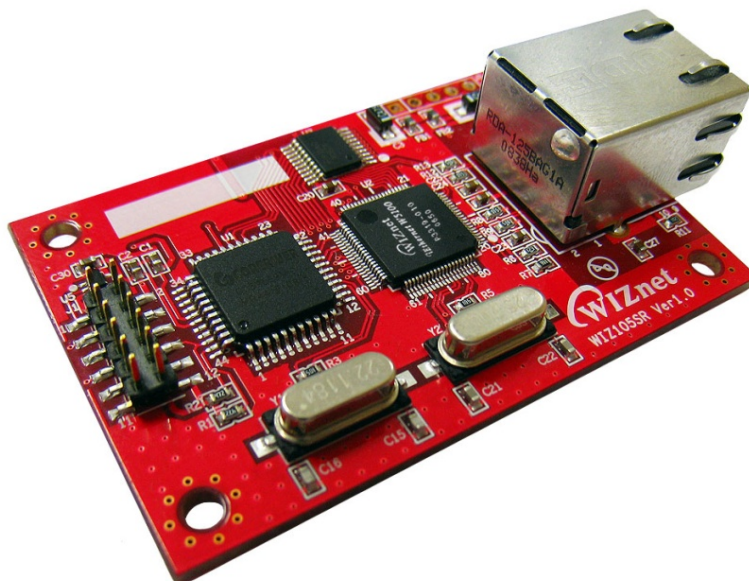


WIZ105SR User's Manual

(Version 1.1)



©2009 WIZnet Co., Inc. All Rights Reserved.

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](http://www.wiznet.co.kr) in WIZnet website (www.wiznet.co.kr). WIZnet will give an answer as soon as possible.



The screenshot shows the WIZnet website homepage. At the top left is the WIZnet logo and a navigation menu with links for HOME, LOGIN, JOIN, CONTACT US, and language options (ENGLISH, CHINESE, JAPANESE, KOREAN). There is also an 'On-line Mail' link. A sidebar on the left contains a menu with categories: PRODUCTS, TECHNOLOGY, TECHNICAL Q&A (highlighted with a 'CLICK' button), LIBRARY, DISTRIBUTOR, PARTNERSHIP, BLOG, and ABOUT US. The main content area features a large image of a WIZnet W5300 chip with the text 'Stable 70Mbps Guaranteed (in DMA!) W5300'. To the right of the chip is a 'WIZnet website Renewal/Open with web 2.0 concepts!' announcement box listing updates like 'Easy-to-check new or amended info. thru. What's updated' board, 'Support RSS in each board', and 'Enhance Search function'. Below the main content are sections for 'RoHS Compliant Semiconductor Production Line Control System', 'NEWS NEWS LETTER' with a list of recent news items, 'NEW PRODUCT W5300' with specifications (Over 50 Mbps, 16/8 bit data bus width, 8 independent sockets), and 'WHAT'S UPDATED' with a list of updates. At the bottom, there are links for 'COMPANY OVERVIEW', 'DISTRIBUTOR', 'Download Center', 'Technical Support', and various event announcements like 'WIZnet 3rd Party e-market place', 'WIZnet e-sale International', 'WIZnet Ethernet 2008 Winners Announcement', 'IIC Taiwan Sep. 9-11, 2008 Booth #: 2L06', and 'Download Sales Materials WIZwiki.tistory.com'.

COPYRIGHT NOTICE

Copyright 2009 WIZnet, Inc. All Rights Reserved.

Technical Support: support@wiznet.co.kr

Sales & Distribution: sales@wiznet.co.kr

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

Contents

1.	Introduction	7
1.1.	Key Features.....	7
1.2.	Products Contents (EVB model)	8
1.3.	Products Specification	10
2.	Getting Started	13
2.1.	Hardware Installation Procedure	13
2.2.	Configuration Tool	14
3.	Firmware Upload.....	24
4.	Serial Configuration	26
4.1.	Serial Command Format	26
4.2.	WIZ105SR Configuration with Serial Command	29
5.	Hardware Configuration.....	31
5.1.	Frame Format.....	31
5.2.	Hardware Configuration Examples	33
6.	Demonstration and Test.....	34
7.	Dimensions	38
8.	Reference Schematic	39
9.	ETC	40
9.1.	Warranty	40
9.2.	Document Revision History	40

Figures

FIGURE 1. WIZ105SR CONNECTOR PIN ASSIGNMENT AND DEFINITION	11
FIGURE 2. CONFIGURATION TOOL (NETWORK CONFIG)	14
FIGURE 3. PPPoE ACCESS PROCESS	15
FIGURE 4. TCP SERVER MODE.....	16
FIGURE 5. TCP CLIENT MODE	17
FIGURE 6. UDP MODE	18
FIGURE 7. CONFIGURATION TOOL (SERIAL CONFIG.)	20
FIGURE 8. CONFIGURATION TOOL (OPTION CONFIG.)	21
FIGURE 9. OPERATION MODE FOR PASSWORD SETTING.....	23
FIGURE 10. BOARD SEARCH WINDOW	24
FIGURE 11. OPEN DIALOG BOX FOR UPLOADING	25
FIGURE 12. FIRMWARE UPLOADING WINDOW	25
FIGURE 13. COMPLETE UPLOADING.....	25
FIGURE 14. SERIAL CONFIGURATION ENABLE SETTING	29
FIGURE 15. SERIAL CONFIGURATION CONSOLE DISPLAY.....	30
FIGURE 16. RESULT WINDOW AFTER RUNNING “SETTING”	35
FIGURE 17. SERIAL TERMINAL PROGRAM CONFIGURATION.....	35
FIGURE 18. NETWORK TERMINAL PROGRAM CONFIGURATION.....	36
FIGURE 19. RECEIVED DATA BY NETWORK TERMINAL PROGRAM	36
FIGURE 20. DEVICE TERMINAL PROGRAM.....	37

Tables

TABLE 1. PRODUCTS CONTENTS	9
TABLE 2. WIZ105SR MODULE SPECIFICATION	10
TABLE 3. PIN ASSIGNMENT	11
TABLE 4. PIN DEFINITION OF RJ-45	12
TABLE 5. SERIAL CONFIGURATION FRAME FORMAT	26
TABLE 6. SERIAL CONFIGURATION REPLY FRAME FORMAT	26
TABLE 7. SERIAL CONFIGURATION STX & ETX	26
TABLE 8. SERIAL CONFIGURATION REPLY CODE	26
TABLE 9. SERIAL CONFIGURATION COMMAND CODE	28
TABLE 10. SERIAL CONFIGURATION TEST PROCEDURE.....	29
TABLE 11. HARDWARE CONFIGURATION FRAME FORMAT	31
TABLE 12. HARDWARE CONFIGURATION REPLY FRAME FORMAT	31
TABLE 13. HARDWARE CONFIGURATION COMMAND CODE.....	31
TABLE 14. HARDWARE CONFIGURATION PARAMETER DESCRIPTIONS.....	32
TABLE 15. HARDWARE CONFIGURATION ENTRANCE MESSAGE	32

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>
	<p>CD (Manual, H/W & S/W Materials inside)</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.

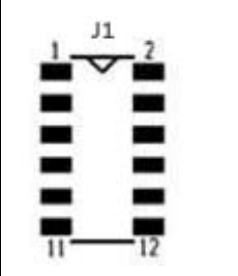
	1	/RESET	2	3.3V
	3	RXD	4	3.3V
	5	CTS	6	/FACTORY_RESET
	7	TXD	8	/HW_TRIGGER
	9	RTS	10	NC
	11	GND	12	GND

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.

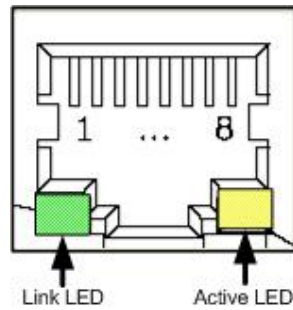


Figure 1. Pin Assignment of RJ-45 in WIZ105SR

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.

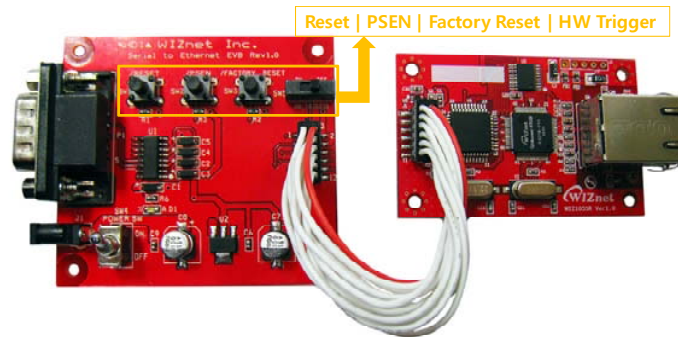


Figure 2. WIZ105SR Configuration Environment Setting Diagram

- 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

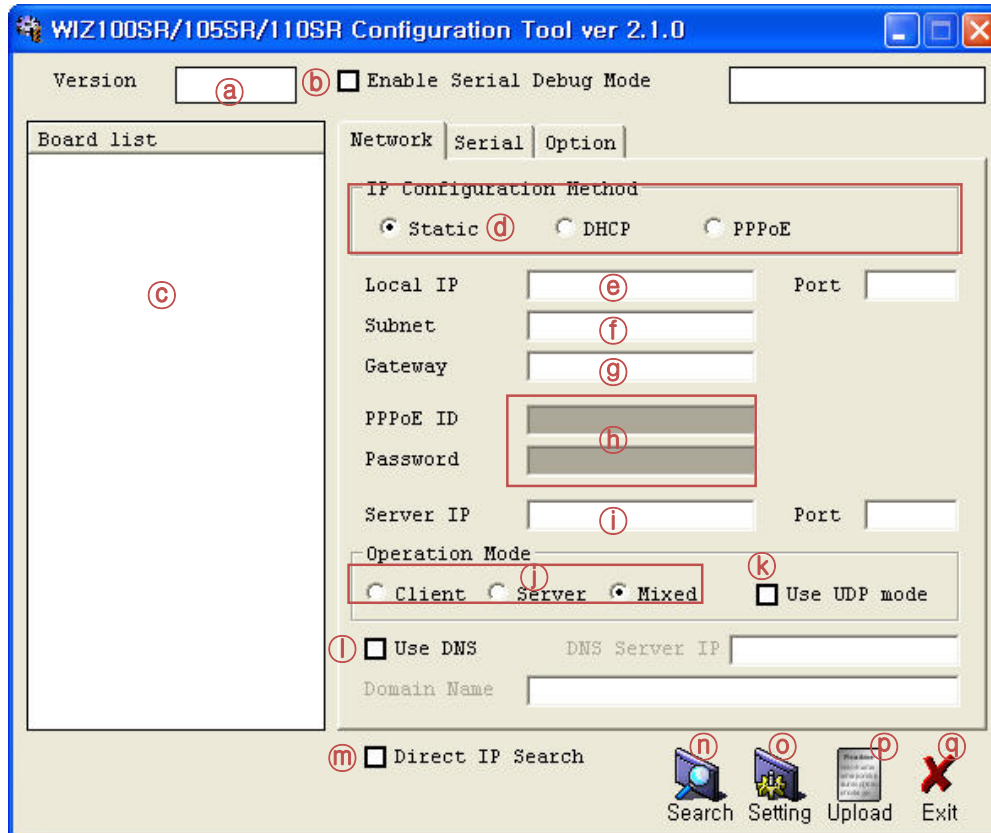


Figure 2. Configuration Tool (Network Config)

Ⓐ 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 Process

Ⓢ **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.

① Subnet : WIZ105SR's subnet mask

② Gateway : WIZ105SR's Gateway address

③ PPPoE ID/Password : If you select 'PPPoE' mode, input ID/Password which you received from ISP company.

④ 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.

⑤ 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>

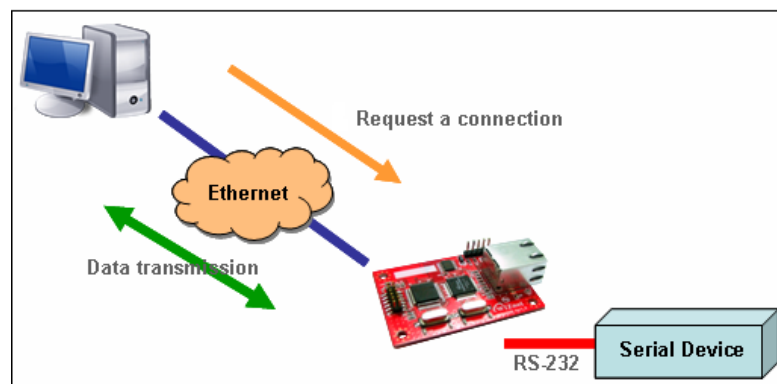


Figure 4. TCP Server mode

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 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 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>

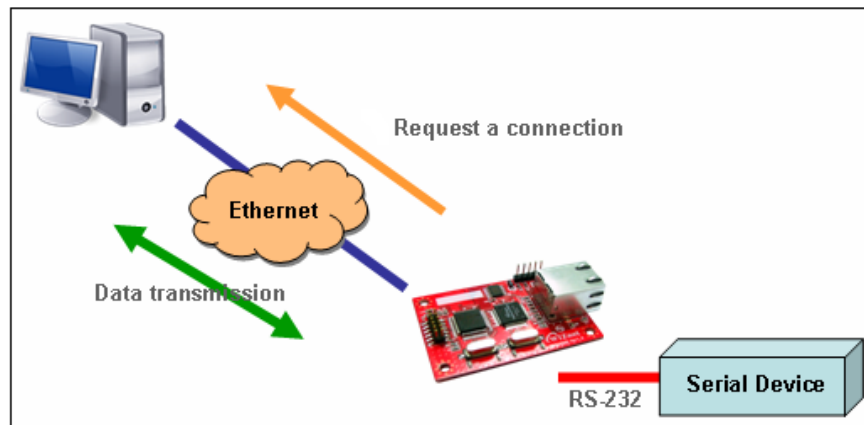


Figure 5. TCP Client mode

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.

Ⓚ Use UDP mode

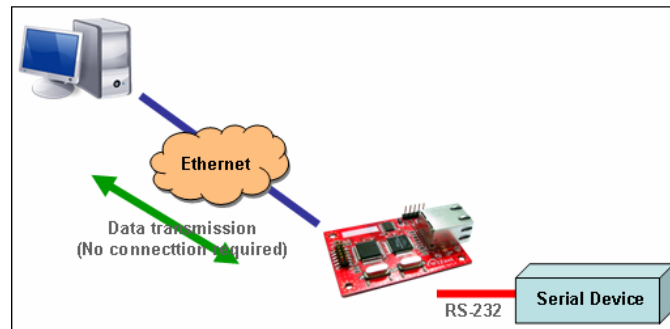


Figure 6. UDP mode

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.

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 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.

Ⓜ 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.

⑩ 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".

⑪ 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.

⑫ Upload

Firmware will be uploaded through network

☞ After uploading the firmware, 20~30 seconds are required for initialization.

- ⑬ Exit : Close the configuration tool program.

2.2.2. Serial configuration

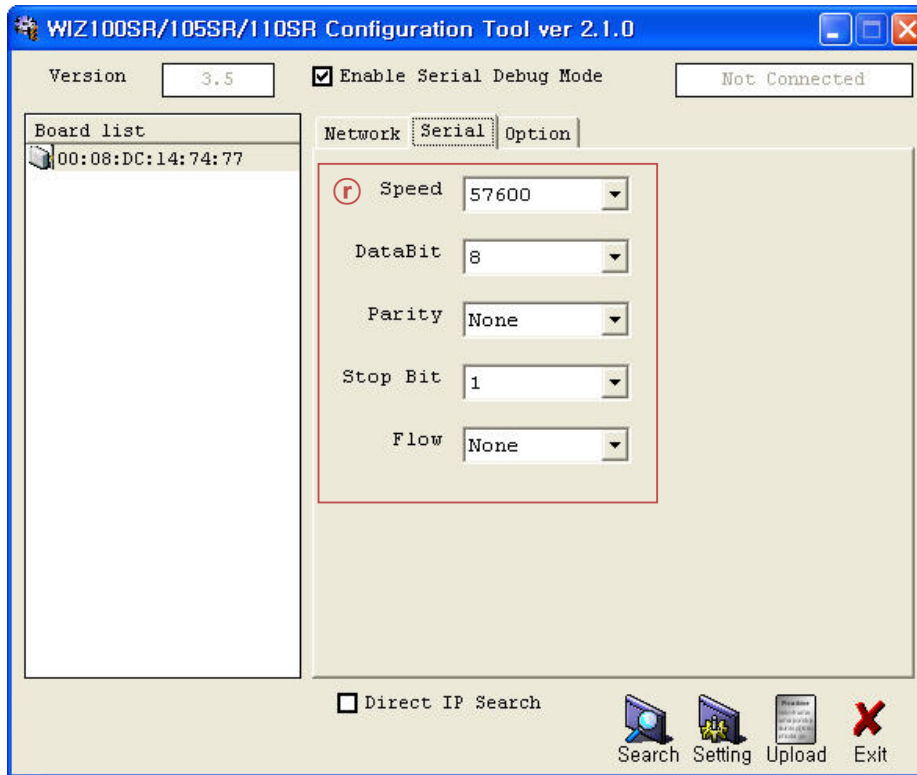


Figure 7. Configuration Tool (Serial Config.)

Ⓜ 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

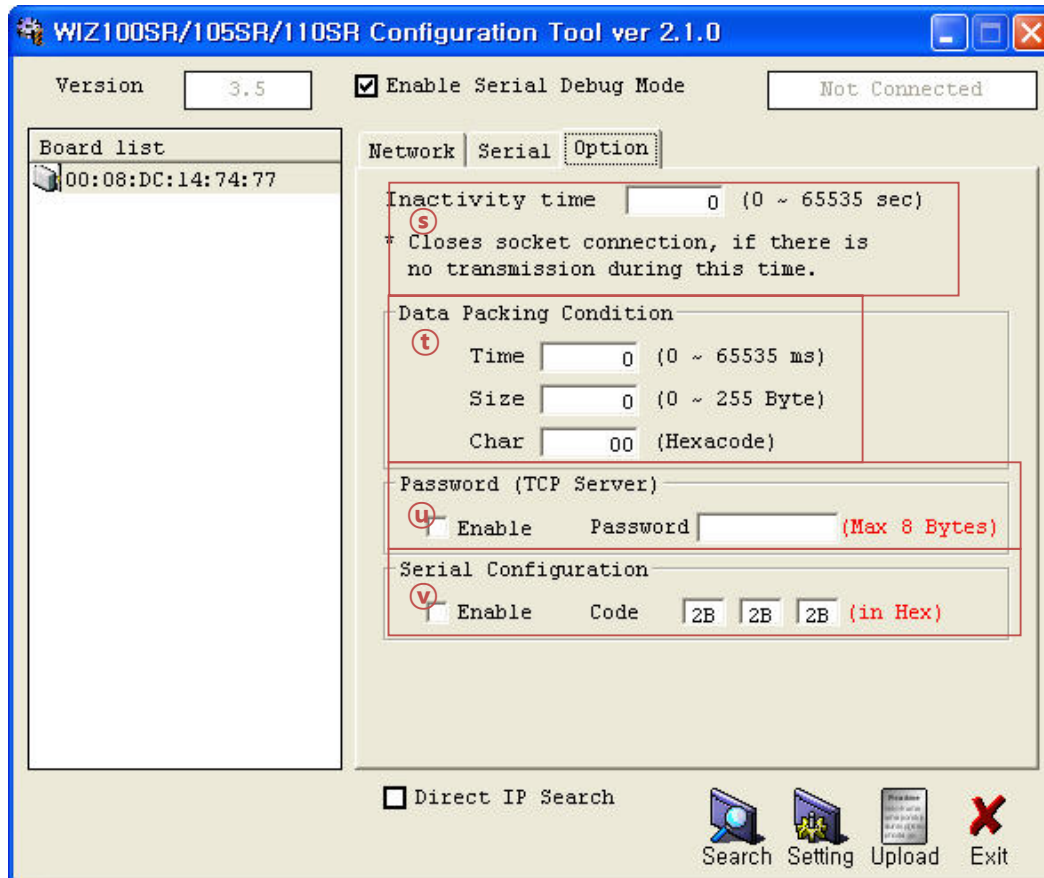


Figure 8. Configuration Tool (Option Config.)

Ⓢ 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.

Ⓢ 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.

Ⓢ 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".

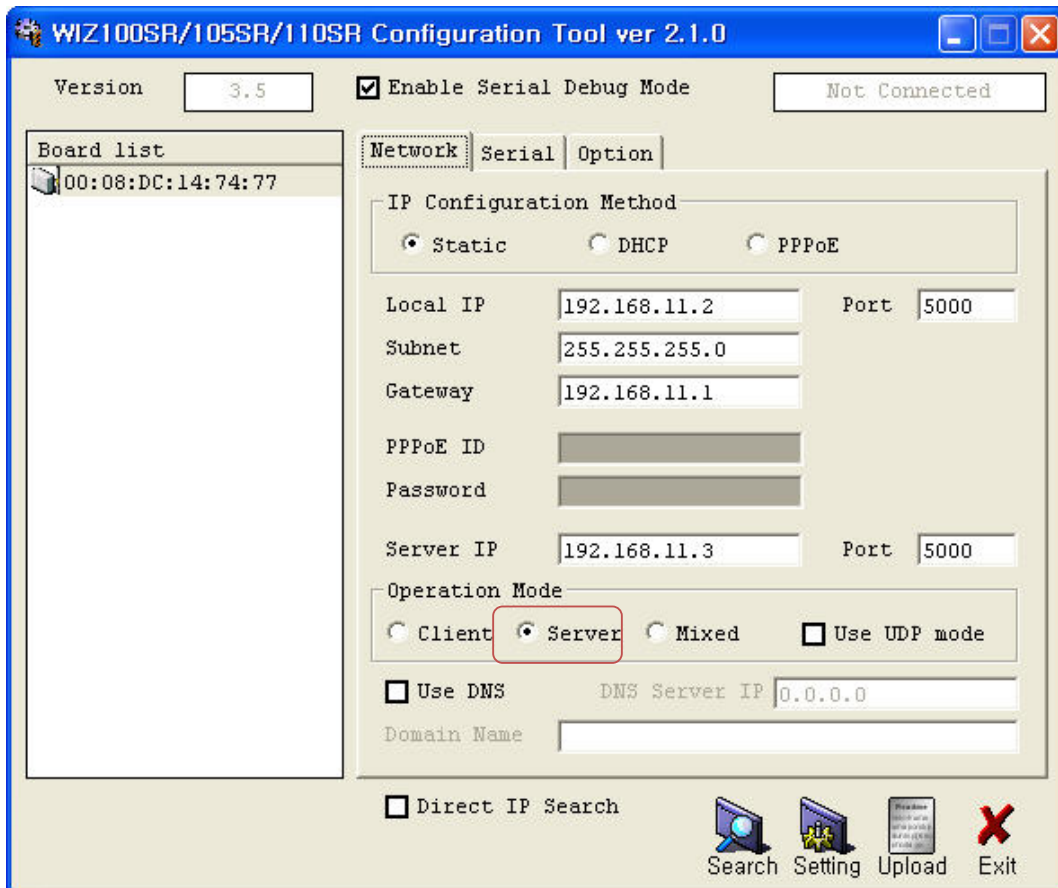


Figure 9. Operation Mode for Password Setting

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.

ⓍSerial 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.

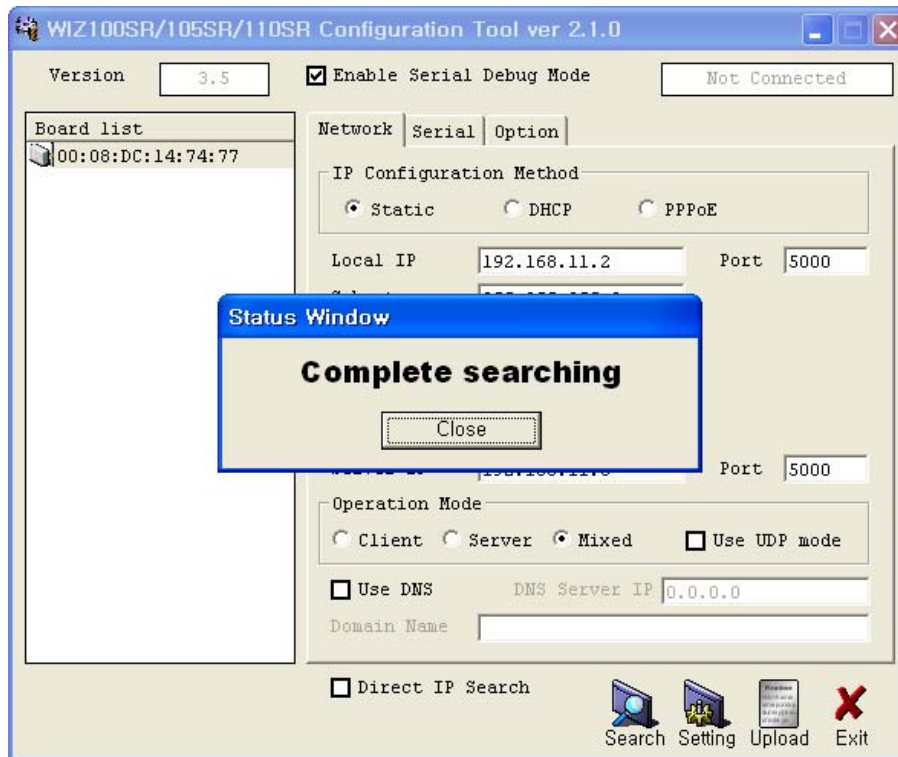


Figure 10. Board Search Window

- 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.

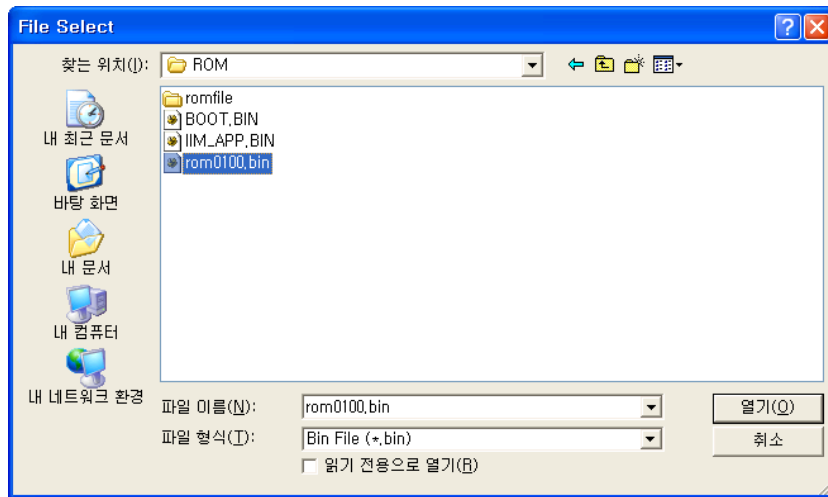


Figure 11. Open dialog box for uploading

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

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

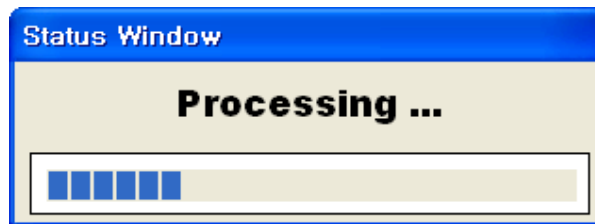


Figure 12. Firmware uploading window

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	xxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxx (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

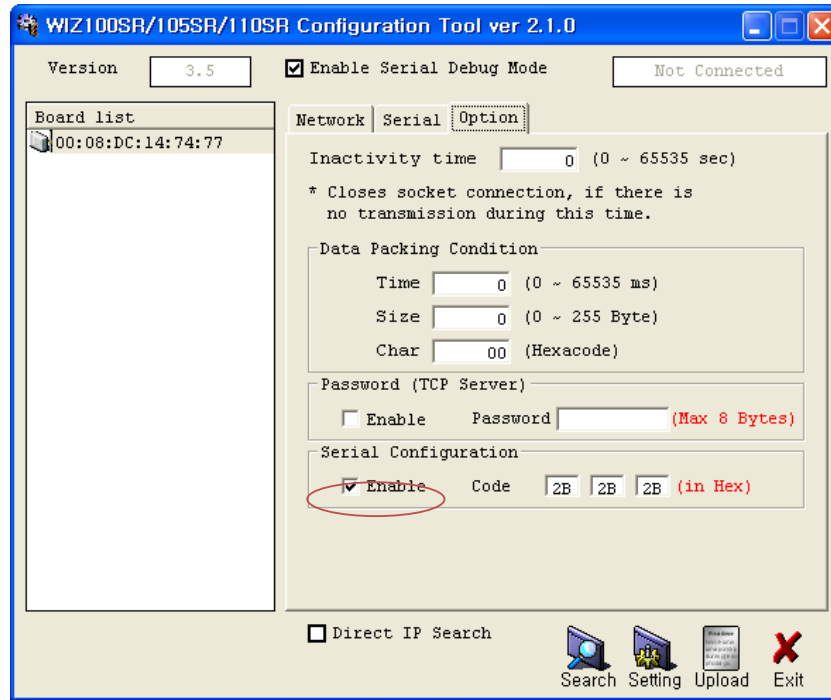


Figure 14. Serial Configuration Enable Setting

- 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 "<WI192.168.11.3>"	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																	
	<table border="1"> <tr> <td>BB:</td> <td>FF:</td> <td>FE:</td> <td>FD:</td> <td>FA:</td> <td>F4:</td> <td>E8:</td> <td>D0:</td> <td>A0:</td> </tr> <tr> <td>230400</td> <td>115200</td> <td>57600</td> <td>38400</td> <td>19200</td> <td>9600</td> <td>4800</td> <td>2400</td> <td>1200</td> </tr> </table>	BB:	FF:	FE:	FD:	FA:	F4:	E8:	D0:	A0:	230400	115200	57600	38400	19200	9600	4800	2400
BB:	FF:	FE:	FD:	FA:	F4:	E8:	D0:	A0:										
230400	115200	57600	38400	19200	9600	4800	2400	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

5.2. Hardware Configuration Examples

5.2.1. Read Parameter

- STEP 1. Supply the power into the module by asserting low 8th pin of J1(or setting 'ON' of SW5 in Test Board).
- STEP 2. Check if the message (':') is displayed to notify the entering of Hardware Configuration. If module is set as 'Debug mode', the message is displayed after showing model name and version.

```
WIZ105SR Ver. 03.06
;
```

- STEP 3. Input '>R' and Carriage Return(0x0D).
- STEP 4. Check response message.

```
WIZ105SR Ver. 03.06
;<S0008DC135E2401C0A80B03FFFFFF00C0A80B011388C0A80B011388FE080001
000000000000000000000301000000000000000020202020202020202020202020
2020202020202020202020202020202020012B2B2B0020202020202020202020
20202020202020202020202020202020200020202020202020202020202020
2020202020202020202020202020202020200000000000000000000FF
```

5.2.2. Changing IP Address

When changing the parameter value, the MAC address is not changed. As MAC address is the unique value for the module, user can't change it. When changing the IP address, input the new value after first 6bytes.

- STEP 1. Check HEX value of new IP address. In here, the new IP address is assumed as '192.168.11.10'. Therefore, the hex value 'C0A80B0A' is input.
- STEP 2. Input '>W01C0A80B0AFFFFFFF00 ... 00FF'.
- STEP 3. Check '<S' message is displayed. After displaying this message, CR(0x0D) & LF(0x0A) are displayed together.
- STEP 4. After completing the change, check if changed value is appropriated saved by using READ command.

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.

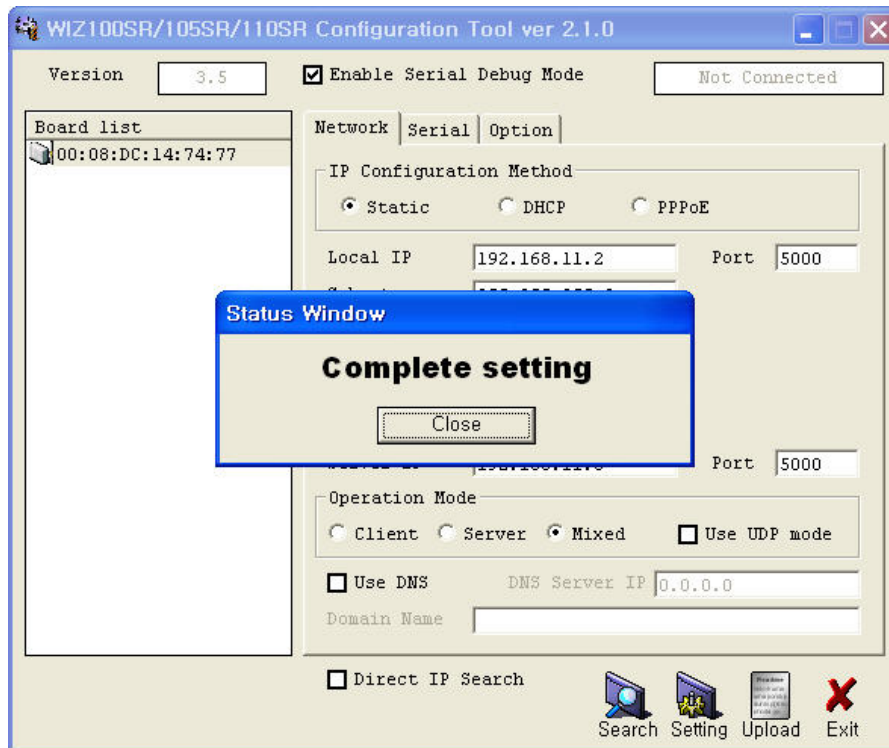


Figure 16. Result Window after Running “Setting”

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

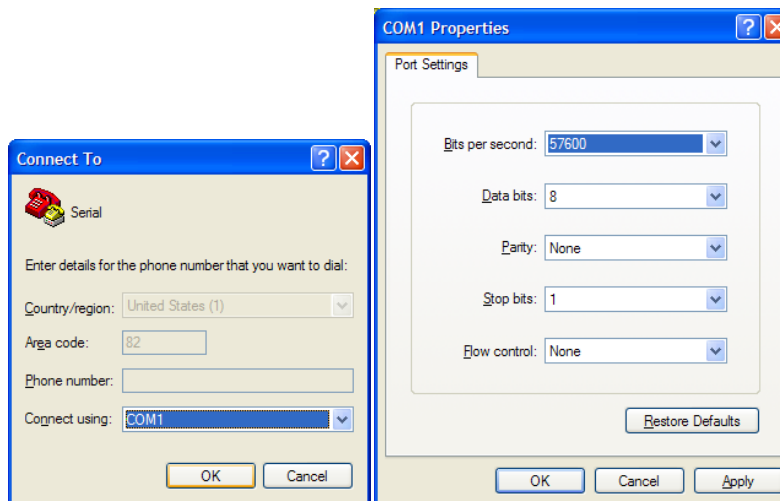


Figure 17. Serial Terminal Program configuration

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

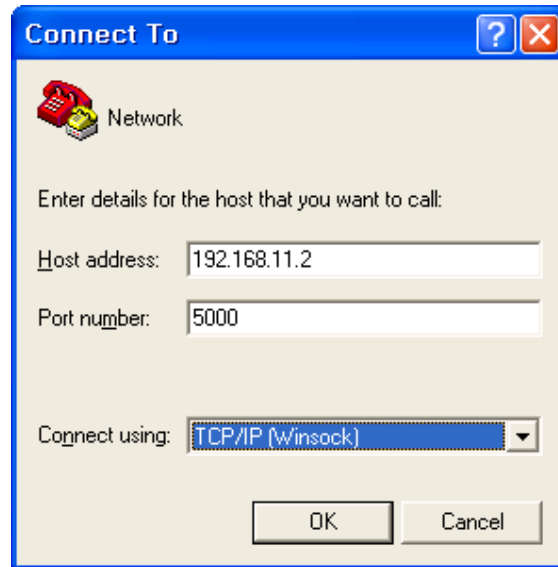


Figure 18. Network Terminal Program configuration

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

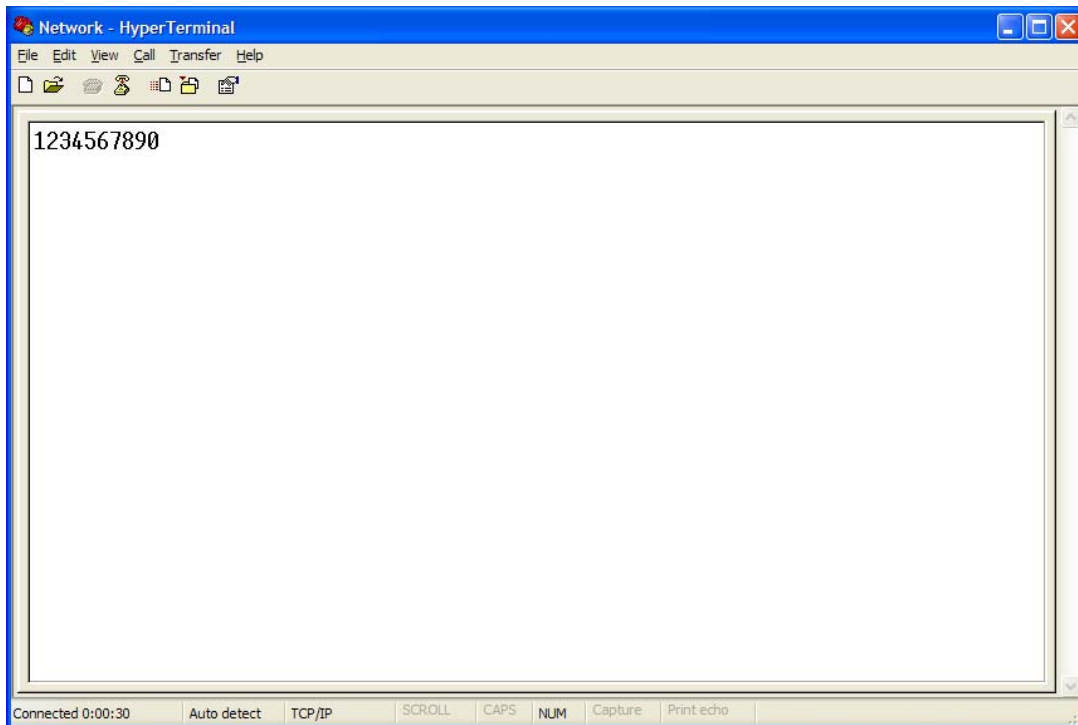


Figure 19. Received Data by Network Terminal Program

- 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.

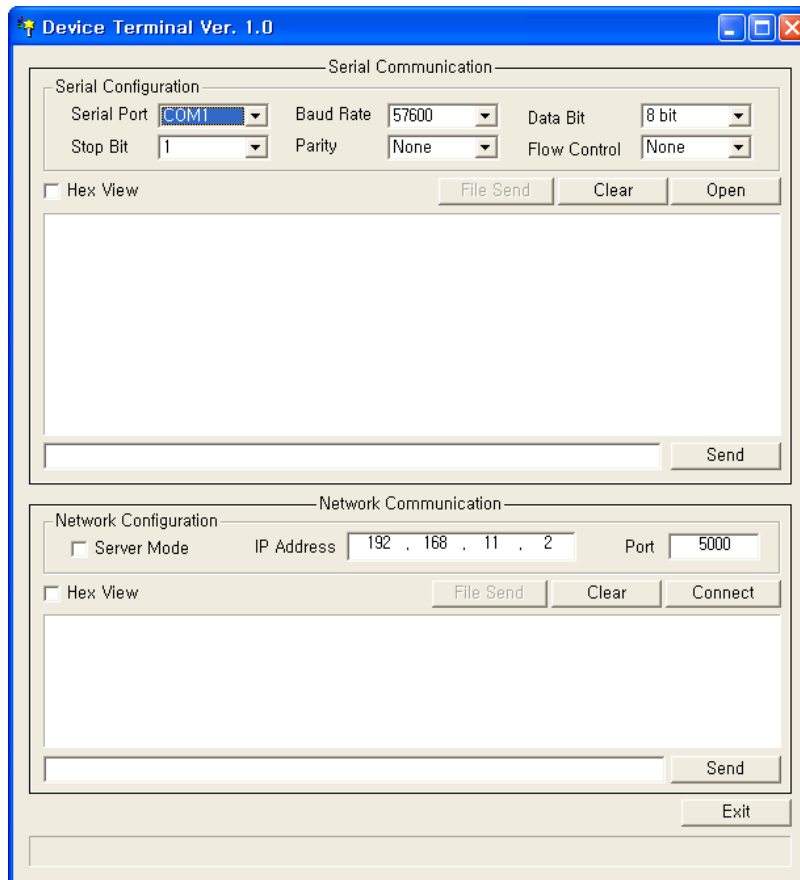


Figure 20. Device Terminal Program

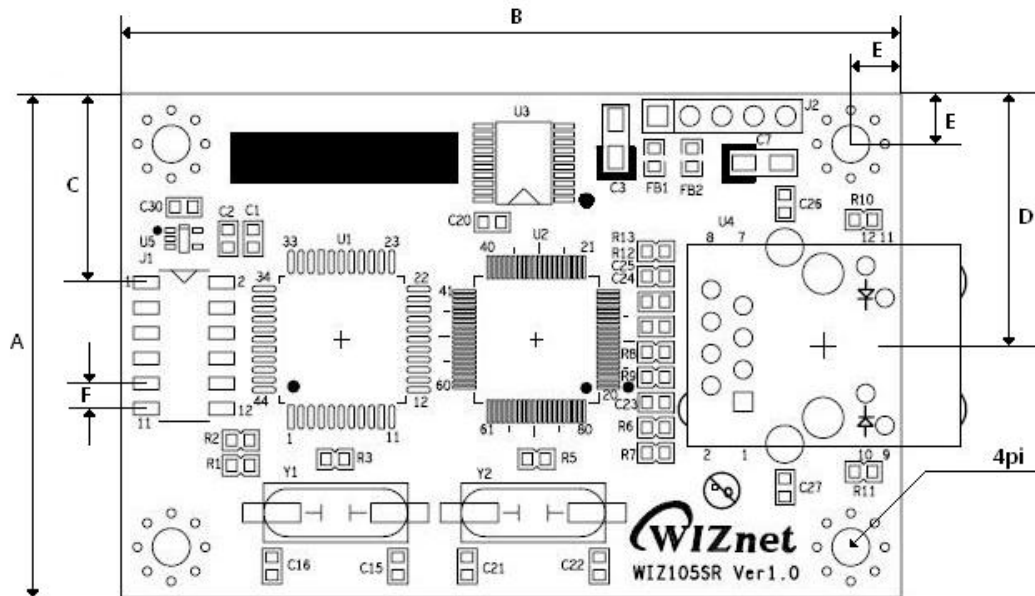
Device Terminal is the program into which serial and network terminals integrated for more efficient testing of WIZnet gateway modules.

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.

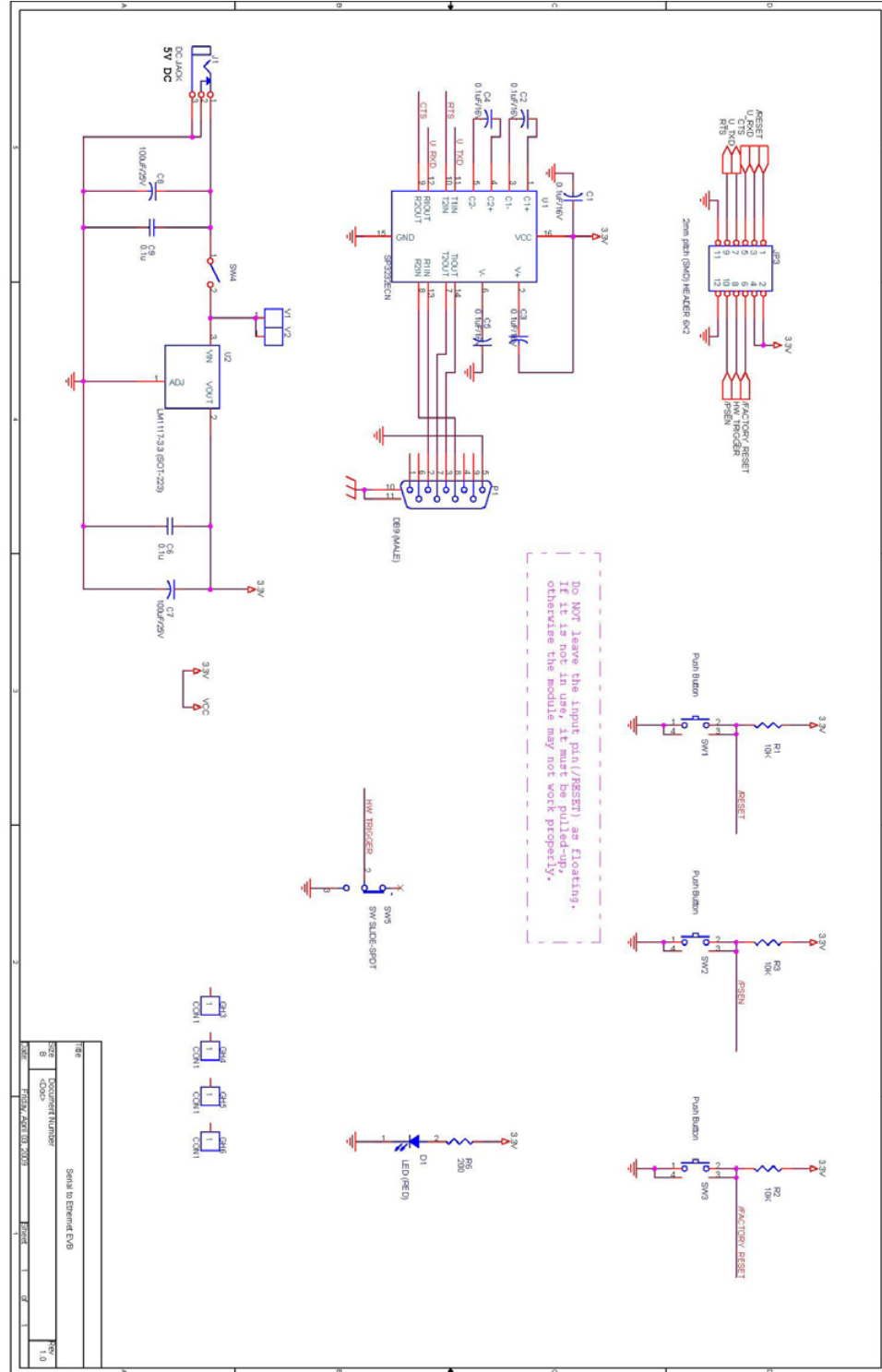
7. Dimensions



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	First Release
2009-04-02	V1.1	Description of nRESET signal is added.(Table3, Page 11)