Programming guide

for

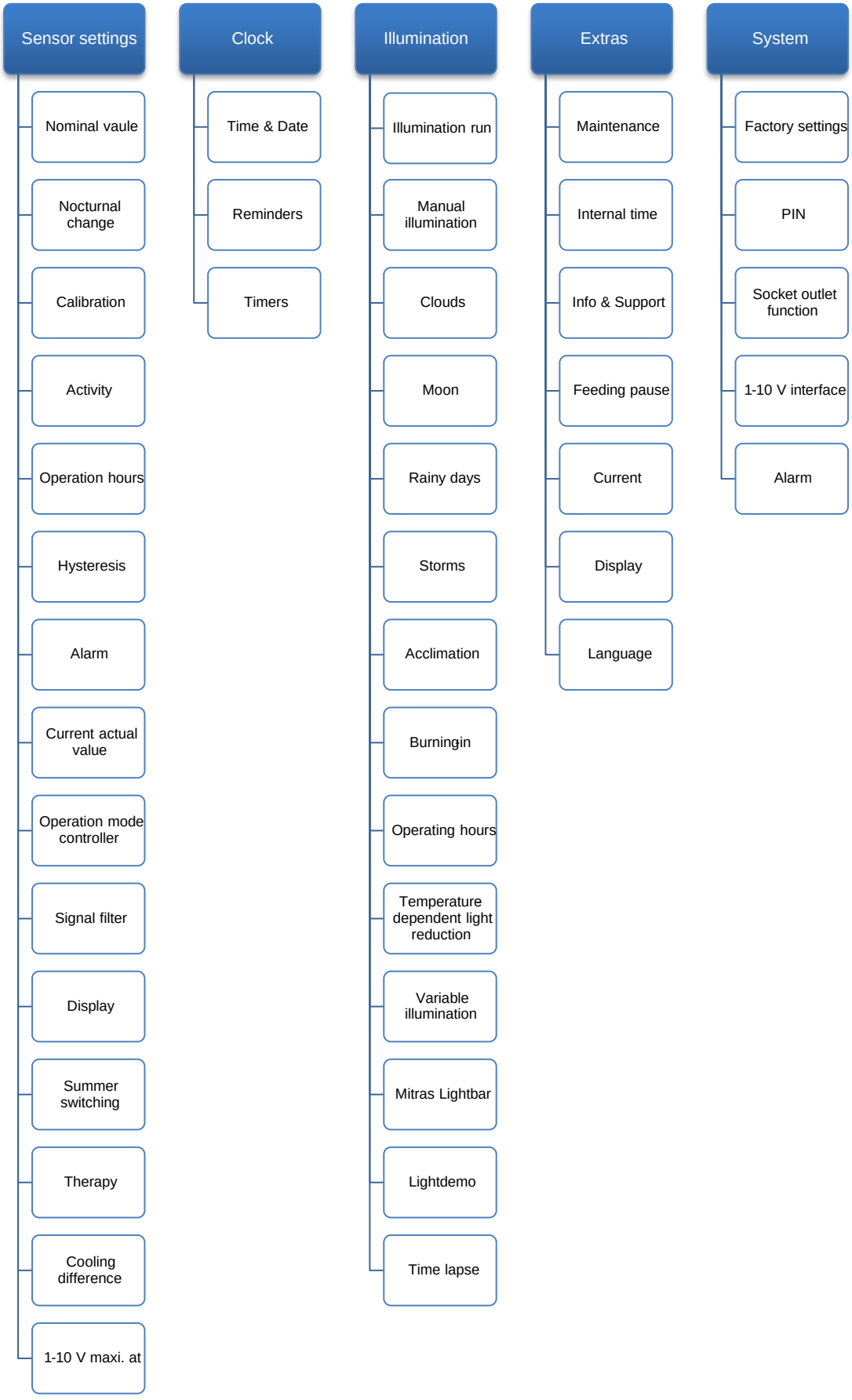
Aquarium computer, Pond computer and Terrarium computer

Models Light, Mini and Terra

Valid from firmware version 1.02

Contents

Below is an overview of the menu structure in *ProfiLux* when operating through the *ProfiLux* keypad (the structure in the PC Software *GHL Control Center* is similar)



1 Preface

Please read these chapters thoroughly before you start to make settings. When you have understood the general operational concept, it will be easier for you to program the *ProfiLux* quickly and target-oriented.

This programming manual puts emphasis on the configuration via the keys at the *ProfiLux*, the operation via the PC-software *GHL Control Center* deviates in some points from this description. But the single settings have the same meaning at the device and also in the PC-Software.

The operation via the keys, the indications on the display of the *ProfiLux* as well as the connection of peripheral equipment (sensors, powerbars, lamps, etc.) are described in the separate operating manual of your *ProfiLux* model, please read them also thoroughly

This programming guide is valid for these *ProfiLux* controllers:

- *ProfiLux Light*
- *ProfiLux Mini*
- *ProfiLux Terra*

The availability of certain functions and setting options described below depends on the ProfiLux model

1.1 Safety hints!

Never leave your aquarium, terrarium or pond without supervision for a longer time!
The *ProfiLux* system is able to support you in many tasks and can indicate error states, but it Ŏ l· y˝Ω ú NJŜLJ f l· ŎŜ l· N personal supervision and control on site!
The maximum time span without personal supervision depends on how long your aquarium, terrarium or pond can endure an error state without getting damaged significantly.

Always keep in mind that every technology can fail and that malfunctions never can be excluded!
A power-cut, inappropriate settings, a damage (e.g. caused by water or overvoltage) or just an unexpected operating condition can lead to fatal damages!

The manufacturer refuses any liability for (consequential) damages or losses related to the use of the *ProfiLux* system as far as legally permissible!

1.2 Preface regarding operational concept

The operational concept of all *ProfiLux* computers requires that you differentiate exactly between 2 groups of settings

- Setting of functions
  e.g. settings such as pH-nominal value, light intensity run of a lamp or behavior of pumps belong here
- Setting of hardware
  e.g. the function of a switchable socket (shall this socket be assigned to an illumination, to a timer or to a temperature sensor) or the function of a 0..10 V-interface (shall this interface be assigned to an illumination or to a pump) belong here

This concept seems to be unfamiliar at a first glance, but it offers a maximum of flexibility. One of the advantages is that a function can be modified extensively independently from the here assigned hardware. This concept makes it possible that you can e.g. select another socket for switching your heater while the corresponding temperature settings remain unchanged.

As soon as you have taken this concept in, you will appreciate its advantages

1.3 Examples for settings

Below are mentioned some typical examples for settings

1.3.1 How do I set the temperature control?

1. Setting of the function: Set the required nominal value, see *2.1 Nominal value*
2. Setting of the hardware: Set which switchable output (socket) is responsible for switching the heater, the ground heater and the cooling (if existing), see *6.3 Switching output*

1.3.2 How do I set the illumination?

1. Setting of the function: Set the illumination run according to your wishes, see *4.1 Illumination run*
2. Setting of the hardware: Set which switching output (for non-dimmable lamps), see *6.3 Switching output*, or which 1 – 10 V-interface (for dimmable lamps), see *6.4 1-10 V interface*, shall react to this illumination run.

1.3.3 How do I set the current pump control?

1. Setting of the function: Set the pump groups and the current pumps, see *5.5 Current*
2. Setting of the hardware: Set which switching output (for pumps that are not speed-controlled), see *6.3 Switching output*, or which 1 – 10 V-interfaces (for speed-controlled pumps), see *6.4 1-10 V interface*, shall react to the pump(s).

1.3.4 How do I set the timer activities?

1. Setting of the function: Set first the required timer, see *3.3 Timer*.
2. Setting of the hardware: Set which switching output (socket) shall be controlled by this timer, see *6.3 Switching output*

Summary: It is recommended to set first the function (illumination run, timer etc.) and after that the hardware (e.g. switching output and 1 – 10 V-interface)!

2 Sensor settings

Here you can make the settings which affect the sensors (except level sensors; their settings can be found beneath). First select the sensor whose settings you would like to change. If you have connected several sensors of the same type, then the numbering is as follows: The firmly built-in connections in *ProfiLux* have the lowest number, the numbering of additional connections on extension cards increases with the number of the slot in which the cards are plugged in.

Attention!	The sensors for pH, conductivity, redox and oxygen must be calibrated before the first use and thereafter regularly (all 2 – 4 weeks)! Check in any case if all sensors show plausible values!

In the sensor settings you can choose among the following options

2.1 Nominal value

Here you can set the nominal value (the value to which it shall be regulated). The nominal value and the current value (actual value) determine if it is regulated upwards or downwards

Hint

Control downwards: If the nominal value is undercut, then the control downwards is switched off, if the nominal value is exceeded by more as a half hysteresis (see *2.6 Hysteresis*), the control downwards is switched on again

Control upwards: If the current value exceeds the nominal value, then the control upwards is switched off, if the nominal value is undercut by more as a half hysteresis, then the control upwards is switched on again.

Overview of the setting options for the nominal value:

Sensor type	Minimum	Maximum	Standard	Resolution
pH	4.5	9.5	7.0	0.1
Temperature	1.0 °C	36.0 °C	26.0 °C	0.1 °C
Humidity	2.0%	98.0%	60.0%	0.1%
Air temperature	0.0 °C	50.0 °C	28.0 °C	0.1 °C

Hint

When the nominal value is adapted, then due to safety reasons, a possibly set nocturnal change is deactivated! This must be activated again afterwards, if necessary!

Hints for the temperature control

The heat dissipation of the illumination and the temperature outside can have an effect on the water temperature. If there is no possibility of cooling available, then it is possible that the nominal temperature is exceeded.

Depending on the difference of the desired and the current temperature, the heater resp. the cooling are switched. Here, the following states can occur:

Heater and bottom heater on / Only bottom heater on / Everything off / Only cooling on

ProfiLux is programmed in a way that the bottom heater attakes precedence over the heater. This enables an optimal heating of the substrate. The heater is then switched additionally if the bottom heater alone is not sufficient anymore.

2.2 Nocturnal change

With this setting, you can determine if the value to which it shall be regulated shall be changed at night. By default, this setting, the nocturnal change is switched off. If you have activated the nocturnal change with this, then you can set afterwards the value by which the value shall be changed at night.

Overview of setting options for the *nocturnal change*:

Sensor type	Minimum	Maximum	Resolution
pH	-1.0	1.0	0.1
Temperature	-6.0 °C	-0.1 °C	0.1 °C
Humidity	1.0%	50.0%	0.1%
Air temperature	-30.0 °C	-0.5 °C	0.1 °C

Hint

Nocturnal nominal value = nominal value + nocturnal change

2.3 Calibration

This function serves for the calibration of the pH-sensor. All other sensors need not (and cannot) be calibrated.

Only if *ProfiLux* has been calibrated with the connected pH-sensor, correct values can be determined. The calibration is always necessary for new sensors. Also due to the aging process of a sensor, the calibration should be repeated from time to time (all 2 ... 4 weeks). Please pay attention to the instructions of the sensor manufacturer. Before the sensor is dipped into a calibration fluid, the sensor has to be always dried carefully (blow out, shake, dry tissue)!

First the `Calibration tolerance` has to be entered (between 1 and 3) which is taken as a basis for the calibration. For old sensors it can occur that the measured value does not sufficiently stabilize and a calibration is not possible. Under certain circumstances, through an increase of the calibration tolerance it is possible to calibrate just this sensor although, of course at the cost of the accuracy of measurement. In principle, calibration processes should be carried out with the smallest possible calibration tolerance, this is normally 1.

Afterwards, for certain sensors you have the possibility to change the values to which it shall be calibrated

Overview of the calibration values

Sensor type	Calibration possible	Calibration values adjustable	Min. calibration value 1	Max. calibration value 1	Min. calibration value 2	Max. calibration value 2
pH	yes	yes	3.5	7.5	5.5	10.0

Now the calibration process itself follows

First of all, you are asked to dip the pH-sensor into a calibration fluid with the first calibration value. A subsequent pressing of *RETURN* starts the measurement process. After completion of the measurement you are asked to repeat the same procedure with a calibration fluid with the second calibration value. Also here the measurement process has to be started with *RETURN*

When the calibration process has ended, you are asked if the data shall be stored. If no errors have occurred, you have to confirm here with *Yes*.

After saving the calibration data the calibration must be checked without exception!
Check on both calibration points if the correct values are displayed, therefore immerse the sensor afterwards into both calibration fluids

Use the sensor for controlling tasks only when the correct function and calibration have been proved without any doubts!

2.4 Activity

Here you can set if the sensor and the herewith related measurement, recording and regulation shall be active (standard: *Yes*). If you set *No* here, then the regulation and sensor monitoring switches off and all switchable sockets connected with this sensor are deactivated. If this input is not used you should deactivate it, otherwise *ProfiLux* may assume a sensor defect and indicate an alarm. A deactivated sensor is displayed with - - - in the display.

2.5 Operation hours

In order to know how long a sensor has already been in use, there is a below operation hour meter. The operation hours are recorded cyclically every 1 h in the non-volatile storage. Through this, it is guaranteed that also in case of a power failure the operation hours are kept.

After the selection of the menu item `Operation hours` the operation hours of the sensor are displayed. After a few seconds have elapsed or a key has been pressed you are asked if the operation hour meter shall be *Reset?* A confirmation with *Yes* resets the operation hour meter to 0 h. This should of course only be done if the sensor is changed.

2.6 Hysteresis

The so-called hysteresis defines the interval between the switching points and is necessary to reduce the switching frequency. The here adjustable hysteresis covers the interval from the switch-on of the socket `Control downward` to the switch-on of the socket `Control upward` of the corresponding sensor.

For temperature sensors the here adjustable hysteresis covers the interval from the switch-on of the bottom heater up to the switch-off of the (main) heater, the switch-on of the cooler lies outside of the hysteresis so that the operation of bottom heater, heater and cooler at the same time is possible (see hint below).

The factory-provided hysteresis setting has normally not to be changed. A reduction of the hysteresis makes then sense if the regulation accuracy shall be increased. But through this, also the switching frequency is increased

Example with a pH-sensor	Nominal value = 7.0 and hysteresis = 0.4 The downwards-socket switches on at 7.2 and off again at 7.0, the upwards-socket switches on at 6.8 and off again at 7.0. You can recognize that the regulation oscillates around 7.1 resp. 6.9 and not exactly around the set nominal value (7.0). This is necessary to enable a use of upwards and downwards-regulation at the same time

Overview of the setting options for the hysteresis:

Sensor type	Minimum	Maximum	Standard	Resolution
pH	0.05	1.00	0.30	0.01
Temperature	0.15 °C	2.00 °C	0.20 °C	0.01 °C
Humidity	0.2%	15.0%	2.0%	0.1%
Air temperature	0.2 °C	3.0 °C	0.5 °C	0.1 °C

Hint for temperature sensors	It depends also on the set hysteresis, when the cooling gets active. The switch-on point of the cooling depends furthermore on the cooling difference (see *2.14 Cooling difference)* and can be calculated as follows T = Nominal temperature + 5/6 * hysteresis + cooling difference for a hysteresis of 0.2 °C results this T = Nominal temperature + 0.167 °C + cooling difference

2.7 Alarm

ProfiLux can monitor the current measured value of a sensor and in case of a too big deviation can react in different ways

First you have to set if the alarm shall be enabled. If the alarm has been activated then the `Maximum deviation` of the actual value from the nominal value has to be entered

Furthermore it can be set if in case of an alarm, the control shall be shut off (`Shut-off control?`)

After the activation of the alarm, the corresponding actual value is compared permanently with the nominal value. If the deviation (exceeding or undercut) is bigger than set under `Maximum deviation`, an alarm is triggered. During the comparison of nominal with actual value, the *hysteresis* as well as the possible *nocturnal change* are automatically considered, for temperature sensors furthermore the *cooling difference* is considered.

During an alarm the red alarm-LED blinks and the buzzer is activated depending on the set mode (see *6.5 Alarm*). Furthermore a switchable socket can be programmed in a way that it is switched on in case of an alarm

If the controller shut-off has been set for the alarm case, then in case of an alarm immediately all sockets are deactivated which are involved in the regulation of this sensor. The alarm settings should be made with highest caution. It has to be absolutely avoided that the alarm limits are exceeded during the normal operation

Overview of the setting options for alarm limits

Sensor type	Minimum	Maximum	Resolution
pH	0.5	3.0	0.1