

DEVELOPMENT MANUAL

CMOS BARCODE SCANNER

Version: v2.0.10

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1 Brief description

This manual mainly provides various function setting commands for barcode reading equipment. By familiarizing with the introduction of various function commands in this manual, users can change the function parameters of the barcode reading device by scanning the setting code or sending setting commands through the interface. The product has provided parameter configuration suitable for most common application functions at the factory. In most cases, the user can put it into use without adjustment. The factory default is UART serial port output, and the default baud rate is 9600.

REMARK:

- (1) All setting parameters with * are system default parameters;
- (2) The CRC included in the commands in this document uses CRC16_XMODEM, polynomial $x^{16}+x^{12}+x^5+1$ (0x1021), the data is reversed to MSB First, and the data format is a string format configuration. For example, a command is: \$xxxxxx-yyyy, the 4 digits of yyy are the check code, and \$xxxxxx-the 8 digits are the content for calculating the checksum.

2 System Setting

2.1 Setting code switch

This function is whether the user can set up the device by scanning the setting code. After the setting code is turned off, the parameter configuration cannot be performed by scanning the setting code. The setting code is regarded as a normal barcode; after the setting code is turned on, the parameter configuration can be performed by scanning the setting code. The default is that the switch is on

Command for off setting code switch: \$010000-525C

Command for on setting code switch: \$010001-616D

Note: These two commands can only be set by sending commands through UART and other interfaces

2.2 Switch for setting code data output

This function is whether the user outputs the scanned setting code content through the UART interface.

 \$010100-24E8 (*No output)		 \$010101-17D9 (Output)
--	--	--

2.3 Parameters setting

Rest to factory default

Restore all parameters to the factory default, the device will automatically restart after this operation.



2.4 Device information

2.4.1 Firmware version



2.4.2 Unique identification code of device

After reading successfully, the device will return a string of 12 bytes to the host. Can be used to identify products.

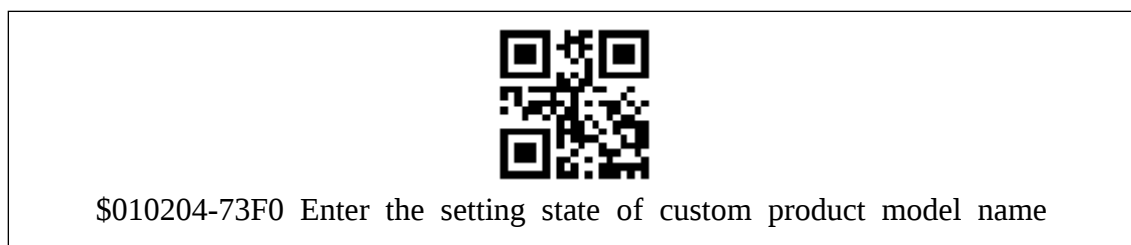


2.5 Custom product model

2.5.1 Set custom product model number

Under this function, the user can name the product model number by himself, and then it can be read by the read command. The steps to set a custom product model are as follows:

- (1) Set the custom product model number by scan following setting codes:



(2) Make a non-setting QR code of a customized product model number and scan the code. The buzzer sounds three times to indicate the setting is successful, and the buzzer sounds once to indicate the setting failed. as follows:



Custom product model number test code, scan the following code after setting in step (1), the custom product model will be set to CUSTOM PRODUCT MODEL TEST, scan 2.5.2 to read the command code of the custom product model or send a command It can be read out.

Notice:

- a. The total characters of the customized product model number cannot exceed 100 bytes, otherwise the setting will fail;
- b. After the setting fails, you need to restart the setting from step (1);
- c. After the setting is successful, if you want to modify the setting model, directly restart the setting from step (1), and the original setting model will be cleared;
- d. After the setting is successful, restoring the factory settings will also retain the set model number.

2.5.2 Read custom product model number

Read the customized product model number set by the user



2.6 Restart

The device will restart immediately after scanning the setting code or sending the setting command.



3 Communication setting

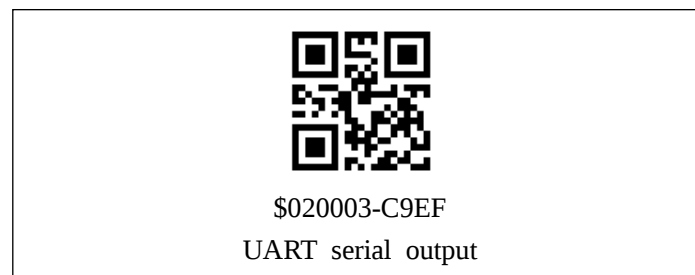
3.1 Interface settings

The factory default is UART interface output. If you need other interface output, scan the enable code of the corresponding interface to switch, the setting will not take effect immediately, you need to manually restart the device to take effect, and the set interface will not be restored after scanning and restoring the factory settings. Keep the original settings unchanged.

3.1.1 UARTserial output

If the data output interface is switched to UART serial output, it will not take effect immediately, and it needs to be manually restarted to take effect.

The default output configuration of the serial port is: baud rate-9600bps, stop bit-1 bit, data bit-8 bits, parity bit-none, no flow control. The baud rate can be changed according to the setting in section 3.1.3.



3.1.2 UART serial port work settings

By default, the UART serial port keeps sending no matter what interface output mode it is in. The receiving will be turned off in the USB virtual serial port output mode, and it will be turned on in other modes. It can be set to only use the serial port to transmit data in the UART serial port output mode.

(Note: The default parameter of v4.x.39, v6.0.9 and higher version is "only work in UART serial output mode", the default parameter before v4.x.39, v6.0.9 is "no matter what interface Keep working in output mode".)

 \$020E01-51BD Keep working regardless of interface out	 \$020E00-628C *Only work in UART serial port output
--	--

3.1.3 UART serial port baud rate setting

The baud rate of the serial port is adjustable, and the default bit is 9600, which will take effect immediately after setting.

 \$020503-75AA (Baud rate 2400)	 \$020504-EC3D (Baud rate 4800)
 \$020505-DF0C (* Baud rate 9600)	 \$020506-8A5F (Baud rate 19200)
 \$020507-B96E (Baud rate 38400)	 \$020508-A950 (Baud rate 57600)
 \$020509-9A61 (Baud rate 115200)	

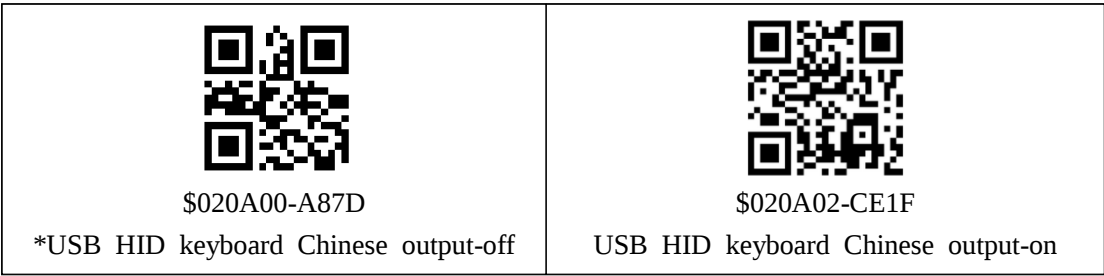
3.1.4 USB HID keyboard output

The data output switch bit USB HID keyboard interface output will not take effect immediately, and it needs to be manually restarted to take effect.



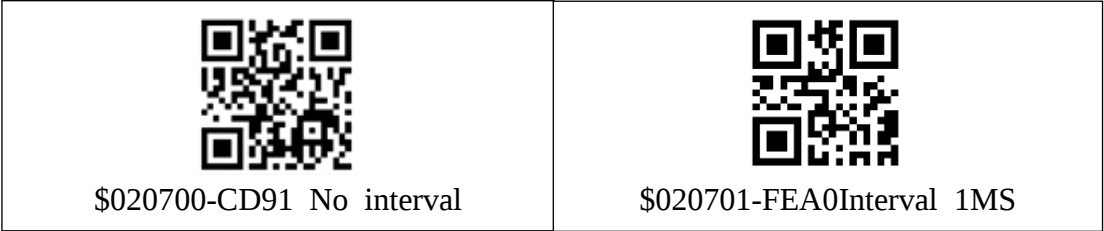
3.1.5 USB HID keyboard output Chinese settings

USB HID keyboard output Chinese is currently only applicable to windows system, currently does not support Chinese output on Android and Linux devices. Chinese output is turned off by default.



3.1.6 USB HID keyboard output interval time

The USB HID keyboard is a character-by-character transmission. Through this setting, the character output speed of the embedded scanner can be changed to meet the requirements of the host. The default is 10ms interval.



 \$020703-98C2 Interval3MS	 \$020705-3264 Interval5MS
 \$02070A-F6F9 *Interval10MS	 \$020714-3665 Interval20MS
 \$02071E-0D0D Interval30MS	 \$020732-F2A3 Interval50MS

3.1.7 USB HID virtual keyboard numeric keyboard selection



3.1.8 USB HID keyboard layout

The USB HID keyboard defaults to the USA keyboard output.

 \$020C00-4515 *USA	 \$020C01-7624 Belgium	 \$020C02-2377 Finland
 \$020C03-1046 France	 \$020C04-89D1 Germany	 \$020C05-BAE0 Sweden
 \$020C06-EFB3 U.K	 \$020C07-DC82 Norway	 \$020C08-CCBC Spain
 \$020C09-FF8D Portugal	 \$020C0A-7E7D TurkeyQ	 \$020C0B-2B2E Japan
 \$020C0C-181F Czech Republic	 \$020C0D-8188 TurkeyF	

3.1.9 USB virtual serial port output

The data output is switched to the USB virtual serial port output, it will not take effect immediately, and it needs to be manually restarted to take effect.

In the window system, you need to install the USB virtual serial port driver (win10 system may automatically install it), and then use the serial port debugging assistant software to open the port for debugging or development. In the Linux system, a ttyACM node will be added.



3.1.10 USB HID POS output

In USB HID POS mode, PID is 0xA4AF, VID is 0x0525, packet size is 32 bytes, input is 32 bytes, output is 32 bytes, there will be a header and a header before and after the module sends data.

The content of the header is: the number of bytes of the QR code content + the length of the check;

The content of the package is to send 32 bytes of data each time, and a checksum is added at the end of the content. The checksum is the sum of all the data in the content package;

The end of the packet is a packet containing only one byte of 0X0D.

(Note: Only FW v4 series version, and v4.x.39 and later versions support this function.)



3.2 Host command response mode

When using the interface to send a setting command, it returns setting status of response mode of. The default is no answer.

No response: After sending the setting command, there is no response content to return whether the setting succeeds or fails.

Response mode 1: The response is fixed content. The response to the successful execution of the command is: \$000100-6148; the response to the failure of the command execution is: \$0001FF-A91F.

Response mode 2: The first 5 characters of the response are the same as the first 5 characters of the command sent to the device; for the 6th to 7th characters, the command execution is successful: "00"; the command execution failure is: "FF"; the 8th is a fixed character "-"; the 8th to 12th characters are CRC16 checking.

Note: (1). There is no response to read commands (such as reading device information), and the read content will be directly responded;

(2). When sending "enter online upgrade status", it will only reply that the command is executed successfully, which only means that the command has been received.

 \$020B00-33A1 (* No response)	 \$020B01-0090 (Response mode1)	 \$020B02-55C3 (Response mode2)
--	---	---

3.3 Heartbeat query

3.3.1 1 Heartbeat mode 1

The host can check whether the code scanning module has a heartbeat response by sending a heartbeat query command, so as to determine whether the code scanning module is working normally.

Heartbeat query: \$01036F-D9DF

Heartbeat response: \$010370-4C10

3.3.2 Heartbeat mode 2

The following phenomena will occur after enabling heartbeat mode 2:

1. Heartbeat will send 0x82 0x83 every 10 seconds;
2. Power up will be sent after power-on and restart



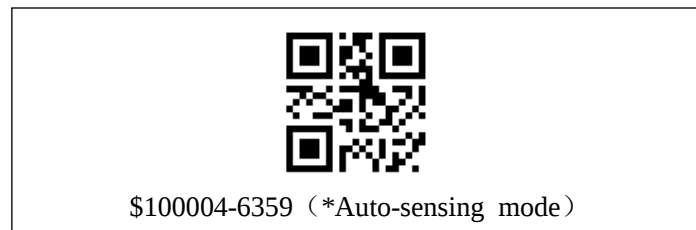
4 Reading parameter settings

4.1 Reading mode

In order to be suitable for different scenarios, the scan code module has a variety of reading modes, and the default is the auto sensing reading mode, The settings are effective immediately.

4.1.1 Auto-sensing mode

In auto-sensing mode, when a barcode enters the field of view of the device, the device will start to read it once. When the reading is successful or the reading exceeds the "single reading time", the reading will stop.



4.1.2 Continuous Mode

In the continuous reading mode, the device reading will continue to be turned on and will not be affected by the "single reading time".



4.1.3 Manual mode(button/key mode)

In manual mode, the key will be used to control the code reading. There are 3 control methods. In order to prevent the setting code from being scanned by mistake and the code cannot be scanned (in the case of no button connection), it is recommended to use the interface to send the setting command to set to this mode, so as to ensure that the setting can be set through the setting command.

(1) **Key once trigger mode:** Press the key once to start the reading. When the reading is successful or exceeds the "single reading time", the device stops reading;

Command: **\$100000-AF9D**

(2) **Key hold mode:** In this mode, the reading is started when the button is pressed, and the reading is stopped when the button is released. When the reading is successful or exceeds the "single reading time", the device stops reading;

Command: **\$100001-9CAC**

(3) **Key switch continuous mode:** In this mode, the key acts as a switch. When it is pressed, it starts continuous reading, and when it is pressed again, it stops reading. The opening period is not affected by the "single reading time".

Command: **\$100002-C9FF**

4.1.4 Command trigger mode

The command trigger mode should be applicable in the key-press once trigger mode, the key hold mode or the auto-sensing mode. The command trigger in the command trigger mode is read as follows:

Command trigger 1: The reading is triggered after sending the command. When the reading is successful or exceeds the "single reading time" or when the "command triggered stop" is received, the device stops reading;

Command: **\$108000-ADB0**

Command trigger 2: After sending the command, the continuous reading is triggered, and the device will stop reading only after sending the "command of trigger stop";

command: **\$108001-9E81**

command trigger stop: It is used to stop the reading triggered by "Command Trigger 1" and "Command Trigger 2".

command: **\$108003-F8E3**

4.2 Automatic sensing sensitivity

This setting is only valid when the "Reading Mode" is "Auto-sensing"; the higher the sensitivity, the easier it is to trigger the device to enter the reading state, the lower the sensitivity, the less likely it is to trigger the device to enter the reading state. The sensitivity needs to be set according to different scenarios, Under normal circumstances, the default settings can be used. The default is the highest sensitivity.

 \$100100-D929 *Highest sensitivity	 \$100101-EA18 High sensitivity	 \$100102-BF4B Middle sensitivity
 \$100103-8C7A Low sensitivity		 \$100104-15ED Lowest sensitivity

4.3 Auto-sensing restart delay setting

This setting is only valid when the "Reading Mode" is "Auto-sensing"; it is used to set the delay time for the next automatic sensing start after the barcode is read; it is not recommended to set the delay too short, otherwise it will cause multiple readings by one scan. The default is 0.5s.。

 \$101304-52D4 (0.3S)	 \$101306-34B6 (*0.5S)
 \$101308-17B9 (0.7S)	 \$10130C-C31A (1S)

4.4 Auto-sensing button mode (for engine)

You can choose the mode of auto-sensing and pressing the key to trigger the reading.

One-time reading mode: press the button once to forcefully trigger an automatic induction reading per unit time

Key hold mode: After pressing once or twice in a row, the module will enter manual mode. In manual mode, the module will not automatically sense to trigger the reading. Press the button to trigger the reading, and release the button to stop reading immediately. When the module stops reading and is idle for 5 seconds, the module will re-enter the auto-sensing mode.

 \$101500-B989 (*one time reading)	 \$101501-8AB8 (Key hold mode)
--	--

4.5 Time of single reading

This setting is only valid when the "reading mode" is "one-time trigger", "key hold", and "auto-sensing"; when the reading time exceeds the "single reading time", the device will stop reading. The default value is 6 seconds.

 \$100200-42F5 (Infinite time)	 \$100203-17A6 (3S)	 \$100206-E853 (*6S)
 \$100209-F86D (9S)		 \$10020F-E00A (15S)

4.6 The choice after reading is completed(In auto-sensing mode)

In auto-sensing mode, after finishing a reading, the module has three states that can be set:

- Keep reading state
- Exit the reading state immediately
- Auto-sensing end mode 3: After scanning the code successfully, the fill light will flash once, and then continue to maintain the trigger state.

 \$101400-CF3D * Exit the reading state	 \$101401-FC0C Keep reading state	 \$101402-A95F end mode 3
---	---	---

4.7 Manual query of motion detection status

query command: \$380000-C23C
No motion-return: \$380010-F50C
Have motion-return: \$380011-C63D



4.8 Motion detection status is automatically sent

This function only takes effect when the reading mode is auto-sensing mode. After enabling, if a physical movement occurs, \$380211-2B55 data will be sent to the host once within 3s.



4.9 Interval of barcode reading

This setting is only valid when the "reading mode" is "auto-sensing", "continuous reading", and "Key switch continuous"; it is used to adjust the interval time of barcode reading to prevent read the same barcode by multiple times due to the reading speed is too fast.

Interval: Read barcode once every XX seconds. The default XX is 0.5S.

Adjacent barcodes will not be output repeatedly within x seconds: The same barcode must be out of the reading area for more than x seconds before it will be read again.

 \$100300-3441 (No interval)	 \$100305-CBB4 (*Interval 0.5S)
 \$10030A-0F29 (Interval 1S)	 \$100314-CFB5 (Interval 2S)
 \$1003FB-30D2 (Adjacent barcodes no output within 0.3S)	 \$1003FD-9A74 (Adjacent barcodes no output within 0.5S)
 \$1003F0-5EE9 (Adjacent barcodes no output within 0.1S)	 \$1003F2-388B (Adjacent barcodes no output within 2S)
 \$1003F3-0BBA (Adjacent barcodes no output within 3S)	 \$1003FF-FC16 (Adjacent barcodes must be different)

5 Fill-Light and Aiming-Light

5.1 Fill-Light

5.1.1 Mode of fill-light

The fill-light can provide auxiliary lighting for shooting and reading, which can improve the reading performance. The user can set it to one of the following states according to the application environment (the default is to light up when reading):

Always on: The fill-light will continue to glow after the device is turned on; it is recommended to set it to always on when the reading environment is dark or there is no light at all.

Always off: Under any circumstance, the light will not light up; it is recommended to set it to no light when read the barcode is on the screen.

Light on when reading: The fill-light lights up when reading, and goes off at other times.

 \$140000-A93C (Always on)	 \$140001-9A0D (Always off)	 \$140002-CF5E (*On when reading)
---	--	--

5.1.2 Control method of fill-light

The fill-light control mode supports PWM control or level control. When it is in PWM mode, you can set the brightness of the fill-light. When it is in the level mode, you can set whether the fill-light is on low level or high level.

The default is PWM control, you can use the following setting code to set the brightness.



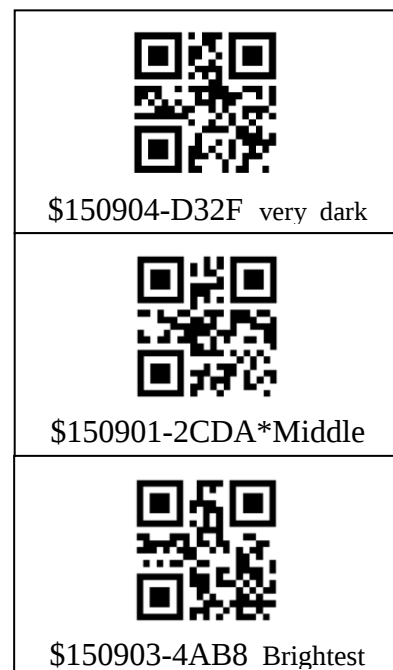
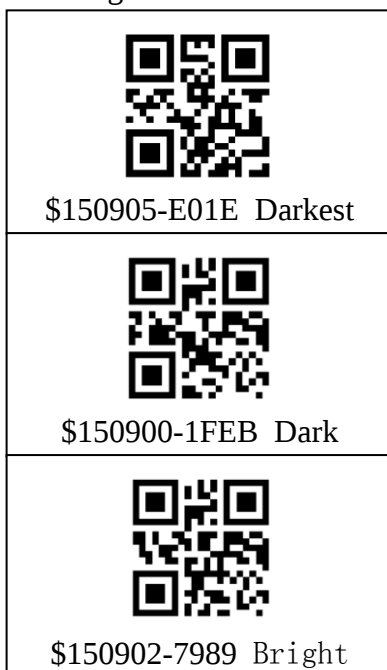
5.1.3 Set fill-light in level-mode

Note: You need to set the fill-light to level mode first, the setting will take effect immediately, and the factory setting will be restored to the default value.



5.1.4 Lighting brightness setting

The brightness can be set only when the light control mode is PWM mode.



5.1.5 Automatically turn on the fill light in dark environment

After turning on this function, in the automatic sensing mode, the module can detect the ambient brightness. When the ambient brightness is too low, it can automatically turn on the fill light with a lower brightness of the fill light.

 \$140300-32E0 *Off		 \$140301-01D1 On
--	--	--

5.1.6 Automatic fill light threshold

This function is a detailed function of "5.1.5 Automatic Fill Light".

This function sets the brightness level at which the fill light will automatically light up

 \$140200-4454 *Bright when the brightness is darkest		 \$140201-7765 Bright when the brightness is dark
 \$140202-2236 Bright when the brightness is middle	 \$140203-1107 Bright when the brightness is high	 \$140204-8890 Bright when the brightness is highest

5.1.7 Time interval of auto fill-light on

This function is the detailed function of "5.1.5 Automatic Fill Light".

This function sets how long the fill light will turn on when the ambient brightness is below the threshold. In the time before turning on, once the ambient b

rightness exceeds the threshold, it will re-time the timer. The default interval time is 0 seconds.

 \$140400-63CD *no interval	 \$140405-9C38 5S	 \$14043C-6797 60S
 \$140478-6FF4 120S	 \$1404B4-1961 180S	 \$1404FF-AB9A 255S

5.2 Aiming-Light

5.2.1 Aiming-Light mode

The aiming beam can help users find the best reading position when shooting and reading; only modules with aiming lights have this function. The user can choose any of the following modes according to the application environment (the default is to aim when reading):

Always on: Continuously on.

Always off: The aiming-light is off under any circumstances.

Bright when reading: only turn on aiming-light when reading.

 \$140100-DF88 (Always on)	 \$140101-ECB9 (Always off)	 \$140102-B9EA (*Turn on when reading)
---	--	---

5.2.2 Aiming light flashes

The user can choose whether the aiming light will flash when the light is on, the default is to turn on the flashing.



6 Prompt during output

6.1 Power-on prompt

If the power-on prompt is turned on, the buzzer and lighting will send out a prompt signal after the device is successfully started, which is turned on by default.

 \$150000-EC9C (Power-on prompt OFF)	 \$150001-DFAD (*Power-on prompt ON)
---	--

6.2 Buzzer prompt when reading

If the reading sound is turned on, the buzzer will beep once every time the decoding is successful. Default is ON.

 \$150100-9A28 (OFF)	 \$150101-A919 (*ON)
--	---

6.3 Buzzer prompt when setting

If the setting prompt sound is turned on, the buzzer will sound according to the setting result each time the parameter is set (3 beeps for successful setting, 1 long beep for failure). Default on

 \$150A00-D85D (OFF)	 \$150A01-EB6C (*ON)
--	---

6.4 LED Indicator light

6.4.1 LED Indicator light ON/OFF

If the LED indicator is turned on, the LED indicator will flash once every time the reading is successful. It is turned on by default.

 \$150200-01F4 (OFF)	 \$150201-32C5 (*ON)
--	---

6.4.2 Set the working level of the reading result indicator

Note: The settings will take effect immediately, and the factory settings will be restored to default values.

 \$382700-D792 *Low level valid	 \$382701-E4A3 High level valid
--	--

6.5 Fill-Light control signal output

If enabled, the original LED indicator function will automatically be invalid, the built-in light of the scan code module is turned off, and the light control signal will be output from the LED indicator control IO port. A high level indicates that the light is on, and a low level indicates that the light is on. The light turns off. Disabled by default.

 \$150600-CB05 (*Disable)	 \$150601-F834 (Enable)
---	--

6.6 Power-on command prompt

If enabled, after the device is started, the command "\$150600-CB05" will be sent to the host, indicating that the device is ready.

 \$150500-50D9 (*Disable)	 \$150501-63E8 (Enable)
---	--

6.7 Buzzer sound duration

The duration of the buzzer sound after the scan code is successfully read once, the default is 60ms.

 \$150303-2213 (30ms)	 \$150306-DDE6 (*60ms)
 \$15030C-2A4A (120ms)	 \$150314-8CB4 (200ms)

6.8 Buzzer signal output mode

Set the buzzer control signal, the default is PWM signal to control the buzzer output. The setting will not take effect immediately, and it will take effect after the setting is manually restarted.

 \$150400-266D (Level output)	 \$150401-155C (*PWM output)
---	---

6.9 Buzzer frequency

This function can be set only when the buzzer control signal is in PWM mode (the control signal output can be set in section 6.8). According to the frequency of the buzzer, set the appropriate control frequency, the default is 2.7 KHZ.

 \$150705-4244 (2KHz)	 \$150706-1717 (2.4KHz)
 \$150707-2426 (*2.7KHz)	 \$150708-3418 (4KHz)

6.10 Buzzer loudness adjustment

This function can be set when the buzzer control signal is in PWM mode (the control signal output can be set in section 6.8) to adjust the loudness of the buzzer. The default is the loudest.

 \$150801-5A6E (*High)	 \$150802-0F3D (Middle)
 \$150803-3C0C (Low)	 \$150804-A59B (Lowest)

6.11 Buzzer working level

This setting is only valid when the buzzer signal output mode is "level output"



\$382800-037C
Sound under Low level



\$382801-304D
* Sound under high level

7 Data editing

Directions:

(1) data format:

Prefix	Barcode type	data	suffix	CRC check	terminator
--------	--------------	------	--------	-----------	------------

(2) The prefix, barcode type name, suffix, CRC check, and terminator are optional, and can be set by scanning setting code or sending serial commands.

(3) Set to remove the user's original data, you can remove the number of bytes specified by the original data according to the setting.

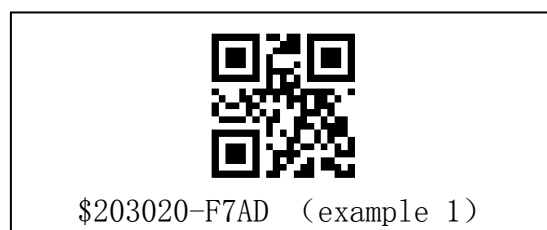
(4) Set filtering rules to filter specific characters or strings in user data.

(5) Set the original data output case, the letters can be output in uppercase or lowercase according to the setting.

7.1 Remove original data settings

This function is to remove the first N bytes and the last M bytes of data in the user's original data. After this function is successfully set, the first N bytes and last M bytes of data in the user data will be removed. If N+M is greater than or equal to the user data length, there will be a sound prompt, but no data output. N being 0 means not removing the previous data of the user, and M being 0 means not removing the last of data. The maximum of M and N is 20, that is, the first 20 bytes and the last 20 bytes of the data can be removed at most.

7.1.1 Example 1 Remove the first 20 bytes of user data



Example 1 Setting code description:

\$2030 is the command identifier that removes the first N bytes of the user's original data, which is fixed

20 is to remove the byte length in front of the original data (in decimal notation) (0-20 bytes), 20 bytes

- Connector, fixed

F7AD CRC check

7.1.2 Cancel remove the previous data



\$203000-99CD (Cancel remove the previous data)

7.1.3 Example 2 Remove the 20 bytes of data after the data



\$203120-8119 (example 2)

Example 2 description:

\$2031 is the command identifier that sets the function of removing the last M bytes in the original data, which is fixed

20 is to remove the byte length at the end of the original data (in decimal notation) (0-20 bytes), 20 bytes

-Connector, fixed

8119 CRC check

7.1.4 Cancel to remove the data of end



\$203100-EF79 (cancel to remove the data of end)

7.2 Only output data at both ends(remove middle data)

This function is to provide users with a setting to output only the first X or the back Y bytes of the data. The range of X and Y is 0~255. After setting, the module will only output the first X or the last Y bytes of the data. If

both the front X only output and the back Y only function are set, the module will splice the first X bytes and the last Y bytes together for output. When X and Y are 0, the function is turned off. X and Y are 0 by default. If X+Y is greater than the data length, no action will be taken when processing the data.

The processing priority of the original data is: first "remove the original data", then "output only the two ends of the data" processing, and finally "prefix and suffix", "terminator" and other data processing.

7.2.1 Example 1 Only output the first 20 bytes of data



Example 1 description:

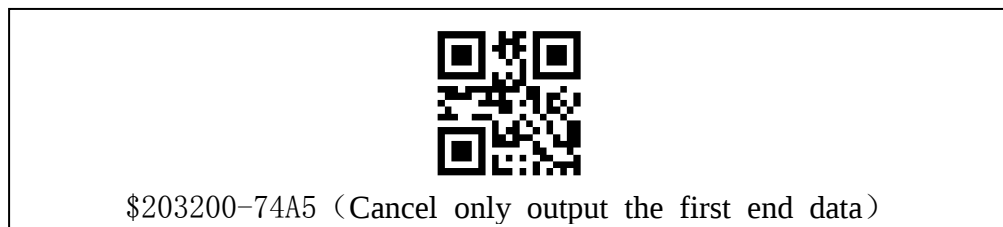
\$2032 is the command identifier that only outputs the first X bytes of data, and it is fixed.

14 is the length of the byte after the original data is removed (in hexadecimal notation), 20 bytes

- Connector, fixed

8F51 CRC check

7.2.2 Cancel only output the first end data



7.2.3 Example 2 Only output the last 20 bytes of data



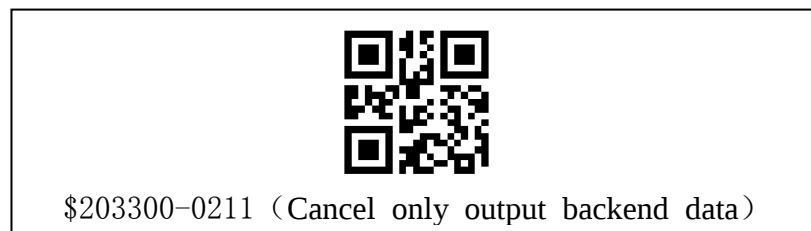
Example 2 description:

\$2033 is a command that only outputs the last Y bytes of data, which is fixed 14 is the length of the byte after the original data is removed (in hexadecimal notation), 20 bytes

- Connector, fixed

F9E5 CRC check

7.2.4 Cancel only output backend data



7.3 Add prefix

7.3.1 Add prefix example1 example2

This function is to add a prefix to the original data. After this function is enabled, if the reading is successful, the corresponding prefix will be added before the data. Two examples are provided below, and users can add their own prefixes according to the instructions.

 \$202004-HEAD-7591 (example1) Add HEAD as prefix	 \$202020-HEAD0123456789abcdef-5B3E (example2) Add HEAD0123456789abcdef as a prefix
---	--

Explanation for Example 1:

Add a prefix setting to the string (the prefix is HEAD):

\$2020 is the identifier of the prefix, which is fixed

04 is the byte length of the prefix content (1-20 bytes), 4 bytes

-Connector, fixed

HEAD prefix content, the length must be consistent with the "prefix byte length" above

- Connector, fixed

7591 CRC check, the CRC16 check of \$202004-HEAD- is 0x7591 (2 words), just convert it into string form 7591 (4 bytes); CRC16 polynomial is 0x1021.

The final command is a string: \$202004-HEAD-7591.

Setting of hexadecimal prefix (add hexadecimal prefix 0x48 0x45 0x41 0x44):
Convert all characters into hexadecimal system, and the corresponding CRC check should also be the CRC check after conversion into hexadecimal system.

0x24 0x32 0x30 0x32 0x30 prefix identification, fixed, that is, the string \$2020

0x30 0x34 The byte length of the prefix content (1-20 bytes), that is, the string 04, 4 bytes

0x2d connector, fixed

0x48 0x45 0x41 0x44 prefix content, the length must be consistent with the "byte length of prefix content" above

0x2d connector, fixed

0x37 0x35 0x39 0x31 CRC check, hexadecimal data 0x24 0x32 0x30 0x32 0x30 0x30 0x34 0x2d0x48 0x45 0x41 0x44 0x2d CRC16 check is 0x7591 (2 words); convert it into string form 7591 (4 bytes, If there are 'a','b','c','d','e','f', they must be changed to uppercase), and then convert the string form to hexadecimal form 0x37 0x35 0x39 0x31; CRC16 The polynomial is 0x1021.

The final command is hexadecimal data: 0x24 0x32 0x30 0x32 0x30 0x30 0x34 0x2d 0x48 0x45 0x41 0x44 0x2d 0x37 0x35 0x39 0x31. The prefix HEAD can be set by sending data in hexadecimal format through the interface.

7.3.2 Clear prefix



7.4 Add suffix

7.4.1 Add suffix example1 example2

 \$202104-TAIL-FB3A (example1) Add suffix TAIL	 \$202120-LIAT0123456789abcdef-E0BB (example 2) Add suffix LIAT0123456789abcdef
--	--

Example 1 description:

\$2021 suffix command, fixed

04 Length of suffix content byte length (1-20 bytes), 4 bytes

- Connector, fixed

TAIL suffix content, the length must be consistent with the "byte length of suffix content" above

- Connector, fixed

FB3A CRC check

For specific instructions and the setting method of character string and hexadecimal suffix, please refer to the setting method of prefix.

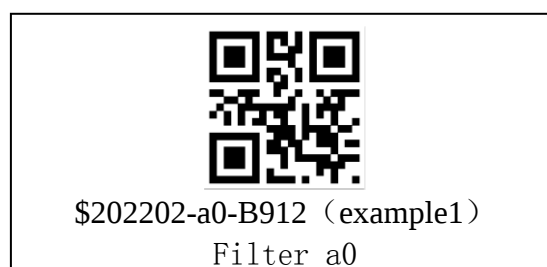
7.4.2 Clear suffix



7.5 Data filtering rule settings

This function is to filter the target character data contained in the data. After this function is turned on, if the reading is successful, a string of data equal to the filtered character data will be removed from the data.

7.5.1 example 1 Filter a0 in the data



Example 1 description:

\$2022 is the command to set the filter function, which is fixed

02 is the byte length of the filtered data part (1-20 bytes), 2 bytes

-Connector, fixed

a0 is the content of the filtered data

-Connector, fixed

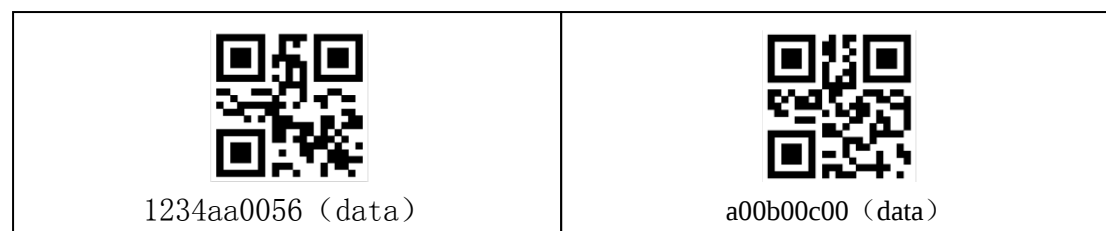
B912 CRC check

For specific instructions, as well as the setting method of string and hexadecimal filter rules, please refer to the setting method of prefix.

Data to be filtered (example):

The following two examples are used to test the filtering rule "a0". After scanning the code or sending the filtering rule "\$202202-a0-B912" through the serial port, scan the two data examples below. The "a0" contained in the string will be filtered out.

。

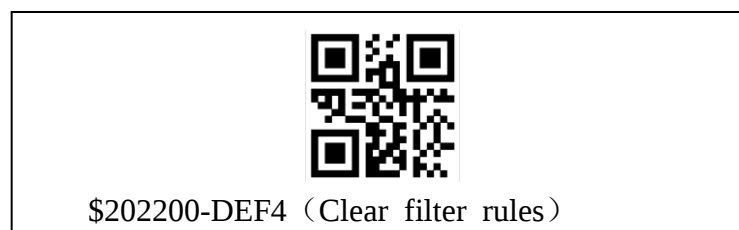


Scanning result after setting "\$202202-a0-B912":

"1234aa0056" scans the code and the result is "1234a056"

The result of scanning "a00b00c00" is "0b00c00"

7.5.2 Clear filter rules



7.6 CRC Check

This function is to add a CRC check to the end of the data (see note (2) in the brief description) function, including the prefix part, the bar code type name, the data part, and the suffix part; but it does not include the terminator. No output by default.

 \$202301-9B71 (CRC check output)	 \$202300-A840 (CRC check no output)
--	--

7.7 Terminator

This function is to allow the host to quickly distinguish the current reading results. After this function is turned on, if the reading is successful, the corresponding terminator will be added after the data. No end mark by default.

 \$201000-DD4E *No end mark	 \$201001-EE7F TAB(0x0B)
 \$201002-BB2C CR (0x0D)	 \$201003-881D CRLF(0x0D,0x0A)

7.8 Barcode type character output

 \$202400-F96D *No output	 \$202401-CA5C Output
---	---

If it is set to output, the first byte of each bar code read will be marked as the type of the bar code, and the specific type of the bar code can be known by checking the appendix 1 bar code type output character table. No output by default.

7.9 Case output settings

This function can set whether the letters in the barcode data are output in all uppercase or lowercase. The default is that the data is not processed as-is output

 \$204000-FE19 *As-is output	 \$204001-CD28 All uppercase	 \$204002-987B All lowercase
---	---	---

7.10 Prohibit URL output

This function can be set to prohibit the URL output or not (if it is disabled, there will be no response when the URL is scanned, there is no light, sound, and output response), and if it is set to not prohibit the URL output, it will respond normally and output the URL.

 \$204200-1371 No output URL	 \$204201-2040 *Output URL
--	--

8 Barcode reading configuration

Generally, the code system that is enabled by default is used for reading. The code system that is enabled by default is some commonly used code systems, and users generally do not need additional settings. Unless the code system required by the customer cannot be solved, turn on this code system in a single bar code configuration. The more code systems that are turned on, the worse the decoding effect will be, so you can turn off some unused barcode types to improve the decoding effect.

8.1 All barcode configurations

Allow all types to be read: All supported barcodes will be turned on.

*Open the default reading type: the default commonly used barcode will be opened.

Prohibit reading all one-dimensional codes: all supported one-dimensional bar codes will be prohibited from reading.

Allow to read all one-dimensional codes: will enable the reading of all supported one-dimensional barcodes.

 \$280101-3FD8 (All barcodes-enable)	 \$280102-6A8B (* Default reading barcodes-enable)
 \$280103-59BA (All 1D barcodes-disable)	 \$280104-C02D (All 1D barcodes-enable)

8.2 Single barcode configuration

Description of barcode length setting: setting the longest and shortest barcode reading is helpful to scan the code system of a specific length, and you can scan the barcode you want to scan more accurately. If the longest reading length of this type of barcode is set to 200 characters, and the shortest reading length is 100 characters, then only this type of barcode with a content of 100-200 characters can be scanned. This type of barcode with other numbers of characters

ters will not be recognized. If the length of the longest and shortest characters to be read is set to 100, the content of this type of bar code must be 100 characters before it can be read, so that the specified bar code can be read accurately. The steps to set the longest and shortest reading length are:

- (1) Scan this type code to enter the longest or shortest reading length setting code;
- (2) Scan the number code in Appendix 2 to set the length. If the length is to be set to 102, scan the number code 1, number 0, and number 3 in order. If the setting is wrong in the middle, scan the abandon code and start the setting again from step (1);
- (3) The longest scan code can be set to 9999, and the shortest can be set to 1. After setting in step (2), scan the save code again, the buzzer will beep 3 times to indicate that the setting is successful, and the setting will take effect immediately.

(Note: FW v6 series version only supports code enable setting, and does not support more detailed settings. FW v4 version supports all code settings)

8.2.1 CODE 128

(1) Enable and disable



(2) Reading length

The range of the max and min length of barcode reading is 1-48, the min default reading length is 1, and the max default reading length is 48. For the setting method, see the description of reading length setting.



(3) Enable and disable ISBT 128



8.2.2 GS1_128

(1) Enable and disable (Note: only FW v4 series version supports)



(2) Reading length

The range of the max and min length of the code reading is 1-80, the min default reading length is 1, and the max default reading length is 80. For the setting method, see the description of reading length setting.



8.2.3 CODE39

(1) Enable and disable



(2) Reading length

The range of the max and min length of barcode reading is 1-48, the min default reading length is 1, and the max default reading length is 48. For the setting method, see the description of reading length setting.



(3) Check code configuration

Note that the check digit type is only suitable for MOD4

*0: No check character. Read and transfer barcodes with or without check characters. (At this time, when scanning a barcode with a check character, the check character will be transmitted together)

1: Enable check and transmit check characters. If the check is passed, the check character will be transmitted together as the last digit of normal data, and the barcode content will not be sent if the check fails

2: Enable check, but do not transmit check characters. If the check is passed, the normal data except the last check character will be transmitted, and the barcode content will not be sent if the check fails.

 \$290540-5F78 *No check character	 \$290541-6C49 Enable Transmit check characters	 \$290542-391A Enable No transmit check characters
---	---	--

(4) Start/stop character transmission configuration

The start/stop characters are located at the front and end of the barcode. Configurable to transmit or not transmit start/stop characters

*0: Do not transmit start/stop characters 1: Transmit start/stop characters.



(5) Code 32 (PARAF) code enable and disable

PARAF Code 32 Pharmaceutical is a form of Code 39 barcode used by Italian pharmacies. This symbology is also called PARAF.



(6) FULL ASCII Code39

If FULL ASCII Code39 decoding is enabled, some characters in the barcode will be decoded into single characters. For example: \$V will be decoded as ASCII character SYN, and /C will be decoded as ASCII character #. For details, see Appendix 3, code39 full ascii table.



8.2.4 Interleaved 2 of 5

(1) Enable and disable



(2) Reading length

The range of the max and min length of barcode reading is 1-48, the min default reading length is 1, and the max default reading length is 48. For the setting method, see the description of reading length setting.



(3) Check character

*0: No check character. Read and transfer barcodes with or without check characters. (At this time, when scanning a barcode with a check character, the check character will be transmitted together)

1: Enable check and transmit check characters. If the check is passed, the nor

mal data except the last check character will be transmitted, and the bar code content will not be sent if the check fails

2: Enable check, but do not transmit check characters. If the check is passed, the check character will be transmitted together as the last digit of normal data, and the bar code content will not be sent if the check fails.

 \$290A40-D7FC * No check character	 \$290A41-E4CD Enable Transmit check characters	 \$290A42-B19E Enable No transmit check characters
--	---	--

8.2.5 Straight 2 of 5 industrial

(1) Enable and disable



(2) Reading length

The range of the max and min reading length is 1-48, the min default reading length is 4, and the max default reading length is 48. For the setting method, see the description of reading length setting.



8.2.6 Straight 2 of 5 IATA

(1) Enable and disable (Note: only FW v4 series version supports)



(2) Reading length

The range of the max and min reading length is 1-48, the min default reading length is 4, and the max default reading length is 48. For the setting method, see the description of reading length setting.



8.2.7 Matrix 2 of 5

(1) Enable and disable



(2) Reading length

The range of the max and min reading length is 1-48, the min default reading length is 4, and the max default reading length is 48. For the setting method, see the description of reading length setting.



(3) Check character

*0: No check character. Read and transfer barcodes with or without check characters. (At this time, when scanning a barcode with a check character, the check character will be transmitted together)

1: Enable check and transmit check characters. If the check is passed, the check character will be transmitted together as the last digit of normal data, and the barcode content will not be sent if the check fails

2: Enable check, but do not transmit check characters. If the check is passed, the normal data except the last check character will be transmitted, and the barcode content will not be sent if the check fails

 \$290B40-4C20 * No check character	 \$290B41-7F11 Enable Transmit check characters	 \$290A42-B19E Enable No transmit check characters
--	---	--

8.2.8 Grid Matrix

(1) Enable and disable (Note: only FW v4 series version supports)



(2) Reading length

The range of the max and min length of the code reading is 1-2751, the min default reading length is 1, and the max default reading length is 2751. For the setting method, please refer to the description of reading length setting.



8.2.9 CODE 93

(1) Enable and disable



(2) Reading length

The range of the max and min length of the code reading is 1-80, the min default reading length is 1, and the max default reading length is 80. For the setting method, see the description of reading length setting.



8.2.10 CODE 11

(1) Enable and disable



(2) Reading length

The range of the max and min length of barcode reading is 1-80, the min default reading length is 4, and the max default reading length is 80. For the setting method, see the description of reading length setting.



(3) Check character

- *0: 2 check digits & transfer
- 1: 1 check digits & transfer
- 2: 2 check digits no transfer
- 3: 1 check digits no transfer
- 4: no check digits, all transfer

 \$290840-66FE *2 check digits & transfer	 \$290841-55CF 1 check digits & transfer	 \$290842-009C 2 check digits no transfer
 \$290843-33AD 1 check digits no transfer		 \$290844-AA3A no check digits,all transfer

8.2.11 CODABAR

(1) Enable and disable



(2) Reading length

The range of the maximum and minimum length of barcode reading is 2-60, the minimum default reading length is 4, and the maximum default reading length is 60. For the setting method, please refer to the description of reading length setting.



(4) Enable and disable transmission start/stop characters

The start/stop characters are located at the front and end of the barcode. Configurable to transmit or not transmit start/stop characters

*0: Do not transmit start/stop characters 1: Transmit start/stop characters



(5) cascade

When cascading is enabled, the barcode scanner will search for the Codabar barcode with the start character "D", which is adjacent to the barcode with the stop character "D".

In this case, the two barcodes are concatenated into one, and the "D" character is omitted.

CODABAR cascade switch, *0: close, 1: open



8.2.12 TELEPEN

(1) Enable and disable (Note: only FW v4 series version supports)



(2) Reading length

The range of the max and min length of barcode reading is 2-80, the min default reading length is 4, and the max default reading length is 80. For the setting method, please refer to the description of reading length setting.



8.2.13 MSI

(1) Enable and disable



(2) Reading length

The range of the maximum and minimum length of barcode reading is 4-48, the minimum default reading length is 4, and the maximum default reading length is 48. For the setting method, please refer to the description of reading length setting.



8.2.14 GS1 DataBar(RSS)

(1) GS1 DataBar Omnidirectional (RSS_14) enable and disable



(2) GS1 DataBar Limited enable and disable



(3) GS1 DataBar Expanded enable and disable



(4) GS1 DataBar Expanded Reading length

The range of the max and min length of barcode reading is 4-74, the min default reading length is 4, and the max default reading length is 74. For the setting method, please refer to the description of reading length setting.



8.2.15 PDF417

(1) Enable and disable



(2) Reading length

The range of the max and min length of barcode reading is 1-2400, the min default reading length is 4, and the max default reading length is 2400. For the setting method, please refer to the description of reading length setting.



8.2.16 MICRO PDF

(1) **Enable and disable** (Note: only FW v4 series version supports)



(2) **Reading length**

The range of the max and min length of the barcode is 1-250, the min default scanning length is 1, and the max default scanning length is 250. For the setting method, please refer to the description of scanning length setting.



8.2.17 Aztec Code

(1) **Enable and disable** (Note: only FW v4 series version supports)



(2) **Reading length**

The range of the max and min lengths of reading codes is 1-3832, the min default reading length is 1, and the max default reading length is 3832. For the setting method, please refer to the description of reading length setting.



8.2.18 MaxiCode

(1) **Enable and disable**(Note: only FW v4 series version supports)



(2) **Reading length**

The range of the max and min length of barcode reading is 1-93, the min default reading length is 4, and the max default reading length is 93. For the setting method, please refer to the description of reading length setting.



8.2.19 MICRO QR

(1) **Enable and disable**(Note: only FW v4 series version supports)



8.2.20 Han Xin code

(1) **Enable and disable**



(2) Reading length

The range of the max and min length of barcode reading is 1-1000, the min default reading length is 1, and the max default reading length is 1000. For the setting method, please refer to the description of reading length setting.



8.2.21 China Post (Hong Kong 2 of 5)

(1) Enable and disable(Note: only FW v4 series version supports)



(2) Reading length

The range of the max and min length of barcode reading is 2-80, the min default reading length is 4, and the max default reading length is 80. For the setting method, please refer to the description of reading length setting.



8.2.22 Data Matrix

(1) Enable and disable



(2) Reading length

The range of the max and min length of barcode reading is 1-3116, the min default reading length is 1, and the max default reading length is 3116. For the setting method, please refer to the description of reading length setting.



8.2.23 NEC 2 of 5

(1) Enable and disable



(2) Reading length

The range of the max and min length of barcode reading is 2-80, the min default reading length is 4, and the max default reading length is 80. For the setting method, please refer to the description of reading length setting.



(3) Check character

*0: No check character. Read and transfer barcodes with or without check characters. (At this time, when scanning a barcode with a check character, the check character will be transmitted together)

1: Enable check and transmit check characters. If the check is passed, the check character will be transmitted together as the last digit of normal data, and the barcode content will not be sent if the check fails

2: Enable check, but do not transmit check characters. If the check is passed,

the normal data except the last check character will be transmitted, and the barcode content will not be sent if the check fails

 \$293840-882C No check character	 \$293841-BB1D Enable transmit check character	 \$293842-EE4E Enable Not transmit check character
--	--	--

8.2.24 UPC-A

(1) Enable and disable

 \$290101-7A78 *Enable	 \$290100-4949 Disable
---	---

Note: When scanning UPC-A is closed, UPC-A barcode will be transmitted as EAN-13

(2) Check whether the code is transmitted

 \$290141-A6B8 *Transmit	 \$290140-9589 No transmit
--	--

(3) Digital system

Digital system character transmission switch

 \$290171-FFE8 *Transmit	 \$290170-CCD9 No transmit
--	--

(4) Additional code

2-digit additional code switch, *0: off, 1: on



3-digit additional code switch, *0: off, 1: on



4-digit additional code is required (only UPC-A with additional code is removed) switch, *0: off, 1: on

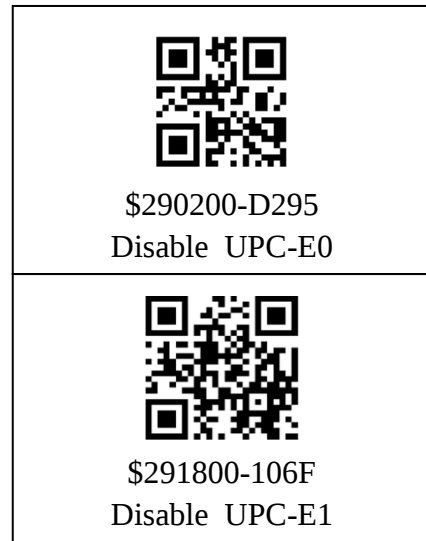
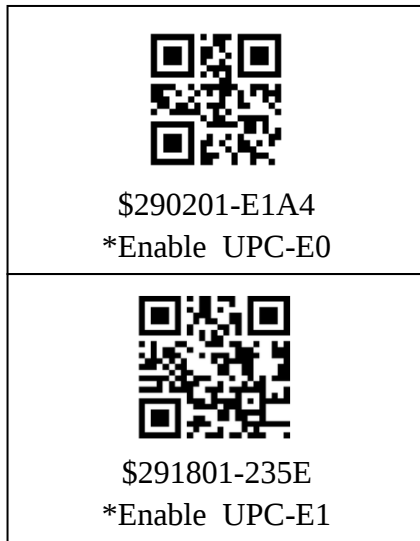


5-digit additional code separator (whether to open spaces to separate additional codes) switch, 0: off, *1: on



8.2.25 UPC-E0 & UPC-E1

(1) Enable and disable



(2) Check whether the code is transmitted



(3) Additional code

2-digit additional code switch, *0: off, 1: on



5-digit additional code switch, *0: off, 1: on



Additional code is required (only UPC-E with additional code) switch, *0: off, 1: on



Additional code separator (whether to open spaces to separate additional codes) switch, 0: off, *1: on



(4) Digital system

Digital system character transmission switch



(5) Barcode extension to 12-digit UPC-A

The UPC-E barcode is expanded to a 12-digit UPC-A format switch, *0: off, 1: on



8.2.26 EAN/JAN-13

(1) Enable and disable

Note: If you want to convert UPC-A barcode to EAN-13 format, please scan UPC-A to close the barcode



Check character

Check whether the character is transmitted



(3) Additional code

2-digit additional code switch, *0: off, 1: on



5-digit additional code switch, *0: off, 1: on



Additional code required (only EAN/JAN-13 with additional code removed) switch, *0: off, 1: on



Additional code separator (whether to open spaces to separate additional codes)
switch, 0: off, *1: on



(4) ISBN Translate

When set to ISBN symbol transmission, EAN-13 Bookland symbol will be converted to equivalent ISBN symbol format



8.2.27 EAN/JAN-8

(1) Enable and disable



(2) Check whether the character is transmitted



(3) Additional code

2-digit additional code switch, *0: off, 1: on



5-digit additional code switch, *0: off, 1: on



Additional code required (only EAN/JAN-8 with additional code removed) switch, *0: off, 1: on



Additional code separator (whether to open spaces to separate additional codes) switch, 0: off, *1: on



Appendix 1 Barcode Type Output Character List

If the barcode type character is set to output, the first byte of each barcode read indicates the type of the barcode. The barcode types corresponding to the characters are shown in the following table:

Barcode type	Output character
AZTEC_CODE	B
China Post	F
CODABAR	G
CODE11	I
CODE39	M
CODE39_BASE32 (CODE 32)	L
CODE93	O
CODE128	J
DATAMATRIX	S
EAN8	W
EAN13	V
GRID MATRIX	X
GS1 128 (EAN-128)	Y
HANXIN CODE	Z
Interleaved 2 of 5	c
Matrix 2 of 5	h
MAXICODE	i
MICROPDF	j
MSI-Plessey	k
PDF417	m
QR CODE/ MICRO QR	q
RSS -14 (GS1_DATABAR)	r
RSS_Expand (GS1_DATABAR_EXP)	>
RSS_Limited (GS1_DATABAR_LIM)	<
Standard 2 of 5/ Industrial 2 of 5/ IATA 2 of 5	s
TELEPEN	t
TRIOPTIC	u
UPCA	w
UPCE	x
NEC 2 of 5	l

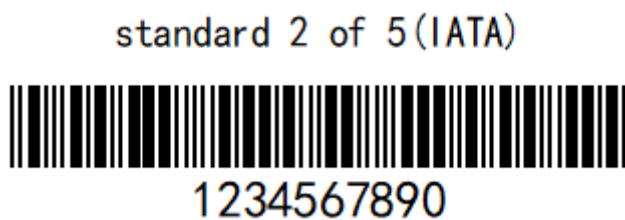
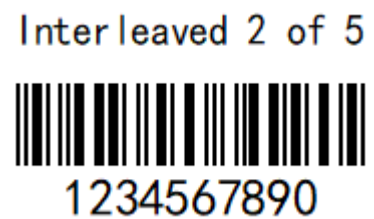
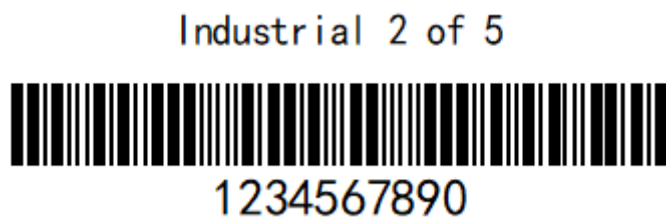
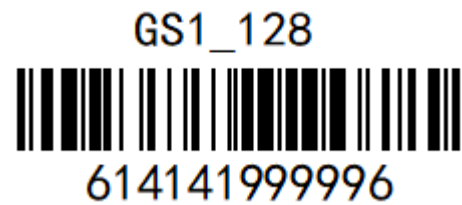
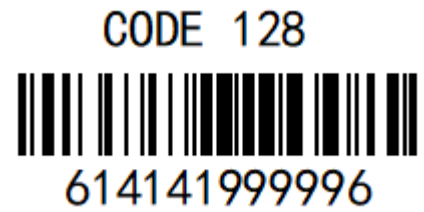
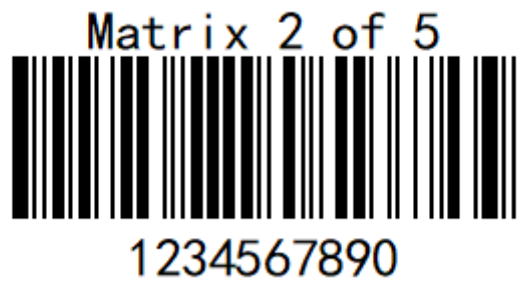
Appendix 2 Digital Code

 \$282001-0DEF (Digital code 1)		 \$282002-58BC (Digital code 2)
 \$282003-6B8D (Digital code 3)		 \$282004-F21A (Digital code 4)
 \$282005-C12B (Digital code 5)		 \$282006-9478 (Digital code 6)
 \$282007-A749 (Digital code 7)		 \$282008-B777 (Digital code 8)
 \$282009-8446 (Digital code 9)		 \$282000-3EDE (Digital code 0)
 \$283001-A7BE (Save)		 \$283000-948F (Abandon)

Appendix 3 CODE39 FULL ASCII Correspondence Table

ASCII	ENCODING	ASCII	ENCODING	ASCII	ENCODING	ASCII	ENCODING
NUL	%U	SP	Space	@	%V	`	%W
SOH	\$A	!	/A	A	A	a	+A
STX	\$B	"	/B	B	B	b	+B
ETX	\$C	#	/C	C	C	c	+C
EOT	\$D	\$	/D	D	D	d	+D
ENQ	\$E	%	/E	E	E	e	+E
ACK	\$F	&	/F	F	F	f	+F
BEL	\$G	'	/G	G	G	g	+G
BS	\$H	(	/H	H	H	H	H
HT	\$I	)	/I	I	I	i	+I
LF	\$J	*	/J	J	J	j	+J
VT	\$K	+	/K	K	K	k	+K
FF	\$L	,	/L	L	L	l	+L
CR	\$M	-	-	M	M	m	+M
SO	\$N	.	.	N	N	n	+N
SI	\$O	/	/O	O	O	o	+O
DLE	\$P	0	0	P	P	p	+P
DC1	\$Q	1	1	Q	Q	q	+Q
DC2	\$R	2	2	R	R	r	+R
DC3	\$S	3	3	S	S	s	+S
DC4	\$T	4	4	T	T	t	+T
NAK	\$U	5	5	U	U	u	+U
SYN	\$V	6	6	V	V	v	+V
ETB	\$W	7	7	W	W	w	+W
CAN	\$X	8	8	X	X	x	+X
EM	\$Y	9	9	Y	Y	y	+Y
SUB	\$Z	:	/Z	Z	Z	z	+Z
ESC	%A	;	%F	[	%K	{	%P
FS	%B	<<	%G	\	%L		%Q
GS	%C	=	%H	]	%M	}	%R
RS	%D	>	%I	^	%N	~	%S
YS	%E	?	%J	_	%O	DEL	%T, %X, %Y, %Z

Appendix 4 Test Barcode



Telepen  1234567890	PDF417  This is PDF417!
Grid Matrix  this is grid matrix! 1234567890	CODE 93  1234567890
Aztec Code  This is Aztec Code!	GS1 DataBar Expanded  (12) 345678 (90) 123
codabar  1234567890	GS1 DataBar Limited  (01) 1 2345678 90123 1
MSI  1234567890	GS1 DataBar (RSS)  (01) 1 2345678 90123 1

Data Matrix



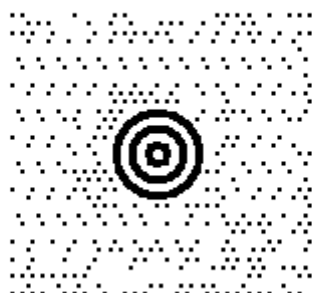
This is Data Matrix!

Han Xin Code



This is Han Xin Code!

MaxiCode (标准符号: 4)



This is MaxiCode!

UPC A



EAN/JAN-13



NEC 2 of 5



EAN/JAN-8



China Post



QR Code



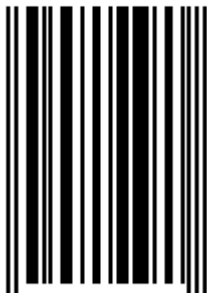
This is QR Code!

Micro PDF417



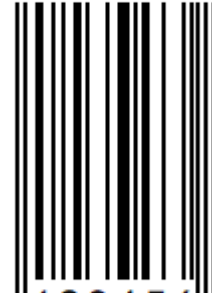
This is Micro PDF417!

UPC-E0



0 402931 1

UPC-E1



1 123456 2

