Veterinary Use

miniAST

Antibiotic Susceptibility Test Analyzer

User Guide

Table of Contents

Chapter 1 Preface

1.1 Introduction

Thank you for selecting the miniAST Antibiotic Susceptibility Test Analyzer (hereinafter called to as the "instrument").

Before using the instrument, please read this user guide thoroughly. It is important to understand the necessary preparations and measurement procedures before conducting the first test. Keep this manual accessible for future reference. Bioguard assumes no liability for any issues arising from improper use due to failure to follow the operational and maintenance instructions in this guide, or from accidents caused by repairs performed by unauthorized personnel.

1.2 Basic Information

- Product: miniAST Antibiotic Susceptibility Test Analyzer
- Model: BGA-1100
- Dimensions: 343mm x 251mm x 149mm
- Weight: 4.71 kg
- Intended Use: To be used in conjunction with antibiotic susceptibility test panels produced by Bioguard, for analyzing antibiotic susceptibility in animal samples.
- Contraindications: None

1.3 Warnings and Precautions

Label Instructions

Pay attention to and follow all warning labels affixed to this instrument. Do not cover or remove the labels. If any label becomes detached or illegible, please contact Bioguard after-sales service or your distributor for a replacement.

Label	Category	Description
	Electricity	This symbol indicates areas where electrical shock hazard may occur due to instrument malfunction.
	Biological hazard	This symbol indicates the use of biohazardous materials. Wear protective equipment and follow general precautions specified by local or national regulations.
	Caution	This label indicates a potential hazard that, if not avoided, could result in injury to the operator or serious property damage.
	Personal injury	This label indicates areas where personal injury may occur due to the operation of the instrument.
IVD	In vitro diagnostic medical device	In vitro diagnostic medical devices as specified in EU Council Directive 98/79/EC
SN	Serial number	This symbol shall be accompanied by the manufacturer's serial number.

Waste Management

- All used reagent discs, culture media, and other consumables should be treated as infectious waste.
- Waste may require special treatment before disposal. Please follow the applicable guidelines set by the relevant authorities in your country or region for handling medical, infectious, and industrial waste.
- Instruments may require special handling before disposal. Please adhere to the relevant guidelines established by the competent authorities in your country or region for medical, infectious, and industrial waste disposal.

Note: miniAST instruments should be regarded as industrial waste after being discarded. Before the instrument is discarded, it must be handled properly according to the relevant laws of the country and region where it is located.

Fire and Damage Prevention

Install the instrument correctly according to the installation environment and conditions described in this guide.

- The instrument must be installed by personnel authorized by Bioguard.
- If you need to change the installation of the instrument, please contact Bioguard after-sales service or your distributor.
- Do not use any combustible or flammable gases near the instrument to avoid the risk of explosion.
- Do not step on, twist, or pull the power cords and cables to prevent fire hazards.
- Failure to use the instrument as specified by the manufacturer may compromise the protection provided by the device.

Infection Prevention

- Always wear appropriate protective gear when handling samples, performing maintenance, and disposing of waste.
- It is recommended to use latex gloves or other suitable gloves.
- Treat all patient samples as potential infection sources. Wear protective equipment and follow universal precautions as required by local or national regulations.
- If the user's skin comes into contact with patient samples, flush the affected area with water and seek medical attention if necessary.
- Immediately wipe up any contaminants spilled on the instrument.
- If any reagent or sample is accidentally ingested, seek medical attention promptly.
- In case of a spill of hazardous substances (reagents or sample contaminants) on the instrument surface or inside the instrument, appropriate disinfection procedures should be followed.
- Do not use cleaning agents or disinfectants that may react chemically with the instrument's components or internal materials, such as stain removers, gasoline, or other flammable organic solvents.

Preventing Personal Injury and Severe Harm

- Ensure the lid is securely closed before operating the instrument.
- Do not place fingers or hands into any openings.
- Avoid touching any machine parts while the instrument is running.
- Do not look directly at the scanner, as it may cause eye injury.
- Unplug the power cord immediately in the following situations:

- The power cord is frayed or damaged.
- Anything is spilled onto the instrument.
- The instrument has been exposed to excessive humidity.
- The instrument has been dropped or the casing is damaged.
- Maintenance or repair is suspected to be necessary.
- Before cleaning the outer shell.

Operating Instructions

- Install and operate the instrument according to the requirements of this guide. The applicable instrument model for this guide is: miniAST BGA-1100.
- The operator of this instrument must be a professionally trained personnel of animal hospitals. All relevant staff must complete professional training before operating the instrument.
- Avoid exposing the analyzer to strong light, as it may cause significant interference with the results.
- Do not place the instrument in a place that is difficult for personnel to operate.
- When moving the instrument, gently lift it from both sides and release your hands only after placing it in the desired location.
- The instrument should be placed on a stable workbench, near a power outlet, and properly grounded.
- If the instrument remains unused for an extended period, dust may accumulate on its surface. Clean the instrument with a clean, soft cloth, and if necessary, use a small amount of cleaning solution. Always turn off the power before cleaning, and keep the lid closed when the instrument is not in use.
- The instrument is designed as a closed system and is intended for use exclusively with the antimicrobial susceptibility test discs produced by Bioguard.
- For guidance on reagent usage and storage, please refer to the relevant instructions. To maintain stable and reliable results, ensure that only reagents within their expiration date are used.
- Operate the instrument strictly according to the procedures outlined in this guide. Improper operation can result in inaccurate results or may lead to instrument malfunction.
- Regular maintenance and servicing of the instrument should be carried out as specified in this guide. Failure to do so may result in instrument malfunction or affect the accuracy and precision of the test results.
- Users must not disassemble or replace any parts of the instrument. For part replacements or repairs, please contact Bioguard's after-sales service or your distributor.
- If abnormal results continue after re-testing, contact Bioguard's after-sales service or your distributor for assistance.

Chapter 2 Instrument Overview

Thank you for choosing our miniAST Antibiotic Susceptibility Test Analyzer (hereinafter referred to as "the instrument"). We will send an engineer to install and provide training for the users. The operator must be a professionally trained veterinary hospital laboratory inspector, and all relevant personnel must undergo professional training before operating the instrument.

2.1 Methodology

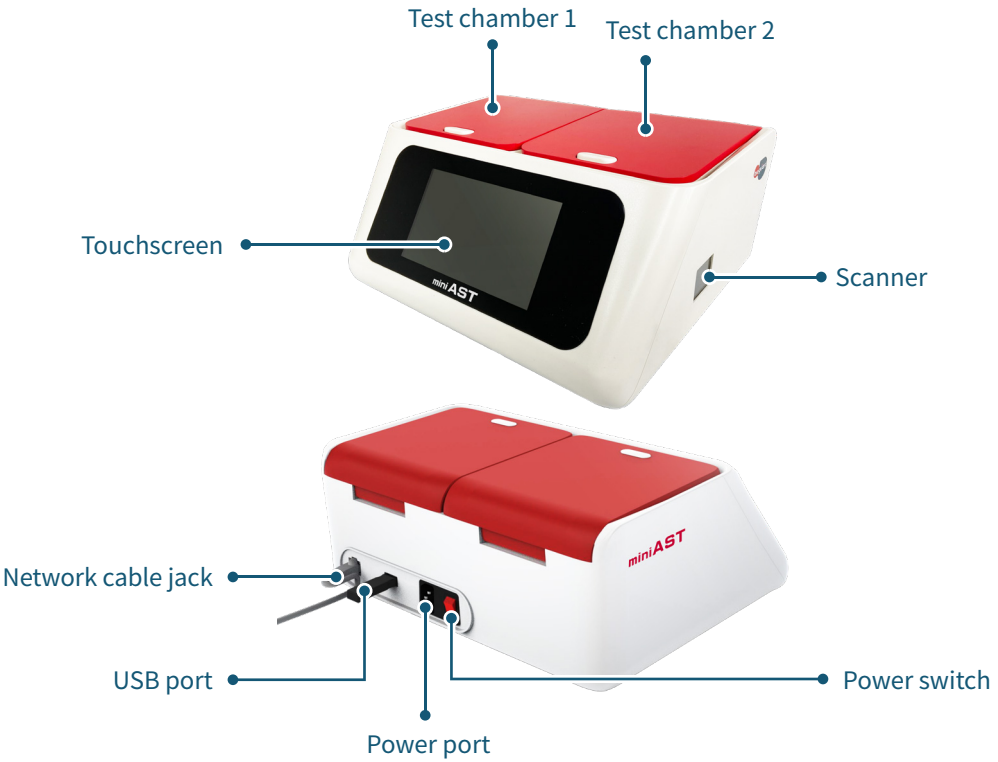
The miniAST antimicrobial susceptibility test disc employs the broth microdilution method, in which microorganisms are inoculated into a culture medium and evenly distributed into the wells of a microfluidic disc containing varying concentrations of antibiotics. After incubation, the instrument uses colorimetric analysis to automatically detect microbial growth based on color changes. This process provides crucial information on the microorganism's sensitivity to antimicrobial agents.

2.2 Technical specifications

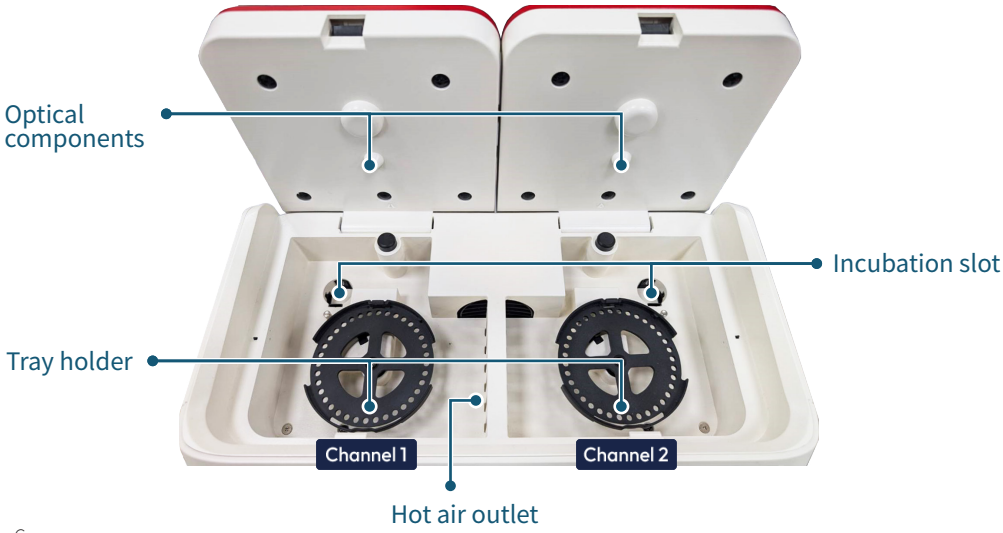
Instrument specification	
Dimensions	343mm x 251mm x 149mm
Weight	4.71kg
Power supply	
Voltage	110V-240V
Frequency	50/60Hz
Volt-ampere	100VA
Operating condition	
Temperature	15°C ~30°C
Relative humidity	40%~85%
Atmospheric pressure	85.0kPa ～ 106.0kPa

Stay away from interference source of strong electromagnetic field
Avoid direct exposure to strong light
Well-ventilated environment
With good grounding condition

2.3 Instrument features



2.4 Internal components of the instrument



Chapter 3 Installation

Upon receiving the instrument, please follow the instructions below for checking and installation:

3.1 Receiving guidelines

- Check whether there are any visible cracks, dents, or potential damage to the packaging box that may have occurred during transport. If you notice any visible cracks, dents, or possible damage, please contact our after-sales service or distributor immediately.
- After receiving the instrument, inspect the packaging for any signs of damage. If the packaging is damaged, the instrument may also be damaged. In such cases, promptly contact the shipping company's representative.
- Once you have received the instrument, notify our company's after-sales service or distributor immediately to schedule an engineer for unboxing and installation.

3.2 Packaging lists

When you receive the instrument, please check whether the items are damaged according to the list in Table 3.2.1.

Item	Quantity
Antibiotic Susceptibility Test Analyzer	1
Power cord	1
Pipette 800uL	1
Pipette 20uL	1

Item	Quantity
Certificate	1
Warranty Card	1
User's Guide	1
Simple operation guide	1
Packing List	1

▲ Table 3.2-1 Packing list

3.3 Installation Environment

Operating Environment

Environment temperature: 15°C ~30°C
Relative humidity: 40%~85%
Altitude: Below 2000 meters
Atmospheric pressure: 85.0kPa ～ 106.0kPa
Keep the instrument on a stable worktable, away from the interference of strong electromagnetic field, avoid direct illumination of strong light, and in a well-ventilated environment with good grounding conditions.

Surroundings

In order to facilitate the operation, maintenance and repair of the instrument, the installation of the instrument must meet the following conditions:

- Distance between the left and right sides of the instrument and the wall should not be less than 20cm
- Distance between the rear panel of the instrument and the wall should not be less than 20cm
- Distance between the front of the instrument and other instruments should not be less than 20cm
- The load-bearing capacity of the workbench where the instrument is placed shall not be less than 10kg

Power Supply

Power voltage:110V-240V

Frequency: 50/60Hz

Rated power: 100VA

The instrument should be positioned near a power outlet and have a reliable grounding condition.

3.4 Installation

Instrument Placement

Gently place the instrument on a level workbench. Ensure the workbench is flat and has a load-bearing capacity of at least 10 kg.

Power Connection

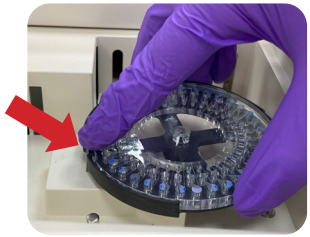
The power outlet used for the instrument must be grounded, and the socket must be secured and provide reliable contact. All grounding points must be properly grounded. First, connect the power cord to the instrument's power port, and then plug the other end into an AC power outlet.

Installing and Removing the Reagent Disc

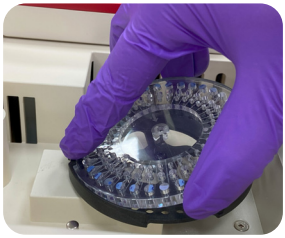
Installation. To install the reagent disc, align the groove on the disc with the corresponding notch on the tray holder. Gently tilt the disc to fit along the groove, then press down lightly to secure it into place (Figure 3.4-2).

▲ Figure 3.4-2 Diagram of AST disc installation

Removal. To remove the disc, hold both ends firmly with your thumb and middle finger. While supporting the disc, use your index finger to press against the edge of the tray holder near the notch. Apply slight upward force to release and lift the disc (Figure 3.4-3).



Hold both ends of the disc securely using your thumb and middle finger. Use your index finger to gently press the edge of the tray holder near the notch.



Apply slight upward force to lift and remove the disc.

▲ Figure 3.4-3 Diagram of removing the AST disc

Chapter 4 Sample Collection

Sample Types

Applicable sample types:

Pus, feces, urine, urogenital swabs, throat swabs, wound swabs.

Non-applicable sample types:

Pleural fluid, ascites fluid, blood, tissue samples, surgical specimens, and non-biological items such as surgical instruments or consumables.

Collection Requirements:

To avoid contamination by other microorganisms, aseptic techniques should be followed during sampling and inoculation. Samples should be processed immediately after collection. Under room temperature conditions, inoculation should be completed within 2 hours. Under refrigeration at 2-8° C, inoculation should be completed within 24 hours.

Chapter 5 Instructions

5.1 System Startup

After correctly connecting the power cord, turn on the power switch located on the back of the instrument. A self-check program will appear on the instrument screen. Please wait patiently for the instrument to complete the self-check.

Enter the user account and password to log in.

*Do not place the disc in the instrument when it is powered on.

5.2 Start Test

Tap "Test" on the touch screen panel.

Step 1: Collect the specimen

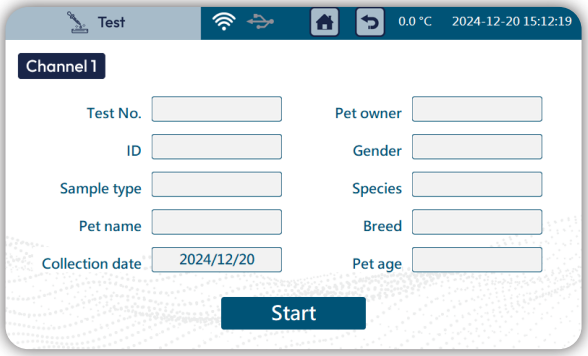
1. Remove the culture medium (pink cap) and allow it to reach room temperature. Use a swab to collect the sample or transfer 0.5 mL of a urine sample into Culture Medium A with a sterile dropper or syringe. Cover the cap tightly.

2. Select the desired chamber, then tap “Preincubation.”

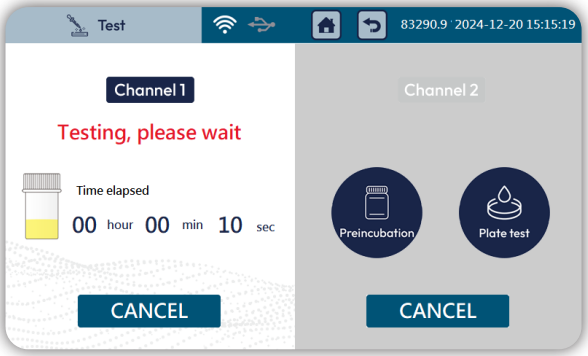
3. Place the culture medium with the sample into the instrument's incubation slot, then tap “OK.”

Incubation slot

4. Enter the basic animal information (pet name is required), then tap “Start”.



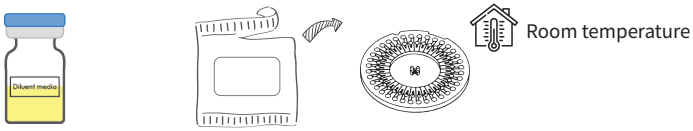
5. Pre-incubation begins automatically. The instrument displays the incubation time and continuously monitors bacterial growth. Once the target turbidity is reached, the user is notified via on-screen message and an audible beep. If saturation is not achieved within 10 hours, the sample is considered negative for bacterial growth.



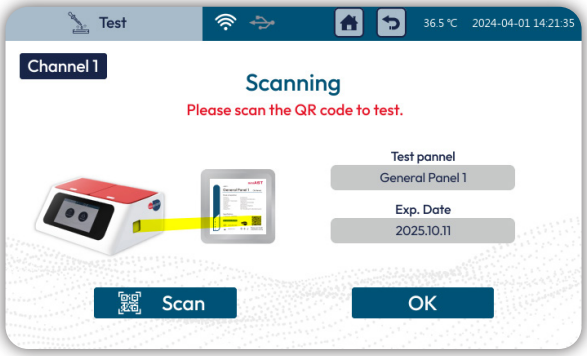
Note: Once pre-incubation is completed, immediately proceed with the AST disc incubation step. Do not leave the culture medium in the instrument for an extended period (e.g., overnight), as this may compromise the accuracy of the test results.

Step 2: AST Disc Incubation

1. Allow the diluent media (blue cap) and AST disc to reach room temperature. Open the foil pouch and remove the AST disc.



2. Scan the QR code on the AST disc packaging, place the disc into the instrument, and verify the item and lot number.

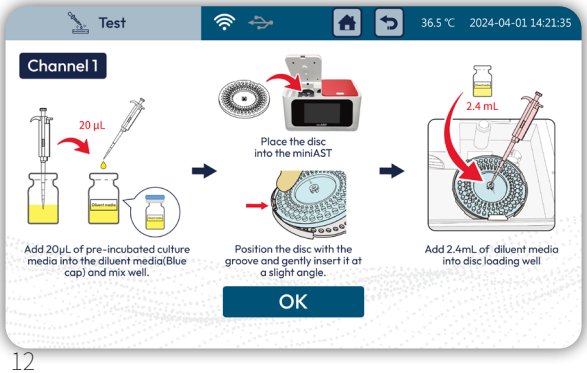


3. Insert the AST disc into the designated testing channel.

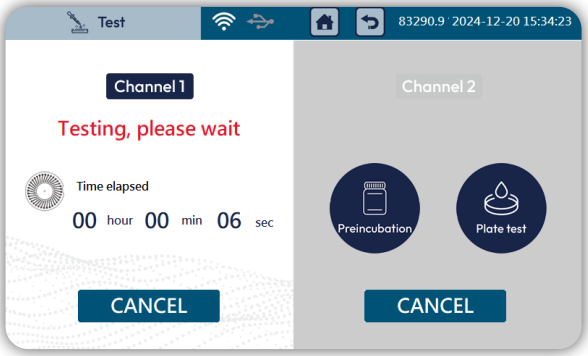
4. Take out the pre-incubated culture medium from Step 1, gently shake it, or use a pipette to mix by repeated aspiration. Use a 20 µL micropipette to transfer 20 µL of the culture medium into the dilution media.

5. After mixing, use an 800 µL pipette to transfer a total of 2.4 mL of the diluted sample（transferring in three separate 800 µL aliquots）into the sample loading well of the AST disc. Avoid drawing up sediment or debris, as this may impact liquid flow.

6. Once the sample has been added, close the instrument lid and tap “OK.”

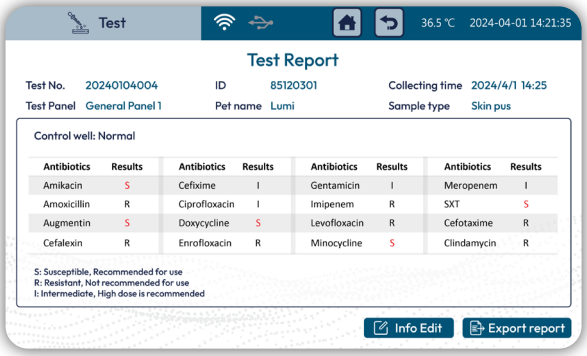


7. The instrument will display the incubation time and automatically detect the antimicrobial susceptibility results once the test is complete. If you need to cancel the test, tap “CANCEL”.



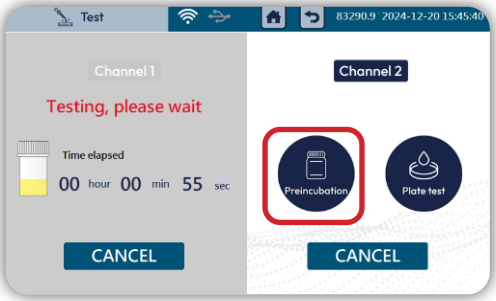
Step 3: Result Interpretation

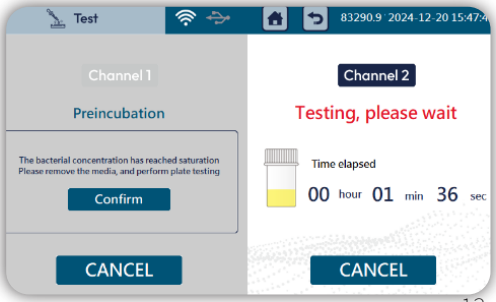
After the test is complete, remove the disc from the instrument. (Refer to Section 3.4 to avoid equipment damage). Dispose of it following infectious waste regulations. The system will display the report on the screen after incubation is finished.



Simultaneous Incubation of Two Test Chambers:

1. The miniAST system supports the incubation of two test chambers simultaneously. After setting up one test chamber and starting the timer, you can switch to the other test chamber's panel and follow Steps 1 to 3.
2. During incubation, you can switch between the settings of the two test chambers.

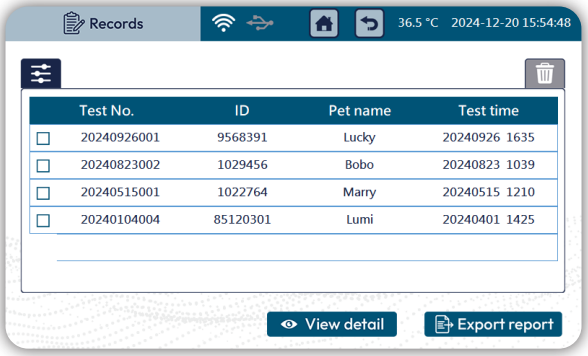




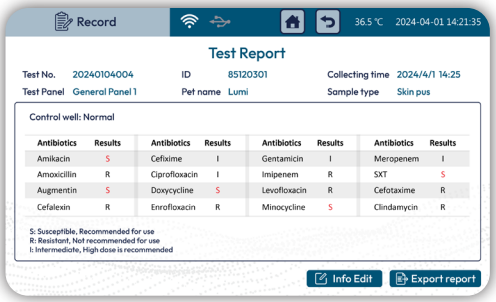
5.3. Test Record Inquiry

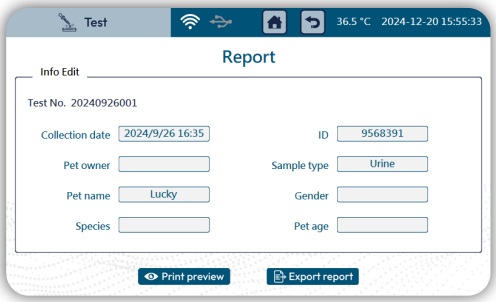
1. On the home screen, select "Records."

2. Choose the desired record and tap "View detail."



3. You can edit the sample information or export the report as needed.





Chapter 6 Maintenance

6.1 Daily maintenance

Temperature Control Device Detection

Before starting a test each day, turn on the instrument and allow it to preheat for 30 minutes. After preheating, touch the tray holder with your hand to feel if there is a noticeable increase in temperature. If so, it indicates that the temperature control device is functioning normally, and testing can proceed. If not, the temperature control device may be malfunctioning, the temperature control device may be malfunctioning. In this case, please contact Bioguard after-sales service or your distributor immediately.

Tray Holder Cleaning

At the end of each workday, clean any residue on the tray holder with an alcohol-soaked cotton pad. Wring out excess liquid from the alcohol pad to prevent dripping into the instrument during cleaning.

Waste Disposal

After the test is complete, promptly dispose of laboratory waste, such as reagent discs and pipette tips.

Note: When performing daily maintenance, wear rubber gloves. After completing maintenance, wash your hands with disinfectant. Reagent discs, pipette tips, and other consumables should be treated as medical waste in accordance with relevant regulations.

6.2 Monthly Maintenance

Outer Shell Cleaning

Wipe the outer surface of the instrument with a cloth moistened with purified water to remove dust and dirt. Do not use alcohol, gasoline, or other flammable organic solvents to clean the instrument, as this may pose a safety hazard. Keep containers of water away from the instrument to prevent spills that may lead to liquid entering the device. Wait for the outer surface to dry before reconnecting the power and operating the instrument to prevent moisture-related damage.

Touchscreen Cleaning

Use a lint-free soft cloth dampened with glass cleaner to wipe the touchscreen. Do not spray the cleaning solution directly onto the touchscreen. Avoid using alcohol, gasoline, or other flammable organic solvents to clean the instrument, as this could pose a safety hazard.

Hot Air Outlet Cleaning

Use a clean brush or vacuum cleaner to remove dust and hair from the air outlet. Be careful not to let hair fall into the outlet. Do not use wet wipes or cloths that may drip, as liquid could enter the outlet and cause damage.

6.3 Semi-Annual or Annual Maintenance

To ensure the miniAST continues to operate in normal condition, the following maintenance should be performed:

- Apply lubricant to the instrument's moving parts.
- Clean and maintain optical components and reflective surfaces.

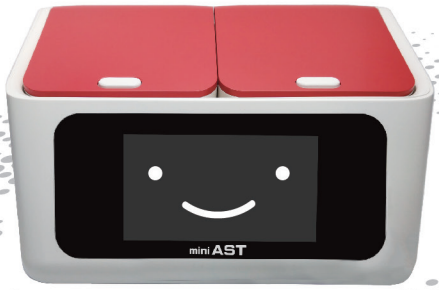
Chapter 7 Frequently Asked Questions and Troubleshooting

When faults or error messages occur, users should follow the recommended actions outlined in the solution section to resolve the issue. If the problem persists, promptly contact Bioguard's after-sales service or your distributor for assistance.

Error Code	Description	Cause	Solution
E-01	IO board is not detected	Motherboard USB connection failure	Restart the device and check if the error persists
		Internal hardware issue	Contact Bioguard
E-02	Camera is not detected	Motherboard USB connection failure	Restart the device and check if the error persists
		Internal hardware issue	Contact Bioguard
E-03	Abnormal vial sensor	Incorrect vial (medium bottle) used	Use the vial provided by Bioguard
		Foreign object in vial position	Remove the foreign object
		Internal detection switch issue	Contact Bioguard
E-04	Centrifugation failure detected	Tray holder is elevated	Tighten the center screw of the tray holder
		Improper disc installation	Verify correct installation and ensure the disc is properly seated
		Malfunction in the internal detection switch	Contact Bioguard
E-05	Abnormal temperature	Incorrect temperature setting	Set the correct temperature xx°C ~xx°C
		Internal heating hardware issue	Contact Bioguard
E-06	Expired Disc	The reagent disc has expired	Verify if the disc is still within its shelf life
		Incorrect internal time setting	If the disc is still valid, check the instrument's internal date and time settings under Setting> General Setting > Date/Time Change date and time
E-07	Optical inspection error	Incorrect vial or disc used	Insert the correct vial and disc
E-08	Optical calibration error	Presence of a foreign object in the vial or disc position	Ensure no vial or disc is placed during calibration
E-09	QR Code error	Incorrect QR Code used or missing profile	Use the correct QR Code

Warning Message	Cause	Solution
The temperature has not reached the specified temperature	The system just started up, or the temperature was recently reset and has not reached the specified temperature.	Wait for the temperature to reach the designated level (within 10 minutes)
No internet	Weak Wi-Fi signal or network issues	Check the network source
	Ethernet cable disconnected	Ensure the network cable is securely inserted
User ID not entered	User ID has not been provided.	Enter the user ID
The password is incorrect	Incorrect password entered	Confirm the correct password and enter it again
USB device is not plugged in	USB is not correctly connected	Ensure the USB device is properly connected
Update file not found	No update file found in the USB device (update folder)	Verify that the correct update file is in the USB, then select update F/W'.
Please select the data	No data has been selected for viewing	Choose a data entry from the history list, then tap "Export report" or "View detail"
Unregistered operator ID	Entered User ID is not registered	Access Admin Mode to create a new User ID
Insufficient storage	Internal storage is full	If the most recent test result has been saved, the oldest data entry will be automatically deleted

Faster, Smarter Antibiotic Choices !



Bioguard Corporation
4F., No. 25, Wugong 5th Rd., Xinzhuang Dist., New Taipei City 248020 , Taiwan
Tel: +886-2-55916688
https://www.bioguardlabs.com