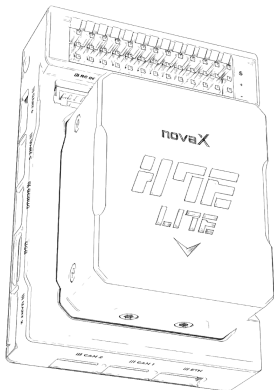


AF-H7E Lite

User Guide



AF-H7E Lite Overview



Compact carrier flight controller that reuses the AF-H7E sensor module (in development). The pin definition may change before release.

AF-H7E Lite Specifications

• Basic Specifications

MCU	STM32H753, ARM Cortex-M7, 480 MHz
RAM / Flash	1 MB / 2 MB
IMU	ICM-42688-P, BMI088
Secondary IMU	ICM-20649 (optional)
Magnetometer	RM3100 (optional; use an external compass when not fitted)
Barometer	2× ICP-20100
Operating Voltage	4.75 – 5.7 V (Rated 5 V)
USB Input	4.75 – 5.25 V
Power Input	POWER 1 + POWER 2 (redundant, I2C power modules)

AF-H7E Lite Specifications

• Basic Specifications

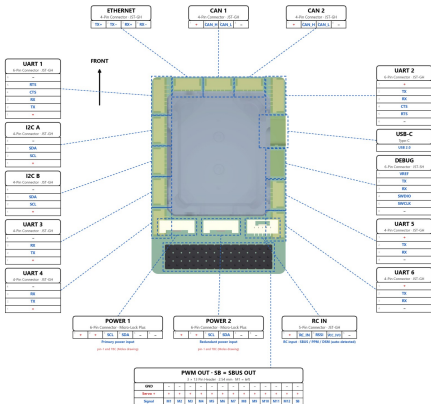
PWM Output	12 FMU channels (DSHOT except M7–M8) + SBUS out
RC Input	S.Bus, PPM, DSM / Spektrum (with DSM bind)
RSSI Input	Analog
UART	6 serial ports (2 with flow control) + debug console
I ² C	2 ports (I2C A, I2C B) + power-module bus on POWER 1 · 2
CAN	2 Port
Ethernet	100 Mbps x 1 Port
Size	43.0 × 63.4 × 29.2 mm (concept case)
Supported F/W	novaX ArduPilot (Copter and Plane releases)

AF-H7E Lite Pinout

• Pinout

AF-H7E Lite — Pinout (Top View)

Concept layout - pin order as seen from above - side connectors sit on the bottom side and plug in from the edges (shown through the PCB)



AF-H7E Lite Pinout

• Pinout Notes

Preliminary pin definition — AF-H7E Lite is in development and connectors may change before release. On every JST connector pin 1 is the supply pin and the last pin is GND, following the Pixhawk connector standard. UART n maps to ArduPilot SERIALn: UART 1–2 default to MAVLink telemetry and UART 3–4 default to GPS. GPS modules connect to any UART or over DroneCAN; there is no dedicated GPS/safety port and no safety switch. RC IN is a 5-pin connector with the same pinout as AF-H7E and takes an SBUS, PPM or DSM receiver directly on pin 2 (protocol auto-detected, wired to the flight-controller MCU, no IO board needed); pin 1 supplies 5 V and pin 4 a switched 3.3 V for DSM / Spektrum satellite receivers, which the flight controller power-cycles to bind them. On-board without a connector: microSD card slot (logging), buzzer and RGB status LED.

AF-H7E Lite Pinout

The + rail of the PWM header is not powered by the flight controller. The 13th header column, SB, is an SBUS output, not a PWM channel: it carries servo channels 1–16 on one wire from USART6 (SERIAL8) with the signal inversion done inside the STM32H7, so SBUS servos, SBUS-to-PWM decoders and gimbals plug in with a standard servo lead and take power from the servo rail. Outputs share rate and protocol within the timer groups M1–M4, M5 · M6 · M9 · M10, M7–M8 and M11–M12; DShot works on every group except M7–M8, whose timer has no DMA (PWM and OneShot only).

AF-H7E Lite Pinout

As on AF-H7E, the PWM signal row (S) is the rearmost row: the case has a keyed comb behind it so servo plugs only fit with S at the rear, and a wall separates POWER 1 · POWER 2 · RC IN from the PWM header. The pinout image is a top view of the concept carrier: side connectors are mounted on the bottom side and plug in from the edges, and each table lists pins in the order they sit when seen from above. POWER 1 and POWER 2 use the same Molex Micro-Lock Plus connector as AF-H7E; their pin-1 end is still to be confirmed. POWER 1 and POWER 2 take I2C (INA2xx) power modules; a DroneCAN power module (for example 14S / 200 A) reports over CAN 1 or CAN 2 (BATT_MONITOR 8) and needs a split cable that feeds its 5 V into POWER 1, because the CAN connectors supply 5 V rather than accept it.

AF-H7E Lite Pin Definition

• POWER 1

Molex Micro-Lock Plus 6P (1.25 mm) · same as AF-H7E ·
Primary power input

Pin	Signal	Function
1	VCC_IN	5 V supply input from the power module
2	VCC_IN	5 V supply input from the power module
3	SCL	Power-module I2C clock (voltage / current monitor)
4	SDA	Power-module I2C data (voltage / current monitor)
5	GND	Ground
6	GND	Ground

AF-H7E Lite Pin Definition

• POWER 2

Molex Micro-Lock Plus 6P (1.25 mm) · same as AF-H7E ·
Redundant power input

Pin	Signal	Function
1	VCC_IN	5 V supply input from the second power module
2	VCC_IN	5 V supply input from the second power module
3	SCL	Power-module I2C clock (voltage / current monitor)
4	SDA	Power-module I2C data (voltage / current monitor)
5	GND	Ground
6	GND	Ground

AF-H7E Lite Pin Definition

• UART 1

JST-GH 6P · SERIAL1 · UART7 · default MAVLink2

Pin	Signal	Function
1	VCC	5 V output
2	TX	UART transmit (FC → device)
3	RX	UART receive (device → FC)
4	CTS	Clear to send — hardware flow control input
5	RTS	Request to send — hardware flow control output
6	GND	Ground

AF-H7E Lite Pin Definition

• UART 2

JST-GH 6P · SERIAL2 · UART5 · default MAVLink2

Pin	Signal	Function
1	VCC	5 V output
2	TX	UART transmit (FC → device)
3	RX	UART receive (device → FC)
4	CTS	Clear to send — hardware flow control input
5	RTS	Request to send — hardware flow control output
6	GND	Ground

• UART 3

JST-GH 4P · SERIAL3 · USART1 · default GPS

Pin	Signal	Function
1	VCC	5 V output
2	TX	UART transmit (FC → device)
3	RX	UART receive (device → FC)
4	GND	Ground

AF-H7E Lite Pin Definition

• UART 4

JST-GH 4P · SERIAL4 · UART8 · default GPS

Pin	Signal	Function
1	VCC	5 V output
2	TX	UART transmit (FC → device)
3	RX	UART receive (device → FC)
4	GND	Ground

• UART 5

JST-GH 4P · SERIAL5 · USART2

Pin	Signal	Function
1	VCC	5 V output
2	TX	UART transmit (FC → device)
3	RX	UART receive (device → FC)
4	GND	Ground

AF-H7E Lite Pin Definition

• UART 6

JST-GH 4P · SERIAL6 · UART4

Pin	Signal	Function
1	VCC	5 V output
2	TX	UART transmit (FC → device)
3	RX	UART receive (device → FC)
4	GND	Ground

• I2C A

JST-GH 4P · I2C2

Pin	Signal	Function
1	VCC	5 V output
2	SCL	I2C clock — external compass, rangefinder, airspeed ...
3	SDA	I2C data
4	GND	Ground

AF-H7E Lite Pin Definition

• I2C B

JST-GH 4P · I2C3

Pin	Signal	Function
1	VCC	5 V output
2	SCL	I2C clock — external compass, rangefinder, airspeed ...
3	SDA	I2C data
4	GND	Ground

• CAN 1

JST-GH 4P · CAN1 · DroneCAN

Pin	Signal	Function
1	VCC	5 V output to CAN peripherals (not a power input)
2	CAN_H	CAN bus high
3	CAN_L	CAN bus low
4	GND	Ground

AF-H7E Lite Pin Definition

• CAN 2

JST-GH 4P · CAN2 · DroneCAN

Pin	Signal	Function
1	VCC	5 V output to CAN peripherals (not a power input)
2	CAN_H	CAN bus high
3	CAN_L	CAN bus low
4	GND	Ground

• RC IN

JST-GH 5P · RC input · SBUS / PPM / DSM (auto-detected)

Pin	Signal	Function
1	VCC	5 V receiver supply
2	RC_IN	SBUS / PPM / DSM receiver input (protocol auto-detected)
3	RSSI	Analog RSSI input (0–3.3 V)
4	VCC_3V3	Switched 3.3 V supply for DSM / Spektrum satellite receivers (power-cycled to bind)
5	GND	Ground

AF-H7E Lite Pin Definition

• ETHERNET

JST-GH 4P · 100BASE-T

Pin	Signal	Function
1	TX+	Ethernet transmit pair +
2	TX-	Ethernet transmit pair -
3	RX+	Ethernet receive pair +
4	RX-	Ethernet receive pair -

• DEBUG

JST-SH 6P · Pixhawk Debug Mini · SERIAL7 · USART3 console

Pin	Signal	Function
1	VREF	3.3 V reference for the debug probe
2	CONSOLE_TX	Debug console transmit (FC → probe)
3	CONSOLE_RX	Debug console receive (probe → FC)
4	SWDIO	SWD data — bootloader programming and firmware recovery
5	SWCLK	SWD clock
6	GND	Ground

AF-H7E Lite Pin Definition

• USB

USB Type-C · SERIAL0 · USB 2.0 Full Speed

Pin	Signal	Function
A4 B4 A9 B9	VBUS	5 V from USB — configuration and firmware update on the bench
A6 B6	D+	USB data +
A7 B7	D-	USB data -
A5 B5	CC1 / CC2	Configuration channel (device role)
A1 B1 A12 B12	GND	Ground

• PWM OUT M1-M12

2.54 mm 3 × 13 pin header · columns 1-12 · Main outputs 1-12

Pin	Signal	Function
S	M1 ... M12	Motor / servo output signal, one per channel (PWM · OneShot · DShot; M7-M8 without DShot)
+	V_SERVO	Servo rail, bussed across all channels — supplied externally (e.g. BEC)
-	GND	Ground

AF-H7E Lite Pin Definition

• SB (SBUS OUT)

2.54 mm 3 × 13 pin header · column 13, next to M12 · SERIAL8
· USART6 · SBus servo out

Pin	Signal	Function
S	SBUS_OUT	SBUS output — servo channels 1–16 on one wire (SERIAL8_PROTOCOL 15, SERIAL8_OPTIONS 2 inverts TX inside the MCU)
+	V_SERVO	Servo rail, bussed across all channels — supplied externally (e.g. BEC)
–	GND	Ground

AF-H7E Lite Setup

1. **Mounting** — Align the board's forward direction with the vehicle nose on a vibration-damped mount; otherwise set `AHRS_ORIENTATION`.
2. **Power** — Supply power within the operating range and check polarity first. Operating voltage: 4.75 – 5.7 V (Rated 5 V).
3. **Peripherals** — Connect the receiver, GPS / compass and ESCs according to the pinout.
4. **Firmware** — Load this product's novaX ArduPilot image from the catalog Web Updater; never use another board's firmware.
5. **Setup** — In Mission Planner or similar, choose the frame, calibrate accelerometer, compass and radio, and set flight modes and failsafes.

AF-H7E Lite Firmware

• Available Firmware

Type	Version	Date
ArduPilot Copter (.apj package)	0.1.0	2026-09-17
ArduPilot Copter - Bootloader + App (merged HEX / DFU / SWD)	0.1.0	2026-09-17
ArduPilot Plane (.apj package)	0.1.0	2026-09-17
ArduPilot Plane - Bootloader + App (merged HEX / DFU / SWD)	0.1.0	2026-09-17

Download files from the product page (QR).

AF-H7E Lite Safety Notes

- Always remove propellers while wiring, configuring or updating firmware.
- Pull connectors by the housing, never by the wires.
- Beware of static discharge; do not operate in wet or dusty conditions.
- Product in development — the pin definition may change before release; check the latest catalog.
- Supply the PWM servo rail (+) from an external BEC.
- Firmware v0.1.0 is a preliminary, build-verified release. Copter and Plane share board ID 6207 — pick the image by file name.

AF-H7E Lite Safety Notes



<Detailed Manual>

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