QR code scanner communication protocol v2.10

This protocol support：

        Ethernet TCP mode,
        WIFI TCP mode,
        485,232, TTL mode

        Can enter into different mode via the corresponding option in configuration tool

Note:

        All the configuration option will become invalid after restart in this protocol, please configure again via configuration tool

Catalog

1   Data transmission protocol

1.1 Request data format(upper->scanner):

Command head + command word + length word + data filed + check word

    Command head: two bytes, Default is 0X55, 0XAA, can be altered via configuration tool
command word: one byte

    length word: two bytes, indicate this command start from length word to check words'85 bytes (not include check word),low-order in front

    Data filed: this option can be 0

    Check word: Byte-by-byte XOR value from the command head to the last byte of the data field

1.2 Response data format(scanner ->upper):

Command head + command word + identifier word
+ length word + data field + check word

    Command head: two bytes, Default is 0x55，0xAA

    Command head: one byte

    Identifier word：one byte, 0x00 means response successfully, others means defeated or error

    Length word：two bytes,indicate this command start from length word to check words' bytes (not include check word),low-order in front

    Data filed: this option can be 0

    Check word: Byte-by-byte XOR value from the command head to the last byte of the data field

2 QR code scanner control request message

2.1 QR、DM、Barcode、NFC settings

Item	Byte	Instruction
Command word	1	0x21
Data field length	2	
Data field	1 or 2	Bit0： 1： enable QR recognition 0： disable QR recognition Bit1： 1： enable DM recognition 0： disable DM recognition Bit2： 1： enable barcode recognition 0： disable barcode recognition Bit3： 1： enable NFC recognition 0： disable NFC recognition
Check word	1	

For example:

55AA21010000DF	Clear all code selection
55AA21010001DE	QR
55AA21010002DD	DM
55AA21010003DC	QR,DM
55AA21010004DB	Barcode
55AA21010005DA	QR,Barcode
55AA21010006D9	DM,Barcode
55AA21010007D8	QR,DM,Barcode
55AA21010008D7	NFC
55AA21010009D6	QR,NFC
55AA2101000FD0	QR,DM,Barcode NFC

When bit2=1, the data length can be 2 bytes (the original data is the first byte in front), and the bar code is represented from bit4~bit15:

bit4: EAN、bit5: EAN13、bit6: ISBN13、bit7: code39
second byte：
bit0: code93、bit1: code9128、bit2: DATABAR、bit3: BAR_EX、bit4: pdf417
bit5: itf bit6: ISBN10 bit7: UPCE
e.g open EAN8
    55 AA 21 02 00 14 00 c8

Note：
    Some PC-side test tools send instructions require spaces between each byte, and some can't have spaces, depending on the test tool。

Instruction format with spaces added：55 AA 21 01 00 00 DF （this format used for TCP & UDP test tool）
Instruction format without spaces: 55AA21010000DF

2.2 Scan code working mode setting

Item	Byte	Instruction
Command word	1	0x22
Data field length	2	
Data field	1	0x01：normal mode(output all scan code content) 0x02：one-shot mode (the same code can be output one time) 0x03：interval mode(The same code at a certain time output only once in the same time interval)
Check word	1	

For example:
55AA22010001DD   normal mode
55AA22010002DE   one-shot mode
55AA220300030200DF interval mode(2 sec)

2.3 Buzzer and LED action time interval setting after scan code success
（Change the interval time in interval mode）

Item	Byte	instruction
Command word	1	0x23
Data field length	2	
Data field	2	Time interval code (milliseconds, range 0~60000), low-order in front 0x00　0x00：0ms 0xF4 0x01：500ms 0xE8 0x03：1000ms 0xD0 0x07：2000ms …

5

		0x60 0xEA: 60000ms
Check word	1	

For example:

55AA230200F4012B   time interval(500ms)

2.4 LED behavior configuration after scan code success

Item	Byte	instruction
Command word	1	0x24
Data field length	2	
Data field	3	0: off 1: on bit 0: enable white light bit 1: enable red light bit 2: enable green light
Check word	1	

For example:

55 AA 24 01 00 01 DB
 enable white light
55 AA 24 01 00 02 D8
 enable red light
55 AA 24 01 00 03 D9
 enable red and white light

55 AA 24 01 00 00 DA
  Light off
55 AA 24 01 00 04 DE
 enable green light
55 AA 24 01 00 05 DF
 enable green and white light
55 AA 24 01 00 06 DC
  enable green and white light

2.5 Buzzer behavior configuration after scan code success

Item	Byte	instruction
Command word	1	0x25
Data field length	2	
Data field	1	0: Buzzer OFF 1: Buzzer ON
Check word	1	

For example:

55AA25010001DA beeper on
(The beeper will automatically turn off after some time,it can be configured via "beeper delay" in configuration tool)
55AA25010000DB beeper off

Note:

0x24 & 0x25 is configuration command, can not and no need to call frequently, after the configuration is success, even restart the device it will remember the status of last time, the same function as "scanning behavior " in configuration tool, if you want active control the beeper and LED light yourself, you need to send 0*24 and 0*25 command or turn off the automatically control in configuration tool, and then

Send 0x04 command to control the device behavior

2.6 GPIO_0 control（only for MX86 series）

Item	byte	instruction
Command word	1	0x26
Data field length	2	
Data field	1	0: output low level 1: output high level
Check word	1	

For example:
55AA26010001D9 output low level
55AA26010000D8 output high level

2.7 GPIO_1 control（only for MX86 series）

Item	byte	instruction
Command word	1	0x27
Data field length	2	
Data field	1	0: output low level 1: output high level
Check word	1	

For example:
55AA27010001D8 output low level
55AA27010000D9 output high level

2.8 GPIO_0 and GPIO_1 output high level voltage control （only for MX86 series）

Item	byte	instruction
Command word	1	0x28
Data field length	2	
Data field	1	0: output high level voltage 4.3V 1: output low level voltage 3.3V
Check word	1	

For example:

55AA28010001D7 high level 3.3V

55AA28010000D6 high level 4.3V

2.9 device status enquiry

Item	byte	instruction
Command word	1	0x01
Data field length	2	
Data field	0	No
Check word	1	

For example:

Send : 55AA010000FE

Answer : 55AA0100020055AA03 the fourth place 00 shows the device is normal, others means not.

2.10 Get device ID （Need to configure the ID via configuration tool in advance）

Item	byte	instruction
Command word	1	0x02
Data field length	2	

Data field	0	no
Check word	1	

For example:

Send: 55AA020000FD

Answer: 55AA0200040080000000079

The red part represent device id, low order in front，**80000000**
represent device id is 128 the fourth place 00 show device is
normal, others means not.

2.11 Voice control （only for MC series）

Item	byte	Instruction
Command word	1	0x29
Data field length	2	
Data field	1	Type:1 byte 0-5

Audio file format request: single channel 16bit wav format 8Khz -192Khz

The whole audio sizes should less than 1M
Audio file name: 0.wav 1.wav ...

For example： send 55AA29010001D6 to call 1.wav voice prompt: welcome to use Alipay

55 AA 29 01 00 00D7   welcome to use Vguang scanner
55 AA 29 01 00 02D5   Welcome to use Wechat payment
55 AA 29 01 00 03D4   Please use right payment code
55 AA 29 01 00 04D3   No voice
55 AA 29 01 00 05D2   No voice

2.12 LED light and beeper control

Item	byte	instruction
Command word	1	0x04
Data field length	2	

		1Byte	switch: 0 off, 1 enable bit 0: reserved bit 1: enable red light bit 2: enable green light bit 3: enable beeper
		1Byte	The times of enable
		1Byte	Duration time (unit 50MS)
		1Byte	Interval time (unit 50MS)
		1Byte	Reserved
Data field	5		
Check word	1		

For example:

55 AA 04 05 00 04 03 50 0A 00 a3   control green light flash 3 times, each time 0x50*50ms, interval 0x0A*50 ms

55 AA 04 05 00 0F 03 50 50 00 f2   control red, green light and beeper work 3 times at the same time

2.13 On and off code scanning function。

Item	byte	Instruction
Command word	1	0x05
Data field length	2	
Data field	1	1 means off,0 means on
Check word	1	

55 aa 05 01 00 01 fa off code scanning function
55 aa 05 01 00 00 fb open code scanning function

3   QR code scanner scanning feedback message

3.1 Get scanning feedback under command mode (QR code & NFC)

Item	byte	instruction
Command word	1	0x30
Data field length	2	
Data field	Uncertain length	
Check word	1	

Under command mode:

Send command 55 AA 30 00 00 cf

If there is no data then back： 55 aa 30 00 00 00 cf
If there is QR code scanning data or card swiping data then back to the result；

For example：

QR code scanning result：
01DG50KXYAVQEFDgMGDAE/7kGFJto1xiar

Back：
55 AA 30 00 22 00 30 31 44 47 35 30 4B 58 59 41 56 51 45 46 44 67 4D 47 44
41 45 2F 37 6B 47 46 4A 74 6F 31 78 69 61 72 9C

3.2 Scan result upload mode

Item	Byte	Instruction
Command word	1	0x31
Data field length	2	
Data field	1	0： Command mode 1： Active mode
Check word	1	

55 AA 31 01 00 01 CE   Active mode
55 AA 31 01 00 00 CF   CMD mode

4. White list setting

Note: The white list stores the NFC positive sequence card number without prefix and suffix

4.1 setting admin password：

Item	Byte	Instruction
Command word	1	0x40
Data field length	2	
Data field	16	Defaulted 1234567887654321
Check word	1	

For example： setting the password as 1996049520111111
55 AA 40 10 00 31 39 39 36 30 34 39 35 32 30 31 31 31 31 31 31 a2

Note：

11

A. This password can be used to open the scan code edit white list function

Scan certain QR code via scanner, can open the edit white list function, after that all the card swiped will be added to white list automatically, or delete from white list automatically

B. If this function need to be ended, need to scan the end code

C. For more details see <Vguang white list configure admin tool >

D. If this function is needed, the initial password must be changed via this command, the initial password can not used to open the scan code edit white list function.

4.2 enable white list function

Item	Byte	Instruction
Command word	1	0x41
Data field length	2	
Data field	1	0: off the white list filter function (default) 1: open the white list filter function
Check word	1	

For example :
55 AA 41 01 00 00 bf   off the white list filter function
55 AA 41 01 00 01 be   open the white list filter function

4.3 add white list card number

Item	Byte	Instruction
Command word	1	0x42
Data field length	2	
Data field	8	store unsigned long data (card number)
Check word	1	

For example :
55 AA 42 08 00 09 09 00 00 00 00 00 00 b5
Add the card with the card number 2312 to the white list

4.3 delete white list card number

Item	Byte	Instruction
Command word	1	0x43

Data field length	2	
Data field	8	Store unsigned long data
Check word	1	

For example :
55 AA 43 08 00 09 09 00 00 00 00 00 00 b4
Delete card with card number 2312 from white list

4.4 delete all white lists

Item	Byte	Instruction
Command word	1	0x44
Data field length	2	
Data field	0	No
Check word	1	

For example :
55 AA 44 00 00 bb   All white lists on the card will be deleted at one time, use
with caution

5. NFC module option

Supported device number :
TX series..............-P
MX series.............-P

5.1 set NFC module into command read-write mode

NFC module have 3 working modes,

Mode 1: always in command mode

Mode 2: always in active upload mode

Mode3: the device will active upload card number first, and then change into command mode automatically, the users can do card reading and writing operations

Note :
    If the NFC switch has been turn on, can swipe card to test
directly

If the NFC switch not turn on, need to use the configuration tool to open, and then restart,in this case the corresponding card swiping command in this protocol can be used

Data sending format：

Item	Byte	instruction
Packet head	2	Default 0x55 0xAA
Command word	1	0x53
Data field length	2	1 fixed
Data field	1	0x01： module enter command mode 0x00： module quit command mode
Check word	1	

Open command mode: 55 AA 53 01 00 01 ac
Off command mode: 55 AA 53 01 00 00 ad

In mode 3,after the device upload the card number, it will enter into command mode automatically, and then this card can be read and write.
When finish read and write, it need to send command to turn off command mode, or the next time can not upload card number when swipe card

Answer data format：

Item	Byte	Instruction
Packet head	2	Defaulted 0x55 0xAA
Command word	1	0x53
Data field length	1	0x00： success Others： fail or no card
Data field	2	Length is 0
Check word	1	

Note：
    only in command mode,NFC will response operation like read
    and write, and only when the command mode was turned off,
    it will upload card number actively when swiping card

5.2 read Mifare One card's data via NFC module

Send data format：

Item	Byte	Instruction
Packet head	2	Defaulted 0x55 0xAA
Command word	1	0x51
Data field length	2	8 fixed

Data field	8	Key type	1 Byte	0x60 indicate A Key authentication; 0x61 indicate B Key authentication;
		Block number	1Byte	S50 card is 0~63 S70 card is 0 ~255 (no)
		key	6Byte	
Check word	1			

E.: 55aa 51 0800　　60 21 000000ffffff 18

E.: 55AA 51 0800 60 25 000000FFFFFF 1C　　(Read the specific test card 6th sector 02 block)

Answer data format:

Item	Instruction
Packet head	Defaulted 0x55 0xAA
Command word	0x51
Data field length	0x00: success Others: fail or no card
Data field	
	If successful, the length is 16, and the length of the failure is 0.
Check word	
Item	Return block data
Packet head	

Failed or no card: 55 AA 51 FF 00 00 51
Success: 55 AA 51 00 10 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 BE

5.3 write data to a certain block of Mifare One card via NFC module

Data sending format:

Item	Byte	Instruction		
Packet head	2	Defaulted 0x55 0xAA		
Command word	1	0x52		
Data field length	2	Fixed 24(0x18)		
Data field	24	Key type	1 Byte	0x60 indicate A Key authentication; 0x61 indicate B Key authentication;
		Block number	1Byte	S50 card is 0~63 S70 card is 0 ~255 (no)
		key	6Byte	
		Data	16Byte	Data to be written
Check word	1			

For example：

55aa52 1800 60 20 000000ffffff 333435363738394041424344454647448 70

55aa52 1800 60 25 000000ffffff 123456789012345678901234567890 12 85

（Write a specific test card 6th sector 02 block
123456789012345678901234567890 12)

Data answer format：

Item	Byte	Instruction
Packet head	2	Defaulted 0x55 0xAA
Command word	1	0x52
Identification word	1	0x00：success others：Others： fail or no card
Data field	2	Fixed 0
Check word	1	

fail or no card : 55 AA 52 FF 00 00 52
success : 55 AA 52 00 00 00 AD

Note: Be careful when writing the key block (the last
block of each sector), otherwise it may cause the
sector to fail. Please refer to the card manual for
specific usage precautions。。

The debugging assistant sends the hexadecimal number and the block number to 64 blocks, which are:

(can be replaced with the red number above)