

WIZ105SR User's Manual

(Version 1.2.0)



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The screenshot displays the WIZnet website interface. At the top, there is a navigation bar with links: HOME, LOGIN, JOIN, CONTACT US, and language options (ENGLISH, CHINESE, JAPANESE, KOREAN). A search bar labeled 'On-line Mail' is also present. On the left, a vertical menu lists: PRODUCTS, TECHNOLOGY, TECHNICAL Q&A (highlighted with a blue 'CLICK' button), LIBRARY, DISTRIBUTOR, PARTNERSHIP, BLOG, and ABOUT US. The main content area features a large image of a WIZnet W5300 Ethernet chip with the text 'Stable 70Mbps Guaranteed (in DMA)! W5300'. To the right, a box titled 'WIZnet website Renewal/Open with web 2.0 concepts!' lists updates: Easy-to-check new or amended info, 'What's updated' board, Support RSS, Enhanced 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!, and Japanese version Coming Soon!. Below this, a 'NEW PRODUCT' section highlights the W5300 with features: Over 50 Mbps, 16/8 bit data bus width, 8 independent sockets, and support for SWTCP/IP. A 'WHAT'S UPDATED' section lists recent updates like PPPoE in W53, WIZnet OSR Firmware V2.9, W5300 Driver Document, W5300 Driver V1.01, and W5300 Reference Schematic. The footer contains links for COMPANY OVERVIEW, DISTRIBUTOR, WIZnet 3rd Party e-market place (www.WIZwiki.net), WIZnet e-sale International (www.ewiznet.com), WIZnet 2007 Ethernet Design Contest Winners Announcement, IIC Taiwan Sep. 9-11, 2008 Booth #: 2L06, and Download Sales Materials (WIZwiki.tistory.com).

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1. Introduction


WIZ105SR is a gateway module between serial device and Ethernet. It can transmit serial data to Ethernet and vice versa. With WIZ105SR, you can connect your serial device with Ethernet via WIZ105SR provides interface quite easier and shorten your development period to obtain more gains.

We also provide full functional configuration tools for WIZ105SR. You can set WIZ105SR upon your needs by using serial configuration command when WIZ105SR is in serial configuration mode or using provided configuration tool via Ethernet to make WIZ105SR embedded in your products well.

1.1. Key Features

- High speed Serial-to-Ethernet gateway module with an RJ-45 jack
- High stability and reliability Ethernet connection solution
- 10/100Mbps Ethernet interface supported with full hardwired TCP/IP stack chip W5100
- Up to 230Kbps serial communication interface
- Serial configuration commands support
 - Simple command frame format
 - Comprehensive & readable command set for network and serial settings
 - On-site configuration without PC
- Powerful remote configuration tool
- RoHS compliant

1.2. Products Contents (EVB model)

| | |
|---|---|
|  | <p>WIZ105SR Module</p> |
|  | <p>Test Board for WIZ105SR (Serial to Ethernet EVB)</p> |
|  | <p>12pin Cable (Connect WIZ105SR with Test Board)</p> |
|  | <p>Serial Cable (Connect Serial Device with Test Board)</p> |
|  | <p>LAN Cable (Connect WIZ105SR with Host)</p> |


| | |
|---|----------------------------------|
|  | <p>Power (DC 5V Adaptor)</p> |
|---|----------------------------------|

Table 1. Products Contents

1.3. Products Specification

1.3.1. WIZ105SR Module

WIZ105SR uses a high performance 8051 compatible microcontroller which feathers 62K in chip Flash, 16K in chip SRAM and 2K EEPROM. WIZ105SR feathers our fast hardwired TCP/IP stack chip W5100 and most of TCP/IP protocols such as TCP, UDP, IP, ARP, ICMP, IGMP, PPPoE and Ethernet MAC are all supported. 10Mbps and 100Mbps Ethernet are all supported and one standard Ethernet Jack is mounted in WIZ105SR. One serial port is provided in WIZ105SR via 12-pin connector which feathers standard RS-232 specification. WIZ105SR can be powered by a DC 3.3V power supply with at least 200mA current supply. The detailed specifications are listed in Table 2.

| 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 RS-232 port (3.3V LVTTTL) |
| 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, GND |
| Software | Remote Download and Configuration |
| Serial Transmission Speed | 1200bps ~ 230Kbps |
| Memory | Internal Memory (62KB Flash Memory, 2KB EEPROM, 16KB SRAM) |
| Temperature | 0°C ~ 70°C (Operating), -40~85°C (Storage) |
| Humidity | 10~90% |
| Power | 3.3V, 200mA |
| Connector type | 2x6, 2mm Pitch Pin header array |
| Size | 40mm x 62mm x 17mm |

Table 2. WIZ105SR Module Specification

1.3.2. Connector Pin Assignment

WIZ105SR provides an external connector to connect it with your application board. The pin assignment and definition of the connector are introduced in Figure.1 and the specification of each pin is described in Table 3.

| | | | | |
|---|----|--------|----|----------------|
|  | 1 | /RESET | 2 | 3.3V |
| | 3 | RXD | 4 | 3.3V |
| | 5 | CTS | 6 | /FACTORY_RESET |
| | 7 | TXD | 8 | /HW_TRIGGER |
| | 9 | RTS | 10 | NC |
| | 11 | GND | 12 | GND |

Figure 1. WIZ105SR Connector Pin Assignment and Definition

| Name | Functions | I/O | |
|----------------|---|------------------|----------|
| 3.3V | Power | | |
| /RESET | Low active reset Minimum 1.2 usec is required. Do NOT leave the input pin(nRESET) as floating. If it is not in use, it must be pulled-up, otherwise the module may not work properly. | Input | |
| RXD | RS-232 Data Input | Input | |
| CTS | RS-232 Clear To Send | Input | Optional |
| TXD | RS-232 Data Output | Output | |
| RTS | RS-232 Request To Send | Output | Optional |
| /FACTORY_RESET | Pull Factory Reset to low and if /RESET is activated, the configuration is changed to factory default. | Input | |
| /HW_TRIGGER | When pulled low, enter the serial command mode while WIZ105SR is powered on or reset. (In S/W trigger method, this signal ignored.) When WIZ105SR is booted over, this pin will indicate the status of TCP/IP socket connection. | Input /Output | |

Table 3. Pin Assignment

☞ All signals are in 3.3V LVTTTL.

1.3.3. RJ-45 Pin Assignment

The pin assignment of Ethernet Jack RJ-45 is described in Figure 2, and description of each pin is introduced in Table 4.

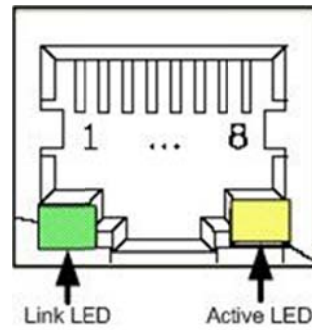


Figure 1. Pin Assignment of RJ-45 in WIZ105SR

| Pin Number | Description |
|------------|-------------|
| 1 | TX+ |
| 2 | TX- |
| 3 | RX+ |
| 4 | Unused |
| 5 | Unused |
| 6 | RX- |
| 7 | Unused |
| 8 | Unused |

Table 4. Pin Definition of RJ-45

2. Getting Started

This chapter describes the configuration steps of WIZ105SR. The following listed items which are included in your WIZ105SR-EVB package will be required in configuration.

- Power Adapter (included in the WIZ105SR-EVB package)
- Serial and Ethernet Cable (included in the of WIZ105SR-EVB package)
- A computer with Network Interface Card (NIC) and/or one RS232 serial port

If you have prepared those things, the configuration of WIZ105SR can be getting started. The board connection steps are introduced in section 2.1.

2.1. Hardware Installation Procedure

The following steps are required while to set up the configuration environment for WIZ105SR and the connection diagram is shown in Figure 3.

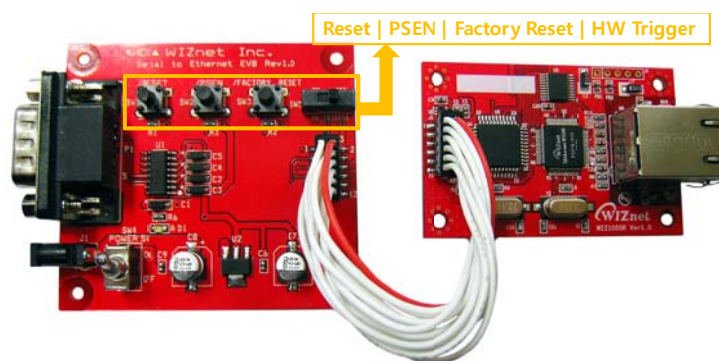


Figure 2. WIZ105SR Configuration Environment Setting Diagram

- STEP 1:** Connect the WIZ105SR module to the test board by using the 12pin cable.
- STEP 2:** Connect the 5V DC power line to the power jack of the test board.
- STEP 3:** Use the RJ45 Ethernet cable in order to connect the module to an Ethernet network.
- STEP 4:** Use the serial data cable to connect the test board to a serial device.

2.2. Configuration Tool

2.2.1. Network Configuration

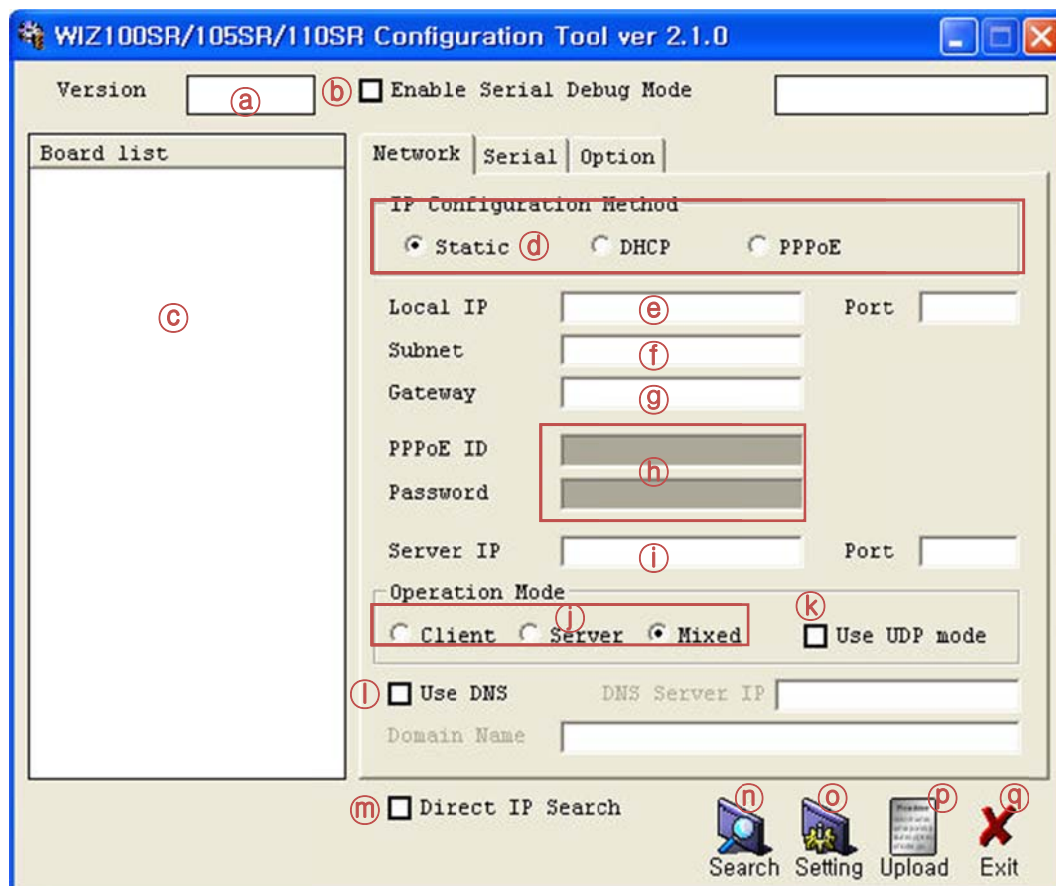


Figure 2. Configuration Tool (Network Config)

Ⓐ 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 WIZ105SR IP with static IP address. Firstly, select MAC address which you wanted to set as static IP in the 'board list'. Then "Local IP, Subnet, Hardwired Internet Connectivity Wizard (WIZnet, Inc.)

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** : WIZ105SR 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 WIZ105SR 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.

```
WIZ105SR Ver. 03.06
-- 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 3. PPPoE Access PrSocess

⑥ **Local IP/Port** : WIZ105SR’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.

⑧ **Subnet** : WIZ105SR's subnet mask

⑨ **Gateway** : WIZ105SR's Gateway address

⑩ **PPPoE ID/Password** : If you select 'PPPoE' mode, input ID/Password which you received from ISP company.

⑪ **Server IP/Port** : When WIZ105SR is set as "Client mode" or Mixed mode", server IP and port should be set. WIZ105SR attempts to connect this IP address.

⑫ **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 WIZ105SR can be divided into TCP Server, TCP Client and Mixed mode according to the connection establishing method. At the TCP server mode, WIZ105SR operates as server on the process of connection, and waits for the connection trial from the client. WIZ105SR 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>

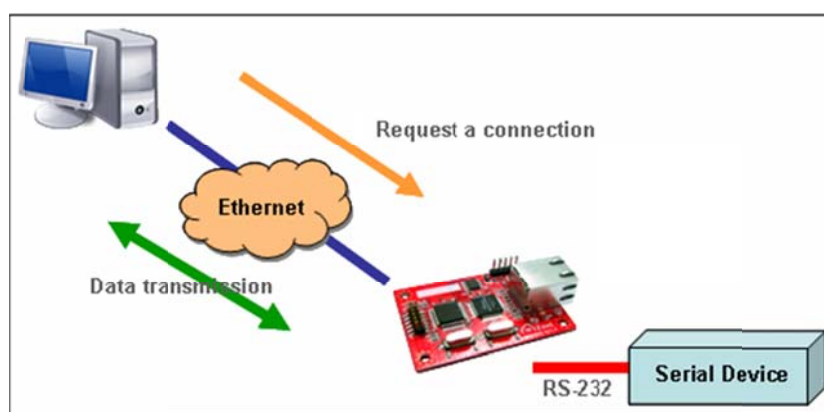


Figure 4. TCP Server mode

At the TCP Server mode, WIZ105SR waits for the connection requests.

TCP Server mode can be useful when the monitoring center tries to connect to the device (where WIZ105SR is installed) in order to check the status or provide the commands. In normal time WIZ105SR 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 Transanction). 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 WIZ105SR 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 WIZ105SR, and from the WIZ105SR to the host

<TCP client mode Communication>

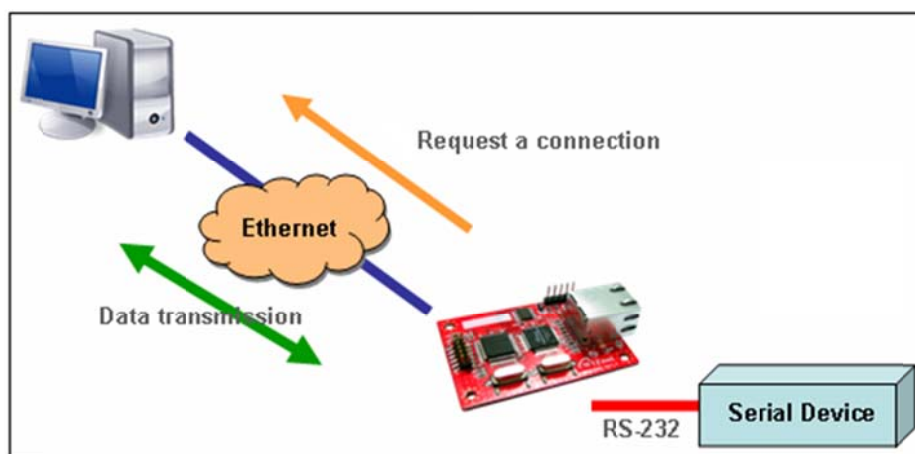


Figure 5. TCP Client mode

If WIZ105SR 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, WIZ105SR 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, WIZ105SR 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 WIZ105SR and from WIZ105SR to the host

<Mixed mode Communication>

In this mode, WIZ105SR normally operates as TCP Server and waits for the connection request from the peer. However, if WIZ105SR 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 WIZ105SR 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.

㉔ Use UDP mode

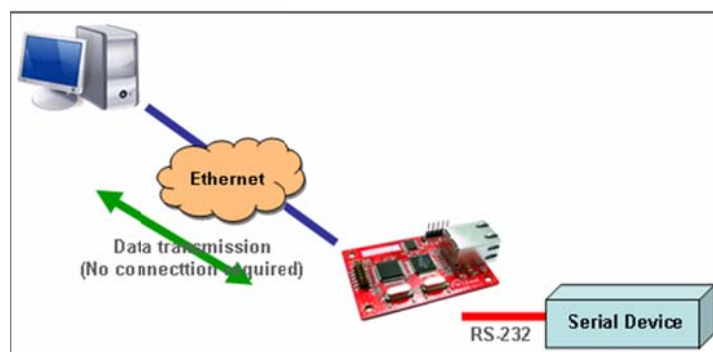


Figure 6. UDP mode

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.

㉕ 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 WIZ105SR. 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.

㉖ Direct IP Search

Direct IP Search can be used for searching WIZ105SR 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.

㉓ 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”.

㉔ 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.

㉕ 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

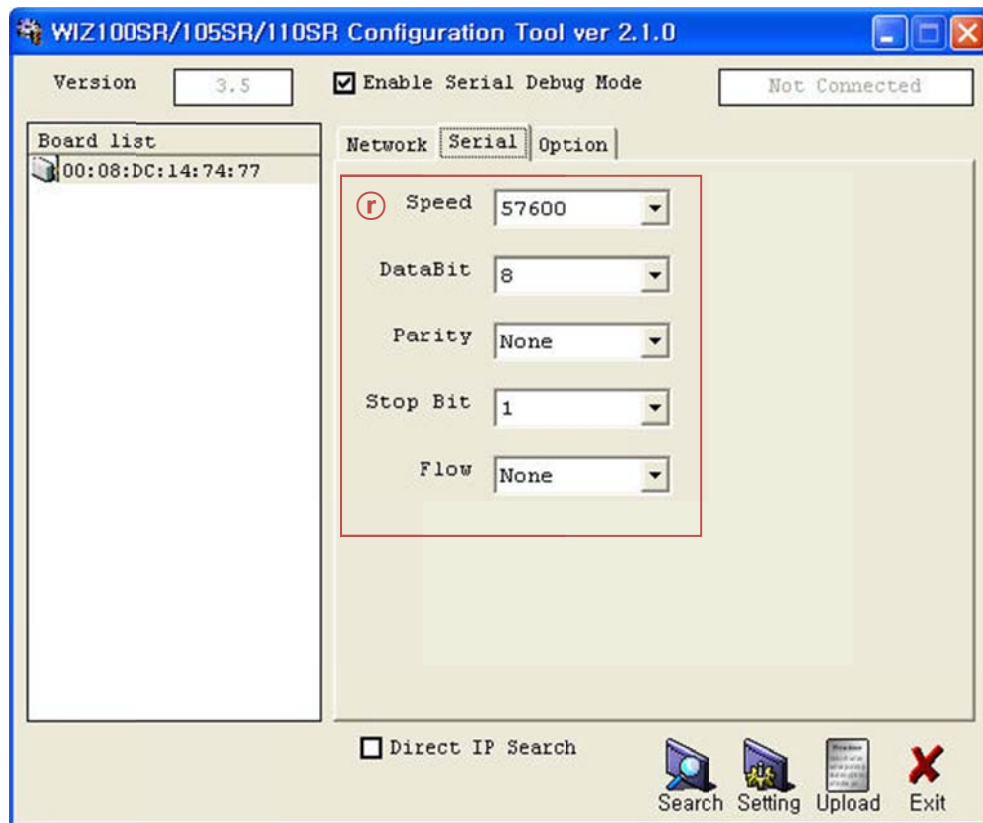


Figure 7. Configuration Tool (Serial Config.)

① Serial

Serial Configuration value of selected module is displayed.

In order to change the serial configuration of WIZ105SR, this menu can be used.

 By clicking the "Setting" button, changed value can be applied.

2.2.3. Option configuration

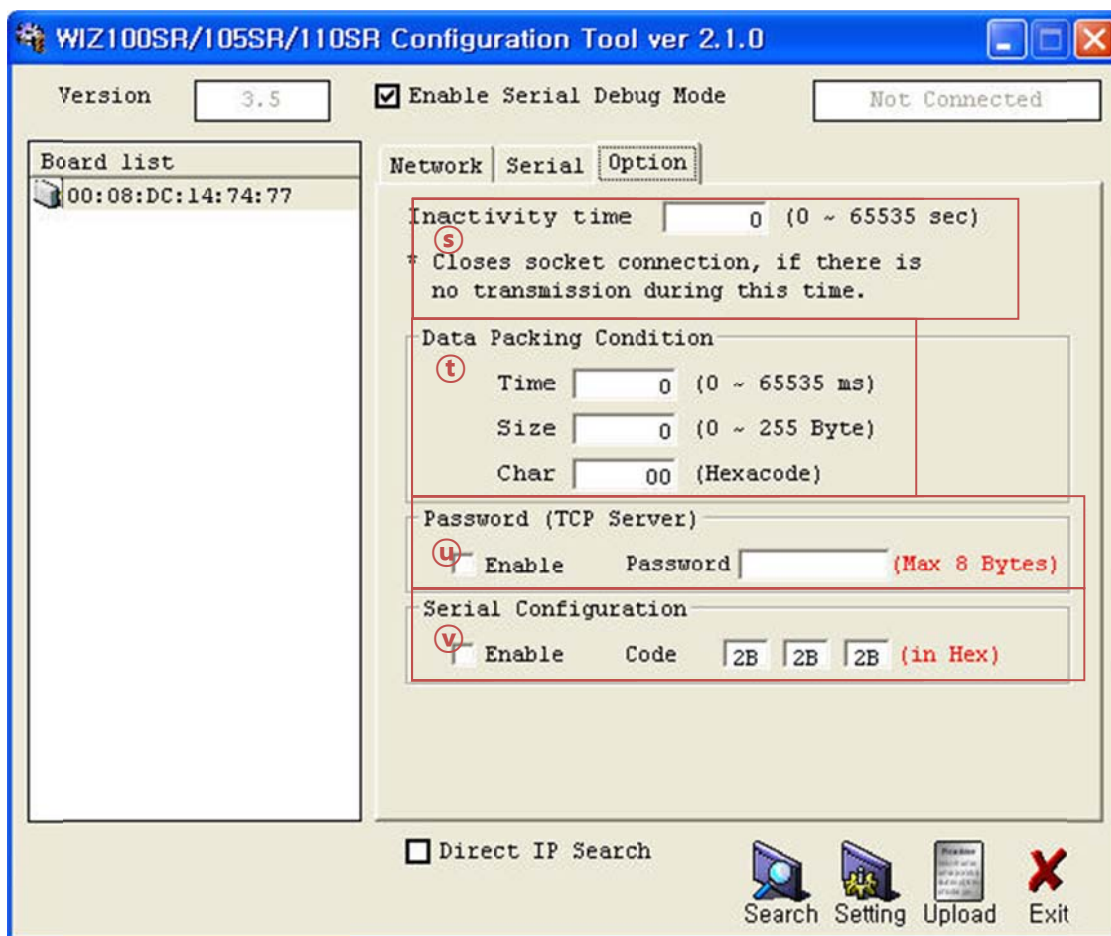


Figure 8. Configuration Tool (Option Config.)

⑤ 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 WIZ105SR module. If one system holds the connection to the WIZ105SR, 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, WIZ105SR 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, WIZ105SR 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 conditions 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".

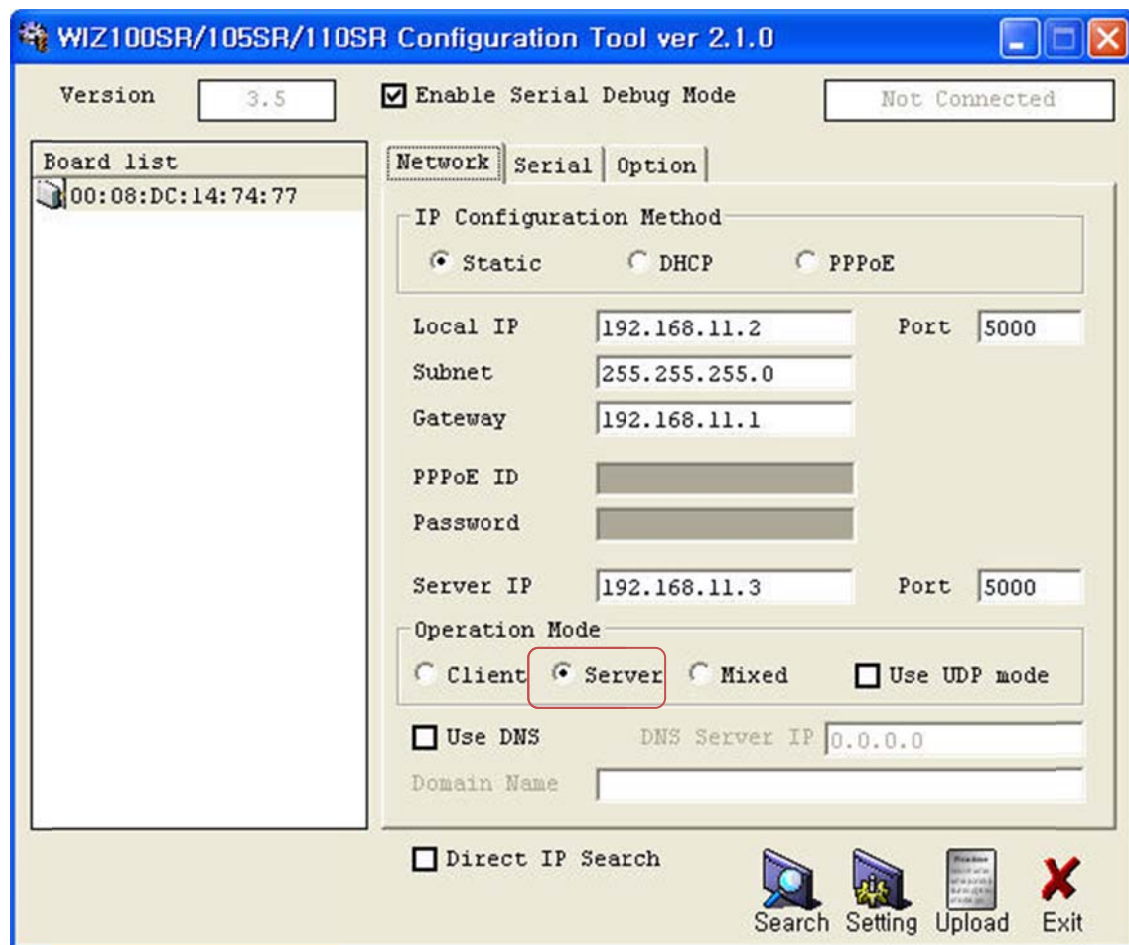


Figure 9. Operation Mode for Password Setting

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/WIZ105SR/WIZ110SR 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.

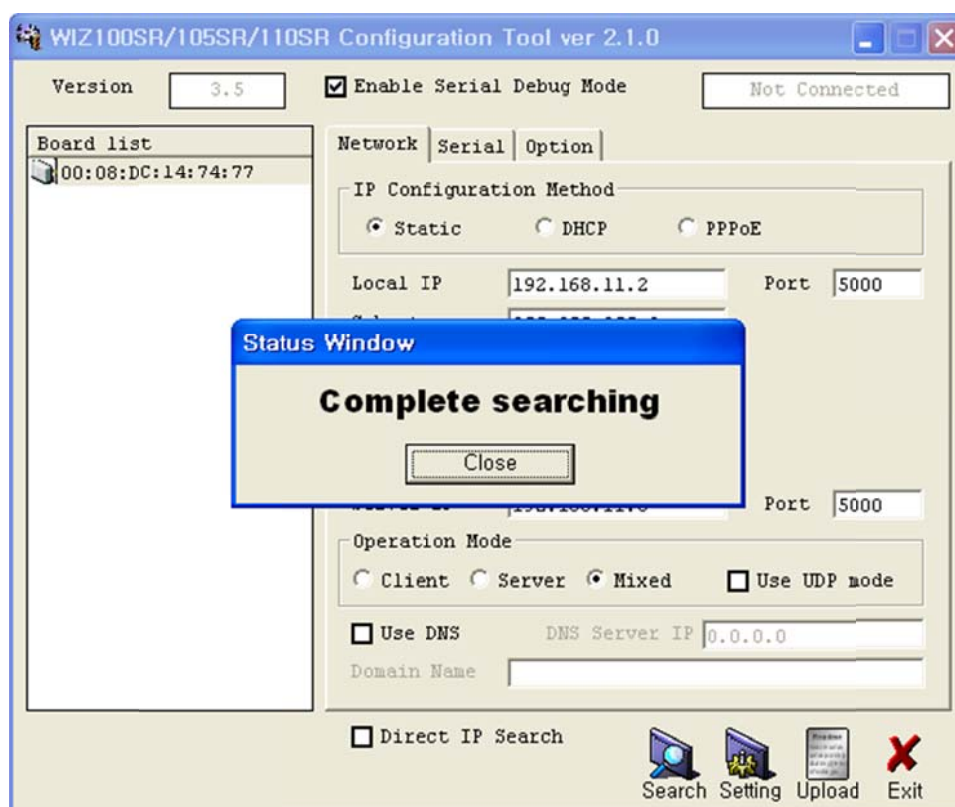


Figure 10. Board Search Window

- ① Select a module shown in "Board list", and click "Upload" button.
- 👉 Before uploading through Ethernet, you should set the network information of WIZ105SR 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.

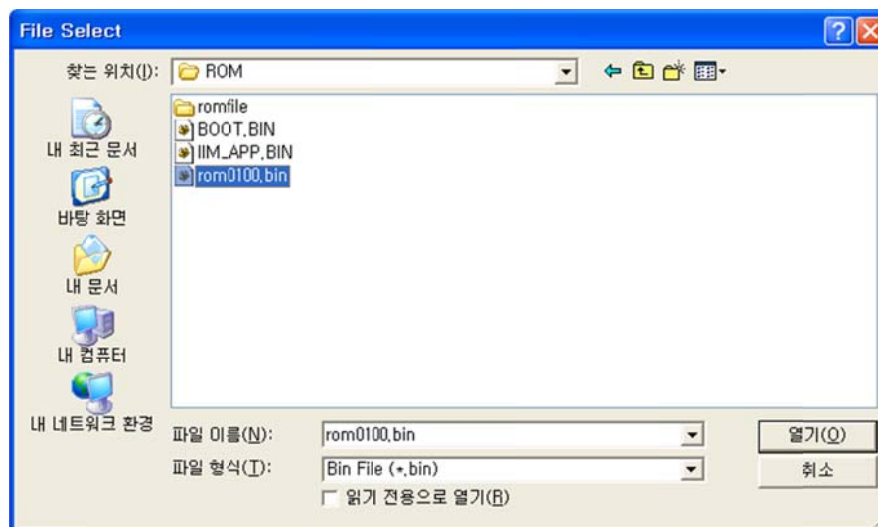


Figure 11. Open dialog box for uploading

Do not upload any other files except for WIZ105SR application firmware file.

- ③ A dialogue box titled "Processing" will be displayed as below.

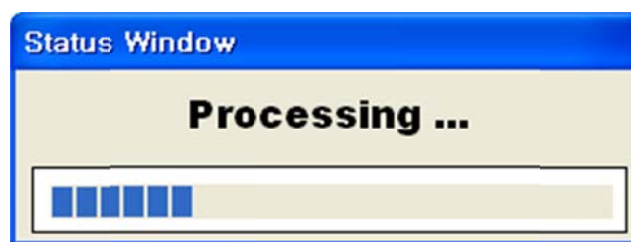


Figure 12. Firmware uploading window

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



Figure 13. Complete Uploading

4. Serial Configuration

4.1. Serial Command Format

It is possible to configure WIZ105SR by using serial command.

By inputting specified 3 characters you can enter into the configuration mode. The characters can be defined at the Configuration Tool.

< Frame Format >

Command Frame format

| Descriptor | STX | Command code | Parameter | ETX |
|---------------|-----|--------------|-----------|-----|
| Length(bytes) | 1 | 2 | Variable | 1 |

Table 5. Serial Configuration Frame format

Reply Frame format

| Descriptor | STX | Reply code | Parameter | ETX |
|---------------|-----|------------|-----------|-----|
| Length(bytes) | 1 | 1 | Variable | 1 |

Table 6. Serial Configuration Reply Frame format

STX & ETX

| Setting | Comments |
|---------|-----------------|
| STX | '<' : Hex = 3Ch |
| ETX | '>' : Hex = 3Eh |

Table 7. Serial Configuration STX & ETX

Reply Code

| Reply | Comments |
|-------|---------------------------|
| S | Command was successful |
| F | Command failed |
| 0 | Invalid STX |
| 1 | Invalid command |
| 2 | Invalid parameter |
| 3 | Invalid ETX |
| E | Enter Serial Command Mode |

Table 8. Serial Configuration Reply Code

Command Code

| Command | Parameter | Comments |
|---------|--|---|
| WI | xxx.xxx.xxx.xxx (eg. 192.168.11.133) | Set Local IP |
| WS | xxx.xxx.xxx.xxx (eg. 255.255.255.0) | Set Subnet mask |
| WG | xxx.xxx.xxx.xxx (eg. 192.168.11.1) | Set Gateway |
| WP | 0~65535 | Set Local IP's port number |
| WD | 0 : Static, 1 : DHCP, 2 : PPPoE | Set the IP configuration method |
| WM | 0 : TCP Client, 1 : TCP Mixed, 2 : TCP Server | Set the TCP operation mode |
| WK | 0 : TCP, 1 : UDP | Set Protocol(TCP or UDP) |
| WB | XXXX eg. [Baudrate]1: 115200, 2: 57600, 3: 38400, 4: 19200, 5: 9600, 6: 4800, 7: 2400, 8: 1200 [data byte] 7 : 7bit, 8bit [parity] 0 : no parity, 1 : Odd, 2 : Even [Flow] 0 : no, 1 : Xon/Xoff, 2 : RTS/CTS | Set the serial baud rate, data, parity and flow control. 4bytes:[Baud][data byte][parity][flow] |
| WT | 0 : Disable, 1 : Enable | Set the serial command method |
| WU | 0 : Not use 1 : Use | DNS Use or Not |
| WE | xxxxxx (eg. In hex format : 2B 2B 2B) | Set the command mode character |
| WX | xxx.xxx.xxx.xxx (eg. 192.168.11.144) | Set server IP address |
| WN | 0~65535 | Set server port number |
| WR | | Restart |
| WV | xxx.xxx.xxx.xxx (eg. 255.255.255.0) | DNS IP Configuration |
| WW | xxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxx (eg. wiznet.co.kr) | Domain Configuration |
| WY | PPPoE ID | PPPoE ID Configuration |
| WZ | PPPoE Password | PPPoE Password Configuration |
| OC | XX | Set delimiter character in hex |
| OS | 0~255 | Set delimiter size |
| OT | 0~65535 | Set delimiter time |
| OI | 0~65535 | Set Inactivity timer value |
| RA | MAC Address | Get MAC Address |
| RU | 0 : Not Use, 1 : Use | DNS Use or Not |
| RV | IP address | DNS IP Check |
| RW | Domain | Domain Check |
| RY | PPPoE ID | PPPoE ID Check |

| Command | Parameter | Comments |
|---------|--|---------------------------------|
| RZ | PPPoE Password | PPPoE Password Check |
| RI | IP Address | Get Local IP |
| RS | Subnet Mask | Get Subnet mask |
| RG | Gateway address | Get Gateway |
| RP | Local Port Number | Get Local IP's port number |
| RD | 0 : Static, 1 : DHCP, 2 : PPPoE | Get the IP configuration method |
| RM | 0 : TCP Client, 1 : TCP Mixed, 2 : TCP Server | Get the operation mode |
| RK | 0 : TCP, 1 : UDP | Get the Protocol |
| RB | XXXX eg. [Baudrate]1: 115200, 2: 57600, 3: 38400, 4: 19200, 5: 9600, 6: 4800, 7: 2400, 8: 1200 [data byte] 7 : 7bit, 8bit [parity] 0 : no parity, 1 : Odd, 2 : Even [Flow] 0 : no, 1 : Xon/Xoff, 2 : RTS/CTS | Get the serial baud rate |
| RT | 0 : Disable, 1 : Enable | Get the serial command method |
| RE | xxxxxx (eg. In hex format : 2B 2B 2B) | Get the command mode character |
| RF | x.x (eg. 3.1) | Get the firmware version |
| RX | xxx.xxx.xxx.xxx (eg. 192.168.11.144) | Get the server IP address |
| RN | 0~65535 | Get the server port number |
| QC | XX | Get delimiter character in hex |
| QS | 0~255 | Get delimiter size |
| QT | 0~65535 | Get delimiter time |
| QI | 0~65535 | Get Inactivity timer value |

Table 9. Serial Configuration Command Code

4.2. WIZ105SR Configuration with Serial Command

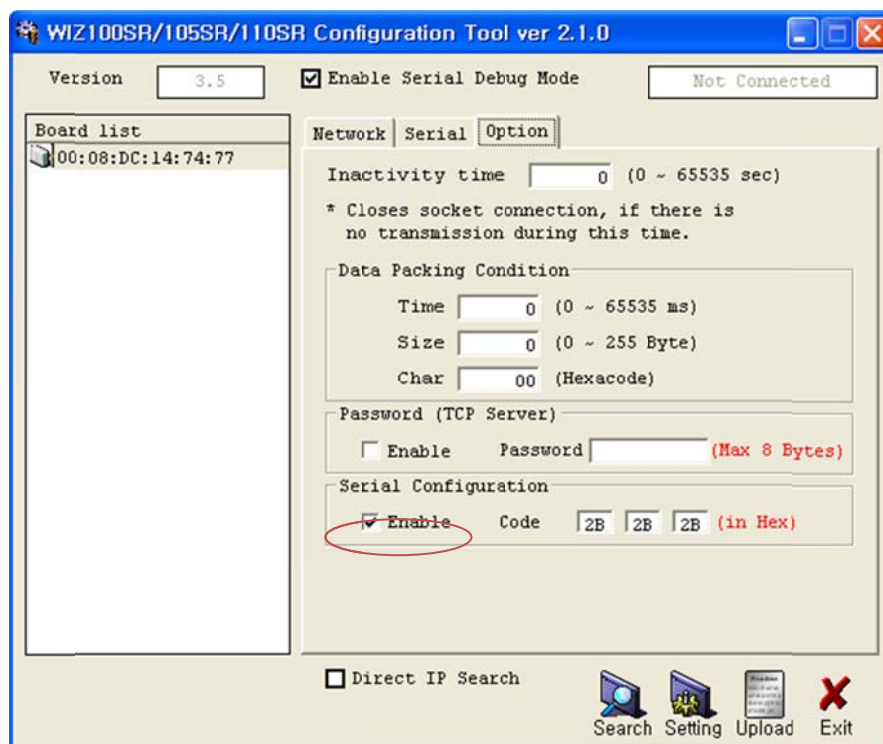


Figure 14. Serial Configuration Enable Setting

- ① Check WIZ105SR Firmware Version. If Version is lower, download the latest firmware from download page of <http://www.wiznet.co.kr>
- ② At the default status, the serial configuration is disabled. So, click 'enable' check box of serial configuration and click 'setting' button. The default value of string is "+++".
- ③ The testing can be processed as below. This testing is checking module IP and changing to another.

| | | |
|---|----------------------------------|---------------------------------------|
| 1 | Input "+++" | Enter Serial Configuration mode |
| 2 | Check "<E>" response | Successfully entered |
| 3 | Input "<W192.168.11.3>" | Change the IP address to 192.168.11.3 |
| 4 | Check "<S>" response | Successfully change the IP address |
| 5 | Input "<RI>" | Check IP address of the module |
| 6 | Check "<S192.168.11.3>" response | Check changed IP address |
| 7 | Input "<WR>" | Re-boot |
| 8 | Check "<S>" response | Successfully re-booted |
| 9 | Module re-booting | |

Table 10. Serial Configuration Test Procedure

Above process is shown in the serial console as below figure.

```
WIZ105SR Ver. 03.06

> Config socket : ok
> Listen : Ok
<E><S><S192.168.11.3><S>

WIZ105SR Ver. 03.06

> Config socket : ok
> Listen : Ok
```

Figure 15. Serial Configuration Console Display

5. Hardware Configuration

At the Serial Configuration, entering serial configuration mode is processed by using specified string. Hardware Configuration enables you to enter into configuration mode by port control. If you supply the power or reset the module by asserting low 8th pin of J1, hardware configuration is allowed. (You can also enter Hardware Configuration mode by turning on SW5) At the hardware configuration mode, networking is not possible. Therefore, after finishing the configuration, be sure to assert high J1.8 for normal operation.

5.1. Frame Format

Command Frame format

| Descriptor | STX | Command code | Parameter | ETX |
|---------------|------------|--------------|-----------|-------------|
| Command | '>' (0x3E) | R / W / X | Variable | 'CR' (0x0D) |
| Length(bytes) | 1 | 1 | Variable | 1 |

Table 11. Hardware Configuration Frame format

Reply Frame format

| Descriptor | STX | Reply code | Parameter | ETX |
|---------------|------------|------------|-----------|--------------------|
| Command | '<' (0x3C) | S | Variable | 'CR' 'LF' (0x0D0A) |
| Length(bytes) | 1 | 1 | Variable | 2 |

Table 12. Hardware Configuration Reply Frame format

Command Code

| Command | Comments |
|---------|----------------------------|
| R | Read Parameter |
| W | Write Parameter |
| X | Exit Hardware Command mode |
| E | Command Error |

Table 13. Hardware Configuration Command Code

The length of parameter can be different according to firmware version.

| Value(byte) | Description | | | | | | | | | |
|----------------------|--|---------------|--------------|--------------|--------------|-------------|-------------|-------------|-------------|--|
| 0008DCxxxxxx(6) | MAC address (xxxxxx is uniquely factory set) | | | | | | | | | |
| 01 (1) | Mode (00: TCP Client, 01 : TCP Mixed, 02 : TCP Server) | | | | | | | | | |
| 00000000 (4) | IP address | | | | | | | | | |
| 00000000 (4) | Subnet mask | | | | | | | | | |
| 00000000 (4) | Gateway address | | | | | | | | | |
| 0000 (2) | Local Port number (Module's Port Number) | | | | | | | | | |
| 00000000 (4) | Server IP address | | | | | | | | | |
| 0000 (2) | Server Port number | | | | | | | | | |
| FE (1) | Serial speed (bps) Default is FE | | | | | | | | | |
| | BB: 230400 | FF: 115200 | FE: 57600 | FD: 38400 | FA: 19200 | F4: 9600 | E8: 4800 | D0: 2400 | A0: 1200 | |
| 08 (1) | Serial data size (08: 8 bit), (07: 7 bit) | | | | | | | | | |
| 00 (1) | Parity (00: No), (01: Odd), (02: Even) | | | | | | | | | |
| 01 (1) | Stop bit | | | | | | | | | |
| 00 (1) | Flow control (00: None), (01: XON/XOFF), (02: CTS/RTS) | | | | | | | | | |
| 00 (1) | Delimiter character | | | | | | | | | |
| 0000 (2) | Delimiter size | | | | | | | | | |
| 0000 (2) | Delimiter time | | | | | | | | | |
| 0000 (2) | Delimiter inactivity time | | | | | | | | | |
| 00 (1) | Debug code (00: ON), (01: OFF) | | | | | | | | | |
| 03 (1) | Software major version | | | | | | | | | |
| 01 (1) | Software minor version | | | | | | | | | |
| 00 (1) | DHCP option (00: DHCP OFF, 01:DHCP ON) | | | | | | | | | |
| 00 (1) | UDP mode (00: TCP; 01: UDP) | | | | | | | | | |
| 00 (1) | Connection Status (00:not connected, 01: connected) | | | | | | | | | |
| 00 (1) | DNS Flag (00:not use DNS, 01:use DNS) | | | | | | | | | |
| 00000000 (4) | DNS Server IP address | | | | | | | | | |
| 00.....00 (32) | Server Domain Name | | | | | | | | | |
| 00 (1) | Serial command method(00:disable, 01:enable) | | | | | | | | | |
| 2B2B2B (3) | Serial command mode character(Hex) | | | | | | | | | |
| 002020.....2020 (32) | PPPoE ID | | | | | | | | | |
| 002020.....2020 (32) | PPPoE Password | | | | | | | | | |
| 00 (1) | Password option for TCP Server (00:disable, 01:enable) | | | | | | | | | |
| 0000000000000000 (8) | Password for TCP Server | | | | | | | | | |
| FF | Last Byte (It means end of parameter) | | | | | | | | | |

Table 14. Hardware Configuration Parameter descriptions

Reply for Entrance Hardware Command Mode (Hex : 0x3B)

| |
|---------------------|
| [Normal mode] |
| ; |
| [Debug mode] |
| WIZ105SR Ver. 03.06 |
| ; |

Table 15. Hardware Configuration Entrance Message

6. Demonstration and Test

In this chapter, we give an example that can be used to test the function of WIZ105SR.

The testing environment is as follows.

<Hardware>

- PC having RS-232 serial port
- WIZ105SR & WIZ105SR Test Board
- Ethernet cable (Direct or Crossover) to connect PC and WIZ105SR
- Serial cable to connect the COM port of PC and serial port of WIZ105SR

<Software>

- WIZ105SR Configuration tool
- Hyper Terminal (or any other terminal program)

STEP1.

- ① Make sure SW5(HW_TRIGGER) is set as 'OFF'. (If it is set as ON, the network is disabled, and Configuration Tool cannot be used)
- ② Connect the PC and WIZ105SR Test board by using serial cable.
- ③ Connect the PC and WIZ105SR Test board by using Ethernet cable.
- ④ Power on the WIZ105SR Test Board.

STEP2. (WIZ105SR Environment Setup)

- ① Modules are searched by click search button of the Configuration Tool.
- ② Select the board to be configured and change the value. To apply the changed value, click Setting button.
- ③ If changed value is successfully applied, the "Complete setting" message is displayed as shown below figure.

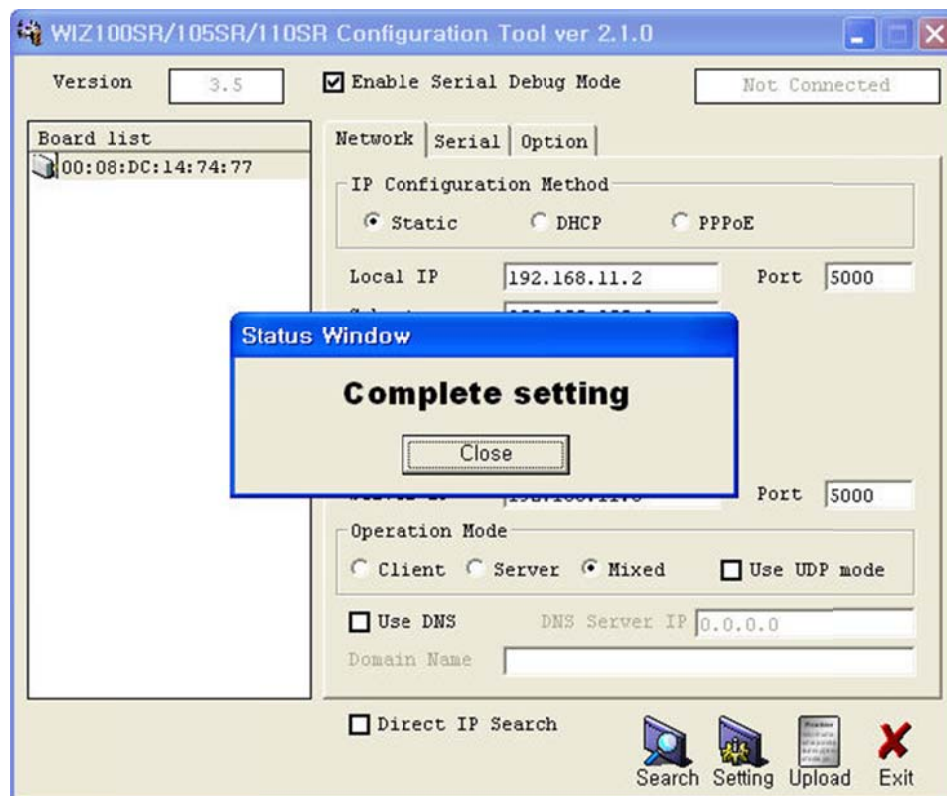


Figure 16. Result Window after Running "Setting"

STEP3. (Data Transmission)

- ① Run terminal emulator program (e.g. Hyper terminal) on Test PC.
- ② Set the baud rate as the same value of WIZ105SR

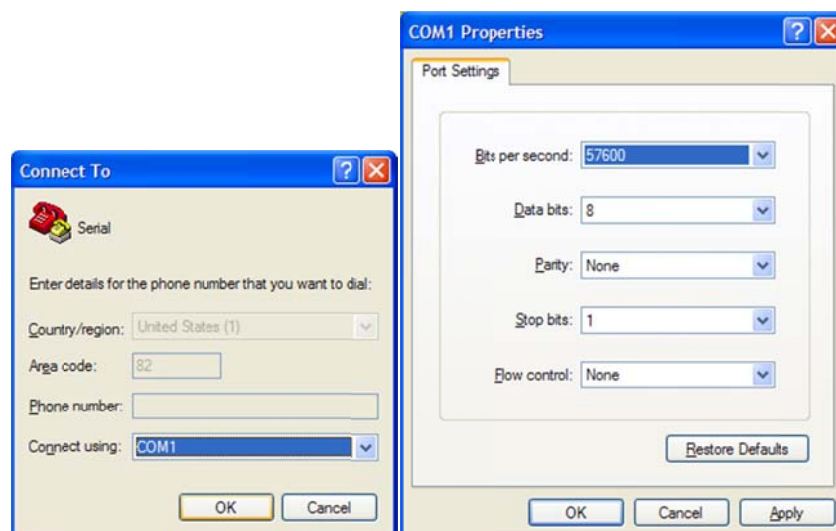


Figure 17. Serial Terminal Program configuration

- ③ Execute another Hyper terminal and set the IP address and port number.

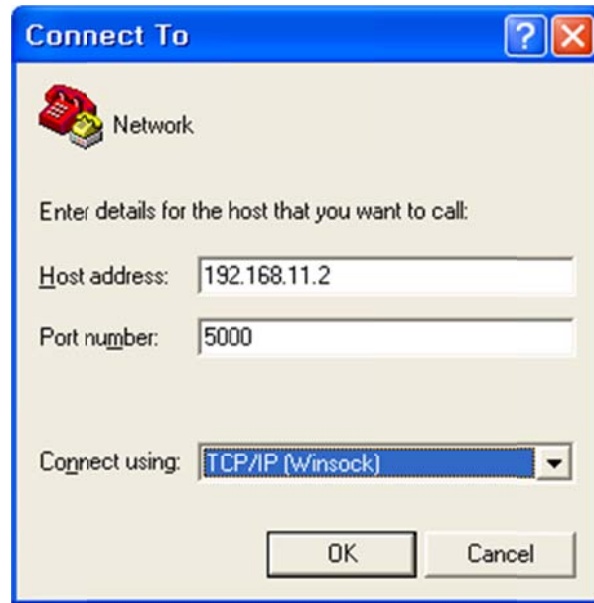


Figure 18. Network Terminal Program configuration

- ④ Type some character on the serial Hyper terminal screen. In this example, "01234567890" is entered.
- ⑤ Make sure this data is shown on the Network Hyper terminal window. (Serial to Ethernet)

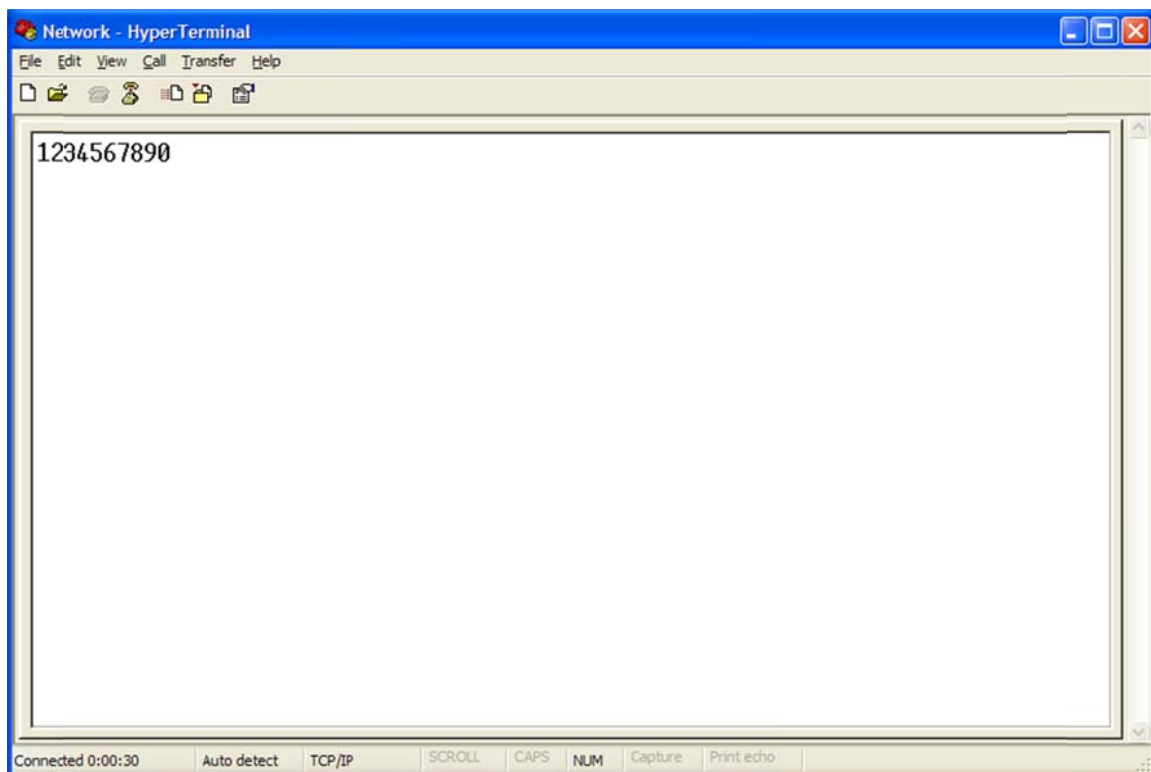


Figure 19. Received Data by Network Terminal Program

- ⑥ As the same way, type some characters on the network Hyper terminal, and then make
- Hardwired Internet Connectivity Wizard (WIZnet, Inc.)

sure these data are shown in the serial Hyper terminal window. (Ethernet to Serial)

* Above test can be performed more easily and conveniently by using Device Terminal program.
Below is the screen of the Device Terminal program.

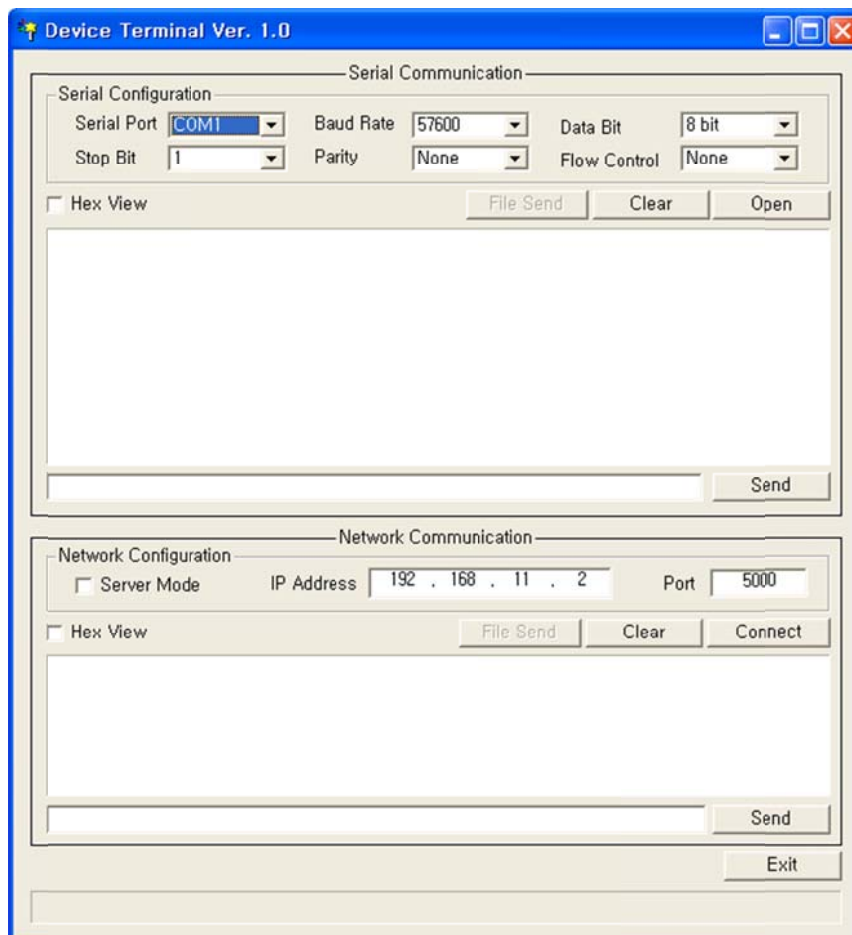


Figure 20. Device Terminal Program

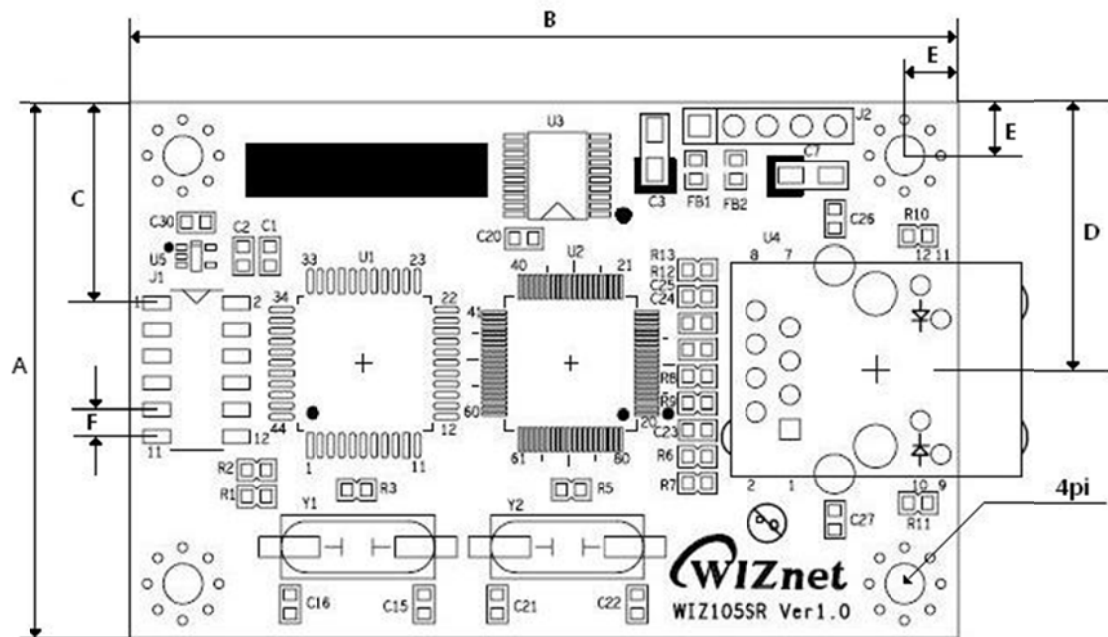
Device Terminal is the program into which serial and network terminals integrated for more efficient testing of WIZnet gateway modules.

As shown in Figure 26, at the upper part of the program, you configure serial setting of WIZ105SR. By click "Open" button, serial communication is available.

At the Network Terminal, the lower part of the program, it is possible to test both of TCP Client and TCP Server modes. If Server Mode is checked, Device Terminal will operate as server mode, and the WIZ105SR module will work as client mode. The PC where the Device Terminal is operating will work as a server, the IP address of the PC should be set as Server IP of the module. If Server mode is not checked, Device Terminal will operate as client mode, and the module as server. For the IP address and port, input IP address and port number of WIZ105SR and click "Connect" button for network communication.

When serial and network terminals are connected, input any character at the Data Input window and click "Send" button. You can check the data transferred to another window.

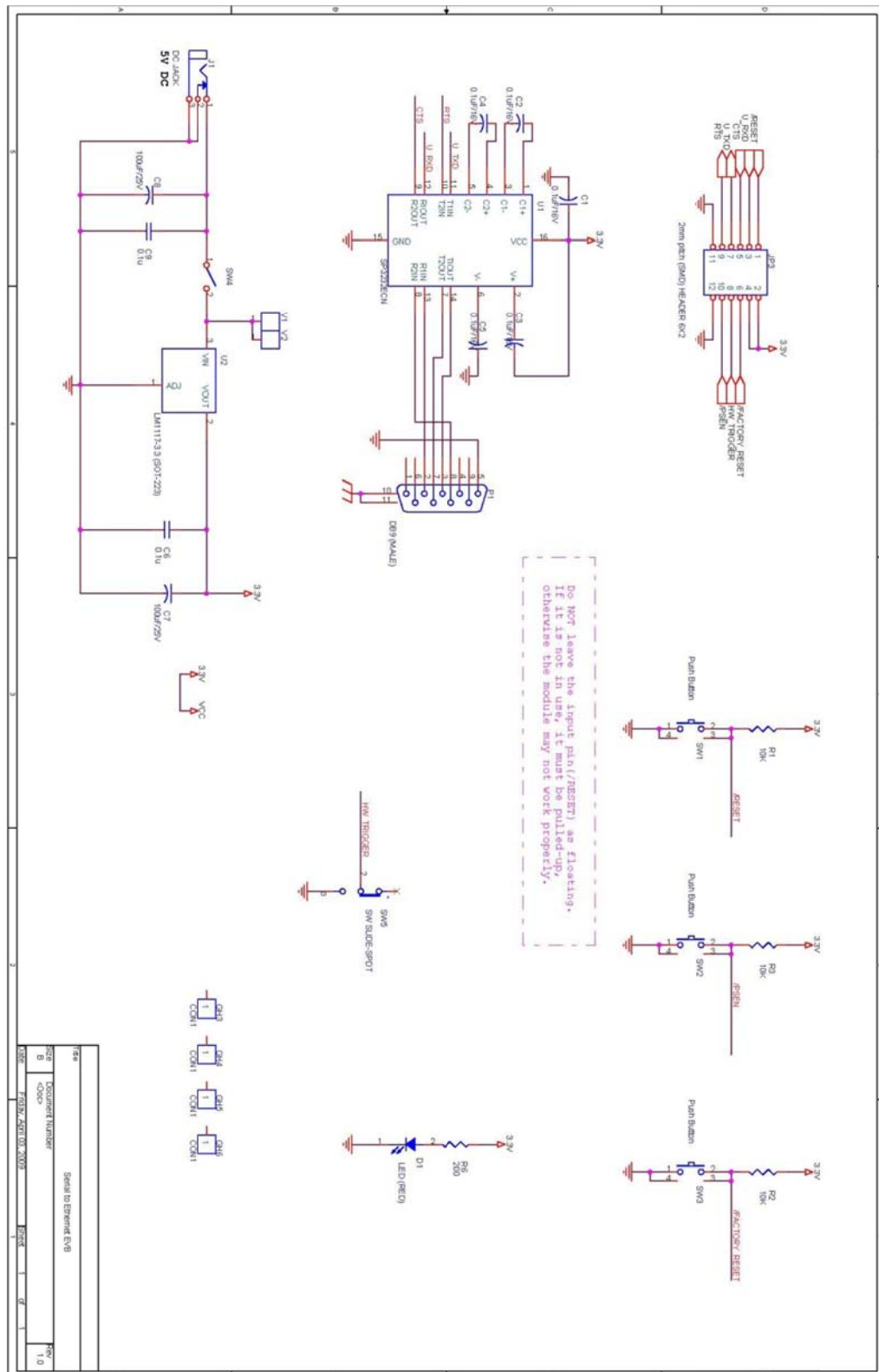
7. Dimensions



| Symbol | Dimension(mm) |
|--------|---------------|
| A | 40 |
| B | 62 |
| C | 15 |
| D | 20 |
| E | 4 |
| F | 2 |

8. Reference Schematic

< Serial to Ethernet EVB>



9. ETC

9.1. Warranty

WIZnet Co., Ltd offers the following limited warranties applicable only to the original purchaser. This offer is non-transferable.

WIZnet warrants our products and its parts against defects in materials and workmanship under normal use for period of standard ONE YEAR for the WIZ105SR Module, Evaluation Board and labor warranty after the date of original retail purchase. During this period, WIZnet will repair or replace a defective products or part free of charge.

Warranty Conditions:

1. The warranty applies only to products distributed by WIZnet or our official distributors.
2. The warranty applies only to defects in material or workmanship as mentioned above in 9.1 Warranty. The warranty applies only to defects which occur during normal use and does not extend to damage to products or parts which results from alternation, repair, modification, faulty installation or service by anyone other than someone authorized by WIZnet Inc. ; damage to products or parts caused by accident, abuse, or misuse, poor maintenance, mishandling, misapplication, or used in violation of instructions furnished by us ; damage occurring in shipment or any damage caused by an act of God, such as lightening or line surge.

Procedure for Obtaining Warranty Service

1. Contact an authorized distributors or dealer of WIZnet Inc. for obtaining an RMA (Return Merchandise Authorization) request form within the applicable warranty period.
2. Send the products to the distributors or dealers together with the completed RMA request form. All products returned for warranty must be carefully repackaged in the original packing materials.
3. Any service issue, please contact sales@wiznet.co.kr

9.2. Document Revision History

| Date | Revision | Changes |
|------------|----------|--|
| 2009-01-13 | v1.0.0 | First Release |
| 2009-04-02 | v1.1.0 | Description of nRESET signal is added.(Table3, Page 11) |
| 2013-06-19 | v1.2.0 | The software CD is not provide anymore. For more software contents, please visit our website. (www.wiznet.co.kr) Modified the table of Product contents in CH 1.2. Software CD is removed in the table of contents. |

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