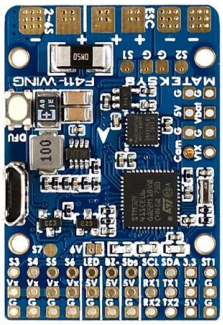
MATEKSYS

FLIGHT CONTROLLER F411-WING

STM32F411, MPU6000, INAVOSD, BMP280, 2x UARTs, 1x Softserial, 1x I2C, 2x Motors & 5x Servos, 2x BEC & current sensor on board.



MATEKSYS Flight Controller F411-WING

* 100MHz STM32F411CEU6
* 6-Axis MPU6000
* Built-in OSD
* BMP280 Barometer

* 2x UARTs, 1x Softserial_Tx, 1x I2C
* 2x Motors & 5x Servos outputs

* 6.5~30V DC (2~6S LiPo)
* 78A Current Sensor, Scale 423
* BEC 5V 2A cont. for FC
* BEC Vx 3A cont. for Servos
  Vx= 5V Default, 6V option
* LDO 3.3V 200mA

* 41x28x10mm
* 7g (Total 12g w/ bottom plate and M2 standoffs)
* Mounting holes 24mm Φ2mm

INAV/BF Target MATEKF411

Firmwares

Gallery & Info

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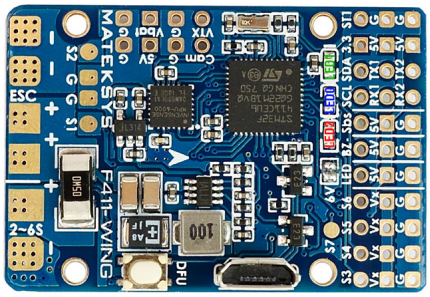
VBat & ESC power pads, 6.5~30V DC.
S1/S2: ESC signal for motor 1 & 2
G: ESC signal ground
Voltage meter scale: 1100
Current Sensor: 78A (Scale 423)

VTX: Video Transmiter Signal
Cam: Camera video signal
5V: onboard BEC 5V 2A
Vbat: LiPo voltage
G: Ground

LED0(Blue) & LED1(Green): FC Status indicator
LED2(Red):3.3V indicator



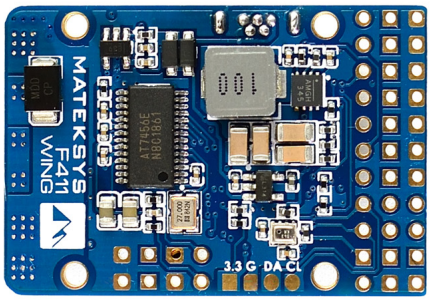
ST1: Softserial_TX1 w/ CPU based serial ports enabled
can be used for PPM input with CPU based serial ports disabled
SDA/SCL: I2C for Compass/ Airspeed Pitot
compass HMC5883 /MAG3110 /QMC5883 /IST8310
Pitot_MS4525
TX1/RX1: UART1
TX2/RX2: UART2

Sbs: Built in inverter of RX1 for SBUS input
No voltage on 5V pad when connecting via USB only
LED: WS2812 LED signal output
Bz- & 5V: General active 5V buzzer
Bz-, 5V & G: Matek Dbuz5V

3.3: LDO3.3V 200mA

S3/S4/S5/S6/S7: Servo signal
Vx: onboard BEC 5V/6V 3A cont. for servos, Default is 5V

Button: Boot(DFU) mode button

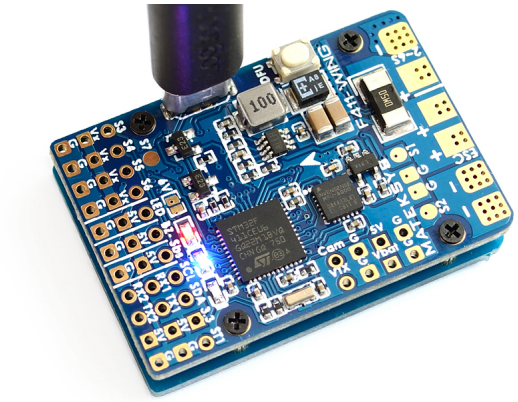


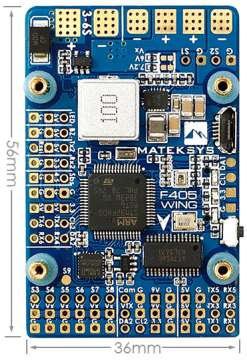
[3.3 G DA CL]: I2C for OLED

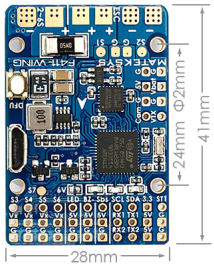
MCU: STM32F411
IMU: MPU6000
OSD: INAV OSD
Baro: BMP280

Vx= 5V

Vx=6V







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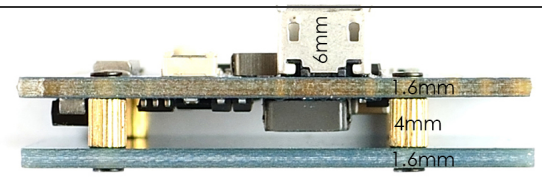
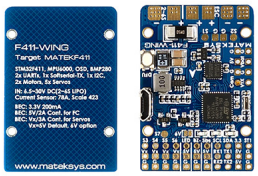




Spec.& Features

FC Specifications

- MCU: 100MHz STM32F411
- IMU: MPU6000 accelerometer/gyro (SPI)
- Baro: BMP280 (I2C)
- OSD: INAV OSD w/ AT7456E chip
- Blackbox: No
- VCP & 2x UARTs
- 2x Motors, 5x Servos outputs
- 1x I2C
- 3x LEDs for FC STATUS (Blue, Red) and 3.3V indicator(Red)
- Built in inverter for SBUS input (UART1-RX)
- SoftSerial_Tx1: ST1 pad by default
- PPM: ST1 pad with softserial disabled
- Battery Voltage Sensor: 1:10 (Scale 1100)

- WS2812 Led Strip : Yes
- Beeper : Yes
- RSSI: No

FC Firmware

- INAV Flight
- Target: MATEKF411

PDB

- Input voltage range: 6.5~30V (2~6S LiPo) w/TVS protection
- 2x ESC power pads
- Current Senor: 78A, 3.3V ADC, Scale 423

BEC 5V output

- Designed for Flight controller, Receiver, OSD, Camera, Buzzer, 2812 LED_Strip, Buzzer, GPS module, AirSpeed
- Continuous current: 2 Amps

BEC Vx output

- Designed for Servos
- Voltage adjustable, 5V Default, 6V via jumper
- Continuous current: 3 Amps

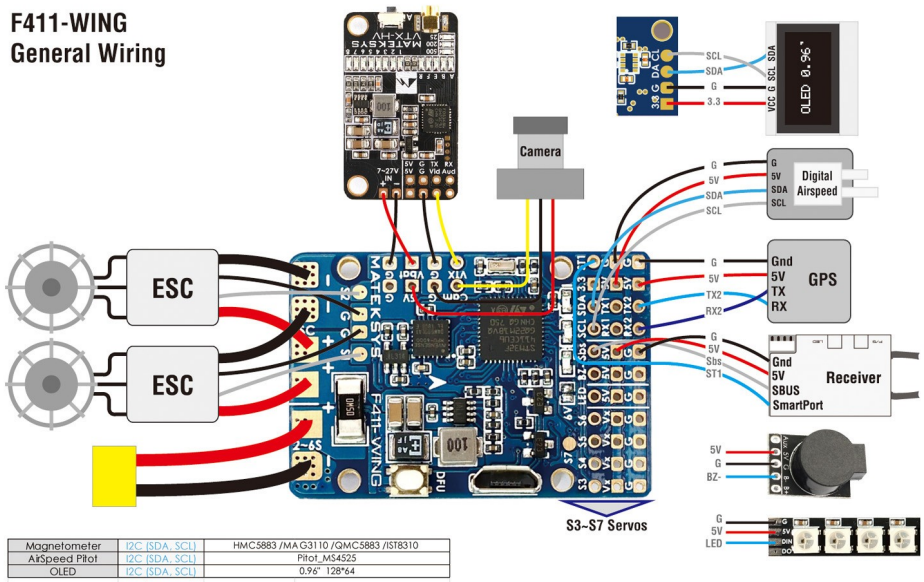
BEC 3.3V output

- Designed for Baro / Compass module/ OLED and Spektrum RX
- Linear Regulator
- Continuous current: 200mA

Physical

- Mounting: 24 x 24mm, Φ2mm
- Dimensions: 41 x 28 x 10mm
- Weight: 7g (Total 12g w/ bottom plate and M2 standoffs)

F411-WING
General Wiring



Magnetometer	I2C (SDA, SCL)	HMC5883 /MAG3110 /QMC5883 /IST8310
AirSpeed Pitot	I2C (SDA, SCL)	Pitot_MS4525
OLED	I2C (SDA, SCL)	0.96" 128*64

SBUS	Sbs pad	Built-in inverter on UART1-RX
GPS	UART2 (Tx2 Rx2)	
Frsky Smartport or VTX control	ST1 pad	Softserial-TX1 is enabled on ST1 pad by default

FPort	UART1 (TX1)	Need non-inverted Smartport signal(hacked)
GPS	UART2 (Tx2 Rx2)	
VTX control	ST1 pad	Softserial-TX1 is enabled on ST1 pad by default

PPM	ST1 Pad	Need to disable CPU based serial ports
GPS	UART1 (Tx1 Rx1)	
VTX control	UART2 (Tx2)	SA / TR

CrossFire	UART1 (Tx1 Rx1)	
GPS	UART2 (Tx2 Rx2)	
VTX control	ST1 pad	Softserial-TX1 is enabled on ST1 pad by default

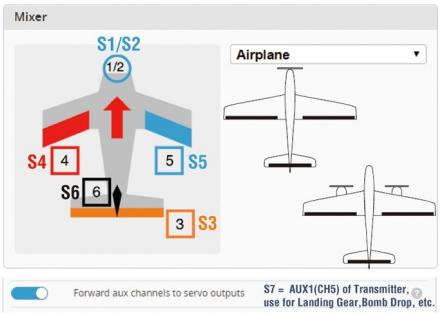
Spektrum/IBUS	UART1 (Tx1 Rx1)	
GPS	UART2 (Tx2 Rx2)	
VTX control	ST1 pad	Softserial-TX1 is enabled on ST1 pad by default

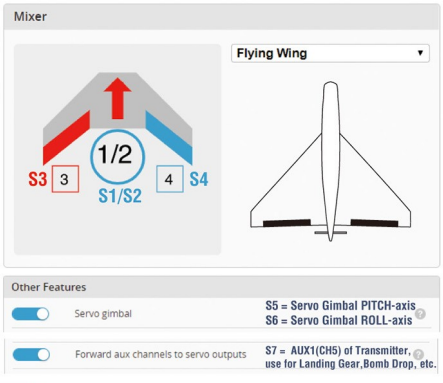
Voltage scale 1100
Current scale 423

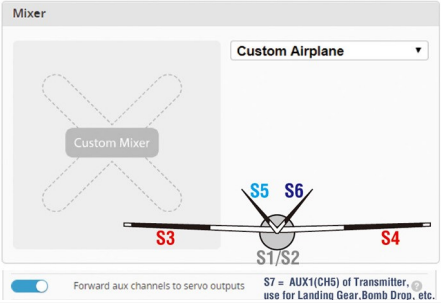
Identifier	Data	Telemetry	RX	Sensors
USB VCP	MSP 115200	Disabled AUTO	Serial RX	Disabled 38400
UART1	MSP 115200	Disabled AUTO	Serial RX	Disabled 38400
UART2	MSP 115200	Disabled AUTO	Serial RX	GPS 9600
SOFTSERIAL1	MSP 115200	SmartPort AUTO	Serial RX	Disabled 38400

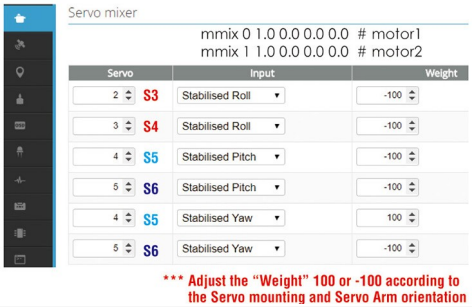
F411-WING Mixer w/ INAV1.9.x

INAV MATEKF411		Airplane	Flying Wing	Custom Airplane
	S1	Motor-1	Motor-1	Motor-1
	S2	Motor-2	Motor-2	Motor-2
	S3	ELEV	Left AILE	Left AILE
	S4	Left AILE	Right AILE	Right AILE
Servo Gimbal Forward aux CH	S5	Right AILE	Gimbal PITCH	Left V-tail
	S6	RUDD	Gimbal ROLL	Right V-tail
	S7	AUX1(CH5)	AUX1(CH5)	AUX1(CH5)



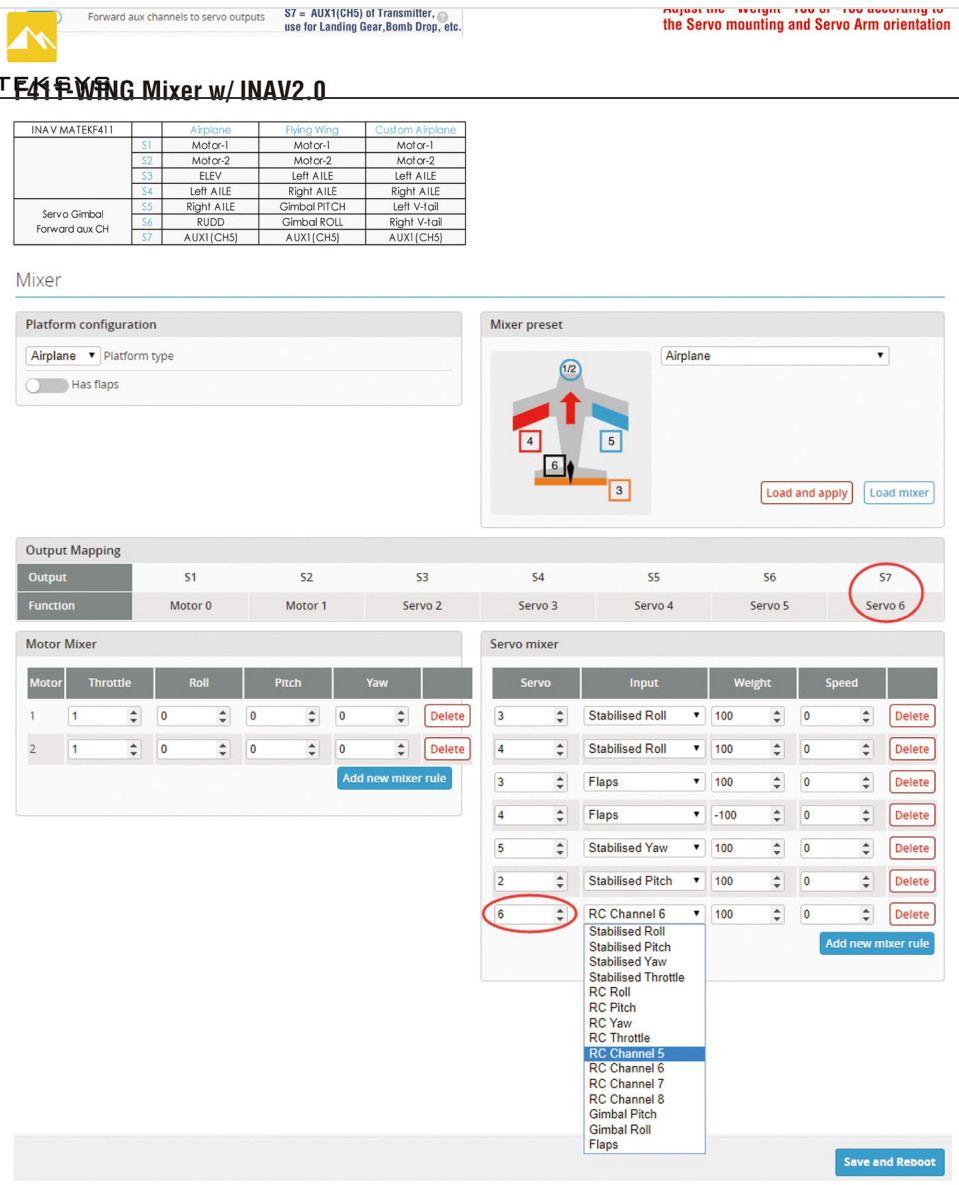






*** Adjust the "Weight" 100 or -100 according to the Servo mounting and Servo Arm orientation

F411-WING Mixer w/ INAV2.0



INAV MATEKF411		Airplane	Flying Wing	Custom Airplane
	S1	Motor-1	Motor-1	Motor-1
	S2	Motor-2	Motor-2	Motor-2
	S3	ELEV	Left AILE	Left AILE
	S4	Left AILE	Right AILE	Right AILE
Servo Gimbal Forward aux CH	S5	Right AILE	Gimbal PITCH	Left V-tail
	S6	RUDD	Gimbal ROLL	Right V-tail
	S7	AUX1(CH5)	AUX1(CH5)	AUX1(CH5)

Mapping

INAV MATEKF411		Airplane	Flying Wing	Custom Airplane
	S1	Motor-1	Motor-1	Motor-1
	S2	Motor-2	Motor-2	Motor-2
	S3	ELEV	Left AILE	Left AILE
	S4	Left AILE	Right AILE	Right AILE

Servo Gimbal Forward aux CH	S5	Right AILE	Gimbal PITCH	Left V-tail
	S6	RUDD	Gimbal ROLL	Right V-tail
	S7	AUX1(CH5)	AUX1(CH5)	AUX1(CH5)

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GPS	UART2 (Tx2 Rx2)	
VTX control	ST1 pad	Softserial-TX1 is enabled on ST1 pad by default

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PPM	ST1 Pad	Need to disable CPU based serial ports
GPS	UART1 (Tx1 Rx1)	

VTX control	UART2 (Tx2)	SA / TR

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CRSF	UART1 (Tx1 Rx1)	
GPS	UART2 (Tx2 Rx2)	
VTX control	ST1 pad	Softserial-TX1 is enabled on ST1 pad by default

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Spektrum/IBUS	UART1 (Rx1)	
GPS	UART2 (Tx2 Rx2)	
VTX control	ST1 pad	Softserial-TX1 is enabled on ST1 pad by default