Flashing your Andaman Dosing Pump

Introduction

The Andaman Doser is based on the ESP-32-C3 Microprocessor. This is the “brains” of the device. It reads it’s code from its on-board non-volatile flash storage (NVS) and one can communicate with the NVS over SPI on UART. However, to make flashing easier, the board also comes with a UART to USB chip that allows you to connect a USB cable to the ESP-32.

Accessing the PCB

You can access the PCB and its USB connector easily. Start by unscrewing the Torx screws on the back connector of the doser. Next, unplug the 2 pin power connector, unscrew the securing nut and remove the power connector. At this point you may spot the USB connector!

Next, unplug the 4-pin motor connector. Finally, you can unscrew the two m2 screws holding in the PCB to the motor, then you can carefully lift the PCB out of the enclosure. Now, you can flash the ESP32!

Flashing the chip

Note: in order to flash the chip, power must be supplied with the power connector. The USB connection doesn’t supply any power to the board

If you have experience flashing ESP32-based devices, you can safely ignore this section. There are no special considerations for this board.

In order to talk to this board, you can use Expressif’s IDF.py frontend: (https://docs.espressif.com/projects/esp-idf/en/stable/esp32/api-guides/tools/idf-py.html)

This will allow you to upload code and anything else you’d like for this MCU. It’s quite powerful!

You can also find the original ADN-Doser firmware here:

https://github.com/SamBkamp/andaman_firmware

FAQ

1. Why can’t the board be powered via USB during flashing?

   - Because this would require a better voltage lowering system, along side a power ORing system so the USB host doesn’t catch 12v from the power supply just in case that is left connected. The motor would also need a lock-out system for when 5v is connected. In short: its possible (and not too hard) but it requires more components and complexity, and that increases costs.

2. Why isn’t the USB connector more easily accessible?

   - Because I think the USB connector is there for tinkerers, who don’t mind cracking open the doser. Having a slot for the USB connector means I need to worry about corrosion and other factors. However, if there is enough demand, that can be added in future versions.