Contact IC card function instruction

Version: V 1.0.6

Definitions and Declarations

A. The numbers in this paper are represented by hexadecimal except that they are represented by adding (DEC) after hexadecimal numbers
B. An integer is represented by a high-order byte before the low-order byte
C. None in the body of the following agreement means empty, and this field needs to be skipped
D. XX in the following documents represents an unfixed dynamic value

Instruction description

Card status CMD_ICC_ST

Describe

Query the status of IC card

Command message

Domain	Value	
STX	AA	
INX	XX	
LEN	LH: 00 LL: 05	
DEVICE	DH:XX DL: XX	
CMD	CH: 18 CL: 00	
DATA	SLOT	1byte
CHK	XX	

Data domain

SLOT: Refer to the appendix for the meaning of the corresponding value of the card slot to be detected

Response data domain

Card status: 1 byte, bit0 bit indicates whether there is a card, 0 - no card, 1 - card

Example

→ AA BB 00 05 00 00 18 00 00 A6
← AA BB 00 05 00 00 18 00 01 A7

CMD_ICC_SEL

Description

Select (Set) a card type which for operating. This instruction should be called before any read/write instruction.

Package

Field	Value	
STX	AA	
INX	XX	
LEN	LH: 00 LL: 06	
DEVICE	DH:XX DL: XX	
CMD	CH: 18 CL: 01	
DATA	SLOT	1 Byte
	CARD_TYPE	1 Byte
CHK	XX	

Data Send

SLOT: The slot id in which the card insert. Value see appendix.
CARD_TYPE： The code of card-type, value see to appendix.

Data Response

None

Example

→ AA BB 00 06 00 00 18 01 00 0C A8
← AA BB 00 05 00 00 18 01 00 A7

CMD_ICC_SLOT_PWR

Description

Control power on or off to specific slot, this is unnecessary instruction, as it'll be power on when CMD_ICC_GETATR executing.

Package

Field	Value	
STX	AA	
INX	XX	
LEN	LH: 00 LL: 06	
DEVICE	DH:XX DL: XX	
CMD	CH: 18 CL: 02	
DATA	SLOT	1 Byte
	ATC	1 Byte
CHK	XX	

Data Send

SLOT: The slot id in which the card insert. Value see appendix.
ACT： Operation to do. 0- power off, 1- power on

Data Response

None

Example

Power off PSAM1
→ AA BB 00 06 00 00 18 02 01 00 A6
← AA BB 00 05 00 00 18 02 00 A4

Reset CPU card CMD_ICC_GETATR

Describe

Reset the ICC card and obtain the ATR information of the card

Command message

Domain	Value	
STX	AA	
INX	XX	
LEN	LH: 00 LL: 05	
DEVICE	DH:XX DL: XX	
CMD	CH: 18 CL: 80	
DATA	SLOT	1byte
CHK	XX	

Data domain

SLOT: Refer to the appendix for the meaning of the corresponding value of the card slot to be detected

Response data domain

ATR information

Example

→ AA BB 00 05 00 00 18 80 00 26
← AA BB 00 15 00 00 18 80 00 3B 78 13 00 00 00 73 C8 40 13 00 90 00 74 01 78 13

CPU card instruction exchange CMD_ICC_APDU

Describe

The reader / writer exchanges instructions with the ISO7816 protocol IC card

Command message

Domain	Value	
STX	AA	
INX	XX	
LEN	LH: XX LL: XX	
DEVICE	DH:XX DL: XX	
CMD	CH: 18 CL: 81	
DATA	SLOT	1byte
	APDU_CMD	XX byte
CHK	XX	

Data domain

SLOT: Refer to the appendix for the meaning of the corresponding value of the card slot to be detected
APDU_CMD: Instruction package to send to card

Response data domain

The data returned successfully are as follows:

Explain	Length (bytes)
Card response packet APDU_REP	XX

Example

→ AA 00 00 0A 00 00 18 81 00 00 84 00 00 08 1F
← AA 00 00 0F 00 00 18 81 00 20 C9 24 32 20 36 81 7F 90 00 11

CPU card set baud CMD_ICC_SET_BAUD

Describe

The reader / writer set baud when communicate with the ISO7816 protocol IC card.
This setting is valid till the device reboot.
This command is not necessary but when MUST change baud with card, and it should be invoke before get ATR .

Command message

Domain	Value	
STX	AA	
INX	XX	
LEN	LH: 00 LL: 08	
DEVICE	DH:XX DL: XX	
CMD	CH: 18 CL: 82	
DATA	SLOT	1byte
	BAUD	4byte
CHK	XX	

Data domain

SLOT: Refer to the appendix for the meaning of the corresponding value of the card slot to be detected
BAUD: the baud communicate with card. 9600/38400 is supported.

Response data domain

None

Example

//Setting as 9600
→ AA 00 00 09 00 00 18 82 00 00 00 25 80 36
← AA 00 00 05 00 00 18 82 00 9F

CPU card PPS CMD_ICC_PPS

Describe

Do a Protocol and Parameters exchange with card, this command shall be invoke just after get ATR if necessary.

Command message

Domain	Value
STX	AA
INX	XX

LEN	LH: 00 LL: 0A	
DEVICE	DH:XX DL: XX	
CMD	CH: 18 CL: 83	
DATA	SLOT	1byte
	PARA	6byte
CHK	XX	

Data domain

SLOT: Refer to the appendix for the meaning of the corresponding value of the card slot to be detected
PARA: Start from PPS0, and PPS1… followed, the useless bytes should be set as all 0.

Response data domain

None

Example

→ AA 00 00 0B 00 00 18 83 00 10 11 00 00 00 00 91
← AA 00 00 05 00 00 18 83 00 9E

Read Memory Of Card CMD_ICC_READ_MEM

Description

Read data from IC Card

Package

Field	Value
STX	AA
INX	XX
LEN	LH: 00 LL: 09
DEVICE	DH:XX DL: XX
CMD	CH: 18 CL: 10

DATA	SLOT	1 Byte
	ADDR	2 Byte
	LEN	2 Byte
CHK	XX	

Data Field

SLOT: The Slot in which the card insert, values see to appendix.
ADDR: The start address of data in the card, 2 bytes.
LEN： The length of data for reading, 2 bytes.

Response Field

ReadData：The data readed

Example

→ AA BB 00 09 00 00 18 10 00 00 20 00 08 92
← AA BB 00 0D 00 00 18 10 00 01 02 03 04 05 06 07 08 B6

Write Card CMD_ICC_WRITE_MEM

Description

Write data to card

Package

Field	Value	
STX	AA	
INX	XX	
LEN	LH: XX LL: XX	
DEVICE	DH:XX DL: XX	
CMD	CH: 18 CL: 11	
DATA	SLOT	1 Byte
	ADDR	2 Byte
	LEN	2 Byte
	WDATA	XX
CHK	XX	

Data Field

SLOT: The slot in which the card insert, values see to appendix.
ADDR: The start address of data for writing, 2 bytes.
LEN： The length of data for writing, 2 bytes.
WDATA：The data for writing.

Response Field

None

Example

→ AA BB 00 10 00 00 18 11 00 00 20 00 08 01 02 03 04 05 06 07 08 82
← AA BB 00 05 00 00 18 11 00 B7

Read Error Code CMD_ICC_READ_ERRCNT

Description

Read remain error count the card can verify. Once 0 if this value, the card will become to invalid.

Package

Field	Value	
STX	AA	
INX	XX	
LEN	LH: 00 LL: 05	
DEVICE	DH:XX DL: XX	
CMD	CH: 18 CL: 12	
DATA	SLOT	1 Byte
CHK	XX	

Data field

SLOT: The slot in which the card insert, values see to appendix.

Data Response

Counter: The count readed, 1 byte.

Example

→ AA BB 00 05 00 00 18 12 00 B4
← AA BB 00 06 00 00 18 12 00 03 B4

Verify User Password CMD_ICC_AUTHEN

Description

Verify card's user password. Card such as 4442/4428, must verify password before writing data.

Package

Field	Value	
STX	AA	
INX	XX	
LEN	LH: XX LL: XX	
DEVICE	DH:XX DL: XX	
CMD	CH: 18 CL: 16	
DATA	SLOT	1 Byte
	PWD	XX
CHK	XX	

Data Field

SLOT: The slot in which the card insert, values see to appendix.
PWD： The user password for verifying, the length depend on card type, 3 byte case of 4442 type card, 2 byte when 4428 card.

Data Response

None

Example

→ AA BB 00 08 00 00 18 16 00 FF FF FF 42
← AA BB 00 05 00 00 18 16 00 B0

Update user-password CMD_ICC_UPDATE_USER_PWD

Description

Update user-password of card.

Package

Field	Value	
STX	AA	
INX	XX	
LEN	LH: XX LL: XX	
DEVICE	DH:XX DL: XX	
CMD	CH: 18 CL: 1A	
DATA	SLOT	1 Byte
	PWD	XX
CHK	XX	

Data Field

SLOT: The slot in which the card insert, values see to appendix.
PWD：The password for updating, the length depend on card type, 3 byte case of 4442 type card, 2 byte when 4428 card.

Data Response

None

Example

→ AA BB 00 08 00 00 18 1A 00 FF FF FF 4E
← AA BB 00 05 00 00 18 1A 00 BC

CMD_GET_SIM

Describe

The reader / writer get the information of SIM card. There is no need to execute other instructions before this instruction

Command message

Domain	Value
STX	AA
INX	XX
LEN	LH: 00 LL: 05
DEVICE	DH:XX DL: XX
CMD	CH: 18 CL: A0
DATA	SLOT (1 byte)
CHK	XX

Data domain

SLOT: Which slot the card locate, 0-Normal Contact Slot, 100-RFID area

Response data domain

All the information is string format. Each item split by String "\r\n"
Items defined as follow:

Flag	Definition
'1'	International Mobile Subscriber Identity (IMSI)
'2'	Integrated Circuit Card Identity (ICCID)

Example

→ AA 02 00 05 00 00 18 A0 00 BF
← AA 02 00 31 00 00 18 A0 00 31 38 30 39 34 36 30 31 31 35 30 35 35 32 38 31 35 36 39 0D 0A 32 38 39 38 36 30 33 32 30 37 34 37 35 35 32 30 33 34 35 30 36 0D 0A 83

Appendix

Card slot No

00：Conventional large card slot
01: SAM1
02: SAM2
03: SAM3

Card Types

Type	Code	
AT24Cxx	01	
AT24C64	02	
4442	03	
4428	04	
7816(CPU Card)	0C	