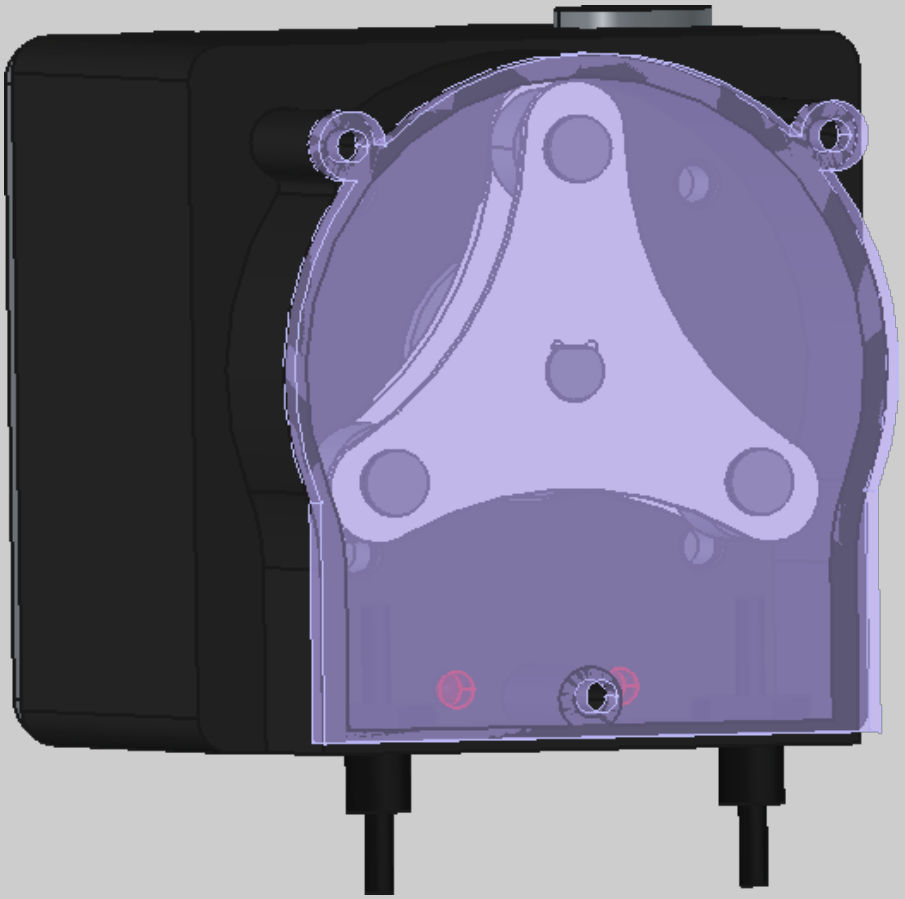
# Andaman Doser V1



## User Manual

# Table of Contents

Introduction..... Page 1
Installation..... Page 2
Connecting to the app..... Page 2
Controlling your doser..... Page 3
Status LEDs..... Page 3
Customization and Repairability..... Page 4
Contact..... Page 4

# Introduction

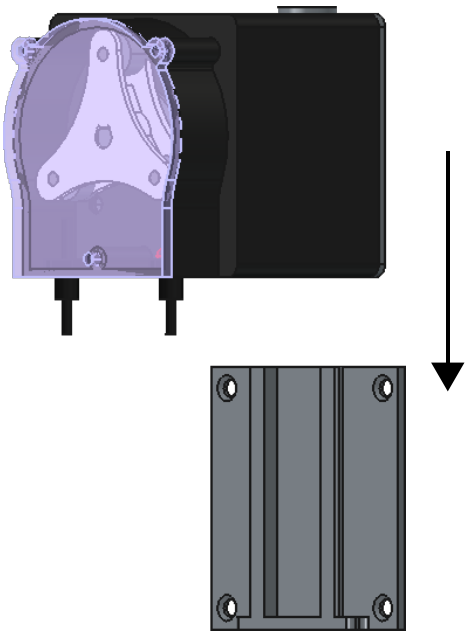
Thank you for buying the first generation Andaman Doser! The Andaman Doser was built to make precise, dependable dosing accessible and adaptable. The design uses a direct-drive system, no gearbox. This allows both extremely precise dosing and a minimum of moving parts to ensure reliability. The pump isn't just supposed to work today, its supposed to work for years.

The software and hardware running this doser is entirely open-source and documented. This doser is yours, and you can do with it whatever you wish. We aspire to be environmentally conscious not only with our materials, but also with repairability and reuseability.
Learn more here: Andaman-reef.com/open-source

# Installation

Start by attaching the wall connector in your desired location. This can be stuck in place using double-sided tape, or it can screwed to the cabinet/beam using the 4 corner holes.

The wall connector is designed to have the same outer sizing as the doser itself, so you can use that as spacing reference if you have several dosers or spacing constraints.



Then, slide the doser down onto the wall connector. Ensure the connection method of the wall part is stable and can support the weight of the doser.

If you wish to mount the doser such that it slides in sideways, you can unscrew the 4 screws on the back of the doser, then rotate the back plate until it is the orientation you desire.

# Connecting to the app

Controlling this doser is typically done with the Andaman Reef app, however, due to the open source nature of the firmware and communication protocol, there may be alternatives. This section only covers how to use the Andaman Reef app.

Start by searching for "Andaman Reef" on the Apple AppStore, or the Google Playstore and downloading it.

Once you open the app, you will see a "+" icon at the top of the screen. Tap this to open a dialogue which will display all scanned Bluetooth Low Energy devices. With the default firmware, Wi-Fi is **not** required, and runs entirely off of Bluetooth.

You will see a device labelled something like "ADN-Doser", select this device and it will be added to your saved devices. Tap on the device listing to open the configuration page.

# Controlling your doser

**Settings**
Once on the doser control page, you will be greeted with several options and ways to program your doser. First, you will see a direction toggle. This allows you to choose between clockwise and counter-clockwise dosing. The setting will take effect once you tap the toggle.

After that, you can choose the dosing schedule. You can choose between "Periodic" and "Timed" dosing. Periodic dosing allows you to specify a dose amount to be executed regularly after a specified period. For instance, you might specify the doser to dose 10ml every 100 seconds. Timed dosing allows you to specify specific times of the day you would like to dose specific amounts. You can specify up to 16 times for the doser to dispense fluid. These times, along side your Periodic dosing schedule are stored on-device, so using different devices to update the schedule is possible.

**Note:** Timed dosing relies on time references provided by your device automatically. If the doser has been powered off for a siginificant amount of time, be sure to connect to the doser with the app to resync your device's time.

**Tools**
Under the tools heading, you can access some other functions you can use with the doser. The manual dosing field allows you to dose a specified amount, this could be used for priming the pump.

Here you can also calibrate the pump. While the pump should come pre-calibrated, we suggest to re-calibrate every 6 litres dosed or so for maximum precision.
Calibration works by first tapping the "10 ml calibration dose" button. This commands the pump to dispense 10ml of liquid. Measure this output, then input how much liquid was actually dispensed, before tapping the "Update calibration" button.

for maximum precision we suggest to dose RO water, and using a scale to measure the output. You can also tap the "10 ml calibration dose" button several times and average out the results more more accuracy.

# Status LEDs

The doser has 2 status LEDs visible under the front panel. One red and one yellow one. The yellow LED will flash once on power-up, and will illuminate while the doser is dosing. The red LED will flash during error conditions, such as overheating, or during an unrecoverable software error.

# Customization and Repairability

At Andaman we really value open-source, resuable, hackable hardware and consumer devices. As a result, this doser was designed for easy access for the end user. Replacement parts can be bought from the Andaman online store, and some retailers. However, some parts can also instead be 3d-printed by you. The STL and FreeCAD files for the 3d-printed parts are available on our website.

Flashing your own firmware onto the doser is also easy. First, unscrew the 4 m3 screws on the back of the unit to get inside. Then, carefully unplug all the connector wires for the LEDs, Motor, and power connection. Next, unscrew the screws holding the PCB in place. Be careful when lifting it out, as it's quite a tight fit.

You will see a USB-C receptacle on the board, this directly communicates with the ESP32 via a USB/UART converter chip. We decided not to include a direct USB access hatch on the outer enclosure for moisture and manufacturing reasons. We figured that if you are confident enough installing your own custom firmware, you won't mind undoing a few screws :)

The ESP32 module can be flashed via the idf.py frontend from expressif. The default firmware is also available if you ever want to reset it back to its default firmware. The block diagram and pin definitions are also available on our website.

**NOTE:** when flashing the ESP32, please make sure the 12v power is connected. There is no power ORing, and the PCB does not utilise USB power to run the chip. So in order for the ESP to be powered, make sure the 12v power header is connected and plugged in.

# Contact

If you have any issues, concerns or questions. You can contact us via email at:

info@andaman-reef.com