



ISO9001:2015 Quality System Certification

ASTG 024 W023-COF Series Specification

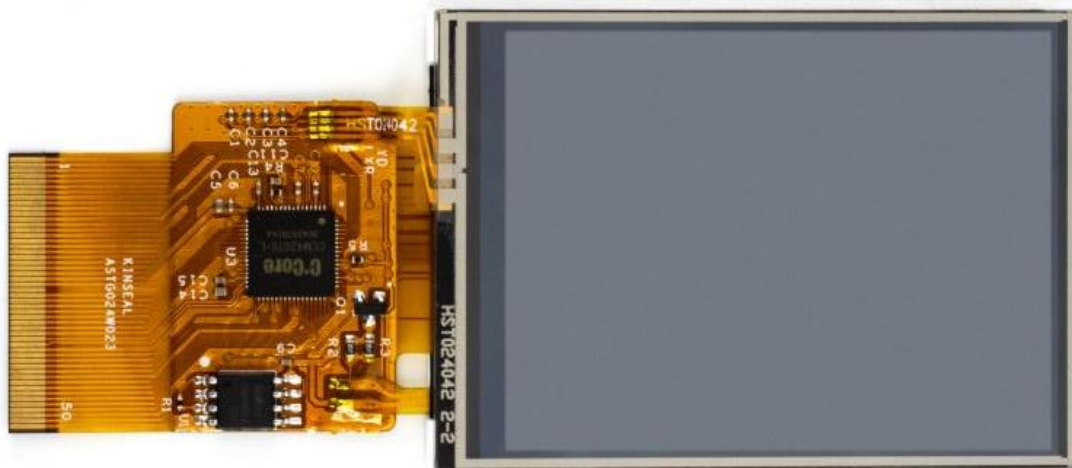
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1. Product Description

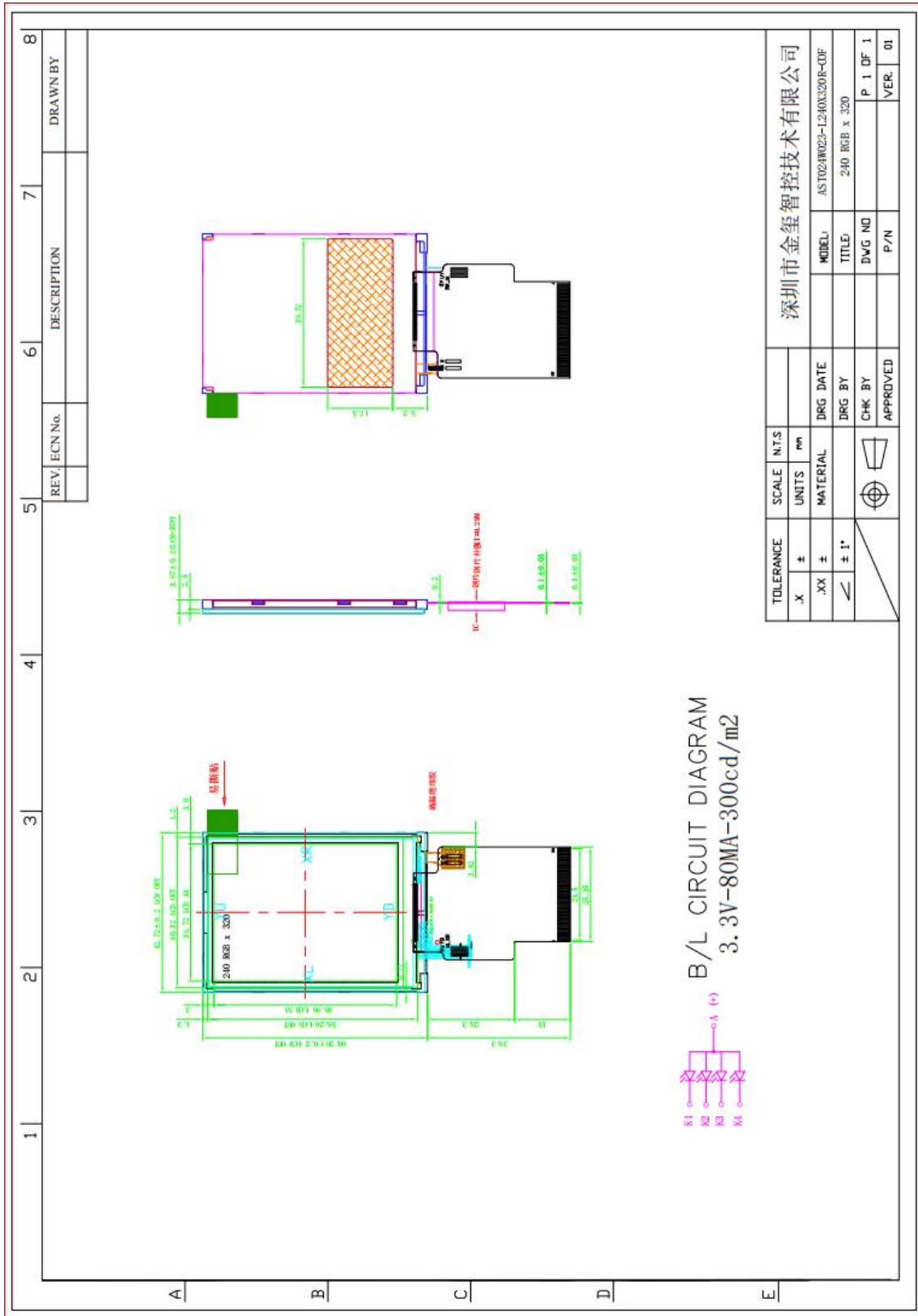
ASTG024W023-L240X320R-COF screen series have two kinds of resistive screen and no touch, and also support the customer's own external capacitive touch screen. COF screen is powered by 3.3V, through our HMILite configuration software for UI design, through the USB download to achieve the customer's desired UI interface. COF screen default support for 1-way serial communication (COF screen supports one serial port communication (UART2) and one CAN (CAN1) communication by default to interact with external controllers; it supports RTC and buzzer by default. This COF screen reserves abundant IO ports, which can be controlled by macro commands for input and output.

1.1 Product Model



model number	Specification
ASTG024W023-L240X320R-COF	ASTG Series, 2.4-inch 240X320 resolution display, DC3.3V, two TTL serial ports, one CAN interface, 10Mbyte SPI NOR Flash, resistive touch, buzzer, COF structure.
ASTG024W023-L240X320N-COF	ASTG Series, 2.4-inch 240X320 resolution display, DC3.3V, two TTL serial ports, one CAN interface, 10Mbyte SPI NOR Flash, no touch, buzzer, COF structure.

1.2 Product Size



1.3 Product Parameters

Product Specification		
hardware performanc e	Model Series	ASTG024W023-L240X320R-COF ASTG024W023-L240X320N-COF
	monitor	2.4" TFT LCD
	Resolution (Px)	240X320
	coloration	65536 colors
	luminance	250 cd/m ²
	Backlight	LED (Does not support backlight adjustment)
	LED Lifetime	20,000 hours
	Screen Active Display Area (AA)	Length*Width = 36.7mm*48.9mm
	Product size (L*W*H)	42.72mm*60.26mm*3.67mm (tolerance +/-0.2mm with TP)
	touchscreens	ASTG024W023-L240X320R-COF: resistive touchscreen ASTG024W023-L240X320N-COF: no touch
	CPU	200MHz ARM Cortex-M4F Built-in 2MB PSRAM memory
	memory (unit)	On-chip 2Mbyte SPI NOR Flash; Off-chip 8Mbyte SPI NOR Flash;
	RTC	Support, Add External Circuitry
	buzzers	Support, Add External Circuitry
	Power down data saving	3S autosave
	USB port	USB Device
	Program download method	USB Download
communication port	1-way TTL level serial interface; 1-way CAN communication interface;	
Plug specification	FPC0.5mm-50P	
Electrical Specificatio	rating	Maximum 1W
	rated voltage	3.3V

ns	Permissible loss of power	<5ms
	ESD testing	Contact discharge: +/-2KV; Air discharge: +/-4KV
	EFT Testing	IEC 61000-4-4 national standard 4 (voltage: $\pm 4KV$; frequency: 5KHZ; time: 120S), no restart, no display abnormality, no touch abnormality and other phenomena, test function is normal
Environmental specifications	operating temperature	-20°C~70°C
	Storage temperature	-30°C~80°C
	Environmental humidity	10~90%RH (non-condensing)
	seismic defenses	10-25 Hz (X, Y, Z directions, 2g/30 min)
	Cooling method	natural air cooling

2. Hardware Introduction

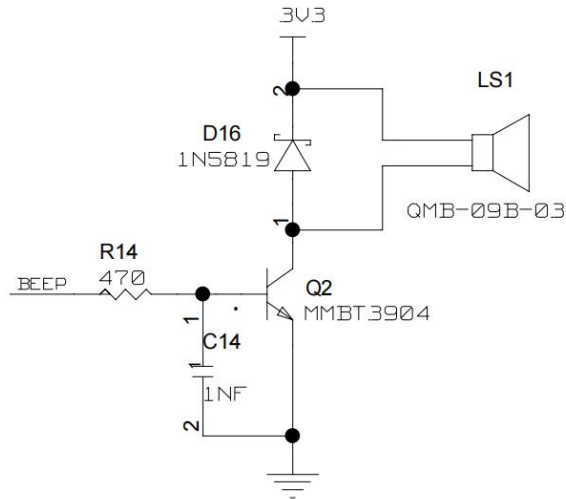
2.1 FPC Pin Definition

Pin	define	clarification
1	UART1 RX	Serial port 1, default is print port
2	UART1 TX	
3	GINT[28]	GPIO, Macro Command Operable
4	GINT[26]	GPIO, Macro Command Operable
5	GINT[31]	GPIO, Macro Command Operable
6	GINT[29]	GPIO, Macro Command Operable
7	GINT[27]	GPIO, Macro Command Operable
8	GND	systematically
9	SD SCK	SD Card Clock
10	SD MOSI	SD CMD signal
11	SD MISO	SD DAT0 signal
12	GND	systematically
13	ADC IN[2]	ADC input
14	CPT RST	Capacitive screen reset signal
15	GND	systematically
16	UART4 TX	Serial 4 communication port Reserved
17	UART4 RX	

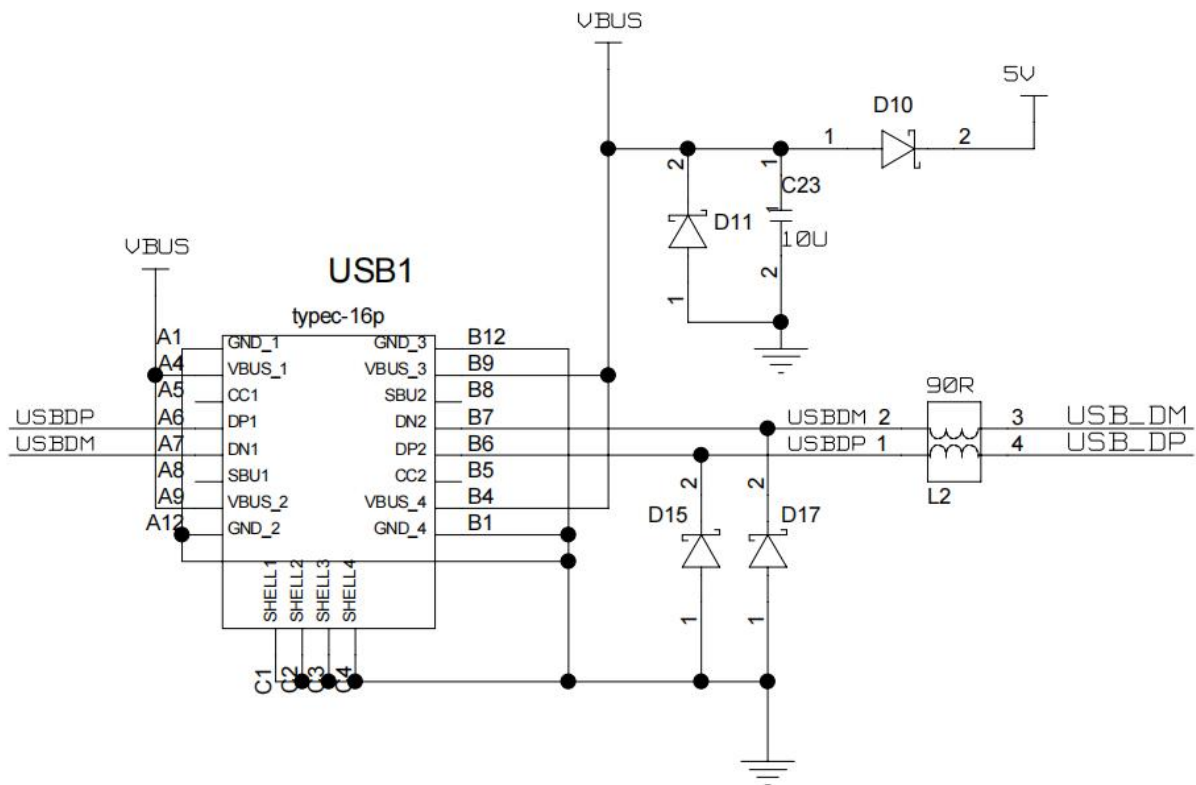
18	GINT[62]	GPIO, Macro Command Operable
19	GINT[63]	GPIO, Macro Command Operable
20-23	3V3	3V3 power supply
24	GND	systematically
25	N.C.	unoccupied
26	CAN2 TX	CAN2 Reserved
27	CAN2 RX	
28	CPT SDA	Capacitive Screen I2C SDA Signal
29	CPT SCL	Capacitive Screen I2C SCL Signal
30	SD CS	
31	I2S SD	I2S interface, can be used as GINT[0]
32	I2S LRCK	I2S interface, can be used as GINT[1]
33	GND	systematically
34	USB DM	USB, Download Port
35	USB DP	
36	GND	systematically
37	GINT[30]	GPIO
38	UART2 TX	Serial port 2, the default communication serial port
39	UART2 RX	
40	BEEP	Buzzer control, 2.7KHz square wave
41	GND	systematically
42	CAN1 TX	Default CAN1 communication interface
43	CAN1 RX	
44	CPT INT	capacitive display interruption
45	SWD TCK	JLINK
46	SWD TDO	
47	RTC SDA	RTC I2C DATA signal
48	RTC SCL	RTC I2C Clock Signal
49	UART3 TX	Serial Port 3, Communication Port, Reserved
50	UART3 RX	

2.2 Recommended Circuit Design

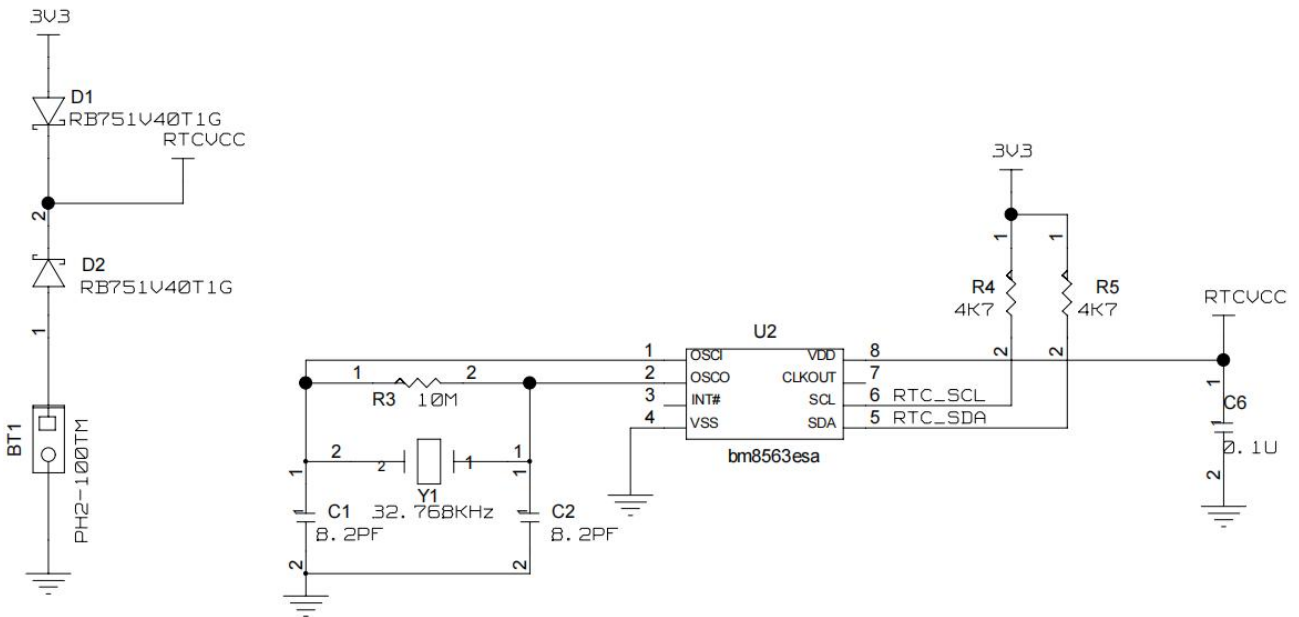
2.2.1 Buzzer Circuit



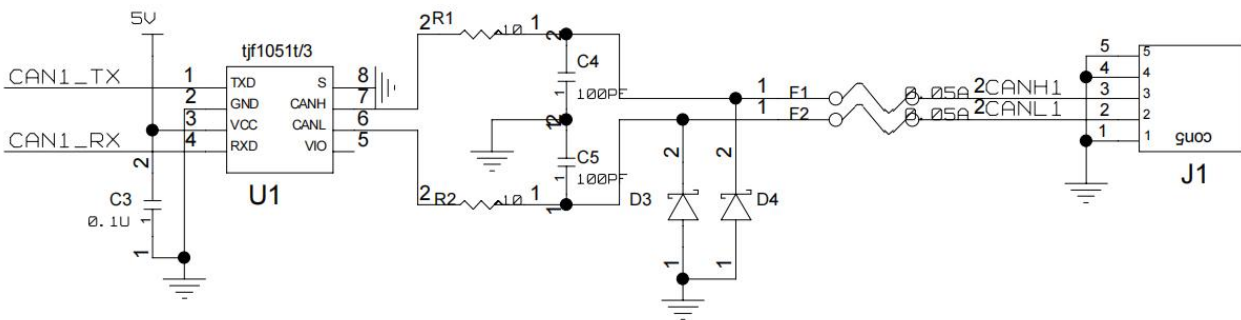
2.2 USB circuit



2.3 RTC circuit

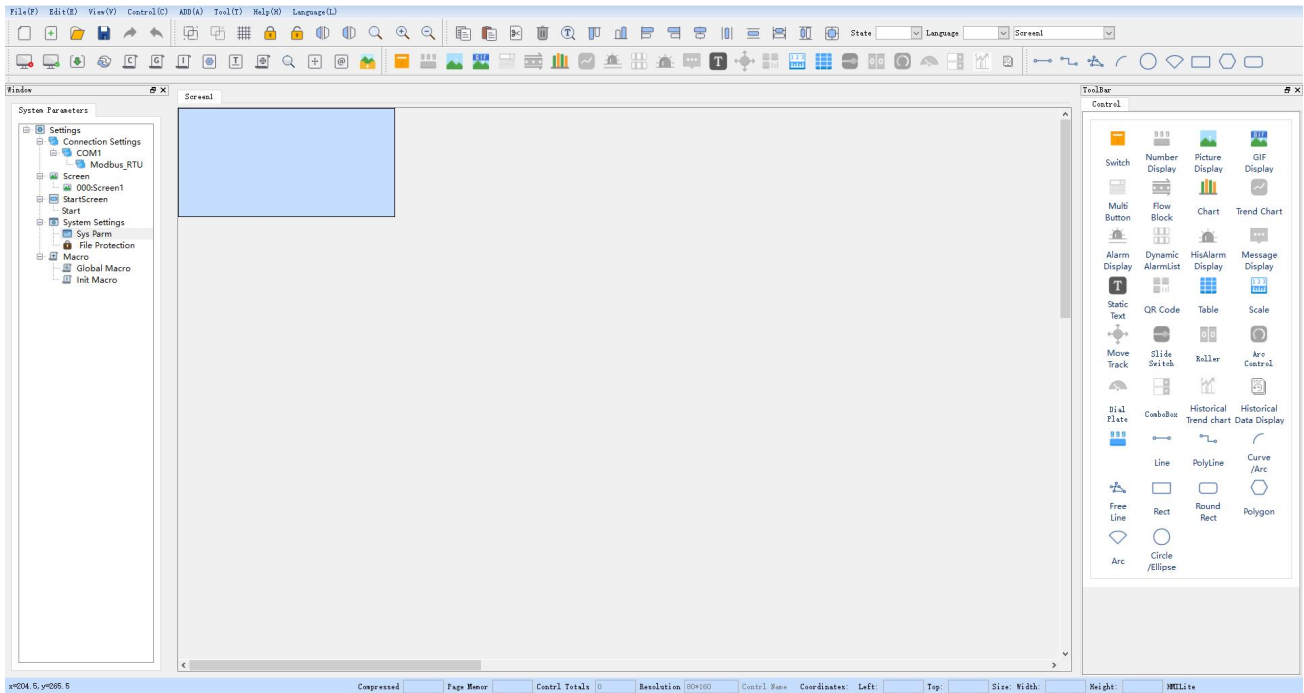


2.4 CAN communication interface circuit



3 Upper configuration software description and download program description

3.1 development software



The configuration software **HMLite** is a set of upper software that can be edited by the customer at will. The customer's applications are all developed on the basis of the upper software, which consists of a rich set of controls that can be combined at will in order to realize the functions desired by the customer:

Controls are included:

switch button	Includes "bit buttons", "word buttons", "indicator lights", "screen buttons", "function buttons", and "multistate buttons". "Function buttons" and "Multistate buttons" can be used to touch the connected device and monitor the status.
Numerical input	Includes multiple binary inputs and displays, ASCII inputs and displays for displaying monitored address values(Up to 16 ascii displays + QR code

and display	controls on a single screen)
mobile block	Animated graphics that simulate the state of liquid flow in a pipe
Static text/table/scale	A variety of basic shapes, including lines, circles, ellipses, rectangles, etc.
Image display and gif animation	Picture display box showing one or more pictures
meter	Bar graphs, gauges, circles, showing some state value of the data
trend chart	Real-time dynamic display of monitoring address data trend graphs(Trend charts + historical trend charts up to 4 supported)
Historical Data Display	Display the data acquired by the data collector in tabular form
Historical Trend Chart	Real-time dynamic display of the trend graph of the data acquired by the data collector(Trend charts + historical trend charts up to 4 supported)
Multi-function buttons	An on/off button, with which all functions can be easily and quickly accessed.(Add up to 2 functions)
trajectory	Control address data by dragging a scrolling block
two-dimensional barcode	Dynamically generated QR code, access by scanning website, payment and other functions(Up to 6 ascii displays + QR code controls for a single screen)
Alarm display	Displays the current alarm information of the device (divided into digital alarms and analog alarms), you must configure the alarm settings before you use the control (you can do up to Digital alarms can be created up to 128)
Dynamic Alarms	Used to display the current alarm, which is different from the alarm control in that the dynamic alarm bar displays the current alarm in the form of

	scrolling text.
Historical Alarm Display	displaying all generated alarm messages. 3S detection saving, up to 3 articles
drop-down box	Drop-down list to select the corresponding item/status
slide switch	Create a slider area to change the value of the specified word address by pressing the slider left/right/up/down.
tire	Create a data area and scroll up and down to modify the current value
circular adjustment	Use the arc style to display the current value, and adjust the current value by dragging the slider to modify it.
meter dial	Use dials to display time, progress, speed and other data

Extended functionality of the host machine configuration software:

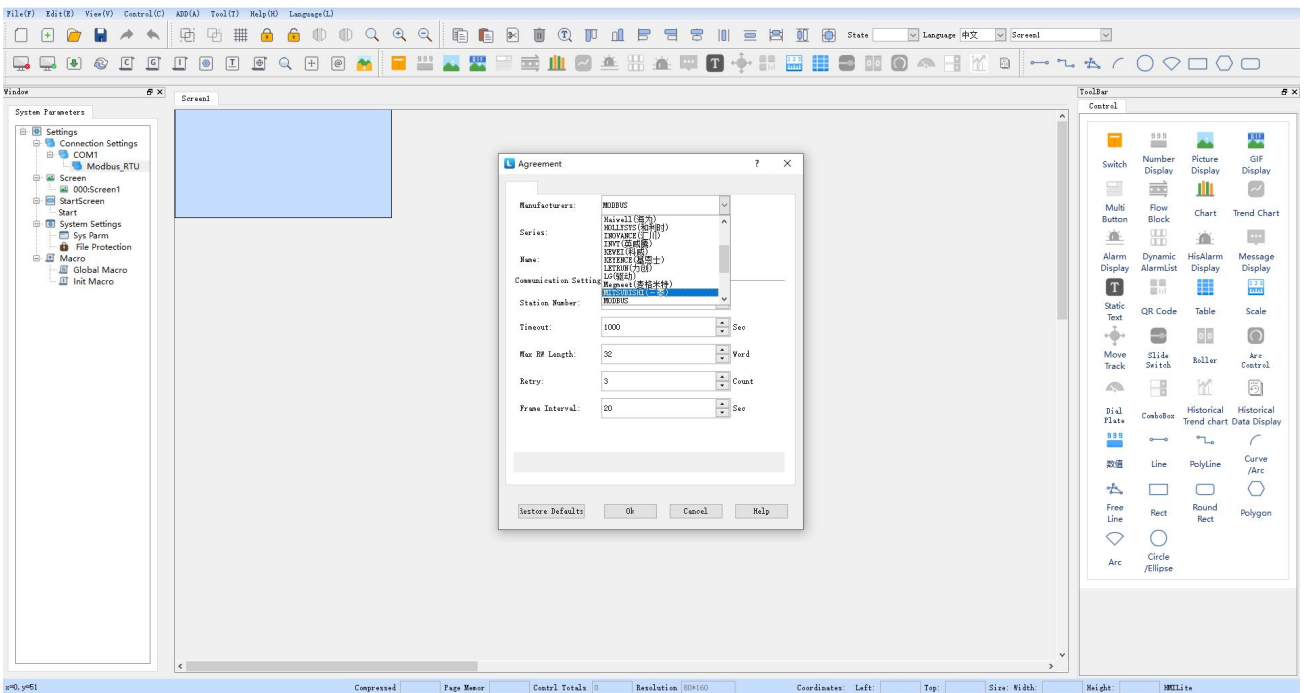
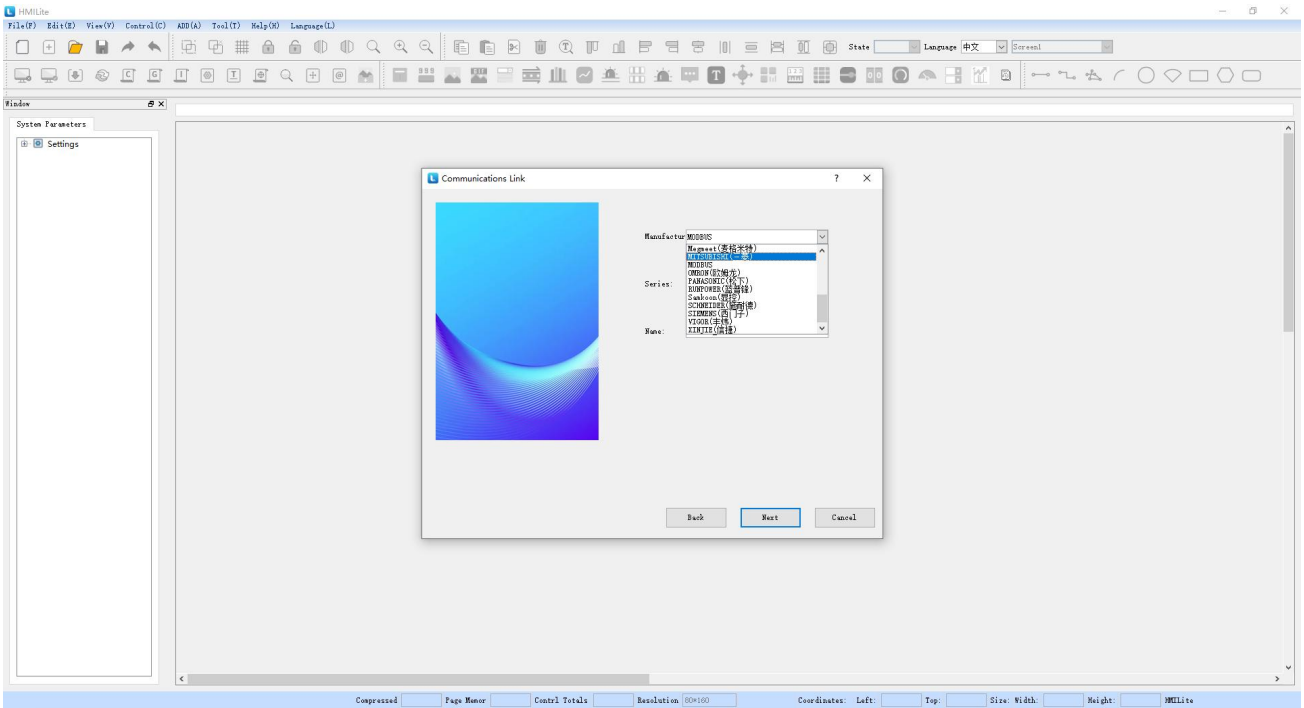
macro instruction	C programming to implement a variety of more complex logic or functions(Macro program (MarcoRun.dat) max. 136KB, max. 100 custom protocols, max. 100 read-only or read/write variables for macros)
PLC control	HMI control via PLC
HMI Protection	The HMI can be used normally within a certain period of time, if the time exceeds the time specified by the user, the HMI will jump to the specified screen previously set by the user, in the specified screen, the user only places the function button below the "panel protection unlock button". (only 3 levels supported)
document protection	Do you need to enter a password to open the project?
User password level	Set user privileges and passwords, access to the appropriate privileges need to enter the appropriate passwords
data acquisition	Data acquisition of temperature, pressure, humidity, etc. is possible. (Data acquisition supports up to 64KB)
multilingualism	Multi-language support(Support up to 4 languages, alarm display, message display and drop-down box only support English and Chinese display)
boot screen	User can customize the boot-up Logo screen

Offline simulation	Before compiling and downloading the screen to the HMI device, you can use the offline simulation function that comes with HMILite to check the correctness of the configuration screen and the effect of the display.
Online Simulation	Online simulation allows you to communicate with plc's and other devices via your personal computer (HMILite configuration software must be installed first) without the use of an HMI.
Supports multiple controller communication protocols	Suitable for a variety of PLC, inverter, servo controller, microcontroller control system, etc. (Mitsubishi, Panasonic, Omron, Delta, Xinjie, Yonghong, Siemens, Keens, LG, modbus, customized and other communication protocols) the user only needs to operate directly in the software to select the call can be!
Custom Add Gallery	Support for customizing the gallery, users can intercept their favorite images loaded into a custom gallery to call according to need
image archive	Rich gallery, support Png, Jpg, Gif, Bmp and other formats of the picture, vector gallery, any zoom non-aliased
Customized Keyboards	Support custom keyboard, according to their own needs to do keyboard style

3.2 Protocol Configuration

Users can run MODBUS RTU, Mitsubishi, Siemens, Delta, Xinjie and other protocols through the upper computer configuration.

Open **HMILite** configuration software, click [**New Project**], you can select the desired communication protocol in [**New Project**], you can also modify the project to select your desired communication protocol, open the com1 port settings below the protocol to change, the following figure.



4. Reliability Testing

All products of JinXi ZhiControl have been subjected to a series of processed reliability tests: ESD test, high and low temperature aging test, group pulse and other tests. Ensure product quality.

4.1 ESD testing

Implementation standard: IEC 61000-4-2

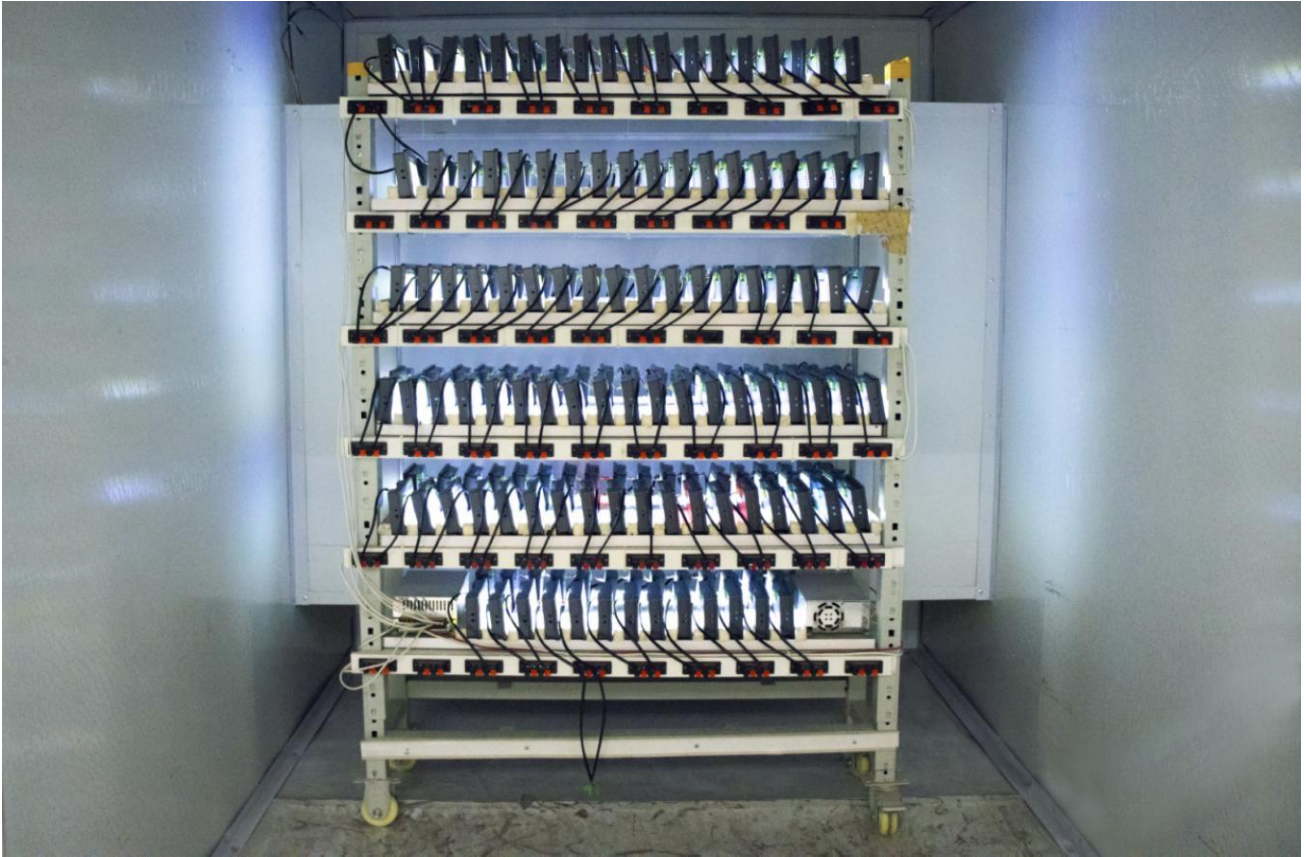
Test process: Place the product flat on the test bench, and conduct contact and air discharge for the touch screen iron buckle periphery and display area in turn, as shown in the following figure. Observe whether the screen resets and restarts, display abnormalities and other phenomena.



Test Data

Product Model	Type of discharge	discharge value	Test results
ASTG024W023-L240X320R-COF	exposure	+/-2KV;	No reboot, crash, splash screen and other abnormal phenomena, the function is normal
	atmosphere	+/-4KV;	No reboot, crash, splash screen and other abnormal phenomena. Normal function

4.2 High and low temperature aging test



Test environment: high and low temperature aging test box in the

Test Temperature: $-20^{\circ}\sim 60$

Test process: Place the product in the high and low temperature aging test box. Through the 50° high temperature, -10° low temperature, high and low temperature alternately changing aging test, observe the test process and test after the test whether there is a reset restart, display anomalies, functional anomalies and other phenomena.

Test Data

Product Model	temp	humid ity level	Test results
ASTG024W023-L240X320R-COF	High temperature 60°	60%	No reboot, crash, splash screen and other abnormal phenomena. Normal function
	Low temperature - 20°	60%	No reboot, crash, splash screen and other abnormal phenomena. Normal function
	Alternating high and low temperatures (-20°~60°)	60%	No reboot, crash, splash screen and other abnormal phenomena. Normal function

4.3 Group Pulse Test

Implementation standard: IEC 61000-4-4

Test process: Place the product flat on the test bench, and power the screen through the power supply after coupling the pulse group by the pulse group generator. The following figure. Observe the screen to see if there are abnormal phenomena such as reset and restart, display abnormality and so on.



Test Data

Product Model	Test standard	Test port	Test results
ASTG024W023-L240X320R-COF	EFT +/-4KV;	power and communication ports	4KV screen without flickering, no reboot, crash, splash screen and other abnormal phenomena. Normal function

5.Contact Us

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