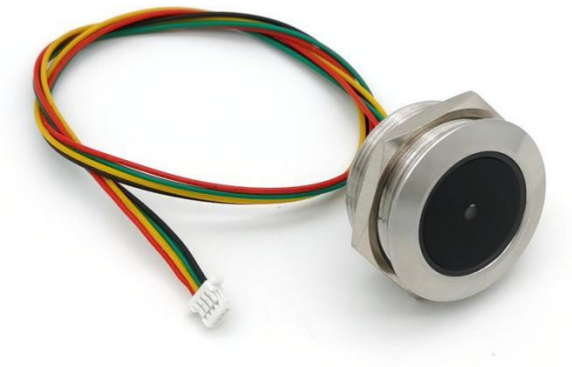
GM60 Bar Code Reader Module
User Manual



Hangzhou Grow Technology Co., Ltd.
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Version Number	Date	Revise Content	Modifier
V1.1	2020.06	Setup	Grow Tech
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Catalog

1 Introduction of Module 1
1.1 Introduction 1
1.2 Operating parameter 1
1.3 Size 2
1.4 Interface definition 2
2 Set Up GM60 3
2.1 Serial Port Instruction 3
2.1.1 Read Zone Bit 3
2.1.2 Write Zone Bit 5
2.1.3 Save Zone Bit To Internal Flash Instruction 6
2.1.4 Zone Bit Reset To Defaults 7
2.1.5 List of zone bit 8
2.2 Setup Code 19
2.3 Reset 19
3 Communication interface 20
3.1 Serial Communication Interface 20
3.1.1 Serial Port Check Bit Configuration 21
4 Read Mode 22
4.1 Continuous Mode(Default) 22
4.2 Induction Mode 23
5 LED Mode 26
5.1 Breathing Lamp 26
5.2 Decoding Successful Prompt Light 29
6 Data Edition 31
6.1 Header With Protocol 31
6.2 Prefix 32
6.3 Suffix 32
6.4 CODE ID 33
6.5 Tail 34
6.6 CRC Output 35

6.7 Cut out Data 35
6.8 RF Information 37
7 Bar code type enables/disable configuration 39
7.1 All types of bar code can be decoded 39
7.2 EAN13 39
7.3 EAN8 40
7.4 UPCA 40
7.5 UPCE0 41
7.6 UPCE1 41
7.7 Code128 41
7.8 Code39 42
7.9 Code 93 43
7.10 CodeBar 44
7.11 QR 44
7.12 Interleaved 2 of 5 44
7.13 DM 45
7.14 PDF417 45
8 Appendix A：Default Setting Table 46
9 Appendix B：Common serial port instruction 47
10 Appendix C：Code ID 48
11 Appendix D：ASCII 49
12 Appendix E：Data code 53
13 Appendix F：Save or Cancel 55

1 Introduction of Module

1.1 Introduction

GM60 Bar code reader module is a high integration and high performance scanner, mainly used to read payment codes. The bar code and QR code formats that can be recognized are **QR Code, Data Matrix, PDF417,EAN13,UPC,Code 39,Code 93,Code 128,UCC/EAN 128 and so on.**

1.2 Operating parameter

Parameter	Performance	
Scan Mode	640*480	
Light	Colorful indicator/green light flashing prompt reading success	
Read Code Type	1D	EAN13
		EAN8
		UPCA
		UPCE0
		UPCE1
		Code128
		Code39
		Code93
		CodeBar
		Interleaved 2 of 5
	2D	QR code,Data Matrix, PDF417
Depth of Field*	QR Code	25mm-150mm *Product performance may be affected to varying degrees by bar code quality and environmental conditions
Contrast*	≥25%	
Scanning angle**	Roll 360° Pitch 55° Yaw 55°	
Viewing Angle	69°(Horizontal) 56°(Vertical)	
Accuracy of reading*	≥5mil	

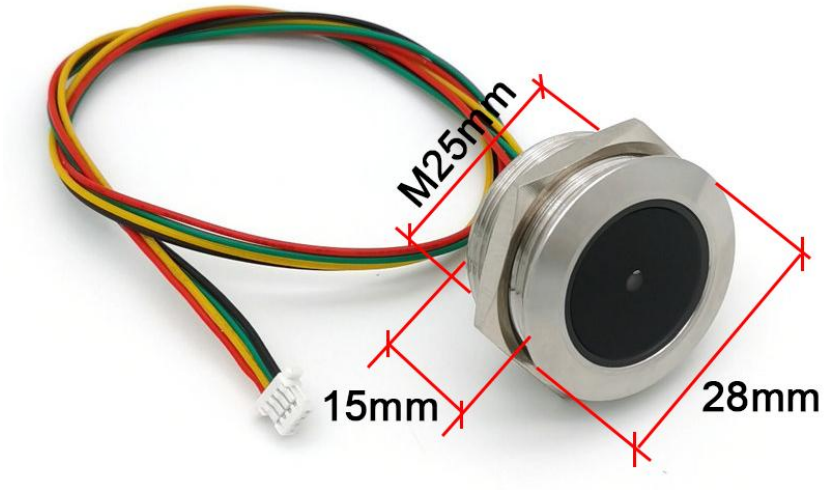
Parameter	Performance
Interface	UART(TTL-232)
Serial Baud Rate（UART）	9600(Default)
Operating Voltage/Current	DC 3.3V / <70mA
Size	External diameter: 28mm Internal diameter: 25mm Height: 15mm thread M25
Weight	25g

Parameter	Performance
Work environment	-20°C - 60°C
Storage temperature	-40°C - 80°C
Environmental light	0~100000LU
Relative humidity	5%-95%

1.3 Size

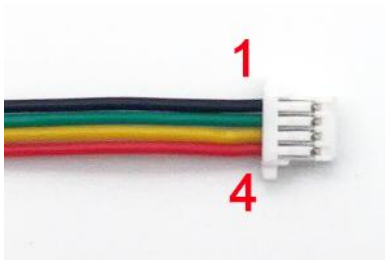
Connector: MX1.0mm-4Pin Thread: M25

External diameter: 28mm Internal diameter: 25mm Height: 15mm



1.4 Interface definition

Connector: MX1.0mm,4Pin

Pin	Name	Description	Cable Pic
1	GND	Ground	
2	RXD	TTL Input	
3	TXD	TTL Output	
4	VCC	3.3V	

2 Set Up GM60

2.1 Serial Port Instruction

Users can settle the module by sending instruction from mainframe.

Please make sure communicate parameter complete matching between module and mainframe.

Module default serial communicate parameter: **Baud rate 9600bps; No check; 8 bit data; 1 bit stop bit; No flow control.**

2.1.1 Read Zone Bit

Max 255 bytes/time for zone bit reading.

Command Format:

Input: {Head1} {Types} {Lens} {Address} {Datas} {CRC}

PS: Head1: 0x7E 0x00（2 bytes）

Types: 0x07（1 byte）

Lens: 0x01（1 byte）

Address : 0x0000~0x00FF（2 bytes）, address to start reading zone bit

Datas: 0x00~0xFF（1 byte）, Numbers of zone bit for Sequential read

CRC: CRC_CCITT check value (2 bytes). Suitable for Types、Lens、Address、Datas;

Characteristic polynomial : X16+X12+X5+1, multinomial coefficient: 0x1021, original value:0 ;

For single byte, the highest bit will be calculated at first, output will be without negation.

The reference code of C is as follows:

```
unsigned int crc_cal_by_bit(unsigned char* ptr, unsigned int len)
{
unsigned int crc = 0;
while(len-- != 0)
{
for(unsigned char i = 0x80; i != 0; i /= 2)
{
crc *= 2;
if((crc&0x10000) !=0) //Last CRC * 2 ， if the first one is 1， so divide 0x11021
crc ^= 0x11021;
if((*ptr&i) != 0) //If the standard is 1， so CRC = last CRC + standard CRC_CCITT
crc ^= 0x1021;
```

```
}
ptr++;
}
return crc;
}
```

Note: users can fill 0xAB 0xCD at CRC byte when CRC validation is not required.

Output: {Head2} {Types} {Lens} {Datas} {CRC}

1) Read successfully and return data

PS: Head2: 0x02 0x00

Types: 0x00（read succeed）

Lens: numbers of upload bytes

Datas: 0x00~0xFF means read data.

CRC: CRC_CCITT check value. Suitable for Types、Lens、Datas;

Characteristic polynomial : X16+X12+X5+1, multinomial coefficient: 0x1021, original value:0 ;

For single byte, the highest bit will be calculated at first, output will be without negation.

(The reference code is the same as above)

2) CRC failed

No response command

3) Unknown command response

No response command

E.G.:

Read address 0x000A of Zone bit

1) Read successfully and return data is 0x3E.

Input: 0x7E 0x00 0x07 0x01 0x00 0x0A 0x01 0xEE 0x8A

Output: 0x02 0x00 0x00 0x01 0x3E 0xE4 0xAC

2) CRC wrong

Input: 0x7E 0x00 0x07 0x01 0x00 0x0A 0x01 0x11 0x22

Output : None

3) When length of command to short or more than 400ms after 0x7e 0x00, treat as unknown command.

Input: 0x7E 0x00 0x07 0x01 0x00 0x0A 0x01

Output: None

2.1.2 Write Zone Bit

Max 255 bytes/time for zone bit reading.

The modified content of the zone bit will be lost after power failure. If the modified content is needed after power loss,You need to save the zone bit to internal Flash(2.1.3).

Command Format:

Input: {Head1} {Types} {Lens} {Address} {Datas} {CRC}

PS: Head1: 0x7E 0x00（2 bytes）

Types: 0x08（1 byte）

Lens: 0x00~0xFF（1 byte）, means numbers of bytes of this datas, times of continuous writing.

Address: 0x0000~0xFFFF（2 bytes）, start location of write

Datas: 0x00~0xFF （1~255 bytes）, dates wrote in zone bit. When configuring multiple zone bit,must follow the order of address from low to high to fill the data domains.

CRC: CRC_CCITT check value (2 bytes). Suitable for Types、Lens、Address、Datas;

Characteristic polynomial : X16+X12+X5+1, multinomial coefficient: 0x1021, original value:0 ;

For single byte, the highest bit will be calculated at first, output will be without negation.

The reference code of C is as follows:

```
unsigned int crc  cal  by  bit(unsigned char* ptr, unsigned int len)
{
unsigned int crc = 0;
while(len-- != 0)
{
for(unsigned char i = 0x80; i != 0; i /= 2)
{
crc *= 2;
if((crc&0x10000) !=0) //Last CRC *  2 ，if the first one is 1，so divide  0x11021
crc ^= 0x11021;
if((*ptr&i) != 0) //If the standard is 1，so CRC =    last CRC + standard CRC_CCITT
crc ^= 0x1021;
}
ptr++;
}
return crc;
}
```

Note: users can fill 0xAB 0xCD at CRC byte when CRC validation is not required.

Output: {Head2} {Types} {Lens} {Datas} {CRC}

1) Read successfully

PS: Head2：0x02 0x00

Types：0x00（read succeed）

Lens：0x01

Datas：0x00

CRC：CRC_CCITT check value（0x33 0x31）

2) CRC failed

No response command

3) Unknown command response

No response command

E.G.:

Write 0x3E in 0x000A of zone bit

1) Successfully set

Input ：0x7E 0x00 0x08 0x01 0x00 0x0A 0x3E 0x4C 0xCF

Output：0x02 0x00 0x00 0x01 0x00 0x33 0x31

2) CRC wrong

Input：0x7E 0x00 0x08 0x01 0x00 0x0A 0x3E 0x11 0x22

Output：None

3) When length of command to short or more than 400ms after 0x7e 0x00, treat as unknown command.

Input: 0x7E 0x00 0x08 0x01 0x00 0x0A 0x3E

Output: None

2.1.3 Save Zone Bit To Internal Flash Instruction

To save the device of the zone bit list to internal Flash,you need to send a save command.

Note: the device cannot save a single zone bit configuration separately, and must keep the entire list at the same time.

Command Format:

Input: {Head1} {Types} {Lens} {Address} {Datas} {CRC}

PS: Head1: 0x7E 0x00

Types: 0x09

Lens: 0x01

Address: 0x0000

Datas: 0x00

CRC: CRC_CCITT check value（0xDE 0xC8）

Output: {Head2} {Types} {Lens} {Datas} {CRC}

1) Saved successful

PS: Head2：0x02 0x00

Types：0x00（read succeed）

Lens：0x01

Datas：0x00

CRC：CRC_CCITT check value（0x33 0x31）

2) CRC failed

No response command

3) Unknown command response

No response command

2.1.4 Zone Bit Reset To Defaults

Command Format:

Input: {Head1} {Types} {Lens} {Address} {Datas} {CRC}

PS: Head1: 0x7E 0x00

Types: 0x09

Lens: 0x01

Address: 0x0000

Datas: 0xFF

CRC: CRC_CCITT check value

Output: {Head2} {Types} {Lens} {Datas} {CRC}

1) Saved successful

PS: Head2：0x02 0x00

Types：0x00（read succeed）

Lens：0x01

Datas：0x00

CRC：CRC_CCITT check value（0x33 0x31）

2) CRC failed

No response command

3) Unknown command response

No response command

2.1.5 List of zone bit

Zone Bit	0x0000
Data Bit	Function
Bit 7	1：Open LED when successfully read 0：Close
Bit 6	None
Bit 5-4	None
Bit 3-2	00：No light 01：Standard 10/11：Always on
Bit 1-0	01：Command Triggered Mode 10：Continuous mode 11：Induction Mode
Zone Bit	0x0001
Data Bit	Function
Bit 7-0	Voice volume： 0x00-0xFF：0-255
Zone Bit	0x0002
Data Bit	Function
Bit 7-1	Keep
Bit 0	Command mode triggers flags, Automatically reset after scanning 1：trigger 0：no trigger
Zone Bit	0x0003
Data Bit	Function
Bit 7-2	Keep
Bit 1	1：Close Settlement Code 0：Open
Bit0	1：Output content of settlement code 0：Not output
Zone Bit	0x0005
Data Bit	Function
Bit 7-0	Read interval 0x00：No interval 0x01-0xFF：0.0-25.5s
Zone Bit	0x0006
Data Bit	Function
Bit 7-0	Time for single read 0x00：infinite 0x01-0xFF：0.0-25.5s
Zone Bit	0x0007
Data Bit	Function
Bit 7	Automatic sleep 1：On 0：Off

Bit6-0	Free Time（High Bit14-8） Unit：100ms
Zone Bit	0x0008
Data Bit	Function
Bit7-0	Free Time（Low Bit7-0） Unit：100ms
Zone Bit	0x0009
Data Bit	Function
Bit 7-0	Keep
Zone Bit	0x000B
Data Bit	Function
Bit 7-0	Time duration for successfully read sound 0x00-0xFF；0-255ms
Zone Bit	0x000C
Data Bit	Function
Bit 7-1	Keep
Bit2	Buzzer/Voice Mode Switch 0：Buzzer Mode 1：Voice Mode
Bit0	Piezo Buzzer 0：high level when free, low level when busy 1：low level when free, high level when busy
Zone Bit	0x000D
Data Bit	Function
Bit 7-2	Keep
Bit 6	Virtual keyboard enable flags 0：Forbid 1：Allow
Bit5-4	Input data encoding format 00：GBK 01：Keep 10：AUTO 11：UTF8
Bit 3-2	Output data encoding format 00：GBK 01：Keep 10：Keep 11：UTF8
Bit1-0	00：serial port output 01：USB PC Keyboard 10：Keep 11：USB virtual serial port
Zone Bit	0x000E
Data Bit	Function
Bit 7-4	Keep
Bit3	Keep
Bit2	1：Decode successfully sound on 0：Decode successfully sound off
Bit1	1：Turn off start-up tone 0：Turn on start-up tone
Bit0	Keep
Zone Bit	0x0011
Data Bit	Function
Bit 7-0	Keep 0x00-0xFF
Zone Bit	0x0012

Data Bit	Function
Bit 7-0	Keep 0x00-0xFF
Zone Bit	0x0013
Data Bit	Function
Bit 7	Same barcode reading delay setting 0：Turn off　1：Turn on
Bit 6-0	Same barcode reading delay time（Unit：100ms） 0x00：Infinite length　0x01-0x7F：0.1-12.7s；
Zone Bit	0x0014
Data Bit	Function
Bit 7-0	Reserved time for information output（Unit：10ms） 0x00-0xFF：0-2.55 s
Zone Bit	0x0015
Data Bit	Function
Bit 7-0	LED Light 0x01-0x63：Light 1%-99% Other Value：Light 99%
Zone Bit	0x001A
Data Bit	Function
Bit 7-6	Output Head data with protocol 00：0x03　01：0x04　Other：Head No Output
Bit 0	CRC Output Switch 0：No Output　1：Open Output
Zone Bit	0x001B
Data Bit	Function
Bit 7-4	Breathing Lamp 1 Switch and Color Setting Breathing Lamp 1 Switch and Color Setting Bit7:　1：Allow Breathing Lamp 1　0：Forbid Breathing Lamp 1 Bit6:　1：Open Red LED　0：Close Red LED Bit5:　1：Open Green LED　0：Close Green LED Bit4:　1：Open Blue LED　0：Close Blue LED
Bit3-0	Decoded Successfully Prompt Light Bit3:　1：Allow　0：Forbid Bit2:　1：Open Red LED　0：Close Red LED Bit1:　1：Open Green LED　0：Close Green LED Bit0:　1：Open Blue LED　0：Close Blue LED
Zone Bit	0x001C
Data Bit	Function
Bit 7-4	Breathing Lamp 3 Switch and Color Setting Breathing Lamp 3 Switch and Color Setting Bit7:　1：Allow Breathing Lamp 3　0：Forbid Breathing Lamp 3 Bit6:　1：Open Red LED　0：Close Red LED

	Bit5: 1：Open Green LED 0：Close Green LED Bit4: 1：Open Blue LED 0：Close Blue LED
Bit3-0	Breathing Lamp 2 Switch and Color Setting Bit3: 1：Allow Breathing Lamp 2 0：Forbid Breathing Lamp 2 Bit2: 1：Open Red LED 0：Close Red LED Bit1: 1：Open Green LED 0：Close Green LED Bit0: 1：Open Blue LED 0：Close Blue LED
Zone Bit	0x001D
Data Bit	Function
Bit 7-4	Breathing Lamp 5 Switch and Color Setting Breathing Lamp 5 Switch and Color Setting Bit7: 1：Allow Breathing Lamp 5 0：Forbid Breathing Lamp 5 Bit6: 1：Open Red LED 0：Close Red LED Bit5: 1：Open Green LED 0：Close Green LED Bit4: 1：Open Blue LED 0：Close Blue LED
Bit3-0	Breathing Lamp 4 Switch and Color Setting Bit3: 1：Allow Breathing Lamp 4 0：Forbid Breathing Lamp 4 Bit2: 1：Open Red LED 0：Close Red LED Bit1: 1：Open Green LED 0：Close Green LED Bit0: 1：Open Blue LED 0：Close Blue LED
Zone Bit	0x001E
Data Bit	Function
Bit 7-4	Breathing Lamp 7 Switch and Color Setting Breathing Lamp 7 Switch and Color Setting Bit7: 1：Allow Breathing Lamp 7 0：Forbid Breathing Lamp 7 Bit6: 1：Open Red LED 0：Close Red LED Bit5: 1：Open Green LED 0：Close Green LED Bit4: 1：Open Blue LED 0：Close Blue LED
Bit3-0	Breathing Lamp 6 Switch and Color Setting Bit3: 1：Allow Breathing Lamp 6 0：Forbid Breathing Lamp 6 Bit2: 1：Open Red LED 0：Close Red LED Bit1: 1：Open Green LED 0：Close Green LED Bit0: 1：Open Blue LED 0：Close Blue LED
Zone Bit	0x001F
Data Bit	Function
Bit 7-0	Cycle time of single LED (unit: 100ms) 0x00-0xFF： 0-25.5s
Zone Bit	0x002B，0x002A
Data Bit	Function
Bit 15	Keep
Bit 14-13	Parity Mode： 0：None 1：Odd 2：Even

Bit 12-0	0x09C4：Serial rate 1200 bps 0x0271：Serial rate 4800 bps 0x0139：Serial rate 9600 bps 0x00D0：Serial rate14400 bps 0x009C：Serial rate19200 bps 0x004E：Serial rate 38400 bps 0x0034：Serial rate 57600 bps 0x001A：Serial rate 115200bps E.G.：9600 Baud rate：0x002A = 0x39 ， 0x002B = 0x01
Zone Bit	0x002C
Data Bit	Function
Bit 7-4	Keep
Bit 3	Keep
Bit 2-1	Bar code switch 00：forbid reading all bar code 01：all bar code can be read; 10/11：Default
Bit 0	Keep
Zone Bit	0x002D
Data Bit	Function
Bit 7-0	Keep
Zone Bit	0x002E
Data Bit	Function
Bit 7-1	Keep
Bit0	Read EAN13 0：Forbid 1：Allow
Zone Bit	0x002F
Data Bit	Function
Bit 7-1	Keep
Bit0	Read EAN13-2 0：Forbid 1：Allow
Zone Bit	0x0030
Data Bit	Function
Bit 7-1	Keep
Bit0	Read EAN13-5 0：Forbid 1：Allow
Zone Bit	0x0031
Data Bit	Function
Bit 7-1	Keep
Bit0	Read EAN8 0：Forbid 1：Allow
Zone Bit	0x0032
Data Bit	Function

Bit 7-1	Keep
Bit0	Read EAN8-2 0：Forbid 1：Allow
Zone Bit	0x0033
Data Bit	Function
Bit 7-1	Keep
Bit0	Read EAN8-5 0：Forbid 1：Allow
Zone Bit	0x0034
Data Bit	Function
Bit 7-1	Keep
Bit0	Read UPCA 0：Forbid 1：Allow
Zone Bit	0x0035
Data Bit	Function
Bit 7-1	Keep
Bit0	Read UPCA-2 0：Forbid 1：Allow
Zone Bit	0x0036
Data Bit	Function
Bit 7-1	Keep
Bit0	Read UPCA-5 0：Forbid 1：Allow
Zone Bit	0x0037
Data Bit	Function
Bit 7-1	Keep
Bit0	Read UPCE0 0：Forbid 1：Allow
Zone Bit	0x0038
Data Bit	Function
Bit 7-1	Keep
Bit0	Read UPCE1 0：Forbid 1：Allow
Zone Bit	0x0039
Data Bit	Function
Bit 7-1	Keep
Bit0	Read UPCE1-2 0：Forbid 1：Allow
Zone Bit	0x003A
Data Bit	Function
Bit 7-1	Keep
Bit0	Read UPCE1-5 0：Forbid 1：Allow

Zone Bit	0x003B
Data Bit	Function
Bit 7-1	Keep
Bit0	Read Code128 0：Forbid 1：Allow
Zone Bit	0x003C
Data Bit	Function
Bit 7-0	Code128 Information minimum length setting 0x00-0xFF：0-255Byte
Zone Bit	0x003D
Data Bit	Function
Bit 7-0	Code128 Information maximum length setting 0x00-0xFF：0-255Byte
Zone Bit	0x003E
Data Bit	Function
Bit 7-1	Keep
Bit0	Read Code39 0：Forbid 1：Allow
Zone Bit	0x003F
Data Bit	Function
Bit 7-1	Keep
Bit0	Read Code32 0：Forbid 1：Allow
Zone Bit	0x0040
Data Bit	Function
Bit 7-1	Keep
Bit0	Read CODE39 FULL ASCII 0：Forbid 1：Allow
Zone Bit	0x0041
Data Bit	Function
Bit 7-0	Code39 Information minimum length setting 0x00-0xFF：0-255Byte
Zone Bit	0x0042
Data Bit	Function
Bit 7-0	Code39 Information maximum length setting 0x00-0xFF：0-255Byte
Zone Bit	0x0043
Data Bit	Function
Bit 7-1	Keep
Bit0	Read Code93 0：Forbid 1：Allow
Zone Bit	0x0044

Data Bit	Function
Bit 7-0	Code93 Information minimum length setting 0x00-0xFF：0-255Byte
Zone Bit	0x0045
Data Bit	Function
Bit 7-0	Code93 Information maximum length setting 0x00-0xFF：0-255Byte
Zone Bit	0x0046
Data Bit	Function
Bit 7-1	Keep
Bit0	Read CodeBar 0：Forbid 1：Allow
Zone Bit	0x0047
Data Bit	Function
Bit 7-0	CodeBar Information minimum length setting 0x00-0xFF：0-255Byte
Zone Bit	0x0048
Data Bit	Function
Bit 7-0	CodeBar Information maximum length setting 0x00-0xFF：0-255Byte
Zone Bit	0x0049
Data Bit	Function
Bit 7-1	Keep
Bit0	Read QR 0：forbid 1：allow
Zone Bit	0x004A
Data Bit	Function
Bit 7-1	Keep
Bit0	Read INT25 0：forbid 1：allow
Zone Bit	0x004B
Data Bit	Function
Bit 7-0	INT25 Information minimum length setting 0x00-0xFF：0-255Byte
Zone Bit	0x004C
Data Bit	Function
Bit 7-0	INT25 Information maximum length setting 0x00-0xFF：0-255Byte
Zone Bit	0x004D
Data Bit	Function
Bit 7-1	Keep
Bit0	Read PDF17

	0：forbid 1：allow
Zone Bit	0x004E
Data Bit	Function
Bit 7-1	Keep
Bit0	Read DM 0：forbid 1：allow
Zone Bit	0x0060
Data Bit	Function
Bit 7	Serial/virtual serial output with or without protocol 0：Original data 1：With protocol
Bit6-5	Type of Tailed 00：CR(0x0D) 01：CRLF(0x0D,0x0A) 10：TAB(0x09) 11：None
Bit4	1：Allow add RF 0：forbid
Bit3	1：Allow add prefix 0：forbid
Bit2	1：Allow add Code ID 0：forbid
Bit1	1：Allow add suffix 0：forbid
Bit0	1：Allow add tail 0：forbid
Zone Bit	0x0061
Data Bit	Function
Bit 7-0	Keep
Zone Bit	0x0062
Data Bit	Function
Bit 7-4	Length of prefix 0x00-0x0F
Bit3-0	Length of suffix 0x00-0x0F
标志位	0x0063 – 0x0071
Data Bit	Function
Bit 7-0	Prefix 0x00-0xFF：Content，max 15Byte
标志位	0x0072 - 0x0080
Data Bit	Function
Bit 7-0	Suffix 0x00-0xFF：Content，max 15Byte
Zone Bit	0x0081
Data Bit	Function
Bit 7-4	Keep
Bit3-0	RF length 0x00-0x0F
Zone Bit	0x0082– 0x0090
Data Bit	Function

Bit 7-0	RF content 0x00-0xFF：Content，max 15Byte
Zone Bit	0x0091 – 0x00A4
Data Bit	Function
Bit 7-0	Code ID settlement 0x41-0x5a & 0x61-0x7a （A-Z,a-z）：Code ID as appendix C
Zone Bit	0x00B0
Data Bit	Function
Bit 7-2	Keep
Bit 1-0	Data Cut out settlement 00：Output whole data 01：Output Start part 10：Output End part 11：Output center part
Zone Bit	0x00B1
Data Bit	Function
Bit 7-0	Cut out M bytes from start 0x00-0xFF：0-255 Byte
Zone Bit	0x00B2
Data Bit	Function
Bit 7-0	Cut out N bytes from end 0x00-0xFF：0-255 Byte
Zone Bit	0x00D9（Only read Zone bit）
Data Bit	Function
Bit 7-0	Function Zone bit 0x55：reset to defaults
Zone Bit	0x00E1（Only read Zone bit）
Data Bit	Function
Bit 7-0	Hardware Version 0x64：V1.00 0x6E：V1.10 0x78：V1.20 0x82：V1.30 0x8C：V1.40 .....
Zone Bit	0x00E2 （Only read Zone bit）
Data Bit	Function
Bit 7-0	Software Version 0x64：V1.00 0x6E：V1.10 0x78：V1.20 0x82：V1.30 0x8C：V1.40 .....
Zone Bit	0x00E3 （Only read Zone bit）

Data Bit	Function
Bit 7-0	Year of software (Add 2000) 0x12：2018 0x13：2019 0x14：2020 .....
Zone Bit	0x00E4（Only read Zone bit）
Data Bit	Function
Bit 7-0	Software month 0x09：9 0x0A：10 0x0B：11 .....
Zone Bit	0x00E5（Only read Zone bit）
Data Bit	Function
Bit 7-0	Software date 0x09：9 0x0A：10 0x0B：11 .....

2.2 Setup Code

Customer can set module by scan setup code.

Note: the entire list of current zone bit is saved to Flash while the configuration is modified through the setup code, that is, the configuration that is configured through the serial port but not saved will also be saved together.

Setup code on

***Off**

Output the setup code content

***Not output**

Output

2.3 Reset

Back to Factory Setting by scan follow code.

Reset

3 Communication interface

GM60 can receive database, control module and set functional parameter by TTL - 232.

3.1 Serial Communication Interface

It's default and common to connect module and mainframe(such as PC, POS) by serial communication interface. Make sure communication parameter for module and mainframe are same, then it will communicate smooth and correctly.

Serial Output

TTL-232 is used for serial interface which suitable for most system. Required change-over circuit for RS-232.

Default Parameter as Form 3-1. Only Baud Rate can be changed.

Form 3-1 Default Parameters

Parameters	Default
Serial communication interface	Standard TTL-232
Baud rate	9600
Verification	N
Data bit	8
Stop bit	1
CTSRTS	N

Baud Rate Settlement

1200bps **4800bps** ***9600bps**

14400bps

19200bps

38400bps

57600bps

115200bps

3.1.1 Serial Port Check Bit Configuration

Modify the parity bit of the serial port by scanning the following configuration code.

*NONE

ODD

EVEN

4 Read Mode

4.1 Continuous Mode(Default)

On this mode, reading module read code continuous and automatic.

Break after reading one code, break time is changeable.

Click the toggle key to pause. Then click to continuous cyclic read code.

***Continuous Mode**

Time settlement for single read

The longest time before first successful reading. After this time, module will be into no read time.

Single Read time: 0.1~25.5 s, step-size: 0.1s;

0 means infinite time.

Default time: 5s.

1000ms

3000ms

***5000ms**

Infinite

Break time settlement

Time between two read. Can be settled from 0 to 25.5 s, step-size: 0.1s; default 1.0s

No break

500ms

***1000ms**

1500ms

2000ms

Same barcode reading delay

The same barcode reading delay refers to that after the module reads the same bar code, it will be compared with the last reading time,when the interval is longer than the reading delay, the same barcode is allowed to be read, otherwise the output is not allowed.

Same barcode reading delay

***Same bar code reading without delay**

Same barcode reading delay time

When the same barcode reading delay is enabled,scan the following code to set same barcode reading delay time.

Infinite delay

500ms

1000ms

3000ms

5000m

4.2 Induction Mode

After setting, module begins to monitor brightness immediately. When scene changed, module will begin to read until time of image stabilization over.

After first successful reading or single reading time out, module will monitor brightness again after some time (changeable)

Module will cycle working as above when follow happen: module can’t find code between single read time, then it will stop reading and jump to monitor brightness.

On induction mode, module can begin reading code by click, and it will begin to monitor brightness when release toggle key or successfully output information.

Induction Mode

Time settlement for single read

The longest time read before first successful reading. After this time, module will be into no read time.

Single Read time: 0.1~25.5 s, step-size: 0.1s;

0 means infinite time interval.

Default time: 5s

1000ms

3000ms

***5000ms**

infinite time interval

Break time settlement

After one successful output or time out for single read. Module will be into monitor after some time.

Time from 0 to 25.5 s, step-size: 0.1s; default 1.0s

No Break

500ms

***1000ms**

1500ms

2000ms

Image stabilization time

Image stabilization time: the time cost after module find scene change then waiting for the scene stable. Time from 0s to 25.5s, step size 0.1s. Default 0.4s.

100ms

***400ms**

1000ms

2000ms

Sensitivity

Detect the degree of change in the scene in inductive reading mode.When the reading module judges that the scene change degree meets the requirements, it will switch from the monitoring state to the reading state.

***Ordinary sensitivity**

Low sensitivity

High sensitivity

Extra high sensitivity

5 LED Mode

5.1 Breathing Lamp

Breathing lamp is used to additional lighting when read.

Normal: Breathing lamp will be on when read, others off.

Normally on(default): always on after boot.

OFF: Breathing lamp is always off

Normal

***Normally on**

Off

Under the Normal on state, the brightness of the breathing lamp can be adjusted by the following configuration code. The user can set it to one of the following states according to the application environment:

Low(Level 1)

Middle(Level 50)

***High(Level 99)**

By default, the breathing lamp will have one color every 3 seconds, and the cycle will be turned on and off according to the color sequence of breathing lamp 1-breathing lamp 7. Users can scan the following configuration code for the corresponding color of breathing lamp

Breathing lamp 1

***Breathing lamp 1-Blue**

Breathing lamp 1-Green

Breathing lamp 1-Red

Breathing lamp 1-White

Breathing lamp 2

***Breathing lamp 2-Blue**

Breathing lamp 2-Green

Breathing lamp 2-Red

Breathing lamp 2-White

Breathing lamp 3

***Breathing lamp 3-Blue**

Breathing lamp 3-Green

Breathing lamp 3-Red

Breathing lamp 3-White

Breathing lamp 4

***Breathing lamp 4-Blue**

Breathing lamp 4-Green

Breathing lamp 4-Red

Breathing lamp 4-White

Breathing lamp 5

***Breathing lamp 5-Blue**

Breathing lamp 5-Green

Breathing lamp 5-Red

Breathing lamp 5-White

Breathing lamp 6

***Breathing lamp 6-Blue**

Breathing lamp 6-Green

Breathing lamp 6-Red

Breathing lamp 6-White

Breathing lamp 7

***Breathing lamp 7-Blue**

Breathing lamp 7-Green

Breathing lamp 7-Red

Breathing lamp 7-White

5.2 Decoding Successful Prompt Light

Decoding successful prompt light are shared with breathing lam. After successful decoding, the breathing lamp is converted into the decoding successful prompt light. User can turn on or off the decoding successfully prompt light function by setting code.

***Turn on**

Turn off

User can adjust the color of decoding successfully prompt light by setting code.

Decoding successfully prompt light-Blue

***Decoding successfully prompt light-Green**

Decoding successfully prompt light-Red

Decoding successfully prompt light-White

6 Data Edition

Sometimes we need to edit the data before output to make data separation and processing more easily.

Data edition include:

- Add Prefix
- Add Suffix
- Cut data
- Output CodeID
- Output “RF” when fail to decode
- Add End words”Tail”

Output sequence after data edition:

【HEAD&LEN】【Prefix】【CodeID】【Data】【Suffix】【Tail】【CRC】

6.1 Header With Protocol

Add Header

The header is to add 1 byte header information (0x03 or 0x04) +2 bytes of length information (including [Prefix] [CodeID] [Data] [Suffix] [Tail]) before the Prefix, can be set by scan the following code.

Add protocol header

***Don’t add protocol header**

After open “Add protocol header”,the specific data of the header can be set by the following code.

Header 0x03

Header 0x04

6.2 Prefix

Add prefix

Prefix is on the head of encoding Information , and can be self-defined.

Scan the code to add prefix.

Allow to add prefix

***no prefix**

Change prefix

Scan “change prefix” and “setup code” code to change prefix.

Use 2 base 16 to express each character.

Max 15 characters.

ASCII on appendix D.

change prefix

E.G. Change prefix to “DATA”

1. “DTAT” in base 16: “44”, “41”, “54”, “41”
2. Confirm open the “ setup code”.(find on 2.2)
3. Scan “change prefix” code
4. Successively scan “Code ID”: “4”, “4”, “4”, “1”, “5”, “4”, “4”, “1”
5. Scan “save” code

6.3 Suffix

Add Suffix

Suffix on the end of encoding Information, and can be self-defined.

Allow add suffix ***no suffix**

Change suffix

Scan “ change suffix” and “setup code” code to change prefix.

Use base 16 to express each character.

Max 15 characters. ASCII on appendix D.

Change Suffix

E.G.: Change suffix to “DATA”

1. “DTAT” in base 16: “44”, “41”, “54”, “41”

2.Confirm opening the “setup code”.(find on 2.2)

3.Scan “change suffix” code

4.Successively scan “Code ID”: “4”, “4”, “4”, “1”, “5”, “4”, “4”, “1”

5.Scan “save” code

6.4 CODE ID

Add CODE ID

Users can identify different types of bar code by CODE ID. CODE ID use one character to identify and can be self- defined.

Allow add CODE ID

***close CODE ID**

Default of CODE ID

Scan “ Default of CODE ID” to back default ID, default ID on appendix C

all bar code back to default ID

Change CODE ID

Users can change CODE ID of any bar code by scan the setup code (as follow) and data edition

code.

Base 16 is used to express each CODE ID.

ASCII on appendix D.

E.G.: change CODE ID of CODE 128 to “A”

1. Find “A”=”41” in base 16
2. Confirm opening the “setup code”.(find on 2.2)
3. Scan “ change CODE 128”
4. Successively scan “Code ID”: “4”, “1”
5. Scan “save” code

Change CODE ID LIST

Change CODE ID of CODE 39

Change CODE ID of CODE 128

Change CODE ID of QR CODE

6.5 Tail

Open this function to help system quickly distinguish current decoding results.

Scan “Add tail” to open this function, if read success, there will be tail on the end of decode data.

Close tail

***Add tail “CR”**

Add tail “TAB”

Add tail “CRLF”

6.6 CRC Output

CRC output (4Byte) is the value obtained after all the previous data are checked together, and is output in ASCII format.

The reference code of C is as follows:

```
unsigned int crc_cal_by_bit(unsigned char* ptr, unsigned int len)
{
unsigned int crc = 0;
while(len-- != 0)
{
for(unsigned char i = 0x80; i != 0; i /= 2)
{
crc *= 2;
if((crc&0x10000) !=0) //Last CRC * 2 ， if the first one is 1， so divide 0x11021
crc ^= 0x11021;
if((*ptr&i) != 0) //If the standard is 1， so CRC = last CRC + standard CRC_CCITT
crc ^= 0x1021;
}
ptr++;
}
return crc;
}
```

Note: If the CRC gets data of "0x1D2E", the output of 4 bytes is 0x31 0x44 0x32 0x45

CRC output can be set by the following code:

Don’t add CRC Output

***Add CRC Output**

6.7 Cut out Data

Open to output part of data.

[Data] is composed of [Start] + [Center] + [End]

Character length of “start” and “end” can be changed

***Output whole data**

Output Start **part**

Output End **Part**

Output Center **part**

Change length of [Start]-M

Scan " Change M" code and "data edition" code to change length of [Start], max 255 characters

Base 16 is used to express length. ASCII on appendix D.

Change M

Change length of [End]-N

Scan " Change N" code and "data edition" code to change length of [Start], max 255 characters

Base 16 is used to express length. ASCII on appendix D.

Change N

Output Start part

E.G. Output "1234567890123" of whole decode information " 1234567890123ABC"

1. "13" ="0D" in base 16
2. Confirm opening the "setup code"(find on 2.2)
3. Scan" change length M"
4. Successively scan "Code ID": "0", "D"
5. Scan "save" code
6. Scan" Output Start part"

Output End Part

E.G. Output "ABC" of whole decode information " 1234567890123ABC"

1. "3" = "03" in base 16
2. Confirm opening the "setup code" (find on 2.2)
3. Scan "change length N"
4. Successively scan "Code ID":"0", "3"
5. Scan "save" code
6. Scan" Output Start part"

Output Center part

E.G.: Output "0123" of whole decode information " 1234567890123ABC"

1. " 10" ="0A"; "3"="03" in base16
2. Confirm opening the "setup code" (find on 2.2)
3. Scan "change length N"
4. Successively scan "Code ID":"0", "3"
5. Scan "save" code
6. Scan " change length M"
7. Successively scan :Code ID": "0", "A"
8. Scan "save" code
9. Scan "Output Center part"

6.8 RF Information

RF(Read Fail): Users can self- define output information when read fail.

Output RF information

Default not output

Change RF information

Scan"change RF information" and "data edition code" to change RF information.

Base 16 is used to express, max at 15 character. ASCII on appendix D.

Change RF information

E.G.: change RF to “FAIL”

1. Find “FAIL” in base-16: “46”, “41”, “49”, “4C”
2. Confirm opening the “setup code”(find on 2.2)
3. Scan “ change RF information”
4. Successively scan “4”、“6”、“4”、“1”、“4”、“9”、“4”、“C”
5. Scan “save” code

7 Bar code type enables/disable configuration

7.1 All types of bar code can be decoded

After scan “ Forbid read all bar code” , module will only support to scan setup code.

Support all

Forbid read all bar code

***Open default support types**

7.2 EAN13

***Allow reading EAN13**

Forbid reading EAN13

***2 bits extra-code Forbidden**

2 bits extra-code Allow

***5 bits extra-code Forbidden**

5 bits extra-code Allow

7.3 EAN8

*Allow reading EAN8

Forbid reading EAN8

*2 bits extra-code Forbidden

2 bits extra-code Allow

*5 bits extra-code Forbidden

5 bits extra-code Allow

7.4 UPCA

*Allow reading UPCA

Forbid reading UPCA

*2 bits extra-code Forbidden

2 bits extra-code Allow

*5 bits extra-code Forbidden

5 bits extra-code Allow

7.5 UPCE0

*Allow reading UPCE0

Forbid reading UPCE0

7.6 UPCE1

*Allow reading UPCE1

Forbid reading UPCE1

*2 bits extra-code Forbidden

2 bits extra-code Allow

*5 bits extra-code Forbidden

5 bits extra-code Allow

7.7 Code128

*Allow reading Code128

Forbid reading Code128

Scan following code to change min length of code 128

Code128 信息最短长度为 0

***Code128 信息最短长度为 4**

Scan following code to change max length of code 128

***Code128 信息最长长度为 32**

Code128 信息最长长度为 255

7.8 Code39

***Allow reading Code39**

Forbid reading Code39

Scan following code to change min length of code39

Code39 min length at 0

***Code39 min length at 4**

Scan following code to change max length of code39

***Code39 max length at 32**

Code39 max length at 255

Scan following code to configure whether Code39 supports Code32 mode and FullAsc mode

***Forbid Code32**

Allow Code32

***Forbid FullAsc Mode**

Allow FullAsc Mode

7.9 Code 93

***Allow reading Code93**

Forbid reading Code93

Scan following code to change min length of code93

Code93 min length at 0

***Code93 min length at 4**

Scan following code to change max length of code93

***Code93max length at 32**

Code93max length at 255

7.10 CodeBar

***Allow reading CodeBar**

Forbid reading CodeBar

Scan following code to change min length of CodeBar

CodeBar min length at 0

***CodeBarmin length at 4**

Scan following code to change min length of CodeBar

***CodeBar max length at 32**

CodeBar max length at 255

7.11 QR

***Allow reading QR**

Forbid reading QR

7.12 Interleaved 2 of 5

Allow reading Interleaved 2 of 5

***Forbid reading Interleaved 2 of 5**

Scan following code to set min length of Interleaved 2 of 5

Interleaved 2 of 5 min length at 0

***Interleaved 2 of 5 min length at 4**

读取以下设置码，将对 Interleaved 2 of 5 条码最长识读长度进行设置。

***Interleaved 2 of 5 max length at 32**

Interleaved 2 of 5max length at 255

7.13 DM

***Allow reading DM**

Forbid reading DM

Scan following code to set whether the module supports decoding multiple DM barcodes simultaneously

***Forbid Read multiple DM barcodes simultaneously**

Allow Read multiple DM barcodes Simultaneously

7.14 PDF417

***Allow reading PDF417**

Forbid reading PDF417

8 Appendix A：Default Setting Table

Parameter	Default Setting	Note
Communication interface	TTL Interface	
Read Mode	Continuous Mode	Single reading code: 10s
Lighting	Lighting: Normal Mode	Breathing lamp mode
Terminator	None	None
Output Protocol	Open	04+Length
All types of bar code can be decoded	Open	

9 Appendix B：Common serial port instruction

Function	Instruction
Baud rate to 9600	7E 00 08 01 00 D9 D3 20 38
Save settlements to EEPROM	7E 00 09 01 00 00 DE C8
Find baud rate	7E 00 07 01 00 2A 02 D8 0F

Module will return following info after mainframe send serial port instruction - find baud rate

Return information	Baud rate
02 00 00 02 C4 09 SS SS	1200
02 00 00 02 71 02 SS SS	4800
02 00 00 02 39 01 SS SS	9600
02 00 00 02 D0 00 SS SS	14400
02 00 00 02 9C 00 SS SS	19200
02 00 00 02 4E 00 SS SS	38400
02 00 00 02 34 00 SS SS	57600

PS：SS SS= check value

10 Appendix C：Code ID

Type of Bar Code	Corresponding character	Zone bit address
EAN-13	d	0x91
EAN-8	d	0x92
UPC-A	c	0x93
UPC-E0	c	0x94
UPC-E1	c	0x95
Code 128	j	0x96
Code 39	b	0x97
Code 93	i	0x98
Codabar	a	0x99
Interleaved 2 of 5	e	0x9A
QR Code	Q	0xA2
Data Matrix	u	0xA3
PDF 417	r	0xA4

11 Appendix D：ASCII

Hexadecimal	Decimalism	Character
00	0	NUL
01	1	SOH
02	2	STX
03	3	ETX
04	4	EOT
05	5	ENQ
06	6	ACK
07	7	BEL
08	8	BS
09	9	HT
0a	10	LF
0b	11	VT
0c	12	FF
0d	13	CR
0e	14	SO
0f	15	SI
10	16	DLE
11	17	DC1
12	18	DC2
13	19	DC3
14	20	DC4
15	21	NAK
16	22	SYN
17	23	ETB
18	24	CAN
19	25	EM
1a	26	SUB
1b	27	ESC
1c	28	FS
1d	29	GS
1e	30	RS

Hexadecimal	Decimalism	Character
1f	31	US
20	32	SP
21	33	!
22	34	"
23	35	#
24	36	$
25	37	%
26	38	&
27	39	`
28	40	(
29	41	)
2a	42	*
2b	43	+
2c	44	,
2d	45	-
2e	46	.
2f	47	/
30	48	0
31	49	1
32	50	2
33	51	3
34	52	4
35	53	5
36	54	6
37	55	7
38	56	8
39	57	9
3a	58	:
3b	59	;
3c	60	<
3d	61	=
3e	62	>
3f	63	?
40	64	@

Hexadecimal	Decimalism	Character
41	65	A
42	66	B
43	67	C
44	68	D
45	69	E
46	70	F
47	71	G
48	72	H
49	73	I
4a	74	J
4b	75	K
4c	76	L
4d	77	M
4e	78	N
4f	79	O
50	80	P
51	81	Q
52	82	R
53	83	S
54	84	T
55	85	U
56	86	V
57	87	W
58	88	X
59	89	Y
5a	90	Z
5b	91	[
5c	92	\
5d	93	]
5e	94	^
5f	95	_
60	96	'
61	97	a
62	98	b

Hexadecimal	Decimalism	Character
63	99	c
64	100	d
65	101	e
66	102	f
67	103	g
68	104	h
69	105	i
6a	106	j
6b	107	k
6c	108	l
6d	109	m
6e	110	n
6f	111	o
70	112	p
71	113	q
72	114	r
73	115	s
74	116	t
75	117	u
76	118	v
77	119	w
78	120	x
79	121	y
7a	122	z
7b	123	{
7c	124	|
7d	125	}
7e	126	~
7f	127	DEL

12 Appendix E：Data code

0 ~ 9

0

1

2

3

4

5

6

7

8

9

A – F

A

B

C

D

E

F

13 Appendix F：Save or Cancel

After reading the data code, you need to scan the "save" setting code to save the data which you read.If there is an error when reading the data code, you can cancel the error reading.

For example, read a set code,and read data "A", "B", "C" and "D" in turn.

If you read "cancel the last read bit", the last read digit "D" will be cancelled.

If you read "cancel the previous read a string of data" will cancel the read data "ABCD",

If you read "cancel modification Settings", you will cancel the data "ABCD" and exit the modification Settings.

Save

Cancel the last read bit

Cancel the previous read a string of data

Cancel modification settings