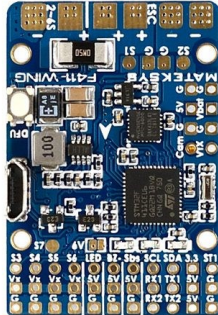




MATEKSYS

# 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 Ø2mm

INAV/BF Target MATEKF411

[Firmwares](#)

[Gallery & Info](#)

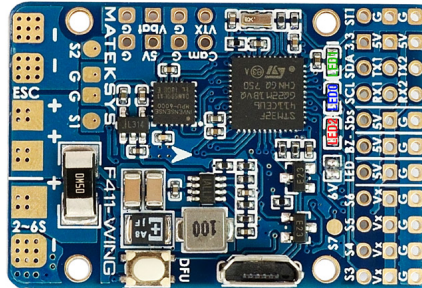


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4x ESC power pads, 6.5-30V DC.  
1x VTX: ESC signal for motor 1 & 2  
G: ESC signal ground  
Voltage meter scale: 1100  
Current Sensor: 78A (Scale 423)

VTX: Video Transmitter 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 HMC3883 /MAG3110 /QMC5883 /IST8310  
Pitot\_LMS4525

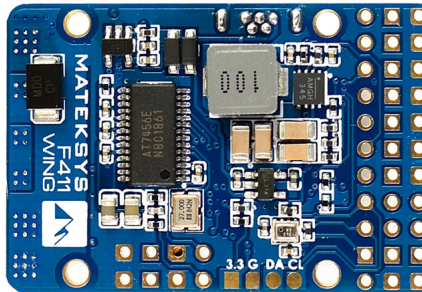
TX1/RX1: UART1  
TX2/RX2: UART2

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: LDO 3.3V 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



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

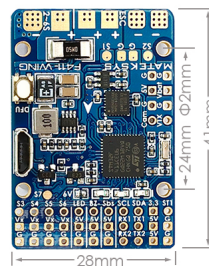
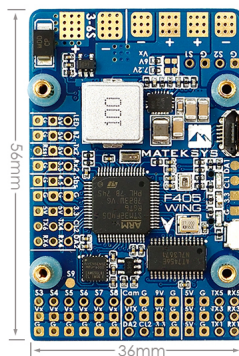
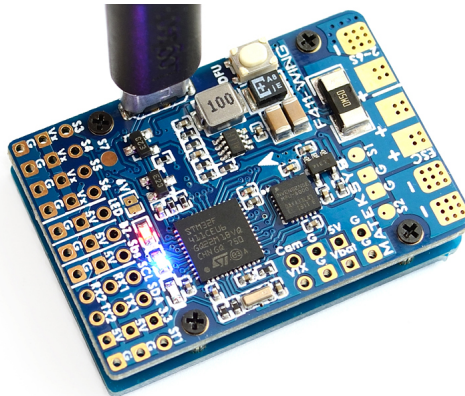


Vx= 5V



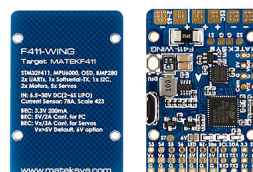
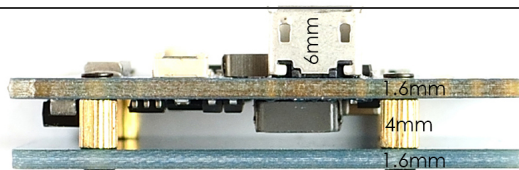
Vx=6V

[3.3 G DA CL]: I2C for OLED






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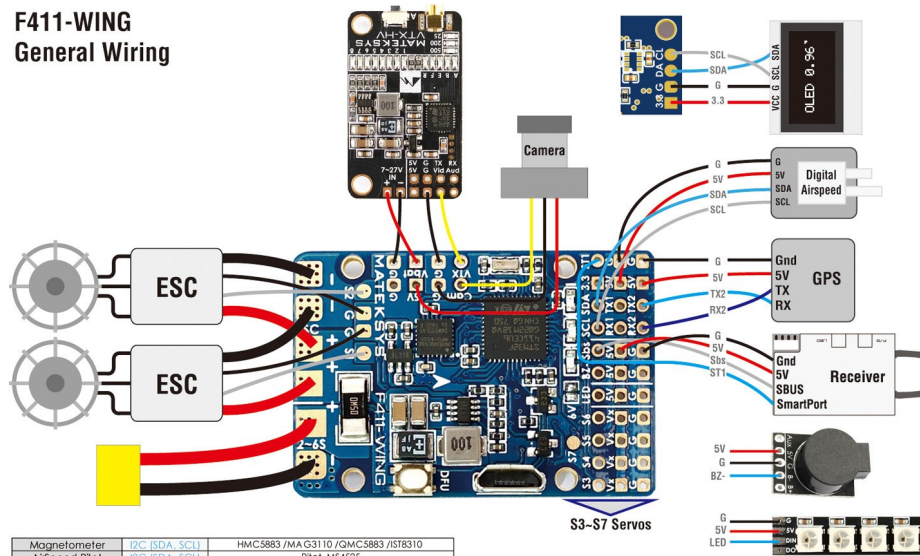
#### Spec.& Features

#### 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)

	<ul style="list-style-type: none"><li>•  2812 Led Strip : Yes</li></ul>	
	<p><b>MATEK SYS</b> : Yes</p> <ul style="list-style-type: none"><li>• RSSI: No</li></ul> <p><b>FC Firmware</b></p> <ul style="list-style-type: none"><li>• INAV Flight</li><li>• Target: MATEKF411</li></ul> <p><b>PDB</b></p> <ul style="list-style-type: none"><li>• Input voltage range: 6.5~30V (2~6S LiPo) w/TVS protection</li><li>• 2x ESC power pads</li><li>• Current Senor: 78A, 3.3V ADC, Scale 423</li></ul> <p><b>BEC 5V output</b></p> <ul style="list-style-type: none"><li>• Designed for Flight controller, Receiver, OSD, Camera, Buzzer, 2812 LED_Strip, Buzzer, GPS module, AirSpeed</li><li>• Continuous current: 2 Amps</li></ul> <p><b>BEC Vx output</b></p> <ul style="list-style-type: none"><li>• Designed for Servos</li><li>• Voltage adjustable, 5V Default, 6V via jumper</li><li>• Continuous current: 3 Amps</li></ul> <p><b>BEC 3.3V output</b></p> <ul style="list-style-type: none"><li>• Designed for Baro / Compass module/ OLED and Spektrum RX</li><li>• Linear Regulator</li><li>• Continuous current: 200mA</li></ul> <p><b>Physical</b></p> <ul style="list-style-type: none"><li>• Mounting: 24 x 24mm, Φ2mm</li><li>• Dimensions: 41 x 28 x 10mm</li><li>• Weight: 7g (Total 12g w/ bottom plate and M2 standoffs)</li></ul>	

## F411-WING General Wiring



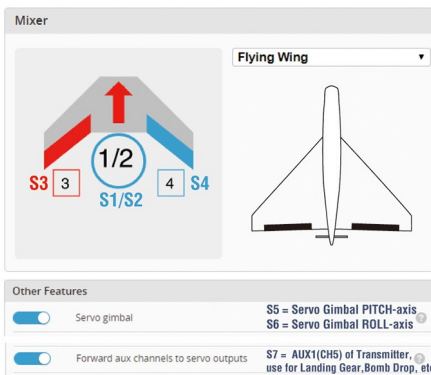
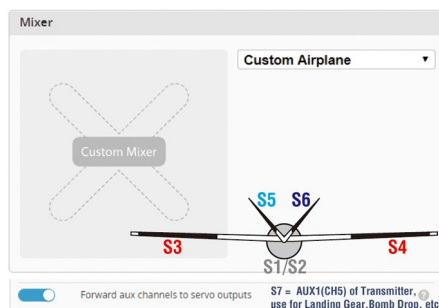
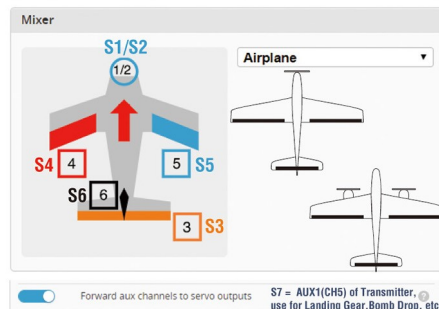
Magnetometer	I2C (SDA, SCL)	HMC5883 / MA G31 IO / QMC5883 / IS78310
AirSpeed Pilot	I2C (SDA, SCL)	Pilot_M54525
OLED	I2C (SDA, SCL)	0.96" 128*64
SBUS	Sbus pad	Built-in inverter on UART1-RX
GPS	UART2 (Tx2 Rx2)	
Frsky SmartPort or VTX control	ST1 pad	Softserial-TX1 is enabled on ST1 pad by default
FPort	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	<input checked="" type="checkbox"/> MSP 115200	Disabled	AUTO	<input type="checkbox"/> Serial RX Disabled 38400
UART1	<input type="checkbox"/> MSP 115200	Disabled	AUTO	<input checked="" type="checkbox"/> Serial RX Disabled 38400
UART2	<input type="checkbox"/> MSP 115200	Disabled	AUTO	<input type="checkbox"/> Serial RX Disabled 38400
SOFTSERIAL1	<input type="checkbox"/> MSP 115200	SmartPort	AUTO	<input type="checkbox"/> Serial RX Disabled 38400

## F411-WING Mixer w/ INAV1.9.x

INAV MATEKF411	Plane	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
	S5 Right AILE	Gimbal PITCH	Left V-tail
	S6 RUDD	Gimbal ROLL	Right V-tail
Servo Gimbal Forward aux CH	S7 AUX1 (CH5)	AUX1 (CH5)	AUX1 (CH5)



Servo	Input	Weight
2 S3	Stabilised Roll	-100
3 S4	Stabilised Roll	-100
4 S5	Stabilised Pitch	-100
5 S6	Stabilised Pitch	-100
4 S5	Stabilised Yaw	100
5 S6	Stabilised Yaw	-100

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





Forward aux channels to servo outputs

S7 = AUX1(CH5) of Transmitter.  
use for Landing Gear, Bomb Drop, etc.

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

## MATEKF411 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)

### Mixer

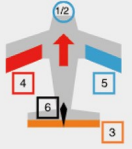
Platform configuration

Airplane

Platform type

☐ Has flaps

Mixer preset



Airplane

Load and apply Load mixer

Output Mapping

Output	S1	S2	S3	S4	S5	S6	S7
Function	Motor 0	Motor 1	Servo 2	Servo 3	Servo 4	Servo 5	Servo 6

Motor Mixer

Motor	Throttle	Roll	Pitch	Yaw	
1	1	0	0	0	Delete
2	1	0	0	0	Delete

Add new mixer rule

Servo mixer

Servo	Input	Weight	Speed	
3	Stabilised Roll	100	0	Delete
4	Stabilised Roll	100	0	Delete
3	Flaps	100	0	Delete
4	Flaps	-100	0	Delete
5	Stabilised Yaw	100	0	Delete
2	Stabilised Pitch	100	0	Delete
6	RC Channel 6	100	0	Delete

Add new mixer rule

Stabilised Roll  
Stabilised Pitch  
Stabilised Yaw  
Stabilised Throttle  
RC Roll  
RC Pitch  
RC Yaw  
RC Throttle  
RC Channel 5  
RC Channel 6  
RC Channel 7  
RC Channel 8  
Gimbal Pitch  
Gimbal Roll  
Flaps

Save and Reboot

### 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



o 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)

-

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)	


control

UART2 (Tx2)

SA / TR

MATEKSYS

-

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

-

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