LabRobot

Dilugent® Shaker

User's manual

Version: DSM_2305.4
Software: 1.2.8



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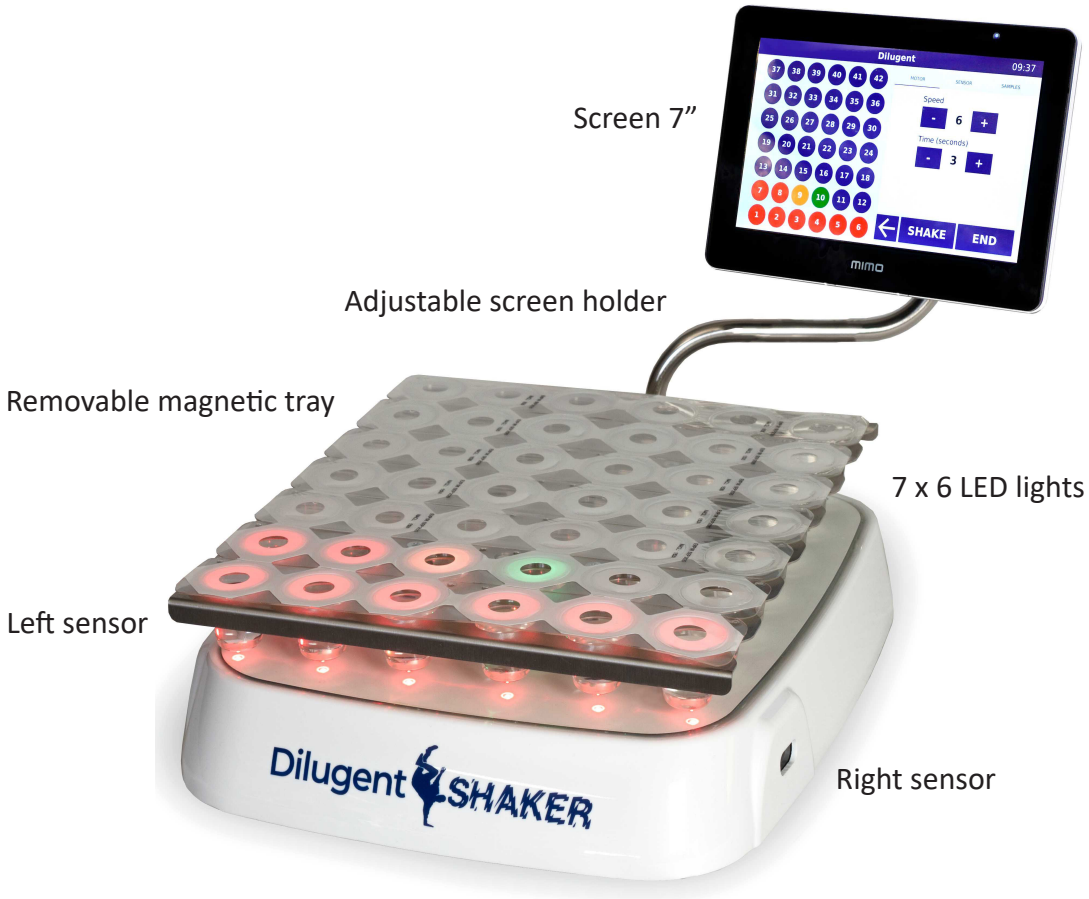
Dilugent® Shaker is an easy-to-use instrument part of the Dilucup® System that facilitates the serial dilution process in the laboratory.

It is manufactured by LabRobot Products AB in Sweden and designed for an easy, full guided and traceable use of Dilucup® Elegance.

This instrument, equipped with two sensors located on the sides, allows its use without physical contact. The 42 LED lights guide the operator during the dilution process by showing which cup is to be processed.

You can download the latest version of this manual on the website:
https://labrobot.com/dilugent-shaker/

Parts of Dilugent® Shaker



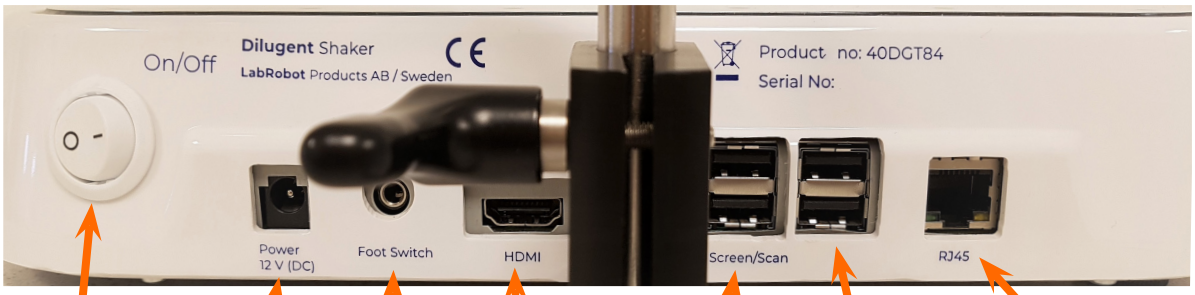
Versions of Dilugent® Shaker

Features	**Dilugent® Shaker *Light***	**Dilugent® Shaker**	**Dilugent® Shaker *Pro***
Possible steering with foot switch	•	•	•
Selectable working direction *(from left or right)*	•	•	•
Up to 2 templates can be stored	•		
Up to 10 templates can be stored		•	•
Visual ”service required” information	•	•	•
Service menu	•	•	•
Error codes	•	•	•
Possible 2D code (bar or QR) reading		•	•
Visual information of active sensor		•	•
Sample identification		•	•
User identification		•	•
Dilucup® batch identification		•	•
Export of information to USB memory		•	•
Full traceability of operations		•	•
Advanced programming			•
Step ahead without shaking for doing replicates			•
Customizable interface colours			•
Customizable LED colours			•
Full connectivity *(LIMS interface not included)*			•
Article number	40DGT84LT	40DGT84SD	40DGT84PO



Setting-up

- Connect the scanner before starting the instrument.
- Place the Dilucup® blister (7x3 or 7x6 cups) on the tray making sure that it is well placed.
- The horizontal position of Dilugent® Shaker can be adjusted with the four feet located underneath the device.
- The position of the screen can be adjusted by moving its support.
- The brightness of the screen can be adjusted by two buttons (+ / -) located at the back of the screen.



Power button
| = on
o = off

Power supply *(DC 12 V)*

Footswitch

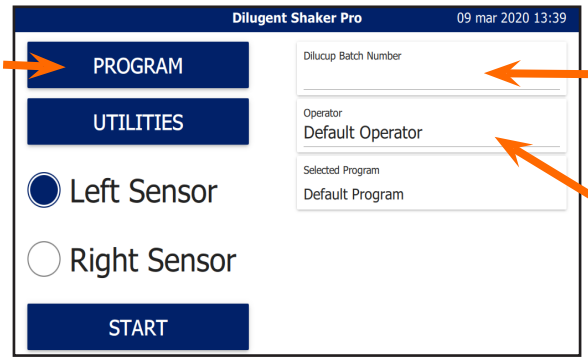
HDMI port *for external screen*

Screen/ Scan ports

USB ports *for export of data*

RJ45 port *for connection to a computer*

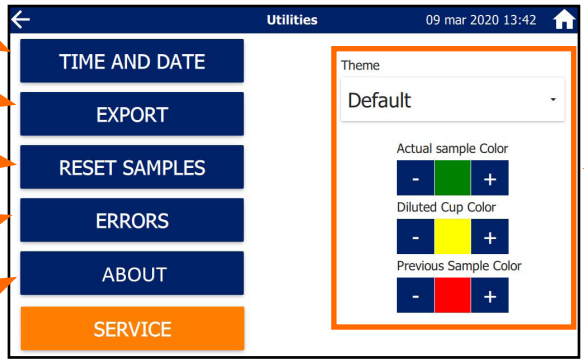
Instructions for programming



Create, select or delete a program

Write the batch number or scan the QR code on the blister of Dilucup®

Write or scan the operator ID



Change the time/date

Export the data to an USB memory

Reset the saved data

Errors will be displayed here

Information about the device/program

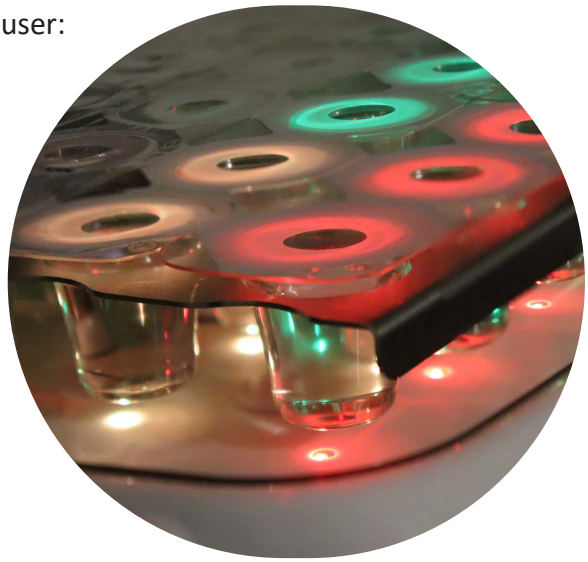
Only on *Pro* version

Every Dilucup® blister has a unique QR code that gives relevant information about its production time which may be useful for identification.

Instructions for use

1. Remove the protective film from the first row of Dilucups.
2. Pipet 1 mL of the sample into the flashing green cup and shake it by using the active sensor or the footswitch. *The cup will turn orange.*
3. Pipet 1 mL from that orange cup into the following green cup and shake.
4. Repeat the same process until the number of required dilutions is completed.
5. Once the dilution sample is completed, plate 1 mL from the orange cups.
6. Start with a new dilution serie in the flashing green cup. *The orange cups will turn red.*

The LED lights will change in order to guide the user:



Colour legend in the default program:

- **Flashing green:** first cup to be used in the dilution series
- **Green**: cup to be used
- **Orange**: cup already used in the current dilution series. The content can be used for further dilution, collecting or plating.
- **Red**: cup already used in the previous dilution series

The sensor used, the sample number, the motor speed and the shaking time can be changed between samples

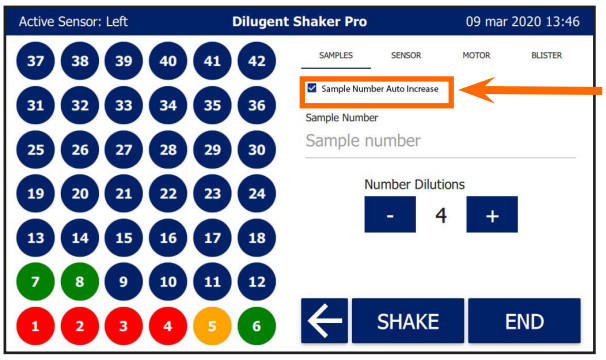


Samples

"Sample Number" is the identification of the sample. Scan the coded label of the sample you are going to use or use the default option where each sample has a different number starting from 1.

If after finishing a sample you try to shake again without changing the name, a warning message will appear saying "Are you sure you want to dilute this sample again?":

- Press "YES" or use the sensor / pedal to continue diluting.
- Press "CANCEL" for going back.
- Scan another coded label for changing directly the name of the sample.



Click here to increase the sample number automatically when you start by a different number than 1

Sensor

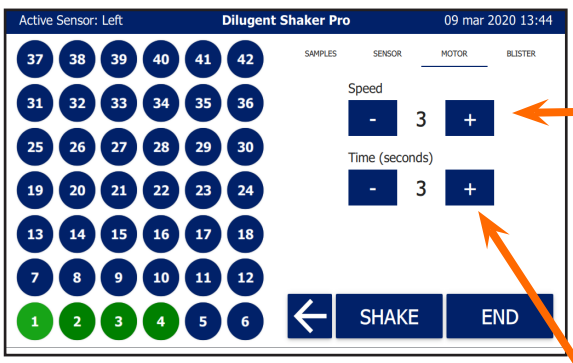


Choose the "Left" or "Right" sensor

Choose the workflow direction to left or right.

! This feature cannot be changed once the dilution series has started.

Motor

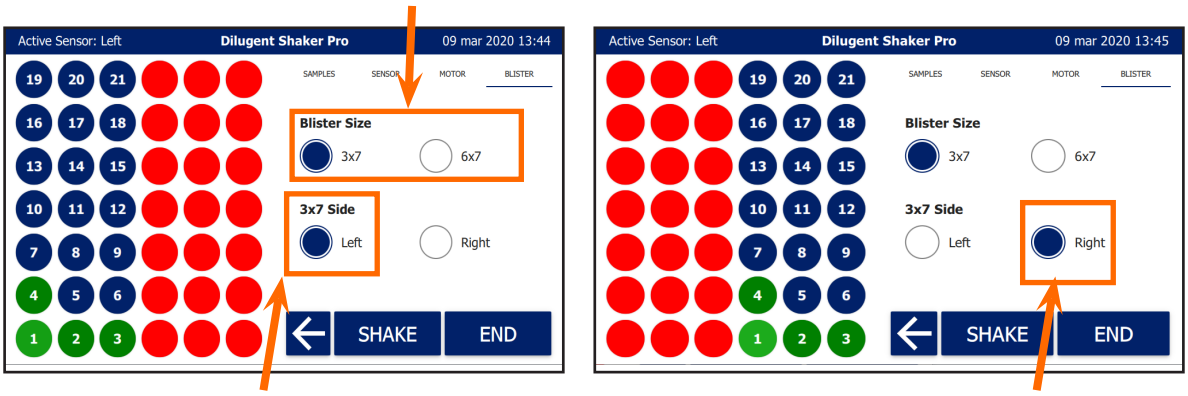


Motor speed	RPM (± 5 %)
1	410 rpm
2	460 rpm
3	510 rpm
4	560 rpm
5	610 rpm
6	660 rpm

Shaking time per dilution: 1 to 60 s

Blister

Choose the blister size: 3x7 or 6x7



For working on the left side

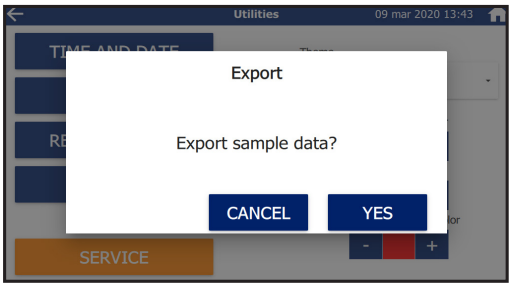
For working on the right side

The cups that are not going to be used can be deselected by touching the corresponding position on the screen.

Export of data

(Feature not available in Light version)

1. Insert an USB stick into one of the ports on the back side of Dilugent® Shaker.
2. In the main menu go to “Utilities” and then press “Export”.
3. An Excel® file called ”dilugent_data” will betransferred to the USB stick.



Go to “Utilities” and then “Reset Samples” to delete the data saved on Dilugent® Shaker.

Example of data obtained in the Excel® file named “dilugent_data”:

	A	B	C	D	E	F	G	H
1	**id**	**rpm**	**duration**	**dilutions**	**sample_id**	**dilucup_batch_number**	**operator**	**timestamp**
2	1	4	3	3	1	NACL: 1944 EXP 24-JUL-2024 12:37:48	Default Operator	2022-02-23 12:18:20
3	2	4	3	3	2	NACL: 1944 EXP 24-JUL-2024 12:37:48	Default Operator	2022-02-23 12:21:46

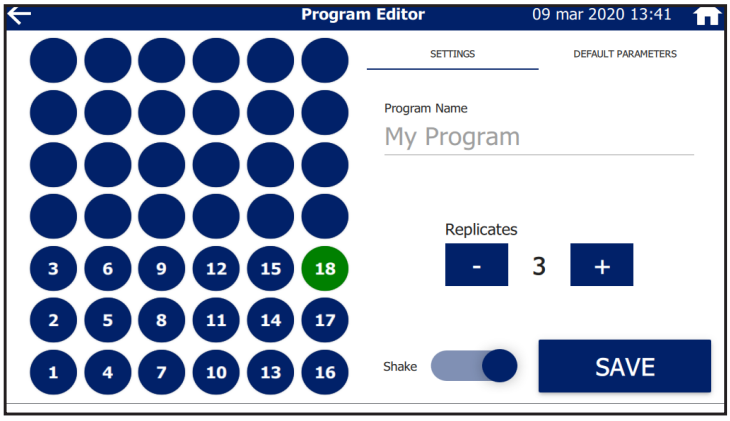
ID	Identification of the dilution
RPM	1 – 6
Duration	Shaking time (1 – 60 s)
Dilutions	Number of dilutions of the sample (1 – 12)
Sample_ID	Identification of the sample
Dilucup_Batch_Number	Information about Dilucup® batch
Operator	Identification of the operator
Time stamp	Time when the sample was processed

Advanced programming (only for *Pro* version)

Advanced programming is useful for working with cups located in different positions than the default or for doing replicates or parallel working.

1. Select “Program”, “New program” and then “Advanced”.
2. Write the program name and choose the “time”, “number of dilutions” and “speed of the shaking” in “Default Parameters”.
3. Make sure that the bottom “Shake” is off.
4. Choose the cups that you want to use without shaking and then press “Shake” to shake.
5. Choose the next cup and press “Shake” for turning it off.
6. Repeat steps 3 to 5 as many times as you need.
7. Press “Save” for saving the program.

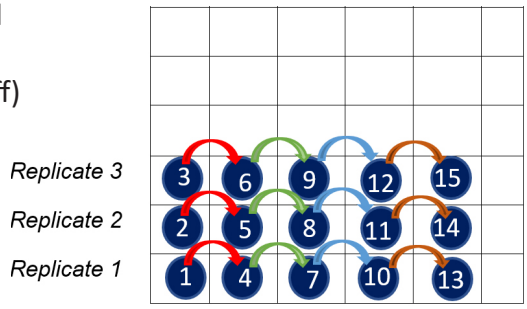
Remember that you must select the program before starting the process.



Example for programming replicates:

If you want to do 3 replicates of 5 dilutions each, you can program the following:

1. Make sure “Shake” is off
2. Press cups 1, 2, 3 and “Shake” (the shaking will start after cup 3)
3. Press cup 4 and “Shake” (the shaking will be off)
4. Press cups 5, 6 and “Shake” (it will be on)
5. Press cup 7 and “Shake” (it will be off)
6. Press cups 8, 9 and “Shake” (it will be on)
7. Press cup 10 and “Shake” (it will be off)
8. Press cups 11, 12 and “Shake” (it will be on)
9. Press cup 13 and “Shake” (it will be off)
10. Press cups 14, 15 and “Shake” (it will be on)



When using the sensor in this program, it will not shake between cups 1 to 3; 4 to 6; 7 to 9; 10 to 12 and 13 to 15, but it will shake between cups 3 and 4; 6 and 7; 9 and 10 and between 12 and 13. The idea is to pipet 1 mL first to cups 1, 2 and 3, to shake the samples for mixing, and then to pipet from 1-3 to 4-6, etc.

Customizable LED lights colours and theme

(only for *Pro* version)

Dilugent® Shaker Pro has the possibility to personalize the colours of the LED lights as well as the theme of the program. For that, go to “Utilities” and choose the different options.

There are seven different LED light colours; red, dark blue, dark green, orange, white, purple and light blue; and four different themes for the display; “Default”, “Dark”, “Teal” and “Dark Teal”.



Maintenance and cleaning

- Dilugent® Shaker can remain (with the power off) in a laminar flow cabinet even when the ultraviolet light is turned on.
- The metal tray is fastened with magnets and can be removed by lifting one of the corners.
- It is recommended **not** to apply alcoholic solutions directly onto the instrument. You may disinfect moderately with a paper towel dipped in an alcoholic solution.
- Avoid using the Dilugent® Shaker when wearing clothes with reflective elements as these may interfere with optical sensors.

Technical information

Power supply	AC input: 100-240 V, 50/60 Hz DC output: 12 V – 5 A, 60W max
Size of the tray (l x w x h)	30 x 26 x 2,2 cm
Size of the base (l x w x h)	38 x 30,5 x 5,5 cm
Size of the screen (h x w x d)	12,7 x 18,4 x 1,1 cm / (7”)
Weight	5,1 kg

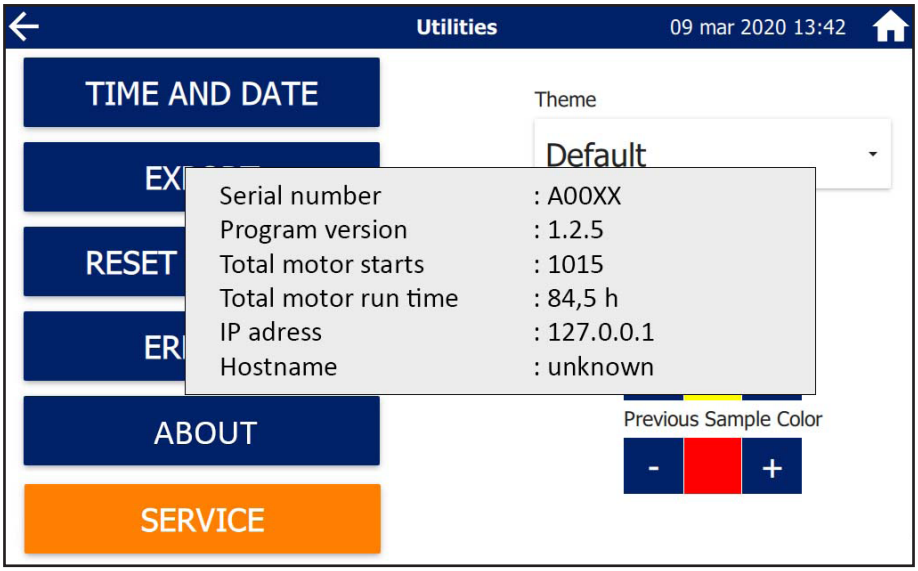
Service interval and warranty

Dilugent® Shaker has a 2-year warranty from the purchase date.

If “SERVICE REQUIRED” appears in the main menu contact the technical service.

LabRobot recommends that Dilugent® Shaker is always serviced after 75,000 starts or 100 hours operating time after the 2-year warranty period to ensure a trouble-free use of the instrument.

This information can be seen in ”About” under ”Utilities”.



Contact information

Contact us if you have any further question. We will be happy to answer.

Visit our website for updated information.

You can also download this manual at https://labrobot.com/dilugent-shaker/

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Follow us on social media!

Declaration of conformity

LabRobot

CE

Declaration of Conformity

LabRobot Products AB
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SE-444 32 Stenungsund

Declares responsibility that the product, Dilugent® Shaker to which this declaration relates, is in conformity with the following European product standard and directives:

EMC, Electromagnetic compatibility

SS-EN 61326-1 Electrical equipment for measurement, control and laboratory use – EMC requirements – Part 1: General requirements

RoHS

Directive 2011/65/EU Restriction of the use of certain hazardous substances

By conformance with the above referenced standard and directive, this product follows the provisions of the directive below:

2014/30/EU Electromagnetic compatibility directive

Date of issue: 2020-03-11, Stenungsund, Sweden

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