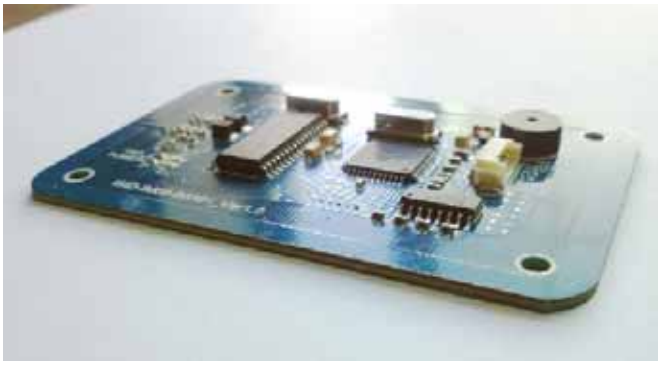

Mifare Class

ISO 14443-A/B

RFID - Reader

날짜	버전	내용
2010.03.10	V1.0	V 1.0 Release
2011.04.08	V1.1	14443-B 추가

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7. EEPROM Data 활용법

7.1 개요

7.2 EEPROM 포맷구조

7.3 EEPROM 기능

7.4 EEPROM Data Read Request (Target , PC → IS-3300)

7.5 EEPROM KEY Read Response (IS-3300 → Target , PC)

7.6 EEPROM Data Write Request (Target , PC → IS-3300)

7.7 EEPROM Data Read Response (IS-3300 → Target , PC)

7.8 EEPROM Data KEY AUTH Request (Target , PC → IS-3300)

7.9 EEPROM Data KEY AUTH Response (IS-3300 → Target , PC)

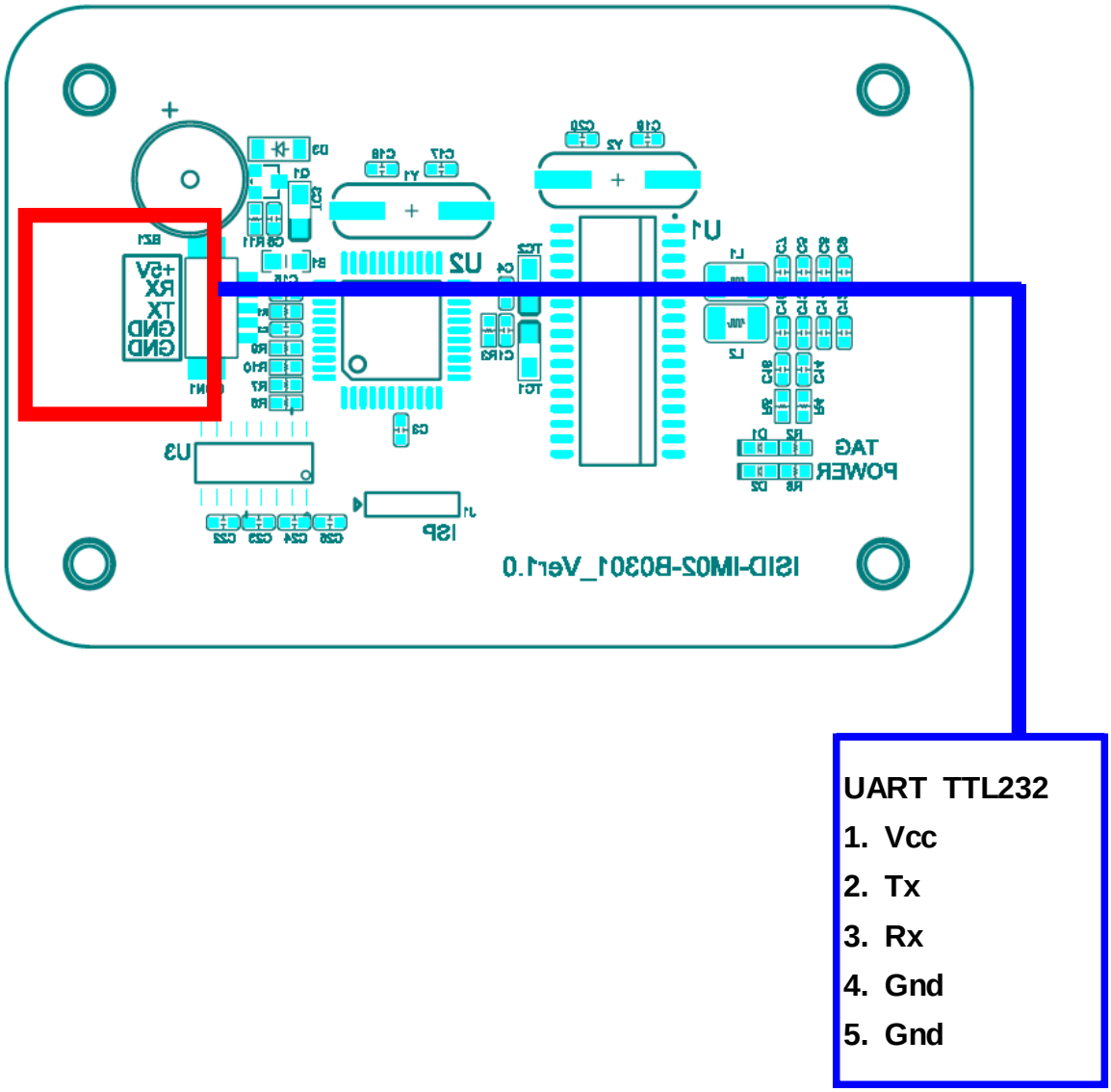
7.10 EEPROM KEY AUTH ->Read Request (Target , PC → IS-3300)

7.11 EEPROM KEY AUTH->Read Response (IS-3300 → Target , PC)

1. Specification

RF Frequency	13.56Mhz
Power Supply	4.5 to 5V DC Operation
Supply Current	40mA @ 5V
Dimensions	82 x 54 x 6 mm
RF Data Rate	ISO14443-A/B Mifare Class
Host Interface	Uart RS232
Antennna	50-ohm Internal antenna
RF Power	80mW @ 5V
Read Range	50mm internal ant
Anticollision	Support(1tags)

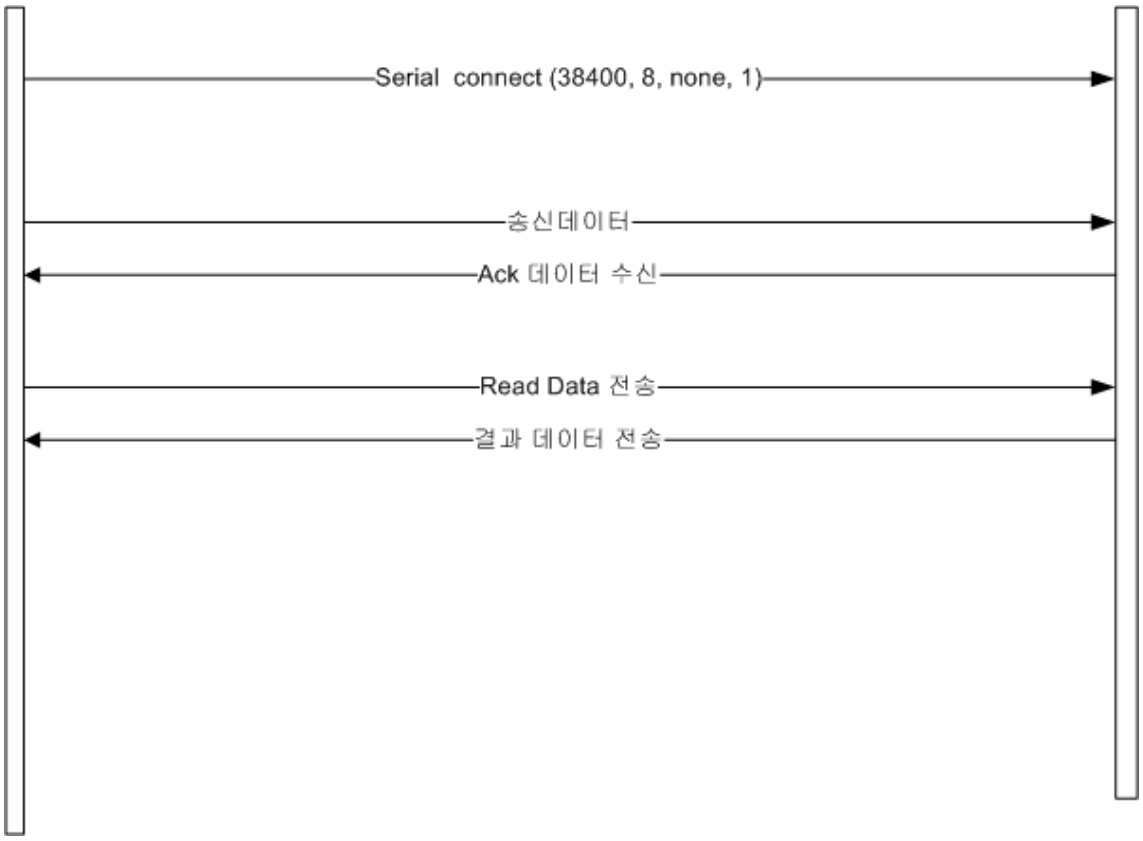
2. IS3300 구성



UART TTL232

1. Vcc
2. Tx
3. Rx
4. Gnd
5. Gnd

3. Serial Setup Interface



- 비트/초 : 38400
- 데이터 비트 : 8
- 패리티 : None
- 정지 비트 : 1
- 흐름 제어 : 없슴

4. Command Interface

4.1 Request (Target , PC → IS-3300)

ITEM	BYTE	DESC		REMARK
STX	1	0x02	Hex	Start Data
Lens	1	Lens	Hex	Packet Lens
Commad	1	Command	Hex	0x14 : Firmware Version 0x15 : Buzzer On/Off 0x22 : Card Mifare Serial Num 0x24 : Mifare Key Auth 0x25 : Mifare Block Read 0x26 : Mifare Block Read, AUTH (일괄처리) Mifare KEY AUTH ->Block Read 0x27 : Mifare Block Write 0x29 : Mifare Card Halt 0x2A : Mifare Card Reset 0x30 : EEPROM KEY Read 0x31 : EEPROM KEY Write 0x32 : EEPROM KEY AUTH 0x33 : EEPROM KEY (일괄처리) KEY AUTH -> Read 0x50 : Card Type 확인 0x52 : 14443B - Serial Num
Data	N		Hex	Request Data
Check Sum	1		Hex	“Check Sum 계산법” 참조
ETX	1	03	Hex	End Data

4.2 Response (IS-3300 → Target , PC)

ITEM	BYTE	DESC		REMARK
STX	1	0x02	Hex	Start Data
Lens	1	Lens	Hex	Packet Lens
Commad	1	Command	Hex	0x14 : Firmware Version 0x22 : Mifare Card Serial Num 0x24 : Mifare Key Auth 0x25 : Mifare Block Read 0x26 : Mifare Block Read, AUTH (일괄처리) Mifare KEY AUTH ->Block Read 0x27 : Mifare Block Write 0x29 : Mifare Card Halt 0x2A : Mifare Card Reset 0x30 : EEPROM KEY Read 0x31 : EEPROM KEY Write 0x32 : EEPROM KEY AUTH 0x33 : EEPROM KEY (일괄처리) KEY AUTH -> Read 0x50 : Card Type 확인 0x52 : 14443B - Serial Num
Data	N		Hex	Response Data
Check Sum	1		Hex	“Check Sum 계산법” 참조
ETX	1	03	Hex	End Data

5. Check Sum 계산법

Check Sum = (BYTE)(Lens + Commad + Data(0) + Data(1) + Data(n))

Example 1:

Lens	Cmd	Check Sum
0x01	0x21	0x22

0x22 = 0x01 + 0x21

♦ Stx 와 Etx는 제외

6. Protocol Data

6.1 Firmware Version Request (Target , PC → IS-3300)

ITEM	BYTE	DESC		REMARK
STX	1	0x02	Hex	Start Data
Lens	1	0x01	Hex	Packet Lens
Commad	1	0x14	Hex	0x14 : Firmware Version
Check Sum	1		Hex	“Check Sum 계산법” 참조
ETX	1	03	Hex	End Data

※ Fireware Version을 읽어 옵니다.

6.2 Firmware Version Response Pass (IS-3300 → Target , PC)

ITEM	BYTE	DESC		REMARK
STX	1	0x02	Hex	Start Data
Lens	1	0x06	Hex	Packet Lens
Commad	1	0x14	Hex	0x14 : Firmware Version
Data(0 ~ 3)	1	Result	Hex	"V1.0"
Check Sum	1		Hex	“Check Sum 계산법” 참조
ETX	1	03	Hex	End Data

6.3 Card Mifare Serial Read Request (Target , PC → IS-3300)

ITEM	BYTE	DESC		REMARK
STX	1	0x02	Hex	Start Data
Lens	1	0x01	Hex	Packet Lens
Commad	1	0x22	Hex	0x22 : Card Serial
Check Sum	1		Hex	“Check Sum 계산법” 참조
ETX	1	03	Hex	End Data

※ Card 에 Serial Number를 읽어 옵니다.

6.4 Card Mifare Serial Read Response Pass (IS-3300 → Target , PC)

ITEM	BYTE	DESC		REMARK
STX	1	0x02	Hex	Start Data
Lens	1	0x06	Hex	Packet Lens
Commad	1	0x22	Hex	0x22 : Card Serial
Data(0)	1	Result	Hex	Success : 0x01 Fail : 0xFF
Data(1 ~ 4)	4	Result	Hex	Card Serial Number
Check Sum	1		Hex	“Check Sum 계산법” 참조
ETX	1	03	Hex	End Data

Data(0) : 성공 0x01, 실패 0xFF
Data(1 ~ 4) : Card Serial Number

6.5 Card Mifare AUTH Request (Target , PC → IS-3300)

ITEM	BYTE	DESC		REMARK
STX	1	0x02	Hex	Start Data
Lens	1	0x09	Hex	Packet Lens
Commad	1	0x24	Hex	0x24 : Card Auth
DATA(0)	1	0x01 : KeyA 0x02 : KeyB	Hex	Key Type
DATA(1)	1	0x00~CardMax	Hex	Card Block Number
DATA(2~ 7)	6	Auth Key	Hex	Key Value
Check Sum	1		Hex	"Check Sum 계산법" 참조
ETX	1	03	Hex	End Data

※ **Card** 인증을 직접 입력하는 방식

DATA(0) : Key Type
DATA(1) : Card Block Number
DATA(2~ 7) : Card Key Value

6.6 Card Mifare AUTH Response (IS-3300 → Target , PC)

ITEM	BYTE	DESC		REMARK
STX	1	0x02	Hex	Start Data
Lens	1	0x02	Hex	Packet Lens
Commad	1	0x24	Hex	0x24 : Card Auth
Data	1	0x01, 0xFF	Hex	Success : 0x01 Fail : 0xFF
Check Sum	1		Hex	"Check Sum 계산법" 참조
ETX	1	03	Hex	End Data

6.7 Card Mifare Block Data Read Request (Target , PC → IS-3300)

ITEM	BYTE	DESC		REMARK
STX	1	0x02	Hex	Start Data
Lens	1	0x02	Hex	Packet Lens
Commad	1	0x25	Hex	0x25 : Card Block Data Read
DATA(0)	1	Block Num	Hex	Block Number
Check Sum	1		Hex	“Check Sum 계산법” 참조
ETX	1	03	Hex	End Data

※ Card Mifare Block Data를 읽어 옵니다. (Card 인증 후 사용 가능)

DATA(0) : Card Block Number

6.8 Card Mifare Block Data Read Response (IS-3300 → Target , PC)

ITEM	BYTE	DESC		REMARK
STX	1	0x02	Hex	Start Data
Lens	1	0x12	Hex	Packet Lens
Commad	1	0x25	Hex	0x25 : Card Block Data Read
Data(0)	1	Result	Hex	Success : 0x01 Fail : 0xFF
Data(1 ~ 16)	16	Result	Hex	Card Block Data
Check Sum	1		Hex	“Check Sum 계산법” 참조
ETX	1	03	Hex	End Data

Data(0) : 성공 여부

Data(1 ~ 16) : Card Block Data

6.9 Card Mifare Auth and Card Block Data Read

Request (Target , PC → IS-3300)

ITEM	BYTE	DESC		REMARK
STX	1	0x02	Hex	Start Data
Lens	1	0x09	Hex	Packet Lens
Commad	1	0x26	Hex	0x26 : Card Auth Card Read
DATA(0)	1	KeyA : 0x01 KeyB : 0x02	Hex	Key Type
DATA(1)	1	0x00~CardMax	Hex	Block Number
DATA(2 ~ 7)	6	Auth Key	Hex	Auth KeyA , KeyB
Check Sum	1		Hex	"Check Sum 계산법" 참조
ETX	1	03	Hex	End Data

※ **Card Mifare Block Data를 읽어 옵니다. (Card 인증을 일괄 처리)**

DATA(0) : Key Type

DATA(1) : Card Block Number

DATA(2 ~ 7) : Card Auth Key Value

6.10 Card Mifare Auth and Card Block Data Read

Response (IS-3300 → Target , PC)

ITEM	BYTE	DESC		REMARK
STX	1	0x02	Hex	Start Data
Lens	1	0x12	Hex	Packet Lens
Commad	1	0x26	Hex	0x26 : Card Auth Card Read
Data(0)	1	0x01, 0xFF	Hex	Success : 0x01 Fail : 0xFF
Data(1 ~ 16)	16	Result	Hex	Card Block Data
Check Sum	1		Hex	"Check Sum 계산법" 참조
ETX	1	03	Hex	End Data

6.11 Card Mifare Block Data Write Request (Target , PC → IS-3300)

ITEM	BYTE	DESC		REMARK
STX	1	0x02	Hex	Start Data
Lens	1	0x12	Hex	Packet Lens
Commad	1	0x27	Hex	0x27 : Card Block Data Write
DATA(0)	1	0x00~CardMax	Hex	Block Number
DATA(1 ~ 16)	16	Block Data	Hex	Block Data
Check Sum	1		Hex	"Check Sum 계산법" 참조
ETX	1	03	Hex	End Data

※ Card Block Data를 Write 합니다. (Card 인증 후 사용 가능)

DATA(0) : Card Block Number

DATA(1 ~ 16) : Write 할 Card Block Data

6.12 Card Mifare Block Data Write Response (IS-3300 → Target , PC)

ITEM	BYTE	DESC		REMARK
STX	1	0x02	Hex	Start Data
Lens	1	0x02	Hex	Packet Lens
Commad	1	0x27	Hex	0x27 : Card Block Data Write
Data(0)	1	0x01, 0xFF	Hex	Success : 0x01 Fail : 0xFF
Check Sum	1		Hex	"Check Sum 계산법" 참조
ETX	1	03	Hex	End Data

6.13 Card Mifare HALT Request (Target , PC → IS-3300)

ITEM	BYTE	DESC		REMARK
STX	1	0x02	Hex	Start Data
Lens	1	0x01	Hex	Packet Lens
Commad	1	0x29	Hex	0x29 : Card Halt
Check Sum	1		Hex	"Check Sum 계산법" 참조
ETX	1	03	Hex	End Data

※ **Card Halt** 시킵니다.

6.14 Card Mifare HALT Response (IS-3300 → Target , PC)

ITEM	BYTE	DESC		REMARK
STX	1	0x02	Hex	Start Data
Lens	1	0x02	Hex	Packet Lens
Commad	1	0x29	Hex	0x29 : Card Halt
Data(0)	1	0x01, 0xFF	Hex	Success : 0x01 Fail : 0xFF
Check Sum	1		Hex	"Check Sum 계산법" 참조
ETX	1	03	Hex	End Data

6.15 Card Mifare Reset Request (Target , PC → IS-3300)

ITEM	BYTE	DESC		REMARK
STX	1	0x02	Hex	Start Data
Lens	1	0x01	Hex	Packet Lens
Commad	1	0x2B	Hex	0x2B : Card Reset
Check Sum	1		Hex	“Check Sum 계산법” 참조
ETX	1	03	Hex	End Data

※ **Card를 Reset** 시킵니다.

6.16 Card Mifare Reset Response (IS-3300 → Target , PC)

ITEM	BYTE	DESC		REMARK
STX	1	0x02	Hex	Start Data
Lens	1	0x02	Hex	Packet Lens
Commad	1	0x2B	Hex	0x2B : Card Reset
Data(0)	1	0x01, 0xFF	Hex	Success : 0x01 Fail : 0xFF
Check Sum	1		Hex	“Check Sum 계산법” 참조
ETX	1	03	Hex	End Data

6.17 Card Type 확인 Request (Target , PC → IS-3300)

ITEM	BYTE	DESC		REMARK
STX	1	0x02	Hex	Start Data
Lens	1	0x01	Hex	Packet Lens
Commad	1	0x50	Hex	0x50 : Card Type 확인
Check Sum	1		Hex	"Check Sum 계산법" 참조
ETX	1	03	Hex	End Data

※ **Card** 종류를 확인 할수 있습니다.

6.18 Card Type 확인 Response (IS-3300 → Target , PC)

ITEM	BYTE	DESC		REMARK
STX	1	0x02	Hex	Start Data
Lens	1	0x03	Hex	Packet Lens
Commad	1	0x50	Hex	0x50 : Card Type 확인
Data(0)	1		Hex	Success : 0x01 Fail : 0xFF
Data(1)	1		Hex	0x20 : 14443-A Type 0x10 : 14443-A Mifare Ultra-Light 0x08 : 14443-A Mifare Class 0x04 : 14443-B Type 0x28 : 14443-A Type + 14443-A Mifare Class
Check Sum	1		Hex	"Check Sum 계산법" 참조
ETX	1	03	Hex	End Data

6.19 Card 14443-B Serial Number Request (Target , PC → IS-3300)

ITEM	BYTE	DESC		REMARK
STX	1	0x02	Hex	Start Data
Lens	1	0x01	Hex	Packet Lens
Commad	1	0x52	Hex	0x52 : 14443-B serial Number
Check Sum	1		Hex	"Check Sum 계산법" 참조
ETX	1	03	Hex	End Data

※ 14443-B Type 카드 UID Reader

6.20 Card 14443-B Serial Number Response (IS-3300 → Target , PC)

ITEM	BYTE	DESC		REMARK
STX	1	0x02	Hex	Start Data
Lens	1	0x06	Hex	Packet Lens
Commad	1	0x52	Hex	0x52 : 14443-B serial Number
Data(0)	1	Result	Hex	Success : 0x01 Fail : 0xFF
Data(1 ~ 4)	4	Result	Hex	Card Serial Number
Check Sum	1		Hex	"Check Sum 계산법" 참조
ETX	1	03	Hex	End Data

6.21 RFID Buzzer On/Off Setting Request (Target , PC → IS-3300)

ITEM	BYTE	DESC		REMARK
STX	1	0x02	Hex	Start Data
Lens	1	0x02	Hex	Packet Lens
Commad	1	0x15	Hex	0x15 : Buzzer On/Off
Data(0)	1	0x01, 0x02	Hex	0x01 :Buzzer On 0x02 : Buzzer Off
Check Sum	1		Hex	"Check Sum 계산법" 참조
ETX	1	03	Hex	End Data

※ **RFID** 모듈에 있는 부저 사용 여부

6.22 RFID Buzzer On/Off Setting Response (IS-3300 → Target , PC)

ITEM	BYTE	DESC		REMARK
STX	1	0x02	Hex	Start Data
Lens	1	0x02	Hex	Packet Lens
Commad	1	0x15	Hex	0x15 : Buzzer On/Off
Data(0)	1	0x01, 0xFF	Hex	Success : 0x01 Fail : 0xFF
Check Sum	1		Hex	"Check Sum 계산법" 참조
ETX	1	03	Hex	End Data

7. EEPROM Data 활용법

7.1 개요

EEPROM에 Key Type과 Key Value를 저장하여 사용하는 방식

7.2 EEPROM 포맷구조

전체 16개의 Key값을 저장 할 수 있습니다.

Data / 번지	0	1	2	3	4	5	6
0	Key Type	Key Value 6자리					
1	Key Type	Key Value 6자리					
2	Key Type	Key Value 6자리					
3	Key Type	Key Value 6자리					
4	Key Type	Key Value 6자리					
5	Key Type	Key Value 6자리					
6	Key Type	Key Value 6자리					
7	Key Type	Key Value 6자리					
8	Key Type	Key Value 6자리					
9	Key Type	Key Value 6자리					
10	Key Type	Key Value 6자리					
11	Key Type	Key Value 6자리					
12	Key Type	Key Value 6자리					
13	Key Type	Key Value 6자리					
14	Key Type	Key Value 6자리					
15	Key Type	Key Value 6자리					

7.3 EEPROM 기능

- EEPROM Data를 이용하여 인증 가능
- EEPROM Data를 이용하여 인증 + Card Block Read 일괄처리 가능
- Key Type : 0x01 : KeyA
  0x02 : KeyB

7.4 EEPROM Data Read Request (Target , PC → IS-3300)

ITEM	BYTE	DESC		REMARK
STX	1	0x02	Hex	Start Data
Lens	1	0x02	Hex	Packet Lens
Commad	1	0x30	Hex	0x30 : EEPROM Data READ
DATA(0)	1	0x00 ~ 0x15	Hex	EEPROM Number
Check Sum	1		Hex	“Check Sum 계산법” 참조
ETX	1	03	Hex	End Data

※ EEPROM 에 저장된 데이터를 읽어 옵니다.

DATA(0) : 16개의 EEPROM Data 중 Read 하고자 하는 번지를 설정

7.5 EEPROM KEY Read Response (IS-3300 → Target , PC)

ITEM	BYTE	DESC		REMARK
STX	1	0x02	Hex	Start Data
Lens	1	0x08	Hex	Packet Lens
Commad	1	0x30	Hex	0x30 : EEPROM Data READ
DATA(0)	1	Key Type	Hex	0x01 : KeyA 0x02 : KeyB
DATA(1 ~ 6)	6	Key Value	Hex	Key Value
Check Sum	1		Hex	“Check Sum 계산법” 참조
ETX	1	03	Hex	End Data

EEPROM에 적용 되는 포맷

0	1	2	3	4	5	6
Key Type	Key Value					

7.6 EEPROM Data Write Request (Target , PC → IS-3300)

ITEM	BYTE	DESC		REMARK
STX	1	0x02	Hex	Start Data
Lens	1	0x09	Hex	Packet Lens
Commad	1	0x31	Hex	0x31 : EEPROM Data Write
DATA(0)	1	0x00 ~ 0x15	Hex	EEPROM Number
DATA(1)	1	0x01 : KeyA 0x02 : KeyB	Hex	Key Type
DATA(1 ~ 6)	6	Key Value	Hex	Key Value
Check Sum	1		Hex	"Check Sum 계산법" 참조
ETX	1	03	Hex	End Data

※ EEPROM 에 Key Value 값을 저장 합니다.

DATA(0) : 16개의 EEPROM Data 중 Write 하고자 하는 번지를 설정

DATA(1) : EEPROM에 저장할 첫 번째 데이터 (Key Type 으로 사용됩니다.)

DATA(1 ~ 6) : EEPROM 저장할 데이터(Key Value 으로 사용됩니다.)

7.7 EEPROM Data Read Response (IS-3000 → Target , PC)

ITEM	BYTE	DESC		REMARK
STX	1	0x02	Hex	Start Data
Lens	1	0x02	Hex	Packet Lens
Commad	1	0x31	Hex	0x31 : EEPROM Data Write
Data(0)	1	0x01, 0xFF	Hex	Success : 0x01 Fail : 0xFF
Check Sum	1		Hex	"Check Sum 계산법" 참조
ETX	1	03	Hex	End Data

7.8 EEPROM Data KEY AUTH Request (Target , PC → IS-3300)

ITEM	BYTE	DESC		REMARK
STX	1	0x02	Hex	Start Data
Lens	1	0x03	Hex	Packet Lens
Commad	1	0x32	Hex	0x32 : EEPROM Data KEY AUTH
DATA(0)	1	EEPROM NUM	Hex	EEPROM Number
DATA(1)	1	CardBlock Num	Hex	Card Block Number
Check Sum	1		Hex	"Check Sum 계산법" 참조
ETX	1	03	Hex	End Data

※ **EEPROM 에 Key Value로 인증을 시도 합니다.**

DATA(0) : 적용하고자 하는 Key가 저장된 EEPROM 번지를 설정 합니다.

DATA(1) : Card Block Number를 설정 합니다.

7.9 EEPROM Data KEY AUTH Response (IS-3300 → Target , PC)

ITEM	BYTE	DESC		REMARK
STX	1	0x02	Hex	Start Data
Lens	1	0x02	Hex	Packet Lens
Commad	1	0x32	Hex	0x32 : EEPROM Data KEY AUTH
Data(0)	1	0x01, 0xFF	Hex	Success : 0x01 Fail : 0xFF
Check Sum	1		Hex	"Check Sum 계산법" 참조
ETX	1	03	Hex	End Data

7.10 EEPROM KEY AUTH ->Read Request (Target , PC → IS-3300)

ITEM	BYTE	DESC		REMARK
STX	1	0x02	Hex	Start Data
Lens	1	0x03	Hex	Packet Lens
Commad	1	0x33	Hex	0x33 : EEPROM KEY AUTH -> Card Block Data Read
DATA(0)	1	EEPROM NUM	Hex	EEPROM Number
DATA(1)	1	CardBlock Num	Hex	Card Block Number
Check Sum	1		Hex	"Check Sum 계산법" 참조
ETX	1	03	Hex	End Data

※ **EEPROM 에 Key Value로 인증 및 Card Block Data 를 Read 합니다. (일괄 처리)**
DATA(0) : 적용하고자 하는 Key가 저장된 EEPROM 번지를 설정 합니다.
DATA(1) : Card Block Number를 설정 합니다.

7.11 EEPROM KEY AUTH->Read Response (IS-3300 → Target , PC)

ITEM	BYTE	DESC		REMARK
STX	1	0x02	Hex	Start Data
Lens	1	0x12	Hex	Packet Lens
Commad	1	0x33	Hex	0x33 : EEPROM KEY AUTH -> Card Block Data Read
Data(0)	1	0x01, 0xFF	Hex	Success : 0x01 Fail : 0xFF
Data(1 ~ 16)	16	Result	Hex	Card Block Data
Check Sum	1		Hex	"Check Sum 계산법" 참조
ETX	1	03	Hex	End Data