

EC2820MA2
and
ES2820MA2
FAQ

Revision History

Version	Date	Description
1.0	11-Mar.-2023	Ver 1.0 Release
1.1	27-Dec-2024	Added item regarding Direct Test Mode
1.2	7-Feb-2024	Added additional explanation to the section on Direct Test Mode
1.3	6-Jun-2024	Correction of errors

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Q1: How do I enable auto-advertising?

A1: To enable auto-advertising, follow these steps.

- I. Execute the "\$SASM:1" command with advertising stopped to enable AutoStart (To disable it, use the "\$SASM:0" command to do the same).
- II. Execute the "\$SAVE" command to save the settings.
- III. Execute the "\$SRST" command to confirm that advertisements will start automatically after resetting.

Note: The device will begin auto-advertising after power up / reset or after the Bluetooth® LE connection has been lost. If the advertising times out, the automatic advertising / scanning will not be performed.

Q2: How do I change the advertising interval time?

A2: If you want to change the advertising interval time, change the first parameter of the "\$ADS1" command to an arbitrary time.

Example: 1 second "\$ADS1:1600:1000"

Note: Please refer to "Data Report" for details on the setting method.

Q3: How do I change the timeout time for advertising?

A3: If you want to change the advertising timeout time, change the second parameter of the "\$ADS1" command to an arbitrary time. If you want to disable the timeout time, set the value to "0".

Example: 60 seconds "\$ADS1:160:6000"

Example: Timeout disabled "\$ADS1:160:0"

Note: Please refer to "Data Report" for details on the setting method.

Q4: How do I change the connection interval and connection timeout (Supervision Time)?

A4: If you want to change the connection interval, change the first and second parameters of the "\$SCPR" command to an arbitrary time. If you want to change the connection timeout, change the fourth parameter of the "\$SCPR" command to an arbitrary time.

The value of the connection timeout can be set to $(1 + \text{latency}) * \text{Interval Max} * 2$ should be set to a minimum value that is greater than this value.

Example: connection interval minimum 0.1 seconds, maximum 0.2 seconds,

connection timeout 4 seconds.

`“$SCPR:80:160:0:400”`

Note: Please refer to “Data Report” for detailed specifications.

Q5: How do I Activate Bonding?

A5: To enable Bonding, run the following command.

- I. Execute the “\$SBND:1” command.
- II. Execute the “\$SAVE” command to save the configuration, then execute the “\$SRST” command to reset the device.
- III. If you connect with pairing setting, “\$EBOND:MAC address” event will be output and Bonding will be completed.

Note: The maximum number of Bonding information can be 8 addresses, please delete the Bonding information when you want to perform Bonding on new device when the maximum number of Bonding information is reached.

Q6: How do I Activate Whitelist?

A6: To enable Whitelist, follow the steps below.

- I. Execute the “\$SWHT:1” command to enable the Whitelist.
- II. Execute the “\$SAVE” command to save the configuration, then execute the “\$SRST” command to reset the device.

Note: If you want to use the Whitelist function, you need to make a bonding with the target device in advance. By enabling Whitelist, central module will receive Advertising data only from devices that have bonded, and peripheral module will only make scan and connection requests from devices that have bonded.

Please refer to “Data Report” for detailed specifications.

Q7: How do I Activate Pairing?

A7: To enable pairing, the security level must be set to “2” or higher. You can change the security level by executing the “\$SSEC:Security level”(Range: 1~4) command.

Example: “\$SSEC:2”

Note: For details about setting method of security level, please refer to “Q1-13: How do I set the security level?”.

Q8: How do I rewrite firmware with DFU function?

A8: In order to perform rewriting with the DFU function, the device must be put into DFU mode. To put the device into DFU mode, set DFU pin(EC2820MA2: P0.14 / ES2820MA2: P0.14) to low state, and perform a reset to enter DFU mode.

After shifting to DFU mode, you can rewrite the firmware by using UART or by Bluetooth® LE.

“Using UART”:

Rewrite the firmware by using “nrf util” which is a tool provided by Nordic. Execute the following command in Command-line interface.

```
“nrfutil dfu serial -pkg dfu_file.zip -p PORT”
```

Note:

a) For more information, please refer to the following documents.

DeviceFirmwareUpdateUserManual_EN.pdf

DeviceFirmwareUpdateSampleApplicationGuide_EN.pdf

b) For dfu_file.zip, specify the zip file that contains the Firmware update file. For PORT, specify the COM Port to which EC2820MA2 / ES2820MA2 is connected. When the command is executed, a progress bar is displayed, and when the update is completed, the update result is displayed.

c) Please check the official website of Nordic for information about the method to obtain and use “nrf util”.

Download page: <https://github.com/NordicSemiconductor/pc-nrfutil>

“Using Bluetooth® LE”

- I. If using PC, please install “nRF Connect for Desktop”.
- II. If using smartphone, please install “nRF Toolbox App”. Please scan the QR code below to download the application of smartphone.



iOS



Android

- III. The device name used for advertising in DFU mode is “KFSAB-DFU”. Please connect to “KFSAB-DFU” with the above application and execute DFU according to the procedure of the following URL.

Method of PC:

https://infocenter.nordicsemi.com/index.jsp?topic=%2Fug_nrfconnect_ble%2FUG%2FnRF_Connect_BLE%2FnRF_Connect_DFU.html

Method of iOS:

<https://github.com/NordicSemiconductor/iOS-nRF-Toolbox>

Method of Android:

<https://github.com/NordicSemiconductor/Android-nRF-Toolbox>

Q9: How do I set up iBeacon and Company ID?

A9: The iBeacon data can be configured with the "\$ADS5" command to set the proximity UUID, major, minor, and measurement power. For Company ID, Apple Inc. ID "0x004C" is fixedly set.

If you want to use iBeacon, you will need to change the advertising mode settings. Changes can be made using the "\$ADS6:2" commands.

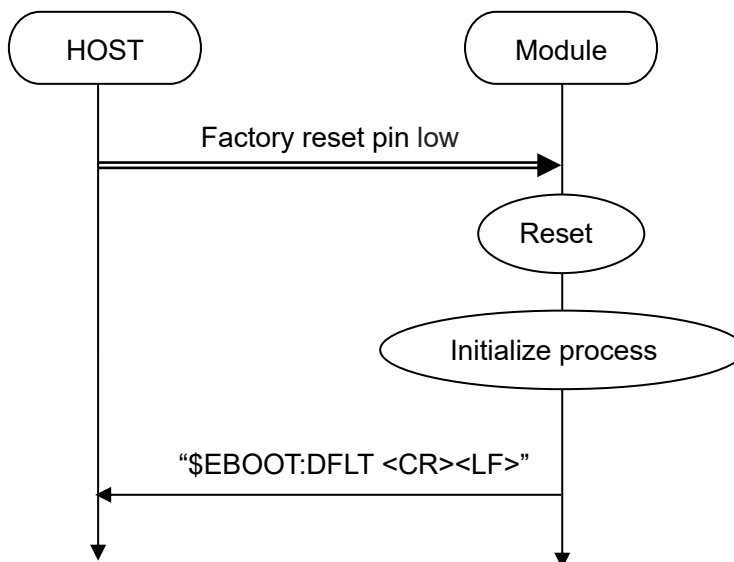
Note: Please refer to "<https://developer.apple.com/ibeacon/>" for iBeacon using licensing information.

Q10: How do I initialize the settings?

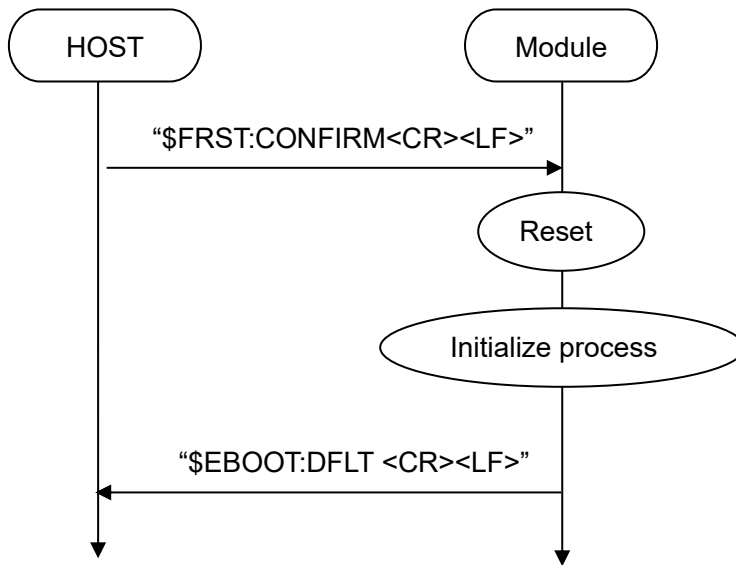
A10: If you want to initialize the settings, you can do so in the following two ways. When the initialization is executed, the parameter of the "\$EBOOT" event after rebooting will be set from "OK" to "DFLT".

- I. Resetting the device with the Factory reset pin (EC2820MA2: P0.15 / ES2820MA2: P0.15) in the low state.
- II. Execute the "\$FRST: CONFIRM" command.

"Factory reset pin"



“FRST command”



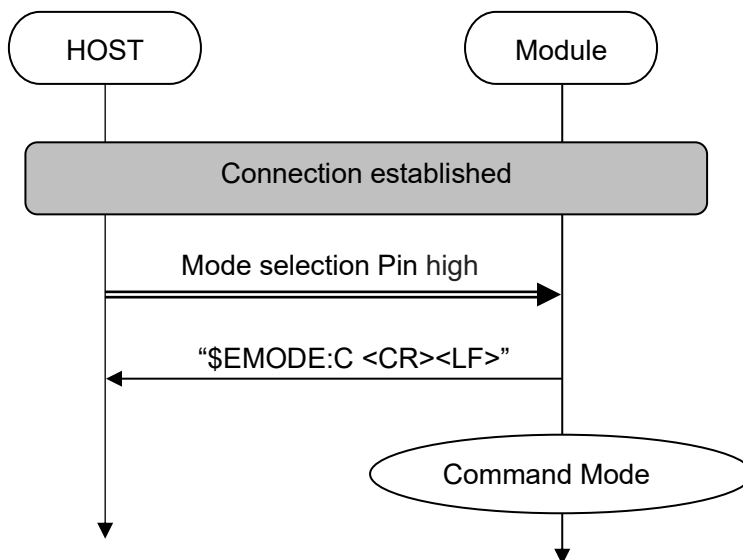
Q11: How do I switch between Command Mode and Through Mode.

A11: After completing the Bluetooth® LE module connection, you can select between two communication modes and switch by executing as follows.

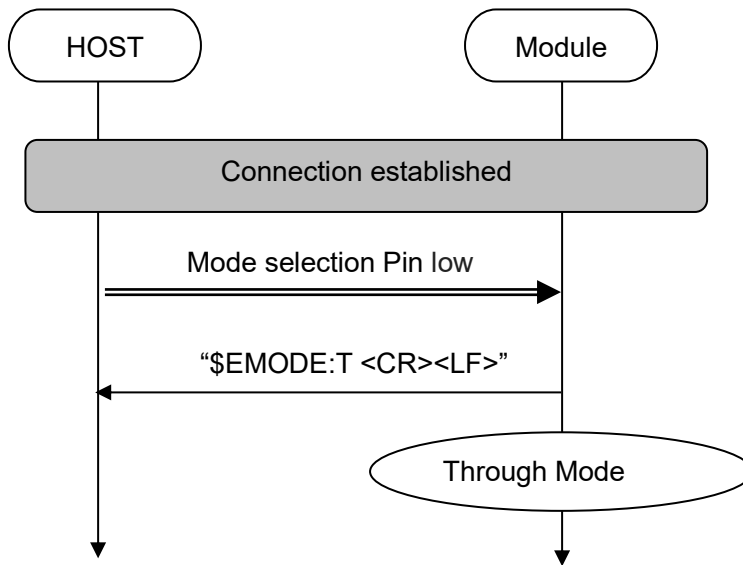
Command Mode: Set the mode selection Pin(EC2820MA2: P0.28 / ES2820MA2: P0.04) to HIGH.

Through Mode: Set the mode selection Pin(EC2820MA2: P0.28 / ES2820MA2: P0.04) to low.

“Command Mode”



“Through Mode (Default)”



Note: Please refer to “Data Report” for detailed specifications.

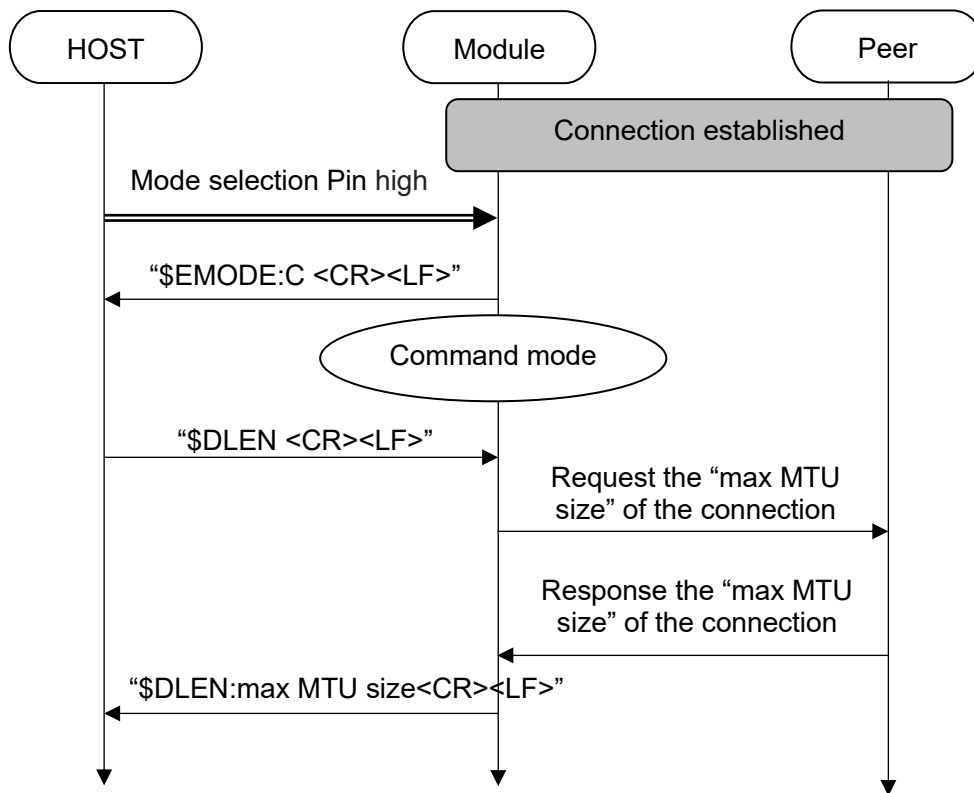
Q12: What will happen if more than 20 bytes of data are sent at a time after the connection is complete?

A12: There are two types of connection modes after the connection is completed, and the behavior differs when more than 20 bytes of data are sent.

“Command Mode”

The default value is 20 bytes, but it depends on the peer device limit. This module supports up to 244 bytes. You can use the “\$DLEN” command to read the maximum MTU size of the connected peer device.

“\$DLEN” command usage example:



“Through Mode”

It is possible to send more than 20 bytes of data at a time. However, normal command operations cannot be executed in Through Mode, so switch to Command Mode before performing command operations.

Note: When data exceeding 20 bytes are transmitted at one time, the displayed content of the received device depends on the processing content of the received device.

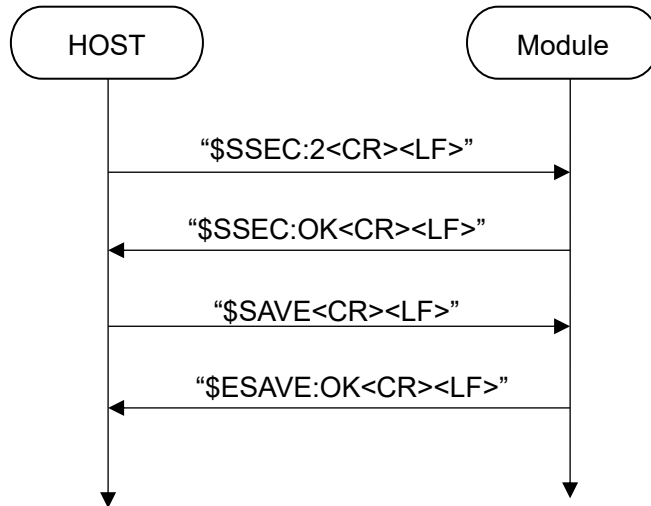
Q13: How do I set the security level?

A13: Perform the following steps.

- I. Execute the “\$SSEC: **security level**” command to set security level.
- II. Execute the “\$SAVE” command to save the setting.
- III. Execute the “\$SRST” command to reset. And if you want to check whether the settings are reflected, you can check by executing the “\$GIOC” and “\$GSEC” command.

Note: For settings that use LE Secure Connection, please refer to “Q14: How do I set up LE Secure Connection?”.

“Security level setting example”

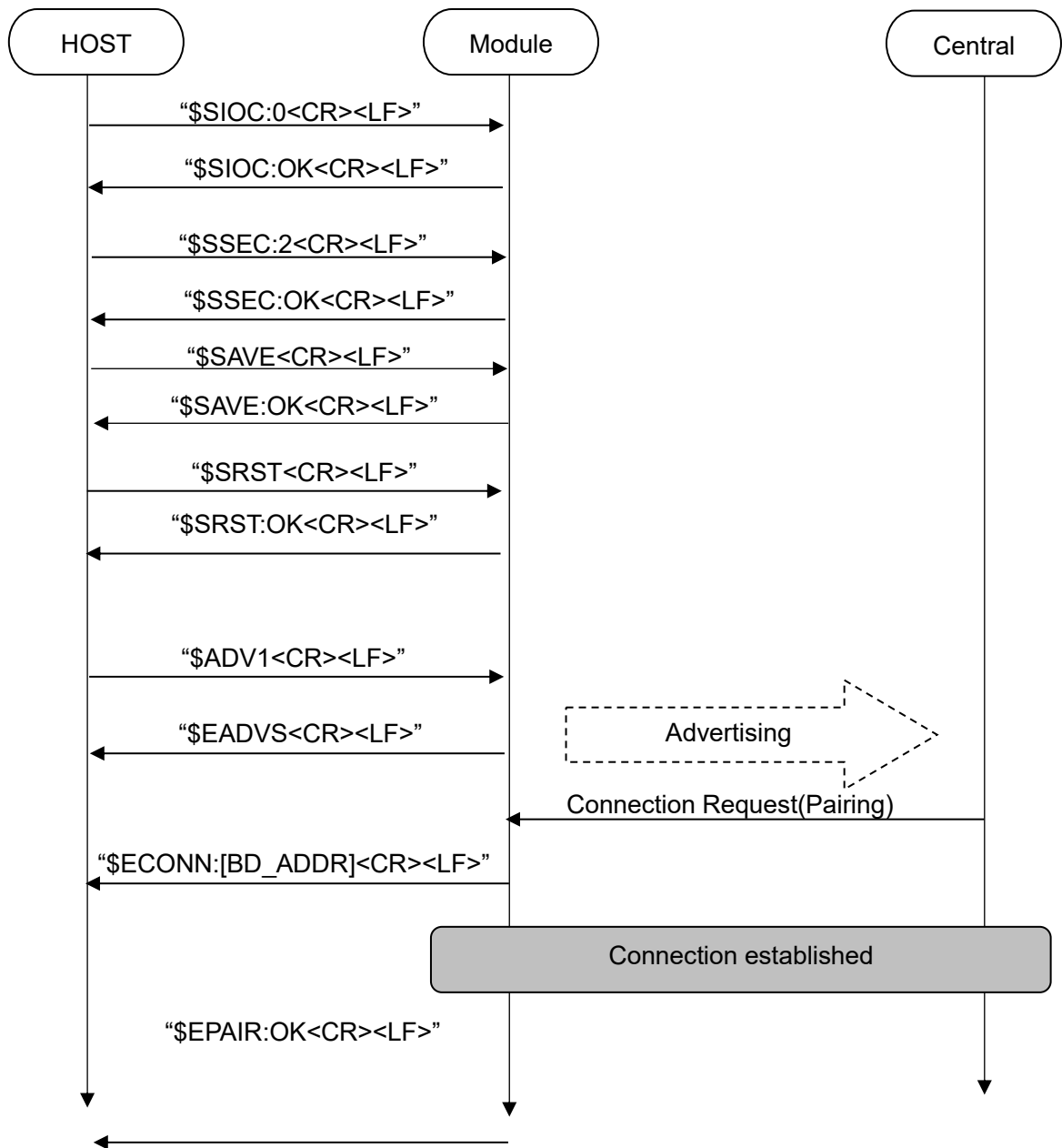


Q14: How do I set up LE Secure Connection?

A14: This section describes the setting procedure for Just Work, Numeric Comparison, Passkey Entry, Out of Band(OOB).

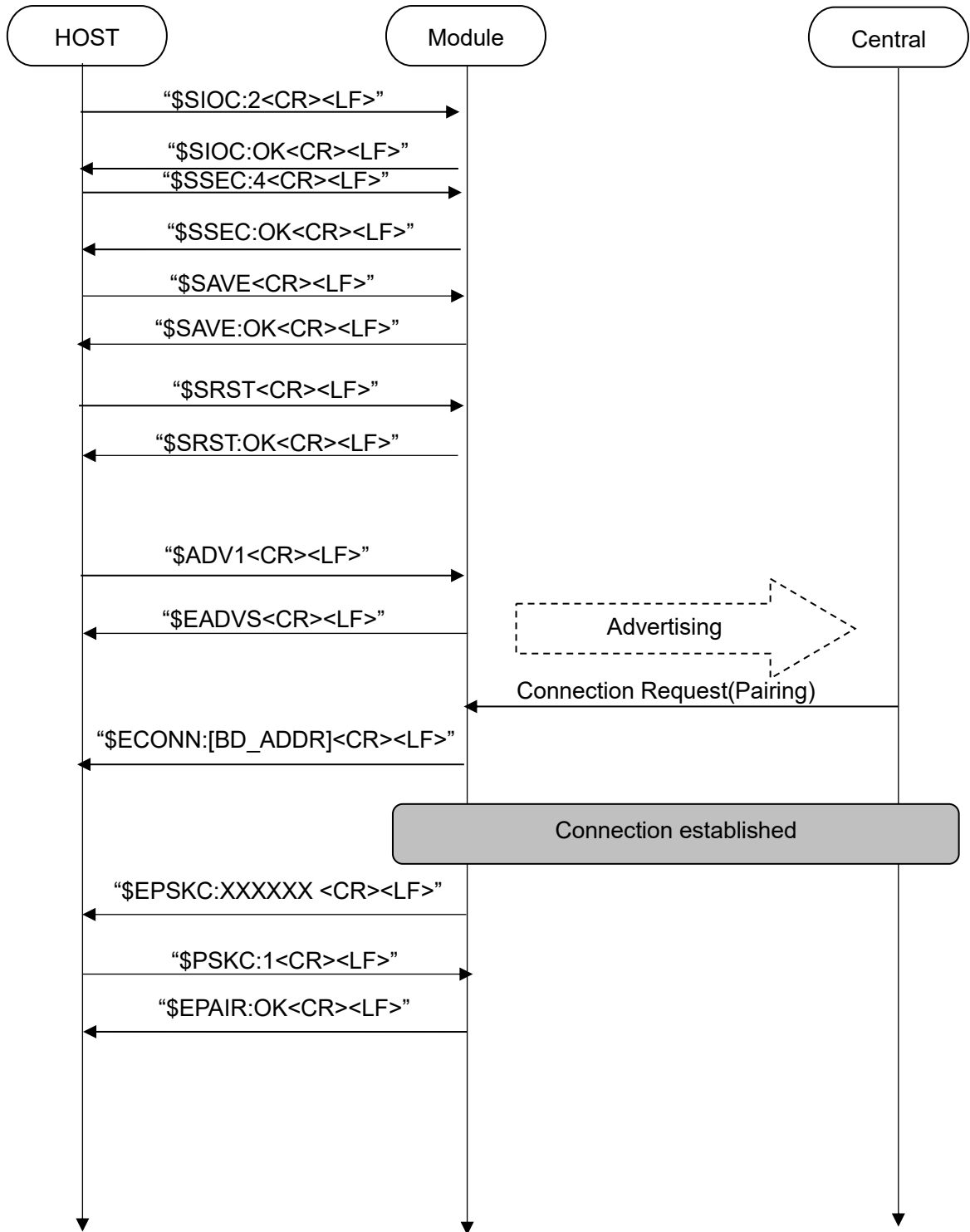
“Just Work”

- I. Execute the "\$SIOC:0" command and set IO Capabilities to "0".
- II. Execute the "\$SSEC:2" command and set the security level to "2".
- III. Execute the "\$SAVE" command to save setting, and reset the device by use "\$SRST" command.
- IV. Execute the "\$ADV1" command to start advertising, and then connect to the central device, and confirm that pairing is done and "\$EPAIR:OK" is output.



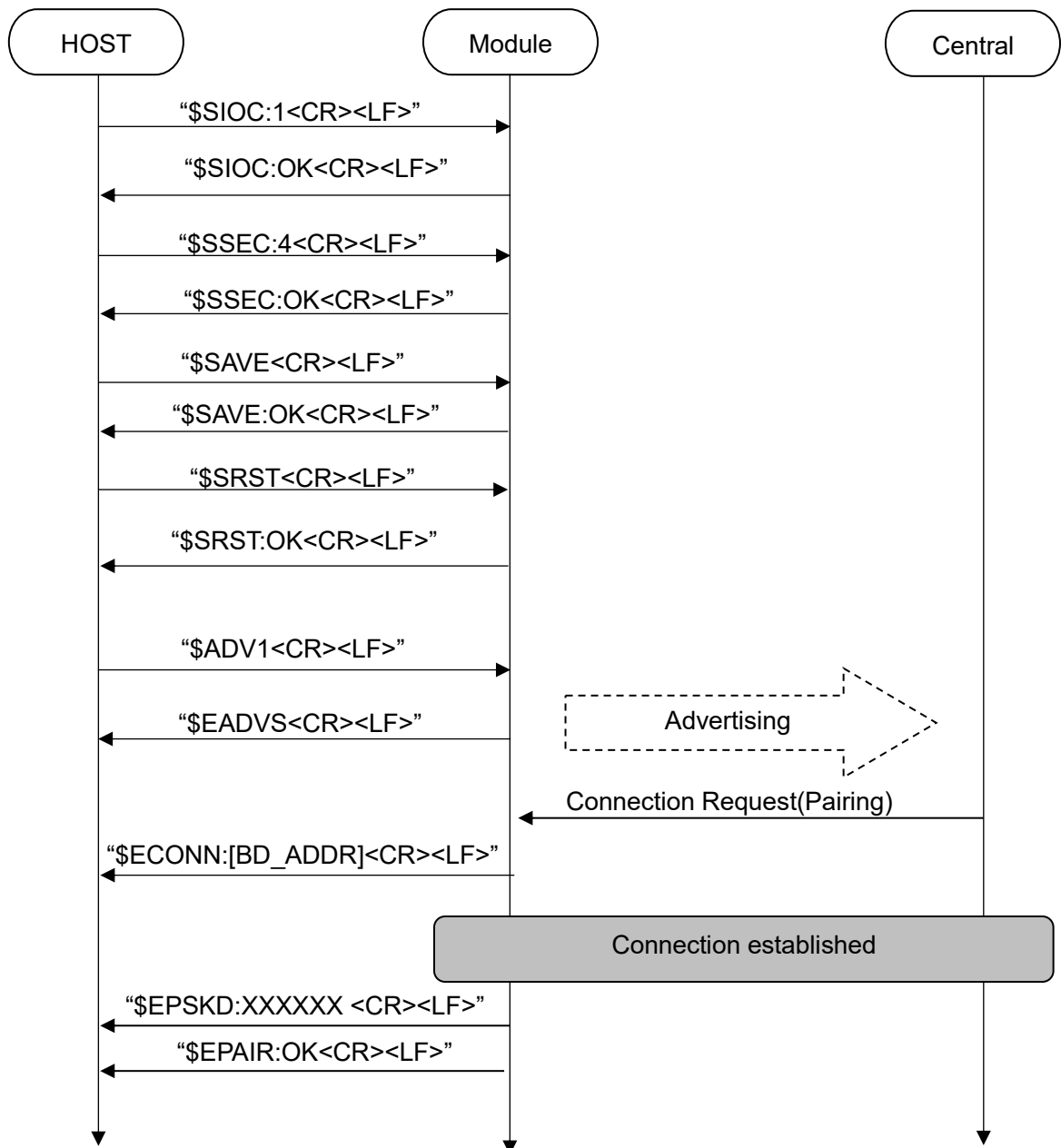
"Numeric Comparison"

- I. Execute the "\$SIOC:2" command and set IO Capabilities to "2".
- II. Execute the "\$SSEC:4" command and set security level to "4".
- III. Execute the "\$SAVE" command and reset the device by use "\$SRST" command.
- IV. Start advertising, and then connect to the central device, and confirm that "\$EPSKC:6-digit number" is output.
- V. If the numbers of "\$EPSKC" of both modules match, both modules also execute the "\$PSKC:1" command, authentication is performed, pairing is performed, and "\$EPAIR:OK" is output. If they do not match, use the "\$PSKC:0" command to disconnect.



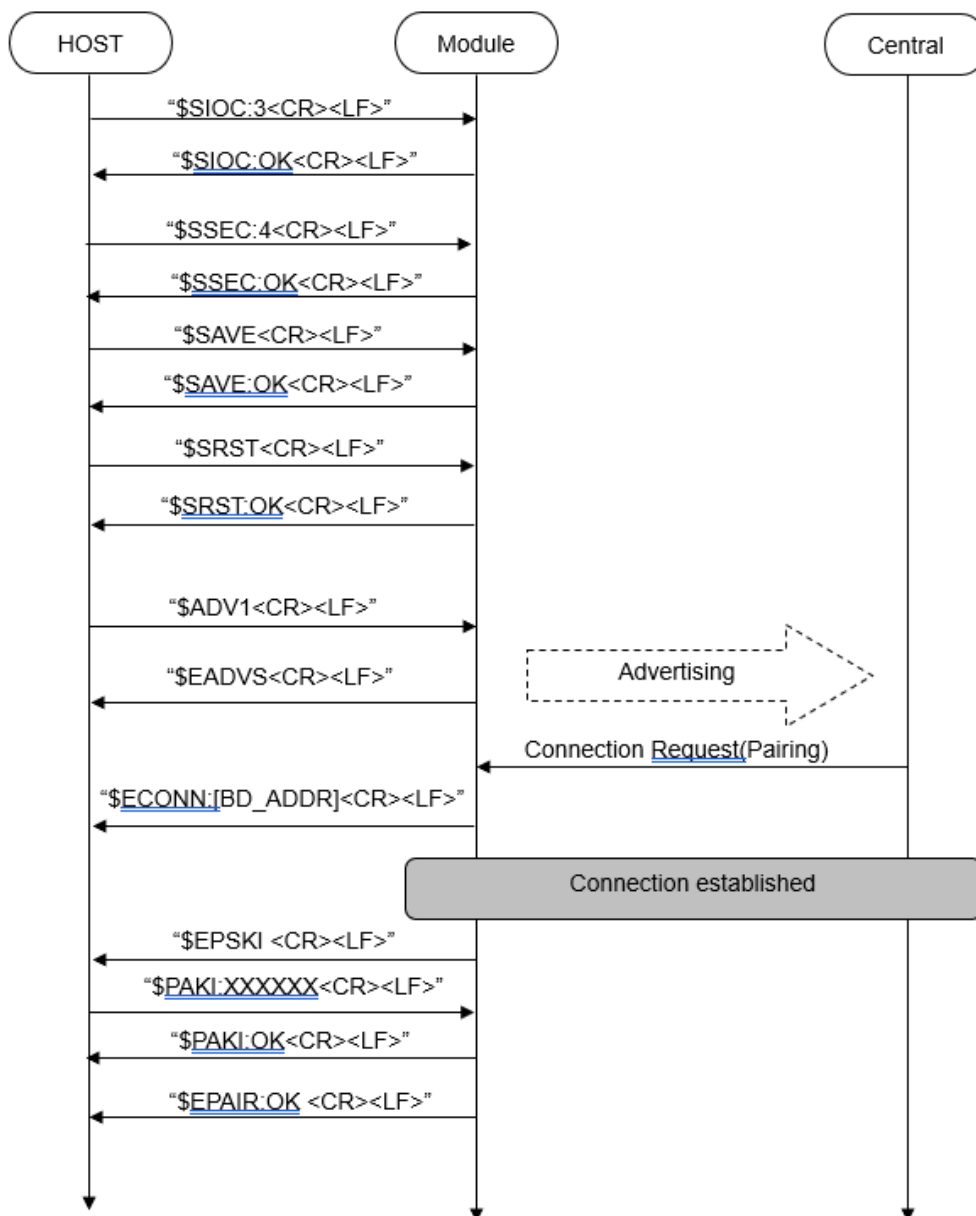
“Passkey Entry (Passkey screen output)”

- I. Execute the “\$SIOC:1” command, and set IO Capabilities to “1” and “3”, respectively.
- II. Execute the “\$SSEC:4” command and set security level to “4”.
- III. Execute the “\$SAVE” command to save setting and reset the device by use “\$SRST” command.
- IV. Start advertising, and then connect to the central device, and confirm that “\$EPSKD:6-digit number” is output.
- V. Confirm that the authentication is completed and “\$EPAIR:OK” is output.



“Passkey Entry (enter Passkey)”

- I. Execute the “\$SIOC:3” command, and set IO Capabilities to “3” and “1”, respectively.
- II. Execute the “\$SSEC:4” command, and set security level to “4”.
- III. Execute the “\$SAVE” command in both the modules to save setting, and reset the device by use “\$SRST” command.
- IV. Start advertising, and then connect to the central device,, and confirm that “\$EPSKD:6-digit number” is output.
- V. Execute the “\$PSKI:[6-digit number]” command. Confirm that “\$PSKI:OK” is output.
- VI. Confirm that the authentication is completed and “\$EPAIR:OK” is output.



Q15: How do I set the number of bytes of the address to be added to the device name?

A15: This module automatically adds the device address after the device name when advertising. You can change the length (number of bytes) of the address that be display by specifying any value with the “\$ADS9:number of bytes” (range: 0~6) command. The setup method is as follows.

- I. Execute the “\$ADS9:number of bytes” command(default value: “2”).
- II. Execute the “\$SAVE” command to save setting.
- III. If you advertise again, the number of bytes added to the device name will change.

In additional, use the “\$ADG9” command can check the current setting.

Note: When set the number of bytes to “0”, only the device name will be display.16

Q16: What is the purpose of Direct Test Mode?

A16: Direct Test Mode is used to perform BLE radio tests (continuous transmission, continuous reception, etc.).

Please refer to the "Direct Test Mode Guide" on the Technical Documentation and Software Providing Page for details on how to use the Direct Test Mode.

The technical information and software pages can be accessed by registering as a user based on the information card included with the evaluation board or evaluation kit.