FC Specifications

- MCU: STM32H743VIT6, 480MHz , 1MB RAM, 2MB Flash
- IMU: ICM42688 (SPI1) & ICM42688 (SPI4)
- Baro: Infineon DPS310 (I2C2)
- OSD: AT7456E (SPI2)
- Blackbox: MicroSD card slot (SDIO)
- 7x Uarts (1,2,3,4,6,7,8) with built-in inversion.
- 13x PWM outputs(including “LED” pad)
- 2x I2C
- 1x CAN
- 6x ADC (VBAT, Current, RSSI, Analog AirSpeed, VB2, CU2)
- 3x LEDs for FC STATUS (Blue, Red) and 3.3V indicator(Red)
- 1x SPI3 breakout
- USB/Beep Extender with Type-C(USB2.0)
-
- Dual Camera Inputs switch
- 5V/9V(12V) for Camera/VTX power switch
- High-precision Current Sense (90A continuous, 220A peak)
- Battery Voltage Sensor: 1K:10K (Scale 1100 in INAV, BATT_VOLT_MULT 11.0 in ArduPilot)
- ADC VB2 voltage divider: 1K:20K
- ADC AirSpeed voltage divider: 20K:20K
- Static power 160mA@5V

FC Firmware

- ArduPilot(ChiBiOS): MATEKH743
- INAV: MATEKH743

PDB

- Input voltage range: 8~36V (3~8S LiPo) w/TVS protection
- 2x ESC power pads
- Current Senor: 220A, 3.3V ADC (Scale 150 in INAV, 66.7 A/V in ArduPilot)
- Sense resistor: 90A continuous, 220A peak.

BEC 5V output

- Designed for Flight controller, Receiver, OSD, Camera, Buzzer, 2812 LED_Strip, Buzzer, GPS module, AirSpeed
- Output 5.15 +/- 0.1V DC
- Continuous current 2 Amps, 3A Peak

BEC 9V /12V output

- Designed for Video Transmitter, Camera, Gimbal ect.
- Continuous current 2 Amps, 3A Peak
- 12V option with Jumper pad

BEC Vx output

- Designed for Servos
- Voltage adjustable, 5V Default, 6V or 7.2V via jumper
- Continuous current 8 Amps, 10A Peak

BEC 3.3V output

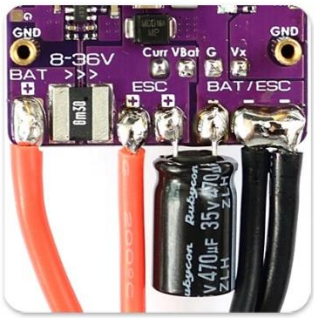
- Linear Regulator
- Continuous current: 200mA

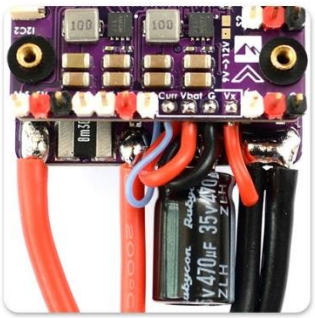
Physical

- Mounting: 30.5 x 30.5mm, Φ4mm with Grommets Φ3mm
- Dimensions: 54 x 36 x 13 mm
- Weight: 30g with USB extender

Including

- 1x H743-WING
- 1x USB(Type-C)/Beep (Passive buzzer) Extender
- 1x 20cm JST-SH-6P to JST-SH-6P cable for USB extender.
- 2x 20cm JST-GH-4P to JST-GH-4P cable for CAN & I2C port
- 1x Rubycon ZLH 35V 470uF capacitor
- Dupont 2.54 pins **(Board is shipped unsoldered)**



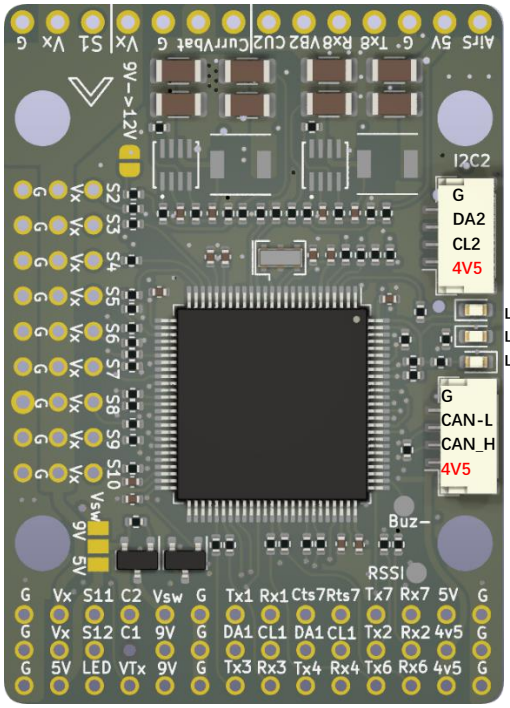


LAYOUT

Vbat: 8~36V DC IN
Voltage divider 1K:10K, Max: 36V supported
BATT_COLT_PIN 10, BATT_VOLT_MULT 11
Curr: for current sensor, 0~3.3V
BATT_CURR_PIN 11, BATT_AMP_PERVLT 66.7
INAV current sacle: 150
VB2: Voltage divider 1K:20K, Max: 69V supported
BATT2_VOLT_PIN 18, BATT2_VOLT_MULT 21 BATT2_CURR_PIN 7
CU2：for external current sensor, 0~3.3v BATT2_CURR_PIN 7

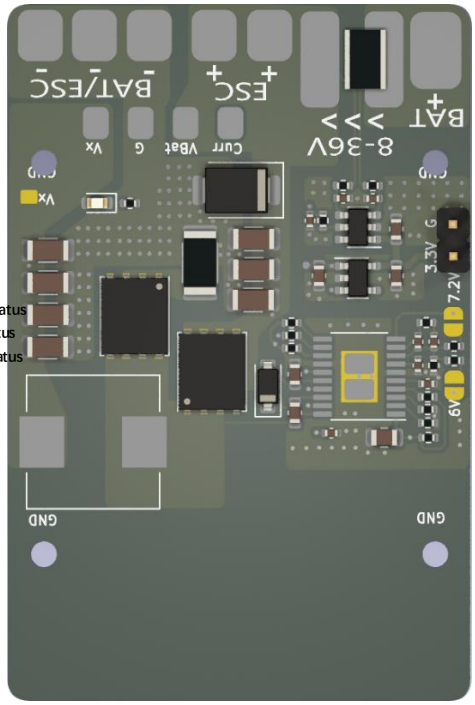
TX8/RX8: UART8
AirS: Analog Airspeed sensor(0-6.6v)
1:1 voltage divider built-in ARSPD_PIN 4

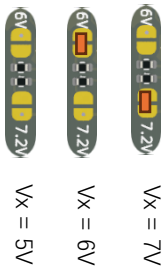
+ & - : Battery & ESC power pads, 8~36V DC (3~8S LIPO)
Current Sensor 90A continuous , 220A peak.
IANV Current sensor scale: 150



DA2 & CL2 I2C2
JST-GH-4P

LED1: Green, FC Status
LED2: Blue, FC Status
LED3: Red, 3.3v Status





Vx = 5V
Vx = 6V
Vx = 7V

CAN Port
JST-GH-4P

Rssi:
Analog RSSI,
RSSI_ANA_PIN 8

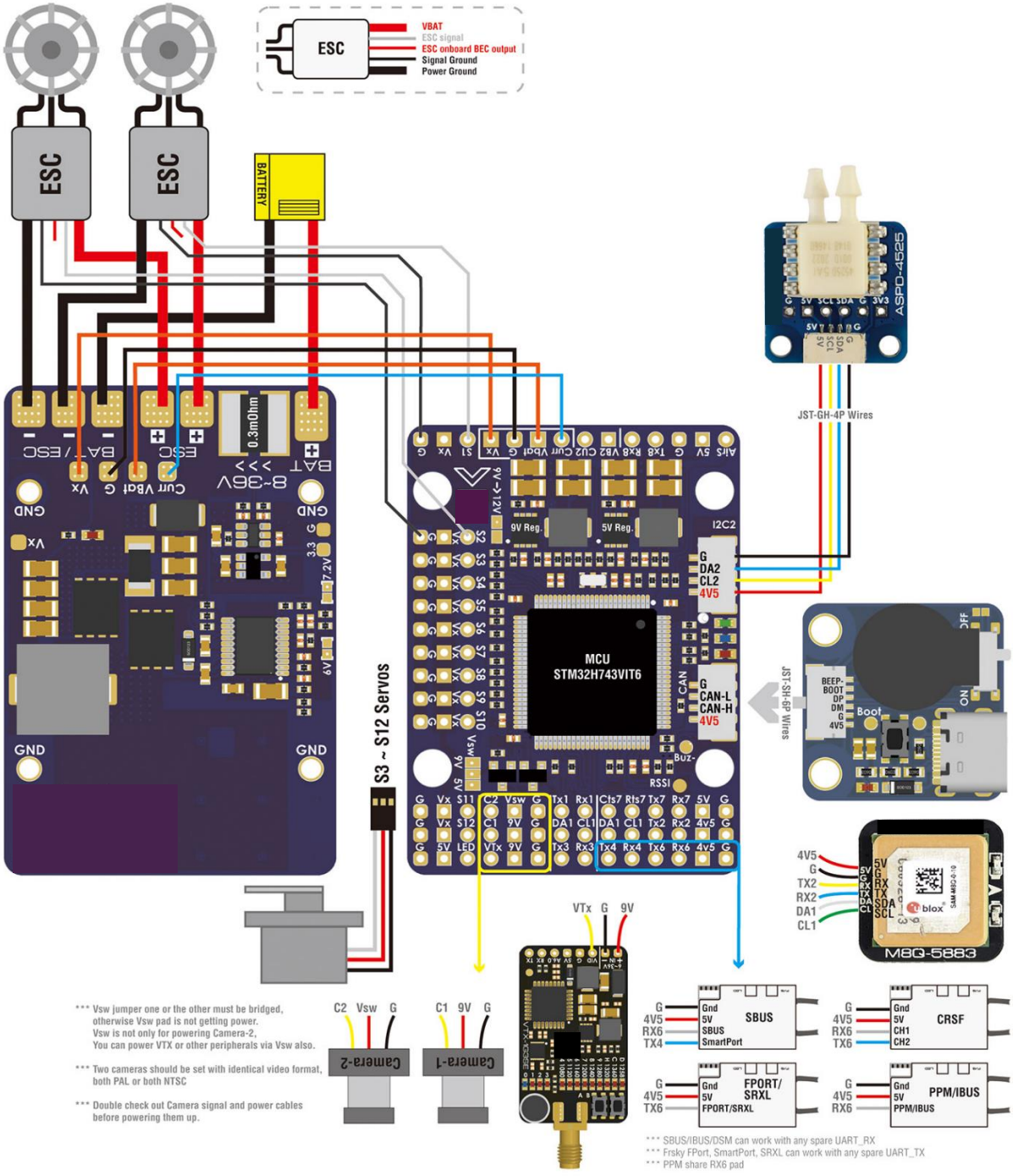
Vsw = 9V

Vsw = 5V

C1：camera 1 video IN (default)
C2：camera 2 video IN

Wiring (Airplane)

INAV fw: MATEKH743
ArduPilot fw: MATEKH743



Ardupilot IO MAP

ArduPilot						
PWM	S1	PB0	5 V tolerant I/O	PWM1 GPIO50	TIM8_CH2N	Group1
	S2	PB1	3.3 V tolerant I/O	PWM2 GPIO51	TIM8_CH3N	
	S3	PA0	5 V tolerant I/O	PWM3 GPIO52	TIM5_CH1	Group2
	S4	PA1	5 V tolerant I/O	PWM4 GPIO53	TIM5_CH2	
	S5	PA2	5 V tolerant I/O	PWM5 GPIO54	TIM5_CH3	
	S6	PA3	5 V tolerant I/O	PWM6 GPIO55	TIM5_CH4	
	S7	PD12	5 V tolerant I/O	PWM7 GPIO56	TIM4_CH1	Gourp3
	S8	PD13	5 V tolerant I/O	PWM8 GPIO57	TIM4_CH2	
	S9	PD14	5 V tolerant I/O	PWM9 GPIO58	TIM4_CH3	
	S10	PD15	5 V tolerant I/O	PWM10 GPIO59	TIM4_CH4	
	S11	PE5	5 V tolerant I/O	PWM11 GPIO60	TIM15_CH1	Group4
	S12	PE6	5 V tolerant I/O	PWM12 GPIO61	TIM15_CH2	
	LED	PA8	5 V tolerant I/O	PWM13 GPIO62	TIM1_CH1	Group5
				SERVO13_FUNCTION 120, NTF_LED_TYPES neopixel		
PWM1~PWM13 are Dshot and PWM capable. However, mixing Dshot and normal PWM operation for outputs is restricted into groups. That is to say, enabling Dshot for an output in a group requires that ALL outputs in that group be configured and used as Dshot, rather than PWM outputs. If servo and motor are mixed in same group, make sure this group run lowest PWM frequency according to the servo specification. That is to say. If servo supports Max. 50Hz, ESC must run at 50Hz in this group.						
ADC	Vbat pad 1K:10K divider builtin	PC0	0~36V	Vbat ADC onboard battery voltage sense	BATT_VOLT_PIN BATT_VOLT_MULT	10 11.0
	Curr pad	PC1	0~3.3V	Current ADC onboard current sense	BATT_CURR_PIN BATT_AMP_PERVLT	11 66.7
	VB2 Pad 1K:20K divider builtin	PA4	0~69V	Vbat2 ADC	BATT2_VOLT_PIN BATT2_VOLT_MULT	18 21.0
	CU2 Pad	PA7	0~3.3V	Current2 ADC	BATT2_CURR_PIN BATT2_AMP_PERVLT	7 /
	RSSI Pad	PC5	0~3.3V	RSSI ADC Analog RSSI	RSSI_ANA_PIN RSSI_TYPE	8 1
	AirS Pad 20K:20K divider builtin	PC4	0~6.6V	AirS ADC Analog Airspeed	ARSPD_PIN ARSPD_TYPE	4 2
I2C	I2C1 CL1/DA1	PB6/PB7	5 V tolerant I/O	Compass	COMPASS_AUTODEC	1
	I2C2 CL2/DA2 on JST-GH-4P	PB10/PB11	5 V tolerant I/O	on board Baro DPS310	Address	0x76
				Digital Airspeed I2C MS4525 DLVR-L10D	ARSPD_BUS ARSPD_TYPE ARSPD_TYPE	0 1 9
CAN	CAN1	PD0/PD1	5 V tolerant I/O	CAN Node	CAN_D1_PROTOCOL CAN_P1_DRIVER	1 1
				CAN GPS CAN Compass CAN Airspeed sensor	GPS_TYPE COMPASS_TYPEMASK ARSPD_TYPE	9 0 8

UART	USB	PA11/PA12	5 V tolerant I/O	USB	console	SERIAL0
	RX7 TX7 RTS7 CTS7	PE7/8/9/10	3.3 V tolerant I/O	UART7	telem1	SERIAL1
	TX1 RX1	PA9/PA10	5 V tolerant I/O	USART1	telem2	SERIAL2
	TX2 RX2	PD5/PD6	5 V tolerant I/O	USART2	GPS1	SERIAL3
	TX3 RX3	PD8/PD9	5 V tolerant I/O	USART3	GPS2	SERIAL4
	TX8 RX8	PE1/PE0	5 V tolerant I/O	UART8	USER	SERIAL5
	TX4 RX4	PB9/PB8	5 V tolerant I/O	UART4	USER	SERIAL6
	TX6 RX6	PC6/PC7	5 V tolerant I/O	USART6	RC input/Receiver	SERIAL7
				RX6	SBUS/IBUS/DSM/PPM	
				TX6	FPORT/SRXL2	

RC INPUT

The Rx6 pin, which by default is mapped to a timer input, can be used for all ArduPilot supported receiver protocols, except CRSF which requires a true UART connection. However, bi-directional protocols which include telemetry, such as SRXL2 and FPort, when connected in this manner, will only provide RC without telemetry.

To allow CRSF and embedded telemetry available in Fport, CRSF, and SRXL2 receivers, the Rx6 pin can also be configured to be used as true UART RX pin for use with bi-directional systems by setting the BRD_ALT_CONFIG to “1” so it becomes the SERIAL7 port’s RX input pin.

With this option, SERIAL7_PROTOCOL must be set to “23”, and:

- PPM is not supported.
- SBUS/DSM/SRXL connects to the Rx6 pin, but SBUS requires that the SERIAL7_OPTIONS be set to “3”.
- FPort requires connection to Tx6 and SERIAL7_OPTIONS be set to “7”. If Telemetry doesn’t work, try set SERIAL7_OPTIONS = 135.
- CRSF also requires a Tx6 connection, in addition to Rx6, and automatically provides telemetry. Set SERIAL7_OPTIONS to “0”.
- SRXL2 requires a connection to Tx6 and automatically provides telemetry. Set SERIAL7_OPTIONS to “4”.
-

ArduPilot Relay(PINIO)

- Camera-1 and Vsw On by default
- Make sure 2 cameras are set with identical video format, both PAL or both NTSC.

GPIOs

- PD10 PINIO1 OUTPUT GPIO(81) //Vsw pad power switch
- PD11 PINIO2 OUTPUT GPIO(82) //Camera switch

RCx_OPTION: RC input option

- 28 Relay1 On/Off
- 34 Relay2 On/Off
- 35 Relay3 On/Off
- 36 Relay4 On/Off

e.g.

- RELAY1_PIN 81 //Vsw GPIO
- RC7_OPTION 28 //Relay On/Off, Use CH7 of Transmitter to switch Vsw

- RELAY2_PIN 82 //Camera switch GPIO
- RC8_OPTION 34 //Relay2 On/Off, Use CH8 of Transmitter to switch camera

or

- RELAY3_PIN 81 //Vsw GPIO
- RC9_OPTION 35 //Relay3 On/Off, Use CH9 of Transmitter to switch Vsw
- RELAY4_PIN 82 //Camera switch GPIO
- RC10_OPTION 36 //Relay4 On/Off, Use CH10 of Transmitter to switch camera

The configured feature will be triggered when the auxiliary switch's pwm value becomes higher than 1800. It will be deactivated when the value falls below 1200.

Check the pwm value sent from the transmitter when the switch is high and low using the Mission Planner's Initial Setup >> Mandatory Hardware >> Radio Calibration screen. If it does not climb higher than 1800 or lower than 1200, it is best to adjust the servo end points in the transmitter.