

Large color screen serial instruction set V5.0

Engineering notes

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revise history

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V4.8	2018/8/28	Increased playing video and audio, replace the boot logo, replace the system Beep Function	Lin Qingtian	
V4.9	2018/9/17	Adding music and turn key tone	Lin Qingtian	
V5.0	2018/9/27	Play audio instructions to increase rearrange the configuration instructions and basic instructions to adjust the sequence of instructions, modify some formatting problems	Lin Qingtian	



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1. Instruction set and instruction format

1.1 Instruction format

A complete serial frame format instructions Table 1.1 Fig. If the command parameter is greater than 1 Bytes, high byte first, followed by the low byte.

The maximum length instruction is 1024 Bytes (including header and trailer), values are hexadecimal. Serial format: 8 Data bits, 1 Stop bits, no parity bit.

table 1.1 no CRC Verify command frame format

instruction	EE	XX	XX XX ... XXX	FF FC FF FF
Description	header	instruction	Command parameters	End of frame

If the user needs to command support CRC Efficacy format, the instruction frame format as shown in Table 1.2 Fig. CRC The algorithm program, please download the official website to download the information bar. CRC Check does not contain header and trailer.

table 1.2 band CRC Check instruction frame format

instruction	EE	XX	XX XX ... XXX	CRC16	FF FC FF FF
Description	header	instruction	Command parameters	Check Digit	End of frame

1.1.1. Instruction operation illustrated

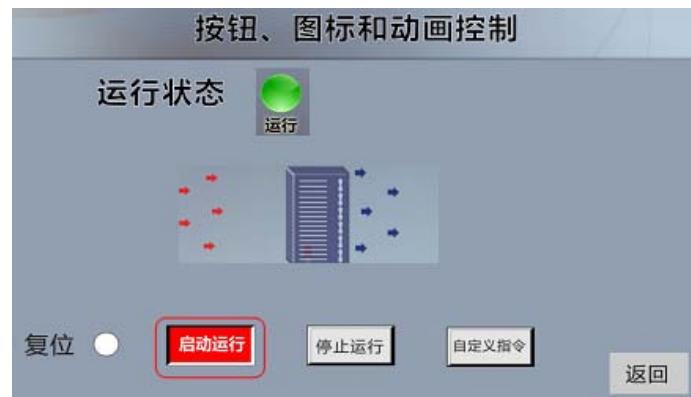
1. Switching the screen. If the user needs to be displayed on the screen in FIG. 1-1 Serial instruction screen illustrated, the host sends the user as follows:



Map 1-1 Switch the screen display

MCU sends commands B1	00 00 01 [EE] FF FC FF FF
Command parsing	EE represents header B1 00 represents a screen switching instruction
	0001 represents a target screen to be displayed ID, 2-byte FF FC FF FF
	indicates end of frame
prompt	ID number of each picture by the host machine generates compiled

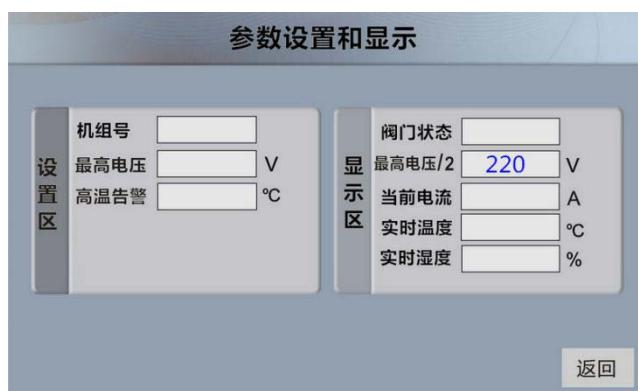
Button control ID Upload. If the user clicks the touch map 1-2 "Start Run" button, assuming the current screen ID for 2 , Button ID for 1 , The serial port to upload screen instructions are as follows:



Map 1-2 Button control ID Upload value

Upload screen instructions	EE [B1 11 00 02 00 01 10 01 01] FF FC FF FF
Command parsing	EE represents the header B1 11 represents a configuration control instructions uploaded; 00020001 2 represents a current picture ID, the control ID is 110 It represents a control for the button control 01 It represents a button control 01 switch type attribute represented by the button pops into a state pressed FF FC FF FF indicates end of frame
prompt	Button controls all ID numbers generated by the host computer configuration, can also be modified self
Explanation	User microcontroller serial more instructions received data can be parsed which button is pressed which screen

Text display. If the user needs to FIG. 1-3 Currently displayed digital voltage 220 , Assuming that the screen ID for 1 , Text control ID for 7 , The host sends the following instructions:



Map 1-3 Text control displays

SCM transmission command	EE [B1 10 00 01 00 07 32 32 30 FF FC FF FF]
Command parsing	EE represents the header B1 10 represents a configuration control command transmitted; 00010007 expressed as a screen ID, control ID of 7323230 represents an ASCII code of 220; FF FC FF FF indicates end of frame
Explanation	Since the color of the font, size, position in the PC pre-configured, so users only need to send data to the microcontroller for the ID number

System keyboard input. If the user needs to FIG. 1-4 The display unit number "1001 No." assume screen ID for 1 , Text control is 1 , Simply click on the text box at the pop-up keyboard input system input "1001 Number "(in English required for switching), and finally click OK, this entry will be automatically embedded in the text displayed in the text box, upload instruction while following:



Map 1-4 Keyboard input parameter display

Upload screen instructions	EE [B1 11 00 01 00 01 11 31 30 30 31 BA C5 00] FF FC FF FF
	EE represents the header
	B1 11 represents a configuration control instructions received; 00010001
	expressed as a screen ID, control ID of 111 Represents a control for the text
	controls 31,303,031 represents an ASCII code BA C5 1001 represents the Chinese character for "No." The character code 00 in the end of FF FC FF FF
	indicates end of frame
Explanation	Users microcontroller receives ASCII code input screen uploaded to obtain information

Custom command output. Users can set up a button is pressed, uploading data to the serial define yourself. examples

1-5 , The user may press the set "Custom instruction" button, send instructions to the screen: FF 01 AA FF .

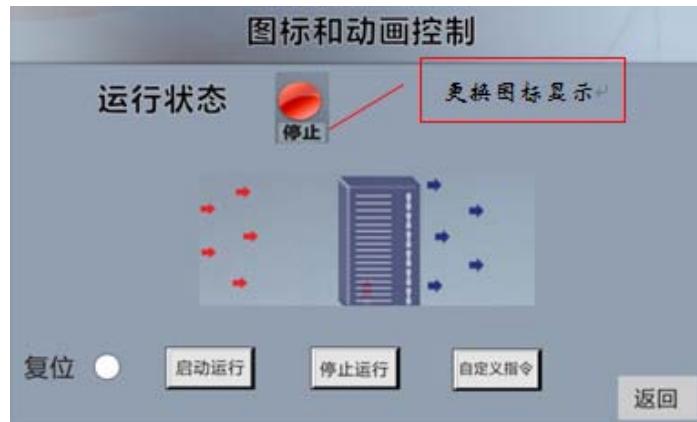
Note: custom data can not contain "FF FC FF FF" character combination, or same end of the frame will be regular instruction, causing the abnormality. For simultaneous multi-output instructions, each instruction requires semicolon separated.



Map 1-5 Custom command output

Icon. If the user wants to achieve a status icon changes to display, such as running time, display the "Run icon" show "Stop icon" reset icon disappears, when two abnormal icon flashes back and forth, then you can use the controls to stop icons solve.

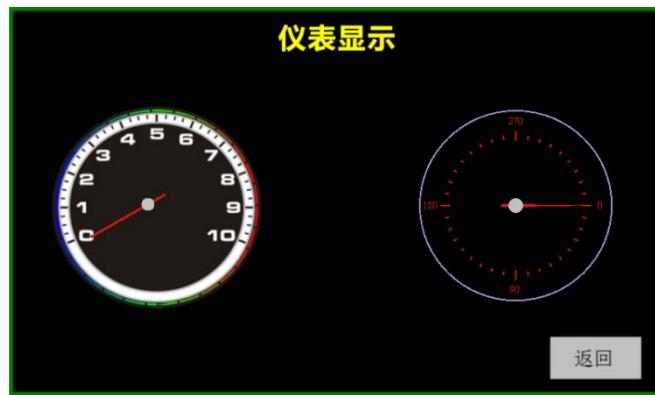
First with built-in software icon generator all status icons will generate a ICON file (ICON File contains all the frames in FIG state), microcontroller then transmits a control command ICON Frame playback. For example, Fig. 1-6 , The user wants to "stop sign" replaced "start icon", an instruction is sent as follows:



Map 1-6 Icon display

SCM transmission command	EE [B1 23 00 03 00 01 01] FF FC FF FF
Command parsing	EE denotes an icon representing the header control instruction B1 23; 00030001 3 shows a screen ID, control ID 101 is it stands for "execution icon" frame ID FF FC FF FF indicates end of frame
Explanation	ICON file there are two picture frames, the frame is stopped ID 0, is up and running frame ID 1, so the playback frame 1 is to show the run icon, the playback frame 0 is displayed stop icon.

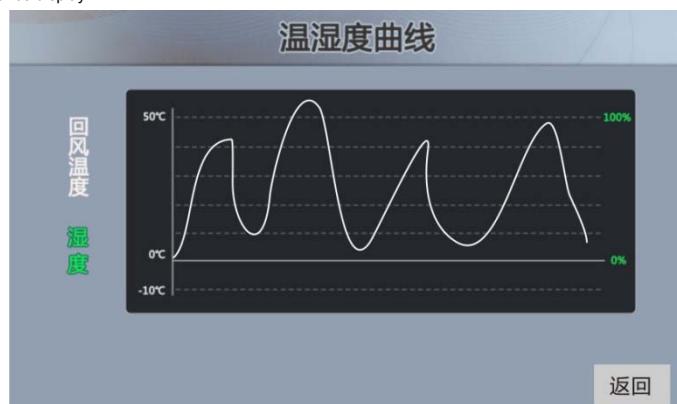
the meter shows. If the user needs to map 1-7 The dial 1 Go pointer degrees 5 Office, assuming the screen ID for 4 , Instrument control ID for 1 The user sends an instruction microcontroller follows:



Map 1-7 Instrument control displays

[EE apparatus upload instruction B1 10 00 04 00 01 00 00 00 32 FF FC FF FF]	
Command parsing	EE represents header B1 10 means that the configuration control command transmitted 00040001 4 shows a screen ID, control ID is represented 100000032 50 FF FC FF FF value indicates the end of frame
Explanation	Since the start value 0 is set in advance PC dial, stop value 100, transmission value 50, a pointer pointing exactly at the direction of the scale 5

Curve display. If users need to achieve chart 1-8 The curve shows, the user simply send the host AD Sampling sequence value, the device will automatically zoom, pan, advance display.



Map 1-8 Curve control displays

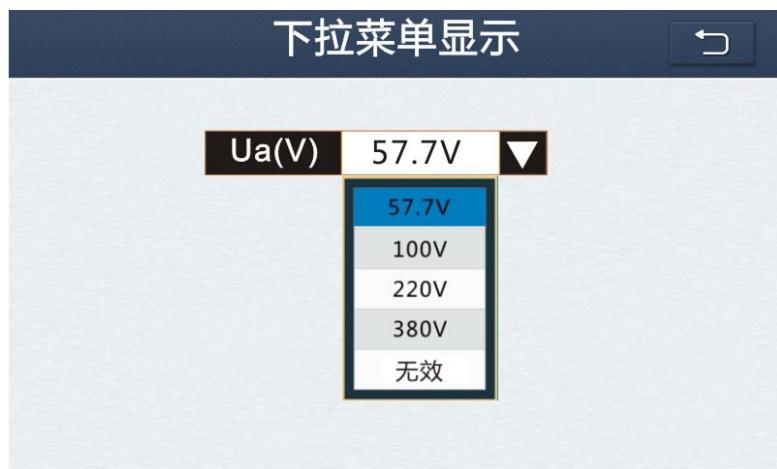
Progress bar and slider displays. If you need to achieve chart 1-9 Scroll display the progress bar, the progress value sent to the user only with the master display. Hypothesis PC The progress bar on the start value is configured 0 Termination value 100 Picture ID for 3 , Progress bar control ID for 1 , The user needs to display the progress bar in the center, sending instructions as follows:



Map 1-9 Progress and slide show

[EE apparatus upload instruction B1 10 00 03 00 01 00 00 00 32 FF FC FF FF]	
Command parsing	EE represents header B1 10 means that the configuration control command transmitted 00030001 3 shows a screen ID, control ID is represented 100000032 50 FF FC FF FF value indicates the end of frame
Explanation	Since the PC start value 0 is set in advance the progress bar, the termination value 100, transmission value 50, the progress bar displayed in the center position of the right

The drop-down menu that appears. Click the drop-down button, automatic pop-up drop-down menu, pull-down menu option value is automatically loaded into the text box is displayed, while the screen upload the drop-down menu ID Options column value to users and microcontroller. Users can resolve the current which the pull-down menu, which option is selected. Figure 1-10 As shown, the user clicks the drop-down button, pop-up drop-down menu, the user clicks 57.7V The data is automatically loaded into the text box.



Map 1-10 Drop-down menu that appears

Select menu display. User selection of all the data pre-populated in the host computer, a display of the number, size magnification ends, and then slide the parameter column, the data display scrolling cycle. After rolling stop, you upload the current screen controls ID And the selected item value to the user microcontroller. Users can choose which to resolve the current menu, which option is selected, select the slide control reference is shown in Figure 1-11 Fig.



Map 1-11 Select the slide show controls

Two-dimensional code display. Users only need to send the microcontroller scans the content of the character information, screen content automatically generate a two-dimensional code image, mobile phone users can scan identification. Magnification, the coding mode of the two-dimensional code, the display color can be set in the host computer. For example, a user serial port to send characters "www.gz-dc.com", The screen automatically produce corresponding two-dimensional 1-12 Fig.



Map 1-12 Two-dimensional code control displays

1.2 Color format

Total support equipment $2^16 = 65536$ Colors (referred to as 65K color), RGB for 565 Format, the high and low bytes are allocated as shown in Table 1.3 Fig.

table 1.3 RG B Color distribution format

The number of bits (Bit)	15, 1, 413, 121, 110, 987, 654							3210		
Color distribution	R		G		B					

For example: pure red = F800H, pure blue = 001FH

Note: Users can debug by visualTFT PC software and get the desired color and RGB values.

1.3 Configuration basic instruction set and instruction set differences

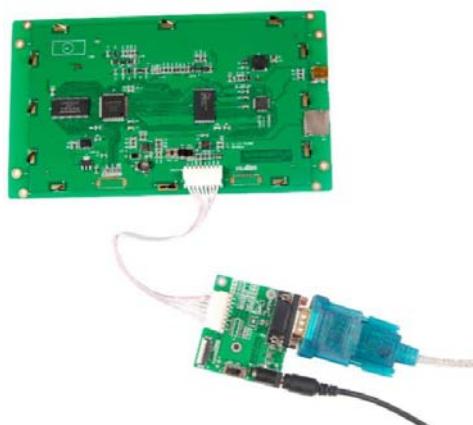
Instruction Set in two parts: the basic configuration control instruction set and instruction set.

The main difference between the two is: Basic set of instructions can be understood as the bottom of a set of instructions, most of the operations must contain coordinates, colors, fonts and other parameters; direct configuration is object-oriented instruction set ID Operation, and all the relevant parameters of these objects is configured in advance in the PC software, downloaded to the memory along with the image of the screen.

Configuring the instruction set to meet 99% The user needs to develop a simple, true "zero" code programming. In addition, in the case where the configuration instruction set can not be met, the user may also be combined basic instructions and configuration, to complete a desired display.

1.4 How quickly become familiar with the instruction set

The serial number of the screen set of instructions, the user can use the serial debug supporting plate with the host computer screen online debugging. Through the built-in PC serial command issued an instruction assistant, the host microcontroller simulated users can quickly become familiar with command functions. Screen and PC VisualTFT Helper line and instructions are shown in Figure 1-13 Fig. 1-14 Fig.



Map 1-13 Screen and PC connection wiring diagram



Map 1-14 Instruction assistant

1.5 Configuration Table Instruction Set

table 1.4 Configuration Instruction Set

category	instruction	Command parameters	Explanation
Handshake instruction	0x04	no	Handshake instruction is mainly used determine whether a device power-on initialization is complete, communication is And whether normal online status. After sending the command to return the device 55 as represented handshake Power. Return instruction format: EE 55 FF FC FF FF
Reset report	0x07	no	Once the device is powered on startup, unexpected restart or reset the monitor chip will immediately upload phase Relevant data, to inform the user equipment has been reset. User host detects an unexpected multiplex device After alignment, and re-initialize the control program execution.
Reset the device	0x07 + 0x35 + 0x5A + 0x5	no	During operation the host to reset the device through the serial port command. The initial suggestion host When the device increase of instructions for the host reset accidentally, followed reset the device.

	3 + 0xA5		Return instruction format: EE 07 FF FC FF FF
Get Device version 0xFE	0x01	no	<p>This instruction is mainly used to read the firmware version screen to 2.22.1025.260 example,</p> <p>Return instruction format: EE FE 02 16 00 02 04 01 01 04 FF FC FF FF;</p> <p>Parameters: 02 refers to the decimal number 2;</p> <p>22 refers to the decimal number 16;</p> <p>0002 refers to the type of screen, refers to the commercial type;</p> <p>0401 refers to the decimal number 1025;</p> <p>0 104 260 refers to a decimal number;</p>
Backlight adjustment	0x60	Light_level	<p>Set backlight brightness value</p> <p>0x00: The brightest backlight 0xFF: backlight off</p>
Automatic screen saver mode	0X77	Enable + BL_ON + BL_OFF + BL_ON_Time	<p>Screensaver mode backlight brightness setting value and the time value. No touch action for some time, automatically reduce the brightness of the screen, saving mode until the wake-up touch is pressed.</p> <p>Enable (1 Bytes): enable signals</p> <p>0x00: Close saving mode 0x01: power-saving mode</p> <p>BL_ON (1 Bytes): the luminance value of the backlight touch activated</p> <p>BL_OFF (1 Bytes): After the luminance value of the backlight power saving mode</p> <p>BL_ON_Time (2 Bytes): in the absence of a touch action, how long into the provincial</p> <p>Electric mode, the unit 1s</p> <p>Note: only suitable for models with touch, without the need to program control backlight products TP</p>
Buzzer control	0x61	Time	Time (1 Bytes): hearing sound time in 10ms
Equipped with touch screen	0x70	Cmd	<p>Cmd (1 Bytes): Configuration parameters</p> <p>BIT0: 1 represents a touch panel is opened, 0 represents off the touch screen;</p> <p>BIT1: 1 represents a touch buzzer sound, 0 indicates no response;</p> <p>BIT4 ~ BIT2: Touch uploads</p> <p>000: Indicates when pressing the touch screen to upload a coordinate</p> <p>001: Indicates the touch screen is pressed until the release after upload time coordinates</p> <p>010: when the touch screen has been pressed, the coordinates of every 100ms timing upload, released</p> <p>Also upload a coordinate</p> <p>011: Indicates the touchscreen when the upload is pressed and released once the coordinates</p> <p>BIT5: 1 Shows 4 Click an area within seconds, continuous 20 , The touch screen to enter school</p> <p>Quasi-mode, 0 It represents disable this function;</p> <p>BIT7-BIT6 : Reserved</p> <p>Touch Upload format:</p> <p>When pressed, upload format: EE 01 XY FF FC FF FF</p> <p>Upon release, upload format: EE 03 XY FF FC FF X coordinate, Y Coordinates</p> <p>are 2 Bytes, high byte first</p>
Touch screen calibration	0x72	no	<p>After calibration is complete, the device returns EE 04 FF FC FF FF</p> <p>Or a point in a non-touch area 4 Within seconds quick click 20 Under automatically enter touch</p> <p>Correction mode, the display automatically returns to the current calibration is complete</p>
Touch Screen Experience	0x73	Enable	<p>Enable : Enable signal</p> <p>0x00: Close experience 0x01: Enable Experience</p> <p>After the user presses the touch screen coordinates corresponding to a red solid circle. Used to measure</p> <p>Touchscreen accuracy test.</p>

			Baudset (unit bps, 1 Bytes), the baud rate serialization: 0x00: 1200 0x01: 2400 0x02: 4800 0x03: 9600 0x04: 19200 0x05: 38400 0x06: 57600 0x07: 115200 0x08: 1M 0x09: 2M 0x0A: 218750 0x0B: 437500 0x0C: 875000 0x0D: 921800
Set the baud rate	0xA0	Baudset	Switching from the current screen to a target screen display Screen_id (2 Bytes): target screen ID The screen display switching instruction is mainly achieved
Read screen	0xB1 + 0x01	no	Reading a current value of the picture ID of Return instruction format: EE B1 01 Screen_id FF FC FF FF Screen_id (2 Bytes): the number of the current picture The instruction is mainly used to obtain the current screen in which screen display
Button control ID value Upload	0xB1 + 0x11	Screen_id + Control_id + Control_type + Subtype + Status	After pressing a button, the device actively upload button ID information Upload format: EE [B1 11 Screen_id Control_id Control_type Subtype Status] FF FC FF FF Screen_id (2 Bytes): Screen Number Control_id (2 Bytes): Control Number Control_type (1 Bytes): fixed value 0x10 , Expressed as a button control type Subtype (1 Subtype button control: byte) 0x00: screen switch, indicates that the current screen switching button is pressed 0x01: switch type, represented by the current switch button is pressed 0x02: custom key-value, representing the current custom key button pressed 0x03: Custom command, indicates that the custom instruction buttons currently pressed 0x04: pop-up menu shows the pop-up menu button Status (1 Bytes): the button state 0x00: a button is pressed into the up state 0x01: state pressed from the pop-up button becomes The main directive tells the user which screen is currently the first few buttons is pressed
Custom command Export	no	no	Instruction issued after pressing a custom button control through the PC, may be a plurality of Output instructions simultaneously, separated by a semicolon between multiple instructions
Set button up and Pressed state	0xB1 + 0x10	Screen_id + Control_id + Status	A button to set the display state to bounce or pressed Screen_id (2 Bytes): Screen Number Control_id (2 Bytes): Control Number Status (1 Bytes): the button state 0x00: Press the button to become a pop 0x01: Press the button to become a pop This command is mainly used to display the button state change
Read button-like controls state	0xB1 + 0x11	Screen_id + Control_id	Discover a button is pressed or the current state of pop Screen_id (2 Bytes): Screen Number Control_id (2 Bytes): Control Number Return instruction format: EE B1 11 Screen_id Control_id Control_type Subtype Status FF FC FF FF Control_type (1 Bytes): fixed value 0x10 , Expressed as a button control type

			<p>Subtype (1 Subtype button control: byte)</p> <p>0x00: screen switch, indicates that the current screen switching button is pressed 0x01: switch type, represented by the current switch button is pressed 0x02: custom key-value, representing the current custom key button pressed 0x03: Custom command, indicates that the custom instruction buttons currently pressed 0x04: pop-up menu shows the pop-up menu button</p> <p>Status (1 Bytes): 0x00 Up state 0x01 Pressed state</p> <p>Note: return the same parameters as defined button control value upload instructions</p>
Update of text controls value	0xB1 + 0x10	Screen_id + Control_id + Strings	<p>Write text data to the specified text controls</p> <p>Screen_id (2 Bytes) : Screen number</p> <p>Control_id (2 Bytes) : Control Number</p> <p>Strings (Variable): numerical text written by the user; The text data displaying instruction is mainly used to implement</p>
Clear inside text controls Allow	0xB1 + 0x10	Screen_id + Control_id	<p>Clear text control content</p> <p>Screen_id (2 Bytes) : Screen number</p> <p>Control_id (2 Bytes) : Control Number</p> <p>The instruction is mainly used to clear the contents of a text control</p>
Reading of text controls value	0xB1 + 0x11	Screen_id + Control_id	<p>Read a text controls currently displayed value</p> <p>Screen_id (2 Bytes): Screen Number</p> <p>Control_id (2 Bytes): Control Number</p> <p>Return instruction format: EE B1 11 Screen_id Control_id Control_type Strings FF FC</p> <p>FF FF</p> <p>Return parameter: Control_type (1 Bytes): fixed value 0x11 ,Expressed as Text Control Types</p> <p>Strings (Variable): append a text value currently displayed text 1 More 0x00 As the terminator</p>
Set text controls flash Shuo cycle	0xB1 + 0x15	Screen_id + Control_id + Cycle	<p>Set text control blink speed</p> <p>Screen_id (2 Bytes) : Screen number</p> <p>Control_id (2 Bytes) : Control Number</p> <p>Cycle (2 Bytes): Blinking period (10 milliseconds), no flashing 0</p>
Set text control roll Moving speed	0xB1 + 0x16	Screen_id + Control_id + Speed	<p>Set text control scroll speed (leftward direction)</p> <p>Screen_id (2 Bytes) : Screen number</p> <p>Control_id (2 Bytes) : Control Number</p> <p>Speed (2 Bytes): Text scroll speed (moving pixels per second), 0 means no scroll</p>
Set text control back view	0xB1 + 0x18	Screen_id + Control_id + BK_Color	<p>Set the background color of the text control</p> <p>Screen_id (2 Bytes) : Screen number</p> <p>Control_id (2 Bytes) : Control Number</p> <p>BK_Color (2 Bytes): Background color RGB color value</p>
Setting text controls Foreground color	0xB1 + 0x19	Screen_id + Control_id + FORE_Color	<p>Set the foreground color text controls</p> <p>Screen_id (2 Bytes) : Screen number</p> <p>Control_id (2 Bytes) : Control Number</p> <p>FORE_Color (2 Bytes): Foreground RGB color values</p>

Set the text background transparent Bright	0xB1 + 0x17	Screen_id + Control_id	The text into the background with the background of the transparent display Screen_id (2 Bytes) : Screen number Control_id (2 Bytes) : Control Number
Formatting text display 0xB1 + 0x07	Screen_id + Control_id + Sig n + Fill_zero + Value		Enter the appropriate conditions according to the text display Screen_id (2 Bytes) : Screen number Control_id (2 Bytes) : Control Number Sign (1 Bytes) : Data type, namely: Unsigned int: unsigned integer, 0x00; Int: Signed integer, 0x01; Float: single precision float, 0x02; Double: double precision floating point, 0x03; Fill_zero (1 Bytes): Decimal places, if you choose to make up less than 0, then, Need to add 0x80; Value (4 Bytes): Added data, in hexadecimal representation;
Pictures significant external update Shown (unsupported type IOT Holding, other models support hold)	0x39	X + Y + Wight + Height	Coordinates and the designated image display width, and then sends the RGB data X (2 Bytes): in points of X Axis coordinate value Y (2 Bytes): in points of Y Axis coordinate value Wight (2 Bytes): Set the text area width Height (2 Bytes): Set Text height range Note: the starting position and the width of the display image, and then send the image BMP Data can, RGB image endian.
Update progress bar control Numerical	0xB1 + 0x10	Screen_id + Control_id + Progressvalue	Write data to the specified progress bar control Screen_id (2 Bytes) : Screen number Control_id (2 Bytes) : Control Number Progressvalue (4 Bytes): the user writes the new value of the progress bar This instruction is mainly used to increment or decrement the progress achieved
Reading progress bar control Numerical	0xB1 + 0x11	Screen_id + Control_id	Read the specified progress bar control's current value Screen_id (2 Bytes): Screen Number Control_id (2 Bytes): Control Number Return instruction format: EE B1 11 Screen_id Control_id Control_type Progressvalue FF FC FF FF Return parameter: Control_type (1 Bytes): fixed value 0x12 ,Expressed as Progress bar control type Progressvalue (4 Bytes): current value of the progress bar
Upload slider controls format	no	no	When drag the slider, the device constantly uploaded cursor values are as follows: Upload format: EE [B1 11 Screen_id Control_id Control_type Slidervalue] FF FC FF FF Screen_id (2 Bytes): Screen Number Control_id (2 Bytes): Control Number Control_type (1 Bytes): fixed value 0x13 Expressed as slider controls Slidervalue (4 Bytes): indicates the current cursor value
Update slider controls Numerical	0xB1 + 0x10	Screen_id + Control_id + Slidervalue	Write data to the specified slider controls Screen_id (2 Bytes) : Screen number Control_id (2 Bytes): Control Number

			Slidervalue (4 Bytes): the user writes the new value of the slider This command is mainly for controlling the position of the cursor slider
Read slider controls Numerical	0xB1 + 0x11	Screen_id + Control_id	Read the specified value slider controls the current cursor Screen_id (2 Bytes): Screen Number Control_id (2 Bytes): Control Number Return instruction format: EE B1 11 Screen_id Control_id Control_type Slidervalue FF FC FF FF Return parameter: Control_type (1 Bytes): fixed value 0x13 ,Expressed as Slider control type Slidervalue (4 Bytes): this value displayed slider
Update Instrument Control Number value	0xB1 + 0x10	Screen_id + Control_id + Metervalue	Write data displayed on the specified instrument controls Screen_id (2 Bytes) : Screen number Control_id (2 Bytes) : Control Number Metervalue (4 Bytes): the user writes the new value of the meter Rotating the instrument main realization instruction pointer
Reads gauge controls value	0xB1 + 0x11	Screen_id + Control_id	Reads the specified instrument control's current value Screen_id (2 Bytes): Screen Number Control_id (2 Bytes): Control Number Return instruction format: EE B1 11 Screen_id Control_id Control_type Metervalue FF FC FF FF Return parameter: Control_type (1 Bytes): fixed value 0x14 ,Expressed as Instrument Control Types Metervalue (4 Bytes): this value is displayed in the meter Note: The return parameters consistent with the definition of the meter updates the control value
Setting back the progress bar view	0xB1 + 0x18	Screen_id + Control_id + Bk_Color	Set the background color of the progress bar Screen_id (2 Bytes) : Screen number Control_id (2 Bytes) : Control Number Bk_Color (2 Bytes): Background color RGB color value
Before setting up the progress bar view	0xB1 + 0x19	Screen_id + Control_id + Fore_Color	Set the foreground color of the progress bar Screen_id (2 Bytes) : Screen number Control_id (2 Bytes) : Control Number Fore_Color (2 Bytes): Foreground RGB color values
Bulk update the number of controls value	0xB1 + 0x12	Screen_id + Control_id0 + Len0 + Strings0 + + ... Control_idn + Lenn + Stringsn	Batch update text, progress bars, meters, buttons, icons and controls values. The benefits of batch updates is an instruction can put the entire contents of the current screen update complete Bi, improve the refresh speed and efficiency. Screen_id (2 Bytes) : Screen number Control_id0 (2 Bytes): No. The first one controls Len0 (2 Bytes): Byte length of a control Strings0 (Variable length): A numerical control, the number of bytes in length Len0 Availability Control_idn (2 Bytes): No n-th control Lenn (2 Bytes): Byte length of the n-th control Stringsn (Variable length): Numerical control of the n-th number of bytes in length Lenn Availability

			Displayed on the specified text control (mode only applicable custom keyboard) Cursor Screen_id (2 Bytes): Screen Number Control_id (2 Bytes): Control Number Enable (1 Bytes): cursor display enable 0x00: turn off the display; 0x01: the tamper-indicating
Setting cursor focus 0xB1 + 0x02		SCREEN_ID + CONTROL_ID + ENABLE	
Manual Disable / Enable Screen updates	0xB3	ENABLE	Manual Disable / Enable screen updates Enable (1 Bytes): update enable 0x00: disable updating; 0x01: Enable Update This command is mainly to solve the excessive number of controls of a screen in real time dynamically updated guide Slow screen updates caused the problem. Usage: The user first sends the screen update instruction is prohibited, and then sends the entire screen The need to update the content, and finally enable the screen updates.
Disable / Enable Control 0xB1 + 0x04		SCREEN_ID + CONTROL_ID + ENABLE	Disable / Enable Control Screen_id (2 Bytes): Screen Number Control_id (2 Bytes): Control Number Enable (1 Bytes): Control Enable 0x00: Prohibition controls; 0x01: Enable Controls This command is used to disable certain controls a screen or enable operation, For the prohibition of certain controls or enable operation according to user needs.
Shield / Hide Controls 0xB1 + 0x03		SCREEN_ID + CONTROL_ID + ENABLE	Will display a control screen or hidden. Screen_id (2 Bytes): Screen Number Control_id (2 Bytes): Control Number Enable (1 Bytes): Enable mask or hide 0x00: masking or hiding controls; 0x01: shielded / Hide lifted The command used to specify a time to failure of the function button control, may also be used Hide a control can not be displayed
Animation control displays	0xB1 + 0x20	SCREEN_ID + CONTROL_ID	Start animation Screen_id (2 Bytes): Screen Number Control_id (2 Bytes): Control Number After starting playback, animation playback from the beginning of each header 0, format only supports GIF.
	0xB1 + 0x21	SCREEN_ID + CONTROL_ID	Stop the animation Screen_id (2 Bytes): Screen Number Control_id (2 Bytes): Control Number After the execution to stop playing, the next start playing from the header 0
	0xB1 + 0x22	SCREEN_ID + CONTROL_ID	Suspended animation Screen_id (2 Bytes): Screen Number Control_id (2 Bytes): Control Number After performing pause, next time will continue to play a pause frame
	0xB1 + 0x23	SCREEN_ID + CONTROL_ID + FlashImage_ID	Specified frame playback Screen_id (2 Bytes): Screen Number Control_id (2 Bytes): Control Number FlashImage_ID (1 byte): a motion image frame ID Specify the start playback from a frame

	0xB1 + 0x24	SCREEN_ID + CONTROL_ID	Played on a Screen_id (2 Bytes): Screen Number Control_id (2 Bytes): Control Number
	0xB1 + 0x25	SCREEN_ID + CONTROL_ID	Play the next frame Screen_id (2 Bytes): Screen Number Control_id (2 Bytes): Control Number
Animation control value Upload	0xB1 + 0x26	SCREEN_ID + CONTROL_ID + Status + FlashImage_ID	Press an animation or slide controls when the device information uploaded: Screen_id (2 Bytes): Screen Number Control_id (2 Bytes): Control Number Status (1 Bytes): 0x00 It indicates touch Press, 0x01 Expressed bounce; FlashImage_ID (1 Bytes): indicates the time by pressing the screen displayed animation frames; Note: Users can configure banned in PC / enable animation control value to upload.
Icon Control display	0xB1 + 0x23	SCREEN_ID + CONTROL_ID + IconImage_ID	PC users to use the built-in icon generator, all the different states of the picture Synthesis of an ICON file, and then specify a host icon frame display. Screen_id (2 Bytes): Screen Number Control_id (2 Bytes): Control Number IconImage_ID (1 byte): An icon frame ID The instruction commonly used in several different states of the display screen at the same image position. Note: If you need to display the icon disappears, you can make a transparent PNG image that is You can achieve the effect disappears.
Icon Control value Upload	0xB1 + 0x26	SCREEN_ID + CONTROL_ID + Status + IconImage_ID	Press or sliding an icon controls when the device information uploaded: Screen_id (2 Bytes): Screen Number Control_id (2 Bytes): Control Number Status (1 Bytes): 0x00 It indicates touch Press, 0x01 Expressed bounce; IconImage_ID (1 Bytes): Press the icon indicates the time frame of the screen display; Note: Users can configure banned in PC / enable icon in the control value to upload.
Settings icon location	0xB1 + 0x28	Screen_id + Control_id + X + Y	Settings icon location Parameter Description: Screen_id (2 Bytes): Screen Number Control_id (2 Bytes): Control Number X (2 Bytes): shown X Coordinate position Y (2 Bytes): shown Y Coordinate position This command is mainly used for dynamically adjusting the position of the icon displayed control.
Curve Control	0xB1 + 0x30	SCREEN_ID + CONTROL_ID + CHANNEL + COLOR	Adds the specified data channel Screen_id (2 Bytes): Screen Number Control_id (2 Bytes): Control Number CHANNEL (1 Bytes): total 8 Data channels, the number range (0 to 7) COLOR (2 Bytes): Color data channel
	0xB1 + 0x31	SCREEN_ID + CONTROL_ID + CHANNEL	Remove the specified data channel Screen_id (2 Bytes): Screen Number Control_id (2 Bytes): Control Number CHANNEL (1 Bytes): total 8 Data channels, the number range (0 to 7)
	0xB1 + 0x32	SCREEN_ID + CONTROL_ID + CHANNEL + DATA_LEN + DATA	Add new data at the end of the specified channel Adding new data to the end of the specified data channel, when the data length exceeds the buffer length When the old data left.

			<p>Screen_id (2 Byte): Number screen; Control_id (2 Byte): Control Number</p> <p>CHANNEL (1 Bytes): total 8 Data channels, the number range (0 to 7)</p> <p>DATA_LEN (2 Bytes): data length</p> <p>DATA : Variable length data, length of the DATA_LEN Specification format: data on behalf of</p> <p>Yes Y Value axis direction, X Will automatically increment the axial direction from the horizontal scaling factor,</p> <p>When the horizontal scaling factor of e.g. 1 When each insertion point X Automatic shaft 1 ,</p> <p>When the horizontal scaling factor 5 When each insertion point X Automatic shaft 5</p>
	0xB1 + 0x33	SCREEN_ID + CONTROL_ID + CHANNEL	<p>Empty specified data channel</p> <p>Screen_id (2 Byte): Number screen; Control_id (2 Byte): Control Number</p> <p>CHANNEL (1 Bytes): total 8 Data channels, the number range (0 to 7)</p>
	0xB1 + 0x34	SCREEN_ID + CONTROL_ID + XOFFSET + XMUL + YOFFSET + YMUL	<p>Specifies the vertical / horizontal zoom / pan</p> <p>Screen_id (2 Bytes): Screen Number</p> <p>Control_id (2 Bytes): Control Number</p> <p>XOFFSET (2 Bytes): horizontal offset data points, the left is positive, negative right</p> <p>XMUL (2 Bytes): the horizontal zoom parameter, the unit 0.01</p> <p>YOFFSET (2 Bytes): vertical offset value, down is positive, the shift is negative</p> <p>YMUL (2 Bytes): the vertical scaling unit 0.01</p> <p>Sampling point and the calculated coordinate point: first N Values of sampling points VX Coordinates $= (N-XOFFSET) * XMUL * 0.01 \text{ Y Coordinates} = (V-YOFFSET) * YMUL * 0.01$</p>
	0xB1 + 0x35	SCREEN_ID + CONTROL_ID + CHANNEL + DATA_LEN + DATA	<p>The front end of the specified channel to add new data</p> <p>Insertion of new data at the head of the specified data channel, when the data length exceeds the buffer length</p> <p>When degrees, the old data to the right</p> <p>Screen_id (2 Byte): Screen Number Control_id (2 Byte): Control Number</p> <p>CHANNEL (1 Bytes): total 8 Data channels, the number range (0 to 7)</p> <p>DATA_LEN (2 Bytes): data length</p> <p>DATA : Variable length data, length of the DATA_LEN Designation</p>
Settings drop-down menu Controls	0xB1 + 0x13	SCREEN_ID + CONTROL_ID + Enable + Textctrl_ID	<p>After setting the pop-up drop-down menu, menu options which data is automatically written into the text box</p> <p>Screen_id (2 Bytes): Screen Number</p> <p>Control_id (2 Bytes): Control Number</p> <p>Enable (1 byte) : Menu enable bit, 00 To hide, 01 Display, point</p> <p>After the attack menu, auto hide</p> <p>Textctrl_ID (2 bytes) : Text Control</p>
Drop-down menu control value Upload	0xB1 + 0x14	SCREEN_ID + CONTROL_ID + 0x1A + Meundai_ID + Status	<p>Menu control to upload data frame format. When you select the drop-down menu items, the system self</p> <p>Upload dynamic control ID value and the value of the selected item.</p> <p>Screen_id (2 Bytes): Screen Number</p> <p>Control_id (2 Bytes): Control Number</p> <p>Meundai_ID (1 byte) : The first of several data options</p> <p>Status (1-byte) : Touch state, 0 Expressed bounce; 1 It means to press</p> <p>Drop-down menu in the upload instruction control values bounce or press will have a corresponding number of instructions</p> <p>According to upload.</p>
Selection control slide provided Pieces of the current selection	0xB1 + 0x10	SCREEN_ID + CONTROL_ID + Select_data_ID	<p>Set selection control slide currently displayed data items</p> <p>Screen_id (2 Bytes): Screen Number</p> <p>Control_id (2 Bytes): Control Number</p>

			Select_data_ID (1 byte) : The first of several data options
Slide selection control value Upload	0xB1 + 0x11	SCREEN_ID + CONTROL_ID + 0x1B + Select_data_ID	Scroll up and down the slide controls the main achievement of the required data is selected, the system automatically select the Pass control ID value and the currently selected item. Screen_id (2 Bytes): Screen Number Control_id (2 Bytes): Control Number Select_data_ID (1 byte) : The first of several data options
Update two-dimensional code control 0xB1 + 0x10		Screen_id + Control_id + Strings	Generating a two-dimensional code display content specified in FIG. Screen_id (2 Bytes): Screen Number Control_id (2 Bytes): Control Number Strings (Variable length): two-dimensional code character content; This command is mainly used to implement the two-dimensional code figure shows, the instruction format text as control
Set the timer	0xB1 + 0x40	Screen_id + Control_id + timedata	Set RTC timer Screen_id (2 Bytes) : Screen No. Control_id (2 Bytes) : RTC Control Number timedata (4 Bytes): timer value The instructions for the hardware only supports the RTC clock of products, equipment, and pre-set PC The clock was set control properties
Start timer	0xB1 + 0x41	Screen_id + Control_id	Start timer Screen_id (2 Bytes) : Screen No. Control_id (2 Bytes) : RTC Control Number Timer ends, uploading screen event notifications, upload format: EE B1 43 Screen_idControl_id 17 FF FC FF FF
Pause timer	0xB1 + 0x44	Screen_id + Control_id	Pause timer Screen_id (2 Bytes) : Screen No. Control_id (2 Bytes) : RTC Control Number After the pause time, sending start the timer will continue to count
Stop the timer	0xB1 + 0x42	Screen_id + Control_id	Stop timer Screen_id (2 Bytes) : Screen No. Control_id (2 Bytes) : RTC Control Number After stopping the timer, the timer count value to restore the original settings
Read timer	0xB1 + 0x45	Screen_id + Control_id	Read timer Screen_id (2 Bytes) : Screen No. Control_id (2 Bytes) : RTC Control Number After reading the timer, the screen will return the corresponding timer value Returned Format: EE B1 45 Screen_idControl_id17 Strings FF FC FF FF Return parameter: Screen_id (2 Bytes) : Screen No. Control_id (2 Bytes) : RTC Control Number 17 (1 byte): 0x17, fixed code Strings (4 Bytes): read timing values
Set 485 screen address (Only supports 485 Screen)	0xA5 + 0x01	Addr	Set 485 screen address Addr : 2 Bytes, the screen indicates the address, from address 1 Start, 0 Broadcast address After the address set up, all instruction will add address information, such as:

			EE Addr1 Addr0 Screen_idScreen_id ... FF FC FF FF
Cancel 485 screen address (Only supports 485 Screen)	0xA5 + 0x00	no	Cancel 485 address information
Writing data to the FLASH	0x87	Addr + Data0 ... + Datan	The data saved in the specified address in FLASH, EEPROM use as Addr (4 Bytes): the start address of the data written Datan (1 Bytes): write data Storage space for 128K Byte address range is 0 ~ 0xFFFF After writing a successful return: EE 0C FF FC FF FF Note: Due to Nandflash There Endurance (10 About million times), an important parameter, The need to repeatedly erase core data storage is not recommended
Read stored in FLASH The data	0x88	Addr + Length	The random data is written or read out in sequential memory Addr (4 Bytes): data read start address Length (2 Bytes): read data length in bytes The returned data format: EE 0B Data0 ... Datan FF FC FF FF
Interception of the current screen and Stored in FLASH (Basic, business , Economical support, Things type is not supported)	0x46	Image_ID	Will save the current screen contents to the device FLASH Image_ID (1 Bytes): custom picture number stored in the memory
Display stored in FLASH The picture taken (group This type of business model, by Economic support-type things together not support)	0x47	Image_ID	A display screen stored in the apparatus, taken in the FLASH Image_ID (1 Bytes): custom picture number stored in the memory
System configuration is locked	0x08	0xA5 + 0x5A + 0x5F + 0xF5	To prevent the system is running, you receive an error frame instruction cause unexpected repair system configuration change. Once the configuration is locked, the external device can not receive the serial command is modified, Until the system is released. Configuration parameters include: baud rate, matrix keyboard and a touch mode, the backlight automatically Adjustable parameters. Returned Format: EE 17 FF FC FF FF
Lift system configuration locking	0x09	0xDE + 0xED + 0x13 + 0x31	Once the system configuration lock is released, the serial device can receive an external command to re-repair Change configuration parameters. Returned Format EE 18 FF FC FF FF
Alarm event is triggered	0xB1 + 0x50	Screen_id + Control_id + Val ue + (Sec + Min + Hour + Day + W eek + Mon + Year)	Alarm event is triggered Screen_id (2 Bytes) : Screen No. Control_id (2 Bytes) : Control data record number Value (2 Bytes) : Alarm event ID number If the customer selected instruction time, the instruction would add the following parameters: Sec (1 Bytes) : Seconds, BCD code representation Min (1 Bytes) : Points, BCD code representation Hour (1 Bytes) : When, BCD code representation Day (1 Bytes) : Japan, BCD code representation

			<p>Week (1 Bytes) : Week, BCD code representation</p> <p>Mon (1 Bytes) : Month, BCD code representation</p> <p>Year (1 Bytes) : Years, BCD code representation</p> <p>This instruction is transmitted to the screen by corresponding event ID, so that the corresponding event ID No alarm event is converted to an output set by the user</p>
Alarm Event lift	0xB1 + 0x51	Screen_id + Control_id + Val ue + (Sec + Min + Hour + Day + W eek + Mon + Year)	<p>Alarm Event lift</p> <p>Screen_id (2 Bytes) : Screen No.</p> <p>Control_id (2 Bytes) : Control data record number</p> <p>Value (2 Bytes) : Alarm event ID number</p> <p>If the customer selected instruction time, the instruction would add the following parameters:</p> <p>Sec (1 Bytes) : Seconds, BCD code representation</p> <p>Min (1 Bytes) : Points, BCD code representation</p> <p>Hour (1 Bytes) : When, BCD code representation</p> <p>Day (1 Bytes) : Japan, BCD code representation</p> <p>Week (1 Bytes) : Week, BCD code representation</p> <p>Mon (1 Bytes) : Month, BCD code representation</p> <p>Year (1 Bytes) : Years, BCD code representation</p> <p>This instruction is transmitted to the screen by corresponding event ID, so that the corresponding event ID No. converted to lift the user to set the alarm event output</p>
Tim controls data record Plus conventional record	0xB1 + 0x52	Screen_id + Control_id + Strings	<p>Adding conventional record</p> <p>Screen_id (2 Bytes) : Screen No.</p> <p>Control_id (2 Bytes) : Control data record number</p> <p>Strings (Variable length): users to add content string</p>
Control data record cleared In addition to recording data	0xB1 + 0x53	Screen_id + Control_id	<p>Clear History data</p> <p>Screen_id (2 Bytes) : Screen No.</p> <p>Control_id (2 Bytes) : Control data record number</p>
Control data record set Display offset configuration record (i.e. the position of the scrollbar)	0xB1 + 0x54	Screen_id + Control_id + Offset	<p>Set record offset (i.e., the position of the scroll bar)</p> <p>Screen_id (2 Bytes) : Screen No.</p> <p>Control_id (2 Bytes) : Control data record number</p> <p>Offset (2 Bytes): line number (i.e., the position of the scroll bar)</p>
Data recording controls won Take the current number of records	0xB1 + 0x55	Screen_id + Control_id	<p>Gets the number of the current data record</p> <p>Screen_id (2 Bytes) : Screen No.</p> <p>Control_id (2 Bytes) : Control data record number</p> <p>Returned Format: EE B1 55 Screen_idControl_id 1D Count FF FC FF FF</p>
Control data record read Take a row record	0xB1 + 0x56	Screen_id + Control_id + Position	<p>Reads a row record</p> <p>Screen_id (2 Bytes) : Screen No.</p> <p>Control_id (2 Bytes) : Control data record number</p> <p>Position (2 Bytes): line number of a line</p> <p>Returned Format: EE B1 56 Screen_idControl_id 1D Strings FF FC FF FF</p>
Data recording controls repair Change in routine record	0xB1 + 0x57	Screen_id + Control_id + Position + Strings	<p>Modify General Record</p> <p>Screen_id (2 Bytes) : Screen No.</p> <p>Control_id (2 Bytes) : Control data record number</p>

			Position (2 Bytes): line number of a line Strings (Variable length): users to add content string
Control delete data record In addition to the conventional recording	0xB1 + 0x58	Screen_id + Control_id + Position	Delete conventional record Screen_id (2 Bytes) : Screen No. Control_id (2 Bytes) : Control data record number Position (2 Bytes): line number of a line
Data recording control plug The conventional recording	0xB1 + 0x59	Screen_id + Control_id + Position + Strings	Into a regular record Screen_id (2 Bytes) : Screen No. Control_id (2 Bytes) : Control data record number Position (2 Bytes): line number of a line Strings (Variable length): users to add content string
Controls selected data record Choose a record	0xB1 + 0x5A	Screen_id + Control_id + Offset	Select a record Screen_id (2 Bytes) : Screen No. Control_id (2 Bytes) : Control data record number Offset (2 Bytes): line number
A control data record Times add multiple records	0xB1 + 0x5B	Screen_id + Control_id + Count + Record0_size + Record0 + Record1_size + Record1 + ...	Once add multiple records Screen_id (2 Bytes) : Screen No. Control_id (2 Bytes) : Control data record number Count (2 bytes) : Number of records added Recordx_size (2 bytes): each of a size corresponding to the record Recordx (Variable length) : Each respective data record
Export data with SD card Data recording controls (CSV format)	0xB1 + 0x5C	Screen_id + Control_id	SD card data export data recording control (CSV format) Screen_id (2 Bytes) : Screen No. Control_id (2 Bytes) : Control data record number Return form : EE B1 5C Screen_idControl_id00 FF FC FF FF
Historical curve	0xB1 + 0x60	Screen_id + Control_id + Value	History curve setting sample values Parameter Description: Screen_id (2 Bytes) : Screen No. Control_id (2 Bytes) : Control data record number The Value (variable length): data types: UINT8, INT8, UINT16, INT16, UINT32, INT32, FLOAT, each channel data according to a set of data types Correspondence, if there are two channels, the data type is UINT8, add two numbers corresponding According to the type of data UINT8 The instruction data sample value history curve for adding, adding the corresponding data to the finger Order inside, instruction to the screen, screen data plotted according to the respective values.
	0xB1 + 0x61	Screen_id + Control_id + Enable	Historical curve disable / enable sampling Parameters: Screen_id (2 bytes): Screen Number Control_id (2 bytes): Text Controls Number Channel (1 byte): Channel ID Show (1 byte): the display prohibition / enable bit 0x00: hidden; 0x01: display; This command is mainly used for history curve Disable / Enable sampling. If the user needs To a certain period, then the input data is not performed, can be implemented using the sample instruction is prohibited; If the user needs to re-impart a sampling function, the need to use a solid sample instruction can cause

			Now.
			<p>Historical trend Hide / Show channel</p> <p>Parameters: Screen_id (2 bytes): Screen Number</p> <p>Control_id (2 bytes): Text Controls Number</p> <p>Channel (1 byte): Channel ID</p> <p>Show (1 byte): the display prohibition / enable bit</p> <p>0x00: hidden; 0x01: display;</p> <p>This command is mainly used for some of the channels for display history curve hidden operation /</p> <p>Make. There are several channel profile in the user interface, the user needs to enter a channel</p> <p>Detailed view line analysis, then, can be used to hide instruction curve corresponding channel,</p> <p>Under the circumstances, it can also be used to display the channel command curve.</p>
0xB1 + 0x63	Screen_id + Control_id + 00 + Sample_Count		<p>History curve setting time length (i.e., number of samples)</p> <p>Parameters: Screen_id (2 bytes): Screen Number</p> <p>Control_id (2 bytes): Text Controls Number</p> <p>00 (1 byte): control type ID number, 0x00: set time width</p> <p>Sample_Count (2 bytes): number of sampling points screen display</p> <p>The instruction is mainly used to set the length of time history curve, i.e., the history can be provided</p> <p>Sampling points of the curve.</p>
0xB1 + 0x63	Screen_id + Control_id + 01		<p>Historical curve scaled to full screen</p> <p>Parameters: Screen_id (2 bytes): Screen Number</p> <p>Control_id (2 bytes): Text Controls Number</p> <p>01 (1 byte): control type ID number, 0x01: zoom to full screen</p> <p>The history of instruction is mainly used to set the zoom curve, i.e., it may be provided historical curve</p> <p>Scaling to achieve full screen.</p>
0xB1 + 0x63	Screen_id + Control_id + 02 + Zoom + Max_Zoom + Min_Zoom		<p>Historical trend set scaling factor</p> <p>Parameters: Screen_id (2 bytes): Screen Number</p> <p>Control_id (2 bytes): Text Controls Number</p> <p>02 (1 byte): control type ID number, 0x02: scaling factor</p> <p>Zoom (2 bytes): scale percentage</p> <p>Max_Zoom (2 bytes): scaling limits, the number of samples up to a screen display</p> <p>Min_Zoom (2 bytes): scaling limits, a display screen minimum number of samples</p> <p>This command is mainly used to set the scaling according to a user-based history curve set</p> <p>Displayed number, such that it will conform to the curve plotted viewing angle of the user.</p>
0xB1 + 0x64	Screen_id + Control_id + Max + Min		<p>History curve setting value display range</p> <p>Parameters: Screen_id (2 bytes): Screen Number</p> <p>Control_id (2 bytes): Text Controls Number</p> <p>Max (4 bytes): maximum</p> <p>Min (4 bytes): minimum value</p> <p>The instruction is mainly used to set maximum and minimum values of the historical curve, i.e. provided</p> <p>Set display range of the historical trend.</p>
Set the spin control Rotation angle	0xB1 + 0x10	Value	<p>Rotary controls to set the angle of rotation</p> <p>Parameters: Screen_id (2 bytes): Screen Number</p> <p>Control_id (2 bytes): Text Controls Number</p>

			<p>Value (2 bytes): rotation angle, the rotation angle 0-360 Degree: while rotating the rotary control supports a small angle, particle size of 0.1 degrees, Value = actual Angle * 10 + 0x8000, for example, the set value of 5.3 = 5.3 * 10 + 0x8000 This command is mainly used for the rotation angle of the rotary control is provided, the user can An instruction pointer-rotation angle according to the rotation center is set.</p>
Multi-language switch command	C1	Ui_lang + check	<p>Multi-language switch command Parameter Description: Ui_lang (1 Bytes): BIT3 ~ BIT0: Markup Language index range: 0-9 BIT6 ~ BIT4: Reservations, default 0 BIT7 : Identifying the keyboard language, 0 :Chinese, 1 :English check (1 Bytes): for checking, check = 0xC1 + Ui_lang , Take low byte. The instructions generally used for multi-language instruction for handover, with Users can change the keyboard command to set the output language is Chinese or English.</p>
Language acquisition system cable lead	C2	no	<p>Instruction format: EE [C2] FF FC FF FF Parameters: None The language instruction for obtaining index screen currently used serial port; Return instruction: EE] [C2 Lang FF FC FF FF Return parameter: Lang (1 byte): BIT3 ~ BIT0: Markup Language Index, range: 0-9 BIT6 ~ BIT4: Reserved, default 0 BIT7: keyboard language identification system, 0: Chinese 1: English</p>
Digital text control change Volume control	0xB1 + 0x1A	Screen_id + Control_id + Option + Delta + Min_Limit + Max_Limit	<p>Digital variable adjustment Screen_id (2 Bytes) : Screen No. Control_id (2 Bytes) : Text Control Number Option (1 Bytes): bit0-0 cut back, 1 increase; bit1-0 Not cycle regulation, 1 Cycle regulation Delta (2 Bytes): delta Min_Limit (2 Bytes): minimum value Max_Limit (2 Bytes): maximum</p>
Video Video Controls Path setting (IOT only Type support)	0xB1 + 0x74	Screen_id + Control_id + Video Path (ASCII Code written)	<p>Video path of the video control settings Screen_id (2 Bytes) : Screen No. Control_id (2 Bytes) : No video controls Video path (Variable): writing a video path ASCII form, the default Placed in a dish</p>
Video playback controls (Only thing linking support)	0XB1 + 0x70	Screen_id + Control_id + Views	<p>Video playback controls Screen_id (2 Bytes) : Screen No. Control_id (2 Bytes) : No video controls Views (2 bytes): the number of video loop, loop 0</p>
Stop video controls (Only thing linking support)	0XB1 + 0x71	Screen_id + Control_id	<p>Stop video controls Screen_id (2 Bytes) : Screen No. Control_id (2 Bytes) : No video controls</p>

Video controls pause / Recovery (was only linked branched hold)	0XB1 + 0x72	Screen_id + Control_id	<p>Pause the video control / recovery</p> <p>Screen_id (2 Bytes) : Screen No.</p> <p>Control_id (2 Bytes) : No video controls</p>
RTC time setting (Need hardware support)	0x81	Sec + Min + Hour + Day + Week + Mon + Year	<p>Time parameters set</p> <p>Sec: SEC Sets Min: Sub-set;</p> <p>Hour: Set hours Day: Date Set</p> <p>Week: Set week Mon: Set month</p> <p>Year: In settings</p> <p>It recommended that the user directly controls the clock to complete the RTC time display and calibration .</p> <p>Note: Each 1-byte BCD code to Sunday is set to 0x00</p>
Read RTC clock (Need hardware support)	0x82	no	<p>Data return format: EE + 0xF7 + Year + Mon + Week + Day + Hour + Min + Sec + FF FC FF FF</p> <p>Note: Each 1-byte BCD code to</p> <p>We recommend that users complete control to directly use the clock RTC Calibration and display time.</p>
The current picture storage TF card (basic, Commercial, economical support Hold, was linked unsupported hold)	0x34	00	<p>The current picture is stored in TF card</p> <p>Corresponding instruction format is: EE 34 00 FF FC FF FF</p> <p>After sending the appropriate command, the TF Card will automatically generate .bmp file.</p> <p>If the store is successful, return to the format: EE 10 FF FC FF FF</p> <p>If the store fails, return to the format: EE 11 FF FC FF FF</p>
Get a wireless network set up Set (only was linked branched hold)	0xD0 + 0xA 1	no	<p>Acquire wireless network settings</p> <p>Corresponding instruction format is: EE D0 A1 FF FC FF FF</p> <p>Returned Format: EE D0 A1 WIFI_GET_CFG FF FC FF FF</p>
Obtain network status (only Was linked support)	0xD0 + 0xA 2	no	<p>Access to network status</p> <p>Corresponding instruction format is: EE D0 A2 FF FC FF FF</p> <p>Returned Format: EE D0 A2 WIFI_GET_STATE FF FC FF FF</p>
Obtain network settings (only Was linked support)	0xD0 + 0xA 5	no	<p>Obtain network settings</p> <p>Corresponding instruction format is: EE D0 A5 FF FC FF FF</p> <p>Returned Format: EE D0 A5 NETWORK_GET_CFG FF FC FF FF</p>
Obtaining network services (only Was linked support)	0xD0 + 0xA 7	no	<p>Obtain network settings</p> <p>Corresponding instruction format is: EE D0 A7 FF FC FF FF</p> <p>Returned Format: EE D0 A7 NETWORK_SERVICE_GET_CFG FF FC FF FF</p>
Searching for wireless networks (only Was linked support)	0xD0 + 0xA 3	no	<p>Searching for wireless networks</p> <p>Corresponding instruction format is: EE D0 A3 FF FC FF FF</p> <p>Returned Format: EE D0 A3 WIFI_SCAN_AP LIST FF FC FF FF</p>
Save the network settings (only Was linked support)	0xD0 + 0xA 4	NETWORK_SET_CFG	<p>Save the network settings</p> <p>Corresponding instruction format is: EE D0 A4 NETWORK_SET_CFG FF FC FF FF</p>
Save network services (only Was linked support)	0xD0 + 0xA 6	NETWORK_SERVICE_S ET	<p>Save Network Services</p> <p>Corresponding instruction format is: EE D0 A6 NETWORK_SERVICE_SET FF FC FF FF</p>

Save wireless network settings Set (only was linked branched hold)	0xD0 + 0xA 0	WIFI_SET_CFG	Save wireless network settings Corresponding instruction format is: EE D0 A0 WIFI_SET_CFG FF FC FF FF
Data transmission network (only Was linked support)	0xD0 + 0xA C	Count + Strings	Send network data Corresponding instruction format is: EE D0 AC Count Strings FF FC FF FF Parameter format: Count (2 Bytes): the number of bytes transmitted Strings (Variable): the user selects data to be transmitted, using a given software Meaning written format, for example: 12 , Written as 3132
Data transmission network (X Hex, only thing linking stand by)	0xD0 + 0xA C	Count + Strings	Send network data Corresponding instruction format is: EE D0 AC Count Strings (Hex) FF FC FF FF Parameter format: Count (2 Bytes): the number of bytes transmitted Strings (Variable): the user selects data to be transmitted, with the corresponding Write format, for example: 1213 , Written as 1213
Save the network settings (only Was linked support)	0xD0 + 0xA A	no	Save the network settings Corresponding instruction format is: EE D0 AA FF FC FF FF
Playing audio files	0x94	The audio file path	Audio file playback Parameters: audio file path (Variable): audio file path set by a user; This command is mainly used for audio file playback set by a user, the screen according to the corresponding text Path pieces play audio files.
Stop audio files	0x95	no	Stop audio files This command is mainly used to play audio files by the state to stop
Volume adjustment	0x93	Value	Volume adjustment Parameter Description: Value (1 Bytes): a volume value, in the range of 0-100. This command is mainly used to adjust the volume of speaker output.
Local / external AV input video	0x4B	Enable	Local / External AV Video Input Parameter Description: Enable (1 Bytes): Local / external screen switching flag 0x00 : Switch to local picture show 0x01 : Switch to AV Video input display This command is mainly used for image display, and local AV A display screen of the video input Switch.
Show / Hide button system plate	0x86	Show + x + y + type + Option + max_len	Show / Hide Keyboard System Parameters: the Show (1 byte): Hide 0, 1 display; x (2 bytes): x coordinate of the pop-up keyboard; y (2 bytes): y coordinate of the pop-up keyboard; type (1 byte): 0 keypad, a full keyboard; Option (1 Bytes): 0 Normal characters, 1 password, 2 time setting; max_len (1 Bytes): keyboard input character length limit; This command is mainly used to show / hide the system keyboard.
Touch screen sensitivity adjustment Section instruction (only for electrical Yung screen)	8A 5A A5	XX	Touch sensitivity adjustment instruction (only capacitive screen) Parameters: XX (1 byte): XX ranges from the spirit 0-7, the higher gear Min, can support a thicker cover The instructions for adjusting the sensitivity of the touch screen for capacitive screen.

				Format: Instruction format: EE [B1 74 Screen_id Control_id Videos_Path] FF FC FF FF Parameters: Screen_id (2 bytes): Screen Number Control_id (2 bytes): Number of video playback controls Videos_Path: video path (can be converted in the instruction Assistant)
Play this The video	Setting this The video path	0xB1 + 0x74	Screen_id + Control_id + Videos_Path	Local video command path is provided: Instruction format: EE [B1 74 Screen_id Control_id Videos_Path] FF FC FF FF Parameters: Screen_id (2 bytes): Screen Number Control_id (2 bytes): Number of video playback controls Videos_Path: Local Video Path (may transit in the instruction assistant change)
	Depending Play frequency	0xB1 + 0x70	Screen_id + Control_id + Number	Play instructions: Instruction format: EE [B1 70 Screen_id Control_id Number] FF FC FF FF Parameters: Screen_id (2 bytes): Screen Number Control_id (2 bytes): Number of video playback controls Number (2 bytes): the number of video loop, loop 0
Play U Intraday view frequency	Set U Video disk path	0xB1 + 0x74	Screen_id + Control_id + Videos_Path	Video Path setting dial command U: Instruction format: EE [B1 74 Screen_id Control_id Videos_Path] FF FC FF FF Parameters: Screen_id (2 bytes): Screen Number Control_id (2 bytes): Number of video playback controls Videos_Path: U disk Video Path (Assistant can command Conversion)
	Depending Play frequency	0xB1 + 0x70	Screen_id + Control_id + Number	Play instructions: Instruction format: EE [B1 70 Screen_id Control_id Number] FF FC FF FF Parameters: Screen_id (2 bytes): Screen Number Control_id (2 bytes): Number of video playback controls Number (2 bytes): the number of video loop, loop 0
Play SD CTV card frequency	Set SD Video card path	0xB1 + 0x74	Screen_id + Control_id + Videos_Path	Set SD card video instructions: Instruction format: EE [B1 74 Screen_id Control_id Videos_Path] FF FC FF FF Parameters: Screen_id (2 bytes): Screen Number Control_id (2 bytes): Number of video playback controls Videos_Path: SD card Video Path (assistant can command Conversion)
	Depending Play frequency	0xB1 + 0x70	Screen_id + Control_id + Number	Play instructions: Instruction format: EE [B1 70 Screen_id Control_id Number] FF FC FF FF Parameters: Screen_id (2 bytes): Screen Number Control_id (2 bytes): Number of video playback controls

			Number (2 bytes): the number of video loop, loop 0
Pause / resume view frequency	0xB1 + 0x72	Screen_id + Control_id	<p>Pause / resume instruction:</p> <p>Instruction format: EE] [B1 72 screen_id control_id FF FC FF FF</p> <p>Parameters: screen_id (2 bytes): Screen Number</p> <p>control_id (2 bytes): Number of video playback controls</p>
Stop playing the video	0xB1 + 0x71	Screen_id + Control_id	<p>Stop command:</p> <p>Instruction format: EE] [B1 71 screen_id control_id FF FC FF FF</p> <p>Parameters: screen_id (2 bytes): Screen Number</p> <p>control_id (2 bytes): Number of video playback controls</p>
Play Audio ID	0x90 + 0x01	Audio ID + Views	<p>Audio playback instructions:</p> <p>Instruction format: EE] [90 01 sounds_id time FF FC FF FF</p> <p>Parameters: sounds_id (2 bytes): Audio ID</p> <p>time (1 byte): Views (0 for loop)</p>
Audio playback is paused	0x90 + 0x02		<p>Audio playback pause command:</p> <p>Instruction format: EE [9002] FF FC FF FF</p>
Audio playback resume	0x90 + 0x03		<p>Audio playback resume instruction:</p> <p>Instruction format: EE [9003] FF FC FF FF</p>
The audio stops playing	0x90 + 0x00		<p>The audio stops playing instructions:</p> <p>Instruction Format: EE [9000] FF FC FF FF</p>
Audio playback sequence	0x90 + 0x04 + 0x00 + 0x01	Audio ID + Views	<p>The audio playback of the sequence of instructions:</p> <p>Instruction Format: EE [90 04 00 01 sounds_id time] FF FC FF FF</p> <p>Parameters: sounds_id (2 bytes): audio sequence ID (with: separate sequence ID)</p> <p>time (1 byte): Views (0 for loop)</p>
System configuration is locked	0x08 + 0xA5 + 0x5A + 0x5 F + 0xF5	no	<p>System configuration is locked:</p> <p>This command is used to configure the locking system (i.e., power-down save the settings), the command is successful with Set, then the device returns EE 17 FF FC FF FF.</p> <p>Return instruction format: EE 17 FF FC FF FF</p>
Lift the lock system configuration set	0x09 + 0xD E + 0xED + 0x13 + 0x31	no	<p>Lift the lock system configuration:</p> <p>The command for releasing the locking function of the system configuration (i.e., power-down save the settings), the Configuration command is successful, then the device returns EE 18 FF FC FF FF.</p> <p>Return instruction format: EE 18 FF FC FF FF</p>

1.6 The basic instruction set table

In the configuration where the display instruction set can not be met, the user may be realized by the basic instruction set, the basic instruction set

Appendix A . Users do not care about basic basic instruction set, the instruction set configuration to meet 99% User needs. The basic set of instructions in the following table 1.5 Fig.

table 1.5 General Instructions

category	instruction	Command parameters	Explanation
Set the foreground color	0x41	Fcolor	Foreground color for points, lines, circles, text, and graphics specified color Fcolor (2 Bytes): RGB Color values
Set the background color	0x42	Bcolor	Specifies the background color for the screen is cleared, text background color and background curves Bcolor (2 Bytes): RGB Color values
Clear screen	0x01	no	Clear the screen according to the specified color NOTE: clear screen color depends on the background color, default is blue
Set the text line Column spacing	0x43	Y_W + X_W	Y_W (1 Bytes) in points of the line spacing, the value 00 ~ 3F X_W (1 Bytes) in points of the column spacing, the value 00 ~ 3F
Set the text box	0x45	Enable + Width + Height	Limiting the text display area to display Wrap Enable (1 Bytes) 0x01: Limit Enable Open text box, 0x00: Close Limit Enable textbox Width (2 Bytes): text box display width Height (2 Bytes): the height of the text box displayed
Picture color filter	0x44	FilterColor	Picture color filter not display the same color value FillColor (2 Bytes): Color filter RGB value
Text Display	0x20	X + Y + Back + Font + Stri ng	Text displayed at arbitrary coordinates specified size X (2 bytes): X-axis coordinate value in points of Y (2 bytes): Y axis coordinate values in units of points Back (background color, one byte) 0x01: Open the background color display 0x00: Off Background Color display Font (character code, 1 byte) 0x00: 8x12 dot matrix (ASCII) 0x01: 8x16 dot matrix (ASCII) 0x02: 12x24 dot matrix (ASCII) 0x03: 16x32 dot matrix (ASCII) 0x04: 12 x 12 dot (GBK) 0x05: 16 x 16 dot (GBK) 0x06: 24 x 24 dot (GBK) 0x07: 32 x 32 dot (GB2312) 0x08: 32 x 64 dot (ASCII) 0x09: 64 x 64 dot (GB2312) Strings: string written by the user (high byte first) Note: The text font color is consistent with the foreground color, background color as the background color
Cursor display	0x21	Enable + X + Y + Width + Height	Displaying a cursor at arbitrary coordinates specified size Enable (1 Bytes): cursor enable signal 0x00: Close 0x01: open X (2 Bytes): in points of X Axis coordinate value Y (2 Bytes): in points of Y Axis coordinate value Width (1 Bytes): the width of the cursor Height (1 Bytes): height of the cursor Note: In contrast to the current cursor color cursor area starting point colors, flashing silent time Recognize one second

			A full screen images, stationary start position (0,0) Image_ID (2 Bytes): Image, MaskEn (1 Bytes): filtration can 0x00: no color filter; 0x01 performs color filtering Note: The filter color depends on the color filter of the pictures, the downloaded picture points Resolution can not exceed the current screen resolution, or can not be displayed.
Full-screen picture display	0x31	Image_ID + MaskEn	Arbitrary coordinates display an image that X (2 Bytes): in points of X Axis coordinate value Y (2 Bytes): in points of Y Axis coordinate value Image_ID (2 Bytes): Image, MaskEn (1 Bytes): filtration can 0x00: no color filter; 0x01 performs color filtering Note: filtering the color depends on the color filter is provided.
Image display area	0x32	X + Y + Image_ID + MaskEn	Any display coordinates from a cut over picture Photo X (2 Bytes): in points of X Axis coordinate value Y (2 Bytes): in points of Y Axis coordinate value Image_ID (2 Byte): To cut a picture ID Image_X (2 Bytes): the starting point of the picture is cut X coordinate Image_Y (2 Bytes): the starting point of the picture is cut Y coordinate Image_W (2 Bytes): the width of cut Image_H (2 Bytes): Cut height MaskEn (1 Bytes): filtration can 0x00: no color filter; 0x01 performs color filtering Note: the color filter color depending on the filter settings
Cut display picture	0x33	X + Y + Image_ID + Image_X + Image_Y + Image_W + Image_H + MaskEn	Arbitrary coordinates display animated GIF X (2 Bytes): in points of X Axis coordinate value Y (2 Bytes): in points of Y Axis coordinate value FlashImage_ID (2 Bytes): movie number Enable (1 Bytes): Play Enable 0x00: Close animation; 0x01: open animation Playnum (1 Bytes): Views 0x00: repeat; 0x01 ~ 0xFF: Specifies the number of times when the player is stopped Serial upload screen EE 02 FF FC FF FF It indicates the end of animation Note: * gif format only supports animation, screen supports only one animation. If you expect to play more than one picture gif animation, and animation pause, stop Stop, play upper / lower frames and other functions, using the animation control configuration, see the following configuration Instruction list.
Animation	0x80	X + Y + FlashImage_ID + Enable + Playnum	As a point on the screen, the color of the foreground color point depends X (2 Bytes): in points of X Axis coordinate value Y (2 Bytes): in points of Y Axis coordinate value
Foreground color painting point	0x50	X + Y	As a point on the screen, depending on the color of the background color point X (2 Bytes): in points of X Axis coordinate value Y (2 Bytes): in points of Y Axis coordinate value
Background color drawing points (Delete Point)	0x58	X + Y	Note: The main drawing points with the foreground color to use, it can be used to clear the foreground color painting point

Drawing a line	0x51	X0 + Y0 + X1 + Y1	The coordinates of the two specified points are connected X₀ (2 Bytes): a straight line in points X Axis coordinate values of the starting point Y₀ (2 Bytes): a straight line in points Y Axis coordinate values of the starting point X₁ (2 Bytes): a straight line in points X Axis coordinate value of the end point Y₁ (2 Bytes): a straight line in points Y Axis coordinate value of the end point Note: The color of the line depends on the value of the foreground color
X coordinate spaced at equal Connection with the foreground color	0x59	X ₀ + Xspace + Y ₀ + ... + Y _n	Quick connect together a plurality of intervals in the X-axis coordinate point designated X (2 Bytes): in points of X Axis coordinate value Xspace (2 Bytes): in points of X Axis interval value, the neighboring points before and after the solid Fixed pitch Xspace Y (2 Bytes): in points of Y Axis coordinate value NOTE: Since this command does not need transmission X coordinate value, the instruction transmitting in half the time, Draw twice as fast. Foreground color of the line depends on the value set
The coordinate offset Connection with the foreground color	0x75	(X, Y) ₀ + (X _{1o} , Y _{1o}) + .. + (X _{no} , Y _{no})	A plurality of offsets specified coordinate points connected by a quick foreground X (2 Bytes): in points of X Axis coordinate value Y (2 Bytes): in points of Y Axis coordinate value X1o (1 Bytes): in points of X Offset shaft Y1o (1 Bytes): in points of Y Offset shaft Note: (X, Y) is absolute coordinates of the first point, a point behind each are represented by a former Absolute coordinates of points added to the current offset. Highest symbol offset Bit 0 represents a positive offset, a negative offset represents the maximum negative offset value 127 Points.
The coordinate offset Connection with the background color	0x76	(X, Y) ₀ + (X _{1o} , Y _{1o}) + .. + (X _{no} , Y _{no})	A plurality of offset coordinate points specified by the background color of the quick connect X (2 Bytes): in points of X Axis coordinate value Y (2 Bytes): in points of Y Axis coordinate value X1o (1 Bytes): in points of X Offset shaft Y1o (1 Bytes): in points of Y Offset shaft Note: (X, Y) of the first point of absolute coordinates of each point are back from the front a Absolute coordinates of points added to the current offset. Highest symbol offset Bit 0 represents a positive offset, a negative offset represents the maximum negative offset value 127 Points.
The designated coordinate points Connection with the foreground color	0x68	(X, Y) ₀ + (X, Y) ₁ ... + (X, Y) _N	A plurality of coordinate points specified by the connected foreground X (2 Bytes): in points of X Axis coordinate value Y (2 Bytes): in points of Y Axis coordinate value Note: The color of the line depends on the value of the foreground color
The designated coordinate points Connection with the background color	0x69	(X, Y) ₀ + (X, Y) ₁ ... + (X, Y) _N	A plurality of coordinate points specified by the background color are connected X (2 Bytes): in points of X Axis coordinate value Y (2 Bytes): in points of Y Axis coordinate value Note: The color of the line depends on the value of the background color
Hollow round draw	0x52	X ₀ + Y ₀ + R	Videos arbitrary coordinates a circle of radius R hollow X₀ (2 Bytes): in points of the center X Coordinate values Y₀ (2 Bytes): in points of the center Y Coordinate values R (2 Bytes): open circles of radius Note: The color depends on the value of the foreground color is set

Draw a filled circle	0x53	X ₀ Y ₀ + R	Videos arbitrary coordinates a solid circle of radius R, X ₀ (2 Bytes): in points of the center X Coordinate values Y ₀ (2 Bytes): in points of the center Y Coordinate values R (2 Bytes): open circles of radius Note: The color depends on the value of the foreground color is set
Draw an arc	0x67	X ₀ Y ₀ + R + EA + SA	Arbitrary coordinates to draw a circular arc X ₀ (2 Bytes): in points of the center X Coordinate values Y ₀ (2 Bytes): in points of the center Y Coordinate values R (2 Bytes): radius of a circle EA (2 Bytes): End angle SA (2 Bytes): starting angle Note: Watch the 3 o'clock direction is 0 degree, Counting counterclockwise; foreground color value depends on Color palette setting
Painting hollow rectangle	0x54	X ₀ Y ₀ X ₁ Y ₁	A hollow rectangle draw an arbitrary position, the screen can also be used for topical cleaning X ₀ (2 Bytes) : Hollow upper-left corner of the rectangle in points X Coordinate values Y ₀ (2 Bytes) : Hollow upper-left corner of the rectangle in points Y Coordinate values X ₁ (2 Bytes) : Hollow bottom right corner of the rectangle in points X Coordinate values Y ₁ (2 Bytes) : Hollow bottom right corner of the rectangle in points Y Coordinate values Note: The color depends on the value of the foreground color is set
Videos solid rectangle / partial Clear screen	0x55	X ₀ Y ₀ X ₁ Y ₁	Draw a filled rectangle anywhere X ₀ (2 Bytes) : Solid top-left corner of the rectangle in points X Coordinate values Y ₀ (2 Bytes) : Solid top-left corner of the rectangle in points Y Coordinate values X ₁ (2 Bytes) : Solid bottom right corner of the rectangle in points X Coordinate values Y ₁ (2 Bytes) : Solid bottom right corner of the rectangle in points Y Coordinate values Note: The color depends on the value of the foreground color is set
Hollow oval painting	0x56	X ₀ Y ₀ X ₁ Y ₁	A hollow oval anywhere Videos X ₀ (2 Bytes): in points leftmost hollow oval X Coordinate values Y ₀ (2 Bytes): uppermost end in points a hollow oval Y Coordinate values X ₁ (2 Bytes): open ovals rightmost end in points of X Coordinate values Y ₁ (2 Bytes): in points lowermost hollow oval Y Coordinate values Description: Sets the foreground color depending on the color value
Solid oval painting	0x57	X ₀ Y ₀ X ₁ Y ₁	A solid ellipse draw an arbitrary position X ₀ (2 Bytes): in points of the ellipse leftmost solid X Coordinate values Y ₀ (2 Bytes): uppermost end in points of the ellipse solid Y Coordinate values X ₁ (2 Bytes): filled in the rightmost point of the ellipse units X Coordinate values Y ₁ (2 Bytes): in points of the lowermost solid ellipse Y Coordinate values Description: Sets the foreground color depending on the color value
Clear Layer	0x05	Layer	Clear the contents of a layer Layer (1 Bytes): writing layer (in the range 0 to 1)
When the screen is switched automatically Clear the current layer	0x06	Enable	Automatically clear whether the current user switching the screen layer disposed Enable (1 Bytes): enable signals 0x01: Auto Clear Layer 0x00: Clear ban Layer Clear All contents of the user inside the two layers default screen is changed.
RTC Display Settings	0x85	Cmd + DisMode + Font	RTC Display Settings

(Need hardware support)		+ Color + X + Y	<p>Cmd (1 Bytes): parameters</p> <p>BIT0 : Enable signal</p> <p>0: RTC closed 1: RTC open</p> <p>BIT7-BIT1 : Reserved</p> <p>DisMode (1 Bytes): the display mode</p> <p>0x00: format HH: MM: SS</p> <p>0x01: format 20XX-MM-DD HH: MM: SS</p> <p>Font (1 Bytes): font selection</p> <p>0x00: 8x12 dot matrix (ASCII) 0x01: 8x16 dot matrix (ASCII)</p> <p>0x02: 12x24 dot matrix (ASCII) 0x03: 16x32 dot matrix (ASCII)</p> <p>0x04: 12 x 12 dot (GBK) 0x05: 16 x 16 dot (GBK)</p> <p>0x06: 24 x 24 dot (GBK) 0x07: 32 x 32 dot (GB2312)</p> <p>0x08: 32 x 64 dot (ASCII) 0x09: 64 x 64 dot (GB2312)</p> <p>Color (2 Bytes): Color Display</p> <p>X (2 Bytes): in points of X Axis coordinate value</p> <p>Y (2 Bytes): in points of Y Axis coordinate value</p> <p>It recommended that the user directly controls the clock to complete the RTC time display and calibration .</p>
-------------------------	--	-----------------	---

2. Configuring instructions Set Details

The following section describes the configuration and usage instruction set functionality, content related to the driver library can be viewed in reference example program. Sample programs can be downloaded from the website.

2.1 Shake hands

Format: EE [04] FF FC FF FF

Equipment return: EE 55 FF FC FF FF

Handshake apparatus for determining whether the instruction is mainly powered on initialized, normal and whether the communication is online status. After sending the command to return the device 55 It represents a handshake successful.

2.2 Reset report

Instruction format: None device returns: EE 07 FF FC

FF FF

Once the device is powered on to start, or restart unexpectedly monitoring chip reset, the data will be uploaded immediately inform users of the device has been reset. After the host detects the device user accidentally reset, the control program needs to restart from the initialization execution.

2.3 Reset the device

Format: EE [07 35 5A 53 A5] FF FC FF FF

Equipment return: EE 07 FF FC FF FF

During operation the host to reset the device through the serial port command. The initialization command is recommended to increase the host device, the host to inadvertently reset the reset device also followed.

2.4 Get Device version

Format: EE [FE 01] FF FC FF FF

Equipment return: EE FE 02 16 00 02 04 01 01 04 FF FC FF FF

Parameter Description: The device returns the firmware version number of the screen 2.22.1025.260 Wherein represents hexadecimal instruction, the corresponding conversion as follows: 02 Conversion is 2,16 Conversion is 22.00 02 Refers to the type of screen number, refers to the commercial type, 0401 Conversion is 1025 , 0104 Conversion is 260. Other types of screens to read the corresponding firmware version is also available in this way.

2.5 Backlight adjustment

Format: EE [60 Light_level] FF FC FF FF

Parameter Description: Light_level (1 Bytes) : Backlight luminance value of the instruction primarily for regulating the brightness of the LCD backlight, range 00H ~ FFH . 00H It represents the brightest backlight, FFH

It represents the darkest backlight, a total of 255 Level brightness adjustment.

If there is no operation of the operation screen within a certain period of time, it is recommended to reduce backlight brightness 30% So, in order to improve the life of the backlight.

2.6 Automatic screen saver mode

Format: EE [77 Enable BL_ON BL_OFF BL_ON_Time] FF FC FF FF

Parameter Description: Enable (1 Bytes): enable signals

0x00: Close saving mode 0x01: power-saving mode 0x03: power-saving mode

and turns on the backlight notifications

BL_ON (1 Bytes): the luminance value of the backlight touch activated

BL_OFF (1 Bytes): luminance value of the backlight into the screen saver



BL_ON_Time (2 Bytes): no touch operation is blanked mode time (unit: 1 second)

This command is mainly used to set the screen saver is activated and the backlight brightness value into the screen saver mode. The power saving mode can not only extend the lifetime of the backlight of the liquid crystal panel, the liquid crystal may also reduce the amount of heat emitted outside the light emitting tube.

2.7 Buzzer control

Format: EE [61 Time] FF FC FF FF

Parameter Description: Time (1 Bytes): Information ring the buzzer time, in 10ms

The instructions for controlling a buzzer, by setting Time Parameters to achieve different frequencies of sound information. General touch Beep time Time Set as 100ms .

2.8 Equipped with touch screen

Format: EE [70 Cmd] FF FC FF FF

Parameter Description: Cmd (1 Bytes): Configuration parameters

BIT0: 1 It represents the touchscreen to open, 0 It indicates touch screen is closed;

BIT1: 1 When the buzzer sound indicates touch, 0 He said they did not ring;

BIT4 ~ BIT2: Touch the coordinate values uploads

000: Uploads when a touch presses 1st coordinate 001: Indicates the touch screen is pressed until after release uploaded 1 coordinates

010: touch has been pressed, every 100ms upload one time coordinate, or upload one time coordinate the release of 011: 1 represents the touch screen coordinates are uploaded when pressed and released 100: Turn off the touch coordinates Upload

BIT5: 0 Shows 4 Within seconds of continuous clicking on a non-touch area 20 , The touch screen to enter calibration

mode, 1 It represents disable this function;

BIT7-BIT6 : Reserved

Upload touch coordinate value format: Upload pressed format: EE 01

XY FF FC FF FF

Upload format release: EE 03 XY FF FC FF FF , X , Y Are 2 Bytes, high byte of the first instruction includes a touch enabled, and coordinates the opening and closing buzzer uploading. As shown below 2-1 Shown, when the touch format configured to upload " 000 ", The user presses the screen (50,100)

After location, and upload data: EE 01 [00,320,064]

FF FC FF FF . Received through hosts determining the coordinates (X, Y) Whether in active touch area to determine if the current touch is valid. Device itself touch pressure value and a number of sampling operations, users no longer need for secondary operations.



Map 2-1 Touch screen work Introduction

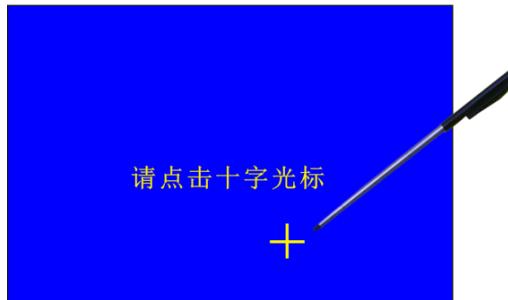
2.9 Touch screen calibration

Format: EE [72] FF FC FF FF

Parameters: None

The instructions for calibrating the touch screen. Before leaving the factory calibrated equipment, users do not need re-calibration. After sending the calibration command, the on-screen prompts corresponding to the click of a cursor, as shown in 2-2 Fig. Click The machine will indicate whether calibration completed successfully, otherwise it needs to be recalibrated. The user can also send commands through the PC calibration software.

In addition, users in a non-touch area of a point 4 Within seconds quick click 20 , The system will automatically enter touch correction mode, automatically returns the currently displayed screen calibration. This feature is more suitable for touch-site calibration.



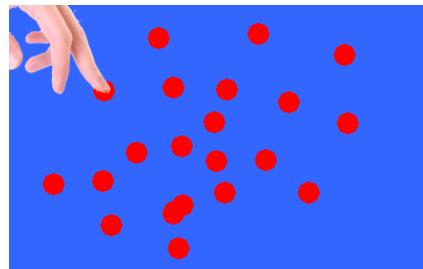
Map 2-2 Touch-screen calibration schematic

2.10 Touch Screen Experience

Format: EE [73] FF FC FF FF

Parameters: None

The test command instruction belongs. Figure 2-3 , The user presses the touch after a red solid circle corresponding coordinates, the user intuitively test quality touch screens and touch experience precise value. Equipment and PC Once connected, the user can click VisualTFT Software tool bar of the "touch experience" to experience a touch of sensitivity and accuracy.



Map 2-3 Touch experience renderings

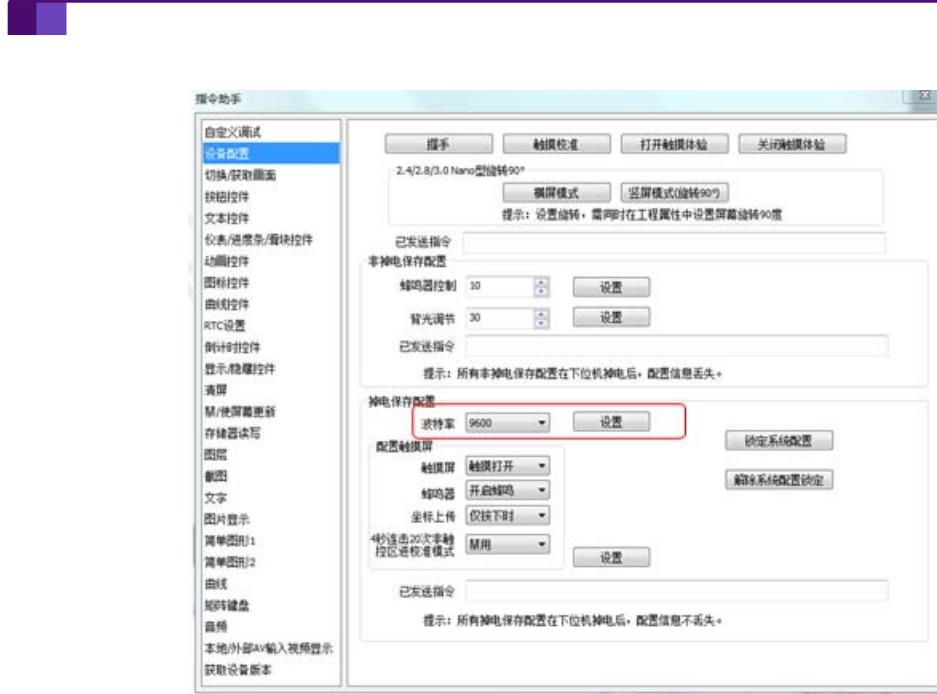
2.11 Set the baud rate

Format: EE [A0 Baudset] FF FC FF FF

Parameter Description: Baudset (1 Bytes): Baud annotating unit bps

0x00: 1200	0x01: 2400	0x02: 4800
0x03: 9600	0x04: 19200	0x05: 38400
0x06: 57600	0x07: 115200	0x08: 1M
0x09: 2M	0x0A: 2187500	0x0B: 437500
0x0C: 875000	0x0D: 921800	

This command is mainly used for baud rate configuration, the range of 1200-2Mbps . The new baud rate value down save. The user can directly through the host computer VisualTFT "Debugging Assistant" Configuring a new baud rate, as 2-4 Fig.



Map 2-4 Baud rate setting

2.12 Changing Screens

Format: EE [B1 00 Screen_id] FF FC FF FF

Parameter Description: Screen_id (2 Bytes): Screen Number

After the screen automatically switches to which button controls may be provided through while a button is pressed, but some occasions where necessary to control the host determines that logical target screen display.

Program reference code:

```
{SetScreen (2);      // Switch to Screen_id = 2 Picture
}
```

2.13 Read screen

Format: EE [B1 01] FF FC FF FF

Parameters: None

This command is used to acquire the current picture ID value. Reliability applications, the host determines whether to switch the screen by sending the command successfully.

Return instruction format: EE B1 01 Screen_id FF FC FF FF

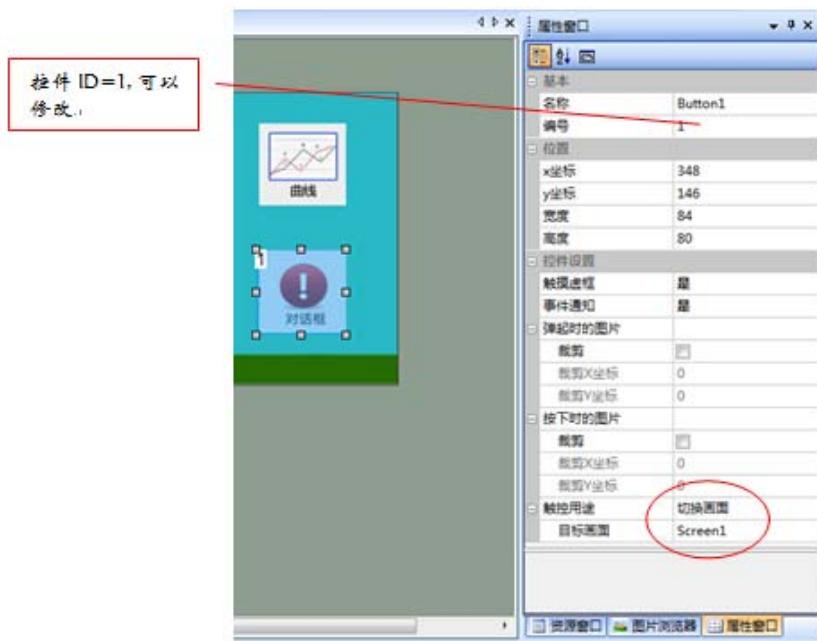
among them, Screen_id (2 Bytes): the number of the current picture

2.14 Button control ID Upload value

Button controls are 5 Such use: screen switching, the switch is described, the custom buttons, menus and pop-up custom instructions.

(1) Switching the screen. Refers to switching the screen automatically switches the screen to another screen displayed after a button is pressed.

For example, Fig. 2-5 As shown, the user clicks to achieve the "box" icon after the switch to the screen Screen1 Show, the first button is set to the entire touch region, and then select the properties window: The touch screen uses → switch; destination screen → Screen1 Finally, run a "virtual serial port screen" effect be verified. Details about PC operations, see "large color screen to configure the serial port Quick Start Guide."



Map 2-5 Button controls - switching screen configuration of FIG.

Screen switch button upload instruction format:

EE [B1 11 Screen_id Control_id Control_type Subtype Status] FF FC FF FF

Parameter Description: Screen_id (2 Bytes): Screen ID Control_id (2 Bytes):

Controls ID Numbering

Control_type (1 Bytes): fixed value 0x10 , Expressed as a button control

Subtype (1 Bytes): fixed value 0x00, It indicates that the current screen to switch the button function

Status (1 Bytes): Reserved

Switch described. Switch means described as a press button or switch bounce function, divided into 4 Styles, reads as follows:

Transients. After pressing, the switch automatically pops up, similar touch switch function;

switch. After pressing, or pressing the switch into the bounce bounce into a press, similar to the interlocking switch function; set. Switch is pressed by the pop-up becomes only; reset. Switch can only be pressed into the bounce; FIG e.g. 2-6 In ①②, the user needs to "Out" button functions as a switch, the first button is set to the entire touch region, and then select the properties window: Touch switch uses → described; style → switch operation; pressed → button to select the picture UI Finally, run a "virtual serial port screen" effect be verified.

After running virtual serial port screen, you can see the "out of service" button is pressed effect, as shown.



Map 2-6 Button controls - type switch configuration of FIG.



Map 2-7 Run virtual serial port Screen View button is pressed

Switch the type of button controls upload format:

EE [B1 11 Screen_id Control_id Control_type Subtype Status] FF FC FF FF

Parameter Description: **Screen_id** (2 Bytes): Screen Number

Control_id (2 Bytes): button control ID Numbering

Control_type (1 Bytes): fixed value **0x10** , Expressed as a button control

Subtype (1 Bytes): fixed value **0x01**, It indicates the current function to the switch button described

Status (1 Bytes): the button state

0x00 : Pressing the button into the up state

0x01 : Pop-up button becomes pressed from

User commands by parsing the microcontroller, which can determine which button is pressed or the screen pop. FIG ③④ is extended instruction,

while the button is pressed represents may also be internal / external output extra instructions, described in detail in this section refer to 4.5 with 4.6 The.

Customize button. Custom Key user is required to pre-designed keyboard on the background image, and then individually for each

Match key settings, such as some digital keys, delete some function, some are Enter Functions. The keyboard can be bound to the current screen of text control After the set, which is the value of the user's keyboard input can be automatically displayed in the text box.

For example, Fig. 2-8 , The user needs to "digital 9 "As a key button 9 Use, the first button is set to the entire touch region, and then select the properties window: → use custom key touch; → character type; write character → 9 Finally, run a "virtual serial port screen" simulation test. Further, in addition to the type of character key, but also you can select " Enter "" Clear "" Backspace "" Esc "or" Shift "Special function keys.



Map 2-8 Button control - key custom configuration of FIG.

Custom Key button to upload the format:

EE [B1 11 Screen_id Control_id Control_type Subtype Key_value Status] FF FC FF FF

Parameter Description: Screen_id (2 Bytes): Screen Number

Control_id (2 Bytes): Control Number

Control_type (1 Bytes): fixed value 0x10 , Expressed as a button control

Subtype (1 Bytes): fixed value 0x02, It indicates the current function of the button as a custom button.

Key_value (1 Bytes): a user-defined key to ASCII Code representation

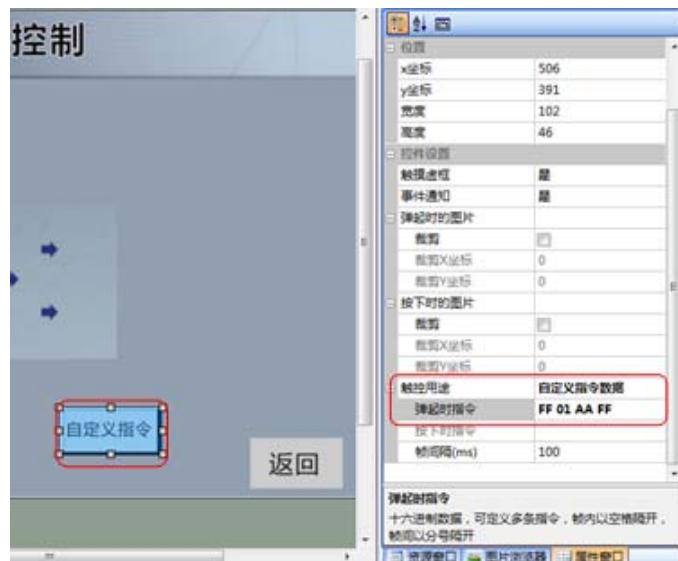
Status (1 Bytes): Reserved

Custom command. Users can set up a button is pressed, uploading data to the serial define yourself. examples 2-9

, The user may press the set "Custom instruction" button, send instructions to the screen: FF 01 AA FF .

Tip: Custom commands can not include FF FC FF FF combination of characters, otherwise it will cause an error with the conventional conflicting instructions.

Pop-up menu. The pull-down menu command mainly with use, can be used in detail in this section refer to the contents of the drop down list.



Map 2-9 Custom command data

2.15 Set button up or down state

The main achievement of the instruction screen by pressing a button or a pop-up force, that is in addition to the user clicks a button is pressed or touched disposed outside the bounce, the microcontroller can send a command to set the button state.

Format: EE [B1 10 Screen_id Control_id Status] FF FC FF FF

Parameter Description: Screen_id (2 Bytes): Screen Number

Control_id (2 Bytes): Button control Number

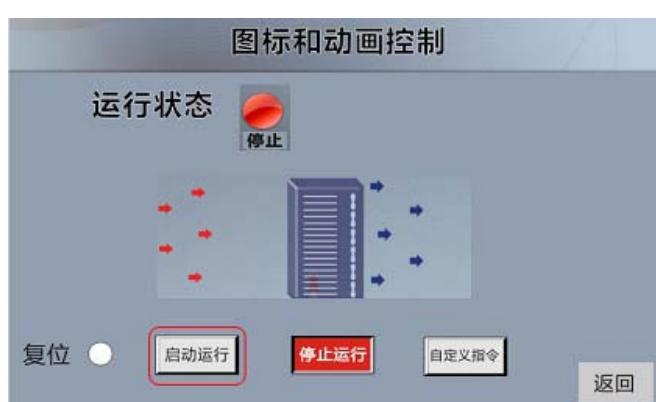
Status (1 Bytes): the button state

0x00: setting button is pressed into the up state 0x01: setting

button from the depressed state into bounce

The instruction is mainly used to "press" the button changes to "bounce" or "pop-up" button to "pressed" state. In some instances, between the button are mutually exclusive, when a button is pressed, the other must be a pop-up button, you can use the instructions.

For example, Fig. 2-10 After, the user presses the "Start Run" button, the required "stops" button (screen ID for 2 , Control ID for 4) From "press" to "pop-up" state, the microcontroller sends instructions: EE B1 10 00 02 00 04 00 FF FC FF FF .



Map 2-10 Button is pressed and set up state

Program reference code:

```
{
```

```

    .....
    // Start operation is detected to be pressed
    SetButtonValue (2,4,0) ; // the picture 2 ,control ID Place 4 Stop the Run button set up state
}

```

2.16 And internal instructions implement exclusive status display button

After the so-called internal instruction may be provided that the user presses a key, the screen also perform some internal instruction sequence, logic and achieve some status display, no external microcontroller involvement, saving the program code.

Figure 2-11 Shown, when the user presses the "up and running" button must be "stopped" button (screen ID for 4 , Control ID for 2) Was bounce, you can directly PC In the configuration. Select the properties window: internal instruction - when pressed → EE B1 10 00 04 00 02 01 FF FC FF FF After this press the "up and running", send internal screen pops "out of service" in order to achieve a button pops up automatically, without the need 4.4 The participation of the external microcontroller section.

Of course, in addition to the configuration pressing the "up and running" bounce "out of service", but also can input instructions in a plurality of other internal command frame, starting e.g. gif Animation, such as changing the operating state flag, multiple instructions separated by semicolons.



Map 2-11 Button Configuration mutually exclusive

2.17 External command output

After the so-called Foreign instruction set is that users can press a button, the external screen instructions to perform user-defined string, similar 4.3 Custom command button control in the section.

2.18 Read button control state

Format: EE [B1 11 Screen_id Control_id] FF FC FF FF

Parameter Description: Screen_id (2 Bytes): Screen Number

Control_id (2 Bytes): Control Number

The instruction is mainly used to query a button is currently "pressed" or "pop-up" state. Return instruction format: EE B1 11 Screen_id Control_id Control_type Subtype Status FF FC FF FF

Parameter Description: Screen_id (2 Bytes): Screen Number

Control_id (2 Bytes): Control Number

Control_type (1 Bytes): fixed value 0x10 , Expressed as a button control

Subtype (1 Bytes): fixed value 0x01, It means that the button switch is of the type described



Status (1 Bytes): the button state

0x00: pop-up buttons Status

0x01: button is pressed

2.19 Update text control value

There are three ways to update text: host user input, the pop-up keyboard input systems and custom keyboard input.

1. Host user input. Data displayed on the screen microcontroller input from a user. Format: EE [B1

10 Screen_id Control_id Strings] FF FC FF FF

Parameter Description: Screen_id (2 Bytes): Screen Number

Control_id (2 Bytes): Control Number

Strings (Variable): The user writes a character string

This command is mainly used for displaying text. Because the system for all text variables memory addresses are assigned, when the screen again to return from the other interface text interface, text data is still stored without refreshing the data again.

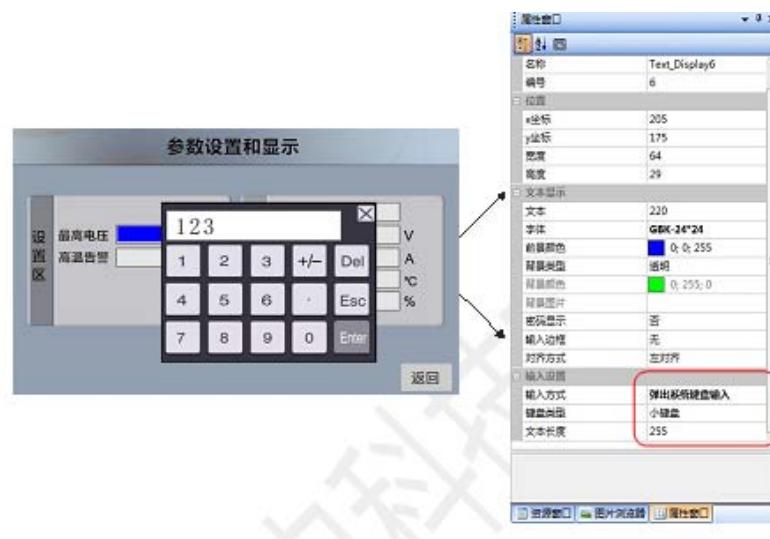
When using text control, the user first related parameters in the PC, such as font size, foreground color, background color, text input mode, and the like, as shown in 2-12 Shown, and then direct the respective host needs only ID Data can be written to change.



Map 2-12 Text control parameter configuration

Pop-up keyboard input system. When clicking the text box, the system automatically eject the built-in keyboard, click OK After the user inputs a desired character, the device will display the characters input in the text box, while the character ASCII Code uploaded to the host.

For example, a user pre-set text controls, input mode selection "pop-up keyboard" as 2-13 Fig. Click on the text box, the system will automatically pop up screen keypad, input "123" Click Enter , The digital input at this time is automatically displayed on the text box, upload both entry ASCII Code, upload the following format to be introduced "to read text control value" to return to the same format. SCM user parsed upload instructions can know the data entry.



Map 2-13 Pop-up keypad system

If users need to input Chinese characters, simply select the type of keyboard is a full keyboard, then click on English switch key on the keyboard, as 2-14 Fig.

Note: because of the display area, only 3.5 inch or more (not including the 3.5-inch) in size only to support full keyboard and input method.



Map 2-14 Pop-up system-wide keyboard and text input

Custom key input. Text box input data from the keyboard in the same picture. Figure 2-15 Shown, when the user needs to implement a password input operation using the first custom key function button control, it will be defined as corresponding to each button ASCII Character (referring to FIG. 2-8 Shown) is then placed in a password box text control, the properties of the input mode is set to "custom key input." After clicking the text box so that the interface will automatically appear flashing cursor, keyboard and on the right, the corresponding number is automatically displayed in the text box, while the input character ASCII Code will also be uploaded to the host.

Tip: Once configured, it is recommended to run a "virtual serial port screen" to view the information screen after pressing each button upload.



Map 2-15 Custom key input

2.20 Clear text control content

Format: EE [B1 10 Screen_id Control_id] FF FC FF FF

Parameter Description: Screen_id (2 Bytes): Screen Number

Control_id (2 Bytes): number of the control value of the current instruction is mainly used to clear the text control.

2.21 Read the text control value

Format: EE [B1 11 Screen_id Control_id] FF FC FF FF

Parameter Description: Screen_id (2 Bytes): Screen Number

Control_id (2 Bytes): Control Number

This command is used to acquire the current value of the text control. For some important parameters, the user can use to get the text value of the control command to re-check.

Return instruction format: EE B1 11 Screen_id Control_id Control_type Strings FF FC FF FF

Return parameter: Screen_id (2 Bytes): Screen Number

Control_id (2 Bytes): Control Number

Control_type (1 Bytes): fixed value 0x11 , Expressed as text controls

Strings (Variable): value of the currently displayed text, the text that follows an additional 0x00 As the terminator

2.22 Setting cursor focus

Format: EE [B1 02 Screen_id Control_id Enable] FF FC FF FF

Parameter Description: Screen_id (2 Bytes): Screen Number

Control_id (2 Bytes): Control Number

Enable (1 Bytes): 0x00 Means closed, 0x01 Represents a turn on the display; the main instruction cursor symbol

transplanted to control displays specified text, the text entered by the user is more intuitive alert.

Tip: valid only in the custom keyboard.

2.23 Set text control flashes

Format: EE [B1 15 Screen_id Control_id Cycle] FF FC FF FF

Parameter Description: Screen_id (2 Bytes): Screen Number

Control_id (2 Bytes): Control Number

Cycle (2 Bytes): blinking cycle (10 Milliseconds), 0 No flashing

This command is mainly used to implement text control flashing alternately, Cycle Value 0 When stops flashing.

2.24 Set the text scrolling speed control

Format: EE [B1 16 Screen_id Control_id Speed] FF FC FF FF

Parameter Description: Screen_id (2 Bytes): Screen Number

Control_id (2 Bytes): Control Number

Speed (2 Bytes): text scroll speed (moving pixels per second), 0 He said they did not scroll

This instruction is mainly used for scrolling text display, default scrolling from right to left, Speed Value 0 It means stop scrolling.

2.25 Set the background color of the text control

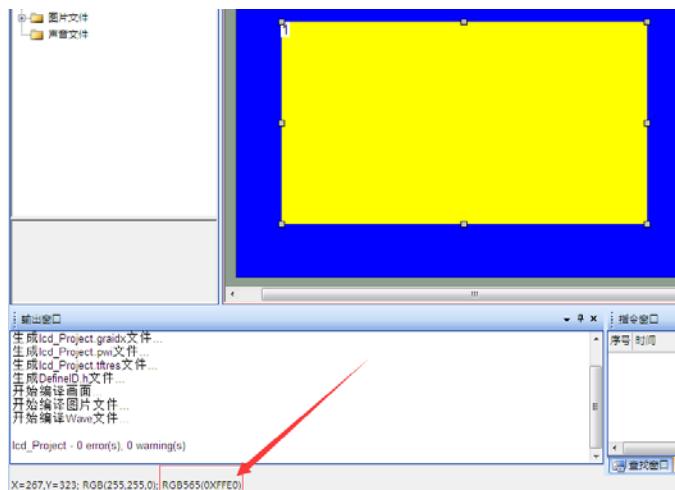
Format: EE [B1 18 Screen_id Control_id BK_Color] FF FC FF FF

Parameter Description: Screen_id (2 Bytes): Screen Number

Control_id (2 Bytes): Control Number

BK_Color (2 Bytes): background color RGB Color values

The instruction is mainly used during operation to add the background display text controls, or text is selected to achieve outstanding results. How to obtain background / foreground RGB Color values? The user can arbitrarily create a screen, drawing a rectangle, the rectangle's color to their desired color, and then the mouse is placed on the rectangle, the bottom left software will display the current screen mouse RGB565 Color values, as in FIG. 2-16 Shows.



Map 2-16 Foreground / background color color extraction

2.26 Set the text background transparent

The instruction is mainly used to cancel text controls with background display instruction format: EE [B1 17

Screen_id Control_id] FF FC FF FF

Parameter Description: Screen_id (2 Bytes): Screen Number

Control_id (2 Bytes): Control Number

2.27 Set the foreground color text controls

The instruction is mainly used to replace the text displayed in the color control operation, achieve some alarm, highlighting the

like. Format: EE [B1 19 Screen_id Control_id FORE_Color] FF FC FF FF

Parameter Description: Screen_id (2 Bytes): Screen Number

Control_id (2 Bytes): Control Number

FORE_Color (2 Bytes): foreground color RGB Color values

2.28 Formatting text display

Format: EE [B1 07 Screen_id Control_idSign Fill_zero Value] FF FC FF FF

Parameter Description: Screen_id (2 Bytes): Screen Number

Control_id (2 Bytes): Control Number

Sign (1 Bytes): data type, namely:

Unsigned int: unsigned integer, 0x00; Int: Signed

integer, 0x01; Float: single precision floating, 0x02;

Double: double precision floating point, 0x03;

Fill_zero (1 Bytes): number of decimal places, if you choose to make up less than 0, then need to add 0x80;

Value (4 Bytes): adding data in hexadecimal representation;

This command is mainly used for inputting text according to the corresponding conditions, to display the text data according to the corresponding constraints.

2.29 Digital command text controls upregulated

Format: EE [B1 1A Screen_id Control_idOptionDeltaMin_LimitMax_Limit] FF FC FF FF

Parameter Description: Screen_id (2 Bytes): Screen Number

Control_id (2 Bytes): Text Control Number

Option (1 Bytes): bit0-0 cut back, 1 increase; bit1-0 Not cycle regulation, 1 Cycle regulation.

Increasing the loop instruction is not 0x01 ; Loop instruction to increase 0x03 ; Loop

instruction is not reduced 0x00 ; Reduced instruction cycle 0x02 ;

Delta (2 Bytes): delta, i.e. the magnitude of each adjustment;

Min_Limit (2 Bytes): minimum value;

Max_Limit (2 Bytes): maximum value;

This instruction is generally used when the click button control, the text display control values up or down, generally used as internal command button control. If the operating style button control is set to a long time, it can be sustained for text control increment or decrement.

2.30 Update progress bar control value

Format: EE [B1 10 Screen_id Control_id Progressvalue] FF FC FF FF

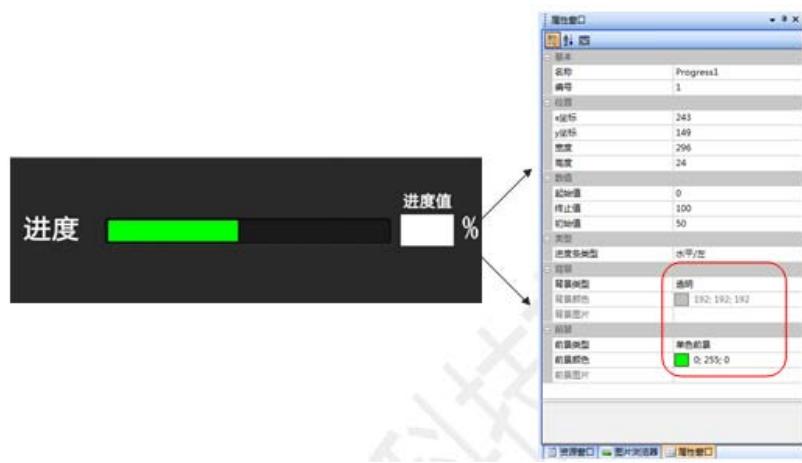
Parameter Description: Screen_id (2 Bytes): Screen Number

Control_id (2 Bytes): Control Number

Progressvalue (4 Bytes): the new value of the progress of increment or

decrement command implemented primarily progress.

When using the progress bar control, the user is first performed in the host computer controls the configuration parameters, such as the foreground, background, maximum and minimum values and the like, as shown in 2-17 As shown in, then the appropriate host needs only to ID Write a progress bar progress bar to scroll value can be realized.



Map 2-17 Progress bar control configuration information

2.31 Reading progress bar control value

Format: EE [B1 11 Screen_id Control_id] FF FC FF FF

Parameter Description: Screen_id (2 Bytes): Screen Number

Control_id (2 Bytes): Controls Number This command is used to acquire the current value of the progress bar. Return

instruction format: EE B1 11 [Screen_id Control_id Control_type Progressvalue] FF FC FF FF

Return parameter: Screen_id (2 Bytes): Screen Number

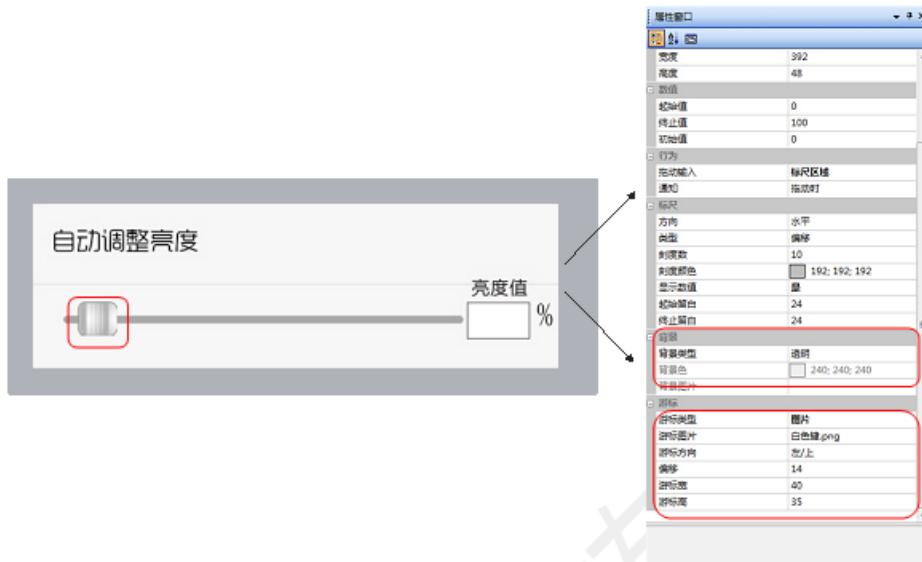
Control_id (2 Bytes): Control Number

Control_type (1 Bytes): fixed value 0x12 , Expressed as a progress bar control

Progressvalue (4 Bytes): this value progress bar

2.32 Slider controls upload format

When using the slider control, the user is first performed in the host computer controls the configuration parameters, such as the scale length, direction, the cursor image, and background values, etc., as shown in 2-18 , When the user drags a cursor, the device will continue to upload the current cursor value to the host, by determining the value of the cursor position to know the current location of the slider.



Map 2-18 Slider control configuration diagram

Upload slider control format:

EE [B1 11 Screen_id Control_id Control_type Slidervalue] FF FC FF FF

Parameter Description: Screen_id (2 Bytes): Screen Number

Control_id (2 Bytes): Control Number

Control_type (1 Bytes): fixed value 0x13 , Expressed as a slider control

Slidervalue (4 Bytes): indicates the current cursor value

2.33 Set the background color of the progress bar

Format: EE [B1 18 Screen_id Control_id Bk_Color] FF FC FF FF

Parameters: Screen_id (2 bytes): Screen Number

Control_id (2 bytes): Controls Number Bk_Color (2

bytes): background color RGB color value

This command is mainly used for the background color progress bar, the user can change the background color of the progress bar by instructions.

2.34 Set the foreground color of the progress bar

Format: EE [B1 19 Screen_id Control_id Bk_Color] FF FC FF FF

Parameters: Screen_id (2 bytes): Screen Number

Control_id (2 bytes): Controls Number Fore_Color

(2 bytes): foreground RGB color value

The instruction set primarily for foreground progress bar, the user can change the foreground color of the progress bar by an instruction.

2.35 Update slider control value

Format: EE [B1 10 Screen_id Control_id Slidervalue] FF FC FF FF

Parameter Description: Screen_id (2 Bytes): Screen Number

Control_id (2 Bytes): Control Number

Slidervalue (4 Bytes): new cursor value

This command is used to control the cursor display position of the slider. The hosts can send the corresponding control command cursor forced display in a certain position.

2.36 Reads the value slider controls

Format: EE [B1 11 Screen_id Control_id] FF FC FF FF

Parameter Description: Screen_id (2 Bytes): Screen Number

Control_id (2 Bytes): number of the control instruction value of the current cursor is used to acquire. Return

instruction format: EE B1 11 [Screen_id Control_id Control_type Slidervalue] FF FC FF FF

Return parameter: Screen_id (2 Bytes): Screen Number

Control_id (2 Bytes): Control Number

Control_type (1 Bytes): fixed value 0x13 , Expressed as a slider control

Slidervalue (4 Bytes): indicates the current cursor value

2.37 RTC Clock Set

Format: EE [81 Sec Min Hour Day Week Mon Year] FF FC FF FF

Parameter Description: Sec: SEC Sets

Min: Set points

Hour: Set hours

Day: Date Set

Week: Set week Mon: Set month



Year: In settings

The above parameters are 1 byte to BCD code, Sunday is set to 0x00

This command is mainly used to set the parameters of the current time, the user is directly set by the PC software. We recommended to use the clock control to display RTC . You can click on the pop-up touch keypad to calibrate the current time.

2.38 Read RTC clock

Format: EE [82] FF FC FF FF

Parameters: None

This command is used to acquire the current time values. Upload data format: EE F7 Year Mon Week

Day Hour Min Sec FF FC FF FF . The above parameters are 1 Byte order BCD Code representation

2.39 Update instrument control value

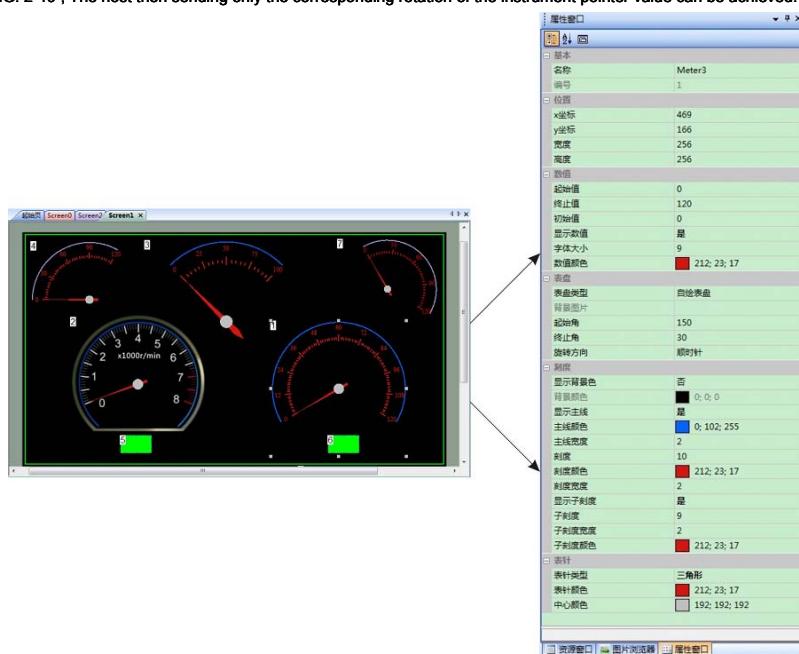
Format: EE [B1 10 Screen_id Control_id Metervalue] FF FC FF FF

Parameter Description: Screen_id (2 Bytes): Screen Number

Control_id (2 Bytes): Control Number

Metervalue (4 Bytes): new instrument value

When using the instrument control, the user is first performed in the host computer controls the configuration parameters, such as the dial, dial, pointer values, etc., in FIG. 2-19 , The host then sending only the corresponding rotation of the instrument pointer value can be achieved.



Map 2-19 Instrument control configuration information

For example, the user needs to first 0 Screens, controls ID for 4 The value written instrument controls 100 , The following program code. Program reference code:

```
{
    ...
    SetMeterValue (0,4,100) // Picture 0 Controls ID for 4 The value written instrument controls 100 ,
}
}
```

2.40 Meter reading value Controls

Format: EE [B1 11 Screen_id Control_id] FF FC FF FF

Parameter Description: Screen_id (2 Bytes): Screen Number



Control_id (2 Bytes): Controls Number This command is used to acquire the current value displayed by the instrument.

Return instruction format: EE B1 11 Screen_id Control_id Control_type Metervalue FF FC FF FF

Return parameter: Screen_id (2 Bytes): Screen Number

Control_id (2 Bytes): Control Number

Control_type (1 Bytes): fixed value 0x14 , Expressed as instrument control type

Metervalue (4 Bytes): this value is displayed in the meter

2.41 Animation control displays

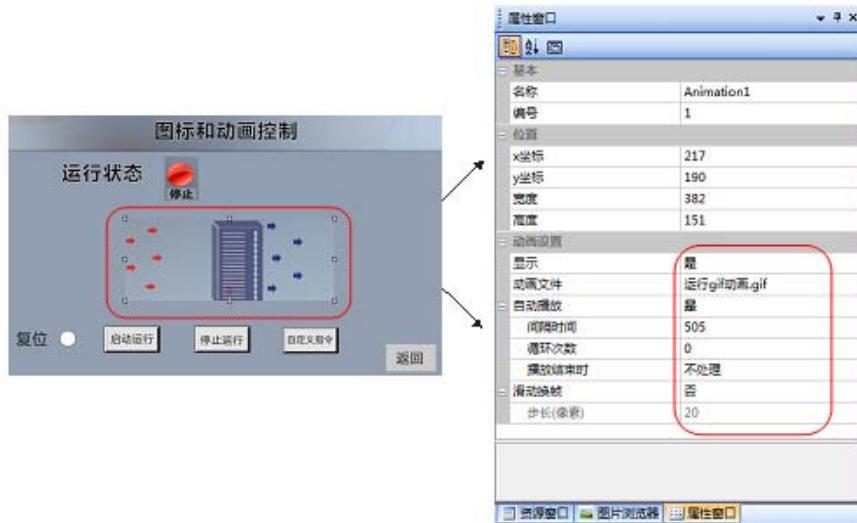
Control calls through animation gif Animation, can support multiple within the same screen gif Display, the user sends a corresponding command can control the animation play, stop, pause, and upper / lower frames and other functions, as described in Table instructions 2.1 Fig.

table 2.1 Animation Control Instruction List

Features	Instruction format
Start animation	EE [B1 20Screen_id Control_id] FF FC FF FF Screen_id (2 Bytes): Screen Number Control_id (2 Bytes): After the control numbers start playback, animation, each frame header from 0 to start playing
Stop the animation	EE [B1 21Screen_id Control_id] FF FC FF FF Screen_id (2 Bytes): Screen Number Control_id (2 Bytes): After the control number to stop playing, the next from the header 0 Start playing
Suspended animation	EE [B1 22Screen_id Control_id] FF FC FF FF Screen_id (2 Bytes): Screen Number Control_id (2 Bytes): After the pause control number, the next will continue to play a pause frame
Specified frame playback	EE [B1 23Screen_id Control_idFlashImage_ID] FF FC FF FF Screen_id (2 Bytes): Screen Number Control_id (2 Bytes): Control Number FlashImage_ID (1 Bytes): a frame animation ID Specify the start playback from a frame
Played on a	EE [B1 24Screen_id Control_id] FF FC FF FF Screen_id (2 Bytes): Screen Number Control_id (2 Bytes): a control number is displayed on the contents of the current frame,
Play the next frame	EE [B1 25Screen_id Control_id] FF FC FF FF Screen_id (2 Bytes): Screen Number Control_id (2 Bytes): Controls the next frame number display contents of the current frame,
Animation control value to upload	EE [B1 26Screen_id Control_idStatusFlashImage_ID] FF FC FF FF Press a animation control when the device to upload the following information: Screen_id (2 Bytes): Screen Number Control_id (2 Bytes): Control Number Status (1 Bytes): 0x00 It indicates touch Press, 0x01 Expressed bounce

	FlashImage_ID (1 Bytes): indicates when the screen is pressed, the frame displayed on the screen at the moment ID Note: Users can configure prohibited PC Software / enable animation control value to upload.
--	---

In use, the user first animation control by calling gif Animation display, and then set the need to touch a notification (that is, if you want to upload click animation animation control ID Value) and auto-play as 2-20 Fig. Interval animation automatically from gif Original file extraction.



Map 2-20 Animation control configuration diagram

2.42 Icon Control display

Format: EE [B1 23 Screen_id Control_id IconImage_ID] FF FC FF FF

Parameter Description: Screen_id (2 Bytes): Screen Number

Control_id (2 Bytes): Control Number

IconImage_ID (1 Bytes): ICON File icon in a frame ID

The command is mainly to solve the same position different from the state of FIG handover or intra display disappears. How to generate ICON icon?

Before using the user to click VisualTFT Software Tools menu, select → icon generation, pop up 2-21 Screen shown, then premade 3 Zhang 62x82 Pixel picture (stop, run and transparent PNG)

Added to it, in accordance with the order, each of 1 Frame stop frame, the first 2 Frame and running 3 Frame transparent pictures, and finally click Generate icon. Such a new ICON File is generated, which contains 3 Picture frames.

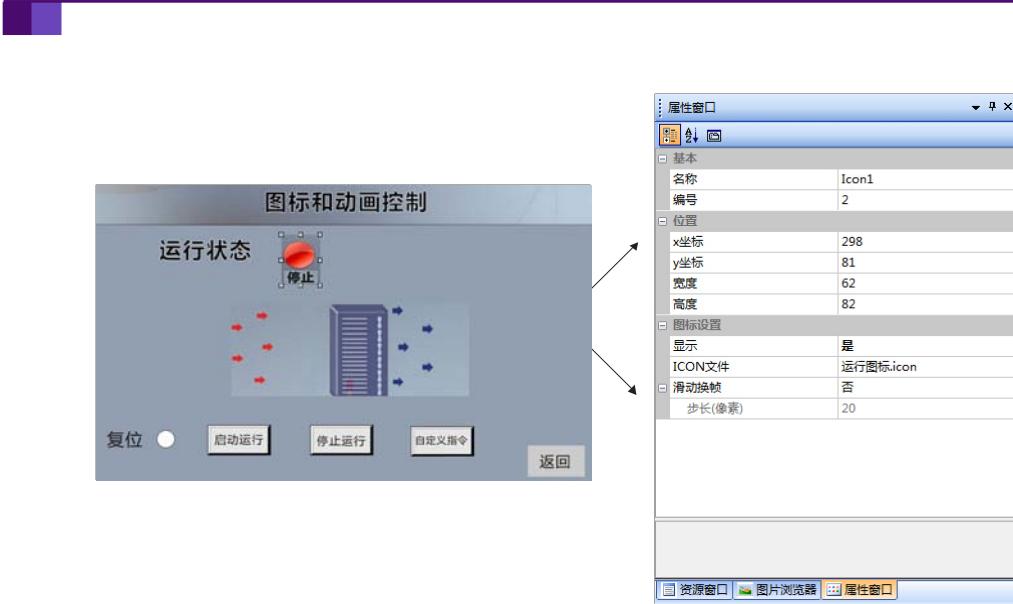


Map 2-21 Icon generation tool

When used, the user first calls the newly generated by the icon controls ICON Display, and then set the need to touch a notification (that is, click on the icon controls whether to upload ID) And AutoPlay, FIG. 2-22 Fig. The default screen display ICON

First 1 Frames, if desired switching state diagram shows, the host program simply send ICON Number and the first few frames to complete the display.

Transparent frame is actually an empty PNG Picture, transparent display frame can achieve the effect icon disappears or hidden.



Map 2-22 Icon Control configuration diagram

2.43 Read numerical control icon

Format: EE [B1 11 Screen_id Control_id] FF FC FF FF

Parameter Description: Screen_id (2 Bytes): Screen Number

Control_id (2 Bytes): Controls Number This command is used to acquire frame currently displayed icon ID . Return instruction format: EE B1 11 Screen_id Control_id Control_type IconImage_ID FF FC FF FF

Return parameter: Screen_id (2 Bytes): Screen Number

Control_id (2 Bytes): Control Number

Control_type (1 Bytes): fixed value 0x16 , Represented as an icon control type

IconImage_ID (2 Bytes): icon display of the current frame ID

2.44 Icon Control value upload

Upload instruction format: EE [B1 26 Screen_id Control_id Status IconImage_ID] FF FC FF FF

Parameter Description: Screen_id (2 Bytes): Screen Number

Control_id (2 Bytes): Control Number

Control_type (1 Bytes): fixed value 0x16 , Represented as an icon control type

IconImage_ID (1 Bytes): ICON File in a picture frame ID

If the PC Software is selecting the notification icon touch control, the user clicks on the icon, the device will be uploaded to icon controls ID

And the current picture frame ID .

2.45 Settings icon location

Upload instruction format: EE [B1 28 Screen_id Control_id XY] FF FC FF FF

Parameter Description: Screen_id (2 Bytes): Screen Number

Control_id (2 Bytes): Control Number

X (2 Bytes): shown X Coordinate position

Y (2 Bytes): shown Y The coordinate position of instruction is

mainly used to dynamically adjust the position of the icon display control.

2.46 Batch updates the control value

Upload instruction format: EE [B1 12 Screen_id + Control_id0 + Len0 + Strings0 + + ... Control_idn + Lenn + Stringsn] FF

FC FF FF

Parameter Description: Screen_id (2 Bytes): Screen Number

Control_id0 (2 Bytes): First 1 No one controls

Len0 (2 Bytes): First 1 A control byte length

Strings0 (Variable length): The first 1 A numerical control, the number of bytes Len0 On the length of

Control_idn (2 Bytes): First n No one controls

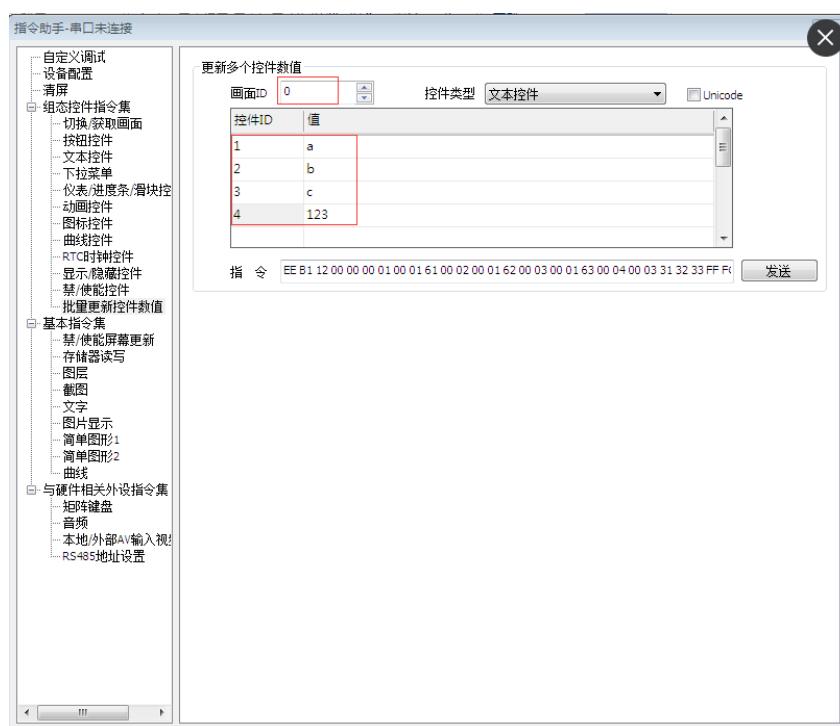
Lenn (2 Bytes): First n A control byte length

Stringsn (Variable length): The first n A numerical control, the number of bytes Lenn On the length of the bulk update instructions to

solve too many controls update data in a screen refresh while low speed problem. Use batch update command transmission not only saves time, but at the same time to update all the data together.

The test batch update command, you can open VisualTFT The "instruction assistant", enter several text verification test control values,

FIG. 2-23 Fig.



Map 2-23 Batch update text controls

2.47 Curve control displays

If you need dynamic chart data collection, automatic pan around the curve control will give users a great convenience. Table instructions introduction 2.2

, The PC software configuration diagram of FIG. 2-24 Fig.

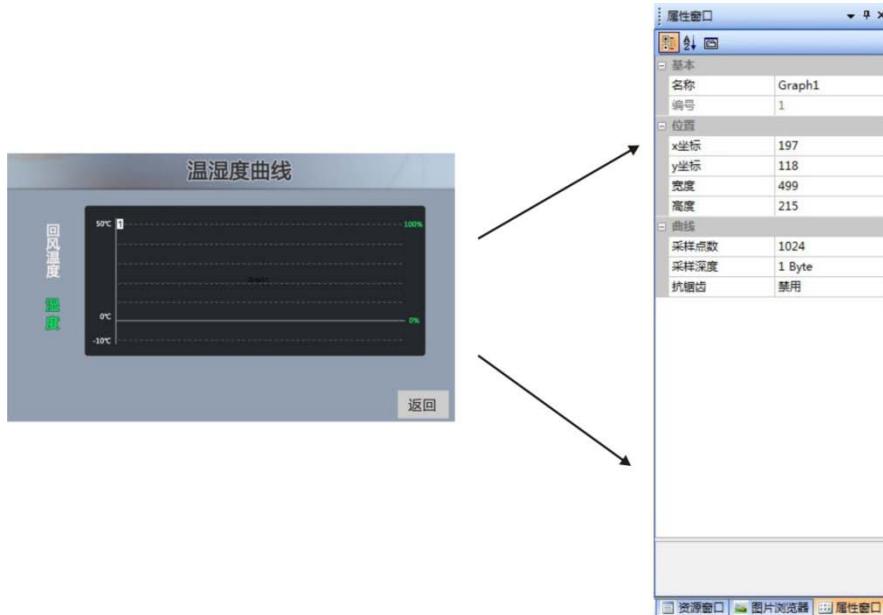
Recommendation: detailed tutorial curve control, you can log in www.gz-dc.com Download the bar to download.

table 2.2 Curve control command table

Features	Instruction format
Adding data channel	EE [B1 30 SCREEN_ID CONTROL_ID CHANNEL COLOR] FF FC FF FF

	<p>Curve color specified data channel and</p> <p>SCREEN_ID (2 Bytes): Screen Number</p> <p>CONTROL_ID (2 Bytes): Control Number</p> <p>CHANNEL (1 Bytes): total 8 Data channels, the number range (0 to 7)</p> <p>COLOR (2 Bytes): Color data channel</p>
Remove the specified data channel	<p>EE [B1 31 SCREEN_ID CONTROL_ID CHANNEL] FF FC FF FF</p> <p>SCREEN_ID (2 Bytes): Screen Number</p> <p>CONTROL_ID (2 Bytes): Control Number</p> <p>CHANNEL (1 Bytes): total 8 Data channels, the number range (0 to 7)</p>
Specifies the vertical / horizontal zoom / pan	<p>EE [B1 34 SCREEN_ID CONTROL_ID XOFFSET XMUL YOFFSET YMUL] FF FC FF FF</p> <p>Specifies the vertical / horizontal zoom / pan</p> <p>SCREEN_ID (2 Bytes): Screen Number</p> <p>CONTROL_ID (2 Bytes): Control Number</p> <p>XOFFSET (2 Bytes): horizontal offset data points, the left is positive, negative right</p> <p>XMUL (2 Bytes): the horizontal zoom parameter, the unit 0.01 YOFFSET (2 Bytes): vertical offset value, down is positive, the shift is negative</p> <p>YMUL (2 Bytes): the vertical scaling unit 0.01</p> <p>Sampling point and the calculated coordinate point: first N Values of sampling points VX Coordinates $= (N \cdot XOFFSET) * XMUL * 0.01$ Y Coordinates $= (V \cdot YOFFSET) * YMUL * 0.01$</p>
The front end of the specified channel to add new data	<p>EE [B1 32 SCREEN_ID CONTROL_ID CHANNEL DATA_LEN DATA] FF FC FF FF</p> <p>Adding new data in the specified data channel front end, when the data length exceeds the length of the buffer, the old data to the right</p> <p>SCREEN_ID (2 Bytes): Screen Number</p> <p>CONTROL_ID (2 Bytes): Control Number</p> <p>CHANNEL (1 Bytes): total 8 Data channels, the number range (0 to 7)</p> <p>DATA_LEN (2 Bytes): data length</p> <p>DATA : Variable length data, length of the DATA_LEN Specification format: Data are representative of Y Value axis direction, X Will automatically increment the axial direction from the horizontal scaling factor, for example, when the horizontal scaling factor 1 When each insertion point X Automatic shaft 1 When the level of zoom factor 5 When each insertion point X Automatic shaft 5</p>
Add new data at the end of the specified channel	<p>EE [B1 35 SCREEN_ID CONTROL_ID CHANNEL DATA_LEN DATA] FF FC FF FF</p> <p>Insertion of new data at the end of the specified data channel, when the data length exceeds the length of the buffer, the old data is left</p> <p>SCREEN_ID (2 Bytes): Screen Number</p> <p>CONTROL_ID (2 Bytes): Control Number</p> <p>CHANNEL (1 Bytes): total 8 Data channels, the number range (0 to 7)</p> <p>DATA_LEN (2 Bytes): data length</p> <p>DATA : Variable length data, length of the DATA_LEN Designation</p>
Empty specified data channel	EE [B1 33 SCREEN_ID CONTROL_ID CHANNEL] FF FC FF FF

	Empty specified data channel SCREEN_ID (2 Bytes): Screen Number CONTROL_ID (2 Bytes): Control Number CHANNEL (1 Bytes): total 8 Data channels, the number range (0 to 7)
--	---



Map 2-24 Control graph configuration of FIG.

2.48 Setting drop-down menu written text control

Format: EE [B1 13Screen_id Control_id Enable Textctrl_ID] FF FC FF FF

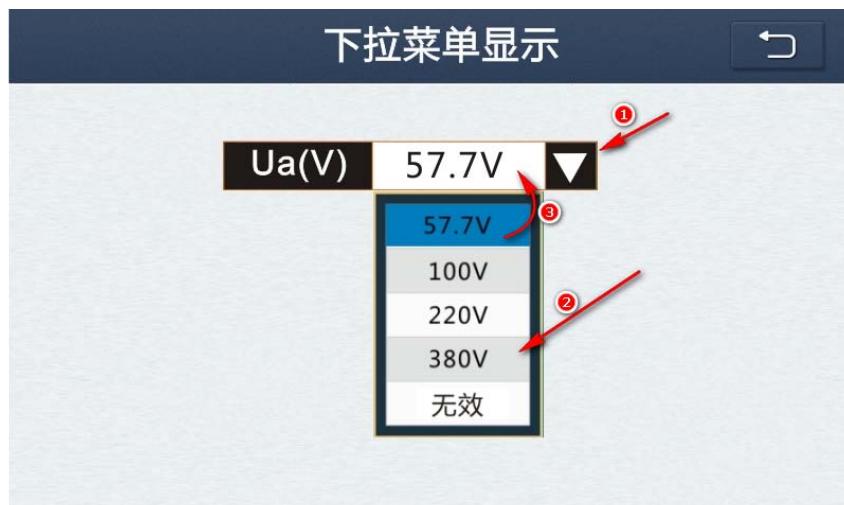
Parameter Description: Screen_id (2 Bytes): Screen Number

Control_id (2 Bytes): Control Number

Enable (1 Bytes): menu enabled. 1 Display menu; 0 The menu is not displayed

Textctrl_ID (2 Bytes): Menu data to be written to a text control number of the instruction set after the main menu pops up, write data to the options menu which text control. Assume that the user needs to achieve the following functions: Click map 2-25 ① shown in the drop-down button, pop-up drop-down menu ②, the user selects 57.7V Data item ③, at which time the control data is automatically written into the text (Text boxes) while uploading screen menu control

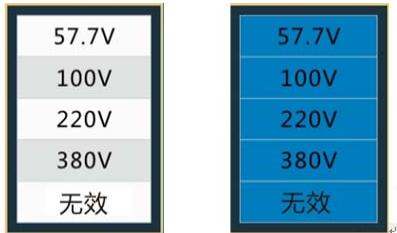
ID Options to the user ID and the microcontroller, the operation is as follows.



Map 2-25 Pull-down menu display

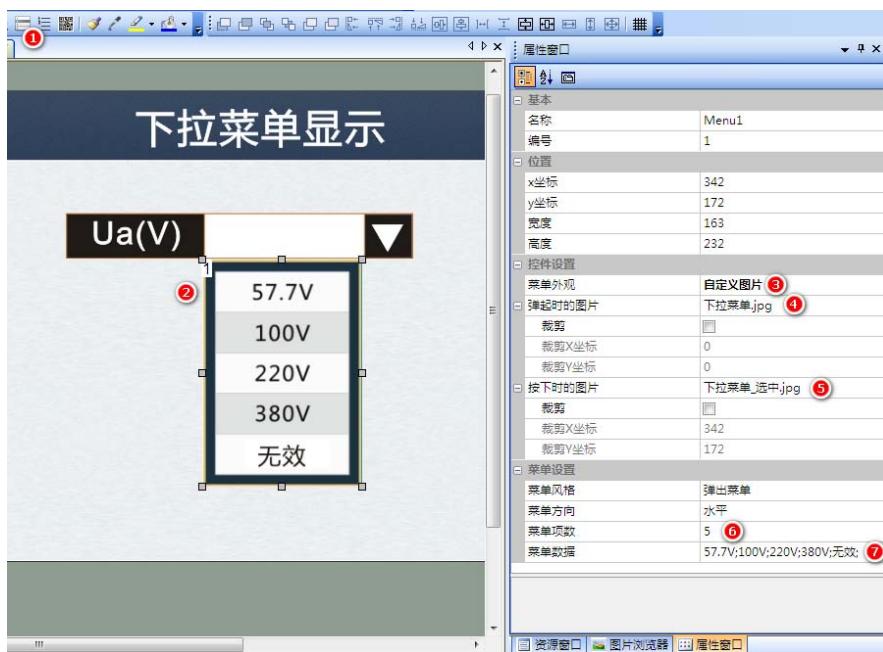
Steps:

1. ready 2 Zhang menu pictures shown 2-26 As shown, selected and unselected. If need to press down to select the effect, not just selected 1 Pictures can be.



Map 2-26 Unchecked (left) and selected (right) pull-down menu picture

Settings drop-down menu properties. According to FIG. 2-27 Shown, click the dropdown menu control at ①, ② in drag at a location map, ③ in the properties window at the right, to the appearance of the menu: custom image, and then set the bounce respectively ④, ⑤ at press the menu picture, the number of menu items at set ⑥ 5 , Expressed 5 Drop-down items, and finally fill all the data in the drop-down ⑦ place. Use spaced separately from the data before the data must DBC semicolons.



Map 2-27 Settings drop-down menu properties

Set the eject button and the menu written text control. Figure 2-27 Shown, into the text control, the control in ① ID for 2 And then placed at ② 1 Control buttons, pop-up menu is provided to use the touch, as indicated by ③, finally ④, ⑤, respectively fill the menu control ID And text controls ID value.



Map 2-28 Settings drop-down menu button and text control

The operation is completed. After compile and run virtual serial port screen, click the drop-down button, it will pop-up menu, and then select the menu item, load the data into a text control and upload ID Information, as 2-29 Fig.



Map 2-29 Upload drop-down menu command

2.49 Upload drop-down menu control value

Format: EE [B1 14 Screen_idControl_id1A Meundata_ID Status] FF FC FF FF

Parameter Description: Screen_id (2 Bytes): Screen Number

Control_id (2 Bytes): Control Number

0x1A (1 Bytes): fixed value, pull down menu

Meundata_ID (1 Bytes): The first several options in the drop-down menu data

Status (1 Bytes): touch state, 0 At the moment represents the button up, 1 Button is pressed when the pop-up drop-down menu,

the user selects the required data, will screen at the moment the current menu controls ID Select the number and value of items uploaded to the user microcontroller. User by analyzing serial data, to know the current press data.

2.50 Selection control value setting slide

Format: EE [B1 10 Screen_idControl_idSelect_data_ID] FF FC FF FF

Parameter Description: Screen_id (2 Bytes): Screen Number

Control_id (2 Bytes): Control Number

Select_data_ID (2 Bytes) : Select the slide control options ID

The instruction selection control slide is provided mainly for the current option, i.e. by sliding option selection control ID To index numbers, this function can be selected by sliding the control "state display" function, i.e. transmitting a corresponding index ID , Select the control slide shows the current data item.

2.51 Reading the control value selection slide

Format: EE [B1 11 Screen_idControl_id] FF FC FF FF

Parameter Description: Screen_id (2 Bytes): Screen Number

Control_id (2 Bytes): Controls Number This command is used to acquire the control slide to select

the current option. Return instruction format: EE B1 11 Screen_id Control_id 1Bvalue FF FC FF FF

Return parameter: Screen_id (2 Bytes): Screen Number

Control_id (2 Bytes): Control Number

0x1B (1 Bytes): fixed value indicating selection control slide

value (1 Bytes): this index value of the selected item selection control displays the slide

2.52 Slide selection control value to upload

Format: EE [B111Screen_idControl_id1B Select_data_ID] FF FC FF FF

Parameter Description: Screen_id (2 Bytes): Screen Number

Control_id (2 Bytes): Control Number

0x1B (1 Bytes): fixed value indicating selection control slide

Select_data_ID (1 Bytes) : The first few options data selection menu

The main achievement of instruction data to select the desired slide up and down, the system automatically select the upload control ID Value and the currently selected value. Assume that the user needs to implement FIG. 2-30 FIG brightness setting effect, a finger slide up and down to select the desired value and then select the slide control screen upload ID Options to the user ID and the microcontroller, the operation is as follows.



Map 2-30 Slide selection control display

Steps:

1. Figure 2-31 As shown, click on the software menu bar at the slide ① selection control, in Figure ② Place a slide control selection



Pieces.

2. ② properties window provided at the font size ASCII16 * 32 , After the size of the display font size is selected.

3. Some parameters are defined as follows:

Color Center: a rear display color data is selected; ends Color: represents

the uppermost and lowermost color data;

Zoom ends: indicates the percentage of the font's size and the lowermost intermediate, 50% intermediate represented ends font half,

0 as all font sizes, not scale.

It shows the number of entries: 3 and 5 fixed to two kinds.

Initial Option: indicates the default selected data. Candidate

data: data representing all selected.

4. For ④, ⑤, ⑥, ⑦ the parameter settings in the properties window.

5. Setting candidate data in the properties window at ⑧: 0; 10; 20; 30; 40; 50; 60; 70; 80; 90 .

6. The operation is completed. Run virtual serial port screen, slide up and down when you can see the screen instructions to upload data, as 2-32 Fig.



Map 2-31 Picker sliding property



Map 2-32 Upload instruction data selection control slide

2.53 Update two-dimensional code control

Format: EE [B1 10 Screen_id Control_id Strings] FF FC FF FF

Parameter Description: Screen_id (2 Bytes): Screen Number

Control_id (2 Bytes): Control Number

Strings (Variable length): two-dimensional code character content, encoding type UTF8

Note: If the contents of the two-dimensional code has sent Chinese characters must be converted into UTF8 format, users need to be familiar with UTF8 encoding format, and then send the converted.

This command is mainly used to implement the two-dimensional code figure shows, the instruction format text as a control. Users need to show what the two-dimensional code, content can be sent directly characters. Assume that the user needs to display in FIG. 2-33 Two-dimensional code shown, scans the content of: www.gz-dc.com, The operation is as follows:



Map 2-33 Two-dimensional code control displays

Steps:

1. Figure 2-34 As shown, click on the navigation ① control icon at the two-dimensional code, placed in the area at the screen ②.
2. ③ In the properties window, enter the text: www.gz-dc.com.
3. The operation is completed. Run virtual serial port to display the map screen 2-33 Two-dimensional code shown in the image, can be accurately identified by scanning the phone.
4. If the user needs to update the current single-chip two-dimensional code content, to send the corresponding commands. Figure assumptions 2-34 In the picture ID for 5 Two-dimensional code control number 1 Display content 123 , The sending command is as follows: EE B1 10 00 05 00 01 31 32 33 FF FC FF FF ,among them 313233 Show 123 of ASCII character.



Map 2-34 Two-dimensional code display settings

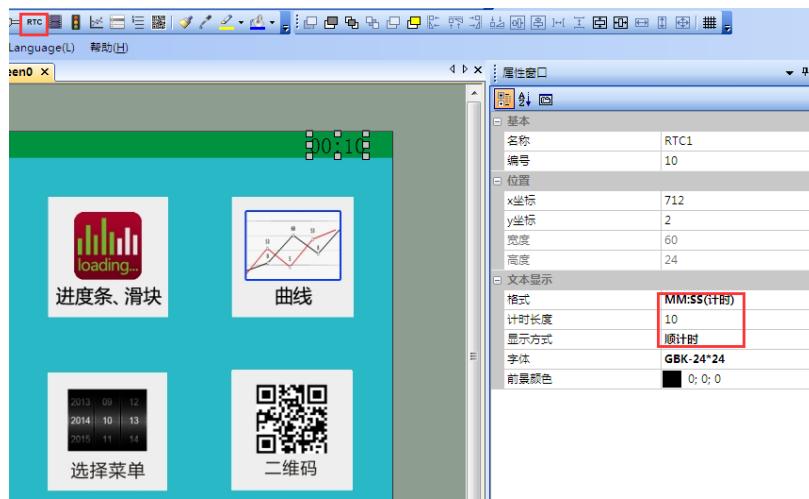
2.54 Start timer

Format: EE [B1 41Screen_id Control_id] FF FC FF FF

Parameter Description: Screen_id (2 Bytes): Screen Number

Control_id (2 Bytes): RTC No. The command controls only for hardware support RTC Screen. When used, first click on the navigation bar RTC Controls, placed in the upper right corner of the screen, set the count format, timing and length of the display, as shown in 2-35 , The microcontroller then transmits a user command to start the timer, start of counting time.

Alarm time is reached, the screen will upload event notifications, upload format: EE [B1 43 Timedata 17] FF FC FF FF . Upload parameters: Timedata (4 Bytes): the time the timer value set by the user, the previous high.



Map 2-35 Set the timer

Users can also set a timer command to modify the timing parameters.

2.55 Set the timer

Format: EE [B1 40Screen_id Control_id Timedata] FF FC FF FF

Parameter Description: Screen_id (2 Bytes): Screen Number

Control_id (2 Bytes): RTC Control Number

Timedata (4 Bytes): The command timer value only for hardware support RTC The screen used to modify the timer parameters.

2.56 Start timer

Format: EE [B1 41 Screen_id Control_id] FF FC FF FF

Parameter Description: Screen_id (2 Bytes): Screen Number

Control_id (2 Bytes): RTC No. The command controls only for hardware support RTC Screen, used to start the timer.

2.57 Pause timer

Format: EE [B1 44Screen_id Control_id] FF FC FF FF

Parameter Description: Screen_id (2 Bytes): Screen Number

Control_id (2 Bytes): RTC No. The command controls only for hardware support RTC Screen to pause the timer to continue counting after the timer is started.

2.58 Stop the timer

Format: EE [B1 42Screen_id Control_id] FF FC FF FF

Parameter Description: Screen_id (2 Bytes): Screen Number

Control_id (2 Bytes): RTC No. The command controls only for hardware support RTC A screen for stopping the timer, the time value will be restored to the initial value.

2.59 Read timer

Format: EE [B1 45 Screen_id Control_id] FF FC FF FF

Parameter Description: Screen_id (2 Bytes): Screen Number

Control_id (2 Bytes): RTC Control Number

This command is used to read the timer value of the corresponding timer after sending the command, the screen will return the corresponding timer value. Returned Format: EE B1 45 Screen_id Control_id 17 Strings FF FC FF FF

Return parameter: Screen_id (2 Bytes): Screen Number

Control_id (2 Bytes): RTC Control Number

17 (1 Bytes): 0x17 , Fixed code

Strings (4 Bytes): read timing values

2.60 Manual Disable / Enable screen updates

Format: EE [B3 Enable] FF FC FF FF

Parameter Description: Enable (1 Bytes): 0x00 Express prohibition update, 0x01 For enabled updates; this command can solve the excessive number of controls in real-time dynamic updating of a screen, leading to problems of slow screen updates. Because the system default 100ms Automatically refresh the screen at once, and on some occasions a large amount of user data, the system automatically updates can not always meet the requirements, it can be used to manually update the on-screen instructions.

Usage: first transmission prohibition program screen update instruction, and then sends the entire contents of the screen needs to be updated, and finally enabling the screen updated so that the updated data is immediately displayed on the screen.

2.61 Show / Hide Controls

Format: EE [B1 03 Screen_idControl_id Enable] FF FC FF FF

Parameter Description: Screen_id (2 Bytes): Screen Number

Control_id (2 Bytes): Control Number

Enable (1 Bytes): 0x00 Represent a hidden control, 0x01 It denotes a display control; the instructions are useful for a specified time the button control function failure, until the shield is released, also be used for an animation / display control icon disappear.

2.62 RS485 Address Settings screen

Format: EE [A501 Addr] FF FC FF FF

Parameter Description: Addr (2 Bytes): the address information of the instruction only supports 485 Screen interface.

The screen address set instruction is mainly used to facilitate system network. After address setup is successful, all the instructions are contained address information, such as instructions to clear the screen: EE 01 FF FC FF FF, After adding address EE Addr1 Addr0 01 FF FC FF FF .

Note: All addresses must be set from 1 to start 0 for broadcast address, all screens can receive the broadcast information.

2.63 RS485 Screen Address Cancel

Format: EE [00 00 A500] FF FC FF FF

Parameters: None

The command supports only 485 Screen interface.

The instruction is mainly used to cancel the screen addresses, the instruction address directly to the broadcast address.

2.64 System configuration is locked

Format: EE [08 A5 5A 5F F5] FF FC FF FF

Parameters: None

This prevents instruction during system operation, the host receives an error frame instruction causes the system configuration accidentally modified.

Once the configuration is locked, the external device can not receive the serial command is modified until the lock is released. Configuration parameters include: baud rate, matrix keyboard and a touch mode, the automatic backlight adjustment parameters, may be directly PC The Assistant to configure command.

2.65 System configuration lock is released

Format: EE [09 DE ED 13 31] FF FC FF FF

Parameters: None

Once the lock is released the system configuration, an external device can be re-received serial command to modify the configuration parameters.

Users can directly PC The Assistant to configure command.

2.66 Alarm event is triggered

Format: EE [B1 50 Screen_idControl_idValue (SecMinHourDayWeekMonYear)] FF FC FF FF

Parameter Description: Screen_id (2 Bytes): Screen Number

Control_id (2 Bytes): Control Data Record Number

Value (2 Bytes) : Alarm Event ID No. If the customer selected instruction

time, the instruction would add the following parameters:

Sec (1 Bytes) : Second, BCD code indicates Min (1 byte):

points, BCD code indicates Hour (1 byte): When, BCD

code indicates Day (1 byte): date, BCD code indicates

Week (1 byte) : week, BCD code indicates Mon (1 byte):

month, BCD code indicates Year (1 byte): years, BCD

code representation

This instruction is transmitted to the screen by corresponding event ID, event ID number so that the corresponding alarm event is converted into an output set by the user.

2.67 Alarm Event lift

Format: EE [B1 51 Screen_id Control_idValue (Sec Min Hour Day Week Mon Year)]

FF FC FF FF

Parameter Description: Screen_id (2 Bytes): Screen Number

Control_id (2 Bytes): Control Data Record Number

Value (2 Bytes) : Alarm Event ID No. If the customer selected instruction

time, the instruction would add the following parameters:

Sec (1 Bytes) : Second, BCD code indicates Min (1 byte):

points, BCD code indicates Hour (1 byte): When, BCD

code indicates Day (1 byte): date, BCD code indicates

Week (1 byte) : week, BCD code representation



Mon (1 byte): month, BCD code indicates Year (1 byte):
years, BCD code representation

This instruction is transmitted to the screen by corresponding event ID, event ID number so that the respective alarm release event is converted to the output set by the user.

2.68 Data recording controls - add conventional record

Format: EE [B1 52 Screen_id Control_id String] FF FC FF FF

Parameter Description: Screen_id (2 Bytes): Screen Number

Control_id (2 Bytes): Control Data Record Number

String (Variable length): users to add content string

This instruction is used to add a user data recording control data for displaying a number of important parameters and corresponding data tables, user instructions can be implemented by adding the corresponding user data to the data record to the control.

2.69 Data recording controls - Clear History data

Format: EE [B1 53 Screen_idControl_id] FF FC FF FF

Parameter Description: Screen_id (2 Bytes): Screen Number

Control_id (2 Bytes): the number of data records control

instructions for recording control data, clear all recorded data.

2.70 Control data records - records show arranged offset

Format: EE [B1 54 Screen_id Control_id Offset] FF FC FF FF

Parameter Description: Screen_id (2 Bytes): Screen Number

Control_id (2 Bytes): Control Data Record Number

Offset (2 Bytes): where the line number

This instruction is used to set the position of the scroll bar, i.e., the first control line corresponding to the recording line number.

2.71 Data logging control - get the current number of records

Format: EE [B1 55 Screen_id Control_id] FF FC FF FF

Parameter Description: Screen_id (2 Bytes): Screen Number

Control_id (2 Bytes): number of the control data record instruction is mainly used for obtaining the

number of recording control data recording current data return instruction: EE [B1 55 Screen_id Control_id 1D Count] FF

FC FF FF

Return parameter: Screen_id (2 Bytes): Screen Number

Control_id (2 Bytes): Control Data Record Number

1D (1 Bytes): 0x1D Fixed value that represents the recording controls

Count (2 Bytes): this number of records

2.72 Data recording controls - read a line record

Format: EE [B1 56 Screen_id Control_id Position] FF FC FF FF

Parameter Description: Screen_id (2 Bytes): Screen Number

Control_id (2 Bytes): Control Data Record Number

Position (2 Bytes): line number of a line

The instructions for recording control to read data recorded in a row, returns the associated data instructions.

Return instruction: EE [B1 56 Screen_id Control_id 1D String] FF FC FF FF

Return parameter: Screen_id (2 Bytes): Screen Number



Control_id (2 Bytes): Control Data Record Number

1D (1 Bytes): 0x1D , Fixed code

String (Variable length): users to add content string

2.73 Data recording controls - Modify General Record

Format: EE [B1 57 Screen_id Control_id Position String] FF FC FF FF

Parameter Description: Screen_id (2 Bytes): Screen Number

Control_id (2 Bytes): Control Data Record Number

Position (2 Bytes): line number of a line

String (Variable length): users to add content string

The instructions for recording control data recording routine modifications, the modifications can be made for a corresponding row.

2.74 Data recording controls - delete a row record

Format: EE [B1 58 Screen_id Control_id Position] FF FC FF FF

Parameter Description: Screen_id (2 Bytes): Screen Number

Control_id (2 Bytes): Control Data Record Number

Position (2 Bytes): line number of a line

The instructions for recording control data to delete a row record, the user can easily delete a record line.

2.75 Data logging control - into a regular record

Format: EE [B1 59 Screen_id Control_id PositionString] FF FC FF FF

Parameter Description: Screen_id (2 Bytes): Screen Number

Control_id (2 Bytes): Control Data Record Number

Position (2 Bytes): line number of a line

String (Variable length): users to add content string

The instructions for recording control data is inserted in a corresponding conventional line recording position, the overall shift recording after this location.

2.76 Data recording controls - Select a line of data records

Format: EE [B1 5A Screen_id Control_id Offset] FF FC FF FF

Parameter Description: Screen_id (2 Bytes): Screen Number

Control_id (2 Bytes): Control Data Record Number

Offset (2 Bytes): where the line number

The instructions for recording control data recorded in the data of a row selected, the selected color is displayed after the corresponding selected. Note:

The user uses the directive shall be recorded in the data recording and the selection control line which allows to select the option to open.

2.77 Data recording controls - once add multiple records

Format: EE [B1 5B Screen_id Control_id Count Record0_size Record0 Record1_size Record1 ...] FF FC FF FF

Parameter Description: Screen_id (2 Bytes): Screen Number

Control_id (2 Bytes): Control Data Record Number

Count (2 Bytes) : Number of records added

Recordx_size (2 Bytes): corresponding to the size of each record, ":" can be considered a byte

Recordx (Variable length) : Each data record corresponding to the instruction length prevail Recordx_size primary record

control data may be implemented in a plurality of data records may be added.

2.78 Data recording controls - SD Card Export command (CSV format)

Format: EE [B1 5C Screen_id Control_id] FF FC FF FF

Parameter Description: Screen_id (2 Bytes): Screen Number

Control_id (2 Bytes): number of the control data recording instruction for recording data

is mainly to control CSV Export to format SD card. Return instruction: EE [B1 5C Screen_id Control_id Status] FF

FC FF FF

Return parameter: Screen_id (2 Bytes): Screen Number

Control_id (2 Bytes): Control Data Record Number

Status (1 Bytes): 0x00 Success, the other for failure

2.79 History curve setting sample values

Format: EE [B1 60 Screen_id Control_id Value] FF FC FF FF

Parameter Description: Screen_id (2 Bytes): Screen Number

Control_id (2 Bytes): Text Control Number

Value (Variable-length): data types are: UINT8 , INT8 , UINT16 , INT16 , UINT32 , INT32 ,

FLOAT, Data of each channel according to the data type corresponding to the set, if there are two channels, the data type is UINT8 , Adding two data corresponding type UINT8 The data

This command is used to add the sample value data history curve, the corresponding data is added to the instruction which, instruction to the screen, screen data plotted according to the respective values.

2.80 Historical curve disable / enable sampling

Format: EE [B1 61 Screen_id Control_id Enable] FF FC FF FF

Parameter Description: Screen_id (2 Bytes): Screen Number

Control_id (2 Bytes): Text Control Number

Enable (1 Bytes): Disable / Enable bit

0x00 : Prohibition;

0x01 :Enable;

This command is mainly used for history curve Disable / Enable sampling. If a user needs a certain period of the input data is not performed, then, may be used to achieve a sample instruction is prohibited; if the user needs to re-sampling function imparting then need to enable sampling instructions.

2.81 Historical trend Hide / Show channel

Format: EE [B1 62 Screen_id Control_idChannel Show] FF FC FF FF

Parameter Description: Screen_id (2 Bytes): Screen Number

Control_id (2 Bytes): Text Control Number

Channel (1 Bytes): Channel ID Show (1 Bytes): the

display prohibition / enable bit

0x00 :hide;

0x01 :display;

This command is mainly used for some channels history curve is show / hide operation. There are several channel profile in the user interface, the user needs to view the detail of a channel, then the analysis can be used to hide instruction curve corresponding channel, under the circumstances, it can also be used to display the channel command curve.

2.82 History curve setting time length (i.e., number of samples)

Format: EE [B1 63 Screen_id Control_id00 Sample_Count] FF FC FF FF



Parameter Description: Screen_id (2 Bytes): Screen Number

Control_id (2 Bytes): Text Control Number

00 (1 Bytes): Control Type ID No. 0x00 : Set time width

Sample_Count (2 Screen display of sampling points: bytes)

The instruction is mainly used to set the length of time history curve, i.e. the number of samples may be provided history curve.

2.83 Historical curve scaled to full screen

Format: EE [B1 63 Screen_id Control_id 01] FF FC FF FF

Parameter Description: Screen_id (2 Bytes): Screen Number

Control_id (2 Bytes): Text Control Number

01 (1 Bytes): Control Type ID No. 0x01 : Zoom to full screen is used to set the scaling instruction is mainly history curve,

i.e. scaling can be provided to achieve full screen history curve.

2.84 Historical trend set scaling factor

Format: EE [B1 63 Screen_id Control_id 02 ZoomMax_ZoomMin_Zoom] FF FC FF FF

Parameter Description: Screen_id (2 Bytes): Screen Number

Control_id (2 Bytes): Text Control Number

02 (1 Bytes): Control Type ID No. 0x02 : Scaling factor

Zoom (2 Bytes): Zoom Percentage

Max_Zoom (2 Bytes): Scaling the maximum limit, a screen displays up sampling points

Min_Zoom (2 Bytes): scaling the minimum limit, a display screen minimum number of samples for the instruction set primarily in

accordance with the historical trend display scaling factor set by the user, so that it will conform to the curve plotted viewing angle of the user.

2.85 History curve setting value display range

Format: EE [B1 64 Screen_id Control_id Max Min] FF FC FF FF

Parameter Description: Screen_id (2 Bytes): Screen Number

Control_id (2 Bytes): Text Control Number

Max (4 Bytes): maximum

Min (4 Bytes): minimum value

The instruction is mainly used to set the maximum and minimum historical curve, i.e. the display range setting history curve.

2.86 Rotary controls to set the angle of rotation

Format: EE [B1 10 Screen_id Control_id Value] FF FC FF FF

Parameter Description: Screen_id (2 Bytes): Screen Number

Control_id (2 Bytes): Text Control Number

Value (2 Bytes): the angle of rotation, angle of rotation 0-360 Degree; while rotating the control supports a small angle of rotation,

the particle size 0.1 degree, Value = The actual angle * 10 + 0x8000 ,E.g 5.3 = The set value of

5.3 * 10 + 0x8000

This command is mainly used for the rotation angle of the rotary control is provided, the user can implement the instruction pointer in accordance with the rotation angle of the rotation center is set.

2.87 Multi-language switch command

Format: EE [C1 Lang Check] FF FC FF FF

Parameter Description: Lang (1 Bytes):

BIT3 ~ BIT0: Markup Language index range: 0-9 BIT6 ~ BIT4: Reservations,
default 0 BIT7 : Identifying the keyboard language, 0 :Chinese, 1 :English

Check (1 Bytes): for checking, Check = 0xC1 + Lang , The low byte of the instruction is generally taken for the instruction to switch

to the multi-language, users can change the command to set the output language is Chinese or English keyboard.

2.88 Language acquisition system index

Format: EE [C2] FF FC FF FF

Parameters: None

The language of instruction for obtaining the index screen serial port currently in

use; return instruction: EE [C2 Lang] FF FC FF FF

Return parameter: Lang (1 Bytes):

BIT3 ~ BIT0: Markup Language index range: 0-9 BIT6 ~ BIT4: Reservations,
default 0 BIT7 : Identifying the keyboard language, 0 :Chinese, 1 :English

2.89 Touch tone replacement system (object linking and only F Series applicable)

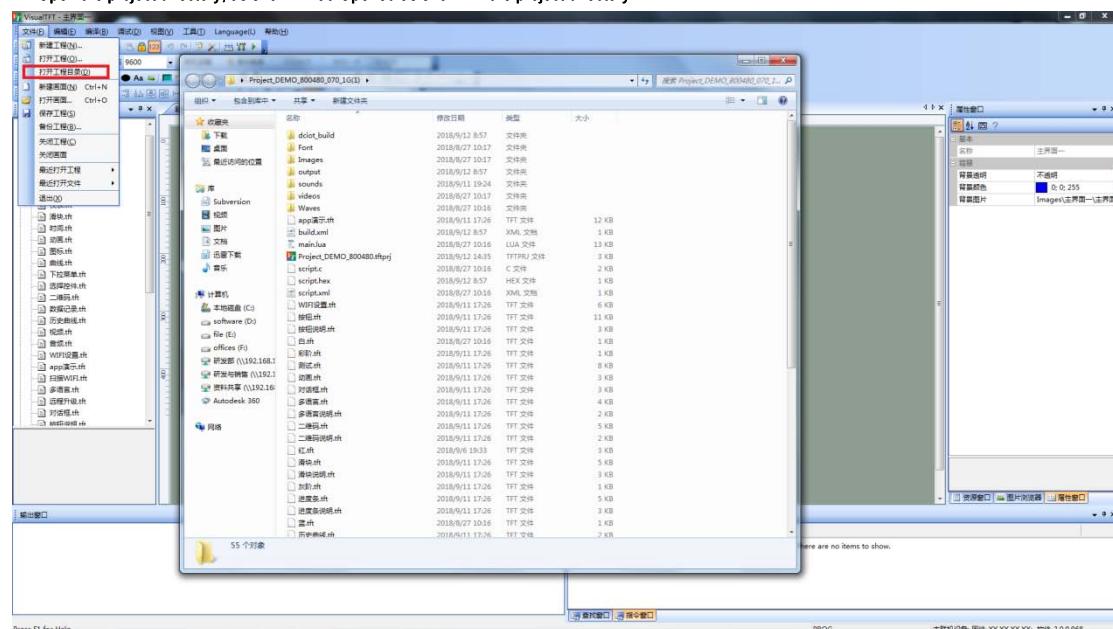
Was linked screen and serial F Series Serial touch screen adds tone, engineering can replace the touch prompt sound according to their needs. The system touch tone audio file name and format is fixed to " key1.wav "The new tone audio file will need to be changed when replacing" key1.wav "And then substituted into the project directory sounds Folder. (Note that not wav You need to go through the conversion of audio formats, can not directly change the suffix name)

Process touch tone replacement system as follows:

1. You need a new tone audio file formats to wav Format and name key1 . (Note: Touch

Beep sound file names and formats are fixed)

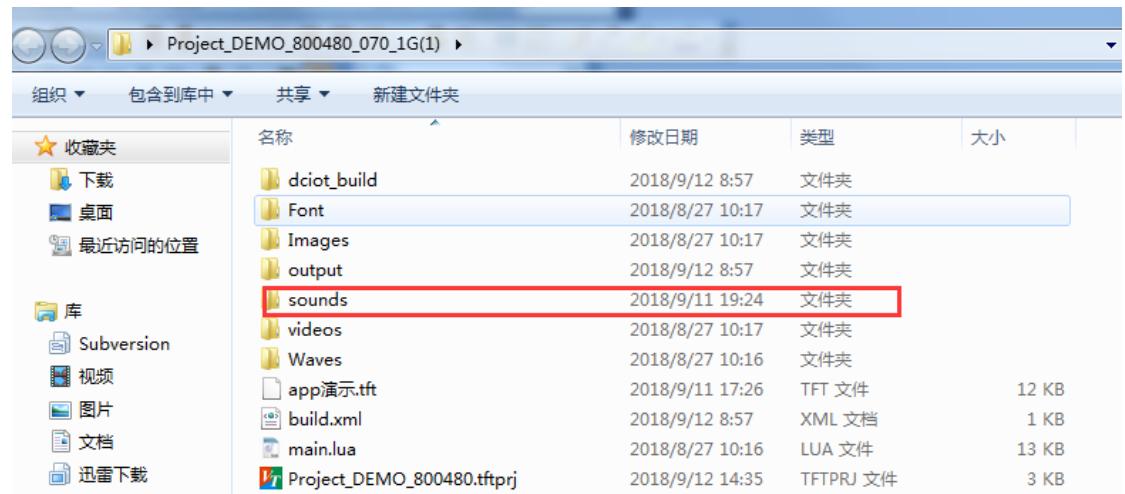
2. Open the project directory, as shown 2-36 Opened as shown in the project directory



Map 2-36 Open Directory Project

3. Opened in the project directory sounds Folder, as 2-37 turn on sounds As shown in the folder, and then

It has been converted into a sound file to replace sounds Folder, re-compile the project to take effect.



Map 2-37 turn on sounds folder

2.90 U Update boot disk logo (Only was linked applicable)

Was linked through the serial port screen LUA Script from U Pictures updated boot disk to read logo . LUA Script code is as follows:

```
function on_usb_inserted (dir) // insert U After-hours calls this function
    upgrade_logo (dir .. '/ logo.jpg') // Update logo
end

function on_usb_inserted (dir) Is a callback function, when the screen is detected serial U This function is called after the disk is inserted and passed U Disk path as parameters; upgrade_logo (dir .. '/ logo.jpg') Function is designed to update the boot logo of API Function parameters dir .. '/ logo.jpg' Yes U Under the root directory logo Path pictures.
```

2.91 And set the boot music tone buttons (only was linked applicable)

Was linked through the serial port screen LUA Script realize Set Start Sound tone buttons and functions.

2.91.1 How to Set Start Sound

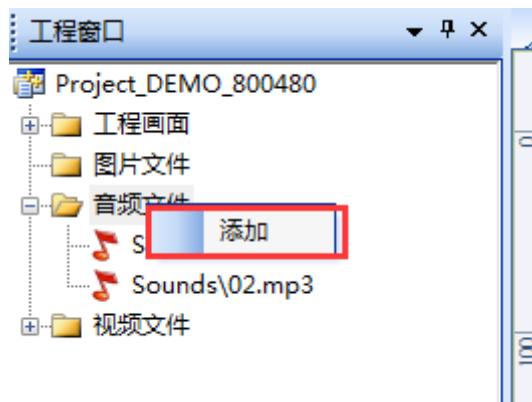
Was linked through the serial port screen LUA Startup script to set to music by following these steps:

1. Next add audio files with a new project directory Sounds Folder, project the added audio files are automatically copied into

Sounds Directory and download the project to the serial port with internal storage partition screen A , Add audio to the project as shown 2-38

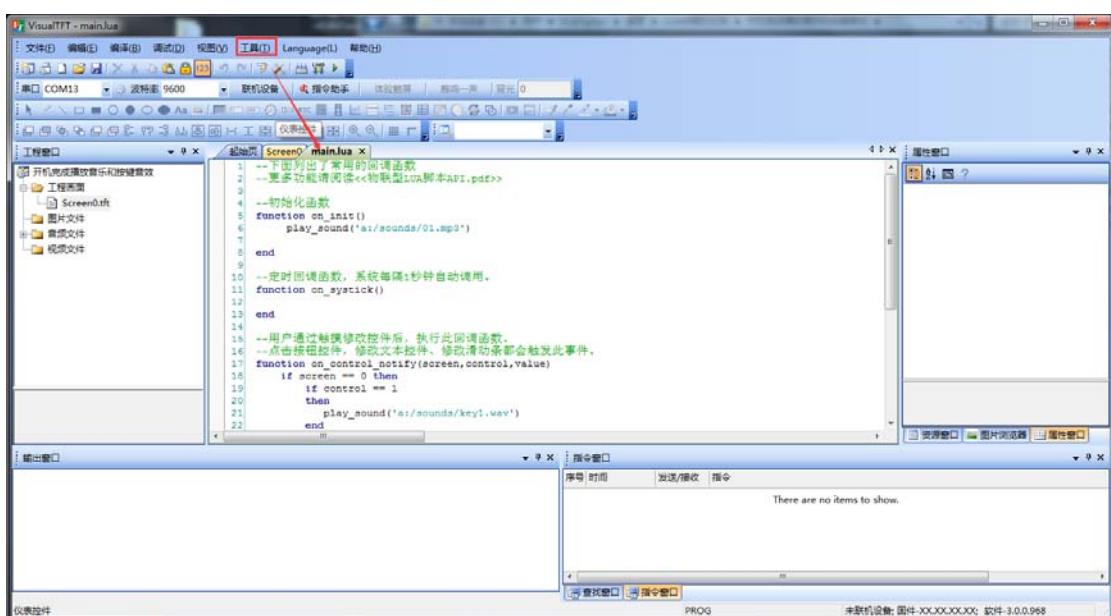
Fig.

Note: Audio format supports only wav or mp3 Format, the audio path and file name for the letter (az),digital(0-9) And underscore (_) combination, does not support other characters.



Map 2-38 Add an audio file

2. write LUA In the software program Visual TFT Open Tools LUA Programming, as 2-39 Shown;



Map 2-39 turn on LUA Scripting

It calls the function after the completion of the serial boot screen on_init () Serial port initialization screen. So just in on_init () Function in the call to play music API Play music function can be realized after the completion of the boot. LUA Procedures are as follows:

```

.....
function on_init ()
    play_sound ('a: /sounds/02.mp3')          -- Initialization callback function
                                                -- Play Audio API Interface functions
end
.....

```

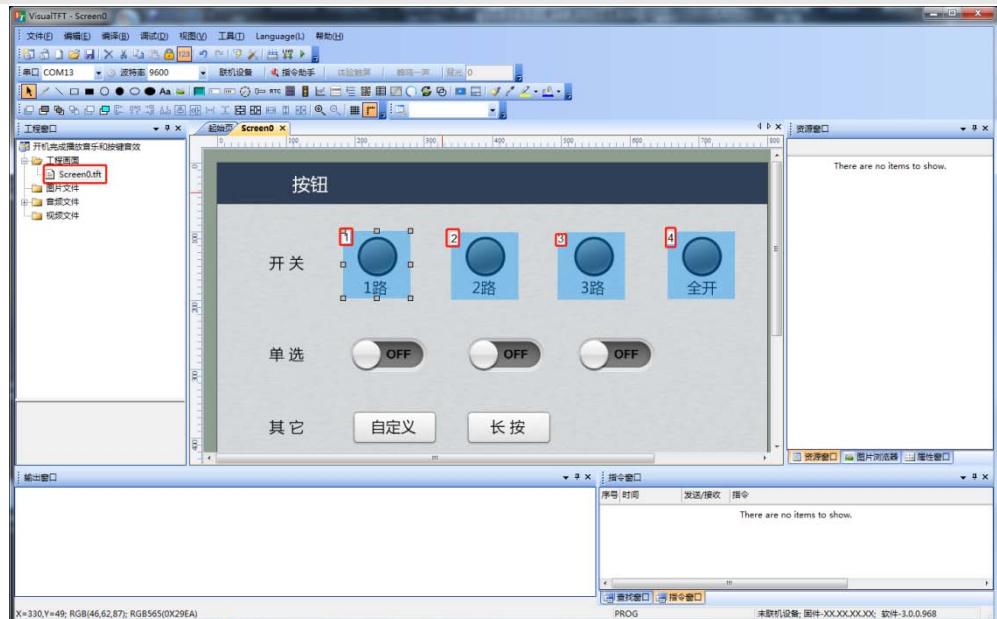
2.91.2 Button Beep

Procedure to play music after setting the tone of the button to complete the boot is basically the same, except that the tone button to trigger the playback button press only. Implementation process: First placed on the screen 4 Buttons, as 2-40 As shown, click on the menu bar [Tools] open LUA Programming in on_control_notify Callback function to judge the button is pressed, it is determined by

After playing under the corresponding tone. Procedures are as follows:

```
-- Click the button control, modify text controls, sliders and other modifications will trigger callback function.

function on_control_notify (screen, control, value)
    if screen == 0 then
        if control == 1 then
            play_sound ('a: /sounds/key1.wav') -- Picture 0
        end
        if control == 2 then
            play_sound ('a: /sounds/key2.wav') -- Button control 1
        end
        if control == 3 then
            play_sound ('a: /sounds/key3.wav') -- Broadcast key1.wav Audio frequency
        end
    end
end
```



Map 2-40 Button placement

2.92 Local video playback (Only was linked applicable)

Use the video playback controls to play serial internal screen video complete the following five steps:

1. Will be added to video converter MP4 Format; (refer to the topic Document "serial-screen playback of video")
2. Adding video works;
3. Add video project screen playback controls;
4. Video playback controls configuration properties window in the "Video File";
5. Send commands to control video playback, pause / resume, stop.

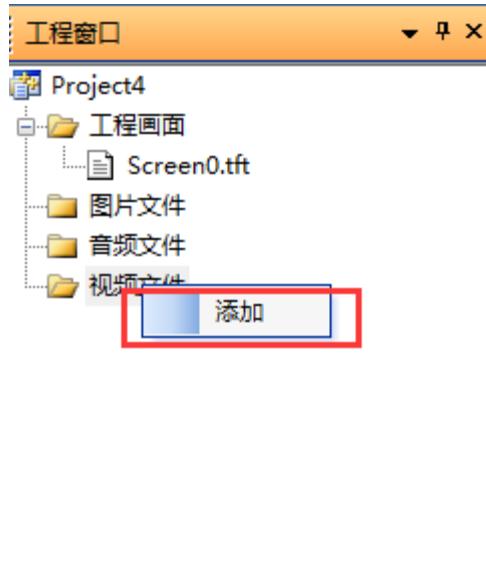
2.92.1 Will be added to convert video to MP4 format

Things serial-type screen playback support MP4 Format, resolution does not exceed 1280 * 720 Video, and video software you need to go through Freemake Video Converter Converted into MP4 Format (format of the source video is MP4 But also through conversion) to

Normal play, if you use another video converter format conversion, serial screen may not play properly. Specific video conversion process can refer to the document "How to serial-screen video playback."

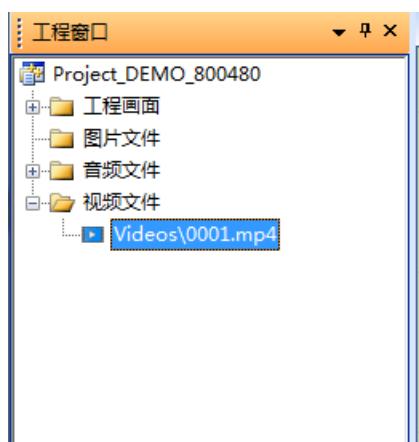
2.92.2 Add video project

in VisualTFT Right-click on the project window "Video File" to add video, add video will be saved to the project directory after the success of " Videos "Folder (add a video file name can not bring Chinese). The default compiler works with stored into the internal storage partition when you add here to download video files A In FIG. 2-41 Shown;



Map 2-41 Add video

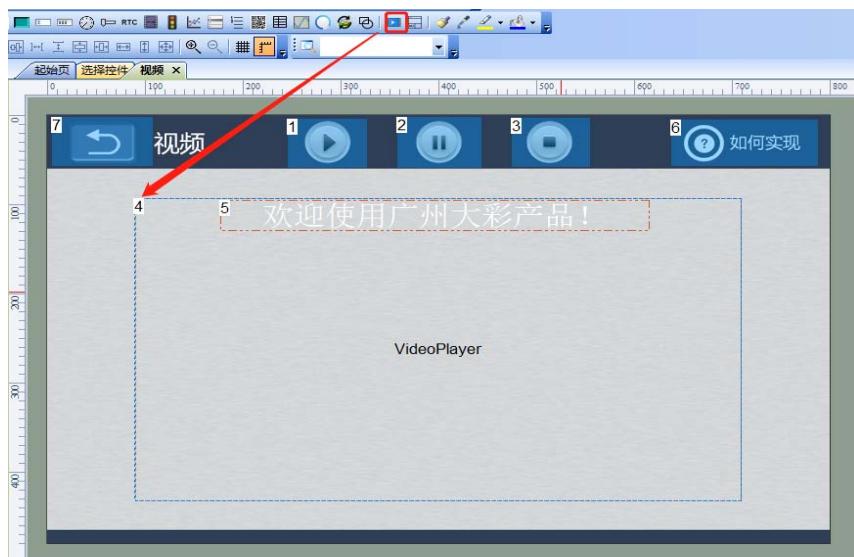
Note: The format for video MP4 Format, video path and file name of the letter (az),digital(0-9) And underscore (_) combination, does not support other characters. Figure 2-42 :



Map 2-42 Added successfully

2.92.3 Add video project screen playback controls

Video playback controls are placed on a screen, as shown in 2-43 Add video playback controls works like this:



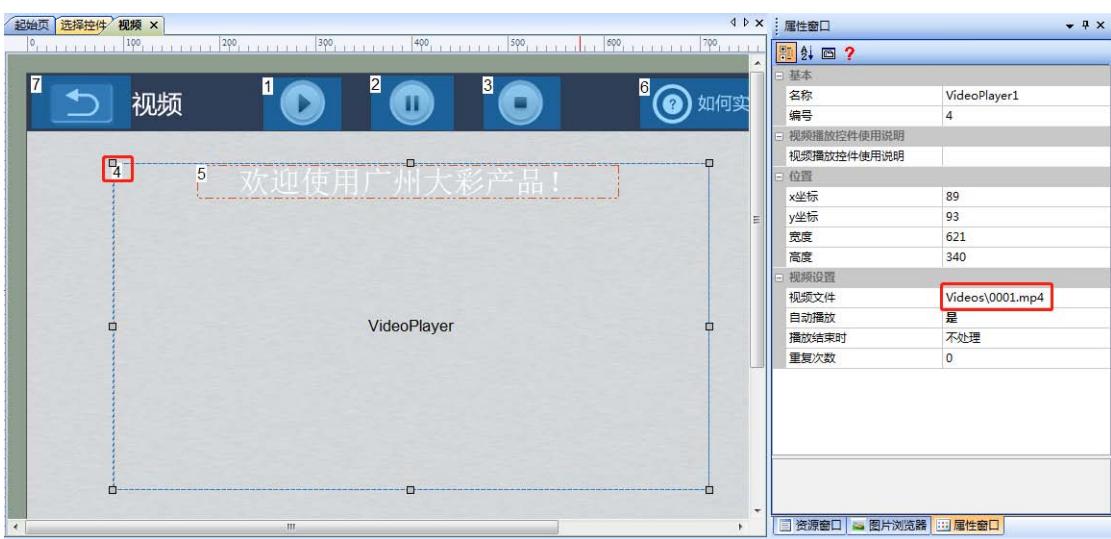
Map 2-43 Add video playback controls engineering

2.92.4 Configure the video playback controls in the Properties window " Video files "

Video playback controls need to configure the properties window in the "Video files" to play the video (Properties window in the "video file" refers to the video path), set the video path two ways:

1. When the project configuration, "Video File" is set to select the video playback controls in the control properties window to add project

Add video, as shown in 2-44 Below:



Map 2-44 Add video path

2. Set video path by sending commands. FIG acquisition command is as follows 2-45 :

1. Picture ID The serial number is on the screen where the video playback controls;
2. Controls ID Serial number for the control video playback controls;
3. Video storage location selected partition A Video name must be added in front of the corresponding video project name. Note: Adding video works by default stored in the internal memory partitions A , The storage partitions B , C Rarely used. Figure 2-45 Below:

设置视频路径

画面ID	17	控件ID	4
视频位置	存储分区A (A:/Videos/)	0001	.mp4
A:/Videos/0001.mp4			
指 令	EE B1 74 00 11 00 04 41 3A 2F 56 69 64 65 6F 73 2F 30 30 30 31 2E 6D 70 34 FF FC FF FF		
发送			

Map 2-45 Internal memory

Format:

Format: EE [B1 74 Screen_id Control_id Videos_Path] FF FC FF FF

Parameter Description: Screen_id (2 Bytes): Screen Number

Control_id (2 Bytes): Number of video playback controls

Videos_Path : Video path (can be converted in the instruction Assistant)

2.92.5 Send commands to control video playback, pause / resume, stop

After the properties window video playback controls in the "video file" is set, a video player can play the control by sending control commands, suspend / resume, or stop the video.

1. Video Player

Input screen video playback controls ID And Controls ID Click "Play" to play the video generation instruction. The issue control instructions cause the video player to play the video, as shown in 2-46 Below:

视频控制

画面ID	17	控件ID	4
播放次数	0	(0循环播放)	播放
停止 暂停/恢复			
指 令	EE B1 70 00 11 00 04 00 00 FF FC FF FF		

Map 2-46 Play Video

Play instruction: Instruction Format: EE [B1 70 Screen_id Control_id Number] FF FC FF FF

Parameter Description: Screen_id (2 Bytes): Screen Number

Control_id (2 Bytes): Number of video playback controls

Number (2 Bytes): the number of video loop, 0 The primary instruction to loop for controlling the video playback controls playback, the video player can set the appropriate number of cycles, so that video playback in accordance with the appropriate setting. (Note: Video playback controls must set video path)

2. Video pause / resume

The pause command for controlling the video playback controls / resume as 2-47 .



Map 2-47 Pause / Resume

Pause / resume instruction: Instruction Format: EE [B1 72 Screen_id Control_id] FF FC

FF FF

Parameter Description: Screen_id (2 Bytes): Screen Number

Control_id (2 Bytes): Number of video playback controls

3. Video stop

Stopping the playback control command for controlling the video playback, FIG. 2-48 .



Map 2-48 stop

Stop instruction: Instruction Format: EE [B1 71 Screen_id Control_id] FF FC FF FF

Parameter Description: Screen_id (2 Bytes): Screen Number

Control_id (2 Bytes): Number of video playback controls

2.93 Broadcast U Video disk (only was linked applicable)

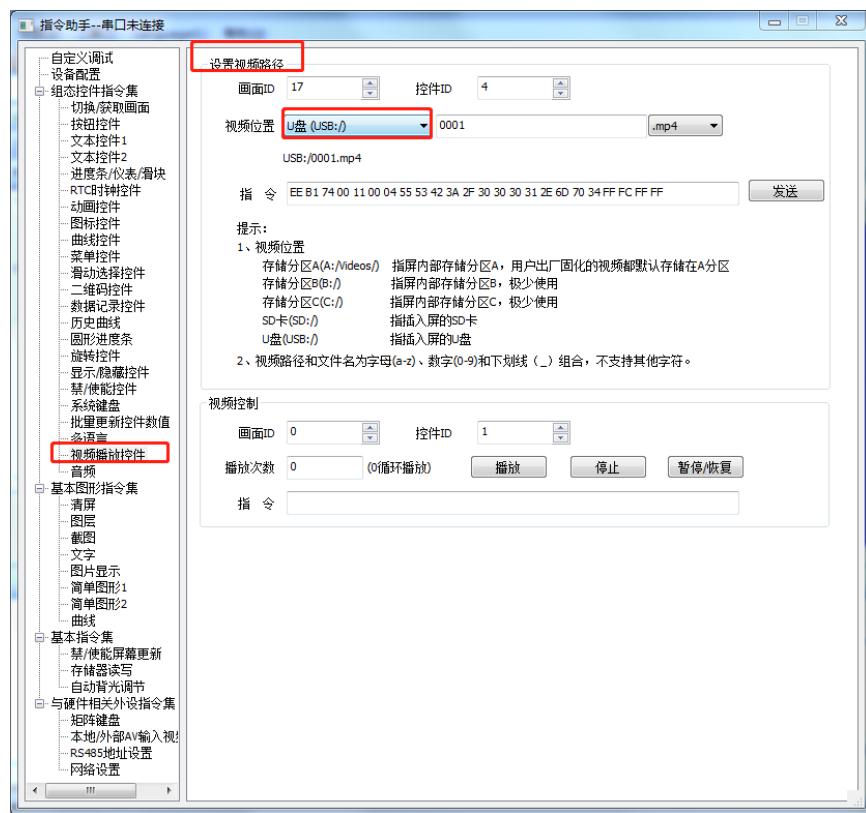
Play outside U And the step of playing a video disc internal video screens substantially the same steps, except that the external player U Video disc can only be set by sending an instruction video path, operation is as follows:

1. Add video project screen playback controls (refer to 2.92.1 chapter);
2. Transmission instruction set video path
3. Send commands to control video playback, pause / resume, stop (see 2.92.5 chapter).

2.93.1 Video path setting instruction

In the video play control command] [assistant may generate instructions to configure the video playback controls, as shown in 2-49 , The parameters are as follows:

1. Picture ID The serial number is on the screen where the video playback controls;
2. Controls ID Serial number for the control video playback controls;
3. Select the video position U Plate, the name must be followed by video U Intraday consistent. Note: The format for video MP4 Format, video path and file name of the letter (az), Digital (0-9) And underscore (_) combination, does not support other characters.



Map 2-49 Set up U Disk path

Format:

Format: EE [B1 74 Screen_id Control_id Videos_Path] FF FC FF FF

Parameter Description: Screen_id (2 Bytes): Screen Number

Control_id (2 Bytes): Number of video playback controls

Videos_Path : Video path (can be converted in the instruction Assistant)

2.94 Broadcast SD Video card (only was linked applicable)

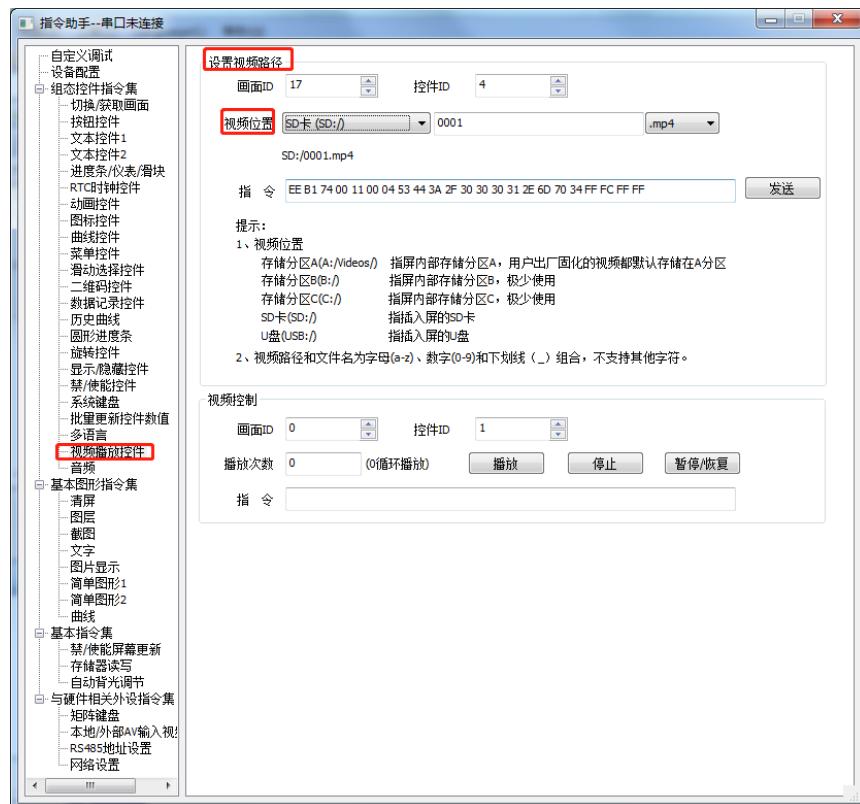
Play outside SD And the step of playing the video card internal video screens substantially the same steps, except that the external player SD Video card can only be set by sending an instruction video path, operation is as follows:

1. Add video project screen playback controls (refer to 2.92.1 chapter);
2. Transmission instruction set video path
3. Send commands to control video playback, pause / resume, stop (see 2.92.5 chapter).

2.94.1 Video path setting instruction

In the video play control command] [assistant may generate instructions to configure the video playback controls, as shown in 2-50 , The parameters are as follows:

1. Picture ID The serial number is on the screen where the video playback controls;
2. Controls ID Serial number for the control video playback controls;
3. Select the video position SD Card, the name must be followed by video SD The same card. Note: The format for video MP4 Format, video path and file name of the letter (a-z),digital(0-9) And underscore (_) combination, does not support other characters.



Map 2-50 Configuration SD Video card path

Format:

Format: EE [B1 74 Screen_id Control_id Videos_Path] FF FC FF FF

Parameter Description: Screen_id (2 Bytes): Screen Number

Control_id (2 Bytes): Number of video playback controls

Videos_Path : Video path (can be converted in the instruction Assistant)

2.95 Use case video playback controls (only was linked applicable)

Things serial-type screen play U Under the root directory test.MP4 Video file. Methods as below:

1. Add three control buttons and a video player on a screen, three buttons of button exclusive configuration attributes and a set

Position, FIG. 2-51



Map 2-51 Button placement

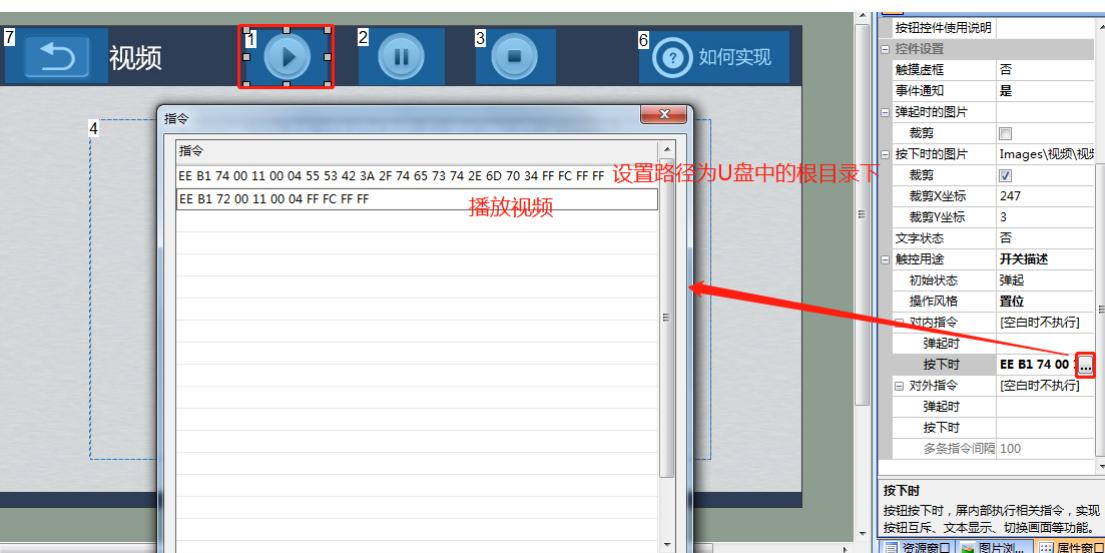
2. Generating a set of video play control in the playback path instruction Assistant U Under the root directory test.MP4 Documents

Instructions and video playback instruction as 2-52 :



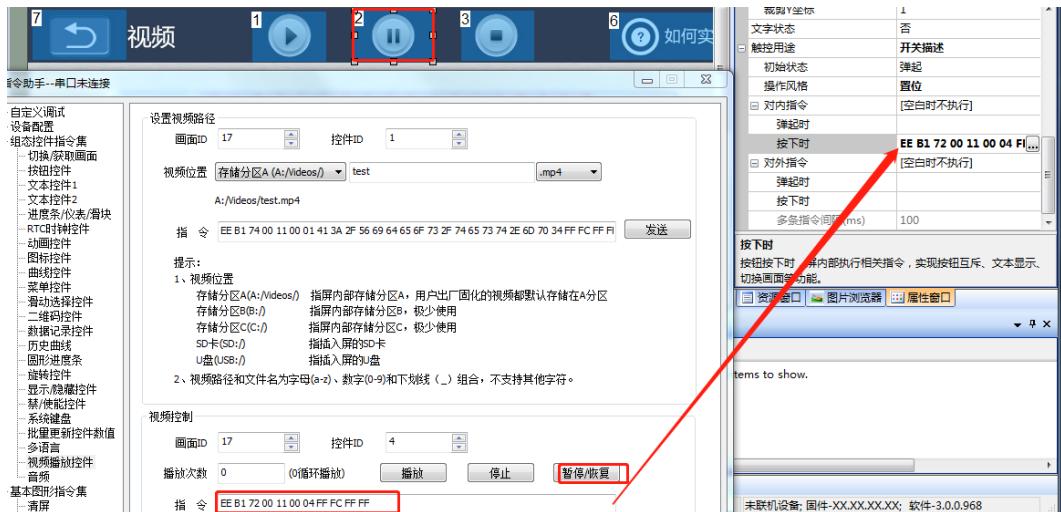
Map 2-52 Generates an instruction

3. Adding to the first two instructions in a button control. Figure 2-53 ;



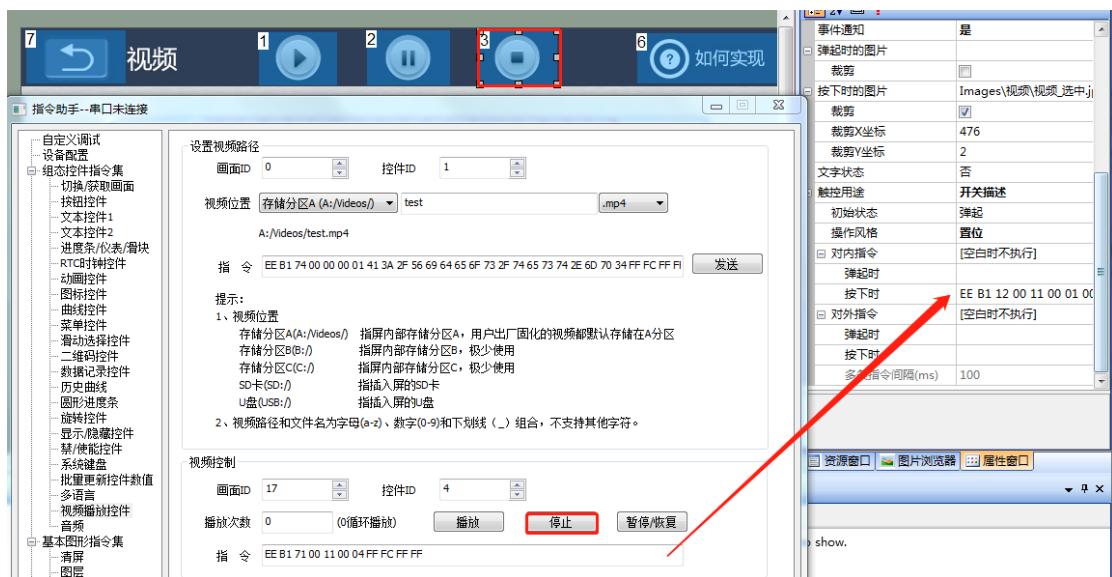
Map 2-53 Add instructions

4. The suspend / resume button is added to the second instruction in FIG. 2-54 :



Map 2-54 Pause / resume instruction

5. The stop command is added to the third button, FIG. 2-55 ;



Map 2-55 Stop command

6. After configuration, download the project to the entity running screen Figure 2-56 Fig.



Map 2-56 Play Video

2.96 Audio Player (Object linking and only F Series applicable)

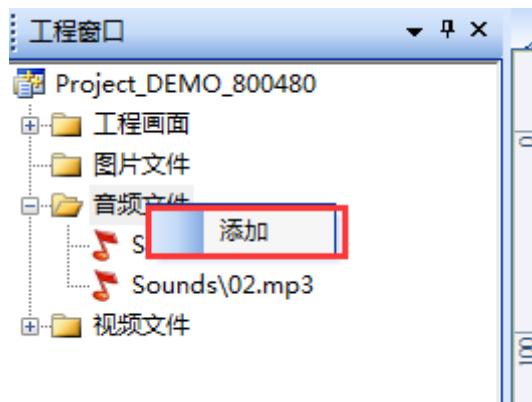
Audio playback screen using the serial port as follows:

1. Add audio into the project (external audio player does not need to do this step);
2. The internal audio playback screen serial or playback external audio path U Disk and SD Under the audio card catalog.

2.96.1 Add an audio file

With a new project directory under Sounds Folder, project the added audio files are automatically copied into Sounds Directory and download the project to the serial port with internal storage partition screen A , Add audio to the project as shown 2-57 Fig.

Note: Audio format supports only wav or mp3 Format, the audio path and file name for the letter (az), digital(0-9) And underscore (_) combination, does not support other characters.

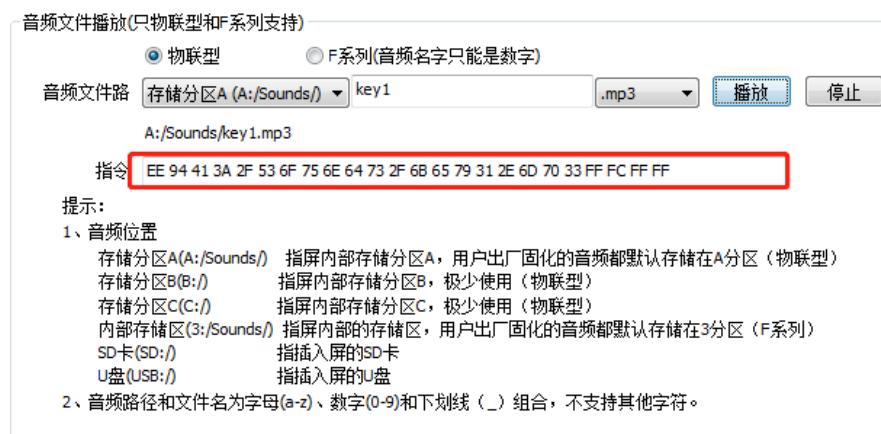


Map 2-57 Add audio to the project

2.96.2 How to play the internal audio screen

Internal screen was linked with three serial memory partitions, each partition is stored A , B , C , Where the default storage into a storage partition when the project download A , The storage partitions B with C Rarely used.

Play storage partitions A Audio files key1.MP3 , As shown below 2-58 Shown



Map 2-58 Audio path

Format: EE [94 Sounds_Path] FF FC FF FF

Parameter Description: Sounds_Path: The audio file path (refer to instruction assistant)

2.96.3 How to Play SD Card Audio

Broadcast SD Under the card root directory key1.mp3 File, as 2-59 Below:

1. [Audio] instruction assistant in the "audio file path" Select SD In the right side of the card and fill in the name of the audio file

Click on the word " Broadcast " It generates an instruction;

2. Send the instructions to play SD Under the card root directory key1.mp3 .



Map 2-59 Broadcast SD Audio card catalog at

Format: EE [94 Sounds_Path] FF FC FF FF

Parameter Description: Sounds_Path: The audio file path (refer to instruction assistant)

2.96.4 How to Play U Audio tray

Broadcast U Under the root directory key1.mp3 File, as 2-60 Below:

1. [Audio] instruction assistant in the "audio file path" Select U In the right side of the tray and fill in the name of the audio file

Word, click "Broadcast" It generates an instruction;

2. Send the instructions to play U Under the root directory key1.mp3 .



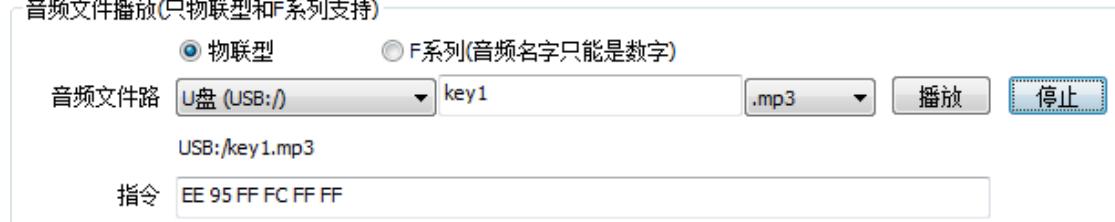
Map 2-60 U The audio in the disk directory

Format: EE [94 Sounds_Path] FF FC FF FF

Parameter Description: Sounds_Path: The audio file path (refer to instruction assistant)

2.96.5 Stop audio playback

The instruction to stop the playback of audio, FIG. 2-61 Fig.



Map 2-61 Stop play

Format: EE [95] FF FC FF FF

2.96.6 Use Cases

Using a button press or the bouncing status play / stop the audio file, the following steps:

1. Placing a first attribute configured as button switches, as 2-62 ;



Map 2-62 Placement and configuration button

2. Fill in the instruction storage partitions path Assistant A Under contents Sounds middle 01.mp3 Audio files, convert

Internal instruction after instruction fill button in FIG. 2-63 .



Map 2-63 Fill command

3. Downloading and Debugging

After configuration, you need to download the project to the physical screen for debugging.

2.97 Audio playback (named applicable to digital audio)

At present, only F Series Serial screen apply.

2.97.1 Audio play command

Format: EE [90 01 sounds_id time] FF FC FF FF

Parameter Description: sounds_id (2 Bytes): Audio ID (Only supports digital ID)

time (1 Bytes): Views (0 Representative loop) of the named

instruction for playing digital audio files.

2.97.2 Pause audio play command

Format: EE [9002] FF FC FF FF

This command is used to pause the audio file playback.

2.97.3 Resume audio playback command

Format: EE [9003] FF FC FF FF

This command is used to restore the audio file playback.

2.97.4 Stop audio play command

Format: EE [9000] FF FC FF FF

This command is used to pause the audio file playback.

2.98 Audio playback sequence (named applicable to digital audio)

The audio play command sequence: Instruction format: EE [90 04 00 01 sounds_id time] FF FC
FF FF

Parameter Description: sounds_id (2 Bytes): Audio ID (Each ID Use; separated)
time (1 Bytes): Views (0 Representatives loop)

2.99 Volume adjustment

Instruction format: EE] [93 Value FF FC FF FF Parameters: Value (1 byte): volume value,
in the range of 0-100 instruction primarily for regulating the output of the speaker volume.

2.100 Matrix keyboard control

Format: EE [79cmd] FF FC FF FF

Parameter Description: Cmd (1 Bytes): Configuration parameters

BIT0: 1 It represents the matrix keyboard is enabled, 0 Close denotes matrix keyboard;

BIT1: 1 It represents a buzzer sound when the key is pressed, 0 He said they did not ring;

BIT4 ~ BIT2: Matrix keyboard uploads

000: Uploads 1 001 when pressed coordinate keyboard: that the keyboard is
pressed until the release once uploaded coordinates

010: When the keyboard is pressed for a long time, once every 100ms upload the coordinates, and then upload one time
coordinate the release of 011: 1 represents the coordinates are uploaded when the keyboard is pressed and released

BIT7-BIT5 : Reserved

Support for external devices 4 * 4 Matrix keyboard input. After pressing the keyboard keys to upload via the serial port to the host. Upload the key
encoded format: Press uploading format: EE 12 K FF FC FF FF ; Upload format release: EE 13 K FF FC FF FF , K for 1 Bytes, on behalf of the uploaded
key keyboard 4 * 4 Matrix keyboard, key coding range 0 To 15 , The corresponding relationship is as follows 2.3 Key code lookup table shown in FIG.

table 2.3 Key code look-up table

Column Line	K6	K7	K8	K9
K1	0	1	2	3
K2	4	5	6	7

K3	8	9	10	11
K4	12	13	14	15

2.101 Write data to FLASH

Format: EE [87 Addr Data0 Data1 Data2 ... Daten] FF FC FF FF

Parameter Description: Addr (4 Bytes): the start address of the data written

Daten (1 Bytes): write data

Storage space for 128K Byte address range is 0 ~ 0xFFFF . After successfully written, the device returns: EE 0C FF FC FF FF .

The primary instruction some part of the user data stored in the device Flash In as EEPROM use.

2.102 Read saved FLASH The data

Format: EE [88 Addr Length] FF FC FF FF

Parameter Description: Addr (4 Bytes): data read start address

Length (2 Bytes): read data length in bytes of the return data format is: EE 0B Data0

Data1 Data2 ... Daten FF FC FF FF . The primary instruction for writing data in the memory is read out.

2.103 The current picture is stored in the TF card

Instruction format: EE [3400] FF FC FF FF Parameters:

None

The command supports basic, business, economy, was linked not supported. After sending the command, automatically generate the corresponding .bmp file TF card. If the store succeeds, return to the format: EE 10 FF FC FF FF If the store fails, return to the format: EE 11 FF FC FF FF

FF

2.104 Save wireless network settings

Instruction format: EE [D0 A0 FF FC FF FF] Parameters:

None Return Instruction: EE D0 A0 WIFI_SET_CFG FF FC FF FF

Return parameter: WIFI_SET_CFG (Variable): save the wireless network setup instructions only

support was linked screen.

This command is mainly used to save the wireless network settings, the user's wireless network settings are saved. Wireless network settings include: Disabled, NIC mode, focus mode.

2.105 Acquire wireless network settings

Instruction format: EE [D0 A1 FF FC FF FF] Parameters:

None Return Instruction: EE D0 A1 WIFI_GET_CFG FF FC FF FF

Return parameter: WIFI_GET_CFG (Variable): Get the instruction set of the wireless network only

support linked screen.

The instruction set is mainly used to obtain the corresponding wireless network, after setting, the screen will return instruction corresponding to the parameters of the wireless network.

2.106 Access to network status

Instruction format: EE [D0 A2 FF FC FF FF] Parameters: None

Return Instruction: EE D0 A2 WIFI_GET_STATE FF FC FF FF

Return parameter: WIFI_GET_STATE (Variable): The network state acquiring instructions only

support was linked screen.

This command is mainly used to acquire a network state, after setting, the status into Wi-Fi network, a wired network connection, connected to a remote server, the client connections. When the network state acquiring command transmitted, the corresponding network status is checked.

2.107 Searching for wireless networks

Instruction format: EE [D0 A3 FF FC FF FF] Parameters: None

Return Instruction: EE D0 A3 WIFI_SCAN_AP LIST FF FC FF FF

Return parameter: WIFI_SCAN_AP LIST (Variable): search for wireless networks that only support

instruction linked screen.

This command is mainly used to search for wireless networks, search for wireless networks, it allows users to search for the corresponding WiFi, Wireless connection.

2.108 Save the network settings

Instruction format: EE [D0 A4 FF FC FF FF] Parameters: None

Return Instruction: EE D0 A4 NETWORK_SET_CFG FF FC FF FF

Return parameter: NETWORK_SET_CFG (Variable): save the network settings instructions only

support was linked screen.

This command is mainly used to save the network settings, the user's network settings saved.

2.109 Obtain network settings

Instruction format: EE [D0 A5 FF FC FF FF] Parameters: None

Return Instruction: EE D0 A5 NETWORK_GET_CFG FF FC FF FF

Return parameter: NETWORK_GET_CFG (Variable): obtaining the network settings instructions

only support was linked screen.

This command is mainly used to get network settings, network setup comprising: IP Address, subnet mask, default gateway, DNS server.

2.110 Save Network Services

Instruction format: EE [D0 A6 FF FC FF FF] Parameters: None Return

Instruction: EE D0 A6 NETWORK_SERVICE_SET FF FC FF FF

Return parameters: NETWORK_SERVICE_SET (variable length): Save the network services directive

only support linking screen.

This instruction is mainly used to save the network settings, users will save up network services. Network services include: disabling the client, server.

2.111 Access to network services

Instruction format: EE [D0 A7 FF FC FF FF] Parameters: None Return

Instruction: EE D0 A7 NETWORK_SERVICE_GET_CFG FF FC FF FF

Return parameters: NETWORK_SERVICE_GET_CFG (variable length): access to network services that instruction only support linking screen.

This instruction is mainly used to obtain network services, network services include: disabling the client, server.

2.112 Send network data

Format: EE D0 AC Count Strings FF FC FF FF

Parameter format: Count (2 Bytes): the number of bytes transmitted

Strings (Variable): the user selects data to be transmitted, using software written in a format defined by, for example: 12 , Written as 3132

The instructions only support was linked screen.

This command is mainly used to send a data network, according to the corresponding ASCII Send code.

2.113 Send network data (hexadecimal)

Format: EE D0 AC Count Strings FF FC FF FF

Parameter format: Count (2 Bytes): the number of bytes transmitted

Strings (Variable length): data sent by the user to select, write the appropriate format, for example: 1213 , Written as 1213

The instructions only support was linked screen.

This command is mainly used to transmit network data sent in the appropriate format.

2.114 Save the network settings

Instruction format: EE] [D0 AA FF FC FF FF Parameters:

None

The instructions only support was linked screen. This command is mainly used to hold the respective network settings.

2.115 Local / External AV Video Input

Instruction format: EE] [4B Enable FF FC FF FF

Parameters: Enable (1 byte): Local / external screen switching flag

0x00: Switch to the local picture show 0x01: Switch to the AV video input display

This command is mainly used for the local video image display screen and the AV display switching input screen.

2.116 Keyboard Display System

Instruction format: EE [86 01 xy type Option max_len FF FC FF FF] Parameters: 01 (1 byte): fixed value, keyboard, display;

x (2 bytes): x coordinate of the pop-up keyboard; y (2 bytes): y coordinate of the pop-up keyboard; type (1 byte): 0 keypad, a full keyboard; Option-(1 byte): 0 normal characters, a password, time setting 2; max_len (1 byte): keyboard input character length limit;



This command is mainly used to show / hide the keyboard system;

Keyboard input value will be output through the serial port, the instruction format 86 01 Strings] [EE FF FC FF FF.

Strings (Variable): ascii code the user inputs a character, such as a keyboard input 123, here 31 32 33;

2.117 Hide system keyboard

Instruction Format: EE [8600] FF FC FF FF Parameters:

None

The instruction system is mainly used to hide the keyboard;

2.118 Touch sensitivity adjustment instruction (only capacitive screen)

Instruction format: EE 8A 5A A5 XX] [FF FC FF FF

Parameters: XX (1 byte): XX in the range 0-7, more sensitive the higher gear position, the serial port is the factory default screen

0, adjust the touch sensitivity thicker support plate. If not necessary, do not arbitrarily adjust the sensitivity. The instructions for adjusting the sensitivity of the touch screen for capacitive screen.

2.119 Enters the standby state

Instruction format: EE [6000] FF FC FF FF

Parameters: None

The instructions for the main screen into a standby state into the standby state from the active state;

2.120 Enter the active state

Instruction format: EE [6001] FF FC FF FF

Parameters: None

The instruction is mainly used to make the screen to enter the active state into an active state from the standby state;

3. appendix A DETAILED DESCRIPTION The basic instruction set

Due to the configuration instruction set to meet 95% Engineering applications, and easy operation, most of the configuration are PC Done, so we do not recommend using the basic instruction set. Relative configuration instruction set, belonging to the bottom of the basic instruction set of instructions, more flexibility, in the case of the configuration command can not be completed, can be implemented using the basic set of instructions. Detail of the instruction set as the following sections.

3.1 Before setting / background color

Instruction Format: Set the foreground color: EE [41 Fcolor] FF FC FF FF

Set the background color: EE [42 Bcolor] FF FC FF FF

Set the foreground and background color: EE [40 Fcolor Bcolor] FF FC FF FF

Parameter Description: Fcolor , Bcolor (2 Bytes) are in the foreground and background colors RGB It is mainly used for displaying foreground color values specified text, points, lines and circles, mainly for cleaning the screen background color and text background color

Specified. For example, by setting the front / background color instructions may complete the display of FIG. 3-1 What it is shown. Reference program:

```
{
    SetBcolor (31);           // Set the background color is blue, clear screen for specifying the color
    GUI_CleanScreen ();       // Clear screen
    SetFcolor (65516);        // Sets the foreground color to yellow, the user designates the display color of the text
    SetBcolor (63488);        // Set the background color to red, is used to specify the text background color (background)
    DisText (50, 50, 1, 6, "Hello, color!");      // In the coordinates ( 50, 50) Writing the string, the background color
    DisText (50, 90, 0, 6, "Hello, serial screen!"); // In the coordinates ( 50, 90) Writing the string, no background color
    SetFcolor (2016);         // Re-set the foreground color to green
    GUI_RectangleFill (256, 57, 370, 116);        // Painting filled rectangle
}
```



Map 3-1 Background foreground Description

3.2 Layers automatically cleared when switching screens

Format: EE [06 Enable] FF FC FF FF

Parameter Description: Enable (1 Bytes): Clear flag

0x00 : Not Clear

0x01 : Auto clear

The instructions for implementing automatic clearing operation when switching the screen layer, the non-control pattern (dots, lines, rectangles, circles, ellipses, text, image) in a layer that is automatically cleared when switching screens.

3.3 Set the text spacing ranks

Format: EE [43 Y_W X_W] FF FC FF FF

Parameter Description: Y_W (1 Bytes) Is the line spacing in points, in the range 00 ~ 3F ;

X_W (1 Bytes) It is in units of column pitch point, in the range 00 ~ 3F .

This command is used to set the ranks of the distance between the text. If only one line of text, line spacing was 0 . For example displayed on the screen

2 Row 32 * 32 String, set line spacing twenty four , Column spacing 16 , The program as shown below. Reference

program:

```
{
    SetForeColor (65504);           // Sets the foreground color to yellow, the color display specified text
    SetBackColor (63488);          // Set the background color is red, the specified text background color
    SetTextSpace (24,16);          // Setting line spacing twenty four , Column spacing 16
    DisText (50, 51, 1, 7, " Guangzhou Science and Technology Industrial Serial color screen "); // Display text strings
}
```

3.4 Set the text box

Format: EE [45 Enable Width Hight] FF FC FF FF

Parameter Description: Enable (1 Bytes): Open / Close Limit Enable textbox

Width (2 byte): The width of the text box;

Hight (2 byte): Height of the text box.

After setting the text box, the text box will be displayed at a defined wrap.

3.5 Picture color filter

Format: EE [44 FillColor] FF FC FF FF

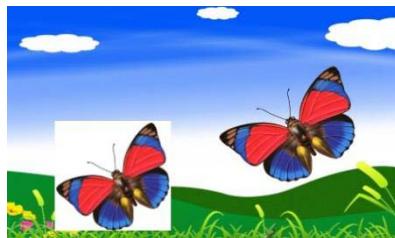
Parameter Description: FillColor (2 Byte): Color filter RGB value;

After setting the color filter, a pixel value when the image coincides with the value of the same color filter, this point will be shielded, not

displayed on the screen. FIG disposed before and after the filter color contrast 3-2 Fig. Reference program:

```
{
    DisArea_Image (0, 0, 0, 0);           // (0,0) Background image displayed at the Prairie
    DisArea_Image (61,130, 1, 0);          // (61,130) Displayed at the unfiltered butterfly pattern
    SetFilterColor (65535);              // Is provided to filter the white color, RGB Value 65535
    DisArea_Image (258,68, 2, 1);          // (258,68) Butterfly pattern displayed at the filtered
}
```

Unfiltered display



After filtration display

Map 3-2 FIG color contrast filter is provided before and after

3.6 Text Display

Format: EE [20 XY Back Font Strings] FF FC FF FF

Parameter Description: X (2 byte) : In points of X Axis coordinate value;

Y (2 byte) : In points of Y Axis coordinate value;
Back (1 Bytes): Background Color Enable
 0x01: background color display 0x00: The background color is not displayed
Font (Character encoding, 1 Bytes)
 0x00: 8x12 dot (ASCII) 0x01: 8x16 dot (ASCII) 0x02: 12x24 matrix (ASCII)
 0x03: 16x32 matrix (ASCII) 0x04: 12 x 12 dot (GBK) 0x05: 16 x 16 dot (GBK)
 0x06: 24 x 24 dot (GBK) 0x07: 32 x 32 dot (GB2312) 0x08: 32 x 64 dot (ASCII)
 0x09: 64 x 64 dot (GB2312)

Strings: String written by the user, high byte first.

The instructions for implementing the specified anywhere on the screen displaying the text. GBK And it contains Chinese characters commonly used fonts such as Japan and South Korea; GB2312 It contains only Chinese characters and character; ASCII Chinese characters can not be displayed. In actual operation, the user determines the foreground color, background color, text font encoding can be continuously written characters or a string, the machine will automatically wrap the display and match in English. FIG text display 3-3 Fig.

Reference program:

```
{
  SetFcolor (65504);           // Set the text foreground color, yellow
  DisText (46, 21, 0, 7, " Industrial Serial Screen LCM 32 * 32 "); // coordinate( 46,21 ) At display text, font is 7 No. font
```



Map 3-3 FIG text display

3.7 Cursor display

Format: EE [21 Enable XY Width Height] FF FC FF FF

Parameter Description: Enable (1 Bytes) : Cursor enable signal

0x00: The cursor is closed, 0x01: cursor open

X (2 byte) : In points of X Axis coordinate value

Y (2 byte) : In points of Y Axis coordinate value

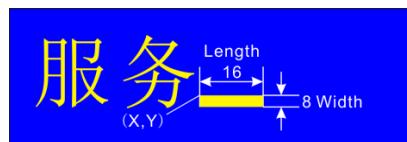
Width (1 Bytes): the width of the cursor

Height (1 Bytes): height of the cursor

This command is mainly used to control a cursor blinking on and off. For example users 24 * 24 Suffix characters display width 16 Height 8 Cursor, as shown in FIG effect 3-4 Fig.

Program reference code:

```
{
  SetBcolor (31);           // Set background color blue
  GUI_CleanScreen ();      // Clear blue screen background
  DisCursor (1,359,40,16,8); // Blinking cursor is enabled, the ( 359,40 ) The display width 16 height 8 Cursor
}
```



Map 3-4 Cursor Parameter Description

3.8 Full-screen picture display

Format: EE [31 Image_ID MaskEn] FF FC FF FF

Parameter Description: Image_ID (2 Bytes): Image,

MaskEn (1 Bytes): Color Filter Enable

0x00: no color filter; 0x01 performs color filtering

The primary instruction full screen image, a fixed start coordinate (0,0), depending on the filter was filtered color color setting. If the image size is smaller than the full screen size, when the instruction is executed, only the actual displayed picture size.

3.9 Image display area

Format: EE [32 XY Image_ID MaskEn] FF FC FF FF

Parameter Description: X (2 Byte): in points of X Axis coordinate value

Y (2 Byte): in points of Y Axis coordinate value

Image_ID (2 Bytes): Image,

MaskEn (1 Bytes): Color Filter Enable

0x00: no color filter; 0x01 performs color filtering

The instructions for implementing the image display arbitrary position. Users need to pay attention to the starting coordinates and pictures length and width, to prevent the display screen outside the

Curtain range. For example the user to the screen (100,50) Is displayed at a ID for 2 The picture, as 3-5 , The procedure is as follows with reference to

FIG.



Map 3-5 Image display area

Program reference code:

```
{
    DisFull_Image (0,0);           // Full screen picture display
    DisArea_Image (100,50, 2, 0); // Picture display area, coordinates ( 100,50 ) At the display ID = 2 picture of
}
```

3.10 Image Cut

Format: EE [33 XY Image_ID Image_X Image_Y Image_W Image_H MaskEn]

FF FC FF FF

Parameter Description: X (2 byte) : In points of X Axis coordinate value

Y (2 byte) : In points of Y Axis coordinate value



Image_ID (2 byte): To cut the number of pictures

Image_X (2 byte): The picture is cut starting point X coordinate

Image_Y (2 byte): The picture is cut starting point Y coordinate

Image_W (2 Bytes): the width of cut

Image_H (2 Bytes): Cut height

MaskEn (1 Bytes) 0x00: no color filter; 0x01 performs color filtering

Note: the color filter color depending on the filter settings

The instructions for implementing the image display is cut over at arbitrary coordinates of the screen. Users can store in Flash In any

A partial image cropping, shearing effect in FIG. 3-6 Fig.

3.11 Animation

Format: EE [80 XY FlashImage_ID Enable PlayNum] FF FC FF FF

Parameter Description: X (2 Bytes): In points of X Axis coordinate value

Y (2 Bytes): In points of Y Axis coordinate value

FlashImage_ID (2 Byte): Animation Number

Enable (1 Bytes): enable signals

0x00: Close animation; 0x01: open animation

PlayNum (1 Bytes)

0x00: repeat; 0x01 ~ 0xFF: play the specified number of times

After the playback is stopped, the device returns EE 02 FF FC FF FF It indicates the end of the animation. The instructions for implementing the display of animated gif arbitrary position. Animated gif format only supports and does not support animated gif two or more same screen while playing. If desired a screen simultaneously displays a plurality of animated gif, animations and pause, stop, play function / lower frames and the like, using the animation control commands, configuration control instructions detailed in the table. Image animation effect is shown 3-6 Fig. Program reference code:

```
{
    DisFull_Image (0, 0); // Full screen display child picture, numbered 0
    DisFlashImage (330,5, 1,1,0); // coordinate( 330,5) The insertion cows Flash Animation, repeat
    DisCut_Image (343,137,0,95,30,92,116,0); // Picture from 0 coordinate( 95,30) Cut size at 92 x116 // Pictures, placed on
                                                // the screen ( 343,137) Displayed at
}
```



GIF 动画显示

剪切显示

Map 3-6 Pictures animated renderings

3.12 Foreground color painting point

Format: EE [50 XY] FF FC FF FF

Parameter Description: X (2 Bytes): In points of X Axis coordinate value

Y (2 Bytes): In points of Y Axis coordinate value



The instructions are implemented at any point of the screen drawing position, depending on the color values of the points set foreground.

3.13 Background color drawing point (point deleted)

Format: EE [58 XY] FF FC FF FF

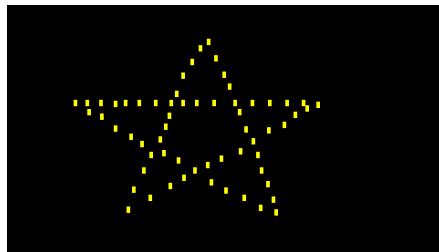
Parameter Description: X (2 Bytes): In points of X Axis coordinate value

Y (2 Bytes): In points of Y Axis coordinate value

The instructions are implemented at any point of the screen position drawn, the color values of the points depends on the background color setting.

The background color with the foreground color is usually stippled stippled use, you can delete points with the foreground color painting.

Figure 3-7 , The user may be displayed on a black background by the foreground FIG stippled a yellow star pattern, to modify or remove this pattern, the same cover can go to the background color coordinates by invoking Videos foreground point instruction writing point. Of course, if the user of the data update rate is not too high, it may be to clear the screen area, and then re-drawn.



Map 3-7 Foreground / background color stippled

3.14 Drawing a line

Format: EE [51 X₀ Y₀ X₁ Y₁] FF FC FF FF

Parameter Description: X₀ (2 byte) : In points of a straight line X Axis coordinate values of the starting point

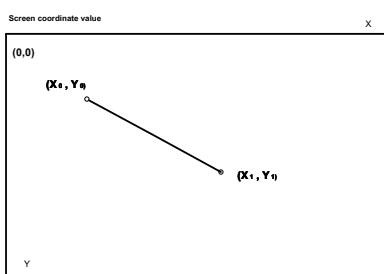
Y₀ (2 byte) : In points of a straight line Y Axis coordinate values of the starting point

X₁ (2 byte) : In points of a straight line X Axis coordinate value of the end point

Y₁ (2 byte) : In points of a straight line Y Axis coordinate value of the end point

This command is mainly achieved between any two points of the screen objects, the foreground color value of the line depends on the setting.

Map 3-8 Fig: For example, by invoking specified objects implement a simple table, the actual display in FIG. 3-8 Fig.



Map 3-8 Draw lines Parameter Description

3.15 The intervals X Connected foreground color coordinates

Format: EE [59 X₀ Xspace Y₀ Y₁ Y₂ ... Y_n] FF FC FF FF

Parameter Description: X₀ (2 Bytes) : In points of X Axis coordinate value

Xspace (2 Bytes): in points of X Two adjacent shaft fixed interval value

Y_n (2 Bytes) : In points of Y Axis coordinate value of the main instruction fast draw polylines. due to X Distance between two points of the front and rear axles are fixed Xspace Therefore from 2 Point start command parameters do not need X Coordinate values. Contrast foreground / background color draw polylines, twice as fast.

3.16 The coordinate offset connection with the foreground color

Format: EE [75 X₀ Y₀ X₁ Y₁ X₂ Y₂ ... X_n Y_n] FF FC FF FF

Parameter Description: X₀ (2 Bytes): in points of X Axis coordinate value

Y₀ (2 Bytes): in points of Y Axis coordinate value

X_n (1 Bytes) : In points of X Offset shaft

Y_n (1 Bytes) : In points of Y Offset shaft

(X, Y) The absolute coordinate of the first point, a point behind each are represented by a point before the current absolute coordinates plus the offset.

The most significant bit is the sign bit of the offset, 0 Represents a positive offset, 1 It represents a negative offset, plus or minus an offset value of the maximum 127 Points.

The main instruction using the coordinate offsets for each coordinate of the original 4 Bytes becomes 2 Bytes, halving the command parameters to achieve polyline drawing twice as fast. The color of the line determined by the setting foreground.

3.17 The designated coordinate point is connected with the foreground color

Format: EE [68 X₀ Y₀ X₁ Y₁ ... X_n Y_n] FF FC FF FF

Parameter Description: X_n (2 byte) : In points of a straight line X Axis coordinate values of the starting point

Y_n (2 byte) : In points of a straight line Y Axis coordinate values of the starting point

The command is mainly implemented by a plurality of coordinate points specified foreground connected. For example, Map 3-9 Shown polyline

And a hexagonal shape, the program as shown below.

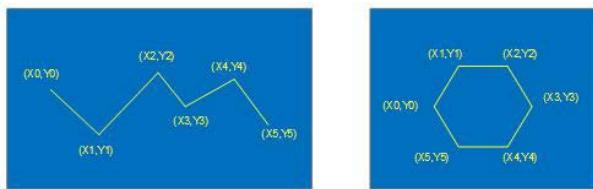


Figure 3-9 is connected with the foreground color coordinate points specified renderings

Program reference code:

```
{
    SetFcolor (65523); // Foreground color to yellow line
    GUI_FcolorConDots (x0, y0, x1, y1, x2, y2, x3, y3, x4, y4, x5, y5); // draw( x0, y0 ) To ( x5, y5 ) Polyline
    GUI_FcolorConDots (x0, y0, x1, y1, x2, y2, x3, y3, x4, y4, x5, y5, x0, y0); // Drawing a hexagonal, end to end
}
```

3.18 The designated coordinate point is connected with the background color

Format: EE [69 X₀ Y₀ X₁ Y₁ ... X_n Y_n] FF FC FF FF

Parameter Description: X_n (2 byte) : In points of a straight line X Axis coordinate values of the starting point

Y_n (2 byte) : In points of a straight line Y Axis coordinate values of the starting point

The command is mainly achieved by connecting a plurality of coordinate points specified background color. The background color with the foreground color to draw polylines usually draw polylines use, can be used to delete the foreground color to draw polylines.

3.19 Wired as a background color coordinates offset

Format: EE [76 X₀ Y₀ X₁ Y₁ X₂ Y₂ ... X_n Y_n] FF FC FF FF

Parameter Description: X₀ (2 Bytes): in points of X Axis coordinate value

Y₀ (2 Bytes): in points of Y Axis coordinate value

X_n (1 Bytes) : In points of X Offset shaft

Y_n (1 Bytes) : In points of Y Offset shaft

(X, Y) The absolute coordinate of the first point, a point behind each are represented by a point before the current absolute coordinates plus the offset.

The most significant bit is the sign bit of the offset, 0 Represents a positive offset, 1 It represents a negative offset, plus or minus an offset value of the maximum 127 Points.

The main instruction using the coordinate offsets for each coordinate of the original 4 Bytes becomes 2 Bytes, halving the command parameters to achieve polyline drawing twice as fast. The color of the line determined by the setting the background color.

3.20 Hollow round draw

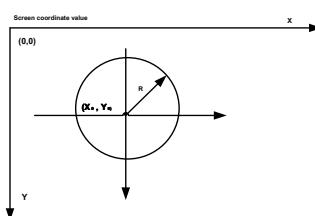
Format: EE [52 X₀ Y₀ R] FF FC FF FF

Parameter Description: X₀ (2 Bytes): In points of the center X Coordinate values

Y₀ (2 Bytes): In points of the center Y Coordinate values

R (2 Bytes): Open circle of radius

The instructions for implementing Videos in a radius at the specified coordinates R Open circle, the circle line color depends foreground color settings. Parameters such as [Map 3-10 Fig.](#)



Map 3-10 Painting hollow circle Parameters

3.21 Draw a filled circle

Format: EE [53 X₀ Y₀ R] FF FC FF FF

Parameter Description: X₀ (2 Bytes): In points of the center X Coordinate values

Y₀ (2 Bytes): In points of the center Y Coordinate values

R (2 Bytes): Solid radius of the circle

The instructions for implementing Videos in a radius at the specified coordinates R Solid circles, depending foreground fill color within the circle is provided. Parameters [Map 3-10 the same.](#)

3.22 Draw an arc

Format: EE [67 X₀ Y₀ R SA EA] FF FC FF FF

Parameter Description: X₀ (2 Bytes): In points of the center X Coordinate values

Y₀ (2 Bytes): In points of the center Y Coordinate values

R (2 Byte): radius of a circle

SA (2 Byte): starting angle

EA (2 字节) : 结束角度

The instructions for implementing Videos in a radius at the specified coordinates R Arc, arc foreground color depending on the settings. Watches 3 As a starting point the direction of an angle 0 Degree, the angle sequentially increases clockwise, as reference coordinates [图 3-11 所示。](#)

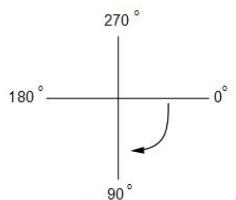


图 3-11 圆弧起始角度参考图

3.23 画空心矩形

指令格式：EE 【 54 X₀ Y₀ X₁ Y₁】 FF FC FF FF

参数说明：X₀(2字节)：以点为单位的空心矩形左上角 X 坐标值

Y₀(2字节)：以点为单位的空心矩形左上角 Y 坐标值

X₁(2字节)：以点为单位的空心矩形右下角 X 坐标值

Y₁(2字节)：以点为单位的空心矩形右下角 Y 坐标值

该指令用于实现在屏幕任意位置画一个空心矩形，矩形边框颜色取决前景色的设置。参数定义如

图 3-12 所示。

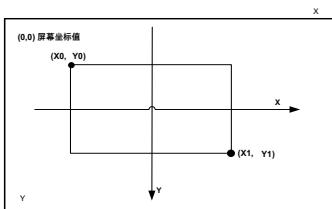


图 3-12 画空心矩形参数说明

3.24 画实心矩形/局部清屏

指令格式：EE 【 55 X₀ Y₀ X₁ Y₁】 FF FC FF FF

参数说明：X₀(2字节)：以点为单位的实心矩形左上角 X 坐标值

Y₀(2字节)：以点为单位的实心矩形左上角 Y 坐标值

X₁(2字节)：以点为单位的实心矩形右下角 X 坐标值

Y₁(2字节)：以点为单位的实心矩形右下角 Y 坐标值

该指令用于实现在屏幕任意位置画一个实心矩形，矩形填充色取决前景色的设置。参数 定义与

图 3-12 相同。该功能还可以作为局部清屏使用。

3.25 画空心椭圆

指令格式：EE 【 56 X₀ Y₀ X₁ Y₁】 FF FC FF FF

参数说明：X₀(2字节)：以点为单位的空心椭圆最左端 X 坐标值

Y₀(2字节)：以点为单位的空心椭圆最上端 Y 坐标值

X₁(2字节)：以点为单位的空心椭圆最右端 X 坐标值

Y₁(2字节)：以点为单位的空心椭圆最下端 Y 坐标值

该指令用于实现在屏幕任意位置画一个空心椭圆，椭圆边框颜色取决前景色的设置。参数 定义说明如

图 3-13 所示。

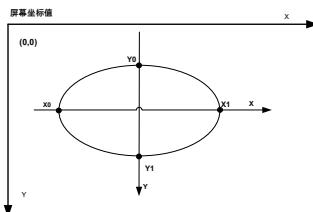


图 3-13 画空心椭圆参数说明

3.26 画实心椭圆

指令格式：EE 【 57 X₀ Y₀ X₁ Y₁】 FF FC FF FF

参数说明：X₀(2字节)：以点为单位的实心椭圆最左端 X 坐标值

Y₀(2字节)：以点为单位的实心椭圆最上端 Y 坐标值

X₁(2字节)：以点为单位的实心椭圆最右端 X 坐标值

Y₁(2字节)：以点为单位的实心椭圆最下端 Y 坐标值

该指令用于实现在屏幕任意位置画一个实心椭圆，椭圆填充色取决前景色的设置。

3.27 清除图层

指令格式：EE 【 05 Layer 】 FF FC FF FF

参数说明：Layer(1个字节)：清除的图层 该指令主要用于清除指定的图层。

3.28 截取当前屏幕并保存在 FLASH 中

指令格式：EE 【 0x46 Image_ID 】 FF FC FF FF

参数说明：Image_ID(1个字节)：用户自定义保存在存储器中的画面编号 该指令支持基本型、商业型、经济型，物联网不支持。该指令主要用于实现将当前屏幕显示内容保存在 Flash 中。Image_ID 值可以任意设置，与工程图片 ID 值不冲突。

3.29 显示保存在 FLASH 中的截取画面

指令格式：EE 【 0x47 Image_ID 】 FF FC FF FF

参数说明：Image_ID(1个字节)

该指令支持基本型、商业型、经济型，物联网不支持。该指令主要用于显示保存在设备 FLASH 中的截取画面。

3.30 RTC 模式设置

指令格式：EE 【 85 Cmd DisMode TextMode Color Xpoint Ypoint 】 FF FC FF FF

参数说明：Cmd(1个字节)：参数配置

BIT0：使能信号

0：RTC关闭 1：RTC开启

BIT7-BIT1：保留

DisMode(1个字节)：显示模式

0x00：格式 HH:MM:SS

0x01：格式20XX-MM-DD HH:MM:SS

Font(1个字节)：字体选择

0x00: 8x12点阵 (ASCII) 0x01: 8x16点阵(ASCII) 0x02: 12x24点阵(ASCII) 0

x03: 16x32点阵(ASCII) 0x04 12 x 12点阵(GBK) 0x05: 16 x 16 点阵 (GBK)

0x06: 24 x 24点阵(GBK) 0x07: 32 x 32点阵(GB2312) 0x08: 32 x 64点阵

(ASCII) 0x09: 64 x 64点阵(GB2312)

Color(2个字节)：显示颜色

X(2个字节)：以点为单位的 X 轴坐标值

Y(2个字节)：以点为单位的 Y 轴坐标值

该指令主要用于 RTC 显示参数的设定。通过设定对应的参数实现不同时钟格式、字体 和位置的显示。RTC 相关设置指令建议用户直接采用上位机 VisualTFT 进行设置，设置参

参考界面如图 3-14 所示。

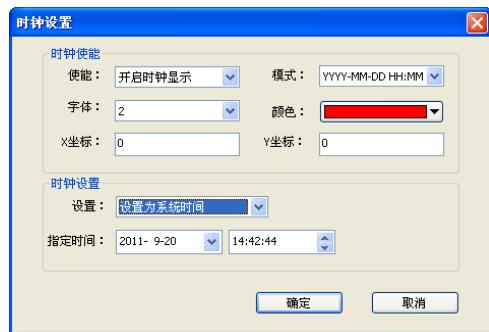


图 3-14 RTC 设置参考图

4. 声明与服务

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