# Upgrading the 8Encoder firmware

## Items required

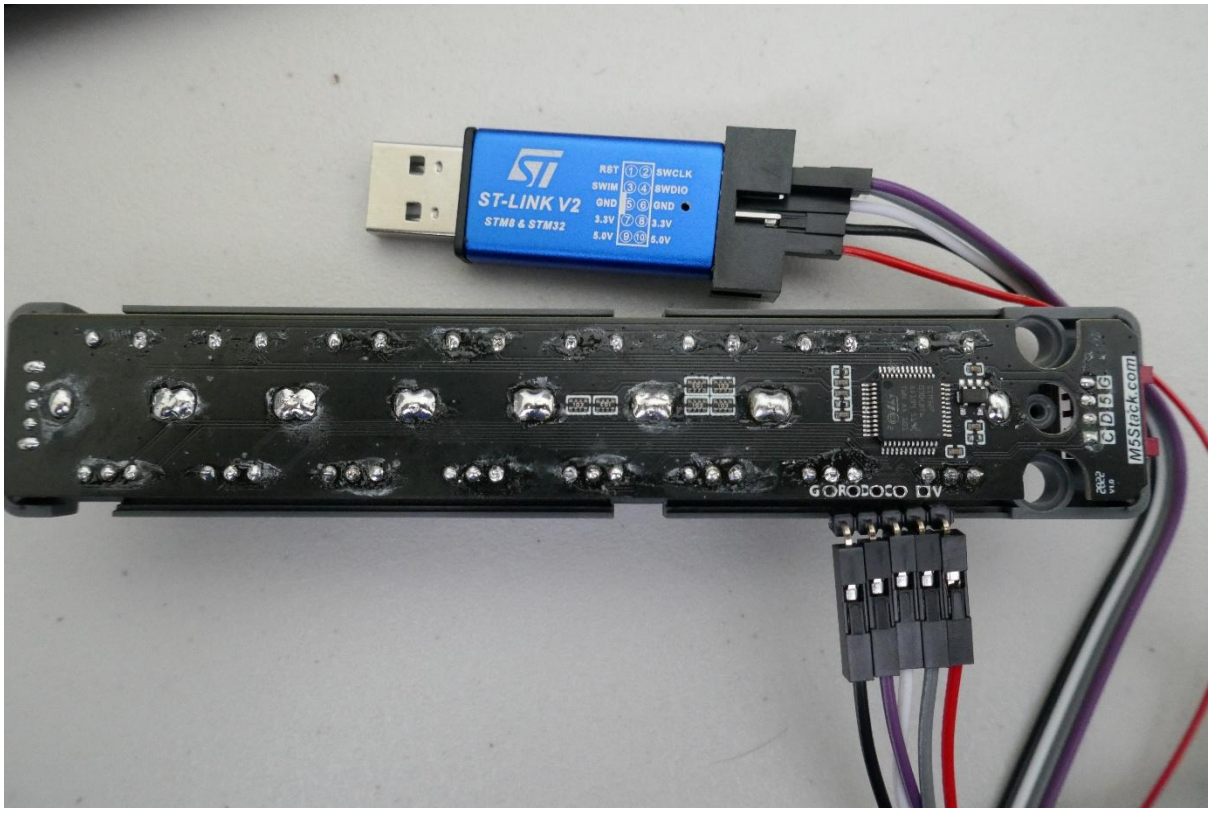
- 1.5mm hex key
- ST-Link USB stick
- 5 pin 0.1” header
- Ribbon cable to connect between ST-Link and header
- Stm32cubeprog STM32CubeProgrammer software for all STM32 (https://www.st.com/en/development-tools/stm32cubeprog.html )
- Latest 8encoder firmware (https://github.com/m5stack/M5Unit-8Encoder-Internal-FW )

## Preparation

- Using the 1.5mm hex key undo the screw on the underside of the 8Encoder
- Gently lever the 4 plastic tabs on the base away from the top
- Locate the programming port
- Using the ribbon cable connect the ST-Link programmer to the header strip

| ST-LINK | GND | RST | SWDIO | SWCLK | 3.3v |
|---|---|---|---|---|---|
| Header | G | R | D | C | V |

- Install Stm32cubeprog



## Programming

- Insert the ST-Link USB stick into the host computer
- Run Stm32cubeprog
- From the left menu select Erasing & programming
- Enter the location of the firmware .hex file
- Carefully (to avoid an electrical short circuit) insert the pins of the header into the holes on the 8Encoder PCB and hold in place to make electrical contact
- Select Connect to verify that the ST-Link can communicate with the 8Encoder
- Select Start Programming

## Verification

- From the left menu select Memory & file editing
- On the Device memory tab select Read
- On the Device memory tab select Read/Compare memory with file
- On the file Open dialog select the previously downloaded .hex file
- There should be no mismatches
- The running firmware version can also be validated by observing changes to register 0x61 when an encoder is rotated

## Reassembly

- Remove the header
- Clip the back into place
- Insert the screw