Ver2.3

ChiTu M20
Manual

CBD-Tech

Controller Board

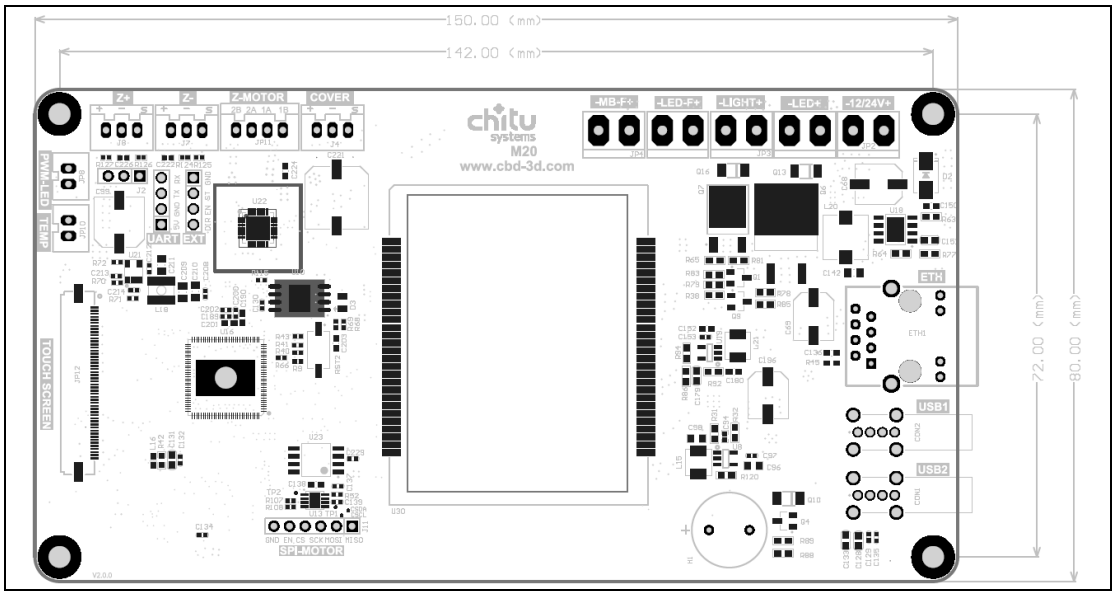
Specification List

Basic Information	**Model**	ChiTu M20
	Time to market	2022
Parameter Information	**Size(mm)**	150 * 80 *20
	Weight(g)	/
	Touch screen size(inch)	5.0（Capacitor）
	Supported panel(inch)	6.6'-4K / 9.1'-4K
		9.25'-6K / 10.3'-8K
	Processor chip	CBD Smart Series
	FPGA chip	-
	Motor driver chip	Trinamic TMC2209
	eMMC	4G
	Input voltage (V)	12~24
	Input current (A)	5~10
Port Information	**Power supply**	1 port, KF2EDG-2P
	Resin panel	1 port, MIPI
	Touch screen	1 port
	USB	2 ports, USB 2.0 Type-A
	RJ45 (network port)	1 port
	UV LED	1 port, KF2EDG-2P
	Motor driver	1 port, xh 2.54-4P
	Endstop	2 ports，Z+、Z-
	Fan	2 ports
	PWM	1 port，xh 2.54-2P
	Temperature measurement	1 port，xh 2.54-2P
	Other motor	2 ports, Z-axis external, SPI motor
	Other port	2 ports, Light shield, serial port
Other Information	**Recommended format**	CHITUBOX Basic 1.9.0 and above
		CHITUBOX Pro 1.0.0 and above
	Supported format	.ctb
	Firmware version	Subject to actual batch

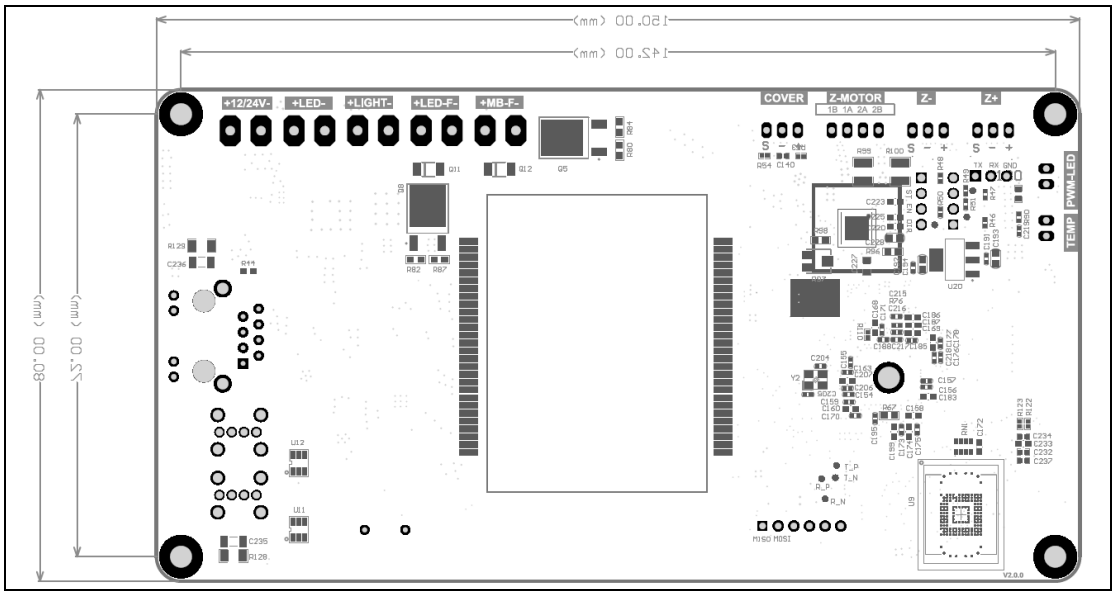
产品说明

1.1 Main Board Size

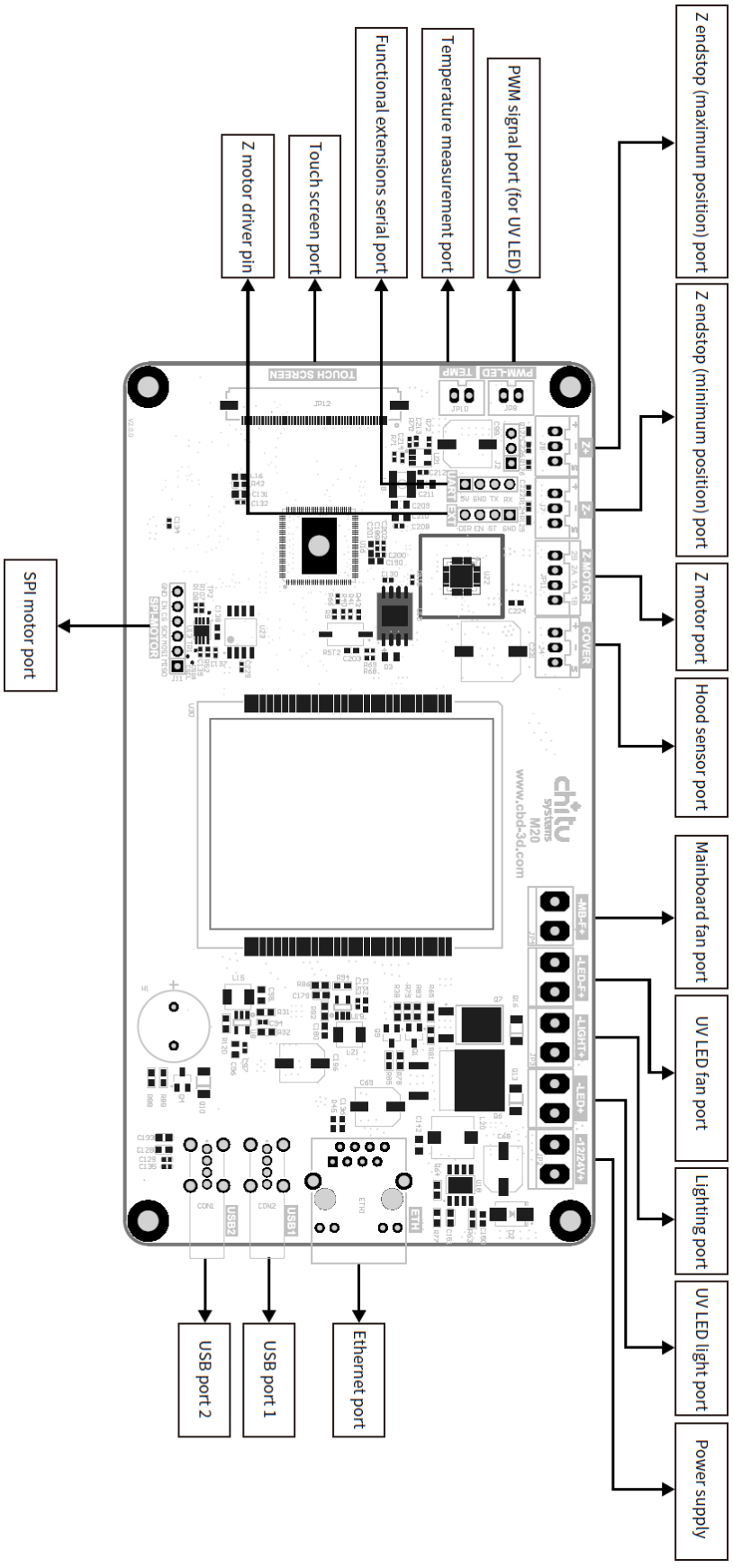
Main view:



Back view:



1.2 Main Board Structure



1.3 Component Description

1.3.1 Power supply

This port is for power supply for the entire controller board.

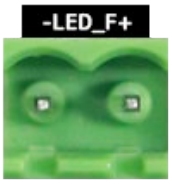
Notification:
The power supply voltage **should be** 12V~24V. The board may not work when voltage under 12V, and there will be a risk in burned when voltage over 24V.

1.3.2 UV LED

This port is for control and signals the LED light device connected.

1.3.3 UV LED fan

This port is for control and signals the LED light fan device connected.



Notification:
This port output is the same as the board input voltage.
The maximum current must **NOT** exceed 1.5A.

1.3.4 Mainboard fan

This port is for control and signals the mainboard fan connected.

Notification:
This port output is the same as the board input voltage.
The maximum current must **NOT** exceed 1.5A.

1.3.5 Z stepper motor

This port is for control and signals the Z-axis stepper motor connected.

Pin Name/Pin Tag	Number	Definition	Description
Z Motor **(Z Motor)**	1	1B	Coil 1 end B
	2	1A	Coil 1 end A
	3	2A	Coil 2 end A
	4	2B	Coil 2 end B

1.3.6 Z- end stop

This port is for control and signals the Z-axis minimum end stop connected.

Pin Name/Pin Tag	Number	Definition	Description
Z- Endstop (Minimum position) **(Z+)**	1	+（VCC）	Power Output
	2	-（GND）	GND
	3	S	Signal pin

1.3.7 LCD resin panel (MIPI port)

This port is for control and signals the LCD panel connected.

1.3.8 TFT Resistive touch screen

This port is for control and signals the resistive touch screen port connected.

1.3.9 USB 2.0

This port is for read the USB 2.0 connected.

1.3.10 Buzzer

This component will emit a "beep" sound to remind you of the completion of an operation or an abnormal error.

The timbre of buzzer maybe not the same because of the different batch.

1.4 Electrical Description

Main Board	M20	Table	Electrical parameters specifications				Date	2022.02.14
Pin_Icon	Pin_Name/Pin_Tag	Pin_Function	Voltage		Current		Power	Note
			Rated input/V	*Maximum input/V*	*Rated input/A*	*Maximum input/A*	*Rated input/W*	*Maximum input/W*
12V/24V	Power Supply **(12V/24V)**	This port is for power supply for the entire controller board.	12-24	24	5-10	10	60-240	240
			Rated output/V	*Maximum output/V*	*Rated output/A*	*Maximum output/A*	*Rated output/W*	*Maximum output/W*
LED+	UV LED **(LED)**	This port is for control and signals the LED light device connected.	12-24	24	4	8	96	192
			Rated output/V	*Maximum output/V*	*Rated output/A*	*Maximum output/A*	*Rated output/W*	*Maximum output/W*
LED_F+	UV LED Fan **(LED_F)**	This port is for control and signals the LED light fan device connected.	12-24	24	1	1.5	12-24	24
			Rated output/V	*Maximum output/V*	*Rated output/A*	*Maximum output/A*	*Rated output/W*	*Maximum output/W*
MB_F+	Mainboard Fan **(MB_F)**	This port is for control and signals the mainboard fan connected.	12-24	24	1	1.5	12-24	24
			额定输出/V	*最大输出/V*	*Drive default output/A*	*Drive maximum output/A*	*Drive default output/W*	*Drive maximum output/W*
Z_MOTOR 2B 2A 1A 1B	Z Motor **(Z Motor)**	This port is for control and signals the Z-axis stepper motor connected.	12-24	24	0.85	1.2	12-24	-
			Rated output/V	*Maximum output/V*	*Rated output/A*	*Maximum output/A*	*Rated output/W*	*Maximum output/W*
Z_S + -	Z- Endstop (Minimum position) **(Z-)**	This port is for control and signals the Z-axis minimum end stop connected.	12-24	24	0.2	0.2	24-4.8	4.8

The inrush current (i.e., starting current) at power on must not exceed the maximum output current (8A).

Please use extension module for large size screen, or high power light source.

The default output is about 0.85A current, which can be adjusted by R39 resistor, and the maximum output current is 1.2A.

1.5 Function List

All functions currently supported by the firmware and overview, can be adjusted according to customer requirements.

Type	Function Name	Description
Device Support	U-disk storage	Can detect the insertion and work of the U disk, and dynamically adjust the status bar and related information according to the current state of the U disk.
	Local storage	Can support 4G and above capacity on-board storage.
	Cloud storage	With networking on the main board, you can remotely access the computer/server side of the file and download the file to the main board.
	Camera support	Up to 1080P camera can be supported.
	USB-WiFi module support	Has supported a variety of WiFi modules, and can support specific WiFi modules according to customer needs.
	USB-Hub module support	Multiple USB devices can be accessed.
Leveling Control	Motion control	Control of four movements of Z-axis: upward, downward, reset/zero, and stop, including movement speed, acceleration, direction, etc.
	Point-and-Shoot (Coarse adjustment)	Directly operate the Z-axis platform to move to the specified height by sliding bar.
	Step control (Fine adjustment)	The distance of the Z-axis movement triggered by each user click. Can support travel distance of any value between [0.01, machine height].
	Endstop setting	The endstop setting of different positions can be realized according to the structure of customer's model, and currently supports three modes(upper/lower/double).
	Zero-point setting	Customize the logical zero point of Z-axis (or Z-axis zero point offset).
	One button to the top	One-touch operation to move the platform to the highest point of the machine.
File System Management	File/folder list management	Files/folders can be filtered, sorted and displayed in a list based on file name, modification time, file type and other information.
	File/folder search	Retrieve all files/folders with target keywords in their file names within all storage devices.
	File move/copy/delete	Move, copy and delete files within storage media in both directions.
	Batch operation	Batch operations on multiple files, such as batch delete, batch copy, batch move, etc.
	File printing	Can identify, and print only for relevant/target type files, and reject for non-relevant files (or error files).
	File information	Can read information about the slice file, including model thumbnail, target model, resolution, resin model, slice parameters, etc.

Print Management	**Print check**	(File check) Check the data of the slice file before printing to determine whether the file has broken, lost or confused data, etc.
		(Life check) Cross comparison with the slice file to determine if the remaining life of the equipment (light source, screen, FEP film, etc.) can complete the current printing needs.
		(Environment check) Based on the feedback from the temperature sensor, determine whether the current environment is suitable for printing.
	Printing parameter information display	Real-time display of current slice image, print height, number of layers, print progress, and remaining print time, etc.
	Print parameter setting (built-in to this machine)	Manufacturers/users can set up a set, or more than one set of printing parameters inside the main board as needed, and before printing, select the corresponding parameters for printing.
	Print parameter setting (dynamic adjustment)	During the printing process, the user can always adjust the single/multiple parameters according to the print status/model condition.
	Print control	General control of the printing process such as start/pause/stop.
	Print lift settings	The lifting distance of the forming platform can be set according to the height of the model and the printing situation (finish/stop/pause).
	Print exception alert	Abnormality alerting by light and sound through external indicator, or self-contained buzzer.
	Print parameter collection	Statistics and collection of the information generated during the printing process, including the number of prints, print success rate, print efficiency, material usage, etc.
	Device life statistics	Record the service life and times of the core equipment, mainly recording FEP film, light source and printing screen.

Network Settings	**Wireless network connection**	Multiple models of USB-WiFi modules can be supported.
	Wired network connection	Conventional wired network port (LAN) connection and data transmission.
	Network management	Support network switching, disconnection and reconnection, signal detection, connection status detection, and other conventional functions.
	Manual setup	Suitable for multiple/batch device application scenarios, static IP address can be set for each printer individually.
	Remote update (OTA)	According to the machine model, directed to drop the firmware version, the user can visualize the firmware update instructions on the display and download the update.
	File sharing	Computers and main board are able to access each other's stored files and bi-directional transmission.
	Remote control	Support for other devices (cell phones, computers, etc.) through the network to remotely connect to the printer, view, operate the printer and so on.
	Account management	One printer can be bound to multiple users.
Information Management	**Machine information**	Record the name, model number, serial number, factory time, usage time, etc. of the machine.
	Device information	Record the basic information and usage information of the core equipment, such as the number of times the print screen, light source, FEP film has been used, etc.
	Print history	Record the printing of each model/document, including the name of the document, printing status (successful/abnormal), printing time, etc.
	Operation records	Record the core operation steps of users in the process of use.
	Function guide (dynamic picture)	Can be used for guideline explanation of new or complex functions through text, pictures, motion pictures and animations.
	Information export	Export target information to U disk or other storage devices with one click according to customer needs.

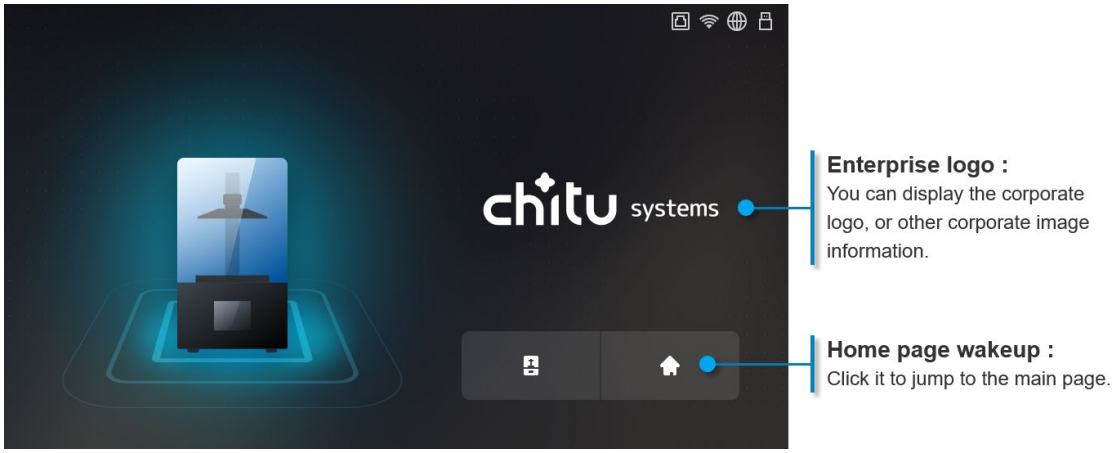
Specialized	**LDCS (Light distribution correction system)**	Through external devices to collect the distribution of screen light intensity, and generate the corresponding mask, embedded in the motherboard, with sliced images together for printing.
Other Functions	**Power-on animation**	Static pictures, as well as animations with dynamic effects, can be displayed each time the power is turned on.
	Equipment test	For each device such as fan, light source, endstop, motor, etc., individual switching and usage tests can be performed to judge the working condition of the device.
	Status indication	Through the status bar, the current working condition of the device is displayed, including U disk, network, temperature, camera, remote connection, password, etc.
	Power on guide	Operation guidance instructions for users when they first turn on the machine, including language settings, machine name settings, etc.
	Standby settings	For a certain period of time, without user operation, the machine will enter standby mode, displaying a specific screen or turning off the screen.
	Advanced mode (password management)	Hide part of the functions/parameters and allow them to be displayed only after a specific operation, or after entering a password.
	Local name setting	Set the name of the current machine.

1.6 Function Description

Related notes on each core function point and page.

1.6.1、 First screen (standby page)

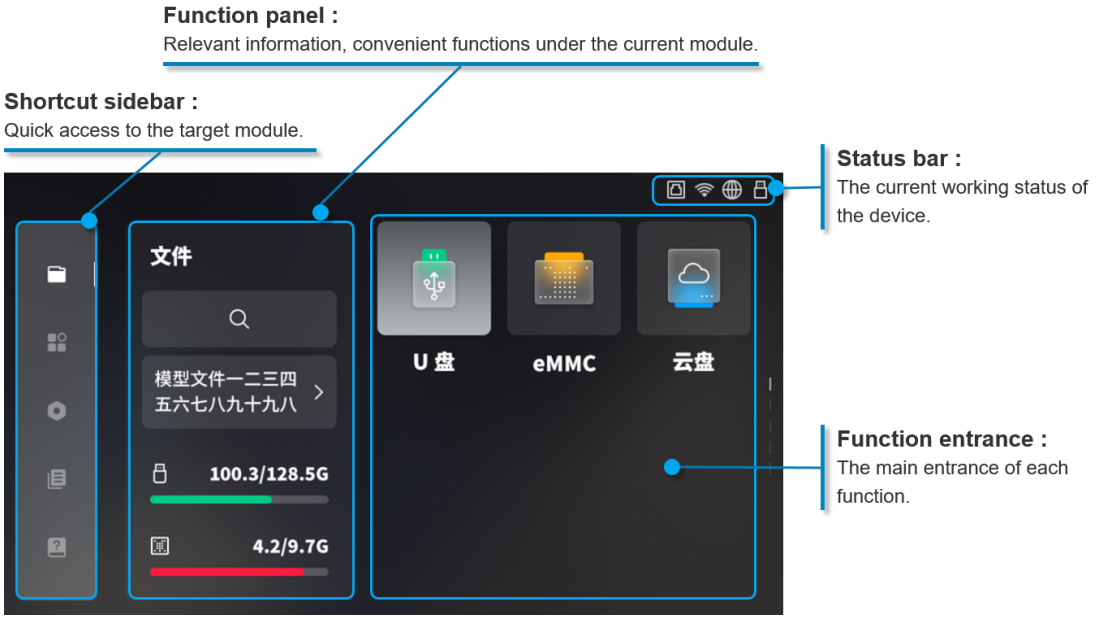
Intuitive display of current model and corporate information.



1.6.2、 Main page

The top is the resident status bar.

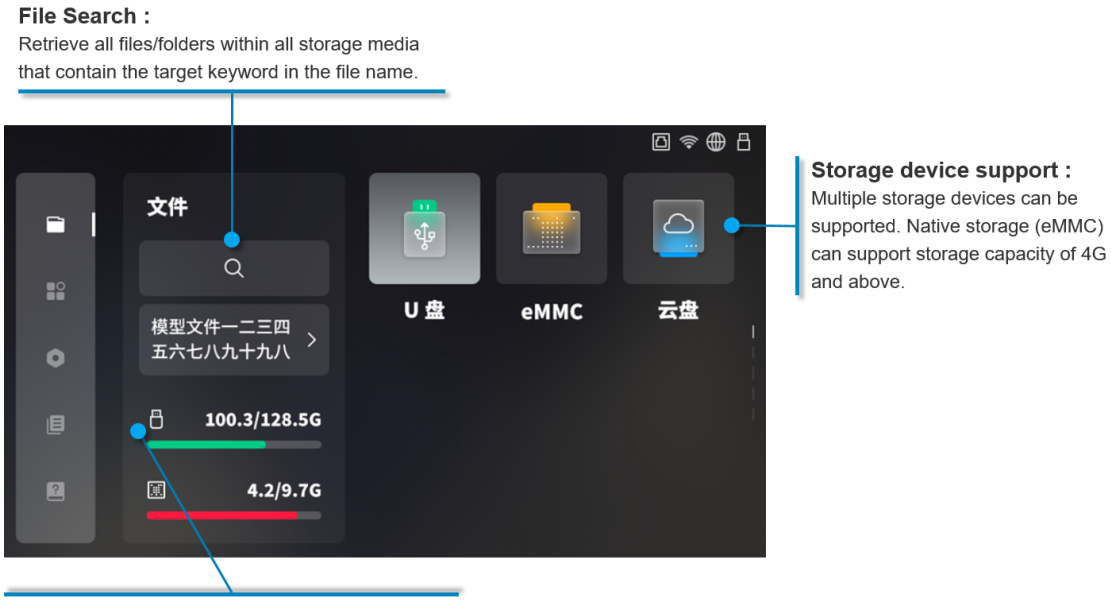
The core areas, from left to right, are: menu bar, function panel, and function entry area.



1.6.3、 File module

It can support various storage devices, such as U disk, local storage (eMMC) and cloud disk.

The local storage (eMMC) can support 4G and above capacity.



1.6.4、 File List

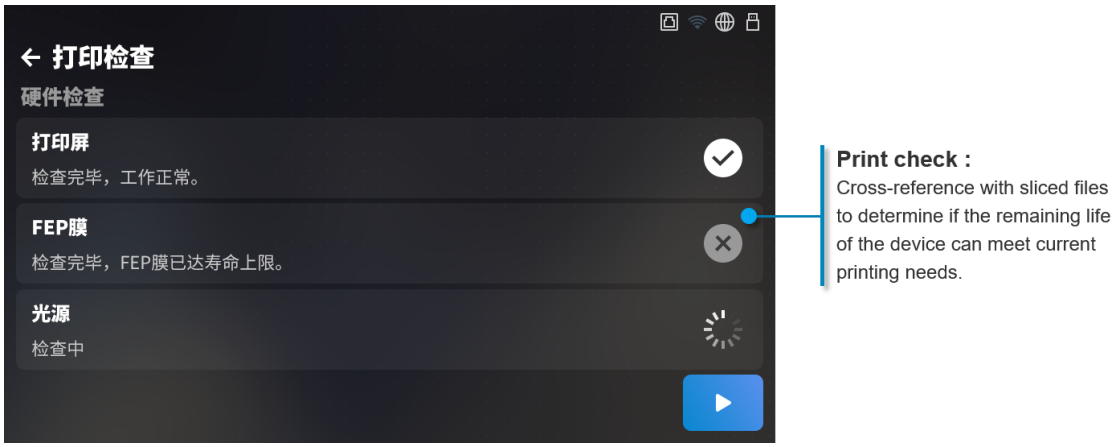
You can view, edit, and print the relevant files in the storage device.

1.6.5、 File Preview Panel

View file details, and related operations.

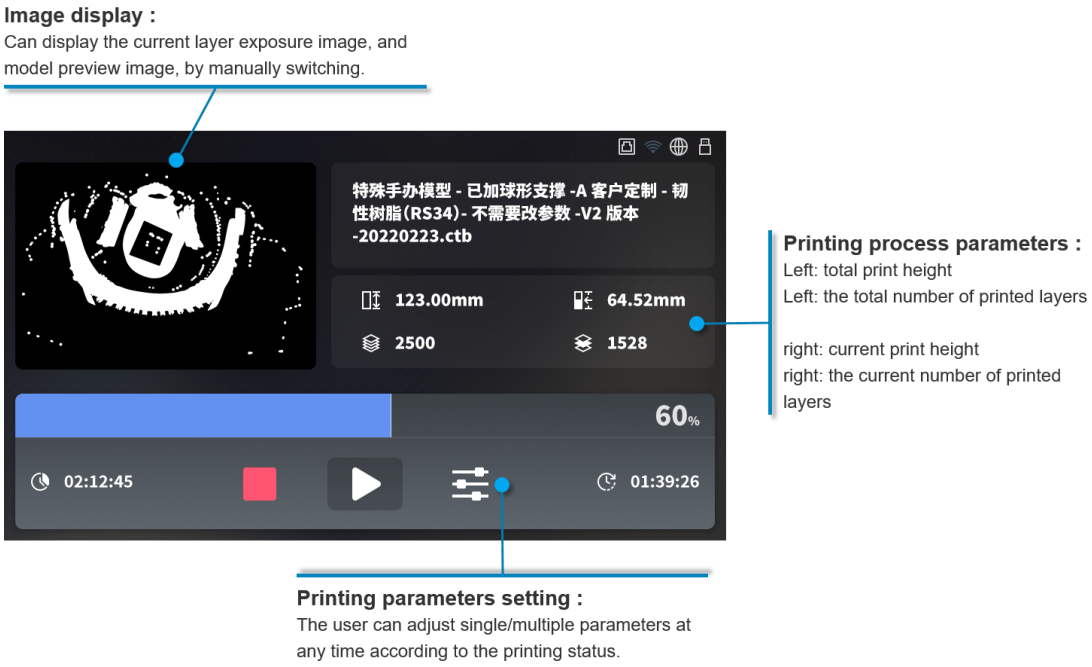
1.6.6、 Print Check

Before starting printing, check data, device life, ambient temperature, etc. for sliced files.

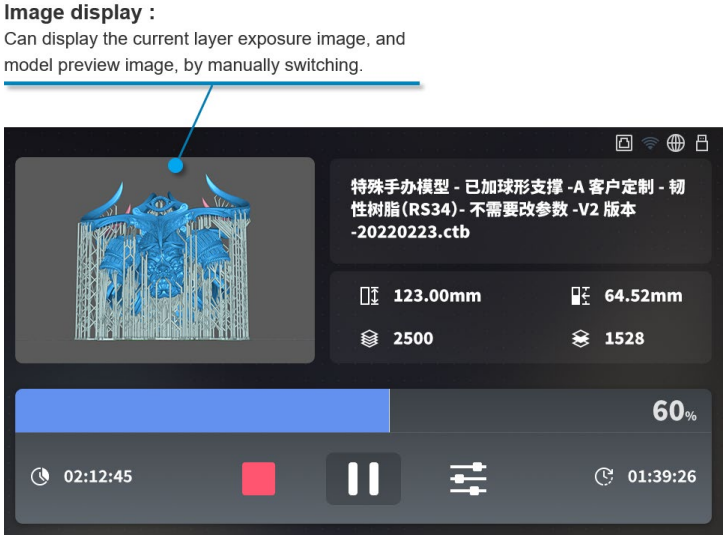


1.6.7、 Printing process

The page when the model file is printed, you can view the exposure picture of the current layer and dynamically adjust the printing parameters.

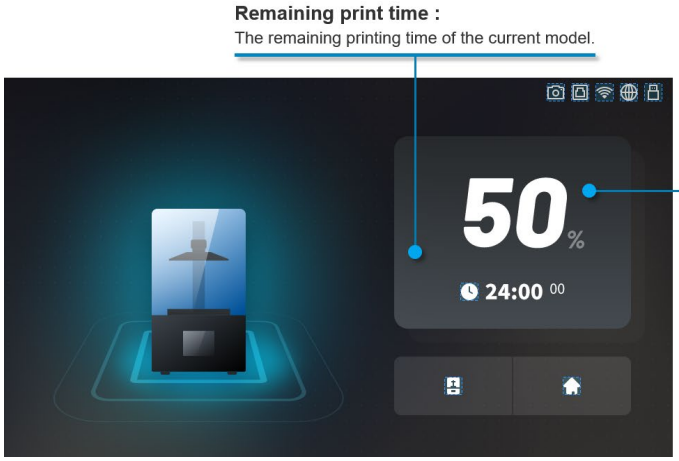


Click on the exposure / preview image area to switch between the two types of images.



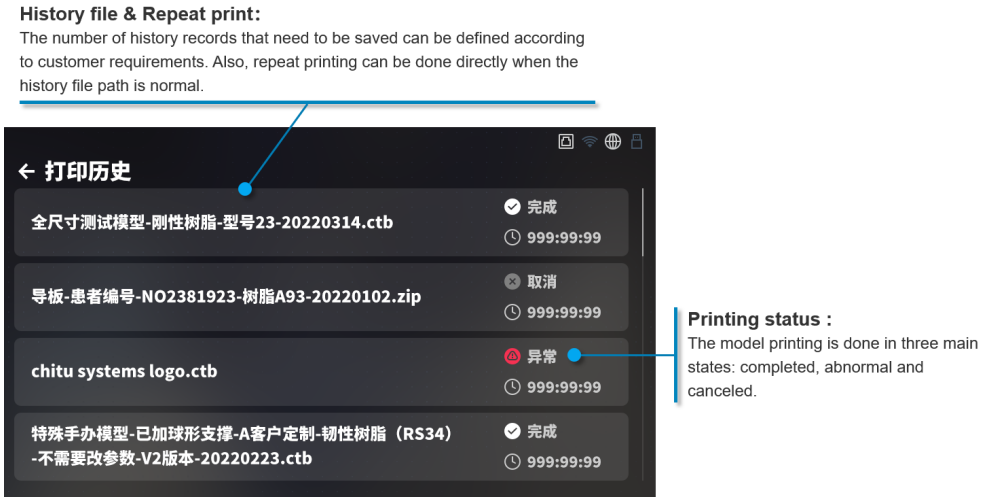
1.6.8、 The Printing Process (standby state)

When no one operates the screen for a long time, it will enter the standby state of the printing process.



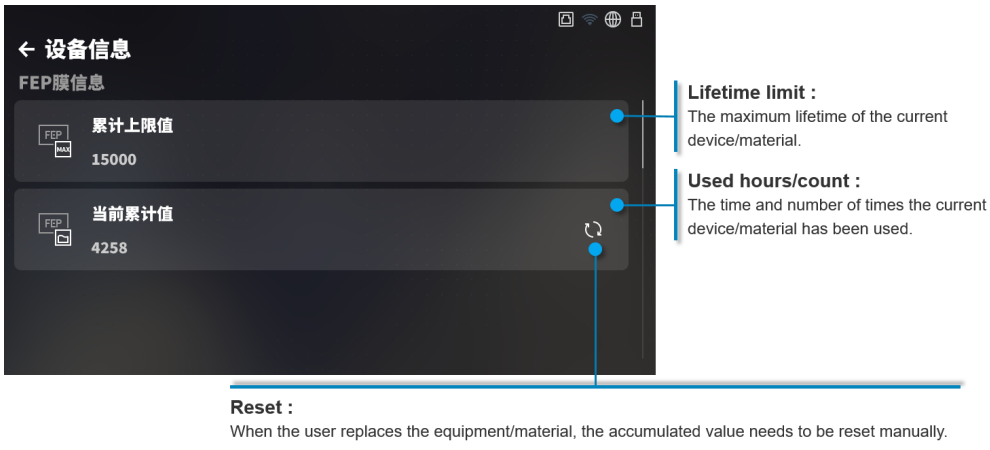
1.6.9、 Print History

The main board will record the status of each print, including the file name, path, results, etc.



1.6.10、 Device Information

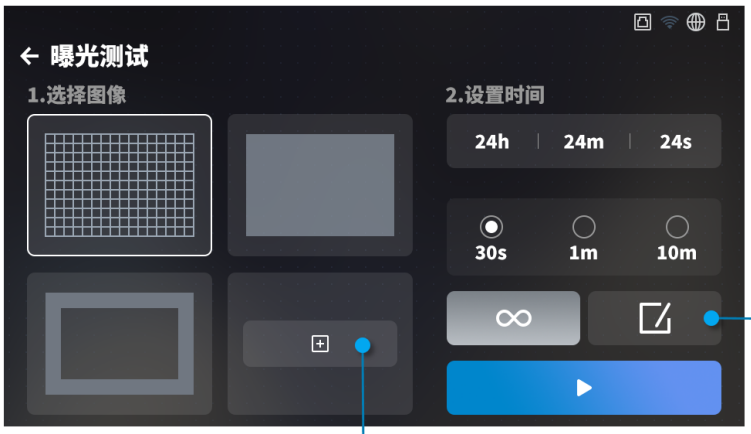
Printing information about the use of supplies/devices will also be recorded together.



1.6.11、 Exposure Test

Users can customize the exposure image and time to test the screen, light source.

Exposure images :
Select the exposure image, the machine has 3 built-in exposure images.



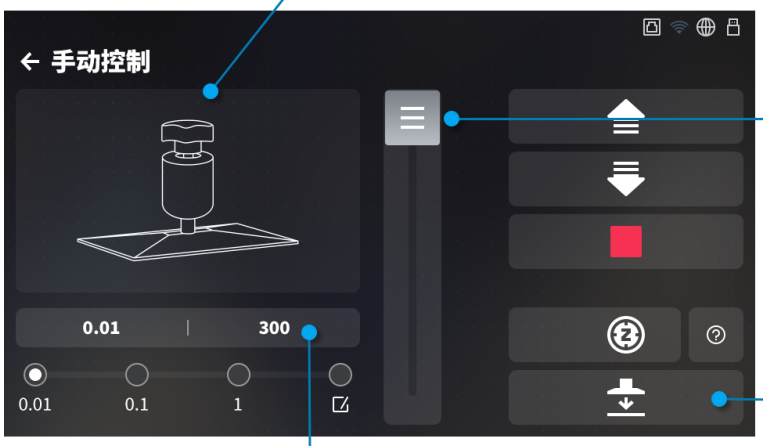
Custom exposure time :
Can be exposed all the time, for screen aging and other tests.

Add / replace exposure image :
Users can replace their own exposure images according to their own testing or printing needs.

1.6.12、 Z-axis Control

Operation and testing of the Z-axis, such as motion control, zero point settings, etc.

Control objects :
The target object of current control, usually the platform, can be switched here if there are squeegees or other devices.



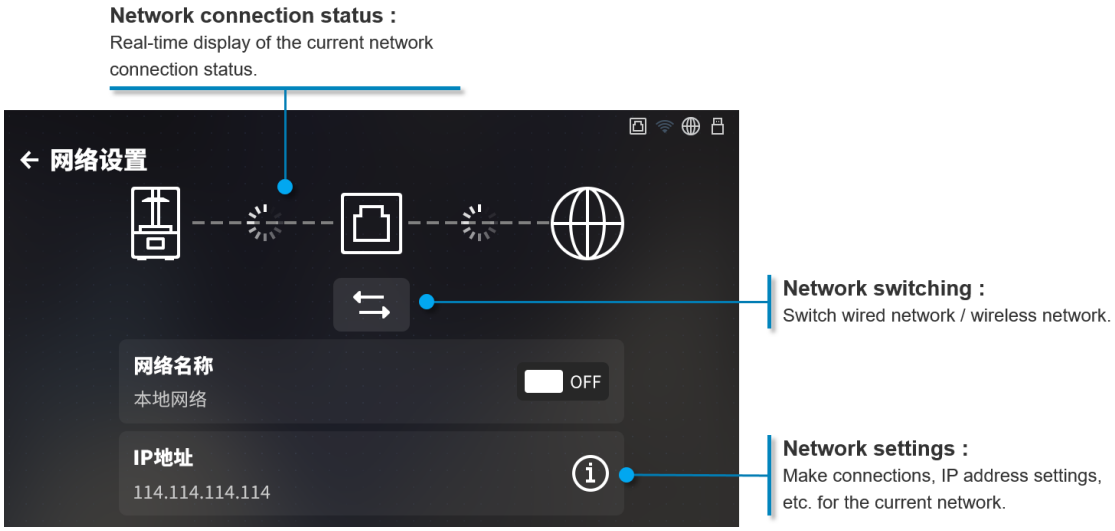
Point-and-Shoot :
The Z-axis stage can be moved to the specified height directly by sliding the bar.

Zero-point setting :
Customize the logical zero point of Z-axis (or Z-axis zero offset).

Current height value :
You can visualize the height position where the forming platform is currently located.

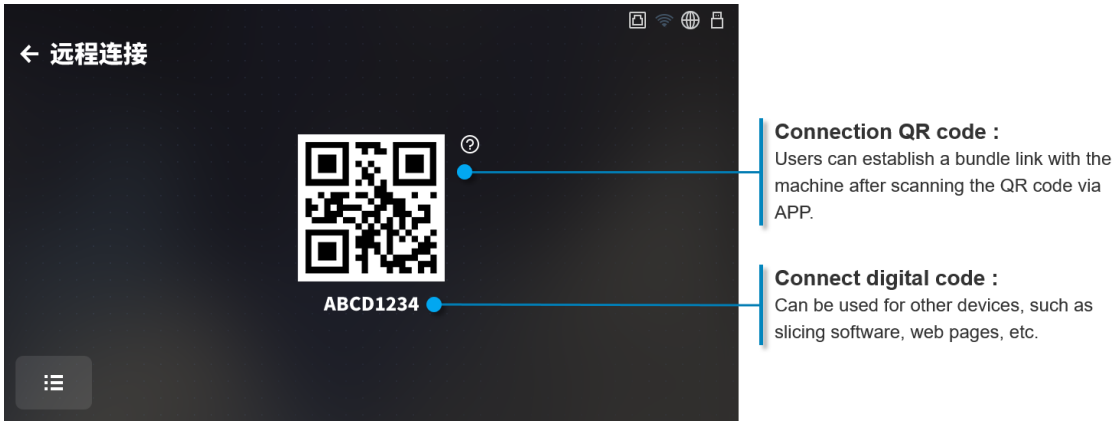
1.6.13、 Network Setting

Support both wired and wireless network, and support static IP setting for cluster management.



1.6.14、 Remote Connection

APP or other devices can be connected remotely to control the printer through the connection code.



1.6.15、 Sharing Settings

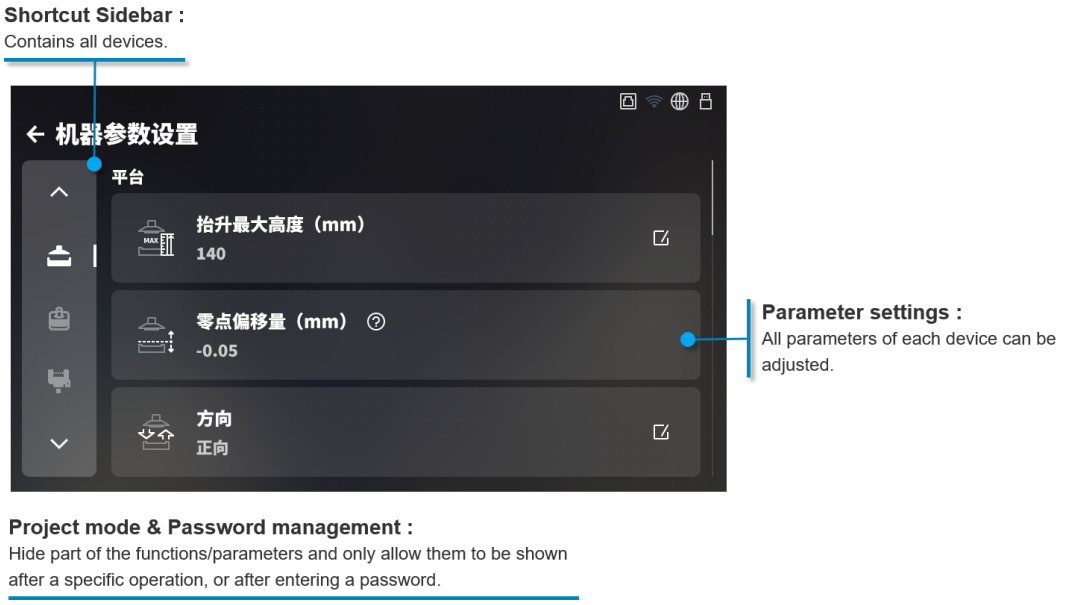
Through sharing settings, computers (or servers, etc.) can access and read files in the printer directly by IP address/machine name.

1.6.16、 OTA Firmware Update

Targeted drop firmware version, users can see the firmware update instructions on the screen and download the update remotely.

1.6.17、 Machine Parameters

All core parameters of the machine, can be edited visually.



1.6.18、 Device Testing

For each external device can be individually tested for switching and use, to help users and after-sales personnel quickly understand the state of the machine.