**Registered Trademarks**
All hardware and software names specified in this manual are registered trademarks or should be regarded as such. The proper names of anvajo products and software are shown in **bold**.

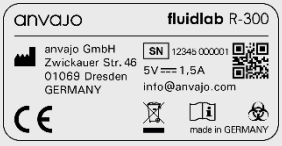
**Errors**
Great care has been taken in compiling the text and figures in this manual. Nonetheless, the possibility of errors cannot be fully excluded. The company accepts no legal responsibility or liability of any kind for incorrect information and the consequences thereof. The company is always grateful for any suggestions for improvement and notifications of errors.

**Gender note:**
To improve readability, the masculine form has been used in the text, but the information refers to members of all genders.

# 1 Table of Contents

# 2 Safety Instructions/Hazard Analysis

## 2.1 Symbols Used in the User Manual and on the Device

| Symbol | Meaning |
|---|---|
|  | Warning! Please observe the warnings and precautions in this manual to enable you to use the product safely. |
|  | Follow the instructions for use. |
|  | Temperature restrictions/permissible temperature range/temperature limits for storage and transport. |
|  | Serial number |
|  | Manufacturer |
|  | USB port |
|  | Standby switch |
|  | CE mark |
|  | Waste symbol; the black bar indicates a key date regulation (cf. 2012/19/EU) |
|  | Direct current |
|  | Biological Risks |
|  | Nameplate with device-specific information, such as serial number, manufacturer and system name (a dummy serial number is shown in the illustration) |

## 2.2 General Safety Instructions

**Warning!**
The system is designed for life science research only. Not for use in diagnostic procedures. The safety regulations that apply in the relevant areas of application must be observed.

**Warning!**
Before using the system, please read the user manual and observe all safety instructions. Each user must be made aware of this user manual before using the system; the user manual must be kept close at hand at all times. The user manual is not, however, able to represent all possible dangers.

Each user is responsible for complying with the safety and health regulations and determining and observing any restrictions before using the device.
These restrictions include avoiding the use of hazardous substances. Please notify anvajo GmbH if any malfunctions, faults or damage to the system are observed during operation.

**Warning!**
To avoid the risk of electric shock, the system must be operated in its original condition, closed on all sides.

The system must be operated within the nominal operating range specified in Chapter 9.1.

**Warning!**
Use only original parts or parts recommended by the manufacturer, to avoid damage to the system and to ensure it functions safely.

**Warning!**
If the device is opened, the manufacturer shall not be liable for the device or for any damage caused thereby. The warranty provisions are set out in Chapter 8.4.

The system must be protected from damp and moisture (for protection rating, see Chapter 9.1). Care must be taken not to spill any liquid over the system or insert any objects through openings.

You must not repair the system yourself. In the event of a defect, please inform the device manufacturer's service department (Chapter 8.7).

Do not use sharp or pointed objects to operate the touch screen.

We recommend the use of gloves when working with the device in order to avoid contamination by direct contact with any infectious samples or sample residues being used.

To ensure the system is functioning correctly, all quality control procedures and cleaning specified in the accompanying documents must be carried out.

In the event of any changes to the system, it is necessary to verify compliance with the requirements of standard EN 61010-1.

**Warning!**
An LED is used during fluid measurements / reference measurements. Avoid looking directly into the active LED, as this may damage the retina.

**Warning!**
If the device is used in a manner not specified by anvajo GmbH, the protection supported by the device may be impaired.

## 2.3 Electromagnetic Considerations

The system is intended for use in an industrial electromagnetic environment.

Do not operate the system in the immediate vicinity of other devices or with other devices in stacks, as this could result in incorrect functioning.

The use of accessories or cables other than those specified by the manufacturer may lead to increased electromagnetic interference or reduced electromagnetic immunity of the system and could result in incorrect functioning.

Portable RF communication devices (mobile phones, radios) should not be used at a distance of less than 30 cm from the system. Failure to observe this instruction may lead to a reduction in performance.

The system has been tested in accordance with EN 61326-1 and ETSI EN 301 489-17. The system is not known to cause any interference. Despite testing, a deterioration in EMC behaviour (transmission and reception) may occur, e.g. as a result of the aging or failure of assemblies. In such cases, the system must be checked at the manufacturer's premises.

Unforeseen interference from the system may occur if the level of interference exceeds the levels required by IEC 61326-1 and ETSI EN 301 489-17. This may occur as a result of the choice of installation site, e.g. amplification of existing sources of interference. In this event, the operator should position the system in such a way as to minimise any interference.

The system has been tested in accordance with EN 62311 and EN 62479. The system is not known to expose the user to any electromagnetic radiation above the level of the basic restrictions for general public exposure specified by these standards.

## 2.4 Lithium Polymer Battery

The system is equipped with a lithium polymer battery. Improper use may lead to a reduction in battery life. To avoid irreversible capacity losses, please observe the following principles:

The optimum temperature range is 10°C to 25°C.

**Warning!**
Only charge the battery in the specified nominal operating range (see Chapter 9)! Failure to observe this instruction may result in permanent damage to the battery.

Avoid fully discharging the battery. A lower charge cycle depth (starting the charging process before a 100% discharge) will increase the battery's service life.

***Note:*** *Lithium batteries do not exhibit a memory effect.*

If storage should be necessary, aim to achieve the optimum storage with a remaining battery capacity of 30% to 40%. Temperatures should be below room temperature (approx. 20°C). To avoid excessive discharge, the battery should be charged to at least 40% once every six months.

The battery should only be replaced by the manufacturer (Chapter 8.7).

**Warning!**
Return the battery in a discharged state (see Chapter 8.9).

**Warning!**
Many chargers consume power while they are plugged in at the socket – even if they are not charging. Disconnect the charger from the mains after charging.

## 2.5 Radio Communications

The system has been tested in accordance with ETSI EN 300 328.

The user should only connect the device to trusted wireless networks (WLAN) that are protected from unauthorised access over the Internet, through the use of firewalls. Always make sure that the data is shared and received only with devices that are trusted and properly secured.

Obstacles (e.g. walls, fences, grates) located between the device and the devices to which it is connected (e.g. WLAN routers, computers with WLAN) may reduce the maximum range of the WLAN connection. Furthermore, in such cases a decrease in the data transfer rate may be expected.

anvajo GmbH will not be responsible for the loss, interception or misuse of data sent or received when using the device's wireless communication methods.

## 2.6 Protection Against Ultraviolet Radiation (UV)

The measuring system is equipped with UV LEDs. The whole system is a continuous wave lamp system, which is classified in the exempt group in accordance with EN 62471:2009. When the system is used as intended, these light sources pose no danger to the user.

**Warning!**
An LED is used during fluid measurements / reference measurements. Never look directly into the light sources while the system is in operation, as this may damage the retina.

**Warning!**
The device shall only be used with the accessories specified by anvajo GmbH.

As far as possible, the slider should be closed during the measuring process.

The device must be switched off while the measuring chamber shaft is being cleaned.

The biological effects arising from UV LEDs depend on the emitted wavelength, the exposure time and the intensity. Potential damage may include: thermal damage, blurring or blind spots on the retina.

In rare cases, LED radiation may also cause thermal damage to the skin (sunburn).

If light escapes as a result of damage to the housing, immediately switch off the device and send it in for repair.

# 3 Introduction

## 3.1 A Brief Description and Intended Purpose

The **fluidlab** R-300 is a compact and versatile fluid analysis device which has been developed for research applications, with which a large variety of liquids can be analysed quickly, easily and inexpensively – both spectrometrically and microscopically. The **fluidlab** R-300 is operated via an intuitive touch screen.

Fluid samples must be inserted into the **fluidlab** R-300 in the sample carriers provided. Using the various adapters that are supplied and which can also be ordered from anvajo, the **fluidlab** R-300 can be made compatible with different sample carrier formats (acella for microscopic measurements, cuvette for spectrometric measurements).

**Overview of the most important performance parameters:**

- Spectrometer for measuring extinction (absorption and scattered light), for creating calibration curves and kinetics plots
- Microscope for cell counts and viability measurements
- Touch screen (for performance data see Chapter 9.1)
- Mains or battery operation possible (for performance data see Chapter 9.1)
- WLAN or USB connection (WLAN as client or hotspot, USB for charging)
- Display of measured value, evaluation via touch screen

**The main benefits of the fluidlab R-300 include:**

- Quick identification and display of quantitative test results
- Measurements for different sample carrier formats with a single system
- Portable, battery-operated system
- Simple, user-friendly operation

| anvajo microscope | |
|---|---|
| Optics | Holographic microscope |
| Sample volume required | 4 – 20 µL |
| Concentration range of the sample | $1x10^4$ – $1x10^7$ cells / mL |
| Cell size limits | 3 - 80 µm (cell count)<br>8 - 80 µm (viability) |
| Field of view | 5.29 mm² |

| anvajo spectrometer | |
|---|---|
| Photometric Measuring Range | 0 - 2.5 |
| Spectral bandwidth | ~2nm |
| Wavelength range | 375 - 700 nm |

## 3.2 Overview

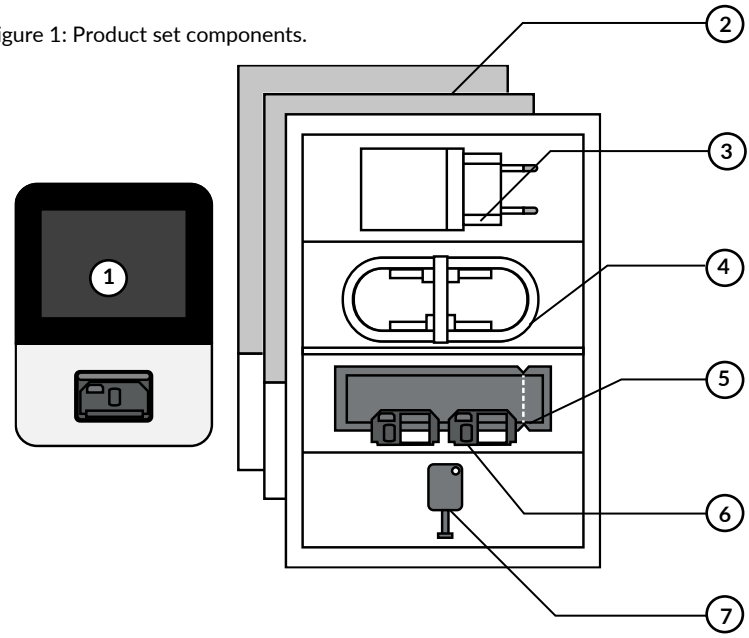
The **fluidlab** R-300 contains a miniaturised high-performance spectrometer that works in the UV/VIS wavelength range from 375 nm to 700 nm. This allows measurements of absorption and scattered light to be carried out on a liquid sample inserted in a sample carrier.

The integrated next-generation microscope captures images of particles in an extremely large field of view (FOV 2.3 mm x 2.3 mm) and guarantees high statistical reliability for every test result. The hologram is then processed by anvajo's intelligent, mathematical reconstruction software, which delivers high-resolution images.

Robust and fast image signal processing and data-parallel operations, combined with a high level of computing power, make efficient analysis of microscopic images possible directly in the **fluidlab** R-300 (local processing, no cloud service required). In addition, machine learning methods, such as deep neural networks, guarantee accurate counting and classification of the optical outputs with immediate quantitative results.

### 3.3 Product Set Components

Figure 1: Product set components.



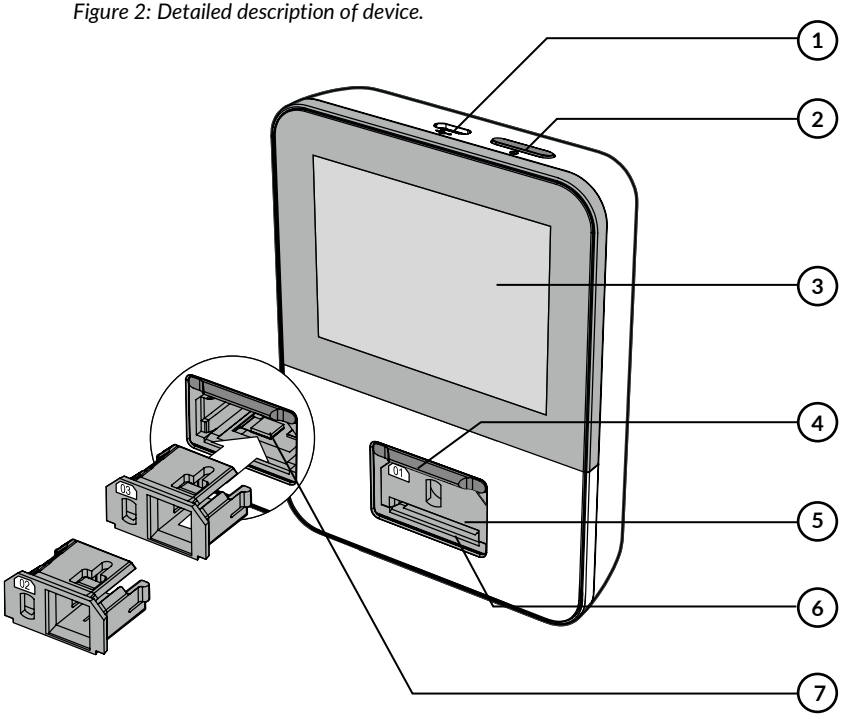

| No. | Name | Description |
|---|---|---|
| 1 | **fluidlab** R-300 | Measuring device with inserted sample carrier adapter 01: **acella** |
| 2 | Technical documentation | User manual<br>Quick Start Guide |
| 3 | USB battery charger | See Chapter 9.2 |
| 4 | USB-C cable | See Chapter 9.2 |
| 5 | Cleaning swabs | See Chapter 8.5.3 |
| 6a | Adapter starter set | Sample carrier adapter 02:<br>**Cuvette for scattered light measurements** |
| 6b | Adapter starter set | Sample carrier adapter 03:<br>**Cuvette for absorption measurements** |
| 7 | Adapter key | Tool for changing the adapter |

***Note:*** *Please check that the product set is complete, based on the delivery note. Only products and accessories that are completely free of defects should be put into operation. Damage must be reported immediately to anvajo GmbH or its representatives.*

***Note:*** *Please note the full part number (see chapter 9.2) as specified on the delivery note for your orders!*

### 3.4 Description of the Device

*Figure 2: Detailed description of device.*




| No. | Name | Description |
|---|---|---|
| 1 | USB-C socket | Port for the charging cable |
| 2 | Power on/off button | Switches the **fluidlab** R-300 on or off |
| 3 | Touch screen | Interface for interaction with the device |
| 4 | Slider | Protects the measuring chamber (shown open in the illustration) |
| 5 | Sample carrier adapter | Sample carrier-specific adapter (exchangeable) |
| 6 | Slot for sample carrier | For inserting the sample carrier (opening corresponds to the space between the adapter and the measuring chamber). |
| 7 | Measuring chamber | Holder for sample carrier adapter |

# 4 Setup and Use

***Note:*** *If used as a portable device, the **fluidlab** R-300 must be held in one hand and operated with the other free hand. If it is being used as a desktop device or when it is being charged, it should be placed on a stable, level, secure surface to prevent it from falling over and being damaged.*

**Warning!**
During the analysis, the device should be kept still. It is recommended that the device should be operated in a stationary manner on a stable surface.

## 4.1 Initial Setup

***Note:*** *On delivery, the **fluidlab** R-300 is in shipping mode. In order to start up your **fluidlab** R-300 for the first time, please connect it to the supplied USB charger using the supplied USB cable before switching it on for the first time.*

1. Remove the protective film from the device's display by taking hold of the small tab on the top right-hand edge of the film (near the power on/off button) and carefully pulling it off downwards over the display.
2. Connect the device to the supplied USB charger, the USB cable and a mains socket – the same procedure as when charging the battery (see Chapter 4.1).
3. The power on/off button (see Figure 2-2) lights up briefly. The device is no longer in shipping mode and can be switched on (see Chapter 4.2).

## 4.1 Charging the Built-in Battery

**Warning!**
Throughout the charging period, the **fluidlab** R-300 must be placed on a stable, level, secure, fire-resistant surface. The charging process may cause the bottom of the device to heat up.

**Warning!**
The device may only be charged and operated using the supplied power supply unit described in the specifications (Chapter 9.2). If the power supply unit fails, a replacement power supply unit should be requested from the manufacturer.

**Warning!**
Only charge the battery in the specified nominal operating range (see Chapter 9.1)! Failure to observe this instruction may result in permanent damage to the battery.

1. Place the **fluidlab** R-300 on a stable, level, secure, fire-resistant surface.
2. Plug the supplied USB charger (Figure 1–3) into a mains socket.
3. Plug the larger of the two connectors on the USB cable (Figure 1–6) into the USB port on the USB charger.

4. Plug the other end of the USB cable into the USB-C socket on the **fluidlab** R-300 (Figure 2-1).
5. The charging process is active when the power on/off button (Figure 2-2) on the **fluidlab** R-300 lights up at regular intervals.
6. The battery is fully charged when the power on/off button stops lighting up at regular intervals or when the battery icon on the display is full.
7. Disconnect the USB charger from the device when the battery is fully charged. First unplug the connector on the USB cable from the device before unplugging the power supply unit from the mains socket.

***Note:*** *The **fluidlab** R-300 can be switched on and used for measurements during the charging process. It is not necessary to wait until the battery is fully charged before switching the device on.*

### 4.2 Switching On the Device

***Note:*** *In order to be able to switch on the **fluidlab** R-300, either the device battery must be charged (partially or fully) or the USB charger must be connected to the device with the USB cable (see Chapter 4.1).*

1. Switch the unit on by pressing and holding down the power on/off button (Figure 2-2) for approx. one second and then releasing it. The device is switched on as soon as the power on/off button lights up.
2. Wait until the system has started. This process takes approx. 40 seconds. Start-up is complete when the main menu appears on the display. The device is now ready for operation.

### 4.3 Switching Off the Device

***Note:*** *There are several possible ways of switching off the **fluidlab** R-300. For fault-free operation of the **fluidlab** R-300, you should use a "normal shutdown" whenever possible. If a "normal shutdown" is not possible (e.g. as a result of a non-responsive system), please select "error shutdown".*

**Normal shutdown (recommended):**

1. Press and hold down the power on/off button (Figure 2-2) on the **fluidlab** R-300 for approx. one second until a selection menu ("Shut down the device – Yes/No") appears on the display. Then immediately release the power on/off button.
2. Tap "Yes" to switch off the device. If you tap "No", the process is cancelled, and the device will remain switched on.

**Error shutdown:**

**Warning!**
Only perform this procedure if a "normal shutdown" (see above) is not possible.

1. Press and hold down the power on/off button (Figure 2-2) on the **fluidlab** R-300 for approx. 8 seconds until the LED starts flashing at a higher frequency. Then immediately release the power on/off button.
2. This will switch the device off immediately. Under certain circumstances, this may result in data loss of the most recent measurements.

### 4.4 Exiting Energy-saving Mode

***Note:*** *The **fluidlab** R-300 has a built-in energy-saving function which, after a predefined period of inactivity, first reduces the brightness of the display and then switches off the display backlight (energy-saving mode). Apart from the display of the graphical user interface, the device is fully functional in this mode.*

**Energy-saving mode:**

- Automatically activated after approx. 2 minutes of non-use
- Display is dimmed after 2 minutes and then switched off
- Power on/off button (Figure 2-2) lights up cyclically (“pulsating”)

To “wake up” the **fluidlab** R-300 from power-saving mode and return it to the active state, proceed as follows:

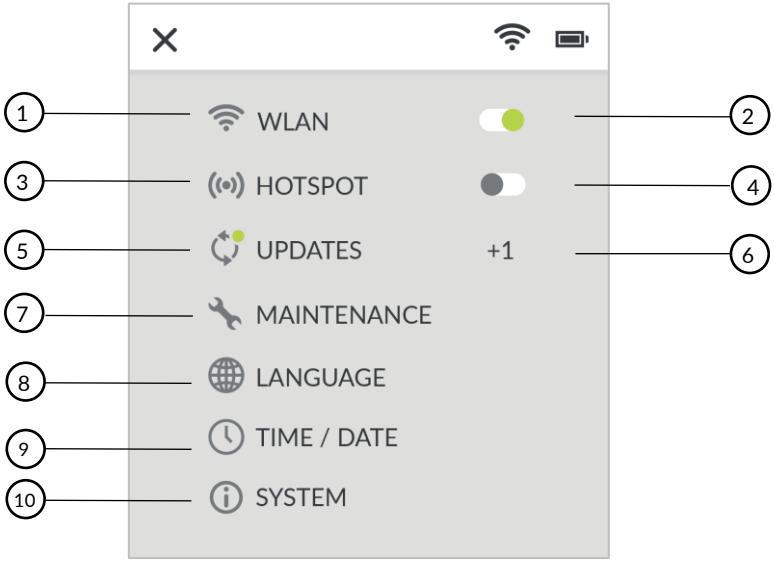
1. Tap on the touch screen.
2. As soon as the display surface lights up on the touch screen, the system has left energy-saving mode and is back in operating mode.

# 5 Setting up the System

## 5.1 Settings Menu

The settings menu can be called up at any point on the **fluidlab** R-300 by tapping the menu icon ( ☰ ). The **fluidlab** R-300 is supplied pre-configured, which means that it is not absolutely necessary to configure the settings.

*Figure 3: Settings menu of the **fluidlab** R-300.*




You can use the following functions from the Settings menu:

| No. | Name | Function |
|---|---|---|
| 1 | WLAN button | Display WLAN settings (see Chapter 5.2) |
| 2 | WLAN switch | Enable/disable WLAN (see Chapter 5.2) |
| 3 | Hotspot button | Display hotspot menu (see Chapter 5.2) |
| 4 | Hotspot switch | Activate/deactivate hotspot (see Chapter 5.2) |
| 5 | Update button | Display Update menu (see Chapter 5.3) |
| 6 | Update indicator | Shows available software updates (see Chapter 5.3) |
| 7 | Maintenance | Sensor status and “Refresh Sensor” (see Chapter 6.5) |
| 8 | Language | Display language settings (see Chapter 5.5) |
| 9 | Time / Date | Display time / date settings |
| 10 | System | Display system information (see Chapter 5.6) |

## 5.2 Configuration of the WLAN Adapter

### 5.2.1 Description of Operating Modes

***Note:*** *Setting up the WLAN adapter is not absolutely necessary for the basic, standalone use of the* ***fluidlab*** *R-300. Full configuration of the WLAN adapter is, however, recommended if you wish to implement* software *updates directly on the* ***fluidlab*** R-300.

The **fluidlab** R-300 has a built-in WLAN adapter, which can be operated in different modes that enable various functions.

In the configuration, you can choose between the following modes:

A) **WLAN mode:** Connect your **fluidlab** R-300 to an existing wireless network (WLAN) in order to establish connections, e.g. to your PC, laptop or a server. If the WLAN has Internet access, extended functions (e.g. software updates) are available to you (see Chapter 5.2.2).
B) **Hotspot mode:** Allow your **fluidlab** R-300 to create a device-specific wireless network (WLAN) that other devices (such as your PC or laptop) can access and use to establish connections to the **fluidlab** R-300 (see Chapter 5.2.3).
C) **Offline mode:** In this mode, the WLAN adapter of your **fluidlab** R-300 is switched off. WLAN and hotspot are disabled. As a result, wireless communication with other PCs or update servers is not possible (see Chapter 5.2.4).

***Note:*** *Obstacles such as walls, glass windows, machines and liquid containers that are located between the* ***fluidlab*** *R-300 and the connected WLAN access point (e.g. router) or a network device connected in hotspot mode may affect the quality of the WLAN connection, reduce the data transfer rate and result in dropped connections.*

***Note:*** *Connectivity problems may also occur in the following situations:*
*a) If you attach metallic stickers near the device's antenna*
*b) If you attach a metal cover to the device*
*c) If the device's antenna is covered by your hands or other objects during mobile data transmission*

### 5.2.2 WLAN Mode

The following section describes how to connect your **fluidlab** R-300 to an existing WLAN.

1. Open the settings menu of the **fluidlab** R-300 by tapping the menu icon ( ☰ ).
2. Tap on the switch to the right of "WLAN". When the switch turns green, WLAN mode is enabled. (This will disable hotspot mode, if it had been previously enabled.) A greyed-out WLAN icon ( ) will appear in the menu bar.
3. Tap on the word "WLAN" to open the WLAN settings.

4. The device will now search for available WLAN networks and, when the search is complete, will list the names (SSID) of the networks it has found on the display.
5. Tap on the name of the WLAN to which you wish to connect your device.
6. If necessary, enter the password for accessing the WLAN network and confirm your entry by tapping on the confirmation button ( ).
7. Your device has successfully connected to the WLAN if the WLAN icon ( ) on the menu bar shows the signal strength.

***Note:*** *Not all WLAN networks allow new devices to be added without prior registration of the device by the network administrator (e.g. networks with MAC address or port filtering). In order to establish connections to the client software, the* ***fluidlab*** *R-300 requires the use of port 8080. In order to be able to obtain online software updates for the device (recommended), the* ***fluidlab*** R-300 *requires Internet access on port 443 (https). Port 9017 is active on the device side for the LIS connection. In this case, please contact your network administrator in advance.*

### 5.2.3 Hotspot Mode

The following section describes how you can allow your **fluidlab** R-300 to create its own WLAN (hotspot). You can then add other WLAN-enabled devices to this WLAN so that they can communicate with your **fluidlab** R-300.

1. Open the settings menu of the **fluidlab** R-300 by tapping the menu icon ( ).
2. Tap the switch to the right of “Hotspot”. When the switch turns green, hotspot mode is enabled. (This will disable WLAN mode if it had been previously enabled.)
3. Tap on the word “Hotspot”.
4. The display will show the data with which your other WLAN-enabled devices, e.g. PC or laptop, can access the WLAN hotspot generated by the **fluidlab** R-300:
   Network name: *fluidlab_########*
   Default password: *fluidlab*
   IP address: 192.168.#.#
5. Hotspot mode has been successfully enabled if the hotspot icon ( ) appears on the menu bar.

You can now access the WLAN hotspot that has just been created with other WLAN-enabled devices (PC, laptop) using the data shown above.

***Note:*** *The necessary steps for connecting a PC or laptop to the* ***fluidlab*** *R-300's WLAN hotspot may be found in the manual for the product in question (keyword “Connecting to WLAN networks”).*

### 5.2.4 Offline Mode

The following section describes how you can disable the **fluidlab** R-300 WLAN adapter if the WLAN or hotspot function has been enabled.

1. Open the settings menu of the **fluidlab** R-300 by tapping the menu icon ( ☰ )
2. Tap on the switch to the right of "WLAN" so that it is greyed out. When the switch is greyed out, WLAN mode is disabled.
3. Tap on the switch to the right of "Hotspot" so that it is greyed out. When the switch is greyed out, hotspot mode is disabled.
4. Both WLAN and hotspot modes are now disabled. As a result, your device is in offline mode.

## 5.3 Software Update

Software updates can be provided for the **fluidlab** R-300 by the manufacturer. They are made available on *the manufacturer's update server.* As part of the updates:

- Security features are updated
- Known software bugs are removed
- Performance improvements are implemented
- Operating concepts are optimised

The **fluidlab** R-300 checks automatically whether new software updates are available if there is an existing Internet connection (see Chapter 5.2.2). Moreover, the user can also manually initiate the update check by clicking on "Check for updates". The installation of these updates is explained below in this chapter.

Updates always require the consent of the user. Please contact our Sales department about the provision of paid content.

***Note:*** *In order to be able to receive software updates for the device, it is necessary for the* ***fluidlab*** R-300 *to be connected to a WLAN and be authorised to access the Internet. If in any doubt, please consult a network administrator in order to permit Internet access for the* ***fluidlab*** *R-300. The device can also be updated via the Hotspot and the datalab (see Chapter 7.3).*

**Warning!**
To install an update, the battery level must be at least 50%. Otherwise, the installation will be aborted for safety reasons.

**Update:**
Updates are only possible if the device is configured in WLAN mode and integrated within a WLAN with Internet access (see Chapter 5.2.2):

1. Open the settings menu of the **fluidlab** R-300 by tapping the menu icon ( ☰ ) once.
2. Tap on the menu item “Updates”.
3. Tap on the “Check for update” button, if this is present. If it is not present, skip this step.
4. Tap on “Install update”.
5. The updates will now be transmitted to the **fluidlab** R-300. This process may take several minutes.
6. The updates will be installed; this process may take several minutes.
7. The installation is complete once the system has automatically restarted.

***Note:*** *If the **fluidlab** R-300 is connected to a WLAN with Internet access, the system will regularly and automatically check for any software updates. The **fluidlab** R-300 notifies you that an update is available with a green dot on the menu icon ( ☰ ) and the update icon ( ⟳ ).*

***Note:*** *If a new software update is available, a message window will appear within the update menu at the bottom right-hand edge of the screen with the appropriate text.*

## 5.4 Maintenance

Various **fluidlab** R-300 sensors require regular checks. For detailed information, see Chapter 6.5.

## 5.5 Language Settings

The text on the **fluidlab** R-300's graphical user interface can be displayed in various languages. The following languages are installed and can be selected when the device is delivered:

- English (factory default setting)
- German
- French
- Italian
- Spanish
- Turkish

It is possible to set a different display language as follows:

1. Open the settings menu of the **fluidlab** R-300 by tapping the menu icon ( ☰ ).
2. Tap on the menu item “Language”.
3. Select the desired display language by tapping on the relevant name. The new setting will be applied and the display will change straightaway.

## 5.6 Displaying system information

You can display the system information for your device as follows:

1. Open the settings menu of the **fluidlab** R-300 by tapping the menu icon ( ☰ ).
2. Tap on the menu item “System”.
3. The system information will now be displayed.

The system information includes the following details:

- The model name (“Device”)
- The serial number of the device (“Serial number”)
- The currently installed software version
- The MAC address of the WLAN adapter
- The hostname

# 6 Carrying Out Measurements

## 6.1 Preliminary Remarks

**Warning!**
Read this user manual before carrying out the first measurements. Please feel free to contact our support department if you have any questions.

***Note:*** *If the **fluidlab** R-300 or the sample carriers have been stored at an ambient temperature ≤ 5°C, they must be unpacked and allowed to adjust to room temperature before measurements are carried out.*

***Note:*** *The **fluidlab** R-300 makes it possible to take measurements on liquid samples in different sample carrier types. The compatibility of the **fluidlab** R-300 with these different sample carrier types is ensured by the use of various sample carrier adapters (see Chapter 3.3.).*

## 6.2 Spectrometric Measurements with the fluidlab R-300

### 6.2.1 General

The **fluidlab** R-300 contains a miniaturised high-performance spectrometer, which in the standard configuration offers a complete UV/VIS spectrum from 375 to 700 nm with a spectral resolution of 2 nm. Full optical absorption measurements can be carried out effortlessly with sample carrier adapter 03 and scattered light measurements with sample carrier adapter 02.

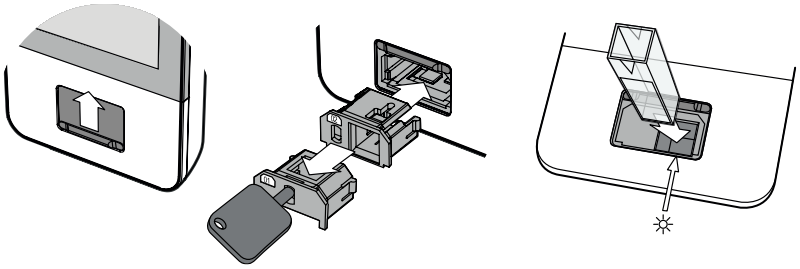
### 6.2.2 Using the Cuvettes

***Note:*** *For spectrometric measurements in the **fluidlab** R-300, you can use all quartz, glass or plastic cuvettes with an outside area of 12.5 x 12.5 mm (10 x 10 mm inside) that are suitable for the UV/VIS measuring range. The centre height of the cuvette shall be 8.5 mm. With a standard cuvette with a maximum filling volume of 3 mL or 4.5 mL, a minimum filling volume of 1.5 mL or 2.5 mL must be used.*

1. Open the green slider (measuring chamber cover) on the **fluidlab** R-300 by placing your thumb on the riser at the bottom and pressing the slider upwards (Figure 4).
2. Check that the sample carrier adapter 02 or 03 is correctly positioned in the measuring chamber (Figure 4) of the **fluidlab** R-300. If in doubt, remove the sample carrier adapter using the adapter key (Figure 4). Reinsert the sample carrier adapter into the measuring chamber until it clicks into place.

***Note:*** *You must wear gloves when filling the cuvette, as fingerprints on the surface may result in an incorrect spectrometer measurement.*

*Figure 4: Inserting sample carrier adapter 03 for absorption measurement or sample carrier adapter 02 for scattered light measurements.*



### 6.2.3 Extinction

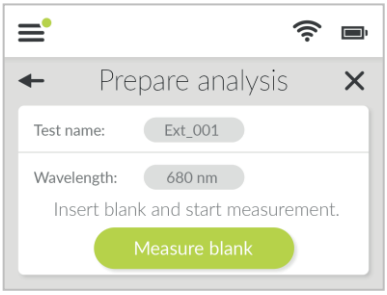
#### 6.2.3.1 General

***Note**:* *The **Extinction** application makes it possible to determine the extinction value of liquids spectrometrically (e.g. with various scattered light measurements of bacteria or yeast cultures and with absorption measurements of dyes, colorimetric reactions etc.; more specific application examples can be found www.anvajo.com). In addition to the extinction value at a preset wavelength, all other extinction values of the liquid in the spectrometer's wavelength range between 375 – 700 nm are measured at the same time. To exclude any systematic errors, a blank sample ("blank") should be measured at the start of each series of measurements. In general, this blank contains the matrix of the sample without corresponding analytes.*

#### 6.2.3.2 Determining the Extinction of Liquids

1. Prepare your samples and the respective blank liquids in the cuvettes and make them ready for the upcoming measurements.
2. Open the slider on the **fluidlab** R-300 as described in Chapter 6.2.2.
3. Insert sample carrier adapter 02 or 03 as described in Chapter 6.2.2.
4. Select the **Extinction** application on the home screen of the **fluidlab** R-300 by tapping on it.
5. In the "*Prepare analysis*" input screen (Figure 5), optionally enter the test name of the measurement (*Test name*) and the mandatory wavelength (*Wavelength*) at which the extinction value of the sample is to be measured.
6. Confirm what you have entered via the displayed keyboards by tapping on the tick sign with a green background .
7. Now insert your blank sample into the **fluidlab** R-300 in the correct orientation (Figure 4).
8. Start the blank measurement by tapping the green *"Measure blank"* button.

*Figure 5: "Prepare analysis" screen of the Extinction application.*



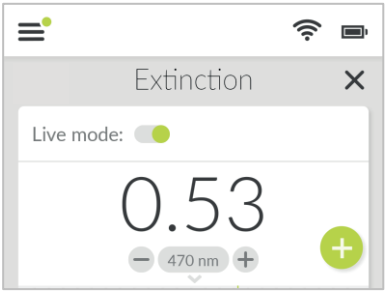

**Warning!**
Do not look directly into the measuring chamber opening during the measurement!

9. After a successful blank measurement, the device will display the "*Prepare analysis*" input screen again and will now prompt you to insert your sample in the device's measuring chamber.
10. Remove the blank sample from the device and insert your sample into the **fluidlab** R-300 in the correct orientation (Figure 4).

Now start the measurement of your sample by tapping on the Continue button with a green background .

11. The device now displays the result, which was measured at the pre-set wavelength.
12. If you scroll down further, the spectral graph of the liquid between 375 and 700 nm is also displayed.

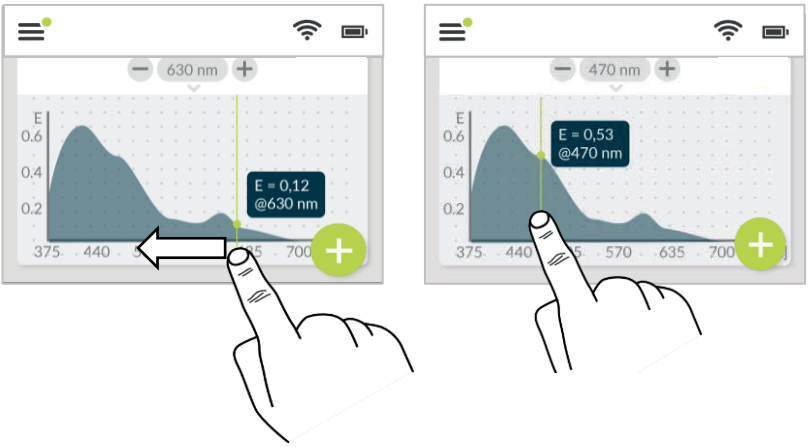
*Figure 6: Results screen of the Extinction application.*




***Note**: Spectral graph (375-700 nm) - The special feature for every extinction measurement with the **fluidlab** R-300 is that, in addition to the extinction value at the preset wavelength, the total extinction of the liquid between 375 and 700 nm is always measured. This means that you only need to carry out one measurement*

*of your liquid, even if you are interested in extinction values at multiple wavelengths. You can move the green cursor manually in the graph and thus display the extinction values of the liquid at other wavelengths. To do so, gently tap on the green point of the cursor, maintain contact with the display and move your finger slowly along the course of the graph. The wavelength and the extinction value will adjust simultaneously (Figure 7). You can also change the wavelength range manually by tapping on the wavelength pre-set, which has a grey background, and entering a new value on the keyboard or by tapping on the plus or minus key.*

*Figure 7: Extinction spectrum of a liquid between 375 and 700 nm.*

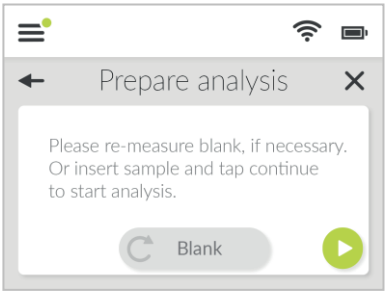



***Note:*** *Real-time measurement (live mode) - You can use the "live mode" function to check whether the extinction value remains stable (Figure 6). To do so, tap on the button and slide it to the right. Real-time measurement is now activated (green dot) and the spectrometer will measure the current extinction value. The "live mode" function can be used to check the stability of the extinction value, especially in the case of measurements that are carried out in a vibration-intensive environment. You can end real-time measurement by moving the dot in the button to the left (grey dot).*

***Note:*** *If the extinction exceeds a value of 2.5, the device shows "saturated". In this case, please dilute the sample.*

13. By clicking on the the green plus key , the next extinction measurement can be performed. It is possible to (optionally) measure a blank sample again or to directly measure the next sample (Figure 8) by clicking the continue button with a green background . The series of measurements will automatically be numbered consecutively and stored in the History.
If the option “Re-measure blank” is chosen, the device automatically starts to measure a blank again.

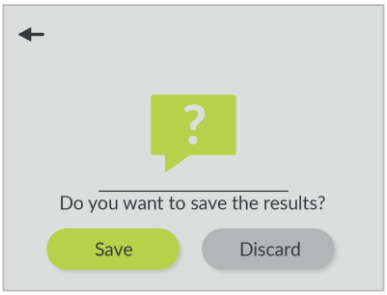
*Figure 8: Optional blanking.*




***Note**: It is recommended to blank between measurements, especially when the unit is cold started, as temperature differences of the unit could be noticeable in the spectra.*

14. To leave the results screen, tap on the ✕. A prompt appears to save the last measurement in the history or to discard it (Figure 9).

*Figure 9: Prompt to save or discard the results.*



### 6.2.4 Kinetics

#### 6.2.4.1 General

***Note:*** *The extinction value of a liquid sample is frequently monitored over time in biological or biochemical research fields to elucidate the rate at which reactions occur within the sample. The **Kinetics** application allows continuous extinction measurements of a sample at a user-specified time interval. The extinction over time is monitored at one user-defined wavelength within the spectrometer's wavelength range between 375 – 700 nm. The time interval can be freely chosen between 2 sec and 60 min (3600 sec). To exclude any systematic errors, a blank sample ("blank") has to be measured at the start of each series of measurements. For optimal results it is recommended to turn on the **fluidlab** and allow the instrument to warm up ahead of performing any spectrometer analysis. In general, this blank contains the matrix of the sample without corresponding analytes.*

*The **Kinetics** application is available since software version 21.21.01 on the **fluidlab** R-300. Please refer to Chapter 5.3 on how to install software updates on your **fluidlab** R-300.*

**Warning!**
An LED is used during kinetic measurements. Avoid looking directly into the active LED, as this may damage the retina.

**Warning!**
The device shall only be used with the accessories specified by anvajo GmbH.

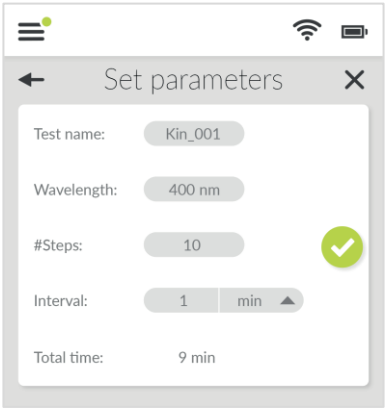
#### 6.2.4.2 Determining the Reaction Kinetics of a Liquid Sample

1. Prepare your samples and the respective blank liquids in the cuvettes and make them ready for the upcoming measurements.
2. Open the slider on the **fluidlab** R-300 as described in Chapter 6.2.2.
3. Insert sample carrier adapter 02 or 03 as described in Chapter 6.2.2.
4. Select the **Kinetics** application on the home screen of the **fluidlab** R-300 by tapping on it.
5. In the "*Set parameters*" input screen (Figure 10), optionally enter the test name of the measurement (*Test name*) and the mandatory wavelength (*Wavelength*) at which the extinction value of the sample is to be measured. It is important to enter the number of steps required for your experiment (*#Steps*) as well as the time interval (*Interval*) between each measurement. It is possible to specify a time interval between 2 sec and 60 min (3600 sec). The maximum number of steps is limited to 500. The estimated total time of the measurement series will be shown at the bottom of the screen.

***Note:*** *The total measuring time is always one time interval lower than the number of steps multiplied by the time interval. It is because the first measurement will be directly performed by starting the kinetic measurement.*

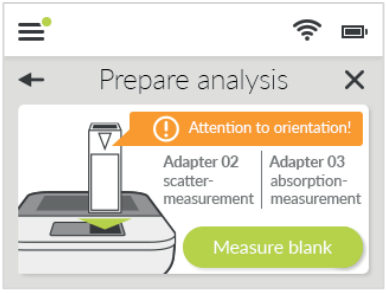
6. Confirm the selected parameters by tapping on the tick sign with a green background .

Figure 10: *"Set parameters" screen of the Kinetics application.*




7. Now insert your blank sample into the **fluidlab** R-300 in the correct orientation (Figure 11).
8. Start the blank measurement by tapping the green *"Measure blank"* button.

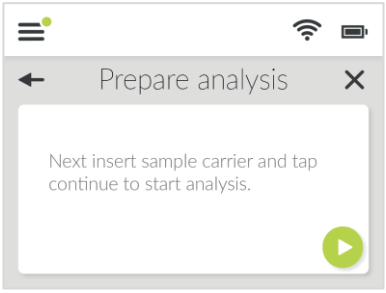
*Figure 11: Insert cuvette in the right orientation before measuring blank.*




9. After a successful blank measurement, the device will display the "*Prepare analysis*" screen and will now prompt you to insert your sample in the device's measuring chamber.
10. Remove the blank sample from the device and insert your sample into the **fluidlab** R-300 in the correct orientation (Figure 11).

11. Now start the measurement of your sample by tapping on the Continue button with a green background (Figure 12).

*Figure 12: "Prepare analysis" screen of the Kinetics application.*

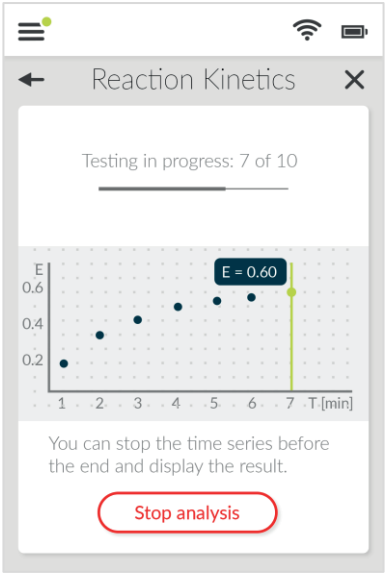



12. The device now displays the progress of the time-series measurement on the *"Reaction Kinetics"* screen (Figure 13).
13. If you scroll down further, a graph showing the extinction value at the pre-set wavelength over time is also displayed. Every new measurement will be automatically added to this graph (Figure 13).
14. It is possible to stop the Kinetics measurement by clicking on *"Stop measuring"* or tapping on the ✕ (Figure 13).

***Note:*** *After clicking "Stop measurement" or tapping on the ✕ the process has to be confirmed by answering the question "Do you really want to cancel the kinetic measurement?" with "Yes". As long as the screen is shown, the device will continue the measurement until "Yes" is chosen.*

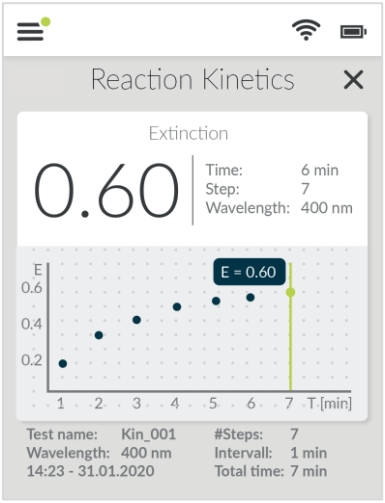
***Note:*** *When the extinction exceeds a value of 2.5, the kinetic measurement will be aborted automatically. The device automatically saves all the measured values which were performed before the abortion.*

*Figure 13: Sample acquisition for kinetics reaction.*




15. It is possible to view the extinction value at a specific time point by clicking on it directly in the graph.

Figure 14*: Results screen of the Kinetics application.*



16. To leave the results screen, tap on the ✕. A prompt will be shown to save the results in the history or to discard them.

### 6.2.5 Calibration Curve

#### 6.2.5.1 Creating calibration curves

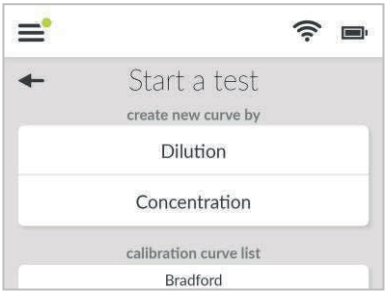
***Note:*** *The Calibration Curve application allows you to import calibration curves of absorbing and scattering media and save them for subsequent quantification of individual samples. The Calibration Curve application eliminates a large number of work steps in cellular and molecular biological experiments in which, for example, proteins need to be frequently extracted and their concentration determined using a biuret test or Bradford assay. For optimal results it is recommended to turn on the* ***fluidlab*** *and allow the instrument to warm up ahead of performing any spectrometer analysis.*

***Note:*** *Creating a new curve with dilution - If your calibration samples have a constant dilution factor, i.e. they use a dilution series, it is advisable to create a new calibration curve by means of dilution. As a starting concentration (concentration first sample), specify the highest concentration of your samples and then indicate the dilution factor and the number of samples you wish to use.*

***Note:*** *Creating a new curve with concentration - If your calibration samples do not have a constant dilution factor, it is advisable to create a new calibration curve by means of concentration. In this case, it makes more sense to enter the respective sample concentrations individually. From Sample#3 onwards, a small grey ✕ button will appear next to the input field after the concentration has been entered. You can delete the sample by tapping on this button. If you delete the sample, the sample numbering will be updated automatically.*

1. Prepare your samples and the blank liquid in the cuvettes and make them ready for spectrometric measurement with the **fluidlab** R-300**.**
2. Open the slider on the **fluidlab** R-300**,** as described in Chapter 6.2.2.
3. Insert sample carrier adapter 02 or 03, as described in Chapter 6.2.2.
4. On the home screen of the **fluidlab** R-300**,** select the **Calibration Curve** application by tapping on it.
5. The *"Start a test"* input screen is displayed. Under *"create new curve by"* you can, depending on the sample type, choose either *Dilution* or *Concentration* (Figure 15).

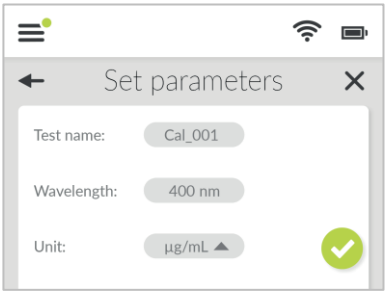
*Figure 15: "Start a test" screen of the Calibration Curve application.*




***Note**: Calibration curve list - Further down you will see the list of saved calibration curves ("calibration curve list") (Figure 15). If you read in calibration curves for different substances and save them on the device, you can call up the created curves at a later time. How quantification works with created curves is described in Chapter 6.2.5.2.*

6. The *"Set parameters"* input screen appears (Figure 16), in which you can optionally give the measurement a *test name*.
7. Now enter the mandatory *wavelength* at which the extinction value of the sample is to be measured.
8. Select the appropriate mandatory *unit* for the quantification.

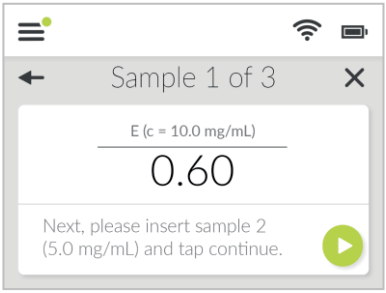
*Figure 16: "Set parameters" input screen of the Calibration Curve application.*



***Note:*** *Depending on whether you are determining the calibration curve by means of dilution or concentration, you must enter mandatory details. These are the highest initial concentration of the sample (conc. first sample), the dilution of the series, the sample number or the concentration of each individual sample#x (Sample#x). The next sample will be available for completion as soon as the concentration of the previous sample has been entered (e.g. sample#4 will only be displayed after you have entered the concentration for sample#3 etc.).*

9. When you have entered the concentration/dilution of the samples, start the measurement run by tapping on the green tick sign .
10. The *"Prepare analysis"* screen will now be displayed.
    Insert the cuvette with the corresponding blank sample into the measuring chamber in the correct orientation.
11. Start the blank measurement by tapping on the green *"Measure blank"* button.
12. After a successful blank measurement, remove the blank sample from the measuring chamber.
13. Now, following the prompt on the *"Prepare analysis"* screen, insert your first sample in the measuring chamber and start the measurement by tapping on the green Continue button .
14. After a successful measurement, the extinction value for Sample#1 will be displayed (*"Sample 1 of 3"*, Figure 17)

*Figure 17: Screen for the measurement of samples in the Calibration Curve application.*




15. Remove Sample#1 from the measuring chamber.
16. You will now see, one after the other, the same number of measurement screens as you have predefined samples. Perform each sample measurement as described for Sample#1.
17. After the measurement of the last sample, confirm the completion of the measurement run by tapping on the green Continue button.
18. After a successful calculation, the calibration curve will be displayed on the *"Results"* screen with the associated parameters (Figure 18, left).

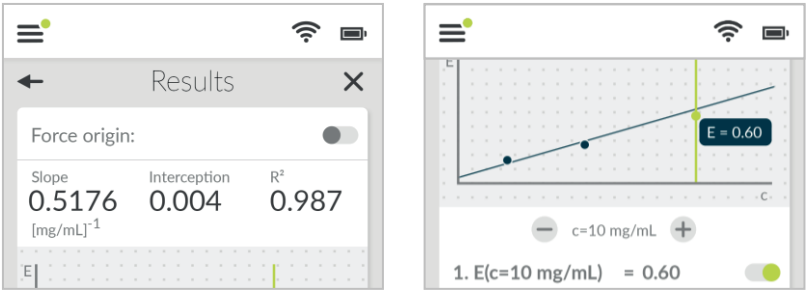
***Note**:* *Force origin - If you tap on the grey button* (Figure 18, *left) and move it to the right, the Force origin function will be activated. This forces the curve to originate from the origin of the graph. You can switch the function off by moving the button back to the left.*

19. The respective concentrations of the samples are plotted in the graph against their extinction. You can use the − and + buttons to select the individual measurement points and display your predefined concentrations below the graph. The green cursor shows the currently selected sample (Figure 18, left).
20. If you scroll down further, you will see a list of all the measured samples with the predefined concentrations and the respective extinction values (Figure 18, right).

***Note**:* *Activation and deactivation of individual measured values - If individual measured values cannot be used for the creation of the calibration curve on account of their extinction value, you have the option of tapping on the green (activated) button next to the respective sample and moving it to the left, thus deactivating it (*Figure 18, right*). The extinction value of the sample will then no longer be included in the calculation of the calibration curve.*

***Note:*** *Saving the calibration curve - If you click on the ✕ in the "Results" screen, you will be asked whether you wish to save the results. If you tap on "Save", the calibration curve will be saved under the entered test name in the calibration curve list and you will return to the home screen. If you tap on "Discard", the measurement will not be saved.*

*Figure 18: "Results" screen depicting the "Force origin" (left) and "individual measured value activation/deactivation" (right) functions.*




### 6.2.5.2 Sample Quantification with Created Calibration Curve

1. Perform an extinction determination of your choice with your samples.
2. Prepare your samples and the respective blank liquid in the cuvettes and make the samples ready for spectrometric measurement with the **fluidlab** R-300**.**
3. Open the slider on the **fluidlab** R-300**,** as described in Chapter 6.2.2.
4. Insert sample carrier adapter 02 or 03, as described in Chapter 6.2.2.
5. On the home screen of the **fluidlab** R-300, select the **Calibration Curve** application by tapping on it.
6. The *"Start a test"* screen is displayed. Select the curve with which you want to quantify your sample from the created calibration curves in the *"calibration curve list"* by tapping on it (Figure 19).

*Figure 19 (left): "Start a test" screen of the Calibration Curve application.*
*Figure 20 (right): Editing menu (green bar) for the created calibration curves.*


***Note**:* *Editing and deleting the created calibration curves - If you select the respective curve from the "calibration curve list" with a long press, you can carry out further options (*Figure 20*). The green square indicates the selected calibration curve. A green bar appears at the top of the screen. On the right-hand side of the bar, you will see a white pencil, a white letter symbol and a white rubbish bin. If you tap on the letter symbol, you can rename the calibration curve. If you tap on the rubbish bin, you can delete the calibration curve. It is also possible to select multiple saved calibration curves with a long press and then delete them all together. You can end the selection mode by tapping on the arrow on the left-hand side of the bar.*
*If you tab on the pencil the saved curve with its individual points will be shown and can be adjusted.*

7. You will now go directly to the "*Prepare Analysis"* screen. There you can optionally enter the *Test name* for your measurement.
8. Insert your blank sample into the measuring chamber in the correct orientation (Figure 4) and tap on the green *"Measure blank"* button to start the blank measurement.
9. After a successful measurement, remove the blank sample from the measuring chamber.
10. Now insert the cuvette with your sample into the measuring chamber in the correct orientation and start the measurement with the green Continue button .
11. The *"Result"* screen will now show you the extinction of the sample at the preset wavelength of the calibration curve as well as the calculated concentration of the sample.

***Note:*** *The graph underneath shows you where on the calibration curve your sample is located, based on its extinction and concentration). If your sample is outside the calibration curve, a quantitative value cannot be indicated.*

12. The green plus key allows you to go directly to the next measurement, which is automatically numbered consecutively.
13. Tap on the ✕ to end the display and, after a prompt, to save the results in history or discard them (Figure 9).

## 6.3 Microscopic Measurements with the fluidlab R-300

### 6.3.1 How the Holographic Microscope Works

The basic difference between the anvajo microscope and a normal optical microscope is that our device does not require a lens system. Instead, a holographic image is generated with a high-resolution electro-optical camera. The image is then reconstructed digitally by means of numerical reconstruction in accordance with the laws of the propagation of light. Various simplifications are used to accelerate the calculation process and the post-processing steps, thus enabling the object to be reconstructed.
Our integrated microscope captures images of particles in a large field of view (FOV 2.3 x 2.3 mm) and thus guarantees a high level of statistical reliability for every test result. The optical output is then processed by anvajo's intelligent, mathematical reconstruction software, which delivers high-resolution images. In addition, machine learning methods, such as deep neural networks, guarantee accurate counting and classification of the optical outputs with immediate quantitative results.

### 6.3.2 Preparation of the *acella* Sample Carrier

***Note:*** *acella is a proprietary sample carrier format made of glass substrate (*Figure 21: *). On account of the low measuring chamber heights, acella is suitable for microscopic applications such as cell counting or particle classification. Our acella sample carriers have been tested with a variety of permanent cell lines, primary cells, blood cells, stem cells and yeast cells in several laboratories and are already used in veterinary medicine for the analysis of urine sediment (a list of the tested cells is available at www.anvajo.com). The acella sample carriers are available with measuring chamber heights of 20 µm, 50 µm and 100 µm with filling volumes of 4 µL, 10 µL and 20 µL respectively. In addition, all acella sample carriers are compatible with all standard stages for subsequent manual microscopy.*

1. Open the slider (measuring chamber cover) on the **fluidlab** R-300 (Figure 4).
2. Check that the sample carrier adapter 01 is correctly positioned in the measuring chamber (Figure 21) of the **fluidlab** R-300. If in doubt, remove the sample carrier using the adapter key (see Figure 1-7). Reinsert the sample carrier adapter into the measuring chamber until it clicks into place (see Figure 21).

**Warning!**
You should wear gloves when filling acella sample carriers, as fingerprints on the glass may result in incorrect measurements.

When drawing up the sample liquid, make sure that no air bubbles form in the pipette tip.

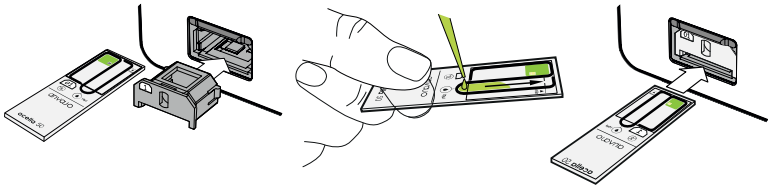
3. To fill the *acella* sample carrier, use a laboratory pipette set to the volume that is printed on the *acella* sample carrier.
4. Place the *acella* on a clean surface and hold the sample carrier on the opposite side of the sample chamber. If you can read the name *"acella"* in the correct orientation, the opening of the sample chamber will be located on the upper side of the sample carrier.
5. Place the pipette diagonally at the opening of the measuring chamber within the semicircular boundary (Figure 21).
6. Pipette the volume printed on the sample carrier (Figure 21) slowly into the semicircular boundary in the direction of the sample chamber.

*Figure 21: Inserting the acella adapter and filling the acella sample carrier.*

*Left: The appropriate adapter for acella is adapter 01.*

*Centre: Filling the acella sample carrier with the sample fluid.*

*Right: Correct orientation of the acella sample carrier when being inserted into the device (coloured square on the lower right-hand side).*



**Warning!**
When filling the sample chamber, be careful not to overfill it, as sample fluid may escape from under the cover glass if the capacity of the sample chamber is exceeded.

The sample chamber automatically fills up with fluid as a result of capillary forces. The microscopic measurement is carried out in the lower part of the sample chamber; therefore, for a successful measurement the chamber should be filled up to the minimum mark. If air bubbles have formed in this part of the chamber, you can position the acella sample carrier and gently tap the bottom edge on a hard surface. If the air bubbles cannot be removed from the lower part of the measuring chamber, a new sample carrier must be filled. Air bubbles in the upper part of the measuring chamber are not a problem, as no measurement is carried out in this part.

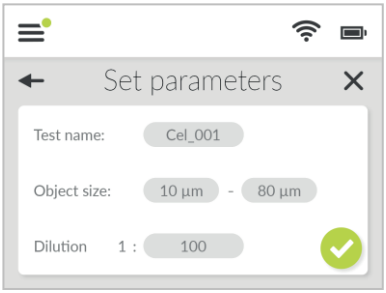
### 6.3.3 Cell Count

#### 6.3.3.1 Automatic Cell Counting

***Note:*** *Sample preparation of adherent cells and suspension cells - The Cell Count application allows cells to be counted if they are in suspension. For adherent cells, this means that they must be detached mechanically or chemically from the bottom of the culture vessel. If the cell suspension is so concentrated that cells overlap in the sample carrier, it should be diluted for a further measurement. Measurement with the Cell Count application is particularly useful in the case of the passaging of cells after washing. The application can also be used very effectively in the preparation of experiments, if the previous quantification of the cells is relevant for the test result or for further calculations.*

1. Prepare your cells as described in the note section above.
2. Open the slider (measuring chamber cover) on the **fluidlab** R-300, as described in Chapter 6.2.2.
3. Insert sample carrier adapter 01, as described in Chapter 6.3.2.
4. Fill the *acella* as described in Chapter 6.3.2.
5. On the home screen of the **fluidlab** R-300, select the **Cell Count** application by tapping on it.
6. The “Set parameters” input screen appears (Figure 22), in which you can optionally specify the Test name for the measurement, as well as the mandatory Object size and the Dilution.

*Figure 22: “Set parameters” screen in the Cell Count application.*



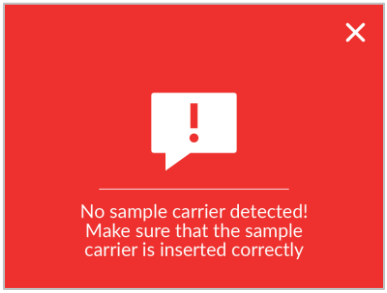
***Note**: In the Dilution input field, enter the dilution level for your sample. The Cell Count application uses the dilution factor you have entered to calculate how many cells are located in your initial solution and shows you the value for the undiluted solution in the results screen. If you have not performed a dilution, enter a 1:1 dilution in the input field. For a 1:10 dilution, the calculation is based on 1 part sample and 9 parts dilution solution.*

7. Confirm what you have entered by tapping on the green tick sign .
8. Insert the sample carrier into the slot on the **fluidlab** R-300.

***Note**: The device shows you in which orientation the sample carrier must be inserted into the device (*Figure 23*). The device will detect if the sample carrier is missing, misaligned or unauthorised and a red information screen will be displayed (Figure 24). If this screen is shown even though the sample carrier was inserted correctly, please run a sensor refresh (see Chapter 6.5.2). The device automatically recognises the different counting chamber heights of the acella 20, 50 and 100 and changes the chamber height accordingly in the volume calculation. Only these sample carriers are authorised for the **fluidlab** R-300.*

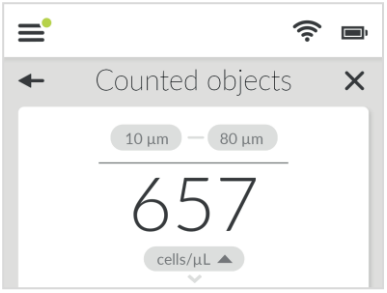
*Figure 23 (left): Correct insertion of the acella sample carrier. The coloured square must be in the lower right-hand corner.*

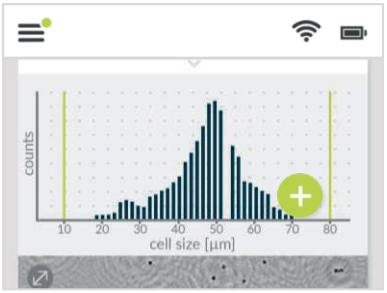
*Figure 24 (right): Warning if the sample carrier is inserted incorrectly or is not authorised.*


***Note**: Cell size histogram - In the histogram (*Figure 26*) on the "Counted objects" screen, the cell count is plotted against cell size. If the cells differ greatly in terms of their size, you can move the green cursor to subsequently adjust the object size of the quantified area and thus discover how many cells of a particular size category have been found. The adapted object size of the area to be quantified will then be displayed at the top of the "Counted objects" screen in the grey input fields (*Figure 25*). If, for example, you have a mixture of various cells of different sizes, you can use this function to differentiate the respective concentrations of the cell types. The object size can also be changed by entering new limit values in the grey input fields; the green cursors will adjust automatically.*

*Figure 25 (left): "Counted objects" screen of the Cell Count application.*
*Figure 26 (right): Histogram of cell size in the Cell Count application.*



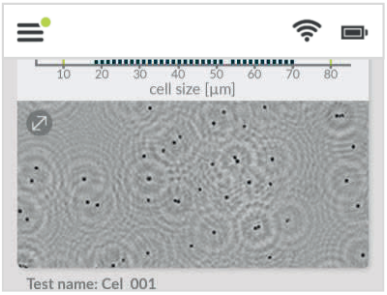



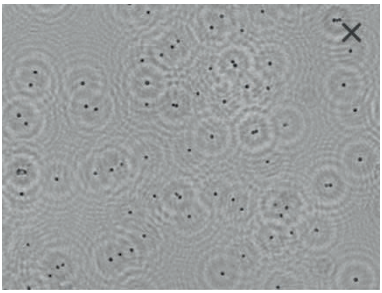

***Note:*** *Warning for high cell density or cell cluster – If cell density is very high or if there are many cell clusters detected in the cell suspension, the number of cells per ml will be marked in orange in the results screen. By clicking on the orange cell number, a full screen warning with more information is displayed. If the cell density is very high, cells may overlap in the sample carrier and may no longer be reliably detected and counted. We therefore recommend checking the measurement results critically, and in particular, to check the cell image that all objects within the user-specified size range were detected and marked by a green box. If necessary, the cell suspension should be further diluted, and a new sample measured. Moreover, a warning is displayed if there are many cell clumps in the cell suspension that may affect the measurement result. Cell clumps are often an indication of poor cell culture quality, e.g. by long incubation times with trypsin for cell detachment.*

7. Start the measurement by tapping on the green tick sign .
8. After the measurement, the results will be displayed in concentration per mL on the *"Counted objects"* screen (Figure 25).
9. Scroll down further to see a section of the cell image.
10. Tap on the double arrow button to enlarge the image (Figure 27, Figure 28).
11. Swipe your index finger across the screen to move to different areas of the image.
12. In full screen mode, tap on the ✕ to exit the view and return to the *"Counted objects"* screen.

*Figure 27 (left): Section of the cell image.*

*Figure 28 (right): Display of the cell image in full screen mode.*



13. The green plus key allows you to go directly to the next measurement with the same parameter setting, which is automatically numbered consecutively.
14. Tap on the ✕ to end the display and, after a prompt, to save the results in history or discard them (Figure 9).

### 6.3.4 Viability

#### 6.3.4.1 Automatic Viability Measurement

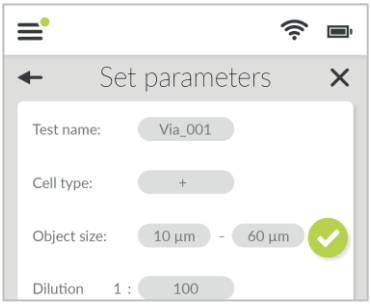
***Note:*** *Sample preparation of adherent cells and suspension cells - The Viability application enables you to determine the viability of the cells in the sample without staining, if they are in suspension. For adherent cells, this means that they have to be detached mechanically or chemically from the bottom of the culture vessel before the analysis. If the cell suspension is so concentrated that cells overlap in the sample carrier, it should be diluted for a further measurement (indicated by an orange cell number, as described in paragraph 6.3.3.1). Viability is calculated from the number of living cells in relation to the total cell count. In addition to viability, the results also list the total number of cells and the number of living and dead cells. This data evaluation can be used for a variety of experimental designs and to answer various questions.*

1. Perform a viability experiment of your choice and prepare your cells in suspension.
2. Open the slider (measuring chamber cover) on the **fluidlab** R-300, as described in Chapter 6.2.2.
3. Insert sample carrier adapter 01, as described in Chapter 6.3.2.
4. Fill the *acella* as described in Chapter 6.3.2.
5. On the home screen of the **fluidlab** R-300, select the **Viability** application by tapping on it.
6. The *"Set parameters"* input screen appears (*Figure 29*), in which you can optionally specify the *Test name* for the measurement and the *Cell type*, as well as the mandatory *Object size* and the *Dilution*.

***Note:*** *In the Dilution input field, enter the dilution level for your sample. The Viability application uses the dilution factor you have entered to calculate how many cells are located in your initial solution and shows you the value for the undiluted solution in the results screen. If you have not performed a dilution, enter a 1:1 dilution in the input field. For a 1:10 dilution, the calculation is based on 1 part sample and 9 parts dilution solution. In the Cell type input field you can enter information regarding your samples, e.g. cell type and abbreviations for incubation times and concentrations.*

7. Confirm what you have entered by tapping on the green tick sign .
8. Insert the sample carrier into the slot on the **fluidlab** R-300.

*Figure 29: "Set parameters" screen in the Viability application.*




***Note**:* *The device shows you in which orientation the sample carrier must be inserted into the device (*Figure 23*). The device will detect if the sample carrier is missing, misaligned or unauthorised and a red information screen will be displayed (Figure 24). Depending on the sample density, the measurement may take 40 seconds. The cell concentration can be displayed on the results screen either per µL or per mL.*

9. Start the measurement by tapping on the green tick sign .

10. *The results (viability, dead and living cells, total cell count) are displayed on the "Viability" screen after the measurement (Figure 30).*

***Note**:* *The set parameters and the date and time of your measurement are displayed below the section of the image. All living cells are marked with a green frame and all dead cells with an orange frame.*

***Note:*** *Histogram for cell size and viability - In the histogram (Figure 30, right) on the "Viability" screen, the cell count is plotted against cell size. The orange bars show the distribution of the dead cells and the green bars the distribution of the living cells. You can move the cursors to subsequently adjust the object size and discover how many cells of a particular size category have been found. The new object size will then be displayed in the grey input fields at the top of the "Viability" screen (Figure 30, left). If, for example, you are examining a mixture of various cells and they are of different sizes, you can use this function to identify the respective quantities of the cell types. The object size can also be changed by entering new limit values in the grey input fields; the cursors will adjust automatically. Depending on the cell size setting, the quantities of living and dead cells and the total cell count will also adjust automatically.*

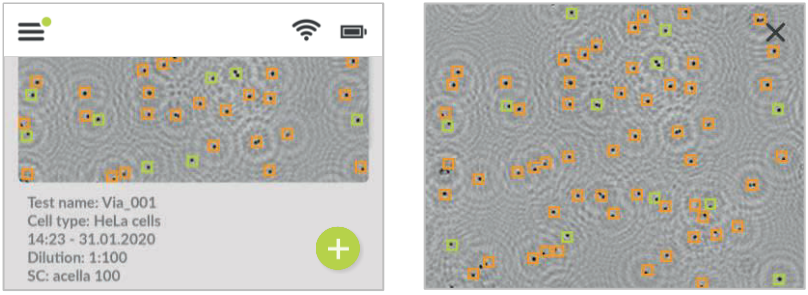
11. Scroll down for a section of the cell image (*Figure 31, left*).

12. Tap on the double arrow button to enlarge the image (Figure 31, *right*).

13. Swipe your index finger across the screen to move to different areas of the image.

*Figure 30 (left): Results screen for viability measurement.*
*Figure 30 (right): Histogram of viability measurement.*


*Figure 31(left): Section of a cell image on the results screen,*
*Figure 31(right): Display of the cell image in full screen mode.*

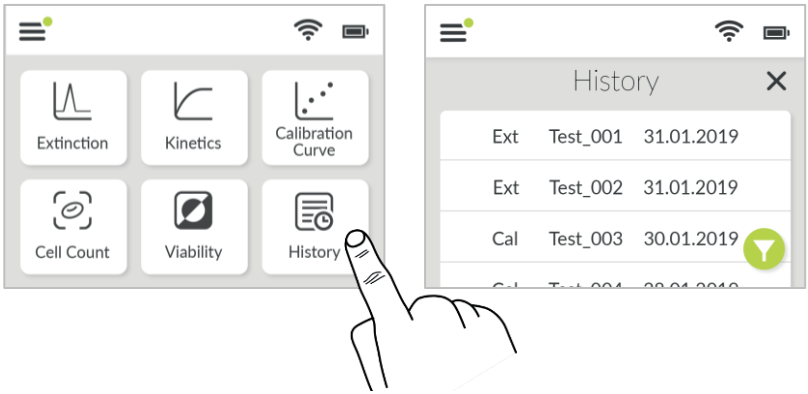



14. In full screen mode, tap on the ✕ to exit the view and return to the *Viability* screen.
15. The green plus key ⊕ allows you to go directly to the next measurement with the same parameter setting, which is automatically numbered consecutively.
16. Tap on the ✕ to end the display and, after a prompt, to save the results in history or discard them (Figure 9).

## 6.4 History

The **History** function of the **fluidlab** R-300 contains all the saved measurements; they can be sorted, filtered, edited and deleted, and can be called up by tapping on *"History"* in the main screen of the **fluidlab** R-300 (Figure 32*Figure 32:* ). The measurements can be sorted by date, application or in alphabetical order (Figure 33).

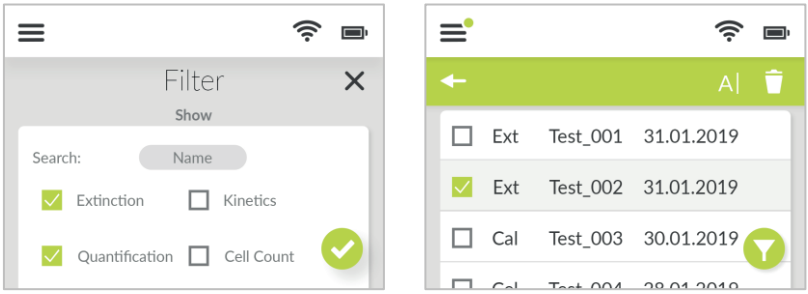
Figure 32: History of the ***fluidlab*** R-300.




**Filter**
The filter function allows you to display only those measurements that were carried out with a particular application (extinction measurements, cell counts, quantifications with calibration curves, viability measurements, kinetics). It is also possible via the search functions to display only measurements with a particular test name.

*Figure 33: Filter and sort function in History.*

*Figure 34: Editing menu in History.*

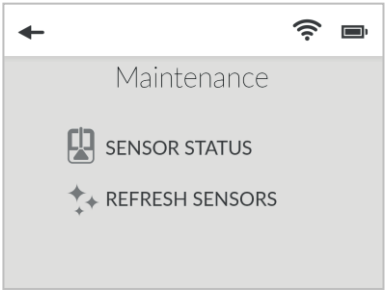



**Editing Measurements**
You can subsequently change the preset parameters of a measurement by briefly tapping on the measurement to call it up and editing the results. You can then save the changes and thus overwrite the previous settings.

**Changing the Test Name and Deleting Measurements**
If, rather than just briefly tapping on a measurement, you maintain the contact between your finger and the screen for several seconds (long press), you can carry out further options (Figure 34). An editing menu appears in a green bar at the top of the screen, containing a pencil, a rubbish bin and an arrow. You can use the pencil to change the test name and the arrow to exit the editing menu. You can use the rubbish bin to delete either a single measurement or multiple measurements, by tapping on the boxes on the left-hand side of the relevant line(s).
If all measurements saved on the device should be deleted at the same time, the "Delete history" button Delete history at the end of the *History* list can be used.

## 6.5 Quality Assurance

*Figure 35: Maintenance options.*



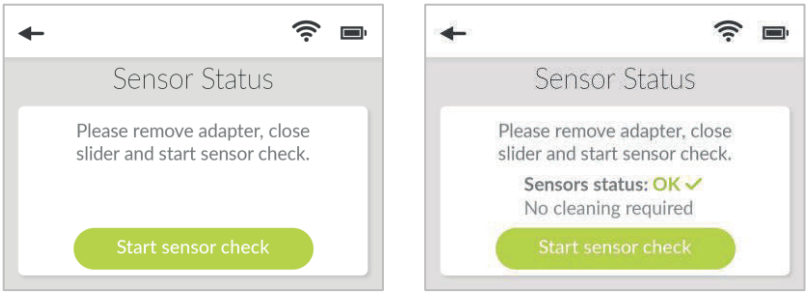

### 6.5.1 Sensor Status

Checking the sensor status is a quality control procedure for maintaining the **fluidlab** R-300's measuring functionality and accuracy.

1. Open the settings menu of the **fluidlab** R-300 by tapping the menu icon ( ☰ ).
2. Tap on the menu item "Maintenance".
3. Tap on the menu item "Sensor Status" (Figure 35).
4. Tap on "Start Sensor Check" (Figure 36).
5. After a few seconds, the result of the sensor check will appear.
6. If the status is "OK", no further action is required. In all other cases, please clean the sensor (see Chapter 8.5.3).

**Warning!**
The device can only be used for further measurements if the sensor status "OK" is displayed. If the sensor status "OK" cannot be obtained even after repeated cleaning of the sensor, the device may no longer be used. In this case, please contact the support department (see Chapter 8.7).

*Figure 36: Checking the sensor status.*



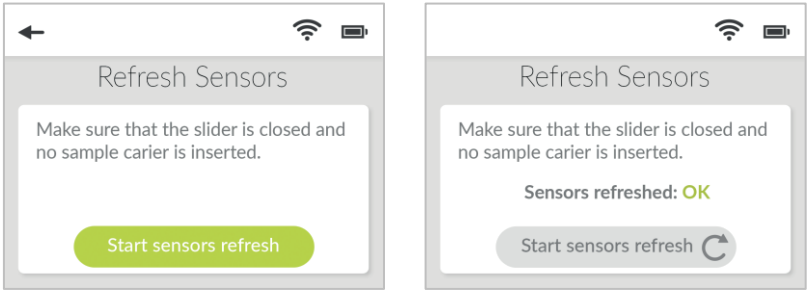

### 6.5.2 Refresh Sensor Data

Detecting the correct orientation of the sample carrier before the actual measurement is a crucial factor in the correct processing of the microscopic images that are recorded. The associated sensors must always be recalibrated if no detection takes place, even if the sample carrier appears to be positioned correctly.

1. Open the settings menu of the **fluidlab** R-300 by tapping the menu icon ( ☰ ).
2. Tap on the menu item “Maintenance”.
3. Tap on the menu item “Refresh Sensor” (see Figure 35).
4. Tap on “Start sensor refresh” (Figure 37).
5. The device collects the new sensor data.
6. The end of the measurement is indicated by “OK”.

**Warning!**
*The device must be positioned on a flat surface, without a sample carrier but with an adapter and a closed slider.*

*Figure 37: Refresh Sensor.*



# 7 anvajo datalab

The anvajo datalab is a desktop client which makes it possible to access and export the data stored on the **fluidlab** R-300 and to update the device. The datalab is available to download for free on our website *www.anvajo.com*. The **fluidlab** R-300 can be connected to any PC running the datalab software and to multiple PC's simultaneously.

***Note**: The datalab is an export software. If you want to change any measurement settings (for example the name) you have to do it directly on the device and save it afterwards.*

## 7.1 Connection to the fluidlab R-300

***Note**: The computer to which the **fluidlab** R-300 should be connected must be WLAN-capable in order to establish a connection.*

### 7.1.1 Connection via WLAN

1. Connect the **fluidlab** R-300 to an existing WLAN (see Chapter 5.2.2).
2. Connect your PC to the same network.
3. Open the anvajo datalab desktop client.
4. Choose the desired device.

***Note:** If the device is not automatically shown on the homescreen of your datalab, add the device manually by clicking on the + button in the upper right corner. Type in the hostname (fluidlab-000xxx) of your **fluidlab** R-300, which you can find in the system information.*

### 7.1.2 Connection via Hotspot

1. Create a local WLAN with your **fluidlab** R-300 by using the Hotspot function (see Chapter 5.2.3).
2. Connect your PC to the network (*fluidlab-000xxx*).
3. Type in the passwort *fluidlab*. You can also find the password in the Hotspot menu.
4. Open the anvajo desktop client.
5. Choose the desired device.

***Note:** If the device is not automatically shown on the homescreen of your datalab, add the device manually by clicking on the + button in the upper right corner. Type in the SSID (fluidlab-000xxx) or IP of your **fluidlab**, which you can find in the Hotspot menu.*

## 7.2 Data Export

1. Open the anvajo datalab desktop client.
2. Connect your **fluidlab** R-300 via WLAN (see Chapter 7.1.1) or Hotspot with your PC (see Chapter 7.1.2).
3. Choose the measurements which should be exported by clicking on the box on the left.
4. Click 

.
5. Choose which data you want to export.
6. Select the path where the files should be saved.
7. Click 

.

## 7.3 Updates via datalab

If it is not possible to connect the **fluidlab** R-300 to a WLAN, you can also update it with a few more steps via the Hotspot and with the help of the datalab.

1. Open the anvajo datalab desktop client.
2. Connect your **fluidlab** R-300 via the Hotspot to your PC (see Chapter 7.1.2).
3. Click 

in the upper right corner.
4. Switch with your PC to a local WLAN and download the latest software version.
5. Switch to the **fluidlab**-WLAN again and install the update.

# 8 Operating and Maintenance Instructions

## 8.1 Prohibitions on Use

The system should not be used:

- for medical diagnostics
- in potentially explosive environments
- with hazardous substances (corrosive, flammable)
- with hot liquids (> 60°C)

The area of use is defined by the technical parameters specified in Chapter 9.1.

## 8.2 Description of Use

### 8.2.1 User Groups

The **fluidlab** R-300 has been designed to ensure intuitive operation. This measuring system is intended for professional users, such as laboratory assistants, doctors and scientists (physicists, biologists, chemists, engineers etc.)

### 8.2.2 User Expertise

Operating the **fluidlab** R-300 does not require any specialised knowledge. The owner of the device should designate users who, based on their training, know how to operate electrical measuring systems. Users should have basic language skills in English, in order to be able to understand the messages and program texts.

The **fluidlab** R-300 has been designed in such a way that no special product training is required to operate it.

### 8.2.3 Service Life

The **fluidlab** R-300 is suitable for 24/7 use. Portable use is limited by the battery life. The 24/7 operating mode requires the external power supply unit to be connected. If the battery is low (20% remaining capacity), the battery icon on the user interface menu bar of the **fluidlab** R-300 will turn red. If you see these indications, you should connect the device to the power supply unit and charge the battery. If no charging takes place, the device will shut down automatically when the remaining battery capacity falls to 5%.

The system's service life is determined to a large extent by the battery life. Under ideal conditions with the system being used as intended, 300-500 charging cycles would be standard for the built-in battery. Assuming a service life of 5 years, this corresponds to one charge per week.

**Warning!**
The device may only be charged and operated using the supplied power supply unit described in the specifications (Chapter 9.2). If the power supply unit fails, a replacement power supply unit should be requested from the manufacturer.

## 8.3 Usage Location

The **fluidlab** R-300 is designed for indoor use in accordance with the conditions specified in 9.1. It is possible to operate the device outdoors, if the conditions specified in 9.1 are adhered to. During measurement, it is necessary to keep the measuring environment consistent in order to obtain reliable results.

## 8.4 Warranty Provisions

Provided that it is used as intended and that it is connected and operated in accordance with the specifications contained in this user manual, anvajo GmbH guarantees a fault-free, functioning system.

- In the event of any device malfunction or failure attributable to material or manufacturing defects, the device will be repaired free of charge within the warranty period.
- The warranty period is one year and commences on the day of delivery.
- This warranty applies only to the manufacturer's products.
- A warranty claim will not affect the duration of the warranty period. Any further claims are excluded.
- Repairs must only be carried out by the manufacturer.

**Limitations:**
The warranty does not cover the following faults:

- Faults caused by changes that have been made without written approval from the manufacturer
- Damage caused by normal wear
- Damage arising from the use of accessories, consumables, hardware or software that do not conform to the manufacturer's specifications
- Faults arising from improper use of the equipment or from incorrectly installed systems
- Faults that are beyond the manufacturer's control, e.g. damage caused by fire, water or lightning
- Faults arising from the transportation of the system

**Warning!**
Removing the serial number will invalidate the warranty.

## 8.5 Cleaning

### 8.5.1 General

The **fluidlab** R-300 does not require any special form of cleaning. Dirt should be removed with a lint-free cleaning cloth. Cleaning must be carried out in a dry condition.

Contact with the biohazardous samples may result in infection. Hence, the components of the device associated with the biohazardous samples are potentially biohazardous.

Please follow Good Laboratory Practices when working with biohazardous samples.

If the biohazardous sample comes into contact with your skin, wash it off immediately with soap and water and apply disinfectant. If necessary, consult a physician.

**Warning!**
Before the start of cleaning, disconnect the **fluidlab** R-300 from the mains power supply.
The device must always be switched off whilst it is being cleaned.

**Warning!**
To prevent unnecessary contamination, the measuring chamber should be closed when not in use.

### 8.5.2 External Cleaning

If the sample is spilled on the device, wipe it up immediately and apply disinfectant.

We recommend the following cleaning supplies:

- A soft microfibre cloth for the display and housing.
- 99% isopropyl alcohol; do not use aggressive cleaning agents, such as benzene or acetone. These may damage the display coating.
- If you are using ethanol as a cleaning agent, do not apply it directly to the device. Moisten a cloth with the cleaning agent and then wipe down the device.

**Warning!**
If you are cleaning the unit with water or a cleaning agent, wring out the cloth so that it does not contain any excess fluid. Do not allow liquid to enter the device. If it does, it may damage the internal components.

**Warning!**
Sample residues in the measuring chamber or on the device may lead to contamination of the user. Be sure to wear appropriate fluid resistant lab coat and approved lab gloves.

### 8.5.3 Cleaning the Sensor and Measuring Chamber

*The measuring chamber (Figure 38) can be cleaned by removing the sample carrier adapter. The sample carrier adapters must be cleaned separately.*

We recommend that the measuring chamber should be cleaned daily in order to maintain the device's measuring performance.

We recommend the following cleaning supplies:

- Swabs for cleaning the sensor and measuring chamber (supplied; further supplies can be ordered from anvajo).
- A soft, clean paper towel.
- 99% isopropyl alcohol; do not use aggressive cleaning agents, such as benzene or acetone. as these may damage the system.
- If you are using ethanol as a cleaning agent, do not insert it directly into the measuring chamber. Moisten a swab with the cleaning agent and clean the measuring chamber and optics without exerting excessive pressure.

**Warning!**
To avoid potential damage to the optical components of the device arising from impurities or carry-over of contamination, the swabs are intended for single use only! New swabs can be ordered via the Service department (Chapter 8.7).

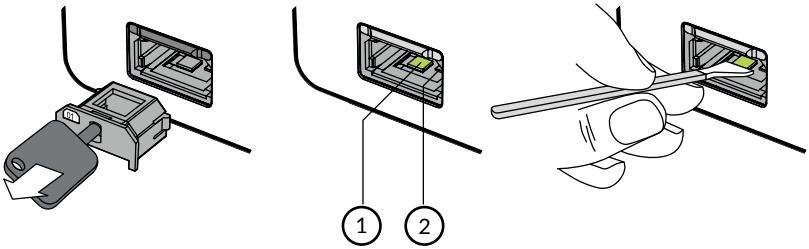
**Warning!**
Do not point the spray nozzle of a cleaner directly at the **fluidlab** R-300's light source.

**Warning!**
Do not use compressed air on the measuring chamber, as this may cause particles of dirt to settle on the internal measuring equipment. In this case, the device would have to be opened and cleaned by the service department.

**Procedure in the event of contamination with dry particles (e.g. dust):**

1. First remove the sample carrier adapter and clean it with a soft paper towel.
2. Turn the device over so that the opening of the measuring chamber is pointing downwards; tap gently on the back of the device so that any dust or loose particles fall out.
3. With the swabs, first clean the sensor surface and then the LED.

*Figure 38: Sensor cleaning process.*




| Item No. | Name | Description |
|---|---|---|
| 1 | Sensor | For microscopic measurement |
| 2 | LED | For spectrometer measurement |

**Procedure in the event of heavier contamination (e.g. ingress of fluids):**

1. First remove the sample carrier adapter and clean it with a soft paper towel moistened with 99% isopropyl alcohol.
2. Turn the device over so that the opening of the measuring chamber is pointing downwards; tap gently on the back of the device so that any dust or loose particles fall out.
3. Clean the measuring chamber with a soft microfibre cloth moistened with 99% isopropyl alcohol.
4. Clean the sensor surface and the LED with the swabs (supplied) moistened with 99% isopropyl alcohol (Figure 38).

**Warning!**
Sample residues in the measuring chamber may lead to contamination of the user. Always wear gloves when working with the measuring chamber.

## 8.6 Maintenance Activities

In principle, the **fluidlab** R-300 is maintenance-free. To determine that it is working correctly, comparative measurements can be carried out as described in Chapter 6.5.
In addition to metrological checks, the **fluidlab** R-300 should be checked in accordance with DGUV (German Social Accident Insurance) Regulation 3 or local equivalent regulation for examination of electrical appliances.

## 8.7 Service/Support

Please notify the anvajo GmbH Service department or your local authorized distributor or dealer if any deviations are detected on the system.

Address: anvajo GmbH
Zwickauer Straße 46
01069 Dresden

Tel.: +49 (0)351 854784 00
E-mail: support@anvajo.com
Web: https://www.anvajo.com

## 8.8 Transportation/Storage

The system should be stored and transported in the delivery box, in accordance with the conditions specified in Chapter 9.1.
Before transportation or storage, the system should be cleaned in accordance with the cleaning instructions (Chapter 8.5).

## 8.9 Decommissioning

If the **fluidlab** R-300 is not going to be used for a period of > 3 months, we recommend that the system should be stored in the delivery box to minimise damage and contamination. Before the system is placed out of service, it should be cleaned in accordance with Chapter 8.5. The battery should be placed in the optimum charge state for storage, see Chapter 2.4.

During storage, the storage conditions specified in Chapter 9.1 must be adhered to. The person responsible for storing the device must have the necessary qualifications for this activity.

## 8.10 Disposal

This measuring device and its components contain electronic parts.

EU Directive 2012/19/EU on Waste Electrical and Electronic Equipment (WEEE) specifies that used devices should not be disposed of as general household waste, laboratory waste or hospital waste. Used systems must be collected separately, to increase the recycling rate and to reduce the impact on human health and on nature.
The device is equipped with a LiPo battery. Batteries require special care in handling and disposal (see Chapter 2). Improper disposal may have adverse effects on human health and may harm the environment.

At the end of its product life cycle, the device should be disposed of as electronic waste. Please contact the dealer from whom you purchased the device or return it directly to anvajo GmbH. We will dispose of it in a professional and environmentally friendly manner. Disposal via municipal collection points is not permitted.
WEEE registration number: DE 63201367

**Warning!**
Please also observe the safety instructions in Chapter 2 when handling the device.

The sample carriers used for measuring purposes must be disposed of after use in accordance with the customer's own laboratory regulations. If the sample carriers have been mixed with human or animal samples, special care is required when handling them. These samples may be contaminated with pathogenic germs or viruses and must be handled as potentially hazardous.

**Warning!**
Always wear gloves when working with sample carriers to avoid any potential hazards, e.g. contamination with infectious material.

# 9 Technical Specifications

## 9.1 fluidlab R-300 specifications

| | |
|---|---|
| **Power supply** | |
| Mains voltage (for charger) | 100 - 240 $V_{AC}$ |
| Mains frequency (for charger) | 50 / 60 Hz |
| Operating voltage **fluidlab** R-300 | 5 $V_{DC}$ |
| Max. current consumption | 1.5 $A_{DC}$ |
| Max. power: | 7.5 W |
| Battery life (continuous measurement operation): | 1.7 h |
| Battery life (standby, display off): | 5.5 h |
| Battery type | Lithium polymer 3.7 V, 1500 mAh |
| Charging port | USB port type C |
| **Touch screen** | |
| Display | 3.5" with 320x240px (landscape) |
| Touch screen | Capacitive |
| **WLAN** | |
| Frequency range | 2.400 – 2.4835 GHz (IEEE 802.11 b/g/n) |
| Radio channels | 13 at IEEE 802.11 b/g/n (2.4 GHz) |
| Transfer rate | Realistic transfer rate: 35 Mbps<br>IEEE 802.11 b up to 11 Mbps<br>IEEE 802.11 g up to 54 Mbps<br>IEEE 802.11 n up to 300/450 Mbps |
| Security | WPA/WPA2; Firewall [1] |
| **Operating System** | |
| OS | Linux |
| **Memory** | |
| Memory space | > 1000 measurements |
| **Nominal operating range** | |
| Ambient temperature | 10°C to 30°C |
| Relative humidity | < 80%, without condensation at 31°C |

[1] factory activation, no setting of parameters by user

| | |
|---|---|
| **Transport/storage conditions** | |
| Ambient temperature | - 25°C to + +50°C (optimum: 20°C) |
| Relative humidity | Max. 95% at 25°C (optimum: 40 – 60%) |
| Duration of transport / storage | Max. 6 months/ max. 1 year |
| **Safety conditions** | |
| Degree of pollution | 2 |
| Protection class in accordance with DIN VDE 106 T1 | SK II |
| Degree of protection according to IEC 60529 | IP20<br>IP2X ≙ Protection against ingress of solid foreign bodies ∅ ≥ 12.5 mm<br>IPX0 ≙ No protection against ingress of water |
| **Dimensions ($W_x$ x $D_z$ x $H_y$)** | |
| **fluidlab** R-300 | 128 mm x 94 mm x 33 mm |
| **Weight** | |
| **fluidlab** R-300 | 240 g |
| **Microscope** | |
| Resolution | Particle size: 3 µm – 80 µm |
| **Spectrometer** | |
| Frequency band / wavelength | VIS [2] / 375 nm - 700 nm [3] |
| UV LEDs | 365 nm with $\Phi_e$ = 13 mW (@20 mA)<br>385 nm with $\Phi_e$ = 16 mW (@20 mA) |

[2] VIS = visible
[3] Intersection of spectrometer wavelength range and LED frequency band

## 9.2 Accessories

| Name | Part number | Description |
|---|---|---|
| USB power supply unit | 10048 | external, type 31507W (inLine ®) |
| USB connection cable [type A to type C] | 10049 | Length: 1.8 m |
| **acella50** sample carrier | 10056 | Microscope sample carrier with a chamber height of 50 µm |
| **acella100** sample carrier | 10085 | Microscope sample carrier with a chamber height of 100 µm |
| Cleaning swabs | 10078 | Plastic sticks with cellulose scraper (set of 12) |
| Sample carrier adapter 01 – **acella** | 10039 | Plastic insert for measuring chamber for acellas |
| Sample carrier adapter 02 – **cuvette** | 10135 | Plastic insert for measuring chamber for scattered light measurements with cuvettes |
| Sample carrier adapter 03 – **cuvette** | 10131 | Plastic insert for measuring chamber for absorption measurements with cuvettes |
| Device case | 10054 | Lockable hard plastic case with internal padding, especially for the **fluidlab** R-300 with accessories |

## 10 Declaration of Conformity

# Declaration of Conformity

In accordance with the EU Directives

| | |
|---|---|
| 2014/30/EU | Directive on the harmonisation of the laws of the Member States relating to electromagnetic compatibility |
| 2014/53/EU | Directive on the harmonisation of the laws of the Member States relating to the making available on the market of radio equipment and repealing Directive 1999/5/EC |
| 2011/65/EU | Directive on the restriction of the use of certain hazardous substances in electrical and electronic equipment |
| 2017/2102/EU | Directive amending Directive 2011/65/EU on the restriction of the use of certain hazardous substances in electrical and electronic equipment |

The manufacturer **anvajo GmbH**
Zwickauer Straße 46
01069 Dresden

declares with this declaration of conformity, under its sole responsibility, that the following products:

Model / Type: **Fluidlab R-300** and
**Fluidlab 1**

conform to the provisions of the aforementioned directives – including any applicable changes thereto in force at the time of this declaration.

The following standards and technical specifications have been taken into account:

| | |
|---|---|
| EN 61010-1:2010 | Safety requirements for electrical equipment for measurement, control, and laboratory use – Part 1: General requirements |
| EN 62471:2008 | Photobiological safety of lamps and lamp systems |
| EN 61326-1:2013 | Electrical equipment for measurement, control and laboratory use - EMC requirements |
| EN 301 489-1 V2.2.3 | Electromagnetic compatibility standard for radio equipment and services - Part 1: common technical requirements |
| EN 301 589-17 V3.2.4 | Electromagnetic compatibility standard for radio equipment and services - Part 17: specific conditions for broadband data transmission systems |
| EN 300 328 V2.2.2 | Wideband transmission systems; Data transmission equipment operating in the 2.4 GHz band |
| EN IEC 63000:2018 | Technical documentation for the assessment of electrical and electronic products with respect to the restriction of hazardous substances |

This product also meets the general product safety standards as described in Directive 2001/95/EC on the general product safety.

Dresden, 15.03.2022

S. Fraedrich

Stefan Fraedrich (Managing Director)