EvolvAqua

Spectra 1

User manual

In brief: The Spectra 1 aquarium photometer can be used for CO_2 drop checker measurements, temperature measurement and colorimetric water tests. The application can display, save and - with the appropriate settings - forward measurement data to a web server.

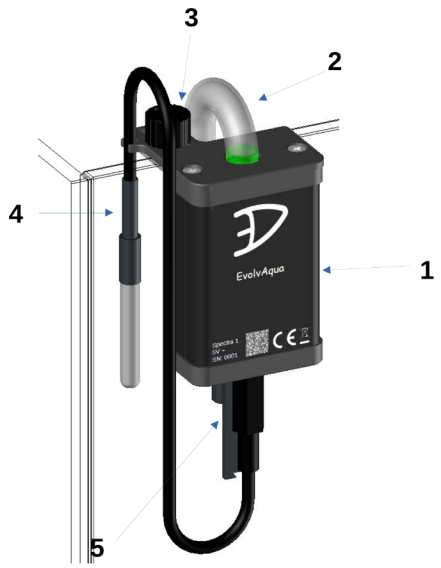
Contents

1. Safety and operating information

Important: Do not immerse the device in water and do not hold it under running water. Spectra 1 is protected against drops falling from above, but the USB-C connector and the electronics must be protected from direct exposure to water.

- Use only a 5 V DC power supply, for example a suitable USB power adapter.
- The permitted cable length is maximum 3 m.
- Use the device at an ambient temperature between 15 and 35 °C.
- Do not open the device and do not modify its enclosure or electronics.
- Always perform water tests according to the reagent manufacturer's instructions.

2. Device parts and technical data



Main components

1. Spectra 1 photometer
2. Cuvette for CO_2 drop checker and water tests
3. Mounting screw
4. Thermometer
5. USB-C power cable

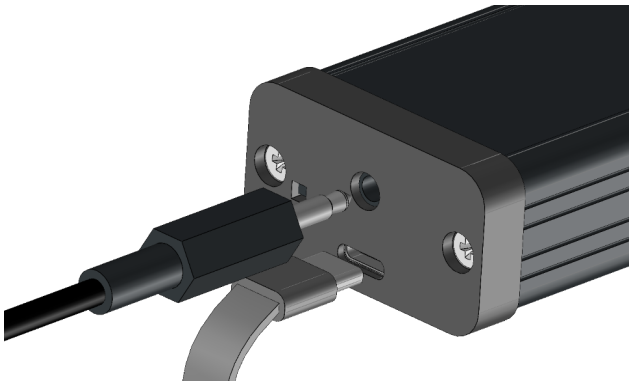
Technical data

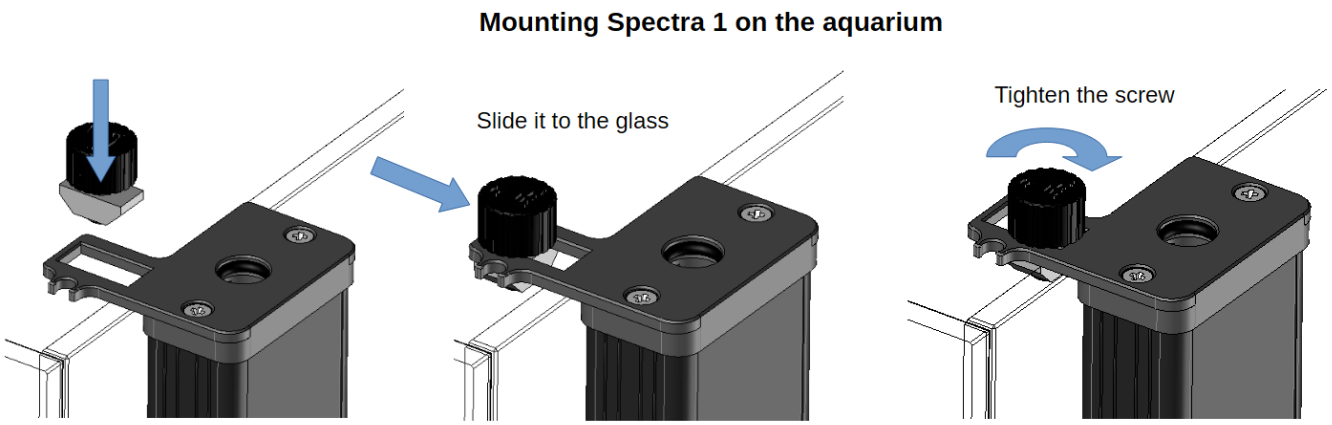
Property	Value
Supply voltage	5 V DC
Maximum current consumption	0,1 A
Permitted cable length	3 m
Wireless connections	2,4 GHz Wi-Fi 6; Bluetooth 5 LE
Operating temperature	15-35 °C
Permitted humidity	maximum 80% RH, non-condensing
Water resistance	Drip-resistant from above; do not immerse in water or hold under running water

3. Mounting on the aquarium

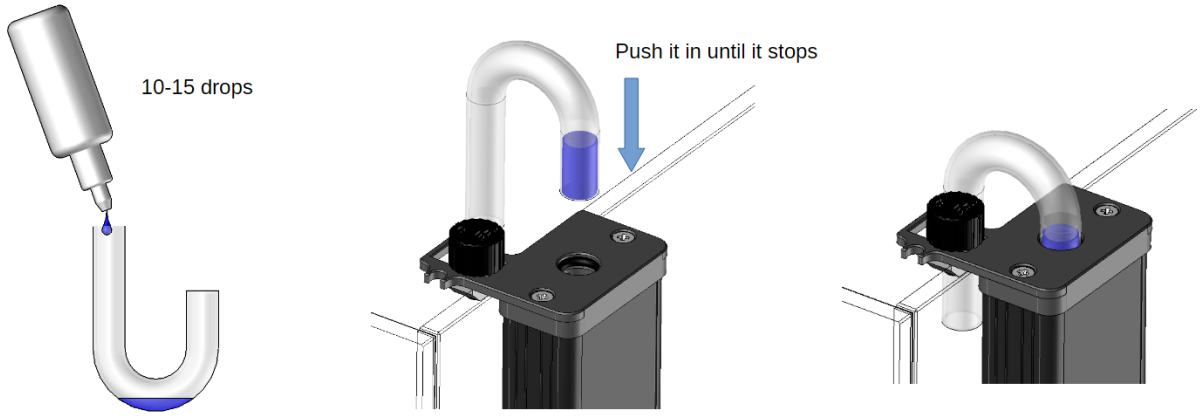
Spectra 1 can be mounted on the aquarium glass. No tools are required; tighten the screw by hand.

1. Place the device on the rim of the aquarium glass so that it sits securely.
2. Slide the mounting screw against the glass as far as it will go.
3. Tighten the mounting screw by hand. Do not overtighten it, as this may damage the mounting element or the aquarium glass.
4. Carefully insert the CO_2 drop checker glass or the test cuvette vertically until it reaches the stop.
5. When positioning the CO_2 drop checker, avoid areas with little or no water flow.

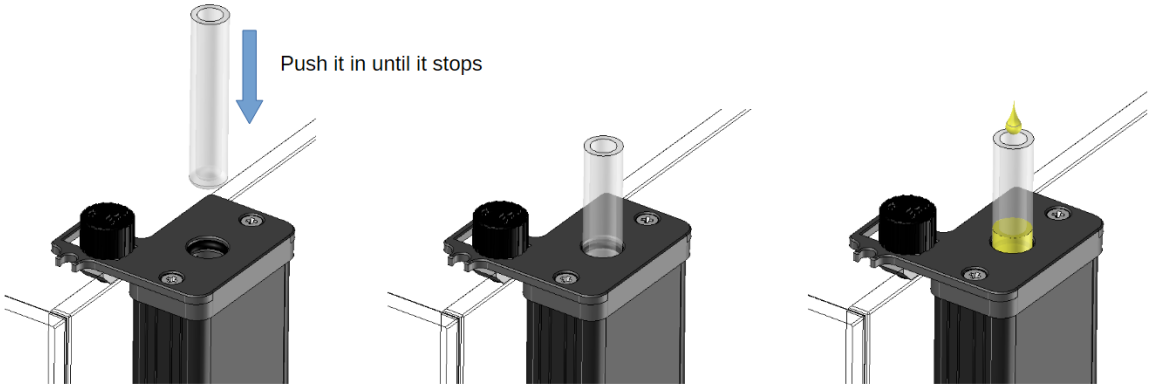




Inserting the CO_2 test fluid



Use of the test cuvette



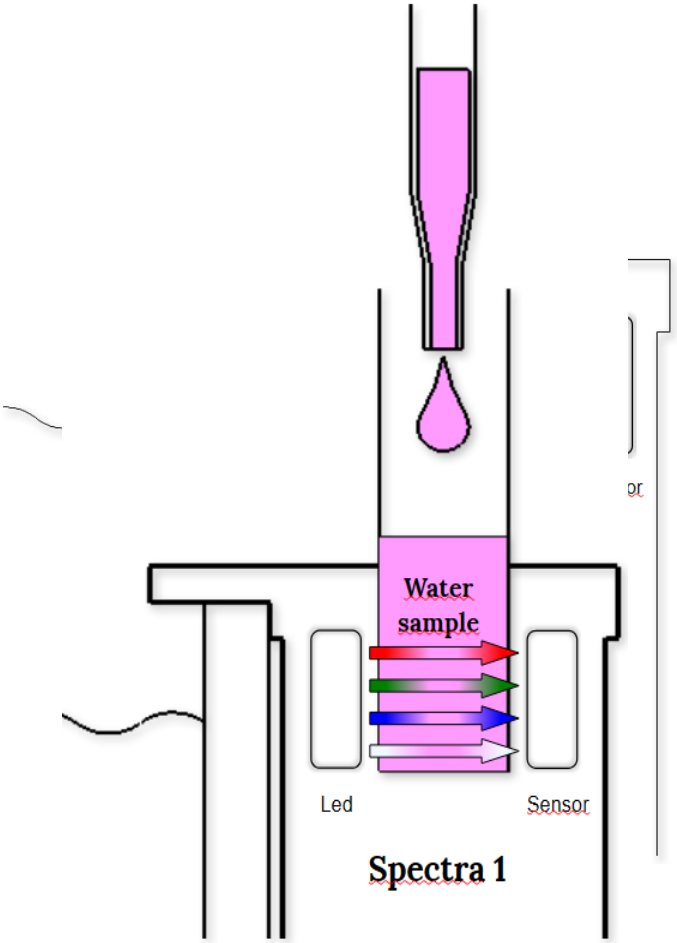
4. Measurement principles

CO_2 drop checker - colour measurement

Spectra 1 measures the colour of the CO_2 test liquid. The colour of the test liquid changes according to the amount of CO_2 diffusing from the aquarium water into the air space of the drop checker. The application uses this measurement to estimate the dissolved CO_2 concentration.

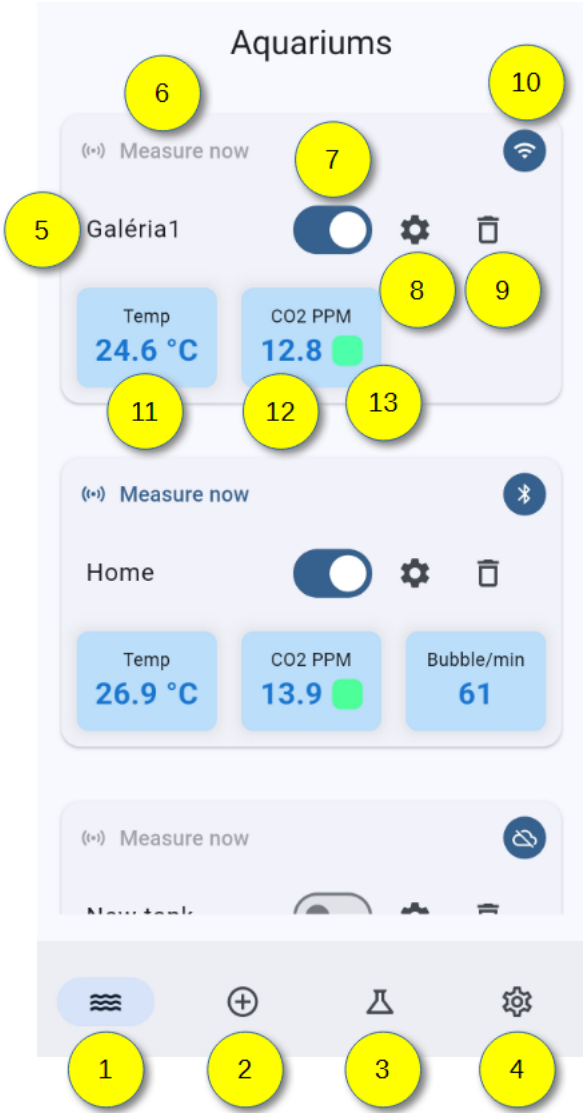
Colorimetric water tests

For colorimetric tests, the device measures the difference in light absorption between the reference water sample and the sample treated with reagents. The measurement is carried out at defined wavelengths.



Note: For accurate measurements, make sure that the outside of the cuvette is clean and free from water drops and fingerprints.

5. EA Monitor application home screen



Main elements

1 Aquariums: list of aquariums

2 New aquarium: create a new aquarium

3 Lab: water tests and reference measurements

4 General settings: connections, server and notifications

5 Aquarium name

6 Measure now: immediate measurement command via Bluetooth

7 Aquarium switch: enable or disable measurement data and alerts for the aquarium

8 Aquarium-specific settings: name, Wi-Fi settings and alarm thresholds

9 Delete aquarium: removes the aquarium and its devices. Measurement results are not deleted from the server.

10 Connection status indicator: Bluetooth, Wi-Fi or cloud connection status

11 Water temperature

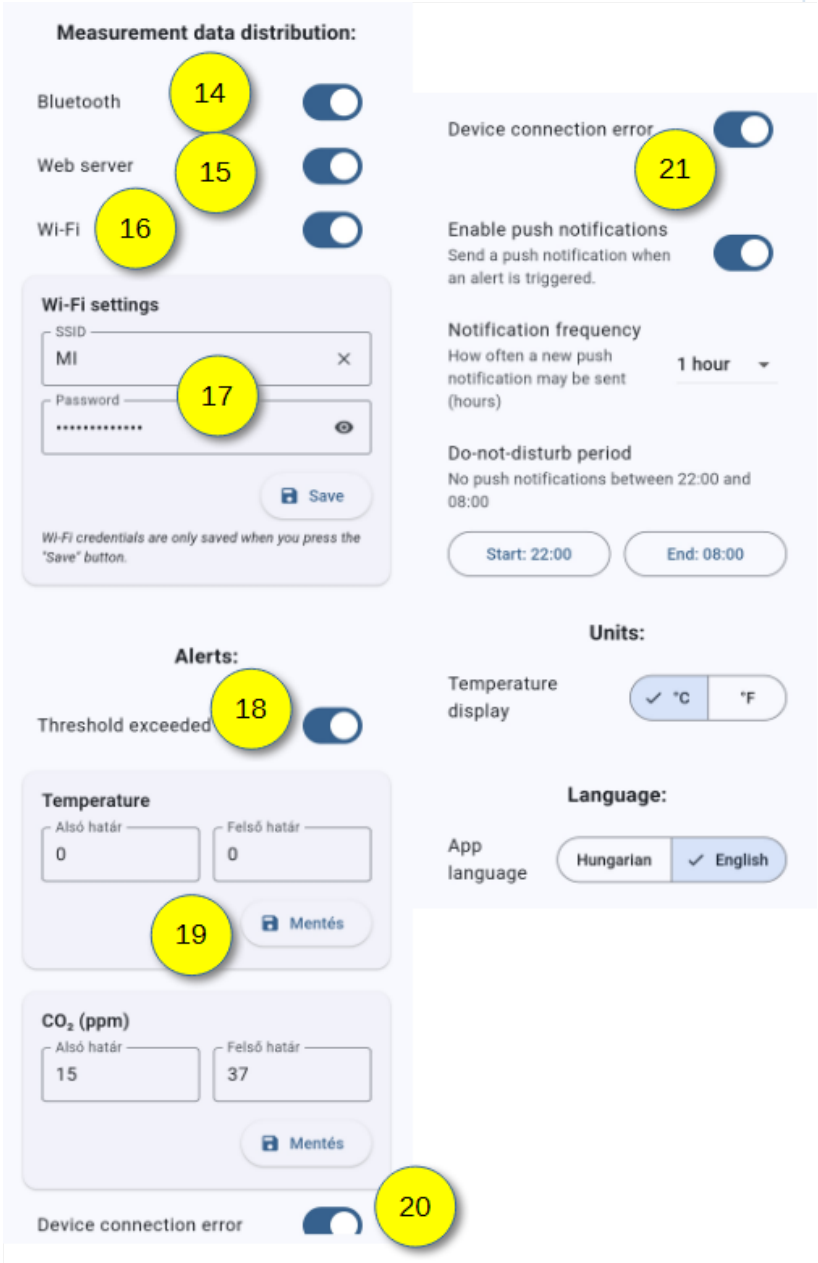
12 Water CO_2 concentration

13 Current colour of the CO_2 test liquid

Data display: With an active Bluetooth connection, the current data are shown. Without a Bluetooth connection, the application displays the most recent measurement results uploaded to the web server.

6. General settings

The General settings menu defines how the application communicates with Spectra 1 devices and when the system sends notifications.



14 Bluetooth: settings and commands can be sent to the device via Bluetooth.

15 Web server: when enabled, the application displays data uploaded to the web server.

16 Wi-Fi: allows the connected Spectra 1 device to send data via Wi-Fi.

17 Wi-Fi settings: enter the name and password of the network that the device will use.

18 Alert when limit is exceeded: the server can send a notification when a limit is exceeded.

19 Limit settings: if the lower and upper limits are 0, the server will not send an alert.

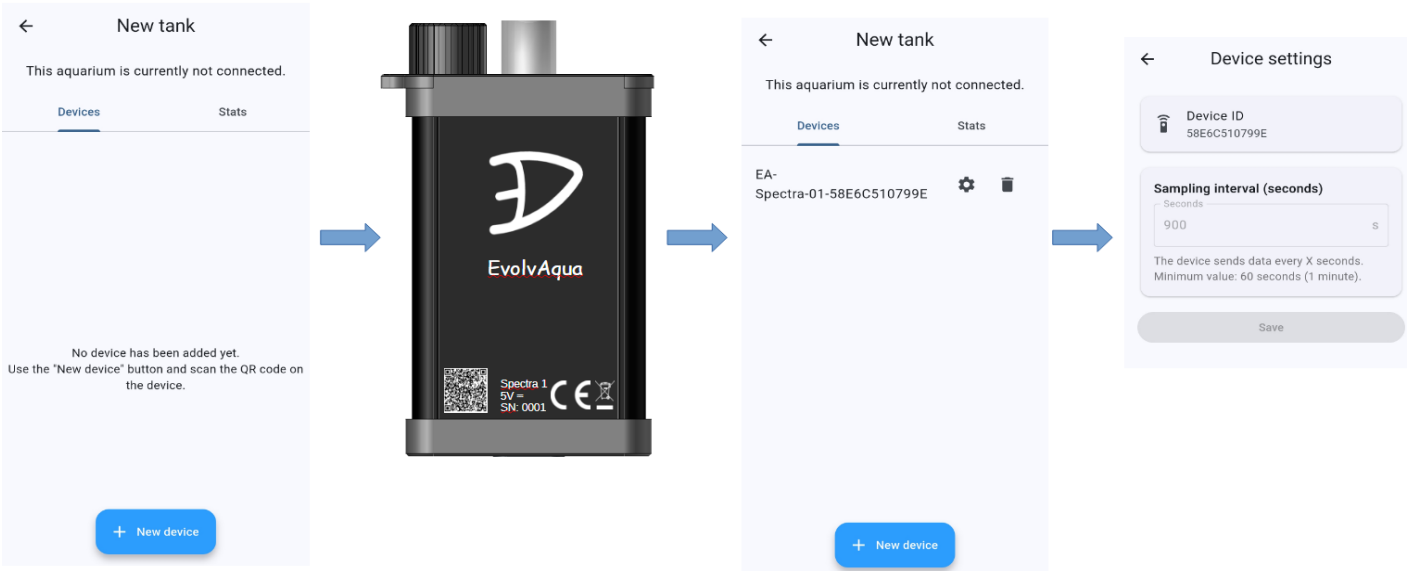
20 Connection failure alert: the server can send an alert if data transmission from a device exceeds the configured sampling interval.

21 Enable and customise alert messages

Requirement: Server functions require an internet connection.

7. Adding a new aquarium and device

1. In the General settings menu, enable Bluetooth, Web server and Wi-Fi.
2. Enter the Wi-Fi network name and password, then save the setting.
3. Open the Aquariums page and create a new aquarium.
4. Name the aquarium, then open its data page.
5. On the Devices tab, tap the New device button.
6. Scan the device QR code with the phone camera.
7. In the device settings, enter the sampling interval, then press Save.
8. Return to the Aquariums page and enable the aquarium.
9. If the data do not appear immediately, press the Measure now button.

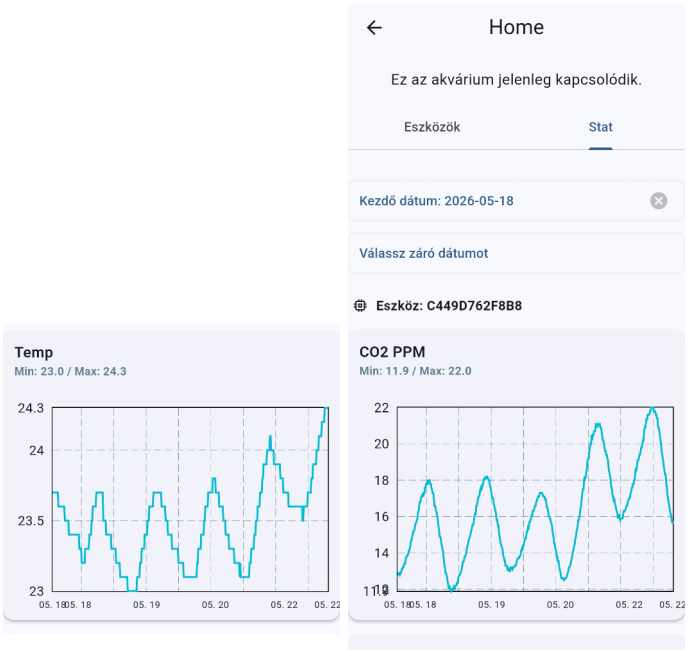


8. Statistics

Functions of the Statistics tab

1. Graphical display of measurement data uploaded to the web server
2. Display of minimum and maximum values
3. Filtering by date
4. Review of earlier measurement data

An internet connection is required to retrieve server data.

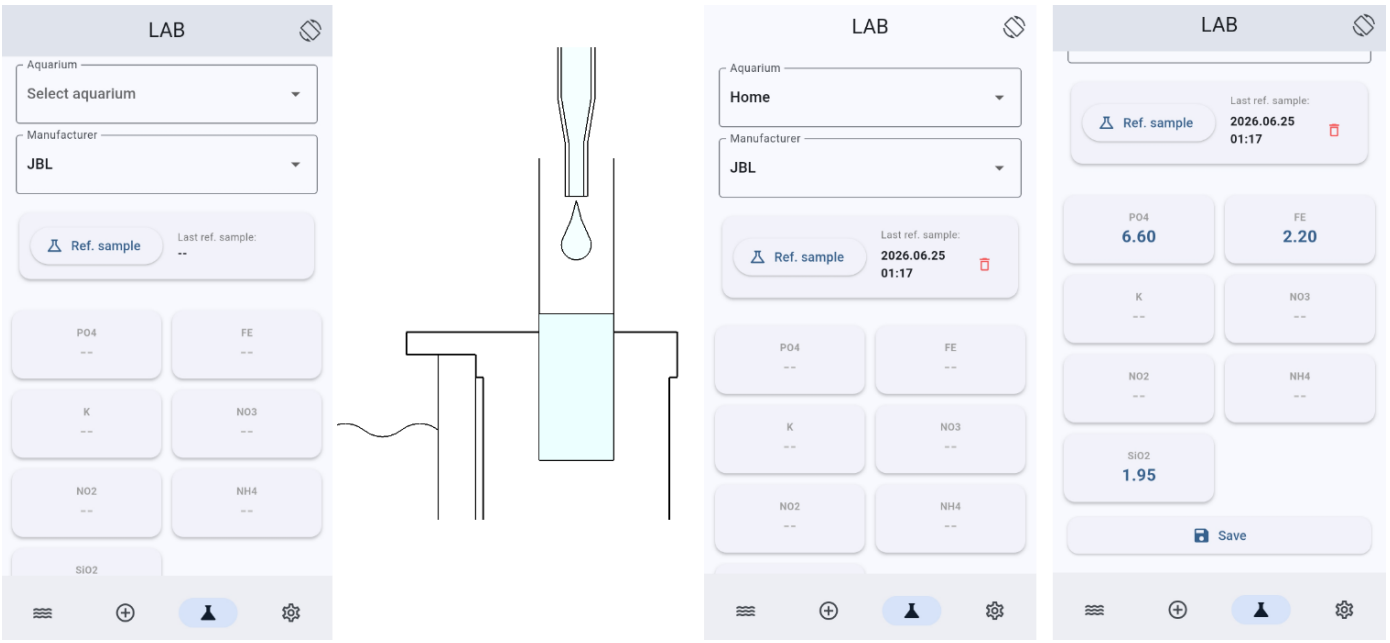


9. Laboratory function - preparation

The Laboratory function works only via Bluetooth.

1. Press the Lab button.
2. Select the Spectra 1 device belonging to the aquarium you want to use.
3. Select the water test manufacturer.
4. Measure the reference sample if no valid reference exists for the selected aquarium.

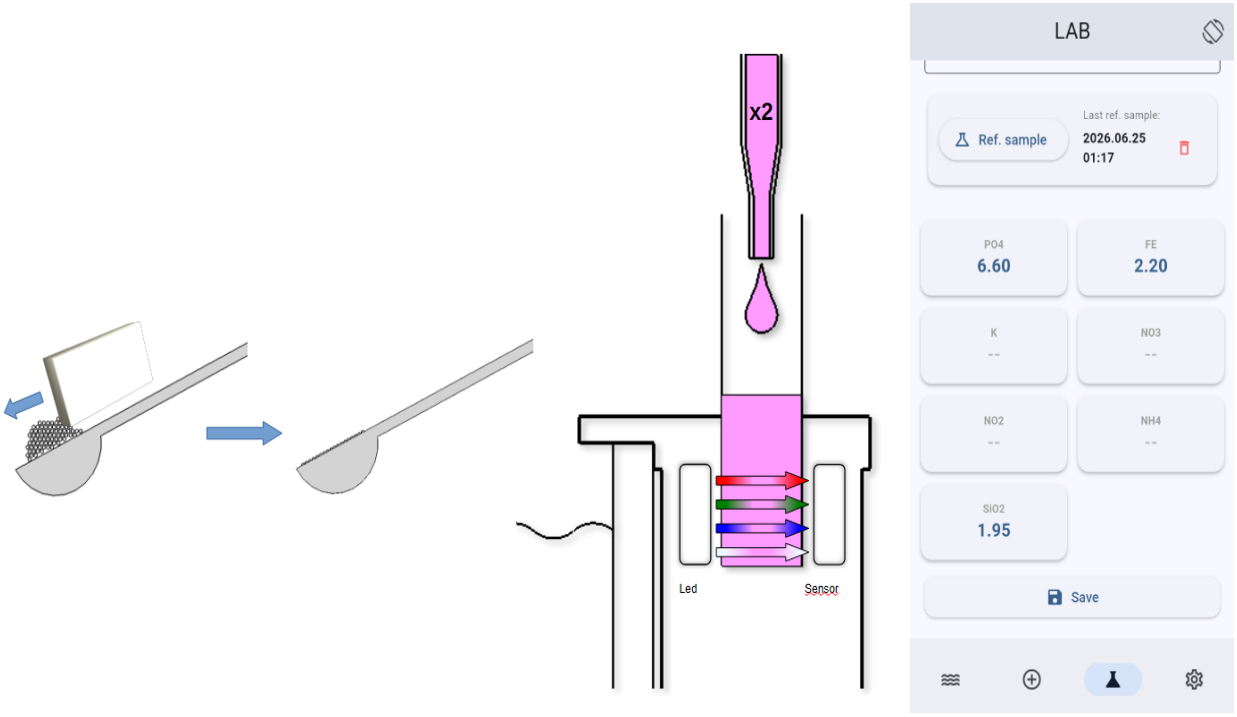
Reference sample: Measurements require clean aquarium water without reagents. Place the test cuvette in Spectra 1, fill it with the clean water sample using the pipette, then press the Ref. sample button. After confirming the pop-up message, Spectra 1 measures the water sample at each wavelength. The saved reference can be used for 24 hours.



10. Laboratory function - water tests

Always perform water tests according to the manufacturer's instructions. Spectra 1 performs the optical measurement of the prepared sample, so accurate reagent dosing, mixing and reaction time directly affect the result.

1. Level the powder or crystalline reagent on the dosing spoon using the supplied plastic card.
2. Prepare the water test according to the manufacturer's instructions, then wait for the specified reaction time.
3. Fill the coloured sample into the cuvette inserted in Spectra 1 using the pipette, at least up to the top plane of the device.
4. In the application, press the button of the component you want to measure.
5. After confirming the pop-up message, Spectra 1 performs the measurement and the result appears on the selected component button.
6. Measurement results can be stored with the Save button. When the Lab menu is opened again, the last saved results are displayed.
7. In the next version of the application, water test results will also be available on the Statistics tab, and data export will also be available.



11. Cleaning and troubleshooting

Cleaning and storage

1 Wipe the outside of the device with a soft, slightly damp cloth.
2 Do not use aggressive solvents, abrasive cleaners or cleaning with large amounts of water.
3 After measurement, rinse the cuvette and let it dry.

Common problems

Problem	Solution
No fresh measurement data are displayed	Check the Bluetooth connection, then press the Measure now button.
Server data are not visible	Check the internet connection, Wi-Fi settings and the Web server function.
No alert is received	Check that alerts are enabled and that the limits are not set to 0.
Unusual measurement result	Check that the cuvette is clean, the reference sample is valid and the water test manufacturer's instructions have been followed.
CO_2 concentration lower than usual	Usually caused by a CO_2 diffusion issue or drop checker positioning problem. Check the water level, diffuser, tubes and cylinder pressure. Place Spectra 1 in an aquarium area where water continuously moves around the drop checker glass. Avoid areas with little or no flow. When the water level changes (e.g. evaporation), the flow conditions and carbonate hardness of the aquarium can change. These affect the CO2 concentration of the water.
CO_2 concentration higher than usual	Check the pressure reducer and the CO_2 test liquid. Condensation may dilute it over time. It is recommended to replace it every 2-3 months.

Measurement accuracy: The most accurate results can be achieved by precise reagent dosing, observing the required waiting times and using a clean cuvette.

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