

7. H7 FC - Wing

7.1. About

For seasoned wing pilots, affordable high quality flight controllers have been far and between. Shortcomings in either supported software, redundancy on hardware, or price, have made it hard to pick a clear contender for your next project.

Introducing the TBS LUCID H7 Wing FC. Full-featured, versatile, reliable, and affordable.

7.2. Specification

Processor:	STM32H743VIH6
IMU:	ICM42688
Baro:	Infineon DPS310
UARTs:	7
I2C Ports:	2
Servo Outputs:	13
Size:	54 x 36 x 13 mm
Mounting:	30.5 x 30.5 mm, M3
Weight:	25 g
Blackbox:	External, by SD-Card
OSD:	Built-in
Input Voltage:	3 - 12 S compatible
BEC Voltage:	5 V: 3 A (FC and Sensors) 9 / 12 V: 5 A (FPV) 5 - 8.4 V: 10 A (Servos)
Receiver:	Solder on (by wire)
DJI Airunit:	Supported
Additional Features:	SPI CAN Multiple analog Inputs Additional Analog Inputs ⁽¹⁸⁾ ADC Vbat2 pad supports up to 69V Current Sensor USB-C Extension Board w. Buzzer

(18) RSSI, Airspeed Sensor, User1, User2



7.3. Firmware

Firmware	Target	Min. FW Version
INAV	TBS_LUCID_H7_WING	9.00
ArduPilot ⁽¹⁹⁾	TBS_LUCID_H7_WING	4.6.0

7.4. Serial Ports

Serial Ports

Port	Usage Usage	Available Pins
UART 0	USB	Full UART
UART 1	S.Bus	Full UART (just RX on DJI plug)
UART 2	GPS	Full UART with DMA
UART 3	MSP, HD Video Connector	Full UART with DMA
UART 4	Spare	Full UART
UART6	Receiver	Full UART with DMA
UART 7	Spare	Full UART with DMA
UART 8	ESC Telemetry	Full UART

ArduPilot Specification

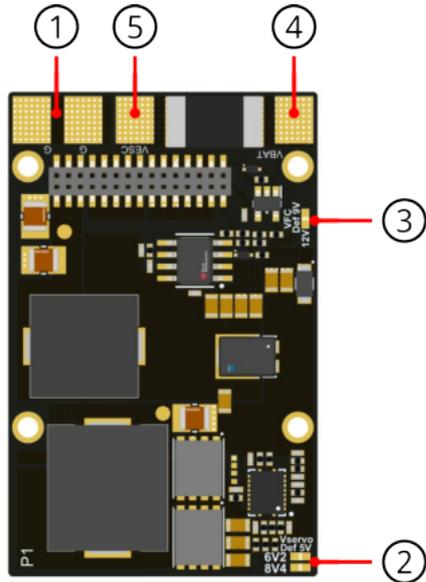
Port	Ardu-Port	Ardu-Usage	5V Tolerant
UART 0	SERIAL0	USB	Yes
UART 1	SERIAL1	S.Bus	Yes
UART 2	SERIAL2	GPS1	Yes
UART 3	SERIAL3	MSP Displayport	Yes
UART 4	SERIAL4	TELEM1	Yes
UART6	SERIAL6	Receiver	Yes
UART 7	SERIAL7	TELEM2	no, 3.3 V
UART 8	SERIAL8	ESC	Yes

(19) [Ardu Wiki for settings](#)



7.5. Pinout

Power Board



1 - GND in/out	2 - Servo Voltage Selector	3 - HD-Video port Voltage Selector
4 - Battery in	5 - Battery out	

Servo Voltage Selector settings

Pin	5 V	6.2 V	8.4 V
6V2	open	closed	open
8V4	open	open	closed



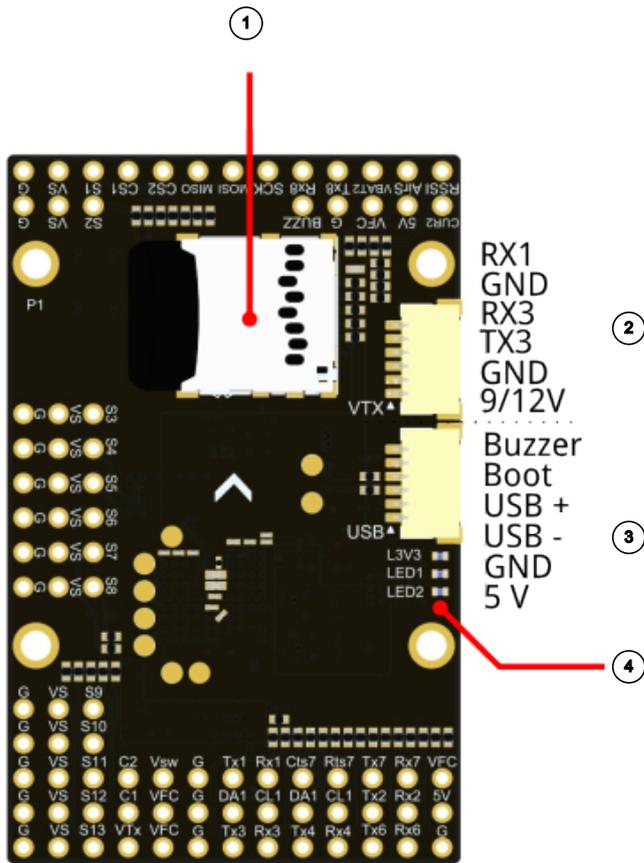
Important:

Do not close both selectors at the same time.

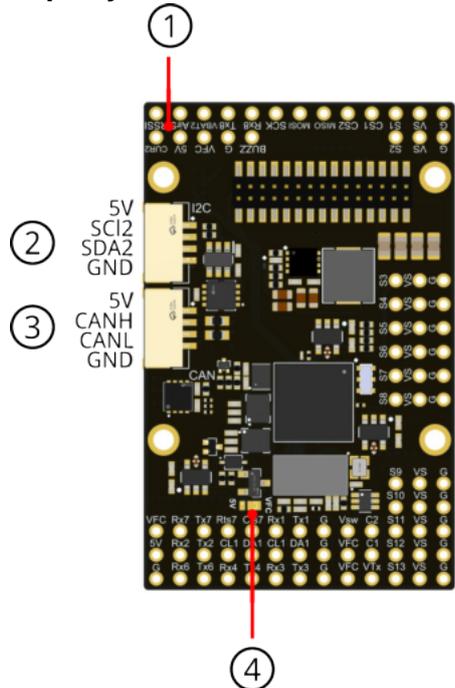
Do not cross-bridge the voltage selector pads.



Top Plate - Top

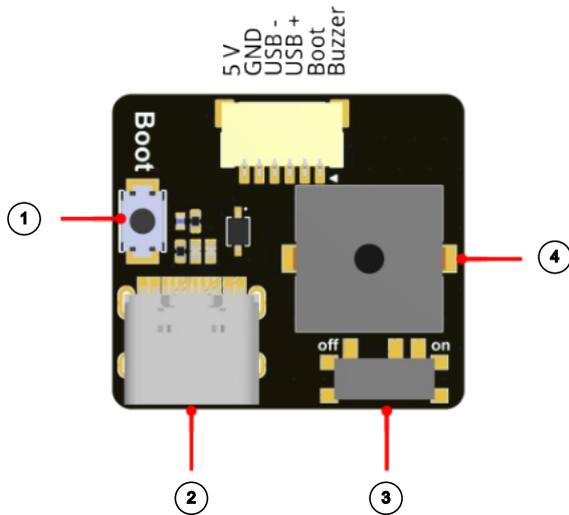


Top Layer - Bottom



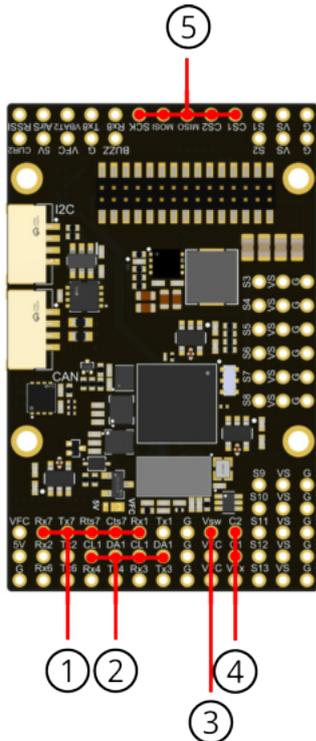
1 - Additional Inputs	2 - I2C 2
3 - CAN	4 - GPIO Voltage Selector

USB Board



1 - Boot-Button	2 - USB-C Port
3 - Buzzer On/Off Switch	4 - Buzzer

Additional Connections



1 - Hardware Flow Control UART 7	2 - I2C 1	3 - PinIO Switch (VSW)
4 - Camera 1/2	5 - SPI	

7.6. GPIO Pins



Note:

All GPIO-Pins are *high-active*.

Settings them to **On** in your Flight Software **enables** the output.

VSW - Voltage Switch (PinIO) - VTX Voltage Supply

Firmware	Function Name	MCU Pin	Function
BETAFLIGHT	PinIO	PD10	USER1
INAV	PinIO	PD10	USER1
ArduPilot	Relay	GPIO 81	RELAY2

Video in Selector (C1/C2)

Firmware	Function Name	MCU Pin	Function
BETAFLIGHT	PinIO	PD11	USER2
INAV	PinIO	PD11	USER2
ArduPilot	Relay	GPIO 82	RELAY3

7.7. Voltage Sensor Settings

INAV Battery Input 1 (up 69 V)

Scale:	2100
Offset:	0

INAV Battery Input 2 (up to 69V)

Scale:	2100
Offset:	0

ArduPilot Battery Input 1 (up 69 V)

BATT_MONITOR:	4
BATT_VOLT_PIN	10
BATT_VOLT_MULT	11.0



ArduPilot Battery Input 2 (up to 69V)

BATT2_MONITOR:	4
BATT2_VOLT_PIN	18
BATT2_VOLT_MULT	11.0

7.8. Current Sensor Settings

INAV Input 1

Scale:	200
Offset:	0

INAV Input 2

Scale:	Depends on used Sensor
Offset:	Depends on used Sensor

ArduPilot Input 1

BATT_CURR_PIN	11
BATT_AMP_PERVLT	40.0

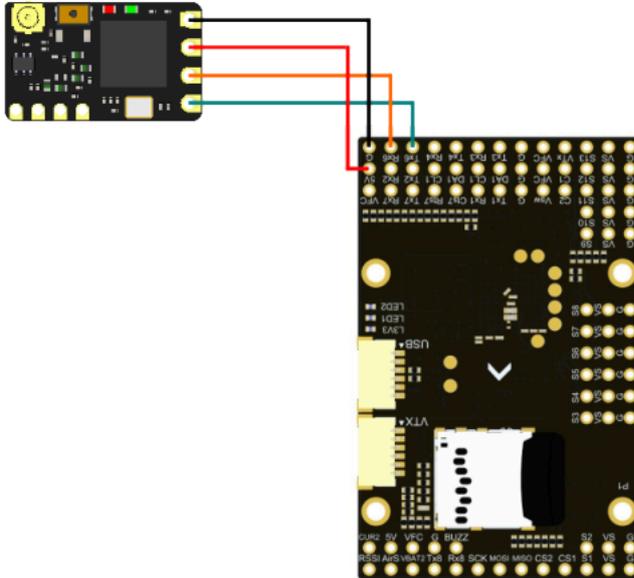
ArduPilot Battery Input 2

BATT2_CURR_PIN	7
BATT2_AMP_PERVLT	Depends on used Sensor

7.9. Peripheral Connections

7.9.1. Receiver

Receiver connection



Note:

Receiver and FC pin layout match up, allowing the receiver to be direct soldered. When done as in the picture above, the *Bind* button can become hard to reach!

Port Settings - BETAFLIGHT/ INAV

UART 6:	Serial RX: on
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ArduPilot

SERIAL6:	Depends on chosen protocol (MAVLink, CRSF)
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Note:

Further information on the settings can be found in the CROSSFIRE/TRACER manual

7.9.2. ESC

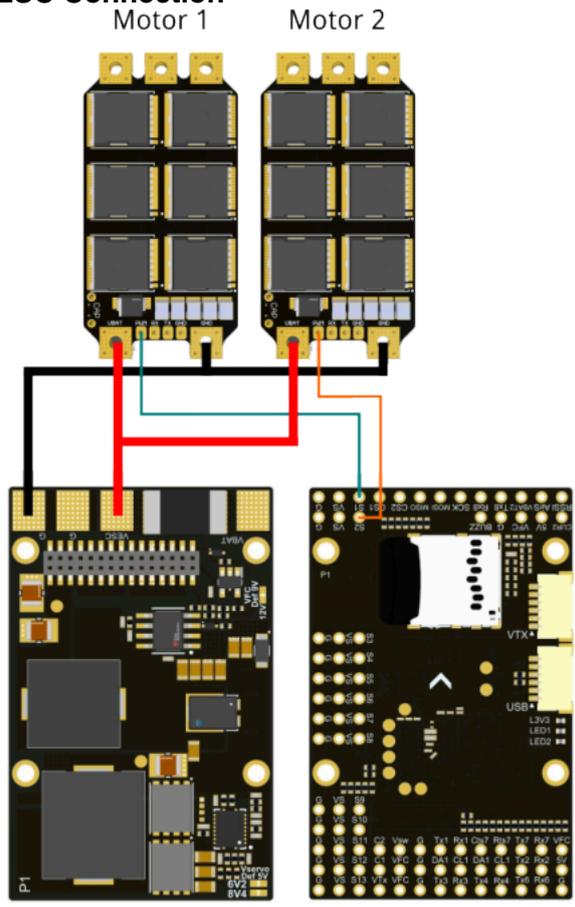


Important:

The Signal ground must always be connected. The ESC can be damaged if left open.



ESC Connection



7.9.3. HD Video Systems



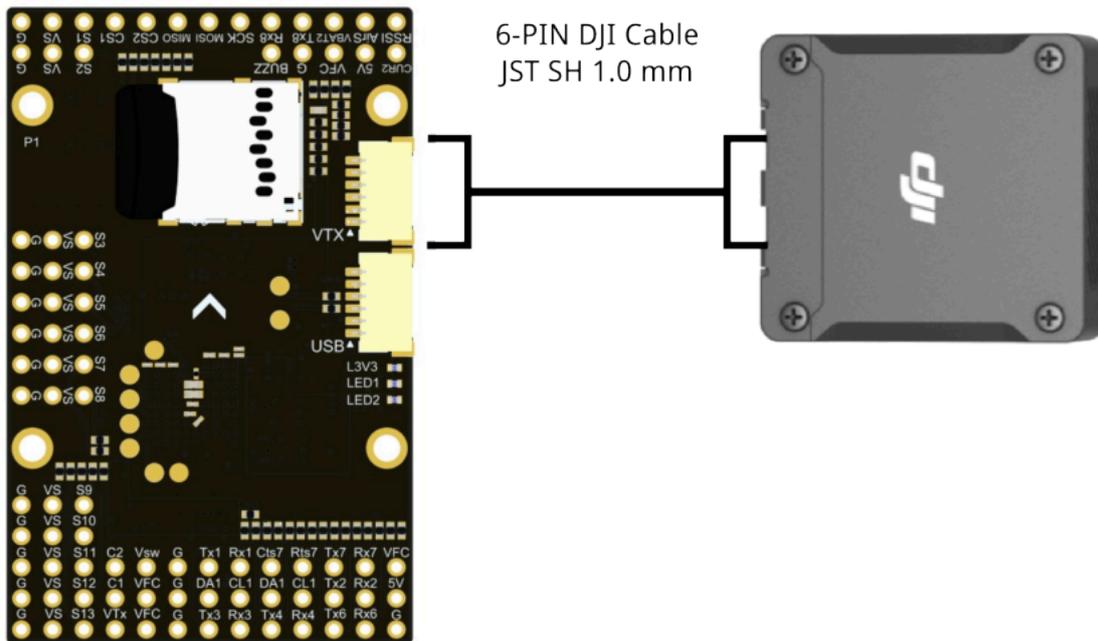
Note:

For the VTX supply to work, **VSW - Voltage Switch (PinIO)** (USER1 (INAV)/ REALY2 (ArduPilot)) must be set to **On**.

Connect your VTX to the designated port for the HD video system.



HD System Connection



The supply voltage is fixed 9 V.

Port Settings

UART 3:	MSP: on/ Peripherals: Displayport
	Baud rate: 115200 ⁽²⁰⁾

Included Receiver Settings (optional)

UART 1:	Serial RX: on
UART 6:	Serial RX: off ⁽²¹⁾

7.9.4. Analog Video Systems



Note:

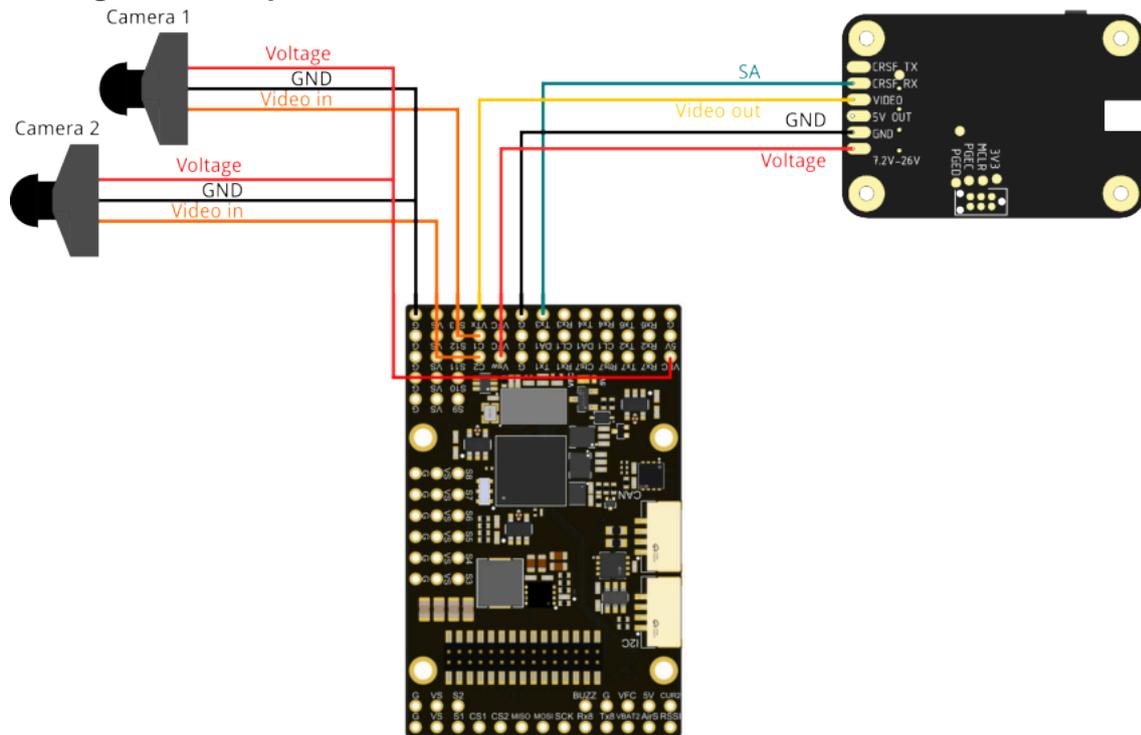
For the VTX supply to work, **VSW - Voltage Switch (PinIO)** (USER1 (INAV)/ REALY2 (ArduPilot)) must be set to **On**.

⁽²⁰⁾ Baud rate might be different. Check the video system manual for details.

⁽²¹⁾ Disables the external receiver

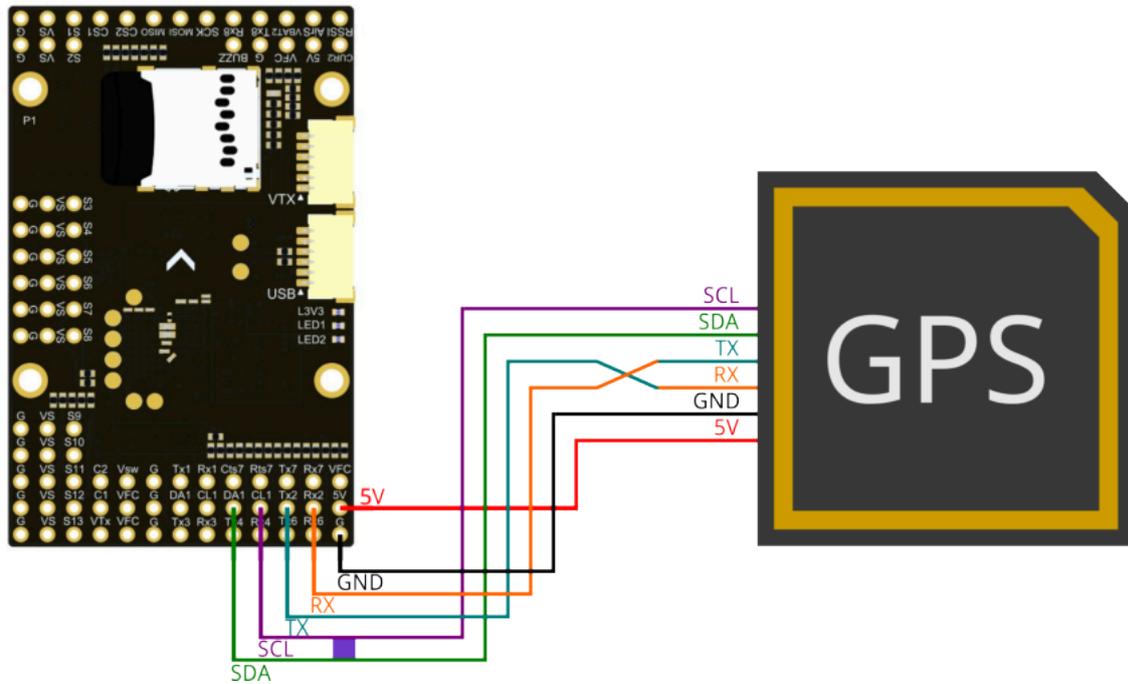


Analog Video setup



7.9.5. GPS and Compass

GPS Connection



Note:

RX and TX must be swapped on one device (FC TX → GPS RX)



BETAFLIGHT/ INAV Settings

UART 2:	Peripheral: GPS
	Baud rate: depends on GPS

