Monochromator based Microplate Reader

MRX Series

User Manual
Basic Handling Guide

MRX Series

User Guide

K LAB Microplate Reader
MRX Series
User Manual

k lab

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Introduction

Thank you for purchasing the MRX Series microplate reader.

This user guide contains instructions on installation and operation, user precautions, and information on accessories and options. Please familiarize yourself with this user guide prior to using the equipment, and use the equipment according to the instructions given. Please also keep this user manual available for consulting when using the equipment.

Important

Please keep this user manual with the product at all times. To ensure safe and smooth operation of the equipment, please familiarize yourself with the Safety Guidelines prior to use. If you require product recalibration or reinstallation, please contact the K LAB Customer Center. If you lose or damage this User Guide, please contact the K LAB Customer Center.

Copyrights

- The MRX Series the PC software MRX View are registered trademarks of K LAB.
- This user guide and all related materials may not be modified or distributed in any form without prior consent from K LAB.

Safety Guidelines

· To ensure safe and smooth operation of the equipment please familiarize yourself with the Safety Guidelines prior to use.
· Please abide by all warnings and cautionary messages in the User Guide.

In this User Guide, warnings and cautionary messages are marked as follows.

Warning	Represents a potentially hazardous situation; failure to heed a warning may lead to death or serious injury.
Caution	Represents a potentially hazardous situation; failure to heed a cautionary message may lead to mild injury or damage to the equipment.
Note	Additional information provided to ensure proper use of the product.

Use of the Equipment

MRX Series is a UV-Vis monochromator-based absorbance reader. Read modes provided are: endpoint, kinetic, spectrum, and well scan. Standard functions are: culture and shake. The product may be used with a cuvette port (optional) or micro-volume plates (optional). The software is used to collect and analyze data. Equipment with an “IVD” label affixed may be used for both clinical and non-clinical purposes, including R&D. Equipment not affixed with such a label may only be used for R&D and other non-clinical purposes.

Important

It is recommended that experiments are carried out in accordance with guidelines and specific recommendations included in the analytic package for the experiment to be carried out. Omission of quality control inspection may result in improper experimental data output.

Note

Repackaging and transporting

In cases where the equipment needs to be returned to K LAB for servicing or repair, please inquire with K LAB for issuance of a service authentication code.

Please use the packaging materials provided upon purchase. Other forms of commercially used packaging materials are not recommended, and may void the product warranty. If the original packaging materials have been damaged or misplaced, please contact K LAB for replacements.

Caution

Matters of caution regarding place of installation

Warning

The place of installation must be equipped with a ventilation system if flammable and toxic samples are being used.

Caution

- MRX Series weighs approximately 12kg. Please give consideration to overall equipment weight when installing.
- The lab table on which the equipment is installed must be able to bear the total weight of the equipment. Also, please use a sturdy table with a depth (front to back) of at least 400mm. Use of a table that is too small may cause the equipment to tilt or fall off.
- Operate the equipment only on a flat and stable surface; avoid excessive humidity.
- Strong sunlight or incandescent light may reduce the linear performance range of the equipment.
- Avoid installing in locations exposed to corrosive gases or excessive dust. These conditions may be harmful against maintaining equipment performance, and may shorten the equipment's life.
- Measurements may be impacted for foreign particles (e.g. dust) in the microplate well. Accurate measurements require a clean workspace.

Matters of caution for installation

Warning

- Please secure the device in place to prevent falling in the event of earthquakes or other disasters.
- Please apply power only after checking the equipment's voltage, power consumption and power frequency requirements. Use of an incompatible power socket may result in electrocution or fire.
- The equipment must be properly grounded to prevent electrocution due to sudden discharge and ensure stable operation.
- Do not place heavy objects on the power cord. Keep the equipment away from hot objects.
- Do not modify the power cord in any way.
- Do not lubricate the microplate holder or holder track. Lubricants may cause dust or other foreign particles to stick to the holder mechanism, causing the equipment to malfunction.
- Do not spill liquids on the equipment. Exposure of internal components to moisture may cause electrocution. If a leak occurs while the program is running, close the program and switch the equipment off. Immediately wipe off any leaked matter. If internal components have been exposed to liquid, do not turn the equipment on. For further assistance, please contact the K LAB customer center.
- Failure to operate the equipment according to the guidelines and protective measures given in this User Guide may result in dangerous situations.

Warning

- Please wear safety gloves when using harmful or biologically infectious samples.
- Do not use combustible sprays near the equipment.

Warranty

The Company's warranty for the product is as stated in the following:

1. Warranty Period

For details on the period and scope of warranty, please inquire with the K LAB Customer Center.

2. About the Warranty

Equipment that fails due to internal defects (software and hardware) during the warranty period is subject to free-of-charge repair or component replacement. Consumables and various accessories may be excluded from free repair or replacement.

3. Exceptions to the warranty

Equipment failures due to the following are excluded from warranty even during the warranty period.

1) If the product has been modified or used improperly
2) If the equipment has been repaired or modified by a third party other than the Company or an agent designated by the Company
3) Damage to basic software, data and the device caused by internal computer viruses
4) Internal damage to the equipment due to blackouts or sudden voltage sags
5) Errors due to causes outside the equipment itself
6) Malfunction due to use in adverse environments, such as high temperature or humidity, corrosive gases or strong vibration
7) Malfunction due to fire, earthquake, contamination by hazardous substances, or external impact

If the product is accompanied by a warranty certificate or a separate agreement specifying separate warranty conditions, the terms stipulated by such document shall apply. In the case of products specially fabricated for use in specific fields, a separate warranty period will be provided.

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Introduction

This chapter introduces the MRX Series, explains its hardware and software features, and provides contact information for technical support.

1. About the product
2. Package contents
3. Optional accessories
4. Product support and services

Introduction

Ch.1

1. About the product

The MRX Series is a monochromator-based absorbance microplate reader for measuring 6 - 384 well microplates in a range of 200 - 999nm and 2µL micro volume measurement (optional accessory) at 200 - 999nm. Read modes provided are: endpoint, kinetic, spectrum, and well scan. Standard basic features include culturing up to 65°C, and shaking. The included software is used for data collection and analysis, as well as report preparation and exporting. The equipment comes in the following four models:

MR: Includes microplate reader and PC software.
MRC: Includes microplate reader with additional cuvette port, and PC software.

The absorbance microplate reader carries out measurement using a monochromator. A xenon lamp is used for UV and visible spectrum measurements. The monochromator operates in a wavelength range of 200 to 999nm, selectable at 1nm increments.
Temperature can be adjusted between +4°C ambient to 65°C. The internal plate supports linear and orbital shaking, allowing for thorough mixing of reagent prior to reading.
128x86mm size 6, 12, 24, 48, 96, 384 well microplates and microvolume plates (optional accessory) may be used. One standard size cuvette can be mounted in the cuvette port (optional).

* For information on performance and technical matters, please consult the “Product Specifications” chapter.

2. Package contents

Package contents and part numbers are subject to change. Please direct inquiries to the K LAB Customer Center.

Component	Part Number
MRX Series	MR/MRC
Power cable	MR-1001
Power adapter	MR-1002
LAN Cable	MR-1003
Product manual	MR-1004
Product certificate	MR-1005
PC software (MRX View) and User Manual	MR-1006

3. Optional accessories

Accessory availability and part numbers are subject to change. Please direct inquiries to the K LAB Customer Center.

Component	Part Number
Standard absorbance test filter (UV)	MR-1007
Standard absorbance test filter (Vis)	MR-1008
MRX Series IQ-OQ-PQ package	MR-1009
Microvolume plate	MR-1010

4. Product support and services

K LAB provides support and services for the MRX Series

Please direct inquiries regarding any of the following to the K LAB Service Center.

· Equipment or software malfunctions
· Instructions on use and maintenance of the product
· Product servicing or repairs

Business hours: 08:00-18:00 (Mon-Fri)
Tel.: (042) 932-7586
Fax: (042) 932-7589
E-mail: service@klabkis.com
Website: www.klabkis.com

To file a service request, please have the following information available:

· Your name, company name, telephone or fax number, and e-mail address
· Product name, model and serial number (see rear panel for serial number)

Note

If you experience a problem with the software or equipment, please run equipment diagnostics. This will provide valuable information for the Service Center.

· If the equipment must be returned to us for servicing or repair, please inquire with the Service Center for a send-to address. Please repackage the equipment according to the instructions provided at the end of Chapter 2.

ch. 2
Installation

This chapter explains the packaging and overall installation process of the MRX Series, and also provides instructions on preparing the equipment for transport.

1. Opening the product package and inspection
2. Choosing a suitable location
3. Removing delivery hardware
4. Installing the power supply unit
5. Connecting to a computer
6. Installing PC software
7. Turning the equipment on
8. System testing
9. Operational/Performance Qualification
10. Repackaging and transporting instructions
11. Installing delivery hardware
12. Repackaging the equipment

Installation

1. Opening the product package and inspection

Please keep all packaging materials included with the equipment as delivered. The original packaging materials must be used to prepare the equipment for transport back to K LAB for repair or replacement. Use of other packaging materials or failure to follow the repackaging instructions will void your warranty. As you unpack the equipment, please inspect the packaging, equipment and accessories for any damage during transport. If the equipment has been damaged, please contact your courier or our Customer Center.

- Open the box and remove the accessory tray. Then remove the equipment from the box. Place on a flat and stable surface.
- Place the packaging materials back in the box. These may be needed for later transport of the equipment.

2. Choosing a suitable location

Install the equipment on a flat and stable surface. The equipment should be installed at a location with an ambient temperature between 18°C(64.4°F) and 40°C(104°F). The equipment is sensitive to extreme environmental conditions. Avoid the following.

Excessive humidity: Condensation of moisture on the sensitive electronic circuits will cause the equipment to fail self-inspection. Humidity should be in a range of 10 to 85% (non-condensing).

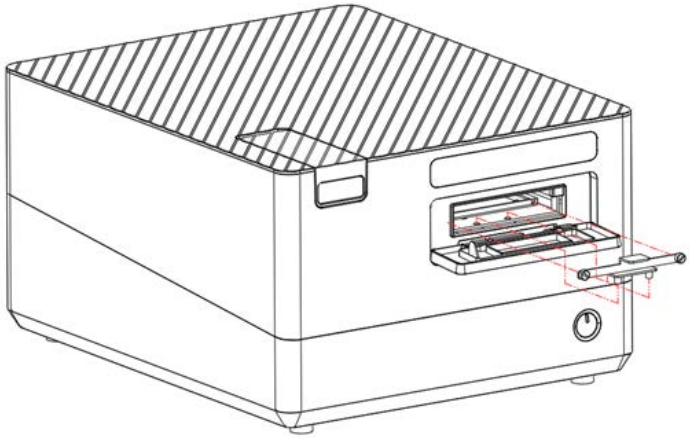
Excessive brightness: Excessively bright light may impact the optics and measurement, reducing the linear range of the equipment.

Dust: Measurements may be impacted for foreign particles (e.g. dust) in the microplate well. Accurate measurements require a clean workspace.

3. Removing delivery hardware

Before turning the equipment on, remove all delivery hardware. Keep these for later use.

1) Pull the microplate holder access door.
2) Using the provided driver, loosen the screw on the delivery bracket holder.
3) Remove the bracket holder by lifting until the pin becomes detached from the bottom of the equipment.
4) Keep the delivery bracket holder in the original delivery box for use when transporting the equipment later on.
5) Remove the tape covering the cuvette port. (If the cuvette option is included)



4. Installing the power supply unit

> ⚠ Caution
>
> **Power rating:** The equipment must be connected to a power socket outputting current and voltage within the rated current and voltage of the system. Use of an incompatible power socket may result in electrocution or fire.
> **Earthing/grounding:** Do not connect the equipment to the main power source using a plug adapter without an earthing(grounding) function.
> Using an adapter without and earthing(grounding) function leaves the equipment unearthed (ungrounded), and poses a serious electrocution risk. The system must always be directly plugged into an earthed (grounded) power socket.

1) Connect the power cable to the power adapter.
2) Locate the power inlet terminal on the rear of the equipment.
3) Connect the round end of the power adapter cord to the power inlet terminal.
4) Connect the opposite end of the power cable to the power socket.

5. Connecting to a computer

The equipment and computer are connected using an Ethernet cable. The Ethernet cable is found at the rear of the equipment.

1) Using the Ethernet cable provided, connect one end of the cable to the Ethernet port on the equipment.
2) Connect the opposite end of the cable to an available Ethernet port on your computer.

6. Installing PC software

> **⚠ Caution**
>
> The MRX Series is controlled using PC software. A specific event sequence must be followed to confirm that the software has been properly installed and configured. To install the software, follow the instructions provided in the Software Startup Guide.

7. Turning the equipment on

1) Locate the power on/off switch on the rear of the equipment. When the power switch is turned on, the red lamp in the bottom right corner of the front face of the equipment comes on. The lamp will turn green when the power button on the front face is pressed. The equipment is now on.
2) Once the equipment has been turned on, a system test will be carried out. During the test, the front LED display will show the message “Initializing...” Do not attempt to communicate with the equipment using the software until the test has been completed. Once the system test is complete, the equipment will eject the microplate holder. The front LED display will show the message “Ready”.

Note

A touch button is provided on the right of the front LED display. This button can be used to insert or eject the microplate holder. If an error occurs during the system test, the front LED display will show an error message.

9. Operational/Performance Qualification

Your MRX Series was inspected at K LAB before release, and should operate normally upon completing the installation procedures described in this chapter.

If you suspect a problem has occurred during delivery, if you have received the equipment back from K LAB following servicing or repair, if operational/performance qualification is needed in accordance with regulatory requirements, or to find out more about the OQ/PQ procedures recommended for the MRX Series, please consult the Service Manual.

Note

You can purchase product qualification and maintenance (IQ/OQ/PQ) packages for your MRX Series. For more information Please contact K LAB's customer center.

10. Repackaging and transporting instructions

Caution! Please read all of the following information before preparing the MRX Series unit for transport.

⚠ Caution

Please contact the K LAB Customer Center to receive a send-to address before returning the equipment.

If the equipment has been exposed to potentially hazardous substances, any contaminants must be removed to minimize risk to any persons transporting, handling or servicing the equipment. For instructions on removing contaminants, please consult the “Maintenance” chapter. Before packaging, remove the microplate from the holder. Any leaked fluids may contaminate the optics system and damage the equipment.

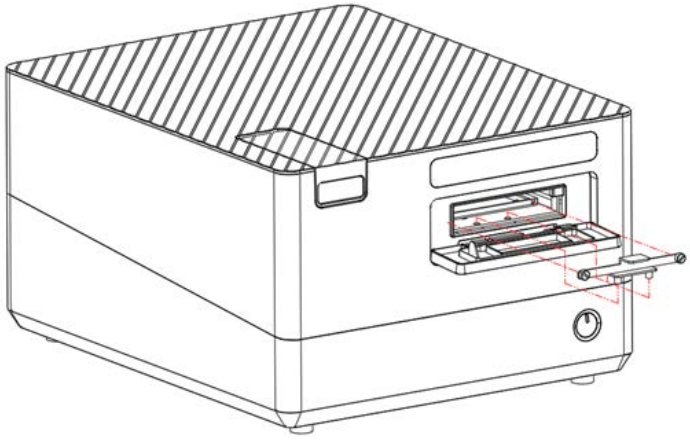
The package design of the equipment is subject to change. If the instructions in this chapter do not apply to the actual packaging materials, please inquire with the K LAB Customer Center for instructions. Reinstall the delivery hardware before repackaging the equipment. If you have misplaced any of these items, please contact the K LAB Customer Center.

· **Bracket holder:** When sending your MRX Series back to K LAB for servicing or repairs, the original packaging materials must be used.
Other forms of commercially used packaging materials are not recommended, and may void the product warranty. The packaging materials have been designed for use at least 5 times. If you have misplaced or damaged the original packaging materials, or have used them 5 times or more, please contact the K LAB Customer Center.

11. Installing delivery hardware

Before sending your MRX Series back, please reconnect the delivery hardware to the plate holder.

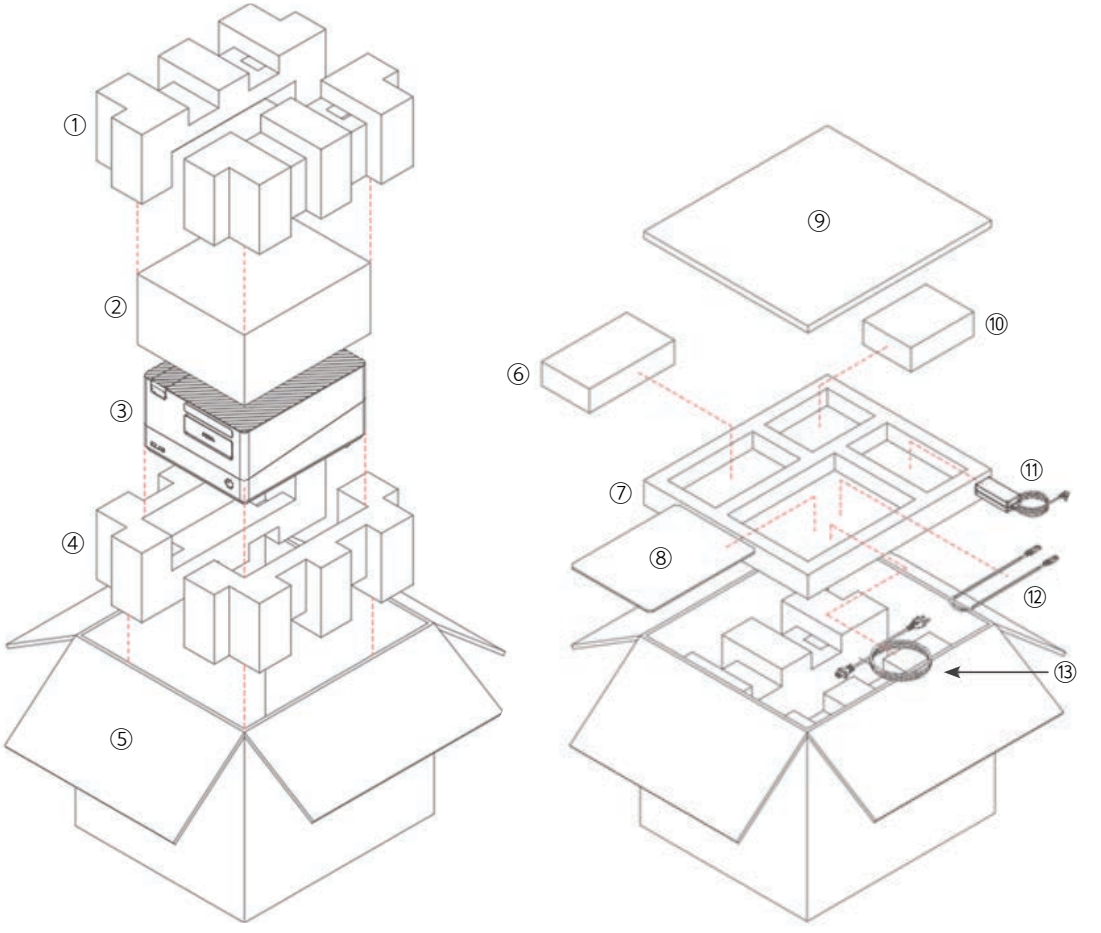
1) Press the insert/eject holder touch button to retract the microplate holder into the equipment.
2) Turn the equipment off, then remove the power adapter from the power socket and the power connector on the rear of the equipment.
3) Remove the Ethernet cable from the computer.
4) If your model has a cuvette, cover the cuvette cover with tape to prevent contamination during transport.
5) Using the driver, reattach the transport bracket to the plate holder.



12. Repackaging the equipment

Confirm that the transport hardware has been connected to the plate holder as instructed in the previous step. Consult the two following illustrations when carrying out the next step:

1. Place two of the four PE foam pieces along the inside corners of the box.
2. Place the equipment in the vinyl cover provided, and place carefully onto the PE foam pieces lining the bottom of the box.
3. Slide the packaging sleeve over the equipment, and place the remaining two PE foam pieces over the packaging sleeve.
5. Place the accessory tray in the box, and place the accessories in the tray as shown in the illustration.
6. Close the top cover of the box and seal the box shut with box tape.
7. Mail the box and its contents to K LAB. Please indicate the send-to address provided in large, easy-to-read letters on the outside of the box.



① PE FORM ② DUST COVER ③ INSTRUMENT ④ PE FORM ⑤ BOX ⑥ ACC BOX(OPTIONAL) ⑦ PE FORM BOX ⑧ MANUAL
⑨ PE FORM COVER ⑩ WIFI ROUTER(OPTIONAL) ⑪ AC ADAPTOR ⑫ LAN CABLE ⑬ POER CABLE

ch. 3
Getting started

This chapter deals with controlling the MRX Series using the software provided. Recommendations for optimal performance are also provided.

1. Software
2. Recommendations for optimal performance

Getting started

1. Software

K LAB software supports all MRX models. The computer software is used to control the equipment, organize and analyze measurement data, and print or export results. This section provides simple instructions on how to create protocols and experiments using the software, and how to read plates. For details, please consult the Help menu in the software.

Protocols and experiments

In the software, protocols include instructions for controlling the equipment and instructions for analyzing data selectively searched in the equipment. A protocol must at minimum include procedures for the analysis to be carried out. The Protocol Manager can be used to save, load, export and import protocols. These instructions briefly explain how to create protocols in the software. More thorough instructions can be found in the Help menu in the software.

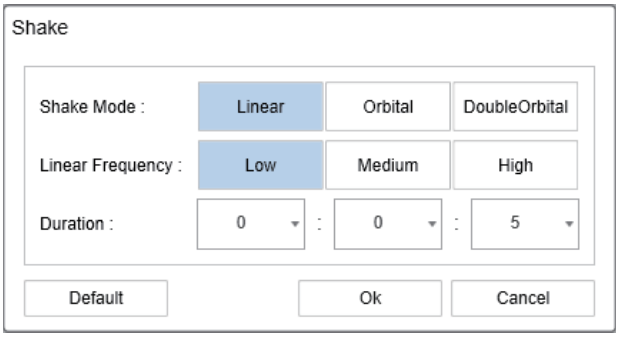
Note

- The software stores measurements and other attributes for individual plate types in a database. Make sure you select (or define) the right plate type for the plate being analyzed. Failure to do so may result in faulty results. Consult the “Plate Type Database” item in the Help menu in the software.
- To read a cuvette, select ‘Cuvette’. If multiple cuvettes are being read, the data is mapped onto a microplate matrix. (Cuvette 1 data in well A1, cuvette 2 data in well A2, and so on)

1) In the Search Tree, press ‘New Plate’.
2) Select the desired measurement mode : endpoint, kinetic, spectrum, or well scan.
3) Configure wavelength, plate type, measuring area and other measurement-related settings.
4) Press ‘Workflow’ in the top ribbon menu to add measuring, temperature sensor on/off and shake procedures.
5) Press ‘Layout Editor’ in the top ribbon menu and assign blanks, samples or reference specimens to the plate.
6) Go to the Protocol Manager tab and press save. Designate a file name.

Plate shake option

As explained in the following, the MRX Series supports various shake modes. Shaking motion is controlled using the top ribbon menu in the software or through Workflow procedures.



Shake options

Mode	Speed	Description
Linear	-	Left-right linear motion
Orbital	Low, medium, high	Orbital motion
Double Orbital	Low, medium, high	Figure eight motion

2. Recommendations for optimal performance

General matters

- Make sure the microplate is clean, without any dust or scratches. Please use a new microplate from a sealed package. Make sure there is no dust on the surface of the solution. If you are not using a plate, please use a microplate cover. Filter the solution to remove any fine particulate matter which may cause inaccurate measurements.
- The MRX Series supports all standard flat-bottom, U-bottom and V-bottom microplates. For optimal performance, use of flat-bottom wells is recommended. For detailed information on compatible plates, please consult the “Equipment Specifications” chapter.
- For U-bottom and V-bottom polyvinyl microplates, uneven optical density at the bottoms of the wells may reduce accuracy. To verify uniform optical density, measure an empty microplate. Dual wavelength measurement can either remove this problem entirely, or bring density measurement variation within tolerances.
- Inaccurate pipetting can have a substantial impact on measurements, especially when using small amounts of liquid. In most cases, for the best results, use at least 100µL per well in a 96-well plate, and at least 25µL per well in a 384-well plate.
- When pipetting solution into a 384-well plate, air bubbles may become trapped inside wells and cause inaccurate measurements. The dual wavelength measurement method generally eliminates such inaccuracies. For best results, degas the plates in a vacuum chamber, or centrifuge the plates before reading to remove air bubbles.
- For some solutions, especially in small volumes, the surface meniscus may cause decreased accuracy. Shaking the microplate prior to measurement may bring the meniscus angle into the tolerable range. Orbital shaking is helpful in reducing the meniscus effect. If available, use Tween 20 (or another wetting agent) to normalize meniscus effect for absorbance measurement. The meniscus effect will last several minutes for some solutions. The degree of the effect varies depending on the microplate brand and composition of the solution. If the center of the meniscus is lowered and the optical path is reduced, the density measurement changes. The shape of the meniscus will stabilize with the passage of time.
- It is the user's responsibility to be familiar with the volume restrictions for the plate type being used in the analysis.
- Using liquids with an acid, corrosive or solvent concentration of 3% or greater may cause damage inside the equipment chamber.

Extended kinetic testing using multiple microplates containing liquids at a concentration of less than 3% may also cause damage to the equipment. If you have any doubts regarding use of acids, corrosives or solvents, please inquire withservice@klabkis.com.

Culturing and partial plate measurement

When carrying out partial plate measurement including a culturing step, the following is recommended to reduce sample evaporation.

· Use a microplate cover.
· Fill unused wells with liquid.
· Cluster the sample wells across the entire plate, with no intervals.
· Position the sample wells in the center of the plate. This arrangement may reduce evaporation compared to cases where samples are placed in wells along the outside of the plate.

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ch. 4
Maintenance and repairs

This chapter provides instructions for cleaning and decontaminating the MRX Series.

Maintenance and repairs

1. Maintenance and repairs - overview

General maintenance of the MRX Series model involves regular cleaning of all exposed surfaces, and removing contaminants from the equipment prior to storage or transport.

This chapter explains the following:

· Procedure for regular cleaning

· Removing contaminants

You will need:

· A mild detergent

· Deionized or distilled water

· Clean, lint-free woven cotton fabric

· Sodium hypochlorite (NaClO or bleaching agent) (only applies for decontamination)

· Protective goggles

· Surgical mask

· Protective gloves

· Lab gown

· Biohazard waste disposal bag

· 125 mL beaker

· Cotton swabs or paper towels

2. Warnings and Matters of Caution

Please read the following before carrying out maintenance and repair procedures.

Warning

Electrocution Warning. Turn the equipment off and disconnect the power plug prior to any and all maintenance and repair work.

Note

Do not immerse the equipment in liquid, or use fabric sprayed with or doused with liquid. Make sure water or other cleaning agent does not leak into the equipment. If any liquids enter the equipment, please contact the K LAB Customer Center.

Warning

Wear protective gloves to handle the equipment when contaminated.
Always assume that gloves are contaminated; keep gloves well clear of the eyes, mouth, nose and ears.

Warning

Mucous membranes are considered a key ingress path for infectious agents. If there is a risk of aerosol infection, wear protective goggles and a surgical mask. Healthy skin is usually effective at blocking infectious organisms. That said, small cuts and scratches can sometimes be invisible to the naked eye. Always wear protective gloves when handling contaminated equipment.

3. Procedure for regular cleaning

This procedure relates to the external case of the MRX Series. It is recommended that the equipment is cleaned regularly to remove any dust or fine particulate matter which may cause inaccurate measurements. Exposed surfaces may be cleaned using water, wet (not soaked) fabric, and a mild detergent.

1) Turn the equipment on and press the insert/eject holder button to eject the microplate holder.
2) Turn the equipment off, and remove the power cable from the power inlet terminal.
3) Wet a piece of clean cotton fabric with water or water with a mild detergent and wring/squeeze until no excess liquid is dripping.
4) Wipe all exposed surfaces of the equipment, as well as the plate holder and inside the plate door.
5) If a detergent has been used, wipe off all surfaces with a piece of fabric wet with water only.
6) Wipe all wet surfaces dry with a dry, lint-free piece of fabric.

If you have spilled liquid inside the reader, contact the K LAB Customer Center for instructions on washing.

4. Removing contaminants

Laboratory equipment used for research or clinical analyses are considered biohazards, and must be decontaminated before use. Decontaminating minimizes risk for all persons coming in contact with the equipment during transport, handling or servicing. Persons carrying out decontamination processes must be familiar with the basic settings and operation of the equipment.

To begin decontamination procedure, turn the equipment off and remove the power cable.

Warning

Wear protective gloves to handle the equipment when contaminated. Always assume that gloves are contaminated; keep gloves well clear of the eyes, mouth, nose and ears. It is not recommended to drink or eat while decontaminating the equipment.

Warning

Mucous membranes are considered a key ingress path for infectious agents. If there is a risk of aerosol infection, wear protective goggles and a surgical mask.

Healthy skin is usually effective at blocking infectious organisms. That said, small cuts and scratches can sometimes be invisible to the naked eye. Always wear protective gloves when handling contaminated equipment.

Decontaminating the outside case of the equipment

You will need:

· A mild detergent
· Deionized or distilled water
· Clean, lint-free woven cotton fabric
· Sodium hypochlorite (NaClO or bleaching agent) (only applies for decontamination)
· Protective goggles
· Surgical mask
· Protective gloves
· Lab gown
· Biohazard waste disposal bag
· 125 mL beaker
· Cotton swabs or paper towels

Procedure

1) Turn the equipment on and press the insert/eject holder button to eject the microplate holder.
2) Turn the equipment off, and remove the power cable from the power inlet terminal.
3) Prepare an aqueous solution of 0.5% sodium chloride (NaClO or bleaching agent). If use of a bleaching agent concerns you, 70% isopropyl alcohol may be used instead.

> **Note**
>
> Check the NaClO ratio in the bleaching agent being used. Commercial bleaching agents generally contain 10.0% NaClO. Prepare a 1:20 dilution. Household bleaching agents generally contain 5.0% NaClO. Prepare a 1:10 dilution.

4) Soak a clean and lint-free piece of fabric in the bleaching agent solution, and squeeze/wring until no excess moisture is dripping. Do not immerse the cloth in the solution.
5) Wipe the plate holder and all exposed surfaces of the equipment.
6) Allow the equipment to dry for 20 minutes so that the bleaching agent can thoroughly remove the contamination.
7) Wet a cloth with deionized or distilled water and wipe off all surfaces wiped using the bleaching agent solution.
8) Wipe all wet surfaces dry with a clean and dry, lint-free fabric.
9) Dispose of the gloves and cloth used using a biohazard waste disposal bag and approved biohazard container.

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ch. 5
Specifications

This chapter states the specifications of the MRX Series.

1. Product specifications
2. Contact information

Specifications

1. Product Specifications

Product name	MRX Series
Detection modes	UV–Vis absorbance
Read methods	Endpoint, kinetic, spectrum, well scan
Microplate types	6 ~ 384–well plates
Temperature control	Up to 65 ˚C
Shaking	Linear, orbital, double orbital
Light source	Xenon flash
Detector	Photodiode
Wavelength selection	Monochromator
Wavelength range	190 – 1100 nm / 1 nm increments
Bandwidth	2.9 nm
Dynamic range	0 – 4.0 OD
Resolution	0.0001 OD
Pathlength correction	Yes
Wavelength accuracy	± 1 nm
Wavelength repeatability	± 0.2 nm
OD accuracy	< 1% at 2.0 OD < 3% at 2.5 OD
OD linearity	< 1% from 0 to 2.5 OD
OD repeatability	< 0.5% at 2.0 OD
Stray light	0.03% at 230 nm
Reading speed(kinetic)	96 Wells fast read: < 8 seconds
Power	110/220V, 50/60Hz
Weight	12 kg
Dimensions(W*D*H)	340mm x 410mm x 225mm
Regulatory	CE, KC

* The above product specifications are subject to change without prior notice.

2. Contact information

Address

94-23, Techno 2-ro, Yuseong-gu, Daejeon 34014 KR

Customer Service and Sales

Equipment servicing and repairs are provided directly by the K LAB Service Center. Please contact the Customer Center to book a service appointment. Please consult our website for up to date contact information. For customer service, sales and technical support, please see below.

Customer Service and Sales	
Website	klab.im
Tel.	+82-42-932-7586
Fax.	+82-42-932-7589
E-mail	sales@klab.im

· Revision History

Date	Revision	Page	Etc
11/2021	Content added	Equipment repackaging section added	Chapter 3 (p.26)
08/2025	Content change	Change the website address	
11/2025	Content change	Change the dedicated email URL for your service	

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