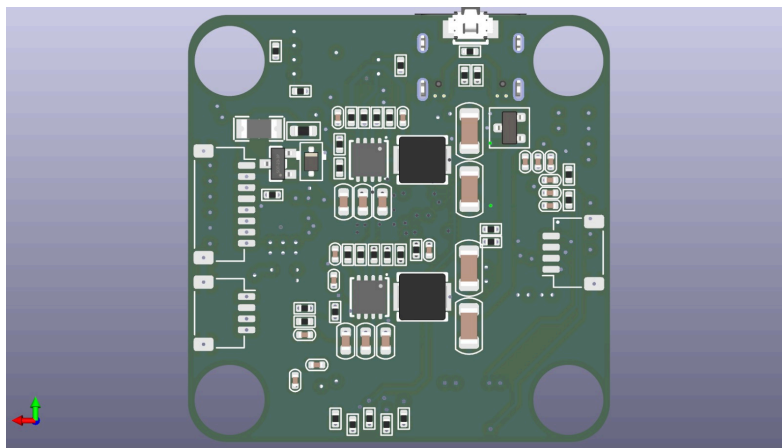
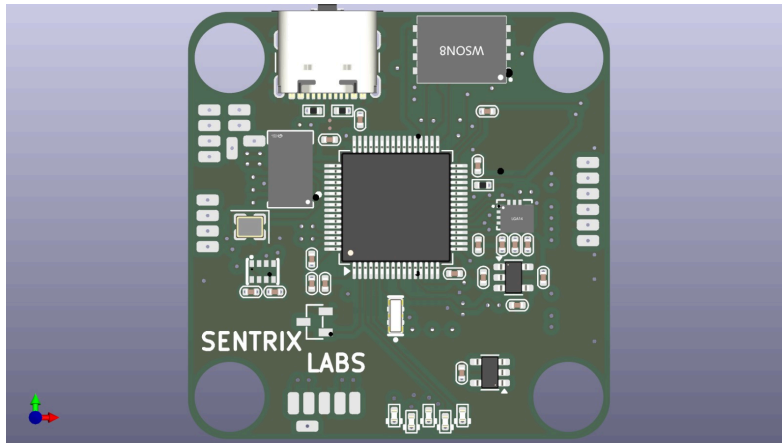


Sentrix Labs F405 Flight Controller — Datasheet



1. Overview

The **Sentrix Labs F405** is a next-generation flight controller engineered for FPV drones, autonomous UAVs, and robotics systems demanding high performance, precision, and reliability. Powered by the **STM32F405** ARM Cortex-M4 processor, it delivers superior computational speed, stable flight performance, and exceptional compatibility with **Betaflight**, **INAV**, and **ArduPilot**.

The board is designed with precision sensor placement, noise-isolated power rails, and advanced peripheral support to ensure smooth and responsive control in both manual and autonomous applications.

2. Key Features

- **STM32F405RGT6** 32-bit ARM Cortex-M4 MCU @168 MHz with FPU
- **ICM-42688P** low-noise 6-axis gyro/accelerometer (SPI interface)
- **BMP280 barometer** for altitude sensing
- **AT7456E OSD** for FPV video overlay

- **MIC5219-3.3 V LDO regulator** (ultra-low dropout, 500 mA max)
- **16 MB onboard Blackbox flash memory**
- Up to **6 UART ports** for GPS, telemetry, and receiver connections
- Compatible with **SBUS, IBUS, CRSF, DSMX, ELRS, and PPM** protocols
- **5 V–6 V power input** with onboard 3.3 V and 5 V regulation
- **Noise-isolated IMU design** for high-loop performance and reduced vibration sensitivity

3. Technical Specifications

Category	Specification
Processor	STM32F405RGT6 (ARM Cortex-M4, 168 MHz, FPU)
Gyro/Accelerometer	ICM-42688P (6-axis, SPI)
Barometer	BMP280
OSD	AT7456E
Blackbox Storage	16 MB onboard flash
Voltage Regulator	MIC5219-3.3V (500 mA max)
Input Voltage Range	5 V – 6 V
Logic Voltage	3.3 V
Firmware Support	Betaflight / INAV / ArduPilot
UART Ports	6 (TX/RX)
I ² C Ports	1
SPI Ports	1 (external device access)
Receiver Protocols	SBUS / IBUS / CRSF / DSMX / ELRS / PPM
Motor Outputs	4 Channels
Buzzer Output	Yes
LED Output	WS2812 addressable
USB Port	Micro-USB (DFU + Serial)
Mounting Pattern	30.5 × 30.5 mm (ø3 mm)
Board Dimensions	36 × 36 mm
Board Thickness	1.6 mm
Weight	~7 g

4. Electrical Characteristics

Parameter	Min	Typ	Max	Unit
Input Voltage	4.5	5.0	6.0	V
3.3 V Output	3.25	3.30	3.35	V
3.3 V Current	—	150	500	mA
MCU Frequency	—	168	—	MHz
Operating Temp	-20	—	85	°C

5. Pinout Summary

Pin Group	Label	Description
Power	5V / G	Power input & ground
Motors	M1 – M4	ESC signal outputs
UART	TX1–TX6 / RX1–RX6	GPS, telemetry, receiver, or VTX control
I²C	SDA / SCL	Compass, barometer, sensors
OSD Video	VIN / VOUT	FPV camera and VTX video path
LED	LED	WS2812 RGB LED output
Buzzer	BUZ+ / BUZ–	Buzzer control
BOOT	BOOT	DFU flashing mode

6. Firmware & Configuration

- Default firmware target: **SENTRIX_F405**
- Bootloader access: Hold **BOOT** while connecting USB
- Supported Configurators:
 - **Betaflight Configurator**
 - **INAV Configurator**
 - **Mission Planner (ArduPilot)**
- PID loop speed: Up to **8 kHz gyro / 8 kHz PID**

9. Manufacturer Information

Sentrix Labs

Pioneering the Future of Flight — Made in India

Designed by: Milind Singh