Overview of Communication Protocol Directives

Version: V 1.0.32

Device Communication Physical Interface

Optional serial communication, communication rate 115200bps
Optional USB interface communication
Bluetooth data communication with BLE mode at 115200bps

Protocol Format Specification

See the General Agreement Rules documentation for details.

Definitions and declarations

A. Numbers in the text are represented in 16-digit except after the decimal number (dec)
B. Express integers in terms of high-bit bytes followed by low-bit bytes
C. XX in the following documents represents an unstable dynamic value

Instruction Code Set

Code interval

0000 – 00FF	Device system comes with
FF00 – FFFF	Simple Device Module
0100~0FXX	Set up for communication class
0100 – 01FF	Bluetooth Module
0200 – 02FF	WIFI Module
0300 – 03FF	Mobile communication module
0400 – 04FF	Ethernet Communication Module
1000~B0XX	For integrated functionality
1000 – 10FF	RFID module
1100 – 11FF	Fingerprint Module
1200 – 12FF	Camera Module
1300 – 13FF	Speech Module
1800 – 18FF	PCD (Contact) Module
CF00 – CFFF	User-defined modules

Overview of Instructions Included in Devices

Instructions	Instruction Value	Describe
CMD_HW_VER	00 00	Device Hardware Version Number

CMD_REBOOT	00 01	System Restart
CMD_GET_FLASH_SIZE	00 02	Get device user memory size
CMD_READ_FLASH	00 03	Read Device User Memory
CMD_WRITE_FLASH	00 04	Write device user memory
CMD_SET_DEVADDR	00 05	Set Address Code
CMD_GET_DEVADDR	00 06	Get Address Code
CMD_SET_BAUDRATE	00 07	Update communication baud rate
CMD_SET_DEV_PWD	00 08	Set device password (for encryption and decryption)
CMD_CRYPT	00 09	Decrypt / Decrypt
CMD_READ_FLASH_EX	00 0A	Read device's user memory extend
CMD_WRITE_FLASH_EX	00 0B	Write device's user memory extend
CMD_SET_LOCTIME	00 0C	Set local time
CMD_GET_LOCTIME	00 0D	Get local time
CMD_DEV_PROC_HAND	00 60	Device agreement handshake (private, not public)
CMD_GET_DEV_SN	00 81	Get device's Serial Number
CMD_REP_GET_UPDATA	00 F0	Confirm receipt of auto-reported data
CMD_SET_ID_OBJ_RESP	00 F1	Setting feedback characteristics for target recognition
CMD_GET_ID_OBJ_RESP	00 F2	Obtaining feedback characteristics for target recognition
CMD_SET_REP_RODATA_PAG	00 F3	Set up read-only report data format
CMD_GET_REP_RODATA_PAG	00 F4	Get Read-Only Upload Data Form

Overview of Simple Device Function Instructions

Instructions	Instruction Value	Describe
CMD_BEEP	FF 00	Device Beep
CMD_LED	FF 01	Control LED
CMD_VOICE_PLAY	FF 02	Voice play a given text
CMD_PLAYER_BACKLIGHT	FF 03	Player to control the back-light
CMD_PLAYER_SHOWTEXT	FF 04	Player to show a string given
CMD_GET_POWER	FF 10	Get device (battery) power
CMD_SET_PWR_OFF_TIME	FF FE	Set Auto Shutdown Wait Time
CMD_POWER_OFF	FF FF	Shutdown

Overview of Bluetooth Module Instructions

Instructions	Instruction Value	Describe
CMD_CLR_BT_INIT	01 00	Clear Bluetooth Initialization State
CMD_SET_BT_NAME	01 10	Set Bluetooth Name
CMD_GET_BT_MAC	01 11	Get Bluetooth MAC
CMD_GET_BT_NAME	01 12	Get Bluetooth Name

Overview of WiFi Client Module Instructions

Instructions	Instruction Value	Describe
CMD_SET_WIFI_AP	02 01	Set WiFi host AP name
CMD_GET_WIFI_AP	02 02	Get WiFi host AP name
CMD_SET_WIFI_PWD	02 03	Set the password when linking WiFi
CMD_GET_WIFI_PWD	02 04	Get the password set when linking WiFi

Mobile Communication Module Instructions Overview

Instructions	Instruction Value	Describe
CMD_NET_SET_SERVER_IP	03 00	Set Server IP Addres
CMD_NET_GET_SERVER_IP	03 01	Get the server IP address
CMD_NET_SET_SERVER_PORT	03 02	Set the server's listening port number
CMD_NET_GET_SERVER_PORT	03 03	Get the server's listening port number
CMD_NET_REP_RODATA_ENABLE	03 04	Enables or closes the auto-report mobile communication channel
CMD_NET_GET_REP_ST	03 05	Gets whether auto-upload is turned on
CMD_NET_SET_URL	03 06	Set the URL of the link
CMD_NET_GET_URL	03 07	Get the URL of the link
CMD_NET_SET_HB_INTV	03 08	Set the Heart-Beat Interval
CMD_NET_GET_HB_INTV	03 09	Get the Heart-Beat Interval
CMD_SET_CONTENT_TYPE	03 0A	Set the content-type
CMD_GET_CONTENT_TYPE	03 0B	Get the content-byte
CMD_SET_PARA_TITLE_DATA	03 10	Set the para-data title
CMD_GET_PARA_TITLE_DATA	03 11	Get the para-data title
CMD_SET_PARA_TITLE_ADDR	03 12	Set the para-addr title
CMD_GET_PARA_TITLE_ADDR	03 13	Get the para-addr title
CMD_SET_PARA_TITLE_TIME	03 14	Set the para-time title
CMD_GET_PARA_TITLE_TIME	03 15	Get the para-time title
CMD_SET_PARA_TITLE_DATATYPE	03 16	Set the para-dataType title
CMD_GET_PARA_TITLE_DATATYPE	03 17	Get the para-dataType title
CMD_SET_PARA_TITLE_PACKTYPE	03 18	Set the para-packType title
CMD_GET_PARA_TITLE_PACKTYPE	03 19	Get the para-packType title
CMD_NET_SET_MQTT_CLIENT	03 20	Set the client name of MQTT
CMD_NET_GET_MQTT_CLIENT	03 21	Get the client name of MQTT
CMD_NET_SET_MQTT_USER	03 22	Set the user name of MQTT
CMD_NET_GET_MQTT_USER	03 23	Get the user name of MQTT
CMD_NET_SET_MQTT_USERPASS	03 24	Set the user's password of MQTT
CMD_NET_GET_MQTT_USERPASS	03 25	Get the user's password of MQTT
CMD_NET_SET_MQTT_PUB_TOPIC	03 26	Set the publish topic of MQTT
CMD_NET_GET_MQTT_PUB_TOPIC	03 27	Get the publish topic of MQTT

Ethernet Communication Module Instructions Overview

Instructions	Instruction Value	Describe
CMD_ETH_SET_LOCAL_IP	04 00	Set local IP Addres
CMD_ETH_GET_LOCAL_IP	04 01	Get the local IP address
CMD_ETH_SET_LOCAL_PORT	04 02	Set the local's listening port number
CMD_ETH_GET_LOCAL_PORT	04 03	Get the local's listening port number
CMD_ETH_SET_GATEWAY_IP	04 08	Set the gateway's IP
CMD_ETH_GET_GATEWAY_IP	04 09	Get the gateway's IP

Overview of RFID module instructions

Instructions	Instruction Value	Describe
CMD_REQUEST_TYPEA	10 00	Looking for ISO14443A card
CMD_AUTHEN_CLASS	10 01	Verify (classic) card password
CMD_READ_CLASS	10 02	Read (Classic) Card
CMD_WRITE_CLASS	10 03	Write (Classic) Card
CMD_HALT	10 04	Sleep Card
CMD_QREAD_CLASS	10 05	One-Click Read (Classic) Card
CMD_QWRITE_CLASS	10 06	One-Click Write (Classic) Card
CMD_INITVAL_CLASS	10 07	Initialization Value (Classic) Card
CMD_INC_CLASS	10 08	Value-added (classic) cards
CMD_DEC_CLASS	10 09	Impairment (Classic) Card
CMD_READVAL_CLASS	10 0A	Read Value (Classic) Card
CMD_RESTORE_CLASS	10 0B	Backup Value (Classic) Card
CMD_READ_TAG	10 10	Read (TAG) Card
CMD_WRITE_TAG	10 11	Write (TAG) Card
CMD_AUTHEN_TAG	10 12	Verify (TAG) password
CMD_TYPEA_CPU_ATR	10 1E	TypeA CPU Card Reset
CMD_TYPEA_CPU_APDU	10 1F	TypeA CPU Card APDU Instruction Exchange
CMD_TYPEA_RAW_EXC	10 20	TypeA Card Bottom Command Exchange
CMD_GET_PBOC_PAN	10 26	Get UnionPay account
CMD_GET_SSC	10 27	Get Social Security Card (CN) information
CMD_GET_PBOC	10 28	Get UnionPay Card information
CMD_RF_SET_TXCW	10 2C	Set RF TX Conductance
CMD_RF_GET_TXCW	10 2D	Get RF TX Conductance
CMD_RF_RST	10 2E	Radio Frequency Reset
CMD_RF_ANT	10 2F	Set up antenna
CMD_RF_SET_RODATA_PARA	10 30	Set read-only data formats
CMD_RF_GET_RODATA_PARA	10 31	Get read-only data formats
CMD_RF_SET_APPENDDATA	10 32	Set Read-only Additional Data

CMD_RF_GET_APPENDDATA	10 33	Get Read-only Additional Data
CMD_RF_SET_REP_RODATA_SEQ	10 34	Set the data order before the read-only data is reported
CMD_RF_GET_REP_RODATA_SEQ	10 35	Get the data order before the read-only data is reported
CMD_RF_SET_RWMODE	10 36	Set Read-Write Mode
CMD_RF_GET_RWMODE	10 37	Get Read-Write Mode
CMD_REQUEST_TYPEB	10 50	Find TypeB card
CMD_TYPEB_APDU	10 52	TypeB Card APDU Instruction Exchange
CMD_REQUEST_15693	10 60	Find ISO15693 card
CMD_15693_EXC_COM	10 61	ISO15693 Common Instruction Exchange
CMD_15693_EXC_CUST	10 62	ISO15693 User Instruction Exchange
CMD_15693_EXC_EX	10 63	ISO15693 Instruction Exchange External
CMD_REQUEST_TYPEF	10 70	Find TypeF card
CMD_TYPEF_APDU	10 72	TypeF Card APDU Instruction Exchange
CMD_QWRITE_FM12XX	10 80	Quick-Write to FM12XX serial card
CMD_QREAD_FM12XX	10 81	Quick-Read to FM12XX serial card
CMD_SEL_ANT	10 90	Select Antenna
CMD_UHF_INVENTORY	10 A0	Inventory UHF Tag
CMD_UHF_READ_TAG	10 A1	Read UHF Tag
CMD_UHF_WRITE_TAG	10 A2	Write UHF Tag
CMD_UHF_SEL_TAG	10 A3	Select UHF Tag
CMD_UHF_LOCK_TAG	10 A9	Lock UHF Tag
CMD_UHF_KILL_TAG	10 AA	Kill UHF Tag
CMD_UHF_SET_LINK_CONFIG	10 AB	Set UHF's RF link configuration
CMD_UHF_GET_LINK_CONFIG	10 AC	Get UHF's RF link configuration

Overview Of PCD Module Instructions

Instructions	Value	Description
CMD_ICC_ST	18 00	Get Card Status
CMD_ICC_SEL	18 01	Select Card Type
CMD_ICC_SLOT_PWR	18 02	Control ON or OFF the power of slot
CMD_ICC_READ_MEM	18 10	Read Data From Card
CMD_ICC_WRITE_MEM	18 11	Write Data To Card
CMD_ICC_GET_ERRCNT	18 12	Get Error Counter
CMD_ICC_AUTHEN	18 16	Verify Card Password
CMD_ICC_UPDATE_USER_PWD	18 1A	Update User Password
CMD_ICC_GETATR	18 80	Reset CPU Card
CMD_ICC_APDU	18 81	APDU With CPU Card
CMD_ICC_SET_BAUD	18 82	Set Baud Rate with card
CMD_ICC_PPS	18 83	Do a PPS with Card
CMD_ICC_GET_SIM	18 A0	Get base information of SIM card

Status code table

Status code value	Meaning Description
00	Execute correctly
01	Invalid protocol header
02	Protocol Frame Data Too Long
03	Protocol Command Word undefined
04	Protocol Frame User Data Length Error
05	DEVICE is invalid in protocol frame
06	Protocol Frame Check Error
07	Communication busy (port occupied)
08	Protocol Frame Data Bit Insufficient
10	No contactless IC card found
12	Classic card password verification failed
13	Failed to read card
14	Failed to write card
15	Non-connected CPU card reset failed
16	APDU command execution timeout failed without CPU card
17	Radio Frequency command execution failed
18	Invalid result data
19	Invalid card value data format
20	IC card not found
22	IC card password verification failed
23	IC card failed to read
24	IC card failed to write
25	IC card reset failed
26	Execution Timeout
27	Radio Frequency command execution failed
28	Invalid result data
29	Invalid value format
2D	CPU card returned error
31	Radio Frequency module failed to perform validation
32	Radio Frequency module bit calculation error
33	Radio Frequency module conflict prevention failure
34	Radio Frequency module check error
35	Radio Frequency module synchronization failed
36	Radio Frequency module input null parameters
37	Other common errors in Radio Frequency module
38	Invalid IC card number
A0	Failed to write internal Flash
A1	Erase Flash failed
A2	Read and write Flash address out of range
B0	Bluetooth Setup Instruction Failed
DF	Device busy

EF	Failed to execute instruction
FF	This command is not supported