



Precision
System
Science
Co., Ltd.

magLEAD 12gC User Manual

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Index

1. Information to the User	3
2. For Safety Usage	4
3. Specifications	10
3.1. Intended Use	10
3.2. Features	10
3.3. Performance	10
3.4. Size, Weight and Power Requirement	10
3.5. Storage Condition	11
3.6. Transport Condition	11
3.7. Environmental Requirement	11
3.8. About Caution Labels Inside Instrument	12
3.8.1. Caution Label for High Temperature	12
3.8.2. Caution label for pinching fingers	13
3.8.3. Caution Label for Biohazard	13
4. System Components	15
4.1. Front View	15
4.2. Side and Rear View	16
4.3. Internal Components	17
5. Installation	18
5.1. Setup procedure	18
5.2. Configuration and setting up the instrument	21
5.2.1. Setting the installation date	21
5.2.2. Setting the serial port	21
5.2.3. Setting time and date	21
5.2.4. Setting the preventive maintenance reminder	21
5.2.5. Installing the bar code reader (Option)	21
5.3. Installing the PC software (Option)	22
5.3.1. System requirements	22
5.3.2. Installing the driver of the USB-RS232 converter	22
5.3.3. Installing the magLEAD Communicator software	24
6. System Components	26
6.1. Accessories	26
6.2. Disposables	28
6.3. Reagents	28
7. Direction for Use	30
7.1. Door operation	30
7.2. Setting Reagent Cartridges on Reagent Cartridge Rack	30
7.3. Setting Sample Tubes	32
7.4. Setting Tip Sets	32
7.5. Setting Elution Tubes	32

7. 6.	Setting Tip/Tube Rack	33
8.	Basic Operation.....	34
8. 1.	magLEAD 12gC Operation Panel.....	34
8. 2.	Start Up and Shut Down Procedure.....	34
8. 2. 1.	Start Up.....	34
8. 2. 2.	Shut Down.....	35
8. 3.	Protocol Run Procedure.....	35
9.	Manual Operation.....	37
9. 1.	Manual Screen.....	37
9. 1. 1.	Home Screen.....	37
9. 1. 2.	Return Tip Screen.....	38
9. 1. 3.	Cleaning Screen	38
9. 1. 4.	Resend Screen	39
9. 2.	UV Screen.....	40
9. 2. 1.	Switching on the UV lamp.....	40
9. 2. 2.	Switching off the UV lamp	41
9. 2. 3.	Lifetime reminder of the UV lamp.....	41
9. 3.	Setup Screen.....	42
9. 3. 1.	Setting the date.....	42
9. 3. 2.	Setting the time.....	42
9. 3. 3.	Setting the serial port.....	43
9. 3. 4.	Setting the preventive maintenance reminder	43
9. 4.	Test Screen	44
9. 4. 1.	Axis Test Screen.....	44
9. 4. 2.	Temp Test Screen.....	44
9. 4. 3.	Serial port test Screen	45
9. 4. 4.	Version Screen.....	46
10.	Bar code reader (Option)	47
11.	Report file	48
12.	magLEAD Communicator (Option)	50
12. 1.	User interface	50
13.	Maintenance	53
13. 1.	Cleaning Procedure	53
13. 2.	D-Ring Maintenance	54
14.	Troubleshooting.....	56
14. 1.	Error Reported During Protocol Run	56
14. 2.	Suspending or Aborting Protocol Run	57
14. 3.	Frequently Reported Problems.....	59
15.	Error Code List.....	60

1.Information to the User

Congratulations on the purchase of magLEAD 12gC, of which PSS' worldwide patented principle of **MAGTRATION® Technology** utilizing magnetic particles.

This book is a guide for the user to use the instrument in safe and effectively. Please read this book thoroughly to understand the instrument before starting operation. Also keep this book nearby the instrument for quick reference when you need.

- Do not operate the instrument without understanding instructions described in this book.
- Always keep this book nearby for easy reference at any time.

Please inform us, Precision System Science Co., Ltd., when this book is lost or damaged.

Followings are packed together in this Instrument Package.

Items	Qty.	Remarks
① magLEAD 12gC Main Body	1	
② Power Cable AC100V	1	
③ Power Cable AC240V	1	
④ Reagent Cartridge Rack	1	
⑤ Tip/Tube Rack	1	
⑥ Silicon Grease	1	
⑦ D-rings	12	
⑧ Fuse(3.15A, 250V)	2	For Power Switch
⑨ magLEAD 12gC User Manual	1	This book
⑩ Package Check List	1	

Option

⑪ Handheld Barcode Reader	1	
⑫ magLEAD Communicator (CD)	1	PC software
⑬ communication cable	1	
⑭ USB-RS232 converter	1	






2. For Safety Usage










Most problems are derived from irregular usage of the instrument without following the safety instructions. Please read this manual thoroughly to understand and to get familiar with preventive activities to avoid any problems in instrument operation.

If used in a manner not specified by the manufacturer, the protection provided by the equipment may be impaired.

About Symbols

In this book, symbols are used for easy understanding for those important in instrument operation. Their meanings are described below.

Symbol	Description
 Warning	This indicates the possibility that one could be killed or seriously wounded when inadequate operation is done.
 Caution	This indicates the possibility that one could be wounded or physical damage could occur when inadequate operation is done.
	Caution Label for High Temperature
	Caution label for pinching fingers
	Caution Label for Biohazard

	<p>CE mark for Europe 98/79/EC (IVD Directive)</p> <p>This instrument has been tested to and complies with standards IEC61010-1 Ed.3 (2010), "Safety Requirements for Electrical Equipment for Measurement, Control and Laboratory Use - Part 1: General Requirements;" IEC61010-2-101(2015), "Safety requirements for electrical equipment for measurement, control, and laboratory use - Part 2-101: Particular requirements for in vitro diagnostic (IVD) medical equipment." IEC61326-1 (2013), "Electrical equipment for measurement, Control and laboratory use EMC requirements – Part1: General requirements." IEC61326-2-6 (2013), "Electrical equipment for measurement, Control and laboratory use EMC requirements – Part2-6: Particular requirements in vitro diagnostic (IVD) medical equipment."</p>
	<p>UL listing mark for Canada and the USA</p> <p>This instrument has been tested to and complies with standards UL 61010-1 Ed.3 (2012) and CSA-C22.2 No.61010-1-12 Ed3.(2012), "Safety Requirements for Electrical Equipment for Measurement, Control and Laboratory Use, Part 1: General Requirements."</p>
	<p>WEEE mark for Europe</p>
	<p>Serial number</p>
	<p>Legal Manufacturer</p>
	<p>Authorized Representative in the European Community</p>
	<p>In Vitro Diagnostic medical devices (98/79/EC)</p>
	<p>Describe reference information regarding operating procedure or specific issues in this manual, or illustrate details of operation or function. When there exists other information to be referenced, describe the pages or sections.</p>
	<p>Describe information to be emphasized or added for important points. It means that you need to pay close attention in operating instrument.</p>



Caution

- Do not use other than MagDEA Dx SV kit
- The magLEAD 12gC CANNOT be used as an accessory for any of following diagnostic applications.
 - 1) Determination of;
 - ◆ the blood groups: ABO system, rhesus (C, c, D, E, e) anti-Kell, anti-Duffy and anti-Kidd
 - ◆ the irregular anti-erythrocytic antibodies
 - ◆ the human cytomegalovirus, and the human chlamydia
 - ◆ the HLA tissue groups: DR, A, B
 - ◆ the tumoral marker: PSA
 - 2) Detection, confirmation and quantification of;
 - ◆ markers of HIV infection (HIV 1 and 2), HTLV I and II, and hepatitis B, C and D in human specimens
 - ◆ congenital infections: rubella, toxoplasmosis in human samples
 - 3) Diagnosis of the hereditary disease: phenylketonuria
 - 4) Evaluation of the risk of trisomy 21
 - 5) Self-diagnosis, including its related calibrators and control materials: device for the measurement of blood sugar.
 - 6) Any other applications listed on the latest version of List A, B and Self-test of Annex II of 98/79/EC.
- Do not use in a strong electric field and magnetic field.
- Use of instrument in a dry environment may cause erroneous results due to damage with static discharge.

Examples of Symbols



This Symbol indicates that message of Caution (including Danger and Warning) is shown. Inside triangle, specific mark is illustrated (the sample on the left shows electric shock.)



This Symbol indicates what you shall not do. Details are illustrated inside symbol or nearby the symbol.



This Symbol is used to restrict operations or to illustrate what to do. Details are illustrated inside the symbol (the sample on the left shows unplugging of AC Plug from wall outlet.)



The following precautionary instructions are included to ensure the safe operation of your magLEAD 12gC. Please always keep this book near by the instrument or operator. Failure to comply with the instructions in this manual may pose dangerous risk to the user and will void the manufacturer's warranty.

When troubles occurred with this instrument, immediately turn off the main-power switch and unplug power cable. Then contact with PSS.



Warning

Installation

- Be sure that no water or liquid would get into the instrument. It would cause fire or electric shock.
- Do not attempt disassembling, modifying or repairing by yourself. It may cause failure of instrument or electric shock to you. Ask PSS for repair or maintenance of the instrument.



Ban



Ban

Actions for Emergency

- In an emergency status of instrument, such as extraordinary hot, smoking, abnormal smell, etc., immediately unplug power cable from wall outlet to avoid fire or electric shock to you and contact with us for repair.



Unplug AC power

- When foreign material or water splashed over or got inside instrument, immediately unplug power cable from wall outlet to avoid fire or electric shock to you and contact with us.



- When power cable is damaged (core wire exposed or broken), immediately unplug power cable from wall outlet to avoid fire or electric shock to you and contact with us.



Caution

Installation

- Avoid places below to install the instrument. Damage to or malfunctions of the instrument may be caused.



-Place where exposed to direct sunshine

-Place with vibration, high humid or dust.

-Place where strong electric or magnetic fields exist.

-Place where liquid or oil could be splashed on.

-Place where flammable gas, corrosive gas or high heat source exist.

- Setting of the instrument shall be made by field service personnel authorized by PSS.
Contact us when you transfer the instrument.



Storage

- Unplug power cable from wall outlet when the instrument may not be used for extended period of time.



Precautions for Instrument Operation

- Possibility of biohazard could not completely be eliminated in operating the instrument. Use a mask, goggles and gloves according to the description in this book.
- Pay close attention in handling sample with high risk of biohazard.
- When operating the instrument under low temperature circumstance, keep the instrument power on.
- Be sure no foreign materials would get into the instrument from outside.
- Do not scratch or press the operation panel using knives or stuff with sharp edges.
- Pay close attention when working around Piercing Unit not to get hurt.
- Replacement of the fuse shall be made by field service personnel authorized by PSS. Contact us for fuse replacement.

About Warranty Period

- 12 months after installation, regardless of its usage.
- This warranty excludes the problem derived from inadequate storage, inadequate usage or operation, repair/modification/maintenance of the instrument by people who are not authorized by PSS, though within warranty period.

About Abolishment

- Contact PSS when you want to abolish the instrument.

3. Specifications

3.1. Intended Use

magLEAD 12gC employs PSS' original technology, Magtration® ,to perform automated isolation and purification of nucleic acids (DNA and RNA, etc.) using magnetic particles.

It is intended to be used only in combination with MagDEA Dx SV kits indicated for use with magLEAD 12gC instrument for the applications described in the IFU of the kit. The system is intended for use by professional users, such as technicians and physicians trained in molecular biological techniques and the operation of the magLEAD 12gC.

3.2. Features

- Full automation of Nucleic Acid extraction/purification by Magtration® technology
- Compact body that occupies minimal space
- High speed simultaneous processing of 12 samples by 12 nozzles
- Special disposable tips and reaction cartridges for ease of operation

3.3. Performance

- Instrument type : Desktop
- Throughput : Samples · · · 1—12 samples/batch
 Processing time · · · About 30 min/1-12 samples
- Temperature control function : Heat Block · · · 40 to 95 deg. C

- Processing Volume : 25 - 1000ul
- Dispensing Accuracy : 25 - 50ul · · · · +/-10%
(Aspiration Accuracy) 50 - 1000ul · · · · +/-3%

- ✘Accuracy with distilled water at room temperature 20 – 25 deg.C
- Protocol : IC Card

Note

- Processing Time depends on protocols.

3.4. Size, Weight and Power Requirement

- Size : W500xD535xH574mm
- Weight : About 55 kg (121 lbs.)
- Power Requirement : AC100—240V ± 10%, 50/60Hz, 300VA



Caution

- Do not share power source with other instruments.
- Do not place close to instruments giving noises or power fluctuation.
- Connect power cable to wall outlet with ground line.
- Connect to Protective Earth.

3. 5. Storage Condition

- Temperature : 5 – 40 deg. C
- Relative Humidity : 15 – 75 % ※Non-Condensing
- Barometric Pressure : More than 70kPa(min)

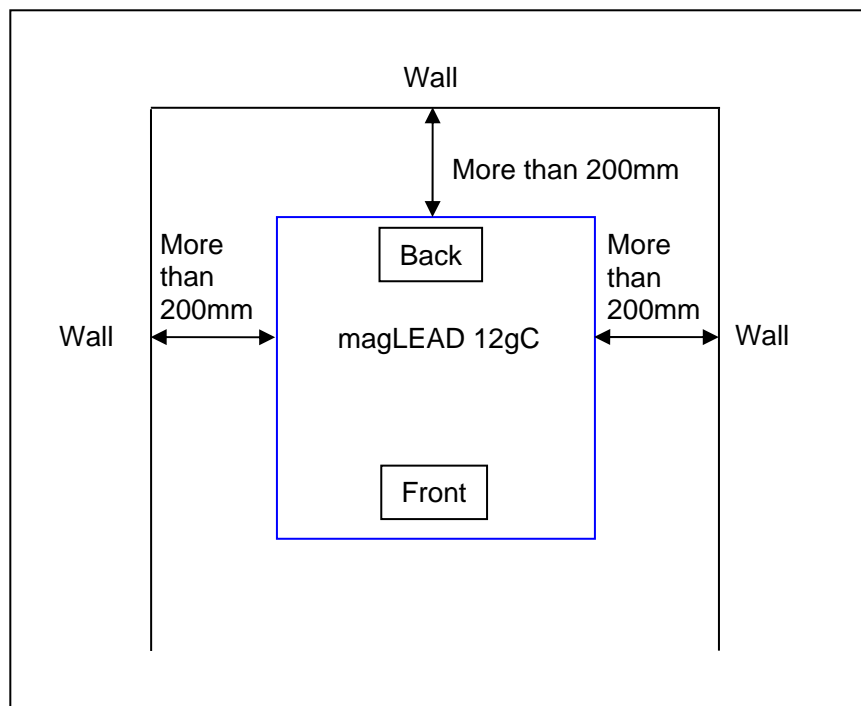
3. 6. Transport Condition

- Temperature : -25 – + 60 deg. C
- Relative Humidity : 15 – 75% ※Non-Condensing
- Barometric Pressure : More than 70kPa(min)

3. 7. Environmental Requirement

- Overvoltage Category : II
transient overvoltage : 2500V
- Pollution Degree : 2
- Installation Site : Indoor Use Only
- Temperature : 15 – 30 deg. C
- Relative Humidity : 15 – 75% ※Non-Condensing
- Altitude : UP to 2,000m
- Space : Keep distances from walls as shown below for ventilation, maintenance work, etc. Also keep more than 200mm space over the instrument.

Environmental Requirement



Caution

- Please set the instrument on horizontal surface that can invariably endure instrument weight.
- Place the instrument on horizontal surface.
- Do not place the instrument where it will get direct sunlight or vibration.
- When operating the instrument in a cold chamber or cold room, keep instrument power on to avoid condensation.

3. 8. **About Caution Labels Inside Instrument**

3. 8. 1. Caution Label for High Temperature

Place attached : Heat block and Inner wall of the cover



Caution

- The part where this label is attached becomes hot. Be sure not to Touch while working.

3. 8. 2. Caution label for pinching fingers
Place attached : Magtration® Unit



 **Caution**

- The part where this label is attached has possibility of pinching your hand or fingers by driving mechanism or open/close operation. Take care not to be pinched.

3. 8. 3. Caution Label for Biohazard
Place attached : Inner wall of the cover



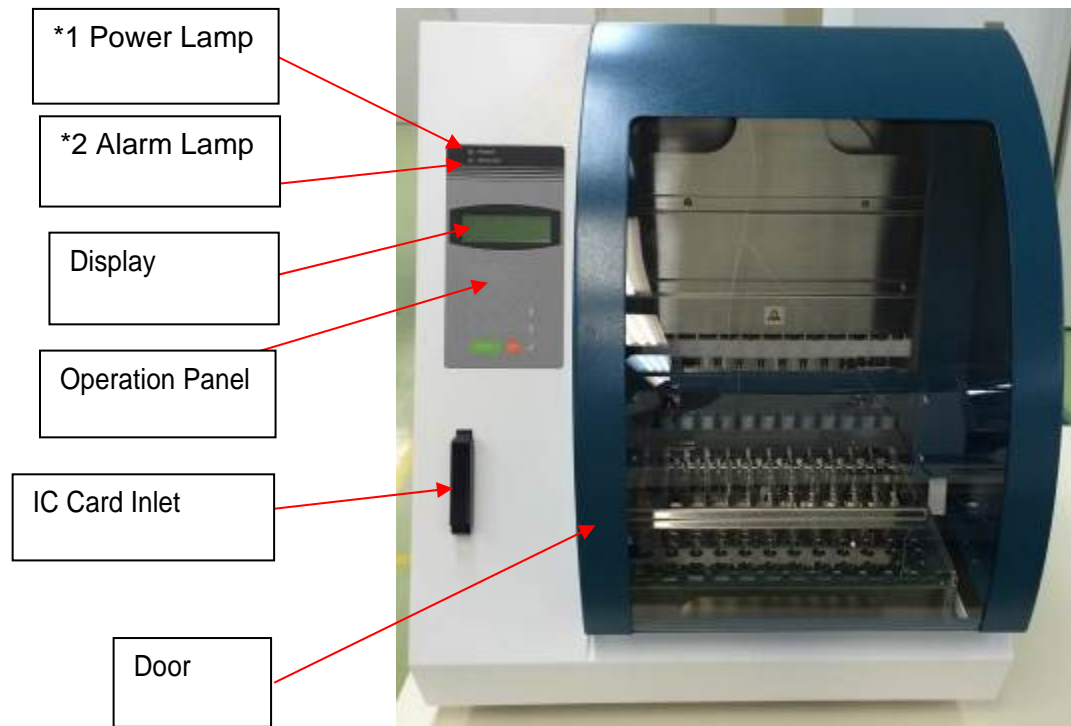


Caution

- The part where this label is attached (inside cover) has possibility of biohazard contamination with samples or extracted/purified products. Take care not to be contaminated.
- Note that it is not possible to completely eliminate risk of biohazard from samples or extracted/purified products in operating this instrument. Wear a mask, goggles and gloves for your own safety, according to the description in this manual.
- Pay close attention when handling highly hazardous samples.

4. System Components

4.1. Front View



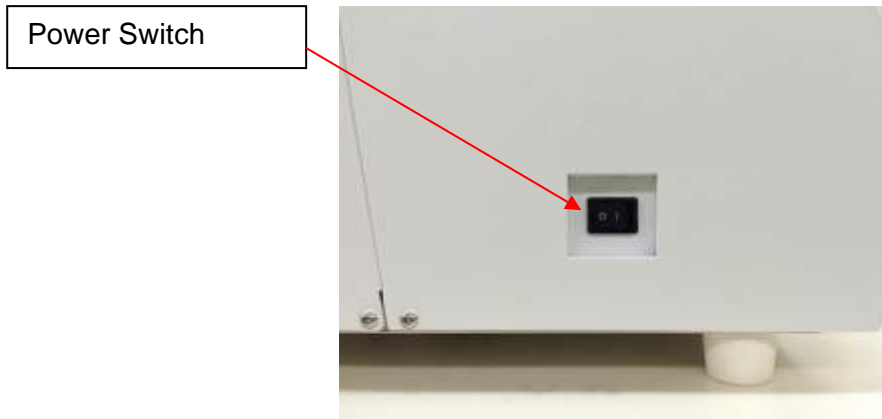
*1: Lit when powered on – Green Lamp

*2: Blinks when an error occurred – Red Lamp

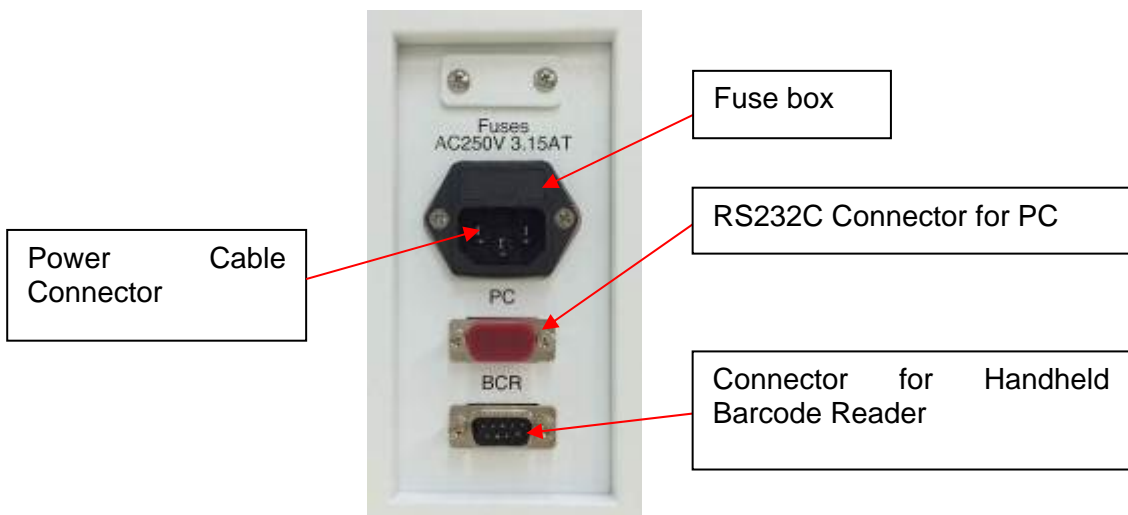
4. 2. Side and Rear View

On the left side of the instrument Power Switch is located.

On the back of the instrument, Fuse box and Connectors are located.



Power Switch



Fuse box

RS232C Connector for PC

Power Connector Cable

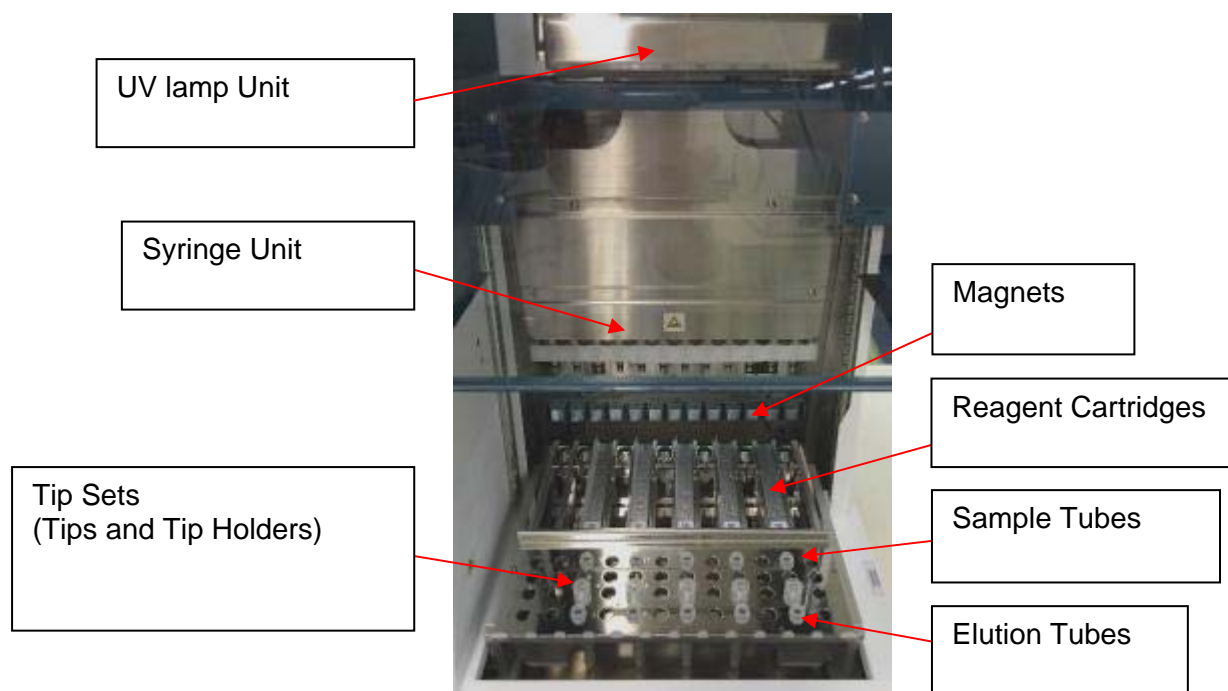
Connector for Handheld Barcode Reader

Note

- Replacement of the fuse shall be made by field service personnel authorized by PSS. Contact us for fuse replacement.

4. 3. Internal Components

Inside the instrument, Magtration® Unit and Stage Unit are located.



1. Magtration® Unit

- Syringe Unit : Twelve nozzles to simultaneously process up to 12 samples with accurate and rapid aspiration and dispensing.
- Magnets : Twelve magnets aligned with 12 tips to simultaneously separate magnetic particles from up to 12 samples.

2. Stage Unit

- Reagent Cartridges : Easy placement of special disposable cartridges (pre-filled with reagents) results in minimizing cross contamination. The far backside two positions (wells) in the cartridge are used for heating.
- Tip Sets : Positions for tips in the tip holders. One or two tips/tip holders are used per sample depending on each protocol. Please refer the instruction indicated in package insert of each reagent kit.
- Elution Tubes : Positions for 1.5ml elution tubes.
- Sample Tubes : Positions for 1.5ml sample tubes.



Warning

The magLEAD 12gC contains a UV lamp. Avoid looking directly UV light. Do not expose your skin to UV light.

5. Installation

5.1. Setup procedure

1. Take the instrument out of the crate.



Warning

- Setting of the instrument shall be made by field service personnel authorized by PSS. Contact us when you transfer the instrument.
2. Remove protection films attached on the instrument.
 3. Open the Door.



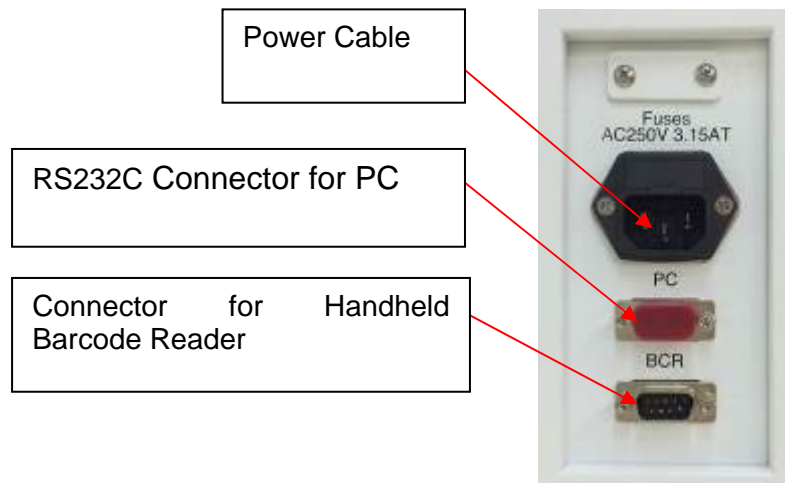
4. Push the pipettor head upward.



5. Remove the bubble wrap, Y-axis fixing bracket and silica gel.



6. Connect Power Cable and Handheld Barcode Reader accompanied with the instrument and then connect Power Cable to wall outlet.



 **Caution**

- Do not use power cable other than provided to avoid troubles such as temporary blackout or fire breaking.

7. Confirm the power switch is turned off. As instructing on Pictures below, open the inlet cover and insert the IC Card. Please make sure that the picture side is left and the triangle mark ▽ faces down when inserting the card. After inserting the card, turn on the power switch on the left side of the unit.



➤ **Removing IC Card**

To remove IC card, make sure that the power switch is turned off and push the bottom as shown below and pull out the card.



Caution

- Be sure the power is OFF when inserting or removing the IC card. The card and/or instrument may be damaged if this is done while the power is on.
- Take care in handling IC Card because IC card can be damaged by shock, water or dirt.
- When IC Card is not inserted properly, LCD may not display correctly. Be sure that IC Card is inserted properly.

8. Please make sure that the instrument completed homing operation of all axes after powered on.

9. Installation Completed.



Caution

- Be sure to put cushions and screws to fix Syringe Unit and Stage, When transporting the instrument to avoid any damage to the instrument.

5. 2. Configuration and setting up the instrument

5. 2. 1. Setting the installation date

The first time the magLEAD 12gC is switched on, it is necessary to enter the installation date. This date will be recorded in the report file described below.

The installation date is also used to let the instrument know when to show the weekly and annual maintenance reminders.

```
SERV: SETUP SYSTEM
Installation date
DD MM YYYY
Key:Up, Dn, SHIFT, ENT
```

Set the day, month, and year. Press “SHIFT”-down arrow to move the cursor right, from DD (day) to MM (month) to YYYY (year).

Press “SHIFT”-up arrow to move the cursor left, from YYYY to MM to DD.

Press the up arrow or down arrow to increase or decrease the value of the selected field.

After setting the date, store the setting by pressing “ENT”.

Press “ESC” to leave the date unchanged.

If you accidentally set the wrong date, call Precision System Science.

5. 2. 2. Setting the serial port

Set the serial port accordingly for use with a PC as the output device for the report file (Section 5.3, 11, 12).

5. 2. 3. Setting time and date

The magLEAD 12gC has an integrated clock and date device.

Check the time and date and reset if necessary.

(Section 9.3.1 and 9.3.2)

5. 2. 4. Setting the preventive maintenance reminder

The magLEAD 12gC reminds you when the annual maintenance is due.

You can set the reminder to remind you annually or semiannually.

(Section 9.3.4).

5. 2. 5. Installing the bar code reader (Option)

The bar code reader is powered through the data cable.

Unpack the bar code reader. Connect the cable to the bar code reader.



Connect the bar code data cable to the instrument.
The connector is located at the rear of the instrument, labeled “Barcode Reader”.
Make sure that the connector is secured with the 2 screws provided.
Switch on the magLEAD 12gC instrument.

The data communication between the reader and the instrument is RS232.

5. 3. Installing the PC software (Option)

The magLEAD 12gC software “magLEAD Communicator” needs to be installed on the PC.

The software is needed to receive report files from instrument and to store data on the PC hard disk.

5. 3. 1. System requirements

- Operating system: Windows 7 or Windows 8
- USB-Port: USB 1.1 or higher
- Microsoft.NET Framework V1.1 (freely available for download at www.microsoft.com) installed on the PC

The instructions in Sections 5.3.2 and 5.3.3 refer to the Windows 7 operating system.

Specifications for Windows 8 are the similar, but the appearance and some parameters may vary.

5. 3. 2. Installing the driver of the USB-RS232 converter

Installing the driver

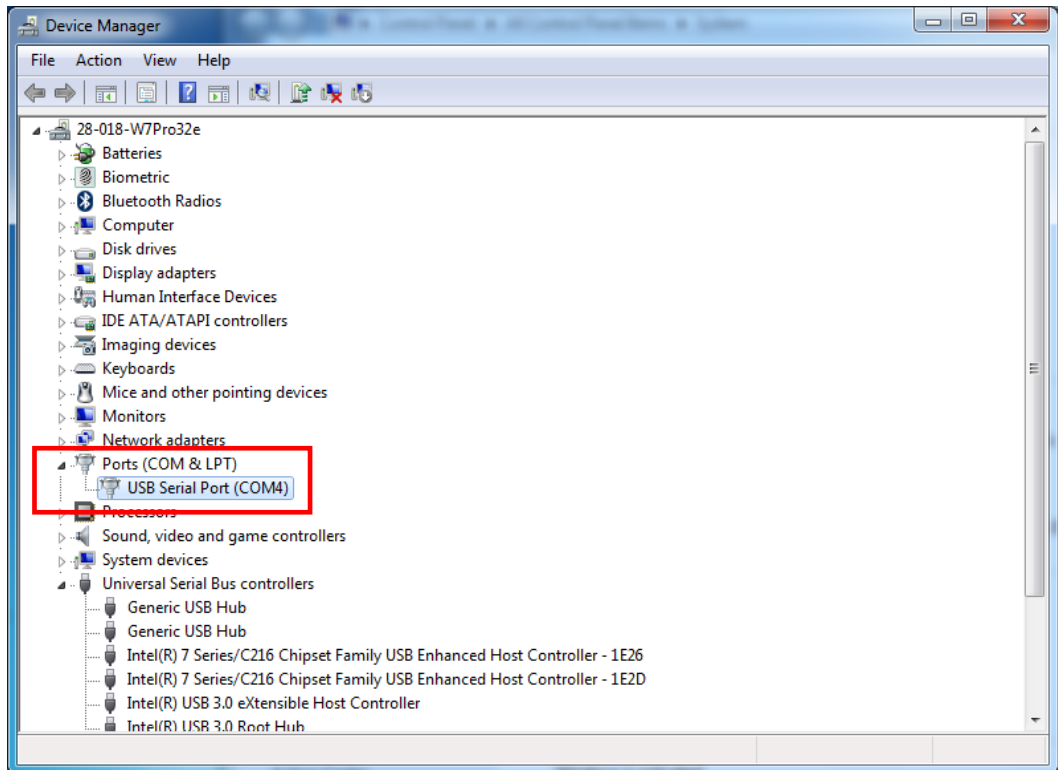
If the PC has no RS232 port, first install the driver of the USB–RS232 converter on the PC.

For the detail of the installation procedures, please refer to the manual attached to the USB-RS232 converter.

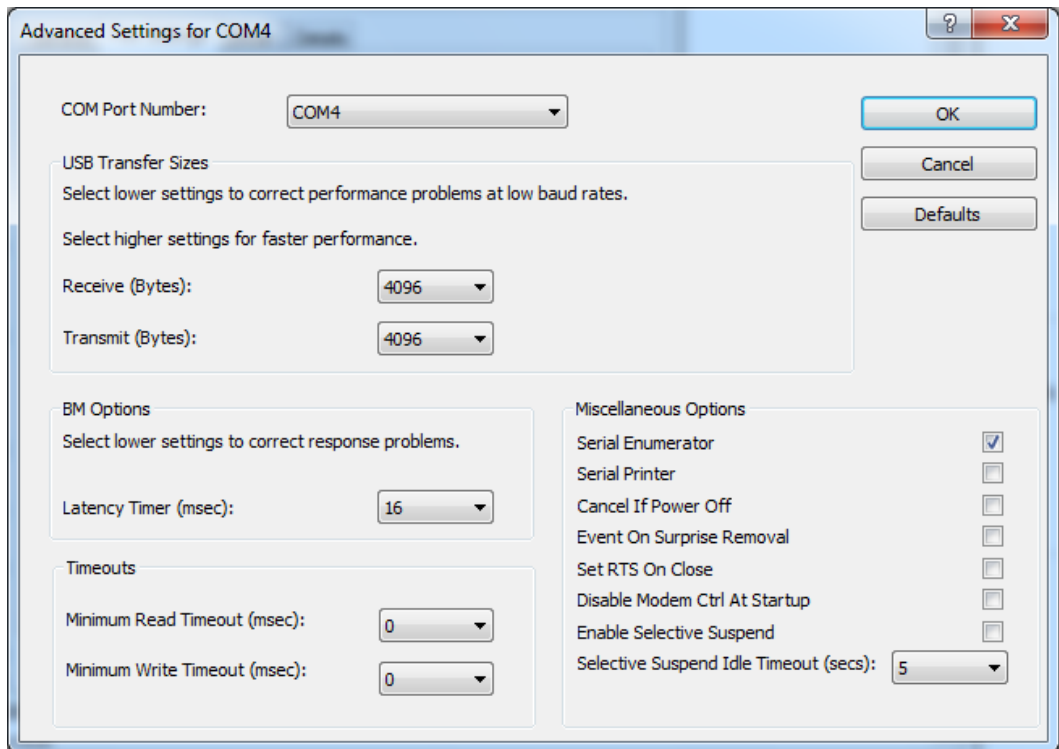
Insert the CD and follow the directions given.

Mapping the COM port (In case of “Windows7 Professional N”)

- Click the “Start” button on your PC and select “Control Panel”.
- Open “Device Manager”.
NOTE: The process to open the Device Manager depends on the version of OS.
- Expand “Ports” to show all available COM ports.
- Connect the converter to an open USB port on the PC.
The device manager should then automatically update the COM port list.
Look for the COM port named “USB Serial Bridge”.



- Right click on this COM port and select “Properties”.
- Click the “Port Setting” tab and select the “Advanced” button.



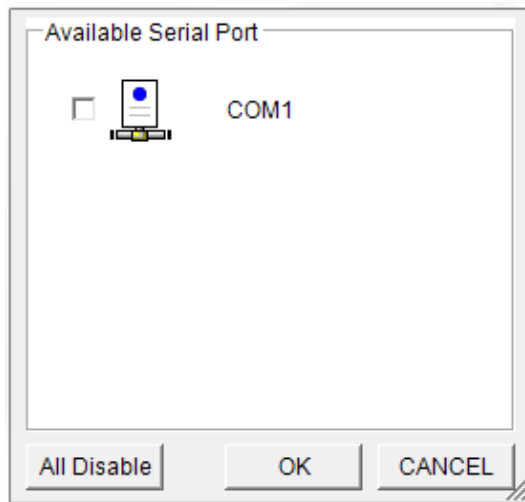
- Change the dialog field “COM Port Number” to “COM1”.
The USB port is now mapped to COM port 1.
Always use COM Port 1 to work with the magLEAD 12gC.

5. 3. 3. Installing the magLEAD Communicator software

- Insert the CD labeled “magLEAD Communicator Software” into the PC.
Start “Setup.exe”.
- The installation wizard will guide you through the installation process.
- After installation, open the magLEAD Communicator software
by double-clicking the magLEAD Communicator icon in the lower system bar.



- The user interface of the “magLEAD Communicator” opens.
- Select “Options” and open the “Serial port” window.
Check the “COM1” box.



- The magLEAD Communicator software is now ready to receive data from the instrument.
- In order to check the connectivity between the PC and magLEAD 12gC, use the test described in Section 9.4.3.

6. System Components

6.1. Accessories

-. Power Cable



Power Cable for 240VAC

Power Cable for 100VAC

-. Silicon Grease, Fuses and D-Rings



Silicon Grease

Fuse (3.15A)



D-Rings

-. Reagent Cartridge Rack



- Tip/Tube Rack



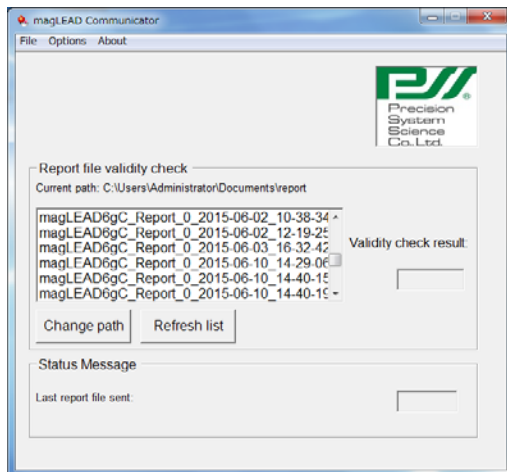
- Handheld Barcode Reader (Option)



Ref

Please refer to an attached Barcode Reader use manual for details.

- magLEAD Communicator (PC Software, Optional product)



Ref

Please refer to "Installing the PC software (Chapter 5.3)" for details.

6. 2. Disposables

Tip(DN-100N Tip) & Tip Holder(Sheath DN100)



Elution Tube · Sample Tube



Ref

Please refer to the package insert of the disposables for details.

6. 3. Reagents

Prefilled Reagent Cartridges



Ref

Please refer to the package insert of the reagent for details.



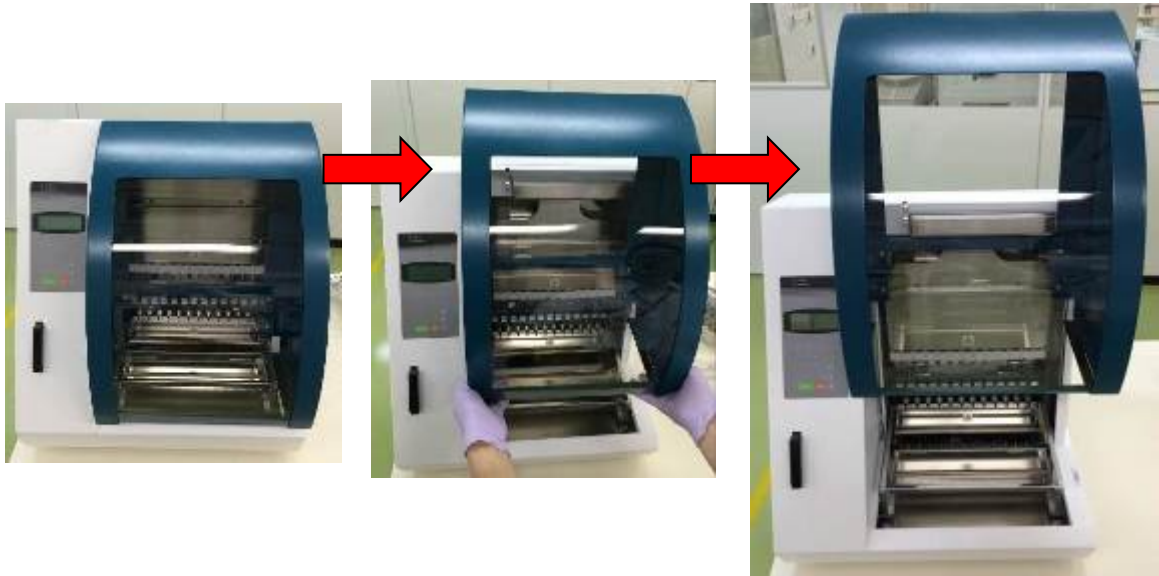
Caution

- Do not reuse any disposables to avoid contamination and/or instrument malfunction.
- Do not use disposables/reagents other than specified to avoid instrument malfunction.
- Be sure to wear a mask, goggles and gloves for your own safety when loading or discarding reagents, disposables and samples.
- When discarding disposables, follows the instructions defined by your facility or regional laws.

7. Direction for Use

7.1. Door operation

The door moves up to open and down to close. It is held by magnets at both ends. When opening/closing Door, be careful not to clamp your hand or fingers and be sure that it is held by magnets at either end.



Caution

- Door may be slide downward when it is not held by magnet at upper end. Make sure that click sounds at the upper end when opening Door.

7.2. Setting Reagent Cartridges on Reagent Cartridge Rack

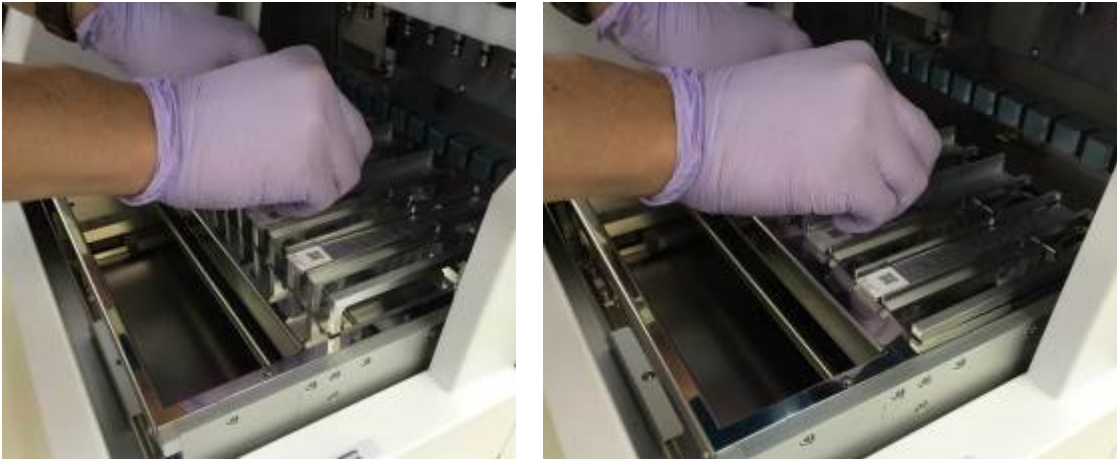
1. Orient each Reagent Cartridge with the arrow pointing towards the Reagent Cartridge Rack and slide the Cartridge all the way back along the groove till resistance is felt, as shown in the picture below. Push down the Cartridge till the cartridge is clicked down under the over-hang part of the rack.



2. Place Reagent Cartridge Rack into the rack setting position on the stage.

Ref

Be sure that two farthest wells of the cartridge fit into the Heating Block.



Caution

-
- Instrument operation without correct placement of Reagent Cartridges or Reagent Cartridge Rack may result instrument malfunction.

7. 3. **Setting Sample Tubes**

Set 1.5ml tubes (w/o caps) containing sample into the Tip/Tube Rack.



7. 4. **Setting Tip Sets**

Put tips into the tip holders, and set them in the holes of Tip/Tube Rack.



7. 5. **Setting Elution Tubes**

Set 1.5 ml elution tubes into the Tip/Tube Rack.

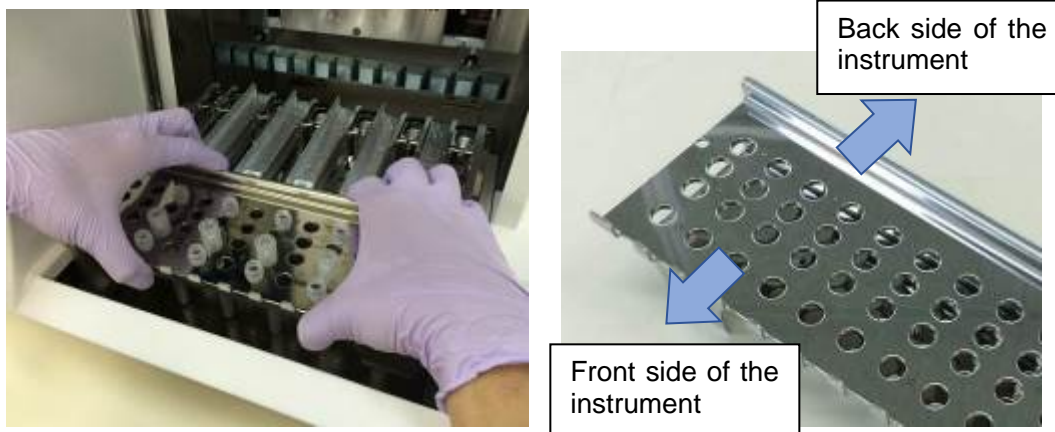


Caution

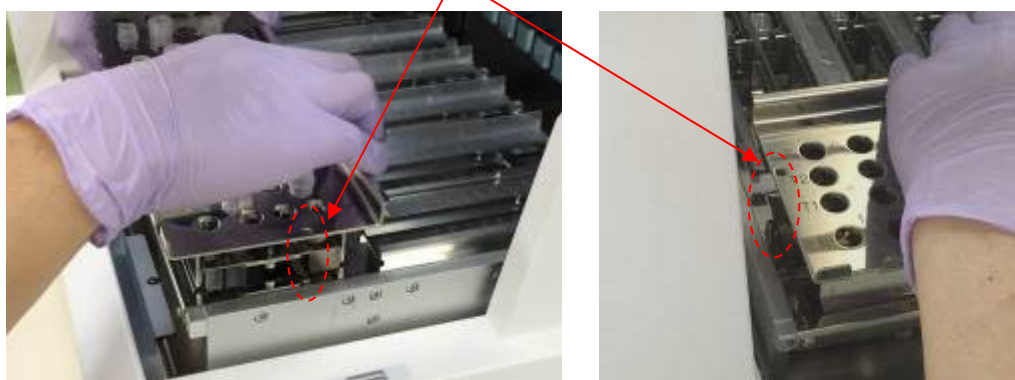
- For the setting position and number of Tubes and Tip Sets, please refer to the package insert of the reagent kit and consumable kit for the details. Be sure to put Tips in Tips Holders before setting them in Tip/Tube Rack.

7.6. Setting Tip/Tube Rack

Set tip/tube rack into the instrument. For the setting direction of the rack refer to pictures below. Please make sure that the tip/tube rack



Place the rack, making sure the holes on the right side fit to location pins.



Caution

- Instrument operation without correct placement of Tip Sets or Tip/Tube Rack may result instrument malfunction.

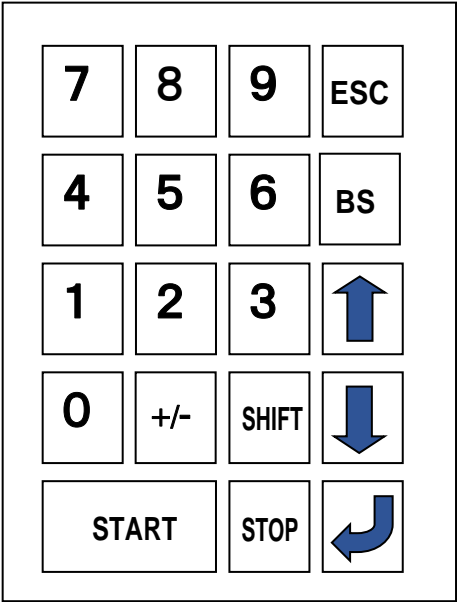
Note

When running a protocol with small number of samples, use bilaterally symmetric positions of Reagent Cartridge Rack and Tip/Tube Rack, prioritizing center positions.

8. Basic Operation

8.1. magLEAD 12gC Operation Panel

Operation Panel



Key	Description
0~9	To choose menu
ESC	To previous menu
START	To run protocol
STOP	To halt or abort protocol
(Enter)	ENTER: To confirm or enter into next menu
SHIFT+Up/Dn	SHIFT + Up/Dn: To enter the installation date

※Normally keys other than listed above may be used.

8.2. Start Up and Shut Down Procedure

8.2.1. Start Up

- ① Be certain that the instrument is turned OFF. Insert IC Card into the IC card inlet, confirming the correct orientation of the card.
- ② Turn on the instrument (Power on switch is located left side of the instrument).
- ③ As shown below, "Power On Screen" screen appears on the Display.
All axes shall be homed automatically (System Initialization).



Caution

- Be sure the power is OFF when inserting or removing the IC card. If IC Card Insertion or Removal is made with the instrument powered on, IC Card and/or instrument may be damaged.

Power ON Screen

```

PSS magLEAD 12gC
Version X. X. X. X

Initializing...
```

On completion of System Initialization, "MENU" Screen is displayed after a while. (Refer to section 8.3 for MENU Screen.)

MENU Screen

```
DD MMM YYYY HH:MM
START:Run 1:UV
2:Man 3:Test 4:Setup
Key:START, 1, 2, 3, 4
```

Press "START" key to run a protocol, when the MENU screen is displayed. Then follow the instructions appeared on the screen, specified by the protocol. UV lamp operation Screen is displayed when "1:UV" key is pressed (Refer to the section 9.2). Manual Screen is displayed when "2.Man" key is pressed (Refer to the section 9.1). Test Screen is displayed when "3.Test" key is pressed (Refer to the section 9.4). Setup Screen is displayed when "4.Setup" key is pressed (Refer to the section 9.3).

8. 2. 2. Shut Down

When a protocol run is completed, MENU Screen is displayed. After confirming that the run is fully completed, turn the instrument Power Switch off.

8. 3. Protocol Run Procedure

After you have inserted the protocol IC Card and switched on the magLEAD 12gC, start a protocol as follows.

- ① Press "START" key to run a protocol, when the MENU screen is displayed. Then follow the instructions appeared on the screen, specified by the protocol.

MENU Screen

```
DD MMM YYYY HH:MM
START:Run 1:UV
2:Man 3:Test 4:Setup
Key:START, 1, 2, 3, 4
```

- ② For generating a report file, please enter additional data, such as user ID, QR code of the reagent cartridge, and bar code of the samples.

Note

The name of reagent and Lot number can be entered by bar-code reading. The on-board calendar is used for the checking of the reagent's expiration period. Therefore, please make sure the date has set correctly. For details of the setting, refer to the section 9.3.1 and 9.3.2.

- ③ Open the Door, and set up the reagent cartridge and consumables according to the messages shown in the display.
For details, refer to the package insert of the reagent and consumables.
- ④ Close the Door, and press “START” key to start the protocol run,
- ⑤ After the protocol run is finished, remove the elution tubes, used reagent cartridges and plastic consumables.
Please discard used reagent cartridge and plastic consumables according to your local safety regulations.
- ⑥ The magLEAD 12gC will automatically generate a report file, and send it to the PC.

Note

For generating and sending a report, please confirm the serial port setting. Please refer to the section 9.3.3.

- ⑦ At the end of the protocol, you may optionally choose to perform a UV decontamination run.
- ◆ When “STOP” key is depressed during a run, the protocol is halted and you can select continuation or abortion of the run. If you selected abortion of the run, the protocol cannot be resumed. (Refer to Chapter 14.2, for further details.)
 - ◆ Do not open Door when starting and during a protocol run.
If Door is not closed correctly, door locking mechanism cannot be worked correctly, therefore a run cannot be started.



Caution

- After confirming that the protocol run is fully completed, open Door to bring out Elution tubes, Tip/Tube Rack and Reagent Cartridge Rack.
- Please discard used reagent cartridge and plastic consumables according to your local safety regulations.

9. Manual Operation

9.1. Manual Screen

Manual Screen is displayed when “2” key is pressed while MENU Screen is displayed. Press ESC key while Manual Screen is displayed to display MENU Screen again.

```
DD MMM YYYY HH:MM
START:Run 1:UV
2:Man 3:Test 4:Setup
Key:START, 1, 2, 3, 4
```

Manual Screen

```
MANUAL OPERATION
1:Home 2:Return Tip
3:Clean 4:Resend
Key:1, 2, 3, 4, ESC
```

9.1.1. Home Screen

Home Screen is displayed when “1” key is pressed while Manual Screen is displayed. While this screen is displayed, homing operation of individual axis or all axes can be selected.

```
MANUAL OPERATION
Home axis 0:ALL
1:Y 2:Z 3:P 4:M
Key:0, 1, 2, 3, 4, ESC
```

- “1” key : Homes Y-Axis
- “2” key : Homes Z-Axis
- “3” key : Homes P-Axis
- “4” key : Homes M-Axis
- “0” key : Home all Axes
- “ESC” key : Displays ORG Screen

The following screen appears.

```
MANUAL OPERATION
Home axis Axis
START:Run
Key:START, ESC
```

“Axis” indicates either the ALL, Y, Z, P, or M function.
Press “START” to perform the “home axis” operation or “ESC” to return to the previous screen.

During operation, following screen appears.

```
MANUAL OPERATION
home axis Axis

Executing...
```

9. 1. 2. Return Tip Screen

When “2” key is pressed while Manual Screen is displayed, the following screen appears.

```
MANUAL OPERATION
return tip
START:Run
Key:START, ESC
```

Press “START” to perform the return tip operation or “ESC” to return to the previous screen.

9. 1. 3. Cleaning Screen

Use the Clean operation to get access the piercing unit for cleaning. The door must initially be closed. Press ”3” in the manual operation screen to choose the “clean” operation. The following screen appears.

```
MANUAL OPERATION
Clean piercing unit
START:Run
Key:START, ESC
```

Press “START” key to clean Piercing Unit. When the key is pressed, Piercing Unit is lowered for cleaning, and the following screen appears.

```
MANUAL OPERATION
Open door and
clean piercing unit
ENT:Done
```

Open the door, and clean the Piercing Unit.
Use paper or cloth moistened with water or 70% Ethanol depending on dirtiness.
After cleaning the piercing unit, close the door and press “ENT” key.



Caution

- Wear mask, goggle and gloves for safety when cleaning Piercing Unit.

9. 1. 4. Resend Screen

If a report file cannot be sent to the PC, it is temporarily stored on the magLEAD 12gC instrument. Up to 10 report files can be stored. Use the “resend” function to manually transmit the report file(s) to the PC. Press “4” in the manual operation screen to choose the “resend” operation. The following screen appears.

```
MANUAL OPERATION
resend report file
START:Run
Key:START, ESC
```

Press “START” to start the “resend” operation or “ESC” to return to the previous screen. While the operation is in progress, the following screen appears.

```
MANUAL OPERATION
resend report file

Executing...
```

If there are no report files temporarily stored on the instrument, the following screen appears.

```
MANUAL OPERATION
No report file to
be sent
Key:ESC
```

Press “ESC” to return to the manual operation screen. If there is an error during transmission, the following screen appears.

```
MANUAL OPERATION
Resend report file
failed
Key:ESC
```

Press “ESC”, and check the connection to the PC. Make sure that the PC is turned on, and the magLEAD Communicator software is installed and running on the PC.

9. 2. UV Screen

At the end of a protocol run, a display message will give you the option of starting a UV decontamination run.

Alternatively, you can start a UV decontamination run manually by switching the UV lamp on as described below.

Note

UV decontamination helps to reduce possible pathogen contamination of the magLEAD 12gC stage surfaces.

The efficiency of inactivation has to be determined for each specific organism and depends, for example, on layer thickness and sample type. Precision System Science cannot guarantee complete eradication of specific pathogens.

9. 2. 1. Switching on the UV lamp

Make sure that the door is closed. In the MENU Screen, press “1” to select the UV light function.

```
DD MMM YYYY HH:MM
START:Run 1:UV
2:Man 3:Test 4:Setup
Key:START, 1, 2, 3, 4
```

The following screen appears.

```
Decontamination
Set Time: 30 min.

Key:0-9, ENT, ESC
```

Use the keys “0” through “9” to set the duration of the decontamination time. The minimum time is 30 minutes, and the maximum time is 330 minutes. The default is 30 minutes.

After setting a valid time, press the “ENT” key. The following screen appears.

```
Decontamination
Time: 30 min.
Run:START
Key:START, ESC
```

If you enter an invalid time (<30 min. or >330 min.), the following screen will appear.

```
UV DECONTAMINATION
Number must be
between 30 and 330
Key:ESC
```

After entering a valid time, press “START” to switch on the UV lamp. The stage will move slowly back and forth under the UV light. During the UV run, the following screen appears.

```
DECONTAMINATION>Run
TotalTime: TT min.
LeftTime: LL min.
Key: STOP
```

“TT” indicates the total time (in minutes), and “LL” indicates the amount of time left. At the end of the run, the following screen appears.

```
DECONTAMINATION>Run
UV lamp cooling

Please stand by
```

For user safety, UV lamp cools for approximately 3 minutes. The door cannot be opened until after the cooling time has elapsed. After cooling, the “MENU Screen” appears.

9. 2. 2. Switching off the UV lamp

During a manual UV run, you can abort the run by pressing the “STOP” key. The following screen appears

```
Attention:
UV decontamination
not finished.
Continue: START/STOP
```

Press “STOP” again to abort the UV run. Press “START” will cause the UV run to continue.

9. 2. 3. Lifetime reminder of the UV lamp

The lifetime of the UV lamp is limited to 5000 cycles. The instrument will remind you when the UV lamp will expire by displaying the following screen.

```
UV Lamp Reminder:
UV lamp expires soon
UV runs left: XXXX.
ENT=continue
```

Beginning 50 cycles before the 5000-cycle limit, the instrument will display this screen every time the instrument is switched on. "XXXX" indicates the number of cycles remaining. If this number is "0", the UV lamp needs to be replaced. Contact Precision System Science for replacement of the UV lamp.

9. 3. Setup Screen

Setup Screen is displayed by pressing "4" key while MENU Screen is displayed. Press "ESC" key while Setup Screen is displayed to display MENU Screen again.

```
DD MMM YYYY HH:MM
START:Run 1:UV
2:Man 3:Test 4:Setup
Key:START, 1, 2, 3, 4
```

```
SYSTEM SETUP
1:Date      2:Time
3:Serial Port4:PM
Key:1, 2, 3, 4, ESC
```

9. 3. 1. Setting the date

Press "1" in the System Setup menu. The following screen appears.

```
SETUP: DATE
DD MM YYYY
Key:
Up, Dn, SHIFT, ENT, ESC
```

Set the day, month, and year. Press "SHIFT"-down arrow to move the cursor right, from DD (day) to MM (month) to YYYY (year). Press "SHIFT"-up arrow to move the cursor left, from YYYY to MM to DD. Press the up arrow or down arrow to increase or decrease the value of the selected field. After setting the date, store the setting by pressing "ENT". Press "ESC" to leave the date unchanged.

9. 3. 2. Setting the time

Press "2" in the System Setup menu. The following screen appears.

```
SETUP: TIME
HH:MM
Key:
Up, Dn, SHIFT, ENT, ESC
```

Press "SHIFT"-down arrow to move the cursor right, from HH (hours) to MM (minutes). Press "SHIFT"-up arrow to move the cursor left, from MM to HH.

Press the up arrow or down arrow to increase or decrease the value of the selected field.

After setting the time, store the setting by pressing "ENT".

Alternatively, press "ESC" to leave the time unchanged.

9. 3. 3. Setting the serial port

This setting configures the serial port for use with a PC as the output device for the report file.

Press "3" in the system setup menu to change the setting of the serial port.

The following screen appears.

```
SETUP: SERIAL PORT
Current: CS
Set:     NS
Key:Up, Dn, ENT, ESC
```

"CS" (current setting) indicates the current setting of the serial port as "PC", or "Not Used".

Press the up arrow or the down arrow to change the "NS" (new setting) field to "PC", or "Not Used".

In case of "Not Used", report file will not be generated/sent.

Store the new setting by pressing "ENT". Alternatively, press "ESC" to leave the current setting unchanged.

9. 3. 4. Setting the preventive maintenance reminder

Press "4" in the system setup menu to change the setting of the preventive maintenance reminder.

The following screen appears.

```
SETUP: REMINDER
PM Interval

Key:Up, Dn, ENT, ESC
```

Press the up arrow or the down arrow to change the "Interval" field to "1/2 year" (semiannual) or "1 year" (annual).

After setting the new interval, store the setting by pressing "ENT".

Alternatively, press "ESC" to leave the current interval unchanged.

9. 4. Test Screen

Test Screen is displayed by pressing “3” key while MENU Screen is displayed. Press “ESC” key while Test Screen is displayed to display MENU Screen again.

```
DD MMM YYYY HH:MM
START:Run 1:UV
2:Man 3:Test 4:Setup
Key:START, 1, 2, 3, 4
```

```
TEST
1:Axis 2:Temp
3:Serial 4:Version
Key:1, 2, 3, 4, ESC
```

9. 4. 1. Axis Test Screen

Axis Test Screen is displayed by pressing “1” key while Test Screen is displayed.

```
TEST:AXIS
insert disposables
START:Run
Key:1, 2, 3, 4, ESC
```

- “Start” key : Press this key to check all axes operation. Use this function to check where a problem occurred during a run. Set all disposables before executing this test.
- “ESC” key : Press this key to display Test Screen.

9. 4. 2. Temp Test Screen

Temp Test Screen is displayed by pressing “2” key while Test Screen is displayed.

```
TEST: TEMPERATURE
set temp: SS.S C
START: Run
Key:Up, Dn, START, ESC
```

“SS.S” indicates the set temperature in degrees Celsius. Press the up arrow or the down arrow to increase or decrease the temperature. The upper limit is 99°C. Press “START” to start the heating process. The following screen appears.

```
TEST: TEMPERATURE
Temp: ss. s C
actual: aa. a C
Key:ESC
```

“ss.s” indicates the set temperature, and “aa.a” indicates the current temperature. “r” indicates the result, showing “O” if the temperature is within a given range or “X” if the temperature is outside the given range.

9. 4. 3. Serial port test Screen

Serial port test screen is displayed by pressing “3” key while Test Screen is displayed.

```
TEST: SERIAL PORT
1:PC
2:Bar code
Key:1, 2, ESC
```

PC

Press “1” in the serial port test screen to test the PC communication. The following screen appears.

```
TEST: PC
Target:PC
START:Run
Key:START, ESC
```

Press “START” to send a test string to the PC. The following screen appears.

```
TEST: PC
Target:PC
Result: PASSED
Key:ESC
```

If the transmission is successful, the result will show “PASSED”. If not successful, it will show “FAILED”.

Bar code reader

Press “2” in the serial port test screen to test the bar code reader. The following screen appears.

```
TEST:

Key:ESC
```

Use the bar code reader to read a bar code.
When a new bar code is read, the previous bar code will be overwritten.
A beep sounds after a successful scan of the bar code.
The following screen appears, showing up to 55 digits.

```
TEST:BBBBBBBBBBBBBBBB
BBBBBBBBBBBBBBBBBBBB
BBBBBBBBBBBBBBBBBBBB
Key:ESC
```

“B” indicates the individual digits of the bar code.

9. 4. 4. Version Screen

Version screen is displayed by pressing “4” key while Test Screen is displayed.
The following screen appears.

```
TEST: VERSION
Firmware: VersionNo

Key:ESC
```

“VersionNo” indicates the current version of the firmware.
Press “ESC” to return to the test screen.

10. Bar code reader (Option)

The bar code reader is preset to read the following types of bar codes.

- Code 39
- Code 128
- QR Code
- Data Matrix

To read a bar code, press the button located on the inner side of the handle of the bar code reader.

A red light appears.

Hold the bar code reader in front of the bar code at a distance of approximately 20 mm.

A beep will sound to confirm that the bar code has been read.

The bar code will be displayed on the screen.

11. Report file

The magLEAD 12gC will generate a report file during the protocol run. The report file contains the fields described in the table below.

Note

For generating and sending a report, please confirm the serial port setting. Please refer to the section 9.3.3.

Up to 10 report files can be stored temporarily on the magLEAD 12gC. When additional files are stored, the oldest report files will be deleted. The following screen appears.

<p>Caution: Memory full Oldest report file will be erased 1:Cont ESC:abort run</p>

Press "1" to delete the oldest report file and continue the protocol run. Alternatively, press "ESC" to abort the protocol run.

Contents of Report file

Parameter	Example output	Description
REPORT - FILE magLEAD 12gC:		Title of report file
Serial no. magLEAD 12gC:	12C1502A0001	Serial number stored on the magLEAD 12gC
User ID:	9267	User ID, set during protocol run Can be a number or a name scanned with the bar code reader Maximum of 9 characters
Firmware version:	V1.0.0	Current firmware version
Installation date of instr.:	Jan 07, 2015	Installation date, set the first time the magLEAD 12gC is powered Stored permanently on the magLEAD 12gC
Weekly maintenance done on:	Jan 14, 2015	When you accept the weekly maintenance reminder, the date is stored and is indicated here
Yearly maintenance done on:	Jan 07, 2015	When you accept the annual maintenance reminder, the date is stored and is indicated here
Date of last UVrun:	Jan 16, 2015	Date of last UV run recorded and stored
Start of last UVrun:	14:04	Start time of last UV run
End of last UVrun:	14:34	End time of last UV run
Status of last UVrun:	o.k.	Status of the last UV run can show ■ o.k.

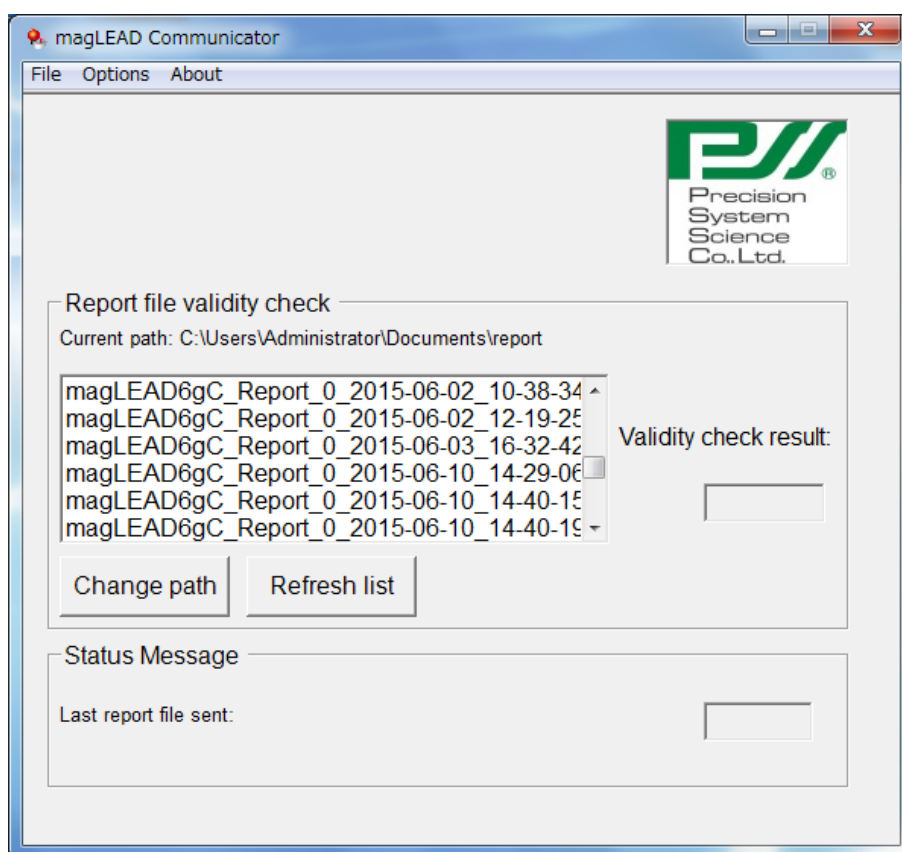
		<ul style="list-style-type: none"> ■ UV run aborted ■ UV lamp expired
Protocol name:	Investigator	Protocol name stored on magLEAD 12gC Card and copied into report file
	Trace	Additional protocol name (specifies the protocol if there are multiple protocols on the magLEAD 12gC Card)
Date of run:	Jan 14, 2015	Time stamp for date of run given through internal clock and calendar
Start of run:	15:13	Time stamp for start of run given through internal clock and calendar
End of run:	15:43	Time stamp for end of run given through internal clock and calendar
Status run:	o.k.	<p>The status of the run can show</p> <ul style="list-style-type: none"> ■ o.k. ■ not o.k. ■ aborted
Error code:	21	See section 7.2 for error codes
Sample input volume[ul]:	300	Sample input volume in microliters, depending on the protocol
Elution volume[ul]:	50	Elution volume in microliters, depending on the protocol
Channel 1:		Information for channel 1 begins here
Sample ID:	8730	Sample ID, defined by the bar code system of the user Maximum of 20 characters
Reagent kit name:	MagDEA Dx SV	Reagent kit name defined by barcode reading.
Reagent lot number:	1151234567	Reagent lot number defined by barcode reading.
Reagent expiry date:	201602 (In this case, February, 2016)	Reagent expiry/expiration date. (This information could be inputted by only barcode reading.)
Assay kit ID:		N/A
Note:		N/A
Channel 2:		Information about channels 2–12 begins here (same format as above for channel 1)

12. magLEAD Communicator (Option)

magLEAD Communicator is a software program that runs on a PC. The software receives the report file and stores it in a folder that you define. After the PC has received the report file, you can use and process the file with a LIMS (Laboratory Information Management System) or other programs.

12. 1. User interface

The main window shows the list of report files received. Click the “Refresh list” button to update the list. Select a file by single-clicking on the name. The software will perform a checksum test on the file. The result is shown under “Validity check result”.

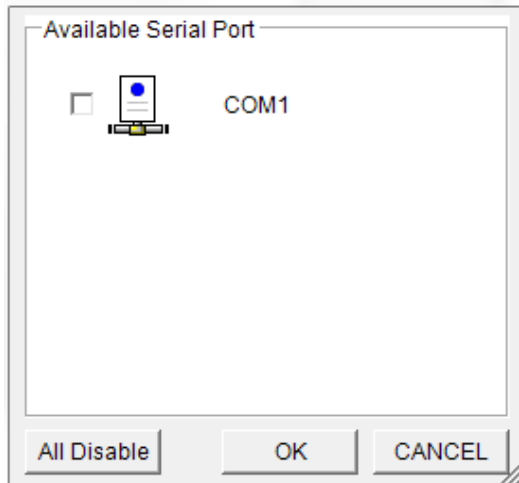


The report file name contains the following components.

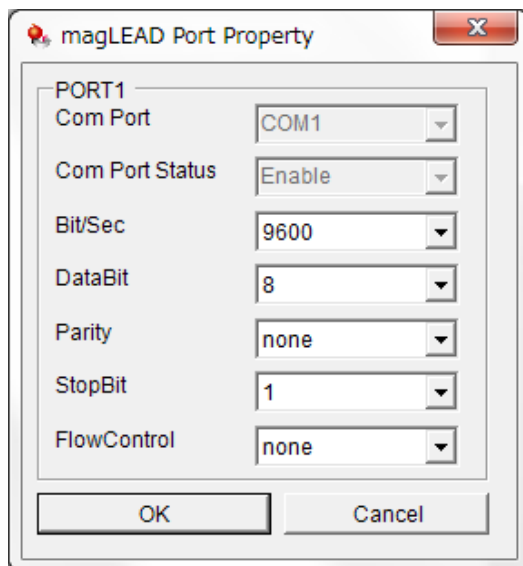
- Title (e.g., magLEAD Report)
- Serial number of the magLEAD
- Date in format YYYY-MM-DD
- Time in format HH-MM-SS
- File extension *.csv (comma-separated value)

The date and time are when the report file was received by the PC.
The “Status Message” panel displays the name of the last report file that was sent.

Select “File” to exit the graphical user interface.
Select “Options” to display the following window showing the magLEAD 12gC serial ports.



COM1 should already be selected.
You can check the serial settings by checking one of the boxes.
The following window opens.



The default settings are as shown above:
baud rate of 9600 bits/s, 8 data bits, parity none, 1 stop bit, flow control none.

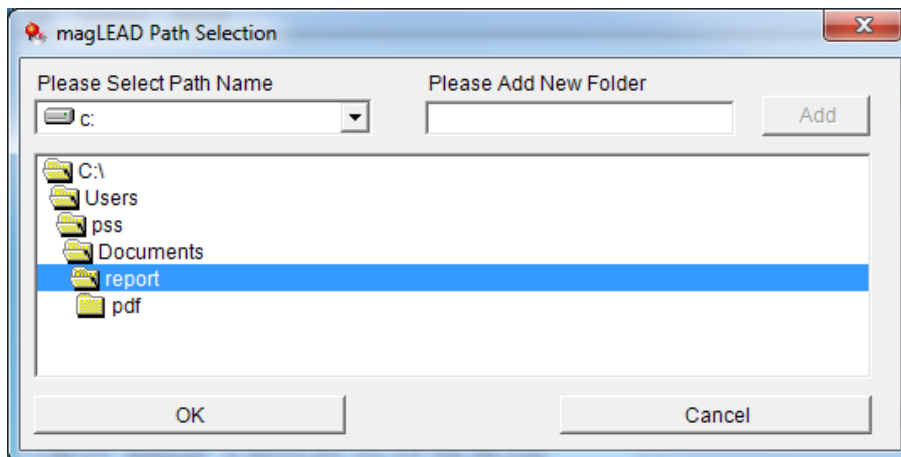
Select "About" in the main window to show the version of the magLEAD Communicator software.

magLEAD Communicator:
magLEAD Communicator Version 1.0.0.0
Copyright (C) 2014
PSS



O.K.

Click the "Change path" button in the main window to change the folder where the selected report file is stored.
The following window opens. Browse and select the folder.



13. Maintenance

Maintenance items to be done are listed below.

Item	Frequency	Done By
Cleaning of Stage and Racks	After every operation	User
Cleaning of Nozzles and Piercing Unit	After every operation	User
Greasing D-Rings	Once two weeks	User
Replacement of D-Rings	Once half year	Field Service



Caution

- Possibility of biohazard from samples or extracted/purified products could not completely be eliminated in operating the instrument. Use a mask, goggles and gloves in maintaining the instrument for your safety, according to the description in this book.
- Be sure that the instrument power is turned OFF, when doing maintenance work.
- Pay close attention when cleaning places where caution labels are attached.

Note

- Maintenance work shall be done as indicated, otherwise the results of extraction/purification runs may not be assured.
- Contact us for maintenance work that shall be done by Field Service personnel.
- Clean up Stage, Nozzles, Piercing Unit and Racks after shutting down the instrument every time.

13. 1. Cleaning Procedure

➤ Places to be cleaned :

- Tip/Tube Rack
- Reagent Cartridge Rack
- Nozzles
- Piercing Unit
- Beside above, all accessories and inside instruments.

➤ Cleaning Method :

- Choose liquid depending on the pollution status and wipe the polluted place using paper, such as Kim Wipe®, moistened with the liquid. Use a mask, goggles and gloves when cleaning the instrument for your safety.

- Water
- 70% Ethanol

Note

- Do not use alcohol when cleaning Clear Panel on Door. Use water for those parts.
- 70% Ethanol is an inflammable. When you use Ethanol 70%, please check close that there is no fire.

13. 2. D-Ring Maintenance

In order to assure complete connection and for prevention of leakage, it is recommended to implement maintenance of D-Rings once two weeks.

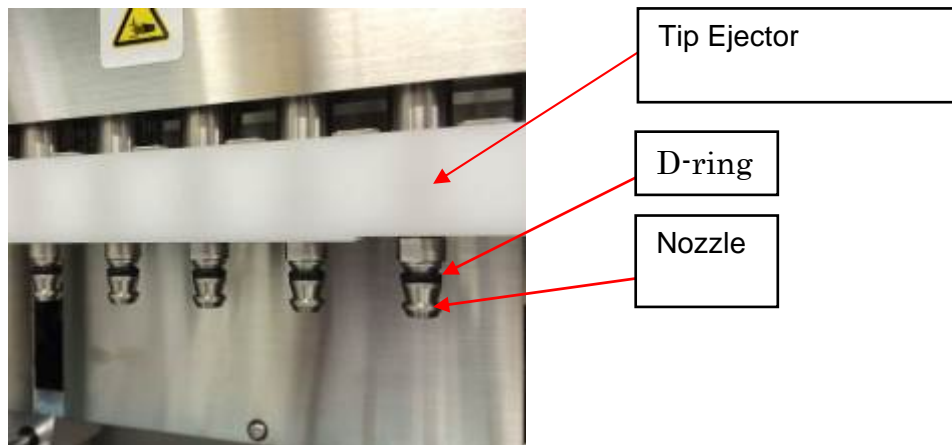
1. Wipe out old grease with paper or cloth, wearing gloves.



2. Take Silicon Grease slightly on fingers.



3. Put Silicon Grease on the surface of D-Rings (black rubber rings on nozzles.)



4. Wipe off excessive Silicon Grease pasted on the edges of nozzles and Tip Ejector with lint-free paper



Caution

- Excessive Silicon Grease may cause troubles for instrument operation, such as improper tip off action.

14. Troubleshooting

14. 1. Error Reported During Protocol Run

```
Error during process
Code:XXX
LineNo. = #####
Key:ESC to return
```

Screen shown above will be displayed, showing error code occurred in xxx.
(Refer to Chapter 15 for Error Code List.)

- ① When an error occurred during a protocol run, screen above is displayed, Alarm Lamp will blink with alarm sounding and the instrument operation is stopped.
- ② Error Code is displayed in the second line as “Code: XXX”. Take appropriate action against the error, referring to Error Code List.
The error code displayed above is needed when contacting us for technical support. Take note of the code.



Caution

- “LineNo.= #####” in the 3rd line indicates the line number of the protocol where the error occurred.
 - Protocol run interrupted by an error cannot be resumed.
- ③ Press “ESC” key after confirming the error shown to display MENU Screen.
 - ④ Press “1” key in MENU Screen to display Manual Screen.
 - ⑤ Press “2” key in Manual Screen to return Tips to Tip Holders and to home all axes.



Caution

- Start with steps described above when instrument stopped with Tips on Nozzles.
 - Keep Door closed when operating the instrument. Re-check that disposables have been set correctly.
- ⑥ Press “ESC” key after confirming that the instrument operation completed to display MENU Screen.

Note

- When the same error occurs in running same protocol after executing appropriate action against the error, contact us for technical support.

14. 2. Suspending or Aborting Protocol Run

While the protocol run is in the phase where data is being read (e.g., sample tube bar code information), you can stop the protocol run by following the instructions below.

1. Press "STOP". The following screen appears.

```
==== PAUSE ====  
START:Continue  
STOP: Stop  
Key:START, STOP
```

2. Press "STOP" again to abort the protocol, or press "START" to continue the protocol.

While the protocol run is in the phase where the instrument is actively processing samples, you can abort the protocol run by following the instructions below.

1. Press "STOP". The following screen appears.

```
Do you really want to  
abort the run ?  
  
Key:START, STOP
```

Note that the protocol has not stopped yet.

2. Press "STOP" again to abort the protocol.
The protocol run will be invalid and will be marked accordingly in the report file.
The following screen appears.

```
DD MMM YYYY HH:MM  
START:Run 1:UV  
2:Man 3:Test 4:Setup  
Key:START, 1, 2, 3, 4
```

Alternatively, if you do not want to abort the protocol at this point, press the "START" key.
In this case, the protocol run is not stopped and should not be affected.

3. After aborting a protocol, press “2” to display “Manual” in the display. Press “2” again to return the tips to the tip rack and to return the modules to their home positions.



Caution

- Start with steps described above when instrument stopped with Tips on Nozzles.
- Keep Door closed when operating the instrument. Re-check that disposables have been set correctly.

14. 3. Frequently Reported Problems

Problem	Possible Cause	Countermeasures To Be Taken
Back light of the Display Is not lit	AC Power Cable is not connected properly.	Check for connection of AC Power Cable. Be sure to use Power Cable supplied with instrument. ※Do not use Power Cable other than supplied with the instrument.
	Fuse is broken	Contact us when fuse needs to be replaced.
Nothing is displayed on the display.	IC Card has not been inserted correctly.	Turn the instrument power off and re-insert IC Card. Be sure that IC Card is inserted to its end.
Error code is displayed	Causes vary by error code.	Record the error code displayed and take appropriate countermeasure, referring to List of Error Codes. If the countermeasure taken does not eliminate the problem, contact us for assistance.
Protocol was started with incomplete setting of Tips or Tubes.	--	Be sure to confirm appropriate setting of reagents and disposables, before starting protocol run. If you want to add disposables after protocol started, press "STOP" to abort instrument operation. It is strongly recommended to restart the protocol run from the beginning after completion of adding disposables. If you want to continue the protocol run from halted point after adding disposables, you shall be responsible for the result. * When Front Door is opened after halting operation, power to the motors is shut by safeguard, resulting displacement of stopping positions of motors.
Protocol run Was stopped.	Front Door was opened during the run.	Be sure not to open Door during a protocol run. When you want to halt the protocol run, press "STOP" key. You can resume the run again. * That if the run is resumed from stopped point, the result may not be correct, because the stop positions of motors could be shifted when Door is opened. This is because motors are deactivated for safety.
Liquid leakage from Tip-end or big difference in liquid level among lanes.	Silicon Grease on D-Ring has been lost or D-Ring is deteriorated.	Grease up D-Rings or replace D-Rings. It is recommended that greasing of D-Rings is made by trained service personnel. *Pay close attention when you replace D-Rings by yourself.

15. Error Code List

Code No	Description	Countermeasure to be taken
10	Zero-returning failure due to an operation other than a protocol	contact us for assistance.
11	End-limit error due to an operation other than a protocol	contact us for assistance.
12	Z-axis zero-returning failure during a protocol run	contact us for assistance.
13	P-axis zero-returning failure during a protocol run	contact us for assistance.
14	M-axis zero-returning failure during a protocol run	contact us for assistance.
15	Y-axis zero-returning failure during a protocol run	contact us for assistance.
16	Z-axis end-limit error during a protocol run	contact us for assistance.
19	Y-axis end-limit error during a protocol run	contact us for assistance.
20	Z-axis time-out error during a protocol run	contact us for assistance.
21	P-axis time-out error during a protocol run	contact us for assistance.
22	M-axis time-out error during a protocol run	contact us for assistance.
23	Y-axis time-out error during a protocol run	contact us for assistance.
24	Door open error when starting an operation	Close Door and follow the operation in sections 14.
25	Bottom sensor of pipettor head (Z-axis) activated during an operation	Check if something obstructed the motion of the corresponding unit. Remove the obstacle if any and try homing operation of all axes, according to the description in sections 14.
26	Communication error between heating block and temperature controller, or card is not a magLEAD 12gC Card	Turn the instrument power off and wait about 10 seconds and then turn the instrument power on.
27	Communication error between motors and driver board.	
30	Protocol import error	contact us for assistance.
31	Door lock error during operation	contact us for assistance.
100	Protocol checksum error	contact us for assistance.
101	VP table checksum error	contact us for assistance.
110	System error	contact us for assistance.

Note

- Most of the causes of errors listed above are originated by inadequate setting of disposables/accessories or by opened door. Be sure to check those before restarting protocol run.
- When you had error codes other than listed above or the error could not be eliminated by taking countermeasure described, contact us with recording the error codes.

Note

- Instrument Specifications and appearance of the product may be changed without prior notification.



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