

Pilotix F405 V3 ICM42688

User manual



Content

1. Product overview.....	3
2. Wiring guide	3
2.1. Power and ESC connection.....	3
2.2. Motor layout	3
2.3. Peripheral wiring (UARTs).....	4
2.4. Video and camera setup	4
2.5. Additional components	4
3. Safety & usage rules	5
Contacts:	6

1. Product overview



Fig.1. Pilotix F405 V3 ICM42688

The Pilotix F405 V3 Stack is a high-performance flight system engineered for 3-8S FPV drones. It features an F405 flight controller equipped with the high-speed ICM42688 gyroscope and a robust 80A ESC running AM32 firmware. This stack is designed for extreme reliability in high-current applications, offering integrated Bluetooth for wireless tuning, dual camera switching, and a dedicated 9V power rail for digital video systems.

2. Wiring guide

2.1. Power and ESC connection

The flight controller (FC) and Electronic Speed Controller (ESC) are the core of your build.

- ESC power (Lipo): Connect your battery leads to the main (+) and (-) pads on the ESC. This ESC supports a massive range of 3S to 8S LiPo batteries.
- Capacitor: Solder a high-voltage, low-ESR capacitor across the main battery pads to protect the sensitive ICM42688 gyro from electrical noise.
- FC link: Use the 8-pin wiring harness to bridge the ESC and FC. This cable carries the battery voltage (Vbat), ground, motor signals (S1-S4), and telemetry data.

2.2. Motor layout

The ESC handles four motors, numbered as follows:

- Pads 1 & 2: Located on the left side of the board.
- Pads 3 & 4: Located on the right side of the board.

Note: In Betaflight, ensure your motor numbering and rotation direction match the physical layout of your frame.

2.3. Peripheral wiring (UARTs)

The Universal Serial Port layout for this FC is standardized as follows:

- UART 1 (GPS): Connect your GPS module here. Match TX to R1 and RX to T1. Use the 5V and GND pads for power.
- UART 2 (Receiver): Solder your ELRS or Crossfire receiver here. (Receiver TX to R2, Receiver RX to T2).
- UART 3 (ESC Telemetry): This is usually handled by the 8-pin connector шлейф to provide motor RPM and temperature data.
- UART 4 (VTX): Connect the control wire (SmartAudio/IRC Tramp) of your video transmitter to the T4 pad.
- UART 5 (Bluetooth): This is an internal module used for wireless tuning via mobile apps.

2.4. Video and camera setup

This FC features advanced camera switching and voltage management.

Camera connections

- Dual camera support: You can solder two cameras. Connect the signal wire of the first to CAM1 and the second to CAM2.
- Switching: Camera 1 is active by default. You can toggle to Camera 2 using a switch on your transmitter (configured as USER3).

Video transmitter (VTX)

- Signal: Connect the VTX video wire to the VTX pad.
- Voltage jumper: (Crucial) Check the bridge on the board before wiring.
 - Solder the bridge to VCC for 3-4S voltage.
 - Solder the bridge to 9V for 6S-8S setups (recommended to prevent VTX burnout).
- Switching: You can remotely turn the 9V VTX power on or off using USER1.

2.5. Additional components

- Buzzer: Solder an active 5V buzzer to the BZ+ and BZ- pads.
- LED indicators: The board features diagnostic LEDs to show the status of the FC (blue), 3V/5V/9V power rails (red/white/green), and Bluetooth (blue).

- I2C (Compass): If your GPS has a compass, connect SCL to SCL and SDA to SDA (located near UART 1)

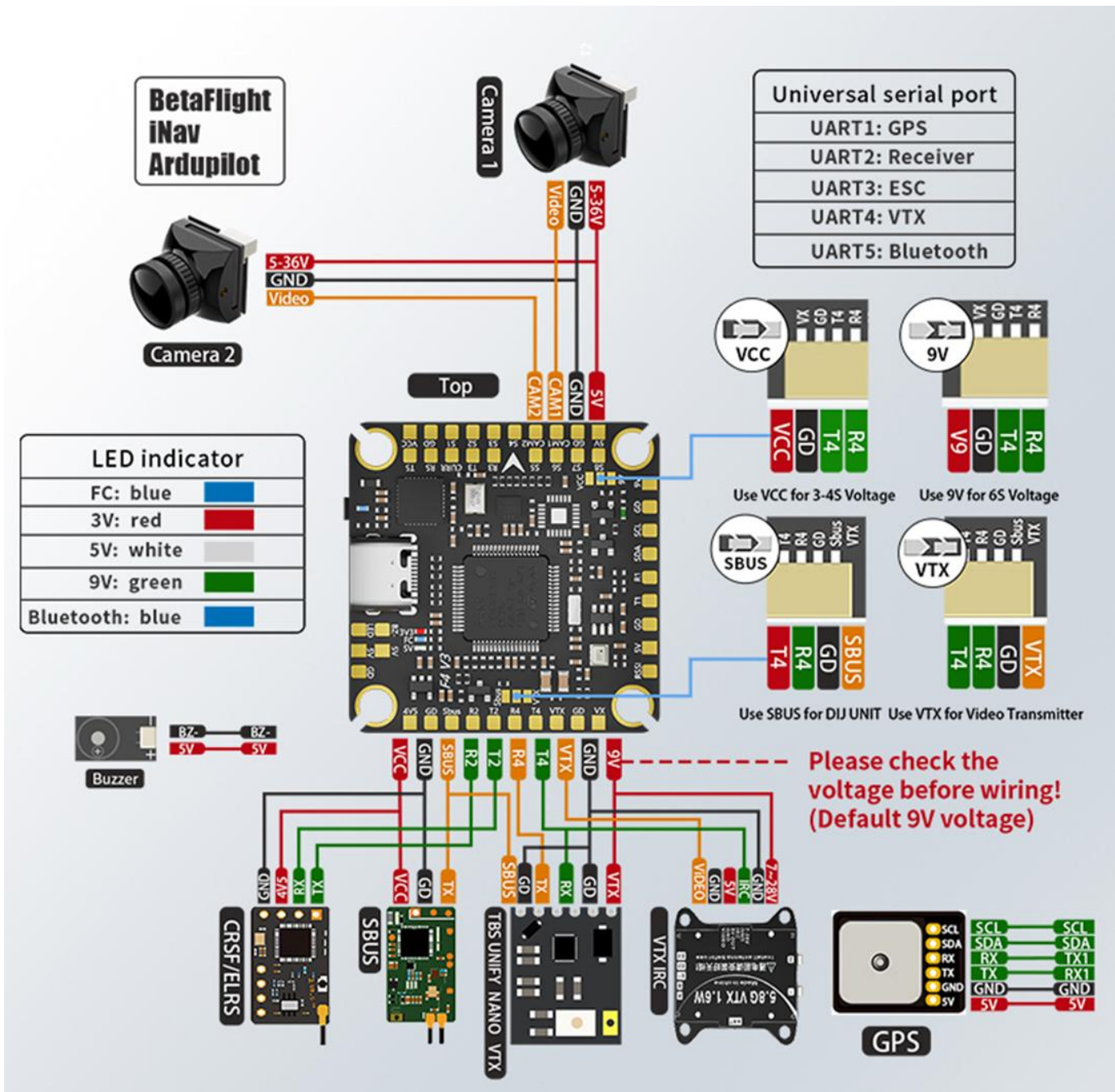


Fig.2. Wiring diagram

3. Safety & usage rules

- Voltage jumper check: Before connecting any peripheral, verify the jumper pads (VCC/9V and VTX/SBUS). The default is often 9V, but if your VTX or camera requires 5V or full battery voltage, miswiring will result in instant hardware failure.

- **Smoke stopper:** Always use a current-limiting "Smoke Stopper" during the first power-up after soldering. This is your only line of defense against a short circuit caused by a solder bridge.
- **Capacitor requirement:** Even without a stack, if you are powering the FC directly from a lipo, you must have a capacitor (minimum 35V-50V 1000uf) on the main power leads. The sensitive ICM42688 gyro can be "blinded" by electrical noise, causing the drone to fly away or crash.
- **Polarity:** Ensure the VBAT and GND pads are wired correctly. The FC does not have reverse polarity protection; swapping plus and minus will destroy the board immediately.
- **Vibration isolation:** The ICM42688 is a high-performance gyro but is extremely sensitive to mechanical noise. Always use soft-mounting rubber gummies and ensure no wires are pressing tightly against the gyro chip (the small black square in the center).
- **Airflow:** The onboard 9V and 5V regulators (bees) generate heat, especially when powering high-output video transmitters or multiple leds. Ensure the FC is mounted in a way that allows active airflow during flight.
- **Solder quality:** Use high-quality leaded or lead-free solder with flux. "Cold" solder joints (dull, grainy appearance) can fail under the high-frequency vibrations of an FPV drone.
- **Bench cooling:** Do not leave the FC powered by a battery on your workbench for more than 2-3 minutes without a fan. The regulators can reach temperatures over 80°C very quickly.

Contacts:

WhatsApp: +420 777 054 888

Email: support@pilotix.eu

Telegram: https://t.me/PilotixSupport_bot