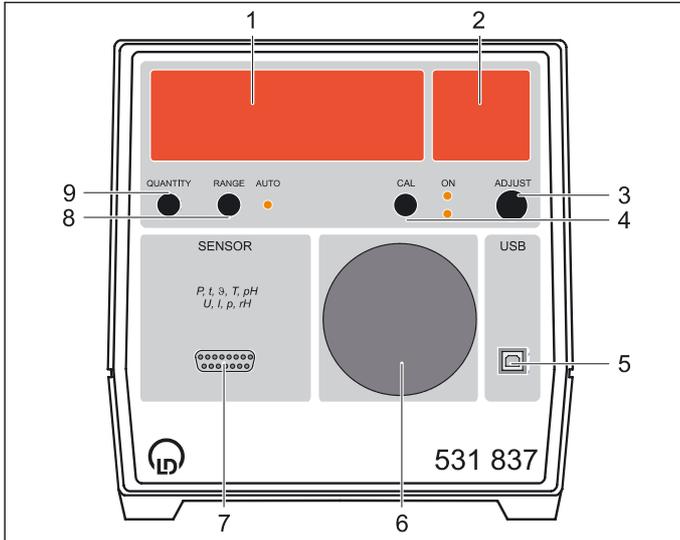


04/10-W00-Wie



## Instruction sheet 531 837

### Universal measuring instrument biology (531 837)

- 1 Numerical display
- 2 Unit display
- 3 Pushbutton ADJUST
- 4 Pushbutton CAL, with 2 status LEDs
- 5 USB port
- 6 Loudspeaker
- 7 Sensor input
- 8 Pushbutton RANGE, with status LED
- 9 Pushbutton QUANTITY

## Safety notes

The universal measuring instrument biology complies with the safety requirements for electrical measuring, control and laboratory equipment in accordance with DIN EN 61010 part 1, and it is constructed in compliance with safety class I. The device is intended for use in dry rooms that are suited for the operation of electrical equipment and devices.

If the device is used as prescribed, its safe operation is guaranteed. However, safety is not guaranteed if the device is improperly used or carelessly handled. If it has to be assumed that safe operation is no longer possible (e.g. in the case of visible damage), shut the device down immediately.

- When putting the device into operation for the first time, check whether the value for the mains voltage indicated on the rating plate (back of housing) agrees with the local value.
- Before putting the device into operation, examine the housing for damage. In case of malfunction or visible damage shut the device down and make sure that it is not used inadvertently.
- Connect the device only to socket-outlets with grounded neutral wire and protective conductor.
- Replace a defective fuse only with a fuse that corresponds to the original value.
- Always keep the ventilation slots of the housing free in order to ensure sufficient air circulation.
- Allow only skilled persons to open the device.

## 1 Description

The universal measuring instrument biology (UMI Biology) is designed for use in lectures, demonstration experiments in the classroom and practical exercises. It has a large digital indicator and provides for the connection of numerous sensors S for measuring pulse, skin resistance, blood pressure, hearing threshold, temperatures, pressure, oxygen and carbon dioxide concentration, illuminance, relative humidity, voltage or current.

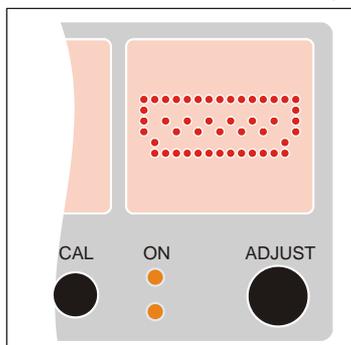
If the device is connected to a computer, it is also possible to display and evaluate time-resolved measurement curves.

Meas. quantity	Suitable sensor S
Pulse	Pulse Sensor S (524 0471)
Blood pressure	Blood Pressure Sensor S (524 0501)
Skin resistance	Skin Resistance Sensor S (524 0481)
Hearing Threshold	Hearing Threshold Adapter S (524 085)
pH-value	pH-Adapter S (524 0672) with sensor
Temperature	Temperature sensor S, NTC (524 044)
Temperature, differential temp.	NiCr-Ni adapter S (524 0673) with sensor
Relative pressure	Pressure sensor S, $\pm 2000$ hPa (524 064)
Relative pressure	Pressure sensor S, $\pm 70$ hPa (524 066)
Absolute pressure	Absolute pressure sensor S, 1500 hPa (524065)
Oxygen concentration	O <sub>2</sub> -Sensor (524 0521)
Carbon Dioxide concentration	CO <sub>2</sub> -Sensor S (524 083)
Illuminance	Lux Adapter S (524 0511) with sensor
Rel. humidity	Humidity sensor S (524 0572)
Voltage, current	UI sensor S (524 062)

## 2 Operation

### Sensor input (SubD15 socket)

for connecting a suitable sensor S. The connected sensor is recognized by the device automatically and the currently measured value is displayed automatically. If no sensor is connected, the open sensor input is displayed in the unit display.



### Loudspeaker

Certain Sensors S use the loudspeaker for an acoustic signal.

The Pulse Sensor S and the Blood Pressure Sensor S emit a synthetic pulse sound each time a heartbeat is detected. The volume of this sound is proportional to the real pulse amplitude. Therefore, systolic and diastolic blood pressure can be estimated from the volume variation of the pulse.

When using the Hearing Threshold Adapter S, the loudspeaker emits a sinewave.

The volume can be adjusted with the "Adjust" rotary knob, when using the Hearing Threshold Adapter S please make sure to select the quantity "volume" (unit "dB" is displayed).

### Pushbutton RANGE

switches cyclically from a measuring range to the next one or switches the automatic range selection on (status LED AUTO shines).

### Pushbutton QUANTITY

switches cyclically from display of one measurement quantity (indicated by the unit) to the next one.

QUANTITY enables to switch over f.i. between the temperatures of the NiCr-Ni Adapter S.

For voltage and current, the display can be switched over to RMS values (indicated by "~").

### Pushbutton CAL

for calibrations of the actual measuring quantity.

1 or 2 point calibration depending on the sensor. The calibration status is shown by the two LED's.

The upper LED shows an offset calibration (adjustment), the lower LED a factor calibration (modification of steepness).

### a) Calibration

Wait until a stable measuring value (f.i. with calibration solution) is shown.

Then push CAL (one of the CAL-LED's is blinking).

Adjust the set-point value with ADJUST (exception: For the Lux Adapter S, the printed factor of the sensor must be adjusted) and then press again CAL (LED light on).

For pH- und O<sub>2</sub>-measurements it is recommendable to use a second calibration point. For this, change the calibration solution and repeat calibration.

For CO<sub>2</sub>-measurements the set-point adjustment is limited around the normal concentration of fresh air (0,037 %).

### b) Saving and deleting of calibration

Each calibration for pH (1 or 2 points), oxygen concentration (1 or 2 points), carbon dioxide concentration (1 point) or illuminance (1 point) is saved automatically.

The calibration remains available after change of a measuring quantity or a sensor, or after switch-on of the instrument or of the software CASSY Lab.

Therefore start-up does not always require a new calibration. Nevertheless, due to ageing of electrodes calibration should be carried out from time to time.

The calibration is deleted by long pressing of CAL (1 s). The status LED's are then turning out.

## 3 Technical data

Meas. quantity:	see instruction sheet of the respective sensor S
Range(s):	see instruction sheet of the respective sensor S
Range selection:	automatic or manual
Calibration:	1 or 2 points (internally saved for pH, conductivity, oxygen and carbon dioxide concentration, illuminance)
Loudspeaker	for acoustic output
Numerical display:	5-digit, 7-segment display
Unit display:	7x25 LEDs
Digit height:	25 mm
Mains voltage:	see rating plate on the back of the housing
Fuse:	see fuse plate on the back of the housing
Dimensions:	20 cm x 21 cm x 23 cm
Weight:	approx. 2 kg
Scanning rate:	max. 10,000 values/s (for measuring curve shapes on a computer)
Measured values storage:	16,000 values (for measuring curve shapes on a computer)
USB port:	compatible with USB 1.x and 2.0 (full speed, isolated)
Developer information:	<a href="http://www.ld-didactic.com/software/cassy-s.html">http://www.ld-didactic.com/software/cassy-s.html</a>

## 4 Scope of supply

- 1 Universal measuring instrument biology
- 1 CASSY Lab software for Windows 98/ 2000/ XP/ Vista, with comprehensive help (unlimited use for the universal measuring instrument biology without activation code)
- 1 USB cable

## 5 Operation on a PC

### 5.1 Hardware and software installation

The installation of the hardware and software requires a properly configured computer with the operating system 98/2000/XP/Vista.

#### **Hardware installation:**

- Connect the UMI Biology to the computer via the USB cable.
- When the UMI Biology is connected to the computer for the first time, it is recognized by the operating system automatically, and the necessary drivers are installed.

Under Windows 98, the driver installation has to be confirmed manually:

- Confirm the dialog windows which appear with "Continue" and have the Windows installation CD ready.

#### **Software installation:**

- Insert the CD with the CASSYLab software.
- Call the program START.EXE.
- Select the desired language.

During the installation an activation code is requested. This code need *not* be entered for the UMI Biology.

After the installation, the software is found in the Start menu under "Programs" → "CASSYLab".

CASSYLab contains a comprehensive help for all of its functions. In order to get familiar with the program, it is recommended to call this help with F1 after starting the program or to read the manual on the CD-ROM.

CASSYLab can be deinstalled in "Control panel" under "Software".

Updates of the software (extensions, error corrections) are free available on our Internet server <http://www.ld-systeme.com/software/cassy-s.html>. There you also find the Developer Information (incl. source code) for creating your own software for the universal measuring instrument biology.

### 5.2 Operation of the UMI Biology on a computer

If the connected UMI Biology was recognized during the start of CASSYLab, a picture of the UMI Biology is displayed. After clicking on an input, the input is switched on. The measurement quantities, ranges and zero calibration are indicated in a settings window. The measurement quantity currently displayed on the UMI Biology can be selected with the pushbutton QUANTITY. The other two pushbuttons of the UMI Biology are inoperative.