todylaboratories®

Urine Strips Reader-S300

CE IVD REF C20US1001

Urine Chemistry Analyzer Urine Strips Reader-S300 User Manual



1. INTRODUCTION

Urine test strips simplify laboratory diagnosis through ease of use, high sensitivity and specificity. These benefits allow you to identify pathological changes in the urine quick and reliably. The addition of the Urine Analyzer to the urinalysis process allows for standardization and efficiency of urine test by eliminating potential sources of error associate with the visual reading of test strips, such as improper lighting at the workplace, or different color discrimination by the user or different timing when the values are read. The urine test strips that shall be used with the instrument are multi parameter strips for the determination of specific gravity, pH, leukocytes, nitrite, protein, glucose, ketones, urobilinogen, bilirubin and blood in urine.

2. SYSTEM DESCRIPTION

2.1 Principles of Measurement

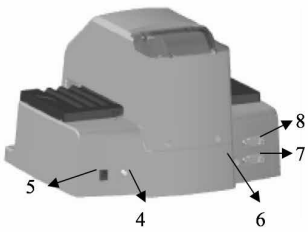
The Urine Analyzer is a urine strip reader and analyzer device for laboratories. The reader is semiautomatic; the forwarding, reading and evaluating are automated. The only thing the operator has to do is to dip the strip into the sample and place it on the strip loading plate.

The Urine Analyzer 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 digitized, and this digitized image is interpreted by the processor. The intelligent image analyzer SW locates the strip and the pads, and based on these color data the parameter values are determined. The results including the date and time of the measurement, sequence number and the ID are stored and printed out by the internal printer.

2.2 Components and Functions



View from above



View of rear

Component	Function
①Printer Cover	Can be lifted to insert paper.
②Strip Loading Plate	Moves the test strip to the measuring position.
③LCD Display / Key	with 6 function keys LCD screen demonstrates working process
④Power Switch	Can be ON or OFF with electronic power.
⑤Power Connector	Socket used to connect the analyzer to the external power supply.
⑥PS/2 Port	Keyboard Socket
⑦RS 232C Port (COM1)	Serial interface port used for connection to a PC or central laboratory (host) computer.
⑧RS 232C Port (COM2)	Connect Barcode Reader (scanner)

2.3 Technical Information

Measurement Method	Reflectance Photometer
Wave Length	460, 550, 650 nm
Dimensions	275*250*170mm
Weight	1300g
Power Supply	Input: 100-250V Output: DC 12V, 3A
Throughput	300 / Hour (Max 800 tests/hour)
Memory	2,000 samples
Printer	Thermal Printer
Serial Communication	RS232C interface port
Available extras	Keyboard / Barcode Reader (Scanner)

3. INSTRUMENT INSTALLATION

3.1 The instrument and parts

- Urine Analyzer
- Strip Loading Plate: Right 2EA
- AC adapter 100-240V / 12V DC 3A : 1EA
- Power Cable: 1EA
- Thermal printer paper: 2 Roll
- Calibration Strip: 1 Bottle
- Operating Manual
- Serial RS-232 cable

Optional accessories

- Barcode Reader (Scanner)
- External Keyboard

3.2 Installation

1. Carefully unpack the Urine Analyzer and place it on a firm and level surface. Do not place the analyzer under direct sunlight or any direct light source.
2. Insert the plate: Grasp the plate end and insert it along the visible sliding rail until it gets between motor gear and bearings sufficiently.
3. Insert the printer paper roll.



4. Unpack the adapter and connect it to the socket in the backside of Urine Analyzer. Plug the adapter into the wall socket. Use only the provided adapter. Use of other type adapter can cause defective measurement and general failure.
5. In case of viewing the test results in your computer connect the serial cable to a serial port COM1 of Urine Analyzer and a port for COM1 in the back of computer. Open the PC management program in the connected computer. Then you can see the test results automatically in your computer after testing
6. To use a Barcode reader/scanner to identify samples etc., plug it into the Serial Port (COM2) on the backside of the Urine Analyzer.
7. To use keyboard to identify samples etc., plug it into the socket on the backside of the Urine Analyzer and input the patient's ID.

The Urine Analyzer is now ready to use.

4. MAIN PROCESS

Step 1. Put the plate into the middle of the instrument and connect AC adapter to the port on the backside of instrument and power on.

Step 2. Automatically the Instrument executes System Check and then the plate moves to the middle of the reader.

Step 3. Calibration (Refer to 5.1 Calibration)

Step 4. Measurement MODE

On condition the plate is stopped, place each strip dipped in the urine one by one.

At this time, there are three selective modes for detecting the test strips.

General Mode: Calculate placing time of 'whole strips'. [press start (►) key '**after**' putting 1st test strip on the groove located in the nearest to center of instrument, place next test strip (max. 10 test strips) and then press **End** (**ENT**) key after placing the last test strip] **(Refer to 5.2 General Mode)**

One by One Mode: Recognize placing time of 'each strip'. [press start (►) key 'after' putting 1st test strip on plate like general mode and press another next (►) key whenever you place each additional strip (max. 10 test strips) and then press **End** (**ENT**) key after placing the last test strip] **(Refer to 5.3 One by One Mode)**

Quick Mode: Place all test strips and then press End (ENT) key. **(Refer to 5.4 Quick Mode)**

Step 5. Waiting

Standby Urine Analyzer until the color incubation of 1st strip is completed.

Step 6. Reading

After the 1st strip finish color incubation, the instrument starts to measure.

Step 7. Remove Strips

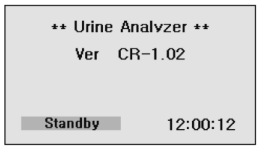
As soon as Urine Analyzer finishes the measurement, it will be changed to waiting mode. At this time,

operator can check the result by watching display or prints out with the naked eye before he/she throw away these already checked out strips.



5. HOW TO OPERATE INSTRUMENT

Turn ON the Power switch in the rear of instrument. Then the start page will be shown as [Fig.5] and the instrument checks the system automatically.

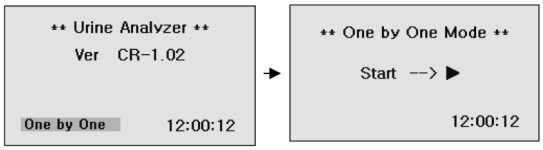


[Fig. 5] Standby mode

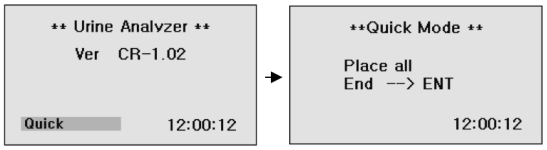
Depending on the method of measurement, 3 different measurement modes can be selected by Function Key (◄) and press ENT key to set.



General Mode



One by One Mode



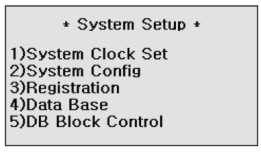
Quick Mode

For more detailed working procedures under each mode, please refer to 5.2, 5.3 and 5.4.

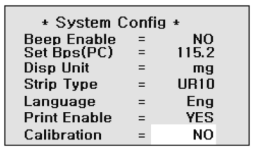
5.1 Calibration

The Urine Analyzer is calibrated before shipment by the manufacturer. The Calibration of instrument should be done prior to first use and then the same process from the 2nd time can be recommended to do in **every 4 weeks** with Calibration Strip in the package. Calibration Strip is used for checking aging processes of the optical system and variation of other internal conditions of instrument. When strong variation is detected which may be caused, for instance, by contamination of the reference pad or low light intensity of a defective light source, an error message will be printed.
The Calibration Strips are plastic white standard strips with defined and constant reflectance characteristics. The Calibration Strip should remain in the vial until use and should be used only once. Do not touch in the middle areas of the strip. The plate strip tray should be clean and dry before a calibration is performed.

For calibration, proceed as follows:
Step1. In the 'Standby' mode, Press < Esc > key **twice** to display "System Setup" **[Fig.6]**.
In System Setup, press number **2** key and the display **[Fig.6.2]** will be shown as below.

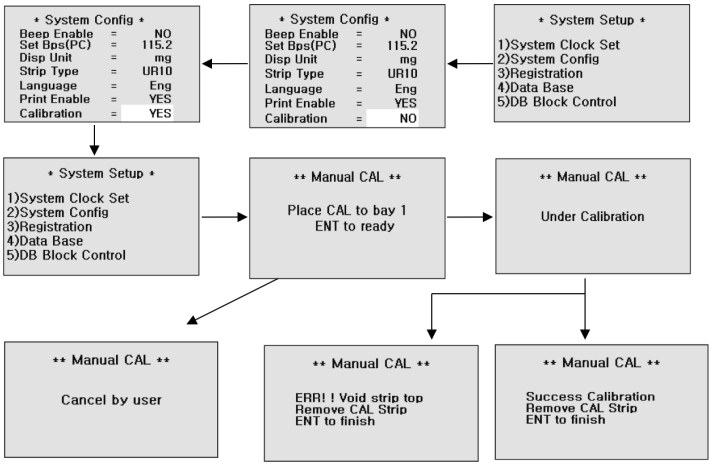


[Fig.6] System Setup Mode



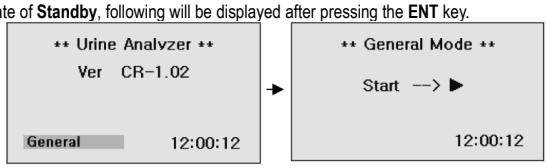
[Fig.6.2] System Configuration Mode

Step2. Move to **Calibration** by using ▲▼ (up, down) keys and select YES by using ◄► (left, right) keys.
Step3. Press **ESC** key twice
Step4. Put the 'Calibration Strip (CAL)' into **the 1st position of Strip Loading Plate** and then press < **ENT** >.
The calibration checking procedure can be stopped by pressing <**ESC**>.
Step5. After calibration finished, the result of calibration print out.
If the calibrations values are between 333+/-10(323 ~ 343), it is OK.

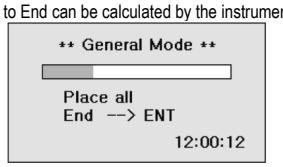


5.2 General Mode (Press ◄ key at 'Standby' mode)

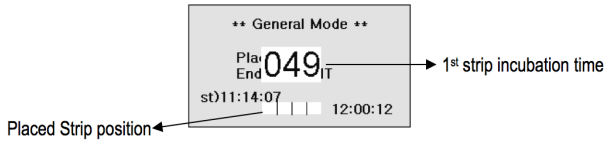
1) In the state of **Standby**, following will be displayed after pressing the **ENT** key.



Press **ESC** key and you will return to **Standby** mode.
2) After the 1st strip dipped in the urine is placed on the plate, press **Start** key (▶).
Put the 2nd ~ 10th (max.) strips one by one from the center of instrument after dipping in each collected urine. (The Progress Bar display for100 sec incubating time)
After the last reagent strip of a batch is placed, press **End** (**ENT**) button. On pressing End key, recognition of measurement time from Start to End can be calculated by the instrument.



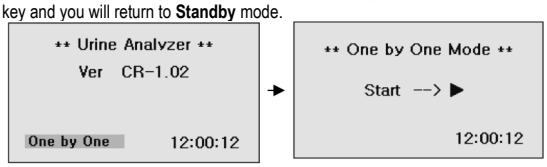
Press **ESC** key to cancel placing strip and evaluation.
3) Waiting for incubation of 1st strip



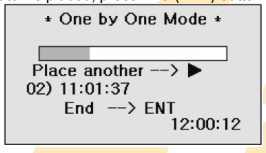
4) After incubation time of the 1st test strip, it start to read test result of the strips on the plate one by one.
5) Test result will be printed out, shown on the LCD and automatically saved in the memory.
6) Press **ESC** key and you will return to **General** mode.

5.3 One by One Mode

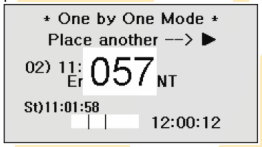
1) In the state of Stand by, following will be displayed after pressing the **ENT** key.
Press **ESC** key and you will return to **Standby** mode.



2) After the 1st strip dipped in the urine is placed on the plate, press **Start** key (▶).
Button **Place another** key (▶) whenever each of next strip is placed on the plate one by one from the center of instrument after dipping in the collected urine and placing on the plate. (The Progress Bar display for 100 sec incubating time) By pressing **Place another** key (▶) per measurement of each strip, the exact measuring/starting time is recognized.
After the last reagent strip of a batch is placed, press **End** (**ENT**) button.



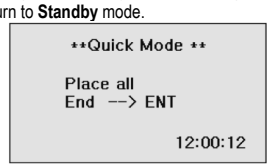
Press **ESC** key to cancel placing strip and evaluation.
3) Waiting for incubation of 1st strip



4) After incubation time of the 1st test strip, it start to read test result of the strips on the plate one by one.
5) Test result will be printed out, shown on the LCD and automatically saved in the memory.
6) Press **ESC** key and you will return to **One by One** mode.

5.4 Quick Mode

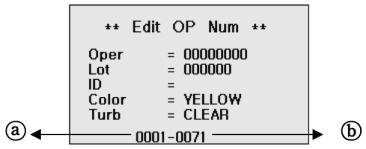
1) In the state of **Standby**, following will be displayed after pressing the **ENT** key.
Press **ESC** key and you will return to **Standby** mode.



2) Test strips are temporarily incubated outside the instrument and inserted at the correct time. After the last reagent strip of a batch is placed, press **End** (**ENT**) button.
3) Test result will be printed out, shown on the LCD and automatically saved in the memory.
4) Press **ESC** key and you will return to **Quick** mode.

5.5 How to input ID

There are 2 ways to input ID into Urine Analyzer.
1st Method
The user can input patient/sample's ID using barcode Reader (scanner) while measurement.
2nd Method (Multi ID input)
In **System Control** mode press ③ key and the display **[Fig.6.3]** will be shown as below. Use ▲▼ key to move to each item. Press **ESC** key and you will return to System Setup mode.



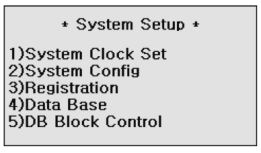
[Fig.6.3] Registration Mode

- **ID**

1) Enter patient/sample's ID using Keyboard or Barcode Reader. Press **ENT** key or ► (Right direction) key. Then enter next patient/sample's ID. If you want to change the ID number, you can go to the ID using ◄► (Right direction, Left direction) key and enter ID number again.
2) Part ⓐ is serial number of urine samples to be tested. As you register patient/sample's ID numbers, the number in entry ⓐ increases in order.
3) Part ⓑ is data location number; this will be stored in data base memory after measurement.
4) If patient/sample's IDs are as same as serial numbers, you may register only the first patient/sample's ID. Then the others will be numbered in order automatically. In that case, next ID number will be increased one by one from the first number. This number will increase even when restarting the system after turning off the power.
5) If patient/sample's ID is not registered before a test, ID columns will be blank.
6) To stop printing patient/sample's ID before the test, make it blank in ID (just input only"0" key, this will erase ID area)

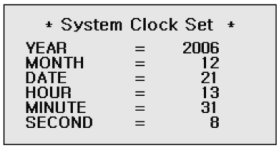
6. SYSTEM SETUP

In **Standby** Mode of **[Fig.5]** press **ESC** key twice to display **System Setup [Fig.6]**.



[Fig.6] System Setup Mode

6.1 System Clock Set: Set Date and Time.

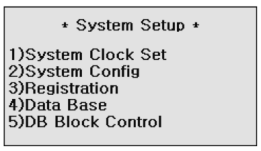


[Fig.6.1] System Clock Set Mode

1) Move to each item by using ▲▼ (up, down) keys and adjust time by using ◄► (left, right) keys or NUM keys.
2) After adjusting local time, press ENT key to set.
3) To escape System Clock Set mode, press ESC key and you will return to **System Setup** mode.
⚠ **Do not forget to press ENT key after finishing time adjustment.**

6.2 System Configuration

In case of changing the **System Configuration** saved in the analyzer, in **System Setup** press 2) key and the display **[Fig.6.2]** will be shown as below.
Move to each item the System Configuration by using ▲▼ (up, down) keys and adjust the details of each System Configuration item by using ◄► (left, right) keys.
If you press the **ESC** button in the selecting screen of the details, you can return to the previous screen.



[Fig.6.2] System Configuration Mode

- **Beep Enable**

If you select **YES**, beep will sound while operating instrument.
Use ◄► keys to select **YES** or **NO**.

- **Set Bps (PC)**

This is to select speed rate while transferring data with each other between the instrument and PC. Under general conditions **115.2** should be selected.

- **Disp Unit**

Select the unit of test results: mg or mol.

- **Strip Type**

This is to select the Strip type for test.
The Strip type should be matched with the Strip type being used.

Name	1	2	3	4	5	6	7	8	9	10	11
URINE 4	G	P	H	O							
URINE 5	G	K	P	H	O						
URINE 6SG	G	K	P	H	S	O					
URINE 7L	O	S	H	G	P	N	L				
URINE 8	U	G	B	K	O	H	P	N			
URINE 9	U	G	B	K	S	O	H	P	N		
URINE 10	U	G	B	K	S	O	H	P	N	L	
URINE 11	U	G	B	K	S	O	H	P	N	L	A

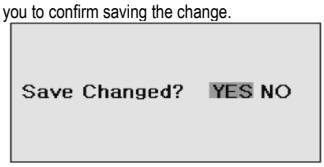
U=Urobilinogen, G=Glucose, B=Bilirubin, K=Ketones, S=S.G, O=Blood, H=pH, P=Protein, N=Nitrite, L=-Leukocytes, A=Ascorbic Acid

- **Language**

English, French, German, Spanish, Italian, Portugal and Chinese

- **Print Enable**

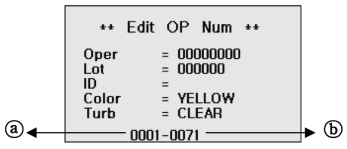
Select printer on or off by selecting **YES** or **NO**. If you select YES, test results will be shown both on LCD and printing paper.
When you finish selecting all conditions, press **ESC** key.
If change from present conditions is not required, just return to **System Setup** mode. But if any change is needful, the display will ask you to confirm saving the change.



If you decide to change anything (YES or NO) and press **ENT** key, you will go back to **System Setup** mode.

6.3 Registration

In **System Setup** mode press 3) key and the display **[Fig.6.3]** will be shown as below. Input data on each item and use ▲▼ key to move to next item. Press **ESC** key and you will return to **System Setup** mode.



[Fig.6.2] System Configuration Mode

- **Oper, Lot**

Enter operator's ID and strip lot number by using numeric keys. If you don't need to record the test operator's ID you may skip and leave it blank.

- **ID**

Enter patient/sample's ID using numeric keys, external keyboard or barcode reader (scanner). Press ENT key or ► (Right direction) key. Then enter next patient/sample's ID. If you want change ID number, you can go to the ID using ◄► key and enter ID number again. **(Refer to 5.5 How to input ID)**

- **Color**

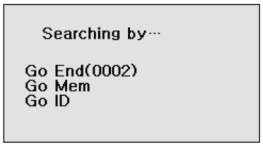
Color changes in order of YELLOW, DK YELLOW, STRAW, AMBER, RED, ORANGE, GREEN and OTHER, by pressing ◄► keys.

- **Turb**

Turbidity changes in order of CLEAR, SL CLOUDY, CLOUDY, TURBID and OTHERS, by pressing ◄► keys.
1) Select patient/sample's Color/Turb using ◄► keys. Press **ENT** key. And then enter next patient/sample's Color/Turb.
2) Part ⓐ is serial number of urine samples to be tested. As you register patient/sample's Color/Turb one by one, the number in entry ⓐ increases in order.
3) Part ⓑ is data location number; this will be stored in data base memory after measurement.
4) If patient/sample's Color/Turb is not registered before a test, Color/turb columns will be blank.
5) To stop printing patient/sample's Color/Turb before the test, make it blank in Color/Turb.

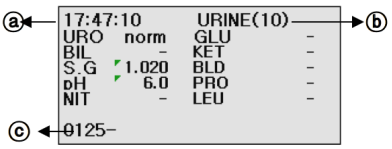
6.4 Data Base

In **System Setup** mode press 4) key and the **Searching by** will be shown as **[Fig.6.4]**.
The data saved in the memory of instrument can be searched by using ▲▼ keys.



[Fig.6.4] Data Base Mode

- **Go End**: Press **ENT** key and then latest result will be shown as **[Fig.6.4.1]**.
- **Go Mem** : Input SEQ Number by Keyboard and then the result will be shown as **[Fig.6.4.1]**.
- **Go ID**: Input patient/sample's ID by Keyboard and then the result will be shown as **[Fig.6.4.1]**.

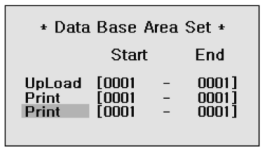


[Fig.6.4.1] Data Base

ⓐ shows the time of measurement.
ⓑ shows strip type.
ⓒ is data's number saved in data base.
1) You can also go to the data by using ◄► keys.
2) You can print out the result on the display by pressing **ENT** key.
Data base can save up to 2000 test results in its memory. When memory is full, the data can be transferred to PC by **RS232c interface cable** and sorted by its tested Date in PC. Otherwise the oldest data of the instrument will be erased on the 'first in first out' basis.
3) To erase all data in Data Base, type in "**9999**" and press "**ENT**" key at area by using keyboard . After clearing this number restarts at 0001.
⚠ **Do this with care as stored data cannot be recovered.**

6.5 DB Block Control

In **System Setup** mode press 5) key and the display will be shown as **[Fig.6.5]**.



[Fig.6.5] Data Base Block control

- **UpLoad**

To transfer test results data to PC by RS 232C.
You can input data using Keyboard. Press **ENT** key to operate a system.

- **Print**

To print out the results data.
Note: Printing Area is limited to max. 50 test results at one time.

- **Print (=Abnormal result Print)**

To print out **the abnormal results**.
1) Select Upload or Print mode, **Print** mode by using ▲▼ key and select the **Start Num** and **End Num** by using Keyboard.
2) If DB is empty, an error message of "**No Data in Data Base**" will appear at the center of display and go back to its previous mode.
3) After all data completely finished, "**OK Finish**" message will appear.

7. HOW TO CLEAN THE STRIP LOADER PLATE AFTER USE

⚠ **Caution: It is better for the strip loader plate to be cleaned everyday because it can be stained by the tested strip and remaining urine smeared into the loader.**
Step1. Turn the instrument **power OFF in advance and then separate the plate** from the body of the instrument.
Step2. Completely clean all the grooves of the detached strip loader plate and clean the contaminated area using a neutral detergent or a water-wet towel. Do not use volatile material like thinner, gasoline, and benzene for cleaning the body.
Step 3. Polish the plate with a soft cloth and make sure to dry it completely



8. TROUBLESHOOTING & MAINTENANCE

Symptoms of Error	Possible Cause or Related Symptoms	Cause/Symptom No.& Remedy
A-1 The instrument will not work even though power is on	1. The connection part for power source may be loose. 2. Defective system electronics	1. Turn the instrument power OFF. Check that the power cord is firmly plugged into the instrument and into a live AC electrical outlet then turn the power ON (AC adapter : 100-240V/12VDC 3A) 2. Contact your Customer Service Office
B-1 Always shows 'false positive (+) test result' **B-2** Result by visual test with color chart shows negative results although instrument result is positive **B-3** Other reference tests shows Negative results although instrument result is positive	1. Examine state of used strip and check out if any belong to a case described below; a) Order (sequence) of test parameter on printed results differ from it of the label on strip's bottle. (Tested strip model is not fit for this mode analyzer) b) Reacted color(s) of reagent pad on the strip is (are) much different from those of the color chart label on the strip bottle. c) Detection was done with dry strip(before dipping in the urine) or any other test strip instead of the reagent strip for this model analyzer d) Tested without placing the dipped strip on the plate e) Strip position was turned upside-down or wrongly positioned f) Reagent pad(s) were not fully wetted by the urine g) Reagent strip was not placed on the tray 'immediately' after dipping in the urine and removal of excessive urine f) Shape of used strip was bent(curved) strip 2. Strip type is wrongly set up (Location for strip set-up: System setup /2.System Config / strip type) 3.There is a lot of dirty urine(contamination) on the calibration strip 4. The Calibration Value not included 333(+/-10) (How to see RGB calibration value can be referred to page 9 on Operator Manual)	1.2 : Careful handling of the strips by referring to instruction of use for strip and operating manual for the analyzer 3.4: The Calibration should be done with new calibration strip
C-1 Does not print	1. Printer mode is set as "NO" (Location for changing printer mode: System Setup /2.System Config /Print enable) 2. Test results can be displayed through LCD monitor	1. Reset "Yes" 2. Replace 'Printer Module' with a new one
C-2 Printer can't push out paper normally **C-3** Very small characters are printed on the paper and there is strange sound	Can hear a sound that the motor inside of the printer makes	Take out printer paper and re-install it into the analyzer. If you have the same error even after re-install of the paper correctly, Contact your Customer Service Office
C-4 Printed characters are not clear or not readable **C-5** Characters are printed partially	The printer paper is not properly installed. (Results should be printed on shinny side of the paper.)	If you have the same error even after re-install of the paper correctly, Contact your Customer Service Office
C-6 The strange characters are printed on the paper	The strange characters are also found on result through LCD monitor	Push 'Power button & ESC & ◄ key' together at a time (reset of the machine) and restart. If you have the same error, Contact your Customer Service Office.
D-1 Display a message "Misplaced strip"	The strip for test is wrongly positioned on the strip plate	Misuse by the user

E-1 Strip Plate does not move into(out from) the machine **E-2** Strip Plate always pull out **E-3** A Strip Plate stops unexpectedly during operation	1. Not used power supply of adapter (12V, 3A) 2. Plate malfunction problem 3. Plate Sensor Problem 4. Motor Problem	1. Misuse by the user 2. Replace 'Plate' with a new one. 3,4 Contact your Customer Service Office
F-1 Key does not work	1. A function key is out of order and Other function keys (strip detection, printing etc.) works normally 2. Other function keys (strip detection, printing etc.) also works incorrectly	1. Replace LCD Module 2. Contact your Customer Service Office
G-1 LCD is black (shows nothing) or wrong	1. The error(s) is(are) found as soon as Power-On and Other functions (strip detection, printing etc.) works normally 2.Other functions (strip detection, printing etc.) also works incorrectly	1. Replace LCD Module with a new one 2. Contact your Customer Service Office
H-1 Can not make "HexTrans" program update **H-2** Can not connect to LIS **H-3** LIS results include strange letters **H-4** When connect to PC, the items can not be shown correctly on the results	1. Check out settings are as followings; Baud rate : 115200, Com Port: COM1 2. Serial cable between analyzer and PC is incorrectly connected 3. Serial port in the computer is USB Port	1. It the set up condition is different from the left conditions, make it as same like left side 2. Correctly connected. But if it is not working, replacement RS232C Cable 3. Use 'USB To RS232 Converter Cable' instead of USB

REGISTRATION SHEET

Please complete the following Registration Sheet, and fax back within two weeks to your local distributor. These data are 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: _____
address: _____
telephone: _____
The person, who is responsible for the operation: _____
Number of the samples in daily routine: _____
The previously used method for urine analysis: _____
Your distributor: _____

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