



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

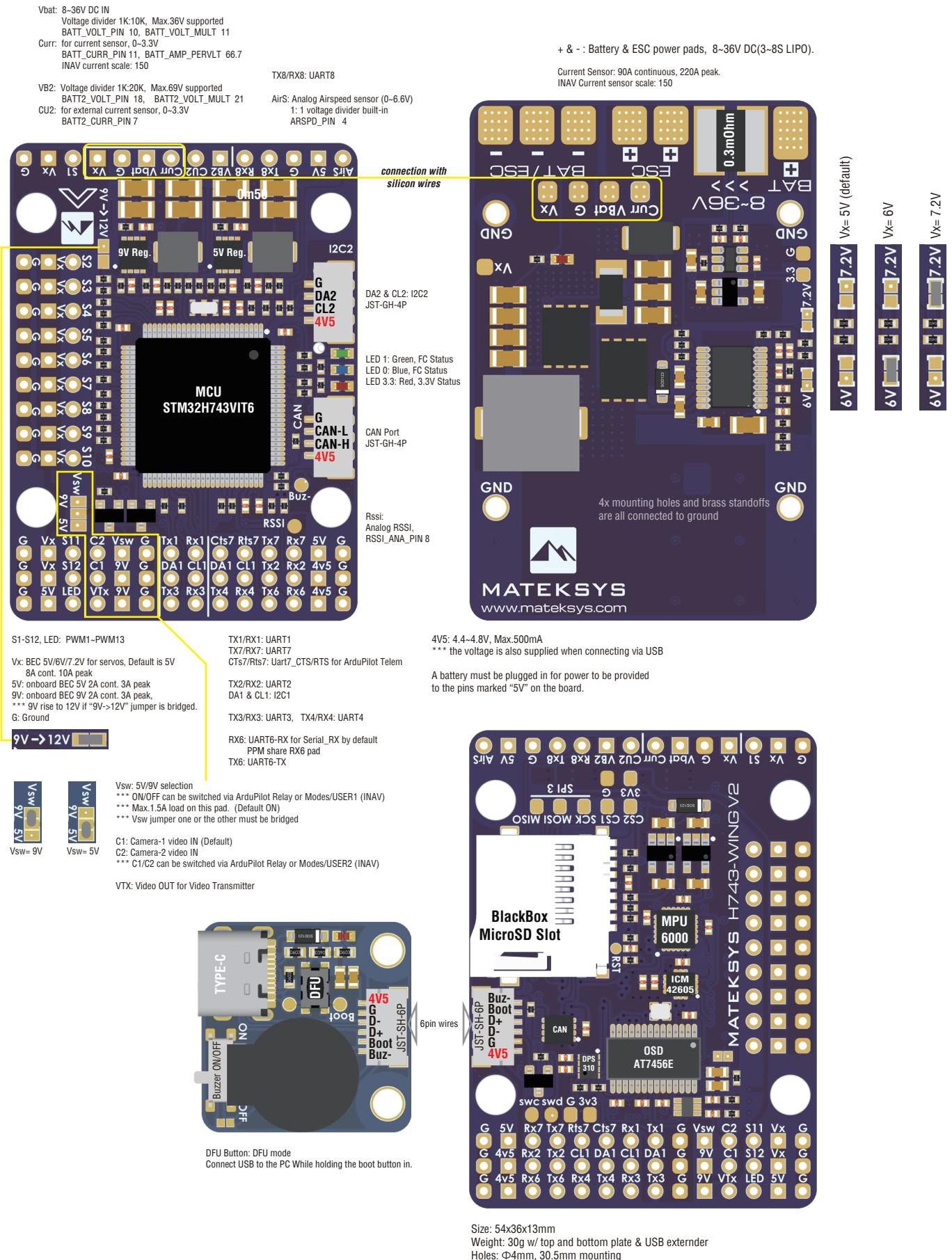
BEC Vx 8A cont. 10A burst for servos, 5V, 6V or 7.2V option

LDO 3.3V 200mA

ArduPilot hwdef: MATEKH743

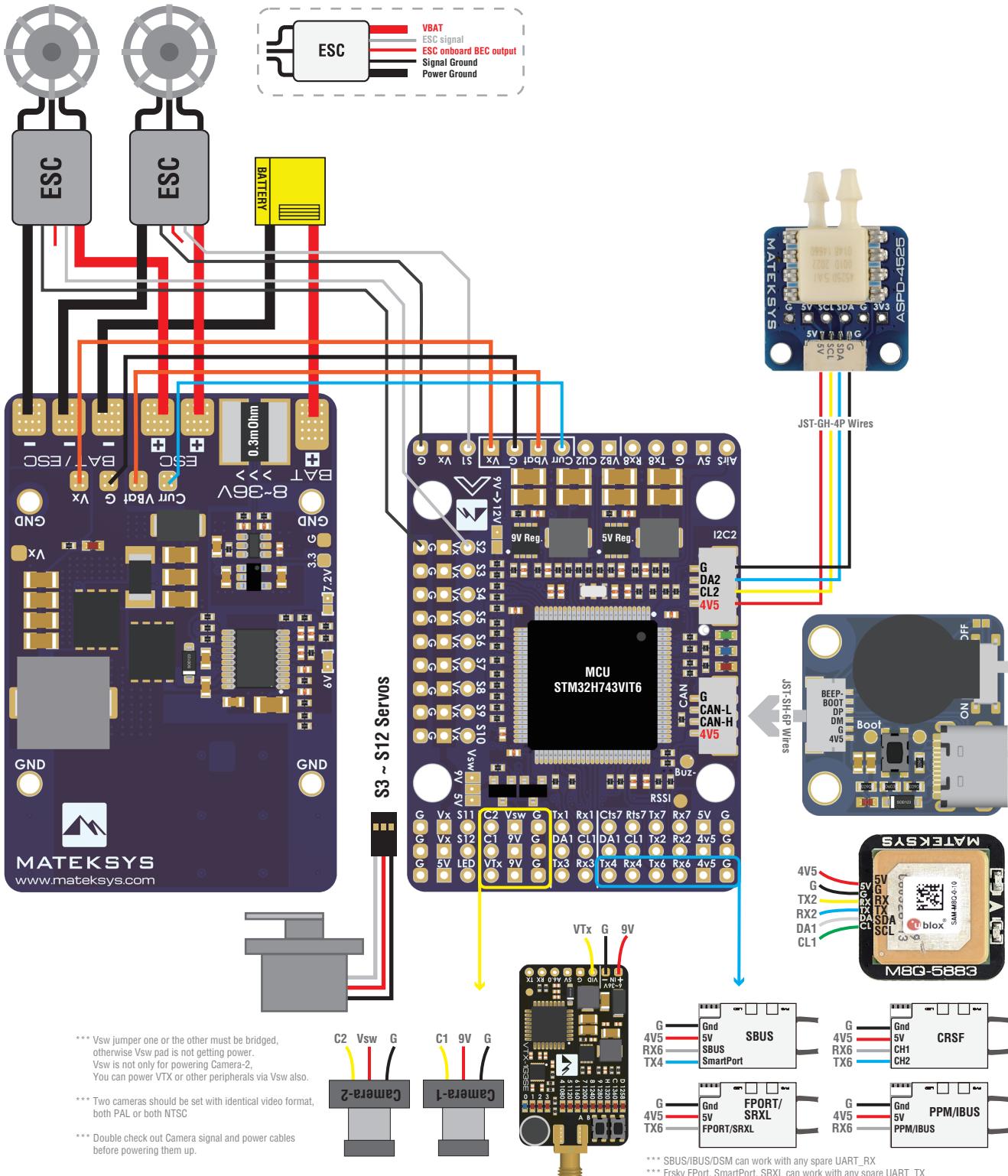
INAV Target: MATEKH743

LAYOUT



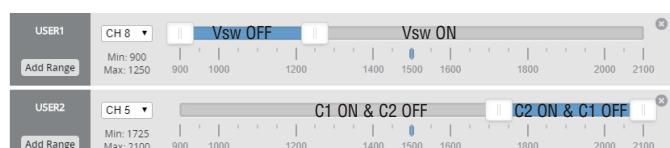
Wiring (Airplane)

INAV fw: MATEKH743
ArduPilot fw: MATEKH743



Vsw Power / Camera switch

USER1 <small>Add Range</small>	No USER1 definition 9Vsw ON by default
USER2 <small>Add Range</small>	No USER2 definition C1 (Camera-1) ON by default



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	
	S5	PA2	5 V tolerant I/O	PWM5 GPIO54	TIM5 CH3	Group2
	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	Group4
	S12	PE6	5 V tolerant I/O	PWM12 GPIO61	TIM15 CH2	
	LED	PA8	5 V tolerant I/O	PWM13 GPIO62	TIM1 CH1	
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, 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	SERIAL7
				RX6	SBUS/IBUS/DSM/PPM	
				TX6	FPORT/SRXL2	

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		
	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	Fixed Wing Servo	
	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		
ADC	LED	PA8	5 V tolerant I/O	TIM1 CH1	2812LED	
	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	
	I2C1 CL1/DA1	PB6/PB7	5 V tolerant I/O	Compass	QMC5883 / HMC5883 IST8310 / IST8308 MAG3110 / LIS3MDL	
				OLED	0.96"	
				onboard Barometer	DPS310	
UART	I2C2 CL2/DA2 on JST-GH-4P	PB10/PB11	5 V tolerant I/O	Digital Airspeed sensor	MS4525	
				Temperature sensor		
				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/SRXL2	
	TX7 RX7	PE7/PE8	3.3 V tolerant I/O	UART7	telem1	
	TX8 RX8	PE1/PE0	5 V tolerant I/O	UART8	USER	