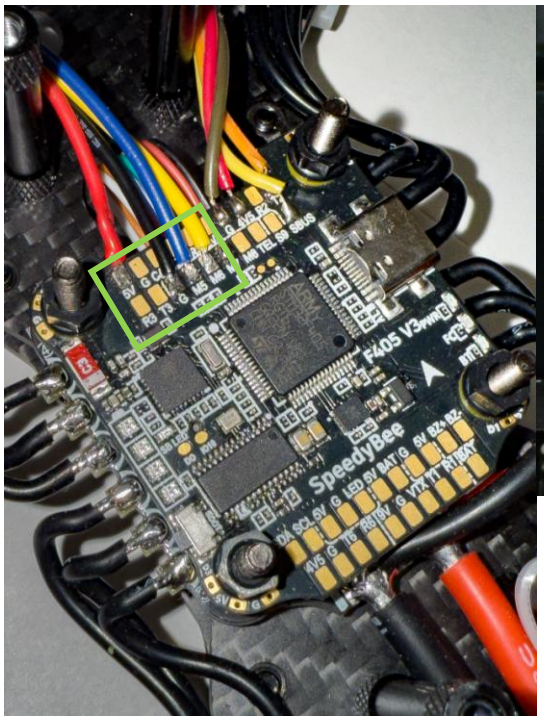
Connecting the M3 to the Flight Controller

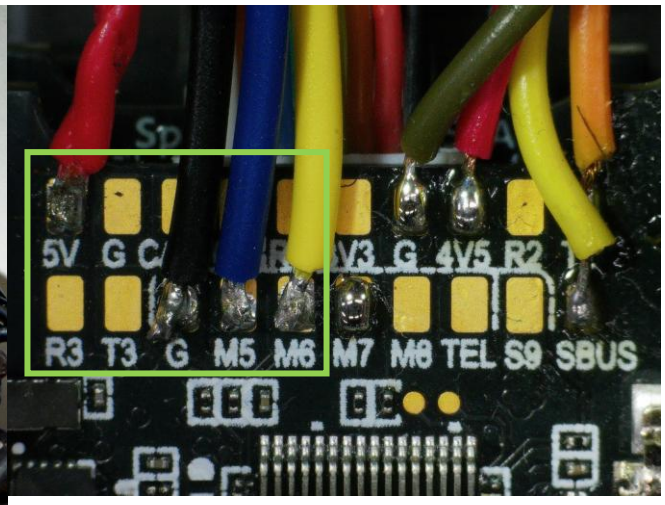
The 4-wire JST-XH4 connector provided with the M3 should be soldered to the flight controller:

1. Red Wire – 5V (Optional)
2. Black Wire – Ground
3. Yellow Wire – Motor Pad 5
4. Blue Wire – Motor Pad 6

Motor Pad 5 and 6 are used in our example, but any available motor pad with PWM capabilities will work. Once soldered to the Flight Controller, plug the JST connector into the reciprocal port on the M3. To secure the connector, you may also hot glue the connector to provide extra security.

Connecting the red wire to the flight controller is optional, as it allows the drone battery to supply the M3 with power directly (omitting the M3's onboard battery). If the drone loses power (battery disconnected or drained), the M3 will then continue on its own power supply (3V onboard battery). Therefore the red wire is optional and does not effect permit switch functionality, as the M3 can reliably operate on its own battery/power if required. The photos below show all four wires soldered properly to the flight controller pads (including the red wire).





Configuring the Flight Controller

The following example setup uses the SpeedyBee F405V3 Flight Controller along with the Betaflight Configurator program on PC. This is an explanation on how to map two Motor Pads to switches on your handheld controller. This will allow you to arm and fire the M3 Initializer via the assigned switches.

In the Betaflight Configurator, IO remapping allows you to configure the pins on the MCU to be utilized for various functions. In our example, we will step through instructions on how to use Motor Pads 5 and 6, and assign them to switches on our handheld radio.

These instructions will applying similarly, if not identically for varying flight controllers and firmware, as almost all publicly accessible flight controllers additional have PWM capabilities.

First, we connect the drone to the computer using a USB cable, open Betaflight Configurator. Press Connect in the top right corner. Select CLI (command line).

Input the command:

```
resource
```

We see the list of resources and the corresponding processor pins used by each of the resources, for example:

```
resource MOTOR 5 B00
resource MOTOR 6 B01
```

Remember processor pins B00 and B01.
To assign custom modes, type the command

```
set pinio_box = 40,41,255,255
set pinio_config = 1,1,1,1
```

Next, we assigned PINIO 1 to USER mode 1 (which is 40), PINIO 2 to USER mode 2 (which is 41).
Now let's assign the corresponding processor pins to these custom modes (this is called PinioBox[2]). We input the following commands:

```
resource PINIO 1 B00
resource PINIO 2 B01
```

Now USER mode 1 will control pin B00 via PINIO 1 and USER mode 2 will control pin B01 via PINIO 2.
To check, we request resources:

```
resource
```

Doublechecking:

```
resource PINIO 1 B00
resource PINIO 2 B01
```

After that, we remember to save our remapping:

```
save
```

See Appendix A for a screen capture of the command line after reprogramming.

The flight controller reboots and Betaflight Configurator should reconnect to the controller. If not, press Connect. At this stage, it is necessary to connect the remote control to the drone and, by moving the sticks of the remote control, make sure that the drone accepts commands (Receiver tab).

Go to the Modes tab, find USER 1 and USER 2 in the list. See Appendix B for a screen capture of Betaflight's Modes Tab

Assign ranges for these modes. We set up USER 1 to be in charge of arming (ARM) and USER 2 to detonate (FIRE).

On the remote control, you need to select two separate buttons that will turn on the USER 1 and USER 2 modes, and for USER 1, a button with locking is better, and USER 2 without locking.

On the X18 remote, we recommend the SD toggle for activation and the SC button for detonation.

It is important that USER 1 is enabled (glow yellow) for activation, and for detonation vice versa, USER 2 must be inactive (not yellow)..

For the USER 1 mode, select the AUX 2 (SD) toggle switch and the 1800-2100 range, and for USER 2, select the AUX 3 (SC) button and the 1800-2100 range. ***On another remote, the names of the buttons and their numbers may differ.***

Press SAVE in the lower right corner of the Modes tab.

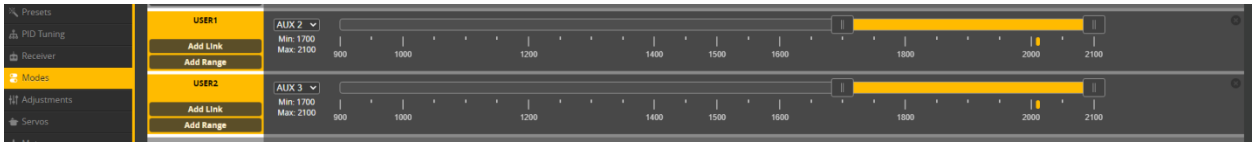
The flight controller and Initializer board can now be mounted to the drone for combat use.

Appendix A

```
# set pinio_box = 40,41,255,255
pinio_box set to 40,41,255,255
# set pinio_config = 1,1,1,1
pinio_config set to 1,1,1,1
# resource PINIO 1 B00

NOTE: B00 already assigned to MOTOR 5.

Resource is set to B00

# resource PINIO 2 B01

NOTE: B01 already assigned to MOTOR 6.

Resource is set to B01

# resource
```

```
# resource
resource BEEPER 1 C05
resource MOTOR 1 B06
resource MOTOR 2 B07
resource MOTOR 3 B08
resource MOTOR 4 B09
resource MOTOR 5 B00
resource MOTOR 6 B01
resource MOTOR 7 B05
resource MOTOR 8 B04
resource LED_STRIP 1 C09
resource SERIAL_TX 1 A09
resource SERIAL_TX 2 A02
resource SERIAL_TX 3 C10
resource SERIAL_TX 4 A00
resource SERIAL_TX 5 C12
resource SERIAL_TX 6 C06
resource SERIAL_RX 1 A10
resource SERIAL_RX 2 A03
resource SERIAL_RX 3 C11
resource SERIAL_RX 4 A01
resource SERIAL_RX 5 D02
resource SERIAL_RX 6 C07
resource I2C_SCL 2 B10
resource I2C_SDA 2 B11
resource LED 1 C08
resource SPI_SCK 1 A05
resource SPI_SCK 2 B13
resource SPI_MISO 1 A06
resource SPI_MISO 2 B14
resource SPI_MOSI 1 A07
resource SPI_MOSI 2 B15
resource ADC_BATT 1 C00
resource ADC_RSSI 1 C02
resource ADC_CURR 1 C01
resource SDCARD_CS 1 A15
resource PINIO 1 B00
resource PINIO 2 B01
```

Appendix B



References:

1. https://betaflight.com/docs/development/LedStrip#resource-remapping
2. https://betaflight.com/docs/wiki/guides/current/pinio-and-piniobox
3. https://betaflight.com/docs/wiki/guides/current/pid-tuning-guide#remap-motors

https://oscarliang.com/betaflight-resource-remapping/