485 half duplex mode ➤ RS422 full duplex mode
Type of serial I/O	
SIO Packets Gap	In some cases, for example, if the Modbus/RTU serial protocol is used, the completion of the message packet in the input buffer is determined by a character-to-character timeout. The SIO Packets Gap of WS-100 defines this timeout period.
SIO Inter-Character Gap	

Parameter Description

Parameter	Description
Remote Host IP	If the WS-121 converter is used in TCP client mode or UDP client mode, the Remote Host IP address must be specified to establish the connection with the designated HOST (server) only.
Remote Host Port	If the WS-121 converter is used in TCP client mode or UDP client mode, the Host Port No. must be specified. This is the port which the Remote Host IP listens for incoming data.
Slave Response Time Out	Expected Time Out for the response of slave machines
Device ID	Just Device ID for WS-121 devices

Parameter Description

Parameter	Description
TCP Link Time Out	<p>When this option is enabled, the TCP communication will be disconnected by the WS-121 converter if there is no further TCP activity within the given timeout value.</p>
Command Port	<p>The WS-121 converter supports the command mode, which user can use to setup the parameters or get the information of the converter with UDP protocol from the remote host. The default Command Port number is 65535. The command port of the WS-121 converter should be set correctly while using the command mode. Please refer to appendix 1 for further</p>

Parameter Description

Parameter	Description
Setup password	This password protects the Setup window of the WS-121 converter from unauthorized entry. To erase an existing password, just leave the Setup password text box blank.
Access password	If this password is configured, the remote host needs to send this access password one second periodically to the Check Status Port of the WS-121 converter, otherwise the data transfer request will not be accepted by the WS-121 converter. To erase an existing password, just leave the Access password text box blank.
Multi Sockets Arbitration Time Period	Arbitration Time period between multi sockets. Default is 0ms for single socket. And 20 ms is suggested when using multi sockets.

The logo for Infosystem, featuring the word "Infosystem" in a white serif font with a registered trademark symbol (®) to its upper right. The text is set against a rectangular background with a vertical gradient from red on the left to orange on the right.

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Infosystem Technology Corporation, Ltd.

No. 45, Lane 167, Dongnan St.

Hsinchu, Taiwan 300, R.O.C.

TEL: +886-3-562-7187

FAX: +886-3-561-1435

Service E-mail: services@infosystem.com.tw

Web page URL: <http://www.infosystem.com.tw>