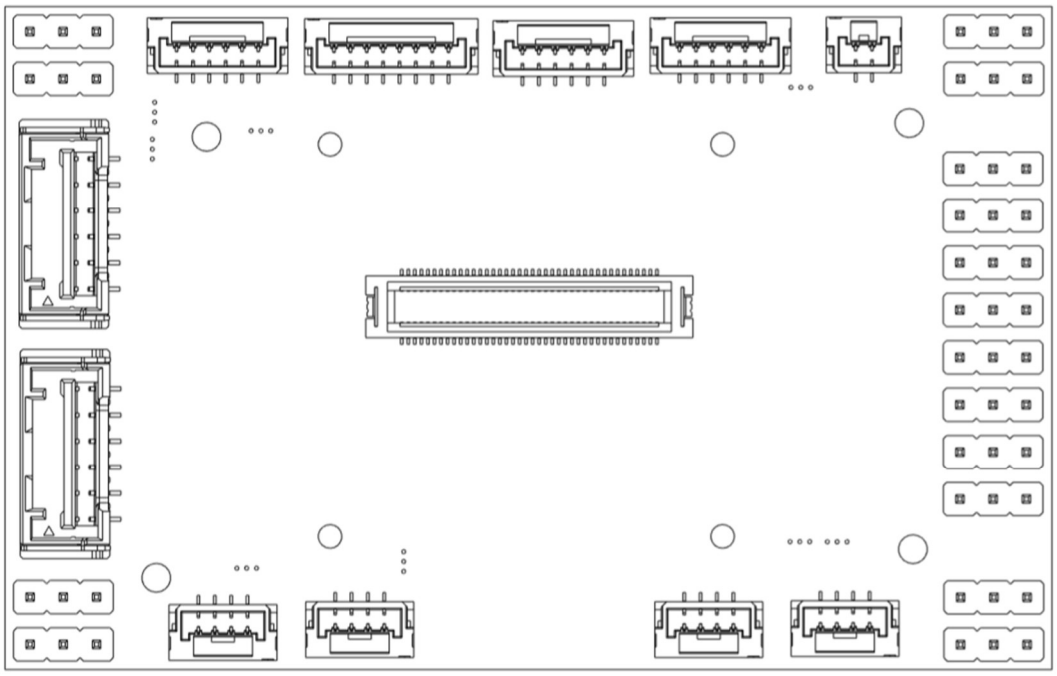
axldrone
your world from above

# axl Carrier Board

User Manual V1.0 | 25.03



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# Introduction

## Overview

The axl Carrier Board is designed to integrate seamlessly with the Cube ecosystem, providing a reliable interface for power, communication, and peripheral management in UAVs. It offers dual redundant power inputs, motor PWM distribution, servo outputs, and multiple connectivity options to support advanced drone builds.

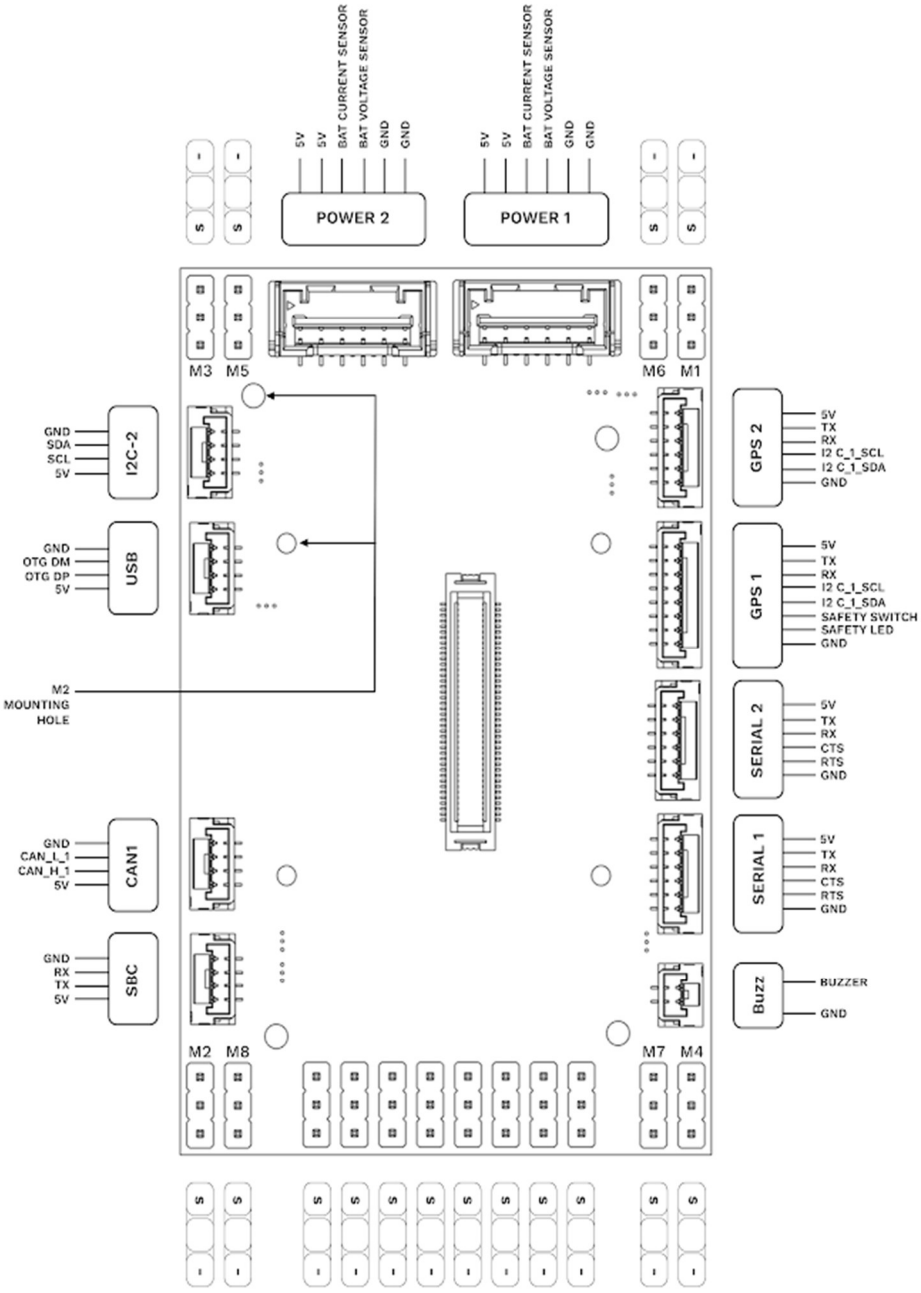
With dedicated ports for GPS, CAN, I2C, serial devices, and companion computers, the axl Carrier Board ensures flexibility and expandability for professional flight applications. Built compact and lightweight, it is well-suited for multirotor, fixed-wing, VTOL, rovers etc.

This manual provides details on specifications, features, installation, and safe use of the carrier board to help ensure proper setup and reliable operation.

# What's in the Box

1 × axl Carrier Board

# Knowing your axl Carrier Board



**Dual power inputs**: Provides redundancy with two independent 5 V inputs. If the primary source fails, the system automatically switches to the backup to ensure uninterrupted operation.

**Motor PWM signal distribution**: Supports up to eight motors through dedicated PWM outputs (M1–M8), allowing stable and organized motor control.

**Servo/AUX outputs**: Six AUX/servo outputs are available, connected to a shared rail that can be powered externally to drive servos or auxiliary actuators.

**SBus in/out**: Equipped with standard 2.54 mm servo headers for SBus input and output, enabling flexible RC system integration.

**GPS ports**: Dual GPS ports (GPS1 and GPS2) allow connection of two GPS modules for redundancy and improved navigation accuracy.

**Serial/UART ports**: Two serial ports are available for telemetry radios, companion devices, or other communication peripherals.

**I2C and CAN**: Provides dedicated I2C and CAN interfaces for connecting sensors, UAVCAN devices, and expansion modules.

**USB Connector**: Connection for firmware flashing, configuration, and data access.

**Buzzer output**: Dedicated port for connecting a buzzer to provide system status and alerts.

**SBC port**: Companion computer interface that enables high-level processing, mission planning, or AI integration alongside the Cube.

**Cube Orange slot**: A secure, dedicated connector designed for the Cube Orange autopilot, ensuring stable and reliable integration.

**M2 mounting holes:** Board includes M2 mounting holes for securing the carrier board to the airframe and dedicated M2 mounting points to fasten the Cube Orange

## Technical Specifications

| Parameter | Specification |
|---|---|
| Model | axl Carrier Board |
| Dimensions (L × W × H) | 80 mm × 50 mm × 12 mm |
| Weight | 21 g |
| Power Input | 5 V |
| Power Ports | 2 × Power inputs |
| PWM Outputs | 8 × Motor outputs (M1–M8) |
| AUX / Servo Outputs | 6 × Servo outputs (shared AUX rail, external power capable) |
| RC Input | SBus In / Out (2.54 mm standard RC input/output) |
| UART / Serial Ports | 2 × UART (SERIAL1, SERIAL2) |
| I2C Ports | 1 × I2C |
| CAN Bus | 1 × CAN1 |
| GPS Ports | 2 × GPS (GPS1, GPS2) |
| Companion Computer Interface | 1 × SBC Port |
| USB | 1 (For firmware flashing & configuration) |
| Buzzer Port | 1 |
| Cube Interface | Dedicated slot for Cube Orange autopilot |
| Operating Temperature | –10 °C to +80 °C |
| Firmware Support | PX4 / ArduPilot (Cube ecosystem) |

# Interfaces

| Port | Connector on the Board | Mating Connector |
|---|---|---|
| GPS1 | JST-GH 1.25 mm (8-pin) — BM08B-GHS-TBT | GHR-08V-S |
| GPS2 | JST-GH 1.25 mm (6-pin) — BM06B-GHS-TBT | GHR-06V-S |
| SERIAL1 | JST-GH 1.25 mm (6-pin) — BM06B-GHS-TBT | GHR-06V-S |
| SERIAL2 | JST-GH 1.25 mm (6-pin) — BM06B-GHS-TBT | GHR-06V-S |
| I2C | JST-GH 1.25 mm (4-pin) — BM04B-GHS-TBT | GHR-04V-S |
| CAN1 | JST-GH 1.25 mm (4-pin) — BM04B-GHS-TBT | GHR-04V-S |
| CAN2 | JST-GH 1.25 mm (4-pin) — BM04B-GHS-TBT | GHR-04V-S |
| USB | JST-GH 1.25 mm (6-pin) — BM06B-GHS-TBT | GHR-06V-S |
| POWER1 | Molex CLIK-Mate 2.00 mm (6-pin) — 502443-0670 | Molex mating: 502439-0600 |
| POWER2 | Molex CLIK-Mate 2.00 mm (6-pin) — 502443-0670 | Molex mating: 502439-0600 |
| BUZZER | JST-GH 1.25 mm (2-pin) — BM02B-GHS-TBT | GHR-02V-S |
| SBC port | JST-GH 1.25 mm (4-pin) — BM04B-GHS-TBT | GHR-04V-S |
| M1–M8 motor headers | 2.54 mm header pins | 2.54 mm header pin sockets |
| AUX rail | 2.54 mm header pins | 2.54 mm header pin sockets |

## Installation

1. Insert Cube Orange into the Cube port.
2. Connect 5 V supply to Power1, and optionally Power2 for redundancy.
3. Connect ESC signal lines to M1–M8 outputs.
4. Attach servos or auxiliary devices to AUX1–AUX6.
5. Connect GPS modules to GPS1 and/or GPS2.
6. Connect telemetry radios/peripherals to SERIAL1 / SERIAL2.
7. Attach UAVCAN peripherals to CAN1.
8. Connect sensors to I2C.
9. Plug a buzzer into the BUZZER port.
10. Plug the companion SBC into the SBC port on the carrier board
11. Use the USB connector for setup and firmware updates.

## Caution

- Ensure correct polarity when connecting power.
- Do not exceed rated current on servo and peripheral outputs.
- Always use common ground between flight controllers and peripherals.
- Double-check wiring before powering the system.

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