IS - 3400 V3.0 RFID Reader

ISO 14443-A

ISO 14443-B

ISO 15693

Mifare Classic

Mifare UltraLight

Mifare Plus

Mifare NTAG

ICode SLIX1, ICode SLIX2

Encryption AES-128Bit, 3DES

날짜	버전	내용
2012.02.29	V1.0	V 1.0 Release
2012.10.20	V1.4	V 1.4 Release
2017.06.12	V3.0	V 3.0 Release

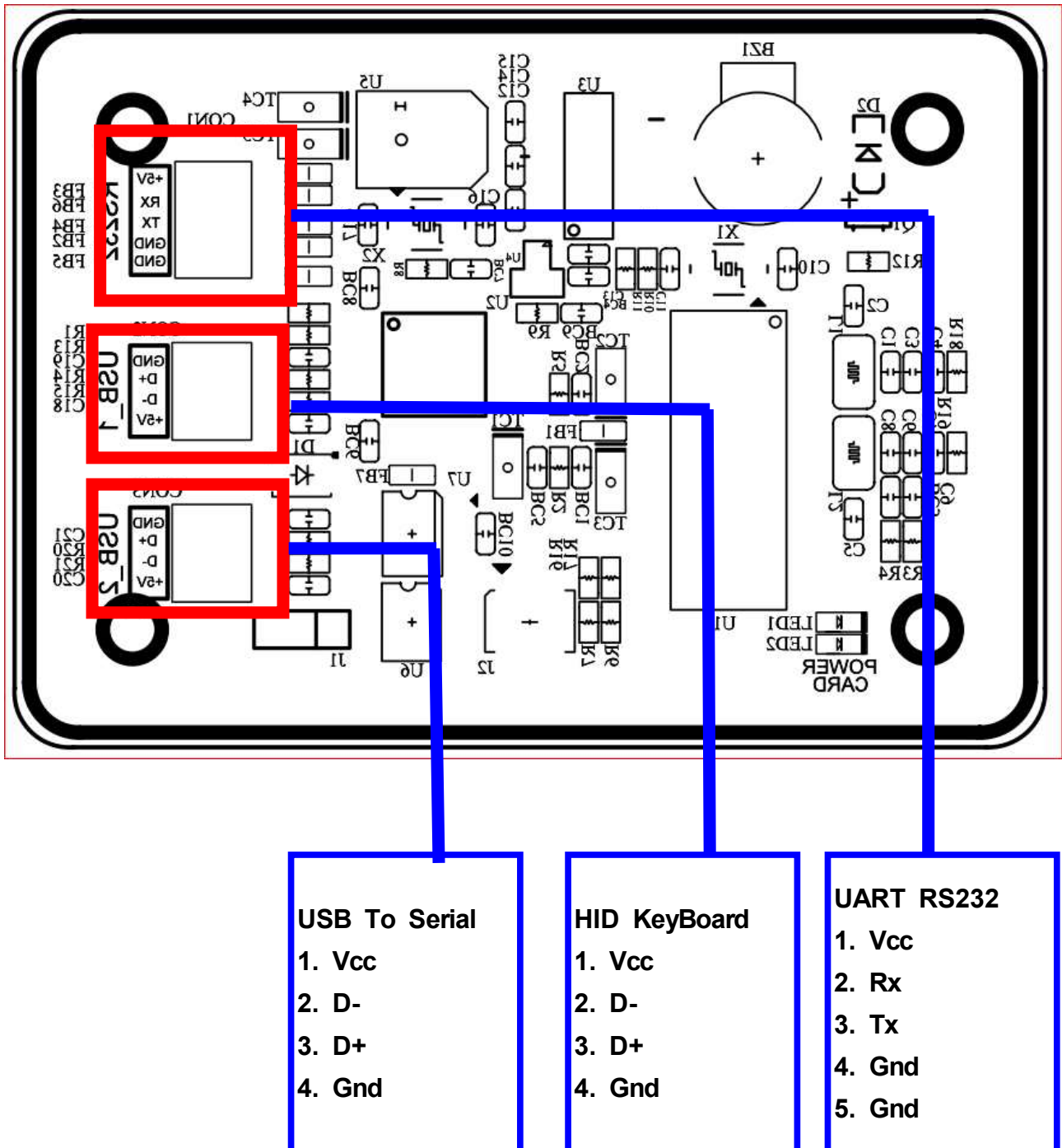– 목 차 –

2. IS-3400 V3.0 구성

    2.1 Connect 구분
    2.2 USB Driver

3. IS-3400 RFID 운영 방식

4. ISReaderPro V3.0 사용법

    4.1 Mifare 사용법

5. Protocol Format

    5.1 Request (Target , PC → IS-3400)
    5.2 Response (IS-3400 → Target , PC)

6. Check Sum 계산법

7. Protcol (Mifare Classic)

    7.1 Mifare Classic Active Request (Target , PC → IS-3400)
    7.3 Mifare Classic Authenticate Request (Target , PC → IS-3400)
    7.5 Mifare Classic Block Read Request (Target , PC → IS-3400)
    7.7 Mifare Classic Sector Read Request (Target , PC → IS-3400)
    7.9 Mifare Classic Block Write Request (Target , PC → IS-3400)
    7.11 Mifare Classic Sector Write Request (Target , PC → IS-3400)
    7.13 Mifare Classic Value Operations Create Request
                                    (Target , PC → IS-3400)
    7.15 Mifare Classic Value Operations Read Request (Target , PC → IS-3400)
    7.17 Mifare Classic Value Operations Increment Request
                                    (Target , PC → IS-3400)
    7.19 Mifare Classic Value Operations Decrement Request
                                    (Target , PC → IS-3400)
    7.21 Mifare Classic Value Operations Transfer Request
                                        (Target , PC → IS-3400)
    7.23 Mifare Classic Value Operations Restore Request
                                        (Target , PC → IS-3400)
    7.25 Mifare Classic Value Operations Increment + Transfer Request
                                    (Target , PC → IS-3400)
    7.27 Mifare Classic Value Operations Decrement + Transfer Request
                                        (Target , PC → IS-3400)
    7.29 Mifare Classic Value Operations Restore + Transfer Request
                                        (Target , PC → IS-3400)

1. Specification

RF Frequency	13.56MHz
Power Supply	4.5 to 5.5V DC Operation
Supply Current	40mA @ 5V
Dimensions	70 x 50 x 6 mm
RF Protocol	ISO14443-A/B, ISO15693 Mifare Classic, Mifare UltraLight, Mifare Plus, Mifare NTAG, ICODE SLIX1, ICODE SLIX 2
Host Interface	RS232, TTL232, USB To Serial(FTDI USB Chip) USB HID Keboard
Antennna	50-ohm Internal antenna
RF Power	150mW @ 5V
Read Range	50mm internal ant
Anticollision	Support(1tags)

2. IS-3400 V3.0 구성

2.1 Connect 구분

USB To Serial
1. Vcc
2. D-
3. D+
4. Gnd

HID KeyBoard
1. Vcc
2. D-
3. D+
4. Gnd

UART RS232
1. Vcc
2. Rx
3. Tx
4. Gnd
5. Gnd

2.2 USB Driver

(1) HID USB KeyBoard
- Driver 설치가 필요 없이 자동으로 인식 됩니다.

(2) USB To Serial Driver
- USB Chip : FTDI230x
- 다운로드 사이트

http://www.ftdichip.com/Drivers/VCP.htm

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3. IS-3400 RFID 운영 방식

Dummy RFID Reader 방식 지원

HOST		IS-3400, RFID

RS232 Port Open Defualt 115200, 8, N, 1

TTL232 Port Open Defualt 115200, 8, N, 1

USB To Serial Open Defualt 115200, 8, N, 1

D2xx RFID SDK Defualt 115200, 8, N, 1

Command Request

Command Response
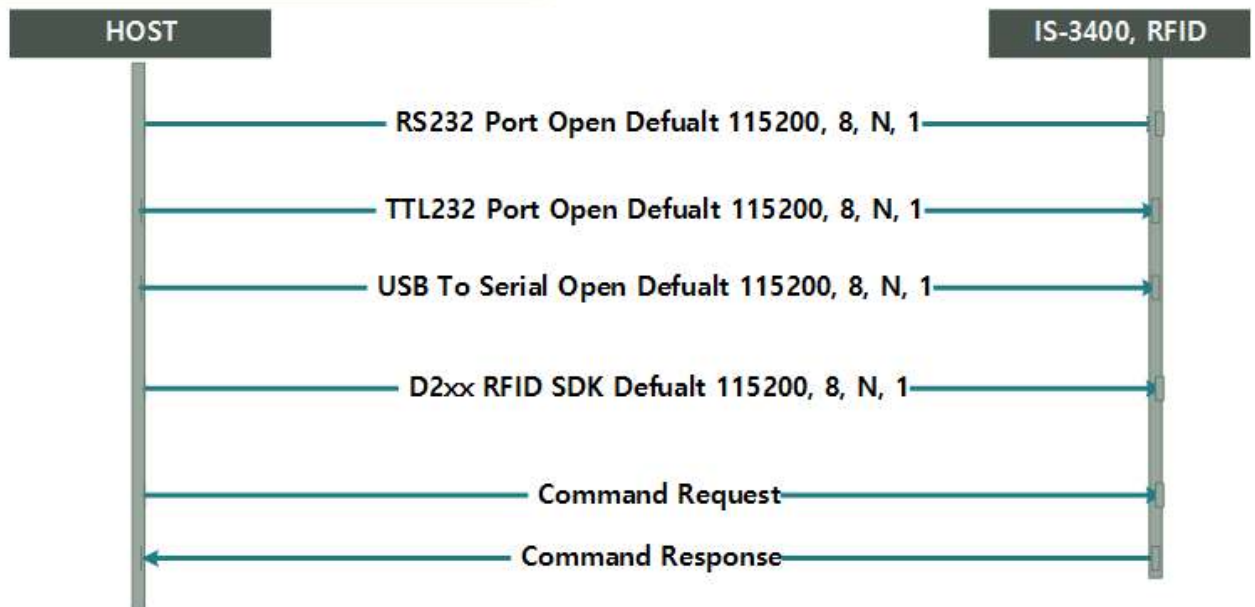
Auto Polling RFID Reader 방식 지원

HOST		IS-3400, RFID

RS232 Port Open Defualt 115200, 8, N, 1

TTL232 Port Open Defualt 115200, 8, N, 1

USB To Serial Open Defualt 115200, 8, N, 1

HID KeyBoard

Command Response
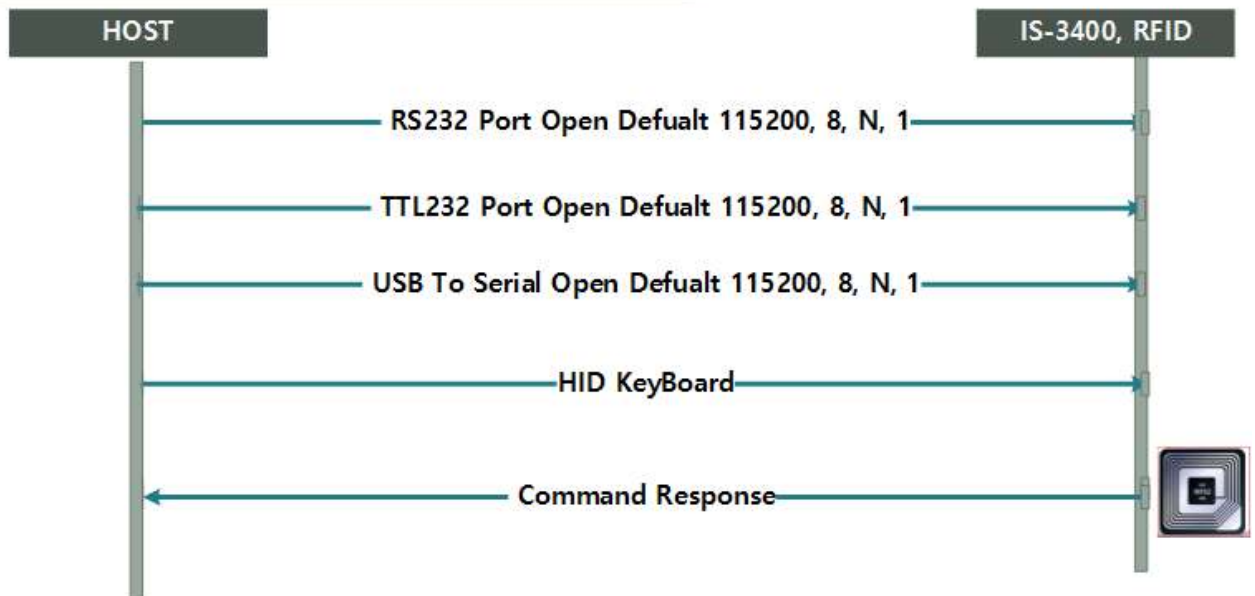
4. ISReaderPro V3.0 사용법
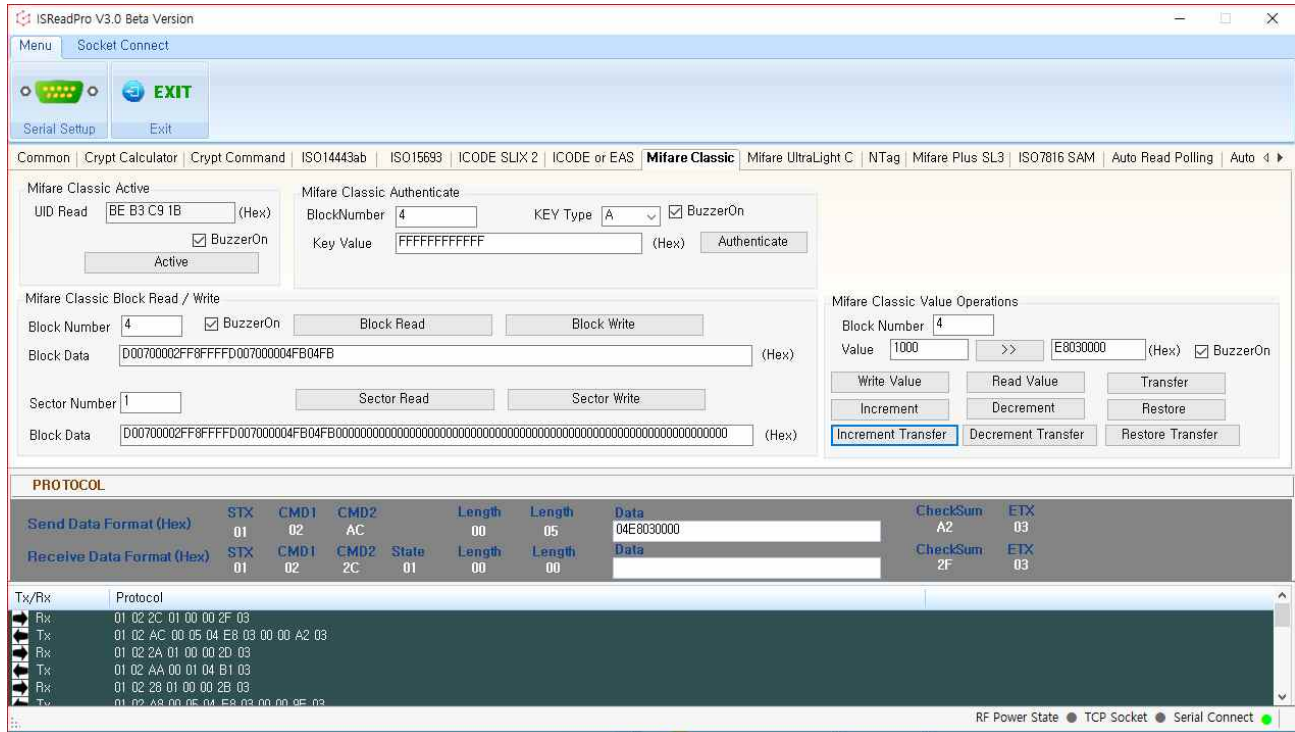
4.1 Mifare 사용법

① Mifare Tag를 ACTIVE 시킵니다. 성공 하면 ②~ⓖ 명령을 실행 시킬 수 있습니다.
　　②~ⓖ 명령을 실행 하기 위해서는 반드시 Active 성공 후 사용 가능 합니다.
② Mifare Block을 읽고, 쓰기 위해서는 반드시 인증을 성공 해야 합니다.
　성공 하면 ③~ⓖ 명령을 실행 시킬 수 있습니다.
③ Mifare Block을 읽습니다.(16Byte)
④ Mifare Block에 기록 합니다.
⑤ Mifare Sector을 읽습니다.(48Byte)
⑥ Mifare Sector에 기록 합니다.(48Byte)
⑦ 10진수를 16진수로 변환 합니다. Value Operations 기능을 이용 하기 위한 16진수 4Byte로 변환 합니다.
⑧ Value Operations 기능으로 블록을 변환 합니다.
⑨ Value Operations 기능으로 저장 되어 있는 4바이트 값을 읽습니다.
Ⓐ Increment, Decrement, Restore 후 Tag에 기록 하기 위해 전송 하여야 데이터가 기록 됩니다.
Ⓑ Value값 만큼 블록에 있는 데이터에 증가 시킵니다.
Ⓒ Value값 만큼 블록에 있는 데이터에 감소 시킵니다.
Ⓓ Increment, Decrement 명령을 사용 했는데 Transfer을 사용 하기 전에 취소가 가능 합니다.
Ⓔ Increment + Transfer 동시에 수행 됩니다.
Ⓕ Decrement + Transfer 동시에 수행 됩니다.
Ⓖ Restore ＋ Transfer 동시에 수행 됩니다.

5. Protocol Format

5.1 Request (Target , PC → IS-3400)

ITEM	BYTE	DESC		REMARK
STX	1	0x01	Hex	Start Data
Command1	1	Command	Hex	상위 명령어
Command2	1	Command	Hex	하위 명령어
Data Length	2	Hi Byte	Hex	Packet Lens
Data Length		Low Byte	Hex	
Data	N		Hex	Request Data
Check Sum	1		Hex	"Check Sum 계산법" 참조
ETX	1	03	Hex	End Data

Command2 수행 후 성공 하면 부저 비프음 발생 명령

Command2 최상위 비트를 1로 만들면 비프음 발생, 최상위 비트가 0이면 비프음 발생 하지 않음

[Exmaple] Card Serial Num 비프음 발생 Command

Command = 0x20 | 0x80;

BIT 7	BIT 6	BIT 5	BIT 4	BIT 3	BIT 2	BIT 1	BIT 0
1	0	1	0	0	0	0	0
비프음 발생	Command						

5.2 Request (Target , PC → IS-3400)

ITEM	BYTE	DESC		REMARK
STX	1	0x01	Hex	Start Data
Command1	1	Command	Hex	상위 명령어
Command2	1	Command	Hex	하위 명령어
State	1		Hex	응답의 상태 0x01 : 정상, 0xFF 에러
Data Length	2	Hi Byte	Hex	Packet Lens
Data Length		Low Byte	Hex	
Data	N		Hex	Request Data
Check Sum	1		Hex	"Check Sum 계산법" 참조
ETX	1	03	Hex	End Data

6. Check Sum 계산법

Check Sum = (BYTE)(Command1 + Command2 + Length(0) + Length(1) + Data(0) + Data(1) + Data(n))

Example 1:

0x01 0x00 0x16 0x00 0x00 0x16 0x03

　　CMD1　　CMD2　　Length(0)　Length(1)　Check Sum

　　0x00 + 0x16 + 　0x00　+　0x00　　　0x16

0x16　= 0x00 + 0x16 + 0x00 + 0x00

♦　Stx, Etx, CheckSum 은 제외

Check Sum = (BYTE)(Command1 + Command2 + STATE + Length(0) + Length(1) + Data(0) + Data(1) + Data(n))

Example 1:

0x01 0x00 0x16 0x01 0x00 0x00 0x16 0x03

　　CMD1　　CMD2　　STATE　Length(0)　Length(1)　Check Sum

　　0x00 + 0x16 + 0x01 + 　0x00　+　0x00　　　0x17

0x17　= 0x00 + 0x16 + 0x01 + 0x00 + 0x00

♦　Stx, Etx, CheckSum 은 제외

7. Protcol (Mifare Classic)

7.1 Mifare Classic Active Request (Target , PC → IS-3400)

ITEM	BYTE	DESC		REMARK
STX	1	0x01	Hex	Start Data
Command 1	1	0x02	Hex	0x02 : Mifare Classic Command
Command 2	1	0x20	Hex	
Data Length	2	0x00	Hex	Packet Lens
Data Length		0x00	Hex	
Check Sum	1		Hex	"Check Sum 계산법" 참조
ETX	1	03	Hex	End Data

7.2 Mifare Classic Active Response (IS-3400 → Target , PC)

ITEM	BYTE	DESC		REMARK
STX	1	0x01	Hex	Start Data
Command 1	1	0x02	Hex	0x02 : Mifare Classic Command
Command 2	1	0x20	Hex	
STATE	1	0x01, 0xFF	Hex	0x01 : 정상, 0xFF : 실패
Data Length	2	0x00	Hex	Packet Lens
Data Length		4 ~ 7	Hex	
Data	4, 7	UID	Hex	UID 4Byte or 7Byte
Check Sum	1		Hex	"Check Sum 계산법" 참조
ETX	1	03	Hex	End Data

7.3 Mifare Classic Authenticate Request (Target , PC → IS-3400)

ITEM	BYTE	DESC		REMARK
STX	1	0x01	Hex	Start Data
Command 1	1	0x02	Hex	0x02 : Mifare Classic Command
Command 2	1	0x21	Hex	
Data Length	2	0x00	Hex	Packet Lens
Data Length		0x08	Hex	
Data	1	0x00 ~ 0xff	Hex	Block Number
	1	0x01, 0x02	Hex	Key Type 0x01 : A Key, 0x02 B Key
	6	0x00 ~ 0xFF	Hex	Key Pass
Check Sum	1		Hex	"Check Sum 계산법" 참조
ETX	1	03	Hex	End Data

7.4 Mifare Classic Authenticate Response (IS-3400 → Target , PC)

ITEM	BYTE	DESC		REMARK
STX	1	0x01	Hex	Start Data
Command 1	1	0x02	Hex	0x02 : Mifare Classic Command
Command 2	1	0x21	Hex	
STATE	1	0x01, 0xFF	Hex	0x01 : 정상, 0xFF : 인증 실패
Data Length	2	0x00	Hex	Packet Lens
Data Length		0x00	Hex	
Check Sum	1		Hex	"Check Sum 계산법" 참조
ETX	1	03	Hex	End Data

7.5 Mifare Classic Block Read Request (Target , PC → IS-3400)

ITEM	BYTE	DESC		REMARK
STX	1	0x01	Hex	Start Data
Command 1	1	0x02	Hex	0x02 : Mifare Classic Command
Command 2	1	0x22	Hex	
Data Length	2	0x00	Hex	Packet Lens
Data Length		0x01	Hex	
Data	1	0x00 ~ 0xff	Hex	Block Number
Check Sum	1		Hex	"Check Sum 계산법" 참조
ETX	1	03	Hex	End Data

7.6 Mifare Classic Block Read Response (IS-3400 → Target , PC)

ITEM	BYTE	DESC		REMARK
STX	1	0x01	Hex	Start Data
Command 1	1	0x02	Hex	0x02 : Mifare Classic Command
Command 2	1	0x22	Hex	
STATE	1	0x01, 0xFF	Hex	0x01 : 정상, 0xFF : 실패
Data Length	2	0x00	Hex	Packet Lens
Data Length		0x10	Hex	
Data	16		Hex	Block Data
Check Sum	1		Hex	"Check Sum 계산법" 참조
ETX	1	03	Hex	End Data

7.7 Mifare Classic Sector Read Request (Target , PC → IS-3400)

ITEM	BYTE	DESC		REMARK
STX	1	0x01	Hex	Start Data
Command 1	1	0x02	Hex	0x02 : Mifare Classic Command
Command 2	1	0x23	Hex	
Data Length	2	0x00	Hex	Packet Lens
Data Length		0x01	Hex	
Data	1	0x00 ~ 0xff	Hex	Sector Number
Check Sum	1		Hex	"Check Sum 계산법" 참조
ETX	1	03	Hex	End Data

7.8 Mifare Classic Sector Read Response (IS-3400 → Target , PC)

ITEM	BYTE	DESC		REMARK
STX	1	0x01	Hex	Start Data
Command 1	1	0x02	Hex	0x02 : Mifare Classic Command
Command 2	1	0x23	Hex	
STATE	1	0x01, 0xFF	Hex	0x01 : 정상, 0xFF : 실패
Data Length	2	0x00	Hex	Packet Lens
Data Length		0x30	Hex	
Data	48		Hex	Sector Data
Check Sum	1		Hex	"Check Sum 계산법" 참조
ETX	1	03	Hex	End Data

7.9 Mifare Classic Block Write Request (Target , PC → IS-3400)

ITEM	BYTE	DESC		REMARK
STX	1	0x01	Hex	Start Data
Command 1	1	0x02	Hex	0x02 : Mifare Classic Command
Command 2	1	0x24	Hex	
Data Length	2	0x00	Hex	Packet Lens
Data Length		0x11	Hex	
Data	1	0x00 ~ 0xFF	Hex	Block Number
	16		Hex	Write Block Data
Check Sum	1		Hex	"Check Sum 계산법" 참조
ETX	1	03	Hex	End Data

7.10 Mifare Classic Block Write Response (IS-3400 → Target , PC)

ITEM	BYTE	DESC		REMARK
STX	1	0x01	Hex	Start Data
Command 1	1	0x02	Hex	0x02 : Mifare Classic Command
Command 2	1	0x24	Hex	
STATE	1	0x01, 0xFF	Hex	0x01 : 정상, 0xFF : 실패
Data Length	2	0x00	Hex	Packet Lens
Data Length		0x00	Hex	
Check Sum	1		Hex	"Check Sum 계산법" 참조
ETX	1	03	Hex	End Data

7.11 Mifare Classic Sector Write Request (Target , PC → IS-3400)

ITEM	BYTE	DESC		REMARK
STX	1	0x01	Hex	Start Data
Command 1	1	0x02	Hex	0x02 : Mifare Classic Command
Command 2	1	0x25	Hex	
Data Length	2	0x00	Hex	Packet Lens
Data Length		0x31	Hex	
Data	1	0x00 ~ 0xFF	Hex	Sector Number
	48		Hex	Write Block Data
Check Sum	1		Hex	"Check Sum 계산법" 참조
ETX	1	03	Hex	End Data

7.12 Mifare Classic Sector Write Response (IS-3400 → Target , PC)

ITEM	BYTE	DESC		REMARK
STX	1	0x01	Hex	Start Data
Command 1	1	0x02	Hex	0x02 : Mifare Classic Command
Command 2	1	0x25	Hex	
STATE	1	0x01, 0xFF	Hex	0x01 : 정상, 0xFF : 실패
Data Length	2	0x00	Hex	Packet Lens
Data Length		0x00	Hex	
Check Sum	1		Hex	"Check Sum 계산법" 참조
ETX	1	03	Hex	End Data

7.13 Mifare Classic Value Operations Create Request

(Target , PC → IS-3400)

ITEM	BYTE	DESC		REMARK
STX	1	0x01	Hex	Start Data
Command 1	1	0x02	Hex	0x02 : Mifare Classic Command
Command 2	1	0x26	Hex	
Data Length	2	0x00	Hex	Packet Lens
Data Length		0x05	Hex	
Data		0x00 ~ 0xFF (1)	Hex	Block Number
		(4)	Hex	초기 생성 Data
Check Sum	1		Hex	"Check Sum 계산법" 참조
ETX	1	03	Hex	End Data

7.14 Mifare Classic Value Operations Create Response (IS-3400 → Target , PC)

ITEM	BYTE	DESC		REMARK
STX	1	0x01	Hex	Start Data
Command 1	1	0x02	Hex	0x02 : Mifare Classic Command
Command 2	1	0x26	Hex	
STATE	1	0x01, 0xFF	Hex	0x01 : 정상, 0xFF : 실패
Data Length	2	0x00	Hex	Packet Lens
Data Length		0x00	Hex	
Check Sum	1		Hex	"Check Sum 계산법" 참조
ETX	1	03	Hex	End Data

7.15 Mifare Classic Value Operations Read Request (Target , PC → IS-3400)

ITEM	BYTE	DESC		REMARK
STX	1	0x01	Hex	Start Data
Command 1	1	0x02	Hex	0x02 : Mifare Classic Command
Command 2	1	0x27	Hex	
Data Length	2	0x00	Hex	Packet Lens
Data Length		0x01	Hex	
Data	1	0x00 ~ 0xFF	Hex	Block Number
Check Sum	1		Hex	"Check Sum 계산법" 참조
ETX	1	03	Hex	End Data

7.16 Mifare Classic Value Operations Read Response

(IS-3400 → Target , PC)

ITEM	BYTE	DESC		REMARK
STX	1	0x01	Hex	Start Data
Command 1	1	0x02	Hex	0x02 : Mifare Classic Command
Command 2	1	0x27	Hex	
STATE	1	0x01, 0xFF	Hex	0x01 : 정상, 0xFF : 실패
Data Length	2	0x00	Hex	Packet Lens
Data Length		0x04	Hex	
Data	4		Hex	Value Operations Read
Check Sum	1		Hex	"Check Sum 계산법" 참조
ETX	1	03	Hex	End Data

7.17 Mifare Classic Value Operations Increment Request

(Target , PC → IS-3400)

ITEM	BYTE	DESC		REMARK
STX	1	0x01	Hex	Start Data
Command 1	1	0x02	Hex	0x02 : Mifare Classic Command
Command 2	1	0x28	Hex	
Data Length	2	0x00	Hex	Packet Lens
Data Length		0x05	Hex	
Data		1	0x00 ~ 0xFF	Hex	Block Number
	4		Hex	
Check Sum	1		Hex	"Check Sum 계산법" 참조
ETX	1	03	Hex	End Data

7.18 Mifare Classic Value Operations Increment Response

(IS-3400 → Target , PC)

ITEM	BYTE	DESC		REMARK
STX	1	0x01	Hex	Start Data
Command 1	1	0x02	Hex	0x02 : Mifare Classic Command
Command 2	1	0x28	Hex	
STATE	1	0x01, 0xFF	Hex	0x01 : 정상, 0xFF : 실패
Data Length	2	0x00	Hex	Packet Lens
Data Length		0x00	Hex	
Check Sum	1		Hex	"Check Sum 계산법" 참조
ETX	1	03	Hex	End Data

7.19 Mifare Classic Value Operations Decrement Request

(Target , PC → IS-3400)

ITEM	BYTE	DESC		REMARK
STX	1	0x01	Hex	Start Data
Command 1	1	0x02	Hex	0x02 : Mifare Classic Command
Command 2	1	0x29	Hex	
Data Length	2	0x00	Hex	Packet Lens
Data Length		0x05	Hex	
Data		1	0x00 ~ 0xFF	Hex	Block Number
	4		Hex	차감 금액
Check Sum	1		Hex	"Check Sum 계산법" 참조
ETX	1	03	Hex	End Data

7.20 Mifare Classic Value Operations Decrement Response

(IS-3400 → Target , PC)

ITEM	BYTE	DESC		REMARK
STX	1	0x01	Hex	Start Data
Command 1	1	0x02	Hex	0x02 : Mifare Classic Command
Command 2	1	0x29	Hex	
STATE	1	0x01, 0xFF	Hex	0x01 : 정상, 0xFF : 실패
Data Length	2	0x00	Hex	Packet Lens
Data Length		0x00	Hex	
Check Sum	1		Hex	"Check Sum 계산법" 참조
ETX	1	03	Hex	End Data

7.21 Mifare Classic Value Operations Transfer Request

(Target , PC → IS-3400)

ITEM	BYTE	DESC		REMARK
STX	1	0x01	Hex	Start Data
Command 1	1	0x02	Hex	0x02 : Mifare Classic Command
Command 2	1	0x2A	Hex	
Data Length	2	0x00	Hex	Packet Lens
Data Length		0x01	Hex	
Data	1	0x00 ~ 0xFF	Hex	Block Number
Check Sum	1		Hex	"Check Sum 계산법" 참조
ETX	1	03	Hex	End Data

7.22 Mifare Classic Value Operations Transfer Response

(IS-3400 → Target , PC)

ITEM	BYTE	DESC		REMARK
STX	1	0x01	Hex	Start Data
Command 1	1	0x02	Hex	0x02 : Mifare Classic Command
Command 2	1	0x2A	Hex	
STATE	1	0x01, 0xFF	Hex	0x01 : 정상, 0xFF : 실패
Data Length	2	0x00	Hex	Packet Lens
Data Length		0x00	Hex	
Check Sum	1		Hex	"Check Sum 계산법" 참조
ETX	1	03	Hex	End Data

7.23 Mifare Classic Value Operations Restore Request

(Target , PC → IS-3400)

ITEM	BYTE	DESC		REMARK
STX	1	0x01	Hex	Start Data
Command 1	1	0x02	Hex	0x02 : Mifare Classic Command
Command 2	1	0x2B	Hex	
Data Length	2	0x00	Hex	Packet Lens
Data Length		0x01	Hex	
Data	1	0x00 ~ 0xFF	Hex	Block Number
Check Sum	1		Hex	"Check Sum 계산법" 참조
ETX	1	03	Hex	End Data

7.24 Mifare Classic Value Operations Restore Response

(IS-3400 → Target , PC)

ITEM	BYTE	DESC		REMARK
STX	1	0x01	Hex	Start Data
Command 1	1	0x02	Hex	0x02 : Mifare Classic Command
Command 2	1	0x2B	Hex	
STATE	1	0x01, 0xFF	Hex	0x01 : 정상, 0xFF : 실패
Data Length	2	0x00	Hex	Packet Lens
Data Length		0x00	Hex	
Check Sum	1		Hex	"Check Sum 계산법" 참조
ETX	1	03	Hex	End Data

7.25 Mifare Classic Value Operations Increment + Transfer Request
(Target , PC → IS-3400)

ITEM	BYTE	DESC		REMARK
STX	1	0x01	Hex	Start Data
Command 1	1	0x02	Hex	0x02 : Mifare Classic Command
Command 2	1	0x2C	Hex	
Data Length	2	0x00	Hex	Packet Lens
Data Length		0x05	Hex	
Data		0x00 ~ 0xFF (1)	Hex	Block Number
		(4)	Hex	충전 금액
Check Sum	1		Hex	"Check Sum 계산법" 참조
ETX	1	03	Hex	End Data

7.26 Mifare Classic Value Operations Increment + Transfer Response
(IS-3400 → Target , PC)

ITEM	BYTE	DESC		REMARK
STX	1	0x01	Hex	Start Data
Command 1	1	0x02	Hex	0x02 : Mifare Classic Command
Command 2	1	0x2C	Hex	
STATE	1	0x01, 0xFF	Hex	0x01 : 정상, 0xFF : 실패
Data Length	2	0x00	Hex	Packet Lens
Data Length		0x00	Hex	
Check Sum	1		Hex	"Check Sum 계산법" 참조
ETX	1	03	Hex	End Data

7.27 Mifare Classic Value Operations Decrement + Transfer Request
(Target , PC → IS-3400)

ITEM	BYTE	DESC		REMARK
STX	1	0x01	Hex	Start Data
Command 1	1	0x02	Hex	0x02 : Mifare Classic Command
Command 2	1	0x2D	Hex	
Data Length	2	0x00	Hex	Packet Lens
Data Length		0x05	Hex	
Data		1	0x00 ~ 0xFF	Hex	Block Number
		4		Hex	차감 금액
Check Sum	1		Hex	"Check Sum 계산법" 참조
ETX	1	03	Hex	End Data

7.28 Mifare Classic Value Operations Decrement + Transfer Response
(IS-3400 → Target , PC)

ITEM	BYTE	DESC		REMARK
STX	1	0x01	Hex	Start Data
Command 1	1	0x02	Hex	0x02 : Mifare Classic Command
Command 2	1	0x2D	Hex	
STATE	1	0x01, 0xFF	Hex	0x01 : 정상, 0xFF : 실패
Data Length	2	0x00	Hex	Packet Lens
Data Length		0x00	Hex	
Check Sum	1		Hex	"Check Sum 계산법" 참조
ETX	1	03	Hex	End Data

7.29 Mifare Classic Value Operations Restore + Transfer Request
(Target , PC → IS-3400)

ITEM	BYTE	DESC		REMARK
STX	1	0x01	Hex	Start Data
Command 1	1	0x02	Hex	0x02 : Mifare Classic Command
Command 2	1	0x2E	Hex	
Data Length	2	0x00	Hex	Packet Lens
Data Length		0x01	Hex	
Data	1	0x00 ~ 0xFF	Hex	Block Number
Check Sum	1		Hex	"Check Sum 계산법" 참조
ETX	1	03	Hex	End Data

7.30 Mifare Classic Value Operations Restore + Transfer Response
(IS-3400 → Target , PC)

ITEM	BYTE	DESC		REMARK
STX	1	0x01	Hex	Start Data
Command 1	1	0x02	Hex	0x02 : Mifare Classic Command
Command 2	1	0x2E	Hex	
STATE	1	0x01, 0xFF	Hex	0x01 : 정상, 0xFF : 실패
Data Length	2	0x00	Hex	Packet Lens
Data Length		0x00	Hex	
Check Sum	1		Hex	"Check Sum 계산법" 참조
ETX	1	03	Hex	End Data