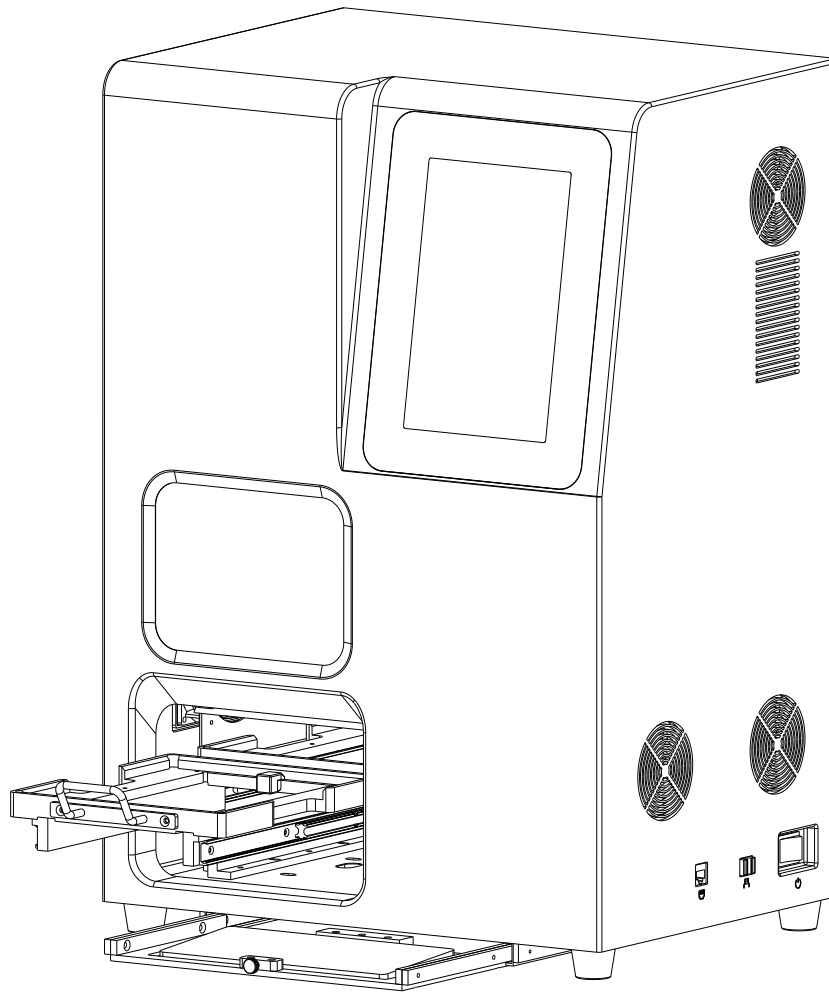




User Manual

Multi-Functional Marking System

ZY-D200

Please read the instructions carefully and keep them properly before using the product for future reference.



Warnings

For risk prevention purposes, please carefully read all instructions in this manual before operating this instrument.

Cautions

While every effort has been made by Servicebio to avoid errors in the text and graphics of this user manual, we do not take responsibility for any potential errors.

Servicebio's principle is to continuously improve our products with the emergence of new technologies and components. Therefore, Servicebio reserves the right to improve performance at any time.

This user manual contains proprietary technical information and patented technologies protected by law. Servicebio reserves all rights, including legal actions, within the scope of the law, for any infringement.

We welcome any criticism and suggestions regarding this user manual.

Product Information

This instrument is a non-IVD instrument intended for research and educational purposes only.

It should not be used for medical diagnosis.

Copyright Information

All rights to the contents of this user manual belong to Wuhan Servicebio Technology Co., Ltd. Without permission, copying, reprinting, and translation are prohibited.

About the Manual

This user manual is applicable to the ZY-D200 Marking Machine. It includes operating instructions and maintenance manual.

Warnings / Dangers / Cautions

This user manual uses three different warning symbols. These warning symbols represent different information and alert users to potential dangers.



Warnings

Indicates that failure to follow operating procedures may result in death or serious injury, as well as partial or complete damage to the instrument.



Dangers

Indicates that failure to follow instructions may result in death or serious injury, as well as partial or complete damage to the instrument, or may cause a fire.



Cautions

Provides helpful information. Ignoring this sign may result in personal injury, damage to the instrument, failure of the experiment, or loss of data.

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01 Safety

1.1 Instrument Safety



Warning

This label is for laser equipment. Proper laser protection measures, such as wearing laser safety glasses, must be taken when operating the instrument.



Warning

The internal optical system of the laser equipment should be enclosed with appropriate sealing covers to prevent direct exposure.

Please make sure to use the provided three-core power cord with grounding and connect it to a 220V 50Hz AC power source. Do not use power cords without grounding conductors.

This instrument emits laser radiation. Laser adjustment requires the use of laser safety glasses.

There are no user-serviceable parts inside this instrument. Do not disassemble the casing. The use of third-party components poses significant unforeseen safety risks. This instrument must be serviced using the provided accessories or spare parts. All repair and replacement parts must be provided by the manufacturer or their authorized suppliers to ensure compliance with safety requirements at all times.

To ensure proper operation of the experiment, the instrument should always be kept level. The internal optical system of the laser equipment should be enclosed with appropriate sealing covers to prevent direct exposure. A laser marking observation window should be provided, and laser safety glasses must be worn when operating this instrument.

For all inquiries and after-sales issues regarding this instrument, please contact Servicebio at info@servicebio.com immediately.

1.2 Precautions

Operating this instrument strictly according to the instructions is safe. Any form of modification to this instrument is not allowed, as it may result in:

- Invalidation of the warranty
- Potential safety hazards
- Operational risks exceeding acceptable levels



Warning

For the internal optical path system of the laser device, it is advisable to use appropriate sealing covers made of corresponding materials to prevent direct exposure.

This instrument has been tested and proven to comply with the directives 2006/95/EC and 2004/108/EC of the European Union. However, this instrument may still cause interference with sensitive equipment nearby or connected to the same circuit; likewise, it may also be subject to interference from surrounding working equipment or power systems. Operators should be aware of these potential impacts and take appropriate measures to avoid interference.

This instrument does not have a power-off memory function. To prevent the loss of experimental data due to accidental power failure, the use of an uninterruptible power supply (UPS) system is considered a proactive and reasonable measure.

02 Overview

2.1 Identification

2.1.1 Safety Labels



Warning

Prominent labels indicating "Laser Protective Eyewear" should be placed on the laser device for debugging purposes.



Warning

For the internal optical path system of the laser device, it is advisable to use appropriate sealing covers made of corresponding materials to prevent direct exposure.



prompt

Located inside the instrument, it protects the ground conductor terminal.

2.1.2 Molded Markings



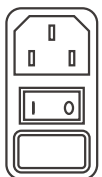
USB

This interface is used for file import or connection to a barcode scanner for reading information. Do not dismantle the plug and use this interface without authorization. The plug should be kept closed.



Network Interface

This network communication interface is only intended for internal connection to a computer for testing purposes by the manufacturer. It is sealed with a plug at the factory. This interface is not accessible to operators. Do not dismantle the plug and use this interface without authorization. The plug should be kept closed.



POWER

This is an integrated power socket, dual on-off switch, dual fuse, and filter component. The detailed parameters of the power supply characteristics and fuses are indicated on the product label. Inside the component on the left side, there are dual fuses installed in the box cover. The power switch is located in the middle of the component. The printed symbol "I" indicates the on state, while "O" indicates the off state. On the right side of the component is a standard three-core power socket.

This label is printed on the front panel of the instrument and the top cover, representing the brand logo of this instrument.

ZY-D200 **Product Model**

The label "ZY-D200" is printed on the front panel, representing the model feature of this instrument.

2.2 Introduction

Laser coding, compared to silk printing, greatly improves coding efficiency. It allows for manual input of characters or batch import of information from Excel, avoiding manual input errors and ensuring efficient coding. With CCD visual positioning, it reduces manual intervention and improves coding quality.

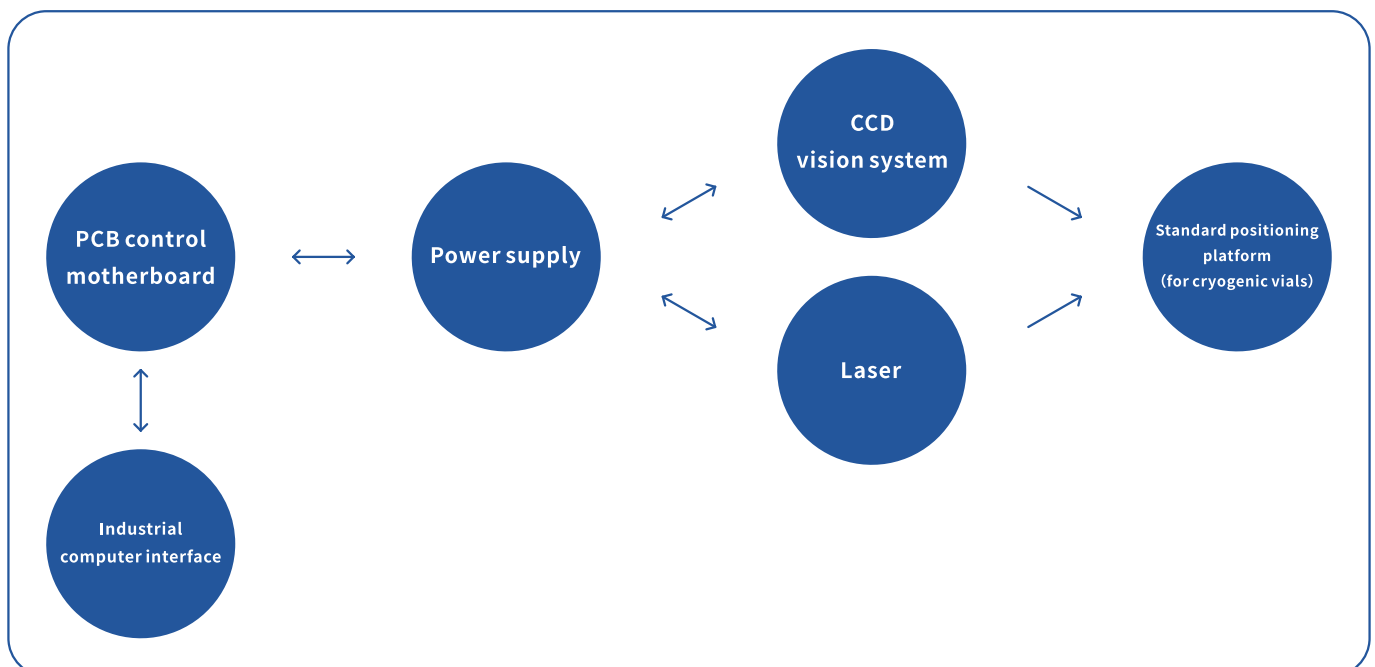
This instrument provides two input modes:

- Manual character input
- Batch import of information from Excel spreadsheets

This instrument utilizes a user-friendly human-machine interaction interface based on a touchscreen, and offers USB external information import. It supports self-check after marking, and provides a brief report at the end of each operation. The instrument supports system self-check.

2.3 Composition and Working Principle

The composition of the instrument is as follows:



The instrument mainly consists of an industrial computer integrated machine, power components, module components, display operation components, and shell components.

Working principle: The operator manually places the item to be marked on the positioning platform. The characters or information for marking are imported/inputted into the industrial computer either manually or through data import. The CCD vision system captures the image and transmits it to the PCBA control motherboard for processing the marking position. When the visual display on the industrial computer indicates "OK," the operator clicks the marking button on the screen. The laser emits light to mark the item on the positioning platform.

2.4 Application



Warning

The internal optical path system of the laser equipment should be sealed as much as possible with corresponding materials to avoid direct exposure.

2.4.1 Operator Requirements

When debugging the laser, protective goggles must be worn.



Laser protective goggles are required.

2.4.2 Risks



Warning

Prominent signs should be set up on the laser equipment, and "laser protective goggles" should be worn during debugging.



Warning

Operators should seal the internal optical path system of the instrument's laser equipment as much as possible with corresponding materials to avoid direct exposure.

2.5 Normal Operating Conditions

Operating temperature	0°C~32°C
Atmospheric pressure	85.0kPa~106.0kPa
Relative humidity	20%~80%
Power supply environment	220V, 50Hz±1Hz, <600W
Region	Not suitable for use in high-temperature and high-humidity areas



Caution

Before powering on, please check whether the above working conditions are met.

Please pay special attention to whether the power cord is reliably grounded.

Do not use beyond normal working conditions.

If in doubt, please consult the manufacturer for details.

2.6 Transportation and Storage Conditions

Transportation temperature and humidity	15°C~30°C; <90%
Storage temperature and humidity	20°C~30°C; <80%

Transportation and storage instructions are reproduced on the outer packaging of this instrument. Labels indicating waterproofing, stacking limitations, handle with care, and fragility should be attached to the packaging box, ensuring that these conditions are always met.





Cautions

For re-transportation: Please keep the original packaging box and inner lining materials for use during re-transportation.

Wrap the instrument in plastic bags or film, use the original packaging box and inner lining materials, and seal and pack it. Choose a suitable carrier and transportation method to ensure the safety of the instrument during transportation and prevent the spread of biohazardous substances.

2.7 Parameters and Performance

Performance Parameters

Product Model	ZY-D200
Module Specifications	50ml centrifuge tube (including the cap and the body), 15ml centrifuge tube (including the cap and the body), embedding mold, slide, cryogenic vial
Laser Wavelength	355nm Ultraviolet Laser
Laser Power and Heat Dissipation	3W air-cooled ultraviolet solid-state laser, air-cooled
Laser Average Power	>3W@40kHz
Overall Dimensions	480×350×705 mm
Weight	39kg

Function

Operating Function	Importing information through the laser and marking the imported information's QR code onto the product.
Marking Working Temperature	Temperature: 15~35°C, humidity ≤90%

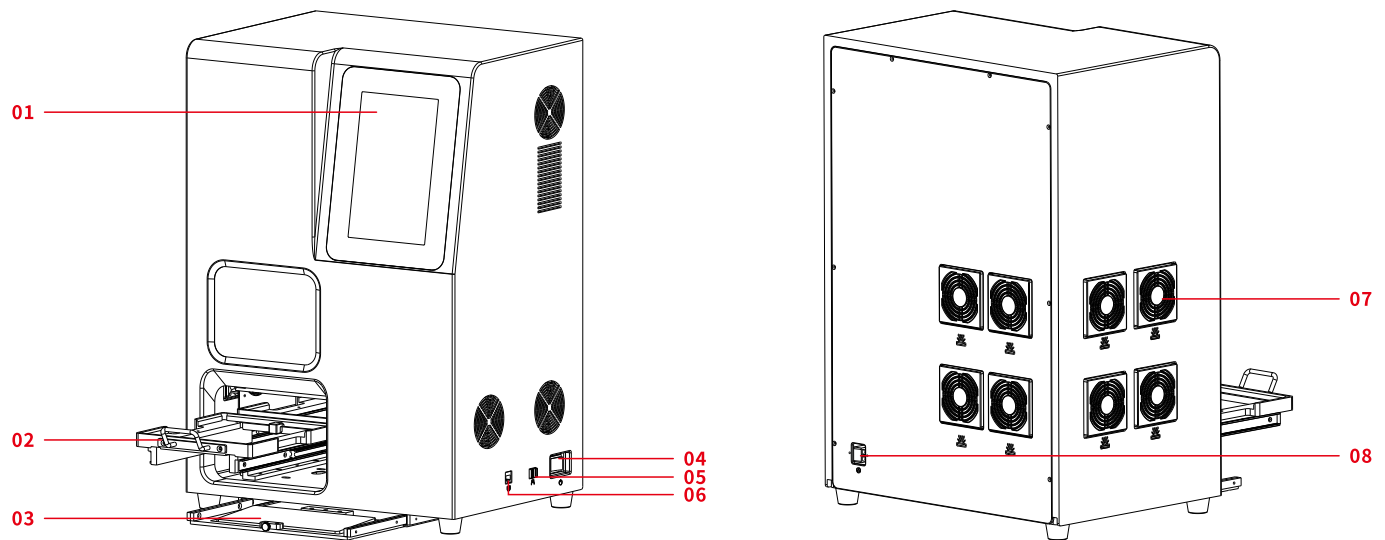
Other Features

Display Screen	10.1" 1280 × 800@ 60 Hz, LED backlight, capacitive touchscreen
----------------	--

User-friendly display of operating status	Yes, with dynamic temperature color background, animated operating status
Multiple interfaces for easy switching	Minimalist main interface, program running interface, CCD visual switching, engineering interface, etc.
Ethernet port	Built-in Gigabit Ethernet port
Performance Upgrades	Explosion-proof, anti-glare, dustproof, waterproof, light-sensitive head (adjusts screen brightness automatically according to the environment), electromagnetic screen, 4G module, GPS, speaker
Intelligent self-check on startup	Yes, the system interface can also start self-check
Marking information recording	Yes
Fault self-diagnosis and reporting	Yes
Estimated total time and remaining time	Yes
Instrument maintenance index function	Yes, evaluates product maintenance based on instrument usage conditions
Touchscreen calibration function	Yes, (calibration can be initiated by long-press during self-check)
Module temperature calibration function	Yes, (limited to factory mode only)
System time	Yes, can set instrument date and time
Key sound	Can be turned on and off
Screen brightness adjustment	Yes, adjustable in multiple levels
Language selection	Yes, switch system language (Chinese/English)
System interface	Includes system settings, self-check, restore factory settings, software upgrade, engineering interface (limited to factory mode), etc.
Help system	Product features, software characteristics, quick guide, fault codes, contact information
WeChat service platform	Yes, when a fault occurs, users can send fault photos to the company's WeChat service platform via mobile phone
Factory mode	Yes, only accessible to manufacturers with special passwords. Allows for system data viewing, settings, parameter calibration, and configuration.

Please consult the manufacturer for further details.

2.8 Instrument Description



01

Touch Screen Used to select pre-written marking programs. For users who are proficient in using the machine, they can also write their own marking content.

02

Carrier Adapter and Push-Pull Device Before marking, the carrier and the item to be marked must be placed in the carrier adapter according to the specified orientation. Push the adapter into the machine and let it magnetically attach before operating the system for marking.

Note The positioning accuracy of the carrier adapter is high and has undergone precise calibration before delivery. Do not apply any force other than pushing and pulling on the carrier adapter and its push-pull device.

03

Keyboard and Mouse Users who are not accustomed to using the touch screen can use a keyboard and mouse as alternatives.

04

Rocker Switch Controls the power on/off of the entire machine.

05

USB Used for connecting external devices such as mouse and keyboard, and supports importing external marking data.

06

RJ45 Interface Network port, supports internet connection.

07

Fan Cover For continuous use of the machine, the fan cover needs to be cleaned once a week. The specific cleaning method is to remove the cover with hands and shake off the dust from the primary filter cotton.

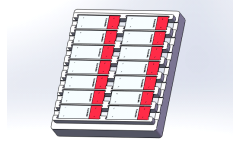
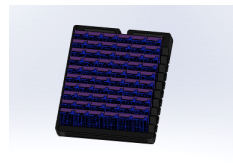
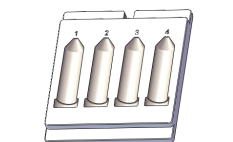
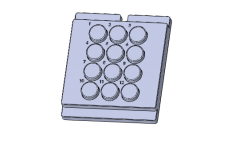
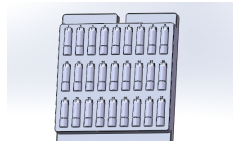
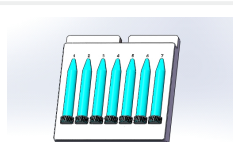
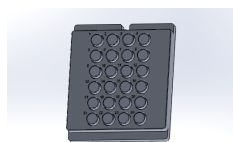
Warning Do not disassemble the fan cover when the machine is powered on.

08

Power Socket National standard three-core power cord socket.

2.9 Carrier Introduction

The instrument currently has 7 types of carriers, including 50ml centrifuge tubes (including the cap and the body), 15ml centrifuge tubes (including the cap and the body), embedding frames, slides, cryovials.

No.	Carrier	Description	Figure
1	Microscope Slide	As shown in the figure, the part (the red area) of the slide that needs to be marked needs to be placed to the right, and a maximum of 14 slides can be marked at a time.	
2	Embedding Frame	After placing the embedding frame into the carrier, place it into the adapter with the embedding frame tilted backward, and up to 60 frames can be marked at a time.	
3	50mL Centrifuge Tube	After pressing the centrifuge tube into the carrier, place it into the adapter with the tube opening facing down, and up to 4 tubes can be marked at a time.	
4	50mL Centrifuge Tube (Self-standing)	As shown in the figure, up to 12 tubes can be marked at a time.	
5	Cryopreservation Tube	As shown in the figure, up to 27 tubes can be marked at a time.	
6	15ml Centrifuge Tube	After pressing the centrifuge tube into the carrier, place it into the adapter with the tube opening facing right, and up to 7 tubes can be marked at a time.	
7	15ml Centrifuge Tube	As shown in the figure, up to 24 tubes can be marked at a time.	

03 Installation

3.1 Introduction

This chapter contains information necessary for installing the instrument, including unpacking, environmental requirements, and power requirements.

3.2 Unpacking Inspection

The instrument is shipped in a cardboard box with transportation and storage conditions marked on the box. Please operate under the specified conditions.

Unpacking steps:

1. Before opening the box, check for any damage to the packaging and immediately record and report any damage.
2. Place the cardboard box vertically, remove the top sealing plate, and then use the handle on the cardboard liner to pull it upwards to open it.
3. Take out the instrument from the box and place it in a horizontal, dust-free, vibration-free, and away from light location.
4. Visually inspect the instrument to ensure there is no disassembly, fracture, arching, or breakage. If any problems are found, immediately collect evidence and report the damage. File a claim with the carrier.
5. Compare the serial numbers on the instrument packaging list and the certificate of conformity. If they do not match, report it immediately.
6. The random documentation is sewn inside the inner packaging. Check the instrument accessories item by item against the instrument packaging list.
7. Keep all packaging materials for future transportation.

3.3 Power Requirements

Acceptable AC voltage range: $220V \pm 22V\sim$, $50Hz \pm 1Hz$, 600VA.

The instrument must be connected to a power system with good grounding.

3.4 Environmental Requirements

The instrument should be placed on a flat, level surface, away from dust, solvents, and acidic vapors, and in a well-ventilated room.

To ensure correct results, avoid vibration and direct light exposure.

3.5 Instrument Installation Process

The following describes in detail the steps that must be followed when installing the instrument.



Dangers

Before powering on, please check if the above working conditions are met.

Pay special attention to whether the power cord is reliably grounded.

Pay special attention to whether the power cord is reliably grounded. Do not use beyond normal operating conditions.



Warning

Moving parts may cause collision and cutting injuries. Please confirm safety when operating the instrument.

After confirming that the above conditions are met, follow these steps to install the instrument:

1. Place the instrument in a location with good ventilation and ensure there is a 20cm gap around the instrument.
2. Make sure the main power switch on the back panel of the instrument is in the off position.
3. Plug the power cable into the main power socket on the back panel of the instrument.
4. Turn on the power switch on the back panel of the instrument, enter self-check mode, and follow the prompts.

04 Operation Instructions

This chapter provides a detailed introduction to the operation methods of the instrument, including how to create, edit, and run laser marking, as well as the setting of instrument system parameters, etc.



Warning

Conspicuous signs should be set on the laser equipment, and "laser protective goggles" should be worn during debugging.



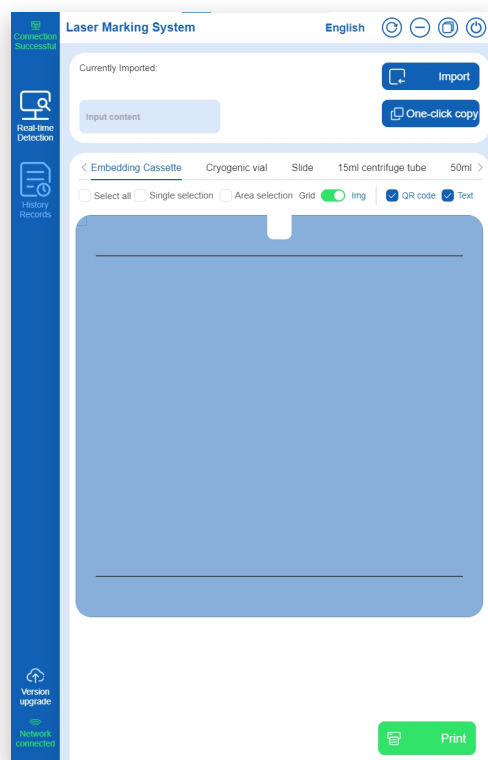
Warning

Operators should use corresponding material sealing sleeves to seal the internal optical path system of the instrument's laser equipment as much as possible to avoid direct exposure situations.

The marking software interface is independently developed by our company. Marking information can be manually entered or imported with a single click. You can choose to print selected items or print all, and you can print in a fixed position order or randomly.

4.1 Introduction of Software Interfaces

4.1.1 Function Introduction

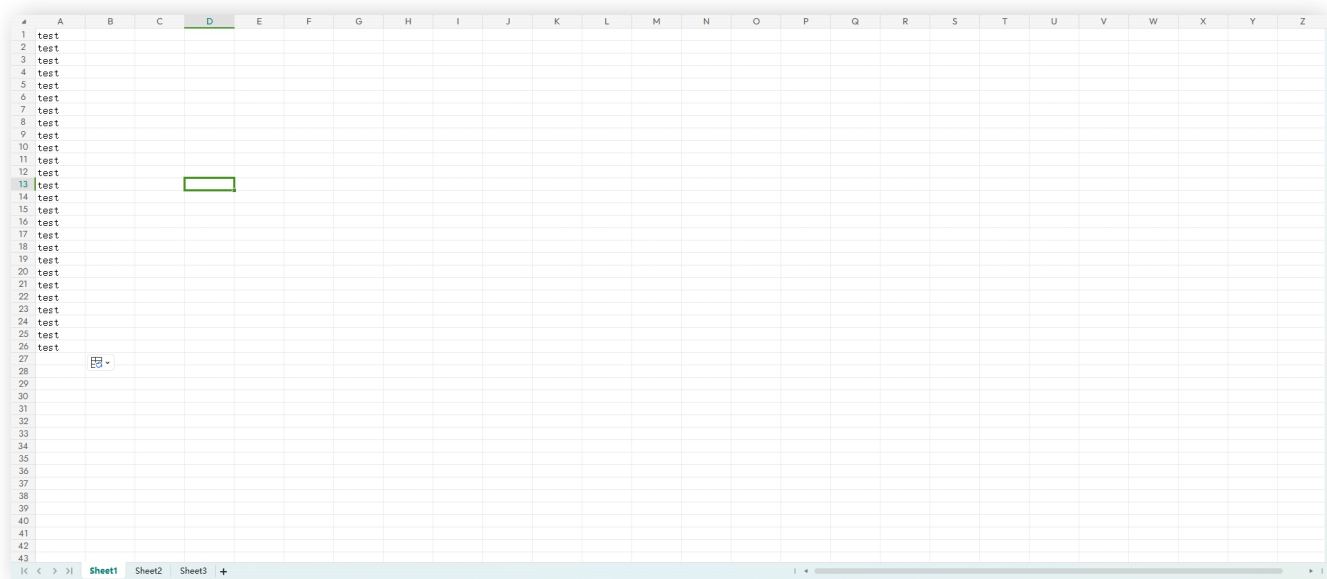


Hardware Connection: The "Connected Successfully" message in the upper left corner indicates whether the hardware is successfully connected. If it displays "Connection Failed", you need to wait for automatic connection success or manually click [here](#) to connect.

Network Connection: If the network is connected, the lower left corner will display green with the message "Network Connected". If it fails, it will display red with the message "Network Not Connected".

Simplified Chinese: Click [here](#) to switch to other languages.

Import: Click "Import" to upload a local Excel file. The file only needs to be in the format shown below.



Current Import: Represents the address of the file you uploaded, making it convenient for you to find.

One-Click Copy: You can enter content in the left input box, or wait for the upload to complete and select a text content. After clicking "One-Click Copy," all currently marked content will be copied consistently.

Consumable Type: After inserting the corresponding consumable, it will automatically recognize the current type, eliminating the need for you to make a selection again.

Select All: When clicked, all printable items will be selected.

Single Selection: After selection, only one item can be chosen at a time.

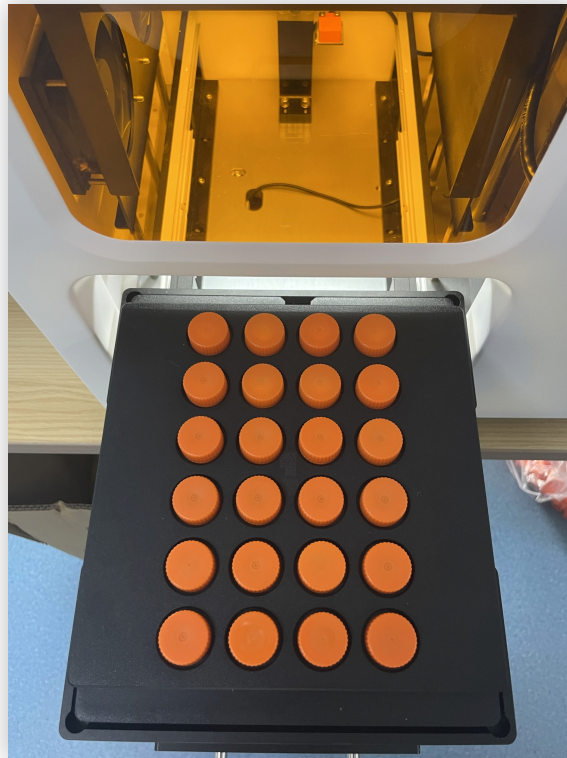
Click to Select Start and End Area: After clicking, select the first item with your mouse as the starting point and the second item as the end point. All content in between will be selected.

Print: When you select the content you want to print, it will directly start printing.

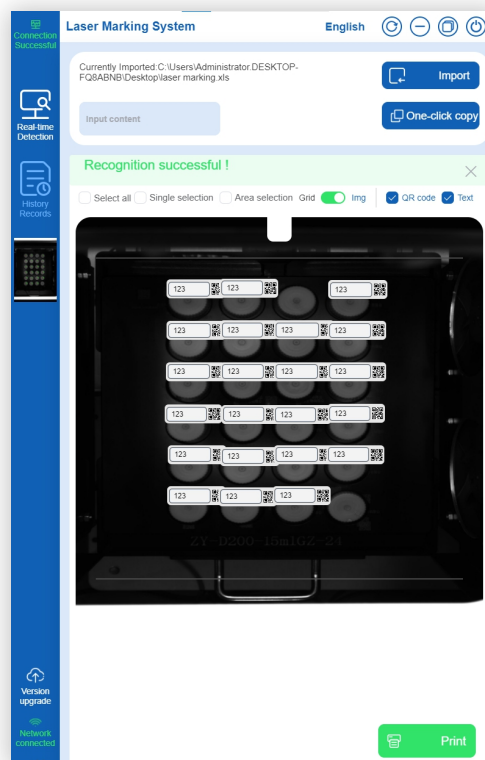
Version Upgrade: After clicking, it can automatically upgrade to the latest software.

4.1.2 Recognition Process

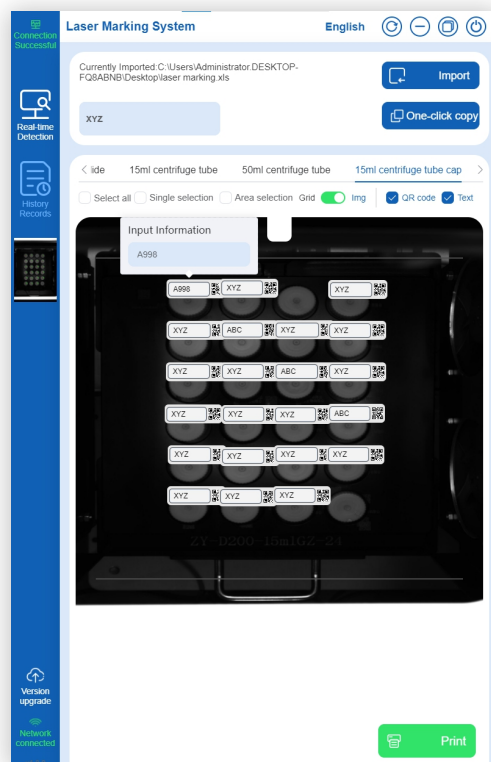
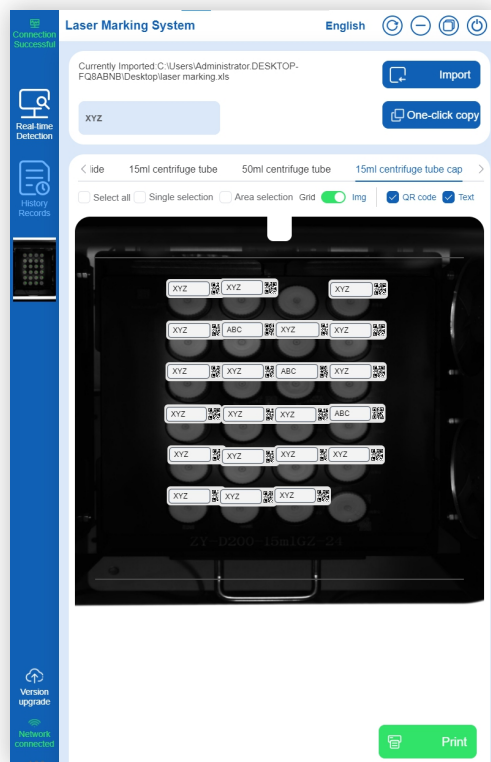
1. Place the consumable correctly and push it into the machine.



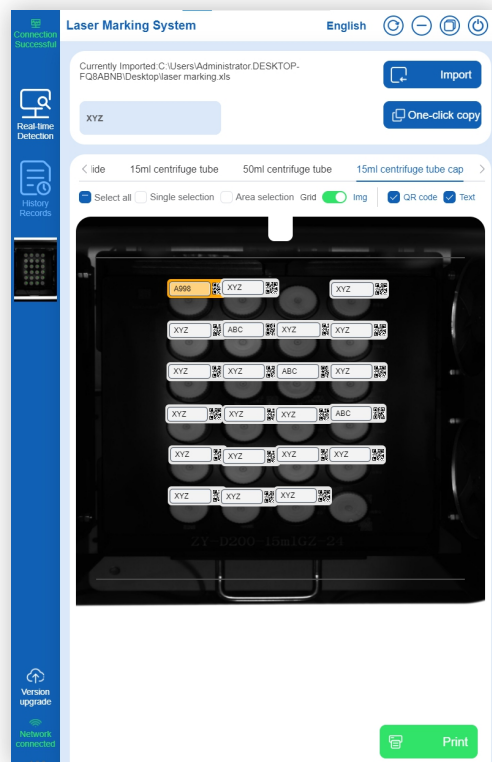
2.The following image is the display after recognition. Items that have already been printed will not be recognized and only those that are printable will be shown.



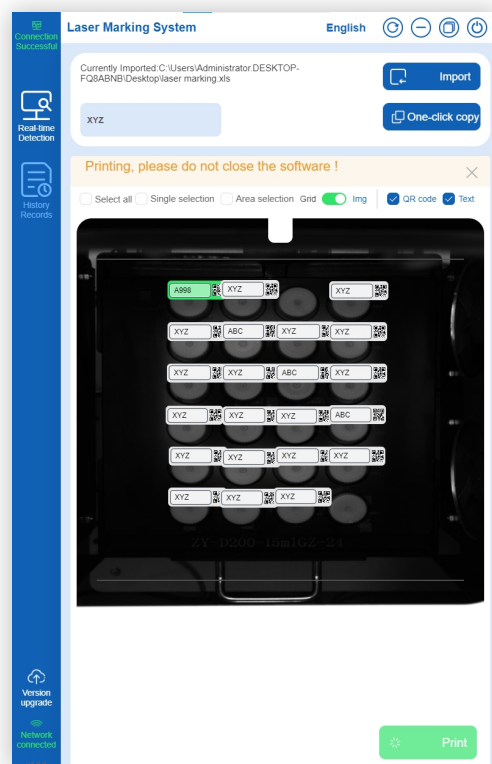
3.You can either click to import or enter content below. Please note that imported data will automatically replace existing data.



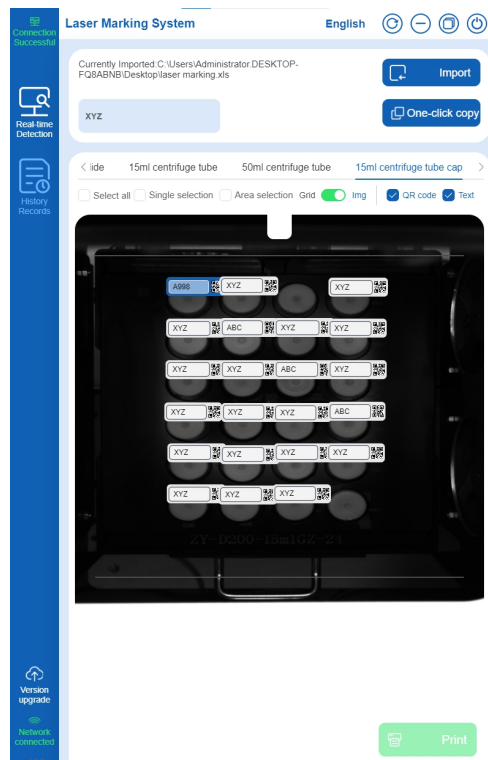
4. Select the data you need to print and click "Print".



5. Below is the status while printing is in progress.



6. Printing is complete. Yellow indicates selected items, green indicates items currently being printed, black indicates unprinted items, and blue indicates items that have already been printed.



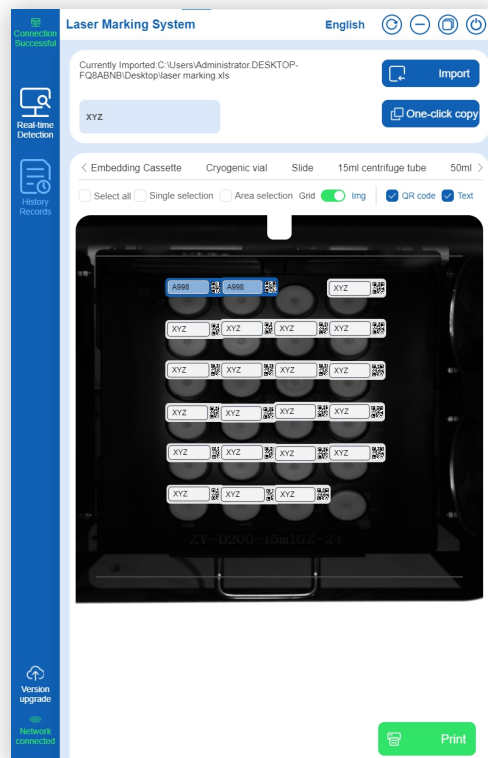
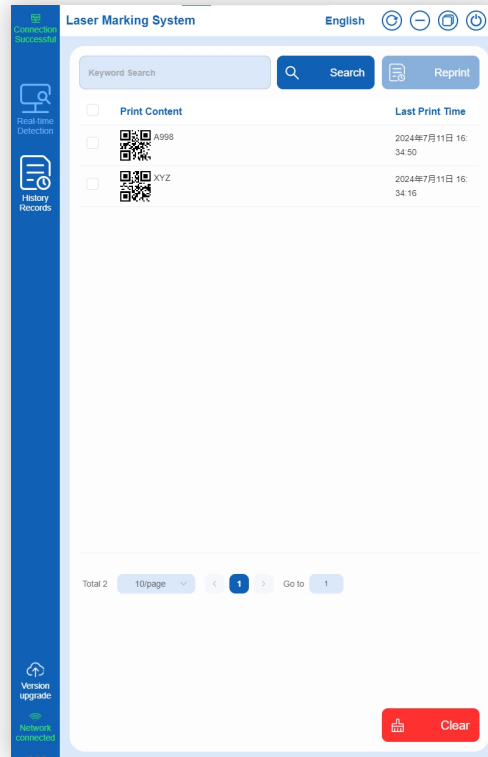
Printing Results:



4.1.3 History

Reprint: Selecting "Reprint" will return to the real-time detection interface, prioritizing data that needs to be reprinted.

Clear: Clicking "Clear" will empty all contents.



4.2 Exception Handling

If the printing software is closed due to an abnormal reason, you can find and open it on your computer desktop, as indicated by the red icon in the following figure.

If the printing software continuously displays a print failure, switch to your computer desktop to check for any abnormal prompts, and open the software shown at the bottom of the following figure.



4.3 Shutdown Method

Turn off the computer first, then press the boat-shaped switch to shut down the machine.

05 Maintenance and Cleaning

5.1 Cleaning the Instrument

1. After the marking machine works for a long time (approximately 3-6 months), dust will adhere to the surface of the scanning mirror. It should be cleaned with a lint-free cloth.
2. After the marking machine works for 2-3 months, the filter dustproof net of the exhaust fan needs to be replaced (4 pieces in total).

5.1.1 Daily Maintenance

The instrument will automatically perform a self-check each time it is powered on, and a manual self-check can also be performed in the user system interface.



Warning

Do not use acetone for wiping, as it may damage the surface of the instrument.

Do not rub the area with characters on the surface of the instrument.

Keep the module holes clean to prevent insufficient PCR reaction in the test tube.

5.2 Periodic Performance Testing and Calibration

Regular calibration of the instrument can eliminate the effects of performance drift to ensure the reliability and credibility of the instrument's performance within the working cycle. Servicebio can provide testing services based on enterprise standards as the qualified judgment standard and issue testing reports.

This service requires the user to return the instrument to the manufacturer, and corresponding fees will be incurred. For more calibration service items, please consult the manufacturer.

5.3 Expected Product Lifespan and Termination

The designed lifespan of this instrument is 5 years.

Proper maintenance may extend the actual period of use. Instruments that have exceeded the designed lifespan can still be used as long as the performance and requirements of the instrument meet the expected purposes and experimental needs.

The actual service life of this instrument is affected by the frequency of use, intensity of use, operating habits, running programs, and maintenance standards.

The instrument has a self-check function at startup. If error messages occur, they should be reported to the manufacturer for repair in a timely manner. When the key performance or safety performance of the instrument after repair cannot meet the indicators specified in the instruction manual or cannot meet the experimental requirements, the product should be discontinued.

For information on early termination of product life, please consult the manufacturer's after-sales service department.

The waste disposal process and methods related to products shall be implemented in accordance with national laws and regulations and relevant medical device management departments.

5.4 Environmental Protection Period



Warning



According to the "Administrative Measures for Pollution Control of Electronic Information Products" and the "Regulations on Recycling and Treatment of Waste Household Appliances and Electronic Products", the safety and environmental protection period of this product is 10 years.

After the instrument is discontinued, it should be disposed of in accordance with the relevant national environmental protection regulations.



Cautions

During the warranty period, users are strictly prohibited from opening the casing of the marking system for self-inspection. If a fault occurs that requires the opening of the casing as indicated in the table, immediately contact Servicebio.

06 Troubleshooting

This topic lists potential hardware issues that may occur when using ZY-D200. If you encounter a problem, please refer to the following chart and try using the recommended solutions to troubleshoot the issue.

Problem	Possible Cause	Solutions
Cannot turn on the machine	The electrical requirements of the device are not met	Ensure that the electrical environment on site meets the requirements of ZY-D200.
	The device is not connected to a power source or the power cord is damaged	First, confirm that you are using the specific power cord and plug provided by us for the particular country/region. Check the power cord and connections again to ensure that the device is connected to the power source.
	The fuse in the integrated switch is burned out	If the fuse still blows immediately after replacement, stop using the device and contact us for technical support.
The computer screen does not light up after turning on, but the internal lighting is on.	The computer cables were loosened due to vibration during transportation.	Contact us for technical support.
Marking range is not reachable	The microscope slide is placed incorrectly	Reconfirm the placement direction of the microscope slide (see 2.9).
	The embedding cassette carrier is placed incorrectly	Reconfirm the placement direction of the embedding cassette carrier (see 2.9).
	Foreign objects are attached to the magnet of the carrier adapter, causing the carrier to be unable to be pushed to the marking position	Test the marking effect after cleaning the foreign objects. Dangers: The clearance under the machine is compact, be careful not to pinch your fingers when removing foreign objects.
	The internal positioning of the machine has changed due to severe shaking or impact during transportation	Contact us for technical support.

Poor marking effect	The components to be marked are not pressed into the carrier	Make sure that all components to be marked are completely pressed into the carrier.
	Foreign objects in the adapter cause the carrier to be uneven when placed	Clean foreign objects and then test the marking effect.

