



SwiftWing SW-PM03-14S

Integrated Power Module & Power Distribution Board for ArduPilot & PX4

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SKU: SW-PM03-14S

Product Page: <https://swiftwingtech.io/product/swiftwing-high-voltage-analog-power-module-pm01a-14s/>

Product Overview

The SwiftWing SW-PM03-14S is an integrated high-voltage Power Module and Power Distribution Board designed for ArduPilot and PX4 based UAV platforms operating from 3S to 14S LiPo battery systems.

The board combines precision battery monitoring, regulated power supplies and high-current power distribution into a single compact module.

The SW-PM03-14S distributes battery power to up to six ESCs while simultaneously providing:

- Regulated 5V output
- Regulated 12V output
- Filtered 5V flight-controller power
- Battery voltage monitoring
- Battery current monitoring

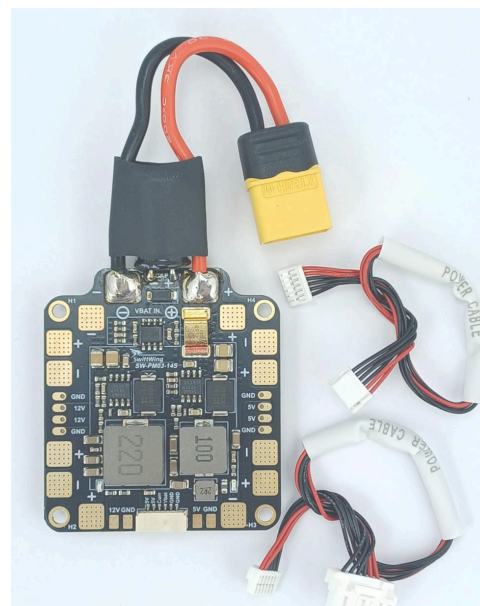


Figure 1: SwiftWing PM03-14S

The board utilizes a precision shunt-based current sensing architecture and industry-standard analog power module interface compatible with Pixhawk, CubePilot, Holybro and CUAUV flight controllers.

Each unit is supplied fully assembled with:

- Rubycon low-ESR input capacitor
- XT60 Male Connector
- 14 AWG silicone wire
- JST-GH flight-controller cable interface

Key Features

- Supports 3S–14S LiPo battery systems (9V–60V)
- Integrated analog power module
- High-current power distribution board
- Precision shunt-based current sensing
- Voltage monitoring up to 60V
- Current monitoring up to 120A
- Six ESC outputs
- Regulated 5V output
- Regulated 12V output
- Dedicated filtered 5V flight-controller rail
- JST-GH 6-pin Pixhawk compatible connector
- Rubycon low-ESR input capacitor pre-installed
- TVS transient protection
- 4-layer PCB with 2 oz copper
- ENIG finish

Typical Applications

- Industrial multirotors
- Heavy-lift UAVs
- VTOL aircraft
- Long-endurance UAVs
- Robotics systems
- ArduPilot platforms
- PX4 platforms

Product Views

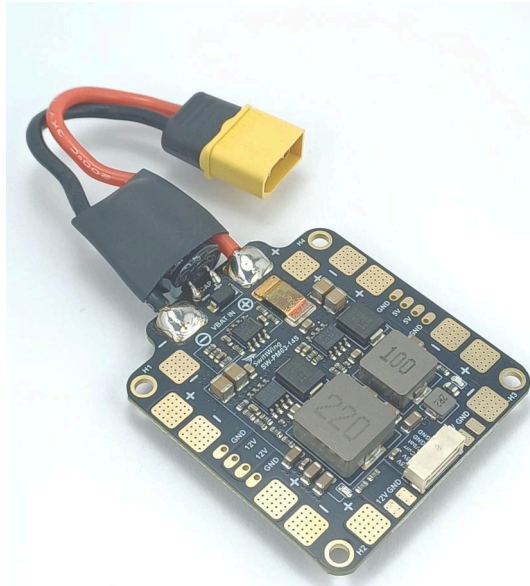


Figure 2: Front view

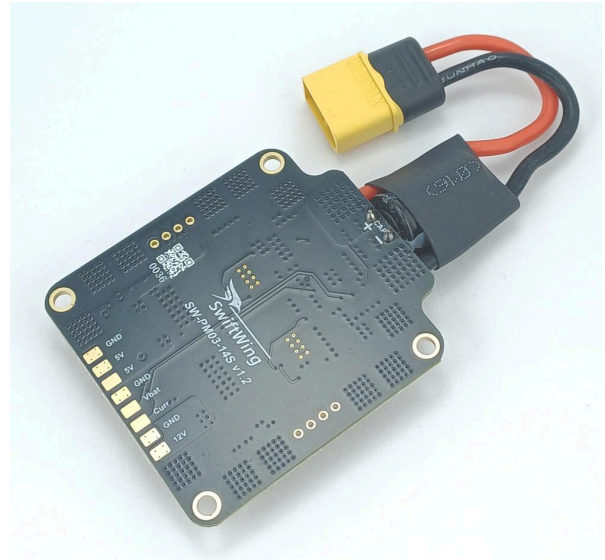


Figure 3: Bottom view

Absolute Maximum Ratings

The following ratings define the maximum limits beyond which permanent damage to the device may occur. Operation beyond these conditions is not recommended.

Parameter	Rating
Maximum Input Voltage	60V DC
Maximum Continuous PCB Current	120A
Maximum Burst Current	150A
5 V Output Current (Peak, <3 s)	5A
12V Output Peak Current (Peak, <3 s)	5A
Maximum PCB Temperature	105°C

Note: Operation beyond these limits may result in permanent damage.

Electrical Specifications

Electrical characteristics measured under nominal operating conditions unless otherwise specified.

Parameter	Specification
Recommended Operating Voltage	9V-60V
Supported Battery Types	3S–14S LiPo
Maximum Continuous Current	120A
Maximum Measurement Range	120A
Voltage Measurement Range	0–60V
Current Measurement Range	0–120A
Current Sensor Type	Precision shunt-based
Voltage Sensor Type	Resistive divider
Voltage Divider	20.66
Amperes per Volt	40
Flight Controller Interface	JST-GH 6-pin
Protection	Transient Protection (TVS)
PCB Construction	4-Layer, 2 oz Copper
Operating Temperature	–10°C to +60°C
Storage Temperature	–20°C to +85°C

 External fusing and correct battery polarity are recommended.

Note:

- Maximum current depends on external battery connector, wiring gauge, solder quality, and thermal conditions.
- BEC Output voltages are intentionally regulated slightly above nominal (5V/12V) to compensate for wiring and connector voltage drops under load.

- Current capability of the assembled product is primarily determined by the installed connector system, wiring gauge, solder quality, cooling conditions and operating environment. The internal PCB current path is designed with 4-layer construction and 2 oz copper to support high-current UAV applications with minimal voltage drop.

Current Rating Note: Actual achievable continuous current depends on the installed connector system, wire gauge, solder quality, cooling conditions, and operating environment. The supplied XT60 connector and 14 AWG battery leads are intended for typical UAV installations. Higher current operation may require appropriately rated connectors and conductors.

Power Outputs

Filtered Flight Controller Output

Parameter	Value
Output Voltage	5.14V $\pm$ 3%
Continuous Current	3A
Peak Current	5A
Output Type	Filtered Buck Output
Interface	JST-GH 1.25mm 6P

Features:

- Ferrite-bead filtering
- LC output filtering
- Dedicated FC power rail
- Reduced conducted switching noise

Auxiliary 5V Output

Parameter	Value
Output Voltage	5.14V $\pm$ 3%
Continuous Current	3A
Peak Current	5A

Auxiliary 12V Output

Parameter	Value
Output Voltage	12.2V $\pm 3\%$ ($V_{IN} \geq \sim 13V$)
Continuous Current	3A
Peak Current	5A

Note: The 12V regulator is a step-down (buck) converter. When battery voltage falls below approximately 12V, the output voltage will follow the battery voltage minus regulator losses.

Accuracy

Parameter	Typical Accuracy
Voltage Measurement	$\pm 2\%$ Typical Accuracy (after calibration)
Current Measurement	$\pm 2\%$ Typical Accuracy (after calibration)

Power Distribution

Parameter	Rating
ESC Outputs	6
Distribution Type	Direct Battery Distribution
Current Path	All battery current passes through precision shunt
Input Capacitor	Rubycon 330 μ F 63V pre-installed

Input Filtering Capacitor

Parameter	Rating
Capacitor Type	Conductive Polymer Aluminum Electrolytic

Manufacturer	Rubycon
Capacitance	330uF
Voltage Rating	63 V
ESR	Low ESR
Purpose	Input ripple suppression and transient filtering

Description

The PM03-14S incorporates a Rubycon low-ESR 330 μ F / 63 V capacitor located directly across the battery input. The capacitor improves voltage stability during rapid load changes, reduces input ripple, and suppresses transient voltage spikes generated by ESC switching activity and long battery leads.

Benefits

- Improved power stability
- Reduced voltage spikes
- Enhanced flight controller reliability
- Improved buck regulator performance
- Reduced conducted noise

Wire Specification

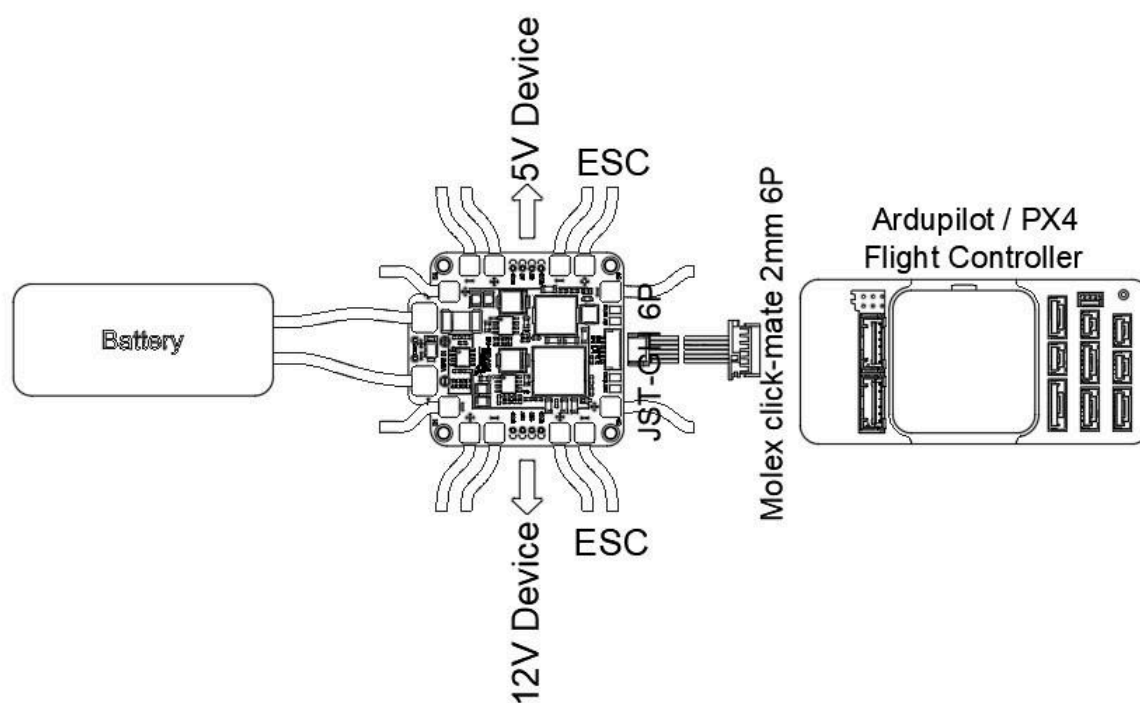
Parameter	Rating
Battery Leads	14 AWG Silicone Wire
Lead Length	100 mm $\pm$ 5mm

Connector Pinout

JST-GH 6-Pin Pinout

Pin	Signal
1	5V
2	5V
3	Current Sense
4	Voltage Sense
5	GND
6	GND

Typical System wiring diagram



ArduPilot & PX4 Configuration

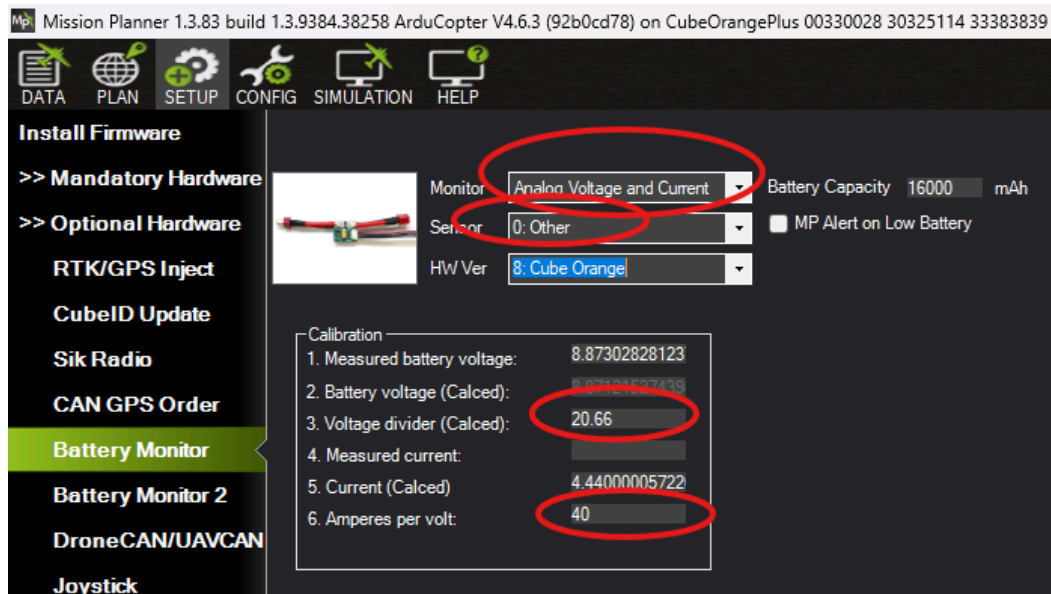
ArduPilot Mission Planner Setup

1. Connect the Power Module to the battery and connect the flight controller to your ground station via USB.
2. Open Mission Planner, go to the *Setup* page and *Battery Monitor* tab, and set the parameters as per below table:

Note:

After configuring the Battery Monitor type, click "Write Params" and reboot the flight controller. Depending on the firmware version, the voltage-divider (BATT_VOLT_MULT) and current-scaling (BATT_AMP_PERVLT) parameters may only appear after the flight controller restarts.

Parameter	Value
BATT_MONITOR	Analog Voltage and Current
Sensor	Other
HW Ver	Set this as per the flight controller being used.
BATT_VOLT_MULT	20.66
BATT_AMP_PERVLT	40

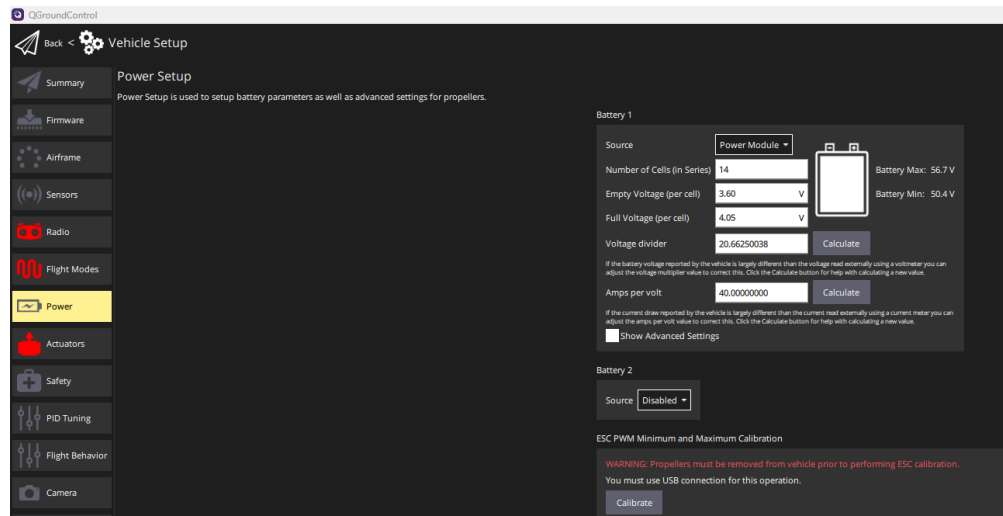


PX4 QGroundControl Setup

Refer to the PX4 [official documentation page](#).

1. Connect the Power Module to a battery and connect the flight controller to your ground station via USB.
2. Open QGroundControl go *Vehicle Setup* and *Power* tab and Input the Number of Cells.
3. Set the Voltage Divider & Amps per Volt as per below table.

Parameter	Value
Battery Source	Power Module
Voltage Divider	20.66
Amps per Volt	40



Calibration Note

The supplied voltage-divider and current-scaling values are nominal design values and provide a suitable starting point for most installations.

Due to normal component tolerances, manufacturing variations, flight-controller ADC tolerances and wiring differences, the measured battery voltage and current may differ slightly from actual values.

For best accuracy, SwiftWing recommends performing a final calibration after installation:

1. Connect a battery to the power module.
2. Measure the battery voltage using a calibrated multimeter.
3. Compare the measured voltage with the value reported by the flight controller.
4. Adjust the Voltage Divider parameter until the reported voltage matches the measured voltage.
5. Apply a known load and compare the reported current against a calibrated current meter.
6. Adjust the Current Scaling (Amps per Volt) parameter until the reported current matches the measured value.

Performing this calibration typically results in the most accurate battery-voltage, current-consumption and remaining-capacity estimates.

Supported Flight Controllers

The SwiftWing PM03-14S utilizes the industry-standard analog power module interface and is designed for compatibility with flight controllers supporting analog voltage and current monitoring through a dedicated power-module port.

Compatible flight controllers typically include:

- CubePilot Cube series (Cube Orange, Cube Orange+, Cube Red, etc.)
- Pixhawk 4 series
- Pixhawk 6 series
- Holybro flight controllers with analog power-module support
- CUAV flight controllers with analog power-module support
- Other ArduPilot and PX4 compatible flight controllers supporting analog voltage and current sensing

Flight controller configuration parameters may vary depending on firmware version and platform. Refer to the corresponding flight-controller documentation for setup and calibration procedures.

Compliance

- RoHS-compliant PCB materials and components
- Designed for UAV and robotics applications
- Intended for integration by qualified personnel

Formal third-party certification is not included unless explicitly stated.

Connector & Assembly Notes

- Observe correct battery polarity
- Verify flight controller power-module settings
- Use supplied JST-GH cable
- Do not exceed 60V input
- Ensure adequate cooling
- Inspect solder joints before operation

What's in the Box

- 1 × SwiftWing PM03-14S Integrated 120A Power Module & Power Distribution Board with XT60 Male & electrolytic capacitor, 330uF 63V (pre-soldered)
- 1 × JST-GH 6-pin cable to JST-GH 6-pin cable (15 cm)
- 1 x JST-GH 6-pin cable to Molex Click-mate 2 mm 6P cable. (15 cm)

Ordering Information

Product Name	SKU
SwiftWing Integrated 120A Power Module & Power Distribution Board	SW-PM03-14S

Manufacturer Information

Manufacturer: SwiftWing Robotics

Product Category: Power Modules

Model: SwiftWing Integrated 120A Power Module & Power Distribution Board

SKU: SW-PM03-14S

Product Page:

<https://swiftwingtech.io/product/swiftwing-high-voltage-analog-power-module-pm01a-14s/>

Website:

<https://swiftwingtech.io>

Disclaimer

Specifications provided in this datasheet are subject to change without notice. While every effort has been made to ensure accuracy, SwiftWing Robotics makes no representations or warranties regarding the completeness or suitability of this information for any particular application.

This product is intended for integration into UAV and multirotor systems by qualified personnel. Incorrect installation, improper battery polarity, insufficient cooling, or operation beyond specified ratings may result in equipment damage or personal injury.

SwiftWing Robotics shall not be held liable for any direct, indirect, incidental, or consequential damages arising from the use or misuse of this product.

Users are responsible for verifying product suitability and ensuring safe system integration.

Revision History

Version	Date	Description
v1.2	Jun, 2026	Initial Production Release