WYSACVLAY-WX

Software User manual

TAIYO YUDEN CO., LTD

Contents

Revision History

Version	Date	Description
1.00	2020/01/017	First official release

1. Introduction

This document describes how to use the software of the product with built-in WYSACVLAY-XZ software.

2. PIN configuration

2.1. UART

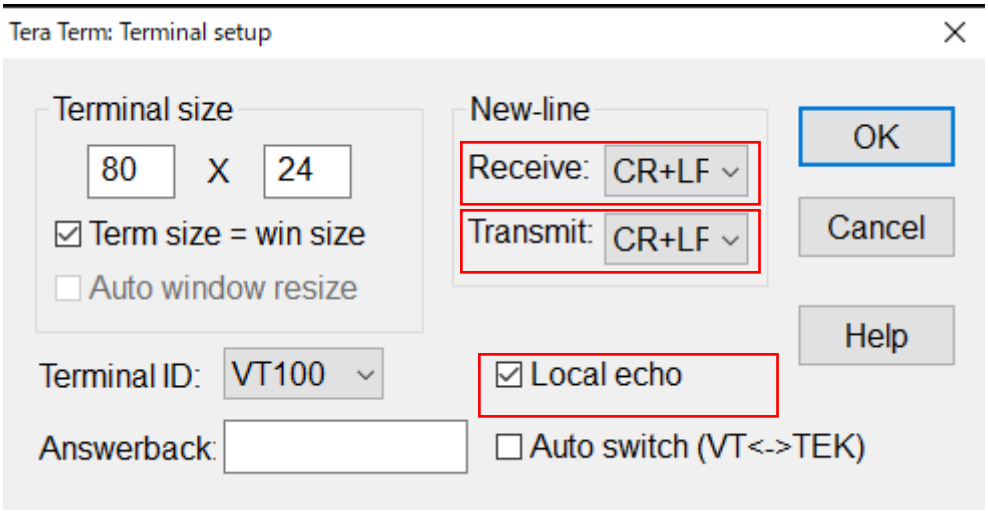
Please set the following serial port settings when using UART.

Port : UART1
Baud rate : 115200 bps (default)
Parity : none
Stop bit : 1
Flow control : hardware

※Baud rate value can be changed by command control described later.
(STC Commands)

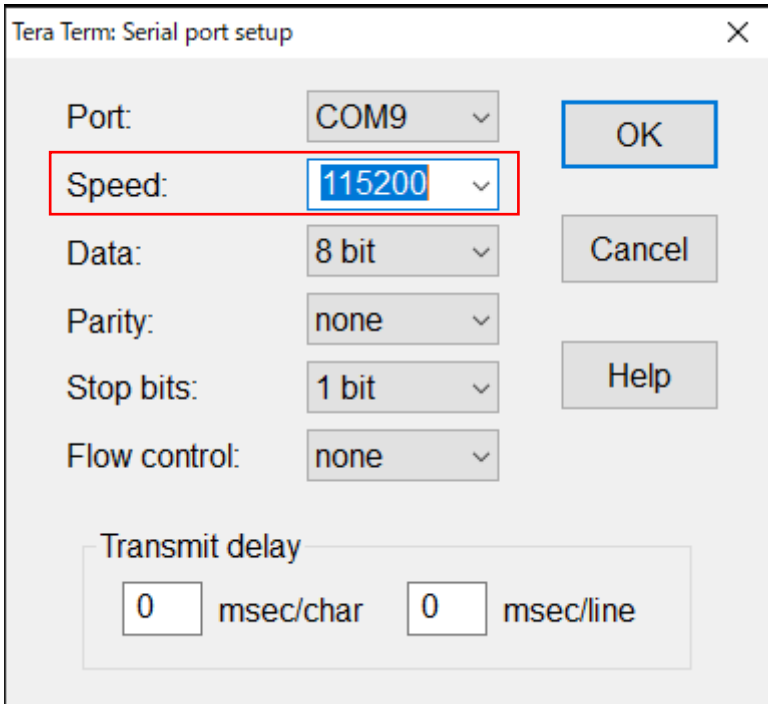
The following is an example of a serial port setting using "Teraterm".
※"Teraterm" can be installed from the following site.
http://www.forest.impress.co.jp/library/software/utf8teraterm/

① Start Teraterm and go to “Settings” → “Terminal” and set the settings as shown below.



Receive：「CR+LF」
Transmit：「CR+LF」
Local echo：ON

② Set the “Setting” → “Serial Port” as shown below.



Speed：115200

※Taiyo Yuden's special terminal software is available. This application is published on the official website of TAIYO YUDEN together with the user manual of the terminal software.

2.2. GPIO

2.2.1. Force initialization

PIN : I2C0_SDA (GPIO_4)
Setting : input, pull-up

In case Low input to this pin at startup, format and initialize user data area at statup.

2.2.2. Labtool

PIN : I2C0_SCL (GPIO_5)
Setting : input, pull-up

In case Low input to this pin at startup, Start as Labtool mode that is RF calibration and testing tool. In Labtool mode, the following message is output at startup (UART1 baud rate is fixed 115200 bps).

<CR><LF>MFG Ver. 2.07.xx<CR><LF>

In Normal mode, the following message is output at startup.

<CR><LF>Ver. 2.07.xx<CR><LF>

※How to use Labtool is not described in this document. Please contact TAIYO YUDEN when you use Labtool.

3. Control Command Syntax

Control commands which the host sends are based on character strings that start with "W" (ASCII code: 0x57, 87 decimal), and that end with <CR><LF> (ASCII code: 0x0D 0x0A) (decimal values 13, 10).
Response event which host receives are started with <CR><LF> and ended <CR><LF>.
Please note that this specification / application does not allow for multiple commands to be sent to the host. The application is not responsible for parsing of packets / command sequences.

Command Mode – Control Command:

W"{command characters}[Parameter0Parameter1::Parameter(N)]<CR><LF>

Command example (when setting SSID to "taiyo" in STA)
WSTU101taiyo<CR><LF>

Command contents
Command characters→STU
Parameter0→1
Parameter1→01
Parameter2→taiyo

Response Event：

<CR><LF>{commandcharacters}[Parameter0Parameter1::Parameter(N)]<CR><LF>

Response example (when a command was issued but not recognized and an error occurred)
<CR><LF>NAK00<CR><LF>

Response example configuration
Command characters→NAK
Parameter0→00

4. Data format

4.1. TCP

To transmit TCP data, the data must be wrapped with STX(0x02), CH and ETX(0x03).
0x03 (ETX) and 0x1b (ESC) inside the data cannot be transmitted without escaping them.
To escape a character you must precede it by the ESC(0x1b).
The character right after ESC is interpreted as a data byte.

The incoming data is delivered in the same format.
<STX><CH><Data：up to 1024byte><ETX>

For instance
Data: 0x41, 0x03, 0x41, 0x1b, 0x41
CH: 1

Data			0x41	0x03		0x41	0x1b		0x41	
Format	STX	CH	0x41	ESC	0x03	0x41	ESC	0x1b	0x41	ETX
Binary	0x02	0x01	0x41	0x1b	0x03	0x41	0x1b	0x1b	0x41	0x03

4.2. UDP

To transmit UDP data, in addition to STX, CH and ETX, the destination IP address and Port is required.
The data section must be escaped in the same manner.

The incoming data is delivered in the same format.
IP address and Port are those of the source(sender).
<STX><CH><IPAddress:4byte><Port:2byte><data：up to 1024byte><ETX>

For instance
IP Address: 192.168.11.5
Port: 3000

Format	STX	CH	IP Address				Port		data	ETX
Binary	0x02	0x01	0xc0	0xa8	0x0b	0x05	0x0b	0xb8	…	0x03

5. Initial setting data list

The initial setting data of Common value (STC, GTC) is as follows.

No	Setting	value
01	baud rate	00:115200
02	Automatic connection	00:OFF
03	IEEE Power Save	00:OFF
04	SSLOption	00: Pre-installed certificate & user certificate
05	Energy detection	00:OFF
06	Listen interval	01: Respond to beacons every time
81	Country of use (channel used)	00:US(1-11ch)

The initial setting data of Profile (STI, GTI, STU, GTU) is as follows.

No	Setting	Value
01	SSID	null
02	Security type	0:No Security
03	Security Key	null
04	Address type	0: Fixed
05	IPAddress	000.000.000.000
06	sub-net mask	000.000.000.000
07	Default gateway	000.000.000.000
08	Primary DNS server	000.000.000.000
09	Secondary DNS server	000.000.000.000
10	BSSID	000000000000
11	Channel	00: Channel variable
12	BSSID Option	0: Connectable with SSID match
13	Channel options	0: All channels can be used
20(STU/GTU)	MAC address filtering available for all channels	0:disable
21-25(STU/GTU)	Filtering MAC address	FFFFFFFFFFFF

User certificate (SCT,GCT)

No	value
1	Null
2	Null
3	Null
4	Null
5	Null

6. μ AP setting method

6.1. Basic settings on μAP

The basic setting of μ AP can be set with this command.STU<Parameter0><Parameter1><Parameter2><CR><LF>
Parameter0 : List Index
Parameter1 : Item No
Parameter2 : Value

Example)WSTU101taiyo<CR><LF>

Item No	Parameter1
01	SSID
02	Security type
03	Security key
04	Address type
05	IP Address
06	sub-net mask
07	Default gateway
08	Primary DNS server
09	Secondary DNS server
10	BSSID
11	Channel
12	BSSID option
13	Channel option
20	MAC Address filtering OFF/ON
21	MAC Address 1
22	MAC Address 2
23	MAC Address 3
24	MAC Address 4
25	MACAddress 5

6.2. Example of basic procedure on µAP side

①Set the SSID.
Enter the following packet example on Teraterm and press Enter.
If the command is executed successfully, "ACK" will be returned.
Example) When setting SSID to "taiyo"
WSTU101taiyo<CR><LF>

②Set the security type.
Enter the following packet example on Teraterm and press Enter.
If the command is executed successfully, "ACK" will be returned.
Example) When setting the security type to WPA2
WSTU1024<CR><LF>

<List of security types >
0:No security
1:WEP with open key
2:WEP with shared key
3:WPA with PSK
4:WPA2 with PSK
※For µAP, only 0 and 4 can be set.

③Set a security password.
Enter the following packet example on Teraterm and press Enter.
If the command is executed successfully, "ACK" will be returned.
Example) When setting the security password to 1234567890
WSTU1031234567890<CR><LF>

④
Set the address type.
Enter the following packet example on Teraterm and press Enter.
If the command is executed successfully, "ACK" will be returned.
Example) When setting the address type to Static
WSTU1040<CR><LF>

<Address type>
0:Static
1:DHCP

⑤Set the IP address.
Enter the following packet example on Teraterm and press Enter.
If the command is executed successfully, "ACK" will be returned.
Example) When setting the IP address to 192.168.0.1
WSTU105192.168.000.001<CR><LF>

⑥Set the subnet mask.
Enter the following packet example on Teraterm and press Enter.
If the command is executed successfully, "ACK" will be returned.
Example) When setting the subnet mask to 255.255.255.0
WSTU106255.255.255.000<CR><LF>

⑦Set the default gateway.
Enter the following packet example on Teraterm and press Enter.
If the command is executed successfully, "ACK" will be returned.
Example) To set the default gateway to 192.168.0.1
WSTU107192.168.000.001<CR><LF>

⑧Start the module as μAP.
Enter the following packet example on Teraterm and press Enter.
If the command is executed successfully, "ACK" will be returned.
Example) When allowing μAP mode
WUSA1<CR><LF>

7. STA setting method

7.1. STA basic settings

The basic settings of the STA (infrastructure mode) can be set with this command.

STI<Parameter0><Parameter1><Parameter2><CR><LF>

Parameter0 : List Index

Parameter1 : Item No

Parameter2 : Value

Example) WSTI101taiyo<CR><LF>

Item No	Parameter1
01	SSID
02	Security type
03	Security key
04	Address type
05	IP Address
06	Subnet mask
07	Default gateway
08	Primary DNS server
09	Secondary DNS server
10	BSSID
11	Channel
12	BSSID option
13	Channel option

7.2. Example of basic procedure on the AP side

① Set the SSID.
Enter the following packet example on Teraterm and press Enter.
If the command is executed successfully, "ACK" will be returned.
Example) When setting SSID to "taiyo"
WSTI101taiyo<CR><LF>

②Set the security type.
Enter the following packet example on Teraterm and press Enter.
If the command is executed successfully, "ACK" will be returned.
Example) When setting the security type to WPA2
WSTI1024<CR><LF>

<Security type>
0:No security
1:WEP with open key
2:WEP with shared key
3:WPA with PSK
4:WPA2 with PSK

③Set a security password.
Enter the following packet example on Teraterm and press Enter.
If the command is executed successfully, "ACK" will be returned.
Example) When setting the security password to 1234567890
WSTI1031234567890<CR><LF>

④Set the address type.
Enter the following packet example on Teraterm and press Enter.
If the command is executed successfully, "ACK" will be returned.
Example) When setting the address type to Static
WSTI1040<CR><LF>

<Address type>
0:Static
1:DHCP

⑤Set the IP address.
Enter the following packet example on Teraterm and press Enter.
If the command is executed successfully, "ACK" will be returned.
Example) When setting the IP address to 192.168.0.2
WSTI105192.168.000.002<CR><LF>

⑥Set the subnet mask.
Enter the following packet example on Teraterm and press Enter.
If the command is executed successfully, "ACK" will be returned.
Example) When setting the subnet mask to 255.255.255.0
WSTI106255.255.255.000<CR><LF>

⑦Set the default gateway.
Enter the following packet example on Teraterm and press Enter.
If the command is executed successfully, "ACK" will be returned.
Example) To set the default gateway to 192.168.0.1
WSTI107192.168.000.001<CR><LF>

8. Connection method

8.1. Example of connection method between modules (μ AP <-->STA)

・ μ AP settings
Set items 1 to 6 in Chapter 6 and start the module as μ AP.
Enter the following packet example on Teraterm and press Enter.
If the command is executed successfully, "ACK" will be returned.
Example) When allowing μ AP mode
WUSA1<CR><LF>

・STA settings
Set items ① to ⑦ in Chapter 7 and connect to μ AP.
Enter the following packet example on Teraterm and press Enter.
If connection to the AP is successful, "CON" will be returned.
Example) When connecting to AP by setting List Index1
WICO1<CR><LF>

If the connection is successful, the following notification will be sent.
CON< Parameter0>,< Parameter1><CR><LF>
Example)CON1,taiyo<CR><LF>

Parameter0
(Mode)
0: μ AP
1:Infrastructure(STA)

Parameter1
[μ AP]
MAC Address
[Infrastructure]
SSID

・When making a TCP connection
①Start the server with the STA side module.
Enter the following packet example on Teraterm and press Enter.
"SOK" is returned when the command is executed successfully.
Example) When starting the server on port 1234
WSOS1234<CR><LF>

If the socket is created successfully, the following notification will be sent.
SOK< Parameter0>,< Parameter1>,< Parameter2>,< Parameter3>,< Parameter4>
Example)SOK1,1,1234,0.0.0.0,0<CR><LF>

Parameter0
(Channel)

Parameter1
0:TCPClient
1:TCPServer
(Listening)
2:TCPServer
(Accepted)
3:UDP

Parameter2
(Local port number)
※TCPClient : 0

Parameter3
(Connection destination IP address)
※TCPServer(Listening)
UDP : 0.0.0.0

Parameter4
(Connection port number)
※TCPServer(Listening)
UDP : 0

②Set the TCP client on the μAP side.
Enter the following packet example on Teraterm and press Enter.
"SOK" is returned when the command is successfully executed and the socket processing is completed.
Example) When connecting to the destination IP address 192.168.0.2, port 1234 by TCP
WSOC0192.168.000.0021234<CR><LF>

8.2. Example of connection method with access point (STA <--> AP)

①Scans for access points around the module.
Enter the following packet example on Teraterm and press Enter.
If the command is executed successfully, the information of the surrounding access points will be "ACK" is replied.
Example) Scan the access points around the TY 's App module
WISC<CR><LF>

If the scan is successful, you will be notified as follows:
SCR< Parameter0>,< Parameter1>,< Parameter2>
Example)SCR04,C225A21695FB,testAP<CR><LF>

Parameter0
(Scan Index)

Parameter1
(BSSID)

Parameter2
(SSID)

②Connect with the access point based on the acquired information.
Set the SSID. (This example connects with SSID: testAP)
Enter the following packet example on Teraterm and press Enter.
If the command is executed successfully, "ACK" will be returned.
Example) When setting the SSID to "testAP"
WSTI101testAP<CR><LF>

③Set the security type.
Enter the following packet example on Teraterm and press Enter.
If the command is executed successfully, "ACK" will be returned.
Example) When setting the security type to WPA2
WSTI1024<CR><LF>

④Set a security password.
Enter the following packet example on Teraterm and press Enter.
If the command is executed successfully, "ACK" will be returned.
Example) When setting the security password to XXXXXXXX
WSTI103XXXXXXXX<CR><LF>

⑤Set the address type.
Enter the following packet example on Teraterm and press Enter.
If the command is executed successfully, "ACK" will be returned.
Example) When setting the address type to DHCP
WSTI1041<CR><LF>

⑥Connect to the AP.
Enter the following packet example on Teraterm and press Enter.
If connection to the AP is successful, "CON" will be returned.
Example) When connecting to AP by setting List Index1
WICO1<CR><LF>

8.3. HTTP GET communication example

①Communicate with the Web server using HTTP GET.
Enter the following packet example on Teraterm and press Enter.
If communication is successful, "RCS" and "RCT" are returned as responses.
Example) Communicate to http://www.yahoo.co.jp/ with HTTP GET
WHTG01http://www.yahoo.co.jp/<CR><LF>

When the HTG command is executed normally, the following notification is issued.
* For any Handle specified by the HTG command in the Handle part of the RCS
You can check if it is a response.
RCS< Parameter0>
Example)RCS01<CR><LF>

Parameter0
(Processing number)

When an HTTP request is made to the Web server, the following notification is sent.
RCS< Parameter0>,< Parameter1>
Example)RCT01,XXXXXXXXXX<CR><LF>

Parameter0
(Processing number)

Parameter1
(Data)

8.4. HTTPS communication example

This document describes how to perform HTTPS communication using the public key certificate of the certificate authority pre-installed in the module.

The module comes with a pre-installed certificate authority public key certificate.
The following shows the support status of public key certificates of certificate authorities.

label	pre-installed	
Comodo AAA Services root	○	
AddTrust Low-Value Services Root	○	
AddTrust External Root	△	See Known issues
AddTrust Public Services Root	○	
AddTrust Qualified Certificates Root	○	
COMODO Certification Authority	○	
COMODO ECC Certification Authority	×	ECC is not supported
COMODO RSA Certification Authority	○	
Comodo Secure Services root	○	
Comodo Trusted Services root	○	
USERTrust ECC Certification Authority	×	ECC is not supported
USERTrust RSA Certification Authority	○	
UTN DATACorp SGC Root CA	○	
UTN USERFirst Hardware Root CA	○	
Baltimore CyberTrust Root	○	
Cybertrust Global Root	○	
DigiCert Assured ID Root CA	○	
DigiCert Assured ID Root G2	○	
DigiCert Assured ID Root G3	×	
DigiCert Global Root CA	○	
DigiCert Global Root G2	○	
DigiCert Global Root G3	×	
DigiCert High Assurance EV Root CA	○	
DigiCert Trusted Root G4	○	
Entrust Root Certification Authority	○	
Entrust Root Certification Authority - EC1	×	
Entrust Root Certification Authority - G2	○	
Entrust.net Premium 2048 Secure Server CA	○	
GlobalSign Root CA	○	
GlobalSign Root CA - R2	○	
GlobalSign Root CA - R3	○	

GlobalSign ECC Root CA - R4	×	ECC is not supported
GlobalSign ECC Root CA - R5	×	ECC is not supported
Go Daddy Root Certificate Authority - G2	○	
Starfield Root Certificate Authority - G2	○	
Starfield Class 2 CA	○	
Go Daddy Class 2 CA	○	
Equifax Secure CA	○	
GeoTrust Global CA	○	
GeoTrust Global CA 2	○	
GeoTrust Primary Certification Authority	○	
GeoTrust Primary Certification Authority - G2	×	
GeoTrust Primary Certification Authority - G3	○	
GeoTrust Universal CA	○	
GeoTrust Universal CA 2	○	
TC TrustCenter Class 2 CA II	○	
TC TrustCenter Universal CA I	○	
thawte Primary Root CA	△	See Known issues
thawte Primary Root CA - G2	×	
thawte Primary Root CA - G3	○	
Verisign Class 3 Public Primary Certification Authority - G3	○	
VeriSign Class 3 Public Primary Certification Authority - G4	×	
VeriSign Class 3 Public Primary Certification Authority - G5	△	See Known issues
Verisign Class 4 Public Primary Certification Authority - G3	○	
VeriSign Universal Root Certification Authority	○	
AffirmTrust Commercial	○	
AffirmTrust Networking	○	
AffirmTrust Premium	○	
AffirmTrust Premium ECC	×	ECC is not supported

label	pre-installed	
VeriSign Class 3 Secure Server CA - G3	○	
VeriSign Class 3 International Server CA - G3	○	
VeriSign Class 3 Extended Validation SSL CA	○	
VeriSign Class 3 Extended Validation SSL SGC CA	○	
VeriSign Class 3 Code Signing 2010 CA	○	
		The same name as root

VeriSign Class 3 Public Primary Certification Authority - G5 (Primary Intermediate)	×	certificate "VeriSign Class 3 Public Primary Certification Authority - G5"

https://www.cybertrust.ne.jp/sureserver/support/download_ca.html

label	pre-installed	
GTE CyberTrust Global Root	○	

①Set the time.
Enter the following packet example on Teraterm and press Enter.
If the command is executed successfully, "ACK" will be returned.
Example) Set the time to 2016/02/29 10:00:00
WSTT220160229100000<CR><LF>

②
A public key certificate of a certificate authority called "VeriSign Universal Root Certification Authority"
Performs HTTPS communication using (Pre-installed in the module.)
This document uses the following test site.
https://ssltest26.bbtest.net/
name：VeriSign Universal Root Certification Authority
expiration date：2008/4/2 00:00:00～2037/12/1 23:59:59
Public key length：RSA 2048bit
Signature algorithm：SHA256

③Communicate with the web server using HTTPS GET.
Enter the following packet example on Teraterm and press Enter.
If communication is successful, "RCS" and "RCT" are returned as responses.
Example: https://ssltest26.bbtest.net/ communicates with HTTPS GET
WHTG01https://ssltest26.bbtest.net/<CR><LF>

9. sleep mode

There are three types of sleep modes for the module.

9.1. Sleep by STC command

IEEE WLAN Power Save standard.
Perform Power Save while keeping the connection.
It operates according to the AP's DTIM and Beacon interval.

Example) When turning on IEEE Power Save
WSTC0301<CR><LF>

Example) To turn off IEEE Power Save
WSTC0300<CR><LF>

Example) When the listen interval is set to 10 beacons
WSTC0610<CR><LF>

9.2. Sleep by DPS command (DeepSleep)

Turning off the power of the WLAN chip in the module reduces current consumption.
Change the sleep / wakeup status with the DPS command.
* This command cannot be used during connection or scanning.
Example)WDPS1<CR><LF>

Execute the following command to wake up
Example)WDPS0<CR><LF>

9.3. Sleep by SBY command

By setting the sleep time with the SBY command, the sleep / wake-up
State control and sleep / wakeup state control with pin states can be performed.
WSBY< Parameter0><CR><LF>
Example)WSBY0<CR><LF>
Parameter0
0: Wake up in GPIO (M_Wakeup) state

1-172800000: Wake up at set time

10. Firmware Update

The following is an example of firmware update of the module.
Update by specifying any Firmware from URI.
WUFW< Parameter 0>< Parameter 1>
例)WUFW1http://set-your-host/fw.bin

Parameter 0
'1' : Module Firmware
'2' : Wi-Fi Firmware
'3' : FTFS

Parameter 1
Firmware file URI
(Max length 1024)

Response Example
ACK : Server Start/Stop
UBG : Update Begin
UEN : Update End

11. MQTT

Start the MQTT Broker at the connection destination and set the MQTT parameters for the MQTT Broker connection in advance. In addition, the information of the connection target AP must be set using the example in section 8.2.

11.1. MQTT Connect

①Connect to the AP.
Enter the following packet example on Teraterm and press Enter.
If connection to the AP is successful, "CON" will be returned.
WICO1 <CR> <LF>

②Setting the time from NTP
Enter the following packet example on Teraterm and press Enter.
If successful, "CON" will be replied.
WSTT0ntp.nict.jp <CR> <LF>

③Set SubscribeTopic name
Enter the following packet example on Teraterm and press Enter.
If successful, "CON" will be replied.
Example) When setting the SubscribeTopic name to "sample1"
WMQT0201sample1 <CR> <LF>

④Set PublishTopic name
Enter the following packet example on Teraterm and press Enter.
If successful, "CON" will be replied.
Example) When setting the PublishTopic name to "sample1"
WMQT40sample1 <CR> <LF>

⑤Execute MQTT connection command
Enter the following packet example on Teraterm and press Enter.
If successful, "RCM200" will be replied and a connection will be established with MQTT Broker
WMQT21 <CR> <LF>

11.2. Send Subscribe

Enter the following packet example on Teraterm and press Enter.
If successful, "RCM" is replied and the Subscribe message set in (3) of Chapter 11.1 is sent to MQTT Broker.
WMQT311 <CR> <LF>

11.3. Send Publish

Enter the following packet example on Teraterm and press Enter.
If successful, "RCM" is replied, and the Publish message set in 4 in section 11.1 is sent to MQTT Broker.
Example) Set the Publish data you want to send to
"{xxxx: aaaaaaaaaaaaaaaaaaaaaaaaaaaaaaaaaaaa}
WMQT41 {xxxx: aaaaaaaaaaaaaaaaaaaaaaaaaaaaaaaaaaaa} <CR> <LF>

11.4. Disconnect MQTT

Enter the following packet example on Teraterm and press Enter.
If successful, "RCM" will be returned.
WMQT20 <CR> <LF>

12. Example of common command usage

① Execute / stop WPS.
When WPS processing is completed, “WRF” is notified for AP and “WEF” for STA.WWPS< Parameter0>< Parameter1>
Example)WWPS1120<CR><LF>

Parameter0
(Start/Stop)
‘0’:Stop
‘1’:Start

Parameter1
(Timeout)

② Execute ICMP Ping.
WPNG< Parameter0>< Parameter1>
Example)WPNG0192.168.000.001<CR><LF>

Parameter0
(Option)
'0':default
'1':custom

Parameter1
(IP Address)

Response example
PING 192.168.0.1(192.168.0.1) 56(84) bytes of data
64 bytes from 192.168.0.1:icmp_req=1 ttl=64 time=6ms
64 bytes from 192.168.0.1:icmp_req=2 ttl=64 time=1ms
64 bytes from 192.168.0.1:icmp_req=3 ttl=64 time=1ms
64 bytes from 192.168.0.1:icmp_req=4 ttl=64 time=1ms
64 bytes from 192.168.0.1:icmp_req=5 ttl=64 time=1ms
5 packets transmitted, 5 received, 0% packet loss
③ You can get the IP address from the host name.
WDNS< Parameter0>
Example)Host name : When obtaining an IP address from www.google.co.jp
WDNSwww.google.co.jp<CR><LF>

Parameter0
Host name
(Max length 255)

④Initialize the setting profile and STC command information.
WERS< Parameter0>< Parameter1>
Example) Initializing the setting of List index1 of μAP
WERS01<CR><LF>

Parameter0
‘0’:micro-AP
‘1’:Infrastructure(STA)
‘2’:Certificate

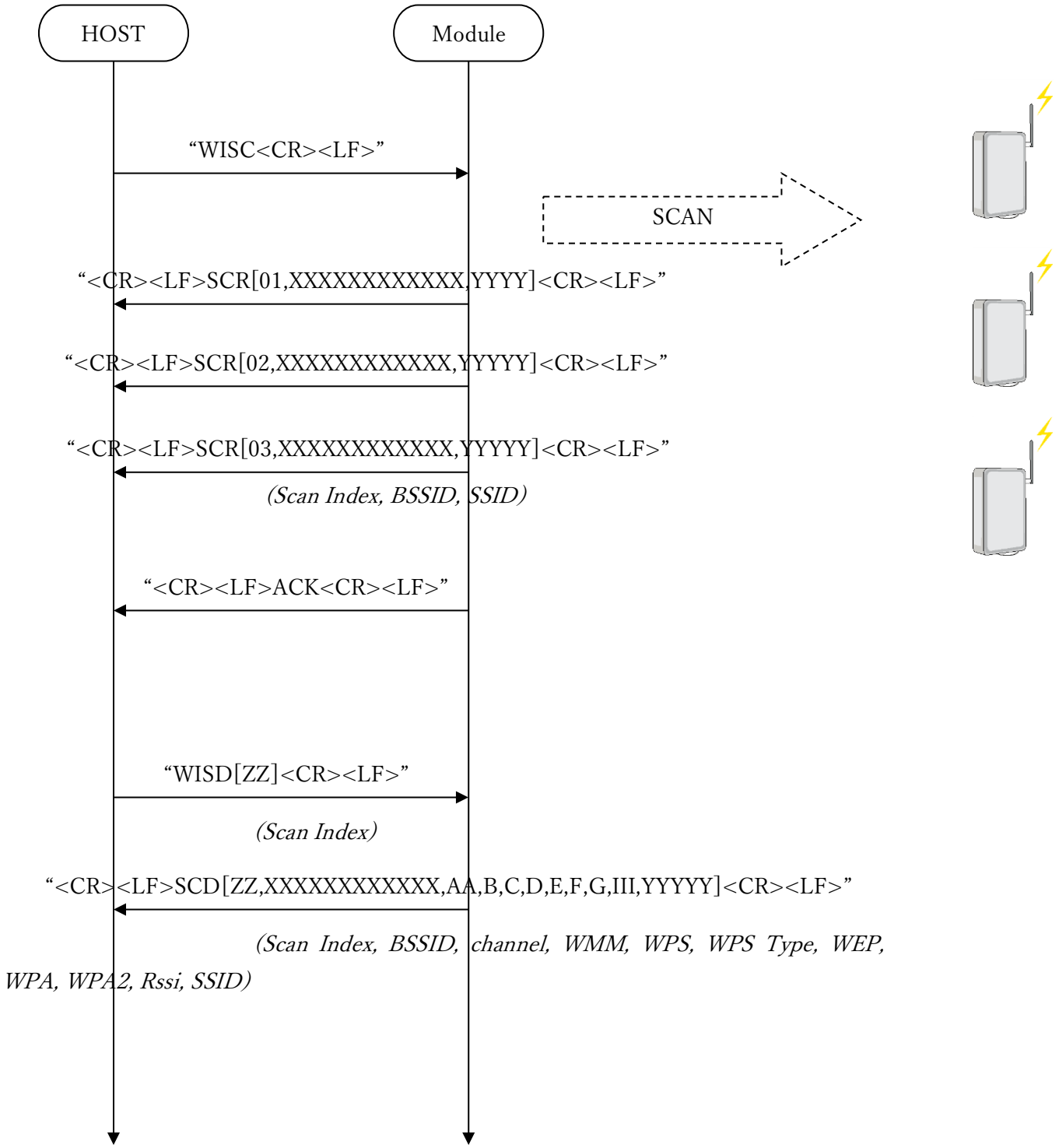
Parameter1
(Profile list index)

⑤Get RSSI / S / N ratio.
When the GSS command is executed, it communicates with the connection destination and the RSSI value at that time is notified.
Example)WGSS<CR><LF>

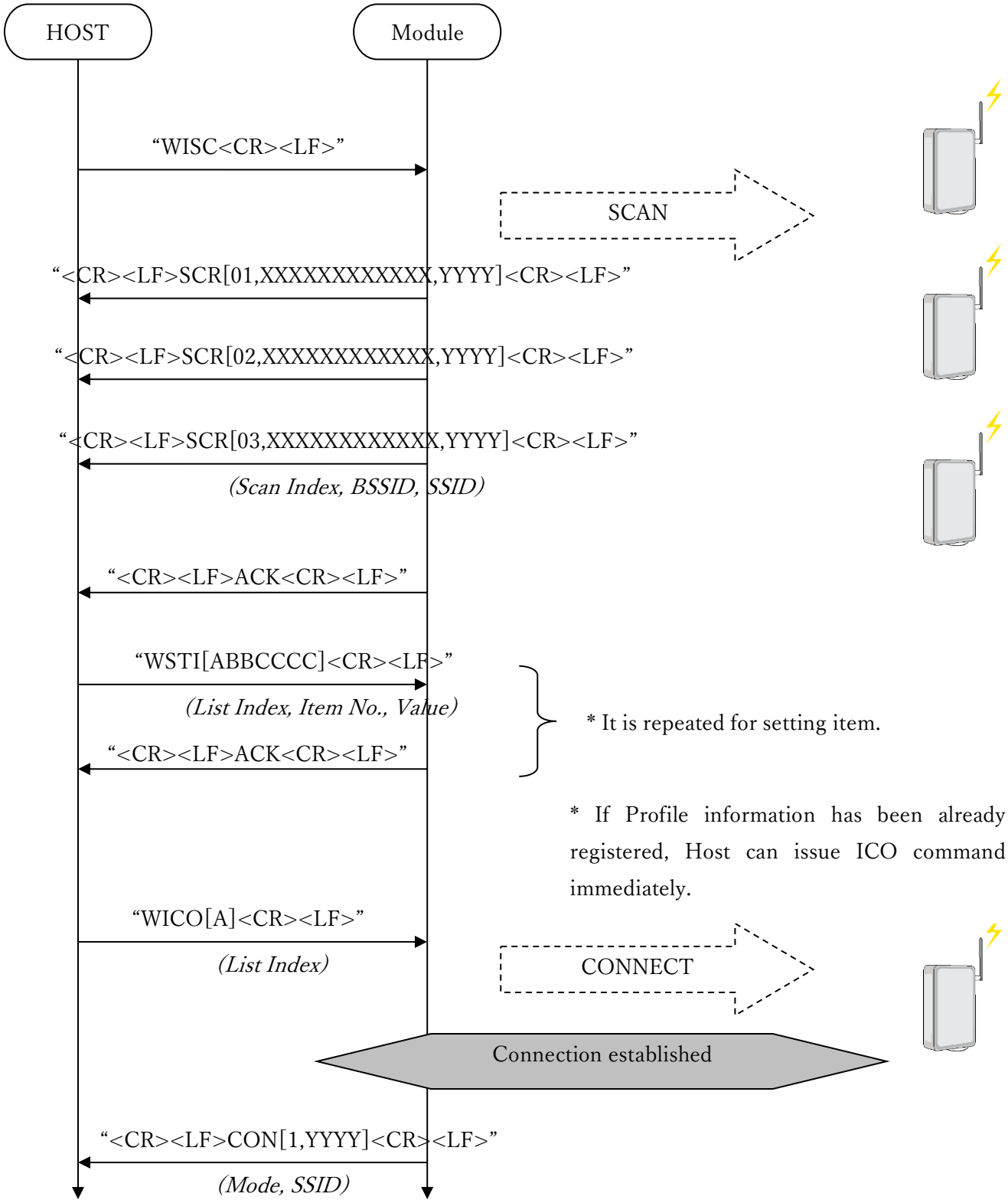
⑤Perform a software reset of the module.
Example)WRST<CR><LF>

13. Message Sequence Chart

13.1. Scan and scan result detail

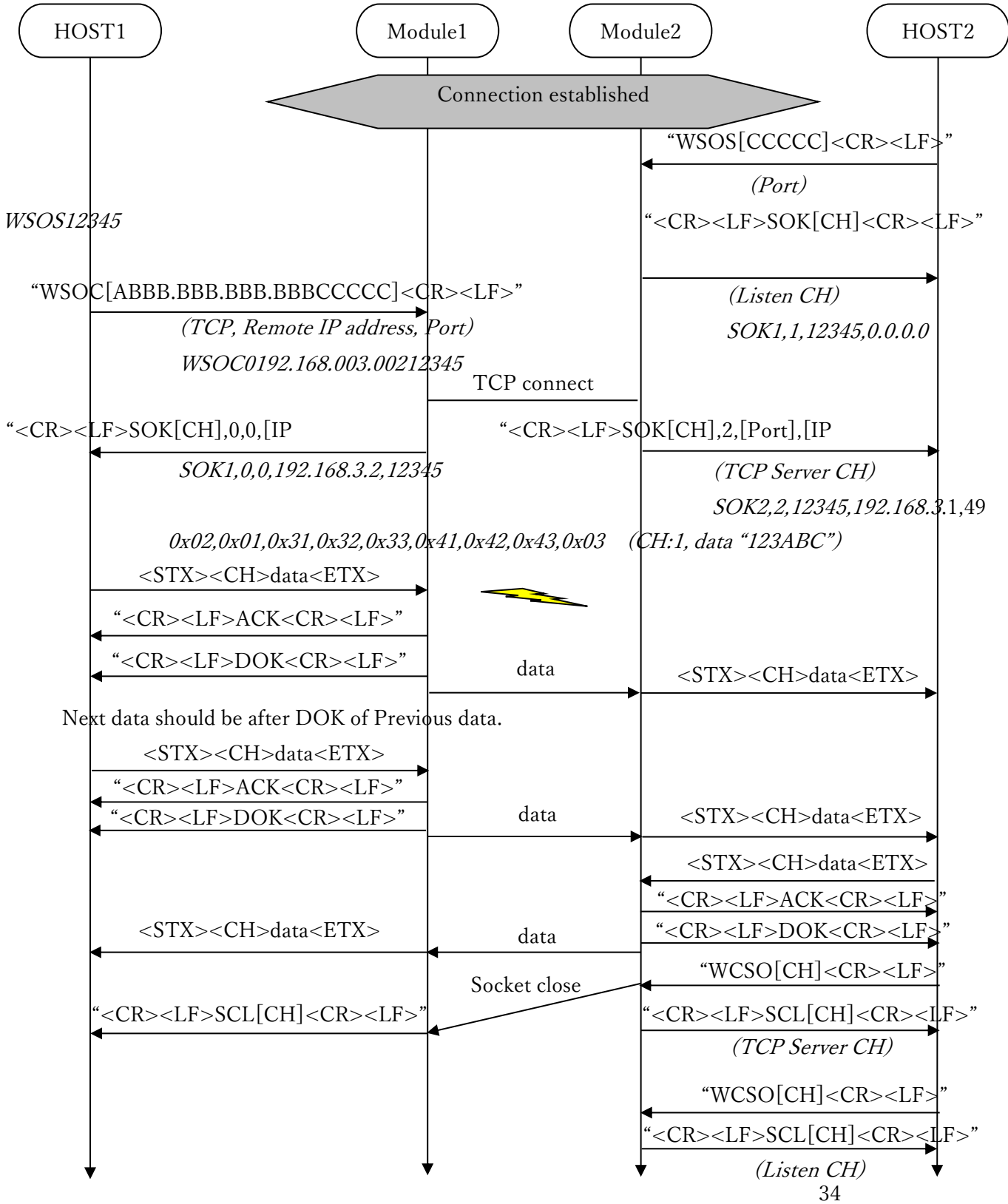


13.2. Connect

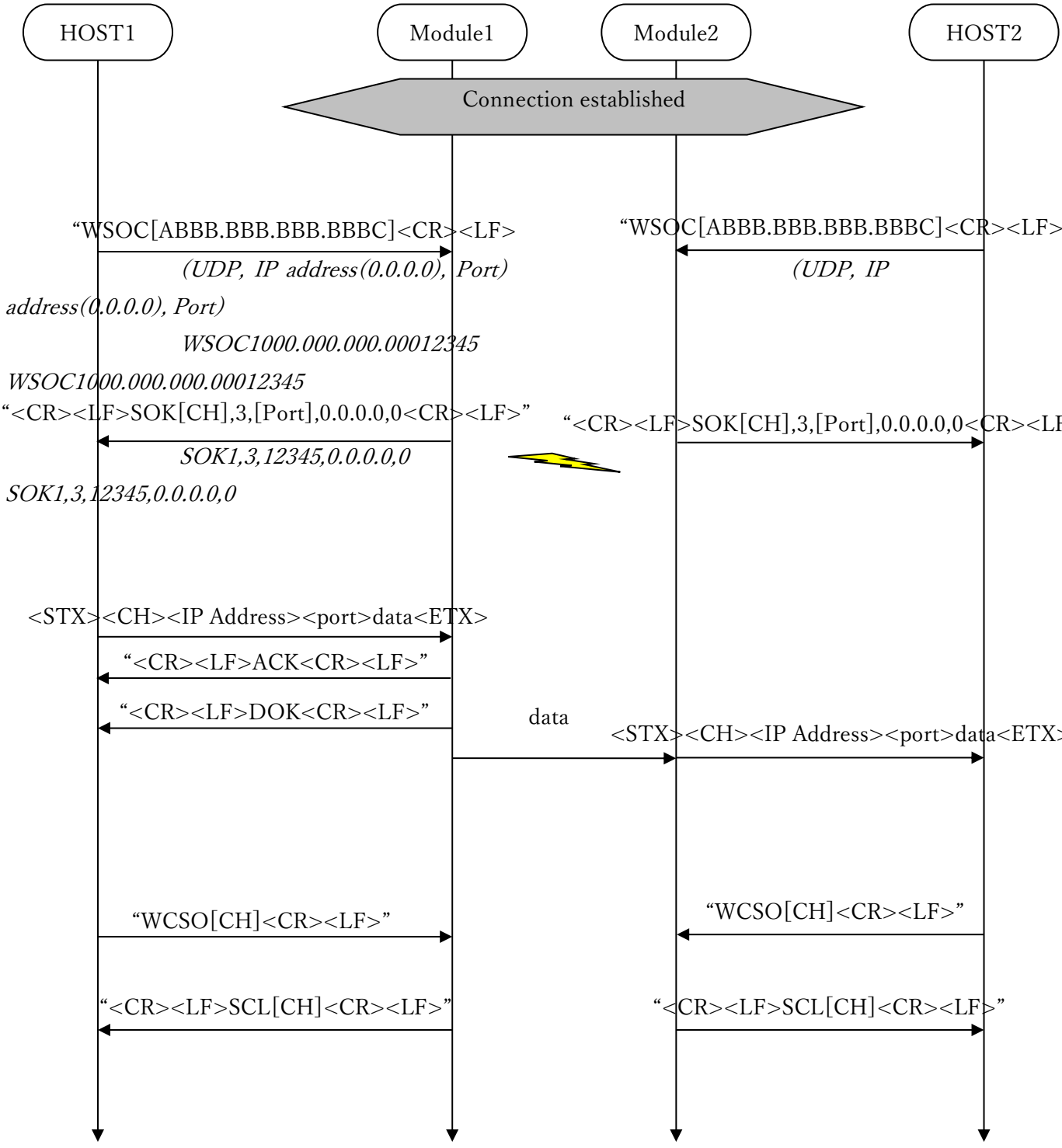


* If Profile information has been already registered, Host can issue ICO command immediately.

13.3. Socket Interface usage (TCP)

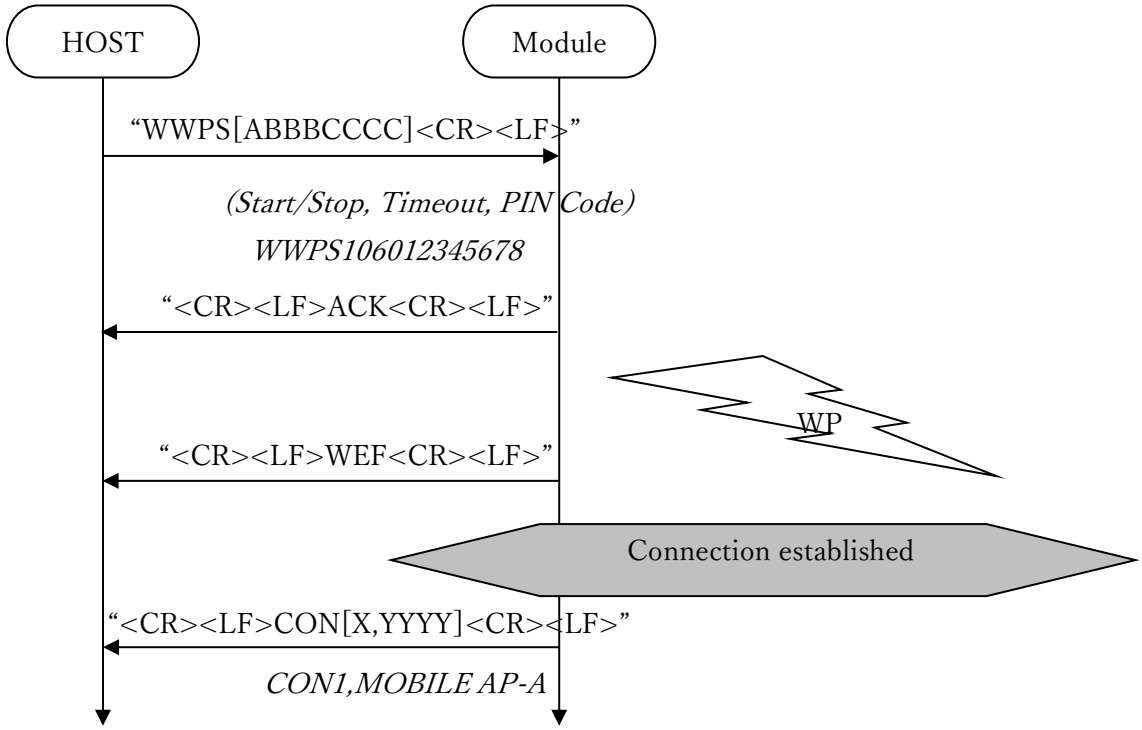


13.4. Socket Interface usage (UDP)

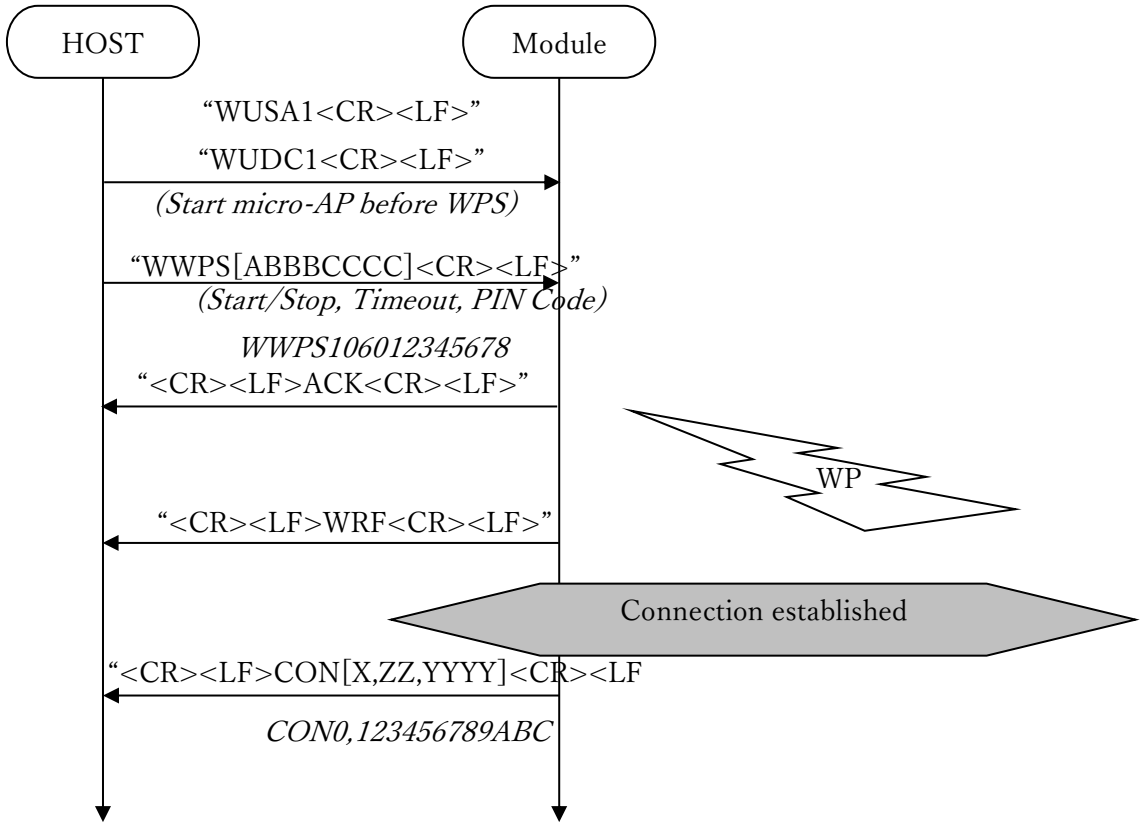


13.5. WPS

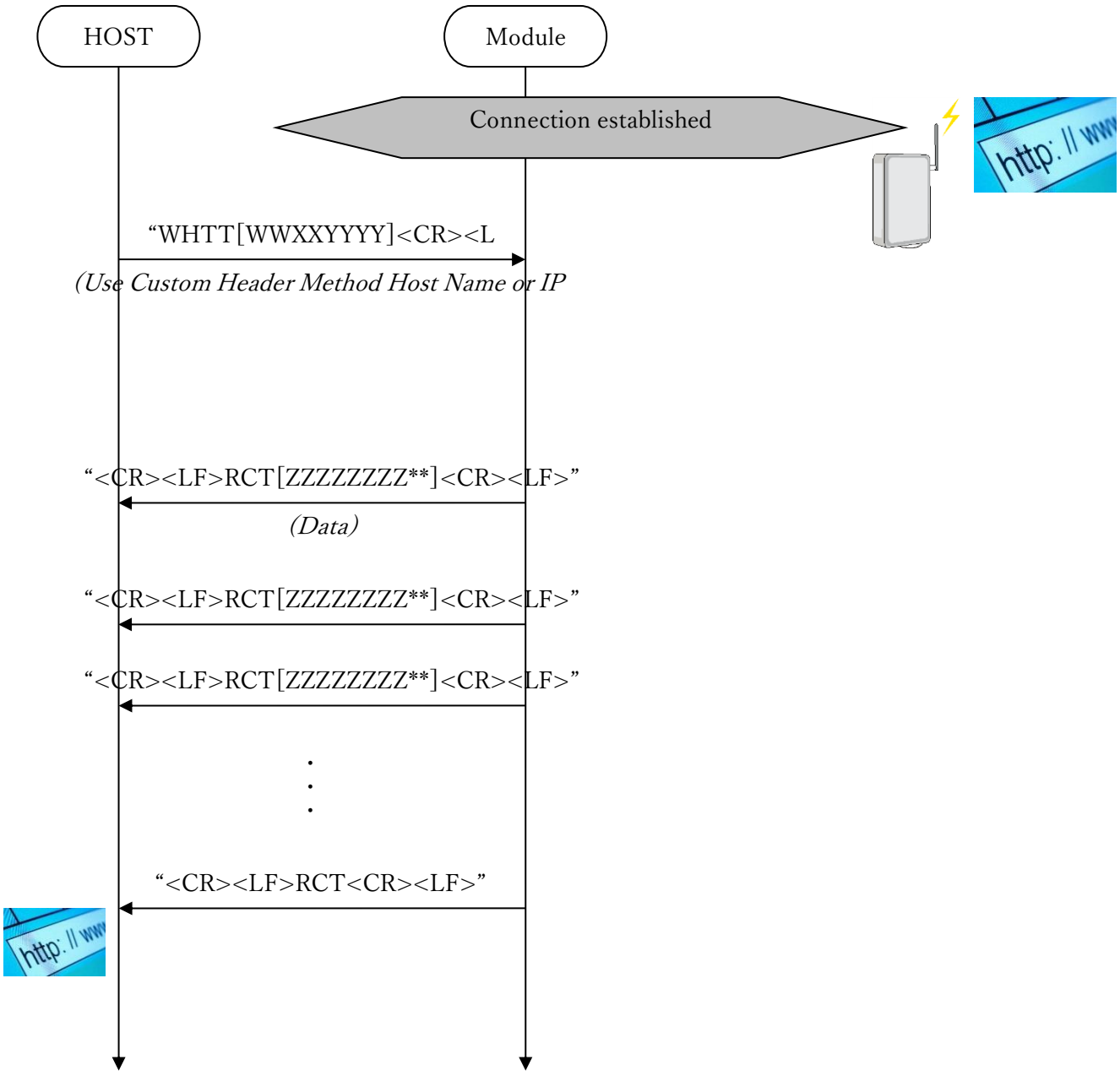
13.5.1. Infrastructure mode (WPS Enrollee)



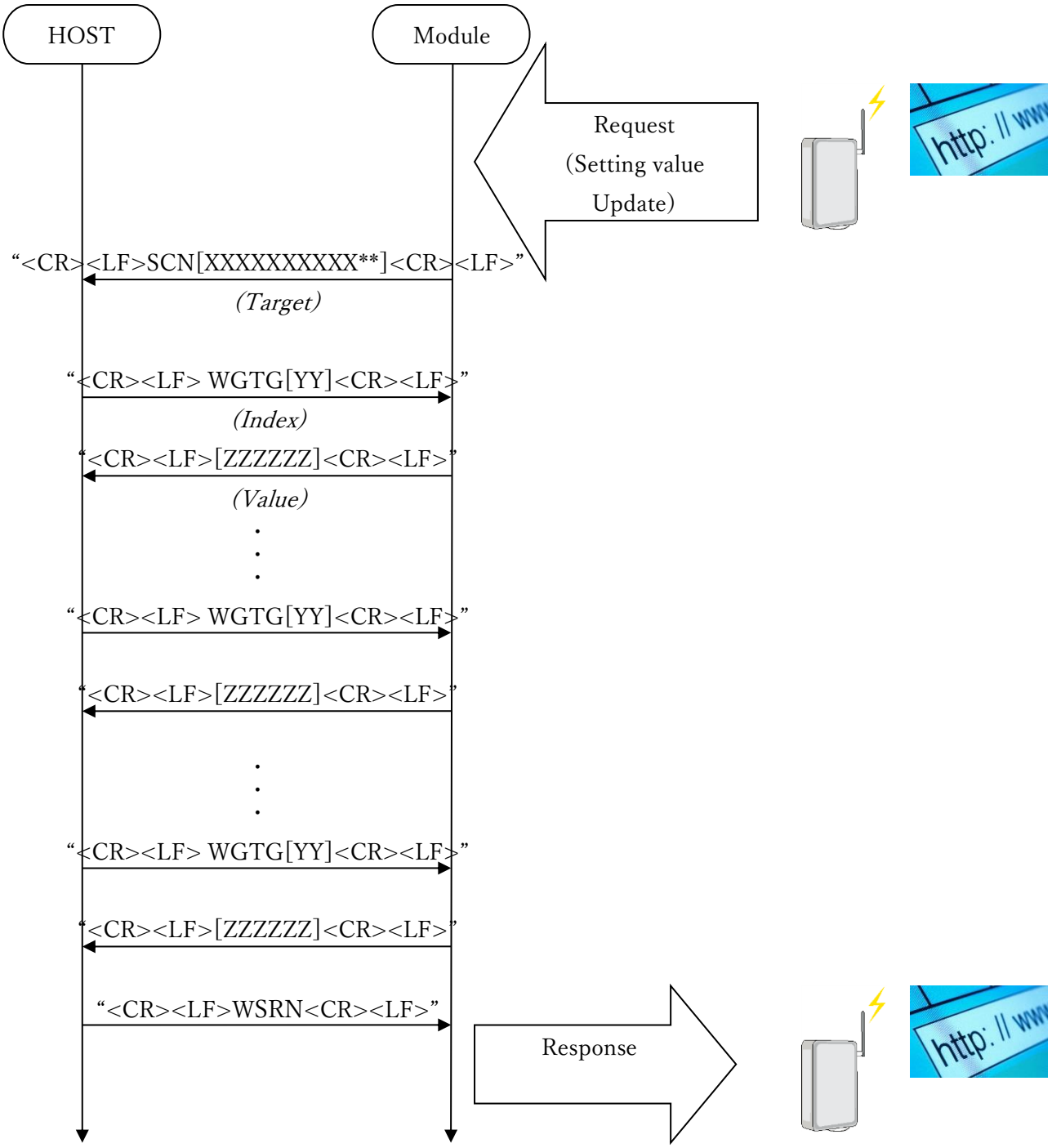
13.5.2. uAP mode (WPS Registrar)



13.5.3. DELETE


HOST
Module
Connection established
"WHTT[WWXXYYYY]<CR><L
(Use Custom Header Method Host Name or IP
"<CR><LF>RCT[ZZZZZZZZ**]<CR><LF>"
(Data)
"<CR><LF>RCT[ZZZZZZZZ**]<CR><LF>"
"<CR><LF>RCT[ZZZZZZZZ**]<CR><LF>"
"<CR><LF>RCT<CR><LF>"

13.6. WEB Configuration



14. Error code

14.1. Common Error Codes

#	Error Name	Program Logic Cause	Action taken by host
FF	System Error	There is the possibility that the hardware is out of order.	Please inquire Taiyo Yuden.
00	Command Not Recognized	It confirms whether or not the command is correct.	Send the command once again.
01	Bad Parameter	It confirms whether or not the parameter is correct.	Send the command once again.
04	Connection Error	General connection error	Check parameter and retry. Reconnect or reboot.
05	Profile Error	UAP / ICO command is called with invalid profile setting.	Set micro-AP / Infrastructure profile
06	WPS running Error	Input commands while WPS is running.	Wait or stop WPS.
07	FlashRom Access Error	It failed in FlashROM access of STC / SHD / STI / STU / SCT / GTC / GHD / GTI / GTU / GCT command.	Please inquire Taiyo Yuden.
10	Network Not Found	Access Point is not exist.	Check Access Point setting.
11	Authentication Failed	Authentication error occurs in association to Access Point.	Check parameter and retry.
12	DHCP Failed	IP address is not assigned after association to Access Point.	Check Access Point setting.
14	Other Infrastructure Connection error	Other error occurs in connection to Access Point.	Check Access Point setting.
15	Infrastructure is connected	ICO / WPS command is called while infrastructure is	Disconnect infrastructure with IDC command.

		connected.	
16	Firmware update Failed	It failed in Firmware update.	Check if firmware file is valid and the command parameters.
20	TCP socket full	Create TCP socket over the limit	Close socket.
21	UDP socket full	Create UDP socket over the limit	Close socket.
22	Socket full	Create socket over the limit	Close socket.
23	Socket TX queue full	Socket TX queue is full	Wait until the queued data is sent.

30	HTTP connection error	Can not access HTTP server	Check WLAN connection and HTTP address. In HTTPS, check whether the valid server's certificate is installed.
31	HTTP status code Error	HTTP status code is not 200 (OK). Status code will be added after a comma. For instance NAK31,301 NAK31,404	Check HTTP status code.
33	HTTP Header Invalid	Cannot add HTTP header	Check HTTP Custom Header Setting
34	HTTP Server is running	HTTP Server is running and SSL certificate option for HTTPS is pre-installed certificates.	Stop HTTP Server or Change SSL certificate option for HTTPS
35	WEB is updating internal setting values.	Internal setting values are being updated by Request from WEB.	Send the command once again.