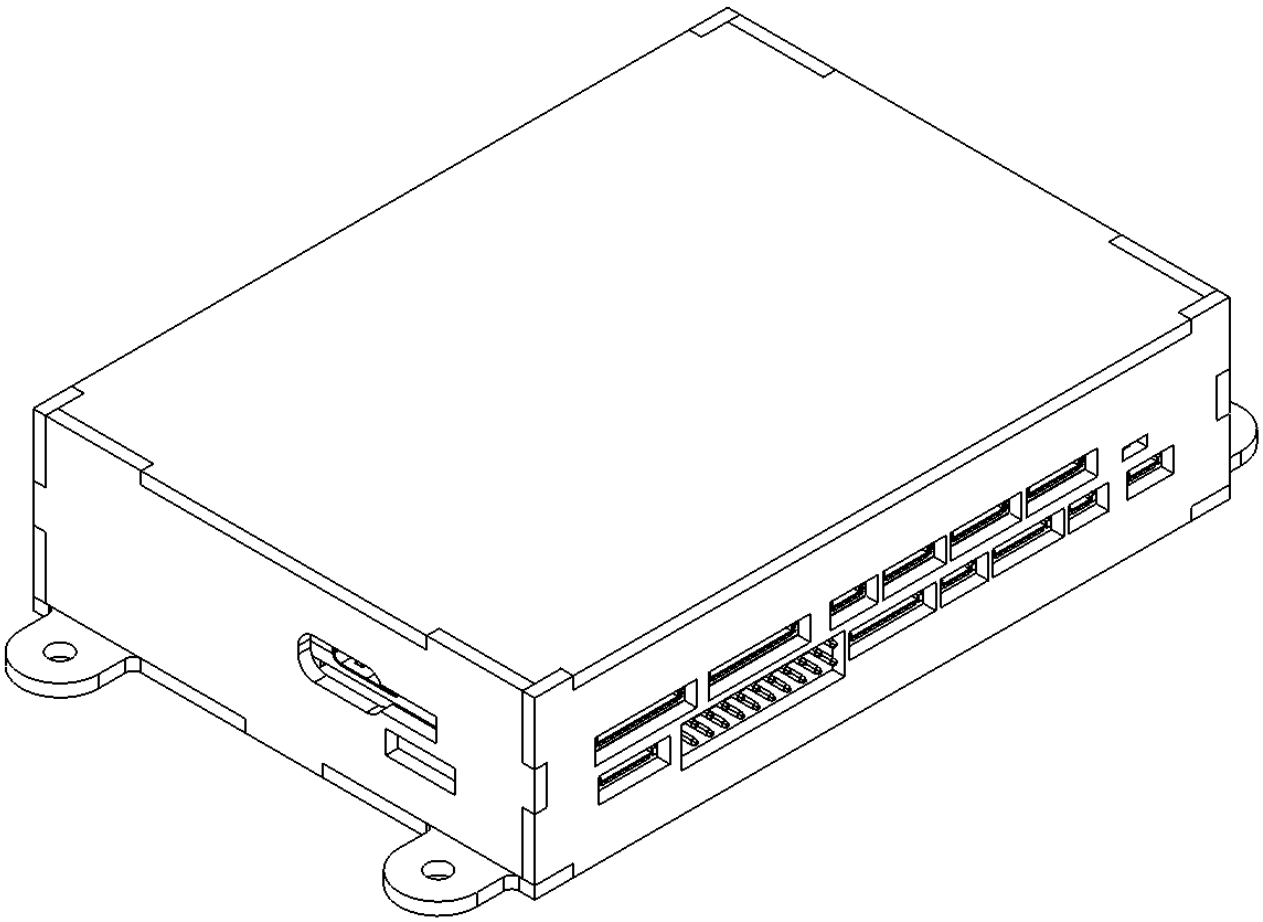
# DARTER V1/V1PRO

v 1.0
2026.03

## User Manual



# Product overview

The **Darter V1/V1 Pro Flight Control Unit (FCU)** is a compact, high-performance autopilot system designed for unmanned aerial vehicles (UAVs) across recreational, commercial, and research applications. It serves as the central processing unit of the drone, responsible for stabilizing flight, processing sensor data, and executing user commands in real time.

Built with a lightweight and efficient architecture, the FCU integrates advanced inertial sensors, high-speed processors, and multiple communication interfaces to ensure precise control and reliable operation. It supports a wide range of drone configurations, including multirotor, fixed-wing platforms, and hybrid VTOL systems.

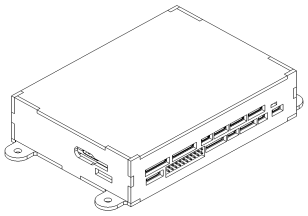
The FCU is engineered for seamless compatibility with modern flight control firmware, enabling users to configure, tune, and expand system capabilities according to their specific requirements.

# Key Features

**High-Performance Processing**
Equipped with a powerful microcontroller for fast and accurate flight calculations.
**Integrated Sensor Suite**
Includes onboard gyroscope and accelerometer for stable and responsive flight control.
**Multiple Communication Interfaces**
Supports UART, I2C, SPI, and CAN protocols for flexible peripheral integration.
**Compact & Lightweight Design**
Optimized for small drones and space-constrained builds.
**Wide Firmware Compatibility**
Compatible with popular flight stacks such as ArduPilot, and PX4.
**Real-Time Flight Stabilization**
Advanced control algorithms ensure smooth and precise maneuverability.
**Expandability**
Supports GPS modules, telemetry systems, cameras, and additional sensors.
**Robust Power Management**
Designed to operate reliably across a wide input voltage range.
**Security Features (Variant-Specific)**
**DARTAR FCU V1:** Does *not* include secure boot functionality.
**DARTAR FCU V1 Pro:** Includes **secure boot support**, ensuring firmware authenticity and protection against unauthorized code execution.

# PACKAGING LIST

- Darter V1/V1 Pro



- 6 to 6 pin cable (power)

- 4 to 4 pin cable (can)

- 6 to 4 pin cable (Data)

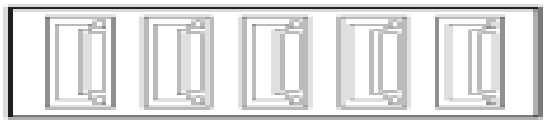
- 10 to 10 pin Cable (PWM)

- 8 to 8 pin cable (AUX)

- PPM/SBUS out cable

- USB Cable

- I2C Splitter



# General Safety Guidelines

**⚠ WARNING**

Improper handling or installation may lead to system failure, crash, or injury.

- Read this manual thoroughly before installing or operating the FCU.
- Ensure all components are properly installed and secured before powering the system.
- Do not modify or tamper with the hardware beyond recommended usage.
- Avoid exposing the FCU to water, excessive moisture, dust, or extreme temperatures.

**⚠ CAUTION**

Sensitive electronic components may be damaged by improper handling.

- Handle the board carefully to prevent electrostatic discharge (ESD) damage.
- Use only compatible components and accessories recommended for UAV systems.
- Always disconnect power before making or modifying any wiring connections.
- Keep the FCU away from conductive materials that may cause short circuits.

# Battery & Power Safety

## ⚠ WARNING

Incorrect battery usage may result in fire, explosion, or permanent damage.

- Use only batteries that meet the recommended voltage and current specifications.
- Verify correct polarity before connecting the power supply.
- Do not exceed the maximum input voltage rating of the FCU.
- Never use damaged, swollen, or leaking batteries.

## ⚠ CAUTION

Improper power connections can damage the FCU and connected components.

- Ensure all power connections are secure and properly insulated.
- Avoid connecting or disconnecting power while the system is active.
- Monitor battery levels to prevent deep discharge.

## ⚠ EMERGENCY NOTICE

- In case of overheating, unusual smell, or smoke, immediately disconnect power.
- Move the system to a safe, non-flammable area.
- Do not reuse the battery until it has been inspected.

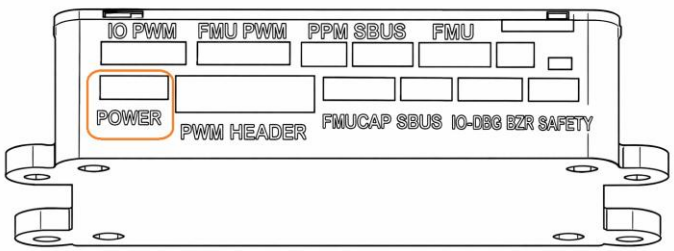
# Installation & Setup

⚠ **WARNING**
Improper mounting can affect flight stability and sensor accuracy

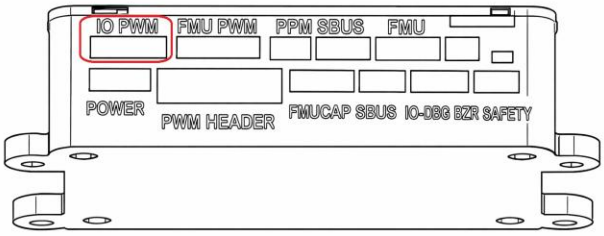
•Use the provided **4 standoff mounts and screws** to secure the FCU.
•Mount the FCU as close as possible to the **center of gravity (CoG)** of the drone.
•Ensure the board is placed on a **vibration-damped surface** if available.
•Align the FCU so that the **arrow marking on the board points forward** (towards the nose of the drone).
•Tighten screws firmly, but avoid over-tightening to prevent board damage.

## Power connection

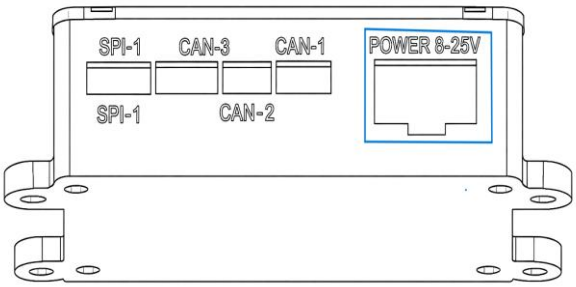
- Connect the **Power Management Board (PMB)** to the FCU using the **6-wire power cable**.
- Ensure the cable is properly seated in the designated **POWER port**.
- This connection supplies regulated battery power to the flight controller.



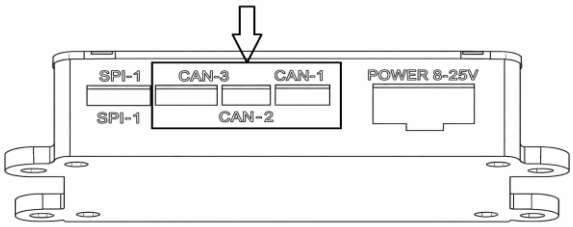
- Connect the **I/O PWM-IN port of the ESC** to the **I/O PWM-OUT port of the FCU**.
- Use the provided **10-wire cable** for this connection.
- This link enables the FCU to send **PWM control signals to the motors**.



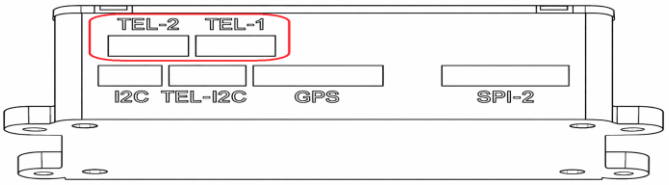

- The FCU supports direct power input from a **Power Distribution Board (PDB)**.
- Use a **2-wire cable** to connect the PDB output to the designated power input connector on the FCU.




- The FCU includes multiple **CAN ports** for connecting compatible peripherals.
- Supported devices may include GPS modules, external sensors, or telemetry units.
- Connect CAN devices to the labeled **CAN ports** as per system requirements.



- The FCU provides **UART (TEL-1, TEL-2)** ports for telemetry and communication.
- These ports can be used for:
- Telemetry radios
- Companion computers
- External modules
- Ensure correct **TX/RX wiring** while connecting UART devices.




**Final Installation Check**

Before powering on the system:

- Verify all connections are secure and correctly oriented
- Ensure no loose wires or exposed conductors are present
- Confirm proper mounting and board orientation
- Check power supply voltage compatibility

⚠ **FINAL WARNING**

Do not power the system until all connections have been verified.

## System Connections

Connect the **Power Distribution Board (PDB)** to the **POWER port** of the FCU using the provided **6-wire cable**. This connection supplies regulated battery power to the autopilot. *(Optional)* Connect a **telemetry radio module** to the **TELEM port** to enable communication between the FCU and the Ground Control Station (GCS) during flight, and to receive real-time telemetry data.

## ESC Connection (PWM Output)

Connect the **I/O PWM-IN port of the ESC** to the **I/O PWM-OUT port of the Indi-FCU-V1** using the provided **10-wire cable**. This connection allows the FCU to transmit **PWM signals to the motors**, enabling precise control of motor speed and thrust.

### Receiver & GPS Connection

•Connect a **radio control receiver** (PPM, DSM, or SBUS) to the designated input port to provide manual and assisted flight control inputs to the FCU.
•Connect the **GPS module** to the appropriate port to enable positioning, navigation, and autonomous flight capabilities.

⚠ **NOTE**
Ensure all connectors are properly aligned and securely attached before powering the system.

## Setup

The **PX4 firmware** serves as the core flight control software of the Indi-FCU-V1 and comes **pre-installed** on the device.
To configure your vehicle, perform mission planning, and monitor flight data, use the **IndiGroundControl** application, available for **Windows, macOS, and Linux**.

- Download IndiGroundControl from: http://qgroundcontrol.com/

## Connecting to IndiGroundControl

1. Install and launch the IndiGroundControl application on your computer.
2. Connect the Indi-FCU-V1 to your system using the provided **USB cable**.
3. The device should be **automatically detected** by the application.
4. Follow the **on-screen instructions** to complete the setup process.

### Initial Configuration

During the first-time setup, you will be required to configure essential hardware components, including:
•Sensor calibration (gyro, accelerometer, compass if applicable)
•Radio controller and frame type configuration
•Flight modes configuration
•Power and battery settings

⚠ **IMPORTANT**
Complete all mandatory setup steps before attempting flight to ensure safe and stable operation.

# Warranty & Support

Warranty Terms
The DARTAR FCU is covered by a **limited warranty** against manufacturing defects in materials and workmanship under normal use.
**Warranty Period:** 12 months from the date of purchase.
The warranty applies only to the original purchaser and is non-transferable.

## ⚠ WHAT IS COVERED

•Manufacturing defects in hardware components
•Failure under normal operating conditions as described in this manual

## ⚠ WHAT IS NOT COVERED

•Damage caused by improper installation, wiring, or misuse
•Damage due to crashes, physical impact, or water exposure
•Electrical damage due to incorrect voltage, reverse polarity, or power surges
•Unauthorized modifications or repairs
•Normal wear and tear

## ⚠ IMPORTANT

Proof of purchase is required to claim warranty. Indiflo reserves the right to inspect and verify the defect before approving any claim.

# Support Contact

For technical support, troubleshooting, or warranty claims, please contact:
**Email:** support@indiflo.com *(replace with actual)*
**Website:** www.indiflo.com *(replace with actual)*
**Response Time:** Typically, within 24–72 business hours
When contacting support, please provide:

- Product model and version (e.g., V1 / V1 Pro)
- Description of the issue
- Photos or videos (if applicable)
- Purchase details

Service Process:

1. Contact support and describe the issue.
2. Receive troubleshooting steps or service authorization.
3. If required, ship the product to the designated service center.
4. After inspection, the unit may be repaired, replaced, or returned based on warranty status.
   - •The customer is responsible for total shipping costs unless covered under warranty. (The customer will be responsible for covering the shipping costs associated with shipping the item when under warranty.)
   - •Repair or replacement timelines may vary depending on issue severity and part availability.