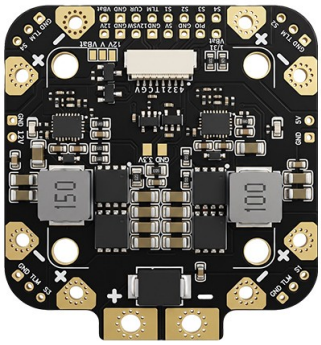
WBP

HIGH-CURRENT POWER DISTRIBUTION



WBP Core-MV 16S480A G1

Power Distribution Board User Manual

INSTALLATION, WIRING & SETUP GUIDE

5S-16S	4 × 120A	12V / 6A	5V / 8A
Input Voltage	Four Outputs	Switchable Output	Auxiliary Output

Dongguan Wanbaopeng Technology Co., Ltd.

WBPTECH | HIGH-CURRENT POWER SYSTEMS

Document No. WBP-CMV16S480A-G1-UM-EN | V1.0 | 2026-08-18

00 Company & Document Information

COMPANY & DOCUMENT INFORMATION

Dongguan Wanbaopeng Technology Co., Ltd.

WBPTECH | HIGH-CURRENT POWER SYSTEMS

MANUAL PURPOSE This manual is intended for system integrators, installers, commissioning engineers, and service personnel. It explains the interfaces, wiring, power-selection options, sensing configuration, and safety requirements of the WBP Core-MV 16S480A G1.

DOCUMENT CONTROL

Item	Description
Product Model	WBP Core-MV 16S480A G1
Manual Version	V1.0
Release Date	2026-08-18
Applicable Hardware	Core-MV 16S480A G1; silkscreen markings and accessories may vary slightly by production batch
Intended Users	UAV system integrators, installers, commissioning engineers, and service personnel

CONTACT INFORMATION

Channel	Information
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REVISION NOTE This product is continuously improved. If the product silkscreen, supplied instructions, or website information differs from this manual, contact WBP Technical Support for confirmation before wiring.

01 Contents

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Quickly locate installation, wiring, configuration, and troubleshooting information.

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READING GUIDE For a first-time installation, read Sections 02, 05, 06, 08, 09, 12, and 13 in order. Before troubleshooting, disconnect the battery and remove all propellers.

02 Safety & Operating Limits

SAFETY & OPERATING LIMITS

DANGER This product is intended for 5S-16S high-voltage, high-current power systems. Reversed polarity, short circuits, defective solder joints, or working on an energized system may cause arcing, equipment damage, fire, or personal injury.

SIGNAL WORDS

Level	Meaning	Required Action
DANGER	May immediately cause serious damage or injury	Stop work and eliminate the hazard first
WARNING	Incorrect operation may damage the ESC, flight controller, or peripherals	Verify specifications and polarity before continuing
CAUTION	May affect reliability, measurement accuracy, or cooling	Install as recommended and complete all tests
NOTE	Helps improve installation efficiency and serviceability	Recommended

MANDATORY PRECAUTIONS

- Disconnect the battery completely before soldering, connecting or disconnecting cables, taking measurements, or changing the power-selection pads.
- Remove all propellers and secure the airframe before first power-on. Use a current-limited supply or an in-line fuse for the initial low-risk inspection whenever possible.
- Verify B+ / B- polarity, every branch-output polarity, and all common-ground connections. This board does not replace reverse-polarity protection or branch fuses.
- The 12V-V and VBAT-V pads are mutually exclusive selections. Never bridge all three pads together.
- Before selecting VBAT to power the flight controller, confirm that the flight controller accepts the full battery voltage. A fully charged 16S battery reaches 67.2 V.
- The 480 A total and 120 A per-output ratings describe maximum system capability; they do not imply continuous operation at these currents under every installation condition.
- Wire gauge, connectors, solder joints, ambient temperature, and airflow must be appropriate for the continuous current and peak duration.
- The fixed 12 V output and 12VSW share the same 12 V / 6 A BEC. Their combined load must not exceed 6 A.

CAUTION The built-in TVS suppresses transient spikes. It does not provide sustained overvoltage protection and cannot replace adequate bus capacitance, proper wiring, or sound surge-control design.

03 Product Overview & Key Features

PRODUCT OVERVIEW

The WBP Core-MV 16S480A G1 is a four-output, high-current power distribution board for medium-to-large multirotors, UAVs, and other high-voltage multi-ESC platforms. It integrates power distribution, dual BECs, flight-controller supply selection, bus voltage/current sensing, ESC signal routing, and a telemetry interface.



Figure 1. Front and rear views (refer to the actual product and production-batch silkscreen)

5S-16S	480A	4 × 120A	8-Layer / 3 oz
High-Voltage Input	Total Capacity	Four Outputs	Heavy-Copper PCB

KEY FEATURES

- Four high-current bus outputs: up to 120 A per output and up to 480 A total capacity.
- Independent dual BECs: efficient synchronous step-down outputs rated at 5 V / 8 A and 12 V / 6 A.
- Switchable 12VSW output: an active-low PIO signal controls power to peripherals.
- Flight-controller supply selection: solder pads select either 12 V or VBAT.
- Bus monitoring: high-side total-current CUR analog output and VBat/31 voltage output.
- Integrated signal routing: S1-S4, TLM, CUR, GND, and V are provided at the flight-controller interface.
- Transient suppression: a built-in TVS improves tolerance to power-bus voltage spikes.

04 Technical Specifications

TECHNICAL SPECIFICATIONS

ELECTRICAL SPECIFICATIONS

Item	Specification	Notes
Battery Input	5S-16S	A fully charged 16S lithium battery reaches 67.2 V; do not exceed 16S
Power Outputs	4 outputs	Common-bus distribution; outputs are not electrically isolated
Per-Output Capacity	Up to 120 A	Actual continuous capacity depends on wiring, solder joints, temperature, and airflow
Total Capacity	Up to 480 A	Maximum system capacity across all four outputs
5V BEC	5V / 8A	Independent auxiliary supply; 8 A total across all 5 V pads
12V BEC	12V / 6A	Fixed 12 V and 12VSW share a combined 6 A limit
12VSW Control	PIO active low	For VTX, gimbal controllers, lighting, and other peripherals
FC V Output	12 V or VBAT	Selected by mutually exclusive solder pads
Voltage Sensing	VBat/31 analog output	Connect to the FC ADC; configuration/calibration required
Current Sensing	CUR high-side bus sensing	Analog output; configuration/calibration required

MECHANICAL & INTERFACES

Item	Specification / Description
PCB	8-layer, 3 oz heavy-copper design
Mounting Pattern	Standard four-hole 30.5 x 30.5 mm mounting pattern
Flight Controller Interface	S4 / S3 / S2 / S1 / TLM / CUR / GND / V
Auxiliary Interface	VBat/31 / PIO / GND / 5V / GND / 12VSW / GND / 12V
Protection & Suppression	Built-in TVS transient-surge suppression; does not replace fusing, reverse-polarity protection, or sustained overvoltage protection

RATING NOTE Evaluate current capacity against the actual mission duty cycle, peak duration, wire and solder-joint temperature rise, ambient temperature, and airflow. Complete a full-system ground load test and retain an appropriate safety margin.

05 Board Layout & Interface Map

BOARD LAYOUT & INTERFACE MAP

ORIENTATION The wiring overview is oriented with the battery at the top and the flight-controller and auxiliary interfaces at the bottom. The board may be rotated to suit the installation; always use the actual product silkscreen as the final reference before wiring.

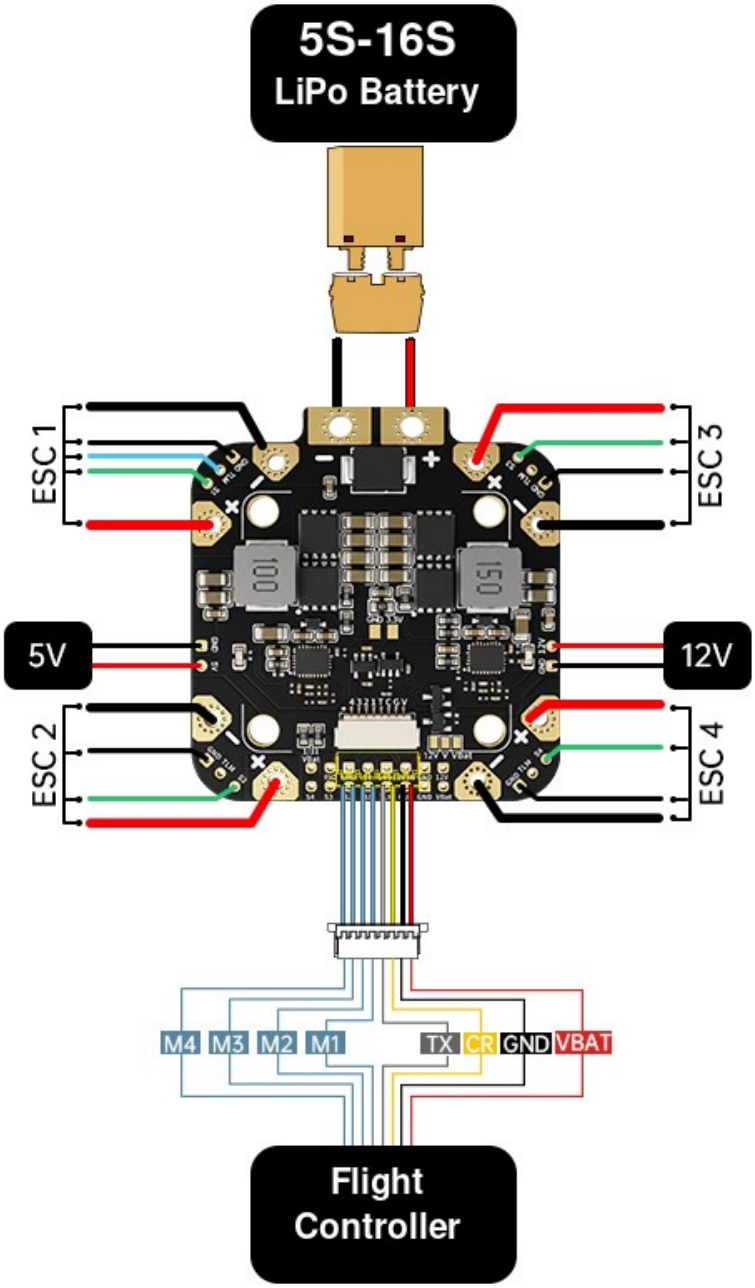


Figure 2-1 Complete wiring overview: battery, four ESCs, 5 V, 12 V, 12VSW, and flight-controller interface

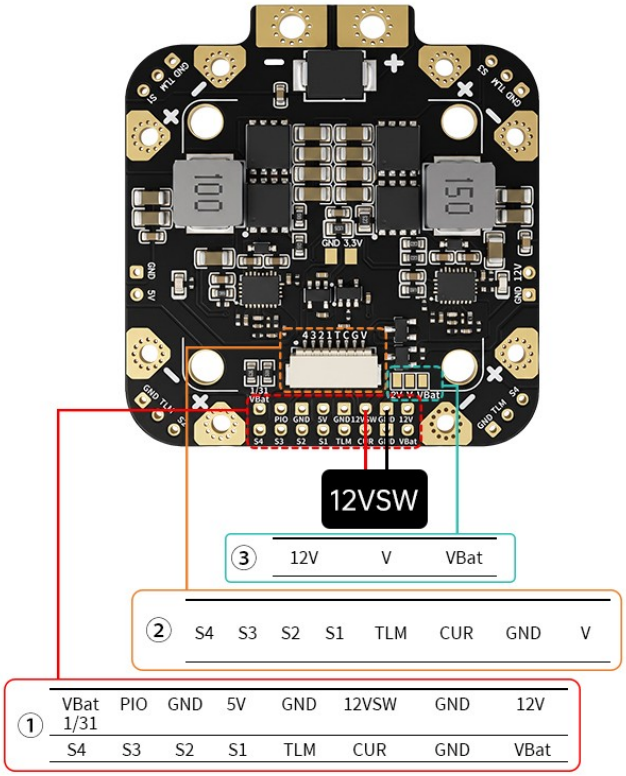


Figure 2-2 Interface Map

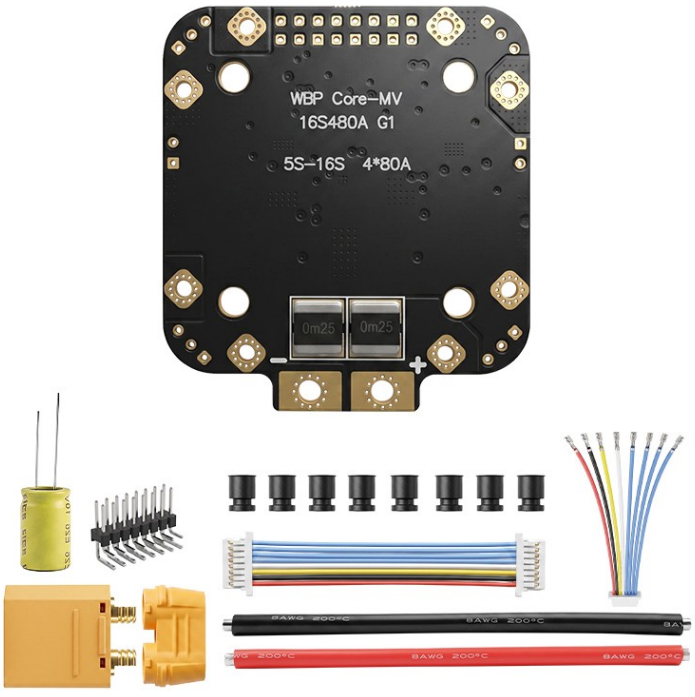


Figure 2-3 Supplied Accessories

INTERFACE GROUPS

Group	Description
A High-Current Pads	Top B+ / B- battery input; four ESC positive and negative power outputs around the board.
B Flight Controller 8-Pin	S4 S3 S2 S1 TLM CUR GND V
C Auxiliary 8-Pin	VBat/31 PIO GND 5V GND 12VSW GND 12V
D Power-Selection Pads	12V - V - VBAT; bridge the center V pad to either 12V or VBAT, never both.
E ESC Signal Pads	Edge-mounted S1-S4 / TLM / GND pads for short, direct ESC connections.
F Fixed-Output Pads	Edge-mounted 5V / GND and 12V / GND pads for auxiliary equipment.

CAUTION Do not connect to test pads, internal debug points, or reserved pads not defined in this manual.

06 High-Current Wiring & Power Distribution

HIGH-CURRENT POWER WIRING



KEY PRINCIPLE The reliability of the high-current path depends on the PDB, wires, connectors, and solder joints. Overall system capacity is limited by the weakest component.

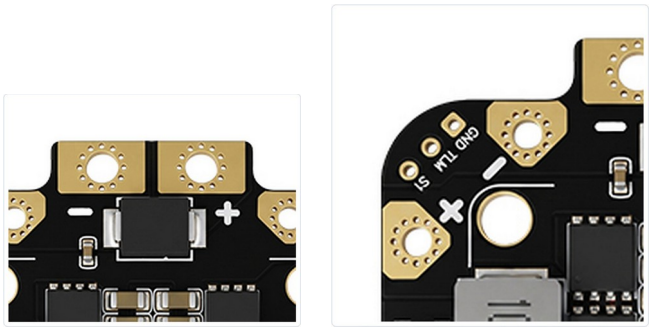


Figure 3. Close-up of the battery input pads and ESC power-output pads

WIRING PROCEDURE

1. Confirm that the battery is 5S-16S and verify B+ / B- polarity. Keep the battery disconnected.
2. Select the battery leads and four output-wire gauges according to continuous current, peak current, cable length, and allowable temperature rise.
3. Pre-tin the pads and wires. Use soldering equipment with sufficient power to produce complete, smooth, fully wetted joints.
4. Connect the battery positive and negative leads to the top input pads. Connect the positive and negative power leads of ESC1-ESC4 to their corresponding outputs.
5. Provide strain relief and insulation so cable vibration does not transfer mechanical force directly to the pads.
6. Use a multimeter to confirm there is no short circuit between B+ and B- and that every output has the correct polarity, then perform the first power-on under current limiting.

CURRENT CAPABILITY

Rating	Meaning	Design Checks Still Required
Up to 120 A per output	Maximum capacity of one output	Wires, solder joints, ESC, cooling, and duration
Up to 480 A total	Maximum system capacity across all four outputs	Battery leads, connectors, bus temperature rise, and airflow

PROHIBITED Do not perform high-current tests with undersized wires, temporary clips, or uninsulated solder joints. Never rework solder joints while the system is energized.

07 ESC Signal & Telemetry Connections

ESC SIGNAL & TELEMETRY

S1-S4 carry PWM, DShot, or other control signals from the flight controller to the four ESCs. TLM returns telemetry from one ESC to the flight controller.

S1	S2	S3	S4	TLM	GND

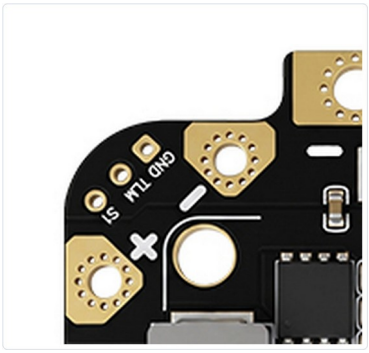


Figure 4. Close-up of one ESC power, PWM, TLM/TX, and GND connection

RECOMMENDED MAPPING

PDB Signal	Connection	Direction / Notes
S1	ESC1 signal input	FC -> ESC1
S2	ESC2 signal input	FC -> ESC2
S3	ESC3 signal input	FC -> ESC3
S4	ESC4 signal input	FC -> ESC4
GND	ESC signal ground	Must share a common ground with the FC and PDB
TLM	TX / telemetry from one ESC	ESC -> FC; connect only one ESC

WIRING NOTES

- Route signal wires away from the high-current bus and motor phase wires. Pair each signal with GND where necessary.
- The four ESC signal numbers must match the flight-controller motor-output map. Remove all propellers for the initial test.
- TLM is a single-wire telemetry return. Normally, only one ESC TX output may be connected; connecting several outputs in parallel may cause bus contention.
- Refer to the ESC and flight-controller manuals for telemetry support, the telemetry protocol, and flight-controller UART settings.
- The PDB only routes signals. It does not modify PWM / DShot logic or replace protocol configuration in the flight controller.

NOTE If motor order does not match the airframe layout, correct the flight-controller resource mapping or signal wiring. Never troubleshoot motor order with propellers installed.

08 Flight Controller 8-Pin Interface

FLIGHT CONTROLLER 8-PIN INTERFACE

ORIENTATION CHECK Before plugging in or soldering the cable, compare every flight-controller pin definition with the PDB silkscreen. Do not determine orientation from the connector shape alone.

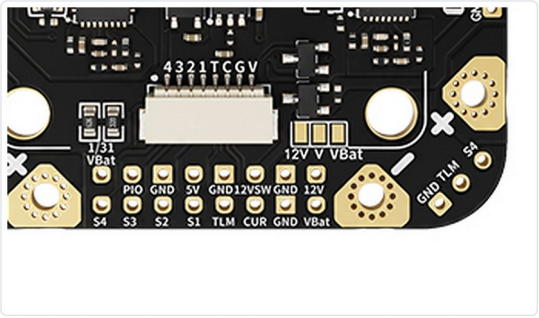


Figure 5. Close-up of the flight-controller cable interface and pin silkscreen

S4	S3	S2	S1	TLM	CUR	GND	V

Flight-controller interface order (S4 through V)

Pin	Type	Function	FC Connection
S4	Digital signal	ESC4 control	Motor / ESC 4 output
S3	Digital signal	ESC3 control	Motor / ESC 3 output
S2	Digital signal	ESC2 control	Motor / ESC 2 output
S1	Digital signal	ESC1 control	Motor / ESC 1 output
TLM	Single-wire input	Telemetry return from one ESC	UART RX / ESC Telemetry input
CUR	Analog output	Total bus-current sensing	Current / ADC input
GND	Power ground	Signal and analog reference ground	GND
V	Power output	12 V or VBAT, selected by solder pads	Flight-controller power input

CONNECTION ORDER

1. Confirm the allowable voltage at the flight-controller V input before setting the 12V / VBAT selection pads.
2. Connect GND and V first. After verifying the supply voltage, connect S1-S4, CUR, and TLM.
3. For the first power-on, connect only the flight controller and essential loads. Add the ESCs and peripherals gradually after confirming normal operation.

IMPORTANT The V pin is not a fixed-voltage output. Its voltage depends on the 12V-V / VBAT-V selection pads and must be measured before connecting the flight controller.

09 Dual BEC & Flight Controller Power Selection

DUAL BEC & FC POWER SELECTION

The PDB integrates two independent synchronous step-down BECs rated at 5 V / 8 A and 12 V / 6 A. The fixed 12 V output and switchable 12VSW output are supplied by the same 12 V BEC.

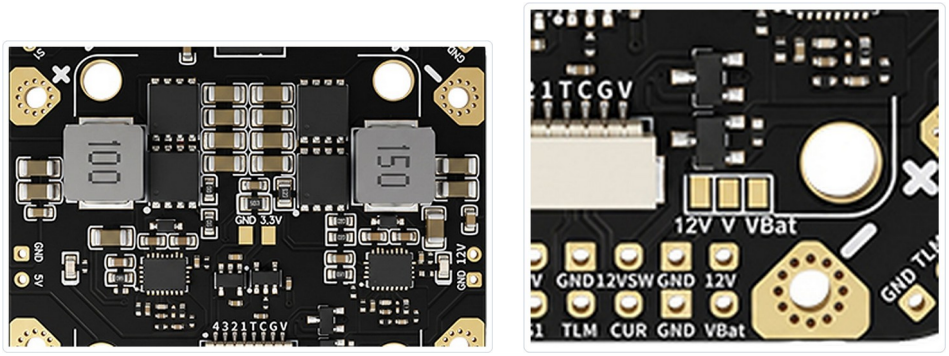


Figure 6. Close-up of the dual-BEC power section and 12V / VBAT flight-controller supply-selection pads

Output	Rated Capacity	Typical Applications	Key Limit
5V	5V / 8A	Receiver, compatible flight controllers, and auxiliary devices	Combined load across all 5 V pads must not exceed 8 A
12V	12V / 6A	Flight controller, VTX, gimbal, and lighting	Combined load with 12VSW must not exceed 6 A
12VSW	Switchable 12 V	Peripherals requiring remote power switching	PIO active low; shares the 12 V / 6 A capacity
V	12 V or VBAT	Flight-controller 8-pin supply	Determined by the mutually exclusive selection pads

V OUTPUT SELECTION

12V	V	VBAT

Bridge the center V pad to either 12V on the left or VBAT on the right - never both.

Selection	V Pin Output	Application	Verification
Bridge 12V - V	12V	Flight controller supports 12 V input	Confirm the FC 12 V input and polarity
Bridge V - VBAT	Full battery voltage	Flight controller supports direct 5S-16S input	Confirm the FC maximum input voltage exceeds the fully charged battery voltage

DO NOT Never bridge the 12V, V, and VBAT pads together. Before changing the selection, disconnect power, remove the previous solder bridge, and use a multimeter to confirm there is no short circuit.

LOAD BUDGET Add the 12 V and 12VSW currents when calculating load. For example, if fixed 12 V loads draw 2 A, do not assume another 6 A is available to 12VSW peripherals.

10 12VSW Switchable Output & PIO

SWITCHABLE 12V OUTPUT

12VSW allows the flight controller to switch peripheral power through PIO. It is suitable for enabling a VTX, camera gimbal controller, or lighting as needed after the system powers up.



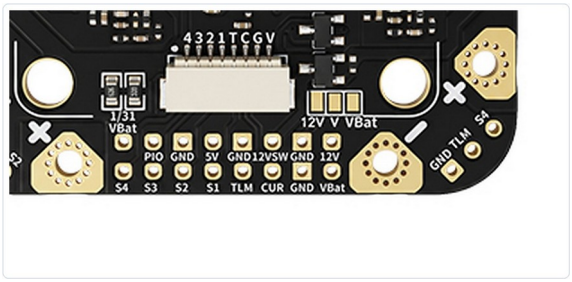


Figure 7. Close-up of the PIO, 12VSW, and adjacent GND connections

CONTROL LOGIC

PIO State	12VSW State	Description
Low / Floating	ON, approximately 12 V output	Active low
High / Inactive	OFF	Configure the FC to drive an explicit inactive level

SETUP & VERIFICATION

1. Confirm that the peripheral is rated for 12 V and calculate the combined load of the fixed 12 V and 12VSW outputs.
2. Connect the peripheral positive lead to 12VSW and the negative lead to the adjacent GND. Connect a controllable flight-controller GPIO to PIO and ensure a common ground.
3. Configure the GPIO active level and startup default state in the flight controller. The recommended default is OFF.
4. Power on without the peripheral connected, then use a multimeter to verify the 12VSW ON/OFF state while switching PIO.
5. After connecting the peripheral, recheck startup current, steady-state current, and 12 V BEC temperature rise.

LOAD GUIDANCE

Recommended	Use with Caution / Not Recommended
VTX, cameras, gimbal controllers, LED lighting, and other 12 V peripherals	High-power motors, loads with excessive startup surge, and devices with an unknown voltage rating

NOTE If peripheral startup causes the 12 V rail to sag, reduce the load, add a startup delay, or use an independent supply. Do not assess suitability from steady-state current alone.

11 Voltage, Current & Telemetry

VOLTAGE, CURRENT & TELEMETRY

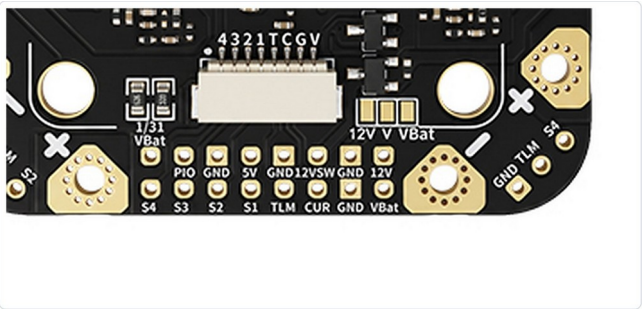


Figure 8. Close-up of the VBat/31, CUR, TLM, and common GND pin area

VBat/31 BATTERY VOLTAGE SENSING

VBat/31 is an analog output equal to 1/31 of the power-battery voltage. Before connecting it to the flight-controller ADC, confirm the ADC input range and connect a common GND.

FORMULA Sense voltage = battery voltage / 31. The examples assume 4.2 V per fully charged lithium cell.

Battery	Fully Charged Voltage	Theoretical VBat/31
5S	21.0V	Approx. 0.677 V
12S	50.4V	Approx. 1.626 V
16S	67.2V	Approx. 2.168 V

CUR TOTAL-CURRENT SENSING

CUR is the analog output of the high-side bus-current sensor. It allows the flight controller to display total system current and accumulated charge. ADC references, scale factors, and software fields vary by flight controller, so measured calibration is required.

- Connect CUR to the flight-controller Current / ADC input and connect a common GND.
- For initial setup, use a known low-current load and compare the flight-controller reading with a reliable ammeter.
- Adjust the scale factor using the current-meter calibration procedure for the flight-controller firmware, then verify it again at a moderate load.
- Before high-current testing, confirm the reading direction, zero offset, measurement range, and filtering.

TLM ESC TELEMETRY

TLM routes the TX / telemetry signal from one ESC to the flight controller. Connect the telemetry output of only one ESC and select the corresponding UART and protocol in the flight controller.

WARNING VBat/31 and CUR are analog signals. Do not connect them to a power output or an incompatible digital interface; incorrect wiring may damage the flight-controller ADC.

12 Installation & First Power-On

INSTALLATION & FIRST POWER-ON

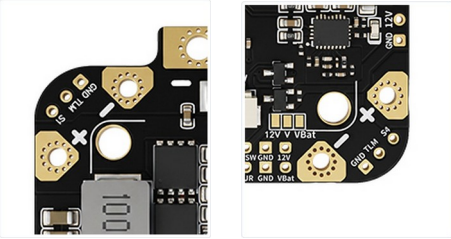


Figure 9. Close-up of the mounting holes, edge pads, and surrounding insulation area

INSTALLATION SEQUENCE

1. Verify the product model, silkscreen, and appearance. Confirm there is no shipping damage, foreign material, or lifted pad.
2. Plan the battery leads, four ESC power branches, flight-controller cable, and peripheral harnesses so they do not press against one another.
3. Select wires and connectors for the mission current. Complete all high-current soldering and clean away flux residue.
4. Install insulating spacers and vibration-resistant fasteners. Keep the board isolated from conductive frames, screws, and carbon-fiber edges.
5. Set the mutually exclusive 12V / VBAT pads for the flight-controller V output and verify continuity with a meter.
6. Connect flight-controller GND/V, S1-S4, CUR, and TLM. Connect 5V, 12V, 12VSW, and PIO as required.
7. Use a multimeter to check B+ / B- resistance and polarity and confirm there is no obvious short circuit.
8. Remove all propellers and perform first power-on under current limiting. Check first for abnormal sound, odor, heating, or input current.
9. Measure 5V, 12V, 12VSW, flight-controller V, and VBat/31 and confirm that each matches the selected configuration.
10. After configuring motor order and calibrating sensing and telemetry, increase the load in stages and record temperature rise.

FIRST POWER-ON CHECK

Check	Acceptance Criterion
No-Load Input Current	No abnormal increase and no rapid localized heating on the board
5V / 12V	Stable voltage, correct polarity, and load within rating
FC V	Matches the 12V / VBAT selection and is compatible with the FC input
12VSW	PIO control logic and default state operate as intended
S1-S4	Correct motor order; test each output with propellers removed
VBat/31 / CUR / TLM	Usable FC readings with basic calibration completed

STOP CONDITION Disconnect power immediately if smoke, odor, sparks, abnormal current, supply-voltage sag, or rapid localized heating occurs. Do not repeatedly cycle power to troubleshoot.

13 Flight Controller Setup & Calibration

FLIGHT CONTROLLER SETUP

The following procedure applies to common flight controllers. Refer to the documentation for the selected flight-controller firmware for menu names, parameter units, and calibration formulas.



Figure 10. S1-S4, TLM, CUR, GND, and V pin mapping for flight-controller configuration

RECOMMENDED CONFIGURATION ORDER

Step	Item	Acceptance Check
1	Power Supply	Confirm the actual V-pin voltage and FC input range; stable power-on with no reset
2	Motor Mapping	S1-S4 match the airframe motor numbers; verify each output with propellers removed
3	Voltage Meter	Select the external ADC; configure the VBat/31 ratio and calibrate with a multimeter
4	Current Meter	Select the external analog-current input; calibrate CUR with a known load
5	Telemetry	Assign TLM to the correct RX / Telemetry function; connect only one ESC
6	PIO	Configure active-low operation, startup default state, and 12VSW control logic
7	System Verification	Test voltage, current, telemetry, temperature rise, and failsafe operation at staged loads

CALIBRATION GUIDANCE

- Voltage: Measure battery-terminal voltage with a reliable multimeter, compare it with the flight-controller display, and adjust voltage scaling.
- Current: Compare the reading with an external ammeter under a low-risk load, then verify linearity and zero offset at a moderate load.
- Accumulated charge: Verify the mAh total using a discharge of known capacity; do not calibrate at only one operating point.
- Telemetry: Confirm that the data originates from the intended ESC and avoid enabling conflicting sensor sources.
- PIO: Verify the default 12VSW state during flight-controller startup, restart, failsafe, and disarm.

SYSTEM ACCEPTANCE

Item	Recommended Criterion
Power Stability	Stable BEC voltages; no FC or peripheral resets and no signs of abnormal ripple
Measurement Consistency	Voltage and current readings agree with external instruments across the required operating range
Thermal Performance	Temperature rise of the board, solder joints, wires, and connectors remains controlled under a representative mission load and airflow
Fault Response	Failsafe, disarm, and PIO default states match the intended mission logic

CAUTION Do not copy voltage/current scaling parameters from another PDB. Even when interface names match, analog ratios and flight-controller ADC configurations may differ.

14 Troubleshooting, Maintenance & Support

TROUBLESHOOTING & SUPPORT

TROUBLESHOOTING

Symptom	Check First	Recommended Action
No 5 V / 12 V output	Battery voltage, polarity, short circuits, and solder joints	Disconnect power and inspect the input and loads; retest with peripherals removed
No voltage at FC V	12V-V / VBAT-V selection pads	Confirm only one side is bridged and measure V relative to GND
12VSW does not switch	Fixed 12 V output, PIO level, and common ground	Measure with no load first, then check GPIO configuration and load startup current
Incorrect voltage display	VBat/31, ADC input, and common ground	Compare with a multimeter and recalibrate voltage scaling
Incorrect current display	CUR input, zero offset, scaling, and noise	Calibrate against an external ammeter at two load levels
No ESC telemetry	TLM source, RX port, and protocol	Connect only one ESC TX and verify the FC UART settings
Board / solder joint overheats	Continuous current, wire gauge, solder joints, and airflow	Reduce the load immediately, repair high-resistance connections, and improve cooling

MAINTENANCE

- After every high-load mission, inspect for discolored solder joints, worn insulation, looseness, corrosion, and signs of localized overheating.
- Keep the board dry and clean. Carbon-fiber dust, metal debris, and moisture may cause leakage current or short circuits.
- After a crash, water ingress, overcurrent event, or reverse-polarity connection, do not power the system again until it has been inspected by qualified personnel.

CONTACT

Item	Information
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REVISION HISTORY

Version	Date	Description
V1.0	2026-08-17	Initial release

> **NOTICE** This manual provides product installation and operating guidance. Warranty, returns, exchanges, and after-sales terms are governed by the order and the latest official WBP policies. Do not reproduce or disclose internal product design information without written permission.

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