

Multifunctional Serial Device Server

# EZL-200F User's Manual

Version 2.1



Sollae Systems Co., Ltd.

<http://www.sollae.co.kr>

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# 1 Overview

## 1.1 Overview

Almost all communication devices including PC are using serial transmission. In this type, devices send and receive data in the order of each byte. The serial communication is quite simple to implement but has weaknesses like short distance and hard maintenance.

EZL-200F lets the serial devices connect to the Internet. To communicate on the Internet, devices should use TCP/IP protocol, so EZL-200F processes the converting serial data to TCP/IP.

EZL-200F supports RS-422 and RS-485 as well as RS-232 including the Telnet COM Port control option (RFC2217), SLIP (Serial Line Internet Protocol) and etc. Furthermore, MIC real time operating system developed by Sollae Systems is loaded.

## 1.2 Application Examples

- 1:1 Connection with a PC



Fig 1-1 1:1 connection with a PC

- Applied to LANs

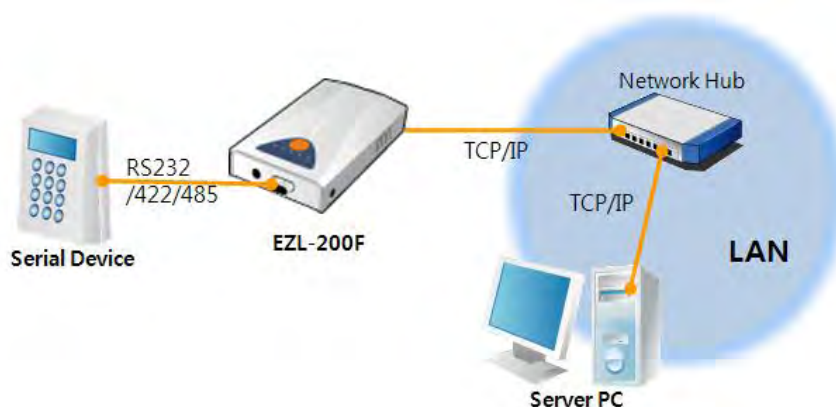


Fig 1-2 applied to LANs

- Applied to the Internet on Cable Networks

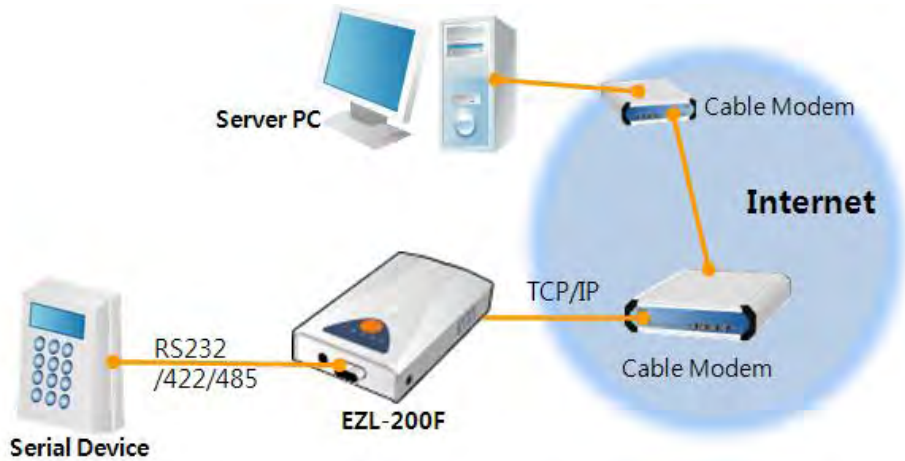


Fig 1-3 applied to the Internet on cable networks

- Applied to the Internet with an IP Share Router

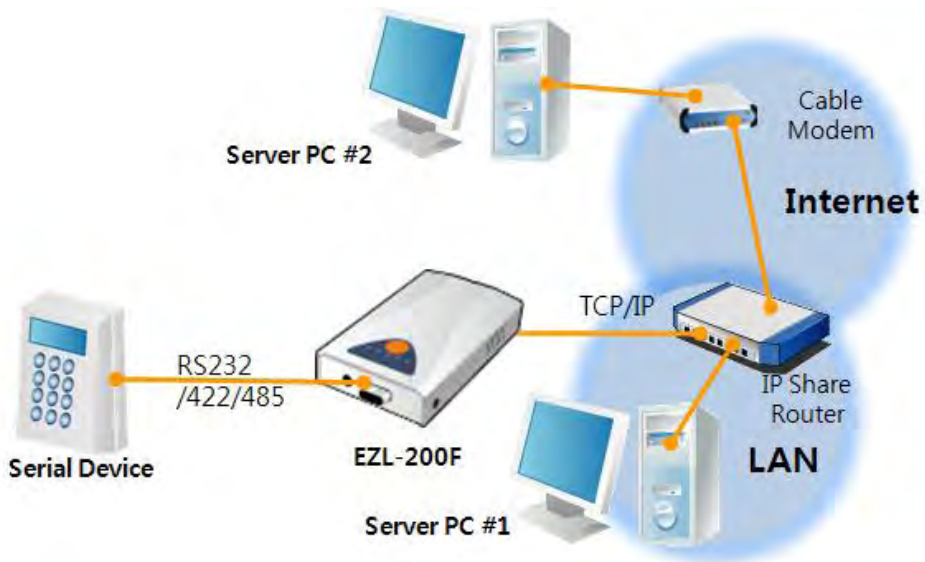
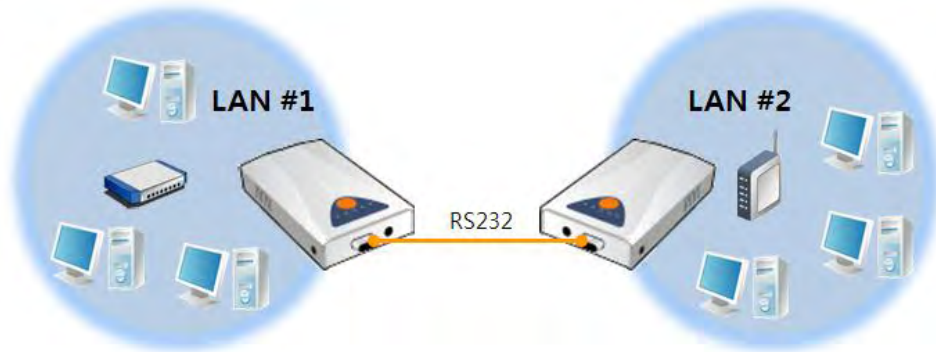
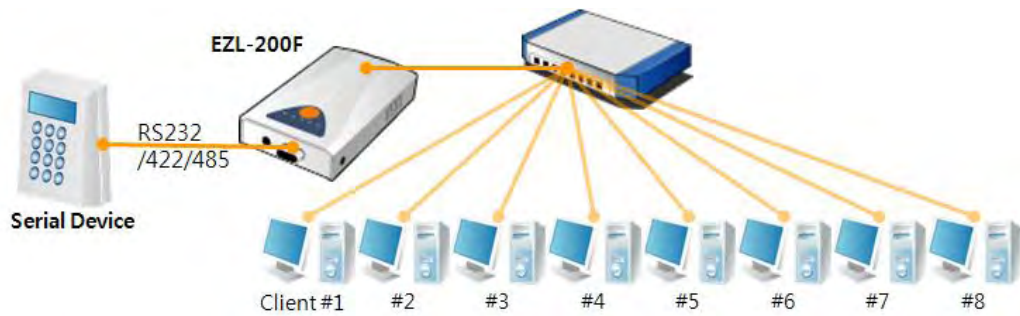


Fig 1-4 applied to the Internet with an IP share router

- An example for Serial Line Internet Protocol (SLIP)



- An example for Multi monitoring function



### 1.3 Components

- EZL-200F's Body
- RS232 Cross Cable (Option)
- DC 5V Power Adapter (Option)
- Wiring Adapter for RS-422 and 485 (Option)

## 1.4 Specification

### 1.4.1 Hardware

Power	Input Voltage	DC 5V ( $\pm 10\%$ )
	Current	320mA typical
Dimension	136mm x 83mm x 29mm	
Weight	About 140g	
CPU	ARM7 Core	
Memory	256 K Bytes Flash Memory, 2M Bytes SDRAM	
Serial Port	Serial	RS232 – RTS/CTS Flow Control / RS422 / RS485 (Baud Rate: 1,200bps ~ 115,200bps)
	Network	10 Base-T / 100 Base-TX Ethernet auto-sense Auto MDI / MDIX cable auto-sense
Temperature	Storage: 0 ~ 55°C / Operating: -40 ~ 85°C	
Certification	* MIC: E-E013-05-1418A * CE: F690501/SP-EMC000415 * FCC: F690501/LF-EMC000949	
RoHS	RoHS Compliant	

### 1.4.2 Software

Protocol	TCP, UDP, IP, ICMP, ARP, DHCP, PPPoE, TELNET, SLIP TELNET COM port Control Option (RFC 2217), SSL, SSH	
Diagnose	Online Debugging Function	
Operation mode	Normal	For Normal Data Communication
	ISP	For Upgrading F/W
	Console	For Configuration via Serial
Communication mode	TCP Server	TCP Passive Connection
	TCP Client	TCP Active Connection
	AT Command	TCP Passive / Active Connection
	UDP	UDP – No Connection
Major Utilities	ezConfig	Configuration Utility for MS Windows (Supports Downloading F/W)
	ezVSP	Serial to TCP/IP Virtual driver for MS Windows



## 1.5 Interfaces

### 1.5.1 Serial Interface

EZL-200F has a serial port for user serial device (1,200bps ~ 115,200bps). This port is interfaced with 9 pins D-sub male connector.

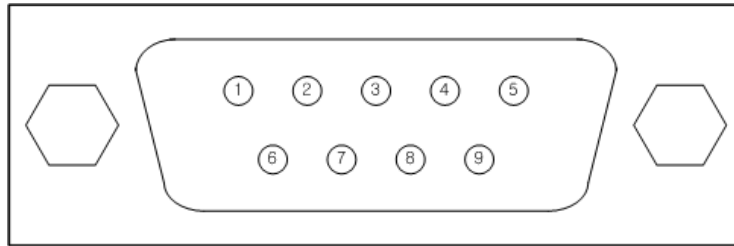


Fig 1-5 9 pins D-sub Male connector

- Pin Assignment for the RS232

Table 1-1 pin assignment for the RS232

Number	Name	Description	Level	I/O	Etc.
1	DCD	Data Carrier Detect	RS232	IN	N/C
2	RXD	Receive Data	RS232	IN	required
3	TXD	Transmit Data	RS232	OUT	required
4	DTR	Data Terminal Ready	RS232	OUT	optional
5	GND	Ground	Ground	-	required
6	DSR	Data Set Ready	RS232	IN	optional
7	RTS	Request To Send	RS232	OUT	optional
8	CTS	Clear To Send	RS232	IN	optional
9	RI	Ring Indicator	RS232	IN	N/C

☞ *N/C: Not Connected*

- Pin Assignment for the RS422

Number	Name	Description	Level	I/O	Etc.
9	TX+	Transmit Data +	RS422	OUT	required
1	TX-	Transmit Data -			
4	RX+	Receive Data +		IN	
3	RX-	Receive Data -			

- Pin Assignment for the RS485

Number	Name	Description	Level	I/O	Etc.
9	TRX+	Data +	RS485	IN/OUT	required
1	TRX-	Data -		IN/OUT	

### 1.5.2 Ethernet Interface

Since part of EZL-200F network is composed of Ethernet, UTP cable may be connected. It will automatically sense 10Mbps or 100Mbps Ethernet and connect itself. It also provides auto MDI/MDIX function that can automatically sense 1:1 cable or cross over cable.

Each Ethernet device has its own unique hardware address. The hardware address of EZL-200F is set in the factory before being shipped to the market. (The hardware address is also known as the MAC address)

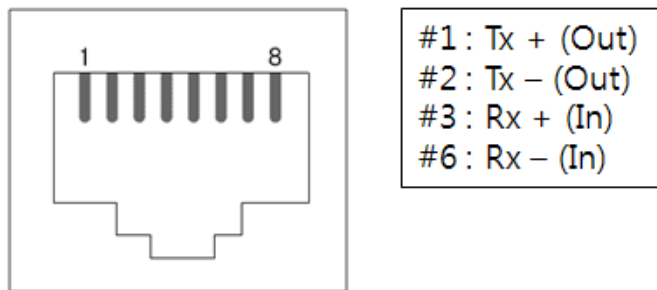


Fig 1-6 the Ethernet interface

### 1.5.3 Power

DC5V is used for the power. The specifications of the power jack are as the following:

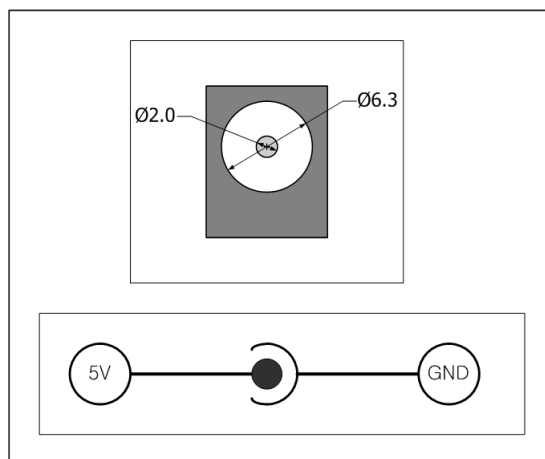


Fig 1-7 power connector

## 1.6 Others

### 1.6.1 System LED

EZL-200F has 5 lamps to show the current system status.

Each lamp shows the following status:

Table 1-2 status of the system LED

Mode	Name	Color	Status	Description
Common	PWR	Red	On	Supplying the Power
	LINK	Green	On	Connecting with 100Base-TX Ethernet
			Blinking	Receiving packets from the Ethernet
		Red	On	Connecting with 10Base-T Ethernet
			Blinking	Receiving packets from the Ethernet
	RXD	Yellow	Blinking	Receiving packets from the Ethernet
TXD	Green	Blinking	Sending packets from the Ethernet	
Normal mode	STS	Yellow	Blinks every second	IP address is assigned
			Blinks 4 times at once	IP address is not assigned yet
			ON	On TCP connection
ISP mode	STS	Yellow	ON	In the ISP mode
Console mode	STS	Yellow	Blinking Rapidly	In the Console mode

### 1.6.2 ISP Switch

There is a switch, which is named ISP switch (or button) located on the side of the product. You can change the operation mode of EZL-200F to ISP or Console mode with this switch.



Fig 1-8 ISP switch

## 2 Installation and Test

### 2.1 Installation

Before testing 200F, connect both serial and Ethernet port to your PC. It will be no problem that the Ethernet connection includes network hubs.



Fig 2-1 connection between 200F and a PC

Procedures for the test are followed.

#### 2.1.1 Setting Network Area

This step is for setting both EZL-200F and users' PC to be located the same network. If only they are, the TCP connection between them can be established.

- Setting of the PC

Add or change the IP address of the network adapter on your PC like following.

Get into the menu of [Windows Control Panel] >> [Network Connections] >> [Properties of the Network Adapter – with right click of your mouse]. Then, you can show the properties of [Internet Protocol (TCP/IP)]. In there, press the [Advanced..] button for adding an IP Address like the below figure.

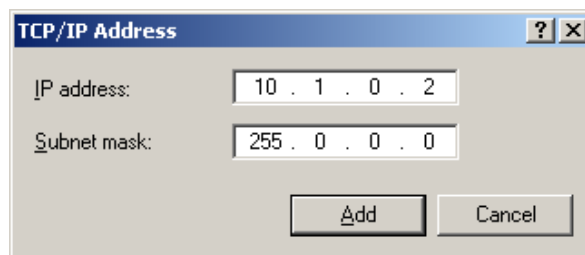


Fig 2-2 adding / changing the IP address of users' PC

- Setting of EZL-200F

EZL-200F uses ezConfig as it's a configuration program. ezConfig is for MS Windows, and this is comfortable to use because it doesn't need installation. First, search your EZL-200F via network. All the values of parameters were set to default values in the factory. To apply it to your system, proper values should be set via ezConfig. Major parameters' default values are listed on below table. To implement this simple test, keep these values without any changes.

Table 2-1 default values of Major parameters

Name		Default Values
Network	Local IP Address	10.1.0.1
	Subnet Mask	255.0.0.0
Option	TELNET	Checked
	IP Address Search	Checked
TCP/IP	Communication mode	TCP Server
	Local Port	1470
Serial Port (COM1)	Serial Type	RS232
	Baud Rate	19,200bps
	Parity	NONE
	Data Bits	8
	Stop Bit	1
	Flow Control	NONE

☞ Users can download the latest version of ezConfig on the [Support] >> [Download] >> [Utilities] menu of our website.

## 2.2 Simple Test

If you press the [Simple Test] button, test program will be shown on your screen.

- Connecting to the EZL-200F via LAN

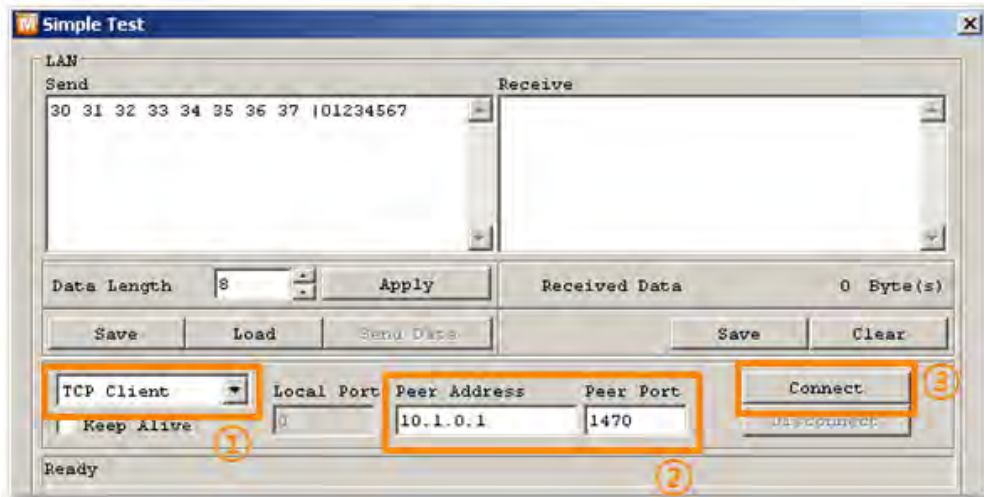


Fig 2-3 settings for TCP connection

- ① Select [TCP Client]
- ② Input correct IP address and port number of EZL-200F
- ③ Click the [Connect] button. (In case of TCP Server, it will be [Listen] button)

- Opening RS232 Port

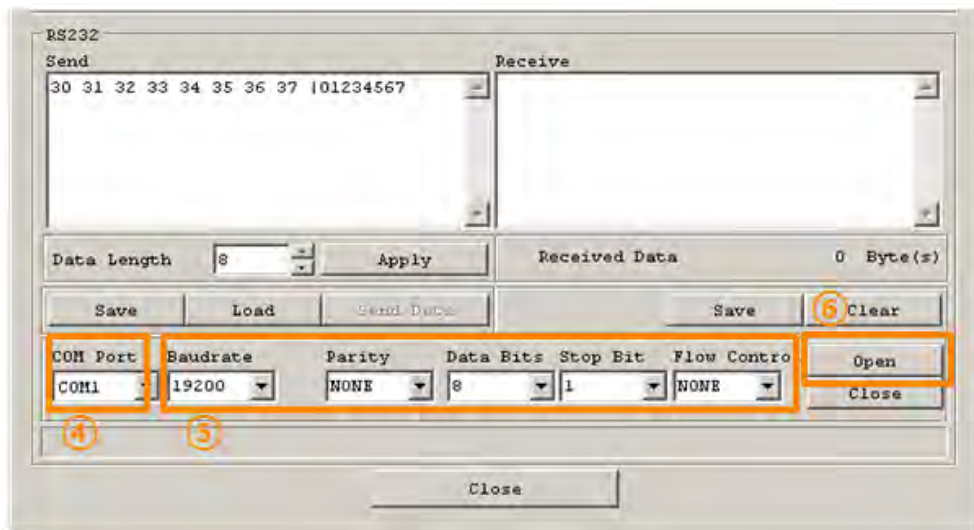


Fig 2-4 opening COM Port

- ④ Select COM port which the EZL-200F is connected to
- ⑤ Make sure that all the parameters are the same with 200F
- ⑥ Press the [Open] button

- Confirm the TCP Connection and COM port status

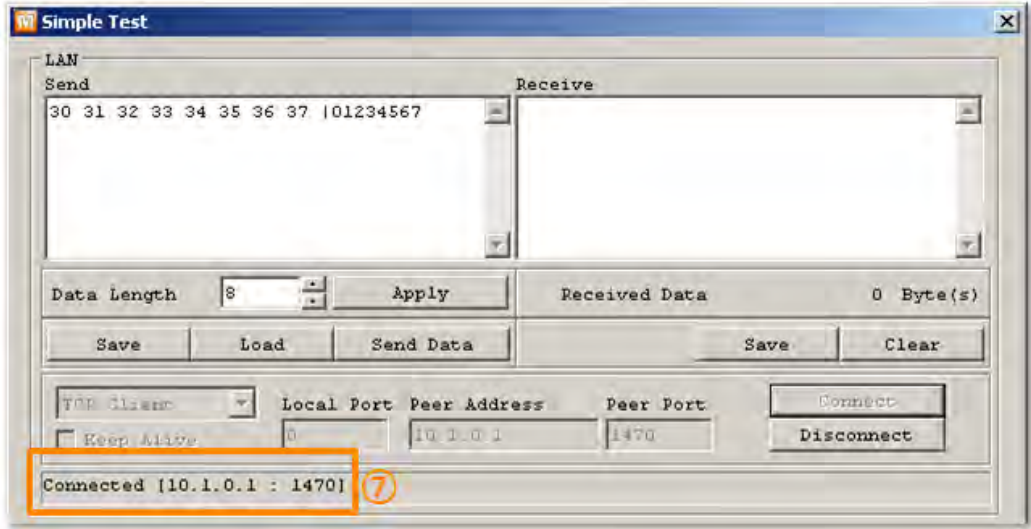


Fig 2-5 TCP Connected message

- ⑦ Check the message if the TCP connection is established

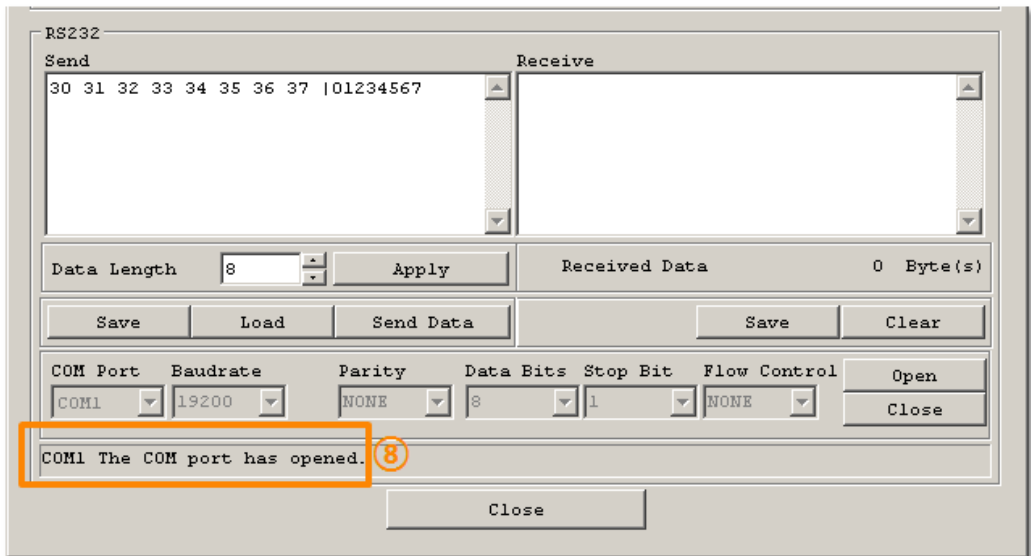


Fig 2-6 COM Port open message

- ⑧ Check the message if the COM port has been opened

- Data transmission test

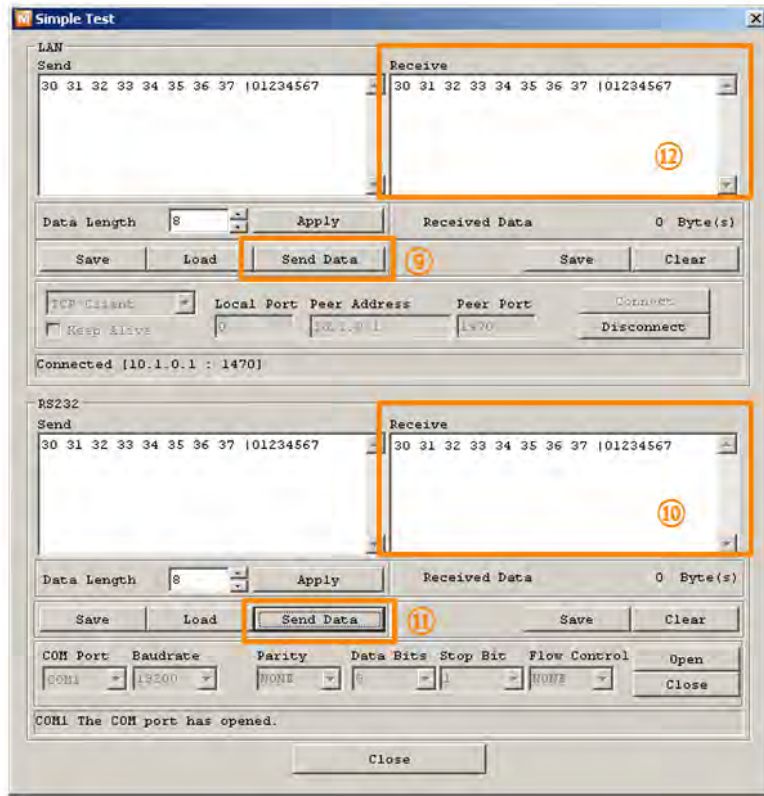


Fig 2-7 successful data transmission

- ⑨ Click the [Send data] on the LAN part
- ⑩ Check the data have been shown from the step ⑨

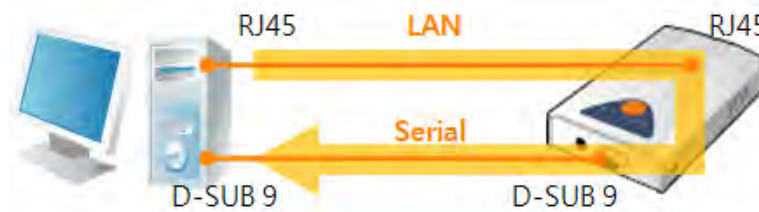


Fig 2-8 LAN → RS232

- ⑪ Press the [Send data] on the RS232 part
- ⑫ Check the data have been received from the step ⑪

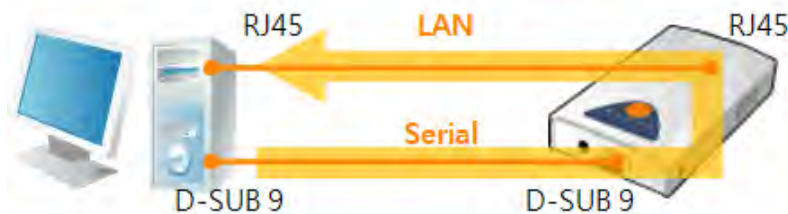


Fig 2-9 RS232 → LAN



# 3 Configuration

## 3.1 Configuration with ezConfig

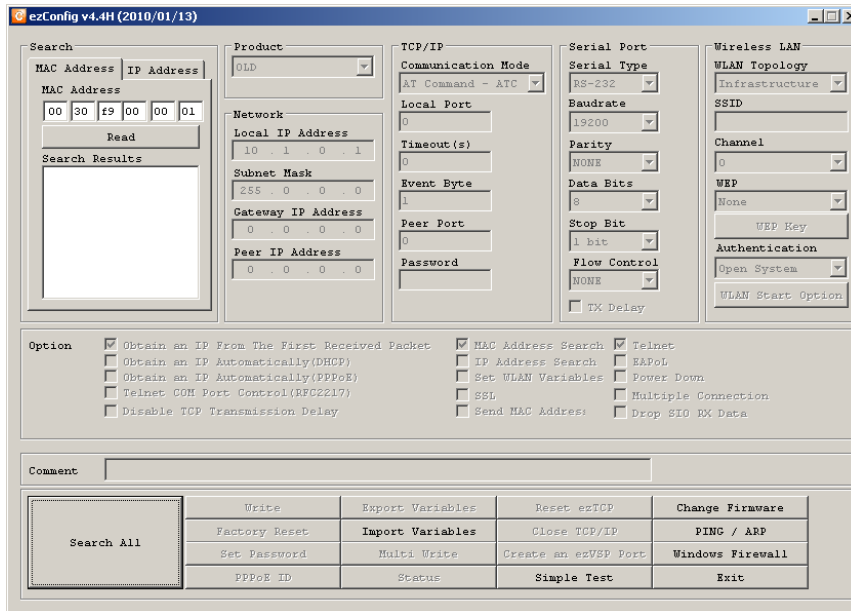


Fig 3-1 initial appearance of ezConfig

### 3.1.1 Configuration via LAN

- Checklists
  - Make sure the connection between your PC and EZL-200F. If they are the same network, [Search All] button on the [MAC Address] tab can be used. If they aren't, only [Read] button on the [IP Address] tab is allowed to use.
- Procedures

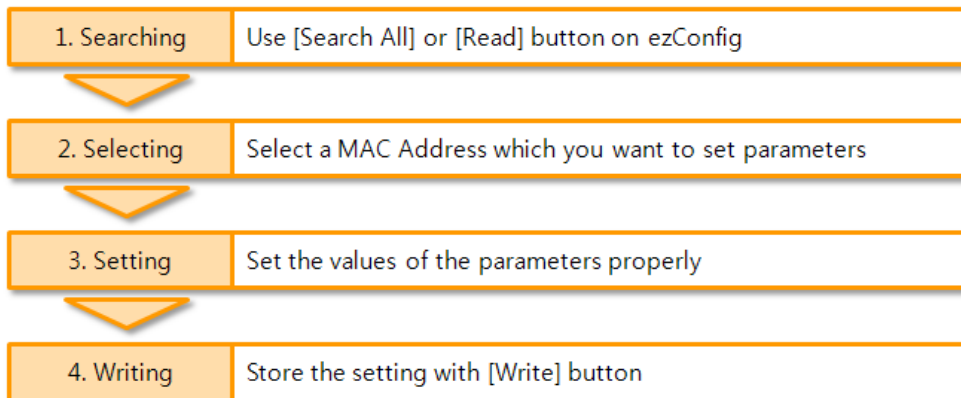


Fig 3-2 procedures for configuration via LAN

## 3.2 Configuration through Console

### 3.2.1 Using TELNET

- Checklists

Make sure the connection between your PC and EZL-200F over Ethernet. [TELNET] option should be checked by the ezConfig and if there is a password, you have to know the password when you log on via TELNET.

- Procedures

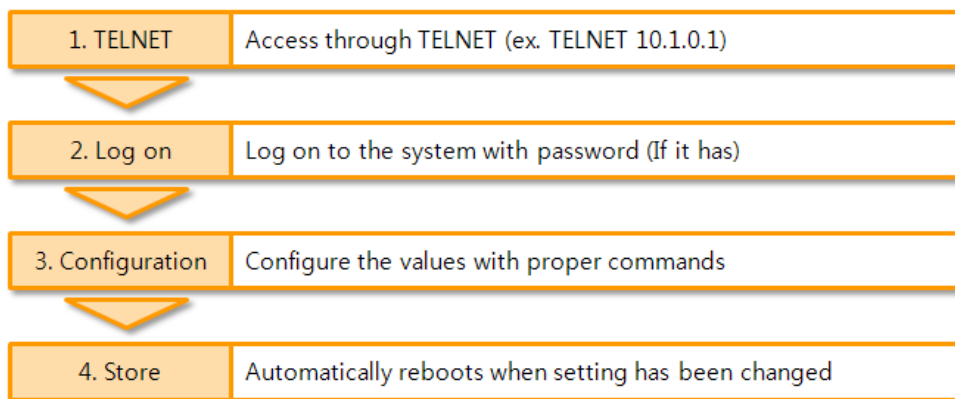


Fig 3-3 procedures for configuration via TELNET

- How to use

- ① Run the command prompt (Start >> Run >> "cmd" command)
- ② Log on via TELNET: Password is required if it is already set
- ③ Configure the values with each command

Table 3-1 configuration commands in console

Cmd.	Module	Parameter	Description
env	if	MAC ADDR	Mac address, fixed value
		EZCFG	Enable Searching with ezConfig
		ARP	Obtain an IP from the first received packet
		DHCP	Obtain an IP Automatically (DHCP)
		PPPoE	Obtain an IP Automatically (PPPoE)
		LOCAL IP	Local IP Address
		SUBNET MASK	Subnet Mask
	GATEWAY	Gateway IP Address	
	ezi	MULTI.COMM	Multiple Connection

		SERIAL TYPE	Serial Type	0	RS-232	
				1	RS-422	
				2	RS-485	
		BAUD RATE	Baud rate: 1,200 ~ 115,200 bps			
		PARITY	Parity	0	None	
				1	Even	
				2	Odd	
		DATA BITS	Data bits: 7, 8 bits			
		RTSCTS	Hardware Flow Control			
		XON/XOFF	Software Flow Control			
		TELNET	Enable TELNET			
		MUX TYPE	Communication mode	0	TCP Server	
				1	AT Command	
	2			TCP Client		
	3			UDP		
	TIME OUT	Timeout (Unit: seconds)				
	LOCAL PORT	Local Port				
	PEER IP	Peer IP Address / Allowed IP Address				
	ext	COMMENT	Comment			
SSL		SSL (Secure Socket Layer)				
SSH		SSH (Secure Shell)				
TELCOM		TELNET COM Port Control Option (RFC2217)				
CONN MAC ID		Send MAC Address				
SLIP		SLIP (Serial Line Internet Protocol)				
SEND DELAY		Delay for sending TCP data (Unit: ms)				
COD DELAY		Delay for connection request (Unit: sec)				
pwd	-	Password				

④ An example

When you input a command and module, each available parameter appears one by one. You can set values directly or use "y" and "n" in some options. If one or more parameters are changed, EZL-200F stores the setting and reboots automatically after the last parameter.

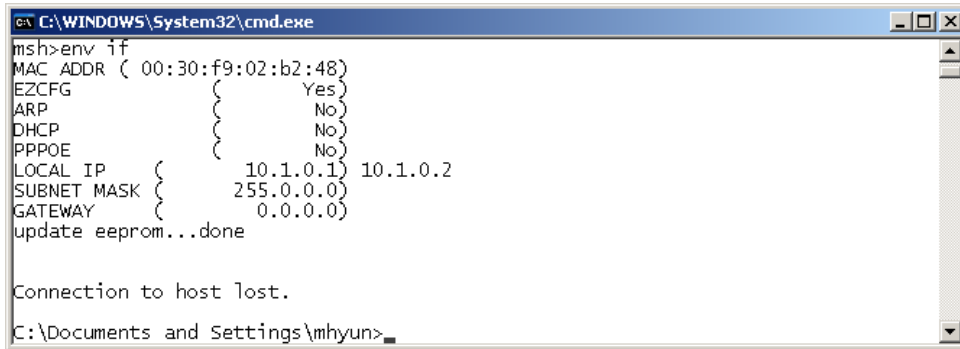


Fig 3-4 configuration by TELNET console

### 3.2.2 Using Serial Port

- Checklists

The connection between PC and product with a RS232 crossed cable is needed and the console mode has to be running. Then, open the COM port by using serial terminal program.

- Procedures

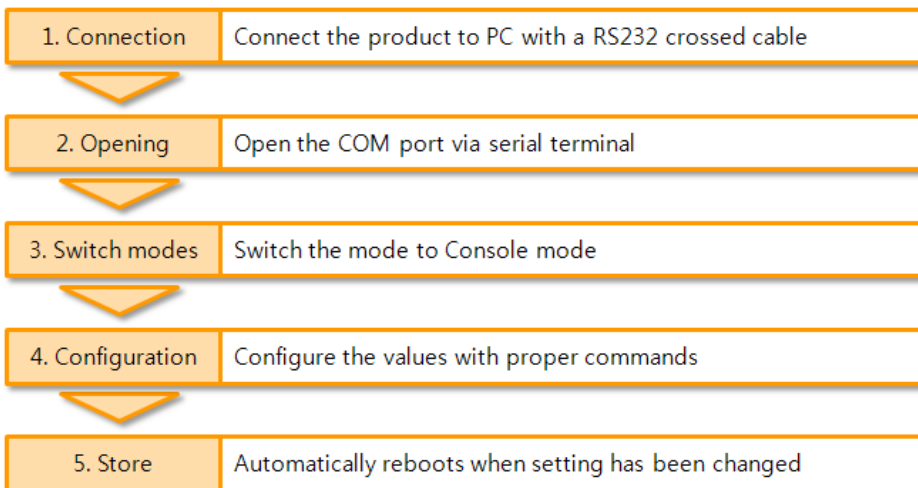


Fig 3-5 procedures for configuration via Serial

☞ *The way of usage is the same with TELNET console.*

### 3.3 AT command

In the AT command mode, you can change some parameters through the serial port.

- Checklists

Make sure the connection between your PC and EZL-200F using RS232 cross cable. To use this, EZL-200F has to be set to [AT command] mode as its communication mode. This can be configured by ezConfig.

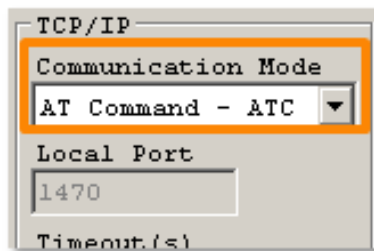


Fig 3-6 setting the communication mode to the AT command

- Procedures

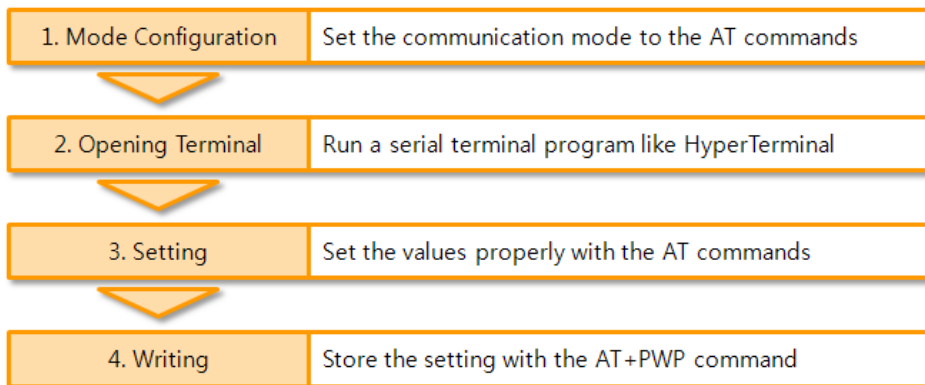


Fig 3-7 procedures for configuration with AT command

Table 3-2 parameters which are available to change with AT command

Division	Available parameters
IP Address related items	Local IP Address, DHCP, PPPoE, Subnet Mask, Gateway IP Address, ...
TCP connection related items	Local Port, Peer Address, Peer Port, ...
Option	MAC address search, timeout, ...

☞ Including above items, rest of parameters can be set by ezConfig

### 3.4 Assigning an IP address automatically

#### 3.4.1 Obtain an IP automatically (DHCP)

In the network environment composing DHCP server, settings related to EZL-200F's IP address, subnet mask, gateway, and name servers can be automatically designated using DHCP protocol. In order to do so, you must check [Obtain an IP Automatically (DHCP)] category on the ezConfig.

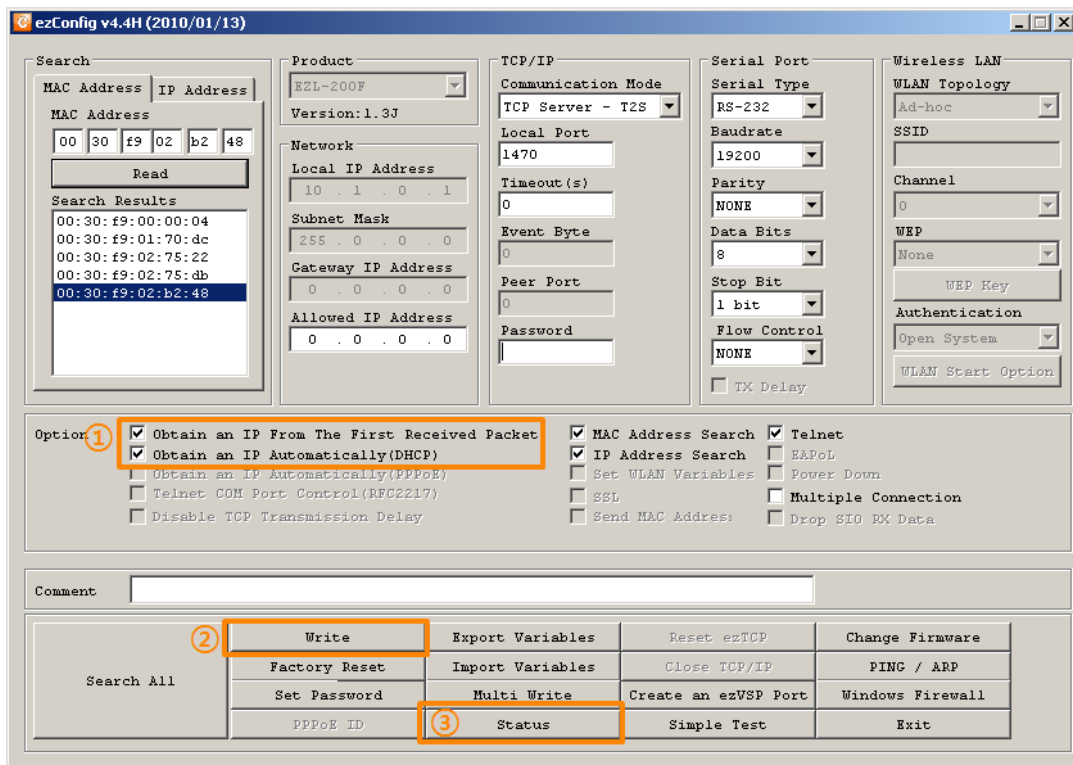


Fig 3-8 Obtain an IP automatically via DHCP

- Procedures

- ① Check the [Obtain an IP automatically (DHCP)] category

☞ *Some DHCP server may need to activate the [Obtain an IP from the First Received Packet] option.*

- ② Store the setting with [Write] button

- ③ Check if an IP address has been assigned from status window with [Status] button

### 3.4.2 Obtain an IP automatically (PPPoE)

PPPoE is used in most ADSL and VDSL networks. To use PPPoE function, PPPoE function should be enabled and PPPoE ID and PPPoE password should be configured. The local IP address of EZL-200F is assigned automatically in PPPoE environment.

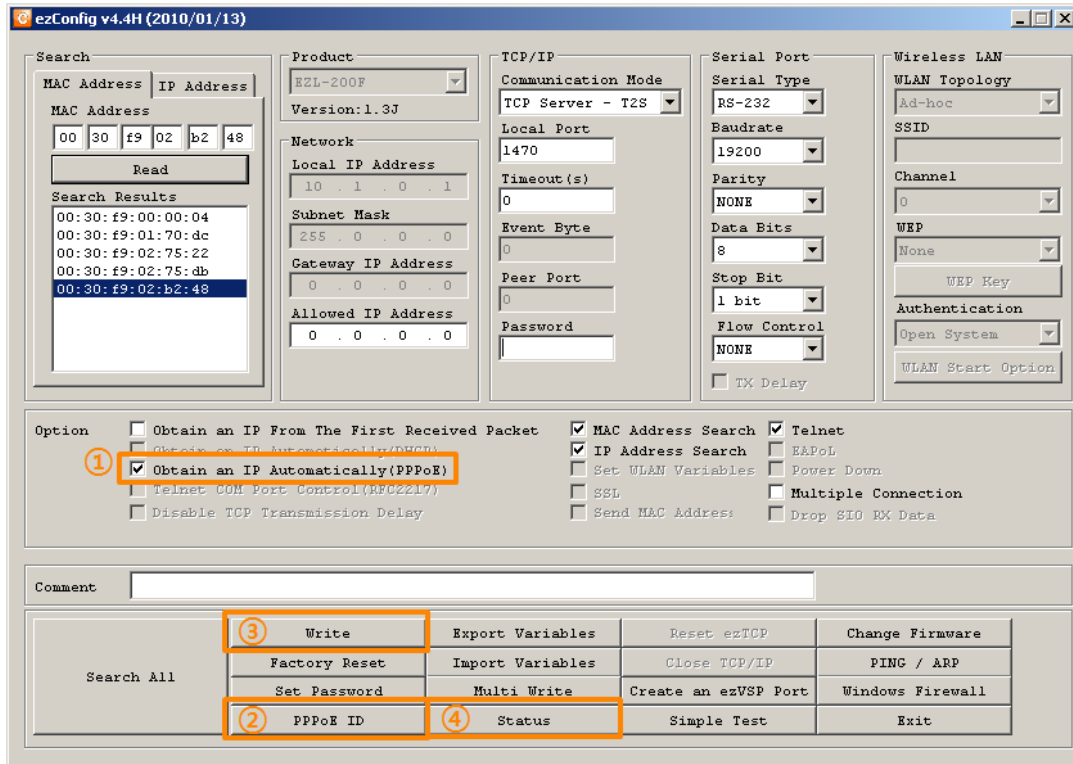


Fig 3-9 obtain an IP automatically via PPPoE

- Procedures

- ① Check the [Obtain an IP automatically (PPPoE)] category
- ② Set correct values of ID and password with click the [PPPoE ID] button
- ③ Store the setting with [Write] button
- ④ Check if an IP address has been assigned from status window with [Status] button

☞ Some ADSL or VDSL environments use DHCP based on the modem type. Please contact your internet service provider (ISP) for further information.

## 4 Operation Modes

### 4.1 What is the Operation Mode?

Each of three operation mode of EZL-200F is defined for specific purpose, and those are followed.

- Normal mode  
This mode is for normal data communication and has 4 different connection modes. Configuring parameters is also available in this mode.
- Console mode  
This mode is for configuring environmental parameters through the RS-232 port. Restrictions on access by the password or IP address can be revoked in this mode.
- ISP mode  
This mode is for upgrading firmware via the serial port.

### 4.2 How to entering each mode

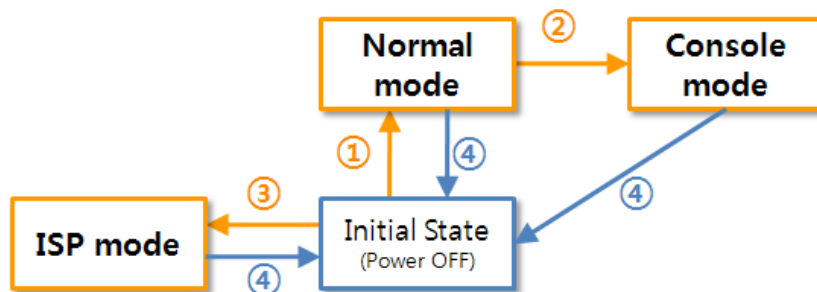


Fig 4-1 How to entering each mode

- ① Entering to the Normal mode: Supply the power without any actions
- ② Entering to the Console mode: Press the ISP button over 1 second
- ③ Entering to the ISP mode: Supply the power pressing the ISP button
- ④ Returning to the Initial State: Turn the power off or reset product



### 4.3 Comparison of each mode

Table 4-1 shows summaries of each mode

Table 4-1 comparison of each mode

Name	Entering	Serial port
Normal	Supply the power.	configured value
Console	Press the ISP button over 1s.	19,200/N/8/1
ISP	Supply the power with pressing the ISP button	115,200/N/8/1

### 4.4 Normal Mode

In normal mode, there are four connection types to communication with a remote host.

- TCP Server
- TCP Client
- AT Command
- UDP

Table 4-2 comparison of four communication modes

Name	Protocol	Connection	Modifying software of serial devices	Console	Topology
TCP Server	TCP	Passive	-	Unavailable	1:1
TCP Client		Active	-	Unavailable	1:1
AT Command		Either	Required	Available	1:1
UDP	UDP	-	-	Unavailable	N:M

TCP is a type of protocol, which has a process of connection. The connection has to be one to one. The part who tries to make the connection is called TCP Client, and the other part is TCP Server. On the other hand, UDP has no connection process. Because of this, each of them can be send and receive data from multiple hosts.

☞ *Basically, the connection should be established 1 to 1 in TCP. However, EZL-200F can make 8 channels at a time while using the [multiple connection] option.*

## 4.5 Console mode

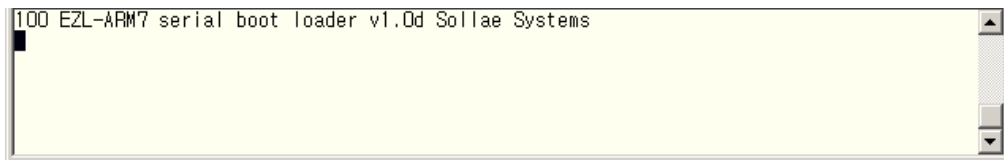
This is a mode for setting environmental parameters through RS232 port. You can also use the ezConfig because the network access is still available. The only difference between this mode and normal mode is that the restrictions on access are no more available. Therefore, when you lost your password or you can't search the product because inactivating the [MAC Address Search] option, enter to this mode and revoke them.

## 4.6 ISP Mode

ISP mode is for upgrading firmware through the serial port. EZL-200F supports both Ethernet and serial port to transfer the firmware file.

In case of using the serial port, follow the processes.

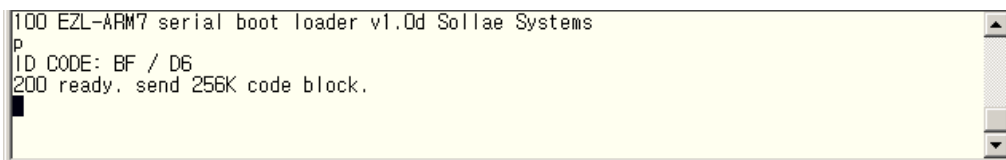
- ① Run a serial communication program (like Teraterm or Hyperterminal)
- ② Open the COM port
- ③ Enter to the ISP mode: Supply the power pressing the ISP button



```
100 EZL-ARM7 serial boot loader v1.0d Sollae Systems
```

Fig 4-2 boot messages

- ④ Input "p" command after the checking boot messages



```
100 EZL-ARM7 serial boot loader v1.0d Sollae Systems
p
ID CODE: BF / D6
200 ready. send 256K code block.
```

Fig 4-3 command "p"

- ⑤ Send a firmware file: You should send it in binary format



```
003F
* programming flash *
00040000
* verify flash *
* verify ok *
101 programming OK.
```

Fig 4-4 upgrade is completed

- ⑥ Reboot when it is completed

## 5 Communication Modes

### 5.1 TCP Server

In this mode, EZL-200F functions as a TCP server. EZL-200F listens to a TCP connection from remote host. Once a host tries to connect to EZL-200F, it responds that request. After the connection is established, EZL-200F converts the raw data from the serial port to TCP/IP data and sends them to the network and vice versa.

#### 5.1.1 Key parameters

- Local Port  
This is a server's port number which is used in the TCP connection.
- Timeout  
If there is no transmission of data for amount of time which is set to this parameter, EZL-200F tries to terminate established TCP connection.
- Restriction of Access  
Users can block TCP connections from unauthorized hosts by using this option. Both IP and MAC address are available.

### 5.1.2 Examples

- Usual passive connection

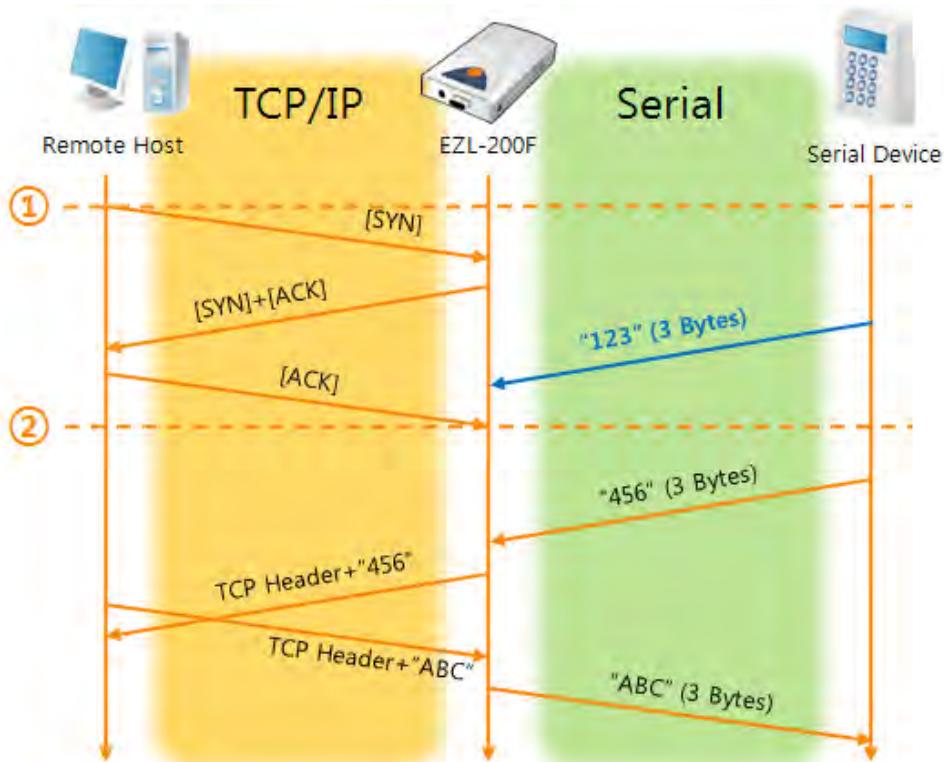


Fig 5-1 time chart for usual passive connection

Table 5-1 states of each point

Points	States
~	Listening to connection requests
①	Remote host has sent a connection request (SYN) segment
~	Processes of the connection
②	The connection has been established
~	Data communication on both sides

Look at the blue arrow. The data "123" from the serial port had been sent before the connection is established. In this case, the data wasn't sent to the network.

- A situation that [Timeout] is set to 5.

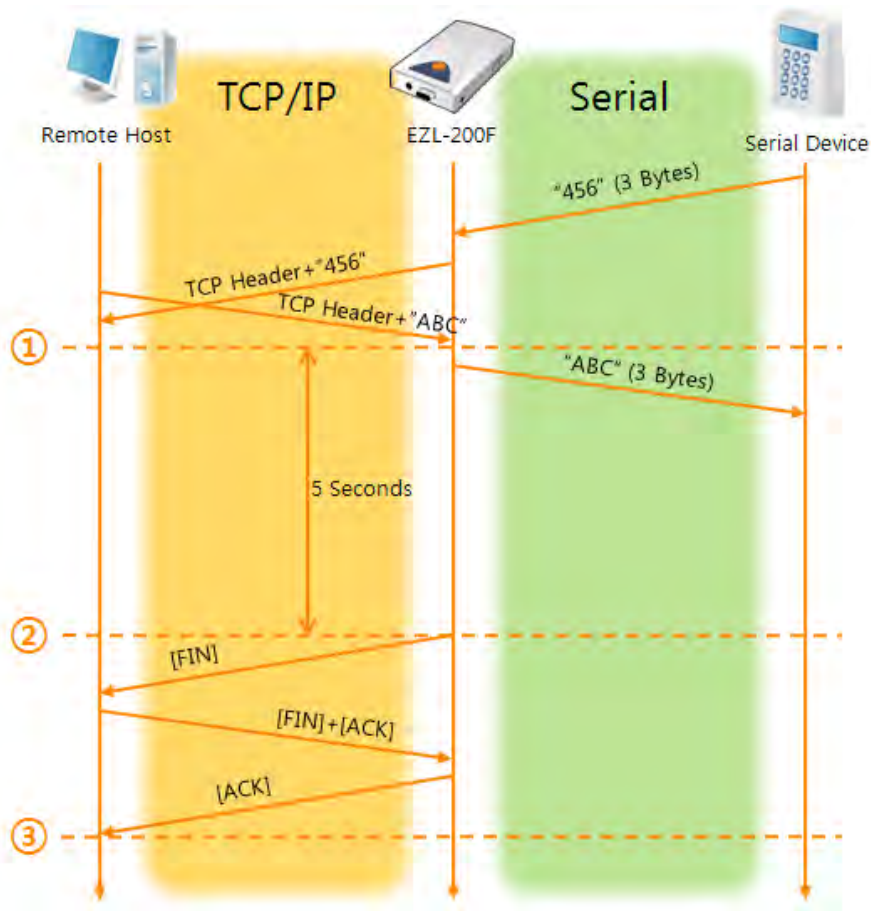


Fig 5-2 time chart for a situation that [Timeout] is set to 5

Table 5-2 states of each point

Points	States
~	Data communication on both sides
①	The last segment has been arrived at the 200F
~	5 seconds are passed with no data communication
②	Sends disconnection request (FIN) to a remote host
~	Processes of the disconnection
③	The connection has been terminated
~	Listening to connection requests

## 5.2 TCP Client

In this mode, EZL-200F functions as a TCP client. EZL-200F sends request segments to a remote host with information of [Peer Address] and [Peer Port]. Once a host is listening and works correctly, the connection will be established. After then, EZL-200F converts the raw data from the serial port to TCP/IP data and sends them to the network and vice versa.

### 5.2.1 Key parameters

- Peer Address  
This item should be an address of a remote host who is listening TCP connections.
- Peer Port  
[Peer Port] should be the port number which is designated by the remote host.
- Event Byte  
EZL-200F decides the time to send the connection request frame with this parameter.

Table 5-3 the operation of Event Byte 1

Value	Description
0	200F sends TCP connection request segment Right after it boots up
Otherwise (1~32,768)	200F sends the segment right after it received amount of data which is set to the [Event Byte] from the serial port

- Timeout  
If there is no transmission of data for amount of time which is set to this parameter, EZL-200F tries to terminate established TCP connection.

### 5.2.2 Examples

- A situation that [Event Byte] is set to 0.

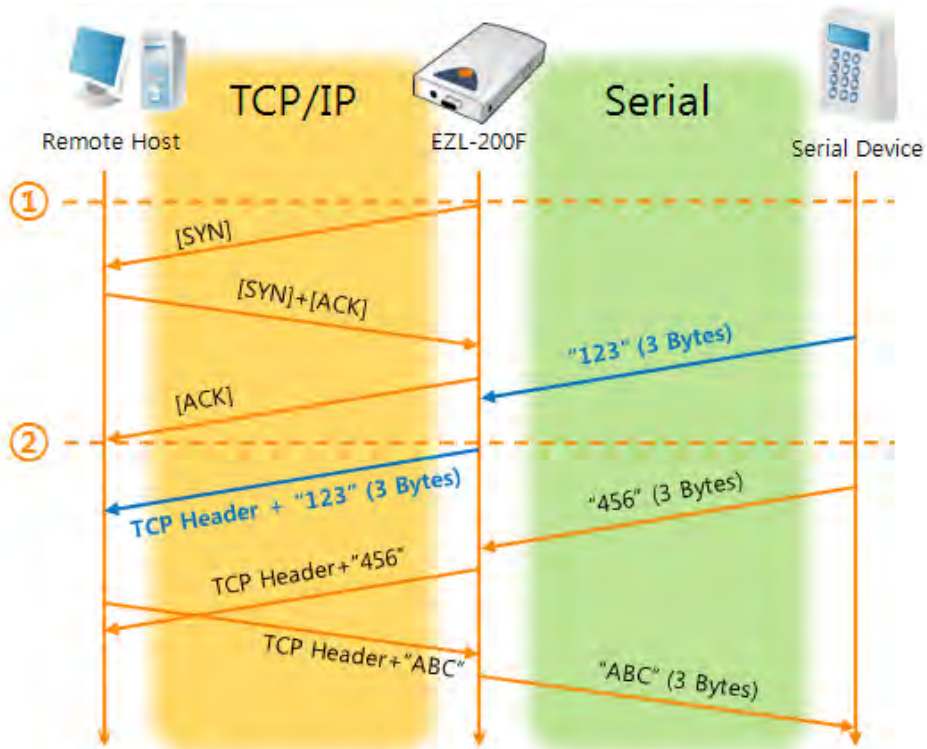


Fig 5-3 time chart for a situation that [Event Byte] is set to 0

Table 5-4 states of each point

Points	States
~	Before the power is supplied
①	Sends TCP connection request segment right after it boots up
~	Processes of the disconnection
②	The connection has been established
~	Data communication on both sides

- A situation that [Event Byte] is set to 5.

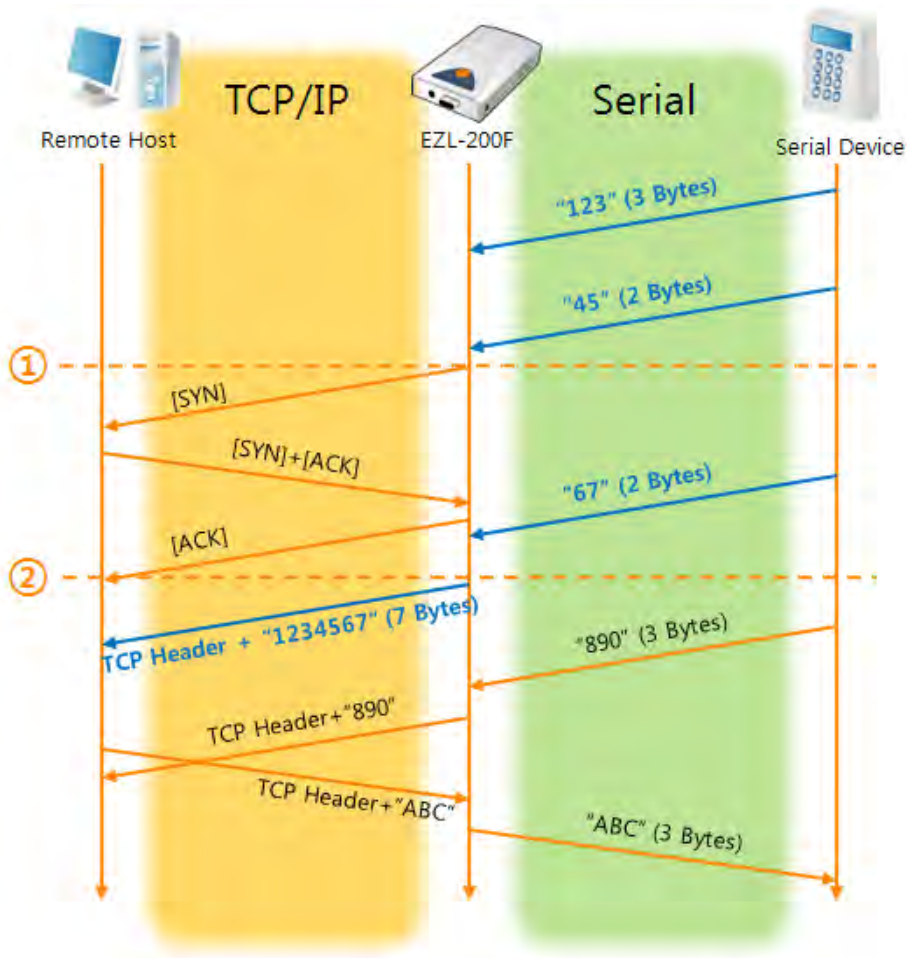


Fig 5-4 time chart for a situation that [Event Byte] is set to 5

Table 5-5 states of each point

Points	States
~	Receiving data from the serial port until the amount is 5 bytes
①	Sends connection request segment right after receiving 5 bytes.
~	Processes of the TCP connection
②	The connection has been established
~	The "1234567" is transmitted to the remote host

As you can see in the figure 5-5, EZL-200F sends request segment right after the serial data had been 5 bytes. Even though those are come before the connection is established, the data "123", "45" and "67" are transmitted to the remote host because of the [Event Byte] is set to 5.



## 5.3 AT Command

AT command is a mode which users control EZL-200F with AT command like controlling modem. In this mode, active and passive TCP connections are available. And users are allowed to configure some environmental parameters with extended commands.

### 5.3.1 Key parameters

The configuration should be implemented via the serial port of 200F

Table 5-6 some of extended commands for configuration

Commands	Description	Examples
+PLIP	Local IP Address	AT+PLIP=10.1.0.1<CR>
+PLP	Local Port	AT+PLP=1470<CR>
+PRIP	Peer IP Address	AT+PRIP=10.1.0.2<CR>
+PRP	Peer Port	AT+PRP=1470<CR>
+PDC	DHCP	AT+PDC=1 (ON)<CR>
+PARP	Temporary IP assignment	AT+PARP=1<CR>
+PTO	Timeout	AT+PTO=10<CR>
+PWP	Store setting	AT+PWP<CR>

- Related items with IP Address and Local Port  
Local port can be set as well as IP address related parameters like IP Address, Subnet Mask and Gateway IP Address.
- Peer Address / Peer Port  
IP address and local port of a remote host are can be set.
- Type of assigning IP address: Manual, DHCP  
Not only manual setting, also automatic assigning protocol (DHCP) is available.
- Others  
Some of options including [Timeout] can be configured in this mode.

### 5.3.2 Examples

- TCP Server – setting parameters and passive connection

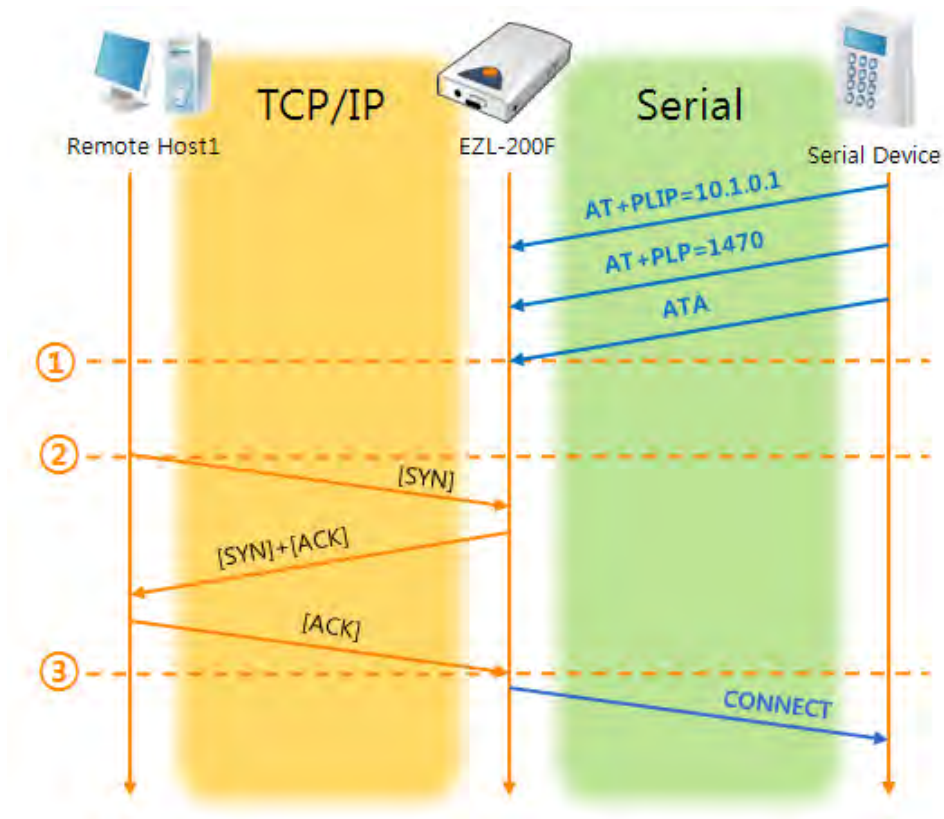


Fig 5-5 TCP passive connection

Table 5-7 states of each point

Points	States
~	Set parameters in the AT command mode
①	Listens TCP connection requests with the ATA command
~	Listening TCP connection requests
②	A remote host has sent SYN segment to 200F
~	Processes of TCP connection
③	TCP connection has been established
~	Sends "CONNECT" message to the serial port

☞ Most of the response messages from the serial port of EZL-200F are omitted on above figure.

- TCP Client - setting parameters and active connection

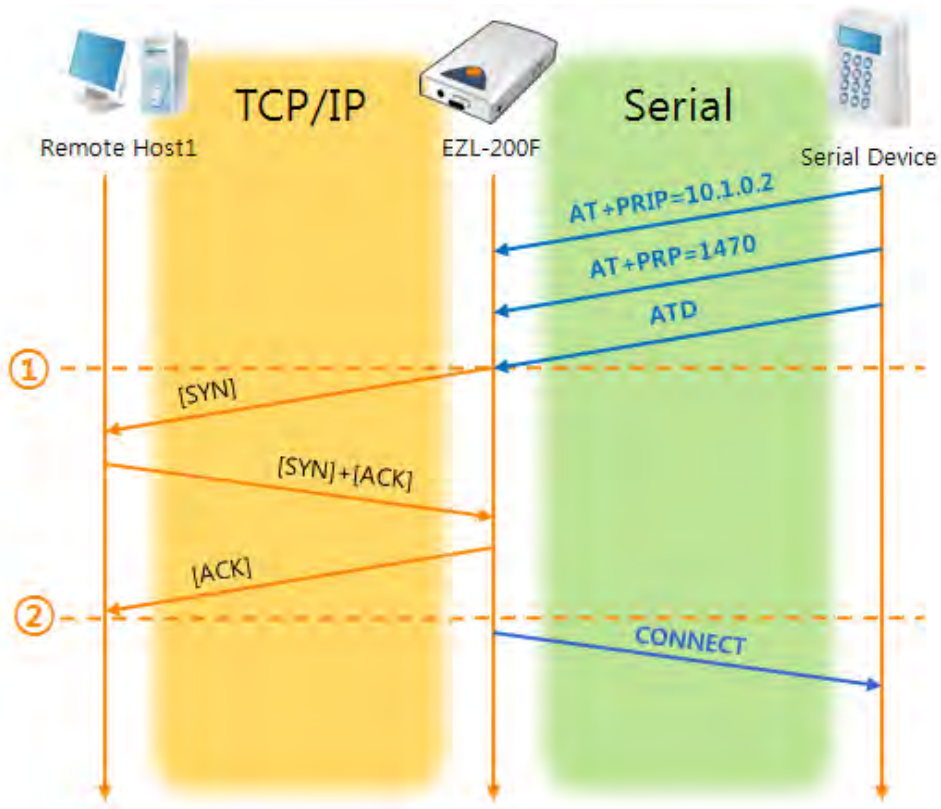


Fig 5-6 TCP Active connection

Table 5-8 states of each point

Points	States
~	Set parameters in the AT command mode
①	Sends a TCP connection request with the ATD command
~	Processes of TCP connection
②	TCP connection has been established
~	Sends "CONNECT" message to the serial port

- Termination of online status – entering the AT command mode

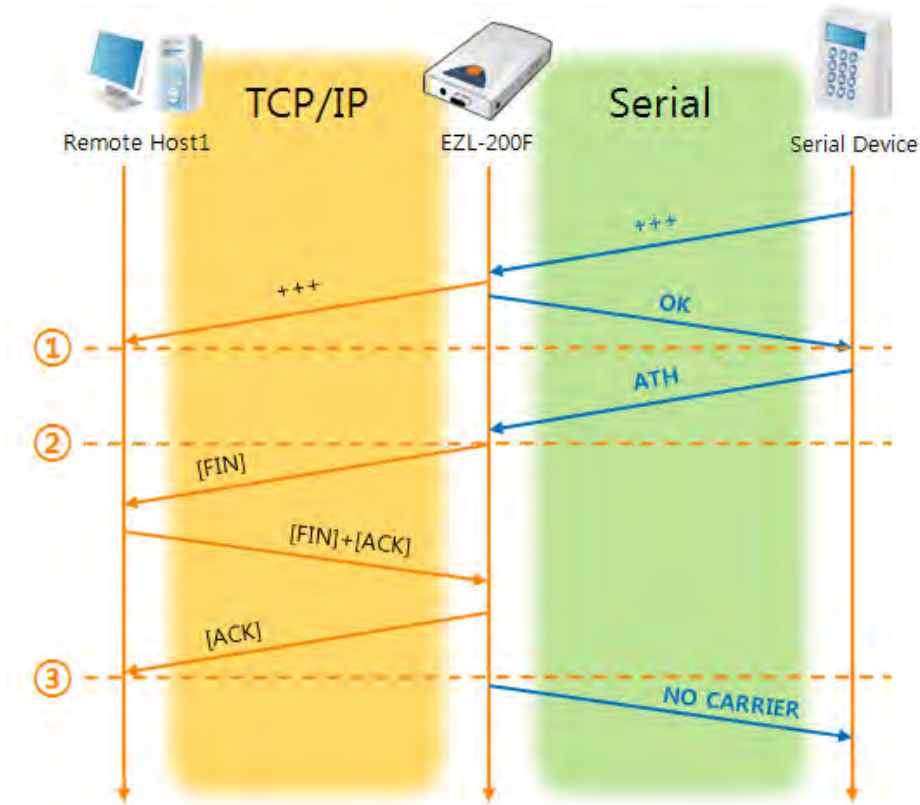


Fig 5-7 Termination of online status

Table 5-9 states of each point

Points	States
~	Keeps TCP connection
①	Enters the AT command mode with receiving "+++"
~	Keeps AC command mode
②	Terminates TCP connection with ATH command
~	Processes of TCP disconnection
③	TCP connection has been terminated
~	Sends "NO CARRIER" with disconnection

EZL-200F changes the mode to AT command, when receiving "+++" and sending "OK" message. In this state, the communication with remote host is not possible because 200F processes only AT command. Whenever you want to go back to online state (TCP connection), use "ATO" command.

☞ For more information about this, please refer to the "ATC mode" on the [Support] >> [Download] >> [Technical Document] menu of our web site.

## 5.4 UDP

UDP has no processes of connection. In this mode, data is sent in block units. Therefore, data that comes through EZL-200F's serial port must be classified in block units to send it elsewhere.

### 5.4.1 Key parameters

- Block Size (Unit: Bytes)  
[Block Size] defines the size of a block in UDP mode. Its unit is byte. When the amount of bytes is come into the serial port, EZL-200F sends them as one block to the network. The maximum value could be 1,020 bytes.
- Block Interval (Unit: 10milliseconds)  
[Block Interval] means the time for gathering data to make one block. Its unit is 10ms. EZL-200F waits data during [Block Interval] after the first data is received and sends all gathered data as one packet. The first data means that the first received data from the serial after the previous packet had been sent. The maximum value could be 3600. (36 seconds)

☞ *Once one of the parameters is sufficient, the block size is decided as the condition.*

### 5.4.2 Examples

- Block Size: 5 bytes / Block Interval: 1s (1000ms)

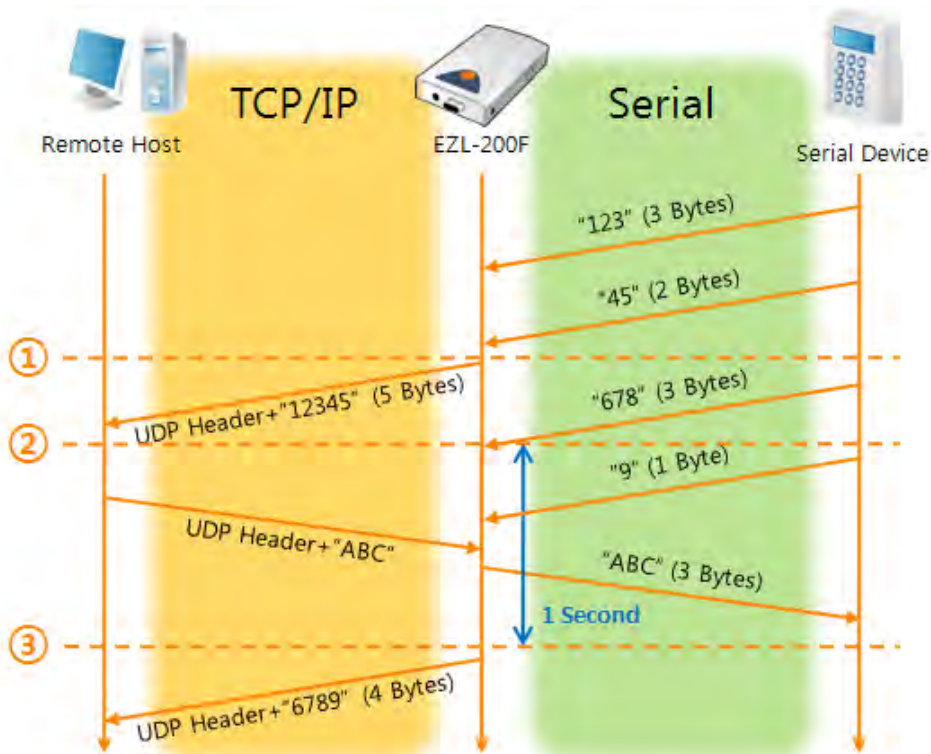


Fig 5-8 time chart for block size is 5 bytes and block interval is 1s

Table 5-10 states of each point

Points	States
~	Receiving data from the serial port
①	Sends 5 bytes as one block based on the [Block Size]
~	Serial device sends data "678" to the 200F
②	Data "678" has arrived
~	Waiting serial data (receives 1 Byte: "9")
~	Sends data from the remote host to the serial device
③	1 second has passed
~	Sends data "6789" based on the [Block Interval]

## 6 System Management

### 6.1 Upgrading Firmware

#### 6.1.1 Firmware

Firmware is a type of software for operation of EZL-200F. If there are needs for adding function or fixing bugs, the firmware is modified and released. We recommend that users keep use the latest released firmware.

#### 6.1.2 Processes

- Downloading the latest released firmware  
Download the newest firmware file. We update our homepage when a new firmware is released. You can find it on our website.
- Run a TFTP client and ready to send the F/W file  
Run a TFTP client program. ezConfig is equipped the client program. Click the [Change Firmware] button.

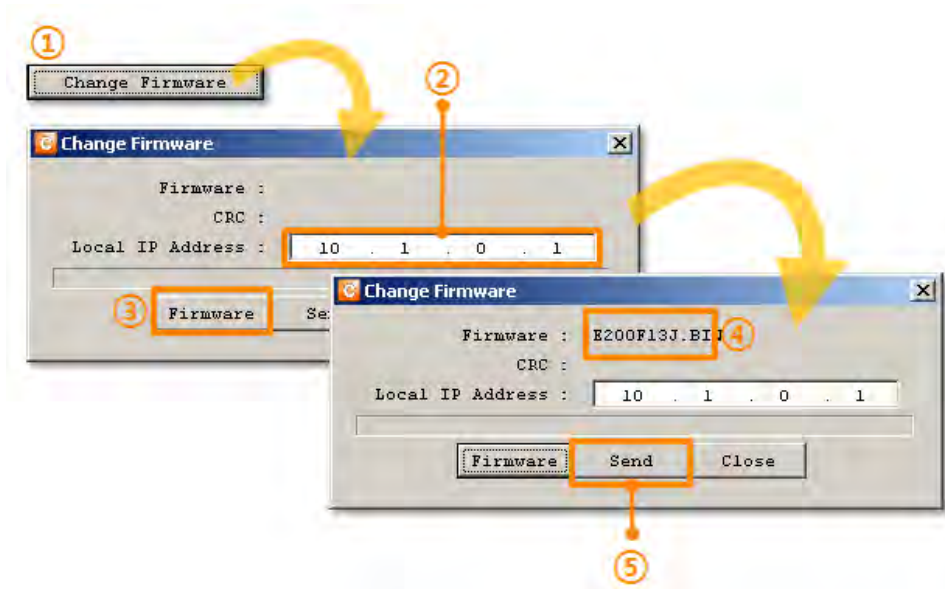


Fig 6-1 running TFTP client and sending a file

- ① Click the [Change Firmware] button to run TFTP client
- ② Check the IP address of EZL-200F on the [Local IP Address] text box
- ③ Press the [Firmware] button and choose the firmware file
- ④ Check the firmware file is correct
- ⑤ Click the [Send] button

- Confirm the messages after the transmission is completed

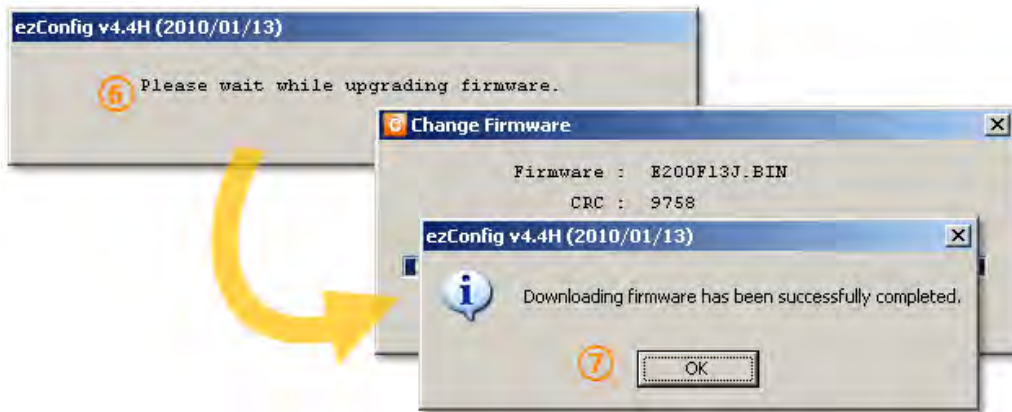


Fig 6-2 completed messages

- ⑥ Confirm the waiting message: Do not turn off before finishing the process
  - ⑦ Downloading has been completed
- ☞ *To upgrade firmware of EZL-200F, some processes including preparing and rebooting are needed on TELNET. However, new versions (4.4H or subsequence versions) handle the additional processes automatically. Following above steps is just needed to users.*
- ☞ *The way of upgrade which was introduced before is still available. For the details of it, please refer to the document on the [Support] >> [Download] >> [Technical Documents] of our website.*



## 6.2 Status Monitoring

### 6.2.1 Using TELNET

Once the [TELNET] option is activated, users can remotely log in to EZL-200F. If a password is set, users should input the password.

After then, messages from EZL-200F appear like Fig 6-3.

```
MIC v2.3A(arm7-little) Copyright(c) Sollae Systems Co.,Ltd.
msh>
```

Fig 6-3 log in to EZL-200F on TELNET

Followed commands let users check each state.

Table 6-1 commands for checking states

Command	Option	Description	Usage
ST	net	Show network status	msh>st net
	sio0	Show statistics for serial port	msh>st sio0
	timer	Show system timer	msh>st timer
	arp	Show ARP table	msh>st arp

- st net

“st net” command displays present network states of all sessions.

```
msh>st net
[TCP/UDP network connections / states ]
-----
local address      peer address      sendq  rcvq    state
-----
TCP      10.1.0.1( 23)    10.16.0.56( 4136)  0      0  ESTABLISHED
TCP      0.0.0.0( 1470)   0.0.0.0( 0)      N/A    N/A  LISTEN
TCP      0.0.0.0( 23)    0.0.0.0( 0)      N/A    N/A  LISTEN
-----
[network interface]
-----
eth0  inet  ea-00:30:f9:02:b2:48 ip-10.1.0.1 sm-255.0.0.0 UP
-----
msh>
```

Fig 6-4 network status

- st sio0

"st sio0" command displays the number of bytes for the serial port.

```
msh>st sio0
[MLN7400 uart0 information]
maxrq maxtq max_rxbuf max_txbuf rx_bytes tx_bytes brk fmg pty ovr
-----
0 0 0 0 0 0 0 0 0 0 0
-----
msh>
```

Fig 6-5 serial port status

- st timer

"st timer" command shows information about system timer.

```
msh>st timer
[Kernel socket timers]
current os_time: 263425 (0 days 0:43:54.25)
event_time: 264424, type: TCP_KEEP_ALIVE
ref_timer is running: event_time: 263429
msh>
```

Fig 6-6 system timer information

- st arp

"st arp" command shows the ARP table of the product.

```
msh>st arp
[Kernel ARP cache table]
netaddr linkaddr timeout
-----
10.16.0.56 50:e0:6c:39:93:6b 70
-----
msh>
```

Fig 6-7 ARP table status

☞ *All the commands are should be used in small letters.*

## 6.2.2 Using ezConfig

Status of EZL-200F can be monitored by [Status] button on ezConfig. By using the [Refresh Every 1 Second] option in the window, the status is automatically updated in every second.

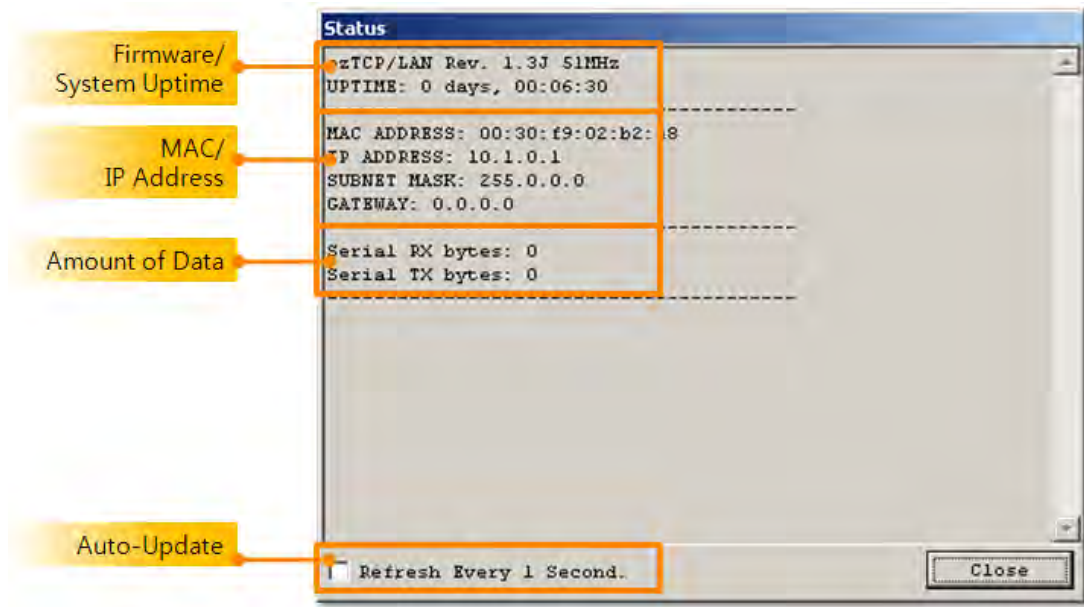


Fig 6-8 status window of ezConfig

- Firmware / System Uptime  
The version of firmware and system uptime information is displayed here.
- MAC / IP Address  
MAC and IP address information is displayed here.
- Amount of Data (Serial port)  
Statistics of the serial port is presented. The unit is byte.

Table 6-2 amount of data (serial port)

Buffer	Description
Serial RX bytes	The number of data which is received from the serial port
Serial TX bytes	The number of data which is sent to the serial port

- Refresh Every 1 Second.  
If this option is checked, ezConfig send query in every second.

### 6.2.3 Debugging Message

By using online debugging function, you can analysis the network situation when the product works abnormally.

- Debugging messages

```
msh>rdb flags ffffffff
msh>rdb
rdb: launch log shell.
MIC v2.3A(arm7-little) Copyright(c) Sollae Systems Co.,Ltd.
msh>e(tcp: 000ecc9c) (state: ESTABLISHED) (msg: TCP_MSG_TIMER)
(tcp: 000ecc9c) (state: ESTABLISHED) (msg: TCP_MSG_RCVD)
[2982 > 23] ACK PSH [seq: 1175152812] [ack: 657180763]
(tcp: 000ecc9c) (state: ESTABLISHED) (msg: TCP_MSG_TIMER)
(tcp: 000ecc9c) (state: ESTABLISHED) (msg: TCP_MSG_RCVD)
[2982 > 23] ACK [seq: 1175152813] [ack: 657180829]
```

Fig 6-9 debugging messages

- ① Log in through TELNET
- ② Set flags with "rdb flags" command
- ③ Start debugging mode with "rdb" command

☞ For the details about online debugging, please refer to the document on [Support] >> [Download] >> [Technical Documents] page in our web site.

## 7 Additional Functions

### 7.1 Access Restriction

#### 7.1.1 Restriction of Access

Setting restriction of access by an IP address is available in TCP server mode.

- Allowed IP Address  
This is for qualifying host with an IP address.

#### 7.1.2 Setting Password

A password can be used for protecting EZL-200F from TELNET login or changing environmental parameters by hosts which are not qualified. The maximum length is 8 bytes of Alphabet or number.

☞ *When you want to revoke all of these restrictions, operate EZL-200F as console mode. In the mode, all restrictions are removable and communication with ezConfig is revoked.*

### 7.2 Sending MAC Address

[Sending MAC Address] is a function that EZL-200F sends its MAC address to the remote host right after the connection is established. By using this function, a server can identify multiple devices with the information.

- Configuration



Fig 7-1 setting of Sending MAC Address function

- ① Log on through TELNET
- ② Input "y" on the [CONN MAC ID] parameter with "env ext" command

☞ *For the details about sending MAC address function, please refer to the document on [Support] >> [Download] >> [Technical Documents] page in our web site.*

### 7.3 TELNET COM port Control Option (RFC 2217)

This option is for sending and receiving serial port states between two devices. Users can send and receive control signals like RTS/CTS when the states are changed.



Fig 7-2 setting of TELNET COM Port Control option

- ① Log on through TELNET
- ② Input "y" on the [TELCOM] parameter with "env ext" command

☞ For the details about TELNET COM port Control Option, please refer to the document on [Support] >> [Download] >> [Technical Documents] page in our web site.

### 7.4 SSL (Secure Socket Layer)

Secure Socket Layer (SSL) is a security protocol over the Internet and widely used in many communication systems.

#### 7.4.1 How to use as a TCP client

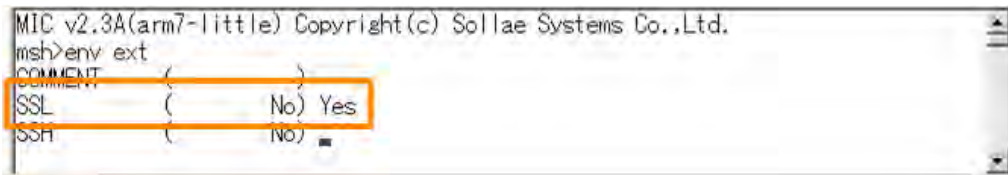


Fig 7-3 activation of the SSL option

- ① Log on through TELNET
- ② Input "y" on the [SSL] parameter with "env ext" command

☞ Both [Multiple Connection] and [TELNET COM Port Control] option are unavailable while using [SSL] option.

## 7.4.2 How to use as a TCP server

To use SSL option as a TCP server, you should create a certification.

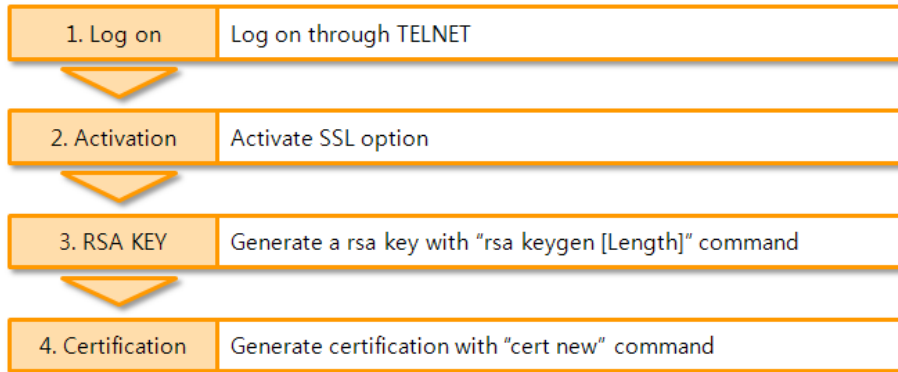


Fig 7-4 processes for SSL

☞ For the details about SSL, please refer to the document on [Support] >> [Download] >> [Technical Documents] page in our web site.

## 7.5 SSH (Secure Shell)

Secure Shell (SSH) is a type of logging on system for the security used in Linux and Unix.

### 7.5.1 How to use

Follow the below procedures

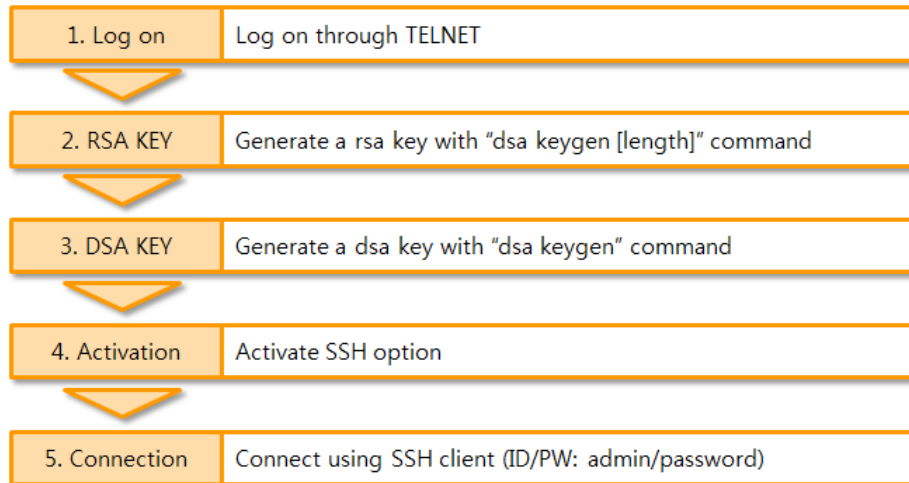


Fig 7-5 processes for setting SSH

☞ For the details about SSH, please refer to the document on [Support] >> [Download] >> [Technical Documents] page in our web site.



## 7.6 Multiple Connection

[Multiple Connection] is for receiving and monitoring a device to multiple hosts (Max. 8 channels) in the same time.

### 7.6.1 How to use

The option is available after activating the [Multiple Connection] on ezConfig.

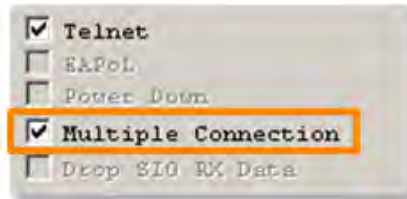


Fig 7-6 activation of the [Multiple Connection]

### 7.6.2 Data flow

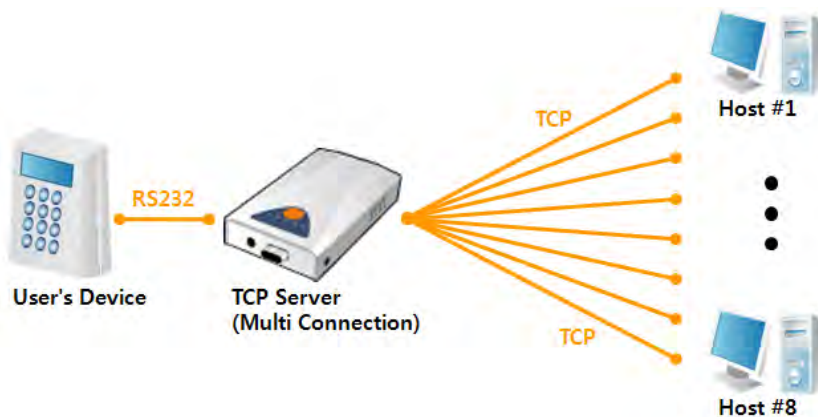


Fig 7-7 diagram for the [Multiple Connection]

- Data from the each host are sent to the User's device via EZL-200F
- Data from the User's device is sent to the all hosts(#1 ~ 8) via EZL-200F

## 7.7 SLIP (Serial Line Internet Protocol)

Serial Line Internet Protocol function of EZL-200F functions link two different networks by serial line. EZL-200F performs like a router and serial to TCP/IP converting is unavailable.

- Configuration
  - ① Log on through TELNET
  - ② Input "y" on the [SLIP] parameter with "env ext" command

## 7.8 RS422 and RS485 Communication

EZL-200F supports RS422 and RS485 as well as RS232. To change another mode, the [Serial Type] option should be changed on ezConfig.

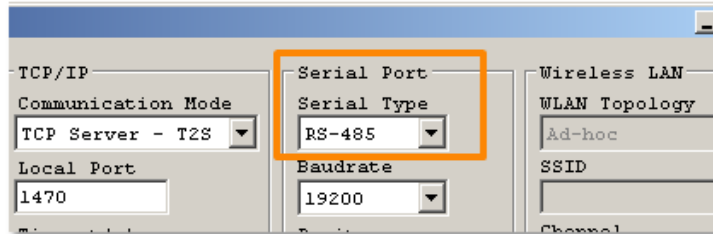


Fig 7-8 the [Serial Type] parameter

- ☞ *By using the Wiring Adapter which is offered as an optional accessory for EZL-200F, you can interface 4 ports terminal block instead of the D-SUB 9 pin connector.*

## 8 Self Test in Trouble

When users are in trouble with EZL-200F, make sure all the followed steps first.

### 8.1 Searching problem with ezConfig

- Confirming types of configuration utility  
EZL-200F can be configured by ezConfig.
- Stopping Firewall operation  
Firewalls of personal computer or network block broadcast packets. Stop all the firewalls before searching EZL-200F

☞ *Most of vaccine programs have firewall functions so it can cause some trouble to search EZL-200F. Stop these programs before the searching.*

- Stable supply of the power  
Check if the power is supplied continually. If the power is constantly supplied, the PWR LED on the EZL-200F's turned ON.
- Connection with the network  
Make sure that the network connection is fine including Ethernet cable. In this step, we recommend that users connect EZL-200F with PC directly or in the same network hub.
- Inactivating [MAC Address Search]  
In case that the [MAC Address Search] option is unchecked, the communication with ezConfig is impossible. When users are in this situation, make EZL-200F operate in console mode.

## 8.2 Connection Problem over TCP/IP

- Checking parameters related with TCP/IP  
When EZL-200F has a private network IP address, personal computer's IP address has to be the same sub network. Check if the IP address and local port number are correct. The subnet mask, gateway IP address should be checked, too.

Table 8-1 major parameters related with TCP/IP

TCP Server side	TCP Client side
Local IP Address, Local Port, Subnet Mask, Gateway IP Address and etc.	Local IP Address, Peer Address, Peer Port, Subnet Mask, Gateway IP Address and etc.

- PING Test  
Confirm the connection over the network by PING test. If the EZL-200F doesn't send any reply from the request, check the network environment.
- Firewall  
In case the networks which need strong security, the access may be denied by their firewall. Under this circumstance, users should ask the person in charge of their network to release ports which will be used. (Ex: TCP 1470, UDP 50005)
- Operation Mode  
TCP connection is not possible when EZL-200F is operating in the ISP or Console mode.
- Communication Mode  
To make TCP connection, both a server and client should exist. If there are only servers or clients, TCP connection can't be established.
- Allowed IP Address  
When users set the [Allowed IP Address], any hosts can't be reachable except for a host which has the allowed IP address. Inactivate the option or check the setting is correct.
- Checking the TCP status  
TCP is a protocol connected one to one without multiple connection function. Because of this, if a device is on TCP connection, other requests are denied. If users are in this situation, check the network status by connecting on TELNET.

☞ *In case of using [Multiple Connection], EZL-200F can accept 8 hosts.*

### 8.3 Data Communication Problem on the Serial

- Connection of Pins

Check if the connection of each pin is right. Using cables, users choose the right type of cable which is suitable for the device. Transmit Data (TXD) pin should be connected with Receive Data (RXD) pin. Look at the figure 8-1.

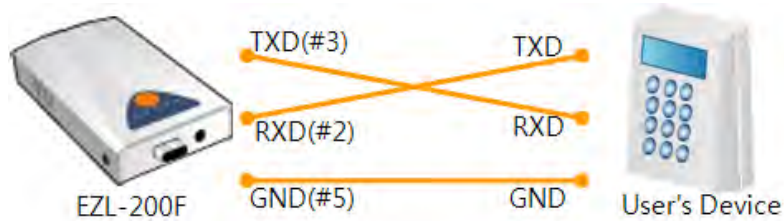


Fig 8-1 RS232 connection

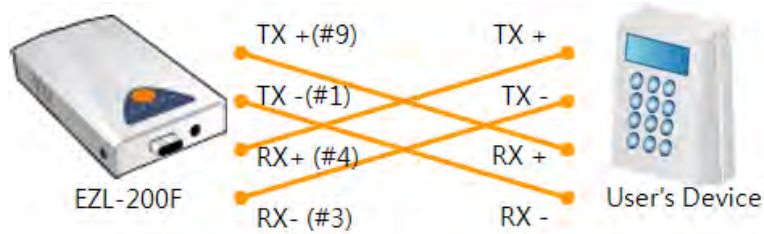


Fig 8-2 RS422 connection

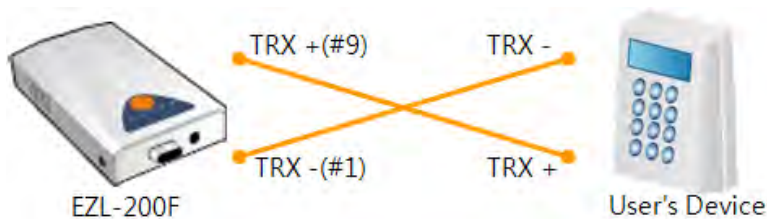


Fig 8-3 RS485 connection

- Setting parameters

Check if all the serial port parameters like Baud Rate, Data bit, Stop bit and Parity are properly set.

☞ *Contact us if you have any questions about above steps or our products.*

## 9 Technical Support, Warranty, and Precaution

### 9.1 Technical Support

If you have any question regarding operation of the product, visit Customer Support FAQ corner and the message board on Sollae Systems' web site or send us an email at the following address:

- E-mail: [support@eztcp.com](mailto:support@eztcp.com)
- Website Address for Customer Support:  
<http://www.eztcp.com/en/Support/support.php>

### 9.2 Warranty

#### 9.2.1 Refund

Upon the customer's request to refund the product within two weeks after purchase, Sollae Systems will refund the product.

#### 9.2.2 Free Repair Services

For product failures occurring within one year after purchase, Sollae Systems provides free repair services or exchange the product. However, if the product failure is due to user's fault, repair service fees will be charged or the product will be replaced at user's expense.

#### 9.2.3 Charged Repair Services

For product failures occurring after the warranty period (one year) or resulting from user's fault, repair service fees will be charged and the product will be replaced at user's expense.

## 9.3 Precaution

- Sollae Systems is not responsible for product failures occurring due to user's alteration of the product.
- Specifications of the product are subject to change without prior notice for performance improvement.
- Sollae Systems does not guarantee successful operation of the product if the product was used under conditions deviating from the product specifications.
- Reverse engineering of firmware and applications provided by Sollae Systems is prohibited.
- Use of firmware and applications provided by Sollae Systems for purposes other than those for which they were designed is prohibited.
- Do not use the product in an extremely cold or hot place or in a place where vibration is severe.
- Do not use the product in an environment in which humidity is high or a lot of oil exists.
- Do not use the product where there is caustic or combustible gas.
- Sollae Systems does not guarantee normal operation of the product under the conditions a lot of noise exists.
- Do not use the product for a purpose that requires exceptional quality and reliability relating to user's injuries or accidents – aerospace, aviation, health care, nuclear power, transportation, and safety purposes.
- Sollae Systems is not responsible for any accident or damage occurring while using the product.

## 10 Revision History

Date	Version	Comments	Author
2005.06.24	1.2	○ The first Released	
2005.12.05	1.3	○ Changed all fonts into Times New Roman ○ Added Revision History	
2005.12.26	1.4	○ Added Trash Mark for WEEE	
2007.01.19	1.5	○ Add SSH, SLIP, Telnet COM Port Option ○ Add MAC ID function ○ Add Applications	
2007.11.28	1.6	○ Correcting Chapter number error in page 34	
2008.06.04	1.7	○ Add Mark/Space Parity	
2009.03.31	1.8	○ Modify the table of 2.2.3. Status LEDs ○ Modify the table of 7.7.1 ○ Modify 9.1 Technical Support ○ Correct some expressions	
2010.04.05	1.9	○ Entire format has been changed	Roy LEE
2010.04.27	2.0	○ 7.8 RS422, 485 and TTL communication has been added.	Roy LEE
2011.05.12	2.1	○ Figure 7-5 has been modified.	Roy LEE