



# MS Reader User Manual



For Veterinary Use

MS Reader 03.2015 V2

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## **WARNING**

**Please read the User's Manual before you operate this instrument.**

**1) Never use *the bent strip* and make sure *to remove excess urine (or milk)* in the strip by using clean absorbent soft tissue paper.**

**2) Clean instrument daily to prevent malfunction.**

***To Clean the instrument, Refer to section 8. How to Clean the Strip Loading Plate after Use.***

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



**BIOHAZARD: Wear personal protective equipment. Use universal precautions. Refer to Appendix A for recommended precautions when working with bio hazardous materials.**

## **1. Introduction**

Urinalysis is routinely performed by veterinary technicians in veterinary clinics. It consists of a number of relatively simple and inexpensive tests which provide a great deal of information to the veterinarian.

Urinalysis is an important tool in disease detection, as well as monitoring and screening animal health. Abnormalities can be indicative of diseases of the urinary system as well as other organ systems, including liver function, acid-base status, and carbohydrate metabolism.

Milk BHB test is a semi-quantitative, colourmetric test that measures the level of  $\beta$ -Hydroxybutyrate in milk. It is useful diagnostic tool for determining if individual cows are experiencing elevated levels of ketones.

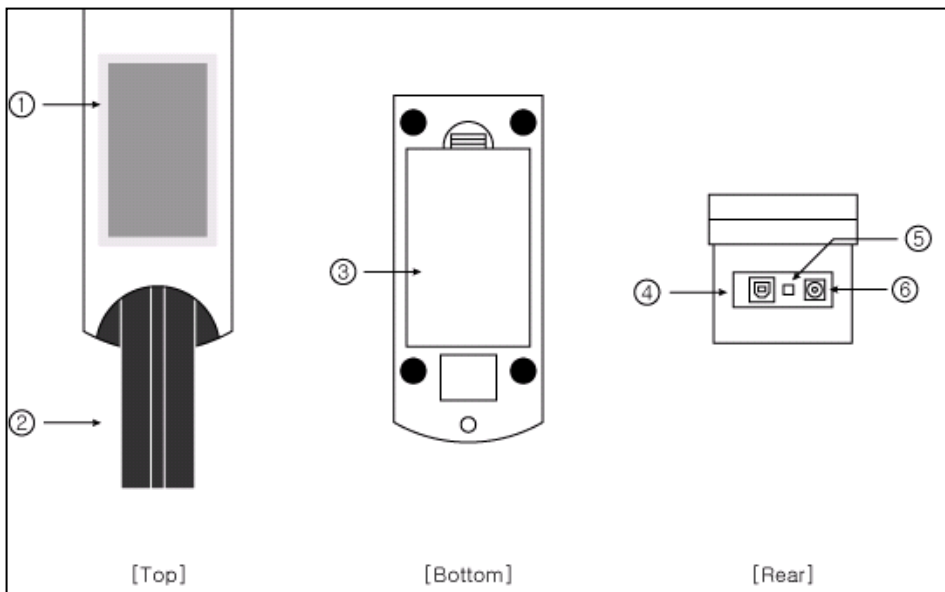
## **2. System Description**

### **2.1 Principles of Measurement**

The Insight Urinalysis MS Reader is a urine & milk BHB strip analysing device. The reader is semi-automatic but the forwarding, reading and evaluating are automated. The only thing that the operator needs to do is to dip the strip into the urine sample and place it on the Strip Loading Plate.

The Insight Urinalysis MS Reader is a reflectance photometer. The strip is illuminated by white light and the reflected light from the strip is detected by the Sensor. The RGB signals are digitised and this digitised image is interpreted by the processor. The intelligent image analyser SW locates the strip and the pads, and based on these colour data the parameter values are determined. The results including the date and time of the measurement, sequence number and ID are stored.

## 2.2 Components and Functions



View from above

View of rear

### Component

### Function

- 
- ① **Full-colour ‘touch-screen’ TET LCD:** Displays the result and the process of test
  - ② **Strip Loading Plate:** Moves the test strip to the measuring position
  - ③ **Battery cover**
  - ④ **USB Port:** Serial interface port used for connection to a PC or central laboratory (host) computer
  - ⑤ **Power Button:** Turns on/off the system
  - ⑥ **Power Connector:** Socket used to connect the analyser to the external power supply

## 2.3 Technical Information

Measurement Method	Reflectance Photometer
Wave Length	470, 530, 626 nm
Dimensions	Width(188mm), Depth(74mm), Height(77mm)
Weight	460g
Power Supply	Input: 100-240V / Output: DC 12V, 3.33A
Battery	AAA 1.5V * 8ea
Throughput	40-50 / Hour (120 tests/hour under 'Quick' mode)
Memory	Up to 2000 samples
Operating Conditions	Temperature (2 °C-30 °C) / Humidity (10%-70%)
Serial Communication	USB Port
Options	External Printer

## 2.4 Interfacing System

Users can interface Insight Urinalysis MS Reader to Host computer through the USB port.

Baud Rate: 38400, Data bit: 8, Parity: none

### **3. Instrument Installation**

#### **3.1 The instrument and parts**

Insight Urinalysis MS Reader: 1EA

Strip Loading Plate: 1EA

AC adapter 100-240V / 12V DC 3.33A: 1EA

Power Cable: 1EA

Operating Manual

USB cable

#### **Optional accessories**

External Printer for exclusive use with the analyser

#### **3.2 Environmental & Storage Requirements**

##### **1) Environmental Requirements**

As with all sensitive electronic instruments, prolonged exposure to excessive humidity and temperature should be avoided. Place the instrument where it will not be subjected to extreme temperature variations. Avoid proximity to open windows, direct sunlight, ovens, hot plates, open burners, radiators, and dry ice baths.

##### **2) Storage and Handling**

Avoid following locations to prevent malfunctioning of the analyser

- High humidity, high-temperature, and low-temperature storage places
- Dusty places
- Very hot places near heating appliances, etc.

Do not leave the instrument exposed to direct sunlight for long periods of time. This may deform or discolour the instrument body and cause

malfunctioning. Do not touch the power-plug with a wet hand. It causes an electric shock. Use a dry towel after cleaning by a neutral detergent or water. Do not use benzene, thinner, gasoline, etc. to clean the instrument body. This may discolour the body of instrument.

### 3.3 Cautions & Warnings

- **AC adaptor**

**(AC CORD Type, Input Voltage: AC 100~240V, 50/60Hz, 1.2A Output Voltage: DC 12V/3.33A)**

Handle the AC adaptor carefully. Improper handling is dangerous.

- Do not touch it with wet hands.
- Do not place heavy objects on top of it.
- △ Be sure to connect only the AC adaptor provided with the instrument
- △ Disconnect the AC adaptor from the power outlet if the instrument is not going to be used for a long time.

- **Instrument**

- ⊘ No altering or remodeling. This can cause malfunction.
- ⊘ No dropping or strong impacts. This can damage the instrument.
- △ Do not forcibly pull/push the Strip Loading Plate. It may cause malfunction.
- △ Be sure to read carefully user's manual before operating the instrument.



## 4. How to operate instrument

Turn ON the power button in the rear of instrument. Automatically the reader executes System Initialize [Fig 1.1] and then the ‘Standby’ mode shall be shown as [Fig 1.2].



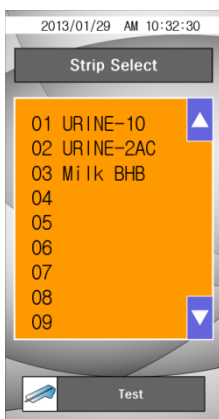
[Fig.1.1] System Initialize



[Fig.1.2] Standby mode

### 4.1 Strip Type Selection

Touch the strip type in order to change the strip to be tested. Use the up (▲) and down (▼) symbol to scroll through the list until the strip type you want to use is searched.



Touch the strip type to confirm and the selected strip type colour change from black to blue. Touch **Test** and return to the Standby mode screen.

⚠ Do not use any reagent strip product other than what is shown on the display. Using the wrong reagent strip will give you incorrect results.

[Fig. 1.2.1] Strip Select

## 4.2 Seq (Sequence)

The test sequence numbers run from 1 to 2000 and can be reset.



Use the move left key (◀) or C (clear) to erase the existing sequence number.

Touch **Test** to confirm the reset or to leave the screen if you have not selected the option to reset the number. You will return to the Standby mode screen.

[Fig. 1.2.2] Seq Set

## 4.3 ID No



Input patient/sample's ID number (Max. 10 numbers) by touching number keypad of display.

Use the move left key (◀) or C (clear) to erase the existing ID number.

Touch **Test** when you finish inputting the ID to return to the Standby mode screen.

[Fig. 1.2.3] ID No Set

## 4.4 Colour



[Fig. 1.2.4] Colour Select

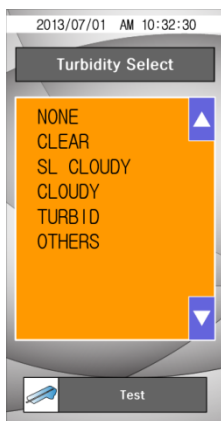
For urine test, the urine sample must be visually observed and then the appropriate colour must be selected.

Touch the colour name to confirm, then the selected colour name area change from black to blue colour.

Touch **Test** to return to the Standby mode screen.

**For Milk BHB test, this function is not applied**

## 4.5 Turbidity



[Fig. 1.2.5] Turbidity Select

For urine test, the urine sample must be visually observed and then the appropriate Turbidity must be selected.

Touch Turbidity name to confirm, then the selected turbidity name colour change from black to blue.

Touch **Test** to return to the Standby mode screen.

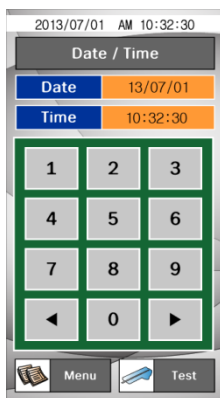
**For Milk BHB test, this function is not applied**

## 4.6 Menu



[Fig. 1.3] Menu

### 4.6.1 Date/Time



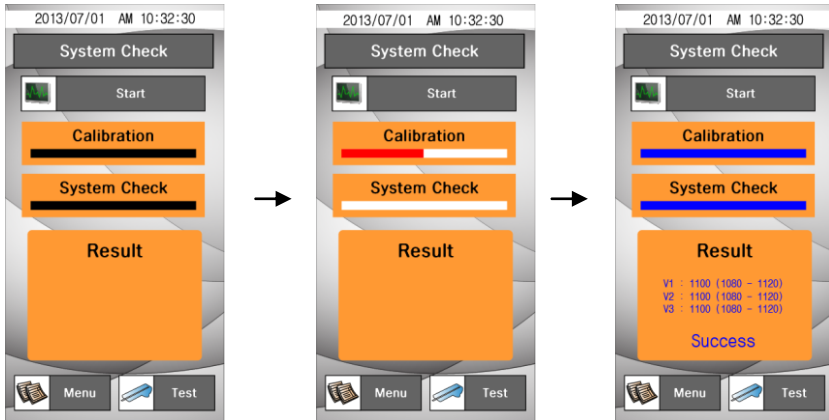
[Fig. 1.3.1] Date/Time

The date and time are displayed on the Select screen and are recorded with test results. If the date and time values are incorrect, change it by touching number key on the display.

Touch **Test** to return to the Standby mode screen.

Touch **Menu** to return to the **Menu** screen.

## 4.6.2 System Check



[Fig. 1.3.2] System Check

**System Check** is used for checking aging processes of the optical system and variation of other internal conditions of instrument. If the values are within the normal range values on the result, “**Success**” message will be displayed.

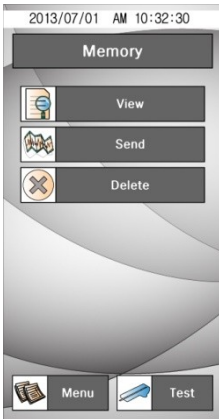
If the values are not within the normal range values on the result, “**Fail**” message is displayed.

△ If **Fail** message is displayed. **Please retry for System Check !!**

Touch **Test** to return to the Standby mode screen.

Touch **Menu** to return to the **Menu** screen.

### 4.6.3 Memory



This allows managing the result data saved in the memory, touch **Memory** on the MENU.

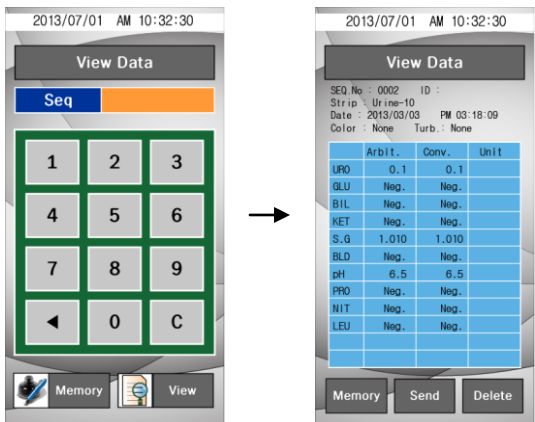
Touch **Test** to return to the Standby mode screen.

Touch **Menu** to return to the **Menu** screen.

[Fig. 1.3.3] Memory

#### 4.6.3.1 View Data

This allows seeing the saved result selectively



[Fig. 1.3.4] View Data

After selecting the Seq. number, touch **View** to see the saved result. The data of the selected SEQ number shows on the screen.

### 4.6.3.2 Send Data



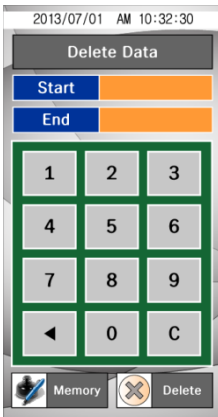
This allows sending the saved data to PC.

After selecting the **Start**-number and **End**-number of the result data's Seq., touch the **Send** icon, then the selected data is sent to PC.

⚠ Confirm the condition of connecting communication with PC before performing the command.

[Fig. 1.3.5] Send Data

### 4.6.3.3 Delete Data



This allows deleting the saved data selectively.

After selecting the **Start**-number and **End**-number of the result data's Seq., touch the **Delete** icon, then part of saved data is deleted.

[Fig. 1.3.6] Delete Data

## 4.6.4 Instrument Setting



It has a series of screen to control & change the Result format, System Setting and %R value.

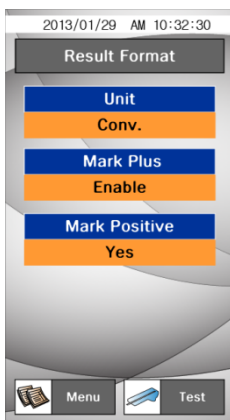
Touch **Test** to return to the Standby mode screen.

Touch **Menu** to return to the **Menu** screen.

[Fig. 1.3.7] Instrument Setting

### 4.6.4.1 Result Format

This allows selection and change of the result display format.



**Unit:** Select the result format (**Conv.** / **SI**)

**Mark Plus:** Select **Enable** if you wish to make plus symbol (+) instead of clinical units such as mg/dl or mmol/L shown in the results.

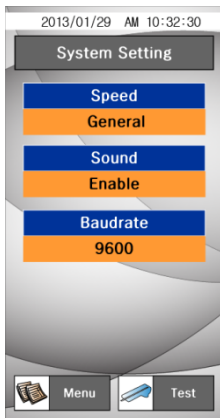
**Mark Positive:** Allows you to choose whether the positive results are highlighted in red colour. (**Yes/No**)

[Fig. 1.3.8] Result Format



#### 4.6.4.2 System Setting

This allows selecting the measurement Speed, Sound and Baudrate.



**Speed:** To select the measurement speed.

**(General/Quick)**

**Sound:** To select the audible tones while operating reader.

**(Enable/Disable)**

**Baudrate:** To select the speed rate of transferring data with each other between the reader and PC.

**(9600/38400/19200)**

[Fig. 1.3.9] System Setting

#### 4.6.4.3 Change %R



**Password Input**

**Item Selection**

**Grade Selection**

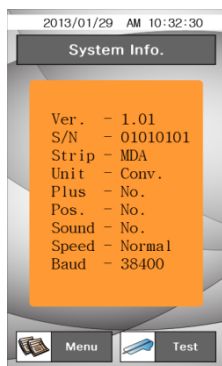
**Change Value**

[Fig. 1.3.10] Change %R

This allows changing the %R value of each parameter's concentration value limit. Select the parameter and the value change by using Direction key. (◀ ▶)

### 4.6.5 System Info.

This screen has information about the analyser.



It shows the current System information. The information can be changed if you change the setting at Result format and System Setting menu.

[Fig. 1.3.11] System Info.

## 5. How to Use

### Step 1.

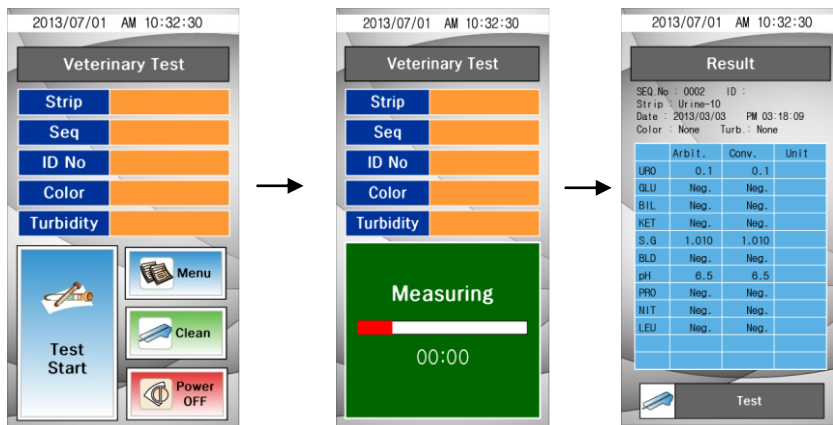
Power-‘on’ and let the initial screen for starting tests displayed through the process of the calibration.

### Step 2.

Dip a strip into fresh urine sample and take it out immediately. Remove excessive urine or milk by touching the edge of strip on a soft absorbent tissue. Place the strip on the plate loader. Touch the **Test Start**.

### Step 3.

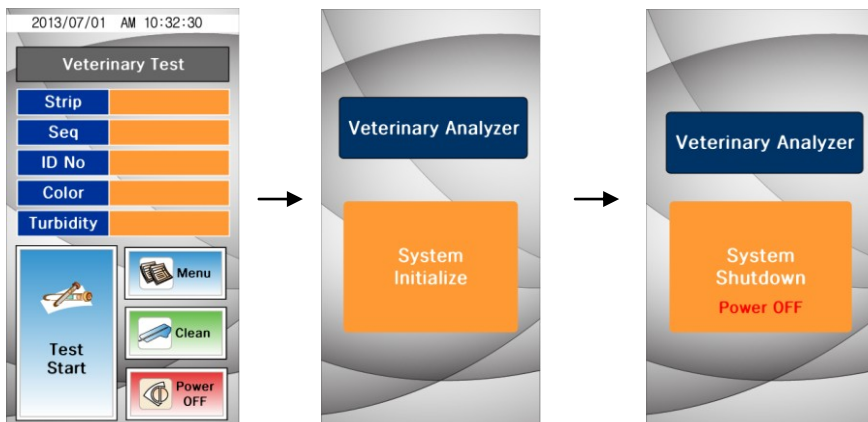
After completing the test and analysing the result, the result is displayed.



These results can be also transmitted into a PC to be observed. (Refer to the View Data function by clicking Memory button for reconfirming the test result.)

### Step 4.

Touch the **Power OFF** to finish the test. To completely finish the test, press the main power button in the back of instrument.



## 6. Table of Results

Item	Abbreviation	Unit		Result of Reading						
Uribilinogen	URO	Con.	mg/dl	Norm	1	2	4	8		
		SI	μmol/l	Norm	16	33	66	131		
		Arb	E.U./dL	norm	norm	+1	+2	+3		
Glucose	GLU	Con.	mg/dl	Neg	100	250	500	1000		
		SI	mmol/l	neg	5.5	14	28	55		
		Arb		neg	±	+1	+2	+3		
Bilirubin	BIL	Con.		neg		Small	Moderate	Large		
		SI								
		Arb		neg		+1	+2	+3		
Ketones	KET	Con.	mg/dl	neg	5	15	40	100		
		SI	mmol/l	neg	0.5	1.5	4	10		
		Arb		neg	±	+1	+2	+3		
Specific Gravity	SG	Con.		1.000	1.010	1.020	1.030	1.040	1.050	1.060
		SI								
		Arb								
Blood	BLD	Con.	RBC/μl	neg	trace	10	50	250		
		SI								
		Arb	neg	±	+1	+2	+3			
pH	pH	Con.		5	6	6.5	7	8	9	
		SI								
		Arb								
Protein	PRO	Con.	mg/dl	neg	trace	30	100	300	1000	
		SI	g/l	neg	trace	0.3	1	3	10	
		Arb		neg	±	+1	+2	+3	+4	
Nitrite	NIT	Con.		neg	pos					
		SI								
		Arb								
Leukocytes	LEU	Con.	WBC/μl	neg		25	75	500		
		SI								
		Arb	neg	+1		+2	+3			
Ascorbic Acid	AsA	Con.	mg/dl	neg		20	40			
		SI	mmol/l	neg		1.2	2.4			
		Arb	neg	+1		+2				
Microalbumin	ALB	Con.	mg/l	10	30	80	150			
		SI								
		Arb								
Creatinine	CRE	Con.	mg/dl	10	50	100	200	300		
		SI	mmol/l	0.9	4.4	8.8	17.7	26.5		
		Arb		10	50	100	200	300		
Albumin to Creainine ratio	A:C	Con.	mg/g	<30		30-300		>300		
		SI	mg/mmol	<3.4		3.4-33.9		>33.9		
				Normal		Abnormal		High Abnormal		
Protein to Creainine ratio	P:C	Con.		<0.5		0.5 - 1		>1		
		SI								
					Normal		Abnormal		High Abnormal	

## 7. How to Change the Strip Loading Plate before Use

Select the strip loading plate types (Long or Short) as per strip length

**Step 1.** Touch the Clean icon  and separate the Strip Loading Plate from the body of the instrument.

**Step 2.** After the cleaning, put back the Strip Loading Plate on the reader and touch the **Long** or **Short** icon.

**Step 3.** Then the Strip Loading Plate is moving in its original position. If the loader is not retreated immediately, slightly push the loader.



**Step 4.** The Strip Loading Plate slightly goes in and comes out then it is ready to start the test.

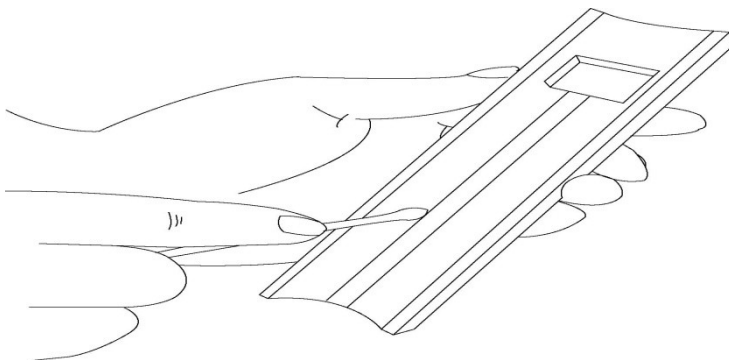
## 8. How to Clean the Strip Loading Plate after Use

Clean the dirty 'Strip Loading Plate' by using a neutral detergent or water-wet towel or swab. Do not use volatile matters like thinner, gasoline and benzene for cleaning the body. It is better to clean the Strip Loading Plate everyday because the rest urine from the tested strip can smear on the 'Strip Loading Plate'.



**Step 1.** Touch the Clean icon and separate the Strip Loading Plate from the body of the instrument.

**Step 2.** Completely wipe the groove of the detached Strip Loading Plate with a water-wet swab.



**Step 3.** After the cleaning, put back the Strip Loading Plate on the reader and touch the use strip loading plate types (**Long** or **Short**) icon. Then the Strip Loading Plate is moving in its original position. If the loader is not retreated immediately, slightly push the loader.

**Step 4.** The Strip Loading Plate slightly goes in and comes out then it is ready to start the test.

## 9. Quality Control

Performance of reader result should be confirmed by testing known negative and positive specimen or controls whenever a new bottle is first opened or for calibration. **Water should NOT be used as a negative control.**

Controls should be tested after performing maintenance or service on the reader. Quality Control materials should be used in accordance with local, state, and/or federal guidelines.

- 1) Quantimetrix dipper urine dipstick control

(Homepage: [www.4qc.com](http://www.4qc.com))

- 2) Thermo SCIENTIFIC MAS UA Control

(Homepage: [www.thermoscientific.com](http://www.thermoscientific.com))

- 3) Bio-Rad Quantify Plus Control

(Homepage: [www.bio-rad.com](http://www.bio-rad.com))

**For Milk BHB test, this quality control is not applied**

## 10. Troubleshooting & Maintenance

### 10.1 Maintenance

No maintenance is required other than routine cleaning.

- Clean the outside of the Insight Urinalysis MS Reader body with a dry towel after wiping clean with a towel dampened by a neutral detergent or water.
- Do not wipe the body of the Insight Urinalysis MS Reader clean with benzene, thinner, gasoline, etc.
- **Do not force the Strip Loading Plate.** It works automatically. Refer to How to Clean the Strip Loading Plate after use of the user's manual.
- If you want to know detailed information for environmental factors and

cautions, refer to Specifications, Cautions & Warnings under User's manual.

## 10.2 Troubleshooting

SYMPTOM	POSSIBLE CAUSE	REMEDY
The Instrument does not operate normally.	No power.	Check the connection of instrument to the power supply using given adaptor.
Strip Loading Plate stops unexpectedly during operation.	Unstable electricity.	Use a rated current. Contact your local Customer Service Office if it doesn't operate correctly
Test results are not being transmitted into a PC.	<ol style="list-style-type: none"> <li>1. Disconnected a serial cable to your computer.</li> <li>2. User's program is not opened.</li> <li>3. Your serial port is not in a proper location.</li> <li>4. You have no serial port in your computer and only a USB port.</li> </ol>	<ol style="list-style-type: none"> <li>1. Check connection of a serial cable between the instrument and the computer.</li> <li>2. Open the User's program.</li> <li>3. Connect correctly a serial port.</li> <li>4. Purchase a cable to convert USB to Serial.</li> </ol>
Display a message "Wrong strip type"	Incorrect strip type select	Check the loading plate type. ->If you select short loading plate type, don't use long length strip type(over 5way)
Display a message "Loader error"	Incorrect put the loading plate type	Check the loading plate type. ->If you select short loading plate type, don't use long loading plate type.
Display a message "No Strip"	<ol style="list-style-type: none"> <li>1. No use strip</li> <li>2. Missing the calibration stick</li> </ol>	<ol style="list-style-type: none"> <li>1. Use to Strip</li> <li>2. Check the loading plate calibration stick</li> </ol>



## **Appendix A: Safety Information**

### **Protecting Yourself from Biohazards**

This information summarises the established guidelines for handling laboratory biohazards. This summary is based on the guidelines developed by the Centers for Disease Control, the Clinical and Laboratory Standards Institute, and the Occupational Safety and Health Administration.

Use this summary for general information only. It is not intended to replace or supplement your laboratory or hospital biohazard control procedures.

By definition, a biohazardous condition is a situation involving infectious agents biological in nature, such as the hepatitis B virus, the human immunodeficiency virus, and the tuberculosis bacterium. These infectious agents may be present in human blood and blood products and in other body fluids.

**The following are the major sources of contamination when handling potentially infectious agents:**

- needlesticks
- hand-to-mouth contact
- hand-to-eye contact
- direct contact with superficial cuts, open wounds, and other skin conditions that may permit adsorption into subcutaneous skin layers

-splashes or aerosol contact with skin and eyes.

**To prevent accidental contamination in a clinical laboratory, strictly adhere to the following procedures:**

-Wear gloves while servicing parts of the system that have contact with body fluids such as serum, plasma, urine, or whole blood

-Wash your hands before going from a contaminated area to a non-contaminated area, or when you remove or change gloves

-Perform procedures carefully to minimise aerosol formation

-Wear facial protection when splatter or aerosol formation is possible

-Wear personal protective equipment such as safety glasses, gloves, lab coats or aprons when working with possible biohazard contaminants

-Keep your hands away from your face

-Cover all superficial cuts and wounds before starting any work

-Dispose of contaminated materials according to your laboratory's biohazard control procedures

-Keep your work area disinfected

-Disinfect tools and other items that have been near any part of the system sample path or waste area with 10% v/v bleach

-Do not eat, drink, smoke, or apply cosmetics or contact lenses while in the laboratory

-Do not mouth pipette any liquid, including water

-Do not place tools or any other items in your mouth

-Do not use the biohazard sink for personal cleaning such as rinsing coffee cups or washing hands

Do not recap, purposely bend, cut, break, remove from disposable syringes, or otherwise manipulate needles by hand. Needlestick injuries may result.



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## MS Reader Registration Sheet

Please complete this Registration Sheet, and fax back within two weeks to your local distributor. This data is recorded in the Service Registration File, providing assistance for our Support Service.

**Serial Number of the Instrument:** \_\_\_\_\_

**Date of delivery:**

**Date of Installation:**

**The Institution / Laboratory Name:**

**Address:**

**Telephone Number:**



Woodley Equipment Company Ltd  
Old Station Park Buildings  
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