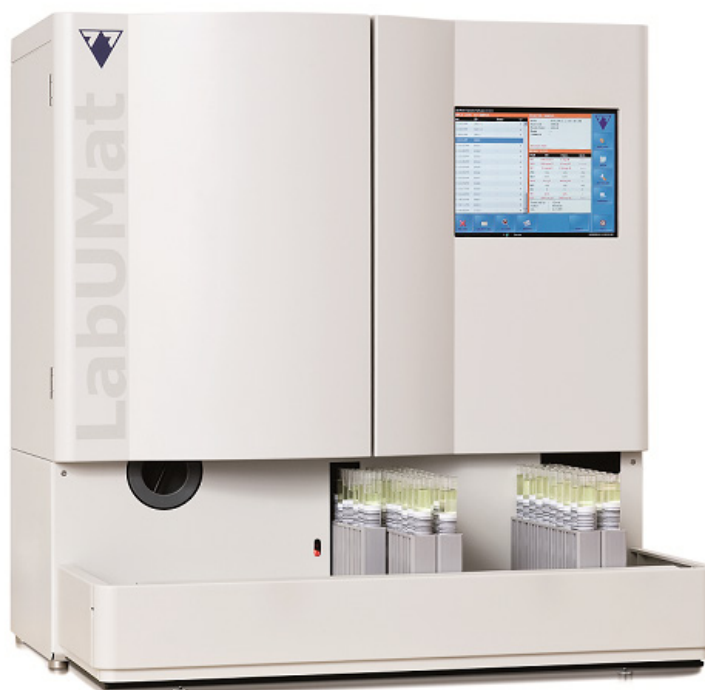


Automated Urine Chemistry Analyzer

User manual for SW version 2.0



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Table of Contents

1 Introduction	4
1.1 General description of LabUMat 2	4
1.2 Methodology of urine testing	5
1.3 Test strips	5
2 Installation	7
2.1 Packing list	7
2.2 Packaging	7
2.3 Installation sequence	8
2.3.1 Installation of the fluidic system	10
2.3.2 Taking LabUMat 2 out of operation	11
2.3.4 Tagging test tubes with bar codes	12
3 Menu system	13
3.1 User rights	14
3.1.1 Logging in to an Administrator user account	14
3.2 Measure menu	15
3.2.1 Clear list	15
3.2.2 Registered strips counter	15
3.2.3 Init	15
3.2.4 Empty feeder	15
3.2.5 Rack out	16
3.2.6 STAT	16
3.2.7 Manual/Auto	17
3.2.8 Start	17
3.2.9 Exit	17
3.3 Data menu	17
3.3.1 Main Features	19
3.3.2 Table of displayed results	21
3.4 Settings menu	22
3.4.1 Measure settings	22
3.4.2 Results settings	24
3.4.3 Functions settings	26
3.4.4 Main settings	28
3.5 General	30
3.5.1 Info	30
3.5.2 Quality Control	30

3.5.3	Line Feed	32
3.5.4	Disinfection	32
3.5.5	Compact	33
3.5.6	Worklist editor	33
3.5.7	PMC User calibration	34
3.5.8	Strip registration	34
4	Operation	36
4.1	Loading strips into LabUMat 2	36
4.2	Measuring modes	37
4.3	Identification of test results	38
4.4	A typical daily routine	39
4.4.1	Basic operation-related troubleshooting	41
5	Maintenance	42
6	Error messages, troubleshooting	45
6.1	Info messages	45
6.2	Warning messages	45
6.2.1	Hardware warning messages	45
6.2.2	Software warning messages	46
6.3	Error messages	47
6.4	Possible measurement errors	50
7	Instrument support	51
7.1	Servicing	51
7.2	Ordering information	51
8	Technical data	52
9	Symbols	54

1 INTRODUCTION

Thank you for choosing LabUMat 2 automatic urine chemistry analyzer, manufactured by 77 Elektronika Kft. in Hungary (EU). We hope that you will be satisfied with the device.

1.1 General description of LabUMat 2

LabUMat 2 is designed specifically for professional use in clinical laboratories. It is a fully automated urine chemistry analyzer that meets all the usual requirements indicated by medical laboratories.

Operation of LabUMat 2 is easy and very efficient. The operator fills the instrument with distilled water, fills up the strip feeder with urine reagent strips and puts the racks with sample-filled test tubes on the rack conveyor. The device takes care of everything else.

To deal with the workload of big laboratories it is a walk-away system offering a unique technology and a new scientific approach to automated urine analysis. LabUMat 2 is an automated desktop reflectance photometer designed for high volume urine test strip reading.

In addition to preserving all its former attractive features, the new version of the LabUMat system has been significantly improved for even better performance	
	<ul style="list-style-type: none"> • easy operation via touch screen;
	<ul style="list-style-type: none"> • automatic handling of test strips and test tubes – including sample mixing and precise dosage for each individual test pad by the pipetting unit –;
	<ul style="list-style-type: none"> • test strip evaluation by an advanced and patented detection technique;
	<ul style="list-style-type: none"> • the measurement of specific gravity, color and turbidity via its PMC (Physical Measurement Cell);
	<ul style="list-style-type: none"> • and intelligent data management provide maximum efficiency while making urinalysis simple.
Continuing its predecessor's mission and offering the broadest features available on any urine analyzer, the walk-away operation of the LabUMat 2 meets all requirements of a modern, automated laboratory.	

The strip results together with the physical parameters from the PMC are stored in the memory of LabUMat 2, which is large enough to store 10000 records.

The LabUMat 2 urine strip reader is a stand-alone instrument, which can be connected to a UriSed 2 microscopic urine sediment analyzer. Together, the two devices make up a Complete Urine Laboratory System.

Biohazard risk



This device may become infectious in the course of use. Dispose of the device in accordance with the local regulations for biohazardous waste

1.2 Methodology of urine testing



Urinalysis is one of the diagnostic methods frequently used by medical doctors in laboratories. The most cost-effective method for screening urine is the use of paper or plastic dipsticks. This micro-chemistry system has been available for many years and allows qualitative and semi-quantitative analysis within one minute by simple but careful visual observation. The color change occurring on each segment of the strip is compared to a color chart to obtain the results. Owing to varying ambient conditions (e.g. external light), however, the results can easily be misread or misinterpreted.



Urine analyzer instruments (urine strip readers) are designed specifically to improve the accuracy and security of urine strip evaluation by automating and standardizing the evaluation process. The analyzers also help in test data handling and report generation by providing data storage and computerized data processing features for medical laboratories.

1.3 Test strips



Good quality dry reagent urine multi-strips are essential for urine analysis. These strips have separate pads for each tested parameter. Pads contain certain chemicals that develop color changes reacting with each tested parameter according to their concentration in urine.

LabUMat 2 works with LabStrip U11 Plus GL urine multi-strips that provide accurate results. Tested ingredients are as follows:

Billirubin	Urobilinogen	Ketones	Ascorbic acid	Glucose
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1 Introduction

Protein	Blood	pH	Nitrite	Leucocytes
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2 INSTALLATION

2.1 Packing list

LabUMat 2 equipment	1 pc
Power cord	1 pc
Serial cable	1 pc
Waste Container	1 pc
Wash Container	1 pc
Container holder	1 pc
Pipes	3 pcs
Rack mover unit	1 pc
Dropping strip tray	1 pc
Pipetting tray	1 pc
Strip forwarding comb	1 pc
Touch screen pen	2 pcs
Test tubes + cap	100 pcs
Test tube with barcode	1 pc
Racks	10 pcs
User manual	1 pc
Packaging manual	1 pc

2.2 Packaging

⚠ Check the shipping list to see if the shipment is complete and not damaged. If it is intact, follow the instructions below, otherwise please contact your distributor immediately.

⚠ Ship and store the device between -20°C and +80°C and between 20–80 % humidity.

⚠ Keep out of direct sunlight as intense light can interfere with the optical sensors.

LabUMat 2 is shipped in 2 cardboard boxes. Prior to unpacking, clear the area where the device is to be operated: an 80 x 60 centimeters (31 x 24 inches) size table is needed that is strong enough to support an almost 60 kg (130 lb) device. Refer to the detailed Shipping manual – attached – on how to pack and unpack the device. Please follow the shipping marks on the box while handling.

⚠ We recommend that you keep the package cushioning and other reusable packaging material for future use.

- 1** Cut off the straps on the wooden shipping box, and remove the lid and the package cushioning. Pull off the outermost packaging shell, and remove the flatpack box on top.
- 2** Remove the package cushioning and wrapping around the main unit box, then pull off its packaging shell.
- 3** Remove the ten (10) test tube racks, the test tubes, and the rack adapters, and place them on the prepared table.
- 4** Remove the separately packed rack conveyor, and place it on the prepared table.
- 5** Remove the box with the User Manual and the small accessories listed in [2.1 Packing list](#).
- 6** Remove both liquid tanks, their tubing, and their bowl and place the tanks in their bowl under the table.
- 7** Cut off the tape around the main unit package shell, and pull off the shell. With a colleague to help you lift it, place the main unit on the table.
- 8** Unwrap all the accessories, dust them off. Check the completeness of the consignment (☞ [2.1 Packing list](#)).

⚠ As the device is quite heavy (about 60 kg (132 lb)), two people are required to move it.

i If the instrument has to be installed in another location, all removable parts have to be removed for transportation and the robot arm has to be fixed with the supplied securing screw and plate. For transportation a trolley might be necessary because of the weight of the device.

2.3 Installation sequence

- 1** Remove all remaining package cushioning from in and around the device.
- 2** Reaching in from the front of the device, find one extending screw and a metal plate in the middle. The retainer plate secures the pipetting probe of the device during shipping. The retainer plate must be removed before the equipment can be switched on. Unscrew the fixing screw, remove the plate, and fix it with the screw in a screw hole on the top crossbar of the chassis, bored for this purpose.

i It is recommended to keep the fixing screw and plate, as you might need them if the device needs to be relocated.

3 Find the strip forwarding comb among the accessories and insert it in the appropriate place on the strip forwarder, on the right-hand side inside the unit (☞ [Figure 21](#)).

4 Find the pipetting tray among the accessories and install it in the appropriate place in the center of the unit (☞ [Figure 21](#)).

5 Find the drip tray among the accessories and slide it into its slot from the front of the instrument (☞ [Figure 21](#)).

⚠ Make sure that one of the openings on the drip tray is aligned with the path of the pipetting probe as it goes down inside the test tubes.

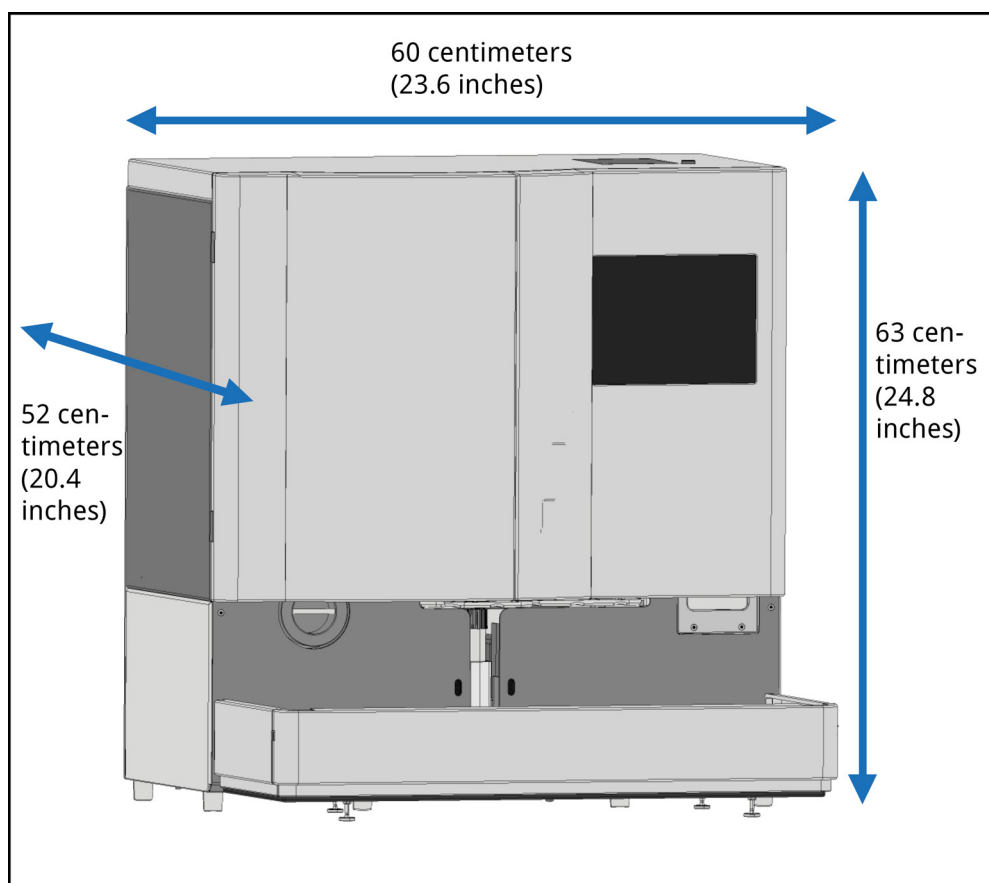


Figure 1: Dimensions of the device with the rack conveyor attached

6 Link the rack mover unit up with the main unit. Fit the two edges flush against each other and snap the conveyor onto the main unit. After fitting their edges push the unit gently until it clicks.

⚠ Use only rack conveyor units specifically supplied with LabUMat 2 devices.

7 Connect the power cable first to LabUMat 2, then to the mains. For safety reasons LabUMat 2 can only be connected to grounded outlets.

8 Use the supplied serial cable or USB port to connect LabUMat 2 to the host PC. Refer to [3.3 Data menu](#) for information on connecting the device to a host PC.

9 Switch on LabUMat 2 and wait for the boot sequence to finish.

⚠ It is important that you remove the retainer plate from the linear robot before you connect the equipment to the mains. When the power is switched on, the instrument is in stand-by mode. When you press the power button, the system initializes, which includes motion checks. The linear robot may be damaged if the retainer plate does not let it perform the motion checks.

⚠ LabUMat 2 operates with 100 to 240 VAC mains voltage. In this range the equipment manages voltage levels automatically. Do not use the equipment with different mains voltages.

⚠ Do not remove the rear panel of the device. Only specially trained service personnel may dismantle the device.

i You need to register test strips before you can use the device (→ [3.5.8 Strip registration](#)).

i After you install the device, it is recommended that you review its performance (→ [3.5.2 Quality Control](#)).

2.3.1 Installation of the fluidic system

1 Lead the two larger size pipes through the two slots of the container cover for waste water. Make sure that the black rubber rings stay in the slots. Leave 10 centimeters (4 inches) from the ends of the pipes inside the container and connect the other ends into the slots on LabUMat 2 marked “Waste” and “Gravity”.

⚠ There is no suction in the gravity tube, so it must be installed so that it slopes downwards all the way to the waste tank.

2 Connect the sensor for this container to the D-sub 9 connector on the back of the device marked “WASTE SENSOR”.

3 Fill the other container with distilled water. Lead the single smaller size pipe through the retainer of the “Wash” container and also the slot on its cover from the inside. Make sure that the black rubber ring stays in the slot. One end


of the pipe has to be at the bottom of the container held fast by the rubber ring and the other end has to be connected into the “Wash” slot on the device.

5 Connect the sensor for water tank to the D-sub 9 connector on the back of the device marked “WASH SENSOR”.

6 Place both tanks into their bowl and place the bowl under the table that supports the assembled analyzer.

2.3.2 Taking LabUMat 2 out of operation

You do not need to take any special steps to take LabUMat 2 out of operation. Perform the steps listed below to preserve good condition of the device while it is not in use.

 **Since urine is a fluid of human origin, it may be infectious and may carry biological risks.**

 **Handle used strips and urine contaminants with care.**

 **Always wear rubber gloves or other protecting clothing when operating LabUMat 2.**


1 Perform the washing cycle with the disinfectant solution ([↗ 3.5.4 Disinfection](#)). Switch off the LabUMat 2 unit and disconnect it from the mains.


2 Discard both unused strips and all used strips from the waste bin.

3 Remove all fluids from both containers and clean them thoroughly. Let them dry and pack them up, leaving their caps open.

4 Use the supplied securing screw and the retainer plate to secure the linear robot module.

5 Clean LabUMat 2 carefully and remove all its removable parts ([↗ 5 Maintenance](#)). Let them dry and pack up LabUMat 2 as it was packaged when it arrived to you.

 **If you would like to put LabUMat 2 back into operation, follow the steps described in [2 Installation](#) to properly install the device.**

 **If the instrument has to be installed at another location all removable parts have to be removed for transportation (the strip timer comb, the pipetting tray, the drip tray, and the rack conveyor unit), and the robot arm has to be fixed with the supplied securing screw and plate. For transportation, a trolley might be necessary as the instrument is quite heavy (about 60 kilos (132 lbs)).**

2.3.4 Tagging test tubes with bar codes

LabUMat 2's built-in barcode reader can automatically identify urine samples by barcodes affixed to the side of test tubes.



Figure 2: The types of bar codes recognized by the system and illustration of their use

- CODE 39
- CODE 128
- EAN-13
- EAN-8
- INTERLEAVED 2 of 5
- CODABAR

Bar codes should be affixed around the middle of the test tubes, between the levels indicated in [Figure 2](#). Bar codes above or below these levels might not be identified by LabUMat 2. When placing samples with bar codes in the racks, take care that the bar codes face towards the open side of the racks, otherwise the bar code scanner will not be able to scan the codes.

One of the supplied test tubes comes with a pre-affixed bar code. It models the optimal positioning of the bar code on the test tube, and can also be used to check the built-in bar code scanner.

3 MENU SYSTEM

LabUMat 2 has an easy-to-use, user-friendly menu system. The main menu points are on the right side of the screen; their relevant sub-menus are in the bottom. The menu points can be selected by tapping on the LCD touch screen, clicking with the connected mouse, or selecting them with the arrows of the external keyboard. Characters can be entered using the external keyboard or on-screen keypad. Some buttons have more than one state, and their appearance indicates their current status.



Figure 3: The Measure menu

At the very bottom of the screen, in the status line, the following information is continuously displayed, from left to right:

Key to status line information	
Description of displayed information	Possible displayed contents
Status of connection between LabUMat 2 and operating PC	Instrument is ready Instrument is not ok Instrument is initializing
Connection status of UriSed sediment analyzer (if enabled)	UriSed connected UriSed not connected

User rights according to login level or User name	Operator Administrator Service User name
Approx. number of strips in the waste bin	Waste:
Current date and time	Date & time

3.1 User rights

Depending on the login system selected, LabUMat 2 users can be categorized and identified by their different access levels or by their individual user names (and corresponding access levels). There are three access levels for LabUMat 2 user accounts: Operator, Administrator and Service with different user rights. Some advanced-level settings are only available to Administrator- or Service-level user accounts, which are always password protected.

 **Only properly trained and authorized service personnel can log in to Service-level user accounts.**


If the access-level based login system is active, the default access level for all users is Operator at the first startup. Operator-level users can perform measurements, manage sample data in the Database, and access the Measure tab on the Settings menu.

3.1.1 Logging in to an Administrator user account

1 Enter Settings Menu and tap the Login button in the bottom left corner.
Enter the default user name ("administrator") and password ("settings") for the Administrator user account (without the quotation marks).

 **For security reasons, asterisks (*) will be displayed instead of the characters that you type in the password text box.**

2 The user rights-indicator in the status line switches to "Administrator".
Make the changes in the settings that you could not access as an Operator.
3 Enter the Settings menu, navigate to the Measure tab, and tap the Logout button to revert to an Operator-level user.

 **The user rights of the currently active user are always displayed in the status line. Here it can always be checked whether the current user has Operator, Administrator or Service rights.**

3.2 Measure menu



On the Measure menu, a list is displayed in the middle of the screen, containing the date, the time, rack and tube numbers, sample IDs as well as the name of the patient and status icons of the strips that are currently evaluated.

3.2.1 Clear list



Press this button to remove all finished measurement records from the list displayed in the “Measure” menu. Removed records will not be deleted from the Database.

3.2.2 Registered strips counter

Displays the number of strips remaining from the last batch of registered strips. You can find the registration code for each batch of strips on a registration card inside every box of LabUStrip U11 Plus GL test strips. When you register a new batch, the Registered strips counter will increase by the number of the newly registered strips.

3.2.3 Init



Press this button to run the same self-test which runs at each startup. This function checks all independent inner parts and after finishing, it initializes LabUMat 2. If you experience any problem while using the device, it is recommended to run this self check by pressing this button.

3.2.4 Empty feeder



Press this button to empty the strip feeder and wait until the icon and the text on the button change. The button is disabled during measurements, unless the number of strips is fewer than 15.

Find the unused strips in the unused strip bin below the strip feeder after emptying the strip feeder module. Unused strips can be used again later. Shake the unused strip bin and pour the strips back into their vial after unscrewing the front cap of the bin after you finished working with LabUMat 2. Try to avoid touching unused strips with your hand!

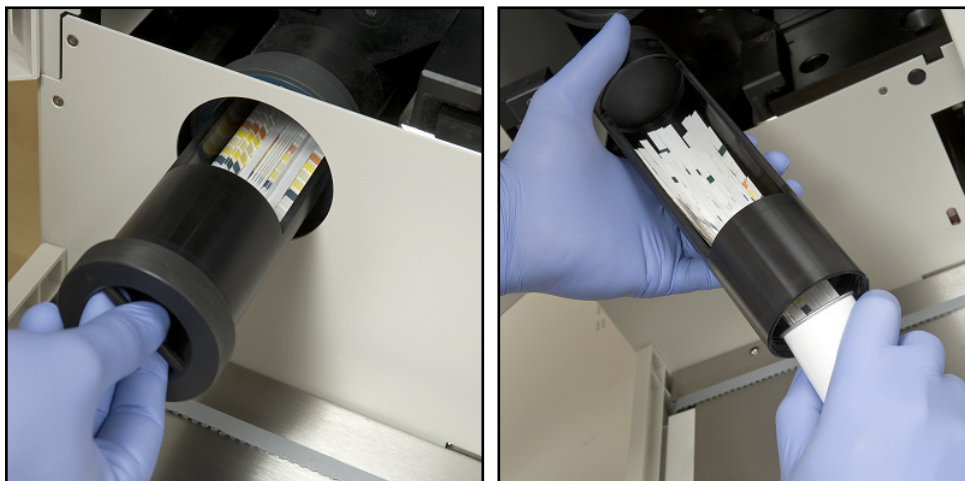


Figure 4: Emptying the unused strip bin back into a test strip vial

⚠ One vial contains the maximum amount of strips you may insert at any one time. Only feed a new vial of LabStrip U11 Plus GL strips into the device if the number of remaining unused strips inside the instrument has dropped below 15.

⚠ Do not store strips in the device. Remove strips from the unused strip bin and put them back into their vials when you stop working with LabUMat 2. Strips in the unused strip bin are not properly protected against moisture, and this can significantly reduce their quality.

3.2.5 Rack out



Press this button to push out the current rack from the test-tube driving hole. This button is disabled during measurement.

3.2.6 STAT




This function should be used if there are some urgent samples, which have to be measured urgently before the scheduled ones. STAT button is disabled if there is no running measurement or control measurement is performed and enabled when normal measurements are running. If STAT button is pressed, the instrument stops only after current sample in rack is measured. Until this has not been realized, "Wait until the current measurement is finished." message is displayed on the screen. Then recent rack is pushed out and the rack mover conveyor moves the following not yet measured racks backwards, in order to make room for the extra rack which contains the urgent samples. The message "Insert the urgent sample(s)." indicates if the instrument is ready to handle the urgent samples, so they can be placed on the rack mover conveyor. Right after pressing the OK button in

the message window, LabUMat 2 pulls in the extra rack and measures the samples in it. These measurements will have an extra ID (e.g. ST-01, and so on). However, if there are barcodes on the urgent sample tubes, barcodes will be assigned as IDs. After measuring the extra rack, the interrupted measurements automatically continue.

3.2.7 Manual/Auto



This two-state button toggles between the automatic and manual measure modes (see [4.2 Measuring modes](#)). In manual measuring mode, tap the 

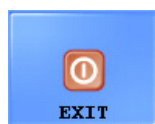
icon to display a numeric keypad to set the desired number of measurements for a measurement cycle. This button is inactive during measurement cycles.

3.2.8 Start



Press this button to Start/Stop the measurement. To study details of the measuring sequence refer to the chapter “Typical daily routine”.

3.2.9 Exit



Press this button when you have finished working with LabUMat 2. After pressing the button, the automatic washing procedure can be initiated or the instrument can be shut down directly. Washing procedure should always be performed at the end of the day. For details of the washing procedure, see Chapter 5 (“Maintenance”). After washing procedure, the software of the instrument will stop and LabUMat 2 will be switched off to stand-by mode. To completely switch off the device you may do it by the main switch button on the lower back side from right. Exit button is only active if measurement has been stopped previously. Exiting is not possible if measurement is under process.

3.3 Data menu

3 Menu system

LabUMat2 Operator Software v2.0.0 RC1.8

SAMPLE LIST: 10 SAMPLE

Time	ID	Name	+/-
5/24 5:10:58 PM	00301	-	+
5/24 5:11:17 PM	00302	-	+
5/24 5:11:34 PM	1010	-	+
5/24 5:11:53 PM	00304	-	+
5/24 5:12:13 PM	00305	-	+
5/24 5:12:32 PM	00306	-	+
5/24 5:12:50 PM	1089	-	+
5/24 5:13:09 PM	00308	-	+
5/24 5:13:28 PM	1014	-	+
5/24 5:13:46 PM	1009	-	+

SELECTED SAMPLE:

Date : 5/24/2012 5:12:50 PM
Rack/Tube : 3/7
Barcode : 1089
Name : -
Comment :
POSITIVE

Pad SI Conv. Arb.

BIL	50 umol/l	3 mg/dl	++
UBG	norm	norm	norm
KET	neg	neg	neg
ASC	neg	neg	neg
GLU	2.8 mmol/l	50 mg/dl	+
PRO	neg	neg	neg
BLD	5-10 Ery/ul	5-10 Ery/ul	+
PH	7.5	7.5	7.5
NIT	pos	pos	+
LEU	75 Leu/ul	75 Leu/ul	++


Color : Pale yellow
Turbidity : Clear
SG. : 1.010

MEASURE
DATA
SETTINGS
GENERAL

DELETE **SELECT ALL** **FILTER** **MODIFY** **SHIFT** **EXIT**


Instrument is ready | Administrator | Waste: 30 | 5/24/2012 5:46:16 PM

Figure 5: The Data menu

-  Data from the performed measurements are available under the "Data" menu. Data management is accessible during the measurement as well. In "Data" menu the screen is divided into two parts: records listed in the "Sample List" on the left identify the evaluated samples, while all available information from the currently "Selected Sample" is gathered in the right side of the screen. The right side of the screen is divided into two main parts: general info of selected sample and the result list. By pressing the arrow button between the general info and the result list, you can list additional information on the selected result.
A new record with measurement results is added to the Sample List only if the measurement on the sample has been successfully performed. Select a record from the Sample List by clicking on it and all information – summarized result and general info – from the selected sample will be displayed in the right side of the screen. Records in the Sample List are identified by the exact date and time of their measurements, by their IDs and the names of the patients (if they had been entered). It is signed in the "+/-" column whether the result of a sample is positive (+), negative (-) or if for some reasons the result of the evaluation was invalid.

3.3.1 Main Features

This section details the general functions that are available across all the tabs via the buttons along the bottom of the display.

 If any of the changes you make have an effect on the sample list in the **Data** menu, the sample list will be automatically refreshed. Depending on the number of records in the database this process can take some time. This is always indicated in the progress bar displayed.

3.3.1.1 Transfer



Tap this button to transfer the measurement records of selected urine samples through the serial port to a host computer or LIS.

 For further information about transfer protocols, contact your distributor.

3.3.1.2 Print



Tap this button to print the results summary for the selected sample or samples via the integrated printer.

3.3.1.3 Export



Tap this button to export selected results to an external USB drive. You can specify the file path for the export in a dialog box that pops up.

3.3.1.4 Import



Tap this button to import results from an external USB drive. You can specify the file path for the import in a dialog box that pops up.

3.3.1.4 Shift



Tap this button to display the second tier of function buttons.

3.3.1.5 Delete



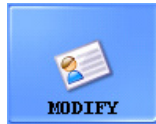
Tap to delete the selected record. Results for deleted samples are removed from the database. This function is disabled during measurement cycles.

3.3.1.6 Select all/Deselect all



Tap to toggle selection of all the records in the list. This function is inactive if there is only one item in the sample list.

3.3.1.7 Modify



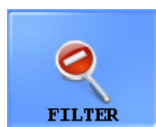
Tap this button to modify the barcode ID, the patient name, or one or more of the physical parameters associated with the selected record, and to add comments. Select the record that you would like to modify. Enter the new ID and patient name with the onscreen keypad and tap the green check mark to save changes or the red X to cancel.

 ID text fields may not be left blank.

 A blue rectangular popup window titled "Modify sample". It contains several input fields: "Barcode" with the value "00104", "Patient name" which is empty, and a large "Comment" text area. Below these is a section titled "Physical parameters" containing three fields: "Color" with a dropdown menu showing "Yellow", "Turbidity" with a dropdown menu showing "Clear", and "SG" with the value "0.7737". At the bottom are two buttons: a green checkmark labeled "OK" and a red X labeled "CANCEL".

Figure 6: The Modify sample popup window


3.3.1.8 Filter



For easy location of one or more sample records, results can be filtered based on measurement date, barcode and patient name. It is also possible to screen out only the positive or negative results.

 A blue rectangular popup window titled "Filter". It contains several filter options: "Date & Time" with two date pickers both showing "5/25/2012", "Last days:" with a numeric input field, "Barcode" with a text input field, and "Patient Name" with a text input field. At the bottom is a section titled "Result" with two checkboxes: "Positive" and "Negative". To the right of these are three buttons: a grey button with a document icon, a green checkmark, and a red X.

Figure 7: The Filter popup window

 When using the Filter function the phrase "with filter" will be appended to the sample count number on top of the sample list.

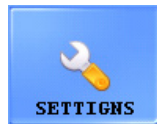
3.3.2 Table of displayed results

Arbitrary results: neg or norm, (+) or trace, +, ++, +++, +++++

LabStripU11 Plus GL Pad names										
Bilirubin Bil	Arbi- trary	neg	(+)	+	++	+++				
	SI	neg	0.5	1	3	6		mg/dl		
	Conv	neg	8.5	17	50	100		umol/l		
Urobilinogen Ubg	Arbi- trary	norm		+	++	+++	++++			
	SI	neg		2	4	8	126	mg/dl		
	Conv	neg		35	70	140	200	umol/l		
Ketones Ket	Arbi- trary	neg	(+)	+	++	+++				
	SI	neg	5	15	50	150		mg/dl		
	Conv	neg	5	1.5	5	15		mmol/l		
Ascorbic acid Asc	Arbi- trary	neg		+	++	+++				
	SI	neg		20	40	100		mg/dl		
	Conv	neg		0.2	0.4	1		mg/l		
Glucose Glu	Arbi- trary	norm	(+)	+	++	+++	++++			
	SI	norm	30	50	100	500	1000	mg/dl		
	Conv	neg	1.7	2.8	8	28	56	mmol/l		
Protein Pro	Arbi- trary	norm	(+)	+	++	+++				
	SI	norm	15	30	100	500		mg/dl		
	Conv	neg	0.15	0.28	1	5		umol/l		
Blood Bld	Arbi- trary	neg		+	++	+++				
	SI	neg		5-10	50	300		Ery/ul		
	Conv	neg		5-10	50	300		Ery/ul		
pH	Arbi- trary	5	5.5	6	6.5	7	7.5	8	8.5	9
	SI	5	5.5	6	6.5	7	7.5	8	8.5	9
	Conv	5	5.5	6	6.5	7	7.5	8	8.5	9
Nitrit Nit	Arbi- trary	neg		+						
	SI	neg		pos						
	Conv	neg		pos						
Leukocytes Leu	Arbi- trary	neg		+	++	+++				
	SI	neg		25	75	500		Leu/ul		
	Conv	neg		25	75	500		Leu/ul		

PMC (Physical Measuring Cell) results:**Turbidity:** Clear, Light turbid, Very turbid**Colour:** Clear, Pale, Yellow, Green, Red, Amber, Brown and Other**SG (Specific gravity):** 1.000–1.050

3.4 Settings menu



The availability of Settings menu tabs depends on user levels. The Measure tab is accessible to all. Further setting options are only available to Administrator- or Service-level users after they log in until they log out. The **Settings** button is disabled during measurement cycles.

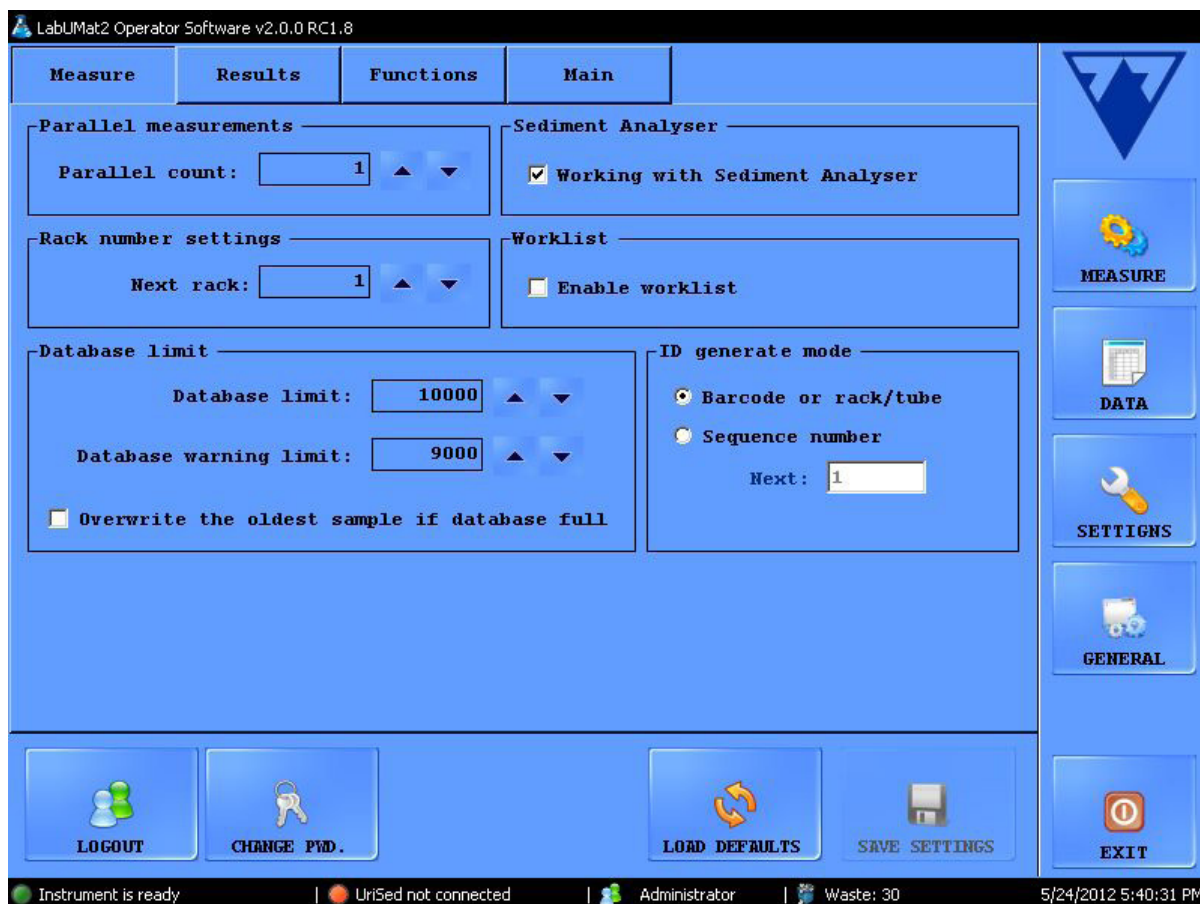


Figure 8: The Measure tab on the Settings menu


3.4.1 Measure settings


In the boxes on this tab, you can set up parameters to do with the measurement process.

3.4.1.1 Parallel measurements

By default, each urine sample is analyzed only once. However, you can set up the

device to make more than one measurement for each sample. The system will attempt to process each sample as many times as you specify in this text box.

 **Measurement records of the same urine sample share an identifier, but have "-1", "-2", and so on added to the end of the shared ID.**

 **LabUMat 2 requires at least 2 milliliters of urine sample for accurate analysis results. This amount is enough for approximately two (2) measurements. If you are setting up parallel measurements, make sure that there is enough sample in the test tubes for each measurement.**


 **This function applies to Auto and Manual measurements as well.**


3.4.1.2 Rack number settings

By default, the first rack in a measurement cycle is assigned the number "1". In this text box, you can specify what number the system assigns to the next-in-line measurement cycle.

 **This setting is reset to default at every system restart.**

3.4.1.3 Database limit


In this text box, you can set the size of the database and the database warning limit, up to a maximum of 10 000 records. When the number of records reaches the database warning limit, a warning message will be displayed ( [6.2.2](#)). Check the **Overwrite...** check box to make the system start overwriting older records when the overall database limit is reached.

 **If you check the Overwrite... check box, the database warning limit is disabled.**

3.4.1.4 Sediment Analyzer

Check this box to make a connected UriSed start a measurement cycle whenever you start a measurement cycle on LabUMat 2.

3.4.1.5 Worklist

Check the **Enable worklist** box to make the system automatically assign the patient names and comments to future measurement records from the worklist you have set up earlier. You can set up worklists in the worklist editor ( [3.5.6](#)).

 **You can only enable the worklist if the Parallel count is set to 1.**

- ID generate mode: You can specify whether the processed test tubes should be identified based on the sequence in which they arrive or based on the barcodes attached to them. If you selected sequential ID generation, you can also specify the starting number for the test tubes in the **Next** text box.

3.4.2 Results settings

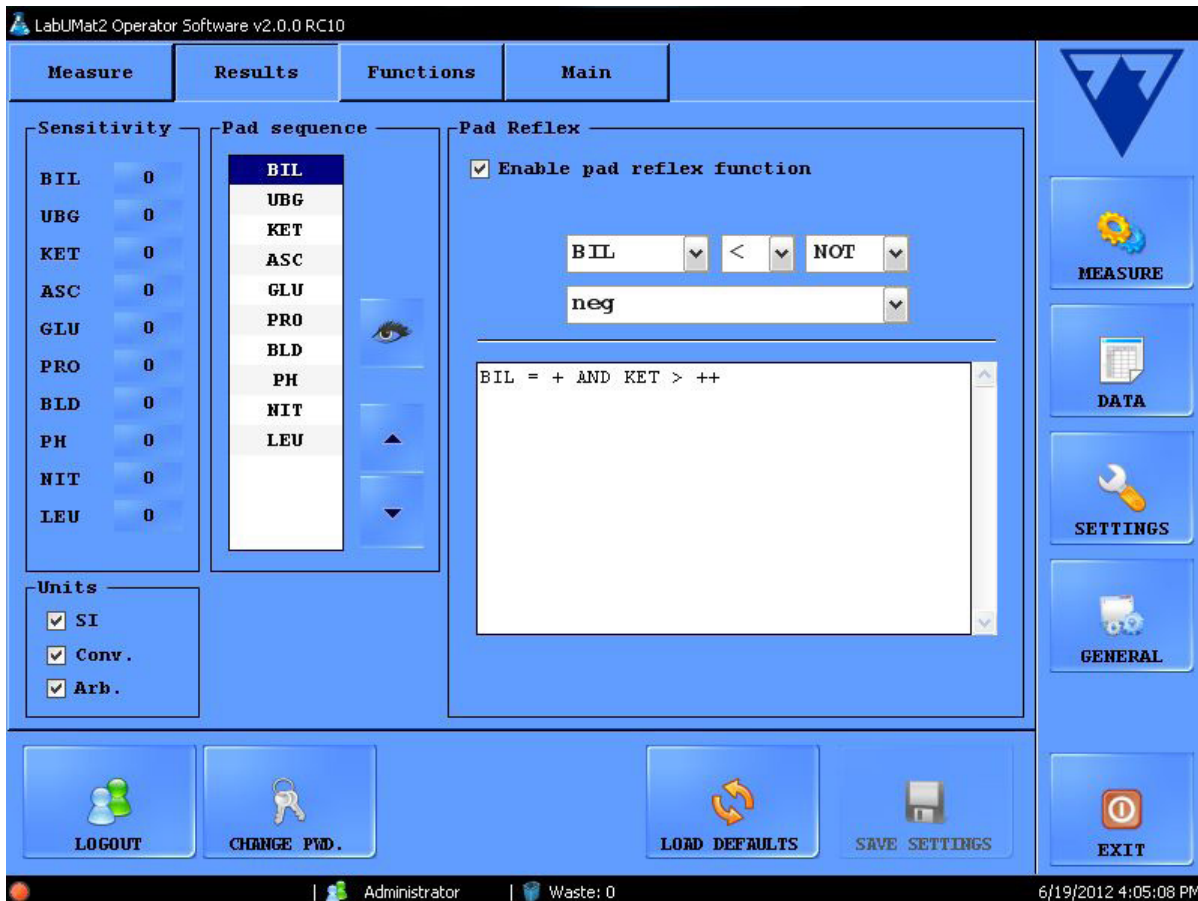


Figure 9: The Results tab on the Settings menu

3.4.2.1 Sensitivity

Measurement sensitivity can be adjusted to up to two levels in either direction (-2, -1, 0, +1, +2) for each individual reagent pad by tapping the number button next to pad labels.

3.4.2.2 Units

Unit of the results can be set to: SI, Conventional or Arbitrary. Measurement results are evaluated according to the set unit in the result table displayed on the **Data** menu.

3.4.2.3 Pad sequence

You can modify the sequence in which the test strip parameters are analyzed and transferred.

- Pad parameters are analyzed and transferred in the order in which they are displayed in the list. Tap the pad label you would like to reorder, and tap the arrows next to the list to move the pad parameter up or down on the list.
- To remove a pad parameter from the list, tap the pad label, and then tap the eye icon next to the list. The pad label will be dimmed, and it will not appear in the measurement records or the transferred data.

3.4.2.4 Pad reflex

In this section, you can create custom filters that will select certain but not all measurement records you want to send to sediment analysis (if you have a UriSed 2 device that interfaces with your LabUMat 2 device). You can specify the conditions for your filters using the measurement results for the individual reagent pads.

- The filter you create will be displayed in the central input window. You can set up the conditions for your filter using the four drop down boxes above this central input window. The drop down boxes and their options are, from left to right:

1

each parameter of the reagent strip, one at a time

2

a selection of mathematical symbols (less than, greater than, equal to, not equal.)

3

the Boolean operators AND, OR, and NOT

4

the possible results for each parameters in arbitrary units (neg, (+), +, and so on).

- Any parameter, symbol, or arbitrary unit you select will be displayed in the central window. You can combine separate conditions for each individual parameter if you wish to create a single complex filter. For example, to select only measurement records with exactly + Bilirubin results and with Ketone results greater than ++,

1

select BIL, =, and + from the relevant drop down boxes to set up the Bilirubin condition,



2

select AND to add the Ketone condition,

3

select KET, > and ++ in the drop down boxes.

The above selection will be displayed as the string "BIL = + AND KET > ++" in the input window (See figure above).

-  Each time you select a parameter, a symbol, an operator, or a unit, it will appear in the window, so you can monitor the creation of your filter.
-  If you set up invalid conditions, the software displays an error message in red below the central input window, and you will not be able to save the filter until you fix the error.

3.4.3 Functions settings

You can adjust all the data management properties on this tab.

3.4.3.1 Automatic print

Check this box to make LabUMat 2 automatically print all measurement records after every finished measurement, regardless of whether the result was positive or negative.



Figure 10: The Function tab on the Settings menu

3.4.3.2 Automatic export


Check this box to make the system automatically export all measurement records after every finished measurement, regardless of whether the result was positive or negative. Use the SET button to enter the file path for the export.

3.4.3.3 Transfer setup

You can set up the properties of the data transfer through the serial port in this screen area.

- Transfer mode: Select the radio buttons to choose between the unidirectional and bidirectional transfer protocols
- Baudrate: Select the radio buttons to set the speed of the transfer
- Automatic transfer: Check this box to make the system automatically transfer all measurement records after every finished measurement, regardless of whether the result was positive or negative.

 **Contact your distributor for more information about data transfer protocols.**

 **Transfer setup is only available if you leave the Sediment analyzer box on the Measure tab unchecked.**

3.4.3.4 Displayed ID

Use the Start and Length spin boxes to specify the first character of the barcode that the system recognizes (the default is 1: the complete barcode is processed), and the total number of processed characters in a barcode (up to 32).

3.4.3.5 Dry strip

Check the Dry strip check box to make the system detect whether any of the reagent pads are dry after sample pipetting. If you enable this function, sample records with dry reagent pads will be displayed with X4 status ([👉 6.4 Possible measurement errors](#)), and will not be added to the database.

3.4.3.6 QC deletion

Check the Enable QC deletion box to allow users to delete QC records from the database.

3.4.4 Main settings

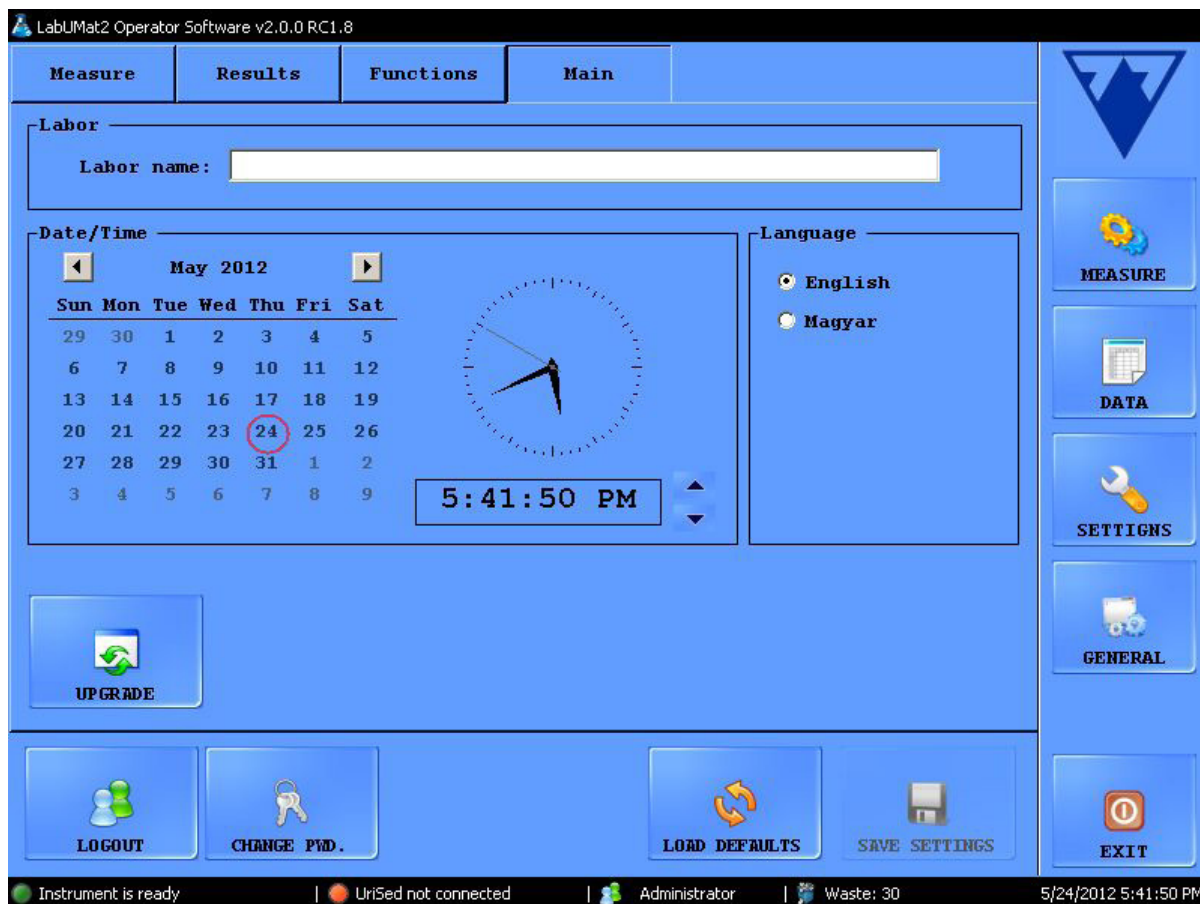


Figure 11: The Main tab on the Settings menu

3.4.4.1 Labor

The text you enter into this text box is displayed as laboratory identification on printed reports, in unidir transfer data, and on exported sample reports.

3.4.4.2 Date/Time

Set the current time and date, and your preferred time and date format.

3.4.4.3 Language

Select the radio buttons to set your preferred user interface language. The setting will take effect after you tap SAVE SETTINGS.


3.4.4.4 Upgrade



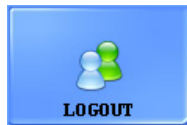
If a software upgrade is available for LabUMat 2, your distributor will send you the new software version. To upgrade the software of LabUMat 2, insert the USB stick you received from your distributor in one of the USB ports of the instrument and tap this UPGRADE button.

No further user action is required. The upgrade process may take several minutes, after which the system will restart.


 The upgrade process will not affect your personal settings.

 **When you first switch on your instrument after upgrading, do not press any buttons until the “Successful software upgrade!” message is displayed.**

3.4.4.5 Logout



Tap this button to revert to an Operator user account with limited user rights. Operator-level users only have access to the Measure tab of the Settings menu.

 After logging out, you will need to enter a valid password to log in as an Administrator-level user.

3.4.4.6 Change password



Tap this button to modify the currently valid password for the user account you are currently logged in to. Only users logged in as Administrators can change the Administrator password.

In the popup window that appears, enter the original password, then the new password, twice, for security, and tap **OK**.

Figure 12: The password change popup window

3.4.4.7 Load defaults



Tap this button to reset all the settings and values you have modified across the complete system to their defaults.

3.4.4.8 Save settings



Tap this button to save the changes you made.

3.5 General

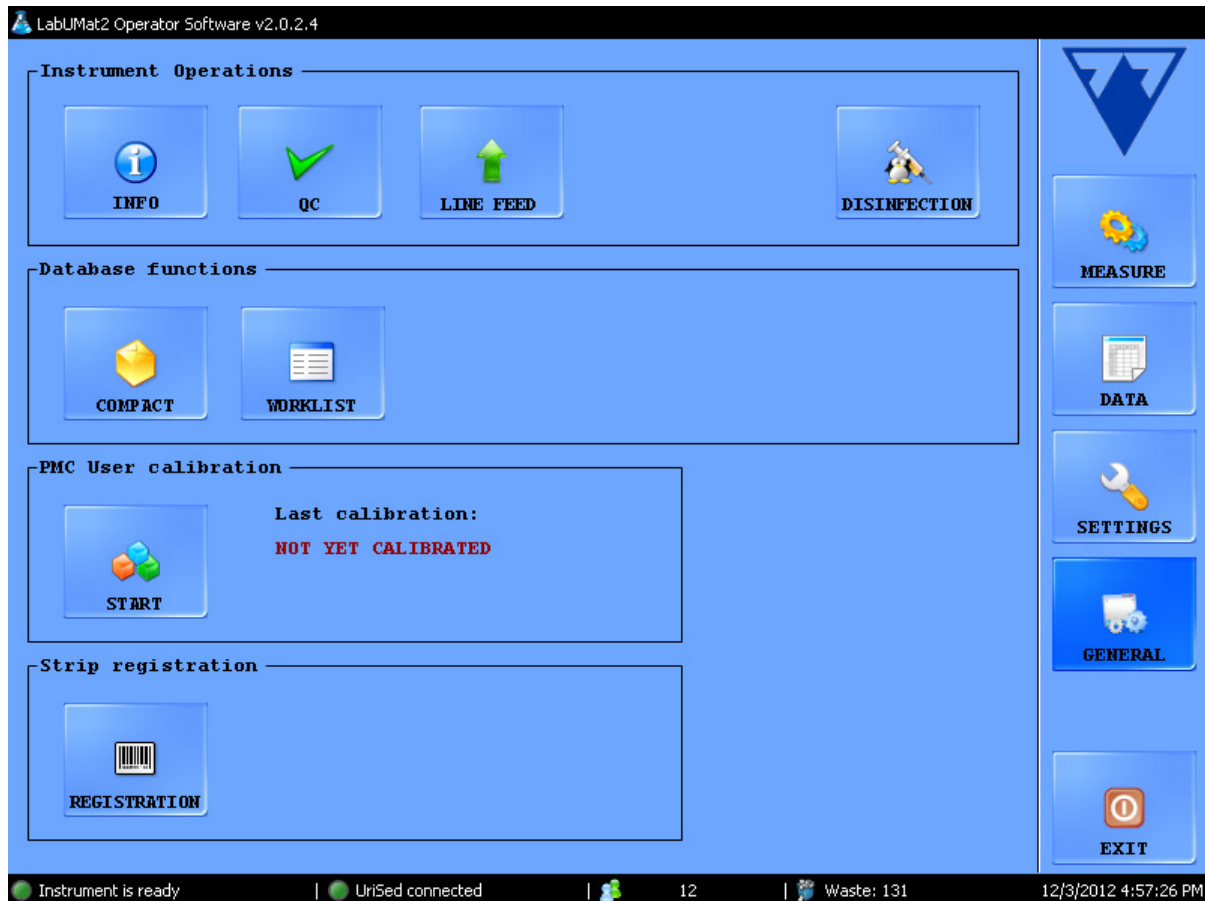


Figure 13: The General menu

3.5.1 Info



This window gathers all software-, and firmware version numbers of different modules currently presented in your LabUMat 2.

3.5.2 Quality Control



You can monitor the performance of your LabUMat 2 can be with the integrated quality control procedure. All information and parameters concerning quality control measurements are collected on this menu. Tap the **QC** button to access the quality control settings discussed in the following.

3.5.2.1 Overview of QC

There are two types of control solution within a set: a solution to mimic a normal (Low level) and an abnormal (High level) urine sample. Normal control


solutions do not contain any chemical components detected by the device, while abnormal control solution – like abnormal urine – contains chemical analytes in given concentration. During quality control the instrument analyzes first the normal, then the abnormal control solution, and compares the results to the preset analyte concentrations for the given control solution lot. Quality control measurements of Low level and High level control solutions are successful if all of checked parameters are within the set values specified in the limit tables.



Figure 14: The Quality Control setup menu

3.5.2.2 Quality Control settings



The QC settings menu lets you collect and manage all your quality control solutions in a single place.

- 1 Tap the  button in the Low Level screen area to start entering the details for a normal control solution in the popup window that appears.
- 2 Select the type of control solution you are using in the drop-down menu (only the listed control solutions can be used).
- 3 Find the lot number and the expiration date on the solution packaging or on the package insert, and enter these details.
- 4 Refer to the acceptance ranges listed on the package insert and enter the minimum and maximum arbitrary values for each of the parameters of the

given Low Level solution lot by tapping the spin buttons in the Min. and Max. columns.

 **The maximum value cannot be lower than the minimum value for any parameter.**


5 Save your changes by tapping the green check mark, and complete steps 1–4 for your abnormal control solution.

6 Use the  (edit) and the  (delete) buttons to manage your control solution lots.

 **If you delete a control lot, all its related quality control records will also be deleted from the database.**



3.5.2.3 Starting a QC measurement

1 Pour at least 2 milliliters of both control solutions two separate test tubes and put them in a rack on the rack conveyor.

2 Select the control solution lot you wish to use in the list. Tap the  button to enable the selected lot. Tap the START QC button.

3 The system will prompt you to insert the test tube filled with the Low level (Level 1) control solution. Then it will prompt you to insert the the test tube containing the High level (Level 2). Insert the rack with the control solutions you prepared and press OK in the dialog box.

4 The device will switch to the Measure menu and perform the control measurements, identical to urine sample analysis. The records of the two control measurements are named and stored in the database as QC_LOW and QC_HIGH, respectively.

5 When the control measurements are finished, a message will be displayed about whether the control was successful or not. Successful and failed QC measurements are labeled  and  in the sample list, respectively. The success or failure of the QC tests is also listed in their comments.

3.5.3 Line Feed



Tap this button to make the built-in printer forward the printer paper by the equivalent of one line of printed text.

3.5.4 Disinfection



Disinfection: The disinfection washing process can be directly started by pressing this button. For details, please refer to the

chapter titled "Maintenance".

3.5.5 Compact



Database compact: The size of database can be optimized, which is important for later fast operation. This process might take a few minutes if the database is large. Please do not switch off the instrument during this process. The compact database function is running automatically by each software upgrade. It is recommended to use the Compact database function once a month, mainly in case of deleting a lot of measurements.

3.5.6 Worklist editor



Worklist: In worklist editor names of the patients can be entered in a list before starting the measurement. During measurement LabUMat 2 takes the names from the worklist one by one and automatically assigns them to test results according to the names sequence in the list or according to identifying barcodes if this function is enabled. Worklist editor can be launched by pressing Worklist button.

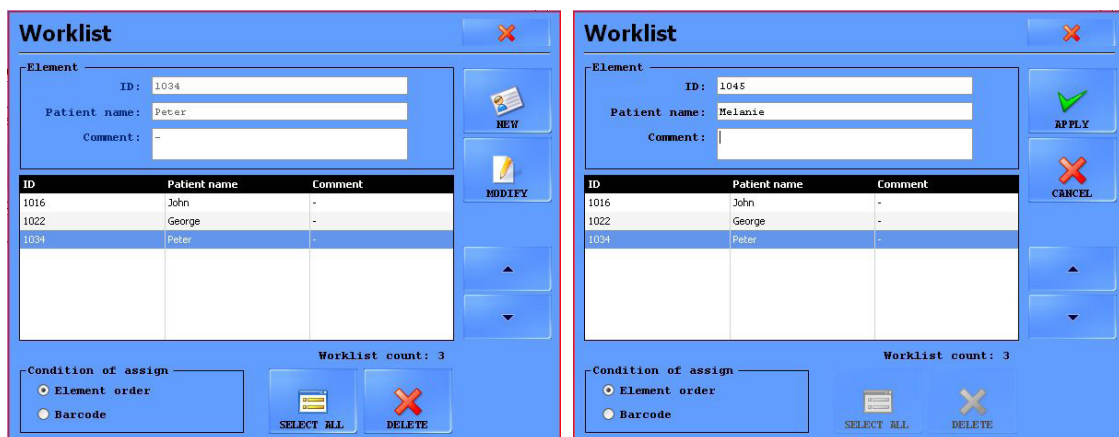


Figure 15: The Worklist popup window with all its function buttons

Key to :

- New: New barcode and patient name can be added to the worklist with this button.
- Modify: Selected worklist item can be modified with this button.
- Apply/Cancel: Modifications can be accepted or cancelled.
- Select all: Every item can be selected by pressing the button.
- Delete: Press this button to erase selected elements of the worklist.

It can also be set on this panel whether patient names should be assigned to measurement results according to their sequence in the list or according to

identifying barcodes. Desired way of assignment has to be selected by the radio buttons.

Scrolling among the elements can be done exactly the same way as in the data menu. Selection of the elements is also similar.

3.5.7 PMC User calibration



If you suspect the Physical Measurement Cell is inaccurate, tap the **START** button to recalibrate the Physical Measurement Cell using distilled water.

⚠ Make sure that both liquid tanks are connected to the system before you start the PMC calibration process.

- 1** Place a single test tube with three (3) milliliters of distilled water in a rack on the rack conveyor.
- 2** Tap the **START** button. The system will measure the specific gravity of the water, compare it to a factory preset, and if calibration is successful, modify its default calibration.

⚠ If user calibration fails, contact 77 Elektronika technical support.

3.5.8 Strip registration

⚠ The LabUMat 2 device can only be operated with properly registered LabStrip U11 Plus GL test strips.



The LabUMat 2 system can fine-tune the analysis process based on the lot-specific test strip-related data stored in the registration codes inside each vial of LabStrip U11Plus GL test strips. The registration code also includes the expiry date, the lot number, and the maximum number of measurements allowed for the given batch of test strips.

⚠ Make sure that the registration code card you are using in the strip registration process corresponds to the vial of test strips you want to start using.

- 1** Tap the **REGISTRATION** button.
- 2** Insert the registration code card (marked LabUMat 2 into the rack passage with the 2D barcode facing towards the right (→).
- 3** Wait for the integrated barcode scanner to read the registration code, indicated by a brief beeping sound. The system will also display a message about whether strip registration was successful or not.

3 Menu system

- i** After a successful strip registration, the number of available strips indicated on the Measure menu will increase by the number of strips stored in the registration code.



Figure 16: Using the registration code card to register new strips

- !** Each registration code card can be used only once.

4 OPERATION

4.1 Loading strips into LabUMat 2

LabUMat 2 operates with single-use reagent urine strips. Strips are supplied in vials, each holding 150 strips. Before starting the measurement strips should be loaded into the instrument.

Open up the doors of the unit and take out the strip loader container of LabUMat 2 by turning it left and pulling out as shown in the pictures below.

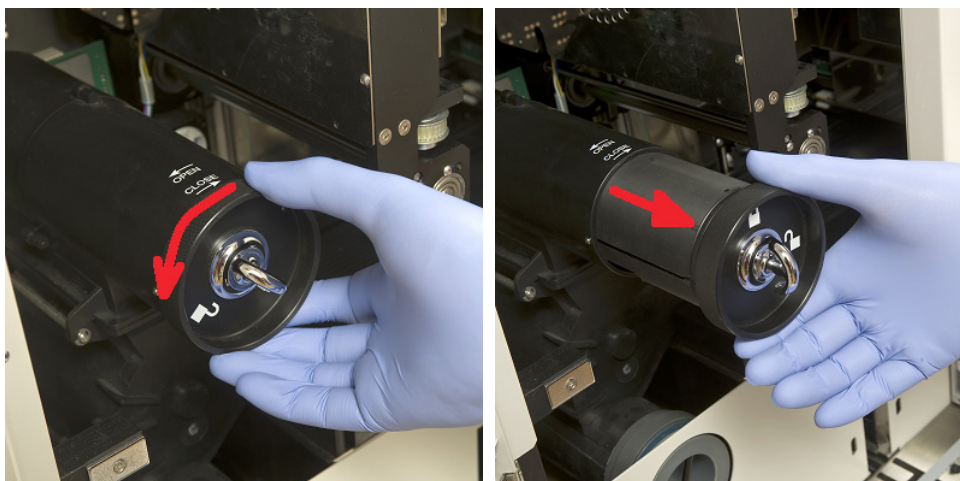


Figure 17: Removing the strip loader cylinder

After removing the strip loader container open the latch by turning it to the right. Pull out the cap.

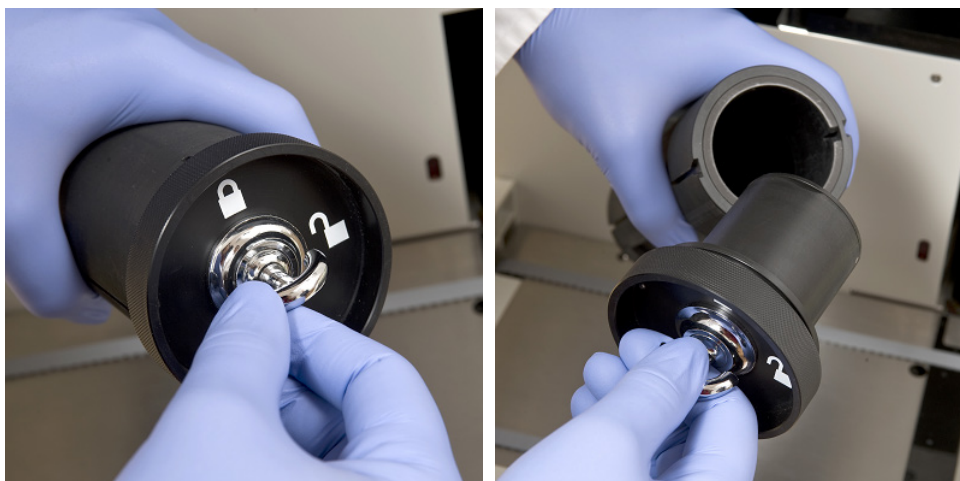


Figure 18: Opening the strip loader cylinder

Pour in the strips from the vial and close the container by locking the latch turning it to the left. You may also add some desiccant into the cap to protect the strips from air humidity.

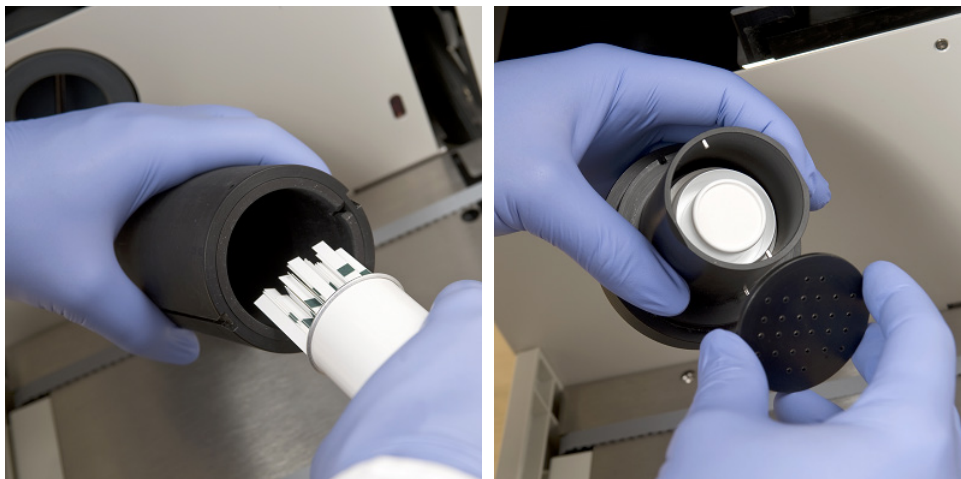


Figure 19: Loading test strips and desiccant into the strip loading cylinder

Push back the strip feeder container to its original position and turn it to the right to close. (There is only one possible orientation for putting it back and closing it properly.) Do not throw away the strip vial as unused strips should be put back at the end of measuring with LabUMat 2.

⚠ The analyzer can be operated only using test strips designed specifically for LabUMat 2, and supplied by the device manufacturer.

⚠ Strips are for single use only. Never re-use test strips.

⚠ Do not touch fresh unused strips: contamination can frustrate the evaluation.

⚠ Since urine is a fluid of human origin, it may be infectious and carry biological risks. Handle used strips and urine contaminants with care. Always wear rubber gloves or other protecting equipment when operating LabUMat 2.

4.2 Measuring modes

i The default measuring mode is Auto: measurements are performed continuously as long as there are samples to be processed and test strips available. You can stop the measurement cycle by tapping the **Stop** measurement button.

⚠ If an Auto measurement cycle stops because there are no more samples to be processed, two (2) test strips will always be left between the feeder drum and the pipetting stage. If you do not start a new measurement, these strips will be forwarded directly into the used strip bin when you switch off the device.

1 If you want greater control over the device measuring cycle, go to the **Measure** menu, and select the **Manual** measuring mode by tapping its button.

2 Using the numeric keypad that pops up (👉 [Figure 20](#)), enter the number of measurements that you want the device to perform in a single measurement

cycle.



Figure 20: The Manual measurement mode numeric keypad

3 Tap the red **X** to apply your selection. The device will analyze the number of samples you specified.

i The measurement cycle will only stop earlier than specified if the test strips run out, or if there are fewer samples on the rack conveyor than specified. You can stop the measurement cycle by tapping the **Stop measurement** button.

i Each new measurement cycle will restart from zero (0).

! You can set up parallel measurements in both Auto and Manual measurement modes (👉 [3.4.1](#)).

! LabUMat 2 requires at least 2 milliliters of urine sample for accurate analysis results. This amount is enough for approximately two (2) measurements. If you are setting up parallel measurements, make sure that there is enough sample in the test tubes for each measurement.

4.3 Identification of test results

Test results can be identified either by automatically generated ID numbers, by bar-codes affixed to test-tubes or by sequence numbers. All identifications can be changed later by renaming records in the “Database” menu using the “Modify” option (i.e. if the barcode was missed or not read properly). Attributes of the possible identifications are concluded as follows:

Automatically generated IDs: LabUMat 2 identifies samples by their position. The first three digits of the ID encode the number of the rack, while the second two digits encode the position of the measured sample in the rack. Numbering of the racks starts again from one after each switching off. However, LabUMat 2 assures that the automatically generated IDs are unique during one day time


period. This means if the instrument was switched off because of any reason during one day and numbering of the racks started again (from first rack first position), instead of giving an already existing ID, LabUMat 2 extends the numbering with one additional number.

Identification by bar-code: Urine samples can be identified by bar-codes if bar-codes are affixed to test-tubes. On what type of barcodes can be used and on how they should be applied on test tubes, please refer to the chapter titled "Placing barcodes on test tubes".

Sequence numbers: Patient urine samples could be identified as well in the order of the sample tubes put into the racks by a running sequence number. Starting sequence number can be adjusted in Settings/Measure.

4.4 A typical daily routine

It is very easy to operate LabUMat 2 after it has been set up for normal operation, strips have been loaded into the instrument and the wet system is properly installed. Just follow the instructions listed below to finish your laboratory work without any effort.


 **Only specially trained professionals are allowed to use the instrument.**

 **Always wear rubber gloves or other protecting clothing when operating LabUMat 2.**


1 Remove all racks from the rack mover part and switch on LabUMat 2 with the start button on it right side. User software of LabUMat 2 starts up, the self-diagnostic procedure is automatically performed and the "Measure" menu appears on the screen.

2 Prepare urine test samples in test tubes and put the test tubes in the supplied racks. If your test-tubes are identified by barcode, make sure that the barcodes face the open side of the racks, otherwise the barcode reader will not be able to identify test tubes.


3 Put the racks with test-tubes containing urine samples on the rack mover unit to the right of the little black pins on the right side of test tube driving hole. Take care to place racks on the rack mover unit by facing their open side to the right. LabUMat 2 automatically ensures correct rack angle right before the rack reaches the test tube driving hole.

 **Fill test tubes with at least 2.0 ml of urine. For the measurement only ~1 ml urine is aspirated, however, bigger amount is needed for performing sampling properly.**

4 Now LabUMat 2 is ready to operate. Select the measurement mode (Auto or Manual). If you selected the Manual mode, specify the number of samples you would like to analyze (☞ [4.2 Measuring modes](#)). If you selected the Auto mode, simply tap the Start button to start the measurement cycle.

 During measurement, the measuring process can be followed on the screen: the date, time, sample position, ID, name and the status of each strip is continuously displayed. The results of the measurements can be studied in the Data menu.


5 When you are finished, tap the **Stop measurement** button.

 The device will not stop immediately. Any test strips that have been pipetted, or were about to be pipetted when you tapped Stop measurement will be processed before the measurement cycle stops.

6 If the last rack remains inside the test-tube driving hole after finishing measurements, press the **Rack out** button to have the rack removed. The measured samples can then be poured out.


7 Open the used strip bin on the right side of the device and empty it. It is also recommended to rinse it at the end of each day.


8 Switch off the instrument to stand by mode by pressing the “Exit” button.

 A disinfectant rinsing procedure is required before you switch off the device at the end of each day (☞ [3.5.4 Disinfection](#)).


9 Switch off the device with the main switch on the bottom right casing panel. Clean the instrument at the end of each day (☞ [5 Maintenance](#)).



4.4.1 Basic operation-related troubleshooting


 In both Auto and Manual modes, the device will not start or will automatically stop if...	...there are no more test tubes to measure.
	...the database is full.
	...it runs out of strips
	...it runs out of distilled water.
	...the used strip bin is full.
	...the waste container is full.
	...the worklist is enabled and all the worklist elements have been processed.
	...the rack mover is full.

 LabUMat 2 can be operated only with its dedicated strips supplied by the manufacturer of the instrument.


 Never touch the rack mover part during operation if there are racks with test tubes on it.


 If you reuse supplied test tubes, do not forget to wash them thoroughly. Dirty test tubes may frustrate test results. Whenever possible use only single-use tubes. Do not reuse single use tubes.

 The measuring process is suspended if any problem arises during operation. In case of a failure  [6 Error messages, troubleshooting](#) for advice.

 Never switch off the instrument with the main switch on the bottom right casing panel while a measuring process is going on. Always exit from the software by pressing the Exit button before switching off the device completely.


 Always perform a disinfection procedure before you switch off the device at the end of the day.

 Do not reach into the device under the front doors while it is in operation! Moving parts might be dangerous and could cause injuries (automatic strip-feeder, automatic probe and pipette) if disregarded!

 Do not touch the parts of the device that are marked with the ESD (Electrostatic discharge) symbol.

5 MAINTENANCE

In order to prevent infection LabUMat 2 must be cleaned adequately. Use alcohol-based cleaning agents and aldehyde free disinfectant (bactericide, fungicide, viricide) solutions.

 **Since urine is a fluid of human origin, it may be infectious and carry biological risks. Handle used strips and urine contaminants with care. Always wear rubber gloves or other protective equipment when operating LabUMat 2.**

To keep LabUMat 2 in perfect condition the following maintenance activities are recommended daily:

1 Before switching off the instrument at the end of the day, fill 6 mL of 2% NaOCl (sodium hypo chlorite) solution into a test tube. Remove all remaining racks with test tubes from the rack conveyor unit and place the test tube with NaOCl solution into a rack all by itself. Press the **Exit** button to confirm the automatic cleaning process and wait until it is finished. This should take about 2 minutes.

2 Switch off the device. Pull out the used strip bin on the right side of the equipment, and empty it. It is recommended that you rinse it with a 2% NaOCl solution, and then with water at the end of each day.

 **No measurement can be started while the used strip bin is full.**

3 Empty the container of waste water and clean it with 2% sodium hypochlorite solution, then rinse it with water.

 **No measurement can be started while the used strip bin is full.**

4 Remove the rack conveyor unit for easy cleaning with a piece of cloth dipped in an alcohol-based, aldehyde-free disinfectant solution. This part does not contain any electrical parts, so there is no danger of a short-circuit if liquid enters it. Nevertheless, immersing the rack mover unit in water is not recommended as flooding damages the bearings inside.

5 Remove the strip pipetting stage and the strip timer comb. Both can be easily removed from inside of the unit.

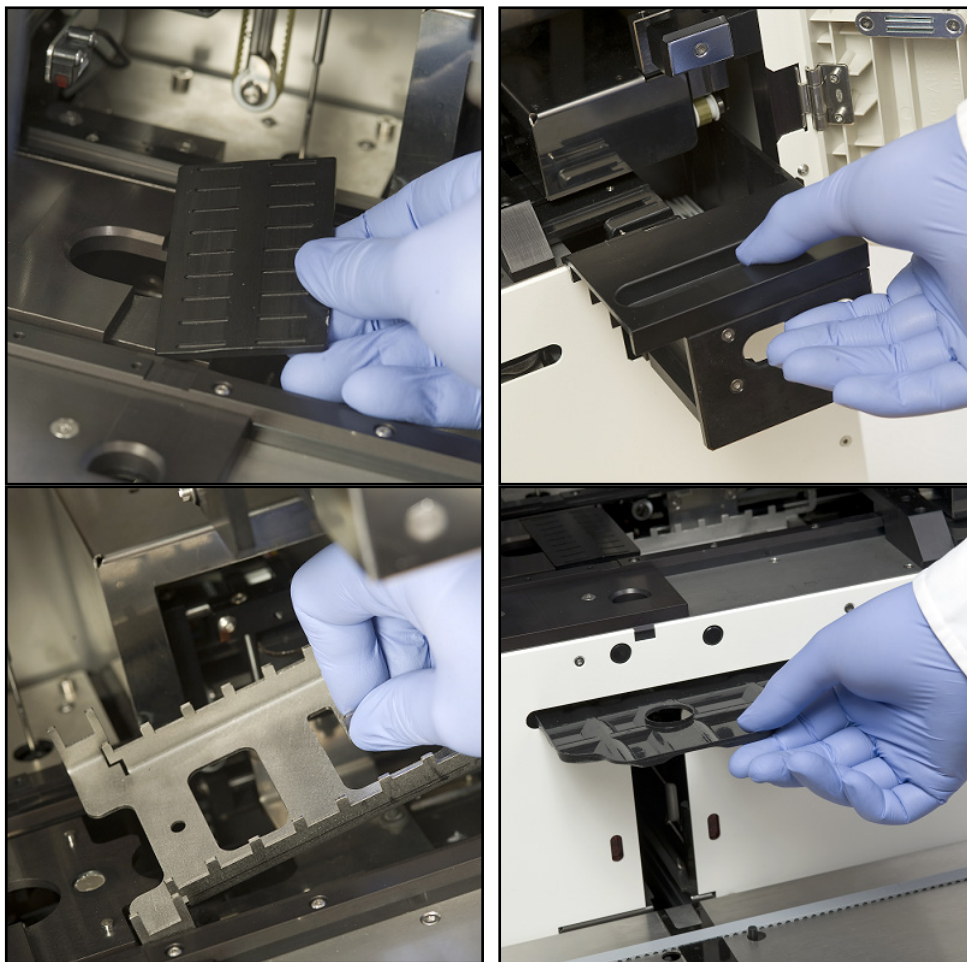


Figure 21: Removing (clockwise) the pipetting stage, the used strip bin, the drip tray, and the strip timer comb for cleaning

6 Clean removable parts with a disinfectant solution. The most efficient way to clean removable parts is by using a disinfectant spray (such as Isorapid Spray, Dentiro Mikro Spray and so on). Instead of spraying them, you can also rinse removable parts in an alcohol- or NaOCl solution.

⚠ Do not spray inside the device. Remove removable parts from the device before you spray them. Use a moistened piece of cloth to clean internal parts.

⚠ Dry removable parts before replacing them.

i Take particular care to clean out-of-reach surfaces.


7 Pull out and clean the tray under the strip forwarder unit easily with a cloth dipped in a disinfectant solution.

8 If necessary, use a wet piece of cloth to clean the covering panels also.

⚠ In case of an extreme obstruction (e.g. because the device had been misused) fill a 5% NaOCl (sodium hypo chlorite) solution into a test tube, place it into a rack on the rack conveyor then start the cleaning process.

⚠ Do not forget to place a test tube filled with disinfectant onto the rack

conveyor before pressing the Exit button.

 Never switch off the device by pressing the main switch at the back before the automatic cleaning process is finished.

6 ERROR MESSAGES, TROUBLESHOOTING

6.1 Info messages

If an info message from the following list appears follow the troubleshooting instructions and press **“OK”**. Some messages disappear immediately if their reasons are resolved.

Find complete list of hardware warning messages in the table below:

Error code	Software info message	Info description
0	Printing in progress...	Printer busy.
1	There are no logs available.	-
2	Data transfer successful.	-

6.2 Warning messages

If a warning message from the following list appears follow the troubleshooting instructions and press **“OK”**. Some messages disappear immediately if their reasons are resolved.

6.2.1 Hardware warning messages

Error code	Hardware warning message	Warning elimination
14	Loading bin is out	Please insert the loading bin! You cannot start the measurement.
16	Empty bin is out	Please insert the empty bin! You cannot start the measurement.
19	Feeder is empty	Please insert strips to the feeder!
22	Washing bin warning	Please take care of the washing liquid!
23	No washing liquid.	Please fill up the washing bin! You can not start the measurement.
25	Waste bin warning	Please take care of the waste liquid!
26	Waste bin full	Please empty the waste bin! You can not start the measurement.
32	Rack mover full	Please empty the measured samples! You can not start the measurement.
33	No rack.	Please prepare a new rack to the rack mover.
36	Left door is opened	Please close the left door! You can not start the measurement.
38	Right door is opened	Please close the right door! You can not start the measurement.

41	Drawer (plate) is out	Please insert the drawer (plate)! You can not start the measurement.
48	Printer out of paper	Please insert paper to the printer!
49	Printer door is opened	Please close the printer door!
63	Comb is out.	Please insert comb!
64	No pipetting stage.	Please insert pipetting stage!

6.2.2 Software warning messages

Error code	Software warning message	Warning elimination
0	Common measure is rejected by the Sediment Analyzer.	Different parallel count measure not allowed.
1	Worklist is empty.	Please add elements to the worklist, or disable it.
2	Worklist elements are consumed.	Please add elements to the worklist, or disable it.
3	Database warning limit is reached.	Please delete data from database, or switch on the "Overwrite the oldest sample" function in the settings/measure.
4	Not enough space in your removable device.	Please delete data from your removable device.
5	There is no removable device.	Please plug in an USB stick or removable HDD.
6	The auto export path is not selected.	Please select auto export path, or switch off the function!
7	The auto export path is not exist.	Please select auto export path, or switch off the function!
8	The sediment analyzer is not ready!	Please check the sediment analyzer!
9	Invalid start parameter received by the sediment analyzer!	Please check the sediment analyzer!
10	The sediment analyzer is busy!	Please check the sediment analyzer!
11	Waste full in the sediment analyzer!	Please check the sediment analyzer!
12	No washing liquid in the sediment analyzer!	Please check the sediment analyzer!
13	Sample count exceed sample limit in the sediment analyzer!	Please check the sediment analyzer!
14	Cuvette registration necessary in the sediment analyzer!	Please check the sediment analyzer!

15	Cuvette waste bin full in the sediment analyzer!	Please check the sediment analyzer!
16	Worklist elements are consumed in the sediment analyzer!	Please check the sediment analyzer!
17	In this common reflex mode the chemical parallel count must be 1!	Please check the sediment analyzer!
18	If you use worklist function the parallel count must be 1 in the sediment analyzer!	Please check the sediment analyzer!
19	There is no actual user in the sediment analyzer!	Please check the sediment analyzer!
20	If you use worklist function the parallel count must be 1!	Please switch off the worklist function or set the parallel count to 1!
21	At least one pad must be visible!	Please switch on at least one pad in the pad sequence setting!
22	Parallel count and sequence mode are conflicted!	In this id generated mode (sequence) the parallel count must be 1!

6.3 Error messages

During operation a control program checks the operational conditions needed for proper execution of each functions. If checking ends with indication of a problem, an error message will be displayed. If an error message appears, press **"Init"** button in **Measure window**. In some cases this will automatically solve the problem by initializing LabUMat 2. If not, try also to switch off and on the instrument as hardware reset may help to eliminate the problem as well.

Find complete list of hardware error messages in the table below:

Error code	Hardware error message	Error elimination (PRESS INIT AFTER EVERY ERROR MESSAGE)
0	No available serial port	Please press the initialization button! If the problem still remains, you must disclaim the mechanical error.
1	Port open error on instrument	Please press the initialization button! If the problem still remains, you must disclaim the mechanical error.
2	Port open error on external line.	Please press the initialization button! If the problem still remains, you must disclaim the mechanical error.
3	Too many serial ports is defined in ini file	Please press the initialization button! If the problem still remains, you must disclaim the mechanical error.
4	Any protocol port isn't defined	Please press the initialization button! If the problem still remains, you must disclaim the mechanical error.
5	Memory allocation error in port definition	Please press the initialization button! If the problem still remains, you must disclaim the mechanical error.
6	Can not find auto port	Please press the initialization button! If the problem still remains, you must disclaim the mechanical error.
7	Driver thread can't start	Please press the initialization button! If the problem still remains, you must disclaim the mechanical error.

6 Error messages, troubleshooting

8	Robot X washer position error	Please press the initialization button! If the problem still remains, you must disclaim the mechanical error.
9	Robot X tube position error	Please press the initialization button! If the problem still remains, you must disclaim the mechanical error.
10	Robot Y upper position error	Please press the initialization button! If the problem still remains, you must disclaim the mechanical error.
11	Robot Y tube position error	Please press the initialization button! If the problem still remains, you must disclaim the mechanical error.
12	Aspiration pump home position error	Please press the initialization button! If the problem still remains, you must disclaim the mechanical error.
13	Feeder (card 1) communication error.	Please press the initialization button! If the problem still remains, you must disclaim the mechanical error.
14	Washer (card 2) communication error.	Please press the initialization button! If the problem still remains, you must disclaim the mechanical error.
15	Robot (card 3) communication error.	Please press the initialization button! If the problem still remains, you must disclaim the mechanical error.
16	Rack (card 4) communication error.	Please press the initialization button! If the problem still remains, you must disclaim the mechanical error.
17	Strip mover (card 5) communication error.	Please press the initialization button! If the problem still remains, you must disclaim the mechanical error.
18	Communication error on sampler (card 6)	Please press the initialization button! If the problem still remains, you must disclaim the mechanical error.
19	Printer (card 7) communication error.	Please press the initialization button! If the problem still remains, you must disclaim the mechanical error.
20	Port thread can't start	Please press the initialization button! If the problem still remains, you must disclaim the mechanical error.
21	Can not create port class	Please press the initialization button! If the problem still remains, you must disclaim the mechanical error.
22	Strip turner home position error	Please press the initialization button! If the problem still remains, you must disclaim the mechanical error.
23	Feeder drop position error	Please press the initialization button! If the problem still remains, you must disclaim the mechanical error.
24	Feeder upper position error	Please press the initialization button! If the problem still remains, you must disclaim the mechanical error.
25	Rack inner position error	Please press the initialization button! If the problem still remains, you must disclaim the mechanical error.
26	Rack outer position error	Please press the initialization button! If the problem still remains, you must disclaim the mechanical error.
27	Aligner opening error	Please press the initialization button! If the problem still remains, you must disclaim the mechanical error.
28	Aligner closing error	Please press the initialization button! If the problem still remains, you must disclaim the mechanical error.
29	Rack position error	Please press the initialization button! If the problem still remains, you must disclaim the mechanical error.
30	Barcode reader connection error	Please press the initialization button! If the problem still remains, you must disclaim the mechanical error.
31	Memory allocation error	Please press the initialization button! If the problem still remains, you must disclaim the mechanical error.

6 Error messages, troubleshooting


32	Strip puller home position error	Please press the initialization button! If the problem still remains, you must disclaim the mechanical error.
33	Comb lifter home position error	Please press the initialization button! If the problem still remains, you must disclaim the mechanical error.
34	Measuring head home position error	Please press the initialization button! If the problem still remains, you must disclaim the mechanical error.
35	Measuring head communication error	Please press the initialization button! If the problem still remains, you must disclaim the mechanical error.
36	Printer head is too hot	Please press the initialization button! If the problem still remains, you must disclaim the mechanical error.
37	Sediment connection error.	Please press the initialization button! If the problem still remains, you must disclaim the mechanical error.
38	Mixing pump home position error	Please press the initialization button! If the problem still remains, you must disclaim the mechanical error.
39	PMC connection error	Please press the initialization button! If the problem still remains, you must disclaim the mechanical error.
40	System init failed	Please press the initialization button! If the problem still remains, you must disclaim the mechanical error.
41	Feeder home position error!	Please press the initialization button! If the problem still remains, you must disclaim the mechanical error.

Find the complete list of other software error messages in the table below:

Error code	Software error message	Error elimination
0	LIS connection error	Please check the LIS system and the cable.
1	Error at LIS connection open	Please check the LIS system and the connection cable.
2	Upgrade command error	Please try to reboot the application. If not success please upgrade directly the cards from the service software!
3	Flash erase error	Please try to reboot the application. If not success please upgrade directly the cards from the service software!
4	Upgrade file (mhx) error	Please try to reboot the application. If not success please upgrade directly the cards from the service software!
5	Flash memory error	Please try to reboot the application. If not success please upgrade directly the cards from the service software!
6	Upgrade file (mhx) not found	Please try to reboot the application. If not success please upgrade directly the cards from the service software!
7	No processor	Please try to reboot the application. If not success please upgrade directly the cards from the service software!
8	Upgrade flash write error	Please try to reboot the application. If not success please upgrade directly the cards from the service software!
9	File IO error.	Please be sure that the removable device works correctly, and is not writing protected.
10	Invalid username or password, login failed!	Please login with correct username and password!
11	Database full!	Please delete data from database, or switch on the "Overwrite the oldest sample" function in the settings/measure.
12	The following sample can't be exported.	Please check the USB device if it has enough free space or if it can be available!

Error code	Software exception message	Error elimination
0	Software exception	Please reboot the device. If the error appears again, Please contact the service.
1	Database compact failed!	Please reboot the device. If the error appears again, Please contact the service.
2	Card upgrade error!	Please reboot the device. If the error appears again, Please contact the service.

If the problem cannot be eliminated by the above suggestions or any other error message appears, please contact your distributor in order they could help you to solve your problem. The instrument should be repaired only by specially trained service personnel.

 **Do not try to repair the equipment without the assistance of a professional.**

6.4 Possible measurement errors

While performing measurements, LabUMat 2 displays the status of the strips in the **Status** column on the **Measure** menu. If the device could not carry out the complete measurement process of a sample for some reason, a red "X" will be displayed in the Status column, with an explanatory code number. The results record for measurements marked with a red X do not appear on the Data menu. You should repeat such measurements to obtain correct results.

Measurement error code	Error description
X1	Flipped strip
X2	Strip lost, or it was detected later than it should have to
X4	Dry strip or inadequate colour of strip pads
X5	White strip or turned strip
Xt	Control measurement error (control measurement result is out of the set range)
X	Measurement stopped by user / HW or other undefined error

7 INSTRUMENT SUPPORT

7.1 Servicing

- The device may be repaired only by qualified and trained experts.
- Only original parts which are recommended by the manufacturer can be used as replacement.
- Before every operation that involves the removal of the instrument cover, the device should be switched off and unplugged from mains cable.
- Right to make changes is reserved by the manufacturer, therefore slight variances can occur between the description and reality.
- The latest documentations to the certain variants should be obtained from the manufacturer.

7.2 Ordering information

Consumables:	
UAZ-9901GL-1	LABSTRIP U11 PLUS GL (1 VIAL HOLDS 150 STRIPS)
UAZ-1105-1	SPECIAL NARROW TEST TUBE (100 PCS)
UAZ-1106-1	TEST TUBE CAP (100 PCS)
Accessories:	
UAZ-4439-3	RACK FOR LABUMAT (10 PCS)

8 TECHNICAL DATA















General	
Evaluated parameters	Bilirubin, Urobilinogen, Ketones, Ascorbic acid, Glucose, Protein, Blood, pH, Nitrite, Leucocytes using LabStrip U11 Plus GL test strips; Specific gravity, Color, Turbidity using the built-in PMC (Physical Measurement Cell) module
Technology	reflectance photometer (wavelengths: 505, 530, 620, 660nm)
Throughput	240 tests/hour
Batch size	100 test tubes
Memory capacity	10 000 results
Dimensions of main unit	
Size	600 x 650 x 635 mm (WxDxH)
Weight	55 kilograms
Interfaces*	USB, RS232 serial port, PS2, VGA
Display	800x600 TFT color touch screen
Printer	built-in thermal printer
Power	
Main Unit	100-240 VAC, 50-60 Hz / Max. 3A
Fuse	2 x T 8A L
Circumstances of operation	
Operating temperature	15–30 °C
Operating humidity	20–80 %
Circumstances of storage	
Storing temperature	(-20)–(+80)°C
Storing humidity	20–80 %
Barcode reader	
Identified barcode types	CODE 39, CODE 128, EAN-13, EAN-8, INTERLEAVED 2/5, CODABAR
Min height of identified barcodes	20 mm
Rack	Only racks provided by the manufacturer can be used
Tube	
Min sample volume in tube	2 ml (checked by liquid level sensor)
Urine homogenization	Stirring by sample mixing
Height (if tube is conical)	70–110 mm
Height (if tube bottom is linear)	70–105 mm
Diameter at the top of tube	16–17.5 mm
Max. diameter at the top of rack (56 mm above bottom of tube)	16.5 mm
Type	LabStrip U11 Plus GL

8 Technical data

Parameters	Bilirubin, Urobilinogen, Ketones, Ascorbic acid, Glucose, Protein, Blood, pH, Nitrite, Leucocytes
Package	150 pcs/vial
Max. strip load	150 pieces (1 vial)
Washing system	
Washing liquid in container	Distilled water or ion-exchange water
Volume of containers	5 liters
Washing liquid consumption	min. 300 measurements can be performed with 5 l distilled water
Washing solution for daily cleaning of LabUMat 2	Min. 6 ml, 2% NaOCl solution in one test tube
Waste bin	
Waste bin size	app. 200 measurements

*All connected devices must comply with EN 60950 standard and all its extensions relevant to the type of connected device.

9 SYMBOLS

	The CE mark identifies that the product complies with the applicable directives of the European Union
	In vitro diagnostic medical device
	This product has been tested to the requirements of CAN/CSA-C22.2 No. 61010-1, second edition, including Amendment 1, or a later version of the same standard incorporating the same level of testing requirements
	Consult instructions for use
	Serial number
	Manufacturer
	Warning: Indicates a potentially hazardous situation that if not avoided could result in personal injury.
	Biohazard: Indicates a potentially dangerous situation involving the presence of biohazardous material. All safety precautions must be taken to prevent personal injury or damage to the equipment.
	Moving parts
	ESD - Electrostatic discharge
	Laser radiation warning (Class 2)
	High voltage
	Caution: Indicates a potentially hazardous situation, that, if not avoided, could lead to damage to the instrument or compromised analysis results.
	Indicates important information or useful tips on the proper use of the device.

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