MM Version
Reader Control Protocol
User Manual

Version Control

Date	Version	Content
2019-04-28	V1.0	Initial version
2019-11-16	V1.1	Update some commands
2020-06-17	V1.2	Update Multi antenna commands

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1. Introduction

Communications protocol definition

Support RS232/ RS485;

The mode of information transmission is asynchronous ， date bits: 8 ， stop bits: 1 ， no checksum。
Rate of data transmission: 57.6kb/s;

The monitoring unit (SU) and device control module (SM) communication mainly from the way, the monitoring unit for the host computer, slave computer monitoring module. SU call SM and issue the command, SM receives the command returns response information. SU 500ms is not receiving a SM response or receiving response information error, think of the communication process to fail.

Supervision Unit (SU): like PC or control device;
Supervisory Module (SM): Reader;

Note: Communication data is HEX; **Denotation Method xxH;**

2. Data's type and the basic format of protocols

2.1. Data's Type

Two types:

- Command: SU to SM;
- Response: SM to SU;

2.2. Basic format of protocol

Table 2-1 basic format of protocols

No.	1	2	3	4	5	6	7
byte	1	2	1	1	1	LENGTH	1
format	SOI	ADR	CID1	CID2	LENGTH	INFO	CHKSUM

Table 2-2 basic format of notes

No.	Symbol	significance	Remarks
1	SOI	START OF INFORMATION	Command(7CH) Response(CCH)
2	ADR	Equip address（1～65534）,(65535 public address,0 reserve address)	FFFFH
3	CID1	Control identification code (data type description)	
4	CID2	Command: control identification code (action type description) Response: RTN（Return code Table 2-3）	
5	LENGTH	INFO Data Length	
6	INFO	Command: Command information Response: Response data information	
7	CHKSUM	The checksum code	

Table 2-3 Return code RTN

No.	RTN Value(HEX)	significance	Remarks
1	00H	Succeed	
2	01H	Fail	
	02H	Response massage for Command	
3	05H	Auto send to SU	

2.3. Data Format

CHKSUM data format:

- **CHKSUM Introduction**

The calculation of CHKSUM is in addition to CHKSUM, other characters in 16 hex code values of cumulative sum, the result modulo 256 remainder taking anti - plus 1.

For example：Receive or send data is：“CC 02 01 B1 22 04 BB 12 02 03 88”. The last byte “88” is CHKSUM.

Calculate as follows：

‘CC’＋‘02’＋‘01’＋…＋‘22’＋‘04’＋‘BB’＋‘12’ ＋‘02’＋‘03’

= CCH + 02H + 01H + … + 22H + 04H + BBH + 12H + 02H + 03H

= 0278H

0278H mode 256 and the remainder is 78H, 78H anti plus 1 is 88H.

- **CHKSUM Calculate refers:**

```
unsigned char    Checksum ( unsigned char *uBuff, unsigned char uBuffLen)
{
    unsigned char i, uSum =0;
    for(i=0; i<uBuffLen; i++)
    {
        uSum = uSum + uBuff[i];
    }
    uSum = (~uSum) + 1;
    return uSum;
}
```

3. Code Table

CID1、CID2 Code Distribution and Classification as follows :

Table 3-1 Command code Classification (SENIOR CID1)

No.	Content	CID1	Remark
1	Read Type C UII	20H	
2	Read Type C Tag Data	21H	
3	Write Type C Tag Data	22H	
4	Lock Type C Tag	26H	
5	Kill/Recom Type C Tag	28H	
6	Encrypted Type C Tag	2AH	
7	Get Access EPC MATCH	2CH	
8	Set Access EPC MATCH	2DH	
9	Get Tx Power Level	50H	
10	Set Tx Power Level	51H	
11	Get Region	52H	
12	Set Region	53H	
13	Get current RF Channel	54H	
14	Set current RF Channel	55H	
15	Get Frequency Hopping Table *	56H	
16	Set Frequency Hopping Table *	57H	
17	Get Modulation *	58H	
18	Set Modulation *	59H	
19	Get Frequency Hopping status	5AH	
20	Set Frequency Hopping status	5BH	
21	Base Parameter	81H	
22	Antenna configuration *	83H	
23	Encryption method for Tag	84H	
24	Protocol Address	85H	
25	UART Baud rate *	86H	
26	Output Mode *	87H	
27	Reset System	D0H	
28	Update Registry	D2H	
29	Erase Registry	D3H	
30	Get GPIO Mode *	D6H	
31	Set GPIO Mode *	D7H	
32			

Table 3-2 Command action Classification (CID2)

No.	Content	CID2	Remarks
1	Senior command	00H	
2	Set command	31H	
3	Get command	32H	

4. Communication Protocol

For the use of this protocol in the protocol code as follows.

Table 4-1 protocol code

No.	Content	CID1	CID2	Remarks
1	Read Type C UII	20H	00H	
2	Read Type C Tag Data	21H	00H	
3	Write Type C Tag Data	22H	00H	
4	Lock Type C Tag	26H	00H	
5	Kill/Recom Type C Tag	28H	00H	
6	Encrypted Type C Tag	2AH	00H	
7	Get Access EPC MATCH	2CH	00H	
8	Set Access EPC MATCH	2DH	00H	
9	Get Tx Power Level	50H	00H	
10	Set Tx Power Level	51H	00H	
11	Get Region	52H	00H	
12	Set Region	53H	00H	
13	Get current RF Channel	54H	00H	
14	Set current RF Channel	55H	00H	
15	Get Frequency Hopping Table *	56H	00H	
16	Set Frequency Hopping Table *	57H	00H	
17	Get Modulation *	58H	00H	
18	Set Modulation *	59H	00H	
19	Get Frequency Hopping status	5AH	00H	
20	Set Frequency Hopping status	5BH	00H	
21	Get Base Parameters	81H	32H	
22	Set Base Parameters	81H	31H	
23	Get Antenna configuration *	83H	32H	
24	Set Antenna configuration *	83H	31H	
25	Get Encryption method for Tag	84H	32H	
26	Set Encryption method for Tag	84H	31H	
27	Get Protocol Address	85H	32H	
28	Set Protocol Address	85H	31H	
29	Get UART Baudrate *	86H	32H	
30	Set UART Baudrate *	86H	31H	
31	Get Output Mode *	87H	32H	
32	Set Output Mode *	87H	31H	
33	Reset System	D0H	00H	
34	Update Registry	D2H	00H	
35	Erase Registry	D3H	00H	
36	Get GPIO Mode *	D6H	00H	

37	Set GPIO Mode *	D7H	00H	

Note: with * command representation is optional command; the reader does not have this feature, if have this feature, should be in accordance with the execution of this agreement. (Hereinafter appearing * place, meaning as described above, not detailed below.)

4.1. Read Type C UII

When the working mode is set to active, this command does not need to be sent, and the reader will automatically read and response,RTN is 05H;

4.1.1. **Command**

CID1: 20H

CID2: 00H

INFO: - None.

Example:

HEAD	ADDR(LSB)	ADDR(MSB)	CID1	CID2	LENGTH	CHECKSUM
7C	FF	FF	20	00	00	0xNN

4.1.2. **Tag Response(When there are multiple tags, the answer returns multiple)**

CID1: 20H

RTN: 02H

INFO: - ANT (8-bit): Ant No.(Def 0x00)

- EPC (variable): Target tag's PC+EPCS
- RSSI (8-bit): RSSI

Example: **ANT=0x00, PC = 0x3000, EPC = 0xE2003411B802011383258566, RSSI=0xC9**

HEAD	ADDR(LSB)	ADDR(MSB)	CID1	RTN	LENGTH	ANT
CC	FF	FF	20	02	10	00
PC (MSB)	**PC (LSB)**	**EPC (MSB)**	**--**	**--**	**--**	**--**
30	00	E2	00	34	11	B8
--	**--**	**--**	**--**	**--**	**--**	**EPC (LSB)**
02	01	13	83	25	85	66
RSSI	**CHECKSUM**					
C9	0xNN					

4.1.3. **Response**

CID1: 20H

RTN: 00H

INFO: - ANT (8-bit): Ant No.(Def 0x00)

- STC (8-bit): Send Tag Count
- RTC (8-bit): Read Tag Count

Example: **ANT=0x00, STC = 0x27, RTC=0x27**

HEAD	ADDR(LSB)	ADDR(MSB)	CID1	RTN	LENGTH	ANT

CC	FF	FF	20	02	03	00
STC	**RCT**	**CHECKSUM**				
27	27	0xNN				

4.2. Read Type C Tag Data

This command should be preceded by a match EPC status command (see 4.8)

4.2.1. **Command**

CID1: 21H

CID2: 00H

INFO: - AP (32-bit): Access Password if target memory bank was password protected. Otherwise, set AP filed to 0x00000000.

- MB (8-bit): Target memory bank; RFU (0x00), EPC (0x01), TID (0x02), User (0x03)
- SA (8-bit): Starting Address word pointer (Word)
- DL (8-bit): Data Length (Word Count).

Example: **Access Password = 0x00000000,**

Target memory bank = EPC,

Start Address = 0x02,

Length = 2 word

HEAD	ADDR(LSB)	ADDR(MSB)	CID1	CID2	LENGTH	AP(MSB)
7C	FF	FF	21	00	07	00
--	--	AP(LSB)	MB	SA	DL	CHECKSUM
00	00	00	01	02	02	0xNN

4.2.2. **Response**

CID1: 21H

RTN: 00H

INFO: - ANT (8-bit): Ant No.(Def 0x00)

- EPC (variable): Target tag's PC+EPC
- DT(variable): Tag memory contents

Example 如: **ANT=0x00,**

PC = 0x3000,

EPC = 0xE2003411B802011383258566,

DT=0x E2003411

HEAD	ADDR(LSB)	ADDR(MSB)	CID1	RTN	LENGTH	ANT
CC	FF	FF	21	00	13	00
PC (MSB)	PC (LSB)	EPC (MSB)	--	--	--	--
30	00	E2	00	34	11	B8
--	--	--	--	--	--	EPC (LSB)
02	01	13	83	25	85	66
DT (MSB)	--	--	DT (LSB)	CHECKSUM		
E2	00	34	11	0xNN		

4.3. Write Type C Tag Data

This command should be preceded by a match EPC status command (see 4.8).

4.3.1. **Command**

CID1: 22H

CID2: 00H

INFO: - AP (32-bit): Access Password if target memory bank was password protected. Otherwise, set AP filed to 0x00000000.

- MB (8-bit): Target memory bank; RFU (0x00), EPC (0x01), TID (0x02), User (0x03)
- SA (8-bit): Starting Address word pointer (Word)
- DL (8-bit): Data Length (Word Count).
- DT (variable): Data to write.

Example: **Access Password = 0x00000000,**

Target memory bank = EPC,

Start Address = 0x02,

Data Length = 2 word,

Data to write = 0x12345678

HEAD	ADDR(LSB)	ADDR(MSB)	CID1	CID2	LENGTH	AP(MSB)
7C	FF	FF	22	00	0B	00
--	--	AP(LSB)	MB	SA	DL	DT(MSB)
00	00	00	01	02	02	12
--	--	DT(LSB)	CHECKSUM			
34	56	78	0xNN			

4.3.2. **Response**

CID1: 22H

RTN: 00H

INFO: - ANT (8-bit): Ant No.(Def 0x00)

- EPC (variable): Target tag's PC+EPC

Example: **ANT=0x00,**

PC = 0x3000,

EPC = 0xE2003411B802011383258566

HEAD	ADDR(LSB)	ADDR(MSB)	CID1	RTN	LENGTH	ANT
CC	FF	FF	22	00	0F	00
PC (MSB)	PC (LSB)	EPC (MSB)	--	--	--	--
30	00	E2	00	34	11	B8
--	--	--	--	--	--	EPC (LSB)
02	01	13	83	25	85	66
CHECKSUM						
0xNN						

4.4. Lock Type C Tag

This command should be preceded by a match EPC status command (see 4.8).

4.4.1. **Command**

CID1: 26H

CID2: 00H

INFO: - AP (32-bit): Access Password if target memory bank was password protected. Otherwise, set AP filed to 0x00000000.

- LD (24-bit): Lock Data.

The high 4 bits of lock operation parameter LD are reserved bits, and the remaining 20 bits are lock operation payload, including mask and action, 10 bits from high to low. For details, please refer to section 6.3.2.11.3.5 of EPC Gen2 protocol version 1.2.0.

Mask is a mask. Only actions with mask bit 1 are valid. Actions in each data area have 2 bits, 00-11, which correspond to opening, permanent opening, locking and permanent locking.

For example, if the kill mask is 2bits 00, the kill action will not take effect regardless of the kill action. When the kill mask is 2bits 10 and the kill action is 2bits 10, it means that the kill password is locked (not perma lock). Only through a valid access password can it be read and written.

The meaning of each bit of mask and action is shown in the table below.

Lock-Command Payload

19	18	17	16	15	14	13	12	11	10	9	8	7	6	5	4	3	2	1	0
Kill Mask		Access Mask		EPC Mask		TID Mask		User Mask		Kill Action		Access Action		EPC Action		TID Action		User Action	

Masks and Associated Action Fields

	Kill pwd		Access pwd		EPC memory		TID memory		User memory	
	19	18	17	16	15	14	13	12	11	10
Mask	skip/ write	skip/ write	skip/ write	skip/ write	skip/ write	skip/ write	skip/ write	skip/ write	skip/ write	skip/ write
	9	8	7	6	5	4	3	2	1	0
Action	pwd read/ write	perma lock	pwd read/ write	perma lock	pwd write	perma lock	pwd write	perma lock	pwd write	perma lock

pwd-write	permalock	Description
0	0	Associated memory bank is writeable from either the **open** or **secured** states.
0	1	Associated memory bank is permanently writeable from either the **open** or **secured** states and may never be locked.
1	0	Associated memory bank is writeable from the **secured** state but not from the **open** state.
1	1	Associated memory bank is not writeable from any state.
pwd-read/write	**permalock**	**Description**
0	0	Associated password location is readable and writeable from either the **open** or **secured** states.
0	1	Associated password location is permanently readable and writeable from either the **open** or **secured** states and may never be locked.
1	0	Associated password location is readable and writeable from the **secured** state but not from the **open** state.
1	1	Associated password location is not readable or writeable from any state.

Example: If you need lock Access Password，then:

Access Password = 0x0000FFFF,

LD = 0x020080

HEAD	ADDR(LSB)	ADDR(MSB)	CID1	CID2	LENGTH	AP(MSB)
7C	FF	FF	26	00	07	00
--	--	AP(LSB)	LD(MSB)	--	LD(LSB)	CHECKSUM
00	FF	FF	02	00	80	0xNN

4.4.2. **Response**

CID1: 26H

RTN: 00H

INFO: - ANT (8-bit): Ant No.(Def 0x00)

- EPC (variable): Target tag's PC+EPC
- DT(variable): Tag memory contents

Example: **ANT=0x00,**

PC = 0x3000,

EPC = 0xE2003411B802011383258566

HEAD	ADDR(LSB)	ADDR(MSB)	CID1	RTN	LENGTH	ANT
CC	FF	FF	26	00	0F	00
PC (MSB)	PC (LSB)	EPC (MSB)	--	--	--	--
30	00	E2	00	34	11	B8
--	--	--	--	--	--	EPC (LSB)
02	01	13	83	25	85	66
CHECKSUM						
0xNN						

4.5. Kill Type C Tag

This command should be preceded by a match EPC status command (see 4.8).

4.5.1. **Command**

CID1: 28H

CID2: 00H

INFO: - KP (32-bit): Kill Password. If KP filed set to 0x00000000, 'Kill Type C Tag' command do not work. The target tag ignores it.

- Recom (8-bit): Recommissioning bits.

Example: **Kill Password =0x87654321, Recom = 0x00**

HEAD	ADDR(LSB)	ADDR(MSB)	CID1	CID2	LENGTH	KP(MSB)
7C	FF	FF	28	00	05	87
--	--	KP(LSB)	Recom	CHECKSUM		
65	43	21	00	0xNN		

4.5.2. **Response**

CID1: 28H

RTN: 00H

INFO: - ANT (8-bit): Ant No.(Def 0x00)

- EPC (variable): Target tag's PC+EPC

Example: **ANT=0x00,**

PC = 0x3000,

EPC = 0xE2003411B802011383258566

HEAD	ADDR(LSB)	ADDR(MSB)	CID1	RTN	LENGTH	ANT
CC	FF	FF	28	00	0F	00
PC (MSB)	**PC (LSB)**	**EPC (MSB)**	**--**	**--**	**--**	**--**
30	00	E2	00	34	11	B8
--	**--**	**--**	**--**	**--**	**--**	**EPC (LSB)**
02	01	13	83	25	85	66
CHECKSUM						
0xNN						

4.6. Encrypted Type C Tag

(Limited encryption mode, only valid for the company's production equipment)

Before this instruction, set the label encryption method of the device (see 4.26). Otherwise, the encryption command is invalid.

4.6.1. Command

CID1: 2AH

CID2: 00H

INFO: - AP (32-bit): Access Password if target memory bank was password protected. Otherwise, set AP filed to 0x00000000.

Example: **Access Password = 0x00000000**

HEAD	ADDR(LSB)	ADDR(MSB)	CID1	CID2	LENGTH	AP(MSB)
7C	FF	FF	28	00	04	00
--	**--**	**AP(LSB)**	**CHECKSUM**			
00	00	00	0xNN			

4.6.2. Response

CID1: 2AH

RTN: 00H

INFO: - ANT (8-bit): Ant No.(Def 0x00)

- EPC (variable): Target tag's PC+EPC

Example: **ANT=0x00,**

PC = 0x3000,

EPC = 0xE2003411B802011383258566

HEAD	ADDR(LSB)	ADDR(MSB)	CID1	RTN	LENGTH	ANT
CC	FF	FF	2A	00	0F	00
PC (MSB)	**PC (LSB)**	**EPC (MSB)**	**--**	**--**	**--**	**--**
30	00	E2	00	34	11	B8
--	**--**	**--**	**--**	**--**	**--**	**EPC (LSB)**
02	01	13	83	25	85	66
CHECKSUM						
0xNN						

4.7. Get Access EPC match status

4.7.1. **Command**

CID1: 2CH

CID2: 00H

INFO: -None

Example:

HEAD	ADDR(LSB)	ADDR(MSB)	CID1	CID2	LENGTH	CHECKSUM
7C	FF	FF	2C	00	00	0xNN

4.7.2. **Response**

CID1: 2CH

RTN: 00H

INFO: - MODE (8-bit): Match Mode

0x00,Mismatch

0x01,select tag action

0x02,select tag action,def use this mode

- LEN (8-bit): Mach EPC length
- EPC (variable): Target tag's EPC data

Example1: **MODE=0x00,**

LEN=0x00,

EPC = null,

HEAD	ADDR(LSB)	ADDR(MSB)	CID1	RTN	LENGTH	MODE
CC	FF	FF	2C	00	02	00
LEN	**CHECKSUM**					
00	0xNN					

Example2: **MODE=0x02,**

LEN=0x0C,

EPC = 0xE2003411B802011383258566,

HEAD	ADDR(LSB)	ADDR(MSB)	CID1	RTN	LENGTH	MODE
CC	FF	FF	2C	00	0E	02
LEN	**EPC (MSB)**	**--**	**--**	**--**	**--**	**--**
0C	E2	00	34	11	B8	02
--	**--**	**--**	**--**	**--**	**EPC (LSB)**	**CHECKSUM**
01	13	83	25	85	66	0xNN

4.8. Set Access EPC match status

4.8.1. **Command**

CID1: 2DH

CID2: 00H

INFO: - MODE (8-bit): match mode

0x00,Cancel current match

0x01,select tag action

0x02,select tag action,def use this mode

- LEN (8-bit): Mach EPC length
- EPC (variable): Target tag's EPC data

Example1: Cancel match

MODE=0x00,

LEN=0x00,

EPC = null,

HEAD	ADDR(LSB)	ADDR(MSB)	CID1	CID2	LENGTH	MODE
7C	FF	FF	2D	00	02	00
LEN	**CHECKSUM**					
00	0xNN					

Example2: Select tag action

MODE=0x02,

LEN=0x0C,

EPC = 0xE2003411B802011383258566,

HEAD	ADDR(LSB)	ADDR(MSB)	CID1	CID2	LENGTH	MODE
7C	FF	FF	2D	00	0E	02
LEN	**EPC (MSB)**	**--**	**--**	**--**	**--**	**--**
0C	E2	00	34	11	B8	02
--	**--**	**--**	**--**	**--**	**EPC (LSB)**	**CHECKSUM**
01	13	83	25	85	66	0xNN

4.8.2. **Response**

CID1: 2DH

RTN: 00H

INFO: - None

Example:

HEAD	ADDR(LSB)	ADDR(MSB)	CID1	RTN	LENGTH	CHECKSUM
CC	FF	FF	2D	00	00	0xNN

4.9. Get Tx Power Level

4.9.1. **Command**

CID1: 50H

CID2: 00H

INFO: - None

Example:

HEAD	ADDR(LSB)	ADDR(MSB)	CID1	CID2	LENGTH	CHECKSUM
7C	FF	FF	50	00	00	0xNN

4.9.2. **Response**

CID1: 50H

RTN: 00H

INFO: - PWR (8-bit): Tx Power Level(15~26 dBm)

Example: **PWR=0x1A,**

HEAD	ADDR(LSB)	ADDR(MSB)	CID1	RTN	LENGTH	PWR
CC	FF	FF	50	00	01	1A
CHECKSUM						
0xNN						

4.10. Set Tx Power Level

The update registry is valid. Otherwise, it is a temporary update.

4.10.1. **Command**

CID1: 51H

CID2: 00H

INFO: - PWR (8-bit): Tx Power Level(15~26 dBm)

Example: **PWR=0x1A,**

HEAD	ADDR(LSB)	ADDR(MSB)	CID1	CID2	LENGTH	PWR
7C	FF	FF	51	00	01	1A
CHECKSUM						
0xNN						

4.10.2. **Response**

CID1: 51H

RTN: 00H

INFO: - None

Example:

HEAD	ADDR(LSB)	ADDR(MSB)	CID1	RTN	LENGTH	CHECKSUM
CC	FF	FF	51	00	00	0xNN

4.11. Get Region

4.11.1. **Command**

CID1: 52H

CID2: 00H

INFO: - None

Example:

HEAD	ADDR(LSB)	ADDR(MSB)	CID1	CID2	LENGTH	CHECKSUM
7C	FF	FF	52	00	00	0xNN

4.11.2. **Response**

CID1: 52H

RTN: 00H

INFO: - Region (8-bit): RF Region

0x01 : China 900M(920.125~924.875MHz),

0x02 : China 800M(840.125~ 844.875MHz),

0x03 : US (902.250~ 926.750MHz),

0x04 : Europe (865.100~ 867.900MHz),

0x05 : Korea (917.100~ 926.900MHz),

Example: **Region=0x01,**

HEAD	ADDR(LSB)	ADDR(MSB)	CID1	RTN	LENGTH	Region
CC	FF	FF	52	00	01	01
CHECKSUM						
0xNN						

4.12. Set Region

The update registry is valid. Otherwise, it is a temporary update.

4.12.1. **Command**

CID1: 53H

CID2: 00H

INFO: - Region (8-bit): RF Region

0x01 : China 900M(920.125~924.875MHz),

0x02 : China 800M(840.125~ 844.875MHz),

0x03 : US (902.250~ 926.750MHz),

0x04 : Europe (865.100~ 867.900MHz),

0x05 : Korea (917.100~ 926.900MHz),

Example: **Region=0x01,**

HEAD	ADDR(LSB)	ADDR(MSB)	CID1	CID2	LENGTH	Region
7C	FF	FF	53	00	01	01
CHECKSUM						
0xNN						

4.12.2. **Response**

CID1: 53H

RTN: 00H

INFO:

- None

Example:

HEAD	ADDR(LSB)	ADDR(MSB)	CID1	RTN	LENGTH	CHECKSUM
CC	FF	FF	53	00	00	0xNN

4.13. Get current RF Channel

4.13.1. **Command**

CID1: 54H

CID2: 00H

INFO: - None

Example:

HEAD	ADDR(LSB)	ADDR(MSB)	CID1	CID2	LENGTH	CHECKSUM
7C	FF	FF	54	00	00	0xNN

4.13.2. **Response**

CID1: 54H

RTN: 00H

INFO: - CH (8-bit): RF Channel

China 900M (0~19), (Freq_CH-920.125M)/0.25M

China 800M (0~19), (Freq_CH-840.125M)/0.25M

US (0~49), (Freq_CH-902.250M)/0.50M

Europe (0~14), (Freq_CH-865.100M)/0.20M

Korea (0~49), (Freq_CH-917.100M)/0.20M

Example: Current working channel 920.250MHz, than **CH=0x01,**

HEAD	ADDR(LSB)	ADDR(MSB)	CID1	RTN	LENGTH	CH
CC	FF	FF	54	00	01	01
CHECKSUM						
0xNN						

4.14. Set current RF Channel

The update registry is valid. Otherwise, it is a temporary update.

4.14.1. **Command**

CID1: 55H

CID2: 00H

INFO: - CH (8-bit): RF Channel

China 900M (0~19), (Freq_CH-920.125M)/0.25M

China 800M (0~19), (Freq_CH-840.125M)/0.25M

US (0~49), (Freq_CH-902.250M)/0.50M

Europe (0~14), (Freq_CH-865.100M)/0.20M

Korea (0~49), (Freq_CH-917.100M)/0.20M

Example: Set Current working channel 920.250MHz,than **CH=0x01,**

HEAD	ADDR(LSB)	ADDR(MSB)	CID1	CID2	LENGTH	CH
7C	FF	FF	55	00	01	01
CHECKSUM						

0xNN						

4.14.2. **Response**

CID1: 55H

RTN: 00H

INFO:

- None

Example:

HEAD	ADDR(LSB)	ADDR(MSB)	CID1	RTN	LENGTH	CHECKSUM
CC	FF	FF	55	00	00	0xNN

4.15. Get Frequency Hopping Table *

4.15.1. **Command**

CID1: 56H

CID2: 00H

INFO: - None

Example:

HEAD	ADDR(LSB)	ADDR(MSB)	CID1	CID2	LENGTH	CHECKSUM
7C	FF	FF	56	00	00	0xNN

4.15.2. **Response**

CID1: 56H

RTN: 00H

INFO: - TS(8-bit): table length (0~50)

- CN (variable): RF channel value

Example: Table Size = 6, channel numbers = 47, 19, 20, 23, 46, 16, then

TS=0x06,CN=0x2F,0x13,0x14,0x17,0x2E,0x10

HEAD	ADDR(LSB)	ADDR(MSB)	CID1	RTN	LENGTH	TS
CC	FF	FF	56	00	07	06
CN0	**CN1**	**CN2**	**CN3**	**CN4**	**CN5**	**CHECKSUM**
2F	13	14	17	2E	10	0xNN

4.16. Set Frequency Hopping Table *

The update registry is valid. Otherwise, it is a temporary update.

4.16.1. **Command**

CID1: 57H

CID2: 00H

INFO: - TS(8-bit): table length (0~50)

- CN (variable): RF channel value

Example: Table Size = 6, channel numbers = 47, 19, 20, 23, 46, 16, than

TS=0x06,CN=0x2F,0x13,0x14,0x17,0x2E,0x10

HEAD	ADDR(LSB)	ADDR(MSB)	CID1	CID2	LENGTH	TS
7C	FF	FF	57	00	07	06
CN0	**CN1**	**CN2**	**CN3**	**CN4**	**CN5**	**CHECKSUM**
2F	13	14	17	2E	10	0xNN

4.16.2. **Response**

CID1: 57H

RTN: 00H

INFO:

- None

Example:

HEAD	ADDR(LSB)	ADDR(MSB)	CID1	RTN	LENGTH	CHECKSUM
CC	FF	FF	57	00	00	0xNN

4.17. Get Modulation

GetCurrent modulation mode. Demodulator parameters include mixer gain, if amplifier gain and signal demodulation threshold.

4.17.1. **Command**

CID1: 58H

CID2: 00H

INFO: - None

Example:

HEAD	ADDR(LSB)	ADDR(MSB)	CID1	CID2	LENGTH	CHECKSUM
7C	FF	FF	58	00	00	0xNN

4.17.2. **Response**

CID1: 58H

RTN: 00H

INFO: - MODE(8-bit): 0x00-high sensitivity,0x01-High-density,0xFF-Custom

- MG (8-bit): Mixer gain

Mixer Gain table

Type	Mixer_G(dB)
0x00	0
0x01	3
0x02	6
0x03	9
0x04	12
0x05	15

- IFG (8-bit): If amplifier gain

IF AMP Gain table

Type	IF_G(dB)
0x00	12
0x01	18
0x02	21
0x03	24
0x04	27
0x05	30
0x06	36
0x07	40

- THRD (16-bit): Signal demodulation threshold

The smaller the signal demodulation threshold is, the lower the RSSI of the demodulable tag is, but the more unstable it is, the lower the threshold is, the less demodulable it is; on the contrary, the larger the threshold is, the greater the RSSI of the demodulable tag is, the closer the distance is, the more stable it is. 0x01b0 is the recommended minimum)

Example:

MODE=0x01,MG=0x01,IFG=0x02,THRD=0x0042

HEAD	ADDR(LSB)	ADDR(MSB)	CID1	RTN	LENGTH	MODE
CC	FF	FF	58	00	05	01
MG	**IFG**	**THRD(MSB)**	**THRD(LSB)**	**CHECKSUM**		
01	02	00	42	0xNN		

4.18. Set Modulation

Set Current modulation mode. Demodulator parameters include mixer gain, if amplifier gain and signal demodulation threshold.

The update registry is valid. Otherwise, it is a temporary update.

4.18.1. **Command**

CID1: 59H

CID2: 00H

INFO: - MODE(8-bit): 0x00-high sensitivity,0x01-High-density,0xFF-Custom

- MG (8-bit): Mixer gain
- IFG (8-bit): If amplifier gain
- THRD (16-bit): Signal demodulation threshold

Example1: Set High-density, than

MODE=0x01,

HEAD	ADDR(LSB)	ADDR(MSB)	CID1	CID2	LENGTH	MODE
7C	FF	FF	59	00	01	01
CHECKSUM						
0xNN						

Example2: Set Custom mode, Mixer gain 9dB,If amplifier gain 36dB,Signal demodulation threshold 0x01B0,than

MODE=0xFF, MG=0x03,IFG=0x06,THRD=0x01B0

HEAD	ADDR(LSB)	ADDR(MSB)	CID1	CID2	LENGTH	MODE
7C	FF	FF	59	00	05	FF
MG	**IFG**	**THRD(MSB)**	**THRD(LSB)**	**CHECKSUM**		
03	06	01	B0	0xNN		

4.18.2. **Response**

CID1: 59H

RTN: 00H

INFO: - None

Example:

HEAD	ADDR(LSB)	ADDR(MSB)	CID1	RTN	LENGTH	CHECKSUM
CC	FF	FF	59	00	00	0xNN

4.19. Get Frequency Hopping status

Get FH state. Auto FH mode or fixed frequency mode.

4.19.1. **Command**

CID1: 5AH

CID2: 00H

INFO: - None

Example:

HEAD	ADDR(LSB)	ADDR(MSB)	CID1	CID2	LENGTH	CHECKSUM
7C	FF	FF	5A	00	00	0xNN

4.19.2. **Response**

CID1: 5AH

RTN: 00H

INFO: - FM (8-bit): Frequency Mode: 0x00 - fixed frequency, 0x01 - Auto FH

Example: FM**=0x01,**

HEAD	ADDR(LSB)	ADDR(MSB)	CID1	RTN	LENGTH	FM
CC	FF	FF	5A	00	01	01
CHECKSUM						
0xNN						

4.20. Set Frequency Hopping status

Set FH state. Auto FH mode or fixed frequency mode.

The update registry is valid. Otherwise, it is a temporary update.

4.20.1. **Command**

CID1: 5BH

CID2: 00H

INFO: - FM (8-bit): Frequency Mode: 0x00 - fixed frequency, 0x01 - Auto FH

Example: FM=**0x01,**

HEAD	ADDR(LSB)	ADDR(MSB)	CID1	CID2	LENGTH	FM
7C	FF	FF	5B	00	01	01
CHECKSUM						
0xNN						

4.20.2. **Response**

CID1: 5BH

RTN: 00H

INFO: - None

Example:

HEAD	ADDR(LSB)	ADDR(MSB)	CID1	RTN	LENGTH	CHECKSUM
CC	FF	FF	5B	00	00	0xNN

4.21. Get Base Parameters

4.21.1. **Command**

CID1: 81H

CID2: 32H

INFO: - None

Example:

HEAD	ADDR(LSB)	ADDR(MSB)	CID1	CID2	LENGTH	CHECKSUM
7C	FF	FF	81	32	00	0xNN

4.21.2. **Response**

CID1: 81H

RTN: 00H

INFO: - OM (8-bit): Output mode, (when the working mode is active, the reader data active output interface)

0x00 - 232(BLE/SPP)

0x01 - 485(USB/HID/WIFI/TCPIP/PDA)

0x02 - WG26

0x03 - WG34

0x04 - WG66

0x05 - WG98 *(not used temporarily)

- WM (8-bit): Working mode,

0x00- Command,

0x01- Active,

0x02- Passive.

- RT (8-bit): Read Type,

0x02-EPC,

0x03-EPC+OTHER DATA. (Valid by active mode)

- RI (8-bit): reading interval, 2~200,unit is 10ms

- RD (8-bit): Read delay,delayed reading after command interaction,0~255,unit is second. (Valid by active mode)

- WG (32-bit): Including (data offset, output period, pulse width, pulse period). (Valid by WG)

Offset (8-bit): (0~14) Byte, Def (0x02)

Interval (8-bit): (0~255) *10ms, Def (0x1E)

Width (8-bit): (0~255) *10us, Def (0x0A)

Period (8-bit): (0~255) *100us, Def (0x0F)

- SI (16-bit): Same ID output interval,(Valid by active mode)

- BZ (8-bit): buzzer enabled; Disabled (0x00) Enabled (0x01),

- UD (112-bit): Additional data for additional send Tags; (Valid by Read Type = 0x03)

AP (32-bit): Access Password if target memory bank was password protected. Otherwise, set AP filed to 0x00000000;

MB (8-bit): Target tag block selection;

0x00 RFU, 0x01 EPC, 0x02 TID, 0x03 User

SA (8-bit): Target tag data address offset (Word)

DL (8-bit): Target tag data length (Word Count).

CT (8-bit): Target tag data capture method.

0x00- EPC+TID,

0x01- TID,

0x02- TID+EPC,

0x03- EPC+TIDKEY.

EL(8-bit): Target tag EPC value length.

KL(8-bit): Target label KEYS value length.

KS(32-bit): Target label KEYS value.

- REV (8-bit): reserve

Note: the red font in information is an extension function, which is not enabled yet. Fill in 0x00 or the default value.

Example:

OM=0x00, WM=0x01, RT=0x02, RI=0x28, RD=0x0A,

Offset = 0x02, Interval=0x1E, Width=0x0A, Period=0x0F,

SI=0x0001, BZ=0x01,

AP =0x00000000, MB=0x02, SA=0x00, DL=0x06,

CT =0x00, EL=0x00, KL=0x00,KS =0x00000000,

REV=0x00,

HEAD	**ADDR(LSB)**	**ADDR(MSB)**	**CID1**	**RTN**	**LENGTH**	**OM**
CC	FF	FF	81	00	1B	01
WM	**RT**	**RI**	**RD**	**Offset**	**Interval**	**Width**
01	02	28	0A	02	1E	0A
Period	**SI(MSB)**	**SI(LSB)**	**BZ**	**AP(MSB)**	**--**	**--**
0F	00	01	01	00	00	00
AP(LSB)	**MB**	**SA**	**DL**	**CT**	**EL**	**KL**
00	02	00	06	00	00	00
KS(MSB)	**--**	**--**	**KS(LSB)**	**REV**	**CHECKSUM**	
00	00	00	00	00	0xNN	

4.22. Set Base Parameters

4.22.1. **Command**

CID1: 81H

CID2: 31H

INFO: - OM (8-bit): Output mode, (when the working mode is active, the reader data active output interface)

0x00 - 232(BLE/SPP)

0x01 - 485(USB/HID/WIFI/TCPIP/PDA)

0x02 - WG26

0x03 - WG34

0x04 - WG66

0x05 - WG98 *(not used temporarily)

- WM (8-bit): Working mode,

0x00- Command,

0x01- Active,

0x02- Passive.

- RT (8-bit): Read Type,

0x02-EPC,

0x03-EPC+OTHER DATA. (Valid by active mode)

- RI (8-bit): reading interval, 2~200,unit is 10ms

- RD (8-bit): Read delay,delayed reading after command interaction,0~255,unit is second. (Valid by active mode)

- WG (32-bit): Including (data offset, output period, pulse width, pulse period). (Valid by WG)

Offset (8-bit): (0~14) Byte, Def (0x02)

Interval (8-bit): (0~255) *10ms, Def (0x1E)

Width (8-bit): (0~255) *10us, Def (0x0A)

Period (8-bit): (0~255) *100us, Def (0x0F)

- SI (16-bit): Same ID output interval,(Valid by active mode)

- BZ (8-bit): buzzer enabled; Disabled (0x00) Enabled (0x01),

- UD (112-bit): Additional data for additional send Tags; (Valid by Read Type = 0x03)

AP (32-bit): Access Password if target memory bank was password protected. Otherwise, set AP filed to 0x00000000;

MB (8-bit): Target tag block selection;

0x00 RFU, 0x01 EPC, 0x02 TID, 0x03 User

SA (8-bit): Target tag data address offset (Word)

DL (8-bit): Target tag data length (Word Count).

CT (8-bit): Target tag data capture method.

0x00- EPC+TID,

0x01- TID,

0x02- TID+EPC,

0x03- EPC+TIDKEY.

EL(8-bit): Target tag EPC value length.

KL(8-bit): Target label KEYS value length.

KS(32-bit): Target label KEYS value.

- REV (8-bit): reserve

Note: the red font in information is an extension function, which is not enabled yet. Fill in 0x00 or the default value.

Example:

OM=0x00, WM=0x01, RT=0x04, RI=0x28, RD=0x0A,
Offset = 0x02, Interval=0x1E, Width=0x0A, Period=0x0F,
SI=0x0001, BZ=0x01,
AP =0x00000000, MB=0x02, SA=0x00, DL=0x06,
CT =0x00, EL=0x00, KL=0x00,KS =0x00000000,
REV=0x00,

HEAD	ADDR(LSB)	ADDR(MSB)	CID1	RTN	LENGTH	OM
7C	FF	FF	81	31	1B	00
WM	**RT**	**RI**	**RD**	**Offset**	**Interval**	**Width**
01	04	28	0A	02	1E	0A
Period	**SI(MSB)**	**SI(LSB)**	**BZ**	**AP(MSB)**	**--**	**--**
0F	00	01	01	00	00	00
AP(LSB)	**MB**	**SA**	**DL**	**CT**	**EL**	**KL**
00	02	00	06	00	00	00
KS(MSB)	**--**	**--**	**KS(LSB)**	**REV**	**CHECKSUM**	
00	00	00	00	00	0xNN	

4.22.2. **Response**

CID1: 5BH

RTN: 00H

INFO: - None

Example:

HEAD	ADDR(LSB)	ADDR(MSB)	CID1	RTN	LENGTH	CHECKSUM
CC	FF	FF	5B	00	00	0xNN

4.23. Get Antenna configuration *

Antenna configuration - multi antenna reader active.

4.23.1. **Command**

CID1: 83H

CID2: 32H

INFO: -None

Example :

HEAD	ADDR(LSB)	ADDR(MSB)	CID1	CID2	LENGTH	CHECKSUM
7C	FF	FF	83	32	00	0xNN

4.23.2. **Response**

CID1: 83H

RTN: 00H

INFO: - CA (8-bit): current ant (1~16)

- EA (16-bit): enabled ant , bit set , for example value is 0x0009,Indicates enable antenna 1 and antenna 4;

Example 1: **CA=0x01,**

EA=0x0009,

HEAD	ADDR(LSB)	ADDR(MSB)	CID1	RTN	LENGTH	CA
CC	FF	FF	83	00	03	01
EA(MSB)	**EA(LSB)**	**CHECKSUM**				
00	09	0xNN				

4.24. Set Antenna configuration *

Antenna configuration - multi antenna reader active.

4.24.1. **Command**

CID1: 83H

CID2: 31H

INFO: - MA (8-bit):

-0x00: Set enabled ant,do not save configuration

-0xFF: Set enabled ant,save configuration

-0x01~0x10: change current ant (Ignore EA)

- EA (16-bit): enabled ant , bit set , for example value is 0x0009,Indicates enable antenna 1 and antenna 4;

Example 1: enabled antenna 1,4,do not save configuration

CA=0x01,

EA=0x0009,

HEAD	ADDR(LSB)	ADDR(MSB)	CID1	CID2	LENGTH	MA
7C	FF	FF	83	31	03	00
EA(MSB)	**EA(LSB)**	**CHECKSUM**				
00	09	0xNN				

Example 2: enabled antenna 1,2,3,4, save configuration

CA=0xff,

EA=0x000f,

HEAD	ADDR(LSB)	ADDR(MSB)	CID1	CID2	LENGTH	MA
7C	FF	FF	83	31	03	FF
EA(MSB)	**EA(LSB)**	**CHECKSUM**				

00	0F	0xNN				

Example 3: Change ant to 1

CA=0x01,

EA=null,

HEAD	ADDR(LSB)	ADDR(MSB)	CID1	CID2	LENGTH	MA
7C	FF	FF	83	31	01	01
CHECKSUM						
0xNN						

4.24.2. **Response**

CID1: 83H

RTN: 00H

INFO: - None

Example :

HEAD	ADDR(LSB)	ADDR(MSB)	CID1	RTN	LENGTH	CHECKSUM
CC	FE	FF	83	00	00	0xNN

4.25. Get Encryption method for Tag

Get tag encryption, pairing encryption or CRC verification encryption.

4.25.1. **Command**

CID1: 84H

CID2: 32H

INFO: - None

Example:

HEAD	ADDR(LSB)	ADDR(MSB)	CID1	CID2	LENGTH	CHECKSUM
7C	FF	FF	84	32	00	0xNN

4.25.2. **Response**

CID1: 84H

RTN: 00H

INFO: - TYPE(8-bit): 0x00-No encryption,0x01-pairing,0x02-CRC

- PM (8-bit): Password high byte,(Pairing encryption is only valid for PM);
- PL (8-bit): Password low byte,(CRC encryption mode PM + PL is effective);

Example: **TYPE=0x01, PM=0x01, PL=0x00,**

HEAD	ADDR(LSB)	ADDR(MSB)	CID1	RTN	LENGTH	TYPE
CC	FE	FF	84	00	03	01
PM	**PL**	**CHECKSUM**				
01	00	0xNN				

4.26. Set Encryption method for Tag

Set tag encryption, pairing encryption or CRC verification encryption.

After set the tag encryption mode, the tags needs to be encrypted (see 4.6), otherwise the card will not be actively identified.

4.26.1. **Command**

CID1: 84H

CID2: 31H

INFO: - TYPE(8-bit): 0x00-No encryption,0x01-pairing,0x02-CRC

- PM (8-bit): Password high byte,(Pairing encryption is only valid for PM);
- PL (8-bit): Password low byte,(CRC encryption mode PM + PL is effective);

Example: **TYPE=0x01, PM=0x01, PL=0x00,**

HEAD	ADDR(LSB)	ADDR(MSB)	CID1	CID2	LENGTH	TYPE
7C	FF	FF	84	31	03	01
PM	**PL**	**CHECKSUM**				
01	00	0xNN				

4.26.2. **Response**

CID1: 84H

RTN: 00H

INFO: - None

Example:

HEAD	ADDR(LSB)	ADDR(MSB)	CID1	RTN	LENGTH	CHECKSUM
CC	FE	FF	84	00	00	0xNN

4.27. Get Protocol Address

Get Current communication address. (when there are multiple readers, this address can be used to distinguish Readers)

4.27.1. **Command**

CID1: 85H

CID2: 32H

INFO: - None

Example:

HEAD	ADDR(LSB)	ADDR(MSB)	CID1	CID2	LENGTH	CHECKSUM
7C	FF	FF	85	32	00	0xNN

4.27.2. **Response**

CID1: 85H

RTN: 00H

INFO: - ADDR(16-bit): protocol address

Example: **ADDR=0xFFFE,**

HEAD	ADDR(LSB)	ADDR(MSB)	CID1	RTN	LENGTH	ADDR(MSB)

CC	FE	FF	85	00	02	FF
ADDR(LSB)	**CHECKSUM**					
FE	0xNN					

4.28. Set Protocol Address

4.28.1. **Command**

CID1: 85H

CID2: 31H

INFO: - ADDR(16-bit): protocol address

Example: **ADDR=0xFFFE,**

HEAD	**ADDR(LSB)**	**ADDR(MSB)**	**CID1**	**CID2**	**LENGTH**	**ADDR(MSB)**
7C	FF	FF	85	31	02	FF
ADDR(LSB)	**CHECKSUM**					
FE	0xNN					

4.28.2. **Response**

CID1: 85H

RTN: 00H

INFO: - None

Example:

HEAD	**ADDR(LSB)**	**ADDR(MSB)**	**CID1**	**RTN**	**LENGTH**	**CHECKSUM**
CC	FE	FF	85	00	00	0xNN

4.29. Get UART Baudrate *

Get UART Baudrate.

4.30. Set UART Baudrate *

Set UART Baudrate.

4.31. Get Output Mode *

Get the output mode of custom data format in the active reading mode.
Working mode is active and effective.

4.31.1. **Command**

CID1: 87H

CID2: 32H

INFO: - None

Example:

HEAD	ADDR(LSB)	ADDR(MSB)	CID1	CID2	LENGTH	CHECKSUM
7C	FF	FF	87	32	00	0xNN

4.31.2. **Response**

CID1: 87H

RTN: 00H

INFO: - EN(8-bit): 0x00-Disabled,0x01-Enabled

- TYPE(8-bit): Output Type. (0~4)

0x00- Decimal ,

0x01- Hex ,

0x02-Wiegand,

0x03-ASCII,

0x04-BAILING

- SL(8-bit): Display the minimum data length. If the data length is less than this value, fill in 0.
- ENTER(8-bit): Whether the last position of the output data brings Carriage return character.
- ST(8-bit): Address offset value of data to be output (byte count).
- DL(8-bit): Length of data to be output (byte count).
- HL(8-bit): Whether to append fixed data length before output data.(0~20)
- HD(160-bit): Add fixed data value (fixed 20 bytes) in front of output data, fill in data according to HL value, default value is 0.
- EL(8-bit): Whether to append fixed data length after output data.(0~20)
- ED(160-bit): Add fixed data value (fixed 20 bytes) after output data, fill in data according to El value, default value is 0.

Example:

EN=0x01, TYPE=0x00, SL=0x08, ENTER=0x01,

ST=0x02, DL=0x03,

HL=0x00, HD=0x00000000000000000000000000000000000000000,

EL=0x00, ED=0x00000000000000000000000000000000000000000,

HEAD	ADDR(LSB)	ADDR(MSB)	CID1	RTN	LENGTH	EN
CC	FF	FF	87	00	30	01
TYPE	**SL**	**ENTER**	**ST**	**DL**	**HL**	**HD(MSB)**
00	08	01	02	03	00	00
--	--	--	--	--	--	--
00	00	00	00	00	00	00
--	--	--	--	--	--	--
00	00	00	00	00	00	00
--	--	--	--	**HD(LSB)**	**EL**	**ED(MSB)**
00	00	00	00	00	00	00
--	--	--	--	--	--	--
00	00	00	00	00	00	00
--	--	--	--	--	--	--
00	00	00	00	00	00	00
--	--	--	--	**ED(LSB)**	**CHECKSUM**	
00	00	00	00	00	0xNN	

4.32. Set Output Mode *

Set the current custom data format output mode.

Working mode is active and effective.

4.32.1. **Command**

CID1: 87H

CID2: 31H

INFO: - EN(8-bit): 0x00-Disabled,0x01-Enabled

- TYPE(8-bit): Output Type. (0~4)

0x00- Decimal ,

0x01- Hex ,

0x02-Wiegand,

0x03-ASCII,

0x04-BAILING

- SL(8-bit): Display the minimum data length. If the data length is less than this value, fill in 0.

- ENTER(8-bit): Whether the last position of the output data brings Carriage return character.

- ST(8-bit): Address offset value of data to be output (byte count).

- DL(8-bit): Length of data to be output (byte count).

- HL(8-bit): Whether to append fixed data length before output data.(0~20)

- HD(160-bit): Add fixed data value (fixed 20 bytes) in front of output data, fill in data according to HL value, default value is 0.

- EL(8-bit): Whether to append fixed data length after output data.(0~20)

- ED(160-bit): Add fixed data value (fixed 20 bytes) after output data, fill in data according to El value, default value is 0.

Example:

EN=0x01, TYPE=0x01, SL=0x08, ENTER=0x01,

ST=0x02, DL=0x03,

HL=0x01, HD=0x02000000000000000000000000000000000000,

EL=0x01, ED=0x03000000000000000000000000000000000000,

HEAD	**ADDR(LSB)**	**ADDR(MSB)**	**CID1**	**RTN**	**LENGTH**	**EN**
7C	FF	FF	87	31	30	01
TYPE	**SL**	**ENTER**	**ST**	**DL**	**HL**	**HD(MSB)**
01	08	01	02	03	01	02
--	--	--	--	--	--	--
00	00	00	00	00	00	00
--	--	--	--	--	--	--
00	00	00	00	00	00	00
--	--	--	--	**HD(LSB)**	**EL**	**ED(MSB)**
00	00	00	00	00	01	03
--	--	--	--	--	--	--
00	00	00	00	00	00	00
--	--	--	--	--	--	--
00	00	00	00	00	00	00

--	--	--	--	ED(LSB)	CHECKSUM	
00	00	00	00	00	0xNN	

4.32.2. **Response**

CID1: 87H

RTN: 00H

INFO: - None

Example:

HEAD	ADDR(LSB)	ADDR(MSB)	CID1	RTN	LENGTH	CHECKSUM
CC	FE	FF	87	00	00	0xNN

4.33. Reset System

Reset System.

4.33.1. **Command**

CID1: D0H

CID2: 00H

INFO: - None

Example:

HEAD	ADDR(LSB)	ADDR(MSB)	CID1	CID2	LENGTH	CHECKSUM
7C	FF	FF	D0	00	00	0xNN

4.33.2. **Response**

CID1: D0H

RTN: 00H

INFO: - None

Example:

HEAD	ADDR(LSB)	ADDR(MSB)	CID1	RTN	LENGTH	CHECKSUM
CC	FF	FF	D0	00	00	0xNN

4.34. Update Registry

System restart is valid.

4.34.1. **Command**

CID1: D2H

CID2: 00H

INFO: - ARG (8-bit): Store (0x01)

Example: ARG**=0x01,**

HEAD	ADDR(LSB)	ADDR(MSB)	CID1	CID2	LENGTH	ARG
7C	FF	FF	D2	00	01	01
CHECKSUM						
0xNN						

4.34.2. **Response**

CID1: D2H

RTN: 00H

INFO: - None

Example:

HEAD	ADDR(LSB)	ADDR(MSB)	CID1	RTN	LENGTH	CHECKSUM
CC	FF	FF	D2	00	00	0xNN

4.35. Erase Registry

System restart is valid.

4.35.1. **Command**

CID1: D3H

CID2: 00H

INFO: - ARG (8-bit): Erase (0xFF)

Example: ARG**=0xFF,**

HEAD	ADDR(LSB)	ADDR(MSB)	CID1	CID2	LENGTH	ARG
7C	FF	FF	D3	00	01	FF
CHECKSUM						
0xNN						

4.35.2. **Response**

CID1: D3H

RTN: 00H

INFO: - None

Example:

HEAD	ADDR(LSB)	ADDR(MSB)	CID1	RTN	LENGTH	CHECKSUM
CC	FF	FF	D3	00	00	0xNN

4.36. Get GPIO Mode *

Get GPIO Mode.

4.37. Set GPIO Mode *

Set GPIO Mode.