AI-80Vet

Morphological Analyzer

Operation Manual

Thank you for purchasing the AI-80Vet Morphological Analyzer

Product features may vary depending on the purchased software options. Before using the product, please carefully review the relevant sections of this manual for testing parameters and function settings. Keep this manual in a safe place for future reference.

Product Name: Morphological Analyzer

Product model: AI-80Vet

Service Company

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Manual Version History

Vision	Revised content	Date
V1.0	1. Initial Release	25.02.24
V2.0	1. Update company name and address. 2. Chapter 2.2.2. Technical Specification, add Analyzer model: AI-80Vet-B 3. In Chapter 5.2 Power-on and login, add notes on the precautions for automatic calibration during software startup. 4. Update Chapter 4.2.2 Remove and fix the Components (Before Power-on). 5. Chapter 4.2.5 Environment Requirement, add Transportation Conditions. 6. Add Appendix A.	25.05.13
V2.1	1. Add the description of “Product features may vary depending on the purchased software options” in foreword. 2. Change hard disk parameter to 256G.	25.06.05

CONTENT

Chapter I Manual Overview

1.1. Overview

This section provides a comprehensive explanation of the AI-80Vet morphological analyzer, covering its purpose, structure, function, and operational procedures. It is essential to thoroughly read and comprehend the details of this manual prior to using the instrument. Correct understanding and application of the instructions will optimize the performance of the AI-80Vet and ensure the safety of the operator.

1.2. Scope of Application

This product is designed for the automatic analysis of animal blood, feces, urine and other biological samples. The manual for the morphological analyzer is specifically intended for veterinary medical laboratory professionals, trained veterinarians, veterinary nurses, or laboratory technicians. It is crucial that only qualified personnel operate this equipment to ensure accurate results and maintain safety standards.

1.3. Guide to the Manual

This manual contains 12 chapters, which the operator finds according to the required information.

Required information	Chapters
Comprehending the Function and Measurement Parameters of the AI-80Vet Morphological Analyzer.	Chapter II Product Overview
Understand the measurement principle of the AI-80Vet Morphological Analyzer.	Chapter III Principle
Understanding the Installation Requirements for the AI-80Vet Morphological Analyzer.	Chapter IV Installation
Understand the basic operation of on/off switching,	Chapter V Basic operation

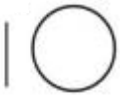
login interface and the purpose of New User Guide and Procedure Guide.	
Understand the purpose of main interface menus and icons.	Chapter VI Main interface
Understand testing procedure and operation of test management on software	Chapter VII Test Management
Understand the basic operations of the instrument's report display interface.	Chapter VIII Report Management
Understand the basic operations of the results interface.	Chapter IX Results Management
Configuring Hospital and Doctor Information and Other Settings.	Chapter X Setting
Maintenance for the AI-80Vet Morphological Analyzer.	Chapter XI Services
Troubleshooting the AI-80Vet Morphological Analyzer.	Chapter XII Troubleshooting
Understand electromagnetic compatibility performance for the AI-80Vet Morphological Analyzer.	Appendix B. Electromagnetic Compatibility Performance

1.4. Manual Conventions

The illustrations included in this manual are provided solely for reference purposes and should not be utilized for any other application. Please note that the graphics, settings, or data depicted in these illustrations may not precisely correspond to what is displayed on the actual AI-80Vet Morphological Analyzer.

1.5. Symbol Instructions

Symbols	Significance
	Date of Manufacture

	Manufacturer
	Serial Number
	AC
	Biological Risks
	Caution
	CE
	ON (power) OFF (power)
	Standby Power / Standby
	Correct Disposal of This Product Statement: Contact the local authorities to determine the proper method of disposal of and protected against spraying water

Chapter II Product Overview

2.1. Overview

This chapter details the key components, operating interface, technical specification, and associated reagents used with the AI-80Vet Morphological Analyzer.

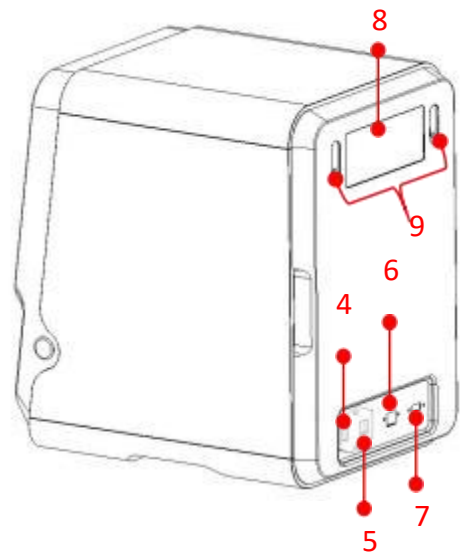
2.2. The host

The AI-80Vet Morphological Analyzer is primarily composed of display and touch components, micrograph components, sample components, AI analysis components, and power components.

2.2.1. Appearance

The front of the product is designed to be compact and efficient, facilitating ease of use in various laboratory settings.

The rear view of the AI-80Vet Morphological Analyzer is depicted below, showcasing the arrangement and accessibility of various ports and components essential for its operation. This layout is specifically designed to facilitate easy connections and maintenance.



No	Description	No	Description
1	Display and Touchscreen	6	Network Port (LAN)
2	Chip Placement Port	7	USB2.0 Interface
3	ON/OFF Switch	8	Exhaust Vent
4	Power Switch	9	Wi-Fi Antenna x2
5	Power Supply Connector		

2.2.2. Technical Specification

Model	AI-80Vet
Specification Parameter	
Display Size	12.1 inch
Hard disk	256G
System	linux
Power specifications	
Voltage	220V to 24V&12V （110-264V）
Power	125W
Dimensions and weight	
Dimension	300mm×400mm×430mm
Weight	16kg
Environmental specifications	
Operating Temperature	5°C~50°C
Storage Temperature	-40℃~40℃
Environment Humidity	20%-85%
Atmospheric Pressure	70kPa~106kPa

2.3. Reagent

Stain reagent

Stain Reagent Usage Guidelines

To stain various species and sample types, consult the specific reagent instructions or the operating instructions located at the new sample interface for specific procedures and the required volume of the original sample prior to staining.

Note: Do not mix staining reagents intended for different species or sample types.

Chip

Procedure for Testing Stained Samples

Once samples have been stained, they should be loaded onto the appropriate chip. This chip is then inserted into the machine for analysis. For the precise volume of sample to be mixed after staining, refer to the specific reagent instructions or the operating instructions located at the new sample interface.

Important Note: For guidance on using the reagent chip, please consult the relevant reagent documentation.

Chapter III Principle

3.1. Overview

The AI-80Vet utilizes advanced liquid staining technology, microscopic imaging technology, and AI recognition technology to analyze and detect morphological characteristics in blood, feces and urine samples.

3.2. Parameters

This instrument is designed for use as a clinical examination screening tool; however, it should not serve as the sole basis for clinical diagnosis. Clinicians are advised to consider additional clinical examination results or other experimental outcomes when making a diagnosis.

The instrument currently supports the testing of blood, urine and feces samples, and the testing chip used is a double-channel chip (left, right).

3.2.1. Blood Sample

3.2.1.1. Blood sample for dog, cat and others mini mammals

The instrument generates 38 report parameters, including one histogram (PLT- RBC CV), two scatter plots (CH-CV, CHC-CV), and one clinical diagnostic hint.

The specific details of the 38 blood reporting parameters are presented in the table below:

Parameter system	English abbreviation	English name
WBC System (16 items)	1. WBC	White Blood Cell Count
	1-1. NEU#	Neutrophils Number
	1-2. NST#	Neutrophil Stab Granulocyte Number

	1-3. NSG#	Neutrophil Segmented Granulocyte Number
	1-4. LYM#	Lymphocytes Number
	1-5. MON#	Monocytes Number
	1-6. EOS#	Eosinophils Number
	1-7. BAS#	Basophils Number
	1-8. NEU%	Neutrophils Percentage
	1-9. NST/WBC%	Neutrophil Stab Granulocyte Percentage
	1-10. NSG%	Neutrophil Segmented Granulocyte Percentage
	1-11. LYM%	Lymphocytes Percentage
	1-12. MON%	Monocytes Percentage
	1-13. EOS%	Eosinophils Percentage
	1-14. BAS%	Basophils Percentage
	1-15 NST/NEU%	Neutrophil Stab Granulocyte Percentage
Red blood cell system (14 items)	2. RBC	Red Blood Cell count
	2-1. HGB	Hemoglobin Concentration
	2-2. HCT	Hematocrit
	2-3. MCV	Mean Corpuscular Volume
	2-4. MCH	Mean Corpuscular Hemoglobin
	2-5. MCHC	Mean Corpuscular Hemoglobin Concentration
	2-6.RDW-SD	Red Blood Cell Distribution Width -Standard Deviation
	2-7.RDW-CV	Red Blood Cell Distribution Width - Coefficient of Variation
	2-8. RET#	Reticulocyte Number

	2-9. RET%	Reticulocyte Percentage
	2-10. NRBC#	Nucleated Red Blood Cell Count
	2-11. NRBC/WBC%	Nucleated Red Blood Cell Percentage
	2-12. ETG#	Erythrocyte Ghost
	2-13.ETG%	Erythrocyte Ghost Percentage
Platelet System (8 Items)	3. PLT	Platelet Count
	3-1. PCT	Plateletcrit
	3-2. MPV	Mean Platelet Volume
	3-3. LPLT#	Large Platelet number
	3-4. P-LCR	Platelet Large Cell Ratio
	3-5. APLT#	Agglutinate Platelet number
	3-6. PDW-SD	Platelet Distribution Width - Standard Deviation
	3-7. PDW-CV	Platelet Distribution Width - Coefficient of Variation

3.2.1.2. Blood sample for Rabbit

The instrument generates 33 report parameters for rabbit blood sample, including one histogram (PLT-RBC CV), two scatter plots (CH-CV, CHC-CV), and one clinical diagnostic hint.

The specific details of the 33 blood reporting parameters are presented in the table below:

Parameter system	English abbreviation	English name
WBC System (9 items)	1.WBC	White Blood Cell Count
	1-1.HET#	Heterophil number
	1-2.LYM #	Lymphocytes number

	1-3.MON#	Monocytes number
	1-4.BAS#	Basophils number
	1-5.HET%	Heterophil percentage
	1-6.LYM%	Lymphocytes percentage
	1-7.MON%	Monocytes percentage
	1-8.BAS%	Basophils percentage
RBC System (16 items)	2.RBC	Red Blood Cell count
	2-1.HGB	Hemoglobin Concentration
	2-2.HCT	Hematocrit
	2-3.MCV	Mean Corpuscular Volume
	2-4.MCH	Mean Corpuscular Hemoglobin
	2-5. MCHC	Mean Corpuscular Hemoglobin Concentration
	2-6.RDW-SD	Red Blood Cell Distribution Width - Standard Deviation
	2-7.RDW-CV	Red Blood Cell Distribution Width - Coefficient of Variation
	2-8.HDW-SD	Hemoglobin Concentration Distribution Width - Standard Deviation
	2-9.HDW-CV	Hemoglobin Concentration Distribution Width - Coefficient of Variation
	2-10.RET#	Reticulocyte number
	2-11.RET%	Reticulocyte percentage
	2-12. NRBC#	Nucleated red blood cell number
	2-13. NRBC/WBC%	Nucleated red blood cell percentage
	2-14.ETG#	Erythrocyte Ghost number
	2-15.ETG%	Erythrocyte Ghost percentage

Platelet System (8 items)	3.PLT	Platelet count
	3-1.PCT	Plateletcrit
	3-2.MPV	Mean Platelet Volume
	3-3. LPLT#	Large Platelet number
	3-4. P-LCR	Platelet Large Cell Ratio
	3-5. APLT#	Agglutinate Platelet number
	3-6.PDW-SD	Platelet Distribution Width - Standard Deviation
	3-7.PDW-CV	Platelet Distribution Width - Coefficient of Variation

3.2.2. Feces Sample

The instrument provides 32 report parameters, one clinical diagnosis hint, and one flora distribution image.

The specific details of the 32 blood reporting parameters are presented in the table below:

Number	Abbreviations	English name
1	Parasite egg	
1-1	ALE#	Ascaris Eggs
1-2	ANE#	Hookworm Eggs
1-3	CEE#	Tapeworm Eggs
1-4	DIP#	Dipylidium caninum Eggs
1-5	SPI#	Spirometra Eggs
1-6	TRE#	Alaria alata Eggs
2	Intestinal protozoa	
2-1	TRI#	Trichomonas

2–2	GIA#	Giardia
2–3	GIAT#	Giardia Trophozoite
2–4	GIAC#	Giardia Cyst
2–5	COD#	Isosporium coccidia
2–6	COD0#	Isosporium coccidia 0
2–7	COD1#	Isosporium coccidia 1
2–8	COD2#	Isosporium coccidia 2
3	Germ	
3–1	COS#	Cocci
3–2	BACI#	Rods
3–3	SBAC#	Brevibacterium
3–4	CBAC#	Crude bacilli
3–5	TBAC#	Thin bacilli
3–6	C/B	Cocci/Rods
3–7	CAM#	Campylobacter
3–8	BAC#	Bacillus
3–9	SS1#	Serpentine spirochetes
3–10	SS2#	Helicobacter
3–11	YEA#	Yeast
4	Cells	
4–1	RBC#	Red Blood Cell
4–2	WBC#	White Blood Cell
4–3	EPC#	Epithelial cells
5	Digestive function	
5–1	STA#	Starch granule
5–2	LFAT#	Lipid drop
5–3	PLA#	Plant fiber

5-4	AF#	Muscle fiber

Note：Giardia refers to both the Giardia trophozoite and the Giardia cyst

3.2.3. Urine Sample

The instrument generates 21 reporting parameters, provides one clinical diagnosis hint, and includes a urine sediment distribution image.

The specific details of the 21 blood reporting parameters are presented in the table below:

Number	Abbreviations	Inspection items
1	Cast	
1-1	HYA#	Hyaline Cast
1-2	CEC#	Cellular Cast
1-3	GRA#	Granule Cast
1-4	WAC#	Waxy Cast
2	Crystal	
2-1	MAP#	Struvite#
2-2	COMC#	Calcium oxalate monohydrate#
2-3	COD#	Calcium oxalate dihydrate#
2-4	CP#	Calcium phosphate#
2-5	UAC#	Uric acid
2-6	CYSC#	Cystine
3	Cells	
3-1	RBC#	Red Blood Cells
3-2	WBC#	White Blood Cells
3-3	RTE#	Renal tubular epithelial cell
3-4	SEC#	Squamous epithelial cell
3-5	TEC#	Transitional epithelial cell
3-6	SPE#	Sperm

4	Germ	
4–1	COS#	Cocci
4–2	BAC#	Bacillus
4–3	YEA#	Yeast
5	Others	
5–1	FAT#	Lipid drop
5–2	PHL#	MUCUS

Chapter IV Installation

4.1. Overview

System Handling and Installation Guidelines

Authorized Personnel Requirement: Only personnel authorized and trained by Tootoo Meditech Co., Ltd should unpack, or install the system.

Unauthorized handling may lead to personal injury or damage to the analyzer. Do not open the box or proceed with installation without the presence of an authorized representative.

Software Management: Installation, verification, upgrades, and modifications to the software supporting the Morphological Analyzer must be executed solely by authorized personnel from Tootoo Meditech Co., Ltd

System Integration Safety: If the device is integrated as part of a larger system, the system builder is responsible for the safety of the entire setup.

Product Integrity Check: Upon opening the packaging, verify the product's integrity against the packing list. Contact our service department or your local agent immediately if any parts are missing.

Shipping and Handling: The analyzer undergoes rigorous testing and is carefully packaged prior to shipment to ensure it is protected from impact. Upon receipt, inspect the packaging for any physical damage. Report any damages immediately to the service department of Tootoo Meditech Co., Ltd or your local agent or distributor.

4.2. Installation Requirements

4.2.1. Handling and Installation Methods

Authorized Personnel Only: Unpacking or installation must be performed by personnel authorized and trained by Tootoo Meditech Co., Ltd Unauthorized handling may cause personal injury or damage to the host.

Do not open the box or install the host without the presence of authorized personnel.

Transportation Precautions: To prevent damage to internal components during transportation, the instrument is shipped without the antenna and dustproof net pre-installed. Before powering on the device, install the external antenna and dust filter as instructed in the Installation Guide.

Installation Procedures: The analyzer must be carried and installed by authorized personnel of Tootoo Meditech Co., Ltd

Do not handle or install the analyzer without contacting the service department of Tootoo Meditech Co., Ltd or the local agent.

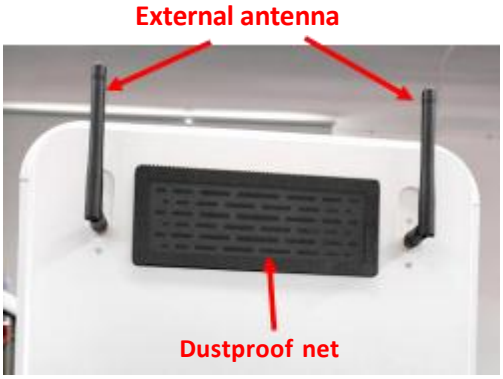
4.2.2. Remove and fix the Components (Before power-on)

Before powering on the instrument, it is necessary to install the external antenna and dustproof net, please follow the instructions in the "Installation Guide" to installation.

1. The External Antenna and Dustproof Net for installation

Installation Dust net: Both the vent and the dustproof net have a magnetic edge that suctions the dust net to the vent.

Installation external antenna: Secure the two external antennas included with the device by tightening them clockwise.



2. **Secondary Transportation:**

Remove: Remove the two external antennas and dustproof net.

Package: Place the antennas, dustproof net, power cable, and device into the product's original packaging case.

4.2.3. Space Requirements for Installation

To ensure proper repair, maintenance, and operation of the instrument, consider the following space requirements for installation:

Placement Height: Choose a suitable height for the host placement to facilitate easy access and maintenance.

Side Clearance: Maintain a minimum clearance of 50 cm between the left and right sides of the host and any doors or walls to accommodate opening and access.

Rear Clearance: Ensure at least 20 cm of space between the rear panel of the main engine and any wall to allow for adequate heat dissipation and cable connections.

Support Capacity: The mounting table or floor should be capable of supporting at least 50 kg to accommodate the weight of the host.

4.2.4. Power Requirements

Grounding Conditions: Ensure the host is used under proper grounding conditions.

Input Voltage: Verify that the input voltage meets the device requirements before starting the machine.

Installation Position: Do not install the device in a position where it is difficult to operate the disconnect device. Choose an installation location close to an electrical outlet to avoid additional electrical interference and potential faulty analysis results.

Plugboard Usage: Place the console in a location where a plugboard is not needed.

Power Cord Usage: Use only the power cord provided by the manufacturer, as it matches the power supply of the device. Using other power cords may damage the analyzer or cause false analysis results.

Power Cord Inspection: Ensure the power cord is free of bends or damage before powering on the device.

4.2.5. Environmental Requirements

Operating Conditions	Temperature Range: 5℃ ~ 50℃ Humidity Range: 20% ~ 85%
Storage Conditions	Temperature Range: -40℃ ~ 40℃
Atmospheric Pressure	Range: 70.0kPa ~ 106.0kPa
Transportation Conditions	Temperature Range:-20℃~+50℃ Humidity Range: 20% ~ 80% Air Transportation: Below 12,000 meters above sea level (Cargo hold pressure ≥ 75kPa) Land Transportation: Normal atmospheric pressure
Usage	Indoor Use Only

Environmental Factors

Dust-Free Environment: Ensure the environment is as dust-free as possible.

Mechanical Vibration: Avoid locations with mechanical vibration.

Pollution-Free: The environment should be free from pollution.

Noise Sources: Avoid areas with large noise sources.

Power Interference: Ensure there is no power interference.

Electromagnetic Environment: Evaluate the electromagnetic environment of the laboratory before running the equipment. Keep the equipment away from strong electromagnetic interference sources to ensure normal operation.

Sunlight and Heat Sources: Avoid direct sunlight and locations in front of heat and wind sources.

Ventilation: Choose a well-ventilated location.

Placement: Do not place the machine on a bevel.

Grounding: Ensure a good grounding environment.

Chapter V Basic Operation

5.1. Overview

The chapter details the basic operation for software, such as instrument power on/off and user login. For new users, highlight and explain the purpose of the New User Guide and operating instruction located at the Create NEW Sample interface.

5.2. Power-on and login

1. **Power-ON**

Activate Main Power: Locate the "O/I" power switch at the back of the instrument and set it to "I" to turn on the main power supply.

Power on the Machine: Press the power button located at the right of the instrument. Once activated, the screen will illuminate, signaling that the instrument is powered on. The instrument will then automatically perform a self-test and initiate the startup sequence.

2. Start-Up Interface

Version Information: Located at the bottom left of the startup interface, this area shows the main program version number, MCU version number, FPGA version number, AI version number, and UI interface version number.

Connection Status: The lower right section of the interface indicates the status of connections, including the lower computer connection, AI model connection, camera connection, and the status of the mechanical reset.

Precautions for Start-up:

- *If the software takes a long time to start, it may be due to the automatic light source calibration process running during system startup. Check the lower-left corner of the startup screen for the message "Auto Calibration in Progress." This is not a software troubleshooting, please wait patiently for the calibration to complete before accessing the login interface.*
  - *To avoid too long startup times caused by automatic light source calibration, you can insert a blood chip into the chip slot before starting the software.*

No.	Description	Remarks
1	Self-check timeout (TCP)	Yellow indicates detection in progress. Green indicates self-check success.
2	Self-check (AI)	
3	Self-check (Camera)	
4	Self-check (mechanical reset)	

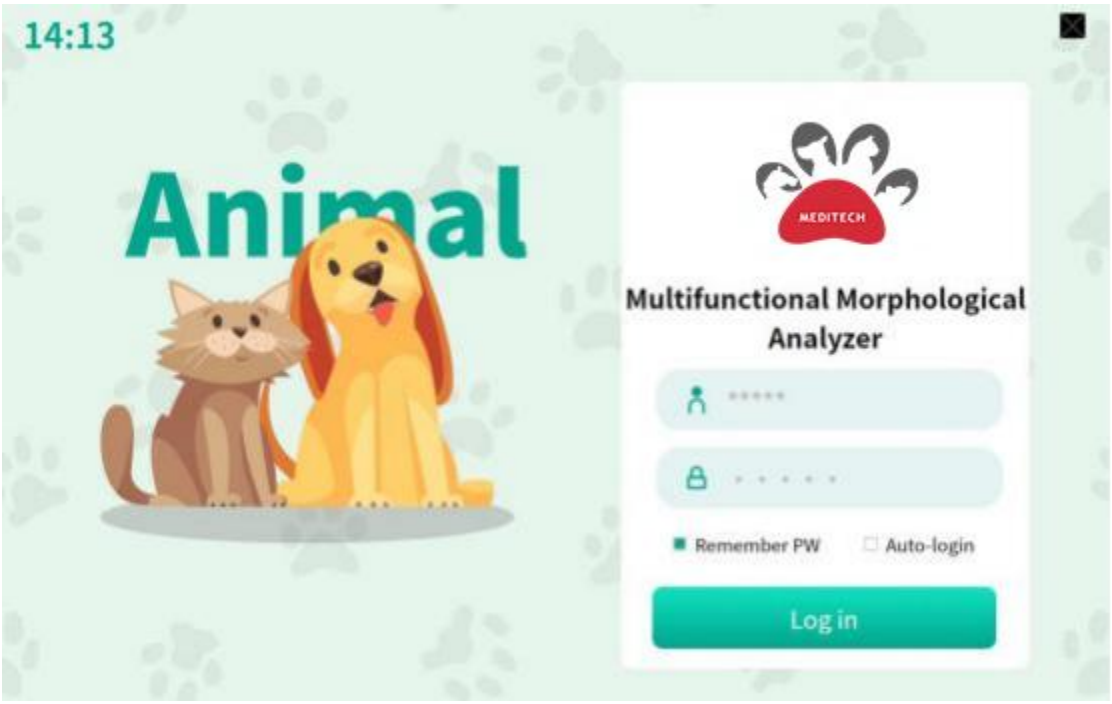
Note：All four squares turning green indicates that the device self-check are successful. If any square has not turned green, please follow the corresponding prompt to process. If you can not process, please contact agent or Anlv engineer.

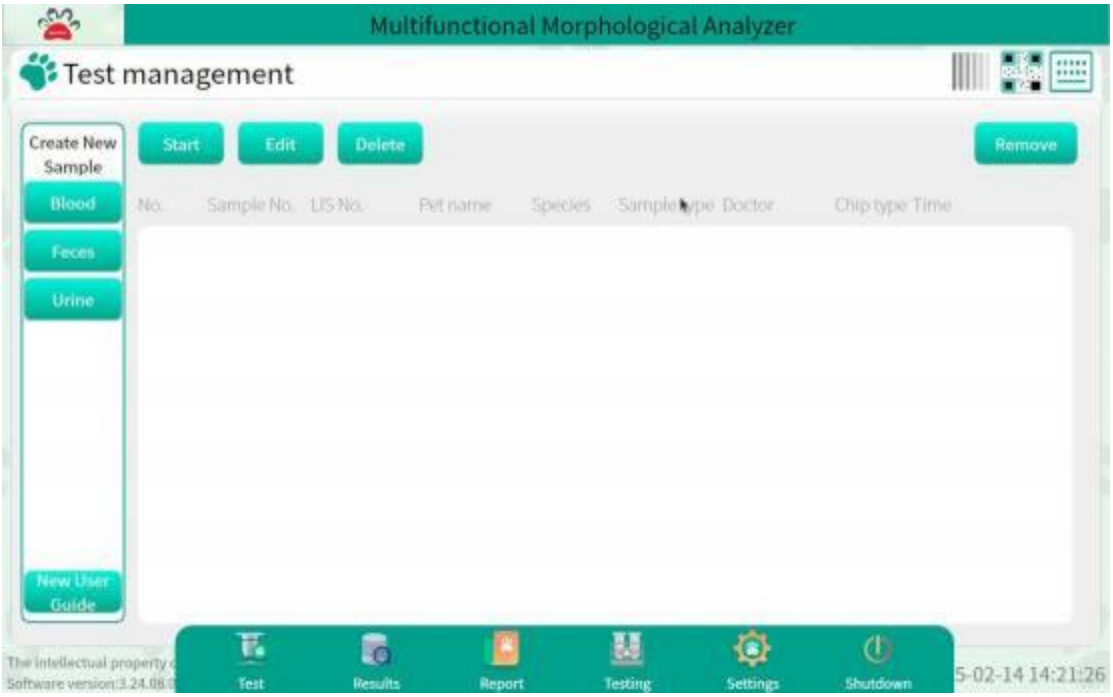
3. Login

Default Login Credentials and Access Procedure

Credentials: The default login account is "**admin**" and the password is "**123456**".

Logging In: To access the software interface, enter the correct username and password in the login dialog box and click.



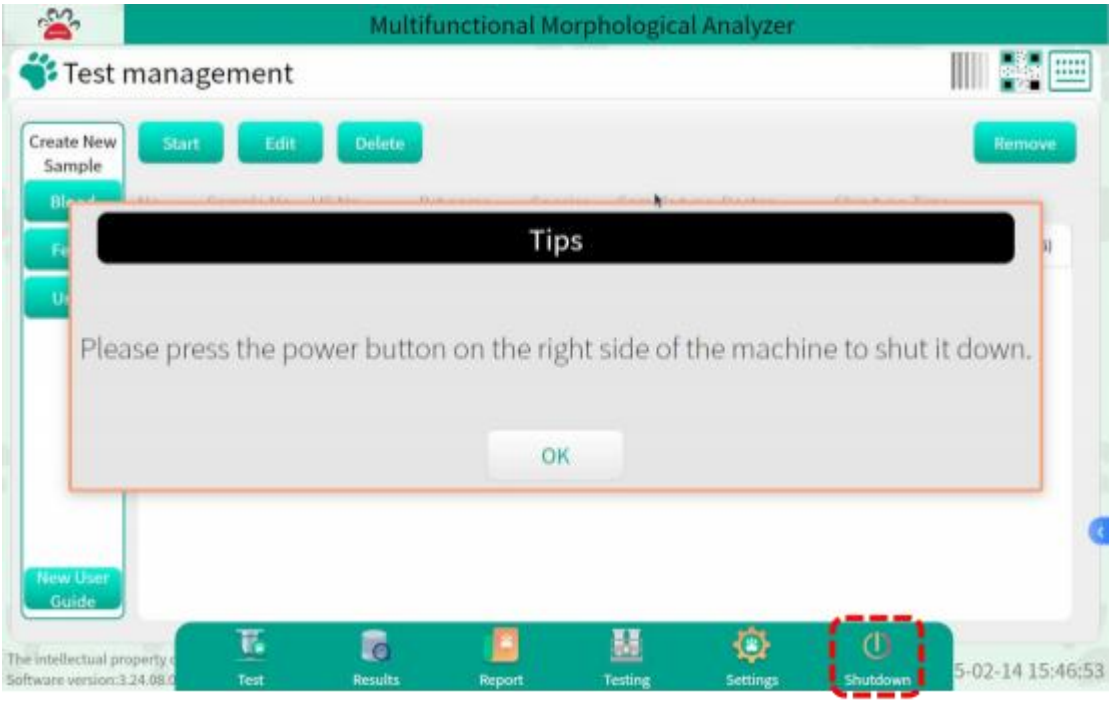


5.3. Power-Off

Exit software: Click "**Shutdown**", a display prompt will appear, click "**ok**".

Power off the machine: Press the power button located at the right of the instrument. Once power off, the instrument screen will light out, signaling that the instrument is powered on.

Power off main power: Locate the "**O/I**" power switch at the back of the instrument and set it to "**O**" to turn off the main power supply.

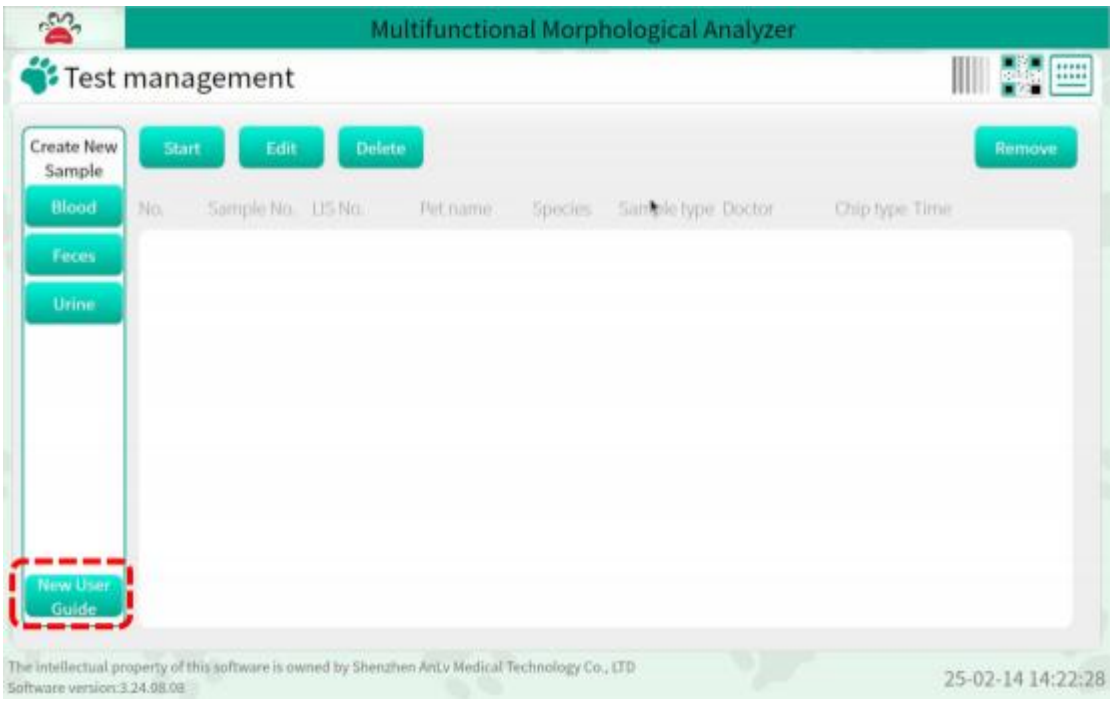


5.4. New User Guide

Two methods for new users are provided: the button of **New User Guide** and the setting of **New User Guide.**

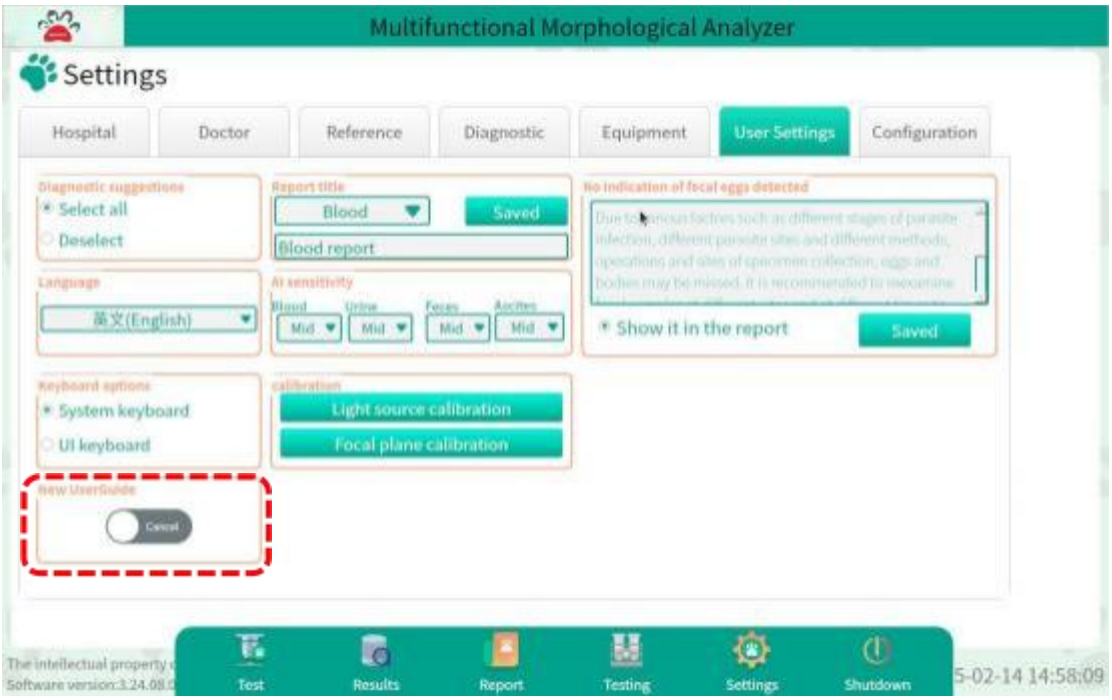
1. **Navigate the button:** Test Management Interface—New User Guide

Click the New User Guide button located at the lower left corner of the test interface to enter the new user mode. This mode will guide the user to enter the Create New Sample interface and guide each step of creating a new sample until the test is started.



2. **Access User Settings**: Settings—User Settings—New User Guide Switch

Additional, in the system settings interface, new users can turn on the New User Guide switch in the user settings interface. After restarting the software, the software system will automatically enter the novice guide mode to guide the user in sample testing operations.



Note: The New User Guide switch only limits the software system to automatically enter the new user guide mode once after restarting. If you want it to automatically enter the new user guide mode again after the next restart, you need to turn on this switch before restarting the software.

5.5. Operating Instruction

The operating Instruction provides detailed operation instructions for the entire operation process of preparing varies samples. Users can prepare samples according to the operation guide located at Create New Sample interface or the reagent instructions.

Two methods for operating instructions are provided: Operating Instruction images or SOP videos located at Create New Sample interface

1. Navigation: Create New Sample Interface — Sample Information Interface — **Operating Instruction image**.

2. Navigation: Create New Sample Interface — Sample Information Interface — **SOP Video**.

Taking the newly created blood sample as an example, as shown in the following figure:

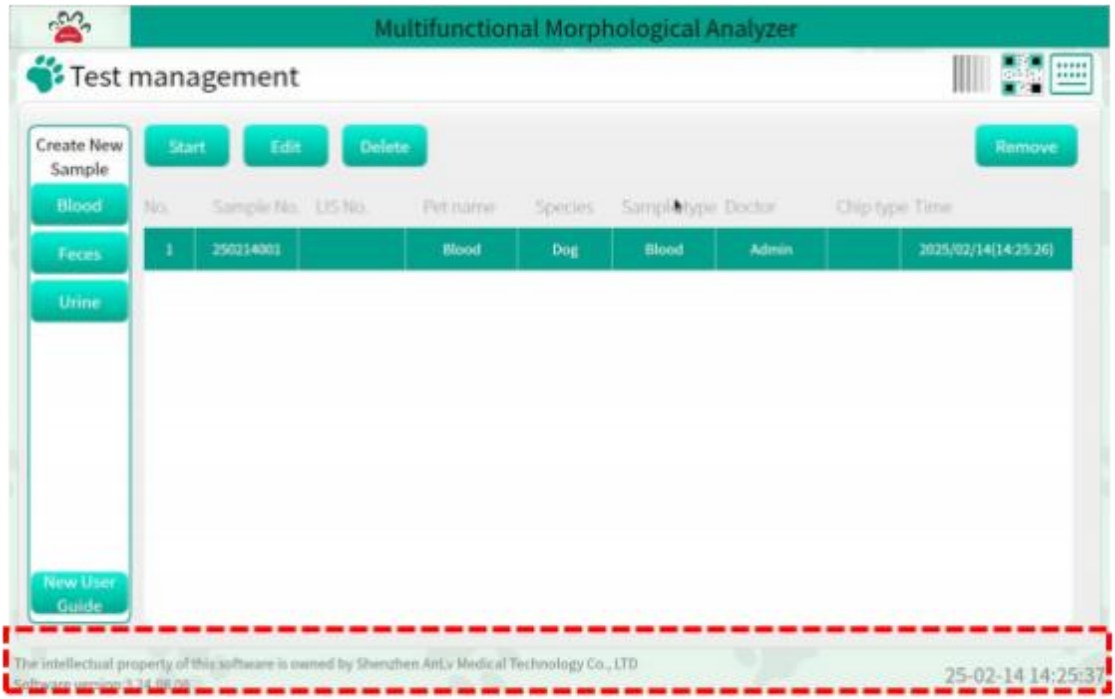
Chapter VI Main Interface

6.1. Overview

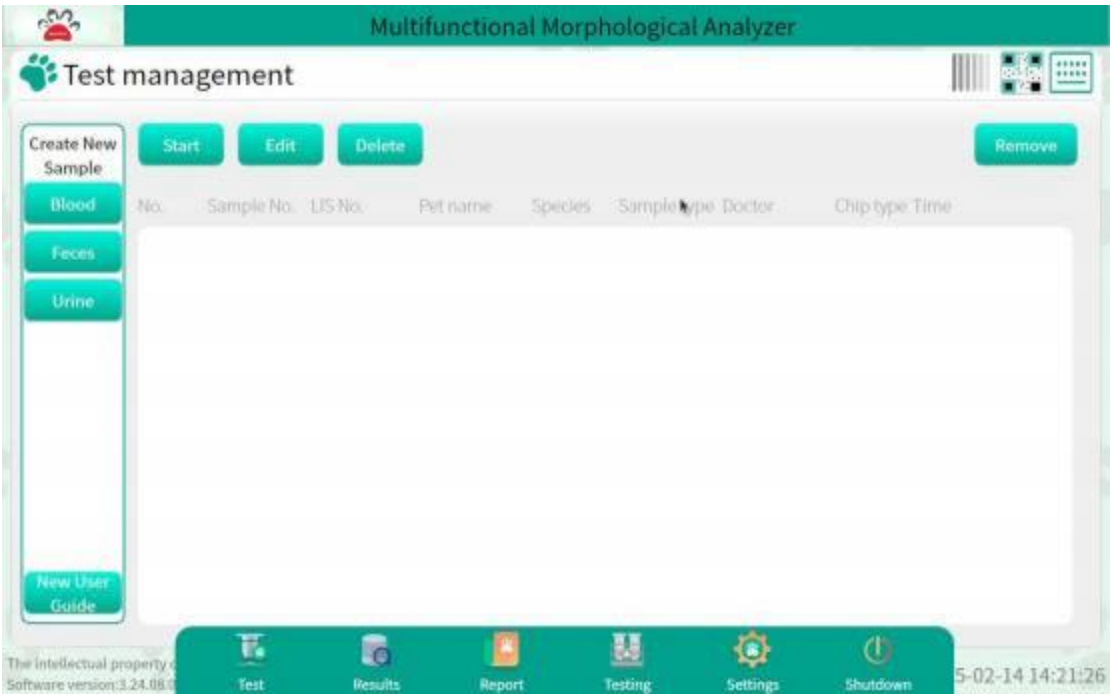
The chapter details the menu navigation bar located at the bottom of main interface and icon located at the right corner of main interface.

6.2. Main menu

Click the bottom of touch-screen area which area is boxed, then the menu navigation bar will pop-up.



Note: Click the left or right side of menu navigation bar, the menu bar will be hidden, click the bottom of main interface again, the menu navigation will pop-up.



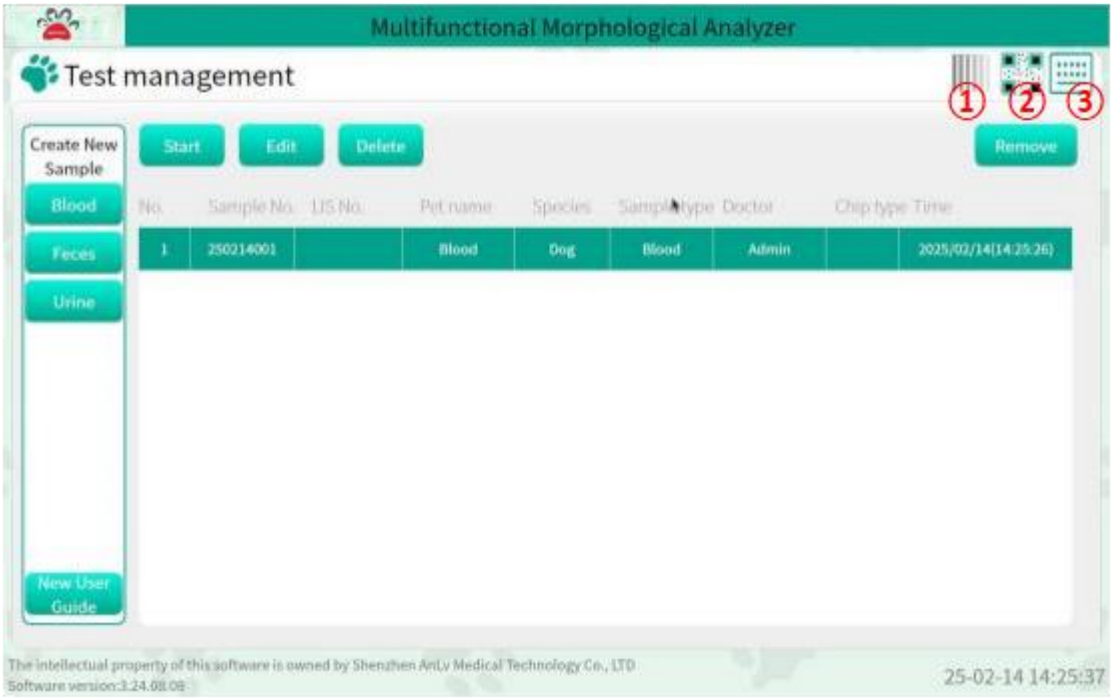
Menu bar description:

Menu Bar	Description
	This item is used for managing create new sample, edit sample information, delete samples, start test and remove chip.
	This item is used for managing results, retest, picture review, open file, delete and search for tested samples.
	This item is used for displaying sample reports and editing reports, viewing image galleries, uploading diagnostic prompts, previewing prints, saving reports, etc.
	This item is used for displaying an animation of the testing process and real-time images of the tested sample currently.
	This item is used for viewing instrument information, entering hospital and doctor information, and setting users and parameters.
	Shutdown the software. Ensure no test is in progress and the chip has been removed for a successful shutdown.

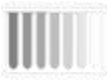
6.3. Main icon

The icons in the upper right corner of the main interface, from left to right, are as follows:

the Turbidity Card, the QR code of the company website, and the keyboard.



Icons description:

No.	Icons	description
①		This icon is used for displaying turbidity card, checking the turbidity of samples when preparing fecal samples.
②		Clicking on this icon will open the QR code of the company official website. Scan and follow the company official website to obtain enterprise information, product introductions, online courses, etc.
③		This icon is used for activating the keyboard when it does not open, activating it by clicking it.

Chapter VII Test Management

7.1. Overview

The chapter details the basic operations of the test management interface on software, covering the all operation process from sample detection to report generation. Moreover, it focuses on detailing the operation process, although different sample types have the same operation process, and there are only differences in the information entered when creating new samples. The main process of sample testing is as follows: creating a new sample - entering sample information - starting the test - generating the report.

7.2. Sample Requirement

7.2.1. Blood Sample

Types of Blood Samples Tested:

1. **Whole Blood Sample:** Venous blood collected in a tube containing EDTA-K2、EDTA-K3(Cat, dog and other mini mammals) or Heparin Lithium(Reptiles) as an anticoagulant according to different animal species.

2. **Peripheral Whole Blood Sample:** Blood collected using a sampling tube designed to capture peripheral whole blood.

3. The test must be should be tested within 4 hours after sample collection, otherwise the final test results will be affected.

7.2.2. Fecal Sample

1. Feces samples from canine and feline.
2. Lavaged feces samples are recommended.
3. The lavage fluid should contain only normal saline, and the addition of other ingredients such as glycerol will affect the final test results.

4. For pets that cannot adopt lavage method, normally excreted feces or anal swab samples should be removed from contaminated impurities and diluted with normal saline to the concentration range of feces sample ratio for testing.

5. To ensure the accuracy of the results, the sample should be tested within 20 minutes of collection, otherwise the parts of the feces are degraded.

7.2.3. Urine Sample

1. Urine samples from canine and feline.

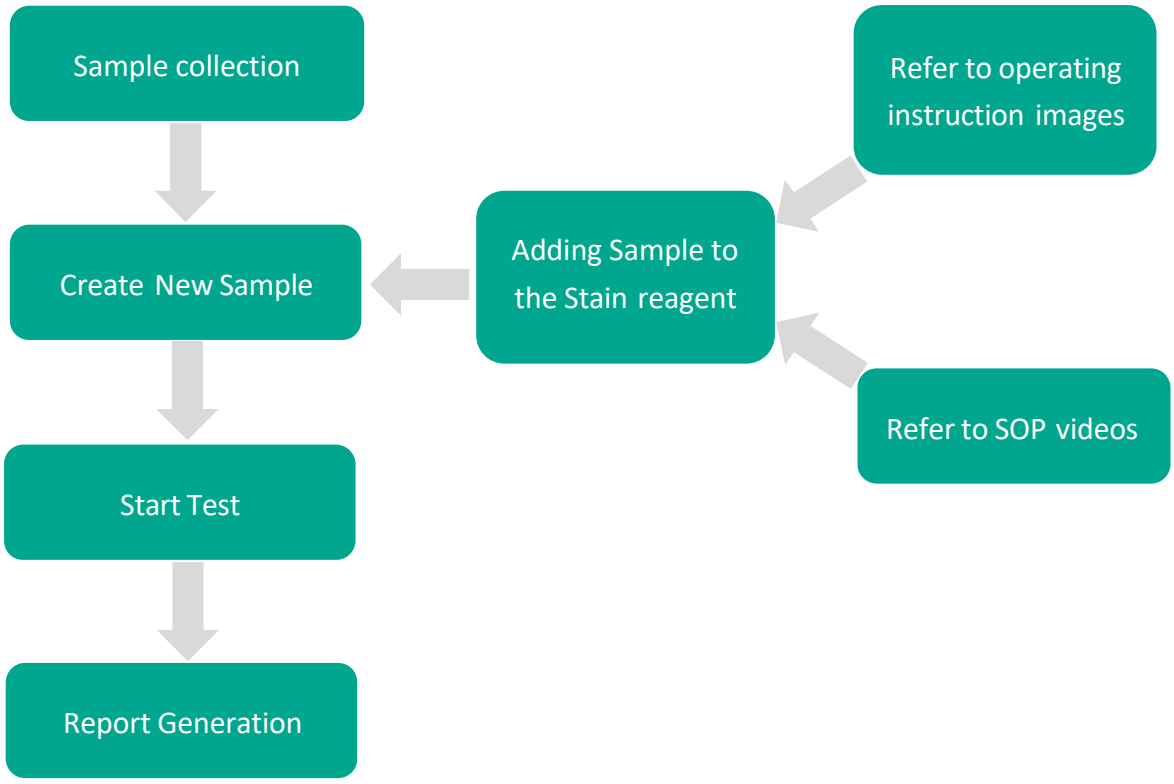
2. This product is suitable for sample detection of puncture sampling, artificial catheterization and natural urination.

3. Sample collection for natural voiding should collect middle urine, otherwise it will cause bias in result detection.

4. To ensure the accuracy of the results, the samples should be completed within 30 minutes of collection, otherwise the collected sample should be placed at 2-8℃ within 6 hours.

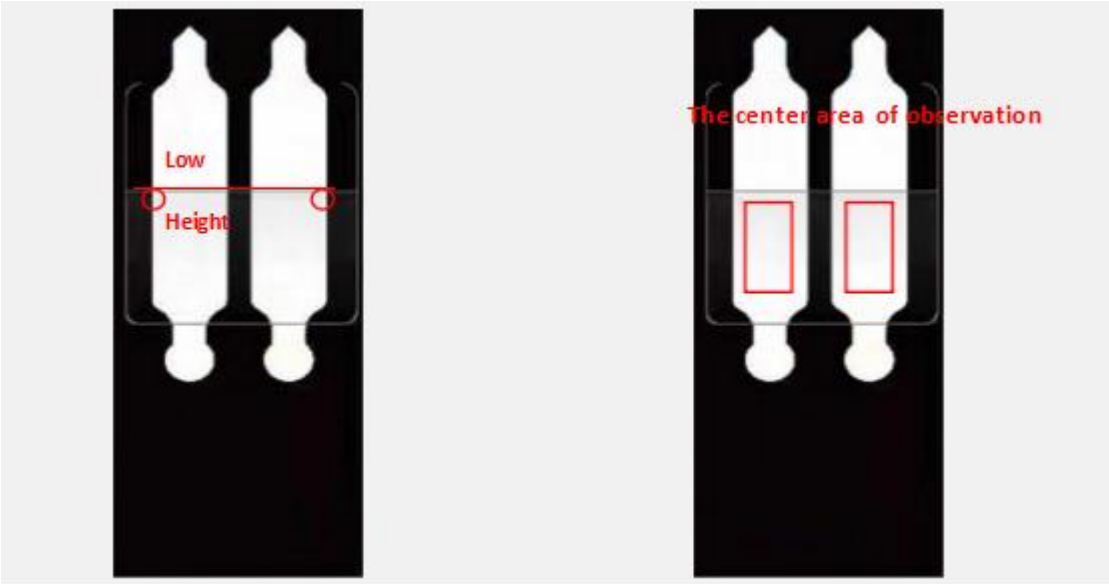
5. The refrigerated samples should be restored to room temperature before being tested.

7.3. Detection Procedure



Note: The operating instruction images and SOP video located at Create New Sample interface provide detailed descriptions of the sample addition and staining process. Simply follow the corresponding sample 's new interface for addition and staining. When filling the chip with the stained mixed solution, check whether there are any noticeable bubbles in the observation area. If there are significant bubbles (diameter > 2mm) at both sides of the high-low channel junction, which could affect detection, the pool needs to be refilled. If there are any bubbles in the center of the observation area that could affect detection, the pool must be refilled. If no bubbles are present, it does not affect detection, and the pool filling is considered complete.

High and low channel junction *The center area of observation*



7.4. Create New Sample

7.4.1. Create Blood sample

Inputting Information for Blood Testing

To input sample information, follow these steps:

1. **Access Sample Input:** Click "Blood" below the menu of "**Create New Sample**" within the "**Test**" interface. A sample information input interface will appear.

2. **Input Details:**

Select the type of "**Animal Subclass**" and "**Animal Species**".

Enter the necessary "**Sample Information**".

Click "**Select the doctor**" to select doctor then click "**Next Page**".

Choose the "*__Sample Volume__"(optional 10μL,40μL, 80μL) as required.

3. **Saving Information:** After all selections have been made, click "**Save**" to store the sample details.

4. **Displaying Sample:** After saving the newly created sample, the sample will be automatically displayed in the list of samples to be tested.

Required Inputs: Fields marked with an asterisk ("*") are mandatory and must be completed.

Animal Subclass and Species for Blood Testing:

Sample type	Animal Subclass	Animal Species
Blood	Mammals	Dogs, Cats, Rabbits, Rabbit, Chinchillas, Rattus, Mus, Cricetinae, Ferret and other mammals.

7.4.2. Create Feces Sample

Inputting Information for Fecal Testing

To input sample information, follow these steps:

1. Access Sample Input: Click "**Feces**" below the menu of "**Create New Sample**" within the "**Test**" interface. A sample information input interface will appear.

2. Input Details:

Select the type of "**Animal Subclass**" and "**Animal Species**"

Enter the necessary "**Sample Information**"

Click "**Select the doctor**" to select then click "**Next Page**"

"**Sample Volume**" fixed volume 150µL

Select test mode optional "**Standard mode (approx. 9-12 minutes)**" and "**Enhanced mode (approx.18-25 minutes)**"

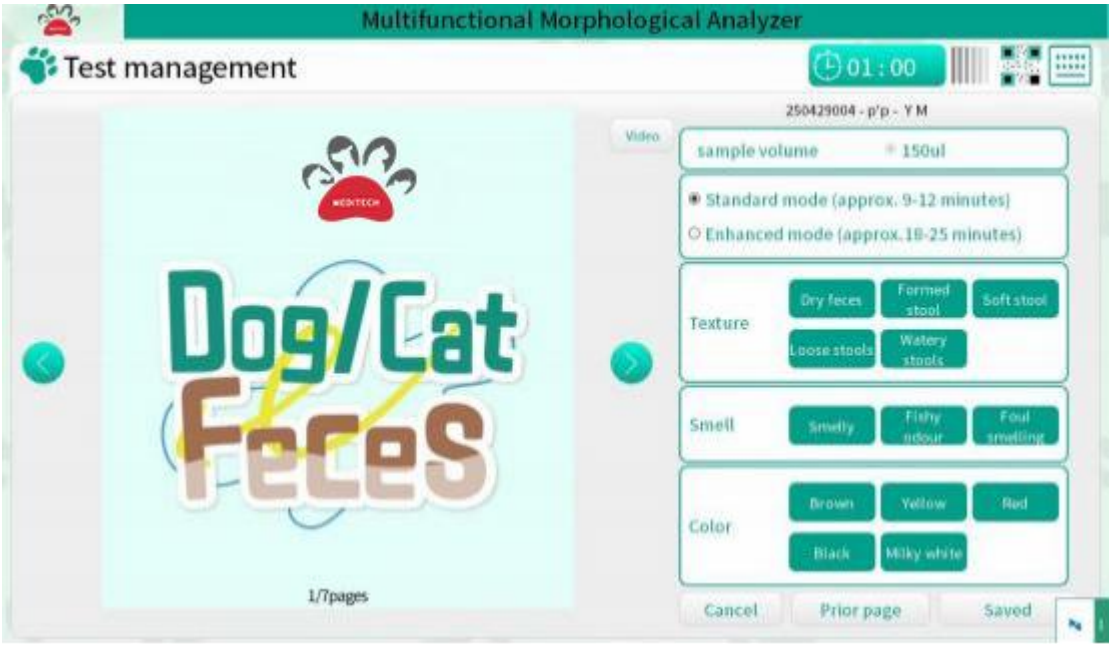
Select feces property "**Texture**","**Smell**", "**Color**"

1. **Saving Information**: After all selections have been made, click "**Save**" to store the sample details.

2. Displaying Sample: After saving the newly created sample, the sample will be automatically displayed in the list of samples to be tested.

Required Inputs: Fields marked with an asterisk ("*") are mandatory and must be completed.

Note: The enhanced mode significantly increases the number of images taken compared to the standard mode to improve the detection rate of parasite eggs, extending the detection time from approximately 9 mins to 18 mins.



Animal Subclass and Species for Feces Testing:

Sample Type	Animal Subclass	Animal Species
Feces	Mammals	Dogs, Cats and other mammals.

7.4.3. Create Urine Sample

Inputting Information for Urine Testing

Input Information

To input sample information, follow these steps:

1. Access Sample Input: Click on "**Urine**" below the menu of "**Create New Sample**" within the "**Test**" interface. A sample information input interface will appear.

2. Input Details:

Select the type of "**Animal Subclass**" and "**Animal Species**".

Enter the necessary "**Sample Information**".

Click "**Select the doctor**" then click "**Next Page**".

"**Sample Volume**" fixed volume 500μL.

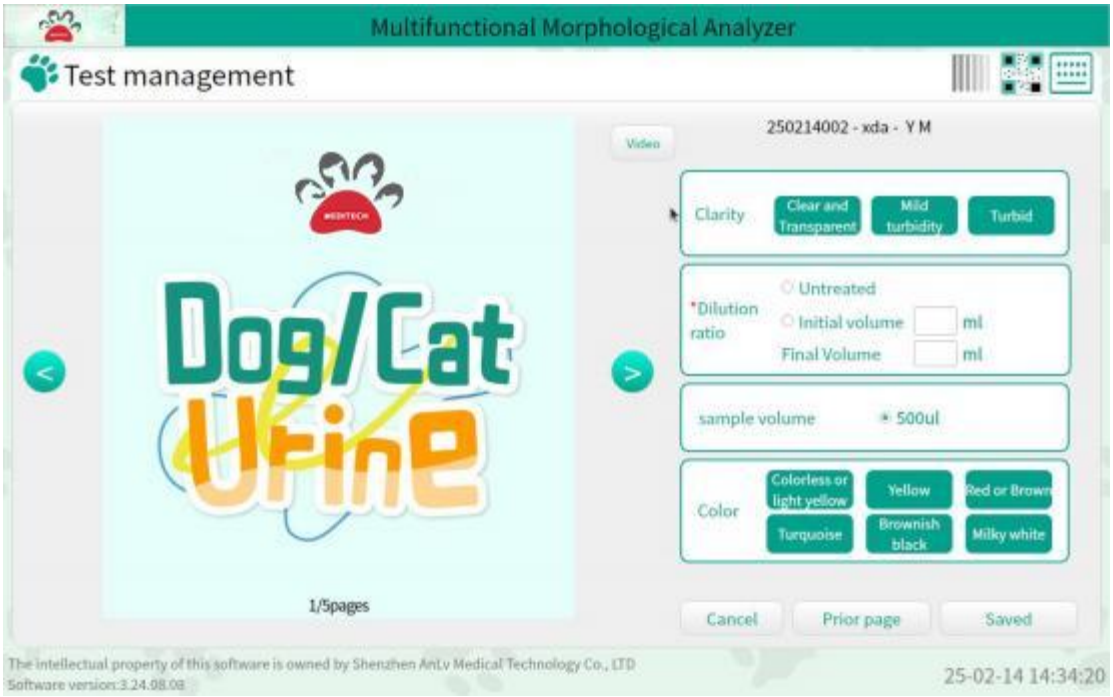
Select "*__Dilution ratio__" type.

Select urine property "**Clarity**", "**Color**".

3. **Saving Information**: After all selections have been made, click "**Save**" to store the sample details.

4. **Displaying Sample:** After saving the newly created sample, the sample will be automatically displayed in the list of samples to be tested.

Required Inputs: Fields marked with an asterisk ("*") are mandatory and must be completed.



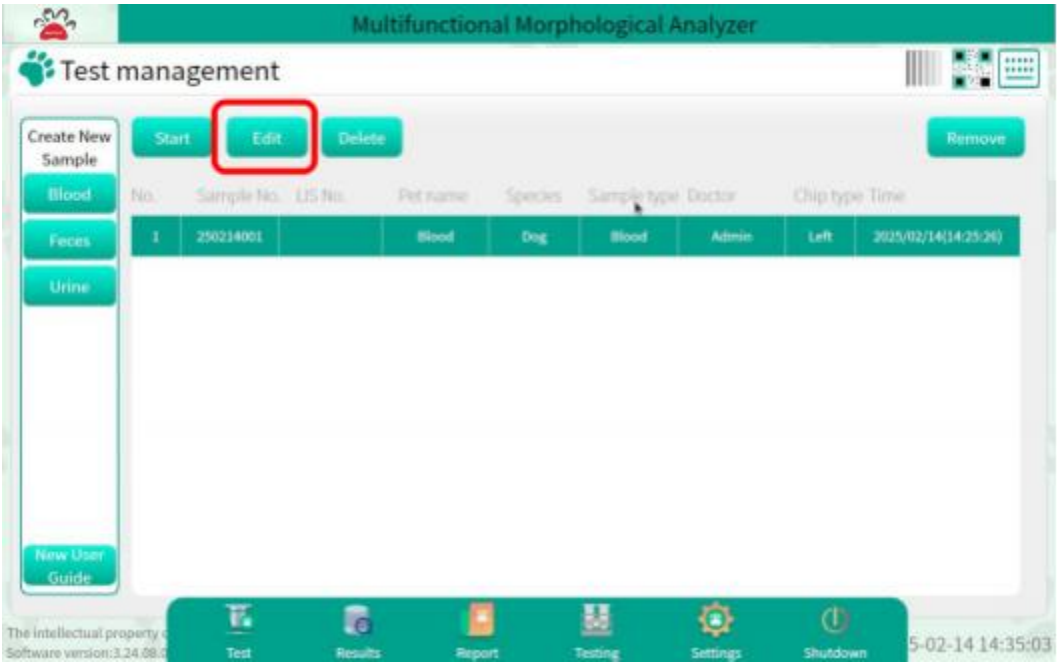
Note: For high concentration samples (such as jaundice urine, highly concentrated turbid urine, or hematuria), manual microscopy is recommended. If instrument testing is required, please refer to the operation guide pictures in the "Create New Sample" interface of the urine for specific steps.

Animal Subclass and Species for Urine Testing:

Sample Type	Animal Subclass	Animal Species
Urine	Mammals	Dogs, Cats and other mammals.

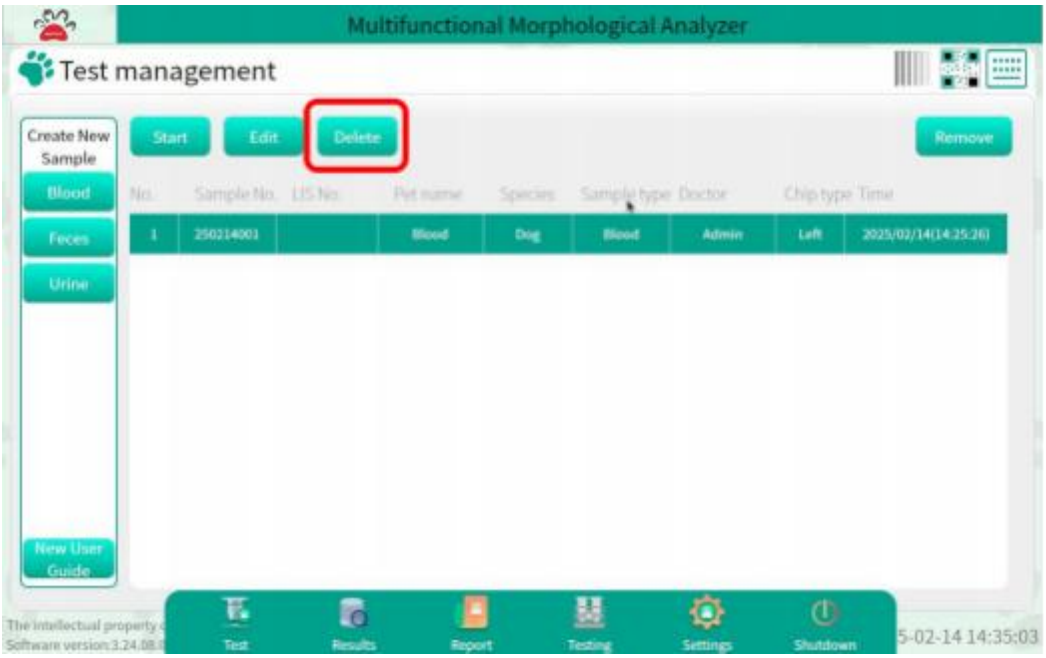
7.5. Editing Sample Information

In the list of samples to be tested, select the created sample and click "**Edit**" to modify this sample information.



7.6. Deleting the Sample

In the list of samples to be tested, select the created sample and click "**Delete**" to delete this sample information.



7.7. Starting the Test Procedure

1. **Select Sample**: Identify and select the sample that needs to should be tested within the system.

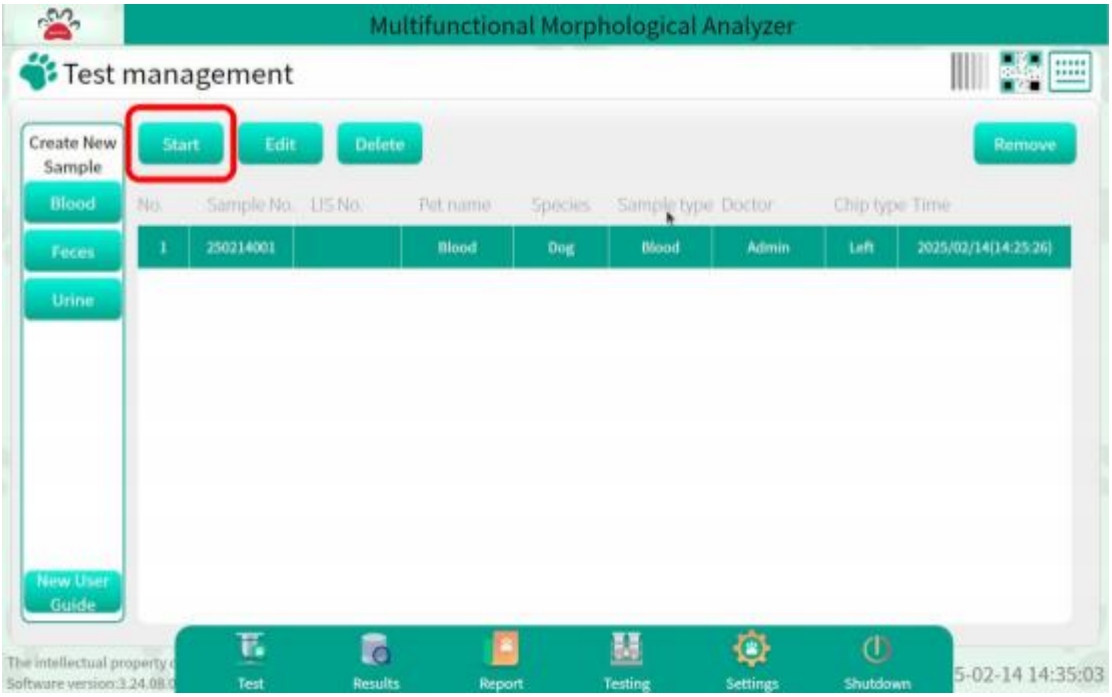
2. **Initiate Test**: Click "**Start**" button then "***Chip channel selection**" a popup will appear. After selecting channel type, the instrument will automatically perform a system reset and the chip holder will be presented.

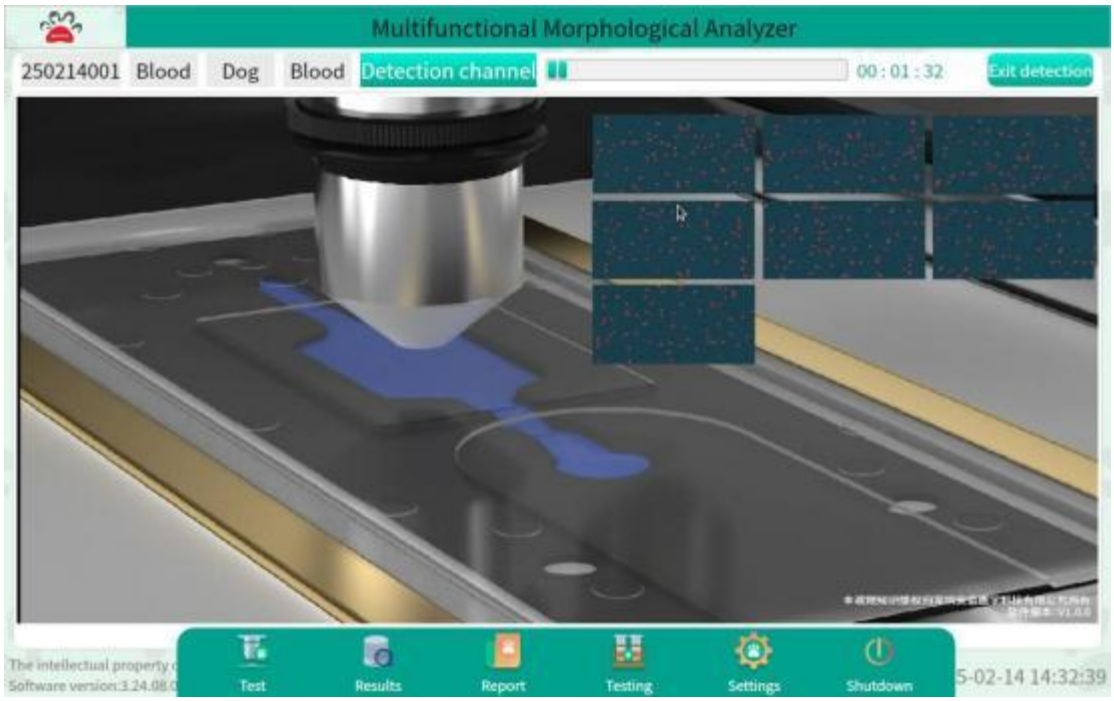
3. **Inserting the Chip**: If no disruptive or obvious bubbles are present, insert the chip into the chip holder. Once properly placed, the chip holder will automatically retract.

4. **Automatic Recovery**: If no chip is placed within the 5-minute window, the chip holder will automatically retract back into the instrument.

5. **Testing Process**: The system will transition to the testing interface, displaying an animation of the testing process and real-time images.

6. **Result Display**: Upon completion of the test, the results will automatically be displayed on the Report interface.





Sample Type	Test Time
Blood test	No longer than 10 mins
Feces test	Standard mode: No longer than 12 mins Enhanced mode: No longer than 25 mins
Urine test	No longer than 11 mins

7.8. Remove Chip

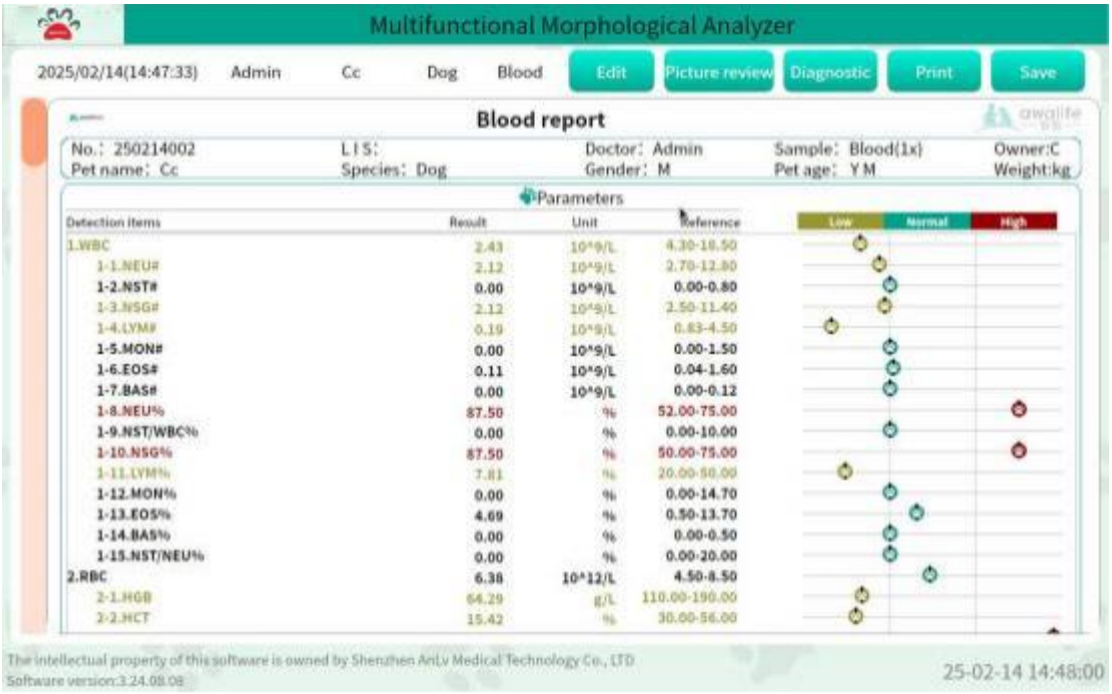
Click "**Remove**", the chip holder will be presented. After removing the chip, the chip holder will automatically retract back into the instrument.


Multifunctional Morphological Analyzer
Test management
Create New Sample
Blood
Feces
Urine
New User Guide
Start
Edit
Delete
Remove
No.
Sample No.
LIS No.
Pet name
Species
Sample type
Doctor
Chip type
Time
1
250214001
Blood
Dog
Blood
Admin
Left
2025/02/14(14:25:26)
Test
Results
Report
Testing
Settings
Shutdown
5-02-14 14:35:03

Chapter VIII Report Management

8.1. Overview

The chapter details the basic operations of the software's report display interface, and focuses on providing a detailed description of operations such as ""Edit"", "Picture review", "Diagnostic", ""Print"", and ""Save"", taking the blood report as an example.



8.2. Picture Review

1. **Accessing Picture Review**: After completing the test, click the "**Picture review**" button located in the upper right corner of the screen to open the picture review interface.

2. **Interface Layout**: The interface is organized into different galleries for easier navigation, including:

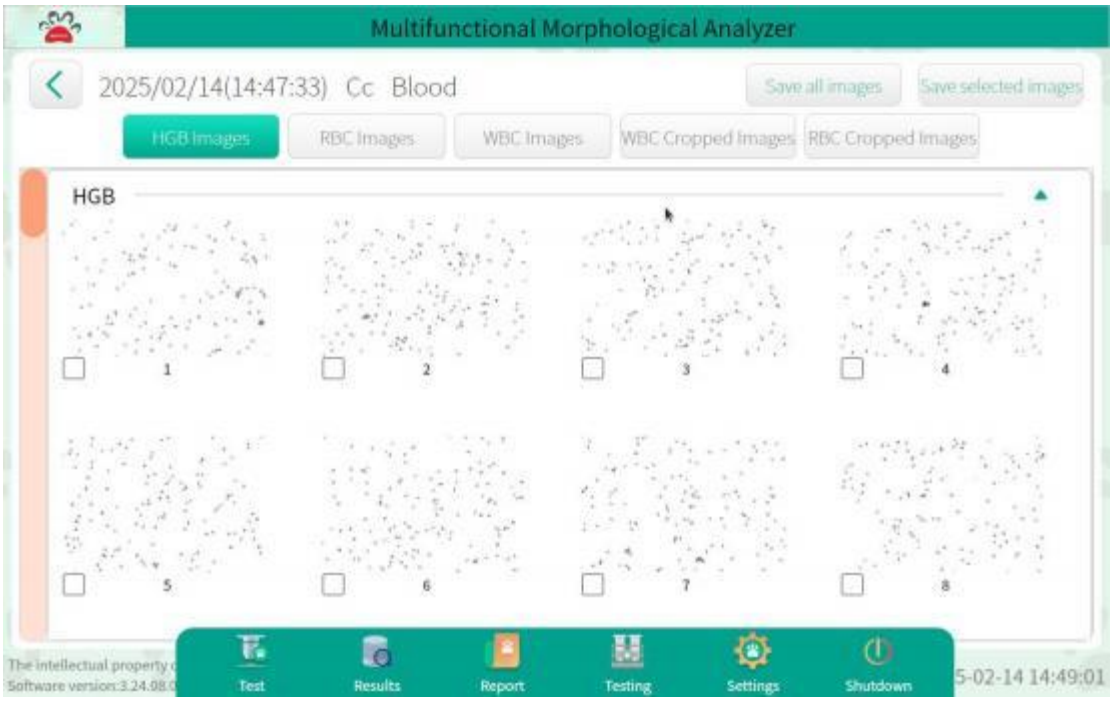
Sample	Types of Picture review
Blood	- HGB Image

	- RBC Image - WBC Image - WBC Cropped Image - RBC Cropped Image
Feces	- Egg Images - Microbial Images - Split Images
Urine	- Cast Images - Cell Images - Germ/lipid droplets images - Split Images

3. **Manually Saving**: In the upper right corner of the interface, you have the option to ""**Save" All Images**" pictures or ""**Save" selected pictures**" after manually selecting the desired images.

4. **Automatic Saving**: The system automatically saves the pictures from the last 20 tests to ensure data is preserved for further analysis or future reference.

Note: Storing too many images will cause the userdata folder(other locations/computer/userdata/anlv_image) to become overly full, which may affect detection. If you need to store images, please regularly check if there is still available space on the userdata folder; when the available space on the userdata folder is less than 20GB, you need to delete previously stored images to free up space.



8.3. Diagnostic Tips

This feature facilitates updates or corrections to enhance the accuracy and relevance of diagnostic guidance in historical data.

1. **Accessing Picture Review**: After completing the test, click the "**Picture review**" button located in the upper right corner of the screen to open the picture review interface.

2. **Accessing Diagnostic Tips:** Click on "**Diagnosis**" located in the upper right corner of the report display interface enter diagnostic tips interface.

3. **Tip Levels:** The diagnostic tips are organized into three levels of detail:

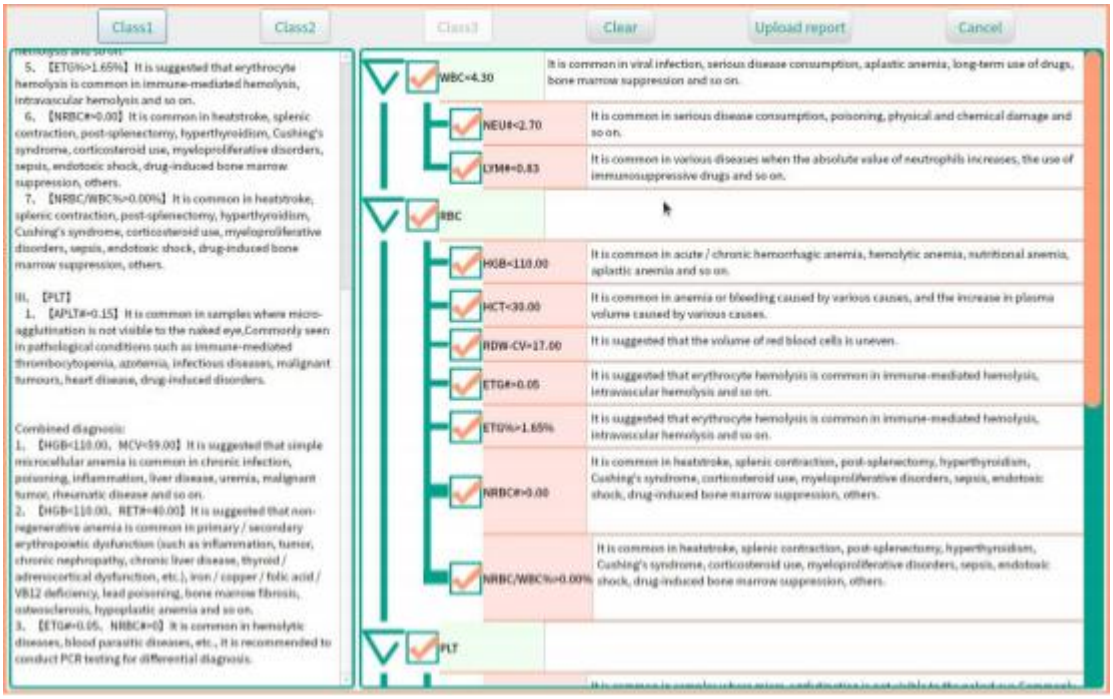
   -Level 1

   -Level 2

   -Level 3

4. **Uploading Tips into Report:** After reviewing the available tips, click "**Upload report**" to include the chosen clinical diagnosis tips in the final report. This allows for tailored advice based on the specific findings of the sample analysis.

5. **Editing Tips:** You have the option to revisit and modify the **diagnostic tips** located in the report of **Diagnostic Recommendation** for any previously generated report.



8.4. Editing the Report

"Edit" supports edit the information of report header.

1. **Accessing Edit Mode**: Click on "**Edit**" located at the upper corner of the report display interface to enter editing mode.

2. **Editing report header information:** Click on the report header area to open the header information interface.

3. **Save:** After completing the information modification, click on "**Save**" to finalize the changes.

8.5. "Save" the Report

After completing the "**Edit**" procedure, click on "**Save**" to save the edited report results.

8.6. Printing the Report

1. **Connection Check**: Ensure the instrument is properly connected to a printer.

2. **Accessing Print Options**: Click on "**Print**" located in the upper right corner of the report display interface to open the print preview interface.

3. **Printer Selection**: From the print preview interface, select the appropriate printer.

4. **Printing the Report**: After selecting the printer, click "**OK**" to begin printing the report. Ensure that the printer settings and paper are correctly configured for optimal print quality.

Chapter IX Results Management

9.1. Overview

The chapter details the basic operations of the results interface, and focuses on providing a detailed description of operations such as ""**Retest**"", "**Send via LIS**", ""**Report review**"", "**Open File**", and ""**Delete**"", **Sorting function** and **Search function**, taking the blood report as an example.

9.2. Sample "Retest"

1. **Access Results Management Interface:** Navigate to the results management section within the system.

2. **Select Sample Record:** Choose the sample record you wish to retest from the list of historical entries.

3. **Sample Retest:** Click "**Retest**" located above the sample records to access the interface of creating new sample.

4. **Check or edit Details:** Check or edit sample information.

5. **Saving Information:** After all selections have been check, click "**Save**" to store the sample details. Then the sample to be retested will appear in the list of test to be detected.

6. Click "**Start**": Select the sample to be retested then click "**Start**"

9.3. Send via LIS

1. **Access Results Interface:** Navigate to the results interface within the system.

2. **Select Sample Record:** Choose the sample record you wish to send via LIS.

9.4. "Report review"

1. **Access Results Interface**: Navigate to the results interface within the system.

2. **Select Sample Record**: Choose the sample record you wish to review from the list of historical entries.

3. **Review Report**: Click on "**Report review**" located above the sample records to access the report display interface.

4. **View Test Results**: In the report display interface, you can examine the test results for the selected sample, providing a detailed overview of the analysis conducted.

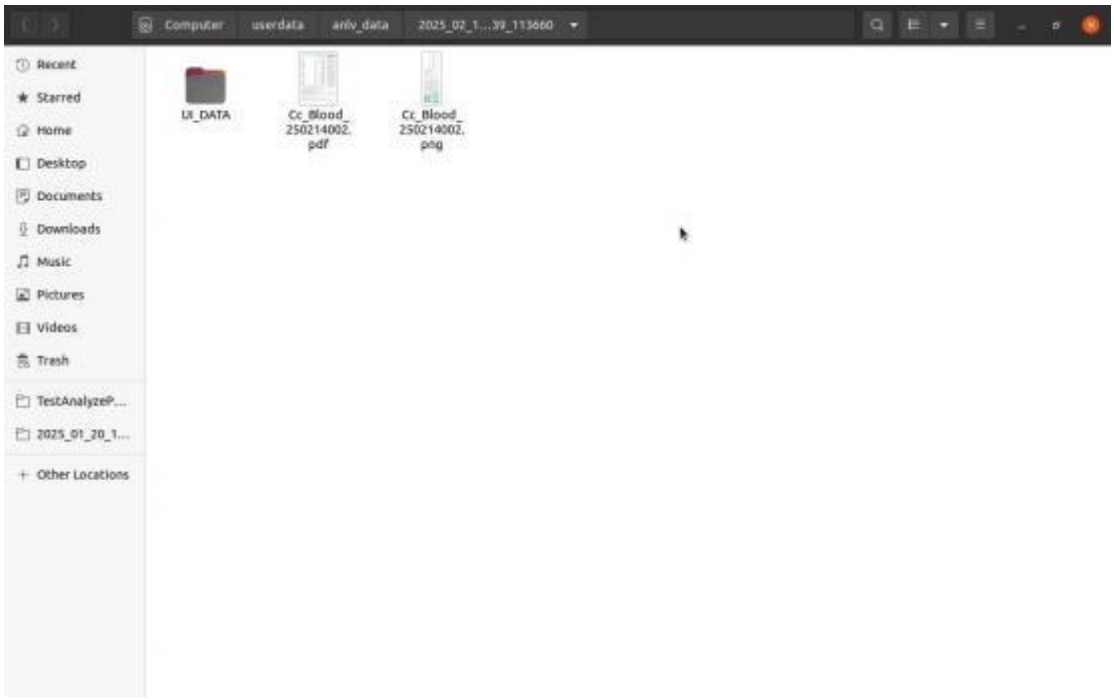
9.5. Opening the File

1. **Navigate to Results Interface**: Access the result interface within the system to locate the example reports.

2. **Select Sample Record**: Choose the specific sample record you want to view from the listed entries.

3. **Open File**: Click on "**Open file**" located at the top of the interface. This action will redirect you to the directory "Other locations\Computer\userdata\anlv_data\XXX".

4. **View Report Files**: In this directory, you can view both PDF and PNG versions of the report, as well as the original images that correspond to the thumbnail pictures displayed within the report. This provides a comprehensive view of the test results and associated imagery.



9.6. Deleting a Sample Record

1. **Access Results Interface**: Open the results interface within the system where sample records are displayed.

2. **Select Sample Record**: Identify and select the sample record you wish to delete.

3. **Initiate Deletion**: Click on "**Delete**". A confirmation prompt will appear asking, "Are you sure to delete the sample?"

4. **Confirm Deletion**: Click "**OK**" in the prompt window to confirm and permanently delete the selected sample record from the system.

9.7. Sorting Function

In the results interface, utilize the sorting feature located in the upper right corner to organize sample records. The sorting options include:

- **Serial Number Sorting**: Click once to sort the records by serial number. Clicking again will reverse the order, allowing for descending order based on serial number.

- **Sample Sorting**: This option sorts the records based on the sample details. A second click reverses the order.

- **Time Sorting**: Organize records chronologically. Clicking again will toggle the sorting between ascending and descending order.

9.8. Search Function

To locate specific records or information within the results interface:

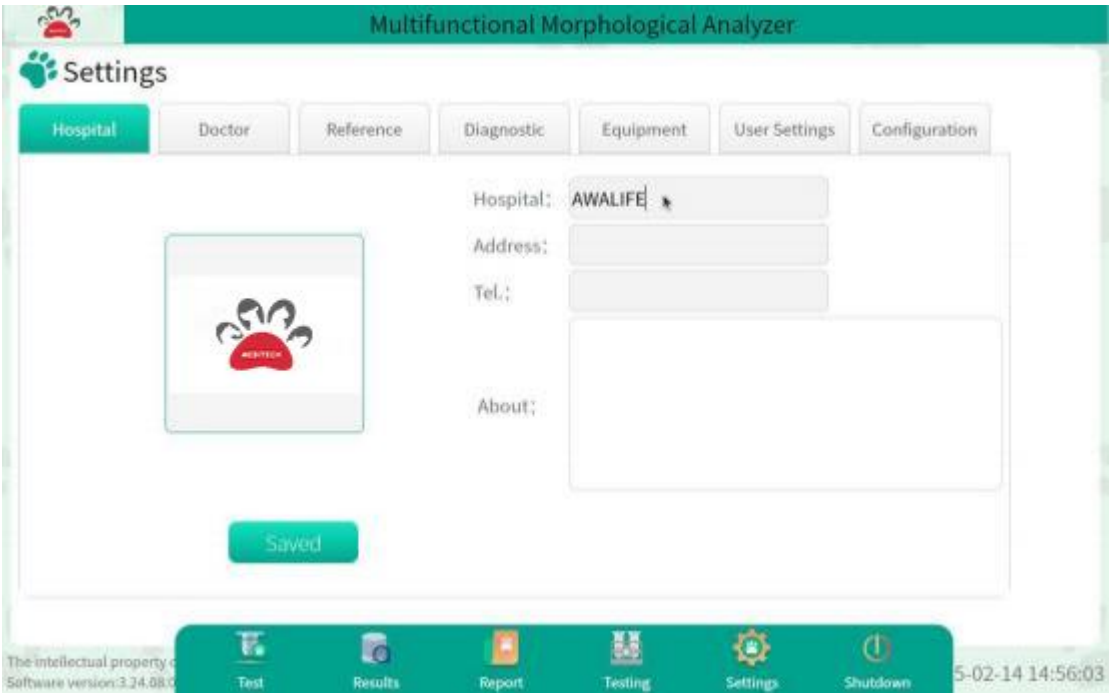
- **Keyword Search**: Enter a keyword into the search box located in the upper right corner of the page. The system will display records that contain the entered keyword, facilitating quick and efficient retrieval of relevant data.


Multifunctional Morphological Analyzer
Results
Retest
Send via LIS
Report review
Open File
Delete
Serial No.
Cc
No.
Sample No.
LIS No.
Pet name
Species
Sample type
Doctor
Chip type
Time
139
250214002
Cc
Dog
Blood
Admin
Right
2025/02/14(14:47:33)
Test
Results
Report
Testing
Settings
Shutdown
02-14 17:48:40

Chapter X Settings

10.1. Overview of Initial Setup and Configuration

The product is fully initialized prior to delivery. Upon first startup, the user will be presented with the default interface. To accommodate various practical applications, the settings of the tangible composition analyzer can be adjusted. The configuration options available in the setting menu include:



10.2. Hospital Information Settings

In the hospital information settings menu, as depicted in the accompanying picture, users have the capability to customize various aspects of the hospital profile that will appear in the final inspection reports. The settings include:

- **Hospital Logo**: Upload or update the hospital logo picture.
- **Hospital Name**: Enter or edit the name of the hospital.
- **Hospital Address**: Specify the hospital's location.
- **Hospital Phone Number**: Provide a contact number for the hospital.
- **Hospital Profile**: Add a brief description or profile of the hospital.

The hospital logo picture and hospital name are prominently featured in the final inspection report to ensure clear identification.

10.3. Doctor Information Settings

In the doctor information settings, users can manage information related to medical personnel. The options available include:

1. Adding a doctor

- **Adding a Doctor**: Users can add new doctors by entering their details into the system.

- **Doctor's Name**: Input the name of the doctor.

- **Doctor's Phone Number**: Provide a contact number for the doctor.

- **Doctor's Introduction**: Include a brief introduction or professional summary of the doctor.

Note: When entering a new sample into the system, it is necessary to select the doctor associated with that sample. The selected doctor's information will then be displayed in the final test report, linking the medical analysis to the overseeing physician.

2. Editing doctor information

- **Editing a Doctor**: Click on the corresponding doctor. The tel number and medical advantage text boxes are changed to be editable.

- **Change a picture**: Click the button to change the picture.

- **Saved**: Click the button to saved after editing.

3. Deleting doctor information

- **Select a Doctor**: Click on the corresponding doctor, the delete button is appear.

- **Deleting a doctor**: Click the button to delete.

10.4. Reference Range Settings

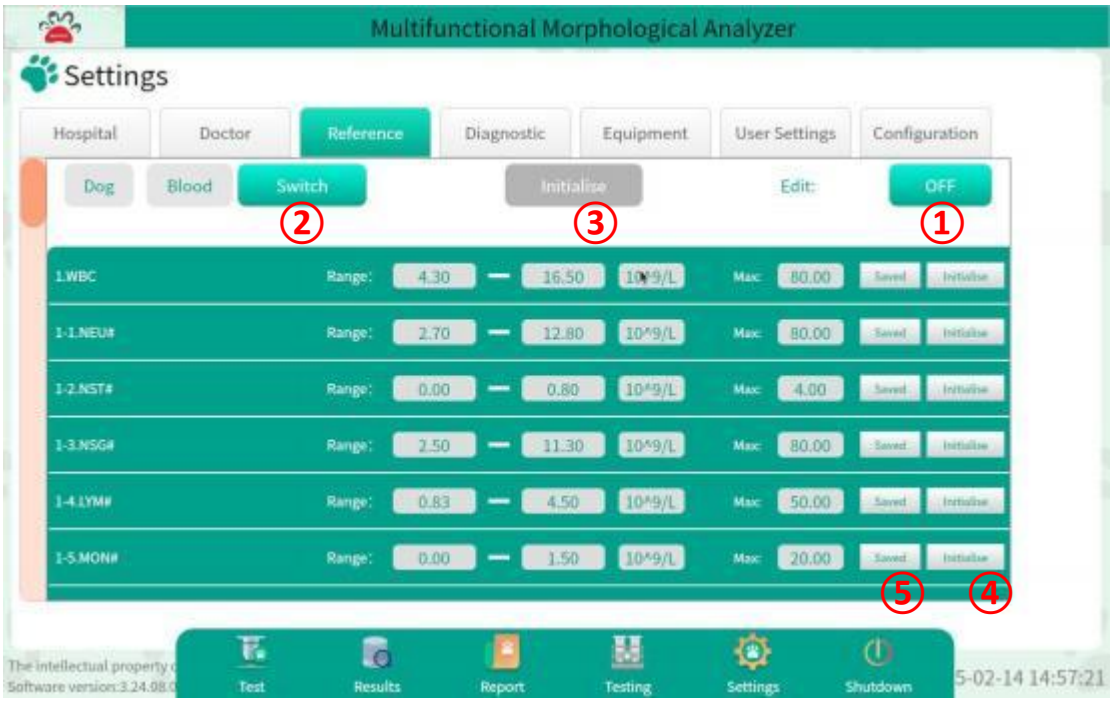
As indicated in the figure below, users can adjust the reference ranges for different species and sample types through the Reference Range menu item. This allows for customized diagnostic references tailored to specific testing needs.

Safety and Accuracy Features:

- "**Edit" Mode**: To prevent accidental modifications, the edit mode is disabled by default.

- **Activating "Edit" Mode**: Users must enable the edit mode explicitly before they can make changes to the reference ranges. When entering edit mode, you will be prompted to enter the password "admin". After entering the password, edit mode can be activated.

This design ensures that reference range adjustments are made deliberately, maintaining the integrity and reliability of test results.



"Setting" description for reference interface:

No.	Setting	Description
①	Edit Mode	Turn on/off the editing mode.
②	Switch	Click "**Switch**" to switch to the reference ranges of the

		corresponding sample types and animal species.
③	Initialise	All items Initialization: Click on "Initialise", then the reference ranges of all items for the current species will be initialized to the factory-set parameter.
④	Initialise	Single item Initialization: click on "Initialization", the reference range of this single item will be initialized to the factory-set parameter.
⑤	Saved	After modifying the reference range of a single item of the detection items for the current species, save this reference range.

10.5. Diagnostic Tips Settings

As illustrated in the provided figure, the Diagnostic Tips menu allows users to customize the diagnostic prompt information specific to various species and sample types. This feature enhances the relevance and utility of diagnostic outputs.

Functionality and Controls:

- **Enable/Disable Tips**: Users have the flexibility to activate or deactivate individual diagnostic tips based on relevance and necessity.

- **Modify Tips:** Add new diagnostic prompts or delete existing ones to tailor the guidance provided by the system.

- "**Edit" Mode:** To safeguard against accidental changes, the edit mode is deactivated by default.

- Activating "Edit" Mode: Users must actively enable the edit mode before they can make any modifications to the diagnostic prompts. This precaution helps to prevent unintended alterations and ensures that all edits are intentional and considered.

When entering edit mode, you will be prompted to enter the password "**admin**" After entering the password, edit mode can be activated.

10.6. Device Information Settings

As detailed in the accompanying figure, the Device Information section provides comprehensive insights into the product. This section is designed to help users easily access and review essential information about the device, ensuring they are fully informed about the specifications and support details.

Included Information:

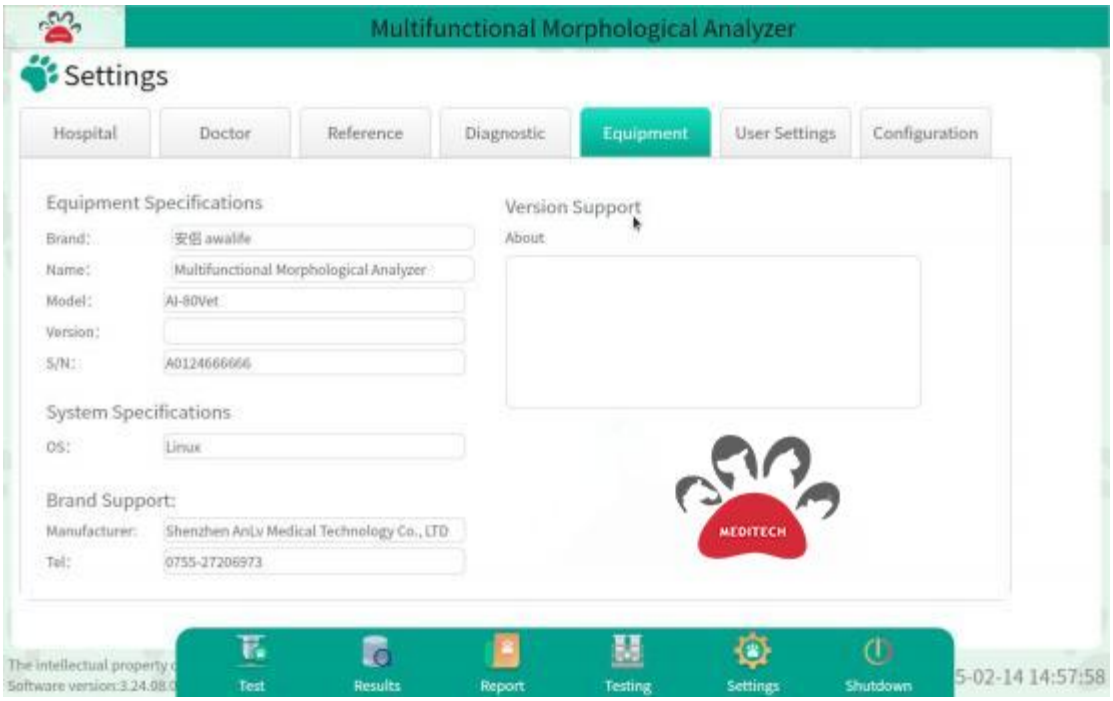
- **Device Specifications:** Details about the physical and operational specifications of the device.

- **System Specifications:** Information about the software

- **Brand Support:** Insight into the brand's support options, including warranty and customer service contacts.

- **Version Support:** Information on the current version of the device's software, including any available updates or compatibility notes.

This section serves as a central resource for all pertinent device information, aiding users in managing and maintaining their equipment effectively.



10.7. User Settings

10.7.1. Diagnostic Prompt Settings

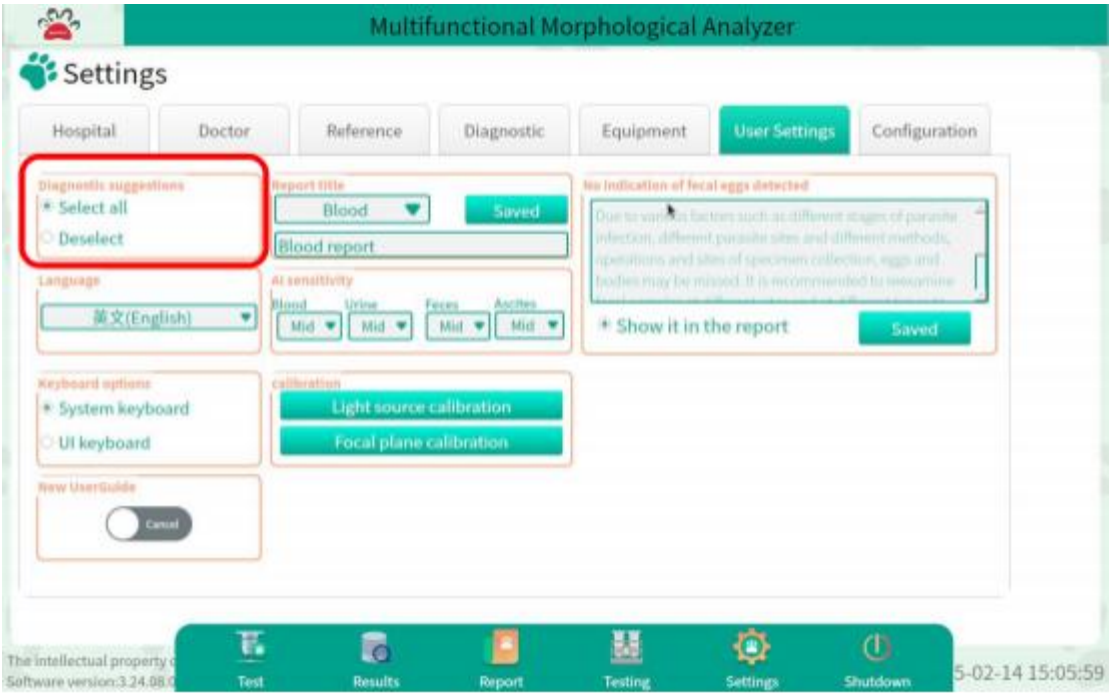
This setting allows users to manage how diagnostic prompts are displayed and selected:

- **Selection Modes**: Users have the option to either select all or none of the diagnostic prompts.

- **Default Selection**: By default, when entering the diagnostic prompt screen, all diagnostic prompts are automatically selected. Upon completing the test, the diagnostic prompts automatically appear on the report.

- **Unselect All**: If not all diagnostic tips are required, users can choose to display the diagnostic tips screen with none selected by default. Upon completing the test, the diagnostic prompts do not appear on the report.

These settings streamline the user's interaction with diagnostic prompts, enhancing the efficiency of customizing diagnostic outputs.



10.7.2. Report Title Settings

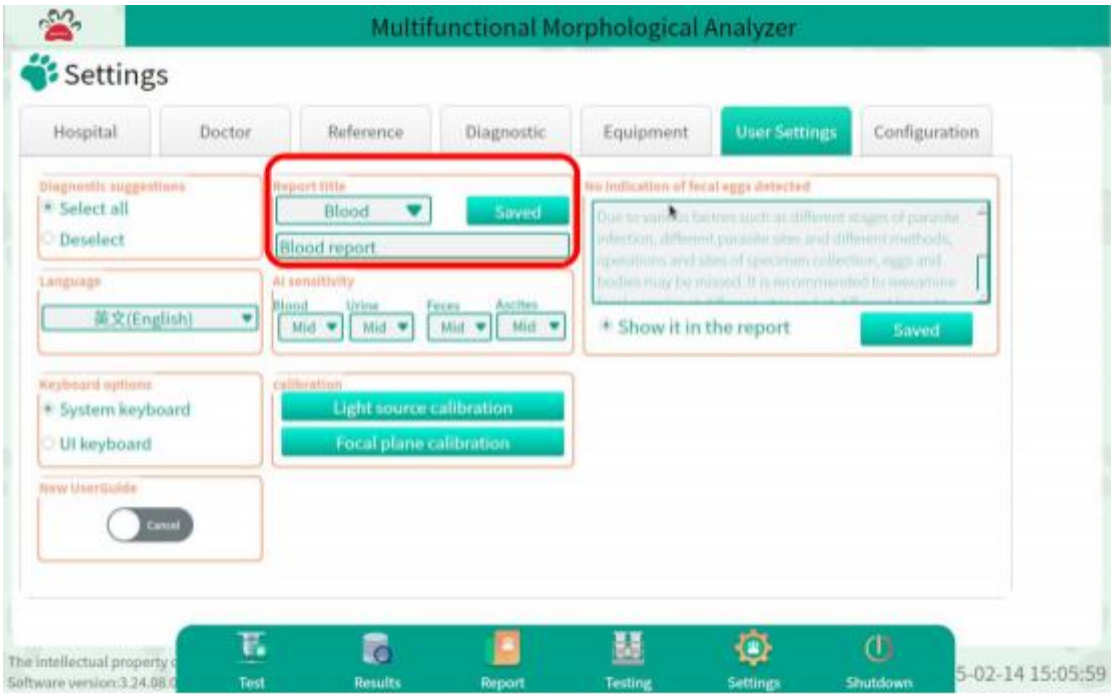
This section supports customization of the report titles based on the type of test being reported:

Supported Titles: Users can select from three types of report headers corresponding to the type of sample tested: blood, feces, urine.

Default Title: The default report header automatically displays the test type followed by "Report" (e.g., "Blood Report").

Customization: Users can customize the report header by entering their desired text in the input box provided. After saving, this customized header will appear on the corresponding reports.

By allowing customization of report titles, users can tailor the output to better fit the presentation and documentation standards required by their practice or laboratory.



10.7.3. Language Switching Settings

This setting facilitates language customization within the system:

Language Options: Users can switch between Chinese and English via a dropdown menu.

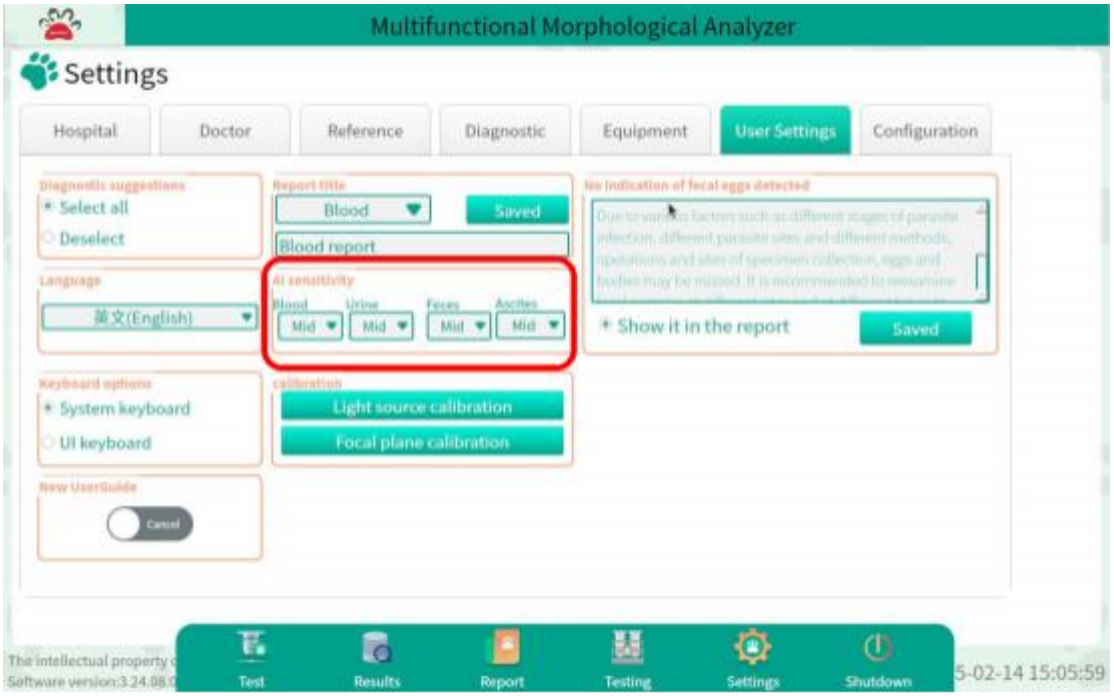
Default Language: The default system language is set to Chinese. Switching to English or other language via the dropdown will change the system language accordingly.

10.7.4. AI Sensitivity Settings

AI sensitivity can be adjusted to suit different analysis needs:

- **Sensitivity Levels**: Options available in the dropdown box include High, Medium, and Low.

- **Default "Setting":** The default sensitivity setting is Medium, balancing accuracy and processing time.



Note: Increasing sensitivity leads to a higher detection rate but reduces accuracy, while decreasing sensitivity lowers the detection rate but improves accuracy.

10.7.5. Keyboard Options

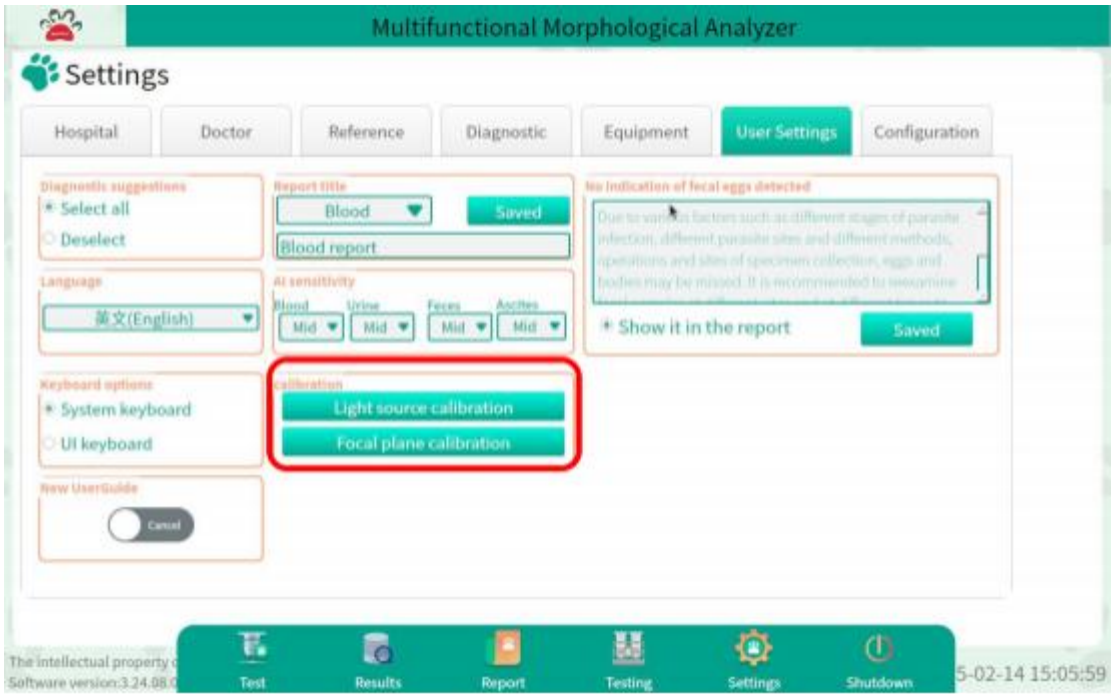
Keyboard options support **System Keyboard** and **UI Keyboard**. By default, the instrument is set to the Windows System Keyboard. After switching to the UI Keyboard mode, restart the device to use the selected keyboard.

10.7.6. Calibration Settings

Calibration Settings support **Light source calibration** and **Focal plane calibration**. Follow the pop-up prompts during calibration.

Light Source Calibration(manual) Procedure: "Settings"—"User Settings"—Click on "Light Source Calibration"—Follow the pop-up prompts during calibration.

Focal Plane Calibration(manual) Procedure: "Settings"—"User Settings"—Click on "Light Source Calibration"—Follow the pop-up prompts during calibration.



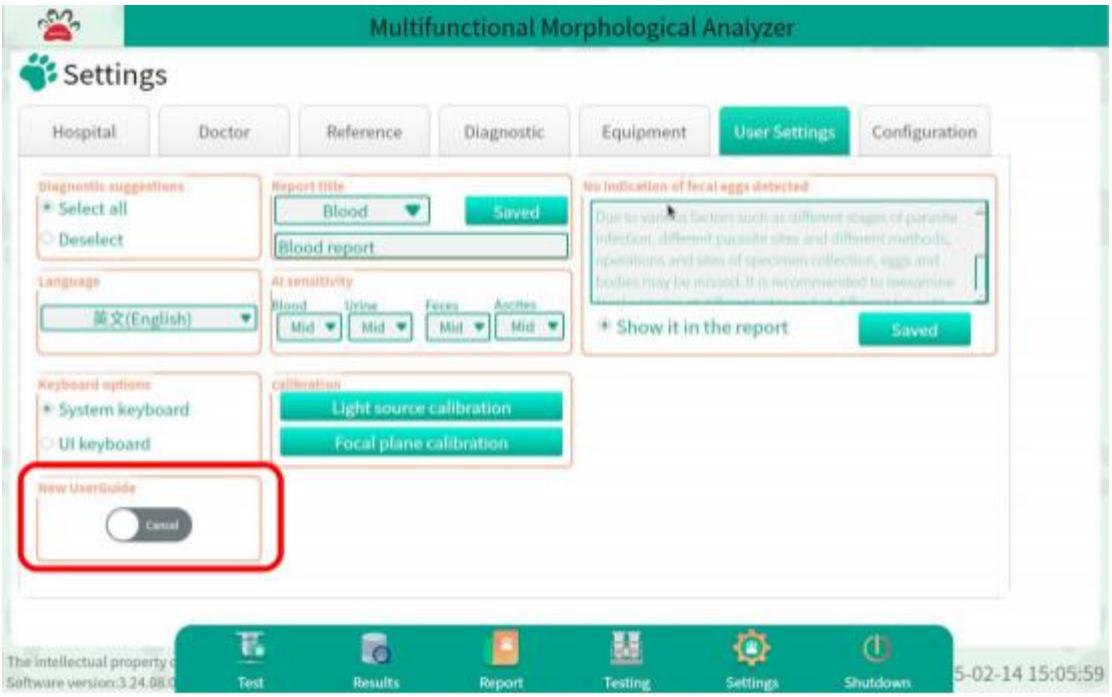
The conditions for calibration are shown in the table below:

Mode	Calibration mode	Calibration conditions
Manual	Light source calibration	Manual light source calibration is required when there are color abnormalities in the images, such as yellowish or reddish hues, to improve image quality.
	Focal plane calibration	Manual focal plane calibration is required when images are unclear or blurry, indicating poor image quality.

Routine	Light source calibration	The system program is set to perform routine light source calibration every two months to ensure the stability of light source. When the scheduled calibration time is reached, the software will automatically perform light source calibration if the sample chip compartment is empty.
	Focal plane calibration	The system program is set to perform routine focal plane calibration every two months to ensure the stability of image quality. If a blood test coincides with the scheduled focal plane calibration time, the system will automatically combine the focal plane calibration with the blood test, extending the blood test time to about 12 minutes. scheduled focal plane calibration time, the system will automatically combine the focal plane calibration with the blood test, extending the blood test time to about 12 minutes.

10.7.7. New User Guide Settings

When the new user guide button is "**ON**", the system will automatically enter guide mode the next time the software starts. If you don't want the software to start in guide mode, simply disable the setting.



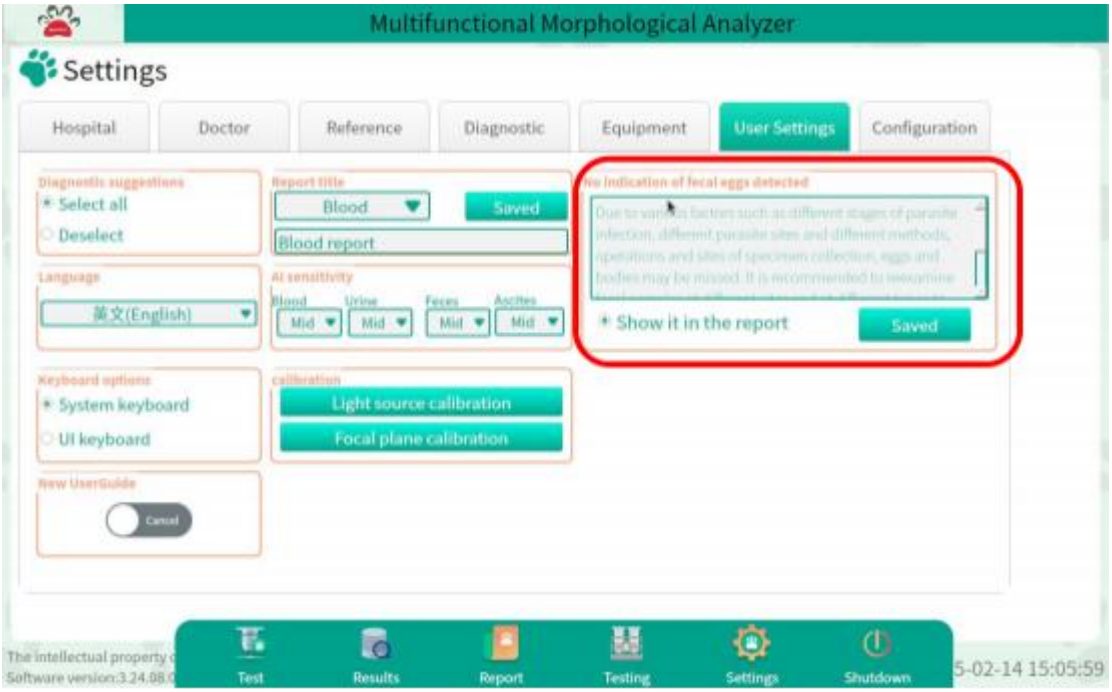
10.7.8. Feces Eggs Miss Detected Warning

This setting addresses the potential for missed detection in feces egg analysis:

Default Text: The default warning text states: Due to the influence of various factors such as different stages of parasite infection, different parasite sites, and different methods, operations, and sites of specimen collection, eggs and worms may be missed. It is recommended to review feces samples at different sites and different times 3 times to improve the testing rate. -- *Laboratory Test Methods for Parasites.*

Custom modifications: Custom modifications are supported by the content.

Report Integration: This warning is automatically included in feces report tests under Diagnostic Tips after testing, enhancing report comprehensiveness.



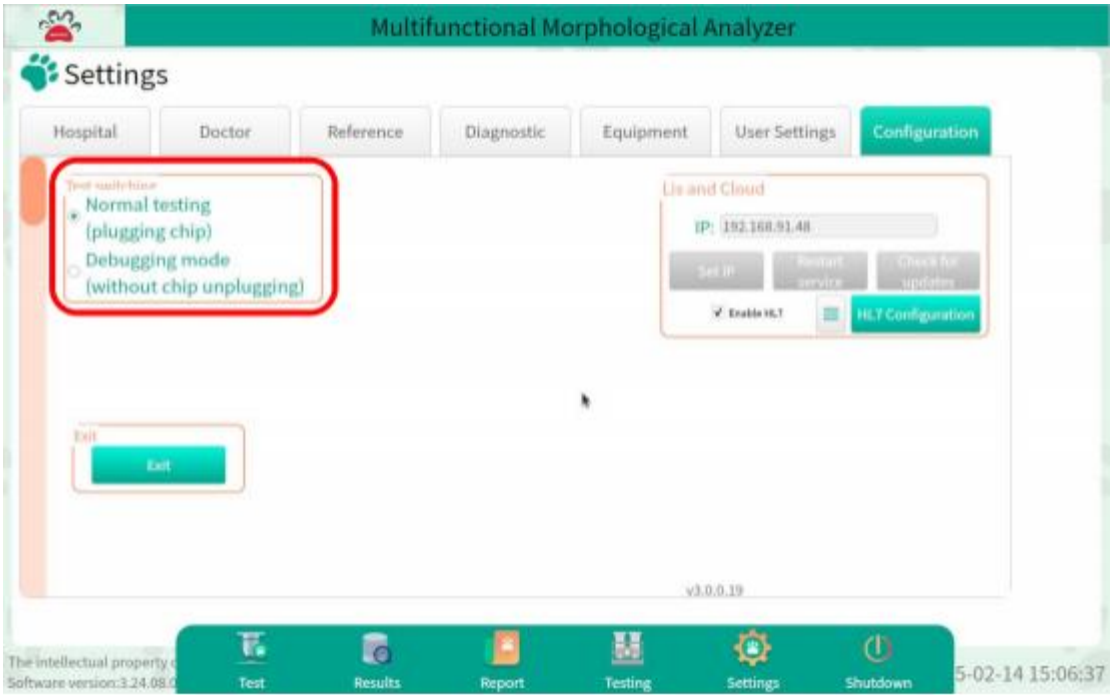
10.8. Configuration Settings

10.8.1. Test Switching settings

Test mode supports normal testing (with chip insertion) and debugging mode (without chip unplugging).

Normal testing: For regular use, users typically perform normal testing, where the system prompts the insertion and removal of the chip during sample testing.

Debugging mode: Debugging testing, primarily for engineers during testing and validation, allows the chip to automatically eject and retract in without requiring manual insertion or removal.



10.8.2. LIS and Cloud settings

The LIS and Cloud settings are used to enable the LIS function, so as to achieve efficient data sharing and support the connection with the cloud platform and HL7.

1. Enable the LIS Cloud Platform

IP address input: Enter the IP address of the LIS receiving - end computer in the IP input box.

Setting: Click on "**Setting**", and the IP address will be automatically written into the cloud service configuration file.

Restart the service: Click on "**Restart Service**" to restart the cloud service, and the IP setting function will be activated.

Verification: After completing the setup, enter the report interface, select the sample to be sent from the sample list, and click "LIS Send", then "Send Successful" message box appears, the Cloud platform LIS function is connected successfully.

2. Enable the HL7

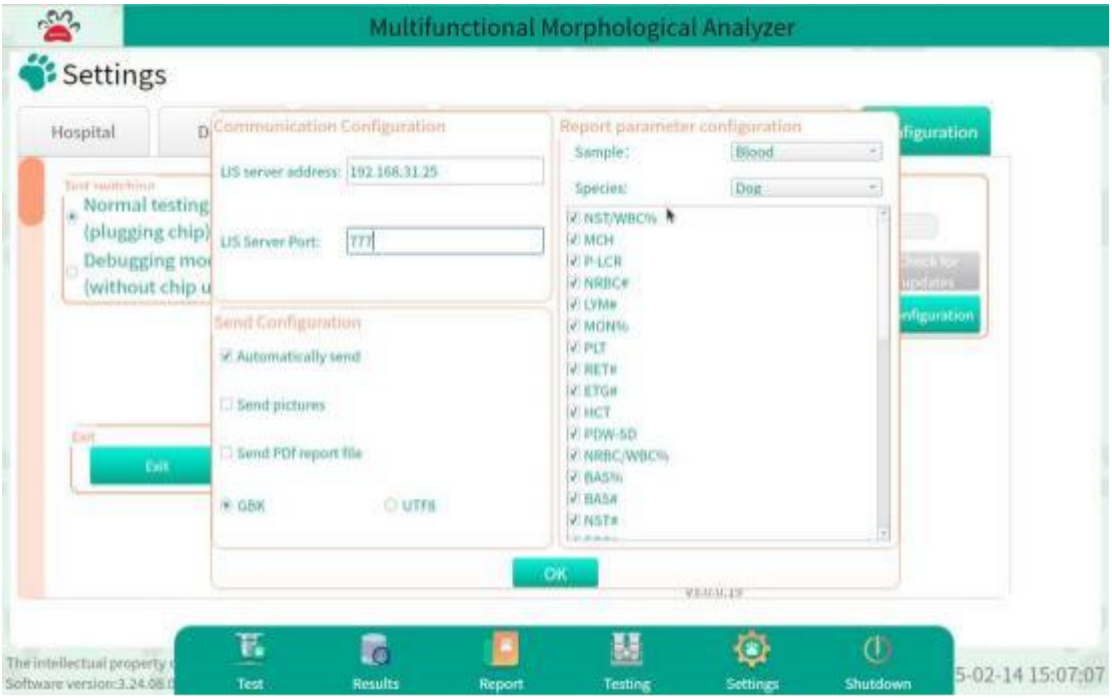
Enable function: Click on "**Enable HL7**" to enable HL7 function

Access configuration: Click on "**HL7 Configuration**" to enter the communication configuration interface, and then enter the LIS server address and the LIS server port.

Sending Configuration: For the sending configuration, you can check "**Automatically Send**" (automatically send after the report is generated), "**Send Pictures**" (send pictures from Other locations\userdata\anlv_image), and "**Send PDF Report Files**" (send PDF report from Other locations\userdata\anlv_report_PDF).

Report Parameter Configuration: Select sample and species via dropdown box, after selecting the corresponding samples and species, select the report parameter items that need to be automatically sent (GBK encoding is suitable for international use).

Verification: After completing the setup, enter the report interface, select the sample to be sent from the sample list, and click "LIS Send", then "Send Successful" message box appears, the HL7 LIS function is connected successfully.



10.9. Device Information and Other Settings

Manufacturer Settings: Certain device information, reference range settings and diagnostic tips settings are preset by the manufacturer and are typically not meant for user modification, ensuring stability and compliance with technical specifications.

Chapter XI Services

11.1. Overview of Routine Maintenance

To maintain the accuracy and effectiveness of the analyzer, it is essential for operators to conduct routine maintenance as outlined in this chapter. Adhering to these maintenance guidelines ensures the analyzer operates optimally and extends its service life.

11.2. Maintenance Warnings

- Replacement Parts: Use only parts provided by Tootoo Meditech Co., Ltd for maintaining the analyzer. This ensures compatibility and reliability.

- Accessories: To maintain equipment performance and safety, use only accessories designated by Tootoo Meditech Co., Ltd For further information, please contact the Customer Service Department or your local sales representative.

- Damaged Parts: Immediately report any damaged parts to Shenzhen Anlv Medical Technology Co., Ltd. or your local agent to prevent further issues or unsafe conditions.

- Post-Maintenance Checks: After completing maintenance tasks, thoroughly check the instrument's status to confirm it is operating accurately and effectively before it is returned to service.

11.3. Biological Hazards

When operating and maintaining the analyzer, it is important to be aware of potential biological hazards and take the necessary safety precautions:

- **Infectious Potential:** The surface and chips of the analyzer may carry infectious agents. Exercise caution and employ safety measures during both operation and maintenance tasks.

- **Reagent Handling:** Reagents used with the analyzer can cause irritation to the eyes, skin, and mucous membranes. To minimize exposure risks:

- Adhere strictly to laboratory safety regulations.

- Wear appropriate personal protective equipment, such as laboratory coats, gloves, and safety goggles, when handling reagents.

Immediate Actions for Exposure:

- Skin Contact: If reagents contact the skin, rinse the affected area immediately with plenty of water. If irritation persists, seek medical treatment.

- Eye Contact: In the event of eye exposure, flush the eyes immediately with ample water and seek medical treatment promptly to prevent serious injury.

11.4. Cautions for Maintenance

When maintaining the analyzer, adherence to proper procedures is crucial to avoid causing damage. Please consider the following precautions:

-Maintenance Guidance: Always follow the maintenance instructions provided in the manual carefully. Improper maintenance practices can lead to equipment damage.

- Professional Support: If the instruction manual does not address a specific issue, contact the after-sales service department of Tootoo Meditech Co., Ltd Professionals designated by the company will provide maintenance recommendations.

- Reporting Damage: If any damaged parts are discovered, promptly inform the after-sales service department or local agents of Tootoo Meditech Co., Ltd

- Cleaning the Instrument: Regular cleaning of the instrument's shell is necessary:

1. Avoid using strong acidic or basic cleaning agents, as these can damage the instrument.

2. The company will not provide warranties for damage or accidents caused using unauthorized cleaning materials.

- Dusty Environments: Prolonged exposure to a dusty environment may cause the performance of the instrument to decline.

- **Chip Sample Preparation:** Prepare chip samples according to the prescribed

method. Using an abnormal sampling process may cause harm.

- **Abnormal Noise or Stutter:** If there is abnormal noise or stuttering of moving parts during use, stop using the instrument immediately and contact user service personnel for inspection or replacement.

- **Use of Designated Reagents:** Use only the matching reagents designated by Tootoo Meditech Co., Ltd Using other reagents will lead to unreliable test results and may cause damage to the instrument.

- **Chip Validity:** Pay attention to the validity period of the supporting chip. Do not use expired chips as extended use will lead to unreliable test results.

- **Chemical Effectiveness:** The reagents, chemicals, or cleaning products mentioned above in this manual should not be used for the disinfection and control of infection sources. For methods on disinfection and infection source control, please consult the hospital's infection prevention department or other relevant infection control authorities.

11.5. Tools

No.	Tools	Number
1	Hex Head Screwdriver 2.5mm	1

11.6. Maintenance Overview

Maintenance tasks for the analyzer include both surface cleaning and heat dissipation vent maintenance to ensure optimal performance and safety.

11.6.1. Maintenance period

Routine maintenance: Clean surfaces and heat dissipation vent.

- **Maintenance schedule:** Once a week.
- **Surface and Display Cleaning:** Use 75% alcohol wipes to clean any stains on the analyzer's surface and display. This ensures that the device remains clean and functional without damaging sensitive areas.

Heat Dissipation Vent Cleaning: Use a soft brush to remove pet hair and other debris from the heat dissipation vents. Keeping these vents clear is crucial for maintaining proper airflow and preventing the device from overheating.

- By regularly performing these maintenance tasks, you can help extend the life of the analyzer and ensure it operates efficiently.

Professional maintenance: Regular servicing must be performed by personnel certified by Tootoo Meditech Co., Ltd.

- Servicing and maintenance must be conducted by Tootoo Meditech Co., Ltd trained personnel. For assistance, contact your local distributor or the company's after-sales service department.

11.7. Version Information Access

To view the current version information of the instrument, follow these steps:

1. **Navigate to Version Info:** Go to the lower left corner of the software interface.

2. **Access the Display:** On the displayed screen, you will find the version information section.

This area of the interface allows users to quickly and easily check the instrument's firmware and software version details, ensuring they are up to date with the latest updates and features.

Chapter XII Troubleshooting

12.1. Overview

This chapter is dedicated to outlining the potential fault information for the analyzer and offering appropriate troubleshooting methods.

Note: This manual is not intended as a comprehensive maintenance guide. Instead, it focuses on the initial actions an operator should take when faced with a fault alarm from the analyzer.

12.2. Error Information and Treatment

12.2.1. Error Information Prompt

- **Error Identification**: During operation, if an error occurs within the analyzer, a pop-up window will appear on the software interface.

- **Fault Display**: This window will display the fault information along with a summary of the error details to assist in rapid identification and resolution.

These features are designed to provide operators with immediate and actionable information to manage and rectify issues efficiently, ensuring minimal downtime and maintaining the reliability of the analyzer

12.2.2. Error and Solution

The table below provides a comprehensive list of potential faults that may occur with the analyzer, along with corresponding troubleshooting steps or help information to address these issues:

Fault Symptom	Temporary Emergency Solution
Self-test timeout (TCP), click [OK] to reboot the machine.	Disconnect the power supply, wait for two minutes, then restart the software.
"AI disconnects (during testing), click [OK] to restart the program."	Disconnect the power supply, wait for two minutes, then restart the software.
"Sample bin ejection failure. Please re-operate (during testing)."	Disconnect the power supply, wait for two minutes, then restart the software.
Focus failed, possibly due to low sample concentration or the presence of bubbles affecting the sample. Please remake the slide and retest.	Prepare the sample according to protocol and re-test.
Abnormal sample volume detected. Please confirm the sample volume and retest after resampling.	Reload the sample and remake the chip according to specifications, then re-test.
The sample is too sparse. It is recommended to choose a sample volume of 40uL for the next encounter with this type of sample	Prepare the sample according to protocol and conduct the test again.
Urine reagent not detected. Please verify correct use of the staining reagent	Use the appropriate urine staining reagent and repeat the test.
Black screen on startup	Power off the device for 2 minutes, then restart the software. If the issue persists, contact Anlü Customer Service Department immediately.

Appendix A. Electromagnetic Compatibility Performance

Appendix A.1. Electrical Safety

The formed element analyzer complies with the applicable clauses of the following safety regulations:

- IEC 61010-2-081:2019 Safety requirements for electrical equipment for measurement, control, and laboratory use – Part 2-081: Particular requirements for automatic and semi-automatic laboratory equipment for analysis and other purposes.
- IEC 61010-2-101:2018 Safety requirements for electrical equipment for measurement, control, and laboratory use – Part 2-101: Particular requirements for in vitro diagnostic (IVD) medical equipment.

Appendix A.2. Electromagnetic Compatibility

- The electromagnetic compatibility (EMC) of the formed element analyzer adheres to the applicable clauses of IEC 61326.
- Users must install and operate the device in accordance with the EMC guidelines provided in the accompanying documentation.