GHL Doser 2.2 Maxi

Instruction Manual

Valid from Firmware Version 1.46

As of 2023-03-02

Table of Contents

GET THE MOST OUT OF YOUR GHL PRODUCT 5

1 SAFETY INSTRUCTIONS 5

1.1 SAFETY OF CHILDREN AND VULNERABLE PERSONS 6
1.2 INTENDED USE 6

2 GENERAL 7

2.1 ABOUT THIS MANUAL 7
2.2 FEATURES 7
2.3 SCOPE OF DELIVERY 7
2.4 IMPORTANT OPERATING INSTRUCTIONS 8

3 CONNECTIONS OF THE GHL DOSER 2.2 MAXI 8

3.1 GENERAL 8
3.2 CONNECTION OVERVIEW 9
3.2.1 Level Sensor Connection (Stand Alone only) 10
3.2.2 Temperature Sensor Input (Stand Alone only) 10
3.2.3 PAB Ports 11
3.2.4 USB Connection (Stand Alone only) 11
3.2.5 GHL Control Pad Connection (Stand Alone only) 11
3.2.6 Power Supply Input 11

4 ACTIVATION 12

4.1 INSTALLING THE GHL DOSER 2.2 MAXI 12
4.2 CONNECTING THE TEMPERATURE SENSOR (SA DOSER ONLY) 15
4.3 CONNECTION TO THE POWER SUPPLY 15
4.4 CONNECTION OF PAB-DEVICES 16
4.4.1 What is the PAB 16
4.4.2 Exemplary Connection of GHL Doser 2.2 Maxi with PAB Devices 17
4.5 STATUS INDICATORS OF THE GHL DOSER 2.2 MAXI 17
4.5.1 System-Status- LED on the housing cover 17
4.5.2 PAB Status LEDs on the Back Panel 18

5 OPERATION 19

5.1 GENERAL OPERATING INSTRUCTIONS 19
5.1.1 Dosing amount 19
5.1.2 Maintenance 19
5.2 OPERATION ON THE DEVICE 20
5.3 OPERATING THE DEVICE 20

6 ASSIGN FURTHER PAB DEVICES TO THE STAND ALONE 20

6.1 REQUIREMENTS 20
6.2 ASSIGNMENT 21
6.3 PUMP NUMBERING 21

7 WARRANTY/LIABILITY 22

8 ADDITIONAL INFORMATION 22

8.1 HELP AND INFORMATION 22
8.2 FIRMWARE-UPDATE 22

9 TECHNICAL DATA 23

Congratulations on your Purchase

Thank you for purchasing our product and allowing us to help support your path to successful fishkeeping!

With a *GHL Doser 2.2 Maxi*, you now own a highly professional piece of equipment that is more than capable of assisting you in your daily monitoring and maintenance routines.

We are confident that our product will help make your hobby more efficient, safe, and ultimately help you spend more time enjoying your aquarium or terrarium.

Enjoy Your Passion!

GHL Takes Care of the Rest

Get the Most out of your GHL Product

GHL products are well-equipped with simple and intuitive features. In order to get the most out of our products, we recommend you read our Programming Guide and Instruction Manual together. Doing so will provide you with the most profound details for using our product. These and other helpful documents can be downloaded from our website's download area (*Support->Downloads*). Visit our homepage at www.aquariumcomputer.com, our Support Forum or meet us on Facebook to become a GHL-Product expert and fully utilize the full range of functions offered from your device!

1 Safety Instructions

Please read these instructions carefully before operating the *GHL Doser 2.2 Maxi*.

GHL products are built with maximum security and safety in mind. However, product safety for this device can only be guaranteed if you follow these guidelines.

Anyone who uses this device must become familiar with the following safety instructions and the operation of the device.

Failure to follow these instructions will void any warranty claims.

Be sure to read over the safety instructions provided by this ProfiLux manual; including the respective manuals of other equipment manufacturers.

In this manual, the following symbols are used:

TIP

General note, tip or advice.

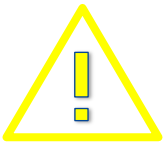
WARNING

Important note for operation, to avoid damage to the equipment, and for your safety.

DANGER

Warning that non-compliance can result in injury or damage to the device.

1.1 Safety of Children and Vulnerable Persons



WARNING

This equipment must not be used:

- By small children and vulnerable persons with limited physical, sensory or mental capabilities.
- By people who are unfamiliar with the functions of this product.

1.2 Intended Use

The *GHL Doser 2.2 Maxi* is intended exclusively for use in the domestic area. *GHL Doser 2.2 Maxi* may only be operated with GHL accessories.

Make sure to place the device away from splashing water, moisture or other liquids.

WARNING

Moisture indicators are placed inside the unit and will change color when exposed to excessive moisture.

Removing these indicators will void all warranty claims.

DANGER

- Make sure that the power cord is plugged into a grounded outlet; otherwise you could get an electric shock or cause a fire.
- Protect the power cable from damage (For example, twisting, kinking, clamping). Please also pay attention to the joints and connections to the device.
- Disconnect the power plug by pulling the plug, not the cable.
- Never attempt to disassemble, repair or alter the equipment by yourself.
- Do not insert sharp objects into the electrical contacts and ports.

DANGER

- If the unit falls into the aquarium or has been exposed to moisture or humidity, first turn off the power to the device via the fuse or circuit breaker, then pull the power cord.
- Never touch the power plug with wet hands.

- If the device has become wet or dirty, thoroughly clean and dry it with a dry cloth.

DANGER

- The device may not be operated if it has been damaged in any way (e.g. damaged power cord or plug, liquids or objects have gotten into the interior, device has been exposed to excessive moisture, the normal operation is disturbed, or the device has been dropped.)

For your own safety, please look at the hazard prevention and safety instructions in the chapters that follow.

2 General

2.1 About this Manual

These instructions apply to the *GHL Doser 2.2 Maxi Stand Alone* and *GHL Doser 2.2 Maxi EXT.*

2.2 Features

- 1x Level sensor port (Double allocation) (Stand Alone only)
- 1x *Digital Temperature-Sensor connection,* BNC (Stand Alone only)
- 1x USB-Connection (Stand Alone only)
- 2x *ProfiLux Aquatic Bus* Ports (Black Western sockets)
- 2x *Magnetic Stirrer* output
- 1x GHL Control Pad Port
- 1x Connection for power supply unit (24V DC hollow socket)

2.3 Scope of Delivery

Please check the contents of this box. The following items should be included:

- *GHL Doser 2.2 Maxi*
- 24V Power supply
- USB-Cable (Stand Alone only)
- Operating and Safety Instructions

Please check to make sure all items are in perfect condition. In case of damage, immediately contact the dealer from whom you purchased the *GHL Doser 2.2 Maxi*.

WARNING

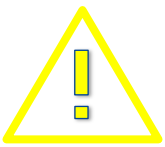
A damaged *GHL Doser 2.2 Maxi* or components may not be put into operation under any circumstances.

2.4 Important Operating Instructions

If your device is an extension (EXT) Doser, please note that this device is not a stand-alone device.

An external controller is required to operate the *EXT Doser*, as the *GHL Doser 2.2 Maxi EXT* does not have its own controller. A *GHL Doser X Stand Alone* (from firmware 1.25), a *ProfiLux 3 Aquarium Controller* from firmware 6.32, or any *ProfiLux 4 Controller* (from firmware 7.09) can be used. If the controller used has older firmware, it must be updated first. You can find our firmware on:

https://www.aquariumcomputer.com/downloads/



WARNING

To ensure safe operation, the following guidelines must be followed.

Disregarding these safety guidelines, will result in voiding your warranty. In which case, the manufacturer rejects any responsibility or liability for damage!

3 Connections of the GHL Doser 2.2 Maxi

3.1 General

Applies to all connections:

WARNING

- Connect only original accessories from GHL.
- Do not use excessive force when plugging-in connectors. If a plug contact does not fit, it is imperative to check that you have chosen the correct socket.

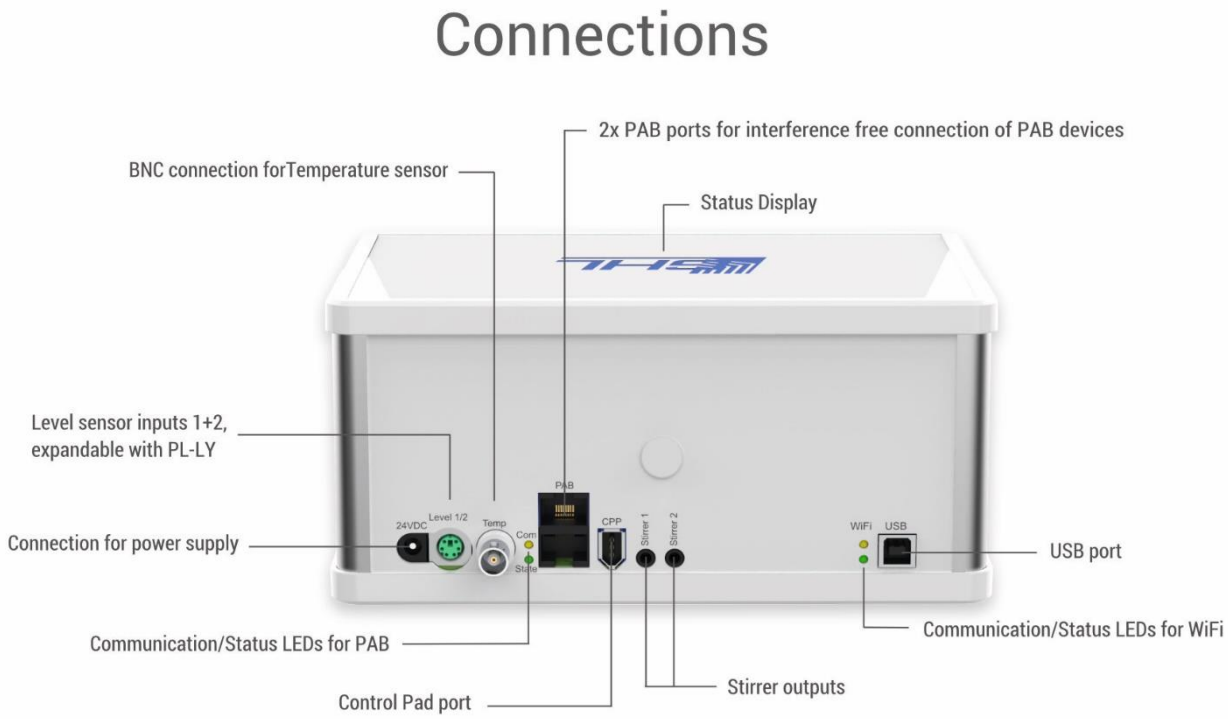
DANGER

- Incorrect connection (For example inserting a USB connector into a *PAB* connector) can lead to damaging the *GHL Doser 2.2 Maxi.*
- A repair caused by this, is not covered under warranty and will therefore incur repair charges**.**

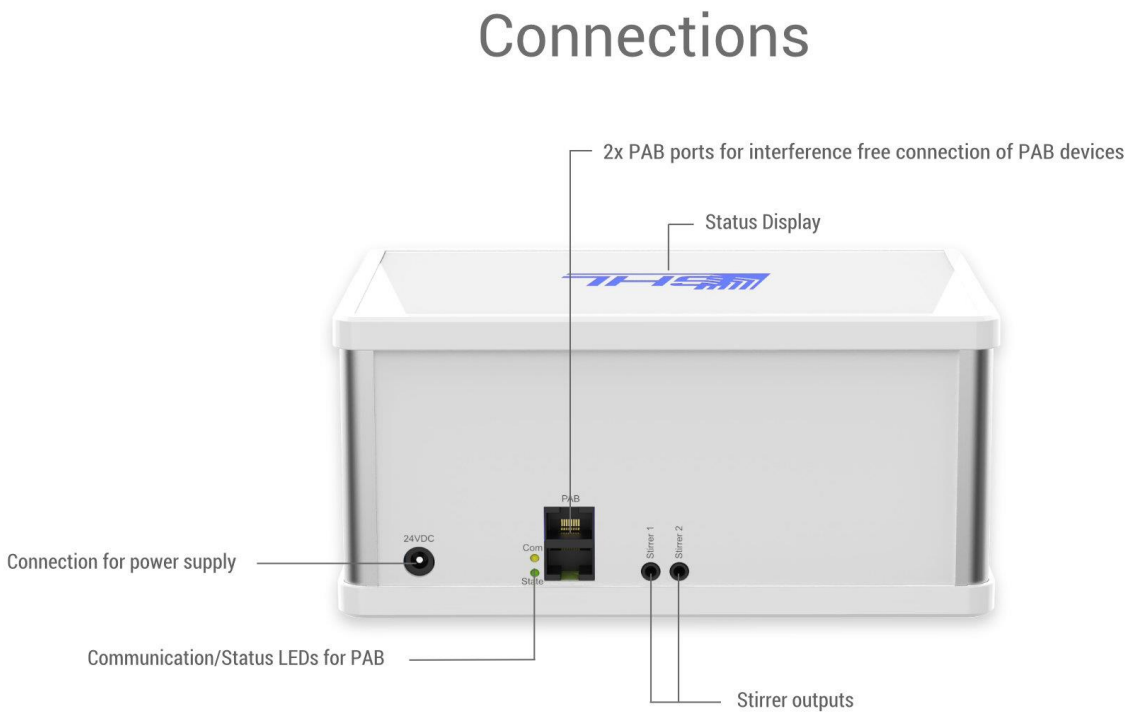
3.2 Connection Overview

The *GHL Doser 2.2 Maxi SA* includes the following connection ports:

Stand Alone:



EXT:



An external controller is required to operate the *EXT Doser*, as the *GHL Doser 2.2 Maxi EXT* does not have its own controller. A *GHL Doser X Stand Alone* (from firmware 1.25), a *ProfiLux 3 Aquarium Controller* from firmware 6.32, or any *ProfiLux 4 Controller* (from firmware 7.09) can be used. If the controller used has older firmware, it must be updated first. You can find our firmware on:

https://www.aquariumcomputer.com/downloads/

3.2.1 Level Sensor Connection (*Stand Alone* only)

Level sensors are used for monitoring and maintaining set water levels. These sensors can be connected to the on-board Level port (**Green** Mini DIN socket). A single Level port can either accept a single sensor or two separate sensors. With a *PL-LY* splitter cable (not included), two level sensors can be connected to a single Level sensor port and be independently controlled.

3.2.2 Temperature Sensor Input (*Stand Alone* only)

The white BNC socket is where a Digital Temperature sensor can be connected.

TIP

- Place the sensors in an area where water can constantly circulate around them.
- To prevent algae growth, it is best to place the sensors in a dark spot. For mounting, an open external filter would be a good place.
- To ensure proper sensor measurement, attach the sensor perpendicular to the water surface.
- Make sure that the cable connection of the sensor is not immersed in water under any circumstances.
- Many sensors are very susceptible to interference due to their low level signals. To provide the most accurate measurements, please have enough distance between the sensors/cables and sources of interference. These can include: Electronic ballasts, power lines, pumps, consumer electronics, etc. False readings can be avoided by following these precautions.

3.2.3 PAB Ports

PAB Devices such as a ProfiLux Controller or an EXT Doser are connected to the **black** RJ45 Western sockets. For more information, please refer to the "*Connection to PAB*" section.

3.2.4 USB Connection (*Stand Alone* only)

The *GHL Doser 2.2 Maxi* can be connected to a PC via a USB cable. This means that all settings can be configured comfortably using *GHL Control Center. GCC* software can be downloaded free of charge from our website's download area.

3.2.5 GHL Control Pad Connection (*Stand Alone* only)

A GHL Control Pad can be connected here.

3.2.6 Power Supply Input

24V DC hollow socket for connection to the power supply. Use only the original power supply for supplying power to the *GHL Doser 2.2 Maxi* device.

DANGER

- Connecting a non-GHL branded power supply may lead to the destruction of the *GHL Doser 2.2 Maxi*!
- A repair caused by this is not a guarantee and is therefore subject to a charge.

4 Activation

4.1 Installing the GHL Doser 2.2 Maxi

The device must be protected from water at all times!

Mount the Doser in a water-protected area. Ensure the unit cannot fall into the water during assembly or regular use. When selecting the mounting material, ensure adequate sizing and stability.

If you want to place the device inside an aquarium cabinet, ensure the chosen area is free from splashing water, moisture, or liquids that can penetrate the appliance.

GHL Doser 2.2 Maxi and its accessories will be destroyed by excess moisture or atmospheric humidity - Please observe the technical data and notes below!

Please observe the following regulations to ensure safe and secure operation! Failure to do so will invalidate warranty claims, and the manufacturer will not accept any responsibility or liability for damage!

Mains voltage-operated devices and water can become a dangerous combination. Therefore, it is essential to supply all mains voltage operated devices utilized in the aquarium or the vicinity with mains voltage via a FI (residual current) circuit breaker!

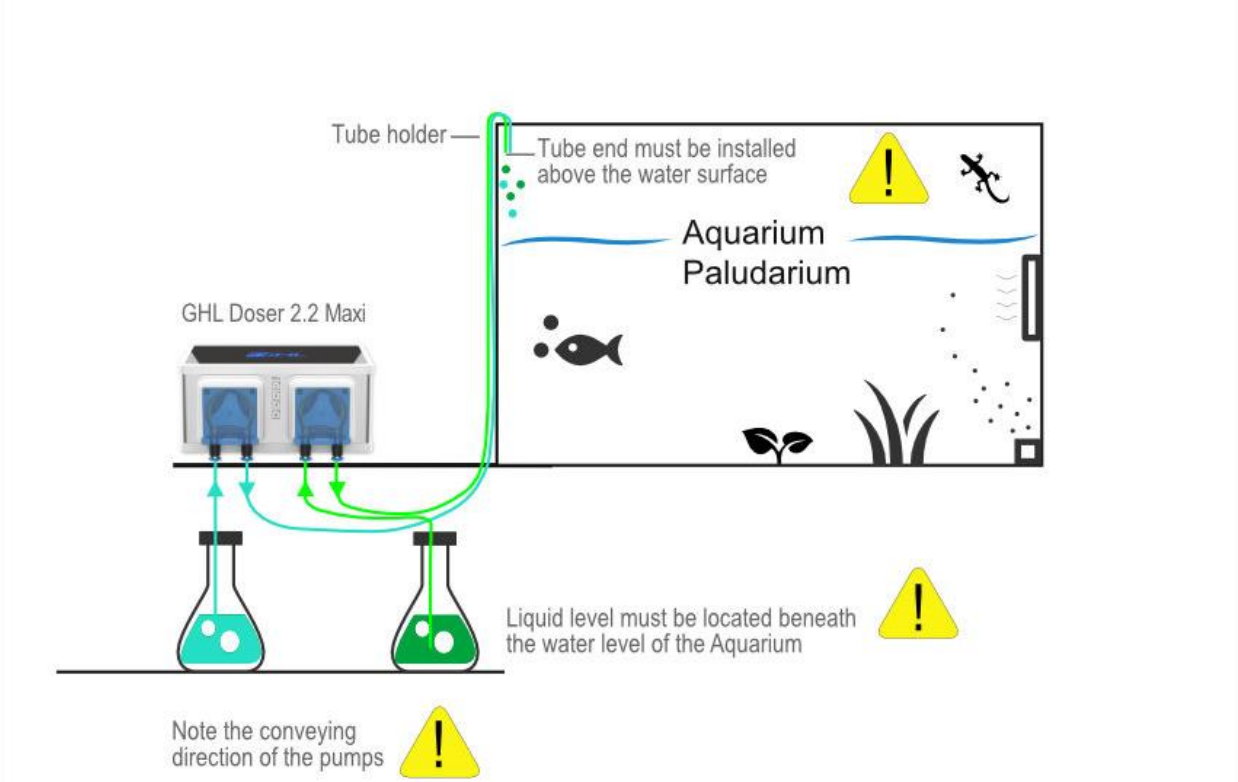
Disconnect all mains voltage-operated devices from the mains (pull out all plugs!) when working in the tank. One never knows if a heating rod, a pump, or a light is defective.

DANGER

Make sure to run a drip loop for all cables and lines coming from the aquarium. Cables and tubing must be routed in a way that prevents water from entering electrical or electronic parts!

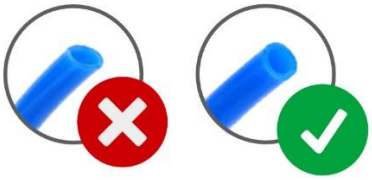
The illustration below shows how to best position the dosing units and the dosing liquid container to prevent the dosing container from running empty into the basin - e.g., in the event of unexpected occurrences.

Optimal Doser Arrangement



You can mount semi-rigid as well as flexible tubes. Select the appropriate tubing material for your application. The Dosers push-pull fittings make assembly particularly easy.

Select the tubing suitable for your application and attach it to the dosing pump. Push semi-rigid tubes directly into the fittings— fit flexible tubes with the tube adapters before connecting them to the pump.



To prevent leakage,
the tubes must be cut straight

Tube adapters for flexible tubes

DANGER

- Flexible tubing may only be mounted with the enclosed adapters. Without adapters, the tubing will be compressed and damaged, which may result in damage to the pump or leakage.
- A repair caused by this is not a warranty case and, therefore, subject to a charge.
- Tubing must be cut straight to prevent leakage.

Insert the straight cut tubes as far as possible into the fittings. Avoid tensile loading.

The pumps of the Doser are self-priming. To facilitate the suction of the dosing liquid, the tube leading into the dosing tank should be kept as short as possible on the suction side.

In order to prevent backflow through the siphon effect, the dosing tube in the tank should not reach directly into the aquarium water on the pump side.

Please also note the following notes:

TIP

- Please ensure good access to the connections of the device
- Please consider the maximum cable lengths of the connected *PAB* cables, sensors etc. when selecting the installation site
- Additional sensor cable extensions (*BNC2 cables*) and PAB cables are available in different lengths to fit your needs. They are available online in our *GHL Store (For US customers, GHL USA Store)*.

WARNING

- To ensure proper operation, the connection cables should never be kinked, crimped, or positioned in an unsuitable way.

DANGER

Products that are already powered should never be pulled by the cable. This may cause malfunction or damage the connected products and the *GHL Doser 2.2 Maxi*.
They should only be pulled by the plug connected to the power socket.

GHL Doser 2.2 Maxi and its accessories are destroyed by moisture or excessive humidity.

4.2 Connecting the Temperature Sensor (SA Doser only)

Connect the sensor connection cable into the corresponding BNC connector socket.

DANGER

- Sensor plugs must not be wet or damp when connecting to the socket.
- Do not use force.
- Only connect *Digital Temperature Sensors* from GHL to the temperature sensor socket of the *GHL Doser 2.2 Maxi*
- Always connect the sensors to the respective jacks to prevent damage to the device or the sensors.
- A repair caused by this is not a guarantee and is therefore subject to a charge.

4.3 Connection to the Power Supply

Connect the *GHL Doser 2.2 Maxi* using the supplied power adapter to the power supply. Insert the DC plug into the designated 24V DC hollow socket on the rear panel and connect the power connection cable with the plug to the power outlet.

DANGER

- Ensure that the mains voltage matches the voltage specified on the identification plate located on the bottom of the device.
- Connect the device only to a properly installed and grounded outlet with a minimum rating of 10 A.
- Never use a different voltage supply. Incorrect polarity or voltage can destroy the device.
- **Use only the supplied AC adapter**.

DANGER

- The connection of a power supply that is not part of the *GHL Doser 2.2 Maxi* leads to the destruction of the *GHL Doser 2.2 Maxi*!
- • A repair caused by this is not a guarantee and is therefore subject to a charge.

4.4 Connection of PAB-Devices

The *GHL Doser 2.2 Maxi* includes two PAB-ports for connecting additional *GHL Doser 2.2 Maxi EXT, GHL Doser 2/2.1 EXT* or *KH Director* devices via *ProfiLux Aquatic Bus*.

4.4.1 What is the PAB

PAB is an interference free CAN-Bus-System which allows for extremely secure data transfer between all PAB devices such as additional *GHL Doser EXT* or *KH Director* devices. The range can be up to 100 m (300 FT).

PAB cables are not in the delivery scope.

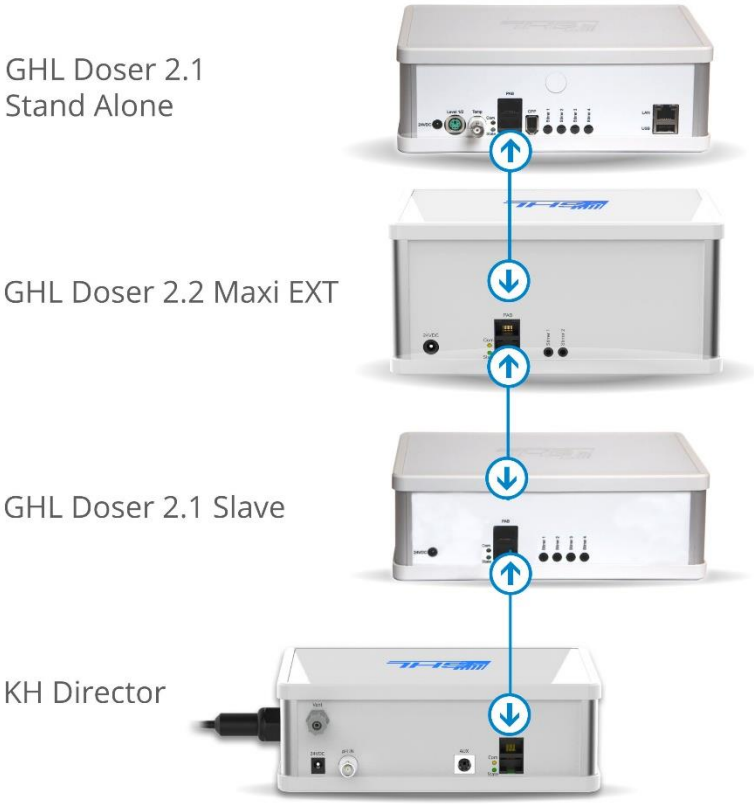
TIP

- Be sure to obtain suitable PAB cables in the appropriate lengths to meet your needs.
- *PAB*-cables are available online at *GHL Store (EU) and GHL USA Shop (US)* in different lengths from 0.5 m up to 50 m.

To enable the operation of the *GHL Doser 2.2 Maxi EXT*, the device needs to be assigned to the respective controller. For thorough information on how to assign PAB devices please refer to our Knowledge Base on our website

https://www.aquariumcomputer.com/knowledge-base/about-the-profilux-aquatic-bus-pab/

4.4.2 Exemplary Connection of GHL Doser 2.2 Maxi with PAB Devices



4.5 Status Indicators of the GHL Doser 2.2 Maxi

The *GHL Doser 2.2 Maxi* includes two status indicator lights located on the housing cover and the back of the device.

4.5.1 System-Status- LED on the housing cover

The LED-backlit GHL Logo in the housing cover of the *GHL Doser 2.2 Maxi* lights up in different colors.

The various colors show the condition of your aquarium at a glance.

The color and blink codes shown depend on the particular *Doser* Firmware.

For the meaning of the blink codes, please refer to the Support-> FAQ section of our homepage www.aquariumcomputer.com.

DANGER

- Never leave your aquarium or terrarium unsupervised for an extended amount of time.
- The maximum amount of time without personal view depends on how long your aquarium, terrarium, or pond can survive without significant damage, even when errors occur.
- Always remember that technology can fail and therefore malfunctions can never be ruled out!
  Power failures, incorrect settings, damage (For example, by water or overvoltage) or simply an unexpected operating situation can lead to fatal damage.
- The manufacturer declines any liability for (consequential) damage or loss arising in connection with the use of the *GHL Doser 2.2 Maxi*, as far as permitted by law

4.5.2 PAB Status LEDs on the Back Panel

Located on the back panel of the *GHL Doser 2.2 Maxi,* next to the connection of the temperature sensor are another two LEDs that provide information about PAB connection status and PAB communication status.

The upper yellow LED indicates proper communication within the *PAB* connection. The lower green LED provides information about the status of the *PAB* communication.

Status	Meaning

Yellow LED flashes	*GHL Doser 2.2 Maxi* GHL Doser 2.2 Maxi receives *PAB* commands
Green LED is ON	*GHL Doser 2.2 Maxi* GHL Doser 2.2 Maxi is ready for operation
Green LED flashes quickly	*GHL Doser 2.2 Maxi* is started, firmware update
Green LED flashes every second, yellow LED is OFF	*GHL Doser 2.2 Maxi* has not received PAB commands for more than 30 seconds
Both LEDs are OFF	*GHL Doser 2.2 Maxi* has no supply voltage

5 Operation

5.1 General Operating Instructions

Channels 1-2 are assigned to the pumps of the Doser. If an EXT unit is also connected, its pumps are assigned channels 3 and the following. The integrated control can control up to 16 pumps independently of each other.

5.1.1 Dosing amount

The amount of fluid that can be dispensed by a single pump is determined by the selected motor speed. Depending on the chosen speed, the *Dosers' 2.2 Maxi* dosing pump can dispense about 320 mL dosing liquid precisely adjustable to 0.1 mL within one minute.

5.1.2 Maintenance

The pumps are largely maintenance-free. It is sometimes advisable to clean the inside of the pumps from dust and other contaminants.

The pumps may be lubricated with Vaseline petroleum jelly to reduce operating noise!

Tubes, pumps and motors are wear parts, the life time depends on the use frequency, flow quantity and environmental conditions.

DANGER

- When malfunctions (e.g. insufficient flow, losing prime, leakage, increased operation noise) or mechanical damages occur the wear parts must be replaced.

  Due to the maintenance-friendly design all wear parts can be replaced easily, all wear parts are available as accessories.

5.2 Operation on the device

The buttons on the front of the device allow for manual operation of the pumps. This allows you to quickly top up, vent the tube or suck in liquid.

5.3 Operating the Device

Operate the GHL Doser 2.2 Maxi via App, Cloud or PC/Mac. Find details here:

https://www.aquariumcomputer.com/knowledge-base/how-to-operate-ghl-devices/

6 Assign further PAB Devices to the Stand Alone

GHL Doser 2.2 Maxi is modular and can be extended with additional *EXT Dosers*.

Before adding additional *GHL EXT Dosers* to the *GHL Doser 2.2 Maxi Stand Alone,* a firmware update may be required.

6.1 Requirements

For proper operation, it is important that the *Stand Alone Doser* as a master unit can clearly identify and assign all *EXT Dosers* and the *KH Director*.

Make sure that the *GHL Doser 2.2 Maxi* and all other PAB devices are powered ON. Download the free program *GHL Control Center GCC* in the download area at www.aquariumcomputer.com Then connect your *GHL Doser 2.2 Maxi Stand Alone* to GCC.

DANGER

- When assigning devices in an existing system, the numbering of the pumps may change (for example, by rearranging the order of the EXT devices, re-connecting the PAB cables to another port, etc.).
- Therefore, please make sure that critical devices and functions are deactivated prior to the assignment.
- Only if all pumps have been correctly assigned and checked again see under. 6.3 "Pump numbering", the deactivated devices may be put back into operation.

6.2 Assignment

If all *PAB* connections and the power supplies of all devices is ensured at the *PAB*, further *EXT Dosers* can be assigned to the Stand Alone Doser. To do this, click on System in the *GCC* menu and select the menu item *Assign devices*.

The Stand Alone Doser searches all devices connected to the PAB and then displays the serial number of the devices found. Then select the serial numbers of **all** devices that should be assigned to this *Stand Alone Doser* and confirm with *OK*.

The order of the devices determines the numbering of the pumps.

6.3 Pump numbering

If additional *EXT Dosers* are to be operated, make sure that one number is not assigned more than once, when numbering the pumps.

DANGER

- If you add, remove, or exchange *EXT Dosers* you always must newly assign them to the *GHL Doser 2.2 Maxi*, so that all pumps can be recognized and accepted by the *GHL Doser 2.2 Maxi Stand Alone*.
- To avoid damage, you must control the numbering of the_pumps before restarting and adjust them if necessary.
- Only when all pumps have been correctly numbered and checked can the devices be put back into operation.

7 Warranty/Liability

You have a 2-year warranty beginning from invoice date. This applies to material and manufacturing defects.

We guarantee that the supplied products correspond to the specifications and that the products do not have material resp. manufacturing defects. For the accuracy of the manuals, we do not guarantee damages of any kind which result from improper operation or from an unsuitable environment. Furthermore, we do not take over warranty for damages that are caused by a false connection or excessive humidity. We assume no liability for direct damages, indirect damages, consequential damages and third-party damages as far as it is legally permitted. We do not take over guarantee that our product package corresponds to the requirements of the buyer. Our warranty expires if the delivered original product is damaged or modified.

8 Additional Information

8.1 Help and Information

For help or further information, please visit the Knowledge Base at our homepage, our *Support Forum* at www.aquariumcomputer.com or contact your retailer.

8.2 Firmware-Update

The firmware of your *GHL Doser 2.2 Maxi* is constantly being further developed. If you want to use new features that are not supported by your current firmware, you can update your *Doser*.

DANGER

- Be sure to back up your data **before** updating!

  You can use the menu item
  "*Backup and Restore*" -> "*Transmit all settings from GHL Doser to file*"
  and load them again after the successful update via "*Transmit from file to GHL Doser*".

For the update, you need the latest firmware and the PC program *GHL Control Center*, both of which can be downloaded free of charge from our homepage www.aquariumcomputer.com in the download area (*Support-> Downloads*), as well as our USB cable.

Instructions for updating firmware can be found from our homepage.

9 Technical Data

The device and its accessories may only be used indoors. Moisture or excessive humidity can lead to malfunctions or damage.

Power supply	Wide range power supply 100 – 240 VAC (50 – 60 Hz), < 0,6 A
Input voltage	24 VDC
Environmental conditions	Operating temperature: 0°C - 40°C / 32°F – 104°F Humidity: Max 80% rel. Humidity non-condensing
Current consumption	2.500 mA max.
pH measurement	BNC input for pH sensor, accuracy 0.1 pH, pH range 3.0 to 10.5 pH
Temperature measurement	BNC input for the supplied digital temperature sensor, accuracy 0.1°C (33.8°F), Measuring range 0.0°C to 40°C (32°F – 104°F)
PC connection	USB Port
PAB ports	2
Dimensions	B x W x H = 220 mm (8.66”) x 150 mm (5.9”) x 103 mm (4.05”)

GHL Advanced Technology©
GmbH & Co. KG
Marie-Curie-Straße 20
67661 Kaiserslautern
www.aquariumcomputer.com