Modular Serial ↔ PPP Converter

EZP-250(A) User Manual

Version 2.6

Sollae Systems

https://www.ezTCP.com

This symbol, found on your product or on its packaging, indicates that this product should not be treated as household waste when you wish to dispose of it. Instead, it should be handed over to an applicable collection point for the recycling of electrical and electronic equipment. By ensuring this product is disposed of correctly, you will help prevent potential negative consequences to the environment and human health, which could otherwise be caused by inappropriate disposal of this product. The recycling of materials will help to conserve natural resources. For more detailed information about the recycling of this product, please contact your local city office, household waste disposal service or the retail store where you purchased this product.

1 Contents

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2 Product Briefs

2.1 Introduction

With the development of Internet technologies, the demands for data communication over Internet are in increasing trends. Data communication over Internet uses the Internet communication protocols TCP/IP. In other words, devices are connected to Internet by implementing TCP/IP protocols. Users can implement TCP/IP by implementing TCP/IP protocol by themselves, porting open TCP/IP, or using an Operating System (OS). However, these methods have many restrictions in terms of time, cost and technology.

The ezTCP series of Serial ↔ TCP/IP protocol converters manufactured by Sollae Systems provide TCP/IP communication (Internet communication) "by simply connecting the serial ports". The ezTCP performs TCP/IP processing on the data received from the serial port and sends the result to the Internet network. In addition, it performs TCP/IP processing on the data received from the Internet network and sends the resulting raw data to the serial port.

EZP-250(A) provides TCP/IP communication through PPP of ezTCP product groups. By connecting one serial port of EZL-250 to user device and the other to CDMA mobile phone, GPRS modem, wireless modem, dial-up modem, or TRS terminal, users can be provided with TCP or UDP communication in the command format defined by Sollae Systems.

EZP-250(A) supports TCP client mode, TCP server mode, UDP data transmission, PING transmission, etc., depending on the commands.

2.2 Features

- compact module type
- connect serial devices to PPP network
- 2 x UART

2.3 Components

- EZP-250(A) Body
- EZP-250(A) Evaluation Board (Optional)

3   Specification

3.1   Brief Specification

Power	Input Voltage	2.7V – 5.5V	
	Current Consumption	3.3V	4mA(Idle) / 10mA(Max)
		5V	15mA(Idle) / 20mA(Max)
Size	34mm x 20mm		
Weight	about 4 g		
Interface	Serial – DTE(TE2)	2mm pitch 1x10 connector 1 x UART, logic level (1,200bps ~ 230,400bps)	
	Serial – Modem(MT2)	2mm pitch 1x10 connector 1 x UART, logic level (1,200bps ~ 230,400bps)	
Protocol	TCP, UDP, IP, ICMP, PPP, Telnet, PAP, CHAP		
Debugging	Debugging Function		
Temperature	Operating: 0 ~ 70℃, Storage: -40 ~ 85℃		
RoHS	Compliant RoHS		
Utilities	ezTerm	Socket communication program for test	
	pflash	Program for firmware downloading through serial port	

Table 3-1 brief specification

☞   ***Firmware and Utilities can be downloaded from our website. (***https://www.ezTCP.com***)***

3.2 Hardware Interface

3.2.1 Dimension
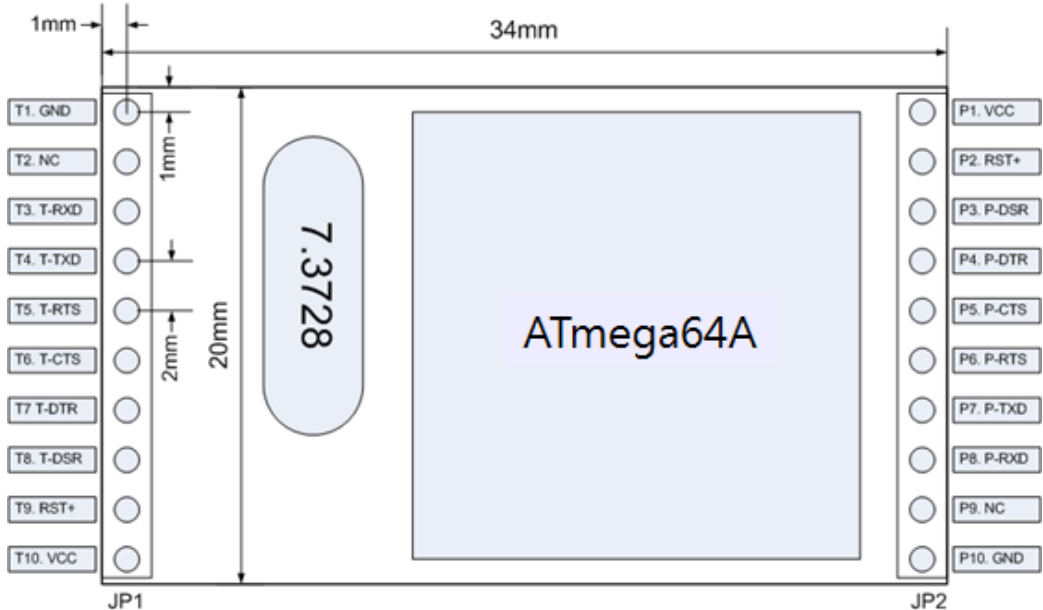
Figure 3-1 dimension

3.2.2 JP1 Port

#	Name	Description	Dir.	Mandatory
T1	GND	Ground	−	●
T2	NC	No connect	−	
T3	RXD	Receive UART data from TE2	IN	●
T4	TXD	Transmit UART data to TE2	OUT	●
T5	RTS	Ready To Receive from TE2	OUT	
T6	CTS	Clear To Send to TE2	IN	
T7	DTR	Data Terminal Ready to TE2	OUT	
T8	DSR	Data Set Ready from TE2	IN	
T9	RST+	Reset EZP-250(A) active HIGH	IN	
T10	VCC	VCC(2.7V − 5.5V)	−	●

Table 3-2 JP1 Port

3.2.3 JP2 Port

#	Name	Description	Dir.	Mandatory
P1	VCC	VCC(2.7V – 5.5V)	－	●
P2	RST+	Reset EZP-250(A) active HIGH - Recommended reset time: over 200μs	IN	
P3	DSR	Data Set Ready from MT2	IN	
P4	DTR	Data Terminal Ready to MT2	OUT	●
P5	CTS	Clear To Send to MT2	IN	
P6	RTS	Ready To Receive from MT2	OUT	●
P7	TXD	Transmit UART data to MT2	OUT	●
P8	RXD	Receive UART data from MT2	IN	●
P9	NC	No connect	－	
P10	GND	Ground	－	●

Table 3-3 JP2 Port

3.2.4 Power

Both DC3.3V and DC5V are used for EZP-250(A). (2.7V ~ 5.5V)

3.2.5 Reset

Reset is active HIGH. Since the reset ports T9 and P2 are connected internally, you may connect one of those.

3.2.6 Serial Port

EZP-250(A) provides two serial ports. One is connected to user terminal (TE2) and the other is connected to modem (MT2). If the amount of data to be transmitted is not large, it is enough to connect just RXD and TXD of UART in TE2, but you must connect the control lines of all serial ports of MT2.

Each serial port may be connected through the RS232 driver, depending on user applications.

☞ **UART port of EZP-250(A) supports data speed from 1,200 to 230,400 bps but this doesn't mean the data throughput. The average speed of the serial port is about 5K bps on PPP network.**

3.2.7 NC

The NC port should not be connected.

4   Using

4.1   Operation

4.1.1 Definition of expression

EZP-250(A) is equipped with 2 serial ports. One is connected to equipment of internet communication and the other is connected to a mobile phone or modem. For the convenience of explanation, its components and ports are defined follows.
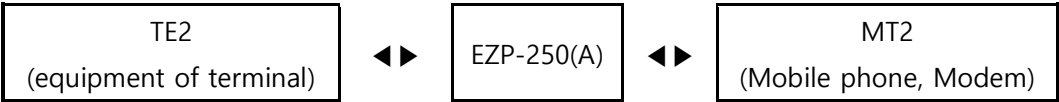
Figure 4-1 Definition of expression
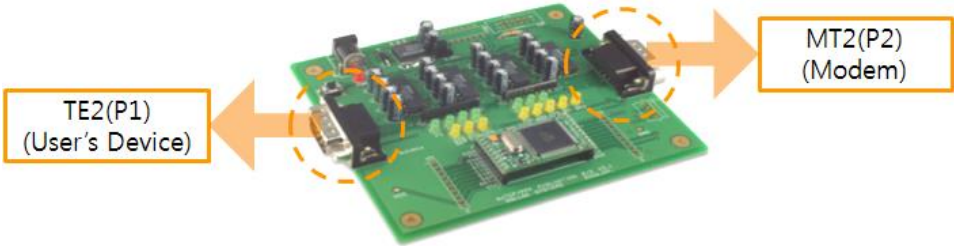
Figure 4-2 positions of TE2 and MT2 on the evaluation board

4.1.2 Modem dialing

A mobile device that supports wireless Internet communication acts like a modem through the serial port. You can do dialing like a typical modem and can connect with the packet network using AT commands. The AT commands are different according to the modem or the network. Therefore user has to ask the modem commands to the modem provider or the network service provider. An example to connect the packet network using a mobile terminal is shown below:

```
AT
OK
ATDT
CONNECT
```

Figure 4-3 Example of dialing with CDMA modem

☞ **The process of dialing and modem setting may be different to ISP (Internet Service Provider) or manufacture of modem. Please ask to ISP or manufacture of modem for the correct process of dialing.**

4.1.3 Data communication

After call setup using the AT command above, TE2 transmits the UP command to EZP-250(A) to perform PPP connection. After PPP connection has been accomplished normally, the mobile terminal can send/receive UDP data to/from the host connected to the Internet network using the US and UL commands. It can also send/receive TCP data to/from the host computer connected to the Internet network using the TO command. After TCP data communication is completed, the remote computer can close the TCP connection or EZP-250(A) can close the TCP connection using <ESC>. After TCP connection is cleared, you have to close the PPP connection and release the call. The procedure for TCP connection and TCP close is summarized below:

```
1. Make a call after modem setting (Dialing)
2. Connect PPP (UP)
3. Connect TCP (TO)
4. Send/receive data
5. Close TCP (<ESC> x 3)
6. PPP down (DN)
7. Hang up
```

Figure 4-4 TCP data communication

☞ **For more details, please refer to** *"5 EZP-250(A) Command"* **and** *"6 Operation Examples".*

4.1.4 Operation states

Operation states of EZP-250(A) can be divided with 3 kinds. Each operation state handles differently a serial data. The following describes operation states of EZP-250(A).

- Before PPP connect command

    EZP-250(A) directly connects the serial ports of TE2 and MT2 upon power up. It transmits all data received from the serial port of TE2 to that of MT2 and vice versa. It can be assumed that the serial ports of TE2 and MT2 are connected directly. However, if the Escape-Character (hereinafter referred to as <ESC>) is entered through the serial port of TE2, EZP-250(A) recognized the characters from <ESC> to <CR> (hexadecimal 0x0d) as a command. The default value of <ESC> is '!'(Hexadecimal 0x21), which can be changed to a character defined by user.

- After PPP connect command

    If the PPP connect command is received, TE2 handles only EZP-250(A) commands and ignores others. MT2 recognizes only the HDLC data format for PPP data processing.
    After PPP has been connected, UDP data can be transmitted or received and TCP connection is allowed.

- TCP connected

    While TCP is connected, all data received from TE2 is processed by TCP/IP/PPP and transmitted to MT2. In addition, the TCP/IP/PPP data received from MT2 is processed and the resulting raw data is transferred to TE2.

4.2   User Command

4.2.1   Definitions

The terms and definitions used in this document are listed below:

Name	Hexadecimal	Description
<ESC>	-	Escape Character of EZP-250(A) Default value is '!'(0x21)
<CR>	0x0d	Carriage Return
<LF>	0x0a	Line Feed
<SP>	0x20	Space
<OP>	-	Optional data for commands

Table 4-1 definitions of terms

Other values not given in <> or () in the command format are ASCII values. For instance, BR is the two bytes of 0x42, 0x52.

4.2.2   Command format

The following describes command format of EZP-250(A).

- A command of EZP-250(A) starts with <ESC> and finishes with <CR> and does not concern upper and lower cases.

- The default value of <ESC> is ! (0x21). You can change this value using the EC command.

- Since all parameters by commands are stored in the volatile memory, their values are cleared to the default values after EZP-250(A) reset

- Command without option

<ESC>	Command (2 bytes)	<CR>

- Command with option

<ESC>	Command (2 bytes)	<SP>	<OP> (n bytes)	<CR>

If a command is defined without option, the current value is to be displayed.

4.2.3 Response Code Format

As shown below, response messages of EZP-250(A) are displayed in two formats, depending on their options:

- Response code without option

<ESC>	Response Code (3 bytes)	<CR>	<LF>

- Response code with option

<ESC>	Response Code (3 bytes)	<SP>	<OP> (n bytes)	<CR>	<LF>

The response codes for commands are given as follows:

Response Code	Option strings (when V1 command applied)	Description
001	–	EZP-250(A) booting
900	COMMAND STATE	EZP-250(A) is ready to receive commands
700	COMMAND OK	Command OK
710	PPP UP	PPP connected
720	TCP CONNECTED	TCP connected
730	UDP SENT	UDP data sent
740	ICMP RCVD	Response to the ICMP echo request has been received
800	UNKNOWN COMMAND	Invalid command
801	BAD STATE	EZP-250(A) is in the bad state
810	PPP DOWN	PPP connection fail or PPP closed
820	TCP CLOSED	TCP connection fail or TCP closed
830	UDP TIMEOUT	EZP-250(A) didn't received during the given timeout
840	ICMP TIMEOUT	Fail in receiving response to ICMP Echo Request

Table 4-2 response codes and option strings

5   EZP-250(A) Command

5.1   BR: Baud Rate of MT2

5.1.1 Description

This command is used to change the baud rate of MT2 serial port

● Command Structure

<ESC>	Command		<SP>	<OP>	<CR>
0x21	0x42	0x52	0x20	Value (2 bytes)	0x0d
'!'	'B'	'R'	' '		–

☞ **If omits <SP> and <OP>, current setting value is returned.**

● A two-digit Hexadecimal value should be entered in the <OP> field. Baud rates are given as follows, depending on setting values:

Setting value	Baud Rate
40	1,200 bps
A0	2,400 bps
D0	4,800 bps
E8	9,600 bps
F0	14,400 bps
F4	19,200 bps
F8	28,800 bps
FA	38,400 bps
FC	57,600 bps
FE	115,200 bps
FF	230,400 bps

5.1.2 Example of use

	Data		Description
	!BR FE<CR>	▶	Set MT2 serial port to 115,200bps
◀	!700<CR><LF>		Command OK
	!BR<CR>	▶	Confirm the baud rate of MT2 serial port
◀	!FE<CR><LF>		Display the setting value
◀	!700<CR><LF>		Command OK

Table 5-1 example of BR

5.2   D0/D1: DTR High/Low

5.2.1 Description

These commands are used to convert the DTR signal output of MT2 to High (D0) or Low (D1). The DTR output holds Low after a call has been connected and a short pulse created by High(D0)→Low(D1) is required to release the call forcibly. Basically, a mobile terminal is automatically disconnected when PPP is closed. However, some modems which are not disconnected automatically should be released using the DTR signal.

● Command Structure

<ESC>	Command		<CR>
0x21	0x44	0x30	0x0d
'!'	'D'	'0'	–

<ESC>	Command		<CR>
0x21	0x44	0x31	0x0d
'!'	'D'	'1'	–

5.2.2 Example of use

	Data		Description
	!D0<CR>	▶	DTR signal High
◄	!700<CR><LF>		Command OK
	!D1<CR>	▶	DTR signal Low
◄	!700<CR><LF>		Command OK

Table 5-2 example of DO/D1

☞   *In above example, signal output is TTL level base which does not pass by RS232 drivers.*

5.3 DN: PPP Down

5.3.1 Description

This command is used to close the PPP connection. After TCP has been disconnected, TE2 has to disconnect the PPP connection using the DN command.

● Command Structure

<ESC>	Command		<CR>
0x21	0x44	0x4e	0x0d
'!'	'D'	'N'	–

5.3.2 Example of use

	Data		Description
	!DN<CR>	▶	PPP down command
◀	!810<CR><LF>		PPP down

Table 5-3 example of DN

5.4 E0/E1: Local Echo Off/On

5.4.1 Description

These commands are used set echo OFF(E0) or ON(E1) for input character strings. It is recommended to set echo to ON with the E1 command where it is necessary to check command input for the operation of EZP-250(A) in the process of product development.

● Command Structure

<ESC>	Command		<CR>
0x21	0x45	0x30	0x0d
'!'	'E'	'0'	–

<ESC>	Command		<CR>
0x21	0x45	0x31	0x0d
'!'	'E'	'1'	–

5.4.2 Example of use

	Data		Description
	!E0<CR>	▶	Local Echo OFF
◀	!700<CR><LF>		Command OK
	!E1<CR>	▶	Local Echo ON
◀	!700<CR><LF>		Command OK

Table 5-4 example of E0/E1

5.5 EC: Escape Character

5.5.1 Description

This command is used to change the <ESC> character. <OP> carries the two-digit hexadecimal value for an ASCII code of the desired <ESC> character. The ASCII value of the current ESC character is displayed when no parameter is entered. Since the value ranges can be from 00 through FF. The initial <ESC> value is '!' (0x21).

● Command Structure

<ESC>	Command		<SP>	<OP>	<CR>
0x21	0x45	0x43	0x20	Value (2 bytes)	0x0d
'!'	'E'	'C'	' '		–

☞ **If omits <SP> and <OP>, current setting value is returned.**

● A two-digit Hexadecimal value should be entered in the <OP> field.

5.5.2 Example of use

	Data		Description
	!EC 2B<CR>	►	Change <ESC> to '+' (0x2b)
◄	!700<CR><LF>		Command OK
	+EC<CR>	►	Confirm <ESC>
◄	+2B<CR><LF>		Display <ESC>
◄	+700<CR><LF>		Command OK

Table 5-5 example of EC

5.6 ES: Erase Script

5.6.1 Description

EZP-250(A) stores user commands in the EEPROM of the product by script function. If there are valid scripts in EEPROM, EZP-250(A) always executes scripts whenever boot up.

ES command erases the script in the EEPROM. The last script will be erased with this command. Before using this command, user has to unlock the EEPROM with UE command.

● Command Structure

<ESC>	Command		<CR>
0x21	0x45	0x53	0x0d
'!'	'E'	'S'	–

5.6.2 Example of use

	Data		Description
	!ES<CR>	▶	Erase the script command
◀	!870<CR><LF>		EEPROM Locked(Command fail)
	!UE 5A3CA5C3<CR>	▶	Unlock EEPROM command
◀	!700<CR><LF>		Command OK
	!ES<CR>	▶	Erase the script command
◀	!700<CR><LF>		Command OK

Table 5-6 example of ES

5.7   FC: Flow Control

5.7.1 Description

This command is used to set ON/OFF for hardware flow control of the serial port connected to TE2 and MT2.

- Command Structure

<ESC>	Command		<SP>	<OP>	<CR>
0x21	0x46	0x43	0x20	Value (2 bytes)	0x0d
'!'	'F'	'C'	' '		_

☞ **If omits <SP> and <OP>, current setting value is returned.**

- A two-digit Hexadecimal value should be entered in the <OP> field. Using hardware flow control is given as follows, depending on setting values:

Setting value	Flow Control
00	No flow control
01	MT2 side only
10	TE2 side only
11	Both MT2 and TE2

5.7.2 Example of use

	Data		Description
	!FC 11<CR>	▶	Use flow control both MT2 and TE2 side
◀	!700<CR><LF>		Command OK
	!FC<CR>	▶	Confirm flow control setting
◀	!11<CR><LF>		Display flow control setting
◀	!700<CR><LF>		Command OK

Table 5-7 example of FC

5.8 HE: Help

5.8.1 Description

This command lists commands of EZP-250(A).

● Command Structure

<ESC>	Command		<CR>
0x21	0x48	0x45	0x0d
'!'	'H'	'E'	–

5.8.2 Example of use

	Data		Description
	!HE<CR>	▶	Request command lists of EZP-250(A)
◀	!BR : UART0 Baud Rate(F4-19.2k, FE-115.2k, FF-230.4K)<CR><LF>		First command list
◀	!D0 : DTR High<CR><LF>		Second command list
	(ellipsis)		
◀	!UE : Unlock EEPROM<CR><LF>		Last command list
◀	!700<CR><LF>		Command OK

Table 5-8 example of HE

5.9   ID/PW: PAP/CHAP User ID, Password

5.9.1 Description

These commands are used to set user ID and password required for PAP or CHAP authentication. Although authentication may be unnecessary for CDMA wireless network, it may be required for PPP server connection from wired telephone network through modem, depending on PPP server types or settings.

● Command Structure

<ESC>	Command		<SP>	<OP>	<CR>
0x21	0x49	0x44	0x20	Value (32 bytes)	0x0d
'!'	'I'	'D'	' '		–

<ESC>	Command		<SP>	<OP>	<CR>
0x21	0x49	0x44	0x20	Value (16 bytes)	0x0d
'!'	'P'	'W'	' '		–

☞ **If omits <SP> and <OP>, current setting value is returned.**

5.9.2 Example of use

	Data		Description
	!ID eztcp<CR>	▶	Set PAP User ID to eztcp
◀	!700<CR><LF>		Command OK
	!PW sollae<CR>	▶	Set PAP User Password to Sollae
◀	!700<CR><LF>		Command OK
	!ID<CR>	▶	Confirm PAP User ID
◀	!eztcp<CR><LF>		Display PAP User ID
◀	!700<CR><LF>		Command OK
	!PW<CR>	▶	Confirm PAP User Password
	!sollae<CR><LF>		Display PAP User Password
◀	!700<CR><LF>		Command OK

Table 5-9 example of ID/PW

5.10 LA: Local IP Address

5.10.1 Description

This command is used when a fixed IP address is assigned to PPP network. Each number of IP address should be separated with a dot like www.xxx.yyy.zzz. Only a decimal value is allowed for each number.

● Command Structure

<ESC>	Command		<SP>	<OP>	<CR>
0x21	0x4c	0x41	0x20	Value (n bytes)	0x0d
'!'	'L'	'A'	' '		–

☞ **If omits <SP> and <OP>, current setting value is returned.**

☞ **Note that user should not set Local IP Address, because in general, IP addresses for PPP connection are allocated dynamically.**

5.10.2 Example of use

	Data		Description
	~ (complete modem dialing after boot up) ~		
	!LA<CR>	▶	Confirm Local IP Address of EZP-250(A)
◄	!0.0.0.0<CR><LF>		Display Local IP Address of EZP-250(A) (IP is 0.0.0.0 because PPP connection closed)
◄	!700<CR><LF>		Command OK
	!UP<CR>	▶	PPP connect command
◄	!710<CR><LF>		PPP connection Success
	!LA<CR>	▶	Confirm Local IP Address of EZP-250(A)
◄	!192.168.0.100<CR><LF>		Display Local IP Address of EZP-250(A) (Obtain from PPP server)
◄	!700<CR><LF>		Command OK

Table 5-10 example of LA

5.11   PA: Peer Host Address

5.11.1 Description

This command is used to set an IP address of the server to be connected. Each number of IP address should be separated with a dot like www.xxx.yyy.zzz. Only a decimal value is allowed for each number.

- Command Structure

<ESC>	Command		<SP>	<OP>	<CR>
0x21	0x50	0x41	0x20	Value (n bytes)	0x0d
'!'	'P'	'A'	' '		–

☞ **If omits <SP> and <OP>, current setting value is returned.**

5.11.2 Example of use

	Data		Description
	!PA 192.168.0.100<CR>	▶	Set remote host IP address
◄	!700<CR><LF>		Command OK
	!PA<CR>	▶	Confirm remote host IP address
◄	!192.168.0.100<CR><LF>		Display remote host IP address
◄	!700<CR><LF>		Command OK

Table 5-11 example of PA

5.12 PP: Peer TCP/UDP Port

5.12.1 Description

This command is used to set a TCP/UDP port of the remote host.

- Command Structure

<ESC>	Command		<SP>	<OP>	<CR>
0x21	0x50	0x50	0x20	Port Number (n bytes)	0x0d
'!'	'P'	'P'	' '		_

☞ *If omits <SP> and <OP>, current setting value is returned.*

☞ *Only a decimal number is allowed for the port number of <OP> field and configuration range is 0 ~ 65,535.*

5.12.2 Example of use

	Data		Description
	!PP 1470<CR>	▶	Set remote host Port
◀	!700<CR><LF>		Command OK
	!PP<CR>	▶	Confirm remote host Port
◀	!1470<CR><LF>		Display remote host Port
◀	!700<CR><LF>		Command OK

Table 5-12 example of PP

5.13 PI: Product Information

5.13.1 Description

This command displays the firmware version and internal software module of EZP-250(A). If there are any problems, you have to check the version and internal software module of your product with the PI command because a different module type may be used depending on its version.

- User format

<ESC>	Command		<CR>
0x21	0x50	0x49	0x0d
'!'	'P'	'I'	_

5.13.2 Example of use

	Data		Description
	!PI<CR>	▶	Confirm product information
◄	!ezTCP/PPP v3.0G (BOOT10) Sollae Systems Co.,Ltd.<CR><LF>		Display firmware revision
◄	!PPP IP CHAP/MD5 VJCOMP ICMP UDP TCP TELNET DEBUG_PPP DEBUG_INET DEBUG_TELNET<CR><LF>		Display the information of software module
◄	!700<CR><LF>		Command OK

Table 5-13 example of PI

5.14 SD: Script Delay

5.14.1 Description

EZP-250(A) stores user commands in the EEPROM of the product by script function. If there are valid scripts in EEPROM, EZP-250(A) always executes scripts whenever boot up.

When there are several scripts in the EEPROM, SD command is used to set delay between each script. It is meaningless using SD command as a normal command; user should use this command as the script for controlling the interval of each script execution.

● Command Structure

<ESC>	Command		<SP>	<OP>	<CR>
0x21	0x53	0x44	0x20	delay (n bytes)	0x0d
'!'	'S'	'D'	' '		–

☞ ***Only a decimal number is allowed for the delay of <OP> field and unit is 10ms.***

5.14.2 Example of use

	Data		Description
	!UE 5A3CA5C3<CR>	▶	EEPROM Unlock command
◄	!700<CR><LF>		Command OK → EEPROM Unlocked
	!WS !PA 192.168.0.100<CR>	▶	Store script that set the remote host IP
◄	!700<CR><LF>		Command OK → script is saved
	!WS !SD 100<CR>	▶	Store script that set delay as 1 sec (100 x 10ms)
◄	!700<CR><LF>		Command OK → script is stored
	!WS !PP 1470<CR>	▶	Store script that set the remote host port
◄	!700<CR><LF>		Command OK → script is saved

Table 5-14 example of SD

5.15   SE: Send ICMP Echo Message (Ping)

5.15.1 Description

This command is used to check if the remote host works normally by receiving a message in response to the transmitted ICMP echo request (ping) message.

This command is available after PPP connection.

● Command Structure

<ESC>	Command		<CR>
0x21	0x53	0x45	0x0d
'!'	'S'	'E'	−

☞   **User should set the IP address of remote host by using "PA" command before using SE command.**

The response code is displayed as follows:

● When the response is arrived from remote host

<ESC>	Response code			<CR>	<LF>
0x21	0x37	0x34	0x30	0x0d	0x0a
'!'	'7'	'4'	'0'	−	−

● When there is no response

<ESC>	Response code			<CR>	<LF>
0x21	0x38	0x34	0x30	0x0d	0x0a
'!'	'8'	'4'	'0'	−	−

5.15.2 Example of use

	Data		Description
	~ (complete modem dialing after boot up) ~		
	!UP<CR>	▶	PPP connect command
◀	!710<CR><LF>		PPP connection Success
	!PA 192.168.0.100<CR>	▶	Set remote host IP address
◀	!700<CR><LF>		Command OK
	!SE<CR>	▶	Send ICMP Echo request
◀	!740<CR><LF>		ICMP Echo response is arrived

Table 5-15 example of SE

5.16   ST: EZP-250(A) Status

5.16.1 Description

This command shows the PPP and TCP connection status of EZP-250(A).

● Command Structure

<ESC>	Command		<CR>
0x21	0x53	0x54	0x0d
'!'	'S'	'T'	–

The output messages and their meanings are given below

Response code	Option strings (when V1 command applied)	Description
920	DEAD	PPP connection is closed
921	ESTABLISH	LCP is being connected
922	TERMINATE	LCP connection is being closed
923	PAP	PAP authentication is in progress
924	NETWORK	IP address is being allocated
925	INET	Connected to the PPP server
930	CLOSED	TCP closed
931	LISTEN	Waiting for TCP connection
932	SYN_SENT	TCP connection signal transmitted
933	SYN_RCVD	TCP connection signal received
934	ESTABLISHED	TCP connected
935	FIN_WAIT1	The TCP closed signal has been transmitted
936	FIN_WAIT2	ACK to the TCP closed signal has been received
937	CLOSE_WAIT	The TCP closed signal has been received
938	CLOSING	The TCP closed signal has been transmitted/received concurrently
939	LAST_ACK	Waiting for acknowledgement to the TCP close signal
940	TIME_WAIT	Waiting for confirming TCP closed

Table 5-16 rsponse codes of ST

5.16.1 Example of use

	Data			description
	!ST<CR>		▶	Request the status of EZP-250(A)
◀	!920<CR><LF>			PPP connection is closed
◀	!930<CR><LF>			TCP closed
◀	!700<CR><LF>			Command OK

Table 5-17 example of ST

5.17 T0/T1: Trace Off/On

5.17.1 Description

These commands are used to set tracing PPP connection to OFF(T0) or ON(T1). The progress in PPP and TCP connection is displayed provided that Trace is set to ON. At this time, the output messages are the same as those displayed by the ST command.

● Command Structure

<ESC>	Command		<CR>
0x21	0x54	0x30	0x0d
'!'	'T'	'0'	–

<ESC>	Command		<CR>
0x21	0x54	0x31	0x0d
'!'	'T'	'1'	–

5.17.2 Example of use

	Data		description
	!UP<CR>	▶	PPP connect command
◀	!710<CR><LF>		PPP connection Success
	!T1<CR>	▶	PPP connection trace ON
◀	!700<CR><LF>		Command OK
	!DN<CR>	▶	PPP down command
◀	!922<CR><LF>		LCP connection is being closed
◀	!920<CR><LF>		PPP connection is closed
◀	!810<CR><LF>		PPP down

Table 5-18 example of T0/T1

☞ **After use "T1" command, there are additional response codes different to "5.3.2 Example of use".**

5.18   TA: TCP Accept

5.18.1 Description

This command is used to accept TCP connection from the remote host. The equipment connected to the PPP network typically acts as a client. The TA command of EZP-250(A) is used to run such equipment as a TCP server.

● Command Structure

<ESC>	Command		<CR>
0x21	0x54	0x41	0x0d
'!'	'T'	'A'	–

When EZP-250(A) listen to TCP connection by using "TA" command following after PPP connection, if an external host attempts connection to the port which is set using the TL command, EZP-250(A) accepts the TCP connections and displays the following message:

● Response code after EZP-250(A) accepts the TCP connection

<ESC>	Response Code			<CR>	<LF>
0x21	0x37	0x32	0x30	0x0d	0x0a
'!'	'7'	'2'	'0'	–	–

If the TO command is executed before TCP connection after running the TA command, the TA command is ignored and EZP-250(A) is connected to the external host as a client.

☞   **Please refer to** "*5.20 TL: TCP Local Port*" **for TL command.**

☞   **Please refer to** "*5.21 TO: TCP Open*" **for TO command.**

5.18.2Example of use

	Data		description
	!UP<CR>	▶	PPP connect command
◀	!710<CR><LF>		PPP connection Success
	!TL 1470<CR>	▶	Set TCP Local Port as 1470
◀	!700<CR><LF>		Command OK
	!TA<CR>	▶	TCP listen at port 1470
◀	!720<CR><LF>		TCP connected

Table 5-19 example of TA

After TCP connection, EZP-250(A) commands are not available because all data transmitted from TE2 is transferred to the host over TCP.

5.19 TB: Baud Rate of TE2

5.19.1 Description

This command is used to change the baud rate of MT2 serial port.

- Command Structure

<ESC>	Command		<SP>	<OP>	<CR>
0x21	0x54	0x42	0x20	Baud Rate (n bytes)	0x0d
'!'	'T'	'B'	' '		–

☞ *If omits <SP> and <OP>, current setting value is returned.*

☞ *Only a decimal number is allowed for the Baud Rate of <OP> field and configuration range is 1,200 ~ 230,400.*

5.19.2 Example of use

	Data		Description
	!TB<CR>	▶	Confirm the Baud rate of TE2 serial port
◀	!115200<CR><LF>		Display the Baud rate of TE2 serial port
◀	!700<CR><LF>		Command OK
	!TB 19200<CR>	▶	Set the Baud rate of TE2 serial port as 19,200bps
Invalid data is received to TE2 serial port because of changing of Baud Rate			

Table 5-20 example of TB

☞ *After using TB command, user should set suitable baud rate of user's serial device or terminal.*

5.20   TL: TCP Local Port

5.20.1 Description

This command is used to set a port number for EZP-250(A) to act as a TCP server. This command is used along with the TA command.

● Command Structure

<ESC>	Command		<SP>	<OP>	<CR>
0x21	0x54	0x4c	0x20	Port number (n bytes)	0x0d
'!'	'T'	'L'	' '		_

☞ **If omits <SP> and <OP>, current setting value is returned.**

☞ **Only a decimal number is allowed for the port number of <OP> field and configuration range is 0 ~ 65,535.**

5.20.2 Example of use

	Data		Description
	!TL 1470<CR>	▶	Set TCP Local port as 1470
◀	!700<CR><LF>		Command OK
	!TL<CR>	▶	Confirm TCP Local port
◀	!1470<CR><LF>		Display TCP Local port
◀	!700<CR><LF>		Command OK

Table 5-21 example of TL

5.21 TO: TCP Open

5.21.1 Description

This command is used to attempt connection with the TCP port of the remote host defined by PA command and PP command.

- Command Structure

<ESC>	Command		<CR>
0x21	0x54	0x4f	0x0d
'!'	'T'	'O'	–

The response code is displayed as follows:

- TCP connection success

<ESC>	Response Code			<CR>	<LF>
0x21	0x37	0x32	0x30	0x0d	0x0a
'!'	'7'	'2'	'0'	–	–

- TCP connection fail

<ESC>	Response Code			<CR>	<LF>
0x21	0x38	0x32	0x30	0x0d	0x0a
'!'	'8'	'2'	'0'	–	–

5.21.2Example of use

	Data		Description
	!UP<CR>	▶	PPP connect command
◀	!710<CR><LF>		PPP connection Success
	!PA 192.168.0.100<CR>	▶	Set the remote host IP address
◀	!700<CR><LF>		Command OK
	!PP 1470<CR>	▶	Set the remote host port as 1470
◀	!700<CR><LF>		Command OK
	!TO<CR>	▶	Try to connect to the remote host
◀	!720<CR><LF>		TCP connected

Table 5-22 example of TO

After TCP connection, EZP-250(A) commands are not available because all data transmitted from TE2 is transferred to the host over TCP.

5.22 UE: Unlock EEPROM

5.22.1 Description

EZP-250(A) stores user commands in the EEPROM of the product by script function. If there are valid scripts in EEPROM, EZP-250(A) always executes scripts whenever boot up.

To erase or add the script in the EEPROM, user has to unlock the EEPROM at the first time. Once unlock the EEPROM, user can erase or add the script in the EEPROM.

● Command Structure

<ESC>	Command		<SP>	<OP>								<CR>
0x21	0x55	0x45	0x20	0x35	0x41	0x33	0x43	0x41	0x35	0x43	0x33	0x0d
'!'	'U'	'E'	' '	'5'	'A'	'3'	'C'	'A'	'5'	'C'	'3'	–

☞ *'5A3CA5C3', <OP> of this command is fixed value.*

5.22.2 Example of use

	Data		Description
	!UE 5A3CA5C3<CR>	▶	EEPROM Unlock command
◀	!700<CR><LF>		Command OK → EEPROM Unlocked

Table 5-23 example of UE

5.23 UL: UDP Local Port

5.23.1 Description

This command is used to set a port to receive UDP data. When data is received through the UDP local port, EZP-250(A) converts the UDP data to raw data and transfers it to TE2.

● Command Structure

<ESC>	Command		<SP>	<OP>	<CR>
0x21	0x55	0x4c	0x20	Port number	0x0d
'!'	'U'	'L'	' '	(n bytes)	↵

☞ **If omits <SP> and <OP>, current setting value is returned.**

☞ **Only a decimal number is allowed for the port number of <OP> field and configuration range is 0 ~ 65,535.**

5.23.2 Example of use

	Data		Description
	!UL 1470<CR>	▶	Set UDP Local port as 1470
◄	!700<CR><LF>		Command OK
	!UL<CR>	▶	Confirm UDP Local port
◄	!1470<CR><LF>		Display UDP Local port
◄	!700<CR><LF>		Command OK

Table 5-24 example of UL

5.24 UP: PPP UP

5.24.1 Description

This command is used to initiate PPP connection. This command is available after the CONNECT message has been displayed after modem dialing process is completed.

● Command Structure

<ESC>	Command		<CR>
0x21	0x55	0x50	0x0d
'!'	'U'	'P'	–

The response code is displayed as follows:

● PPP connection success

<ESC>	Response Code			<CR>	<LF>
0x21	0x37	0x31	0x30	0x0d	0x0a
'!'	'7'	'1'	'0'	–	–

● PPP connection fail

<ESC>	Response Code			<CR>	<LF>
0x21	0x38	0x31	0x30	0x0d	0x0a
'!'	'8'	'1'	'0'	–	–

After PPP has been connected (PPP UP), UDP data can be transmitted or received using US and UL commands. In addition, it is possible to connect TCP using the TO or TA command and to perform ping test using the SE command.

5.24.2 Example of use

	Data		Description
	!UP<CR>	▶	PPP connect command
◀	!710<CR><LF>		PPP connection Success
	!UP<CR>	▶	PPP connect command
◀	!810<CR><LF>		PPP connection Fail

Table 5-25 example of UP

5.25   US: UDP Send

5.25.1 Description

This command is used to send UDP data to the IP address set by PA and the port set by PP. Unlike TCP, UDP transmits data by the block. Therefore, the number of bytes to be transmitted or its duration should be set to define a block. UDP data is transmitted, when one of two conditions, Size and Timeout is satisfied.

- Command Structure

<ESC>	Command		<SP>	<OP>	<SP>	<OP>	<CR>
0x21	0x55	0x53	0x20	Size (n bytes)	0x20	Timeout (n bytes)	0x0d
'!'	'U'	'S'	' '		' '		–

<OP> Size: Number of bytes to be transmitted by one block

<OP> Timeout: Time interval to separate data blocks to be transmitted (Unit: 10 ms)

☞ **Only a decimal number is allowed for Size of <OP> field and configuration range is 0 ~ 256.**

☞ **Only a decimal number is allowed for Timeout of <OP> field and configuration range is 0 ~ 65,535. It may be omitted (shaded field in the above figure).**

The response code is displayed as follows:

- UDP data is sent

<ESC>	Response Code			<CR>	<LF>
0x21	0x37	0x33	0x30	0x0d	0x0a
'!'	'7'	'3'	'0'	–	–

- Fail to send UDP data

<ESC>	Response Code			<CR>	<LF>
0x21	0x38	0x33	0x30	0x0d	0x0a
'!'	'8'	'3'	'0'	–	–

5.25.2 Example of use

	Data		Description
	!US 5<CR>	▶	Command to send 5-byte UDP data (block interval is not configured)
	Hello	▶	Send 5-byte data
◀	!730<CR><LF>		UDP data is sent
	!US 3 100<CR>	▶	Command to send 3-byte UDP data (block interval is configured as 1 sec)
		▶	No data is sent during 1 sec
◀	!830<CR><LF>		UDP data transmission fail

Table 5-26 example of US

5.26 V0/V1: Verbose Response Off/On

5.26.1 Description

These commands are used to display the response code followed by string so that those developers who use EZP-250(A) first can easily understand meanings of output messages.

- Command Structure

<ESC>	Command		<CR>
0x21	0x56	0x30	0x0d
'!'	'V'	'0'	–

<ESC>	Command		<CR>
0x21	0x56	0x31	0x0d
'!'	'V'	'1'	–

The response code is displayed as follows:

- When Verbose is set to OFF(V0)

<ESC>	Response Code	<CR>	<LF>
0x21		0x0d	0x0a
'!'	Value (3 bytes)	–	–

- When Verbose is set to ON(V1)

<ESC>	Response Code	<SP>	Option strings	<CR>	<LF>
0x21		0x20		0x0d	0x0a
'!'	Value (3 bytes)	' '	Value (n bytes)	–	–

☞ **Please refer to "Table 4–2" in "4.2.3 Response Code Format" for detail information of option strings**

5.26.2 Example of use

	Data		Description
	!V0<CR>	▶	Verbose OFF command
◀	!700<CR><LF>		Command OK
	!V1<CR>	▶	Verbose ON command
◀	!700 COMMAND OK<CR><LF>		Command OK

Table 5-27 example of V0/V1

5.27 VS: View Script

5.27.1 Description

EZP-250(A) stores user commands in the EEPROM of the product by script function. If there are valid scripts in EEPROM, EZP-250(A) always executes scripts whenever boot up.

VS command is used to confirm scripts stored in the EEPROM of EZP-250(A).

● Command Structure

<ESC>	Command		<CR>
0x21	0x56	0x53	0x0d
'!'	'V'	'S'	–

5.27.2 Example of use

	Data		Description
	!VS<CR>	▶	Confirm scripts command
◄	!PA 192.168.0.100<CR><LF>		Display first script
◄	!PP 1470<CR><LF>		Display second script
◄	!700<CR><LF>		Command OK

Table 5-28 example of VS

5.28 WS: Write Script

5.28.1 Description

EZP-250(A) stores user commands in the EEPROM of the product by script function. If there are valid scripts in EEPROM, EZP-250(A) always executes scripts whenever boot up.

This command adds a script to the last line of EZP-250(A)'s script. The saved script is executed as soon as the EZP-250(A) boots up (except there are SD commands in the scripts). Therefore, to execute the new script, user has to reboot the EZP-250(A).

● Command Structure

<ESC>	Command		<SP>	<OP>	<CR>
0x21	0x57	0x53	0x20	Script (n bytes)	0x0d
'!'	'W'	'S'	' '		–

☞ *Script of <OP> inputs in the format identical with EZP-250(A) command format.*

☞ *Before using this command, user have to do 'UE' command (refer to "5.22 UE: Unlock EEPROM") to unlock the EEPROM.*

5.28.2 Example of use

	Data		Description
	!UE 5A3CA5C3<CR>	▶	EEPROM Unlock command
◄	!700<CR><LF>		Command OK → EEPROM Unlocked
	!WS !PA 192.168.0.100<CR>	▶	Store script of PA command
◄	!700<CR><LF>		Command OK
	!WS !PP 1470<CR>	▶	Store script of PP command
◄	!700<CR><LF>		Command OK

Table 5-29 example of WS

6   Operation Examples

6.1   Changing setting values

6.1.1 Normal mode

	Data		Description
◄	!001<CR><LF>		EZP-250(A) reset
◄	!900<CR><LF>		EZP-250(A) is ready to receive user commands
	!BR FE<CR>	▶	Set MT2 serial port to 115,200bps
◄	!700<CR><LF>		Command OK
	!BR<CR>	▶	Confirm the baud rate of MT2 serial port
◄	!FE<CR><LF>		Display the setting value
◄	!700<CR><LF>		Command OK
	!EC 23<CR>	▶	Change <ESC> to '#' (0x23)
◄	#700<CR><LF>		Command OK
	#ID eztcp<CR>	▶	Set PAP User ID to ezTCP
◄	#700<CR><LF>		Command OK
	#ID<CR>	▶	Confirm PAP User ID
◄	#eztcp<CR><LF>		Display PAP User ID
◄	#700<CR><LF>		Command OK
	#PW Sollae<CR>	▶	Set PAP User Password to Sollae
◄	#700<CR><LF>		Command OK

Table 6-1 changing setting values

6.2 PPP Connection

6.2.1 Example of PPP Connection fail in CDMA

	Data		Description
	!PA 192.168.0.100<CR>	▶	Set remote host IP address
◄	!700<CR><LF>		Command OK
	!PP 1470<CR>	▶	Set remote host Port
◄	!700<CR><LF>		Command OK
	AT<CR>	▶	Check operation of modem(sent to MT2)
◄	<CR><LF>OK<CR><LF>		Command OK(Response from MT2)
	ATDT<CR>	▶	Dialing modem(sent to MT2)
◄	<CR><LF>CONNECT<CR><LF>		Dialing is completed (Response from MT2)
	!UP<CR>	▶	PPP connect command
◄	!810<CR><LF>		PPP connection fail
	<CR><LF>NO CARRIER<CR><LF>	▶	Call release(Response from MT2)

Table 6-2 PPP connection fail in CDMA

☞ *If there is not a try for PPP connection for a while after completing dial connection, the connection might be lost. Thus, try establishing PPP connection after dialing as soon as possible.*

6.2.2 Example of PPP connection success in CDMA

	Data		Description
	!PA 192.168.0.100<CR>	▶	Set remote host IP address
◄	!700<CR><LF>		Command OK
	!PP 1470<CR>	▶	Set remote host Port
◄	!700<CR><LF>		Command OK
	AT<CR>	▶	Check operation of modem(sent to MT2)
◄	<CR><LF>OK<CR><LF>		Command OK(Response from MT2)
	ATDT<CR>	▶	Dialing modem(sent to MT2)
◄	<CR><LF>CONNECT<CR><LF>		Dialing is completed (Response from MT2)
	!UP<CR>	▶	PPP connect command
◄	!710<CR><LF>		PPP connection success

Table 6-3 PPP connection success in CDMA

6.2.3 Example of PPP connection success in TRS (KT Powertel)

	Data		Description
	!PA 192.168.0.100<CR>	▶	Set remote host IP address
◄	!700<CR><LF>		Command OK
	!PP 1470<CR>	▶	Set remote host Port
◄	!700<CR><LF>		Command OK
	AT<CR>	▶	Check operation of modem (sent to MT2)
◄	<CR><LF>OK<CR><LF>		Command OK (Response from MT2)
	AT+WV330=1,1470,1470,6,"10.23.6.2"<CR>	▶	Set modem(sent to MT2) ※ 4th parameter of WV330: 6(TCP) or 17(UDP)
◄	<CR><LF>OK<CR><LF>		Command OK (Response from MT2)
	AT+WVNAT=1,1470,6<CR>	▶	Set modem(sent to MT2) ※ 3rd parameter of WVNAT: 6(TCP) or 17(UDP)
◄	<CR><LF>OK<CR><LF>		Command OK (Response from MT2)
	AT+WS46=24<CR>	▶	Set modem(sent to MT2)
◄	<CR><LF>OK<CR><LF>		Command OK (Response from MT2)
	AT+WS45=4<CR>	▶	Set modem(sent to MT2)
◄	<CR><LF>OK<CR><LF>		Command OK (Response from MT2)
	AT&W2<CR>	▶	Set modem(sent to MT2)
◄	<CR><LF>OK<CR><LF>		Command OK (Response from MT2)
	ATD S=2<CR>	▶	Dialing modem(sent to MT2)
◄	<CR><LF>CONNECT<CR><LF>		Dialing is completed (Response from MT2)
	!UP<CR>	▶	PPP connect command
◄	!710<CR><LF>		PPP connection success

Table 6-4 PPP connection success in TRS

6.2.4 Example of PPP connection success in GPRS (China Mobile)

	Data		Description
	!PA 192.168.0.100<CR>	▶	Set remote host IP address
◀	!700<CR><LF>		Command OK
	!PP 1470<CR>	▶	Set remote host Port
◀	!700<CR><LF>		Command OK
	!LA 0.0.0.0<CR>	▶	Set Local IP address (setting for China Mobile)
◀	!700<CR><LF>		Command OK
	AT<CR>	▶	Check operation of modem (sent to MT2)
◀	<CR><LF>OK<CR><LF>		Command OK (Response from MT2)
	AT+CGDCONT=1,"IP","CMNET"<CR>	▶	Set modem(sent to MT2)
◀	<CR><LF>OK<CR><LF>		Command OK (Response from MT2)
	ATDT*99***1#<CR>	▶	Dialing modem(sent to MT2)
◀	<CR><LF>CONNECT<CR><LF>		Dialing is completed (Response from MT2)
	!UP<CR>	▶	PPP connect command
◀	!710<CR><LF>		PPP connection success

Table 6-5 PPP connection success in GPRS

6.2.5 PPP Down

Since PPP is rarely closed by the PPP server, it can be assumed that PPP is closed by EZP-250(A) or by call release due to communication fail.

After TCP has been closed, TE2 should close PPP using the DN command. Typically, the time required for PPP down is about several tens of milliseconds. However, where call is cleared due to communication fail, more than 4 seconds may be required for PPP down and EZP-250(A) should wait for the "810" message displayed. Since the process for PPP down is simple compared with closing TCP, it is enough to check the down message of EZP-250(A). Since call may be released while transmitting/receiving TCP data, it is necessary to monitor the PPP down message transmitted from EZP-250(A).

After normal PPP down, TE2 has to ensure that the call has been released by checking "NO CARRIER" or response to the "AT" command. There are some mobile terminals that would not be disconnected automatically, although most mobile terminals are automatically disconnected after PPP down. For such mobile terminals, call should be released by creating a pulse of moderate duration for the DTR pin, using the D0→D1 command. Where the DTR pin is not connected, call may be released using the "+++" escape sequence. However, it is desirable to connected DTR line to mobile terminal because there are some mobile phone types that do not support this scheme.

	Data		Description
	!PA 192.168.0.100<CR>	▶	Set remote host IP address
◀	!700<CR><LF>		Command OK
	!PP 1470<CR>	▶	Set remote host Port
◀	!700<CR><LF>		Command OK
	AT<CR>	▶	Check operation of modem(sent to MT2)
◀	<CR><LF>OK<CR><LF>		Command OK(Response from MT2)
	ATDT<CR>	▶	Dialing modem(sent to MT2)
◀	<CR><LF>CONNECT<CR><LF>		Dialing is completed (Response from MT2)
	!UP<CR>	▶	PPP connect command
◀	!710<CR><LF>		PPP connection success
	(TCP or UDP data communication)		
	!DN<CR>	▶	PPP down command
◀	!810<CR><LF>		PPP down
	<CR><LF>NO CARRIER<CR><LF>	▶	Call release(Response from MT2)

Table 6-6 PPP down

6.3   TCP Communication

6.3.1 Example of TCP Connection fail

	Data		Description
	!PA 192.168.0.100<CR>	▶	Set remote host IP address
◀	!700<CR><LF>		Command OK
	!PP 1470<CR>	▶	Set remote host Port
◀	!700<CR><LF>		Command OK
	AT<CR>	▶	Check operation of modem(sent to MT2)
◀	<CR><LF>OK<CR><LF>		Command OK(Response from MT2)
	ATDT<CR>	▶	Dialing modem(sent to MT2)
◀	<CR><LF>CONNECT<CR><LF>		Dialing is completed(Response from MT2)
	!UP<CR>	▶	PPP connect command
◀	!710<CR><LF>		PPP connection success
	!TO<CR>	▶	TCP connect command (TO: TCP Open)
◀	!820<CR><LF>		TCP connection fail

Table 6-7 TCP connection fail

6.3.2 Example of TCP Connection success

	Data		Description
	!PA 192.168.0.100<CR>	▶	Set remote host IP address
◀	!700<CR><LF>		Command OK
	!PP 1470<CR>	▶	Set remote host Port
◀	!700<CR><LF>		Command OK
	AT<CR>	▶	Check operation of modem(sent to MT2)
◀	<CR><LF>OK<CR><LF>		Command OK(Response from MT2)
	ATDT<CR>	▶	Dialing modem(sent to MT2)
◀	<CR><LF>CONNECT<CR><LF>		Dialing is completed(Response from MT2)
	!UP<CR>	▶	PPP connect command
◀	!710<CR><LF>		PPP connection success
	!TO<CR>	▶	TCP connect command (TO: TCP Open)
◀	!720<CR><LF>		TCP connection success

Table 6-8 TCP connection success

6.3.3 TCP Disconnection

● TCP closed by the remote host

When the remote host tries to disconnect the connection, TCP connection is closed. At this time, the following message is displayed.

<ESC>	Response Code			<CR>	<LF>
0x21	0x38	0x32	0x30	0x0d	0x0a
'!'	'8'	'2'	'0'	–	–

● TCP closed by EZP-250(A)

In order to close TCP connection by EZP-250(A), <ESC> must be sent 3 times according to the below sequence.

Communication Data1	Guard Time	Send <ESC>	Guard Time	Communication Data2
	Over 500ms	Interval between <ESC>: 0~500ms	Over 500ms	

A guard time longer than 500ms is required before and after sending three <ESC>s. That is, it is prohibited to send other data for 500ms before/after sending the <ESC>s. EZP-250(A) cannot recognize commands starting with <ESC> while TCP is connected but can recognize three <ESC> characters with a guard time of 500ms.

☞ **The <ESC> data are transmitted to the connected host.**

6.3.4 Example of TCP close by a remote host

	Data		Description
	!PA 192.168.0.100<CR>	▶	Set remote host IP address
◀	!700<CR><LF>		Command OK
	!PP 1470<CR>	▶	Set remote host Port
◀	!700<CR><LF>		Command OK
	AT<CR>	▶	Check operation of modem(sent to MT2)
◀	<CR><LF>OK<CR><LF>		Command OK(Response from MT2)
	ATDT<CR>	▶	Dialing modem(sent to MT2)
◀	<CR><LF>CONNECT<CR><LF>		Dialing is completed (Response from MT2)
	!UP<CR>	▶	PPP connect command
◀	!710<CR><LF>		PPP connection success
	!TO<CR>	▶	TCP connect command (TO: TCP Open)
◀	!720<CR><LF>		TCP connection success
~ TCP data communication(TCP Connected) ~			
The remote host tries to disconnect the connection			
◀	!820<CR><LF>		TCP connection closed
	!DN<CR>	▶	PPP down command
◀	!810<CR><LF>		PPP down
	<CR><LF>NO CARRIER<CR><LF>	▶	Call release(Response from MT2)

Table 6-9 TCP close by a remote host

6.3.5 Example of TCP closed by EZP-250(A)

	Data		Description
	!PA 192.168.0.100<CR>	▶	Set remote host IP address
◀	!700<CR><LF>		Command OK
	!PP 1470<CR>	▶	Set remote host Port
◀	!700<CR><LF>		Command OK
	AT<CR>	▶	Check operation of modem(sent to MT2)
◀	<CR><LF>OK<CR><LF>		Command OK(Response from MT2)
	ATDT<CR>	▶	Dialing modem(sent to MT2)
◀	<CR><LF>CONNECT<CR><LF>		Dialing is completed (Response from MT2)
	!UP<CR>	▶	PPP connect command
◀	!710<CR><LF>		PPP connection success
	!TO<CR>	▶	TCP connect command (TO: TCP Open)
◀	!720<CR><LF>		TCP connection success
	~ TCP data communication(TCP Connected) ~		
	Wait over 500ms		
	!!!	▶	Send <ESC> character three times
	Wait over 500ms		
◀	!900<CR><LF>		Transition to command mode
◀	!820<CR><LF>		TCP connection closed
	!DN<CR>	▶	PPP down command
◀	!810<CR><LF>		PPP down
	<CR><LF>NO CARRIER<CR><LF>	▶	Call release(Response from MT2)

Table 6-10 TCP close by EZP-250(A)

6.4 UDP Communication

6.4.1 Example of UDP Data Send/Receive

	Data		Description
	!PA 192.168.0.100<CR>	▶	Set remote host IP address
◀	!700<CR><LF>		Command OK
	!PP 1470<CR>	▶	Set remote host Port
◀	!700<CR><LF>		Command OK
	!UL 2000<CR>	▶	Set UDP Local Port
◀	!700<CR><LF>		Command OK
	AT<CR>	▶	Check operation of modem(sent to MT2)
◀	<CR><LF>OK<CR><LF>		Command OK(Response from MT2)
	ATDT<CR>	▶	Dialing modem(sent to MT2)
◀	<CR><LF>CONNECT<CR><LF>		Dialing is completed (Response from MT2)
	!UP<CR>	▶	PPP connect command
◀	!710<CR><LF>		PPP connection success
	!US 5 100<CR>	▶	Command to send 5-byte UDP data (block interval is configured as 1 sec)
	<5 bytes data>	▶	Send 5-byte data within 1 sec
◀	!730<CR><LF>		UDP data is sent
◀	<3 bytes data>		UDP data received through port 2,000
	!DN<CR>	▶	PPP down command
◀	!810<CR><LF>		PPP down
	<CR><LF>NO CARRIER<CR><LF>	▶	Call release(Response from MT2)

Table 6-11 UDP data send/receive

7 Related Materials

7.1 Documents

You can find each document on our web site or included CD in your package.

- Datasheet

- EZP-250 EVB manual

- Declaration of RoHS Compliance

8 Technical Support and Warranty

8.1   Technical Support

If there are any questions regarding the product, please use FAQ or Q/A board in Sollae Systems' homepage. Also, feel free to contact us by email.

- Customer support homepage address
  https://www.eztcp.com/en/support/

- E-mail address
  support@eztcp.com

8.2   Warranty

8.2.1 Refund

If user demands refund within 2 weeks of purchase, the product will be refunded.

8.2.2 Free A/S

If product malfunctions within 2 years of purchase, repair and product exchange will be done without charge.

8.2.3 Charged A/S

Products after 2 years of purchase or product malfunctions due to user's miss care will be repaired and exchanged with charge.

9 Precaution and Exemption from Liability

9.1 Precaution

- Sollae Systems is not responsible for product failures occurring due to user's alternation 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.

9.2　Exemption from Liability

9.2.1　English version

In no event shall Sollae Systems Co., Ltd. and its distributors be liable for any damages whatsoever (including, without limitation, damages for loss of profit, operating cost for commercial interruption, loss of information, or any other financial loss) from the use or inability to use the EZP-250(A) even if Sollae Systems Co., Ltd. or its distributors have been informed of such damages.

The EZP-250(A) is not designed and not authorized for use in military applications, in nuclear applications, in airport applications or for use in applications involving explosives, or in medical applications, or for use in security alarm, or for use in a fire alarm, or in applications involving elevators, or in embedded applications in vehicles such as but not limited to cars, planes, trucks, boats, aircraft, helicopters, etc..

In the same way, the EZP-250(A) is not designed, or intended, or authorized to test, develop, or be built into applications where failure could create a dangerous situation that may result in financial losses, damage to property, personal injury, or the death of people or animals. If you use the EZP-250(A) voluntarily or involuntarily for such unauthorized applications, you agree to subtract Sollae Systems Co., Ltd. and its distributors from all liability for any claim for compensation.

Sollae Systems Co., Ltd. and its distributors entire liability and your exclusive remedy shall be Sollae Systems Co., Ltd. and its distributors option for the return of the price paid for, or repair, or replacement of the EZP-250(A).

Sollae Systems Co., Ltd. and its distributors disclaim all other warranties, either expressed or implied, including, but not limited to, the implied warranties of merchantability and fitness for a particular purpose, with respect to the EZP-250(A) including accompanying written material, hardware and firmware.

9.2.2 French version

- Documentation

La documentation du CSW-M85 est conçue avec la plus grande attention. Tous les efforts ont été mis en œuvre pour éviter les anomalies. Toutefois, nous ne pouvons garantir que cette documentation soit à 100% exempt de toute erreur. Les informations présentes dans cette documentation sont données à titre indicatif. Les caractéristiques techniques peuvent changer à tout moment sans aucun préavis dans le but d'améliorer la qualité et les possibilités des produits.

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10 Ordering Information

EZP-250(A)–BO	EZP-250(A)-E
EZP-250(A)–SE	EZP-250(A)-E Evaluation Board for EZP-250(A)-E 5V Power Adaptor (CE) CD
EZP-250(A)–SK–SU	EZP-250(A)-E Evaluation Board for EZP-250(A)-E 5V Power Adaptor (UL) CD

11 Revision History

Date	Version	Comments	Author
2005.11.01.	1.1	○ Initial release	
2005.12.26.	1.2	○ Added Trash Mark for WEEE	
2006.03.07.	1.3	○ Add response string table in V0/V1 command section ○ Add response string item in Response code format section ○ Add Ordering Information	
2008.03.04.	1.4	Add an example of GPRS network (China Mobile)	
2009.08.17.	1.5	○ Change document format ○ Add description of ES, SD, TB, UE, VS and WS command ○ Add example of use for each command ○ Correct some errors about description of command ○ Add an example of GPRS network (China Mobile) ○ Modify Ordering Information	
2009.09.01.	1.6	○ Modify description of ID/PW command ○ Modify description of UL command	
2009.10.19.	1.7	○ The style color has been changed ○ A description about average speed of RS232 has been added	
2009.12.02.	1.8	○ Form of Revision History has been modified. ○ Operating/Storage temperature have been added. ○ Examples of TCP Communication have been modified.	Roy LEE
2010.03.26.	1.9	○ The figure 4-1 has been added.	Roy LEE
2012.02.24.	2.0	○ Modify description of 6.2.3 example ○ Correct the link of support page ○ Correct some errors and expressions ○ Add description about termination of dial connection.	Roy LEE
2012.06.20.	2.1	○ Change the domain name to 'www.ezTCP.com' ○ Extend the warranty period to two years ○ Correct some errors and expressions	Roy LEE
2012.08.21.	2.2	○ Change name of product (EZP-250(A) to EZP-250(A)) ○ Change position of caption "Table" ○ Correct some errors and expressions	Roy LEE
2013.02.22.	2.3	○ Add recommended system reset time	Roy LEE

2013.05.16.	2.4	○ Add captions of tables ○ Remove icons on the front page ○ Add Related Materials chapter ○ Add Exemption from Liability chapter	Roy LEE
2012.12.19.	2.5	○ Correct some errors and expressions	Roy LEE
2018.04.19.	2.6	○ Improve descriptions about a UART specification ○ Modify the link of homepage (http → https) ○ Improve some expressions	Andy Lee