

Multi-Protocol SDK User Manual

Rev1.0

Revision History

Revision	Date	Author	Description
1.0	2012.09.17	C.K	1 st Release
1.1	2012.10.22	C.K	Add Ultralight Function

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1. Protocol Package

1.1 Command Frame Format

Name	SOF	LENG-H	LENG-L	CMD Category	CMD	Data	LRC
Value	0xAE						
Bytes	1-Byte	1-Byte	1-Byte	1-Byte	1-Byte	n-Bytes	1-Byte

1.1.1 Meaning of byte in command frame format

Name	Meaning
SOF	Start of frame byte(0xAE)
LENG-H	High byte of packet length from cmd category to data
LENG-L	Low byte of packet length from cmd category to data
CMD Category	Command category byte
CMD	Command byte in specified command category
Data	Data bytes
LRC	Check sum of package which is XORing result from LENG-H to Data

(1) The package length that maximum is 258 bytes

1.1.2 CMD Category

CMD Category	Meaning
0x00	Command category for general function
0x01	Command category for ISO14443A
0x02	Command category for ISO14443B
0x03	Command category for ISO15693

1.2 Response Frame Format

Name	SOF	LENG-H	LENG-L	CMD Category	CMD	Resp	Data	LRC
Value	0xAE							
Bytes	1-Byte	1-Byte	1-Byte	1-Byte	1-Byte	1-Byte	n-Bytes	1-Byte

1.2.1 Meaning of byte in command frame format

Name	Meaning
SOF	Start of frame byte(0xAE)
LENG-H	High byte of packet length from cmd category to data
LENG-L	Low byte of packet length from cmd category to data
CMD Category	Operated command category byte
CMD	Operated command byte
Resp	Response flag of operated command
Data	Response data bytes
LRC	Check sum of package which is XORing result from LENG-H to Data

1.2.2 Response Flags(Resp)

Category	Response Name	Resp	Description
No Error	Operation Success	0x01	Operation is successful
UART Error	LRC error	0x10	LRC check sum verification fails
	Command error	0xFF	Unknown command
RF Communication Error	No Response	0xE0	There is no card or doesn't respond
	Framing Error	0xE1	Received frame error
Mifare	Authenticate Error	0xA1	Mifare authenticate fail

1.3

2. General Command

2.1 General Command Overview(0x00)

Command Name	Command	Description
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Select Communication Protocol	0x00	Config the communication protocol
Get Firmware Version	0x01	Get the firmware version
Auto Polling	0x02	Enable/Disable Auto Polling

2.1.1 Select Communication Protocol

Request Format

CMD Category	Command	Payload
0x00	0x00	Type

Type: 0x00 – ISO14443A

0x01 – ISO14443B

0x02 – ISO15693

Response Format

CMD Category	Command	Resp	Payload
0x00	0x00	0x01	

2.1.2 Get Firmware Version

Request Format

CMD Category	Command	Payload
0x00	0x01	

Response Format

CMD Category	Command	Resp	Payload
0x00	0x01	0x01	FirmwareString(NBytes)

FirmwareString: Product + Version + Meaningful filename

2.1.3 Auto Polling

Request Format

CMD Category	Command	Payload
0x00	0x02	Value

Value = 0x00 – Enable

0x01 – Disable(Default)

UID Format : UID(0)+UID(1)+...+UID(N)

Please turn off Auto Polling before executing any commands of card

Response Format

CMD Category	Command	Resp	Payload
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0x00	0x02	0x01	
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2.1.4

2.2

3. ISO14443A Command

3.1 ISO14443A Command Overview(0x01)

Command Name	Command	Description
Get UID	0x00	Preform three command in ISO14443-3 then get the UID.
RATS	0x01	Perform RATS command in ISO14443-4
APDU	0x02	
Deselect	0x03	
Mifare Read Block	0x04	Read Mifare Classic One Block
Mifare Write Block	0x05	Write Mifare Classic One Block
Ultralight Read Page	0x06	Read Ultralight one page
Ultralight Write Page	0x07	Write Ultralight one page
Topaz Get UID	0x08	

3.1.1 Get UID

Request Format

CMD Category	Command	Payload
0x01	0x00	

Response Format

CMD Category	Command	Resp	Payload
0x01	0x00	0x01	UID(0)+..UID(N)

3.1.2 RATS

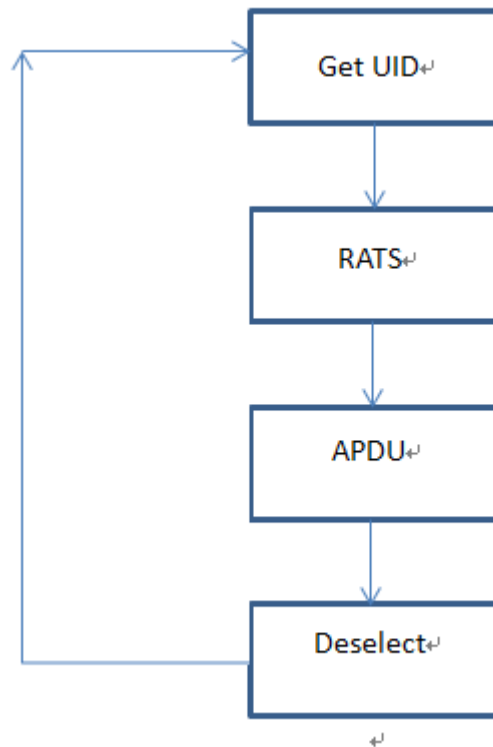
CMD Category	Command	Payload
0x01	0x01	

Response Format

CMD Category	Command	Resp	Payload
0x01	0x01	0x01	

3.1.3 APDU

Using APDU command has to comply with that following flowchart



CMD Category	Command	Payload
0x01	0x02	APDU Commmad

APDU Command: N Byte

Response Format

CMD Category	Command	Resp	Payload
0x01	0x02	0x01	APDU Response

3.1.4 Deselect

CMD Category	Command	Payload
0x01	0x03	

Response Format

CMD Category	Command	Resp	Payload
0x01	0x03	0x01	

3.1.5 Read Mifare Block

CMD Category	Command	Payload
0x01	0x04	Block + KeyType + Key

Block:Block Number
 KeyType: KeyA - 0x00
 KeyB - 0x01
 Key:6Byte Value

Response Format

CMD Category	Command	Resp	Payload
0x01	0x04	0x01	BlockData(0)+...+BlockData(15)

3.1.6 Write Mifare Block

CMD Category	Command	Payload
0x01	0x05	Block + KeyType + Key + Data

Block:Block Number
 KeyType: KeyA - 0x00
 KeyB - 0x01
 Key:6Byte Value
 Data:16Byte

Response Format

CMD Category	Command	Resp	Payload
0x01	0x05	0x01	

3.1.7 Read Ultralight Page

CMD Category	Command	Payload
0x01	0x06	Page

Page:Page Number

Response Format

CMD Category	Command	Resp	Payload
0x01	0x06	0x01	Data(0)+Data(1)+Data(2)+Data(3)

3.1.8 Write Ultralight Page

CMD Category	Command	Payload
0x01	0x07	Page+Data(0)+Data(1)+Data(2)+Data(3)

Page:Page Number

Response Format

CMD Category	Command	Resp	Payload
0x01	0x07	0x01	

3.1.9

4. ISO14443B Command

4.1 ISO14443B Command Overview(0x02)

Command Name	Command	Description
Get UID	0x00	Preform three command in ISO14443B then get the UID.
ATTRIB	0x01	
APDU	0x02	
Deselect	0x03	
Get UID(For Cepas)	0x04	Get Cepas UID
Get UID(For SRI Series)	0x05	Get UID For SRI Series
Read Block(For SRI Series)	0x06	Read Block For SRI Series
Write Block(For SRI Series)	0x07	Write Block For SRI Series

4.1.1 Get UID

Request Format

CMD Category	Command	Payload
0x02	0x00	

Response Format

CMD Category	Command	Resp	Payload
0x02	0x00	0x01	UID(0)+..UID(N)

4.1.2 ATTRIB

Request Format

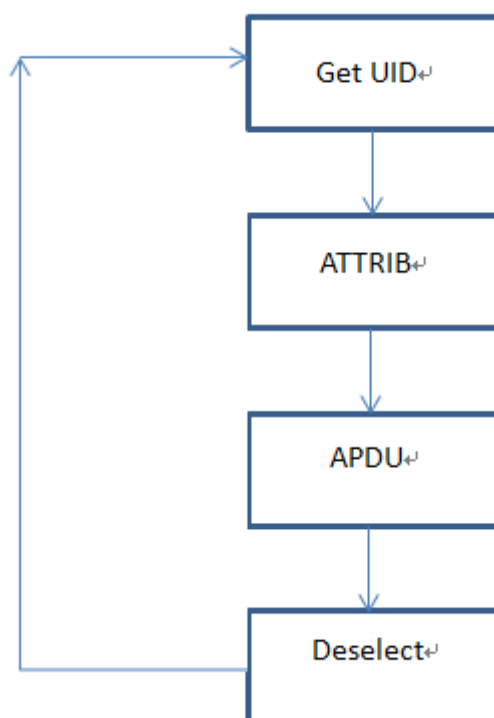
CMD Category	Command	Payload
0x02	0x01	

Response Format

CMD Category	Command	Resp	Payload
0x02	0x01	0x01	

4.1.3 APDU

Using APDU command has to comply with that following flowchart



Request Format

CMD Category	Command	Payload
0x02	0x02	APDU Commmad

Response Format

CMD Category	Command	Resp	Payload
0x02	0x02	0x01	APDU Response

4.1.4 Deselect

Request Format

CMD Category	Command	Payload
0x02	0x03	

Response Format

CMD Category	Command	Resp	Payload
0x02	0x03	0x01	

4.1.5 Get UID For Cepas

Request Format

CMD Category	Command	Payload
0x02	0x04	

Response Format

CMD Category	Command	Resp	Payload
0x02	0x04	0x01	UID(0)+...+UID(N)

4.1.6 Get UID For SRI
Request Format

CMD Category	Command	Payload
0x02	0x05	

Response Format

CMD Category	Command	Resp	Payload
0x02	0x05	0x01	UID(0)+...+UID(N)

4.1.7 Read Block For SRI
Request Format

CMD Category	Command	Payload
0x02	0x06	Address

Response Format

CMD Category	Command	Resp	Payload
0x02	0x06	0x01	Data(0)+...+Data(3)

4.1.8 Write Block For SRI
Request Format

CMD Category	Command	Payload
0x02	0x07	Address+Data(0)+...+Data(3)

Response Format

CMD Category	Command	Resp	Payload
0x02	0x07	0x01	

5. ISO15693 Command

5.1 ISO15693 Command Overview(0x03)

Command Name	Command	Description
Get UID	0x00	Preform three command in ISO5693 then get the UID.
Read Block	0x01	Read single block
Write Block	0x02	Write single block

5.1.1 Get UID

Request Format

CMD Category	Command	Payload
0x03	0x00	

Response Format

CMD Category	Command	Resp	Payload
0x03	0x00	0x01	UID(0)+..UID(N)

5.1.2 Read Block

Request Format

CMD Category	Command	Payload
0x03	0x01	Block

Block:Block Address(1Byte)

Response Format

CMD Category	Command	Resp	Payload
0x03	0x01	0x01	Data(0)+...+Data(3)

5.1.3 Write Block

Request Format

CMD Category	Command	Payload
0x03	0x02	Block+Data(0)+...Data(3)

Response Format

CMD Category	Command	Resp	Payload
0x03	0x00	0x01	