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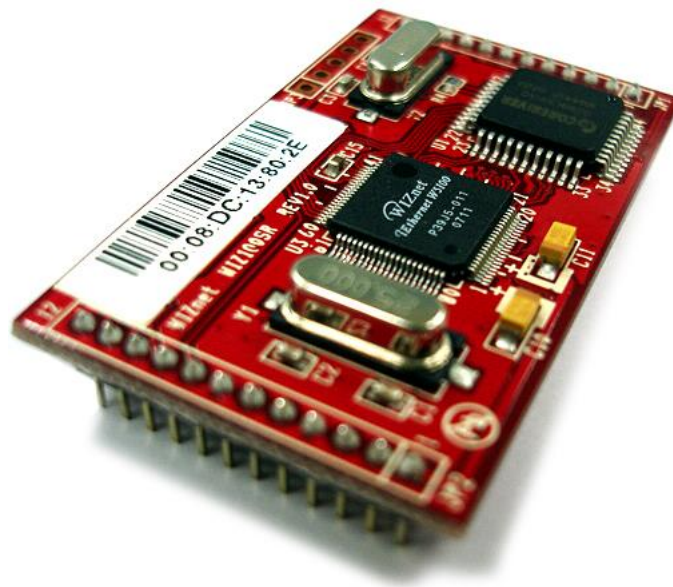
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WIZ100SR User's Manual

(Version 2.2.0)



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For more information, visit our website at <http://www.wiznet.co.kr>

WIZnet's Online Technical Support

If you have something to ask about WIZnet products, write down your question on [Q&A Board](#) in WIZnet website (www.wiznet.co.kr). WIZnet will give an answer as soon as possible.



The screenshot shows the WIZnet website interface. At the top, there is a navigation bar with links for HOME, LOGIN, JOIN, CONTACT US, and language options (ENGLISH, CHINESE, JAPANESE, KOREAN). A dropdown menu for 'On-line Mail' is also visible.

On the left, a vertical navigation menu includes: PRODUCTS, TECHNOLOGY, TECHNICAL Q&A (highlighted with a blue 'CLICK' button), LIBRARY, DISTRIBUTOR, PARTNERSHIP, BLOG, and ABOUT US. A 'Q&A BOARD' button is also present.

The main content area features a large image of a WIZnet Ethernet W5300 P4FW0-162 0803 chip. Text next to it reads: 'Stable 70Mbps Guaranteed (in DMA)! W5300'. To the right, a box titled 'WIZnet website Renewal/ Open with web 2.0 concepts!' lists several updates:

- Easy-to-check new or amended info. thru. 'What's updated' board
- Support RSS in each board
- Enhance Search function
- Open Blog & Community menu
- Build Technical forum as well as Q&A
- Easy-to-find local distributors
- WIZnet own innovation spirit visualized.
- Chinese version Grand Open!
- Japanese version Coming Soon!

Below the main content, there are several sections:

- RoHS Compliant:** Semiconductor Production Line Control System.
- NEWS | NEWS LETTER:** A list of recent news items with dates.
- NEW PRODUCT:** A section for the W5300 chip, listing features like 'Over 50 Mbps!', '16/8 bit data bus width', '8 independent sockets', and 'Also, support SWTCP/IP simultaneously thru,'.
- WHAT'S UPDATED:** A list of recent updates, including 'How to use PPPoE in W53', 'WIZ1x0SR Firmware V2.9', 'W5300 Driver Document', 'W5300 Driver V1.01', and 'W5300 Reference Schematic'.
- COMPANY OVERVIEW:** A button to download a document.
- DISTRIBUTOR:** A section for worldwide WIZnet distributors.
- Using PC18 W5100 Bootcamp:** A button to download a document.
- Download Center:** A button to download a document.
- Technical Support:** A button to access technical support.

At the bottom, there are several promotional banners for WIZwiki.net, ewiznet.com, WIZnet Ethernet Design Contest Winners Announcement, IIC Taiwan Sep. 9-11, 2008 Booth #: 2L06, and Download Sales Materials.

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1. Introduction

WIZ100SR is a gateway module that converts RS-232 protocol into TCP/IP protocol. It enables remote gauging, managing and control of a device through the network based on Ethernet and TCP/IP by connecting to the existing equipment with RS-232 serial interface. In other words, WIZ100SR is a protocol converter that transmits the data sent by serial equipment as TCP/IP data type and converts back the TCP/IP data received through the network into serial data to transmit back to the equipment

1.1. Key Features

- Direct Connection to the Serial Device
 - Adding Network Function Simply and Quickly
 - Providing Firmware Customization
- System Stability and Reliability by using W5100 Hardware Chip
- Supports PPPoE Connection & its Authenticaiton Configuration
- Supports Serial Configuration - with Simple and Easy command
- Supports Password for the Security
- Configuration Tool Program for easy Configuration
- 10/100 Ethernet Interface and max 230Kbps Serial Interface
- Supports DHCP, Statict & PPPoE for Network Configuration
- Supports DNS
- RoHS Compliant

1.2. Products Contents (EVB model)


	<p>WIZ100SR Module</p>
	<p>WIZ100SR Test Board</p>
	<p>Serial Cable (to connect Serial device and Test board)</p>
	<p>Network Cable (Crossover Cable)</p>
	<p>Power (DC 5V 500mA Adaptor)</p>

Table 1. Products Contents

1.3. Products Specification

1.3.1. WIZ100SR Module

Category	Specification
Protocol	TCP, UDP, IP, ARP, ICMP, IGMP, MAC, DHCP, PPPoE, DNS
Network Interface	10/100 Base-T Ethernet (Auto detection)
Serial Port	1 UART (3.3V TTL) / EVB : 1 RS-232 port
CPU	8051 compatible
Serial line format	8-N-1, 8-O-1, 8-E-1, 7-O-1, 7-E-1
Serial flow control	None, XON/XOFF, CTS/RTS
Serial signal	TXD, RXD, RTS, CTS, DTR, DSR, GND
Software	Remote Downlod and Configuration
Serial Transmission Speed	1200bps ~ 230Kbps
Memory	Internal Memory (62KB Flash Memory, 2KB EEPROM, 16KB SRAM)
Temperature	10°C ~ 80°C (Operating), -40~85°C (Storage)
Humidity	10~90%
Power	3.3V, 150mA
Connector type	2x12 2mm Pin header array
Size	50mm x 30mm x 8.85mm

Table 2. WIZ100SR Module Specification

1.3.2. WIZ100SR Test Board

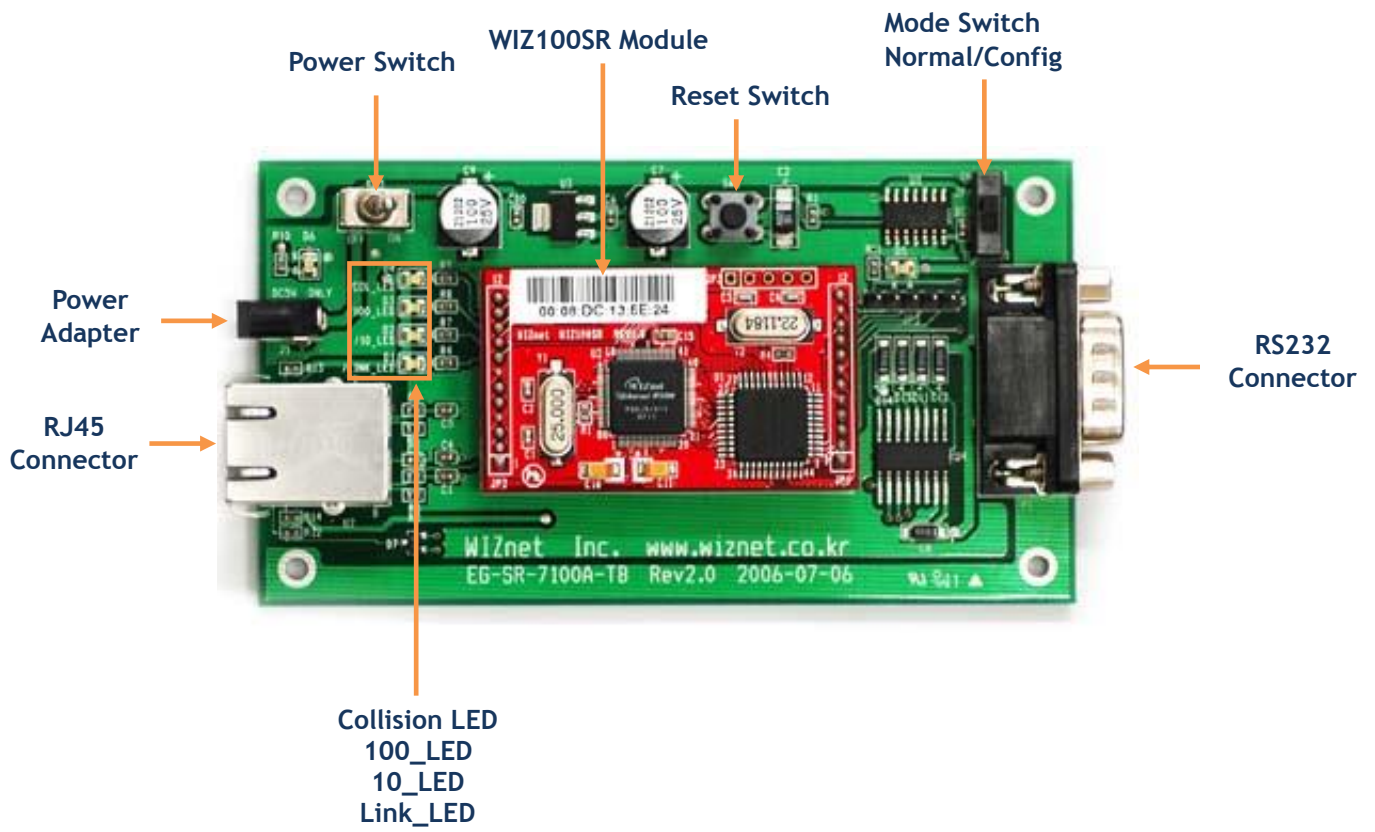


Figure 1. WIZ100SR Test Board

- ☞ NOTE : Be careful of setting Mode Switch. If Mode Switch is set as Config mode, the network function is not normally operated. For the function test, set it as Normal mode.
- ➔ If LED(D5) is on, it indicates that network is connected or Config mode is set.

1.3.2.1. Serial Interface

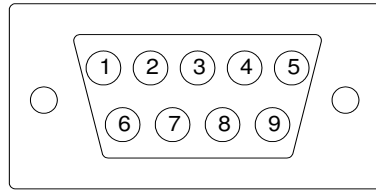


Figure 2. Serial Pin Assignment of WIZ100SR Test Board

Pin Number	Signal	Description
1	NC	Not Connected
2	RxD	Receive Data
3	TxD	Transmit Data
4	DTR	Data Terminal Ready
5	GND	Ground
6	DSR	Data Set Ready
7	RTS	Request To Send
8	CTS	Clear To Send
9	NC	Not Connected

Table 3. Serial Pin Description

- RxD, TxD, GND : These are all you need if the device does not use hardware handshaking.
- RxD, TxD, GND, RTS, CTS : These are the signals used when serial device uses hardware handshaking.
- DTR, DSR : not used

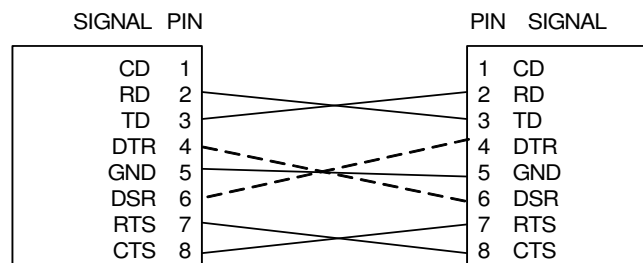


Figure 3. Serial Cable

1.3.2.2. LED

- Power LED: displays power status of WIZ100SR
- Link LED: indicates network link is established
- 10 LED: indicates network speed is 10Mbps
- 100 LED: indicates network speed is 100Mbps
- Collision LED: indicates a packet transmitted from the Ethernet controller to the network has collided with another packet

2. Getting Started

2.1. Hardware Installation Procedure

For the testing, module and test board should be prepared.

- **STEP1:** Plug the WIZ100SR module into the sockets on the test board.
 - ☞ **Be careful of connecting the JP1 on the module to the correct JP1 on the test board.**
 - ☞ **Use test board rev 2.0 or above for WIZ100SR testing.**
- **STEP2:** Connect the RJ-45 connector of WIZ100SR test board to the Ethernet hub or LAN port of PC.
- **STEP3:** Connect the DB9 jack of WIZ100SR and serial device with RS-232 serial line.
- **STEP4:** Connect the 5V (500mA) DC power adaptor to the WIZ100SR test board.
The power used fo WIZ100SR is 3.3V.

2.2. Configuration Tool

2.2.1. Network Configuration

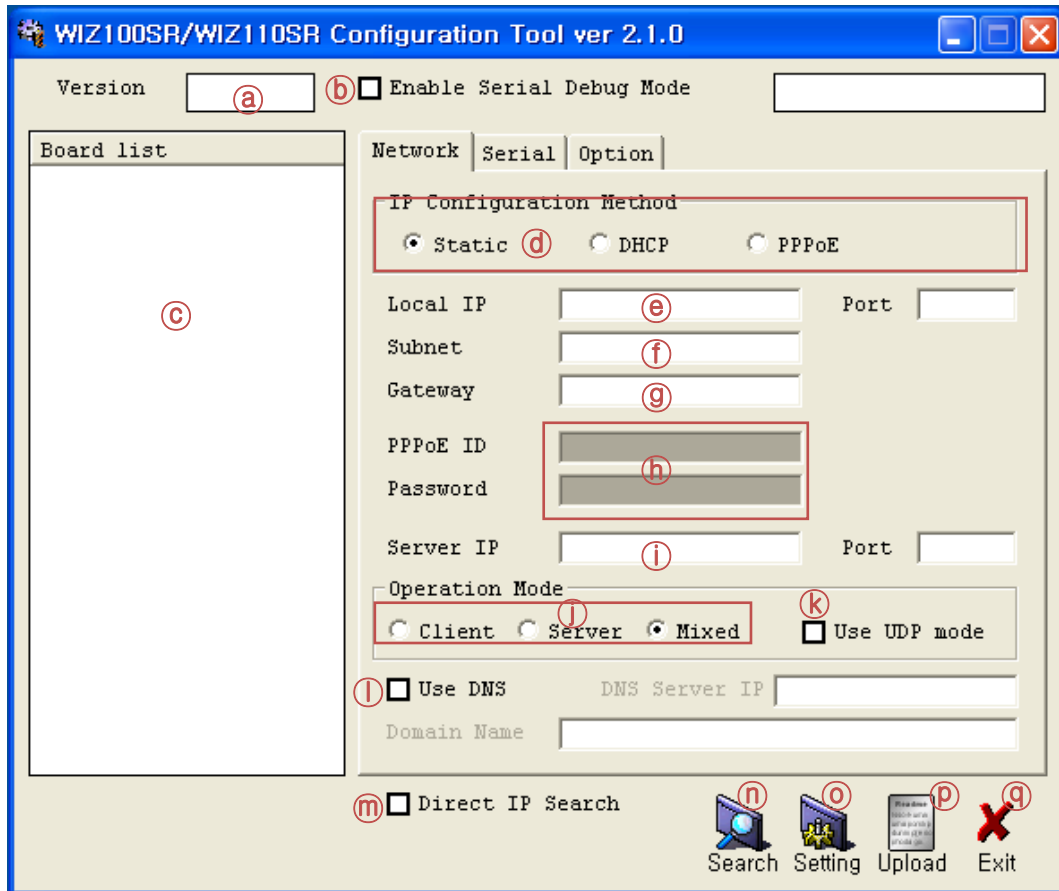


Figure 4. Configuration Tool (Network Config)

Ⓐ **Version** : Displays firmware version.

Ⓑ **Enable Serial Debug Mode** : If this mode is checked, you can monitor the status module and socket message (listen OK, connect fail etc.) through serial terminal. If Debug mode is on, debug message can cause abnormal operation of the serial device. Therefore, just use this mode only for Debug mode.

Ⓒ **Board List** : If you click “Search” button, all the MAC addresses on a same subnet, will be displayed.

Ⓓ **IP Configuration Method**: Select IP setting mode, you can select one of Static, DHCP, PPPoE mode.

- **Static**: “Static” is option for setting WIZ100SR IP with static IP address. Firstly, select MAC Hardwired Internet Connectivity Wizard (WIZnet, Inc.)

address which you wanted to set as static IP in the 'board list'. Then "Local IP, Subnet, Gateway box will be enabled. Input Static IP address and click "setting" button. Then set the IP address as you wanted. (PPPoE ID, Password box is disabled)

- **DHCP**: Set this option to use DHCP mode. Firstly, check 'DHCP' and click 'Setting' button. If IP address is successfully acquired from DHCP server, the MAC address will be displayed on the configuration window. (It takes some time to acquire IP address from DHCP server)

When a module on the board list is selected, IP address, Subnet mask and Gateway are displayed. If module could not acquire network information from DHCP server, IP address, Gateway Address and Subnet mask will be initialized to 0.0.0.0.

- **PPPoE** : WIZ100SR supports PPPoE for ADSL user. When you select PPPoE at the "IP Configuration Method", PPPoE ID & Password box is enabled.

1. To set PPPoE, connect PC to WIZ100SR directly and execute Configuration Tool program on PC. (Configuration Tool Version should be 2.1 or above)

2. Select 'PPPoE' of the "IP Configuration Method" tab and input ID & Password.

3. Click "setting" button to apply.

4. Connect Module to ADSL Line.

5. If "Enable Serial Debug Mode" is selected, you can see PPPoE access status via serial console.

```
WIZ100SR/WIZ110SR Ver. 02.02
-- PHASE 0. PPPoE(ADSL) setup process --

-- PHASE 1. PPPoE Discovery process -- ok

-- PHASE 2. LCP process -- ok

-- PHASE 3. PPPoE(ADSL) Authentication mode --
Authentication protocol : c223 00,
-- Waiting for PPPoE server's admission --ok

-- PHASE 4. IPCP process --ok
```

Figure 5. PPPoE Access Process

ⓐ Local IP/Port : WIZ100SR's IP address and Port number for network connection

☞ Be sure to input correct network information. If you input incorrect IP address, it can cause network collision or mal-function.

ⓑ Subnet : WIZ100SR's subnet mask

ⓒ Gateway : WIZ100SR's Gateway address

ⓓ PPPoE ID/Password : If you select 'PPPoE' mode, input ID/Password which you received from ISP company.

ⓔ Server IP/Port : When WIZ100SR is set as "Client mode" or Mixed mode", server IP and port should be set. WIZ100SR attempts to connect this IP address.

ⓕ Network mode:

- client/server/mixed : This is to select the communication method based on TCP. TCP is the protocol to establish the connection before data communication, but UDP just processes the data communication without connection establishment.

The Network mode of WIZ100SR can be divided into TCP Server, TCP Client and Mixed mode according to the connection establishing method. At the TCP server mode, WIZ100SR operates as server on the process of connection, and waits for the connection trial from the client. WIZ100SR operates as client at the TCP Client mode on the process of connection, and tries to connect to the server's IP and Port. Mixed modes supports both of Server and Client. The communication process of each mode is as below.

<TCP server mode Communication>

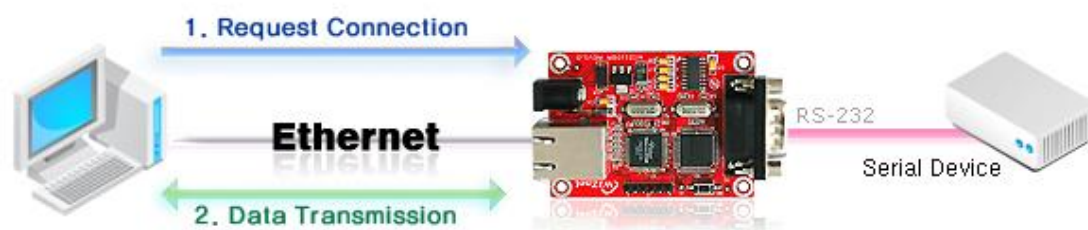


Figure 6. TCP Server mode

At the TCP Server mode, WIZ100SR waits for the connection requests.

TCP Server mode can be useful when the monitoring center tries to connect to the device (where WIZ100SR is installed) in order to check the status or provide the commands. In normal time WIZ100SR is on the waiting status, and if there is any connection request (SYN)

from the monitoring center, the connection is established (ESTABLISH), and data communication is processed (Data Transaction). Finally connection is closed (FIN).

In order to operate this mode, Local IP, Subnet, Gateway Address and Local Port Number should be configured first.

As illustrated in the above figure, data transmission proceeds as follows,

1. The host connects to the WIZ100SR which is configured as TCP Server mode.
2. As the connection is established, data can be transmitted in both directions - from the host to the WIZ100SR, and from the WIZ100SR to the host

<TCP client mode Communication>

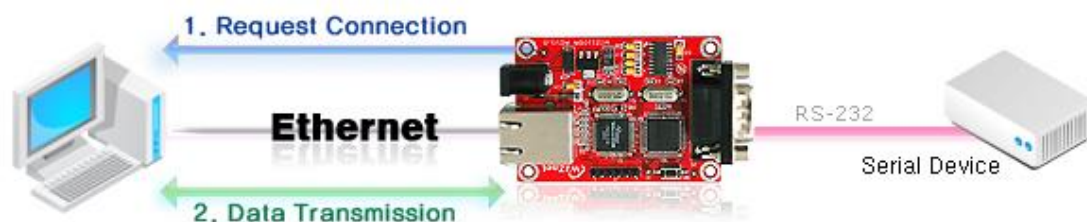


Figure 7. TCP Client mode

If WIZ100SR is set as TCP Client, it tries to establish connection to the server.

To operate this mode, Local IP, Subnet, Gateway Address, Server IP, and Server port number should be set. If server IP had domain name, use DNS function.

In TCP Client mode, WIZ100SR can actively establish a TCP connection to a host computer when power is supplied.

As illustrated in the above figure, data transmission proceeds as follows:

1. As power is supplied, WIZ100SR board operating as TCP client mode actively establishes a connection to the server.
2. If the connection is complete, data can be transmitted in both directions - from the host to the WIZ100SR and from WIZ100SR to the host

<Mixed mode Communication>

In this mode, WIZ100SR normally operates as TCP Server and waits for the connection request from the peer. However, if WIZ100SR receives data from the serial device before connection is established, it changes to the client mode and sends the data to the server IP. Therefore, at the mixed mode, the server mode is operated prior to the client mode.

As like TCP Server mode, the Mixed mode is useful for the case that the monitoring center tries to connect to the serial device (in which WIZ100SR is used) to check device status. In addition to this, if any emergency occurs in the serial device, the module will change to Client mode to establish the connection to the server and deliver the emergency status of the device.

Ⓚ Use UDP mode

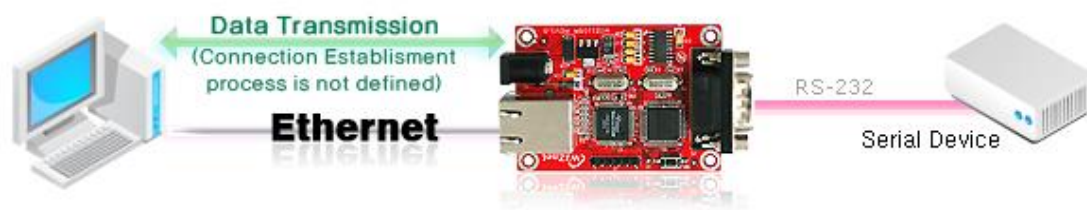


Figure 8. UDP mode

At the UDP mode, the connection establishment is not defined. Just set the IP address and port number of the peer and send the data.

① **Use DNS** : If DNS function is needed, check this option and input the domain name of DNS server. DNS(Domain Name System) is the database system having information about IP address and corresponding domain name. When connecting to domain name, you can use DNS function of WIZ100SR. Input IP address of DNS server provided by ISP in *DNS Server IP*, and domain name in the *Server (Domain)*

If server has dynamic IP address, but domain name, if you use DNS function, you do not need to configure server IP address whenever it's changed.

Ⓜ Direct IP Search

Direct IP Search can be used for searching WIZ100SR not installed in the same subnet.

If the Direct IP search is checked, the configuration tool use the TCP instead UDP broadcast to search modules. Therefore, network information of the module such as IP address, subnet mask and gateway is required for the search.

If you check Direct IP search, the field in which IP address is input, will be activated. In this field, input IP address of the module, and click "Search" button.

☞ If module does not have valid network information, Direct IP search is not available. Check if module is connected to the NAT or private network. If so, it is not possible to connect to the module from outside.

⑧ Search

The Search function is used to search all modules existing on the same LAN. By using UDP broadcast, all modules on the same subnet will be searched.

The searched module is displayed as MAC address in the “Board list”.

⑨ Setting

This function is to complete the configuration change.

If you select the MAC address from the “Board list”, the default configuration value of the module will be displayed. Change the configuration and click “Setting” button to complete the configuration. The module will re-initialize with the changed configuration. Changed value is saved in the EEPROM of the module. Thus, the value is not removed even though power is disconnected.

The configuration value can be changed in below steps.

- ① Select the mac address of which configuration value should be changed in the “Board list. The values configured will be displayed.
- ② Change the value
- ③ Click “Setting” button. The configuration change will be complete.
- ④ The module will be initialized to the changed values (re-booting is processed)
- ⑤ To check configuration result, click ‘Search’ button.

⑩ Upload

Firmware will be uploaded through network

 **After uploading the firmware, 20-30 seconds are required for initialization.**

- ④ Exit : Close the configuration tool program.

2.2.2. Serial configuration

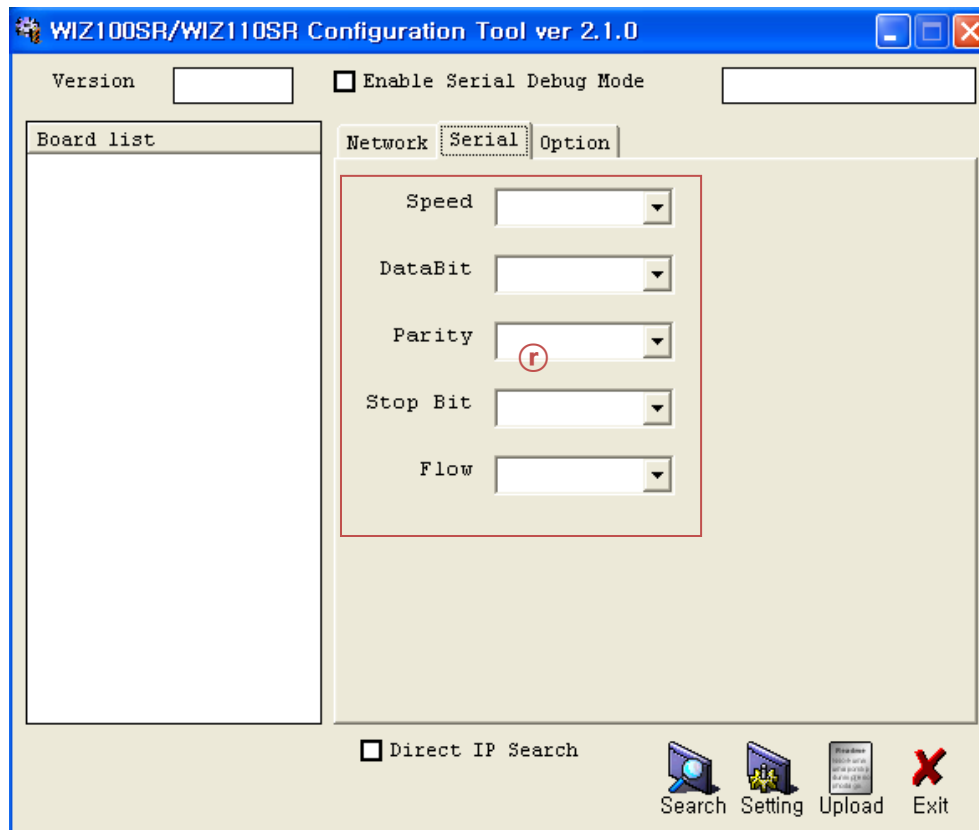


Figure 9. Configuration Tool (Serial Config.)

① Serial

Serial Configuration value of selected module is displayed.

In order to change the serial configuration of WIZ100SR, this menu can be used.

☞ By clicking the “Setting” button, changed value can be applied.

.

2.2.3. Option configuration

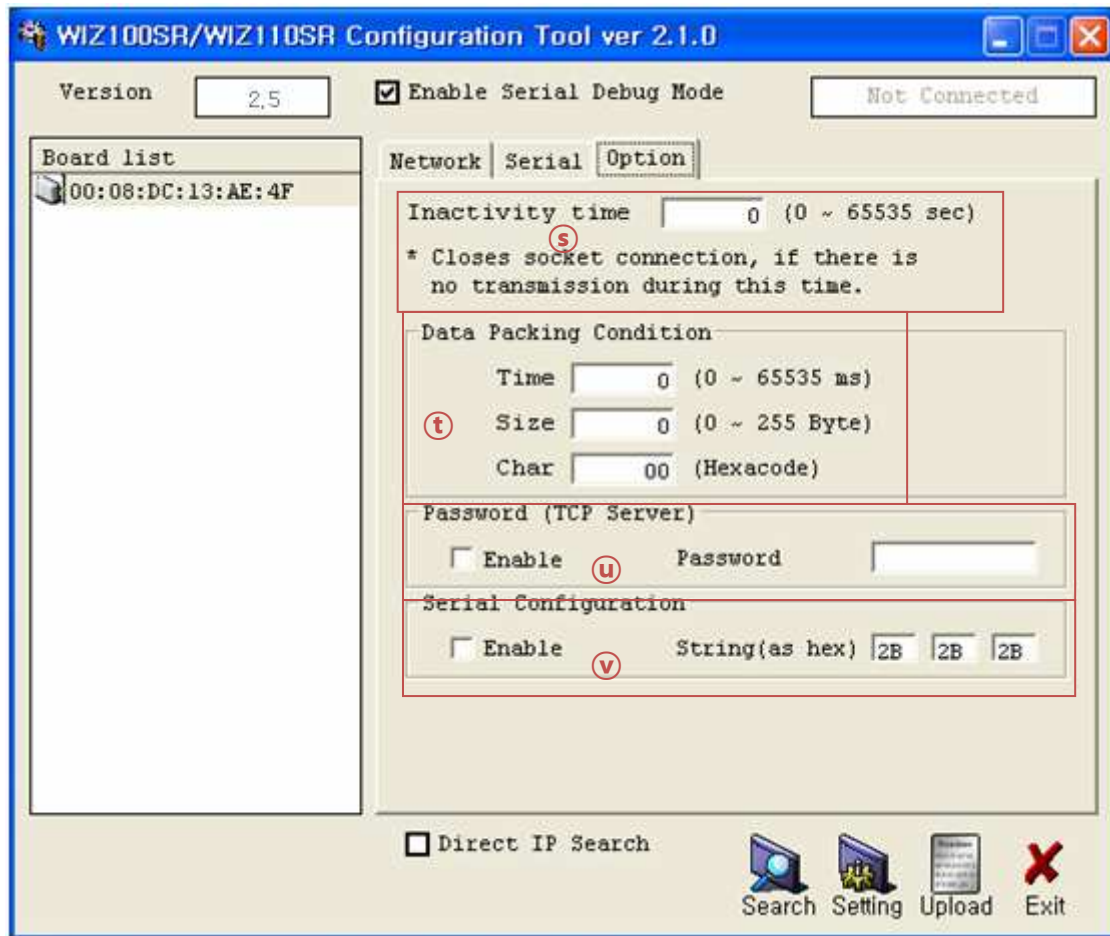


Figure 10. Configuration Tool (Option Config.)

③ Inactivity time

After the connection is established, if there is not data transmission within the time defined in Inactivity time, the connection is closed automatically.

The default value is '0'. If '0' is set, this function is not activated. In this default setting, the connection is maintained even though there is no data transmission. In order to close the connection, the 'Close' command should be given.

This function can be used for more than two or more systems to connect to a WIZ100SR module. If one system holds the connection to the WIZ100SR, other systems can not connect to the module. If there is no data transmission during the time defined in Inactivity time, the connection will be closed for other system to be connected.

Inactivity Time also can be useful for the case when the server system is unexpectedly shut down. In this status, if there is not any data communication during the time defined in the

Inactivity time, WIZ100SR will close the connection and enter into waiting status.

① Data Packing Condition

You can designate how the serial data can be packed to send to the Ethernet.

In default mode, WIZ100SR checks the serial buffer and sends any received data to Ethernet without any standard. Therefore, the data can be regarded as error data due to inconsistent data length. In order to solve this problem, the data from serial can be packed according to the specified condition before sending to Ethernet. The condition is as below.

Time: If there is not any new data during designated time, all data in the serial buffer is converted to Ethernet packet. If new data is received, the time is re-calculated and the received data is saved in the serial buffer. Time condition can be utilized when the serial data size is variable and has no ending character, but needs to be delivered in frame unit. (If the value is '0', option is not used)

Size: When data is collected as much as the defined size in the serial buffer, it is transmitted to Ethernet (If the value is '0', option is not used)

Character: The data is collected in the serial buffer until specified character is received, and transmitted to Ethernet. The character can be specified in Hex formation. (The value is '0', this option is not used)

One of three condition is satisfied, the data is transmitted to the Ethernet.

Ex) Delimiter: Size=10, Char=0x0D

Serial data : 0123456789abc

Ethernet data : 0123456789

☞ "abc" data remains in the serial buffer of module.

② Password

'Password' function is for blocking client's access which is not allowed.

'Password' function can be operated only in 'TCP Server' mode. When 'password' function operates, clients should input password to access.

1. Execute Configuration Tool program.(Configuration Tool version should be 2.1 or above)
2. Select 'Server' of "Operation Mode".

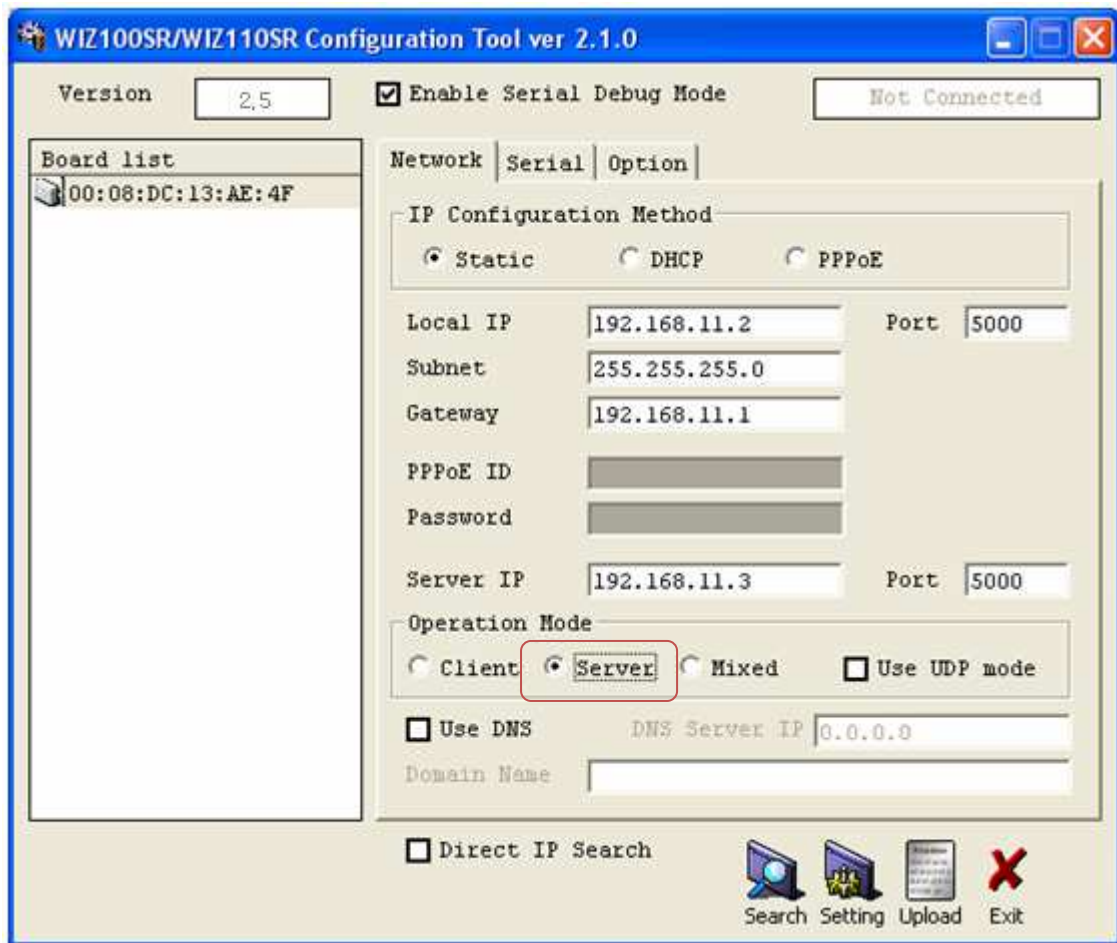


Figure 11. Operation Mode for Password Setting

3. As shown in Figure 10, select Option tab and check 'Enable' combo box of "Password" menu.
4. Input password.
5. Click "Setting" button to apply password setting
6. When any client accesses the module, client should send 'password' to server module first, and then access will be allowed.

④Serial Configuration:

This function is for module configuration not through network with Configuration tool but through serial communication. When you want to set via serial communication, check "enable". Please detail about serial configuration refers to "4. Serial Configuration".

3. Firmware Upload

- ① Run 'WIZ100SR/WIZ100SR Configuration Tool' program, and click "Search" button.
- ② If the module is properly connected to the network, "Complete Searching" message and MAC address will be displayed on the "Board List" as shown below Figure.

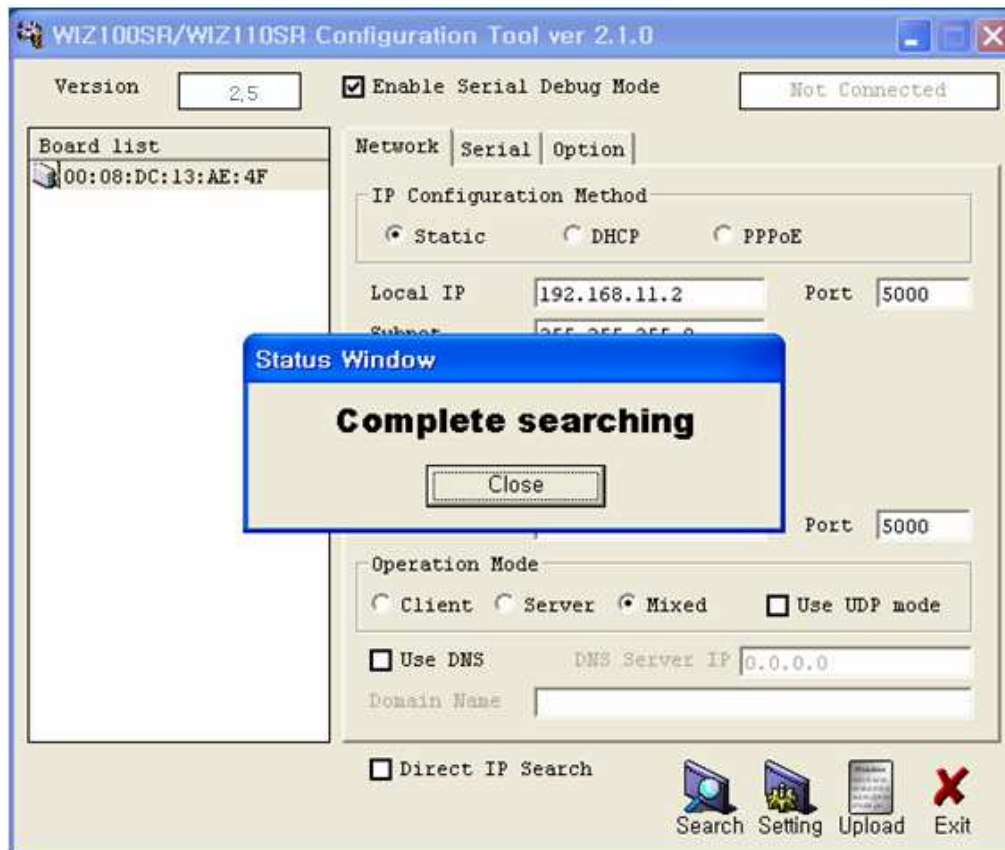


Figure 12. Board Search Window

- ① Select a module shown in "Board list", and click "Upload" button.
- ☞ Before uploading through Ethernet, you should set the network information of WIZ100SR first by Configuration Tool program as shown above Fig 10. By using Ping test, you can check if network is correctly configured.
- ② When the window as shown below Figure is displayed, select file for upload and click "Open" button.

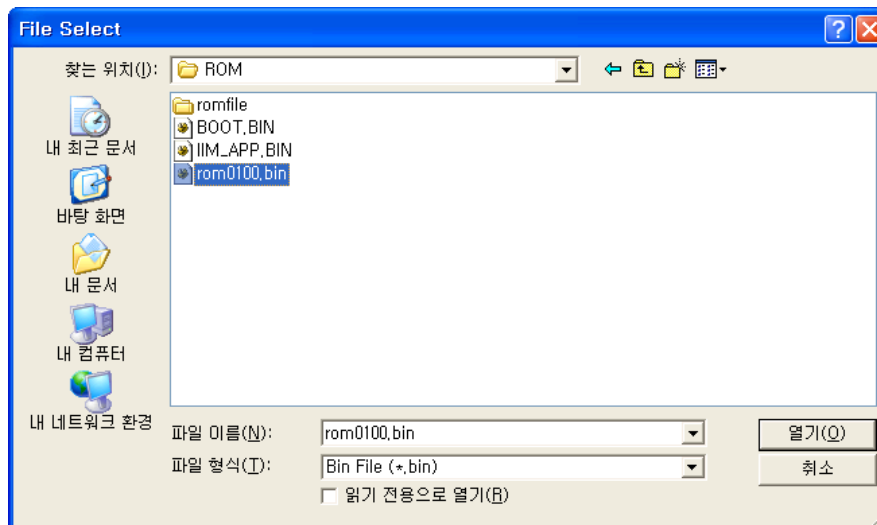


Figure 13. Open dialog box for uploading

Do not upload any other files except for WIZ100SR application firmware file.

③ A dialogue box titled “Processing” will be displayed as below.

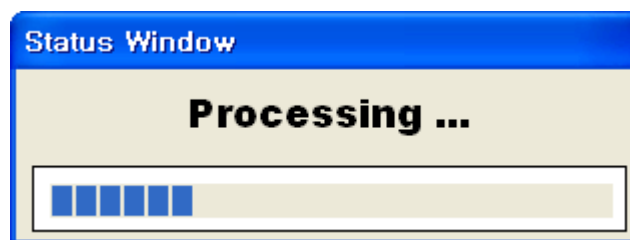


Figure 14. Firmware uploading window

④ When uploading is complete, a message box with “Complete Uploading” will be displayed as shown in Figure 14.



Figure 15. Complete Uploading