



MATEKSYS

FLIGHT CONTROLLER H743-WING V2

QUICK START GUIDE

MCU: STM32H743VIT6, 480MHz, 2MB Flash
IMU: MPU6000 (SPI1) & ICM42605 (SPI4)
Baro: 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
2x I2C
1x CAN
6x ADC (VBAT, Current, RSSI, Analog AirSpeed, VB2, CU2)
1x SPI3 breakout

Switchable Dual Camera Inputs
Switchable 5V/9V(12V) for Camera/VTX

8~36V DC IN (3~8S LiPo)
High-precision Current Sense (90A continuous, 220A peak)
BEC 5V 2A for FC
BEC 9V 2A for camera/VTX, 12V option
BEC Vx 8A cont. 10A burst for servos, 5V, 6V or 7.2V option
LDO 3.3V 200mA

ArduPilot hwdef: MATEKH743
INAV Target: MATEKH743

LAYOUT

Vbat: 8-36V DC IN
 Voltage divider 1K:10K, Max.36V supported
 BATT_VOLT_PIN 10, BATT_VOLT_MULT 11
 Curr: for current sensor, 0-3.3V
 BATT_CURR_PIN 11, BATT_AMP_PERVLT 66.7
 INAV current scale: 150

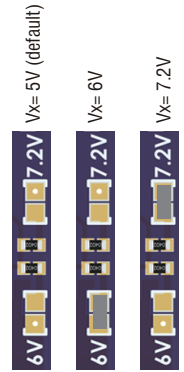
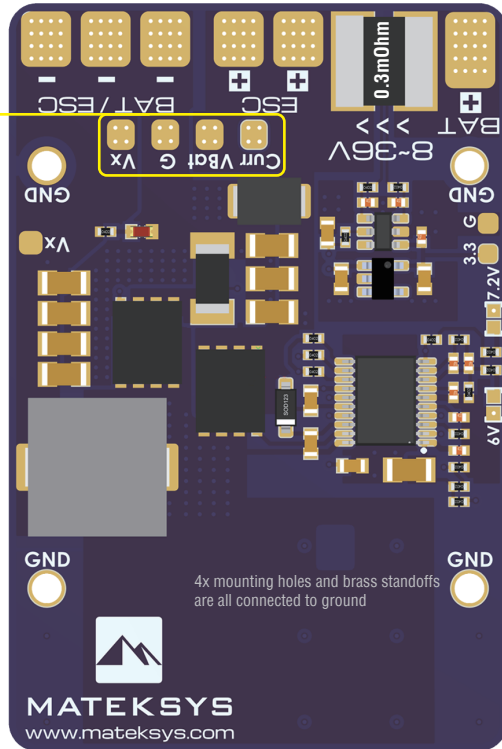
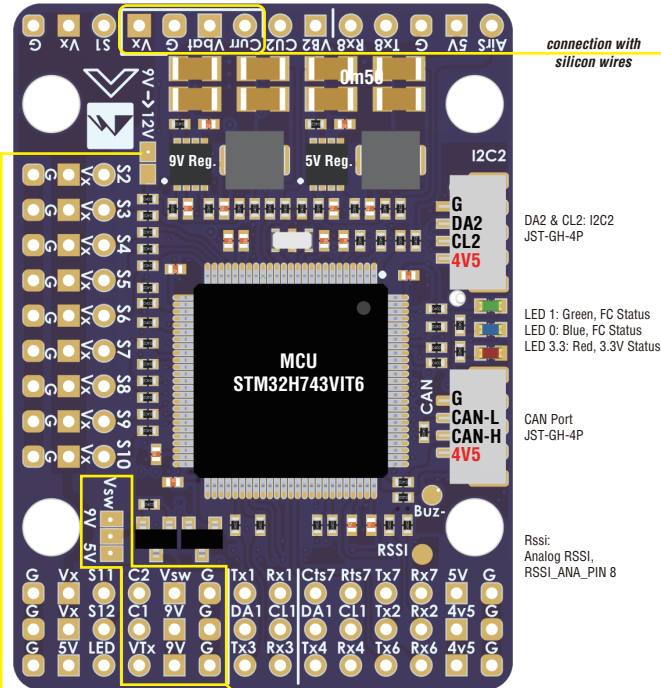
VB2: Voltage divider 1K:20K, Max.69V supported
 BATT2_VOLT_PIN 18, BATT2_VOLT_MULT 21
 CU2: for external current sensor, 0-3.3V
 BATT2_CURR_PIN 7

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.
 INAV Current sensor scale: 150



S1-S12, LED: PWM1-PWM13

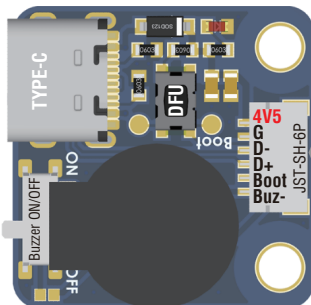
Vx: BEC 5V/6V/7.2V for servos, Default is 5V
 8A cont. 10A peak
 5V: onboard BEC 5V 2A cont. 3A peak
 9V: onboard BEC 9V 2A cont. 3A peak,
 *** 9V rise to 12V if "9V->12V" jumper is bridged.
 G: Ground



Vsw: 5V/9V selection
 *** ON/OFF can be switched via ArduPilot Relay or Modes/USER1 (INAV)
 *** Max.1.5A load on this pad. (Default ON)
 *** Vsw jumper one or the other must be bridged

C1: Camera-1 video IN (Default)
 C2: Camera-2 video IN
 *** C1/C2 can be switched via ArduPilot Relay or Modes/USER2 (INAV)

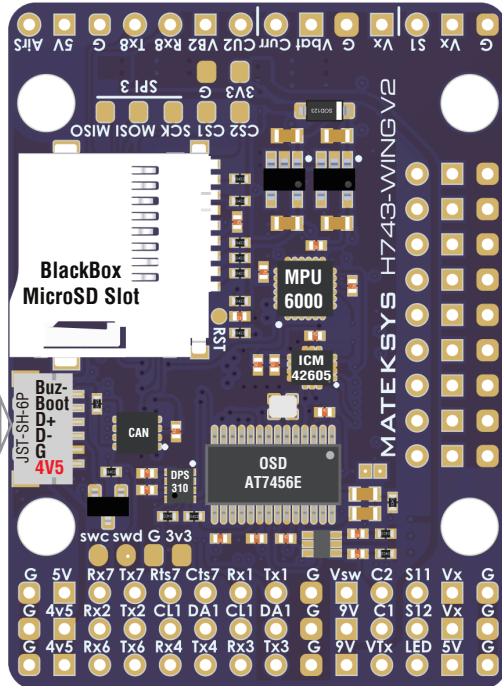
VTX: Video OUT for Video Transmitter



DFU Button: DFU mode
 Connect USB to the PC While holding the boot button in.

4V5: 4.4-4.8V, Max.500mA
 *** the voltage is also supplied when connecting via USB

A battery must be plugged in for power to be provided to the pins marked "5V" on the board.

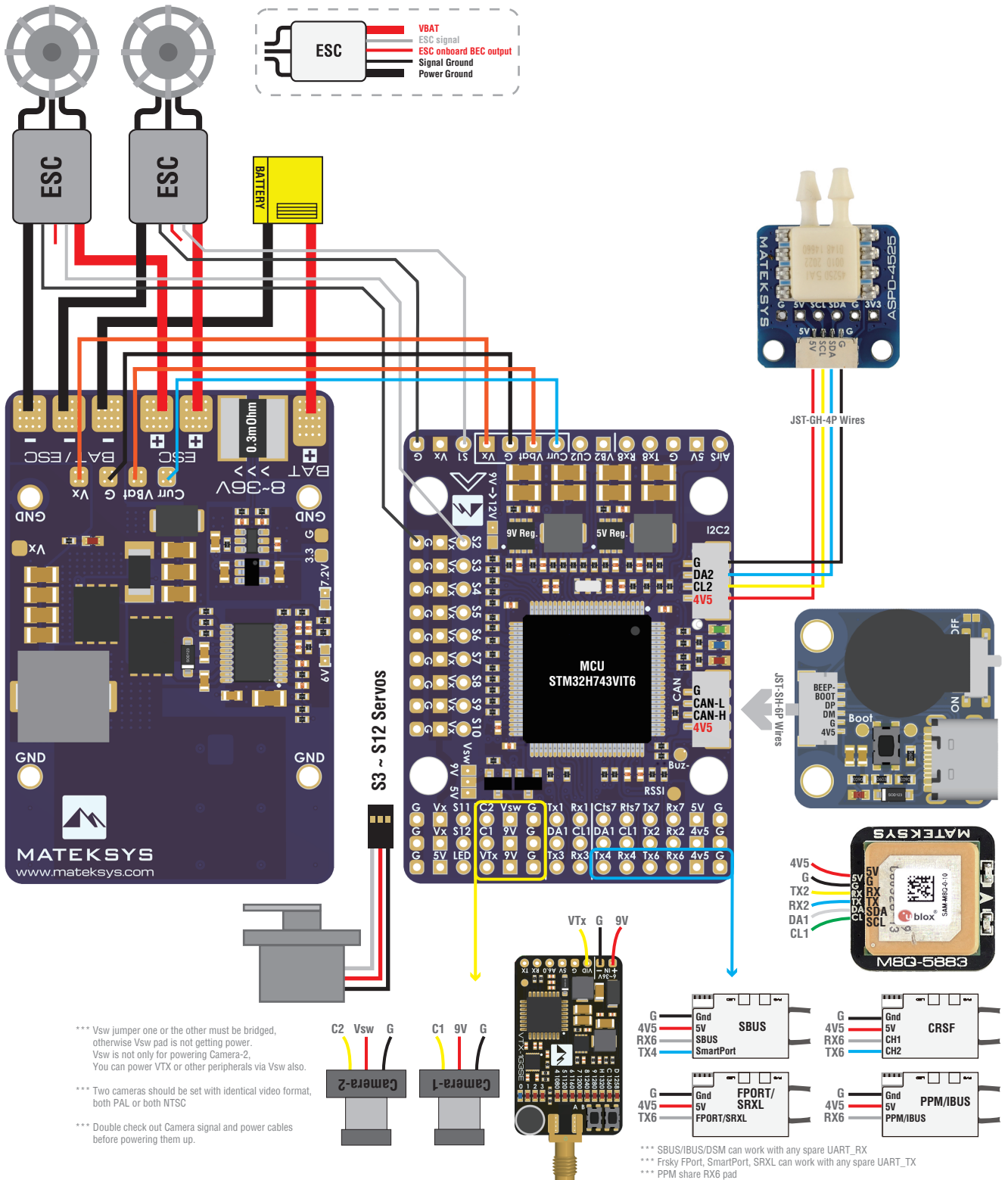


Size: 54x36x13mm
 Weight: 30g w/ top and bottom plate & USB extender
 Holes: \varnothing 4mm, 30.5mm mounting
 M3 Silicon Grommets included

Wiring (Airplane)

INAV fw: MATEKH743

ArduPilot fw: MATEKH743



- *** Vsw jumper one or the other must be bridged, otherwise Vsw pad is not getting power. Vsw is not only for powering Camera-2, you can power VTX or other peripherals via Vsw also.
- *** Two cameras should be set with identical video format, both PAL or both NTSC
- *** Double check out Camera signal and power cables before powering them up.

*** SBUS/IBUS/DSM can work with any spare UART_RX
 *** Fisky FPort, SmartPort, SRXL can work with any spare UART_TX
 *** PPM share RX6 pad

Vsw Power / Camera switch

USER1	No USER1 definition 9Vsw ON by default
USER2	No USER2 definition C1 (Camera-1) ON by default

USER1: CH 8, Vsw OFF, Vsw ON (Min: 900, Max: 2100)

USER2: CH 5, C1 ON & C2 OFF, C2 ON & C1 OFF (Min: 1725, Max: 2100)

I/O Mapping

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	
	S4	PA1	5 V tolerant I/O	PWM4 GPIO53	TIM5_CH2	Group2
	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	Group3
	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	
	S12	PE6	5 V tolerant I/O	PWM12 GPIO61	TIM15_CH2	Group4
	LED	PA8	5 V tolerant I/O	PWM13 GPIO62	TIM1_CH1	
				SERVO13_FUNCTION 120, NTF_LED_TYPES neopixel		Group5
PWM1-PWM13 are Dshot and PWM capable. However, mixing Dshot and normal PWM operation for outputs is restricted into groups, ie. 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. ie. 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	GPS_TYPE COMPASS_TYPEMASK	9 0
				CAN Airspeed sensor	ARSPD_TYPE	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 SBUS/IBUS/DSM/PPM FPORT/SRX2	SERIAL7

iNAV					
PWM	S1	PB0	5 V tolerant I/O	TIM3_CH3	Fixed Wing Motor
	S2	PB1	3.3 V tolerant I/O	TIM3_CH4	
	S3	PA0	5 V tolerant I/O	TIM5_CH1	
	S4	PA1	5 V tolerant I/O	TIM5_CH2	Fixed Wing Servo
	S5	PA2	5 V tolerant I/O	TIM5_CH3	
	S6	PA3	5 V tolerant I/O	TIM5_CH4	
	S7	PD12	5 V tolerant I/O	TIM4_CH1	
	S8	PD13	5 V tolerant I/O	TIM4_CH2	
	S9	PD14	5 V tolerant I/O	TIM4_CH3	
	S10	PD15	5 V tolerant I/O	TIM4_CH4	
	S11	PE5	5 V tolerant I/O	TIM15_CH1	
	S12	PE6	5 V tolerant I/O	TIM15_CH2	
	LED	PA8	5 V tolerant I/O	TIM1_CH1	2812LED
ADC	Vbat pad 1K:10K divider builtin	PC0	0-36V	Vbat ADC ADC_CHANNEL_1	scale 1100
	Curr Pad	PC1	0-3.3V	Current ADC ADC_CHANNEL_2	scale 150
	RSSI Pad	PC5	0-3.3V	RSSI ADC ADC_CHANNEL_3	Analog RSSI
	AirS Pad 20K:20K divider builtin	PC4	0-6.6V	AirS ADC ADC_CHANNEL_4	Analog Airspeed
	VB2 Pad 1K:20K divider builtin	PA4	0-69V	ADC_CHANNEL_5	scale 2100
	CU2 Pad	PA7	0-3.3V	ADC_CHANNEL_6	spare
I2C	I2C1 CL1/DA1	PB6/PB7	5 V tolerant I/O	Compass	QMC5883 / HMC5883 IST8310 / IST8308 MAG3110 / LIS3MDL
	I2C2 CL2/DA2 on JST-GH-4P	PB10/PB11	5 V tolerant I/O	OLED	0.96"
				onboard Barometer Digital Airspeed sensor Temperature sensor	DPS310 MS4525
UART	USB	PA11/PA12	5 V tolerant I/O	USB	
	TX1 RX1	PA9/PA10	5 V tolerant I/O	USART1	telem2
	TX2 RX2	PD5/PD6	5 V tolerant I/O	USART2	GPS1
	TX3 RX3	PD8/PD9	5 V tolerant I/O	USART3	GPS2
	TX4 RX4	PB9/PB8	5 V tolerant I/O	UART4	USER
	TX6 RX6	PC6/PC7	5 V tolerant I/O	TX6 & RX6	CRSF
				UART6_RX	SBUS/IBUS/DSM/PPM
				UART6_TX	FPORT/SRX2
RX7 TX7	PE7/PE8	3.3 V tolerant I/O	UART7	telem1	
TX8 RX8	PE1/PE0	5 V tolerant I/O	UART8	USER	