



UNO-STAGE-TOP-INCUBATOR

UNO-T

UNO-T-H-PREMIXED

UNO-T-H-CO2

Manual

This page was left Blank

Index

1	PREFACE	1
2	SYMBOL DESCRIPTION	2
2.1	SYMBOLS USED IN THIS MANUAL	2
2.2	SYMBOLS ON THE PRODUCT LABEL	2
3	SAFETY NOTES	3
4	EQUIPMENT OVERVIEW	5
4.1	UNO-T	5
4.2	UNO-T-H-PREMIXED	5
4.3	UNO-T-H-CO2	6
5	COMPATIBILITY	8
6	EQUIPMENT DESCRIPTION	9
7	INSTALLATION	11
7.1	CONNECTION OF THE CHAMBER BASE AND THE CHAMBER LID	11
7.2	CONNECTION OF GF-MIXER-HM (HUMIDITY MODULE)	11
7.3	GAS CONNECTION	14
7.3.1	Gas connection for UNO-T-H-PREMIXED	14
7.3.2	Gas Connection for UNO-T-H-CO2	16
7.3.2.1	<i>How to use 2GF-MIXER</i>	18
7.4	CONNECTION OF T SENSOR	20
7.5	CONNECTION OF THE OBJ-COLLAR (OPTIONAL)	20
7.6	MINI-USB PORT	21
7.6.1	Connection of MINI-USB-OTG cable	21
7.6.2	Connection of MINI-USB cable	21
7.7	RS232 SERIAL PORT	22
8	USER INTERFACE	24
8.1	HOME PAGE	24
8.1.1	How to enter the Setpoint	25
8.1.2	Graph view	25
8.1.3	Controller Status: colours led and meaning	26
8.2	SETTINGS	27
8.2.1	Control Mode	27
8.2.1.1	<i>Chamber Control mode</i>	28
8.2.1.2	<i>Sample Control mode</i>	29
8.2.2	Chamber & Insert	31
8.2.2.1	<i>Compatible Okolab H301 incubating chamber List</i>	33
8.2.3	Objective Heater	35
8.2.4	Humidity	36
8.2.5	Calibrations	38
8.2.5.1	<i>Chamber</i>	39
8.2.5.2	<i>T Sensor</i>	42
8.2.5.3	<i>Obj. Heater</i>	44
8.2.6	Logging	47
8.2.7	Alarms	51
8.2.8	Display	52
8.2.8.1	<i>Options</i>	53
8.2.8.2	<i>Brightness</i>	53
8.2.8.3	<i>Calibration</i>	54
8.2.8.4	<i>Date & Time</i>	54
8.2.8.5	<i>Visual Effects</i>	55

8.2.8.6	<i>Factory Reset</i>	56
8.2.8.7	<i>Password</i>	56
8.2.8.8	<i>Summary</i>	57
8.2.8.9	<i>Auto on/off</i>	57
8.3	STATUS OVERVIEW.....	59
8.4	ICON AND GLANCE MODE VIEW.....	59
8.5	INFO PAGE.....	59
9	TOUCH SCREEN CALIBRATION	61
10	CLEANING & MAINTENANCE	62
11	SUPPORT	63
12	TECHNICAL SPECIFICATIONS	64
13	TROUBLESHOOTING	66
14	FIGURE LIST	67
15	TABLE LIST	68
16	MANUAL REVISION TABLE	68

UNO-STAGE-TOP-INCUBATOR ensures the highest temperature accuracy on sample temperature by controlling simultaneously up to six integrated channels with a state-of-art multichannel controller.

UNO-STAGE-TOP-INCUBATOR is designed to control the environmental conditions inside the top stage incubator, where specimens are located. UNO-STAGE-TOP-INCUBATOR features a system to control the temperature from 3°C above ambient temperature (minimum temperature set point 25°C) to 60°C. The 4.3" touch screen controller interface allows working in both Chamber and Sample control mode. The temperature accuracy is $\pm 0.1^\circ\text{C}$ in Sample Control mode and $\pm 0.3^\circ\text{C}$ in Chamber Control mode, if Room Temperature is stable within $\pm 1^\circ\text{C}$. UNO-STAGE-TOP-INCUBATOR includes an external fine gauge thermocouple for sample feedback operation.

UNO STAGE-TOP-INCUBATOR requires the selection of one stage top chamber. It is compatible with all Okolab H301 incubating chamber (to be ordered separately).

UNO-STAGE-TOP-INCUBATOR is available in three different configurations:

- **UNO-T** including:
 - *UNO-CONTROLLER* - the temperature controller.
- **UNO-T-H-PREMIXED**, stage top incubator's controller for application with premixed gas, including
 - *UNO-CONTROLLER* - the temperature controller.
 - *GF-REGULATOR* - flow rate regulator for the premixed gas. The regulator, equipped with a calibrated output orifice, allows to set the desired output gas flow rate (in the range 0.1 - 0.4 l/min) by regulating manually the pressure.
 - *GF-MIXER-HM* - the Humidity Module. Dry premixed gas is humidified by flowing over warm water, heated up by the Humidifier. The Humidifier is composed of a glass bottle, Humidifier Bottle, and its heater. A heated tube delivers the humid premixed gas to the stage top incubator preventing moisture condensation.
- **UNO-T-H-CO2**, stage top incubator's controller for application with 100% CO2 and background air, including:
 - *UNO-CONTROLLER* - the temperature controller.
 - *GF-MIXER-HM* - the Humidity Module.
 - *2GF-MIXER* - a two-channel gas flow regulator. The 2G-MIXER is a manual mixer that allows the mixing of CO2 and air at the desired concentration by two floating ball flow meters. The CO2 concentration can be regulated in the range 0-15% in air with an accuracy of $\pm 1\%$.
 - *OKO-AP* - air pump. It enables to use background air as a convenient alternative to the compressed air.

UNO-STAGE-TOP-INCUBATOR is also compatible with Okolab objective Heater, OBJ-COLLAR series, recommended for immersion objectives. Collars connect directly to the controller and are calibrated with automatic routine.

The controller features on-board memory for data logging and mini-USB port for data download.

In addition, data logging is possible via DATA-LOG Okolab software and via following third-party Imaging software: LASX 2.0, NIS-Elements, SlideBook, MetaMorph and MicroManager. Macro for ZEN Black software is available upon request.

UNO-STAGE-TOP-INCUBATOR is also capable to receive TTL input (requires to order separately TTL-CABLE).

2 Symbol description

This paragraph describes the symbols used in this manual and on the product label.

2.1 Symbols used in this manual

The following symbols identify important information to note:



CAUTION or WARNING: this symbol warns you about the risk of electrical shock.



CAUTION or WARNING or IMPORTANT: this symbol warns you of circumstances or practices that can affect the functionality of the instrument.

Tip ► *Supplies you with helpful suggestions.*

Note ► *Supplies you with important information to successfully use the instrument.*

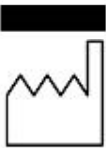
2.2 Symbols on the product label



CE MARKING: this symbol indicates product compliance with EU legislation.



PRODUCT DISPOSAL: this symbol indicates that this product must not be disposed as urban solid waste.



This symbol indicates the product production date.



This symbol indicates the Manufacturer data.



This symbol warns you to read the user manual before starting the device.

3 Safety Notes

In order to achieve maximum performance and to ensure proper operation of your new equipment, please read carefully the following safety notes and the instructions. If you have any question, please contact Okolab.

- The equipment must only be used as intended and as described in this Manual.
- Equipment should be operated only by technically qualified personnel.
- Do not start up the equipment if some of its parts are damaged.
- This instrument is not intended for use in locations subject to flammable or explosive gases.
- Transport the equipment with care.
- Equipment and its internal parts can be damaged by dropping and by shock.
- Not following these instructions can result in damage or breakdown of the device and its accessories.
- The products labels can be found on the bottom panel of the Main Box.
- Do not disassemble any part of the system.
- Do not use a volatile solvent such as paint thinner to clean the instrument, because deformation or discoloration may occur.
- Use a soft, dry cloth to remove stains from the instrument.
- Do not exceed voltage indicated in this manual and on the product label.
- Avoid excessive induction noise, static electricity and magnetic fields.
- Do not expose this instrument to rain or moisture.
- Do NOT go in close contact with or breathe any gas stream whose composition is different from that of ambient air.
- Prevent throttling and kinking of tubing.
- Check tubing time to time for possible material usage.
- Check that all tubing ends are well inserted into the connectors so they cannot slip off
- This device is not designed for use for medical applications.
- Install safety valves and adequate pressure regulators on gas lines before the unit input connectors.
- Power cord of unit should be unplugged from electrical outlet when left unused for a long period of time.
- PRESSURIZED GAS. Secure all connections with hose clamps. Never exceed the input pressure limit of 10 barg (145 psig). Bleed all lines before disconnecting. Wear safety goggles if needed. If pressure regulators are not within sight and reach, make sure at least one shut off valve is within reach.
- LOW OXYGEN ATMOSPHERES and HIGH CO₂ ATMOSPHERE. Never enter a room or enclosure which has a low oxygen/high CO₂ atmosphere because of severe danger of suffocation. Only operate in well-ventilated room. A small amount for carbon dioxide gas leaks continuously out of the instrument and should never be allowed to build up in the room.
- VENTILATION. Unit should be situated so that its location or position does not interfere with proper ventilation. Neither the gas mixer nor stream destinations should be in poorly ventilated areas.
- Unit should be situated away from heat sources such as open flames, radiators, heat registers, stoves, or other appliances or processes that produce heat.





- Do not start up the equipment if the supply cable is damaged.
 - Connect the equipment only to grounded mains power socket.
 - Do not disconnect cables while in operation.
 - Do not open the unit. Do not remove cover or back.
 - Prevent metal fragments or lead wire scraps from falling inside instrument to avoid electric shock, fire or malfunction.
 - No user serviceable parts inside.
 - Unit should never be used where it can fall or be pushed into water.
-



International caution symbol marks this device. It is important to read the “Safety Notes” before installing, using and commissioning this device, as the notes contain important information relating to safety and EMC. Not following these instructions can result in damage or breakdown of the device and its accessories

We reserve the right to make technical variations.

IN NO EVENT SHALL OKOLAB S.R.L. BE LIABLE FOR ANY DIRECT, INCIDENTAL OR CONSEQUENTIAL DAMAGES OF ANY NATURE, OR LOSSES OR EXPENSES RESULTING FROM ANY DEFECTIVE PRODUCT OR THE USE OF ANY PRODUCT.

4 Equipment Overview

4.1 UNO-T

Figure 1 illustrates the equipment overview for UNO-T configuration:

1. **UNO-CONTROLLER (x1)**, temperature controller
2. **Y-CABLE-1 (x1)**. To connect chamber's base and lid to the temperature controller.
3. **24V-DC Power Adapter (x1)**.
4. **OBJ-COLLAR (optional)**
5. **Okolab H301 incubating chamber (required, to be ordered separately)**.
6. **MINI-USB-OTG cable (x1)**. To connect a USB pen to the temperature controller for data download.
7. **Temperature Sensor (T Sensor) and extension (x1)**.

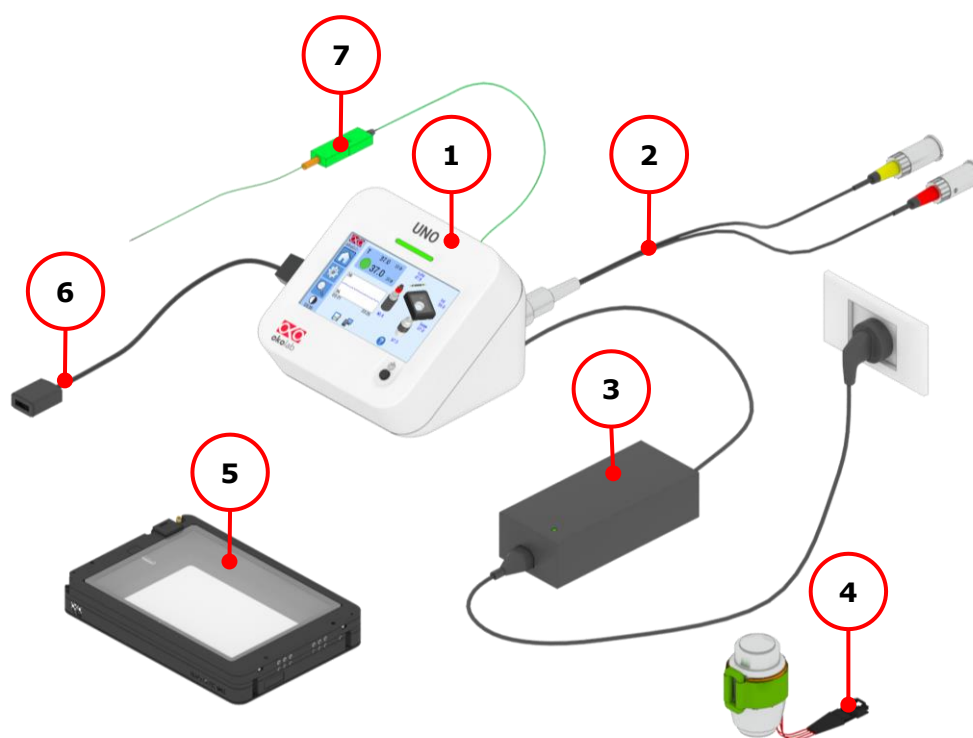


Figure 1. UNO-T Equipment Overview.

4.2 UNO-T-H-PREMIXED

Figure 2 illustrates the equipment overview for UNO-T-H-PREMIXED configuration:

1. **UNO-CONTROLLER (x1)**, temperature controller
2. **Y-CABLE-2 (x1)**. To connect the Humidifier and the Heated tube to the temperature controller.
3. **Y-CABLE-1 (x1)**. To connect chamber's base and lid to the temperature controller.
4. **24V-DC Power Adapter (x1)**.
5. **MINI-USB-OTG cable (x1)**. To connect a USB pen to the temperature controller for data download.
6. **Temperature Sensor (T Sensor) and extension (x1)**.
7. **TUBE-A (x1)**. Transparent rigid tube 6mm O.D.. Use TUBE-A to connect the premixed gas supply to the gas input of the Gf-REGULATOR.

8. **GF-REGULATOR (x1)**, flow rate regulator for the premixed gas.
9. **TUBE-C (x1)**. Blue rigid tube 6mm O.D. with attached a 4mm I.D. silicon transparent with a PTFE filter in the middle. Use TUBE C to connect the gas output of the GF-REGULATOR to the gas input connector of Humidifier.
10. **Humidifier (x1)**. It is composed of a glass bottle, Humidifier Bottle, with TUBE E (6 mm O.D. silicone tube with a glass bubbler at the end) and its heater, Humidifier Heater.
11. **Heated Tube (x1)**. Use Heated Tube to connect the Humidifier to Okolab H301 incubating chamber.
12. **Okolab H301 incubating chamber (required, to be ordered separately)**.
13. **OBJ-COLLAR (optional)**.

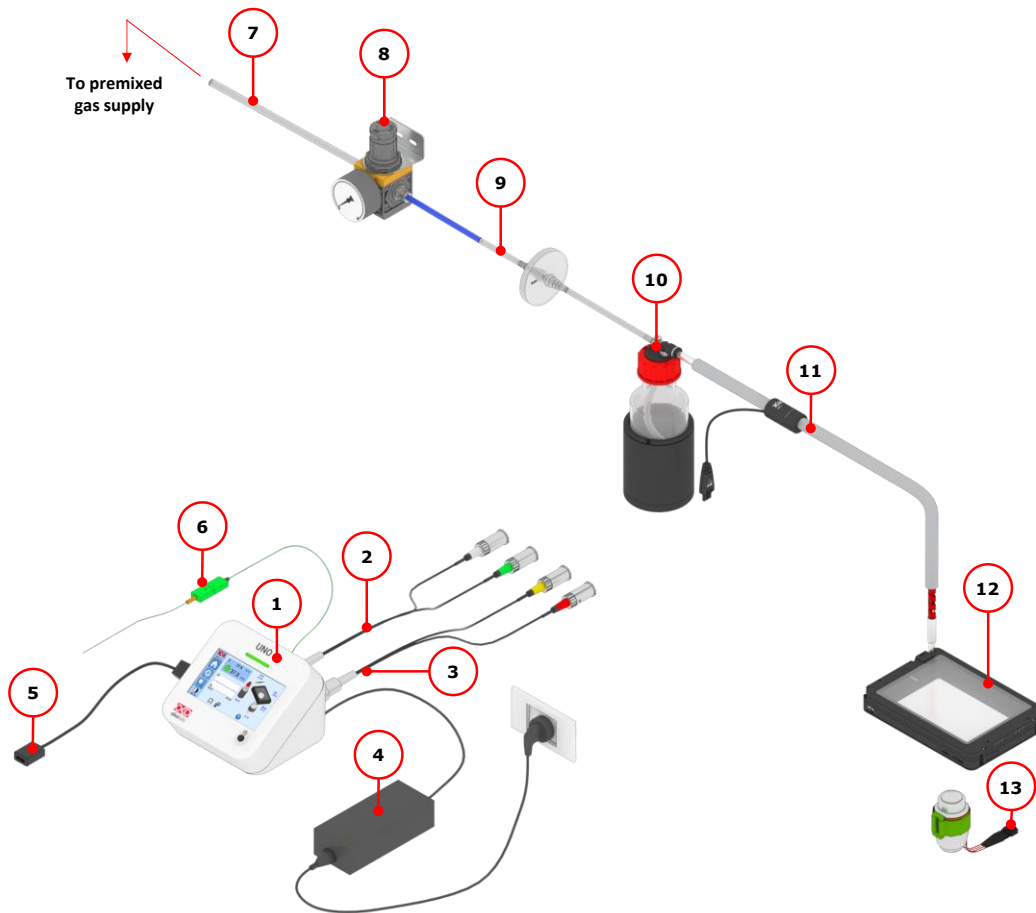


Figure 2. UNO-T-H-PREMIXED Equipment Overview.

4.3 UNO-T-H-CO2

Figure 3 illustrates the equipment overview for UNO-T-H-CO2 configuration:

1. **UNO-CONTROLLER (x1)**, temperature controller
2. **Y-CABLE-2 (x1)**. To connect Humidifier and the Heated tube to the temperature controller.
3. **Y-CABLE-1 (x1)**. To connect chamber's base and lid to the temperature controller.
4. **24V-DC Power Adapter (x1)**.
5. **MINI-USB-OTG cable (x1)**. To connect a USB pen to the temperature controller for data download.
6. **Temperature Sensor (T Sensor) and extension (x1)**.
7. **OKO-AP (x1)**, air pump with 24V-DC power adapter.

8. **TUBE-B (x1)** Transparent silicon 4mm I.D. tube with a PTFE filter in the middle connected at both ends to a blue rigid tube 6 mm O.D.. Use TUBE-B to connect OKO-AP to the air input port on the rear panel of 2GF-MIXER.
9. **2GF-MIXER (x1)**, manual Mixer to mix Air and CO₂.
10. **Pressure Gauge for CO₂ (x1)**. Install pressure gauge between the pure CO₂ supply pressure regulator and the corresponding CO₂ input port on the rear panel of 2GF-MIXER.
11. **TUBE-A(x1)**. Transparent rigid tube 6mm O.D.. Use TUBE-A to connect the output port of the pressure gauge to the CO₂ input port on the rear panel of 2GF-MIXER.
12. **TUBE-C (x1)**. Blue rigid tube 6mm O.D. connected to a 4mm I.D. silicon transparent with a PTFE filter in the middle. Use TUBE C to connect the gas output of the GR-REGULATOR to the gas input connector of Humidifier.
13. **Humidifier (x1)**. It is composed of a glass bottle, Humidifier Bottle, with TUBE E (6 mm OD silicon tube with a glass bubbler at the end) and its heater, Humidifier Heater.
14. **Heated Tube (x1)**. Use Heated Tube to connect the Humidifier to Okolab H301 incubating chamber.
15. **Okolab H301 incubating chamber (required, to be ordered separately)**.
16. **OBJ-COLLAR (optional)**

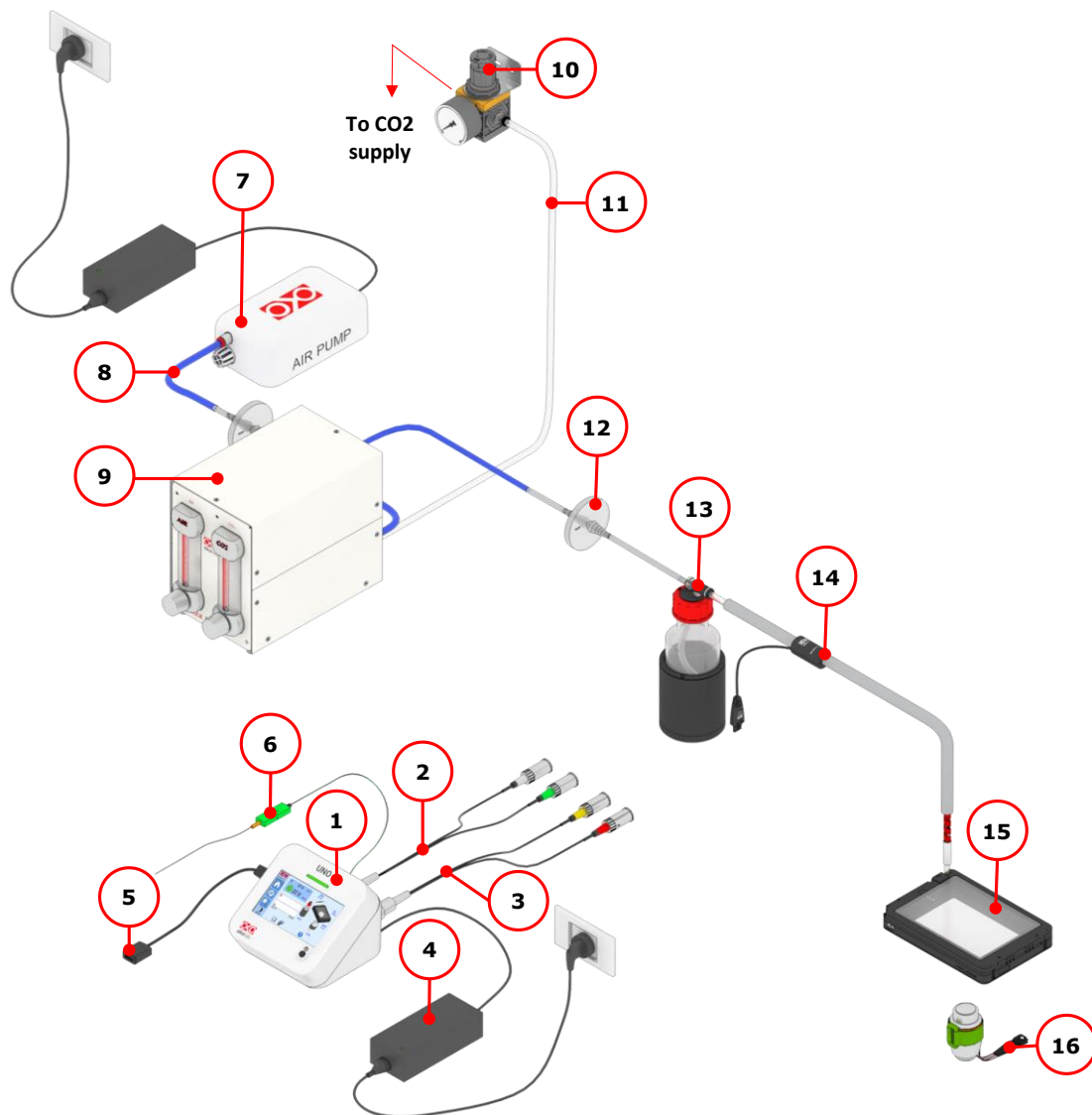


Figure 3. UNO-T-H-CO₂ Equipment Overview.

Note ► For U.S. shipment, Okolab provides a push to fit adapter from ¼" to 6 mm rigid tube.

5 Compatibility

UNO-STAGE-TOP-INCUBATOR is compatible with:

- **Okolab H301 incubating chamber (required, to be ordered separately)**, with heated lid and base, chamber riser with one or more plate adapters. Refer to paragraph 8.2.2.1 for the complete list of compatible H301 incubating chamber.
- **OBJ-COLLAR series (optional)**, recommended for immersion objectives.
- **DATA-LOG (optional)**. Software used to log, view, and store data from a PC. It may be used to change parameters of the controllers via PC. Data can be exported in .xlsx format.

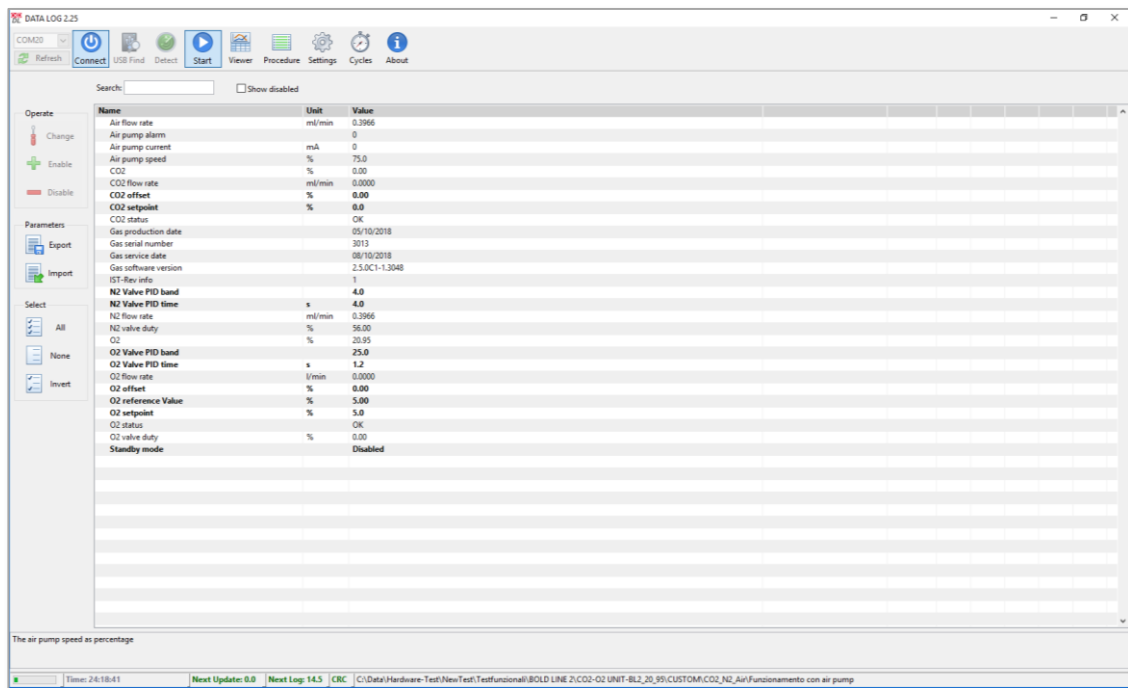


Figure 4. DATA LOG software.

6 Equipment Description

Figure 5 illustrates UNO-CONTROLLER left panel:

1. **MINI-USB port.** To connect the supplied MINI-USB-OTG cable or a standard MINI-USB cable.
2. **RS232 Serial port.** To connect a standard RS232 Serial cable.

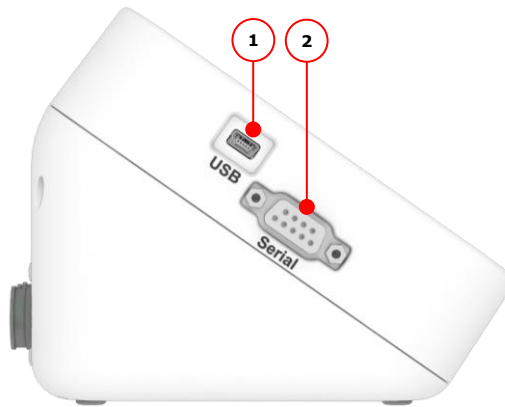


Figure 5. UNO-CONTROLLER Left Panel Overview.

Figure 6 illustrated UNO-CONTROLLER rear panel:

3. **Power input**
4. **Base / Lid connector.** To provide power to the Chamber Base and Chamber Lid.
5. **Humidifier / Heated Tube connector.** To provide power to Humidifier and Heated Tube.
6. **Obj. Heater connector.** To provide power to OBJ-COLLAR.
7. **T Sensor connector**

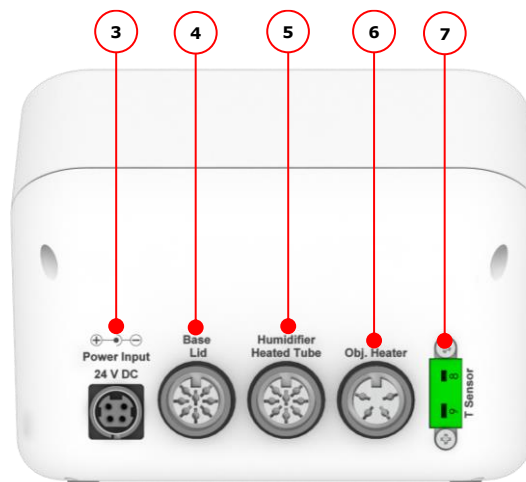


Figure 6. UNO-CONTROLLER Rear Panel Overview.

Figure 7 illustrates UNO-CONTROLLER front panel:

8. **Status Led.**
9. **ON/OFF Button.**

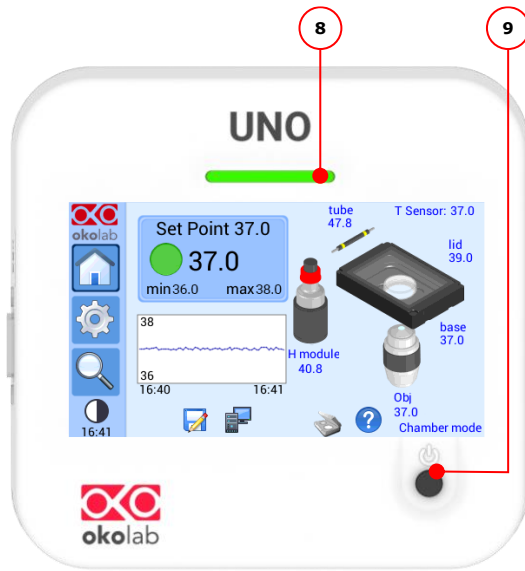


Figure 7. UNO-CONTROLLER Front Panel Overview.

7 Installation

The following paragraph illustrates how to install UNO-STAGE-TOP-INCUBATOR.



The following instructions shall give you the possibility to install the unit quickly. For safe operation of the unit, it is absolutely necessary to read carefully all the instructions and safety notes.

7.1 Connection of the Chamber Base and the Chamber Lid

Follow the instructions below to connect the Base and the Lid of the Okolab H301 incubating chamber to UNO-CONTROLLER (see Figure 8):

1. Connect the Y-CABLE-1 connector to “Base/Lid” connector on the rear panel of UNO-CONTROLLER.
2. Connect the Base cable of the Chamber Base to its corresponding connector of WP-CABLE. Connect the **RED** labeled connector of WP-CABLE to its corresponding connector of Y-CABLE-1.
3. Connect the Lid cable of the Chamber Lid to its corresponding connector of WP-CABLE. Connect the **YELLOW** labeled connector of WP-CABLE to its corresponding connector of Y-CABLE-1.

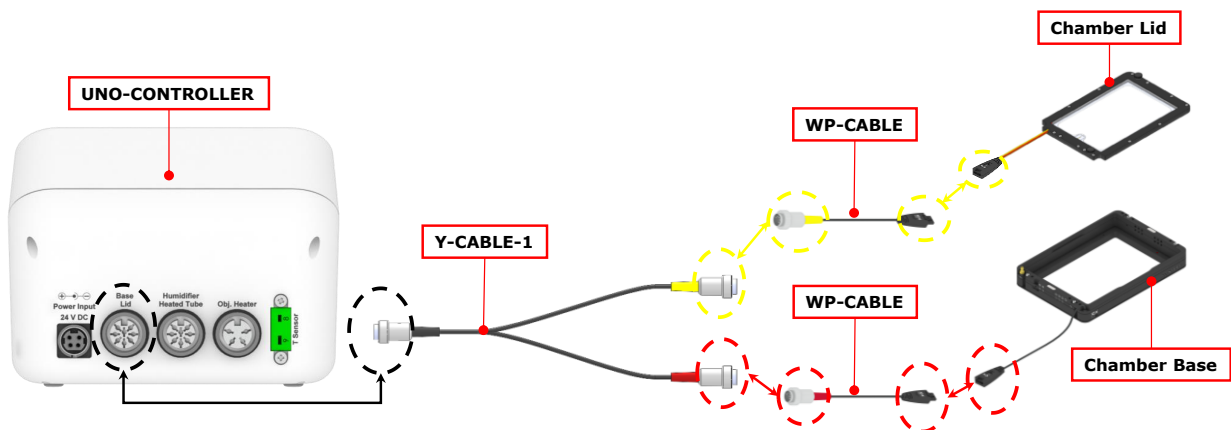


Figure 8. Chamber Base and Chamber Lid - Connection.

Tip ► Connecting cables are equipped with identification tags to guide you through the installation process.

Note ► If the Base cable or the Lid cable is equipped with a DIN connector, attach it to its corresponding connector of Y-CABLE-1.

7.2 Connection of GF-MIXER-HM (Humidity Module)

This section describes how to install GF-MIXER-HM, the Humidity Module, included in UNO-T-H-PREMIKED and UNO-T-H-CO2 configurations. Follow the steps below for a correct installation:

1. Connect TUBE-E to the connector located inside the Humidifier Cap (see image 1 in Figure 9).
2. Fill the Humidifier Bottle with distilled water and insert the TUBE-E with the Humidifier Cap. Make sure to place the O-RING on the lip of Humidifier Bottle's neck (see image 2 in Figure 9).
3. Screw the Humidifier Cap and place the Humidifier Bottle in its heater (see image 3 in Figure 9).

The Humidifier Cap is equipped with a Gas Inlet connector, barb connector for 4 mm I.D. silicon tube, and a Gas Outlet connector, push to fit connector for 6 mm O.D. rigid tube (see image 4 in Figure 9).

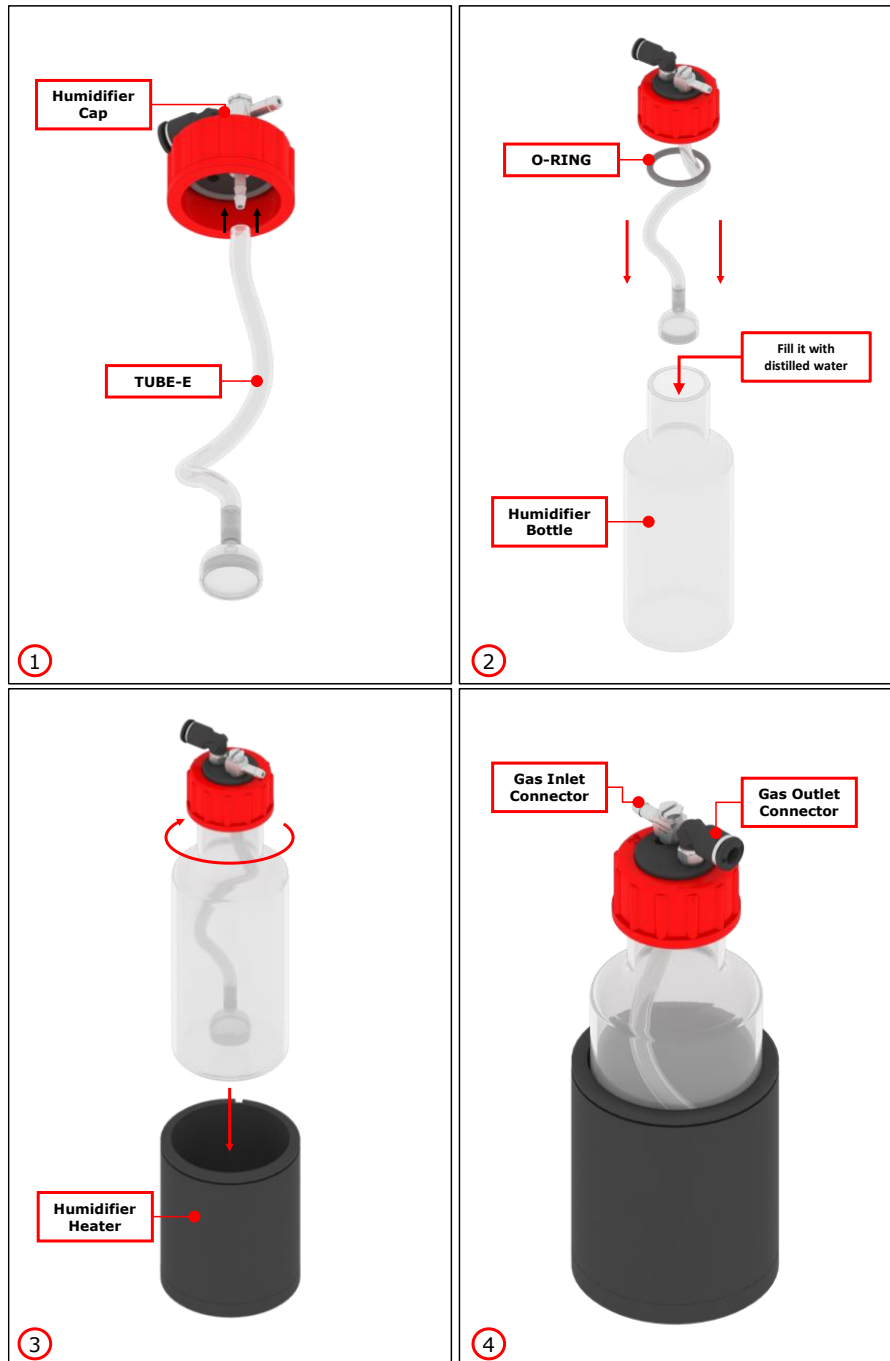


Figure 9. Humidifier - Assembly.

Connect the rigid end of Heated Tube to the Gas Outlet connector of Humidifier. Connect the silicon end of Heated Tube to the gas input connector located on a corner of Okolab H301 incubating chamber (see Figure 10).

Tip ► Make sure to push the tubes all the way into the connectors thus avoiding any gas leak.

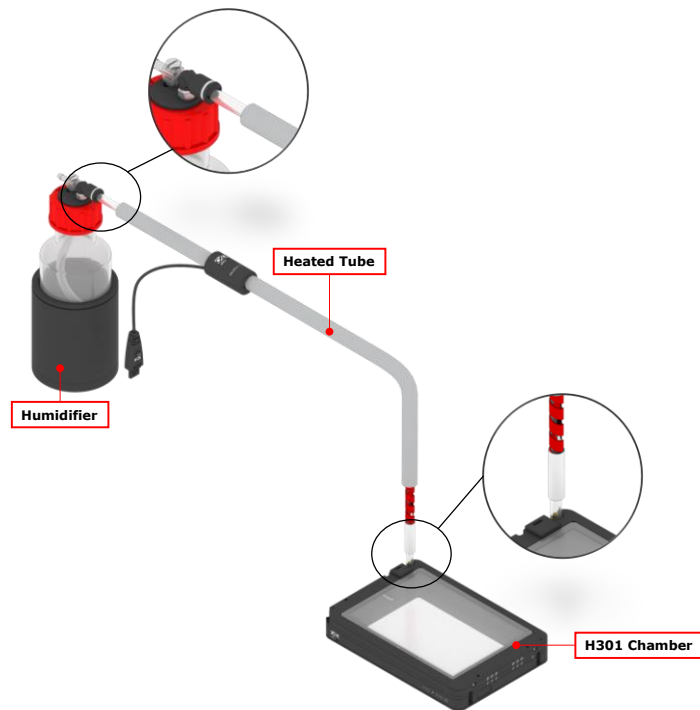


Figure 10. Heated Tube - Assembly.

Follow the instructions below to connect GF-MIXER-HM, the Humidity Module, to UNO-CONTROLLER (see Figure 11):

1. Connect the Y-CABLE-2 connector to “Humidifier/Heated Tube” connector on the rear panel of UNO-CONTROLLER.
2. Connect the GREEN labeled Humidifier Heater cable of the Humidifier to its corresponding connector of Y-CABLE-2.
3. Connect the Heated Tube cable to its corresponding connector of WP-CABLE. Connect WP-CABLE to the GREY labeled connector of Y-CABLE-2.

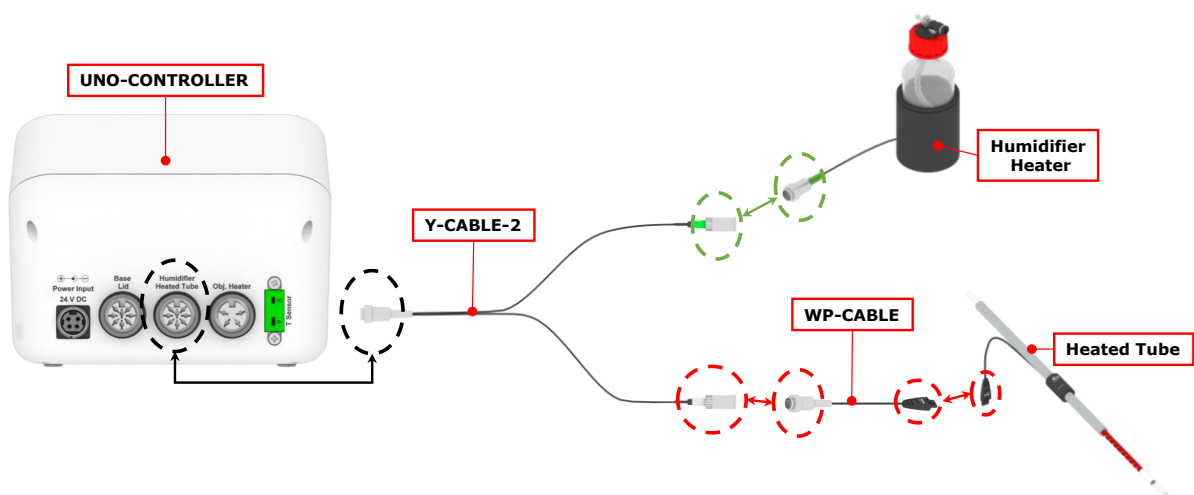


Figure 11. GF-MIXER-HM - Connection.

Tip ► Connecting cables are equipped with identification tags to guide you through the installation process.

7.3 Gas Connection

7.3.1 Gas connection for UNO-T-H-PREMIXED

UNO-T-H-PREMIXED is suitable for applications with premixed gas supply. Follow the steps below for a correct installation:

1. Install the GF-REGULATOR between the premixed gas supply and the Humidifier (see Figure 13). Use TUBE-A to connect the premixed gas supply to the push to fit input connector for a 6 mm O.D. rigid tube of the GF-REGULATOR (see Figure 13).



During this operation make sure that both the premixed gas tank and the GF-REGULATOR are closed.

Be careful to follow the direction of the arrow on the rear of the GF-REGULATOR for the correct gas in-out orientation (see Figure 12).

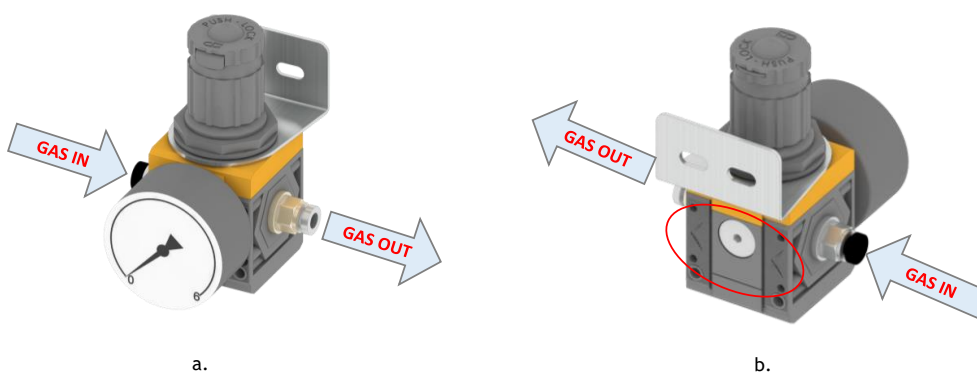


Figure 12. GF-REGULATOR - front and rear view (a - b).



The premixed gas tank must be equipped with a pressure regulator to decrease the pressure from the pressure tank to 4 barg (58 psig). Do not exceed 10 barg (145 psig) for GF-REGULATOR inlet gas pressure. This may damage the GF-REGULATOR.

2. Connect the blue rigid end of TUBE-C to the output connector of GF-REGULATOR. Connect the silicon end of TUBE-C to the Gas Inlet gas connector of the Humidifier (see Figure 13). TUBE-C is equipped with a PTFE filter in the middle. Make sure to install the TUBE-C in the direction of the gas flow indicated by the labels on both ends of TUBE-C and on both sides of the PTFE filter.

Tip ► Replace the PTFE filter each 2-3 months of continuous operation or if you see water in the inner part of the filter.



Do not use TUBE-C without the PTFE filter.

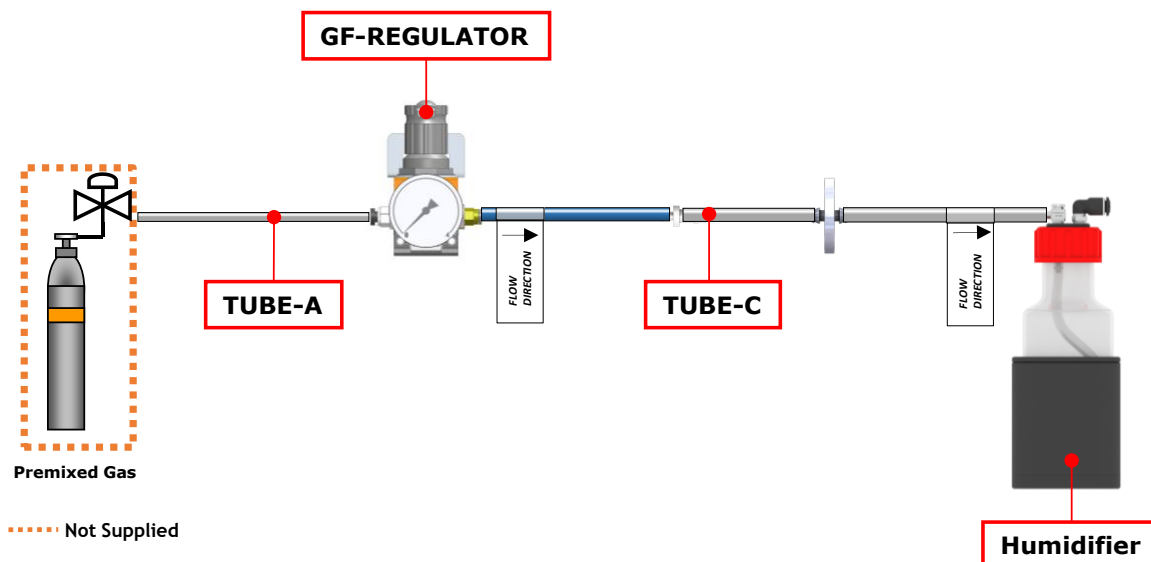


Figure 13. UNO-T-H-PREMIXED - Gas connection.

Tip ► Make sure to push the tubes all the way into the connectors thus avoiding any gas leak.

The GF-REGULATOR provides an easy output gas flow rate regulation in the range 0.17 – 0.41 l/min, thanks to its calibrated orifice. Regulate the pressure of the GF-REGULATOR to obtain the desired gas flow rate. Table 1 shows the relation between pressure and the gas flow rate for the GF Regulator.

Pressure [barg]	Gas Flow Rate [l/min]
0.2	0.17
0.4	0.22
0.6	0.27
0.8	0.32
1.0	0.37
1.2	0.41

Table 1. GF-REGULATOR- Pressure vs Gas Flow Rate.

Tip ► If the desired gas flow rate is 0.27 l/min, the pressure of the GF-REGULATOR has to be set at 0.6 barg (8.7 psig).

Tip ► Okolab suggests setting the gas flow rate in the range 0.3 – 0.4 l/min. If the total control volume is

Figure 14 shows how to use the GF-REGULATOR correctly:

- A. Pull the knob up to release the lock.
- B. Rotate the knob until the pressure reaches the desired value (clockwise/counterclockwise to increase/decrease the pressure).
- C. Push the knob down to lock it.

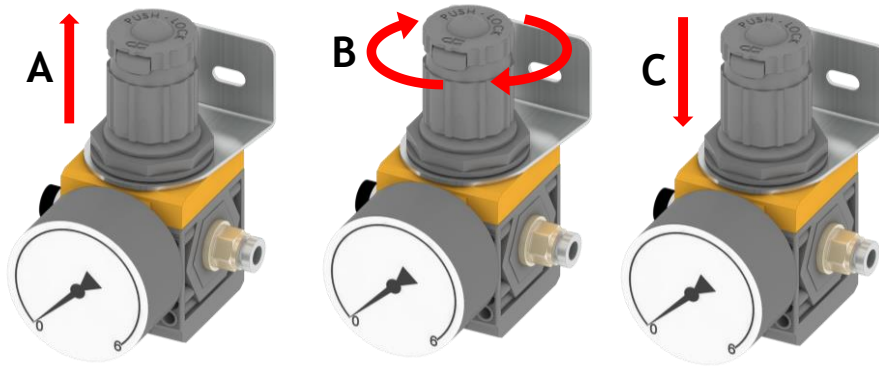


Figure 14. GF-REGULATION - Use.

7.3.2 Gas Connection for UNO-T-H-CO2

UNO-T-H-CO2 is suitable for applications with 100% CO2 and background air. Follow the steps below for a correct installation:

1. Install the pressure gauge between the CO2 supply and the 2GF-MIXER (see Figure 15). The pressure gauge is equipped with a push to fit input connector for a 6 mm O.D. rigid tube.

Tip ► Cut and use TUBE-A according to your needs. TUBE-A is suitable for connecting the CO2 supply to the gas input of the pressure gauge.



During this operation make sure that both the CO2 tank and the pressure gauge are closed.

Be careful to follow the direction of the arrow on the rear of the pressure gauge for the correct gas in-out orientation.



The CO2 tank must be equipped with a pressure regulator to decrease the pressure from the pressure tank to 2 barg (29 psig).
Do not exceed 10 barg (145 psig) for the pressure gauge inlet gas pressure. This may damage the pressure gauge.

2. Use TUBE-A to connect the output connector of the pressure gauge to the “CO2 In” push to fit connector on the rear panel of 2GF-MIXER (see Figure 15). Set the pressure at 1 barg (14.5 psig).
3. Connect TUBE-B between the OKO-AP gas connector and the “Air In” push to fit connector on the rear panel of 2GF-MIXER (see Figure 15). TUBE-B is equipped with a PTFE filter in the middle. Make sure to install the TUBE-B in the direction of the gas flow indicated by the labels on both ends of TUBE-B and on both sides of the PTFE filter.

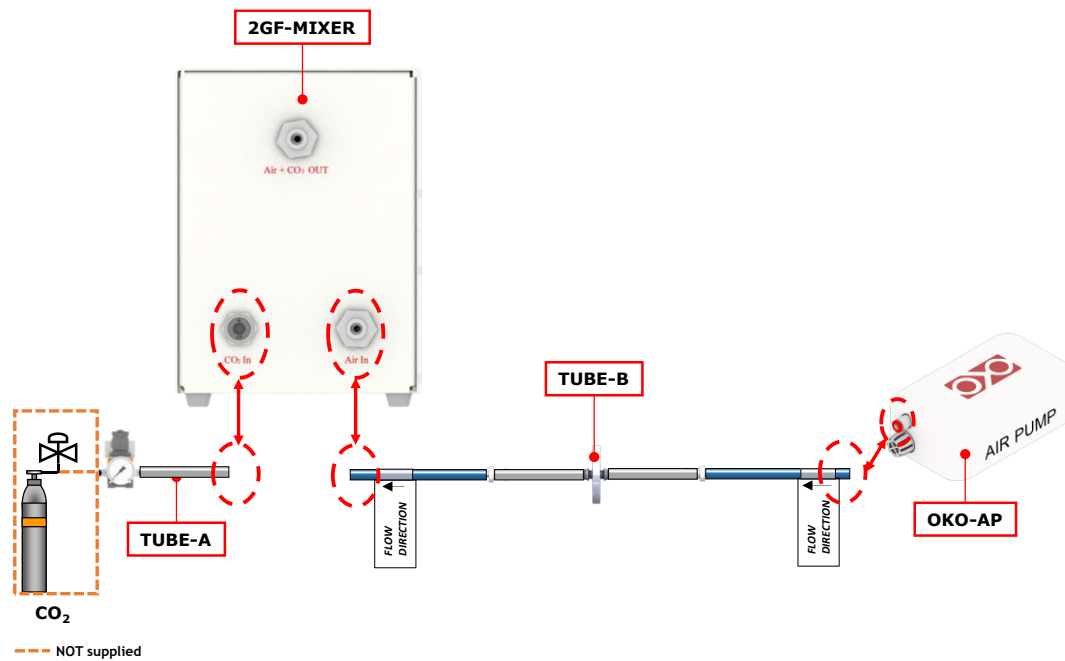


Figure 15. UNO-T-H-CO₂ - Inlet gas connection.

OKO-AP features two alternative outlet air flow rate: Low Flow (in the range 0 – 0.5 l/min) and High Flow (in the range 0.5l/min – 1.0 l/min). Slide to the right the manual switch placed on the bottom panel of OKO-AP to select the High Flow mode (see image A in Figure 16). Slide to the left the manual switch to select the Low Flow mode (see image B in Figure 16).

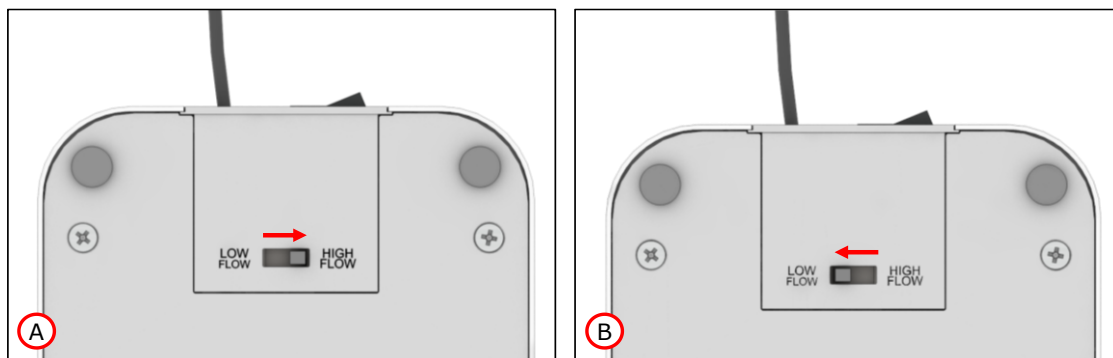


Figure 16. OKO-AP – Low Flow and High Flow.

Note ► To switch OKO-AP on use the Power switch on the rear panel (see Figure 17).

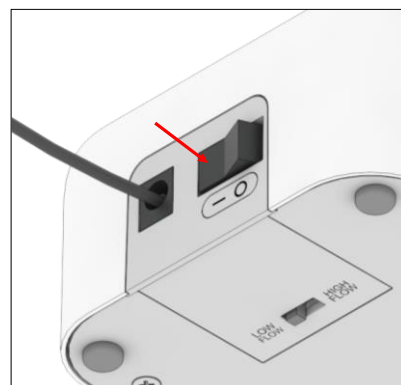


Figure 17. OKO-AP – Power switch.

4. Connect the blue rigid end of TUBE-C to the “Air + CO₂ OUT” push to fit connector of on the rear panel of 2GF-MIXER. Connect the silicon end of TUBE-C to the Gas Inlet gas connector of the Humidifier (see Figure 18). TUBE-C is equipped with a PTFE filter in the middle. Make sure to install the TUBE-C in the direction of the gas flow indicated by the labels on both ends of TUBE-C and on both sides of the PTFE filter.

Tip ► Replace the PTFE filter of TUBE-B and TUBE-C each 2-3 months of continuous operation or if you see water in the inner part of the filter.



Do not use TUBE-B or TUBE-C without the PTFE filter.

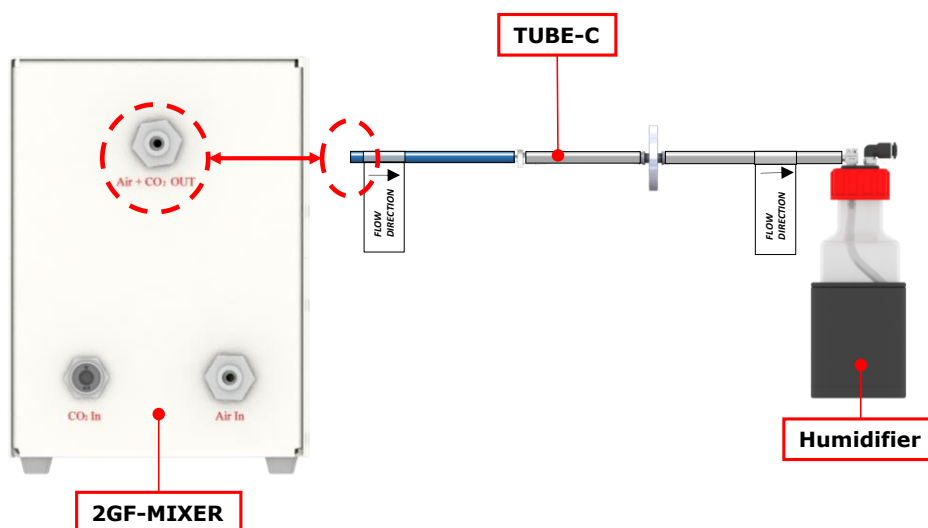


Figure 18. UNO-T-H-CO₂ – TUBE-C connection.

Tip ► Make sure to push the tubes all the way into the connectors thus avoiding any gas leak.

7.3.2.1 How to use 2GF-MIXER

The 2GF-MIXER generates a CO₂/air mixture with an adjustable CO₂ concentration in the range 0-15%. The desired CO₂ concentration is obtained by regulating the air and CO₂ flow rate, in the range 0.1 – 1 l/min and 0.013 – 0.13 l/min respectively, using the two floating ball flow meters.



Do not use the 2GF-MIXER as closing-opening valves. Once regulated the flow rate (at inlet CO₂ pressure of 1 barg), use the 2GF-MIXER carefully only for fine regulations.

Follow the instructions below:

1. Open the gas valves about 15 minutes before inserting the sample in the H301 Okolab incubating chamber.
2. Table 2 reports the CO₂ and air flow rates to be set in order to obtain a concentration of CO₂ equal to 5% at the 2GF-MIXER outlet. “Target Gas Percentage” indicates the desired outlet gas percentage that the operator wants during the experiment. “Gas flow rate”, in litre per minute [l/min], are the values of gas flow rate to be set on the graduated scale on the front panel of 2GF-MIXER. “Total” column reports the measured the total gas flow rate at the 2GF-MIXER outlet.

Target Gas Percentage [%]		Gas flow rate values to be set [l/min]		
Air	CO ₂	Air	CO ₂	Total
95.00	5.00	0.60	0.03	0.63
95.00	5.00	0.80	0.04	0.84
95.00	5.00	1.00	0.05	1.05

Table 2. 2GF-MIXER flow rate regulation for 5% CO₂ concentration.

Note ► If you need, ask Okolab for other Target Gas Percentage values.

Example: If the target Air percentage is 95.00% and the target CO₂ percentage is 5.00%, there are three possibilities to realize the desired gas percentage (see Table 2).

Note ► Values reported in Table 2 have been optimized considering the CO₂ consumption, condensation (normally it decreases if the outlet total gas flow rate increases) and medium evaporation (normally it decreases if the outlet total gas flow rate decreases).

If the desired outlet total gas flow rate is 0.84 l/min, the air flow rate has to be set at 0.80 l/min and the CO₂ flow rate at 0.04 l/min.

- Flow rate regulation means turning the knob until the floating-ball is placed in correspondence of the desired value (see Figure 19). Notice that the correct position of the floating-ball (black sphere in Figure 19) is having its middle point in correspondence of the desired graduate scale value.

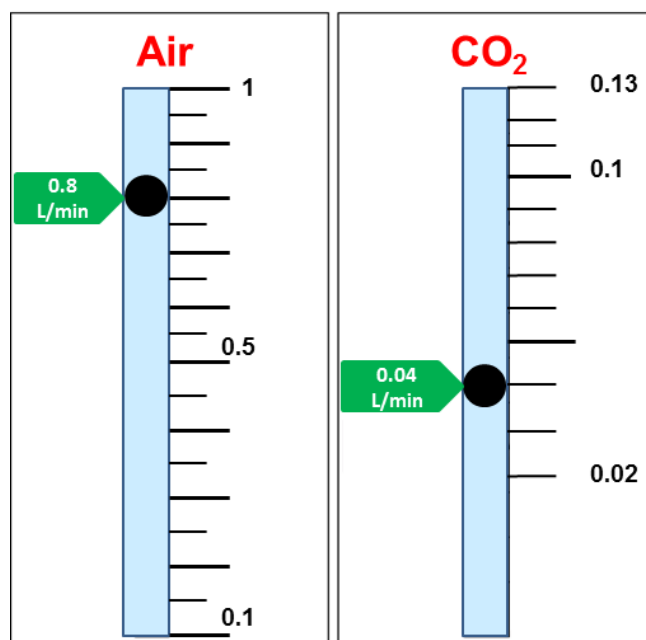


Figure 19. 2GF-MIXER - Graduated scales.

Tip ► If you use a premixed gas tank supply (95% air and 5% CO₂), Okolab suggests that the premixed gas supply should be connected to the "Air in" connector on the rear panel of the 2GF-MIXER. The air flow rate should be set at 0.1 l/min. Make sure that the CO₂ valve is totally closed.

7.4 Connection of T Sensor

Plug the T Sensor to the green port placed on the rear panel of UNO-CONTROLLER (see Figure 20).

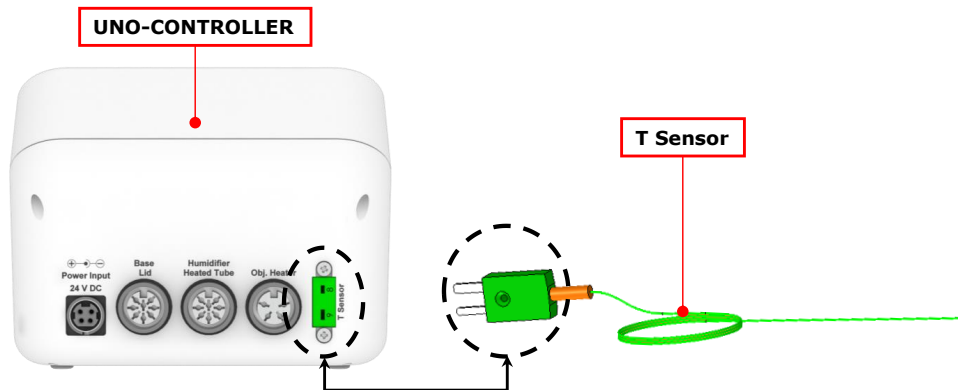


Figure 20. T Sensor - Connection.

Tip ► T Sensor has two connector pins of different dimensions. Make sure to follow the right direction of entry into the openings UNO-CONTROLLER's green connector. Insert the widest connector pin of T Sensor into the bottom opening of UNO-CONTROLLER's green connector.

7.5 Connection of the OBJ-COLLAR (optional)

To connect the OBJ-COLLAR to UNO-CONTROLL, follow the instructions below:

1. Assembly the OBJ-COLLAR around the objective heater (see Figure 21).

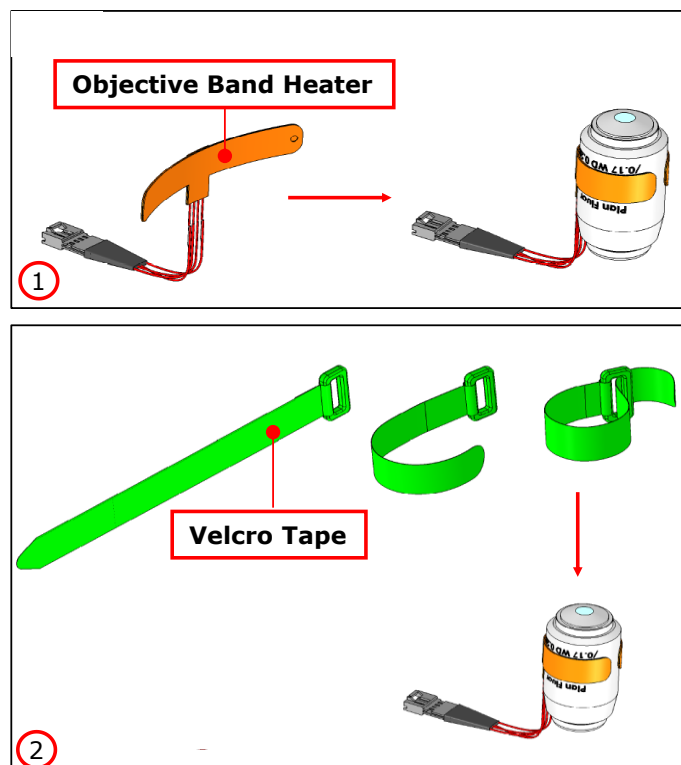


Figure 21. OBJ-COLLAR - Assembly.

2. Connect the OBJ-COLLAR cable to its corresponding connector of the WP-CABLE (see Figure 22).

3. Connect the WP-CABLE to “Obj. Heater” connector on the rear panel of UNO-CONTROLLER (see Figure 22).

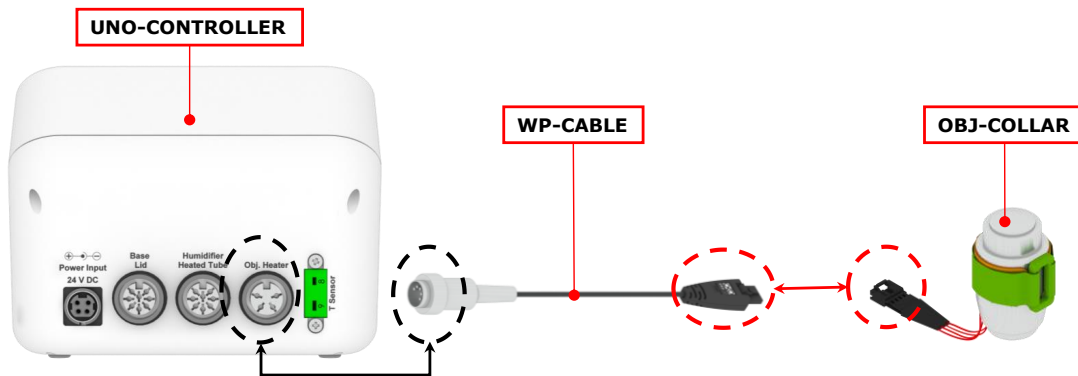


Figure 22. OBJ-COLLAR - Connection.

Tip ► Connecting cables are equipped with identification tags to guide you through the installation process.

7.6 MINI-USB port

The MINI-USB provides the connection for the supplied MINI-USB-OTG cable or a standard MINI-USB cable.

7.6.1 Connection of MINI-USB-OTG cable

Use the supplied MINI-USB-OTG cable to connect a USB pen drive (not supplied) to UNO-CONTROLLER, as shown in Figure 23.

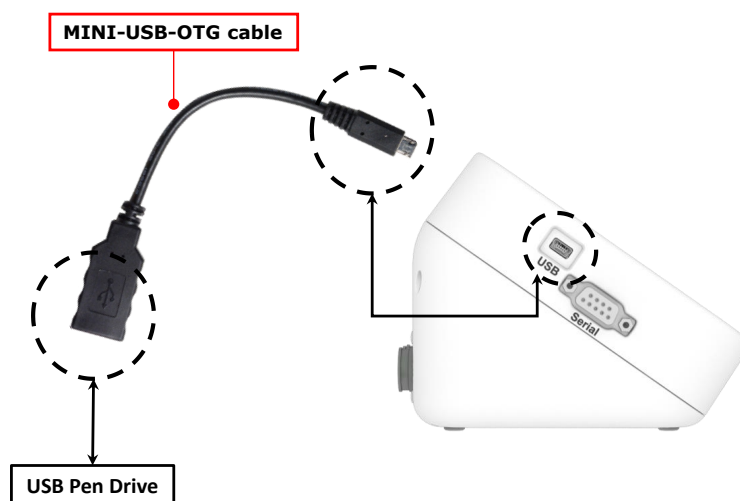


Figure 23. MINI-USB-OTG cable - Connection.

7.6.2 Connection of MINI-USB cable

Use a standard MINI-USB cable to connect UNO-CONTROLLER to a PC, as shown in Figure 24. UNO-CONTROLLER can communicate with the PC by using:

- DATA-LOG software. The software allows to log and analyze the data provided by UNO-CONTROLLER via PC. Refer to DATA-LOG user manual for more info.
- SDK (OKOLAB API) for integration in third party software http://www.oko-lab.com/support#soft_int_tools.

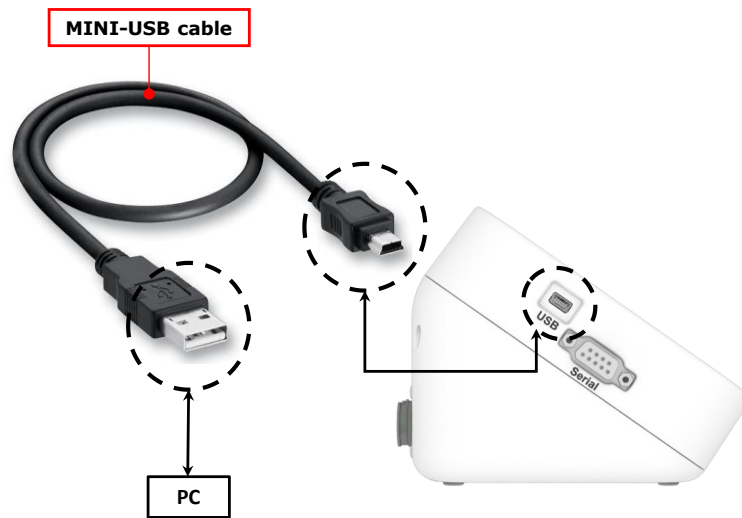


Figure 24. MINI-USB cable - Connection.

7.7 RS232 Serial port

Use a standard RS232 serial cable to connect UNO-CONTROLLER to a PC as shown in Figure 25. This option is advisable when the PC is at a distance greater than 10 meters from UNO-CONTROLLER.

You can interface with UNO-CONTROLLER via PC by using:

- DATA-LOG software. The software allows to log and analyze the data provided by UNO-CONTROLLER via PC. Refer to DATA-LOG user manual for more info.
- SDK (OKOLAB API) for integration in third party software http://www.oko-lab.com/support#soft_int_tools.

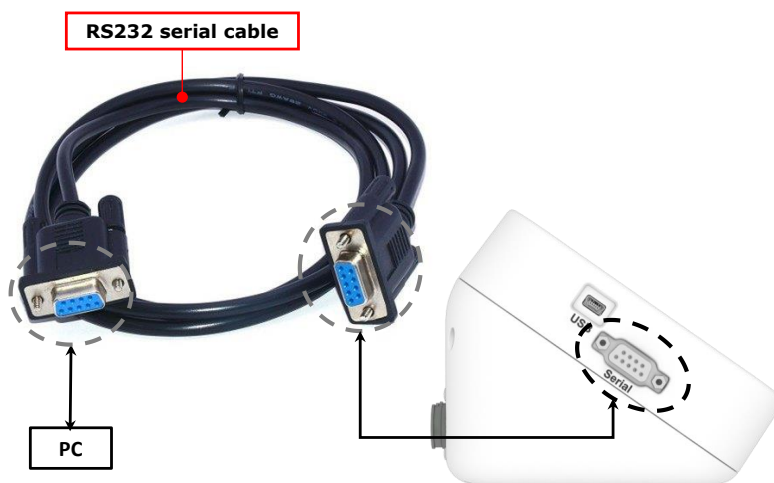


Figure 25. RS232 serial cable - Connection.



Without a serial port COM, to install the Serial Communication cable to your PC, you need to install a USB to serial converter following the manufacturer instructions. If you want to log, you have to use the COM port number that Windows assigned to the drive.

8 User Interface

This chapter describes the user interface of UNO-CONTROLLER.

8.1 Home page

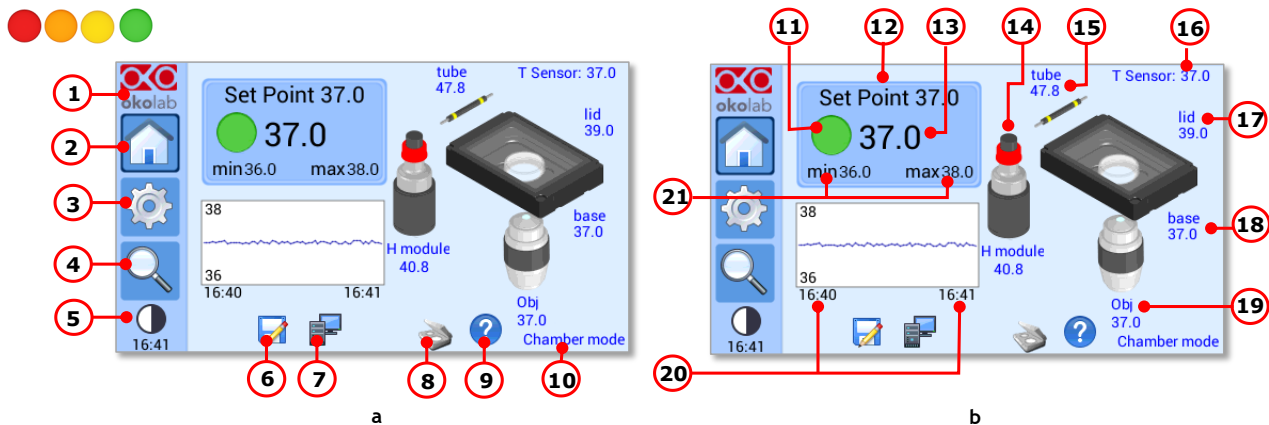


Figure 26. Homepage of UNO-CONTROLLER Touch Screen Display.

1. *Info*. Press here to access the Info page (see paragraph 8.5).
2. *Home*. To open the Homepage.
3. *Settings*. Press here to access system options and settings (see paragraph 8.2).
4. *Status*. Press here to access the Status page (see paragraph 8.3).
5. *Display mode*. Press here to switch the display mode (see paragraph 8.4).
6. *Logging icon*. See paragraph 8.2.6 for more information.
7. *PC or USB Connection indicator*. It appears when UNO-CONTROLLER is connected to a PC using a standard MINI-USB cable.
8. *Open/Close Incubator icon*. Open incubator feature is available for Sample Control mode (see paragraph 8.2.1.2).
9. *Support*. To open Support page.
10. *Control mode indicator*. It reports Sample Control mode or Chamber Control mode (see paragraph 8.2.1).
11. *Status indicator* (see paragraph 8.1.3).
12. *Temperature Set point*. See paragraph 8.1.1 to learn how to change the set point.
13. *Temperature current value*.
14. *Temperature at the Humidifier*.
15. *Temperature at the Heated Tube*.
16. *Temperature read by T sensor*.
17. *Temperature at the Chamber Lid*.
18. *Temperature at the Chamber Base*.
19. *Temperature at the Objective Heater*.
20. *Chart history length set at 1 minute*.
21. *Min/max Temperature values within the time-frame set in the Options subpage* (see paragraph 8.2.8.1).

8.1.1 How to enter the Setpoint

To input a new Temperature Setpoint, touch the corresponding tab, as indicated in Figure 27 a. The Setpoint regulation page will appear as in the Figure 27 b. You can modify the Setpoint by clicking on **+** and **-** (pointer 1 in Figure 27 b). Once you have input the new Temperature Setpoint, press **Set** (pointer 2 in Figure 27 b) to save or **Cancel** to undo.

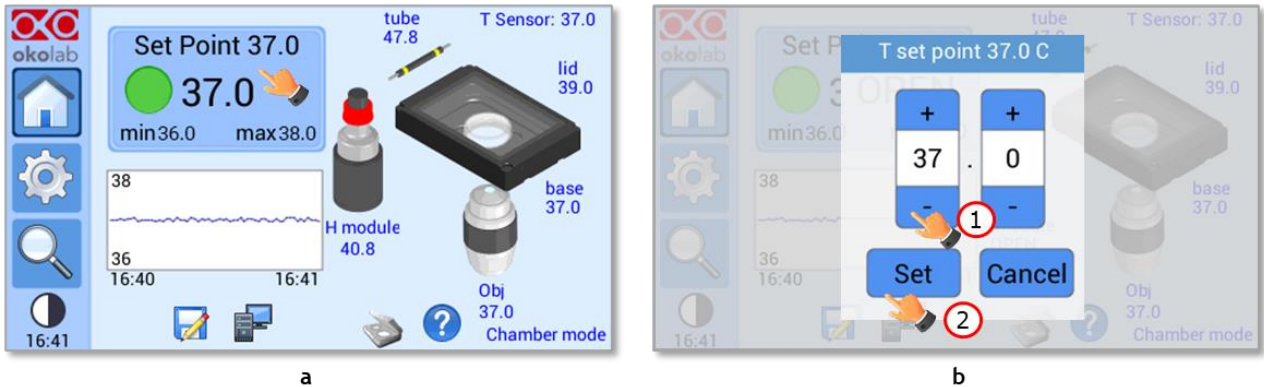


Figure 27. How to change the Temperature Setpoint (a - b).

Tip ► After any change in the Setpoint value, UNO-CONTROLLER enters into a transient regime, the Status Indicator and the TOP LED (see Figure 29) turn yellow (see paragraph 8.1.3). During the transient regime, UNO-CONTROLLER will not trigger on alarm. The maximum duration of the transient regime is set by the operator as indicated in paragraph 8.2.7.

8.1.2 Graph view

Press on the Temperature evolution chart (pointer 1 in Figure 28) to open the Graph view page. Check the box *Grid* (pointer 2 in Figure 28), to show the grid behind the graph.

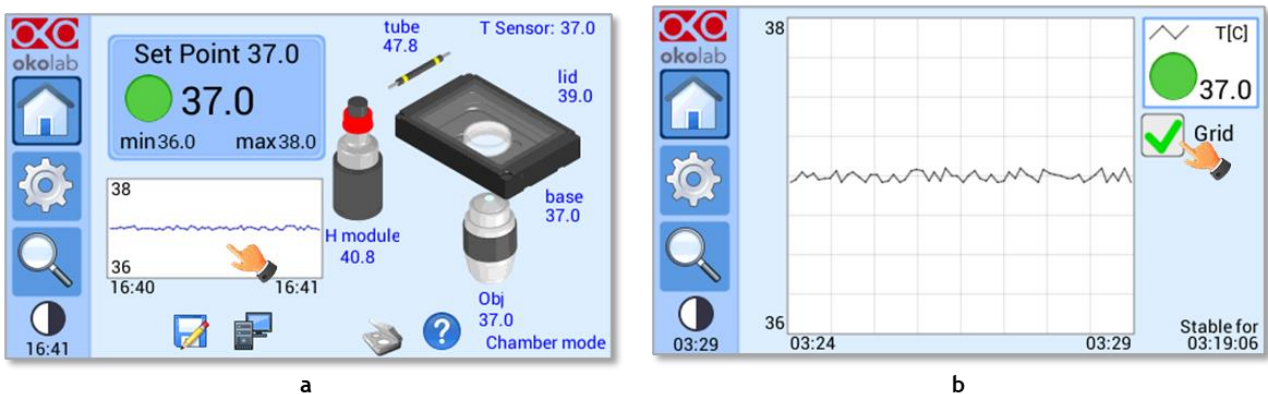






Figure 28. Graph view page (a - b).

8.1.3 Controller Status: colours led and meaning

UNO-CONTROLLER can assume four different status, which are represented by the colors assumed by the Status Indicator and by the TOP LED (see Figure 29):

	<p>The GREEN color indicates that the Setpoint value has been reached (within the tolerance defined in the alarm subpage, see paragraph 8.2.7) and that the system is working properly.</p> <p>Controller Status: NORMAL</p>
	<p>The YELLOW color indicates that the controller is in transient regime. The Yellow light will appear after the controller is turned on and after any Setpoint change. The system is working properly, it is not in alarm and no action is needed. As soon as UNO-CONTROLLER reaches the temperature setpoint, UNO-CONTROLLER Status changes to NORMAL and the color turns GREEN. If UNO-CONTROLLER cannot reach the setpoint value within the maximum time defined by the operator (see paragraph 8.2.7), the Status changes to ALARM and the color turns ORANGE.</p> <p>Controller Status: TRANSIENT</p>
	<p>The ORANGE color indicates that the current temperature value is not correct and its value is out of the set tolerance (see section <i>ALARMS</i> in paragraph 8.2.7). Most commonly this is related to gas leaks or gas source(s) running low. Verify that all cables are correctly connected. Check all tubing for gas leaks and pressure in gas supply tanks.</p> <p>Controller Status: ALARM</p>
	<p>The RED color indicates that there is a problem with the unit itself (for example the sensor is broken). The system is on alarm. Turn the system off, wait for 5 minutes, and turn it back on. If the color is still red, contact Okolab at www.oko-lab.com for support.</p> <p>Controller Status: ALARM</p>

Tip ► The TOP LED follows the same color code as the Status Indicator (see Figure 29). To enable/disable the TOP LED follow the instruction reported in paragraph 8.2.8.5.

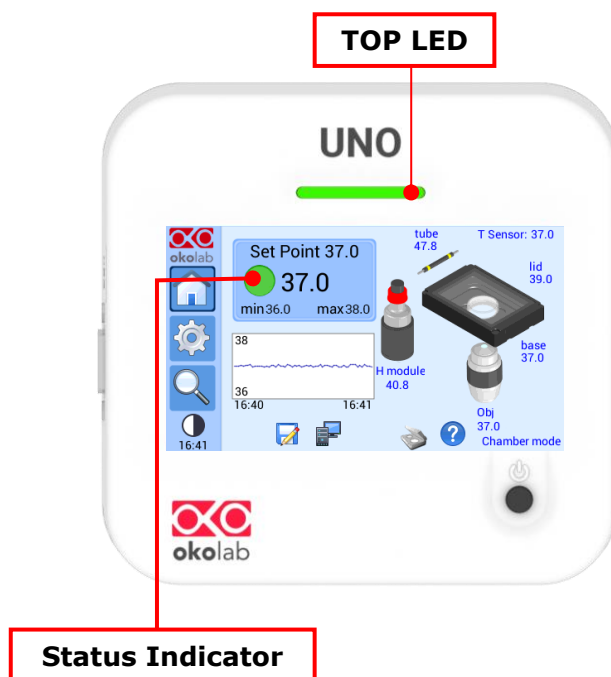


Figure 29. Status Indicator and TOP LED.

8.2 Settings

Press on *Settings* icon  to enter the *Settings* menu, as shown in the Figure 30 a.

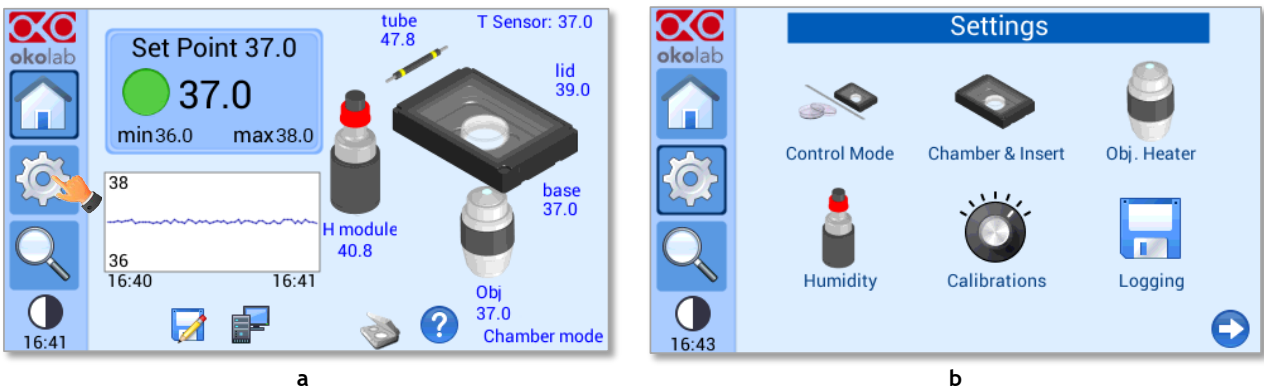


Figure 30. How to enter the Settings menu (a - b).

Press the arrow in the bottom right corner of the page (see Figure 31 a) to open the second page of the *Settings* menu (see Figure 31 b).

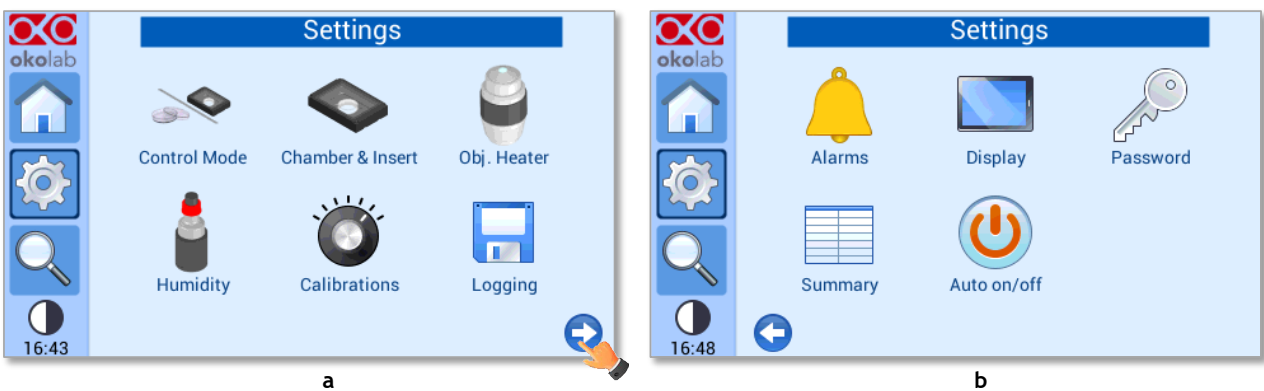



Figure 31. Settings menu (a -b).

8.2.1 Control Mode

Press on *Control Mode* icon  to enter the Control Mode menu (see Figure 32).

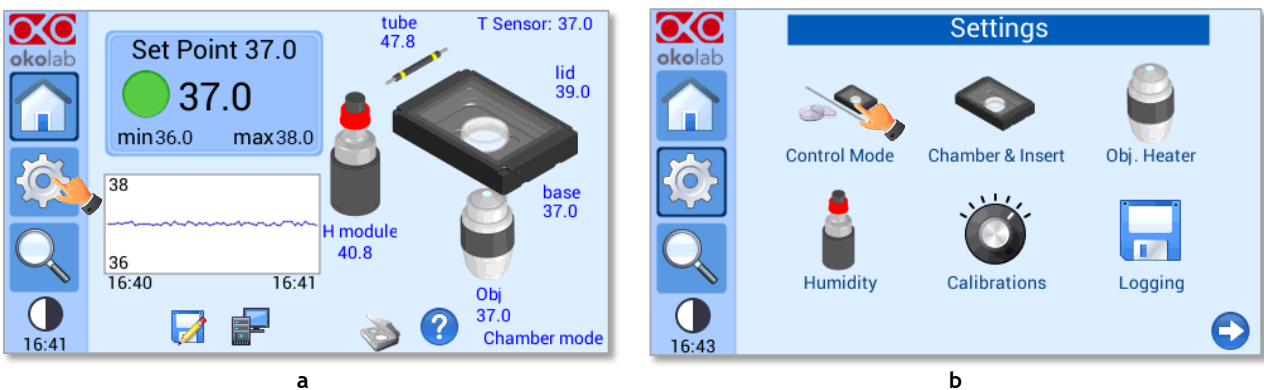


Figure 32. How to enter the Control Mode menu (a - b).

UNO-CONTROLLER can work in two alternative modes: **Chamber Control** mode (see paragraph 8.2.1) and **Sample Control** mode (see paragraph 8.2.1.2).

Note ► *The Chamber Control mode is set by default.*

8.2.1.1 Chamber Control mode

To select the Chamber Control mode, press on the Chamber icon (see pointer 1 in Figure 33 b) and press on *Save* to confirm (see pointer 2 in Figure 33 b).

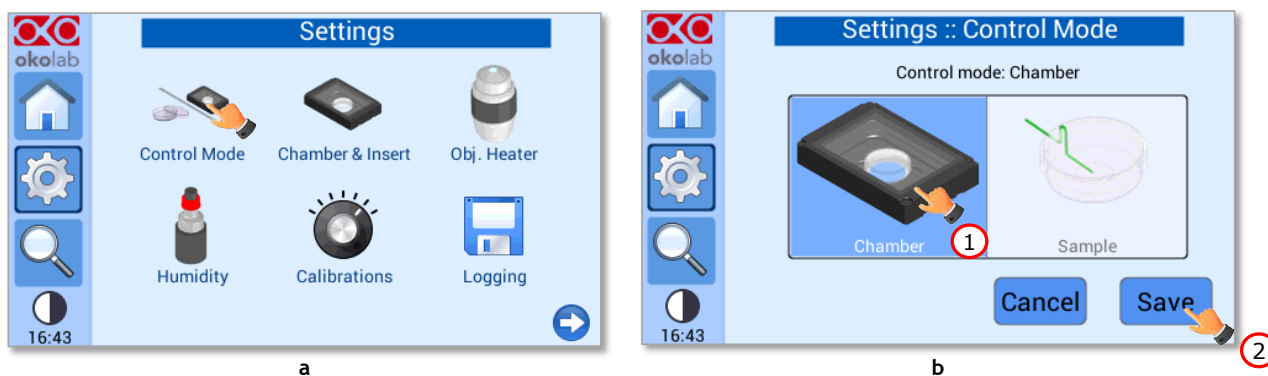


Figure 33. Settings – Control Mode – Chamber Control mode (a – b).

In Chamber Control mode, the temperature of the Chamber Base and Chamber Lid of Okolab H301 incubating chamber are strictly controlled to guarantee that the sample temperature is maintained at the desired set point value.

Note ► *The Chamber Control mode affords a quick experiment start. No further actions are required for multi user applications.*

Tip ► *In Chamber Control mode, there is no need to place the T Sensor (the fine gauge thermocouple) into a reference well during experiment.*

After selecting Chamber Control mode, the screen in Figure 34 b will appear:

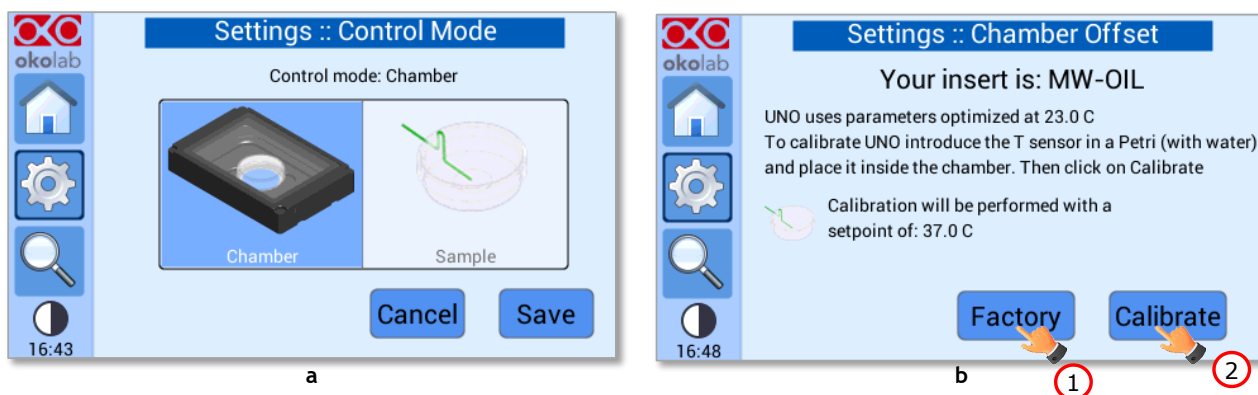


Figure 34. Settings – Control Mode – Chamber Control mode – Offset (a – b).

At this point you can choose:

1. By pressing *Factory* button (see pointer 1 in Figure 34 b) UNO-CONTROLLER will recover and use the factory calibration parameters.

Note ► *Factory calibration was performed at a Room Temperature of 23°C ±1°C for a temperature set point of 37°C. Use factory calibration parameters if your Room Temperature is 23°C ±1°C.*

- By pressing *Calibrate* (see pointer 2 in in Figure 34 b) UNO-CONTROLLER will start a routine to calibrate its parameters using the T Sensor (see paragraph 8.2.5.1).



Calibrate UNO-CONTROLLER if you Room Temperature differs by more than $\pm 1^{\circ}\text{C}$ from 23°C .

8.2.1.2 Sample Control mode

To select the Sample Control mode, press on the Sample icon (see pointer 1 in Figure 35 b) and press on *Save* to confirm (see pointer 2 in Figure 33).

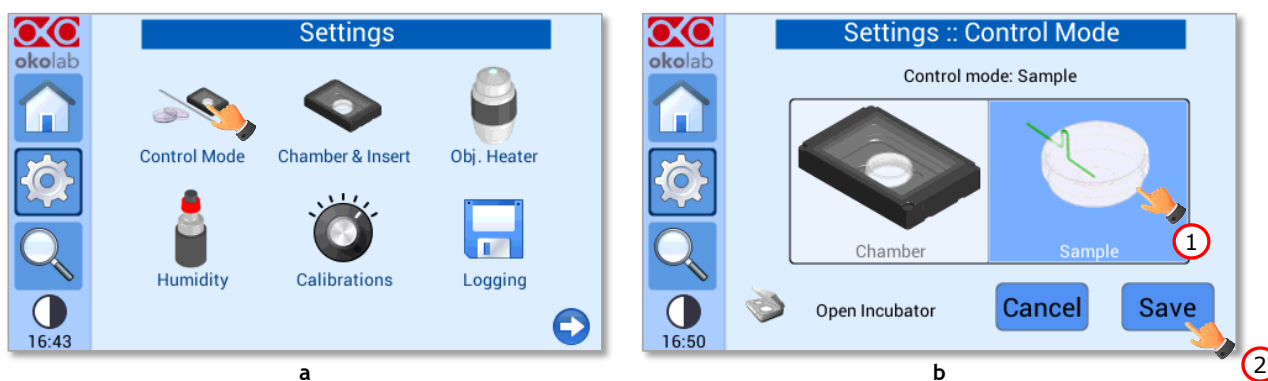


Figure 35. Settings – Control Mode – Sample Control mode (a – b).

The Sample Control mode enables the direct monitoring and the active control of sample temperature. Moreover, the Sample Control mode ensures that the temperature sample differs by not more than 0.1°C from the temperature set point regardless from the Room Temperature's variations. The disadvantage of this control is that it requires manual operation for the correct placement of the T sensor in a reference well.

In Sample Control mode, while running the experiment, the T Sensor needs to be placed into a dish (Petri dish, Chambered Glass Slide, etc.) or a well (Reference Well) adjacent to your sample position.

Tip ► Check if your Okolab H301 incubating chamber provides the Reference Well.

If you use a dish, secure the T Sensor to the bottom of the dish with commercial adhesive tape as shown in Figure 36 a. Do not cover the tip of the T-Sensor. Fill the dish or the Reference Well with oil or distilled water. Make sure the tip of the T Sensor is immersed in the liquid.

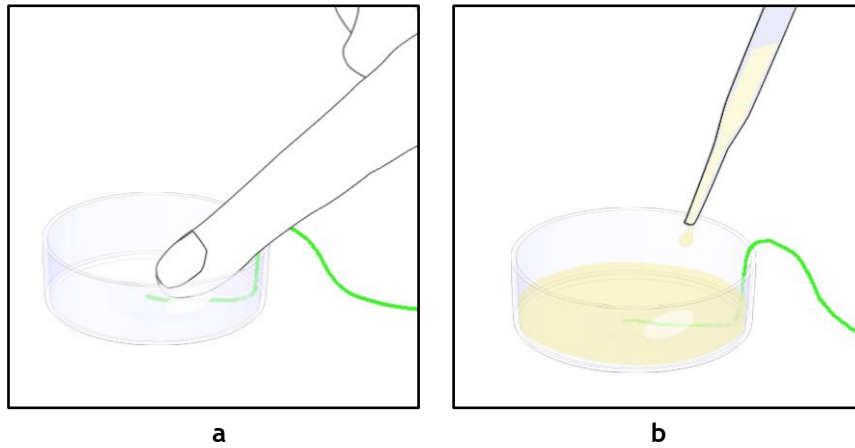


Figure 36. T Sensor attached on the bottom of the Petri dish (a -b).

When possible close the Petri dish with its own plastic lid (or with Okolab SENSOR LID, to be ordered separately) and place it in the appropriate sample holder.

Tip ► It is recommended using an Okolab SENSOR LID (available for purchase) to secure the T Sensor in place in the dish during calibration or operation in Sample Control mode.

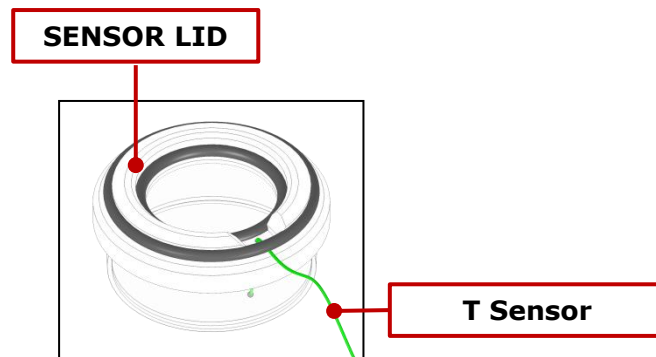




Figure 37. SENSOR LID-35 for 35 mm Petri dish.

Sensor lids are available for the following: 35 mm, 60 mm Petri-dish, chamber slide and chambered cover glass. Sensor Lids are ordered separately using the codes in following table.

SENSOR LID CODES	
SENSOR LID-35	Temperature sensor lid. To be used in specimen feedback in a 35 mm Petri Dish
SENSOR LID-60	Temperature sensor lid. To be used in specimen feedback in a 60 mm Petri Dish
SENSOR LID-GS	Temperature sensor lid. To be used in specimen feedback in chamber slides and chambered cover glass

Table 3. Sensors lid codes.

The Sample Control mode provides the *Open Incubator* feature. During the normal operation it could be necessary to open the incubating chamber where the sample is placed. Follow the procedure as described below:

1. Press on  *Open Incubator* icon (see Figure 38 a).
2. Open your incubator by removing the Chamber Lid.
3. Close the incubating chamber and wait for 2 minutes in order to let the environment achieve steady state.
4. Press on  *Incubator Closed* icon and UNO-CONTROLLER recovers normal operation (see Figure 38 a).

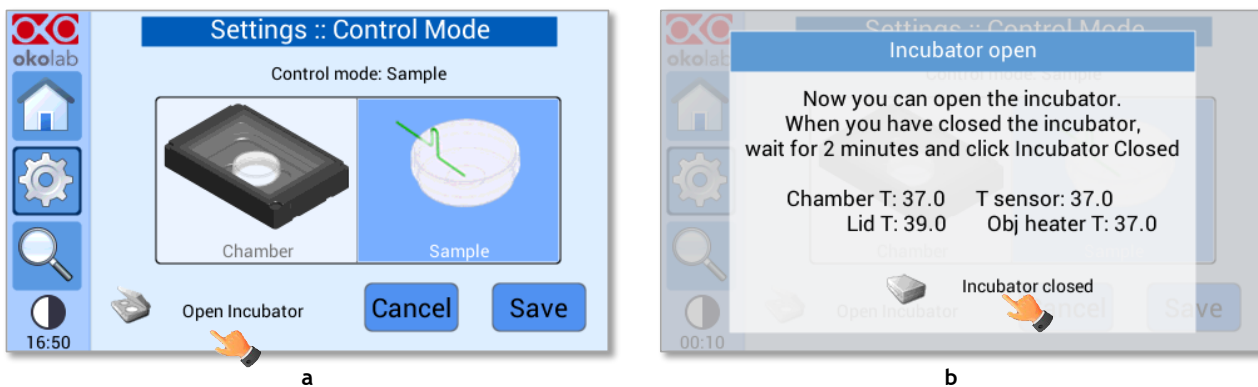



Figure 38. Settings – Control Mode – Sample Control mode – Open Incubator (a – b).



Opening the incubating chamber can lead to controller instability since both the specimen and the inside of the chamber are exposed to the external environment. In order to avoid the problem, when the Open Incubator feature is enabled, UNO-CONTROLLER places the thermal controller in stand-by mode to avoid the sample overheating.

8.2.2 Chamber & Insert

Press on *Chamber & Insert* icon  to enter the Chamber & Insert menu (see Figure 39).

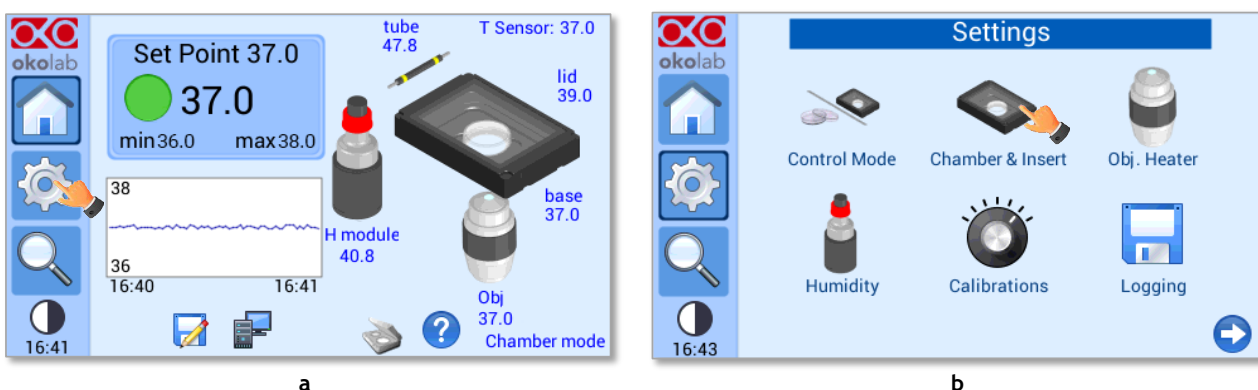


Figure 39. How to enter the Chamber & Insert menu (a - b).

Here you have to set the model of Okolab H301 incubating chamber that you have purchased and the type of sample adapter being inserted into it. Depending on these selections, UNO-CONTROLLER will automatically change the control settings.

To set the configuration press on the Chamber icon (see pointer 1 in Figure 40 a), then scroll among different chambers using the arrows on the left and right sides of the screen (see pointer 2 in Figure 40 b). When the chamber you use appears on the screen, press *Next* to select it (see pointer 2 in Figure 40 b).

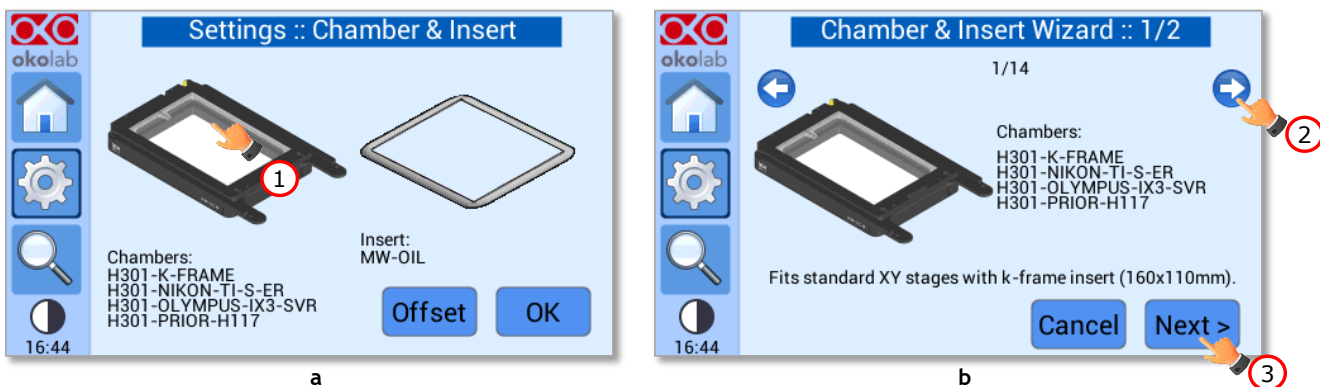


Figure 40. Settings - Chamber & Insert – Chamber selection (a - b).

Repeat this sequence to find and select the sample adapter. Scroll among different sample holders using the arrows on the left and right sides of the screen (see pointer 1 in Figure 41 a). When the sample holder you use appears on the screen, press *OK* to select it (see pointer 1 in Figure 41 a). The selected chamber and sample holder will be displayed on the screen (see Figure 41 b). Press *OK* to confirm (see pointer 3 in Figure 41 b).

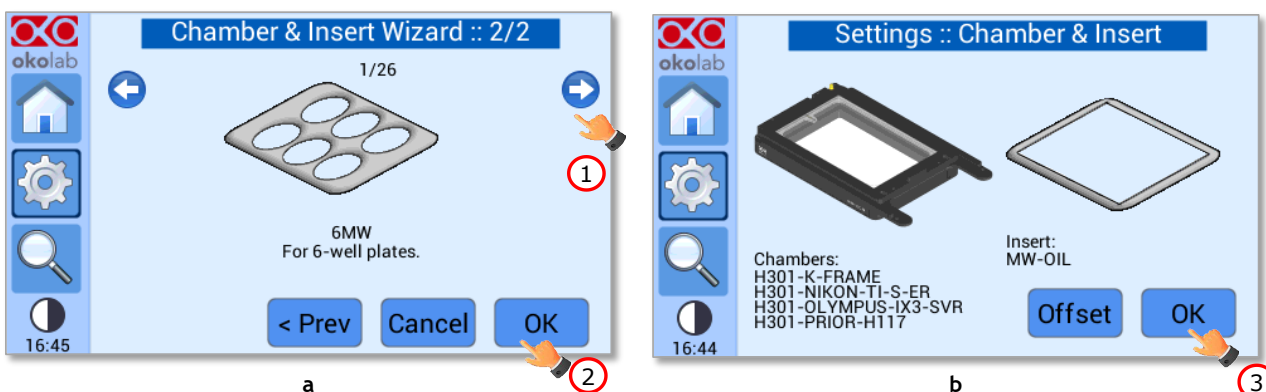


Figure 41. Settings - Chamber & Insert – Insert selection (a - b).

Tip ► Chambers equipped with MW-OIL insert have been factory calibrated at a Room Temperature of 23°C ±1°C for a temperature set point of 37°C. The offset of the Chamber Base and the Chamber Lid has been optimized to guarantee a uniform temperature for all the wells. Okolab suggests operating using factory offset values. To view factory offset value click on *Offset* button (see Figure 42 a).

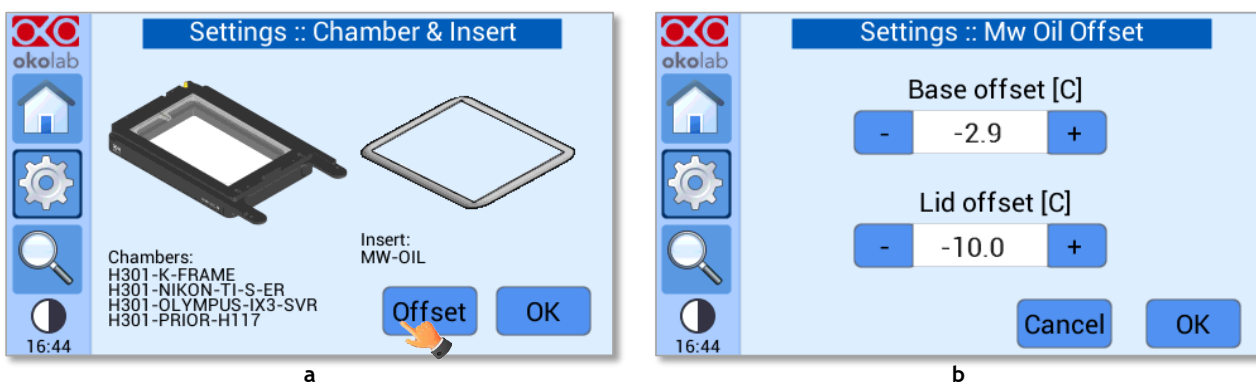


Figure 42. Settings - Chamber & Insert – Offset (a - b).

If the desired temperature set point could not be achieved, Okolab suggests performing Chamber calibration to find the offset values suitable for your experimental conditions (see paragraph 8.2.5.1).

8.2.2.1 Compatible Okolab H301 incubating chamber List


Table 4 reports all the available Okolab H301 incubating chambers for UNO-STAGE-TOP-INCUBATOR.

	<p>Chambers: H301-K-FRAME H301-NIKON-TI-S-ER H301-OLYMPUS-IX3-SVR H301-PRIOR-H117</p> <p>Detail: Fits standard XY stages with k-frame insert (160x110mm).</p>
	<p>Chambers: H301-LUDL96A602 H301-MCL-Z100/500 H301-NIKON-NZ100/200/500-N H301-PI-736-160x110</p> <p>Detail: Fits Z-piezo stages models listed.</p>
	<p>Chambers: H301-MINI</p> <p>Detail: Fits in any MW plate holder.</p>
	<p>Chambers: H301-NIKON-TI-SR H301-OLYMPUS-IX-SUSP</p> <p>Detail: Fits rectangular stages with circular opening.</p>
	<p>Chambers: H301-EC-LG-BL</p> <p>Detail: Fits Leica Super Z Galvo Stage (SP5/SP8).</p>
	<p>Chambers: H301-PRIOR-NZ500</p> <p>Detail: Fits Prior Z-piezo stages models NZ250/400/500.</p>

	<p>Chambers: H301-PRIOR-NZ100-H107 H301-PRIOR-NZ100-H117 H301-PI-736-ZR15/ZR25</p>
	<p>Chambers: H301-UP</p> <p>Detail: Fits any Upright Microscopes. It allows the usage of dipping lenses.</p>
	<p>Chambers: H301-EC-LG-UP-BL</p> <p>Detail: Fits Upright Leica Super Z Galvo Stage. It allows the usage of dipping lenses.</p>
	<p>Chambers: H301-DUAL-GAS</p> <p>Detail: Chamber with two independent gas compartments.</p>
	<p>Chambers: H301-ALPHA3-SMALL</p> <p>Detail: Incubating chamber for PhaseView Alpha3 system small version.</p>
	<p>Chambers: H301-ALPHA3-LARGE</p> <p>Detail: Incubating chamber for PhaseView Alpha3 system large version.</p>
	<p>Chambers: H301-MIZAR-TILT</p> <p>Detail: Incubating chamber for Mizar Tilt modular Light Sheet system.</p>
	<p>Chambers: CUSTOM</p> <p>Detail: Parameters for custom chambers.</p>

Table 4. Compatible Okolab H301 incubating chamber List.

8.2.3 Objective Heater

Press on  Objective Heater icon (see Figure 43 a) to enter the Objective Heater menu, see Figure 43 b.

Note ► The Objective Heater is enabled by default. Disable the Objective Heater if it is not in use; otherwise, UNO-CONTROL will be in alarm.

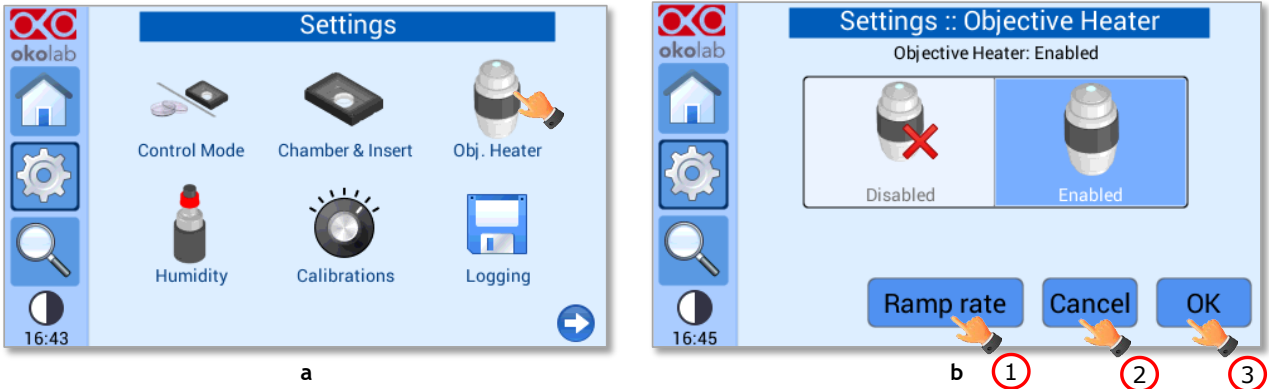


Figure 43. Ho to enter the Obj, Heater menu (a -b).

At this point you can choose:

1. By pressing on *Ramp Rate* button, the submenu in Figure 44 b will appear. Use the slide bar or the + and – icons to select the maximum heating rate (in °C/min) for the Objective Heater and press *Save* to confirm.

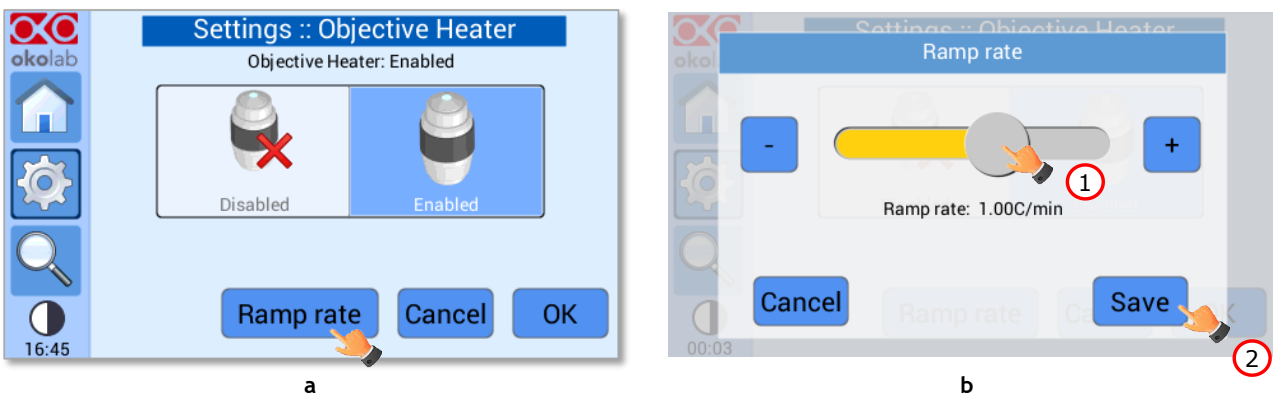


Figure 44. Settings – Obj. Heater – Ramp rate (a – b).

Tip ► It is particularly indicated to use a low heating rate in case of Objective Heater acting on a very sensitive objective. Check with the objective manufacturer.

Note ► The ramp rate can be defined in the range 0.1-1.5°C/min. Above 1.5°C UNO-CONTROLLER attributes the value MAX to the ramp rate. If MAX is selected, UNO-CONTROLLER will operate without constraint on the maximum heating rate for the Objective Heater.

2. Press *Cancel* to discard your choice (see pointer 2 in Figure 43 b).
3. Press *OK* to confirm (see pointer 3 in Figure 43 b), the menu in Figure 45 b will appear.

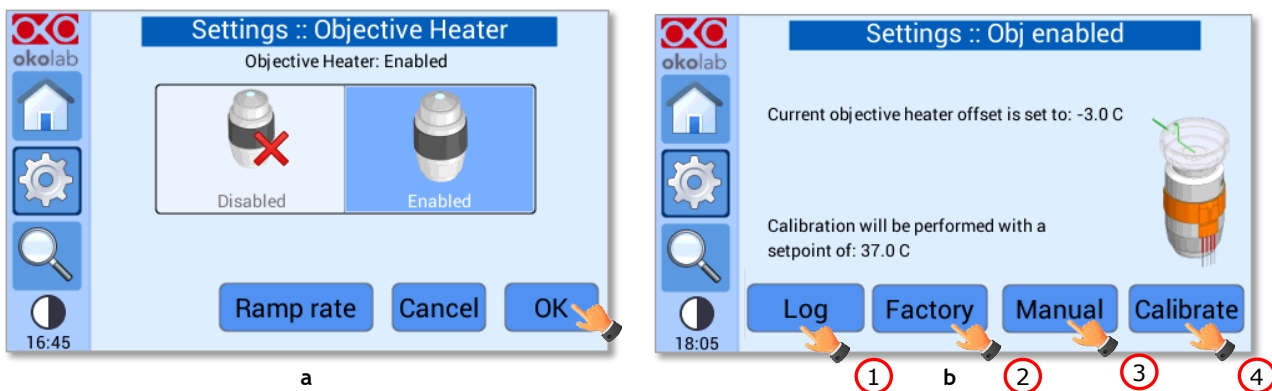


Figure 45. Settings – Obj. Heater –Enabled - menu (a – b).

Four options are available:

1. By pressing *Log* button (see pointer 1 in Figure 45 in b) you can select parameters obtained by calibrations previously performed (see paragraph 8.2.5.3).
2. By pressing *Factory* button (see pointer 2 in Figure 43 b) UNO-CONTROLLER will recover the factory offset.
3. Press *Manual* button (see pointer 3 in Figure 43 b) to insert the offset value manually (see paragraph 8.2.5.3).
4. By pressing *Calibrate* button (see pointer 4 in Figure 43 b) UNO-CONTROLLER will perform a calibration routine for your specific environment, see paragraph 8.2.5.3.

Note ► To disable the Objective Heater press on the Disabled icon (see pointer 1 in Figure 46 a) and press OK to confirm (see pointer 1 in Figure 46 b).

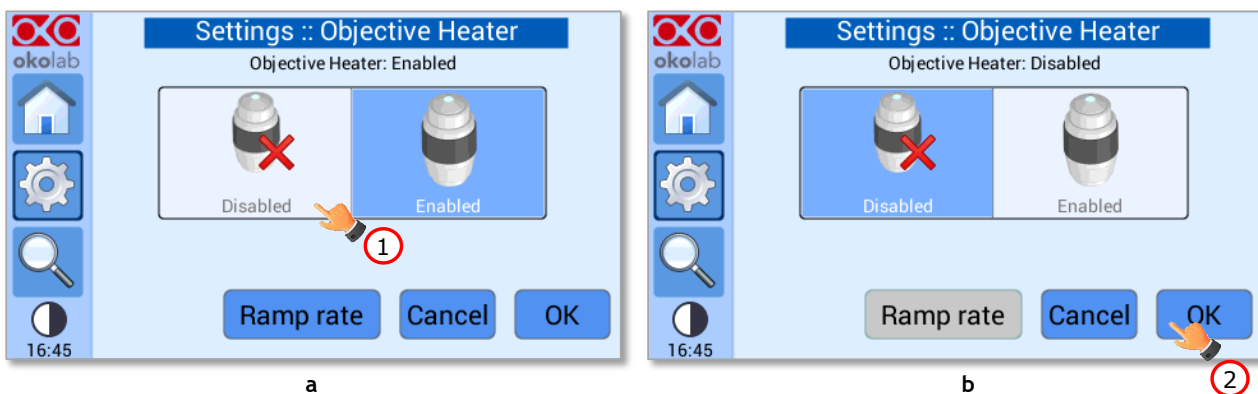



Figure 46. Settings – Obj. Heater –Disabled (a -b).

8.2.4 Humidity

Press on  Humidity icon to enter the Humidity menu, see Figure 47.

Note ► The Humidity control is enabled by default. Disable the Humidity control if the GF-MIXER-HM (Humidity Module) is not in use; otherwise, UNO-CONTROLL will be in alarm.

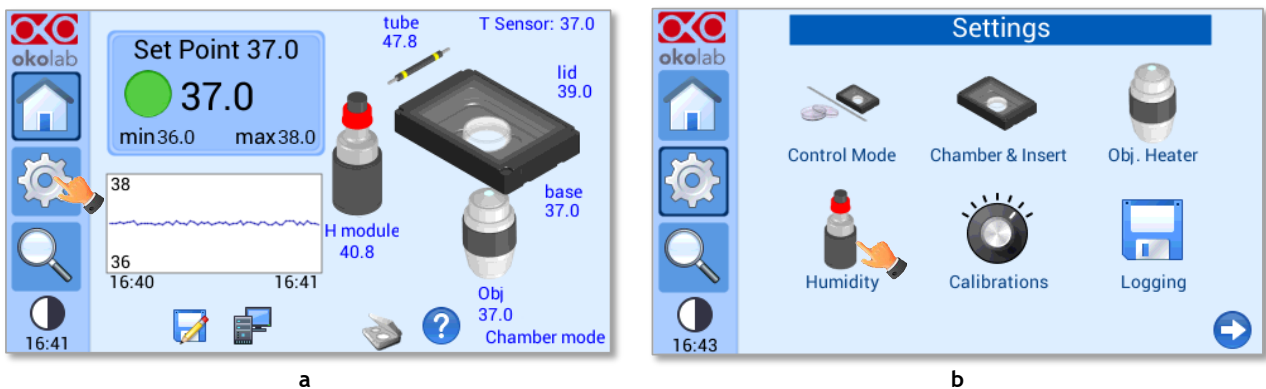


Figure 47. How to enter the Humidity menu (a -b).

GF-MIXER-HM (Humidity Module) supplies a humidity level up to 90% of Relative Humidity acting on the temperatures of both the Humidifier Bottle and the Heated Tube. In order to make the humidity control work properly, the user has to set the actual Room Temperature- Press the + / - icons to set the Room Temperature (see pointer 1 in Figure 48 b) and press *Save* to confirm (see pointer 2 in Figure 48 b).

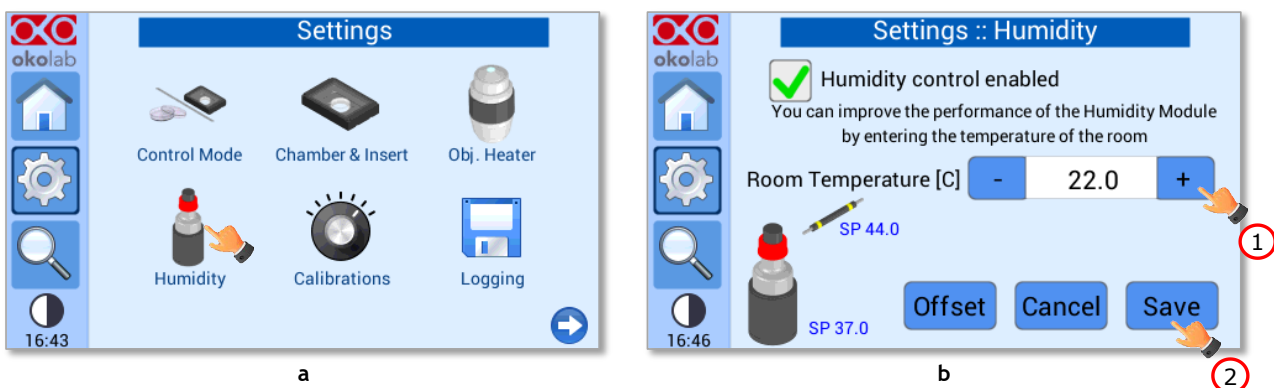


Figure 48. Settings - Humidity - menu (a- b).

It is possible to act on the Humidity Module Offset if the desired humidity level cannot be achieved.



The humidity level of 90% of Relative Humidity may not be guaranteed if the Room Temperature differs by more than $\pm 1^{\circ}\text{C}$ from 23°C and the GF-MIXER-HM (Humidity Module) is installed near heating and air conditioning vents or near windows and doors that are frequently open.

By pressing the *Offset* button (see pointer 1 in Figure 49 a), the Offset subpage will be opened. Press the + / - icons to insert the Offset value (see pointer 2 in Figure 49 b) and press *OK* to save (see pointer 3 in Figure 49 b). Reduce the Offset value to increase the actual humidity level and, on the contrary, increase the Offset value to lower the humidity content.



Figure 49. Settings – Humidity – Offset (a – b).

Note ► To disable the Humidity check off the checkbox “Humidity control enabled” (see pointer 1 in Figure 50) and press OK to confirm (see pointer 2 in Figure 50).

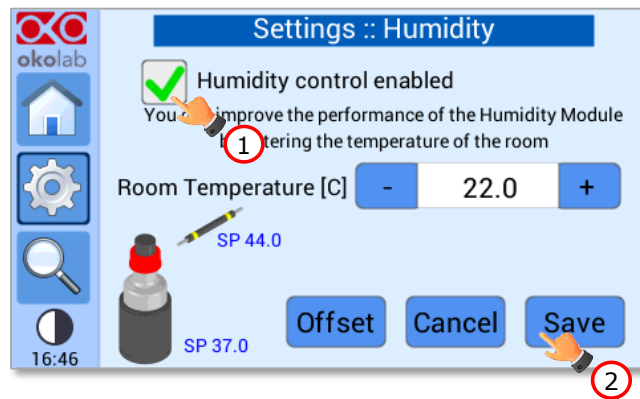



Figure 50. Settings – Humidity – Disabled.

8.2.5 Calibrations

Press on *Calibration* icon  to enter the *Calibrations* menu (see Figure 51).

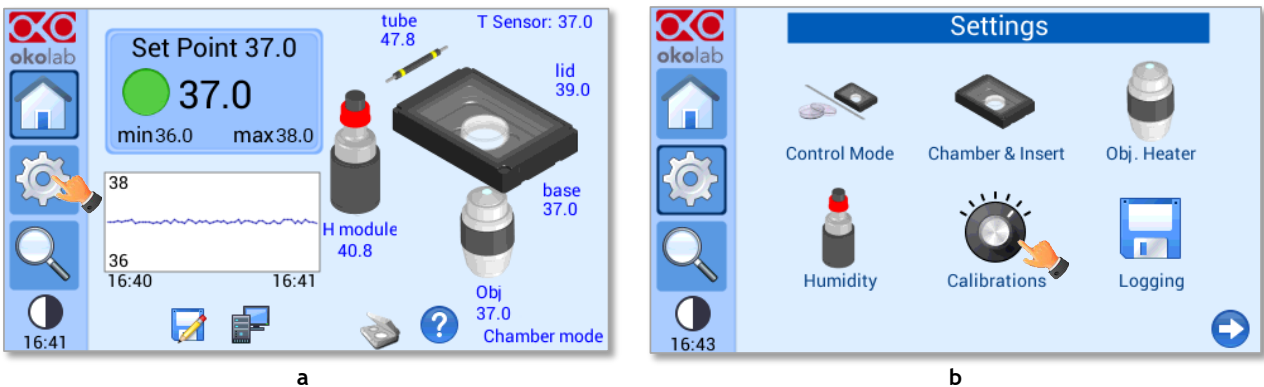


Figure 51. How to enter the Calibrations menu (a - b).

The Calibrations menu shows three options:

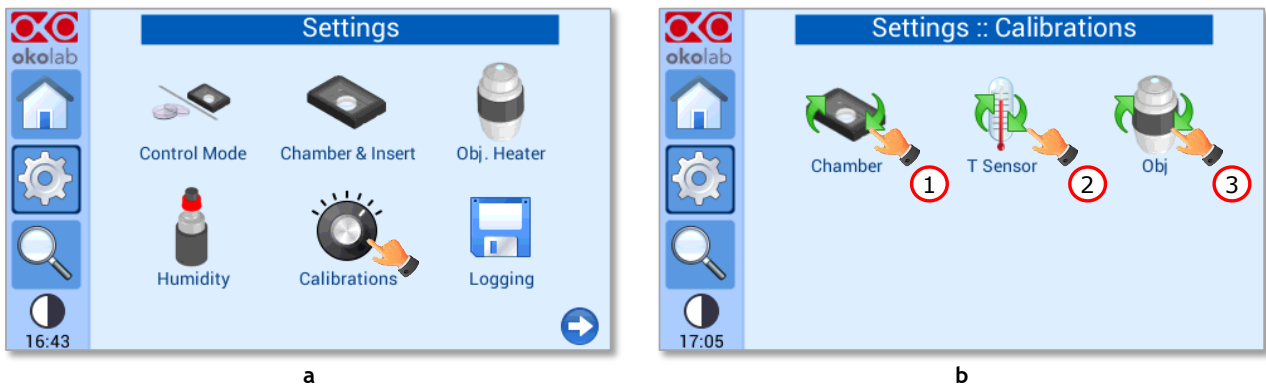


Figure 52. Settings - Calibrations - menu (a - b).

1. *Chamber* (see pointer 1 in Figure 52). Here you can perform the calibration of the incubating chamber, see paragraph 8.2.5.1.
2. *T Sensor* (see pointer 2 in Figure 52). Here you can perform the calibration of the T Sensor, see paragraph 8.2.5.2.
3. *Obj* (see pointer 3 in Figure 52). Here you can perform the calibration of the Objective Heater, see paragraph 8.2.5.3.

8.2.5.1 Chamber

Press on *Chamber* icon , to enter the Chamber calibration submenu (see Figure 53).

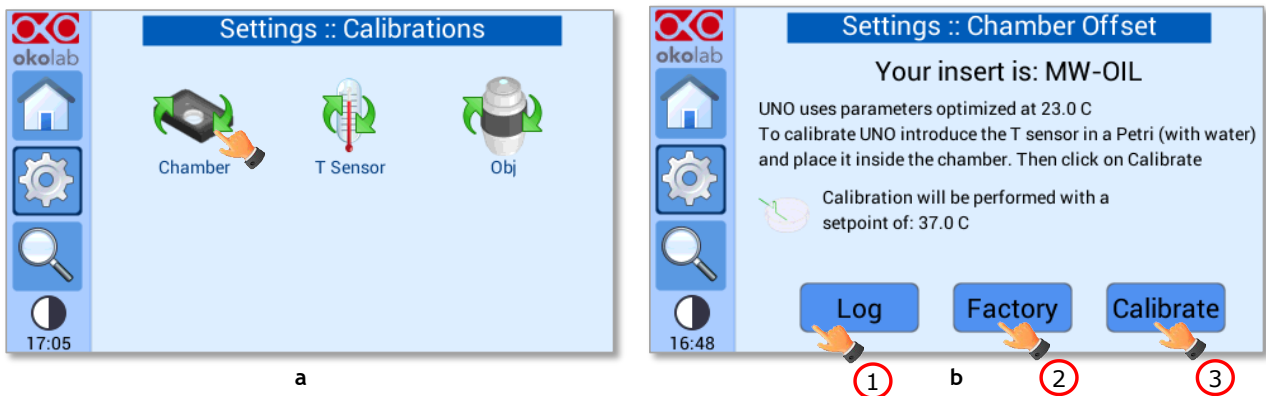


Figure 53. Settings - Calibrations - Chamber (a - b).

At this point you can choose:

1. By pressing *Log* button (see pointer 1 in Figure 53 b) you can select parameters obtained by calibrations previously performed (see Figure 54 b).

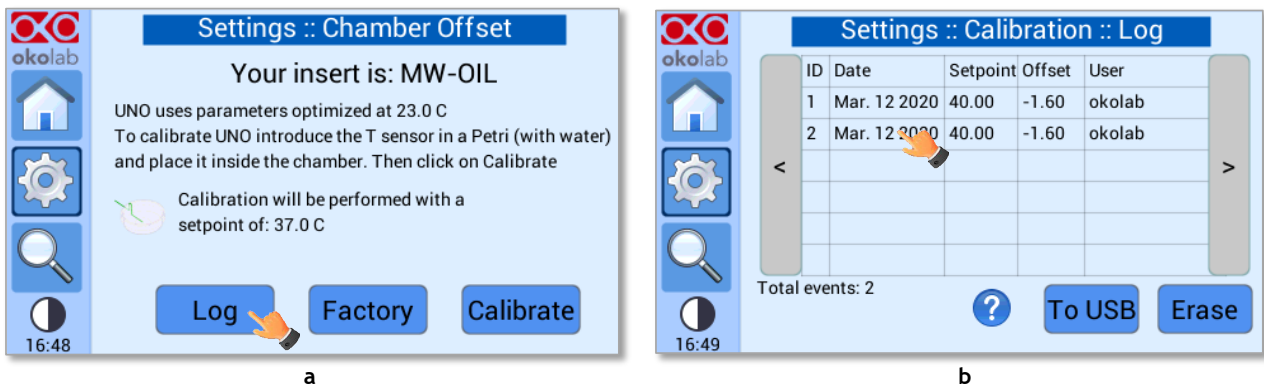


Figure 54. Settings – Calibrations - Chamber – Log (a – b).



UNO-CONTROLLER stores the parameters obtained by previous calibrations for each combination of selected chamber with its selected sample holder. You can recover calibration parameters only for the selected pair of chamber and its sample holder.

- By pressing *Factory* button (see pointer 2 in Figure 53 b) UNO-CONTROLLER will recover and use the factory calibration parameters.

Note ► *Factory calibration was performed at a Room Temperature of 23°C for a temperature set point of 37°C. Use factory calibration parameters if your Room Temperature is 23°C ±1°C.*

- By pressing *Calibrate* (see pointer 3 in Figure 53 b) UNO-CONTROLLER will start a routine to calibrate its parameters using the T Sensor.



Calibrate UNO-CONTROLLER if your Room Temperature differs by more than ±1°C from 23°C.

To start the chamber calibration, follow the instructions below:

- Make sure that T Sensor is connected to UNO-CONTROLLER (see paragraph 7.4).
- Secure with commercial adhesive tape the T Sensor to the bottom of the sample holder you use during standard operation (Petri dish, Chambered Glass Slide, etc.) as shown in Figure 55. Do not cover the tip of the T-Sensor with the adhesive tape.

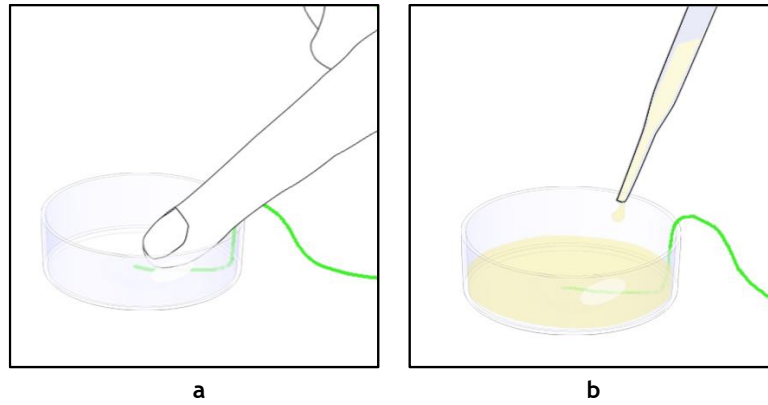


Figure 55. T Sensor attached on the bottom of the Petri dish (a -b).

Tip ► Use the same dish that you use in regular practice.

- Fill the sample holder with water or oil to the level used during standard operation. Make sure the tip of the T Sensor is immersed in the liquid. Cover the sample holder with the lid or leave it open, according to the protocol followed during standard operation.
- Close the incubating chamber with its lid.
- Press *Calibrate* button (see Figure 56 a) to start the Chamber calibration procedure (see Figure 56 b). Click on *Abort* button to interrupt the procedure (see Figure 56 b).

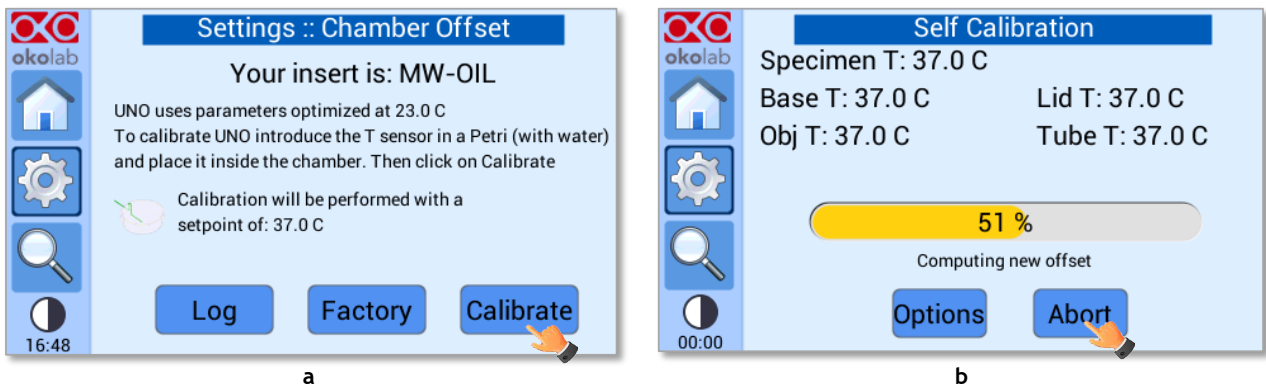


Figure 56. Settings – Calibrations – Chamber – Calibrate (a - b).

By clicking *Options* (see pointer 1 in Figure 57 a), the menu *Advanced calibration parameters* will appear (see Figure 57 b) and, here, it is possible to set the calibration Accuracy (see pointer 2 in Figure 57 b) and Precision (see pointer 3 in Figure 57 b). Press *Default* (see pointer 4 in Figure 57 b) to recover factory settings and *OK* (see pointer 4 in Figure 57 b) to confirm.

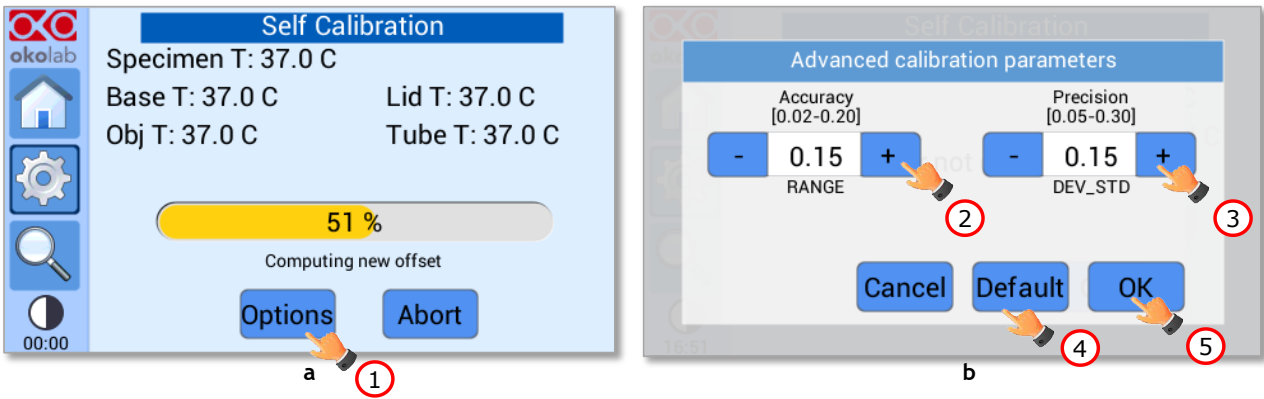


Figure 57. Settings – Calibrations – Chamber – Calibrate – Options (a – b).

8.2.5.2 T Sensor

Press on *T Sensor* icon , to enter the T Sensor calibration submenu (see Figure 58).

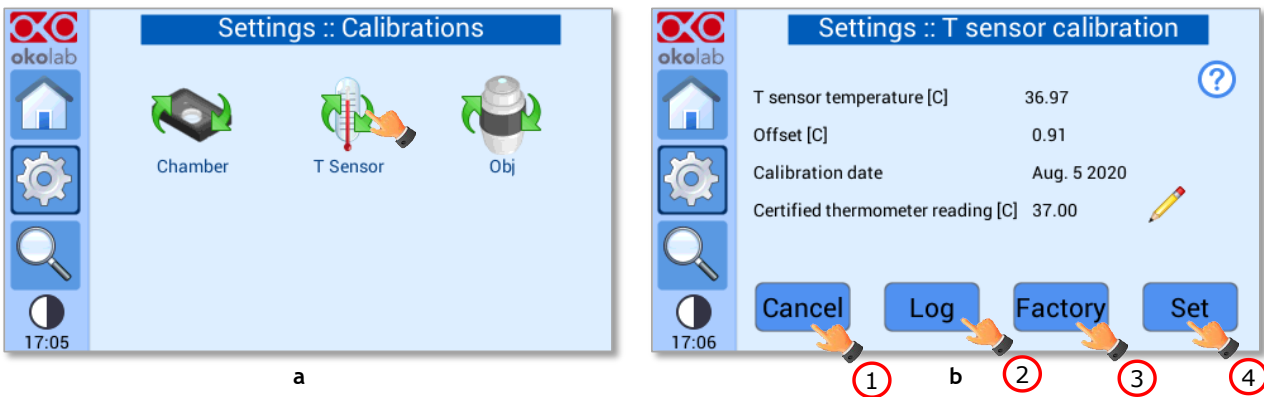


Figure 58. Settings-Calibrations-T Sensor (a – b).

At this point you can choose:

1. Press *Cancel* button (see pointer 1 in Figure 58 b) to exit the page.
2. By pressing *Log* button (see pointer 2 in Figure 58 b) you can select parameters obtained by calibrations previously performed (see Figure 59 b).

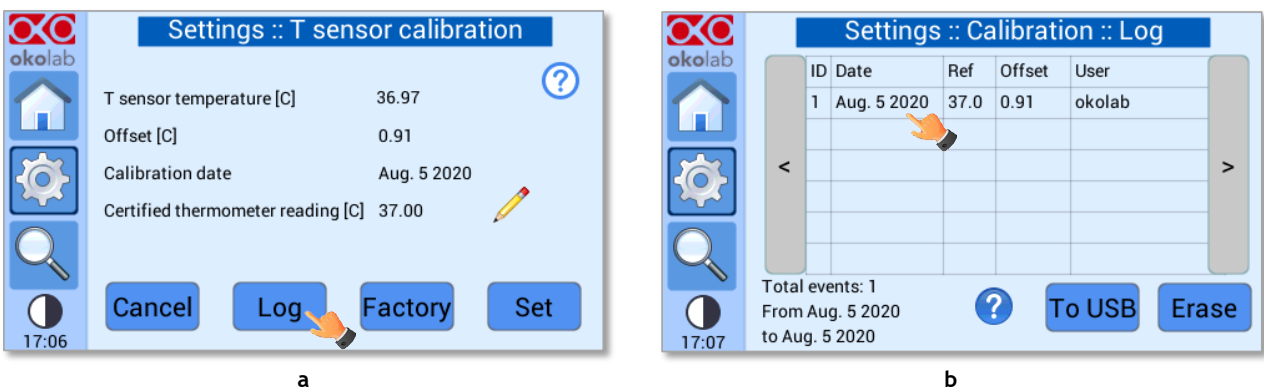


Figure 59. Settings – Calibrations – T Sensor – Log (a – b).

- Press *Factory* button (see pointer 3 in Figure 58 b) to view the factory calibration parameters. Press *Use factory* to recover and use the factory calibration parameters (see Figure 60 b).

Note ► *T Sensor is factory calibrated at three different temperatures: 35.0°C, 37.0 °C and 40.0°C.*

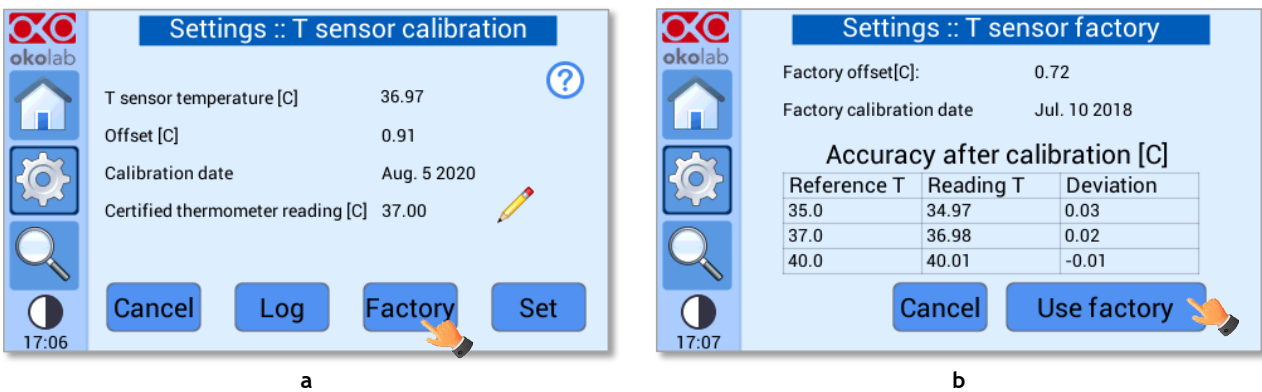



Figure 60. Settings – Calibrations – T Sensor – Factory (a – b).

- By pressing *Set* (see pointer 4 in Figure 58 b) UNO-CONTROLLER adjusts the reading of the T Sensor against the reading of the certified thermometer.

To start the T Sensor calibration, follow the instructions below:

- Make sure that T Sensor is connected to UNO-CONTROLLER (see paragraph 7.4).
- Set a water bath to the temperature you use as set point for the heating devices during standard operation (most of the times it is 37°C);
- Measure water temperature by immersing the T Sensor and a certified thermometer;
- Press on the pencil icon  (see Figure 61 a) and insert the reading of the certified thermometer by pressing + / - (see pointer 1 in Figure 61 b). Press *OK* to confirm (see pointer 2 in Figure 61 b).

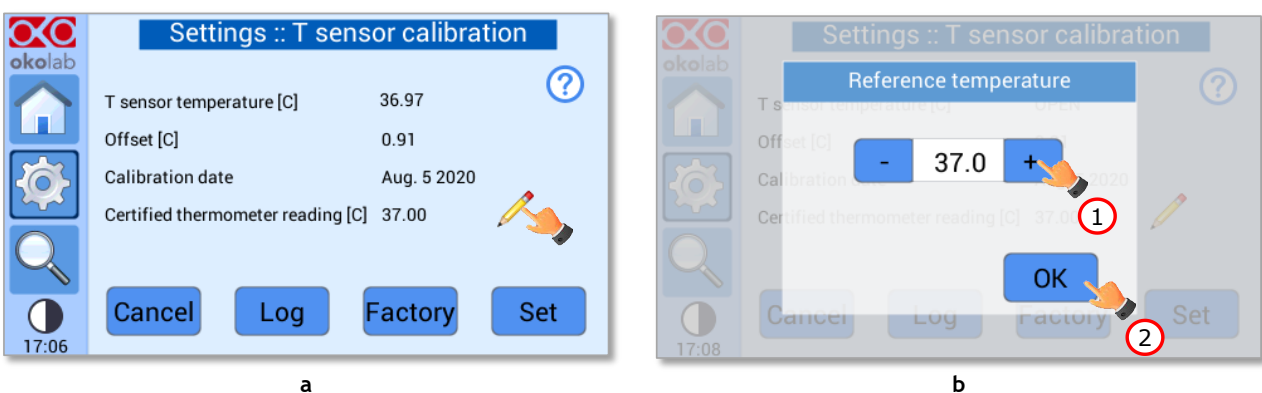




Figure 61. Settings – Calibrations – T Sensor – Set (a – b).

- Press on *Set* (see pointer 4 in Figure 58 b) to adjust to reading of the T Sensor against the reading of the certified thermometer.

Tip ► Press on icon  to receive instructions on how to calibrate the T Sensor.

Note ► *Okolab recommends using a certified thermometer as external reference.*

8.2.5.3 Obj. Heater

Press on *Obj* icon , to enter the Objective Heater calibration submenu (see Figure 62).

Note ► Make sure that the Objective Heater is enabled (see paragraph 8.2.3).

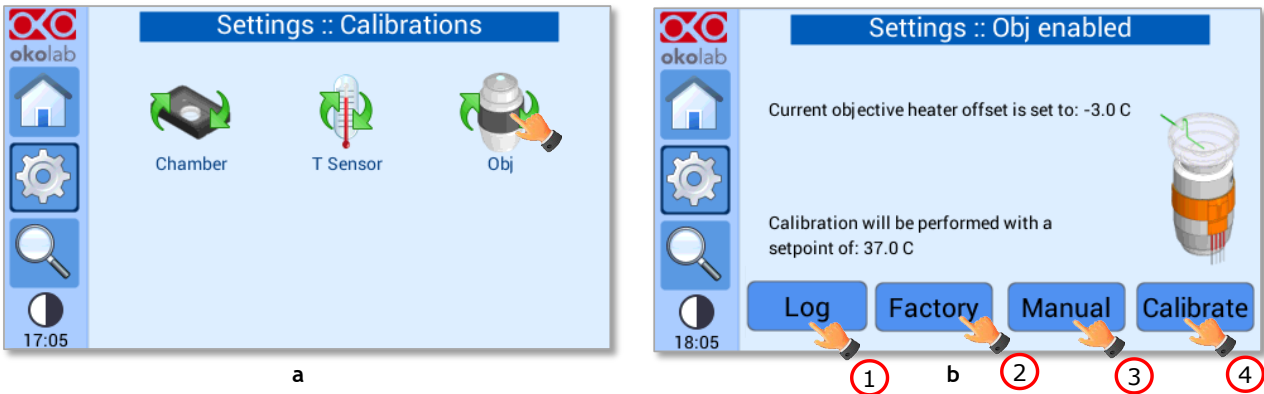


Figure 62. Settings – Calibrations - Obj. Heater (a – b).

At this point you can choose:

1. By pressing *Log* button (see pointer 1 in Figure 62 b) you can select parameters obtained by calibrations previously performed (see Figure 63 b).

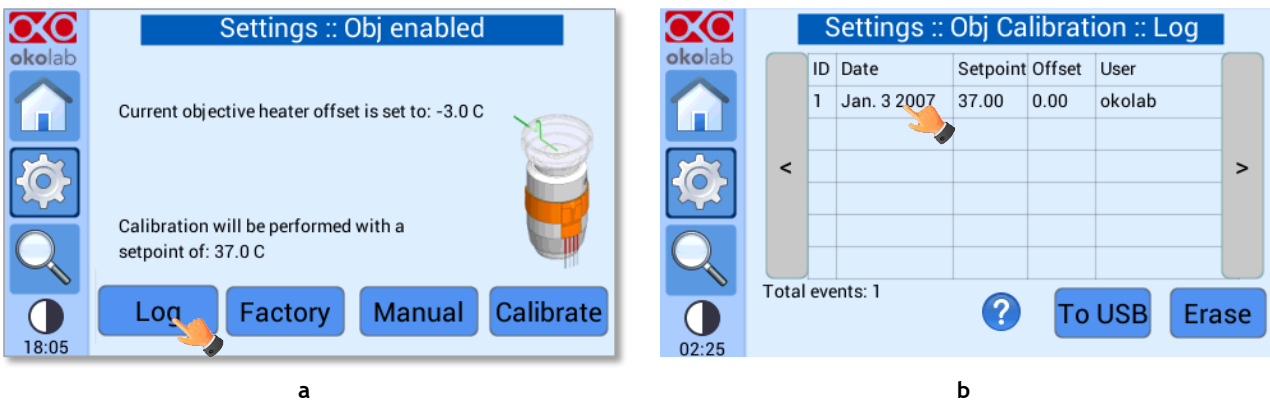


Figure 63. Settings – Calibrations – Obj. Heater - Log (a – b).

2. By pressing *Factory* button (see pointer 2 in Figure 62 b) UNO-CONTROLLER will recover the factory offset.
3. To perform the *Manual* procedure, follow the instructions below:

Note ► Make sure that a Chamber Calibration has been performed (see paragraph 8.2.5.1).

- Make sure that T Sensor is connected to UNO-CONTROLLER (see paragraph 7.4).
- Secure with commercial adhesive tape the T Sensor to the bottom of the sample holder you use during standard operation (Petri dish, Chambered Glass Slide, etc.) as shown in Figure 64. Do not cover the tip of the T-Sensor with the adhesive tape.

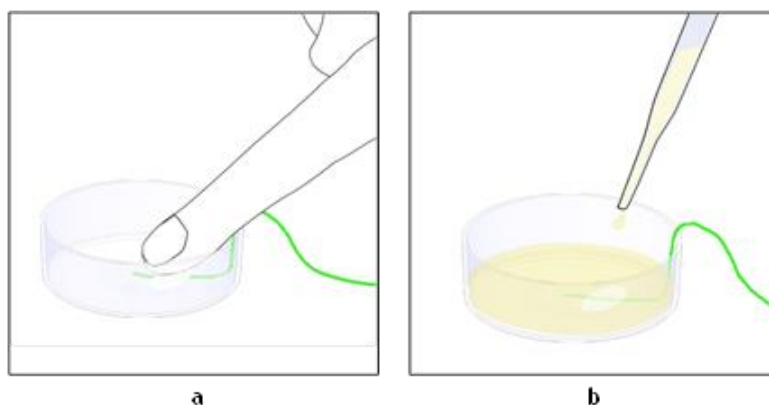


Figure 64. T Sensor attached on the bottom of the Petri dish (a -b).

Tip ► Use the same dish that you use in regular practice.

- Fill the sample holder with water or oil to the level used during standard operation. Make sure the tip of the T Sensor is immersed in the liquid. Cover the sample holder with the lid or leave it open, according to the protocol followed during standard operation.
- Close the incubating chamber with its lid.
- Make sure that the microscope objective heater is equipped with the OBJ-COLLAR. Make sure that the Objective Heater touches the sample in both oil immersion and water dipping imaging.
- Be sure that the reading of T Sensor is stable and then press *Manual* button (see pointer 3 in Figure 62 b) and insert the offset value clicking on + or - on the Offset tab (see pointer 1 in Figure 65 b) to adjust the Objective Heater offset value and press on *OK* to save (see pointer 2 in Figure 65 b). The offset is defined as the temperature difference between the set point and the reading of T Sensor.

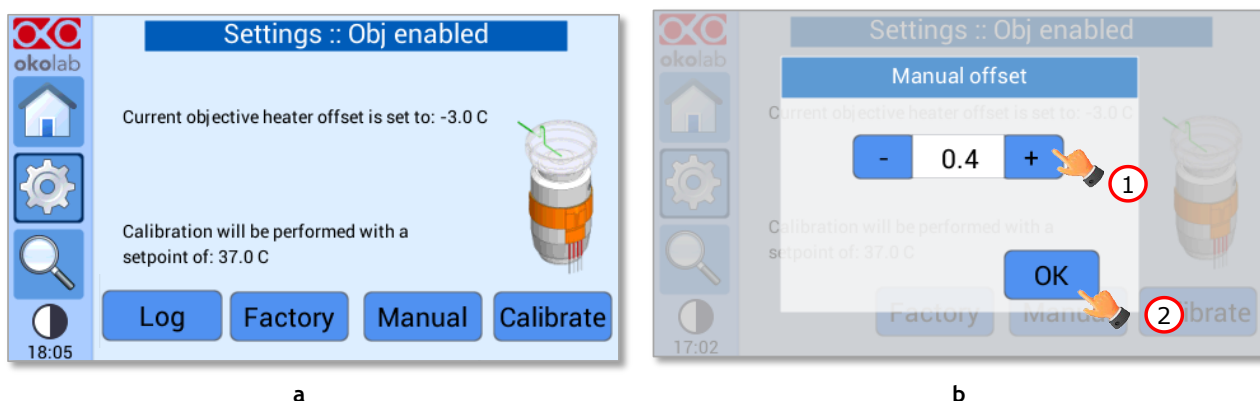


Figure 65. Settings – Calibrations – Obj. Heater - Manual (a -b).

- To verify if the *Manual* procedure ends correctly, wait until the reading of T Sensor is stable and check if it is equal to the set point value. If this does not happen, insert a new manual offset as the difference between the set point temperature and the reading of T Sensor. Repeat the procedure until the reading of T Sensor becomes equal to the set point.
4. By pressing *Calibrate* button (see pointer 4 in Figure 62 b) UNO-CONTROLLER will perform a calibration routine for your specific environment.

Note ► Make sure that a Chamber Calibration has been performed (see paragraph 8.2.5.1).

A distinction should be made between the **Chamber Control** mode and the **Sample Control** mode.

To start the Obj. Heater calibration in **Chamber Control** mode, follow the instructions below:

- Make sure that T Sensor is connected to UNO-CONTROLLER (see paragraph 7.4).
- Secure with commercial adhesive tape the T Sensor to the bottom of the sample holder you use during standard operation (Petri dish, Chambered Glass Slide, etc.) as shown in Figure 66. Do not cover the tip of the T-Sensor with the adhesive tape.

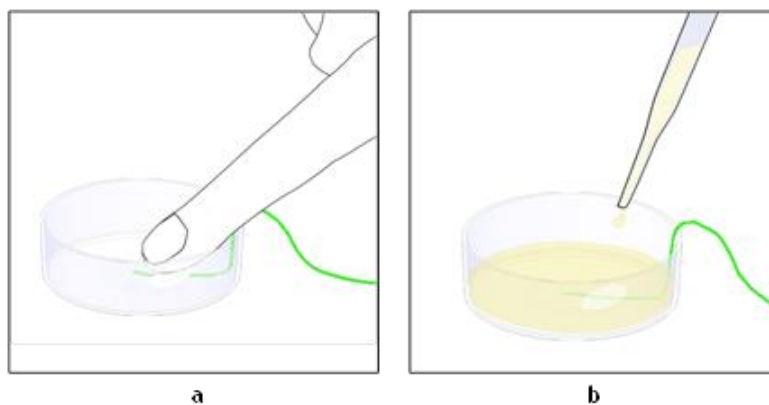


Figure 66. T Sensor attached on the bottom of the Petri dish (a -b).

Tip ► Use the same dish that you use in regular practice.

- Fill the sample holder with water or oil to the level used during standard operation. Make sure the tip of the T Sensor is immersed in the liquid. Cover the sample holder with the lid or leave it open, according to the protocol followed during standard operation.
- Close the incubating chamber with its lid.
- Make sure that the microscope objective heater is equipped with the OBJ-COLLAR. Make sure that the Objective Heater touches the sample in both oil immersion and water dipping imaging.
- Press *Calibrate* button (see pointer 5 in Figure 62 b) to start the Obj. Heater calibration procedure (see Figure 56 b). A pop-up message will appear warning you that the Chamber calibration must be performed before the Obj. Heater one. Make sure that the Chamber calibration has been already performed and click *OK* to proceed. Click on *Abort* button to interrupt the Obj. Heater calibration procedure (see Figure 56 b).

Tip ► If you need to perform the Chamber calibration, you can keep the Objective Heater enabled. Make sure that the Objective Heater does not touch the sample during the Chamber Calibration procedure.

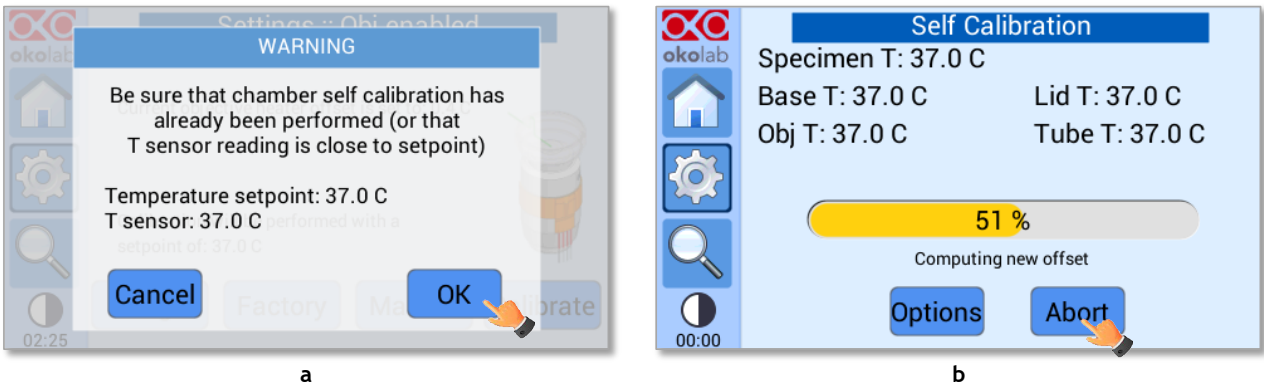


Figure 67. Settings – Calibrations – Obj. Heater – Calibrate (a – b).

By clicking *Options* (see pointer 1 in Figure 68 a), the menu *Advanced calibration parameters* will appear (see Figure 68 b) and, here, it is possible to set the calibration Accuracy (see pointer 2 in Figure 68 b) and Precision (see pointer 3 in Figure 68 b). Press *Default* (see pointer 4 in Figure 68 b) to recover factory settings and *OK* (see pointer 4 in Figure 68 b) to confirm.

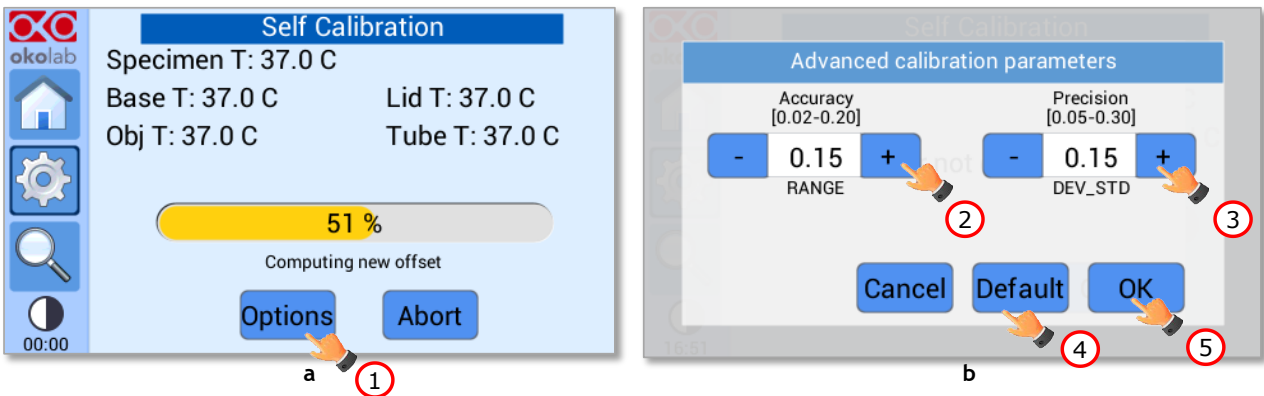




Figure 68. Settings – Calibrations – Obj. Heater – Calibrate – Options (a – b).

If you operate in **Sample Control** mode, you need to press *Calibrate* button and then make the Objective Heater touch the sample in both oil immersion and water dipping imaging.

8.2.6 Logging

UNO-CONTROLLER is equipped with on-board memory for data logging and storage. A simple routine allows downloading data to USB drive or to PC. In order to log and download the logged data, connect a USB drive (not supplied) to UNO-CONTROLLER, using the supplied MINI-USB-OTG cable (see paragraph 7.6.1).

To activate the logging, follow the steps indicated below:

1. Press on Settings icon  (see Figure 69 a) and press on Logging icon  (see Figure 69 b).

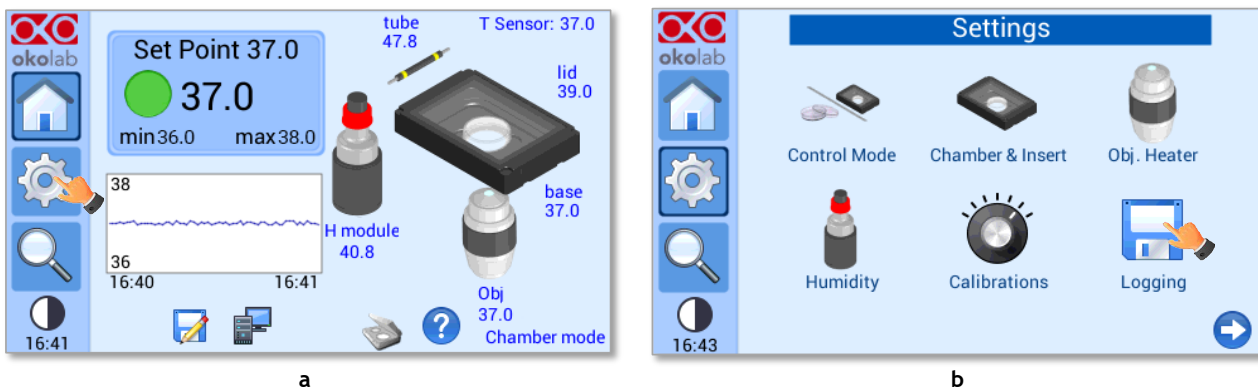


Figure 69. How to enter the Logging menu (a – b).

2. Flag *Internal memory* in the page that appears (see Figure 70).

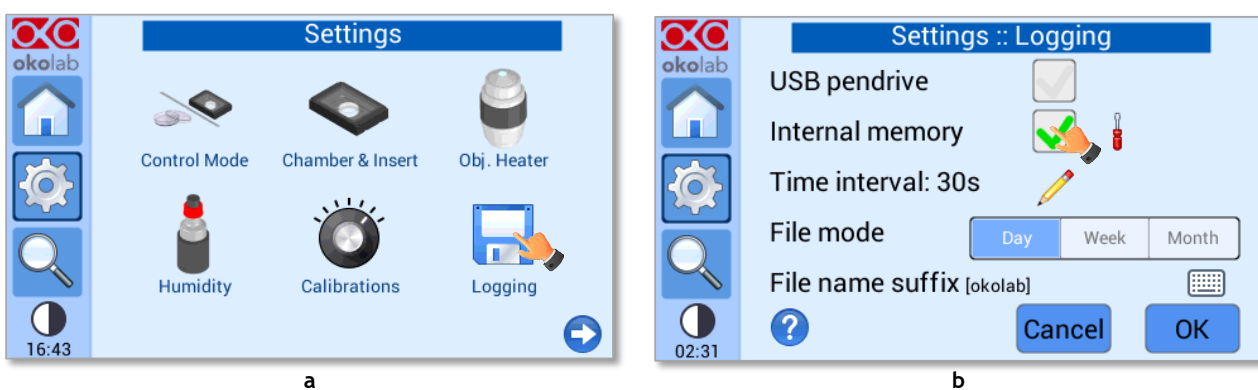



Figure 70. Settings – Logging - menu (a-b).

Tip ► When activating the logging on the internal memory, you can access the Logging page also by pressing the activated logging icon  on the Homepage, as shown in Figure 71.

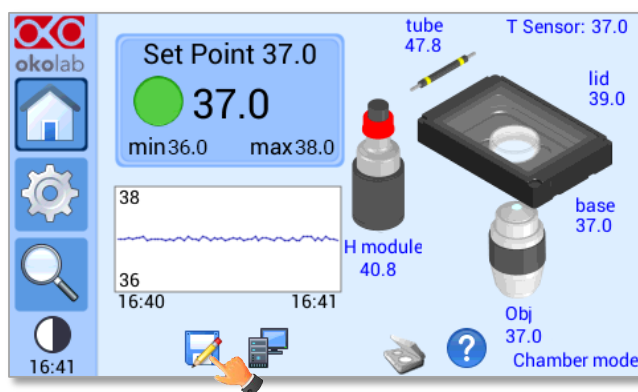



Figure 71. How to enter the Logging menu from the Homepage.

3. Press on the icon  to insert the *Time Interval* i.e. the frequency with which you want to record a data point, as shown in Figure 72. In this example a data point is logged every 30 seconds, you can change *Time Interval* in the range 1-60 seconds.

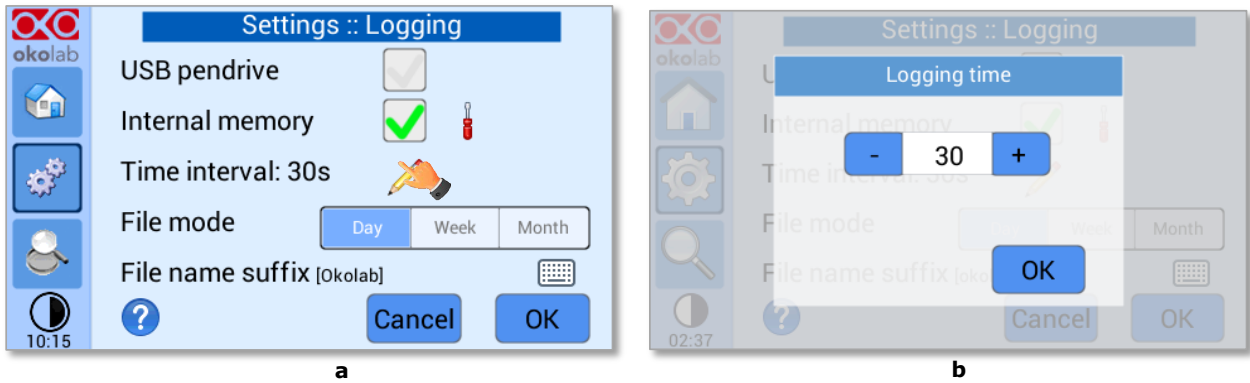



Figure 72. Settings – Logging – Logging time (a – b).

- Choose how you want to organize the data when downloaded, by pressing on Day, Week or Month, see Figure 72 a.

Tip ► If you select Day, the data will be split in files, each one containing the data of one day. If you select Week, the data will be split in files, each one containing the data of one week.

- Write the file name suffix to be reported in the downloaded files by pressing on the keyboard icon , see Figure 73 a.
- Press Save, see Figure 73 b.

Tip ► With the selections as in Figure 72 and in Figure 73, the data will be downloaded on the USB drive as shown in Figure 74.

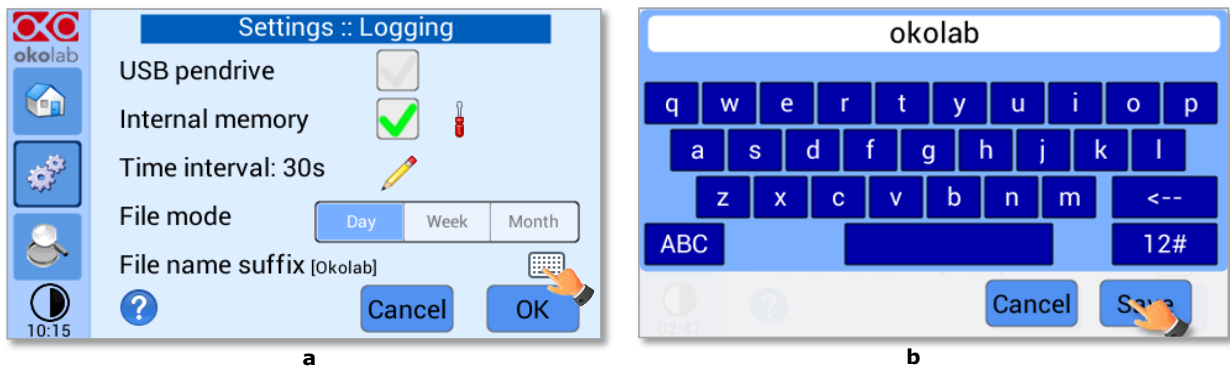


Figure 73. Settings – Logging – File name suffix (a – b).

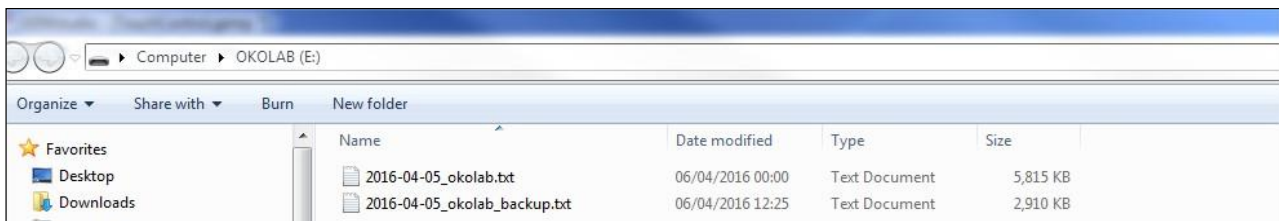



Figure 74. Downloaded files on the pen drive.

Note ► If you press on the screwdriver icon  (see Figure 75 a) you can view the logging starting date, the available memory and the latest download, see Figure 75 b.

Note ► The available memory depends on the time interval you have inserted in the Logging page. The default logging Time Interval is 30 seconds.

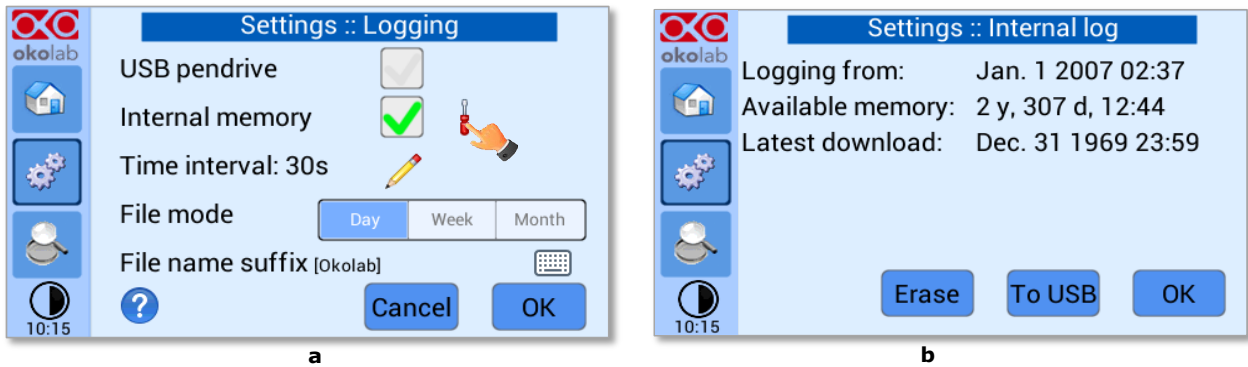


Figure 75. Settings – Logging - Internal log (a - b).

To download the data, press on *To USB* or on *Erase* if you want to delete the data, see Figure 75 b.

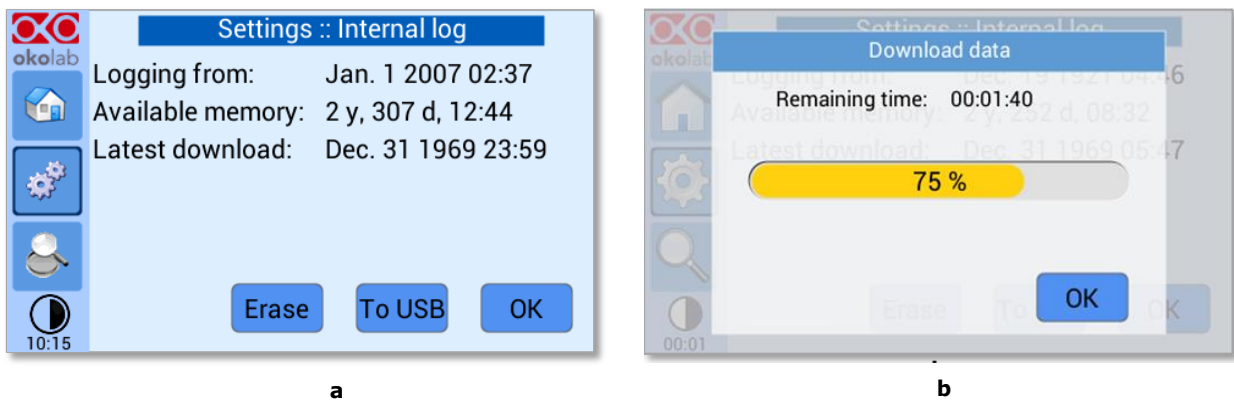


Figure 76. Settings – Logging - Download to USB (a - b).

You can activate the logging also on the *USB drive*, by flagging on *USB drive*, see Figure 77 a.

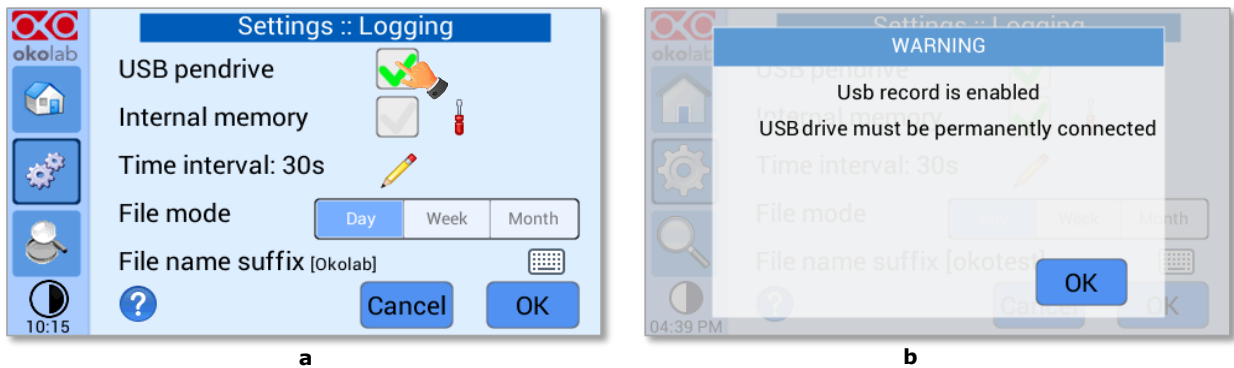


Figure 77. Settings – Logging - Download to USB - Reminder to connect the USB drive (a - b).

In this case, UNO-CONTROLLER warns you that a USB drive must be connected to the USB port, see Figure 77 b, and will store the data on the USB drive.

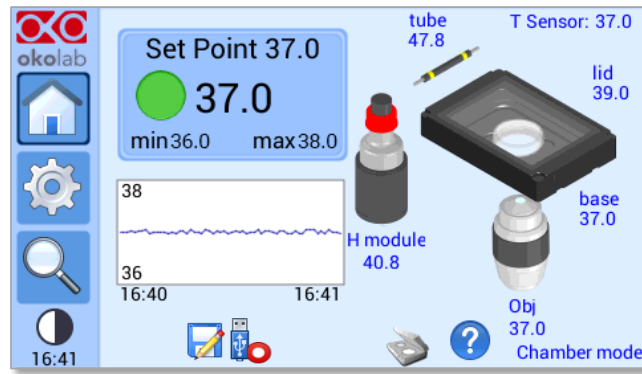




Figure 78. Homepage - Logging to USB drive.

Note ► When connecting the USB drive to UNO-CONTROLLER, a USB drive icon  appears on the Homepage. If you activate the logging on USB drive, a red dot appears on the USB drive, to remind that the USB drive should not be disconnected while data logging is ongoing see Figure 78.

8.2.7 Alarms

UNO-CONTROLLER allows activating visual and audible alarms.

To set the alarms specifications, press the *Alarms* icon  (see Figure 79 a), then follow the indications below:

1. Insert the alarm time; i.e. the time for which the temperature may remain outside the allowed tolerance before the controller triggers in alarm (see pointer 1 in Figure 79 b).

Note ► The alarm time range is 5-20 minutes.

2. Insert the *Tolerance* value. This value defines the allowed tolerance from the set point (see pointer 2 in Figure 79 b).

Note ► The tolerance vale range is 0.1-2.0°C.

3. Insert the transient time; i.e. the maximum time that the system can take to reach a new set point, without triggering the alarm (see pointer 3 in Figure 79 b).

Note ► The transient time range is 30 – 240 minutes-.

4. Press *Save* to confirm (see pointer 3 in Figure 79 b).

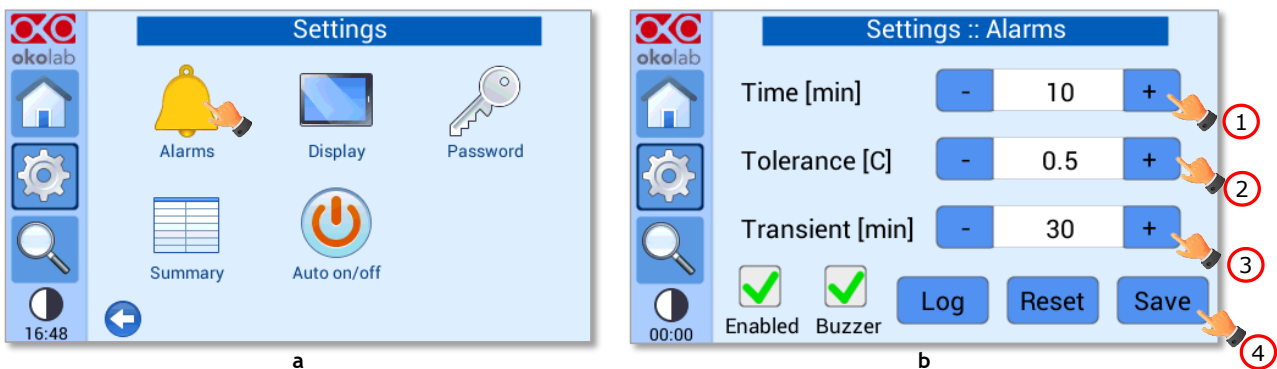


Figure 79. How to enter the Alarms menu (a -b).

Note ► After any change in the Setpoint value the device enters into a transient regime.

Note ► For example, if the Tolerance from setpoint is 0.5 or greater (for a temperature setpoint of 37°C and the temperature reaches a value equal or less than 36.5°C or equal or more than 37.5°C) for a period of time equal or longer than 10 minutes (Time set in Figure 79 b) then the system triggers an Alarm.

Flag the *Buzzer* checkbox if you want the Alarm to be acoustical as well rather than just being displayed. To disable the visual and acoustical alarms, remove the flag from the tab labeled *Enabled*. In this case the Alarms page becomes as shown in Figure 80.

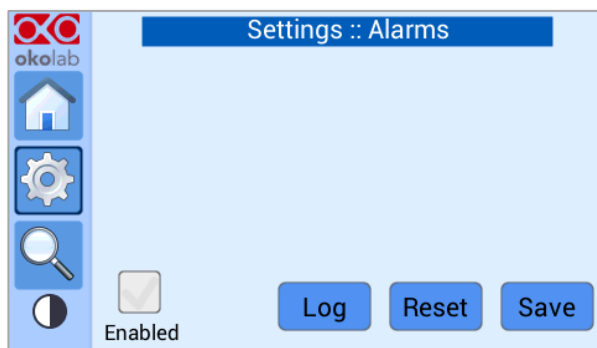


Figure 80. Settings – Alarms - Disabled.

Note ► When disabling the alarms, a possible alarm condition is shown only by a red status LED (for example is a device is accidentally disconnected).

Note ► By Pressing on Log (see Figure 81 a), you can view all the times that the status LED has changed color (see Figure 81 b). Press on To USB if you want to download the alarms data to a USB drive or on Erase if you want to delete them.

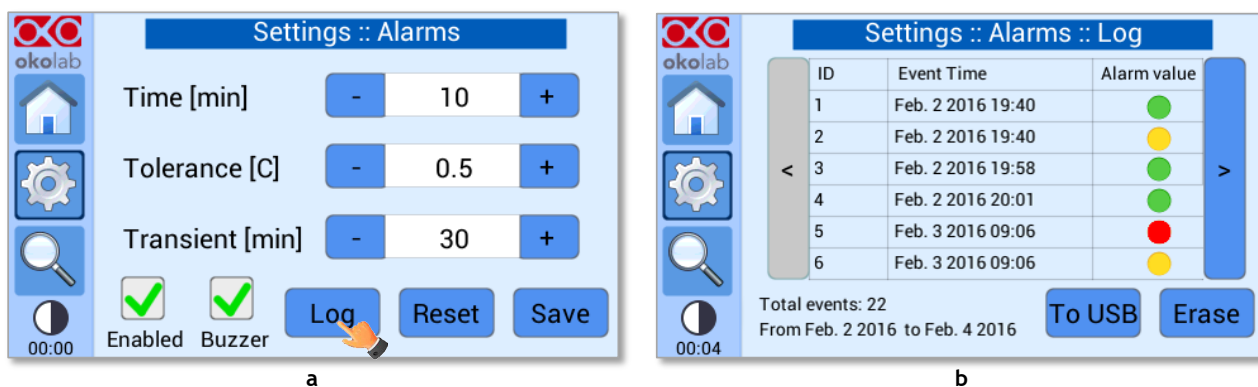



Figure 81. Settings – Alarms – Log (a - b).

8.2.8 Display

Press on *Display* icon  (see Figure 82 a) to enter the display configuration menu (see Figure 82 b).

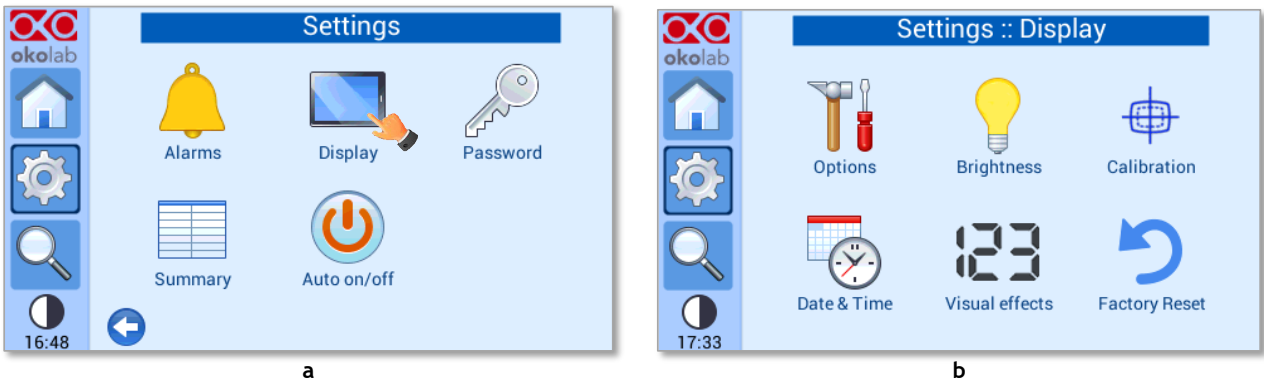



Figure 82. How to enter the Display menu (a – b).

8.2.8.1 Options

Press the *Options* icon  (see Figure 83 a) to enter the Display Options page. The Display Options menu allows to set the time frame in which the minimum and maximum temperature values are collected.

To insert the time frame, press the $+ / -$ icons or scroll the *Chart history length* bar (1 in Figure 83 b).

Note ► The chart history value length is pre-set at 5 minutes.

Note ► Recommended value for the chart history length is 60 or 120 minutes.

To change the sound frequency, press the $+ / -$ icons or scroll the *Buzzer frequency* bar (2 in Figure 83 b), then press *Save* (4 in Figure 83 b) to confirm.

Note ► To activate a sound at each touch, flag the *Touch Buzzer* checkbox (3 in Figure 83 b).

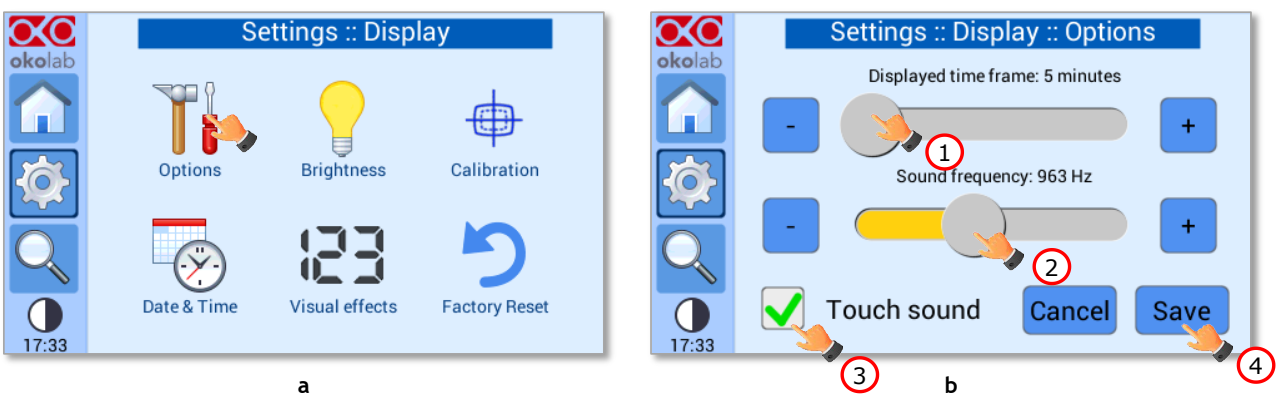



Figure 83. Settings – Display - Options (a – b).

8.2.8.2 Brightness

Press the icon  (see Figure 84 a) and scroll the bar (1 in Figure 84 b) or press the $+ / -$ icons in the page that opens to modify display *Brightness*. Set the required configuration and press *Save* (2 in Figure 84 b) to confirm.

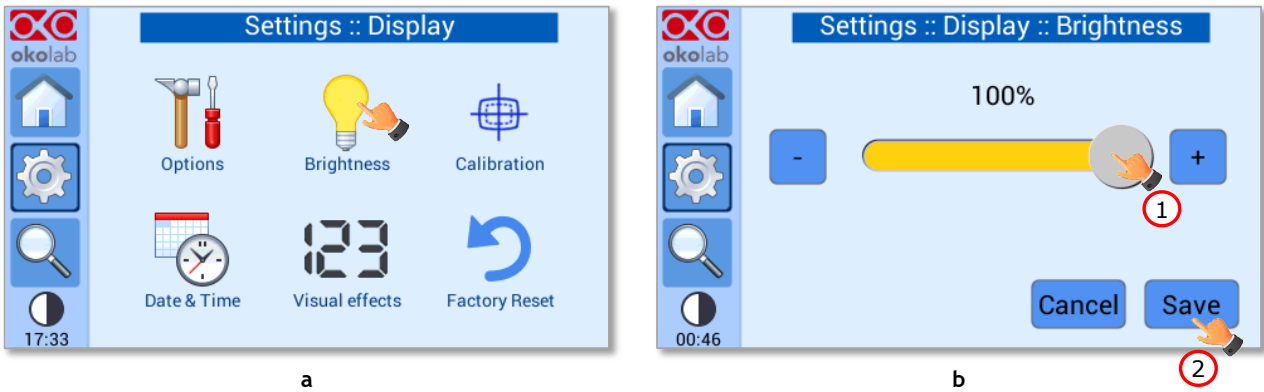



Figure 84. Settings – Display - Brightness (a – b).

8.2.8.3 Calibration

When pressing the *Calibration* icon  (see Figure 85), the procedure for the calibration of the touch screen will start.

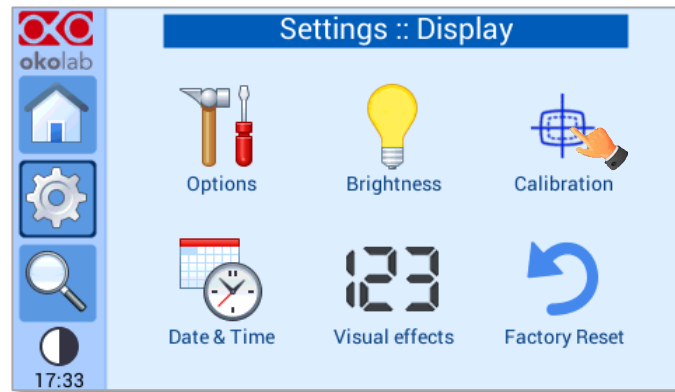



Figure 85. Settings – Display - Calibration.

8.2.8.4 Date & Time

To set Date & Time, follow the instructions below:

1. Press the *Date & Time* icon  (see Figure 86 a).
2. Set the values by using the +/- icons (see pointer 1 and 2 in Figure 86 b).
3. Click on *Save* to confirm (see pointer 3 in Figure 86 b) or *Cancel* to undo.

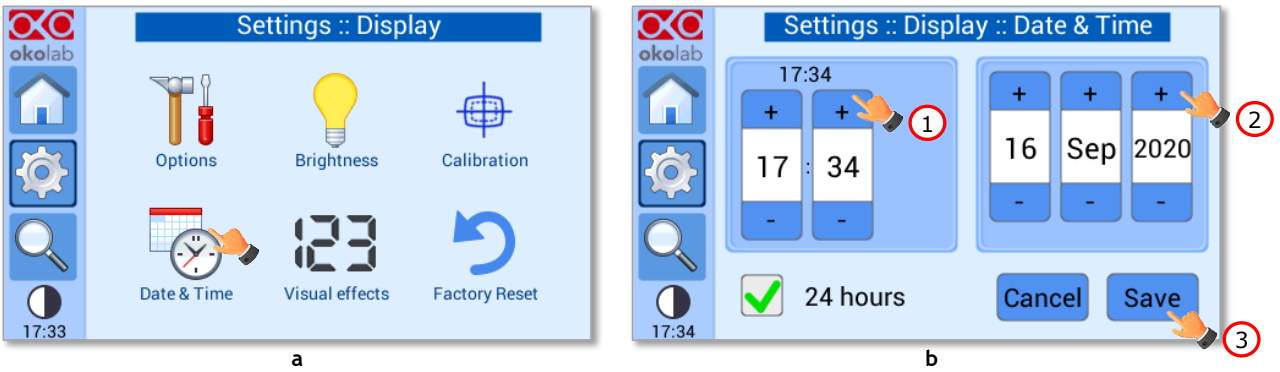


Figure 86. Settings – Display - Date and Time (a – b).

Note ► The default time format is a 24-hour clock.

Tip ► Deselect the 24 hours box, if you want to use the hour format based on 12 hours (see Figure 87 a). If you have selected 12 hour clock format, press on am or pm button (see pointer 1 in Figure 87 b) when you set the time. Press Save to confirm (see pointer 2 in Figure 87 b).

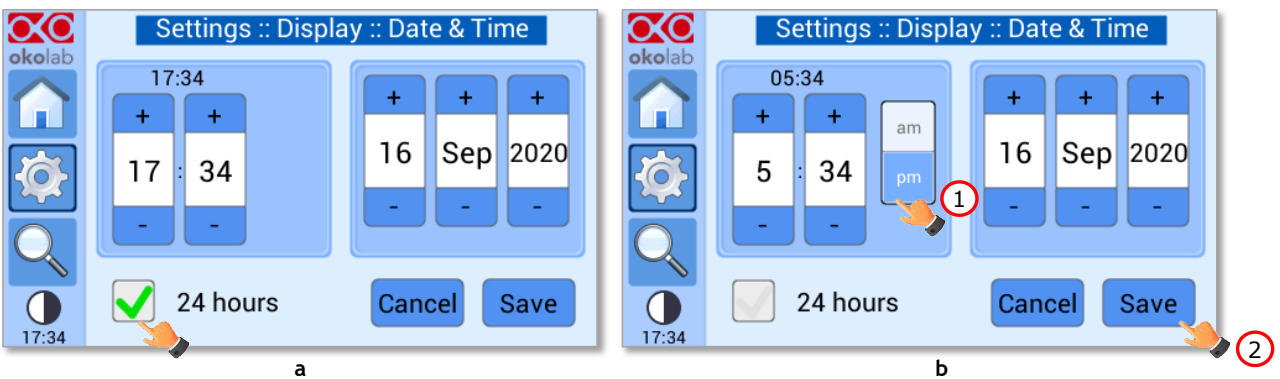



Figure 87. Settings – Display - Date and Time - 12 hour format (a - b).

8.2.8.5 Visual Effects

Press on the icon  to enter the Display visual effects menu, see Figure 88. Settings – Display - Visual effects (a – b).

a.

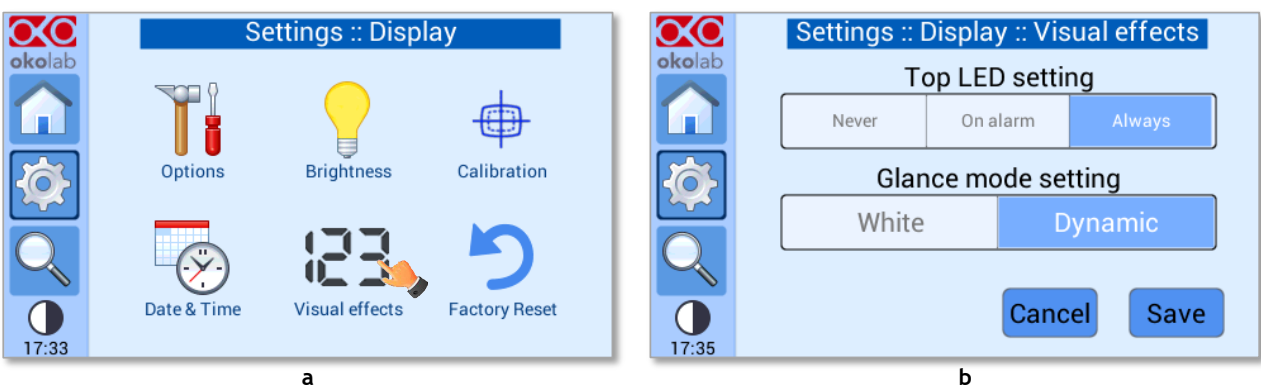




Figure 88. Settings – Display - Visual effects (a – b).

- **TOP LED Settings.** The TOP LED settings allows you to establish when the TOP LED should be illuminated: if you select *Never*, the Top LED will never illuminate, if you select *On Alarm*, the TOP LED will illuminate only when UNO-CONTROLLER is in Alarm Status. If you select *Always*, the TOP LED will always illuminate.
- **Glance Mode Setting** (see also paragraph 8.4). The Glance mode setting defines the colour of the TOP LED and of the digits displayed in Glance Mode. If you select *White*, the TOP LED illuminates in white colour (according to the criterion selected in TOP LED setting) and the digits displayed in Glance Mode are white. If you select *Dynamic* the colour of the TOP LED and the colour of the digits in Glance Mode follow the colour coding reported in 8.1.3.

Tip ► To swap between Icon and Glance mode press on the icon  (see paragraph 8.4).

8.2.8.6 Factory Reset

To reset the display settings, press on the icon  (see Figure 89 a) and press *Start* to confirm (see Figure 89 b).

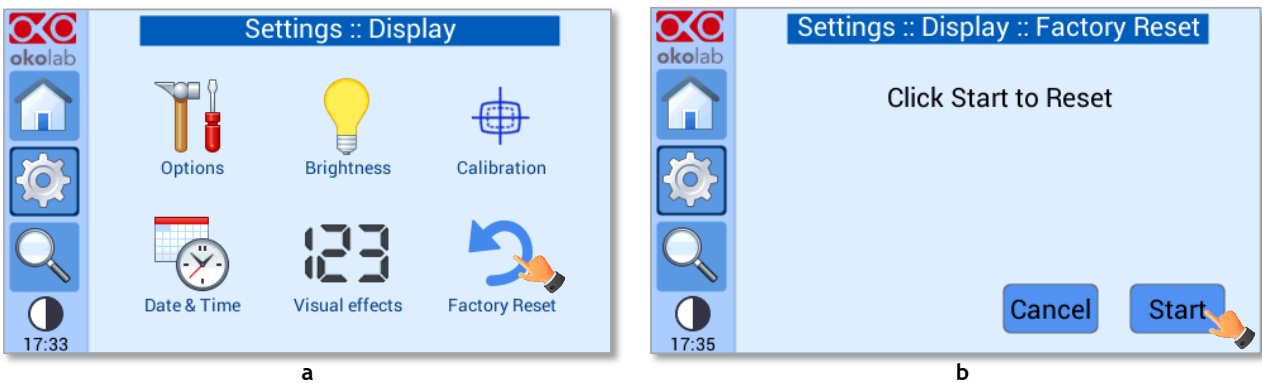



Figure 89. Settings – Display - Factory Reset (a - b).

8.2.8.7 Password

Press on *Password* icon  (see Figure 90 a) to access to password settings page and flag on *Password Enabled* to enable the password use (see Figure 90 b).

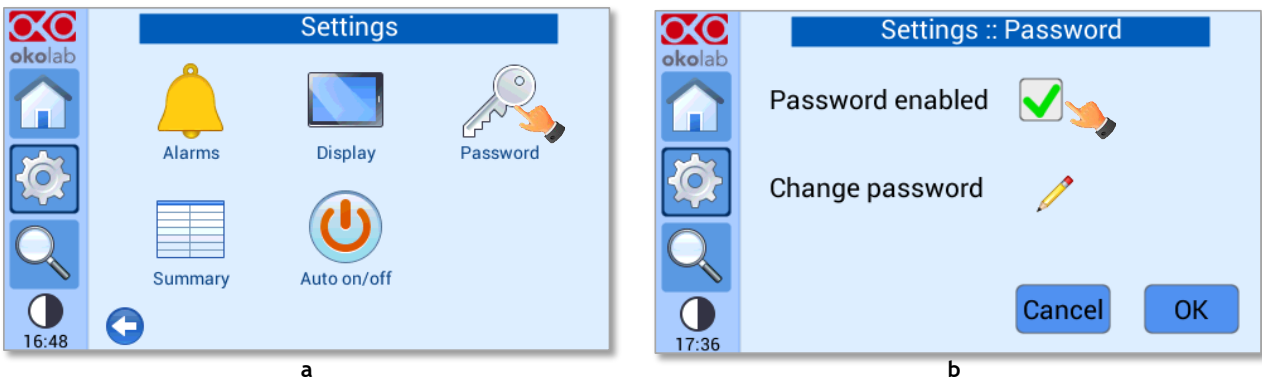



Figure 90. How to enter the Password menu (a - b).

Note ► The default password is *okolab*.

Note ► If you forgot the password, use the restore password reported on the certificate attached to UNO-CONTROLLER.

To change the password, press on the icon  (see Figure 91) and follow the indications that will appear.

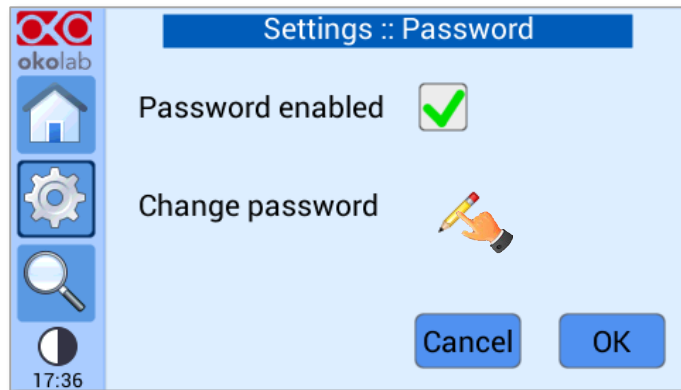



Figure 91. Settings – Password - Change password.

8.2.8.8 Summary

Press on the Summary icon  (see Figure 92 a) to enter the summary page, which reports technical information.

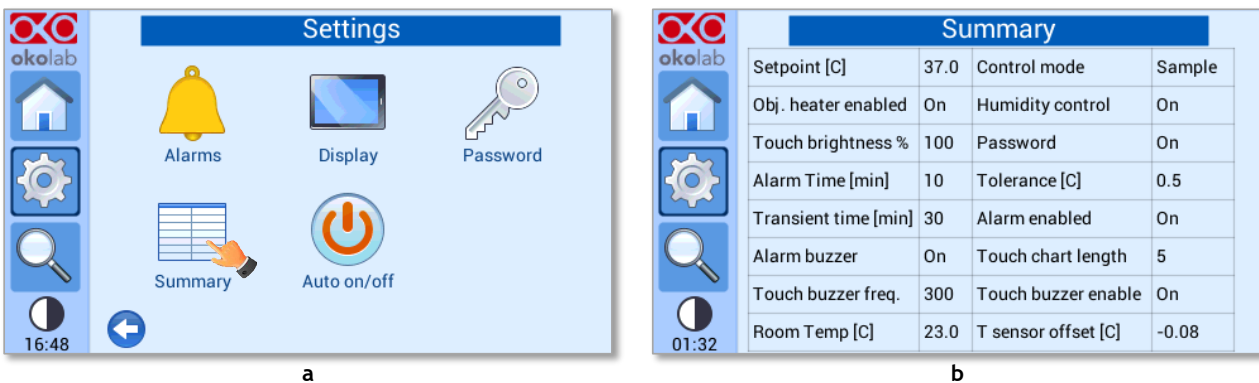



Figure 92. How to enter the Summary page (a – b).

Note ► This page contains data useful for technical/control reasons. In case you requested support from one of Okolab engineers you may be asked for some of these data.

8.2.8.9 Auto on/off

UNO-CONTROLLER can be programmed to turn on and/or turn off automatically at specific times. Press Auto on/off icon  (see Figure 93 a) to enter Auto on/off menu (see Figure 93 b).

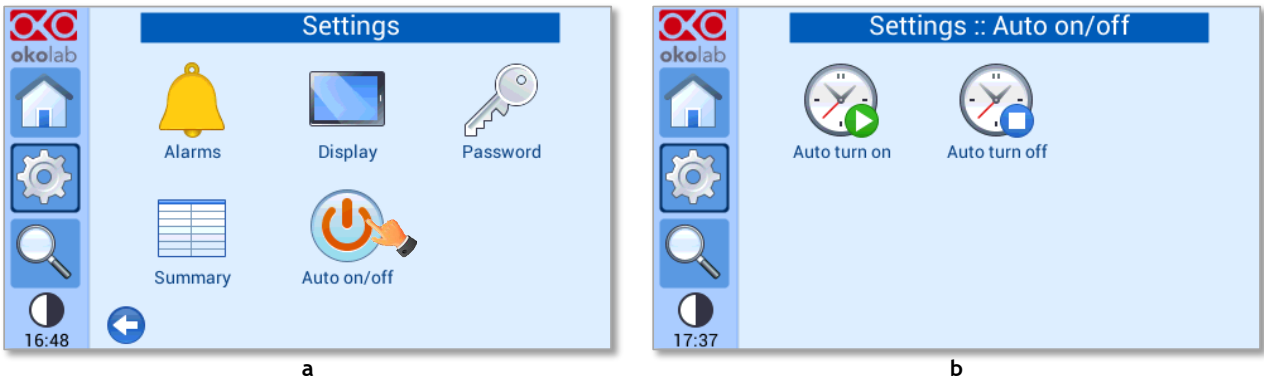



Figure 93. How to enter the Auto on/off menu (a - b).

Press on Auto turn on icon  to enter in Auto Turn on menu (see Figure 94 a). Set the switching on time, the first number is for setting hour (from 0 to 23), the second number is for minutes (see pointer 1 in Figure 94 b). If you select:

- *Disable*: UNO-CONTROLLER will not turn on automatically (see pointer 2 in Figure 94 b).
- *Every day*: UNO-CONTROLLER will turn on automatically every day at set time (see pointer 3 in Figure 94 b).
- *Specific days*: UNO-CONTROLLER will turn on automatically at set time on selected days (see pointer 4 in Figure 94 b). Flag the desired days and press *OK* (see Figure 95).

Click on *Save* to confirm or *Cancel* to undo (see pointer 5 in Figure 94 b).

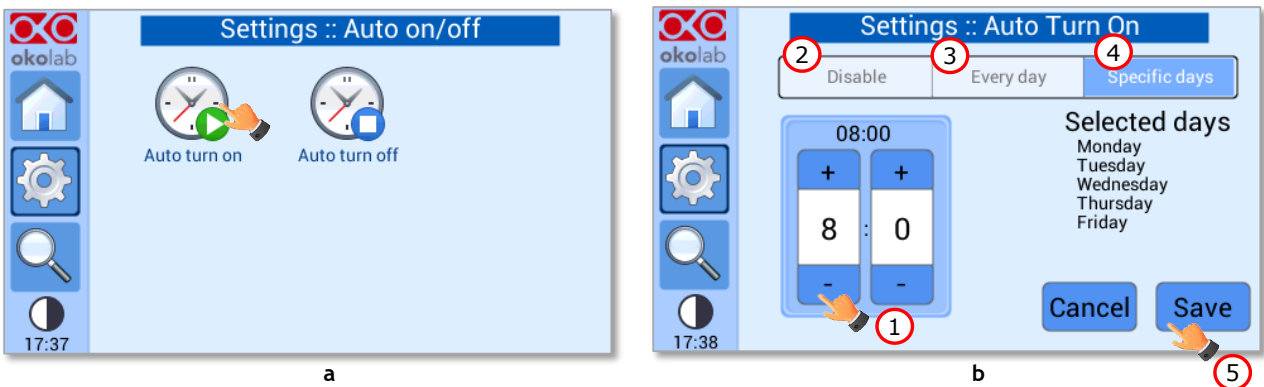


Figure 94. Settings – Auto on/off- Auto Turn On (a - b).

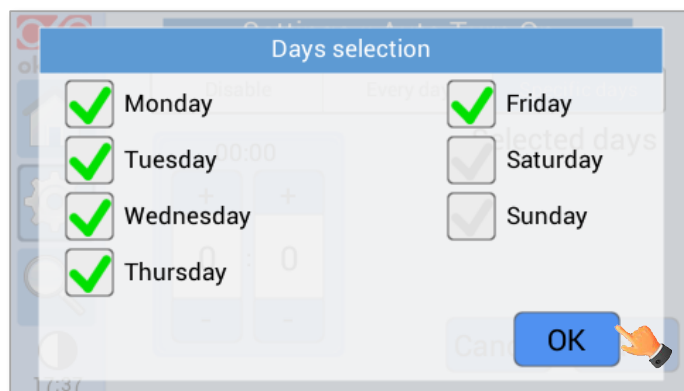



Figure 95. Settings – Auto on/off- Auto Turn On – days selection.

Note ► Auto turn on procedure's description perfectly fits also to the Auto turn off procedure.

8.3 Status Overview

To open the *Status* page, press on the icon  as show in Figure 96 a.

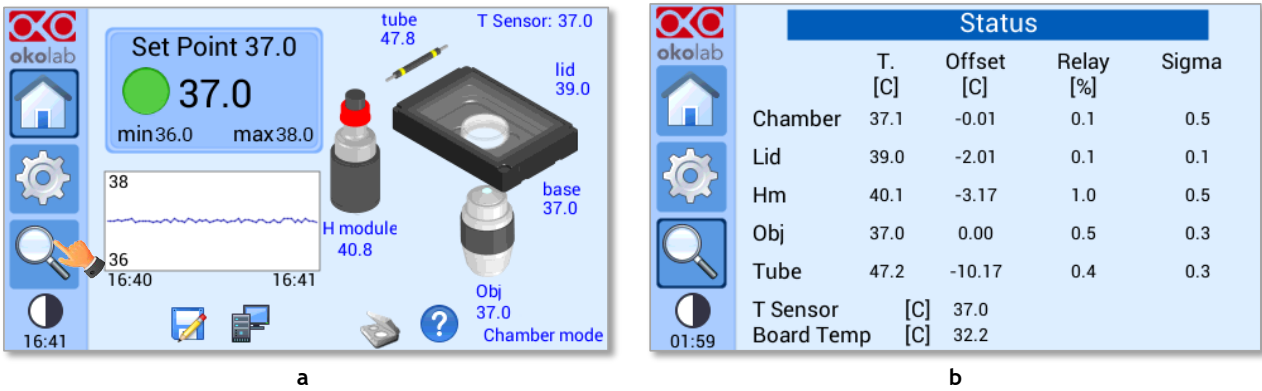



Figure 96. How to enter the Status Overview page (a - b).

Note ► This page contains data useful for technical/control reasons. In case you requested support from one of Okolab engineers you may be asked for some of these data

8.4 Icon and Glance Mode View

UNO-CONTROLLER features two display modalities: *Icon mode* and *Glance Mode*, as shown in Figure 97 a and b. You can swap between the two display modalities by pressing on icon .

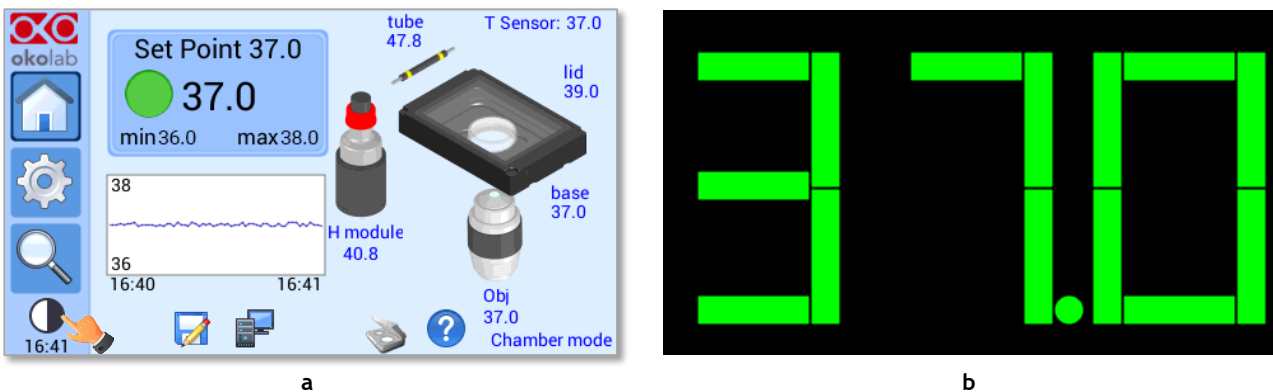



Figure 97. Icon Mode and Glance Mode (a - b).

8.5 Info page



Press the icon  to access the Info Page, as shown in Figure 98 a. This page contains the information related to the UNO-CONTROLLER version (as shown in Figure 98 b).

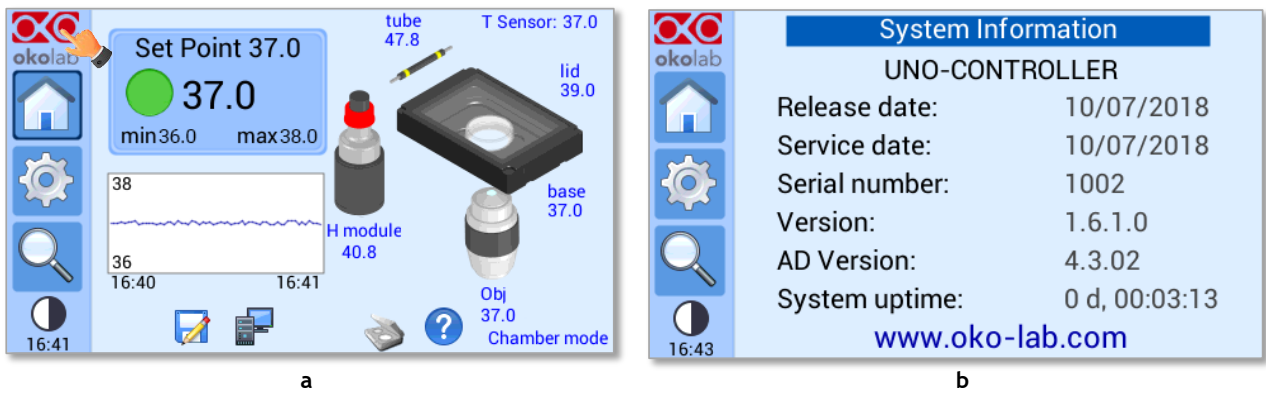


Figure 98. How to enter the Info Page (a - b).

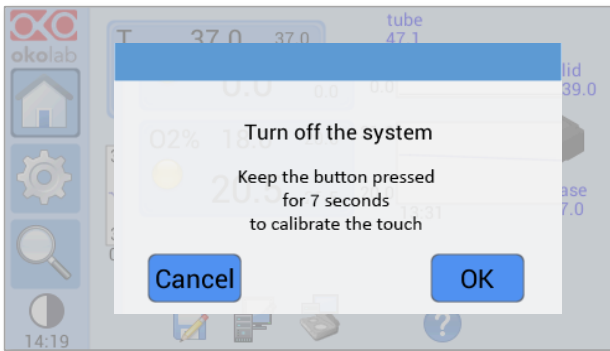
Tip ► Please have this information handy when contacting Okolab for support

9 Touch Screen Calibration

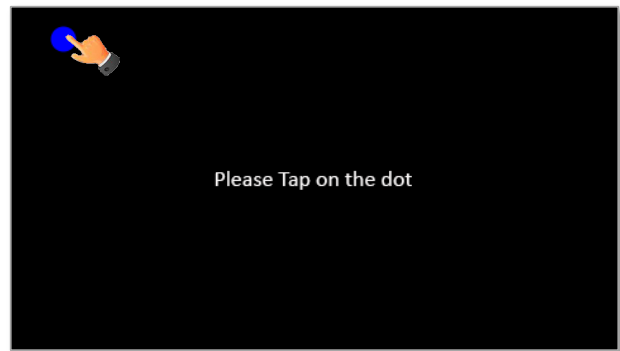
Keep pressed the *ON/OFF* button on UNO-CONTROLLER for 7 seconds to start the Display Calibration (see Figure 99). While holding the button, the pop-up message shown in Figure 100 a appears. Then tap blue calibration dots until the calibration is complete (see Figure 100 b).



Figure 99. Display Calibration.



a



b

Figure 100. Start Touch Screen Calibration (a - b).

10 Cleaning & Maintenance

Cleaning

UNO-CONTROLLER: external surfaces can be cleaned like reported as follows:

- Turn the device off and unplug all power cables.
- Dampen a soft microfiber cloth with 70% ethyl alcohol solution and clean the treated surface for one minute.
- Do not pour or spray any liquid directly on the device.
- Keep acid solvents away from the device. They might cause corrosion and discoloration.

Humidifier Bottle could be mostly exposed to algae and fungi formation due to the presence of warm water. It is recommended that users empty the Humidity Bottle once per week, and to clean both the glass and metal parts by using 70% ethyl alcohol solution with a one minute application time. Before refilling the bottle, it is important to flush excess alcohol by using distilled water.

Objective Heater: Remove the objective heater from the microscope objective. Clean the flexible heating band with a soft microfiber cloth dampened with a 70% ethyl alcohol solution. Treat the surface for one minute. Clean the microscope objective following the cleaning instructions provided by the microscope supplier. At this point you can put the objective heater back onto the microscope objective.

Maintenance

- Verify periodically the status of all hoses/tubing. If some hoses/tubing is damaged, contact Okolab to receive assistance.
- After 2 years, disconnect all polyurethane tubing, cut the last 1 cm of the tubing and reconnect them.
- Replace the PTFE filter each 2-3 months of continuous operation or if you see water in the inner part of the filter.
- Okolab Air pumps (OKO-AP) have to be replaced every 18-24 months.

11 Support

To contact one of our engineers please write to support@oko-lab.com or contact us through the live chat in www.oko-lab.com. You can request a remote support session anytime.

Please, do not hesitate to contact Okolab should you need any further commercial information or technical support.

For **HARDWARE SUPPORT:** sibillo@oko-lab.com
Phone +39 081 806 3470
Fax: +39 081 876 4410
Mobile: +39 348 96807 18

For **COMMERCIAL SUPPORT WORLDWIDE:** lanzaro@oko-lab.com
Phone +39 081 806 2624
Fax: +39 081 876 4410
Mobile: +39 348 96807 17

For **COMMERCIAL SUPPORT US&CANADA:** foppiano@oko-lab.com

For **COMMERCIAL SUPPORT CHINA:** tong@oko-lab.cn

12 Technical Specifications

UNO-T- Technical Specifications	
Temperature	Control Range: 3°C above ambient temperature (minimum temperature set point 25°C) to 60°C Step size: 0.1°C Accuracy: <ul style="list-style-type: none"> ± 0.1°C in Sample Control mode ± 0.3°C in Chamber Control mode, if the Room Temperature is stable within ± 1°C.
Power Supply	
UNO-CONTROLLER – Supply Voltage	24 V-DC
Power Consumption	120 W max
Dimension	
UNO-CONTROLLER (LxWxH)	129mmx125mmx104mm
UNO-CONTROLLER Weight	0.400 Kg

Table 5. UNO-T Technical Specifications.

UNO-T-H-PREMIXED – Technical Specifications	
Temperature	Control Range: 3°C above ambient temperature (minimum temperature set point 25°C) to 60°C Step size: 0.1°C Accuracy: <ul style="list-style-type: none"> ± 0.1°C in Sample Control mode ± 0.3°C in Chamber Control mode, if the Room Temperature is stable within ± 1°C.
GF-REGULATOR input gas	Premixed Gas supply The premixed gas tank must be equipped with a pressure regulator to decrease the pressure from the pressure tank to 4 barg (58 psig).
GF-REGULATOR input gas connector	Push to fit connector for 6 mm O.D. rigid tube
GF-REGULATOR output gas	0.2 – 1.2 barg
GF-REGULATOR flow rate	0.1 - 0.4 l/min
Humidification Power	85% - 90% Relative Humidity if the Room Temperature is stable within ±1°C at 23°C, the GF-MIXER-HM (Humidity Module) is installed away from heating and air conditioning vents and windows /doors that are frequently open.
Power Supply	
UNO-CONTROLLER – Supply Voltage	24 V-DC
GF-MIXER-HM (Humidity Module) – Supply voltage	24 V DC
Power Consumption	120 W max
Dimension	
UNO-CONTROLLER (LxWxH)	129mmx125mmx104mm
UNO-CONTROLLER Weight	0.400 Kg
Humidifier	diameter 72 mm, height 190 mm

Table 6. UNO-T-H-PREMIXED Technical specifications.

UNO-T-H-CO2- Technical Specifications	
Temperature	Control Range: 3°C above ambient temperature (minimum temperature set point 25°C) to 60°C Step size: 0.1°C Accuracy: <ul style="list-style-type: none"> • ± 0.1°C in Sample Control mode • ± 0.3°C in Chamber Control mode, if the Room Temperature is stable within ± 1°C.
Pressure Gauge – input gas	CO2 gas supply The CO2 tank must be equipped with a pressure regulator to decrease the pressure from the pressure tank to 2 barg (29 psig).
Pressure Gauge – input gas connector	Push to fit connector for 6 mm O.D. rigid tube
2GF-MIXER	CO2 Control Range in air: 0 -15 % Accuracy: ±1% CO2 flow rate Range: 0.013 – 0.13 l/min CO2 inlet connector: Push to fit connector for 6 mm O.D. rigid tube Air flow rate Range: 0.1 – 1.0 l/min Air inlet connector: Push to fit connector for 6 mm O.D. rigid tube Gas outlet connector: Push to fit connector for 6 mm O.D. rigid tube
OKO-AP Outlet pressure	1.3 bar (19 psi)
OKO-AP Outlet flow rate	<ul style="list-style-type: none"> • Low Flow: 0 – 0.5 l/min • High Flow: 0.5 – 1.0 l/min
Humidification Power	85% - 90% Relative Humidity if the Room Temperature is stable within ±1°C at 23°C, the GF-MIXER-HM (Humidity Module) is installed away from heating and air conditioning vents and windows /doors that are frequently open.
Power Supply	
UNO-CONTROLLER – Supply Voltage	24 V-DC
GF-MIXER-HM (Humidity Module) – Supply voltage	24 V DC
OKO-AP - Supply Voltage	12 V-DC
Power Consumption	120 W max
Dimension	
UNO-CONTROLLER (LxWxH)	129mmx125mmx104mm
UNO-CONTROLLER Weight	0.400 Kg
OKO-AP (LxWxH)	96mmx160mmx57mm
OKO-AP Weight	0.350 Kg
Humidifier Bottle	diameter 72 mm, height 190 mm
2GF-MIXER (LxWxH)	126mmx200mmx178mm
2GF-MIXER Weight	3.0 Kg

Table 7. UNO-T-H-CO2 Technical Specifications

13 Troubleshooting

We have collected in the table below some frequently asked questions, please contact Okolab if you need support.

Symptom	Probable cause	Remedy
Acoustic alarm sounds	The current temperature values are far temperature set-points	Check the cable connections and if the problem is still present contact Okolab
Humidifier is not showing bubbles	Not properly inserted tubes	Strongly push the tube into the Humidifier
Data download does not start	USB pendrive is not correctly formatted	Make sure that USB pendrive is FAT32 formatted
	USB pendrive is damaged	Format your USB pendrive using FAT32 file system
Calibration/alarm events are not logged	Internal memory is full (a warning icon in homepage is present)	Erase the full memory. If you need this information, download it before erasing the data
The device does not log the data on the internal memory but only on the USB pendrive	Internal memory is full (a warning icon in homepage is present)	Erase the full memory. If you need this information, download it before erasing the data
The screen does not respond properly or not at all	The display is not calibrated	Press and hold the power button for more than 10 seconds and the touch calibration will start

Table 8. Troubleshooting

14 Figure List

Figure 1. UNO-T Equipment Overview	5
Figure 2. UNO-T-H-PREMIXED Equipment Overview	6
Figure 3. UNO-T-H-CO2 Equipment Overview.....	7
Figure 4. DATA LOG software.....	8
Figure 5. UNO-CONTROLLER Left Panel Overview.	9
Figure 6. UNO-CONTROLLER Rear Panel Overview.....	9
Figure 7. UNO-CONTROLLER Front Panel Overview.....	10
Figure 8. Chamber Base and Chamber Lid - Connection.....	11
Figure 9. Humidifier - Assembly	12
Figure 10. Heated Tube - Assembly.....	13
Figure 11. GF-MIXER-HM - Connection.	13
Figure 12. GF-REGULATOR - front and rear view (a - b).....	14
Figure 13. UNO-T-H-PREMIXED - Gas connection.	15
Figure 14. GF-REGULATION - Use	16
Figure 15. UNO-T-H-CO2 - Inlet gas connection.....	17
Figure 16. OKO-AP – Low Flow and High Flow.....	17
Figure 17. OKO-AP – Power switch.	17
Figure 18. UNO-T-H-CO2 – TUBE-C connection.	18
Figure 19. 2GF-MIXER - Graduated scales.....	19
Figure 20. T Sensor - Connection.....	20
Figure 21. OBJ-COLLAR - Assembly.....	20
Figure 22. OBJ-COLLAR - Connection	21
Figure 23. MINI-USB-OTG cable - Connection.....	21
Figure 24. MINI-USB cable - Connection.	22
Figure 25. RS232 serial cable - Connection.	22
Figure 26. Homepage of UNO-CONTROLLER Touch Screen Display.....	24
Figure 27. How to change the Temperature Setpoint (a - b).....	25
Figure 28. Graph view page (a - b).....	25
Figure 29. Status Indicator and TOP LED.	26
Figure 30. How to enter the Settings menu (a - b).	27
Figure 31. Settings menu (a -b).	27
Figure 32. How to enter the Control Mode menu (a - b).	27
Figure 33. Settings – Control Mode – Chamber Control mode (a - b).	28
Figure 34. Settings – Control Mode – Chamber Control mode – Offset (a - b).	28
Figure 35. Settings – Control Mode – Sample Control mode (a - b).	29
Figure 36. T Sensor attached on the bottom of the Petri dish (a -b).	30
Figure 37. SENSOR LID-35 for 35 mm Petri dish.....	30
Figure 38. Settings – Control Mode – Sample Control mode – Open Incubator (a - b).	31
Figure 39. How to enter the Chamber & Insert menu (a - b).	31
Figure 40. Settings - Chamber & Insert – Chamber selection (a -b).	32
Figure 41. Settings - Chamber & Insert – Insert selection (a -b).	32
Figure 42. Settings - Chamber & Insert – Offset (a - b).....	32
Figure 43. Ho to enter the Obj, Heater menu (a -b).	35
Figure 44. Settings – Obj. Heater – Ramp rate (a - b).	35
Figure 45. Settings – Obj. Heater –Enabled - menu (a - b).....	36
Figure 46. Settings – Obj. Heater –Disabled (a -b).....	36
Figure 47. How to enter the Humidity menu (a -b).	37
Figure 48. Settings - Humidity – menu (a- b).....	37
Figure 49. Settings – Humidity – Offset (a - b).	38
Figure 50. Settings – Humidity – Disabled	38
Figure 51. How to enter the Calibrations menu (a - b).	38
Figure 52. Settings - Calibrations - menu (a - b).....	39
Figure 53. Settings – Calibrations - Chamber (a - b).....	39
Figure 54. Settings – Calibrations - Chamber – Log (a - b).	40
Figure 55. T Sensor attached on the bottom of the Petri dish (a -b).	41
Figure 56. Settings – Calibrations – Chamber – Calibrate (a - b).....	41
Figure 57. Settings – Calibrations – Chamber – Calibrate – Options (a - b).	42
Figure 58. Settings-Calibrations-T Sensor (a - b).....	42
Figure 59. Settings – Calibrations – T Sensor - Log (a - b).	42
Figure 60. Settings – Calibrations – T Sensor - Factory (a - b).....	43
Figure 61. Settings – Calibrations – T Sensor - Set (a - b).	43
Figure 62. Settings – Calibrations - Obj. Heater (a - b).	44
Figure 63. Settings – Calibrations – Obj. Heater - Log (a - b).....	44
Figure 64. T Sensor attached on the bottom of the Petri dish (a -b).	45
Figure 65. Settings – Calibrations – Obj. Heater - Manual (a -b).	45
Figure 66. T Sensor attached on the bottom of the Petri dish (a -b).	46

Figure 67. Settings – Calibrations – Obj. Heater – Calibrate (a – b).....	47
Figure 68. Settings – Calibrations – Obj. Heater – Calibrate – Options (a – b).....	47
Figure 69. How to enter the Logging menu (a – b).....	48
Figure 70. Settings – Logging - menu (a-b).....	48
Figure 71. How to enter the Logging menu from the Homepage.....	48
Figure 72. Settings – Logging – Logging time (a – b).....	49
Figure 73. Settings – Logging – File name suffix (a – b).....	49
Figure 74. Downloaded files on the pen drive.....	49
Figure 75. Settings – Logging - Internal log (a - b).....	50
Figure 76. Settings – Logging - Download to USB (a - b).....	50
Figure 77. Settings – Logging - Download to USB - Reminder to connect the USB drive (a – b).....	50
Figure 78. Homepage - Logging to USB drive.....	51
Figure 79. How to enter the Alarms menu (a -b).....	51
Figure 80. Settings – Alarms - Disabled.....	52
Figure 81. Settings – Alarms – Log (a - b).....	52
Figure 82. How to enter the Display menu (a – b).....	53
Figure 83. Settings – Display - Options (a – b).....	53
Figure 84. Settings – Display - Brightness (a – b).....	54
Figure 85. Settings – Display - Calibration.....	54
Figure 86. Settings – Display - Date and Time (a – b).....	55
Figure 87. Settings – Display - Date and Time - 12 hour format (a - b).....	55
Figure 88. Settings – Display - Visual effects (a – b).....	55
Figure 89. Settings – Display - Factory Reset (a - b).....	56
Figure 90. How to enter the Password menu (a - b).....	56
Figure 91. Settings – Password - Change password.....	57
Figure 92. How to enter the Summary page (a – b).....	57
Figure 93. How to enter the Auto on/off menu (a – b).....	58
Figure 94. Settings – Auto on/off - Auto Turn On (a – b).....	58
Figure 95. Settings – Auto on/off - Auto Turn On – days selection.....	58
Figure 96. How to enter the Status Overview page (a - b).....	59
Figure 97. Icon Mode and Glance Mode (a – b).....	59
Figure 98. How to enter the Info Page (a – b).....	60
Figure 99. Display Calibration.....	61
Figure 100. Start Touch Screen Calibration (a – b).....	61

15 Table List

Table 1. GF-REGULATOR- Pressure vs Gas Flow Rate.....	15
Table 2. 2GF-MIXER flow rate regulation for 5% CO2 concentration.....	19
Table 3. Sensors lid codes.....	30
Table 4. Compatible Okolab H301 incubating chamber List.....	34
Table 5. UNO-T Technical Specifications.....	64
Table 6. UNO-T-H-PREMIXED Technical specifications.....	64
Table 7. UNO-T-H-CO2 Technical Specifications.....	65
Table 8. Troubleshooting.....	66

16 Manual Revision Table

Revision Number	Additions or changes	Date
01	First Emission	January 2021
02	Calibration	April 2021

WARRANTY

Okolab S.r.l. warrants “UNO-T, UNO-T-H-PREMIXED, UNO-T-H-CO2” to be free of defects in materials and workmanship for a period of one year starting from invoice date. If the unit malfunctions, it must be returned to the factory for evaluation. If the equipment has to be returned to the factory, please ensure that is carefully and properly packed. Okolab S.r.l. accepts no responsibility for damage due to unsatisfactory packing. If the unit is found to be defective, it will be repaired or replaced at no charge. This warranty does not apply to defects resulting from any actions of the purchaser. Components which wear are not warranted. Okolab S.r.l. neither assumes responsibility for any omissions or errors nor assumes liability for any damage that may results from improper use of its products in accordance with information provided by Okolab S.r.l. Okolab S.r.l. warrants only the parts manufactured by Okolab S.r.l to be free of defects. Okolab S.r.l. makes no other warranties or representations of any kind whatsoever, express or implied, except that of title, and all implied warranties including any warranty of merchantability and fitness for a particular purpose are hereby disclaimed. LIMITATION OF LIABILITY: the total liability of Okolab S.r.l. shall not exceed the purchase price of the component upon which liability is based. In NO event shall Okolab S.r.l. be liable for consequential, incidental or special damage.