

Bluetooth Control Messages

Contents

1. Bluetooth Connections between a POS Terminal and a Printer	2
2. Types of Bluetooth Master Control Messages	3
3. Control Message Format	5
3.1. Reset Message (0x01).....	5
3.2. Connect Request Message (0x02)	5
3.3. Connect Result Message (0x03)	6
3.4. Disconnect Request Message (0x04).....	7
3.5. Disconnect Result Message (0x05)	8
3.6. Discovery Request Message (0x06).....	9
3.7. Discovery Result Message (0x07)	10
3.8. Read BD_ADDR Message (0x08)	11
3.9. Report BD_ADDR Message (0x09)	11
3.10. Check Status Message (0x0A)	12
3.11. Report Status Message (0x0B).....	12
3.12. Read Config Message (0x0C)	12
3.13. Read Config Result Message (0x0D)	13
3.14. Write Config Message (0x0E).....	14
3.15. Write Config Result Message (0x0F).....	15
3.16. Read PrnInfo Message (0x10).....	15
3.17. Read PrnInfo Result Message (0x11).....	16
3.18. Write PrnInfo Message (0x12)	17
3.19. Write PrnInfo Result Message (0x13).....	17
4. An Example Of A Host Software Modification.....	18
4.1. POS Printer (Bluetooth Slave) Side.....	18
4.2. POS Terminal (Bluetooth Master) Side	18

1. Bluetooth Connections between a POS Terminal and a Printer

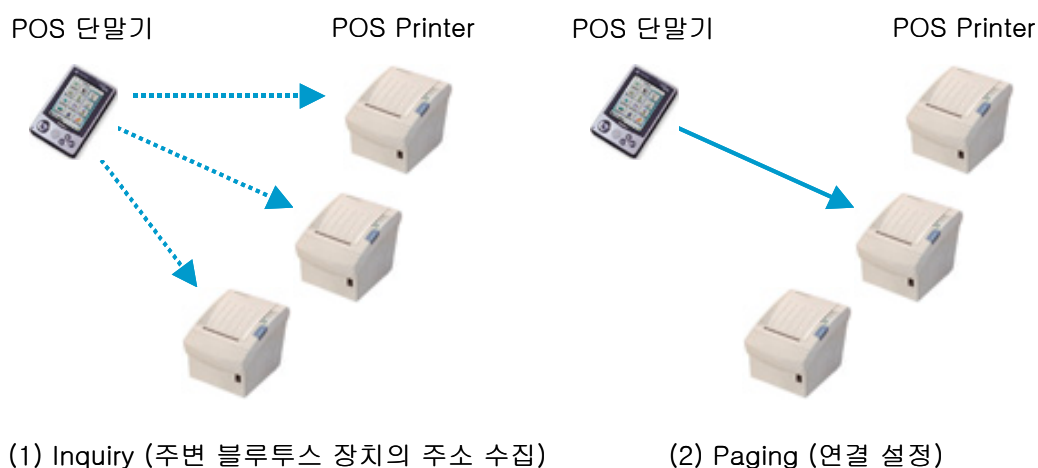
1) In general, the following two steps are used to create a Bluetooth connection:

- ▶ **Inquiry**: Discovers the addresses of neighboring Bluetooth devices.
- ▶ **Paging**: Makes a Bluetooth connection to a certain device (address of the device is required).

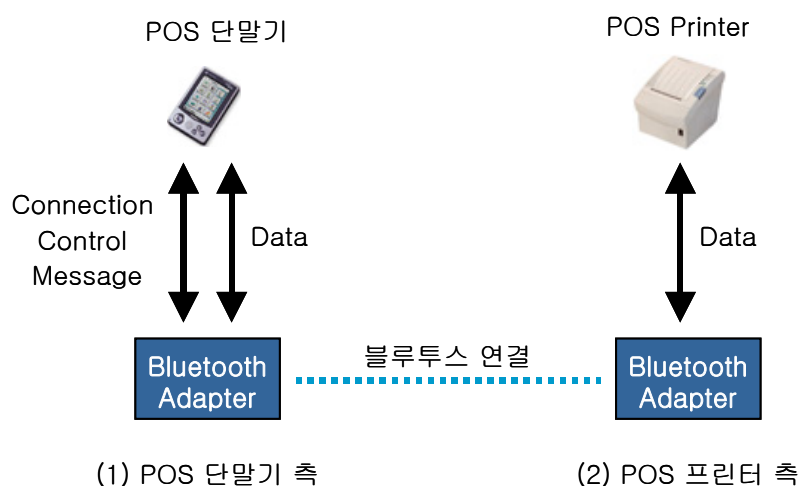
When a Bluetooth device A, is trying to make a Bluetooth connection with another device, B, and already knows B's address, A can skip the inquiry process. On the other hand, if A does not know B's address, A must first perform an **inquiry** to discover B's address before proceeding with **paging**.

Note that the address of the Bluetooth device mentioned here consists of 6 bytes and complies with the IEEE 802.3 standard for address formats (the same address format as that applied to Ethernet card addresses).

2) In a Bluetooth POS system, the POS terminal (Master) always initiates a Bluetooth connection. Therefore, the POS terminal does the **paging**, and performs the **inquiry** to collect the address of the device for paging. Note that the POS printer (Slave) does not perform either of these two steps. (See picture below)



3) Therefore, the POS terminal needs an interface to transmit the Bluetooth connection control messages (such as **inquiry** or **paging** initiation messages to the Bluetooth Master) and another interface to receive the outcome after such messages are processed. On the other hand, the POS printer does not require such Bluetooth connection control interfaces. (See picture below)



4) Your Bluetooth interface designer will determine whether or not to have the POS terminal perform an **inquiry** before **paging**.

However, since some of the components of the POS terminal, such as the ECR, have severely limited user interfaces (UI), you may not be able to display the device addresses (collected as a result of the inquiry) and have the user choose address to connect (**paging**).

To resolve this problem, the following method is used.

- ▶ You must define and save the **<Printer ID = Bluetooth address of the printer>** relationship data in the Bluetooth Master of the POS terminal beforehand.
- ▶ The POS terminal transmits the ID of the printer to connect to the Bluetooth Master.
- ▶ The Bluetooth Master of the POS terminal discovers the Bluetooth address of the printer from the printer ID received and proceeds with **paging**.

In other words, this method skips the inquiry process because the Bluetooth Master does not actively seek and collect the Bluetooth address data of the printer. However, the **<Printer ID = Bluetooth address of the printer>** relationship data must be stored in flash memory within the MCU of the Bluetooth Master of the POS terminal beforehand. Therefore, to manage and control the relationship data, you need additional control messages. These additional control messages are described in detail in the next chapter.

2. Types of Bluetooth Master Control Messages

As previously mentioned, the POS terminal transmits special control messages to the Bluetooth Master to control and manage the Bluetooth connections. In addition, the POS terminal uses different commands for different functions, such as setting the movement parameters for the Bluetooth Master, checking its status and registering the printer ID. Control Messages carry these control commands, which are defined as shown in the picture below. (Note: The following message format applies only when a control message is sent and therefore does not apply to the regular data transmission. In a regular data transmission, the data is transmitted unchanged, in the form of stream data.)

0	1	2	3	4	5	...
ESC	DC2	'B'	'T'	Msg Type	Para Length	Message Parameters

Each control message field has the following meaning:

- 1) The first **4 bytes** in a control message form a text string pattern indicating the beginning of the message.
(ESC = 0x1B, DC2 = 0x12, 'B' = 0x42, 'T' = 0x54)

- 2) The “control message type (Msg Type)” field indicates the type of the control message. Various types of control messages and their corresponding codes are given in the following table: (Note that in the table below, “Direction” indicates the direction in which a message is transmitted; “T” represents the POS terminal (PC); “B” represents the Bluetooth Master.)

Category	Message Type	Code	Direction	Description
Reset	Reset	0x01	T → B	A request to initialize the Master.
Bluetooth Connection	Connect Request	0x02	T → B	A request to make a Bluetooth connection (paging)
	Connect Result	0x03	T ← B	A response to the Bluetooth connection
	Disconnect Request	0x04	T → B	A request to terminate the Bluetooth connection
	Disconnect Result	0x05	T ← B	A response to the termination of the Bluetooth connection
Bluetooth Device Discovery	Discovery Request	0x06	T → B	Bluetooth device search (inquiry)
	Discovery Result	0x07	T ← B	A response to the Bluetooth device search (inquiry)
Adapter Information	Read BD_ADDR	0x08	T → B	Reads the Master Bluetooth address
	Report BD_ADDR	0x09	T ← B	Reports the Master Bluetooth address
	Check Status	0x0A	T → B	A request to check the status of the Master
	Report Status	0x0B	T ← B	Reports the status of the Master
Adapter Configuration	Read Config	0x0C	T → B	A request to read the configuration data of the Master
	Read Config Result	0x0D	T ← B	Response to the reading of the configuration data of the Master
	Write Config	0x0E	T → B	A request to write the configuration data belonging to the Master
	Write Config Result	0x0F	T ← B	A response from the writing of the configuration data of the Master
	Read PnInfo	0x10	T → B	A request to read the printer properties
	Read PnInfo Result	0x11	T ← B	A response to the reading of the printer properties
	Write PnInfo	0x12	T → B	A request to write the printer properties
	Write PnInfo Result	0x13	T ← B	A response to the writing of the printer properties

- ▶ In the table above, the message types in the “Adapter Information” row are used to check the address or the current operating status of the Bluetooth Master.
- ▶ The message types in the “Adapter Configuration” row are used to make an **inquiry** or modify the Master configuration data stored in the flash memory of the MCU within the Bluetooth Master. See the message descriptions for more details about the configuration data.

- 3) The “parameter length (Para Length)” field indicates the length (in bytes) of the following Message Parameters field. This field value is “0” when there is no message parameter.
- 4) In the message parameter (Message Parameters) field, the field parameters are listed by control message type. The types and structures of the parameters by message type are described in detail in the next chapter.

3. Control Message Format

3.1. Reset Message (0x01)

This control message initializes the Bluetooth Master. This message can be used on the printer terminal (Bluetooth Slave) as well as on the POS terminal. The message has the following structure:

Reset						
0	1	2	3	4	5	6
ESC	DC2	'B'	'T'	0x01	0x01	Level
0x1B	0x12	0x42	0x54			

The message has the following parameters:

Parameter	Type	Length	Description
Reset Level	UINT8	1 Byte	Sets the level of initialization. 1 = Initializes only the Bluetooth module within the Master. 2 = Initializes the entire Master system.

3.2. Connect Request Message (0x02)

This control message allows the POS terminal to connect to the POS printer. This message can have one of the following two alternative message structures:

Connect Request Message (프린터 ID 로 요청)						
0	1	2	3	4	5	6
ESC	DC2	'B'	'T'	0x02	0x01	ID
0x1B	0x12	0x42	0x54			

Connect Request Message (블루투스 주소로 요청)

0	1	2	3	4	5	6	7	8	9
ESC	DC2	'B'	'T'	0x02	0x07	ID = 0	Add1	Add2	Add3
10	11	12							
Add4	Add5	Add6							

1) This is a request using the printer ID: In this case, the Bluetooth Master of the POS terminal must have a Bluetooth address matching the printer ID received. The parameters required in this case are as follows:

Parameter	Type	Length	Description
Printer ID	UINT8	1 Byte	Printer ID. The value must be a number between 1 and 7.

2) A request using the Bluetooth address: The POS terminal making the request provides the Bluetooth address of the POS printer. The required parameters in this case are as follows:

Parameter	Type	Length	Description
Printer ID	UINT8	1 Byte	The printer ID must be "0."
BT Address	UCHAR[6]	6 Bytes	Bluetooth address (IEEE 802.3 format)

3.3. Connect Result Message (0x03)

The Bluetooth Master generates this message to notify the POS terminal that the Bluetooth Master has attempted to connect to the POS printer via a "Connect Request". "Connect Request" This message can have one of the following two alternative message structures:

Connect Result Message (프린터 ID 로 응답)

0	1	2	3	4	5	6	7
ESC	DC2	'B'	'T'	0x03	0x02	ID	Result
0x1B	0x12	0x42	0x54				

Connect Result Message (블루투스 주소로 응답)

0	1	2	3	4	5	6	7	8	9
ESC	DC2	'B'	'T'	0x03	0x08	ID = 0	Add1	Add2	Add3
10	11	12	13						
Add4	Add5	Add6	Result						

- 1) A response using the printer ID: This is when the "Connect Request" was made using the printer ID. The parameters required in this case are as follows:

Parameter	Type	Length	Description
Printer ID	UINT8	1 Byte	The same printer ID used in the "Connect Request"
Result	BOOL	1 Byte	1 = Success; 0 = Failure.

- 2) A response using the Bluetooth address: This is when the "Connect Request" was made using the Bluetooth address of the printer. The parameters required are as follows:

Parameter	Type	Length	Description
Printer ID	UINT8	1 Byte	The printer ID must be "0."
BT Address	UCHAR[6]	6 Bytes	The same Bluetooth address used in the "Connect Request"
Result	BOOL	1 Byte	1 = Success; 0 = Failure.

3.4. Disconnect Request Message (0x04)

This control message enables the POS terminal to terminate a connection. This message can have one of the following two types of message structure:

Disconnect Request Message (프린터 ID 로 요청)						
0	1	2	3	4	5	6
ESC	DC2	'B'	'T'	0x04	0x01	ID
0x1B	0x12	0x42	0x54			

Disconnect Request Message (블루투스 주소로 요청)									
0	1	2	3	4	5	6	7	8	9
ESC	DC2	'B'	'T'	0x04	0x07	ID = 0	Add1	Add2	Add3
10	11	12							
Add4	Add5	Add6							

- 1) A request using the printer ID: This is after the "Connect Request" used the printer ID to create a connection.
The parameter(s) required are as follows:

Parameter	Type	Length	Description
Printer ID	UINT8	1 Byte	The same printer ID used in the "Connect" request.

- 2) A request using the Bluetooth address: This is after the "Connect Request" I used the Bluetooth address to create a connection.
The parameters required are as follows:

Parameter	Type	Length	Description
Printer ID	UINT8	1 Byte	The printer ID must be "0."
BT Address	UCHAR[6]	6 Bytes	The same Bluetooth address used in the "Connect Request".

3.5. Disconnect Result Message (0x05)

This message enables the Bluetooth Master to terminate a Bluetooth connection to the POS printer upon receiving a “Disconnect Request” from the POS terminal and to notify the POS terminal of the result of the request. The message can have one of the following two types of message structure:

Disconnect Result Message (프린터 ID 로 응답)

0	1	2	3	4	5	6	7
ESC	DC2	'B'	'T'	0x05	0x02	ID	Result
0x1B	0x12	0x42	0x54				

Disconnect Result Message (블루투스 주소로 응답)

0	1	2	3	4	5	6	7	8	9
ESC	DC2	'B'	'T'	0x05	0x08	ID = 0	Add1	Add2	Add3
10	11	12	13						
Add4	Add5	Add6	Result						

- 1) A response using the printer ID: This is when the “Disconnect” request was made using the printer ID. The parameters required in this case are as follows:

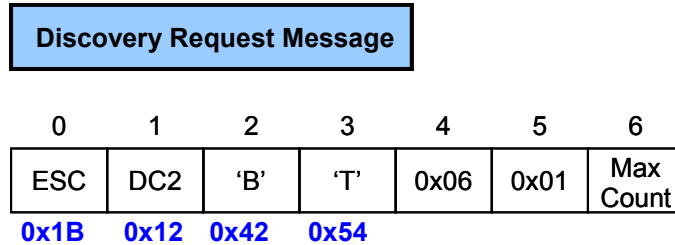
Parameter	Type	Length	Description
Printer ID	UINT8	1 Byte	The same printer ID used in the “Disconnect” request.
Result	BOOL	1 Byte	1 = Success; 0 = Failure.

- 2) A response using the Bluetooth address: This is when the “Disconnect” request was made using the Bluetooth address of the printer. The parameters required are as follows:

Parameter	Type	Length	Description
Printer ID	UINT8	1 Byte	The printer ID must be “0.”
BT Address	UCHAR[6]	6 Bytes	The same Bluetooth address used in the “Disconnect” request.
Result	BOOL	1 Byte	1 = Success; 0 = Failure.

3.6. Discovery Request Message (0x06)

This control message enables the Bluetooth Master to find a Bluetooth POS printer in the vicinity of the POS terminal. When the Bluetooth Master receives such message, it performs the Bluetooth inquiry process to collect the addresses of the Bluetooth devices in the vicinity.



The message has the following parameters:

Parameter	Type	Length	Description
Max Count	UINT8	1 Byte	Designates the maximum number of devices to search. If set to "0", the Bluetooth Master finds as many devices as possible within the maximum search period. The maximum number of devices that can be searched is 7. Note that the maximum search period is 10.24 seconds.

3.7. Discovery Result Message (0x07)

This message is a result of “Discovery” request from the POS terminal. This message notifies the POS terminal that the Bluetooth Master has collected the Bluetooth addresses of the printers in the vicinity. The Bluetooth Master’s response to the “Discovery” request is as follows:

1. The Bluetooth Master performs an inquiry to collect the addresses of the Bluetooth devices in the vicinity. However, since there can be other Bluetooth devices in the vicinity that are not printers, it first connects to each device to see if the device provides printing service in compliance with the HCRP (Hardcopy Cable Replacement Profile).
2. The Bluetooth Master then selects only the addresses of the devices providing the HCRP service and sends out a “Discovery Result” message to the POS terminal. The message has the following structure:

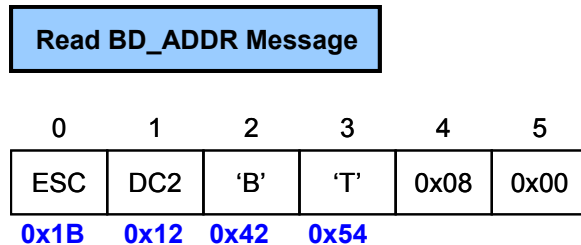
Discovery Result Message									
0	1	2	3	4	5	6	7	8	9
ESC	DC2	'B'	'T'	0x07	35*n+1	n	Add1	Add2	Add3
10	11	12	13	14	15	16	17	18	19
Add4	Add5	Add6	Name1	Name2	Name3	Name4	Name5	Name6	Name7
20	21	22	23	24	25	26	27	28	29
Name8	Name9	Name10	Name11	Name12	Name13	Name14	Name15	Name16	Loc1
30	31	32	33	34	35	36	37	38	39
Loc2	Loc3	Loc4	Loc5	Loc6	Loc7	Loc8	Loc9	Loc10	Loc11
40	41	...							
Loc12	Loc13								

The message has the following parameters:

Parameter	Type	Length	Description
n	UINT8	1 Byte	Number of Bluetooth printers discovered (Max. number 7).
BT Address	UCHAR[6]	6 Bytes	Bluetooth addresses of the Bluetooth printers discovered.
Device Name	CHAR[16]	16 Bytes	Device name of the printer. NULL (=0) terminated character.
Device Location	CHAR[13]	13 Bytes	Installation location of the printer. NULL terminated (=0) character.

3.8. Read BD_ADDR Message (0x08)

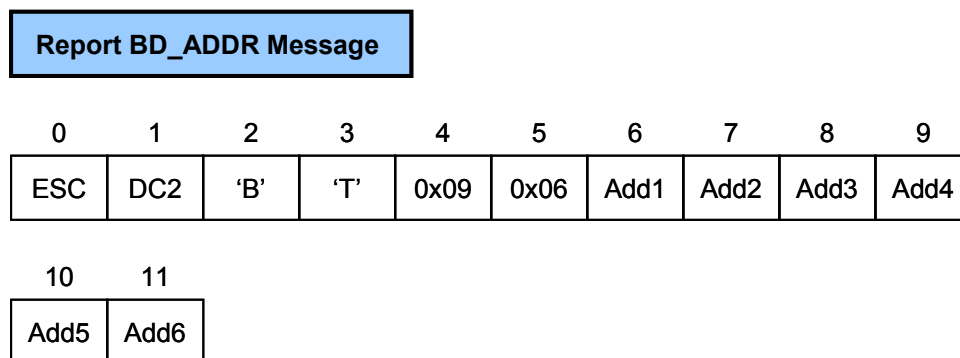
This control message enables the POS terminal to read the Bluetooth address (BD_ADDR) of the Bluetooth Master. A Bluetooth address consists of six bytes and follows the IEEE 802.3 standard address formats. The message has the following structure:



This message does not require any parameter.

3.9. Report BD_ADDR Message (0x09)

This control message enables the Bluetooth Master to report its Bluetooth address (BD_ADDR) upon receiving a "Read BD_ADDR" request. A Bluetooth address consists of six bytes and follows the IEEE 802.3 address format. The message has the following structure:



The message has the following parameters:

Parameter	Type	Length	Description
BT Address	UCHAR[6]	6 Bytes	Bluetooth address of the Master.

3.10. Check Status Message (0x0A)

The POS terminal uses this message to check if its Bluetooth Master is in normal operating condition. Since the Bluetooth Master takes several hundred milliseconds to initialize its hardware and software, there is a possibility of an error if a command is given to the Bluetooth Master before initialization is complete. Therefore, it is necessary to first check the operating status of the Master through a "Check Status" message. If the situation allows sufficient time after the power is turned on and before a command is given to the Bluetooth master, there is no need to check the operating status using such a control message. The message has the following structure:

Check Status Message					
0	1	2	3	4	5
ESC	DC2	'B'	'T'	0x0A	0x00
0x1B	0x12	0x42	0x54		

This message does not require any parameter.

3.11. Report Status Message (0x0B)

The Bluetooth Master uses this message to notify the POS terminal of its operating status upon receiving a "Check Status" request from the POS terminal. The POS terminal can check the operating status of the Bluetooth Master by sending a "Check Status" message and receiving this "Report Status" message in return. The message has the following structure:

Report Status Message						
0	1	2	3	4	5	6
ESC	DC2	'B'	'T'	0x0B	0x01	Status
0x1B	0x12	0x42	0x54			

The message has the following parameters:

Parameter	Type	Length	Description
Status	UINT8	1 Byte	Operating status of the Bluetooth Master. 1 = Normal operating status. 0 = Abnormal operating status.

3.12. Read Config Message (0x0C)

The POS terminal sends this control message to read the configuration data stored in the flash memory of the MCU within the Bluetooth Master. You can apply this on the POS printer (Slave) as well as on the POS terminal. Currently, the configuration data stored in the flash memory of the MCU includes: Role, Baud rate, Flow Control Option, Device Name Auto Detect Flag, Device Name, and Device Location. See next page for descriptions of these terms. The message has the following structure:

Read Config Message					
0	1	2	3	4	5
ESC	DC2	'B'	'T'	0x0C	0x00
0x1B	0x12	0x42	0x54		

This message does not require any parameter.

3.13. Read Config Result Message (0x0D)

The Bluetooth Master uses this message to send the configuration data stored in the flash memory of its MCU to the POS terminal (or the POS printer) upon receiving a “Read Config” request from the POS terminal (or the POS printer). The configuration data includes: Role, Baud rate, Flow Control Option, Device Name Auto Detect Flag, Device Name and Device Location. The message has the following structure:

Read Config Result Message									
0	1	2	3	4	5	6	7	8	9
ESC	DC2	'B'	'T'	0x0D	0x23	Role	Auto Connect	Wait ForAll	Baud
10	11	12	13	14	15	16	17	18	19
Flow Control	Auto Detect	Name1	Name2	Name3	Name4	Name5	Name6	Name7	Name8
20	21	22	23	24	25	26	27	28	29
Name9	Name10	Name11	Name12	Name13	Name14	Name15	Name16	Loc1	Loc2
30	31	32	33	34	35	36	37	38	39
Loc3	Loc4	Loc5	Loc6	Loc7	Loc8	Loc9	Loc10	Loc11	Loc12
40	Loc13								

The message has the following parameters:

Parameter	Type	Length	Description
Role	UINT8	1 Byte	Chooses the role of the Bluetooth. (0 = Slave; 1 = Master)
AutoConnect	BOOL	1 Byte	Designates whether to connect automatically to the registered Bluetooth printer when the power is turned on. Available only when the Bluetooth is designated as the Master (of the POS terminal). (0 = Automatic connection disabled, 1 = Automatic connection enabled)
WaitForAll	BOOL	1 Byte	Available only when the AutoConnect flag is set to “1.” Used to designate the output mode for an auto-created 1:n connection. 0: Output continues to the rest of the printers even when some of the n connections have been terminated. 1: Output continues to the printers only when all n number of connections are maintained (stands by until all printers are connected).
Baudrate	UINT8	1 Byte	Communication speed between the Master and the host. (0 = 1200, 1 = 2400, 2 = 4800, 3 = 9600, 4 = 19200 , 5 = 38400, 6 = 57600, 7 = 115200, default = 4)
FlowControl	UINT8	1 Byte	Flow control between the Master and the host. (0 = None; 1 = Hardware (RTS/CTS); 2 = Software (Xon/Xoff); and default = 1)
AutoDetect	BOOL	1 Byte	Automatically detects the device name. (1 = ON; 0 = OFF)
DeviceName	CHAR[16]	16 Bytes	Device name text string. NULL terminated (=0) character.
DeviceLocation	CHAR[13]	13 Bytes	Installation location text string. NULL terminated (=0) character.

3.14. Write Config Message (0x0E)

This control message modifies the configuration data stored in the flash memory of the MCU within the Bluetooth Master. This message can be used on the POS printer (Slave) as well as on the POS terminal. The configuration data includes: Role, Baud rate, Flow Control Option, Device Name Auto Detect Flag, Device Name, and Device Location. The message has the following structure:

Write Config Message									
0	1	2	3	4	5	6	7	8	9
ESC	DC2	'B'	'T'	0x0E	0x23	Role	Auto Connect	Wait ForAll	Baud
10	11	12	13	14	15	16	17	18	19
Flow Control	Auto Detect	Name1	Name2	Name3	Name4	Name5	Name6	Name7	Name8
20	21	22	23	24	25	26	27	28	29
Name9	Name10	Name11	Name12	Name13	Name14	Name15	Name16	Loc1	Loc2
30	31	32	33	34	35	36	37	38	39
Loc3	Loc4	Loc5	Loc6	Loc7	Loc8	Loc9	Loc10	Loc11	Loc12
40	Loc13								

The message has the following parameters:

Parameter	Type	Length	Description
Role	UINT8	1 Byte	Chooses the role of the Bluetooth. (0 = Slave; 1 = Master)
AutoConnect	BOOL	1 Byte	Designates whether to connect automatically to the registered Bluetooth printer when the power is turned on. Available only when the Bluetooth is designated as the Master (of the POS terminal). (0 = Automatic connection disabled; 1 = Automatic connection enabled)
WaitForAll	BOOL	1 Byte	Available only when the AutoConnect flag is set to "1." Used to designate the output mode for an auto-created 1:n connection. 0: Output continues to the rest of the printers even when some of the n connections have been terminated. 1: Output continues to the printers only when all n number of connections are maintained (stand by until all printers are connected).
Baudrate	UINT8	1 Byte	Communication speed between the Master and the host. (0 = 1200, 1 = 2400, 2 = 4800, 3 = 9600, 4 = 19200 , 5 = 38400, 6 = 57600, 7 = 115200, default = 4)
FlowControl	UINT8	1 Byte	Flow control between the Master and the host. (0 = None; 1 = Hardware (RTS/CTS); 2 = Software (Xon/Xoff); and default = 1)
AutoDetect	BOOL	1 Byte	Automatically detects the device name. (1 = ON; 0 = OFF)
DeviceName	CHAR[16]	16 Bytes	Device name text string. Ends with a NULL (=0) character.
DeviceLocation	CHAR[13]	13 Bytes	Installation location text string. Ends with a NULL (=0) character.

3.15. Write Config Result Message (0x0F)

The Bluetooth Master sends this message to the POS terminal to indicate the result (success or failure) of a Write Config message (refer to the previous section), which saves the modified Bluetooth Master's configuration data. The configuration data includes: Role, Baud rate, Flow Control Option, Device Name Auto Detect Flag, Device Name and Device Location. The message has the following structure:

Write Config Result Message						
0	1	2	3	4	5	6
ESC	DC2	'B'	'T'	0x0F	0x01	Result
0x1B	0x12	0x42	0x54			

The message has the following parameters:

Parameter	Type	Length	Description
Result	BOOL	1 Byte	1 = Success; 0 = Failure.

3.16. Read PrnInfo Message (0x10)

The POS terminal uses this control message to read the printer properties stored in the flash memory within the MCU of the Bluetooth Master. The printer properties include: relationship data such as **<Printer ID = Bluetooth address of the printer>**, device name, and installation location. The message has the following structure:

Read PrnInfo Message					
0	1	2	3	4	5
ESC	DC2	'B'	'T'	0x10	0x00
0x1B	0x12	0x42	0x54		

This message does not require any parameter.

3.17. Read PrnInfo Result Message (0x11)

Bluetooth Master uses this control message to notify the POS terminal of the printer properties stored in the flash memory within its MCU at the “Read PrnInfo” request from the POS terminal. The printer properties include: relationship data such as **<Printer ID = Bluetooth address of the printer>**, device name, and installation location. The message has the following structure:

Read PrnInfo Result Message									
0	1	2	3	4	5	6	7	8	9
ESC	DC2	'B'	'T'	0x11	36*n+1	n	ID	Add1	Add2
10	11	12	13	14	15	16	17	18	19
Add3	Add4	Add5	Add6	Name1	Name2	Name3	Name4	Name5	Name6
20	21	22	23	24	25	26	27	28	29
Name7	Name8	Name9	Name10	Name11	Name12	Name13	Name14	Name15	Name16
30	31	32	33	34	35	36	37	38	39
Loc1	Loc2	Loc3	Loc4	Loc5	Loc6	Loc7	Loc8	Loc9	Loc10
40	41	42	...						
Loc11	Loc12	Loc13							

The message has the following parameters:

Parameter	Type	Length	Description
n	UINT8	1 Byte	Number of printer properties (Max. number 7).
Printer ID	UINT8	1 Byte	Printer ID. Value must be a number between 1 and 7.
BT Address	UCHAR[6]	6 Bytes	The Bluetooth address of the Bluetooth printer.
DeviceName	CHAR[16]	16 Bytes	Device name text string. NULL terminated (=0) character.
DeviceLocation	CHAR[13]	13 Bytes	Installation location text string. NULL terminated (=0) character.

3.18. Write PrnInfo Message (0x12)

The POS terminal uses this control message to modify the printer properties stored in the flash memory within the MCU of the Bluetooth Master. The printer properties include: relationship data such as **<Printer ID = Bluetooth address of the printer>**, device name, and installation location. The message has the following structure:

Write PrnInfo Message									
0	1	2	3	4	5	6	7	8	9
ESC	DC2	'B'	'T'	0x12	36*n+2	Flash Update	n	ID	Add1
10	11	12	13	14	15	16	17	18	19
Add2	Add3	Add4	Add5	Add6	Name1	Name2	Name3	Name4	Name5
20	21	22	23	24	25	26	27	28	29
Name6	Name7	Name8	Name9	Name10	Name11	Name12	Name13	Name14	Name15
30	31	32	33	34	35	36	37	38	39
Name16	Loc1	Loc2	Loc3	Loc4	Loc5	Loc6	Loc7	Loc8	Loc9
40	41	42	43	...					
Loc10	Loc11	Loc12	Loc13						

The message has the following parameters:

Parameter	Type	Length	Description
Flash Update	BOOL	1 Byte	1 = Renew properties in the flash memory. 0 = Renew properties only in the RAM. (Data becomes lost when the system is rebooted.)
n	UINT8	1 Byte	Number of printer properties (Max. number 7).
Printer ID	UINT8	1 Byte	Printer ID. Value must be a number between 1 and 7 to be valid.
BT Address	UCHAR[6]	6 Bytes	The Bluetooth address of the Bluetooth printer.
DeviceName	CHAR[16]	16 Bytes	Device name text string. Ends with a NULL (=0) character.
DeviceLocation	CHAR[13]	13 Bytes	Installation location text string. Ends with a NULL (=0) character.

3.19. Write PrnInfo Result Message (0x13)

The Bluetooth Master uses this control message to save the modified printer properties in the flash memory within its MCU and notify the POS terminal of the result at the "Write PrnInfo" request from the POS terminal. The printer properties include: relationship data such as **<Printer ID = Bluetooth address of the printer>**, device name, and installation location. The message has the following structure:

Write PrnInfo Result Message						
0	1	2	3	4	5	6
ESC	DC2	'B'	'T'	0x13	0x01	Result
0x1B	0x12	0x42	0x54			

The message has the following parameter(s):

Parameter	Type	Length	Description
Result	BOOL	1 Byte	1 = Success; 0 = Failure.

4. An Example Of A Host Software Modification

Previously POS terminals and printers were built on the physical cable connections instead of the Bluetooth connections. Therefore, it may be necessary to modify the host software programs on the POS terminal or the POS printer in order to replace the existing connection mechanism with the one based on the Bluetooth technology. Refer to the paragraphs below for brief descriptions of the required modifications.

4.1. POS Printer (Bluetooth Slave) Side

Only the POS terminal (Master) can create and terminate connections using the Bluetooth control messages, which cannot be used on the Bluetooth Slave attached to the POS printer. Therefore, from the POS printer's point of view, the replacement of the previous physical cable connections with the Bluetooth connections does not make any difference. In short, there is no need to make any changes to the software programs on the POS printer side.

4.2. POS Terminal (Bluetooth Master) Side

On the POS terminal side, you must use control messages (described in Chapter 3) to manage all communication with the Bluetooth Master, Bluetooth connections and the printer properties. However, specifically managing the communications of the printer properties does not necessarily require a POS terminal and can be done using a software application on a regular PC. Therefore, you should focus on the management of the Bluetooth connections.

In the following, the printing function of the ECR device is used as an example to show you how to modify the host software program. The parts requiring modification (or an addition) are underlined. A detailed user scenario is as follows:

“Send the receipt to printer No. 2.”

- 1) The ECR terminal operator presses the **“Print to printer No.2”** button.
- 2) The ECR terminal sends the **“Connect Request”** message to its Bluetooth Master to create a connection. Here, the printer ID (=2) is used to designate the printer to which to print.
- 3) The ECR terminal waits until it receives the **“Connect Result”** message from the Bluetooth Master. When the “Connect Result” message arrives, it reviews the “Result” parameters and proceeds to the next step if the result is **“Success.”**
- 4) The ECR terminal **prints the receipt to the printer.** The printer No. 2 prints out the receipt.
- 5) The ECR terminal sends the **“Disconnect Request”** message to its Bluetooth Master to terminate the Bluetooth connection. Here, the printer ID (=2) is used to designate the printer to which to terminate the connection.
- 6) The ECR terminal waits until it receives the **“Disconnect Result”** message from the Bluetooth Master.
- 7) Upon receiving the “Disconnect Result” message, the terminal **returns to its main routine** regardless of the result parameters. The ECR terminal continues to carry out its main routine.