



# RF Module

## MD-551L+

# User Manual

**V1.00**

**2017/02/20**

***Sunion Electronic Corporation***

11F, 123-7, Shine De Rd., San Chung City, Taipei 241, Taiwan, R.O.C.

TEL : +886-2-8512-1456 FAX : +886-2-8512-1457

<http://www.sunion.com.tw>

## — Table of contents —

1. MD-551L+ Specification -----	3
2. Communication protocol -----	5
3. Command list -----	6
4. Command description -----	7
5. Appendix(Supporting cards) -----	43

### **NOTE**

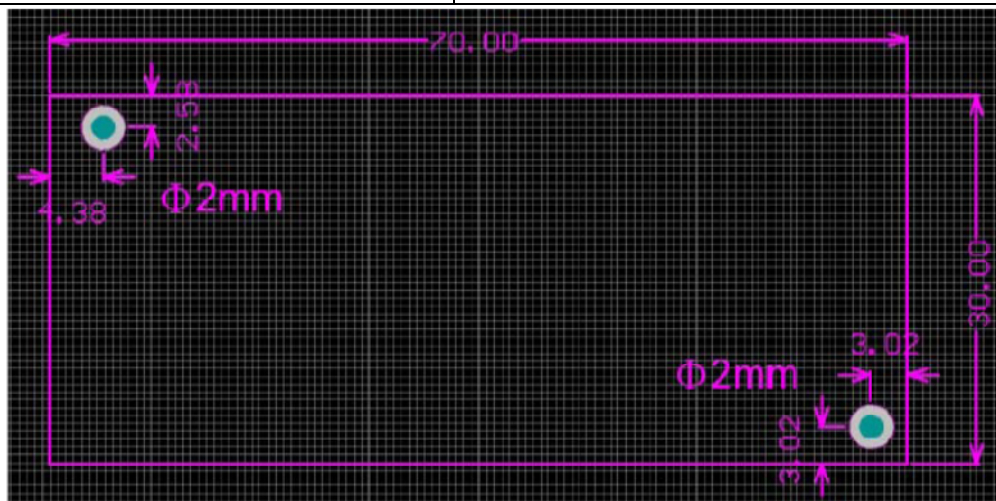
This document is written by SUNION Electronic Corp. SUNION Electronic Corp. reserves the right to change devices or specifications detailed herein at any time without notice. Any third party is forbidden strictly to copy, edit, modify or quote the contents of this document without written approval from SUNION electronic Corp. SUNION's products are not authorized for use as critical components in life support devices or systems.

**Copyright 2003~2007, SUNION Electronic Corporation All right reserved.**

## 1 MD-551L+ Specification

### 1-1 Specification

Part Number	MD-551L+
Firmware Version	MD-551L+ V1.00
RF Transmit Frequency	13.56MHz
Supported Transponder	ISO 15693(R/W) ISO 18092(R/W) ISO 14443-A(R/W) ISO 14443-B(Read UID)
Antenna impedance	Loop Antenna, 50 ohm
Operating Temperature	-20℃ to + 85℃
Storage Temperature	-20℃ to + 85℃
Storage Humidity	5 ~ 97% non-condensing
Power Supply	DC 5V
Power Consumption(MAX)	Operating: 100mA Standby: 20mA
Dimensions (Unit : mm)	70 x 30 x 5.3 ( L x W x H )
Weight	6g (around)
Communication Protocol	The Nation Standard UART format



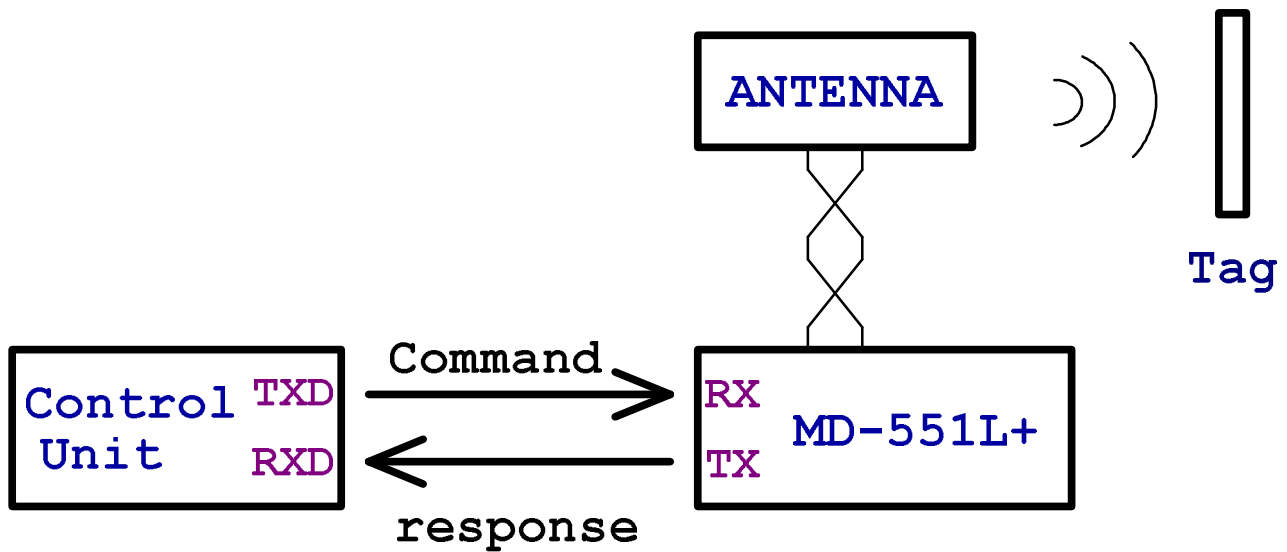
L: 70mm x W:30mm x H:5mm

以上尺寸需加公差 0.5mm

Unit: mm±0.5mm

## 1-2 Specification

### MD-551L+ and MCU circuit examples



## 1-3 Pin Assignment



Pin		Name	Function
CON1	1	VDD	Supply voltage
	2	USB	D-
	3	USB	D+
	4	GND	Ground
	5	GND	
CN2		ANT MHF	MHF CONNECTOR

## 2 Communication protocol

MD-551L+ use the National Standard **UART** format to communicate with host, and the parameters must be set to **9600, N, 8, 1**.

The command format as below:

HEADER						DATA			CHECK
SOH	PT	ID1	ID2	FC1	FC2	STX	DATA	ETX	BCC
01	Identify	01		Function Code		02	Data	03	Check sum

Description:

1. Each SOH, STX and ETX are all one byte character for system, the definition of these characters as follows:

SOH=01H, STX=02H, ETX=03H

Note: The “SOH” represents the start byte of the command.

The “STX” represents the start byte for “Data”.

The “ETX” represents the end byte for “Data”.

You need these characters to determine the content of data string which is sent or received; the length of data string might be different, it's depended on the command that you send.

2. PT (Packet Type) is used to identify the message was sent by the host or MD-551L+; “S” represents that the command was sent by the host, and “s” represents that the message was sent by MD-551L+.
3. ID1, ID2 are the reader ID code, the value of ID1 and ID2 combination is always “01”.
4. FC1 and FC2 are function codes, and the combination of FC1 and FC2 determines the content of DATA string and the string length, please refers to the below pages about the all functions of MD-551L+.
5. BCC is the checksum to ensure the command transferred correctly, the command each bytes from SOH to ETX do “xor”, and do “or” 20H finally.
6. Time Out should be set to 100ms after every command was sent.
7. The returned data format is LSB.
8. The example of BCC operation:

The host send the command as follow:

SOH	"S"	"01"	"A1"	STX	"010"	ETX	BCC
-----	-----	------	------	-----	-------	-----	-----

BCC = 01H xor 53H xor 30H xor 31H xor 41H xor 31H xor 02H  
 Xor 30H xor 31H xor 30H xor 03H or 20H =33H

## 3 Command list

No.	Code	Description	Page
1	"A0"	Read card UID continuously	7
2	"A1"	Read card UID at once	8
3	"A9"	Read card UID at once and identify the chip of card	9
4	"E1"	Model number and firmware version	10
	"E2"	Reset the reader	11
	J2	Get System settings	
	J3	Set System settings	
5	"K0"	Read data from the specified Block	11
6	"K1"	Write data into the specified Block	14
	"K2"	Choose a Key	
	"K3"	Set A/B Key value of 32 Sector	
7	"K4"	Keep a key (KeyA or Key B) in memory of MD551L+ temporarily	16
8	"K5"	Add value function	19
9	"K6"	Subtract value function	20
10	"K7"	Backup specified Block data	21
11	"K8"	Mifare Plus Functions	22
12	"K9"	ISO15693 RFID Functions ( Read UID, Read Single Block Write Single Block, Lock Block, Write AFI, Write Locked Block, Kill )	24
13	"KA"	ISO18092 RFID Functions (Read/Write Block,Enable/Disable NDEF)	38

**Note 1 :** "K0"~"K8" Command sets have to be applied to ISO14443A Mifare series only.

**Note 2 :** "K9" Command set has to be applied to ISO15693 card only.

**Note 3:** "KA" Command set has to be applied to ISO18092 Felica card only.

## 4 Command description

### 4-1 "A0": Read card UID continuously

The command is sent by host:

SOH	"S"	ID1	ID2	"A"	"0"	STX	ETX	BCC
-----	-----	-----	-----	-----	-----	-----	-----	-----

The message is responded by MD-551L+:

SOH	"s"	ID1	ID2	"A"	"0"	STX	data	ETX	BCC
-----	-----	-----	-----	-----	-----	-----	------	-----	-----

#### Data description:

- (1) The format of "data" is the Card type (1 byte) + UID (16 byte).
- (2) The digits of card number include "0" ~ "9", "A" ~ "F" (Hex). For example, "00000000003EA88F".

#### Function description:

- (1) If MD-551L+ could not get the card UID, it will be no response.
- (2) The data which include card UID will be returned while MD-551L+ got the card UID.
- (3) MD-551L+ will respond "Y" before the reading is started.

#### Example :

The command is sent by host:

SOH + "S01A0" + STX + ETX + BCC

The message is responded by MD-551L+:

Success:

SOH + "s01A0" + STX + "M0000000000123456" + ETX + BCC

Failure:

SOH + "s01A0" + STX + ETX + BCC

## 4-2 “A1”: Read card UID at once

The command is sent by host:

SOH	“S”	ID1	ID2	“A”	“1”	STX	ETX	BCC
-----	-----	-----	-----	-----	-----	-----	-----	-----

The message is responded by MD-551L+:

SOH	“s”	ID1	ID2	“A”	“1”	STX	<b>data</b>	ETX	BCC
-----	-----	-----	-----	-----	-----	-----	-------------	-----	-----

### Data description:

- (1) The format of “data” is the Card type (1 byte) + UID (16 byte).
- (2) The digits of card number include “0” ~ “9”, “A” ~ “F” (Hex). For example, “000000000003EA88F”.

### Function description:

- (1) Use this function to obtain card UID.
- (2) The “data” will be “N” if MD-551L+ couldn’t get card UID. Such as: STX + “N” + ETX.
- (3) MD-551L+ clear data after responding.

### Example :

The command is sent by host:

SOH + "S01A1" + STX + ETX + BCC

The message is responded by MD-551L+:

Success:

SOH + "s01A1" + STX + "M00000000000123456" + ETX + BCC

Failure:

SOH + "s01A1" + STX + " N " + ETX + BCC



## 4-3 "A9": Read card UID at once and identify the chip of card

The command is sent by host:

SOH	"S"	ID1	ID2	"A"	"9"	STX	ETX	BCC
-----	-----	-----	-----	-----	-----	-----	-----	-----

The message is responded by MD-551L+:

SOH	"s"	ID1	ID2	"A"	"9"	STX	data	ETX	BCC
-----	-----	-----	-----	-----	-----	-----	------	-----	-----

### Data description:

- (1) The format of "data" is the Card type (1 byte) + UID (16 byte).
- (2) The digits of card number include "0" ~ "9", "A" ~ "F" (Hex). For example, "00000000003EA88F".

- (3) The list of card chip as follows:

0151: SONY Felica Lite

0152: SONY Felica Lite s

0201: ST Srix 4K

0401: NXP Mifare\_UltraLight

0403: NXP Mifare\_One(S50\_4byte)

0404: NXP Mifare\_One(S50\_7byte)

0405: NXP Mifare\_One(S70\_4byte)

0411: NXP Mifare\_DESFire\_EV1 4K

0415: NXP Mifare Plus\_s 2K

0416: NXP Mifare Plus\_s 4K

0417: NXP Mifare Plus\_x 2K

0418: NXP Mifare Plus\_x 4K

0431: NXP I-CODE SLI

0731: TI HF-I Plus

0732: TI HF-I Pro

### Function description:

- (1) Use this function to obtain UID and the chip model of card.
- (2) The "data" will be "N" if MD-551L+ couldn't get card UID. Such as: STX + "N" + ETX.

### Example :

The command is sent by host:

SOH + "S01A9" + STX + ETX + BCC

The message is responded by MD-551L+:

Success:

SOH + "s01A9" + STX + "M00000000001234560401" + ETX + BCC

Failure:

SOH + "s01A9" + STX + " N " + ETX + BCC

### Description:

- (1) Card UID: "0000000000123456".

(2) "0401" indicates the card chip which is NXP UltraLight.

## 4-4 “E1”: Model Number and Firmware Version

The command is sent by host:

SOH	“S”	ID1	ID2	“E”	“1”	STX	ETX	BCC
-----	-----	-----	-----	-----	-----	-----	-----	-----

The message is responded by MD-551L+:

SOH	“s”	ID1	ID2	“E”	“1”	STX	date	ETX	BCC
-----	-----	-----	-----	-----	-----	-----	------	-----	-----

### Data description :

The string of data” includes model number and current firmware version.

### Function description :

Use this function to get model number and firmware version of MD-551L+.

### Example :

The command is sent by host:

SOH + "S01E1" + STX + ETX + BCC

The message is responded by MD-551L+:

SOH + "s01E1" + STX + "V1.01 MD-551L+" + ETX + BCC

### Description :

- (1) The model number is MD-551L+ and the firmware version is V1.01.
- (2) Sunion Electronics Corp. reserves the right to update firmware at any time without notice.

## 4-5 “E2”: Reset the reader

The command is sent by host:

SOH	“S”	ID1	ID2	“E”	“2”	STX	ETX	BCC
-----	-----	-----	-----	-----	-----	-----	-----	-----

The message is responded by MD-551L+:

SOH	“s”	ID1	ID2	“E”	“2”	STX	data	ETX	BCC
-----	-----	-----	-----	-----	-----	-----	------	-----	-----

### Function description:

- (1) Use this function to reset MD-551L+.
- (2) If “data” is responded “Y”, it is successful for resetting, it’s responded “N” for unsuccessful.
- (3) MD-551L+ will send the message “Y” before reset.

### Example :

The command is sent by host:

SOH + "S01E2" + STX + ETX + BCC

The message is responded by MD-551L+:

SOH + "s01E2" + STX + “Y” + ETX + BCC (“Y” represents successful for resetting)

## 4-6 “K0”: Read data from specified block

The command is sent by host:

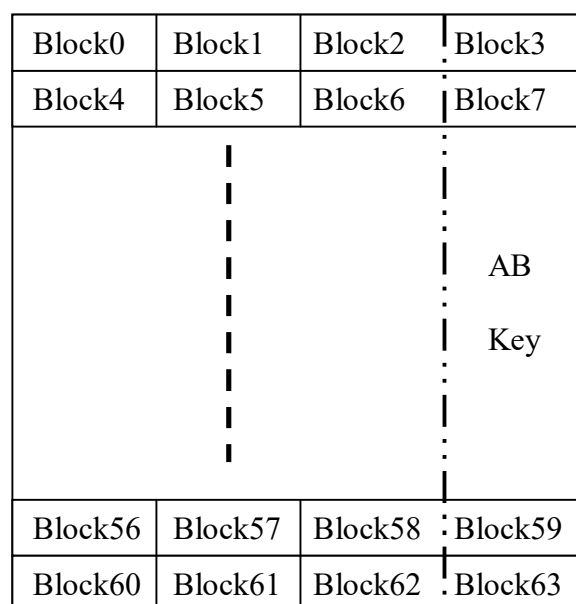
SOH	“S”	ID1	ID2	“K”	“0”	STX	<b>DATA</b>	ETX	BCC
-----	-----	-----	-----	-----	-----	-----	-------------	-----	-----

The message is responded by MD-551L+:

SOH	“s”	ID1	ID2	“K”	“0”	STX	<b>data</b>	ETX	BCC
-----	-----	-----	-----	-----	-----	-----	-------------	-----	-----

### Data description :

- (1) “DATA”: DATA must be Card type (“M”, 1 bytes) + specified Block number (2 bytes).
- (2) “data”: MD-551L+ would be responded Card type (“M”, 1 bytes) + Card LOCK/UNLOCK status (1 bytes) + Block number (2 bytes) + value which is stored in the Block (32 bytes).
- (3) If you need to read the value which is stored in specified Block of Mifare Series Card, the length of block number is fixed, 2 bytes. The range of Block number are between “00” ~ “3F”(HEX) , 64 Blocks (Block 0 is store the card number and settings, it's also locked by factory).



**Figure 3: Mifare Card's Block diagram**

### Function description:

- (1) Use this function to Read the specified Mifare Card Block DATA.
- (2) The Mifare Card is organized in 16 Sectors with 4 Blocks of 16 bytes each, the 4<sup>th</sup> Block of each sector is stored Keys (Key A and Key B) and settings, it could not store the user's data.
- (3) Due to protect the keys and data in Blocks, the Key A of each sector is

always shown "0", not truth.

- (4) Mifare Card doesn't support LOCK function, Card LOCK byte is always returned "0".

## Example 1 :

The command is sent by host:

SOH + "S01K0" + STX + "M02" + ETX + BCC

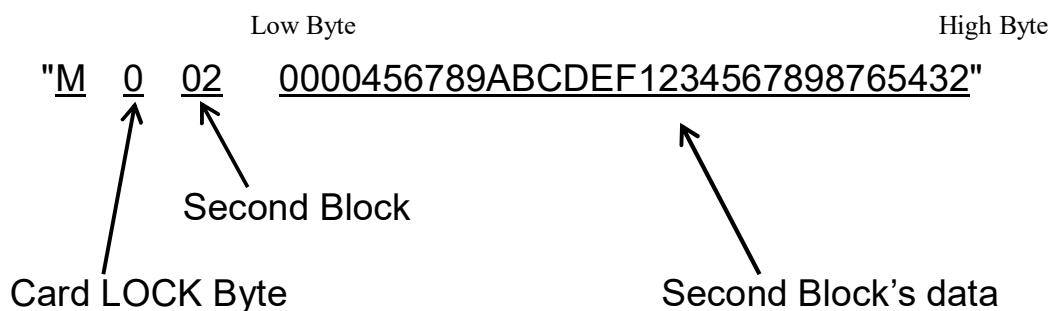
The message is responded by MD-551L+:

SOH + "s01K0" + STX +

"M0020000456789ABCDEF1234567898765432" + ETX + BCC

## Description:

The message is responded by MD-551L+:



## Example 2:

The command is sent by host:

SOH + "S01K0" + STX + "M03" + ETX + BCC

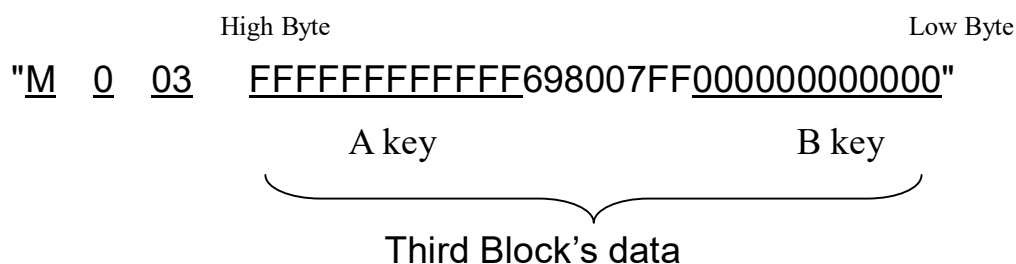
The message is responded by MD-551L+:

SOH + "s01K0" + STX +

"M003000000000000698007FFFFFFFFFFFFFFFF" + ETX + BCC

## Description :

The message is responded by MD-551L+:



## Example 3 :

If the chip of card is Ultralight, MD-551L+ could read 16bytes (4 Blocks) at once time. (Due to every Block of Ultralight is 4 bytes.)

The command is sent by host:

SOH + "S01K0" + STX + "M04" + ETX + BCC

The message is responded by MD-551L+:

SOH + "s01K0" + STX +

"M004000000000107550177772E636F6DFE00" + ETX + BCC

## "J2": Get System parameters

The command is sent by host:

SOH	"S"	ID1	ID2	"J"	"2"	STX	ETX	BCC
-----	-----	-----	-----	-----	-----	-----	-----	-----

The message is responded by MD-551L+:

SOH	"s"	ID1	ID2	"J"	"2"	STX	data	ETX	BCC
-----	-----	-----	-----	-----	-----	-----	------	-----	-----

### Data description :

1.List 1 , DATA length is 12 Bytes :

Byte	1	2	3	4	5	6	7	8
Default	"01"		"00"		"00"		"0A"	
Features	Data Transmission Format		UID Format		ISO14443A Sensitivity		ISO14443B Sensitivity	
9	10	11	12					
"04"		"00"						
ISO15693 Sensitivity		ISO18092 Sensitivity						

2. List 2 , **Function description:**

Byte	Function	Value
1-2	The UID transmission is Low Byte (LSB) first, just only for Mifare Card, otherwise is High Byte (MSB) transmission.	"00"

	All transmissions are set to Low Byte (LSB).	"01"
	All transmissions are set to High Byte (MSB).	"02"
3-4	Hex	"00"
	Dec	"01"

5-6	ISO14443A Sensitivity	List 3
7-8	ISO14443B Sensitivity	List 3
9-10	ISO15693 Sensitivity	List 3
11-12	ISO18092 Sensitivity	List 3

## 3. Sensitivity List:

List 3:

	ISO14443B/ISO15693/ ISO18092	ISO14443A
Value	Gain(dB)	Gain(dB)
"0C"	30	30
"08"	33	33
"04"	34	34
"00"	35	35
"0D"	39	39
"09"	41	41
"05"	42	42
"01"	43	43
"0E"	41	41
"0A"	49	49
"06"	50	50
"02"	51	R.F.U
"0F"	55	
"0B"	58	
"07"	59	
"03"	60	

## 4.

### Function description:

1. Mifare Low Byte: The UID transmission is Low Byte (LSB) first, just



only for Mifare Card, otherwise is High Byte (MSB) transmission.

2.Low Byte: All transmissions are set to Low Byte (LSB).

3.High Byte: All transmissions are set to High Byte (MSB).

**Example :**

The command is sent by host:

SOH + "S01J2" + STX + ETX + BCC

The message is responded by MD-551L+:

SOH + "s01J2" + STX + "0100000A0400"+ ETX + BCC

## "J3": Set System parameters

The command is sent by host:

SOH	"S"	ID1	ID2	"J"	"3"	STX	<b>DATA</b>	ETX	BCC
-----	-----	-----	-----	-----	-----	-----	-------------	-----	-----

The message is responded by MD-551L+:

SOH	"s"	ID1	ID2	"J"	"3"	STX	<b>Data</b>	ETX	BCC
-----	-----	-----	-----	-----	-----	-----	-------------	-----	-----

### Function description :

1. Use this function to set the system parameters, the system will be reset while the instruction is finished.

2. Note: The DATA length is fixed, 12 bytes, if DATA length is not 12 bytes, the system will be failure.

### Data description :

1. List 1 , DATA length is 12 Bytes :

Byte	1	2	3	4	5	6	7	8
Default	"01"		"00"		"00"		"0A"	
Features	Data Transmission Format		UID Format		ISO14443A Sensitivity		ISO14443B Sensitivity	
9	10	11	12					
"04"		"00"						
ISO15693 Sensitivity		Felica Sensitivity						

### List 2 , Function description:

Byte	Function	Value
1-2	The UID transmission is Low Byte (LSB) first, just only for Mifare Card, otherwise is High Byte (MSB) transmission.	"00"
	All transmissions are set to Low Byte (LSB).	"01"
	All transmissions are set to High Byte (MSB).	"02"
3-4	Hex	"00"
	Dec	"01"

5-6	ISO14443A Sensitivity	List 3
7-8	ISO14443B Sensitivity	List 3
9-10	ISO15693 Sensitivity	List 3
11-12	ISO18092 Sensitivity	List 3

## 3. Sensitivity List:

List 3:

	ISO14443B/ISO15693/ ISO18092	ISO14443A
Set Value	Gain(dB)	Gain(dB)
"0C"	30	30
"08"	33	33
"04"	34	34
"00"	35	35
"0D"	39	39
"09"	41	41
"05"	42	42
"01"	43	43
"0E"	41	41
"0A"	49	49
"06"	50	50
"02"	51	R.F.U
"0F"	55	
"0B"	58	
"07"	59	
"03"	60	

## 4.

1. The data is returned "Y" which it is successful , "N" for unsuccessful .
2. Mifare Low Byte: The UID transmission is Low Byte (LSB) first, just only for Mifare Card, otherwise is High Byte (MSB) transmission.
- 3.Low Byte: All transmissions are set to Low Byte (LSB).
- 4.High Byte: All transmissions are set to High Byte (MSB).

### Example :

The command is sent by host:

SOH + "S01J3" + STX + "0100000A0400" + ETX + BCC

The message is responded by MD-551L+:

SOH + "s01J3" + STX + "Y" + ETX + BCC

## 4-7 "K1": Write data into the specified block

The command is sent by host:

SOH	"S"	ID1	ID2	"K"	"1"	STX	DATA	ETX	BCC
-----	-----	-----	-----	-----	-----	-----	------	-----	-----

The message is responded by MD-551L+:

SOH	"s"	ID1	ID2	"K"	"1"	STX	data	ETX	BCC
-----	-----	-----	-----	-----	-----	-----	------	-----	-----

### Data description :

- (1) DATA must be Card type (1 bytes) + specified Block number (2 bytes) + the user data which is modified by user.
- (2) Mifare Card type must be set to "M" + specified Block number. The range of Block number is between "01" ~ "3F"(HEX) , 63 Blocks.
- (3) MD-551L+ will return "data" string as following:
  - a. It is written successful for "Y".
  - b. If it is written failed, the string will be returned "N".
- (4) **Attention: When you write new Key A and Key B into the 4<sup>th</sup> Block of any Sector, the Keys would be changed immediately. The Keys could NOT be read from the Block.**

### Function description:

- (1) Use this function to write user's data into specified Block of Mifare Card.
- (2) Use this function to write Key A and/or Key B into specified Trailer Block (the 4<sup>th</sup> Block) of any Sector.

### Example :

The command is sent by host:

SOH + "S01K1" + STX +  
"M0711111111111698007FFFFFFFFFFFFFFF" + ETX + BCC

The message is responded by MD-551L+:

SOH + "s01K1" + STX + "Y" + ETX + BCC  
(“Y” means the data is written into specified Block successfully.)

### Example 2 :

Ultralight can be written 4byte only at once time:

The command is sent by host:

SOH + "S01K1" + STX + "M07000000000107550177772E636F6DFE00"  
+ ETX + BCC

Write data: 000000000

The message is responded by MD-551L+:

Successful :

SOH + "s01K1" + STX + "Y" + ETX + BCC

Failed:

SOH + "s01K1" + STX + " N " + ETX + BCC

## 4-8 “K2”: Choose a Key

The command is sent by host:

SOH	“S”	ID1	ID2	“K”	“2”	STX	DATA	ETX	BCC
-----	-----	-----	-----	-----	-----	-----	------	-----	-----

The message is responded by MD-551L+:

SOH	“s”	ID1	ID2	“K”	“2”	STX	data	ETX	BCC
-----	-----	-----	-----	-----	-----	-----	------	-----	-----

### Data description :

- (1) “DATA” consists of Card type (“M”, 1 byte) + Key Sector (2 bytes).
- (2) The range of Key Sector is between "01"- "20"(HEX). Where "01" ~ "10" for Key A, "11" ~ "20" for Key B.
- (3) The representations of “data” are as follow:  
If “data” is “Y” means Key Sector is selected successfully.  
If “data” is “N” means failed.
- (4) If DATA is set to "00", it will not be able to authenticate.

### Function description:

- (1) Use this function to select a key to authenticate.
- (2) “Key Sector” means stored in memory of MD-551L+, it will not volatile while power-off.
- (3) It is necessary to re-select Key Sector while MD-551L+ restarts, because the Key (Key A and Key B) will set to default (“FF”).

### Example :

The command is sent by host:

SOH + "S01K2" + STX + "M08" + ETX + BCC

The message is responded by MD-551L+:

SOH + "s01K2" + STX + "Y" + ETX + BCC

### Description :

MD-551L+ responds:

"08": Select “08” Key Sector to authenticate with Mifare card.

## 4-9 “K3”: Set A/B Key value of 32 Sector.

The command is sent by host:

SOH	“S”	ID1	ID2	“K”	“3”	STX	DATA	ETX	BCC
-----	-----	-----	-----	-----	-----	-----	------	-----	-----

The message is responded by MD-551L+:

SOH	“s”	ID1	ID2	“K”	“3”	STX	data	ETX	BCC
-----	-----	-----	-----	-----	-----	-----	------	-----	-----

**Data description :**

- (1) DATA consists of Card type (“M”, 1 byte) + [ Key Sector (2 bytes) ] + the key that you want to input (12 bytes)
- (2) The range of Sector is between "01"- "20"(HEX). Where "01" ~ "10": for Key A, "11" ~ "20" for Key B.
- (3) The representations of “data” string are as follow:  
If “data” is “Y” means Key Sector is set successfully.  
If “data” is “N” means failed.

**Function description:**

- (1) Use this function to keep Key A or Key B in the memory of MD-551L+, the keys will not volatile after power-off.
- (2) **The steps of authentication: “K3”→”K2”→”K0” or “K1”**

**Example :**

The command is sent by host:

SOH + "S01K3" + STX + "M12123456789ABC" + ETX + BCC

The message is responded by MD-551L+:

SOH + "s01K3" + STX + "Y" + ETX + BCC

**Description :**

The command is sent by host:

"M12" : Set Key Sector "12"(HEX)

"123456789ABC" : Write the key into Key Sector "20" (HEX)

## 4-10 “K4”: Keep a key (Key A or Key B) in memory of MD-551L+ temporarily

The command is sent by host:

SOH	“S”	ID1	ID2	“K”	“4”	STX	DATA	ETX	BCC
-----	-----	-----	-----	-----	-----	-----	------	-----	-----

The message is responded by MD-551L+:

SOH	“s”	ID1	ID2	“K”	“4”	STX	data	ETX	BCC
-----	-----	-----	-----	-----	-----	-----	------	-----	-----

The message is responded by MD-551L+:

- (1) DATA consists of card type, Key Sector and the key that you want to input as follow: **Card type (“M”, 1 byte) + [ Key Sector (2 bytes) ] + Key (12 bytes)**
- (2) Responded “data” string as below:  
 If “data” is “Y” means Block is successfully locked.  
 If “data” is “N” means failed.

### Function description :

- (1) Use this function to set a key (Key A or Key B) which keep in the memory of MD-551L+, but it would be volatile immediately while power-off. You have to set the key again while MD-551L+ is restarted next time if you need.
- (2) If you want to perform the function “K0” or “K1” and the card had be locked by keys, you have to perform “K4” function to set a key (Key A or Key B) correctly first. **Due to you can keep only one key (Key A or Key B) in the memory of MD-551L+ temporarily, MD-551L+ will set the key to Key A when Key Sector is set to “01”~“10” (A Key). Similarly, MD-551L+ will set the key to Key B when Key Sector is set to “11”~“20” (B Key).**
- (3) It is not necessary to perform “K2” if “K4” had be performed.
- (4) Please perform this function again if you want to change the key.



- (5) Mifare Ultralight could be read or written directly without the any key.
- (6) It needs 6 bytes key authentication to read or write Mifare Plus S/X data while security level is upgraded to Level 1.
- (7) It needs 16 bytes key authentication to read or write Mifare Plus S/X data while security level is upgraded to Level 3. The default setting is 0xff.

### **Example :**

The command is sent by host:

SOH + "S01K4" + STX + "M01123456789ABC" + ETX + BCC

The message is responded by MD-551L+:

SOH + "s01K4" + STX + "Y" + ETX + BCC

## ● Block frame in the adding and subtracting value function

1. First, before adding or subtracting the value, you have to write 3 values to specified Block, one of these values must be reversed. Then, you have to fill the 4 addresses into the same Block, similarly, two of addresses must be reversed. See the table as below.

0	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15
Value				<u>Value</u>				Value				Address	<u>Address</u>	Address	<u>Address</u>

**Example :**

00000000FFFFFFFF00000000FF00FF00

2. Attention: Don't write the data into the 4<sup>th</sup> Block of each Sector. The key and settings would be changed and the card may not be read or written again.

## 4-8 “K5”: Adding value function

The command is sent by host:

SOH	“S”	ID1	ID2	“K”	“5”	STX	<b>DATA</b>	ETX	BCC
-----	-----	-----	-----	-----	-----	-----	-------------	-----	-----

The message is responded by MD-551L+:

SOH	“s”	ID1	ID2	“K”	“5”	STX	<b>data</b>	ETX	BCC
-----	-----	-----	-----	-----	-----	-----	-------------	-----	-----

### Data description :

- (1) DATA must be Card type (1 bytes) + specified Block (2 bytes) + the value (4 bytes).
- (2) The representations of responded “data” string are as follow:  
 If “data” is “Y” means the Block is added value successfully.  
 If “data” is “N” means it’s failed.

### Function description :

1. Use this function to add value and store the value in specified Block.
2. The default value of Block must be written into the specified Block before adding value (See Page 18) to allow this operation.

### Example :

The command is sent by host:

SOH + "S01K5" + STX + "M0100000001" + ETX + BCC

The message is responded by MD-551L+:

SOH + "s01K5" + STX + "Y" + ETX + BCC

## 4-9 “K6”: Subtracting value function

The command is sent by host:

SOH	“S”	ID1	ID2	“K”	“6”	STX	DATA	ETX	BCC
-----	-----	-----	-----	-----	-----	-----	------	-----	-----

The message is responded by MD-551L+:

SOH	“s”	ID1	ID2	“K”	“6”	STX	data	ETX	BCC
-----	-----	-----	-----	-----	-----	-----	------	-----	-----

### Data description :

- (1) DATA must be **Card type (“M”, 1 byte) + specified Block (2 bytes) + value (4 bytes)**
- (2) The representations of responded “data” string are as follow:  
If “data” is “Y” means Block is subtracted value successfully.  
If “data” is “N” means it’s failed.

### Function description :

1. Use this function to subtract value and store the value in specified Block.
2. The default value of Block must be written into the specified Block before adding value (See Page 18) to allow this operation.

### Example :

The command is sent by host:

SOH + "S01K6" + STX + "M0100000001" + ETX + BCC

The message is responded by MD-551L+:

SOH + "s01K6" + STX + "Y" + ETX + BCC

## 4-10 “K7”: Backup the specified Block data

The command is sent by host:

SOH	“S”	ID1	ID2	“K”	“7”	STX	DATA	ETX	BCC
-----	-----	-----	-----	-----	-----	-----	------	-----	-----

The message is responded by MD-551L+:

SOH	“s”	ID1	ID2	“K”	“7”	STX	data	ETX	BCC
-----	-----	-----	-----	-----	-----	-----	------	-----	-----

### Data description :

- (1) DATA must be **Card type (“M”, 1 byte) + Source Block Number (2 bytes) + Destination Block Number (2 bytes)**
- (2) The representation of responded “data” string are as follow:  
 If “data” is “Y” means backup is successfully.  
 If “data” is “N” means it’s failed.

### Function description :

1. Use this function to backup Block A data to Block B, **but both Block A and Block B must be in the same sector.**
2. **The default value of Block must be written into the specified Block before adding value (See Page 18) to allow this operation.**

### Example :

The command is sent by host:

SOH + "S01K7" + STX + "M0102" + ETX + BCC

The message is responded by MD-551L+:

SOH + "s01K7" + STX + "Y" + ETX + BCC

## 4-11 "K8": Mifare Plus Security Level Function

The command is sent by host:

SOH	"S"	ID1	ID2	"K"	"8"	STX	DATA	ETX	BCC
-----	-----	-----	-----	-----	-----	-----	------	-----	-----

The message is responded by MD-551L+:

SOH	"s"	ID1	ID2	"K"	"8"	STX	data	ETX	BCC
-----	-----	-----	-----	-----	-----	-----	------	-----	-----

### 4-11-1 Data description

1. The format of "DATA" is as below:

Command 1	Command 2	Parameter
-----------	-----------	-----------

(1)The lengths of Command 1 & Command 2 are both 2 bytes, respectively.

(2) The length of DATA is 2 bytes with ASCII, but it is 1 byte with Hex.

(3) Parameter: The definition and length of DATA depend on C1 and

C2.

Command1(C1) :

7	6	5	4	3	2	1	0
Command				0000			

Table1: Command1 list

Command	Description
0001	Mifare Plus upgrade

Command2(C2) :

7	6	5	4	3	2	1	0
Tag type				0000			

Table2: Tag type list

Command	Description
0001	Mifare Plus S/X upgrade Level1
0010	Mifare Plus S/X upgrade Level2
0011	Mifare Plus S/X upgrade Level3

C1, C2 :

C1	C2	C1+C2
Upgrade	Mifare Plus S/X upgrade Level1	1010
	Mifare Plus S/X upgrade Level2	1020
	Mifare Plus S/X upgrade Level3	1030

## 4-11-2 Function description

Mifare Plus upgrade (Command = 0001)

DATA:

C1	C2	Parameter
00010000	00000000	Null
2 byte	2 byte	0 byte

The representations of “data” string are as follow:

1. “Y” means it is successfully.
2. “N” means it is failed.

### ● Exemple 1

The command is sent by host:

SOH + “S01K8” + STX+ “1010” + ETX + BCC

The message is responded by MD-551L+:

Success:

SOH + “s01K8” + STX + “Y” + ETX + BCC

Failure:

SOH + “s01K8” + STX + “N” + ETX + BCC

## 4-12 “K9”: ISO15693 RFID Functions

The command is sent by host:

SOH	“S”	ID1	ID2	“K”	“9”	STX	DATA	ETX	BCC
-----	-----	-----	-----	-----	-----	-----	------	-----	-----

The message is responded by MD-551L+:

SOH	“s”	ID1	ID2	“K”	“9”	STX	data	ETX	BCC
-----	-----	-----	-----	-----	-----	-----	------	-----	-----

### 4-12-1 Data description

- The format of “DATA” is as below:

Command 1	Command 2	Parameter
-----------	-----------	-----------

- (1) The lengths of Command 1 & Command 2 are both 2 bytes.
- (2) The length of DATA is 2 bytes with ASCII, but it is 1 byte with Hex.
- (3) Parameter: The definition and length depend on C1 and C2.

Command1(C1) :

7	6	5	4	3	2	1	0
Command				0000			

Table1: Command1 list

Command	Description
0000	Read UID
0001	Read Single Block
0010	Write Single Block
0011	Lock Block
0100	R.F.U
0101	R.F.U
0110	Write AFI
0111	Lock AFI
1000	R.F.U
1001	R.F.U
1010	Write Locked Block
1011	Kill
1100	R.F.U
1101	R.F.U
1110	R.F.U
1111	R.F.U



Command2(C2) :

7	6	5	4	3	2	1	0
Tag type				0000			

Tag type	Description
0000	ALL TYPES
0001	R.F.U
0010	Tag-it HF-I Plus
0011	Tag-it HF-I Pro
0100	R.F.U
0101	R.F.U
0110	ICODE2
0111	R.F.U
1000	R.F.U
1001	R.F.U
1010	R.F.U
1011	R.F.U
1100	R.F.U
1101	R.F.U
1110	R.F.U
1111	R.F.U

Table2: Tag type list

\*1: R.F.U = Reserve for Use

## 2. DATA format:

The definition and length of DATA depend on C1 and C2.

2. All Tag types and commands supported by “K9” are listed as following table:

Table 3 : Tag type & Supported Command table (K9)

Command		Tag type						
		R.F.U	R.F.U	Tag-it HF-I Plus	Tag-it HF-I Pro	R.F.U	R.F.U	ICODE2
		0000	0001	0010	0011	0100	0101	0110
0000	Read UID	V						
0001	Read Single Block			V	V			V
0010	Write Single Block			V	V			V
0011	Lock Block			V	V			V
0100	R.F.U							
0101	R.F.U							
0110	Write AFI			V	V			V
0111	Lock AFI			V	V			V
1000	R.F.U							
1001	R.F.U							
1010	Write Locked Block				V			
1011	Kill				V			
1100	R.F.U							
1101	R.F.U							
1110	R.F.U							
1111	R.F.U							

\*1: R.F.U = Reserve for Use

\*2: V = Supported

\*3: The different tag type is corresponding to different command set, if the host send a command which is not supported by the tag, MD-551L+ will return “N” which represents failure.

## 3. C1, C2 Combinations for all supporting tags and command sets:

Table4 Combinations

C1	C2	C1+C2
Read UID	All types	"0000"
Read Single Block	TI HF-I Plus	"1020"
	TI HF-I Pro	"1030"
	R.F.U	"1040"
	R.F.U	"1050"
	I-CODE2	"1060"
Write Single Block	TI HF-I Plus	"2020"
	TI HF-I Pro	"2030"
	R.F.U	"2040"
	R.F.U	"2050"
	I-CODE2	"2060"
Lock Block	TI HF-I Plus	"3020"
	TI HF-I Pro	"3030"
	R.F.U	"3040"
	R.F.U	"3050"
	I-CODE2	"3060"
Write AFI	TI HF-I Plus	"6020"
	TI HF-I Pro	"6030"
	R.F.U	"6040"
	I-CODE2	"6060"
Lock AFI	TI HF-I Plus	"7020"
	TI HF-I Pro	"7030"
	R.F.U	"7040"
	I-CODE2	"7060"
Write Locked Block	TI HF-I Pro	"A030"
Kill	TI HF-I Pro	"B030"

## 4-12-2 Function description

### 4-12-2.1 Read UID (Command = 0000)

DATA:

C1	C2	Parameter
00000000	00000000	None
2 byte	2 byte	0 byte

data:

<Successful>

'M'	UID
1 byte	16 byte

<Unsuccessful>

Return 'N'

#### Example1

The command is sent by host:

SOH + "S01K9" + STX+ "0000" + ETX + BCC

The message is responded by MD-551L+:

SOH + "s01K9" + STX + "MCD0712345678ABE0" + ETX + BCC

#### Description :

"0000" means "to read the serial number of All Type cards".

"M" - Multi Page

UID: "CD0712345678ABE0"

## 4-12-2.2 Read Single Block (Command = 0001)

DATA:

C1	C2	Parameter
00010000	xxxx0000	Block Address
2 byte	2 byte	2 byte

1. xxxx represents specified card type in tag type list
2. Block Address range:  
TI HF-I Plus: 00H – 3FH  
TI HF-I Pro: 00H – 0BH  
I-CODE SLI: 00H – 1BH

data:

<Successfully>

'M'	Status	Block Address	Block Data
1 byte	1 byte	2 byte	8 byte

- 1 MD-551L+ will return "N" if it is failure.
- 2 Status: "0" - not locked; "2" – locked.
- 3 Block Data: 8 bytes Tag data.

### Example1

The command is sent by host:

SOH + "S01K9" + STX+ "102005" + ETX + BCC

The message is responded by MD-551L+:

SOH + "s01K9" + STX + "M00512345678" + ETX + BCC

### Description :

The command is sent by host:

"1020": Read Single Block, TI HF-I Plus.

"05": Block 05H.

The message is responded by MD-551L+:

"M": Multi page.

"0": Unlocked.

"05": Block 05H

"12345678": Block data.

### Example2

The command is sent by host:

SOH + "S01K9" + STX+ "102005" + ETX + BCC

The message is responded by MD-551L+ :

SOH + "s01K9" + STX + "M20512345678" + ETX + BCC

### Description:

The command is sent by host:

"1020" : Read Single Block, TI HF-I Plus

"05" : Block 05H

The message is responded by MD-551L+ :

"M": Multi page.

"2": Locked.

"05": Block 05H

"12345678": Block data.

## 4-12-2.3 Write Single Block (Command = 0010)

DATA:

C1	C2	Parameter	
00100000	xxxx0000	Block Address	Block Data
2 byte	2 byte	2 byte	16 byte

data:

<Successful>

MD-551L+ will return "Y".

<No card or Unsuccessful>

MD-551L+ will return "N".

### Example1

The command is sent by host:

SOH + "S01K9" + STX+ "20200112345678" + ETX + BCC

The message is responded by MD-551L+

SOH + "s01K9" + STX + "Y" + ETX + BCC

### Description :

"2020" : Write Single Block, TI HF-I Plus

"01" : Block 01H

"12345678": Block data.

MD-551L+ responds "Y" means data is written successfully.

### Example2

The command is sent by host:

SOH + "S01K9" + STX+ "20600912345678" + ETX + BCC

The message is responded by MD-551L+:

SOH + "s01K9" + STX + "N" + ETX + BCC

### Description :

The command is sent by host:

"2060" : Write Single Block, I-Code2

"09" : Block 09H

"12345678" is Block Data which user desire to write into Block 09H.

The message is responded by MD-551L+:

MD-551L+ return "N", it can not write data into Block 09H or no Tag.

## 4-12-2.4 Lock Block (Command = 0011)

DATA:

C1	C2	Parameter
00110000	xxxx0000	Block Address
2 byte	2 byte	2 byte

data:

<Successful>

MD-551L+ will return "Y".

<Unsuccessful>

MD-551L+ will return "N".

◎The data in the locked Block can not be changed, and the locked Block can not be unlocked. Just only Tag-it HF-I Pro could be written the data into locked Block using "Write Locked Block".

◎The Block 0BH of Tag-it HF-I Pro is used to set the Password, but it can not be read while the Block 0BH is locked.

### Example1

The command is sent by host:

SOH + "S01K9" + STX+ "30200A" + ETX + BCC

The message is responded by MD-551L+:

SOH + "s01K9" + STX + "Y" + ETX + BCC

### Description :

"3020" : Lock Block, TI HF-I Plus

"0A" : Block 0AH

MD-551L+ responds "Y" means Block 0AH is locked successfully.

### Example2

The command is sent by host:

SOH + "S01K9" + STX+ "303005" + ETX + BCC

The message is responded by MD-551L+:

SOH + "s01K9" + STX + "N" + ETX + BCC

### Description :

"3030" : Lock Block, TI HF-I Pro

"05" : Block 05H

MD-551L+ responds "N" means Block 05H is locked failure.



## 4-12-2.5 Write AFI (Command = 0110)

DATA:

C1	C2	Parameter
01100000	xxxx0000	AFI value
2 byte	2 byte	2 byte

data:

< Successful>

MD-551L+ will return "Y".

< Unsuccessful>

MD-551L+ will return "N".

### Example1

The command is sent by host:

SOH + "S01K9" + STX+ "602080" + ETX + BCC

The message is responded by MD-551L+:

SOH + "s01K9" + STX + "Y" + ETX + BCC

### Description :

"6020" : Write AFI, TI HF-I Plus

"80" : AFI Value

MD-551L+ responds "Y" means AFI value is written successfully.

### Example2

The command is sent by host:

SOH + "S01K9" + STX+ "603090" + ETX + BCC

The message is responded by MD-551L+:

SOH + "s01K9" + STX + "N" + ETX + BCC

### Description :

"6030" : Write AFI, TI HF-I Pro

"90" : AFI Value

MD-551L+ responds "N" means AFI value is written failure.

**4-12-2.6 Lock AFI (Command = 0111)**

DATA:

C1	C2	Parameter
01110000	Xxxx0000	None
2 byte	2 byte	0 byte

data:

&lt;Successful&gt;

MD-551L+ will return "Y".

&lt;Unsuccessfully&gt;

MD-551L+ will return "N".

**Example1**

The command is sent by:

SOH + "S01K9" + STX+ "7020" + ETX + BCC

The message is responded by MD-551L+:

SOH + "s01K9" + STX + "Y" + ETX + BCC

**Description :**

"7020" : Lock AFI, TI HF-I Plus

MD-551L+ responds "Y" means AFI is locked successfully.

**Example2**

The command is sent by host:

SOH + "S01K9" + STX+ "7030" + ETX + BCC

The message is responded by MD-551L+

SOH + "s01K9" + STX + "N" + ETX + BCC

**Description :**

"7030" : Lock AFI, TI HF-I Pro

MD-551L+ responds "N" means AFI is locked failure.

## 4-12-2.7 Write Locked Block (Command = 1010)

- ◎ This function is only Tag-it HF-I Pro card available.
- ◎ This function is used to write the data into a locked Block using Password and UID.
- ◎ This function is allowed to perform while the Password is enabled.
- ◎ The content of Block 0BH is the Password and it is enabled while Block 0BH is locked.
- ◎ Password can be read or written while it is enabled.

DATA:

C1	C2	Parameter			
10100000	00110000	Tag UID	Pwd	Block Address	Block Data
2 byte	2 byte	16 byte	8 byte	2 byte	8 byte

data:

< Successfully>

MD-551L+ will return "Y".

< no Tag>

MD-551L+ will return "N".

### Example1

The command is sent by host:

SOH + "S01K9" + STX +

"A0306207C4A509C215E0AAAAAAA0712345678" + ETX + BCC

(Write Locked Block、TI HF-I Pro、Tag UID = E007C4A509C21562、  
Pwd = AAAAAAAA、Block Address = 07、Block Data = 12345678)

The message is responded by MD-551L+:

SOH + "s01K9" + STX + "Y" + ETX + BCC

## 4-12-2.8 Kill (Command = 1011):

- ◎ This function is only Tag-it HF-I Pro card available.
- ◎ Use this function to kill a Tag-it HF-I Pro card.
- ◎ A killed tag can not be read any data and responded.
- ◎ This function is allowed to perform while the Password is enabled.
- ◎ The content of Block 0BH is the Password and it is enabled while Block 0BH is locked.

DATA:

C1	C2	Parameter	
10110000	00110000	Tag UID	Pwd
2 byte	2 byte	16 byte	8 byte

data:

<Successful>

MD-551L+ will return "Y".

<Unsuccessful>

MD-551L+ will return "N".

### Example1

The command is sent by host:

SOH + "S01K9" + STX + "B0306207C4A509C215E0AAAAAAA" +  
ETX + BCC

(Kill \ TI HF-I Pro \ Tag UID = E007C4A509C21562 \ Pwd = AAAAAAAA)

The message is responded by MD-551L+:

SOH + "s01K9" + STX + "Y" + ETX + BCC (Kill successfully)

The command is sent by host:

SOH + "S01K9" + STX + "B0306207C4A509C215E0AAAAAAA" + ETX +  
BCC

The message is responded by MD-551L+:

SOH + "s01K9" + STX + "N" + ETX + BCC (Kill Failure)

## 4-12-2.9 Read System

This function is only TI HF-I Plus and I Code 2 available.

DATA:

C1	C2	Parameter
11100000	xxxx0000	Null
2 byte	2 byte	0 byte

data:

MD-551L+ will return successful data as below:

Info flags	UID	DSFID	AFI	Other fields
8 bit	64 bit	8 bit	8 bit	24 bit

## ● Example

The command is sent by host:

SOH + "S01K9" + STX+ "E020" + ETX + BCC

The message is responded by MD-551L+ :

SOH + "s01K9" + STX + "0F83284406822007E000993F038B" + ETX + BCC(Read System successfully)

(0F=Info flags, 83284406822007E0=uid, 00= DSFID, 99=AFI, Other fields=3F038B)

## 4-13 "KA" (ISO18092 RFID Function)

The command is sent by host:

SOH	"S"	ID1	ID2	"K"	"A"	STX	DATA	ETX	BCC
-----	-----	-----	-----	-----	-----	-----	------	-----	-----

The message is responded by MD-551L+:

SOH	"s"	ID1	ID2	"K"	"A"	STX	data	ETX	BCC
-----	-----	-----	-----	-----	-----	-----	------	-----	-----

### 4-13-1 Data Description

1.DATA :

Command 1	Command 2	Parameter
-----------	-----------	-----------

- (1)The lengths of Command 1 & Command 2 are both 2 bytes.
- (2) The length of DATA is 2 bytes with ASCII, but it is 1 byte with Hex.
- (3) Parameter: The definition and length of DATA depend on C1 and

C2.

Command1(C1) :

7	6	5	4	3	2	1	0
Command				0000			

Command	Description
0001	Read Single Block
0010	Write Single Block
1100	Enable NDEF
1101	Disable NDEF

Command2(C2) :

7	6	5	4	3	2	1	0
Tag type				0000			

Tag type	Description
00010000	Sony Felica

2. DATA:

The definition and length of DATA depend on C1 and C2.

## 4-13-2 Function Description

### 4-13-2.1 Read Single Block (Command = 0001)

DATA:

C1	C2	Parameter
00010000	xxxx0000	Block Address
2 byte	2 byte	2 byte

data:

'M'	Status	Block Address	Block Data
1 byte	1 byte	2 byte	32 byte

1. MD-551L+ will return "N" while the specified Block is read failure.
2. Status: "0" - Unlocked; "2" - Locked
3. The Lock status is always "0", due to the Lock function is unavailable for Felica.
4. Block Address range:  
Felica lite:00h~88h  
Felica lite S:00h~A0h
5. Block Data: The length of data is 32 byte

#### ● Example 1

The command is sent by host:

SOH + "S01KA" + STX+ "101005" + ETX + BCC

The message is responded by MD-551L+:

SOH + "s01KA" + STX + "M0051234567812345678" + ETX + BCC

Description :

The command is sent by host:

"1010" means "Read Single Block, Sony Felica".

"05" means Block 05H.

The message is responded by MD-551L+

"M" – Multi-Page

"0" –Unlocked

"05" – Block 05H

"1234567812345678" – Block data

## 4-13-2.2 Write Single Block (Command = 0010)

DATA:

C1	C2	Parameter	
00100000	xxxx0000	Block Address	Block Data
2 byte	2 byte	2 byte	32 byte

data:

1. MD-551L+ will return “Y” while the data is written successfully.
2. MD-551L+ will return “N” while the data is written unsuccessfully.
3. Block Address range Felica lit :00h~88h  
Felica lite S:00h~A0h

### ● Example 1

1. The command is sent by host:

SOH + “S01KA” + STX+

“20100112345678123456781234567812345678” + ETX + BCC

The message is responded by MD-551L+:

SOH + “s01KA” + STX + “Y” + ETX + BCC

Description:

“2010” means 「Write Single Block, Felica」

“01” Block 01H

“12345678123456781234567812345678” represents Block Data

MD-551L+ responds “Y” means the data is written successfully.

### ● Example 2

2. The command is sent by host:

SOH + “S01K9” + STX+

“20100912345678123456781234567812345678” + ETX + BCC

The message is responded by MD-551L+:

SOH + “s01K9” + STX + “N” + ETX + BCC

Description:

“2010” means 「Write Single Block, Sony Felica」

“09” Block 09H

“12345678123456781234567812345678” represents Block Data

MD-551L+ responds “N” while it can not write the data into Tag or no Tag.



## 4-13-2.3 Enable NDEF(Command = 11000000)

DATA:

C1	C2	Parameter	
11000000	xxxx0000	Block Address	Block Data
2 byte	2 byte	2 byte	32 byte

1. Use this function to enable NDEF for NFC data access.
2. It writes Block Data into Block Address "88H" to enable NDEF function.
3. The length of Block Data is 32 bytes, it is "FFFFFF01FF0000000000000000".  
data:

- 1 It is "Y" for success.
- 2 It is "N" for failure.

### ● Example 1

1. The command is sent by host:  
SOH + "S01KA" + STX+ "C01088FFFFFF01FF0000000000000000" + ETX + BCC

The message is responded by MD-551L+

Success: SOH + "s01KA" + STX + "Y" + ETX + BCC

Failure: SOH + "s01KA" + STX + "N" + ETX + BCC

Description:

"C010" represents "Enable NDEF, Sony Felica"

"88" represents Block 88H

"FFFFFF01FF0000000000000000" represents Block Data

MD-551L+ responds "Y" while Block Data is written successfully.

MD-551L+ responds "N" while Block Data is written failure.

## 4-13-2.4 Disable NDEF(Command = 11010000)

DATA:

C1	C2	Parameter	
11010000	xxxx0000	Block Address	Block Data
2 byte	2 byte	2 byte	32 byte

1. Use this function to disable NDEF for NFC data access.
2. It writes Block Data into Block Address "88H" to disable NDEF function.
3. The length of Block Data is 32 bytes, it is  
"FFFFFF00FF0000000000000000"

data:

- 1 It is "Y" for success.
- 2 It is "N" for failure.

### ● Example 1

1. The command is sent by host:  
SOH + "S01KA" + STX+ "C01088 FFFFFFFF00FF0000000000000000" +  
ETX + BCC

The message is responded by MD-551L+:

Successful: SOH + "s01KA" + STX + "Y" + ETX + BCC

Failure: SOH + "s01KA" + STX + "N" + ETX + BCC

Description:

"C010" represents "Enable NDEF, Sony Felica"

"88" represents Block 88H

"FFFFFF00FF0000000000000000" represents Block Data

MD-551L+ responds "Y" while Block Data is written successfully.

MD-551L+ responds "N" while Block Data is written failure.

### Appendix

#### Supporting Cards:

##### ISO 15693(R/W):

1. TI HF-I Plus
2. TI HF-I Pro
3. NXP I-Code SLI

##### ISO 14443-A(R/W):

1. NXP Mifare\_One(S50\_4byte)
2. NXP Mifare\_One(S70\_4byte)
3. NXP Mifare\_One(S50\_7byte)
4. NXP Mifare\_UltraLight
5. NXP Mifare\_UltraLight c
6. NXP Mifare Plus S 2K/4k
7. NXP Mifare Plus X 2K/4k
8. NXP NTAG213

##### ISO 18092(R/W):

1. SONY Felica Lite s
2. SONY Felica Lite

##### ISO 14443-A(Only Read UID) :

1. NXP Mifare DESFire\_EV1 4K

##### ISO 14443-B(Only Read UID) :

1. ST SRIX 4K