SwiftWing EDGE-M10 GNSS & Compass Module

Professional Multi-Constellation GNSS Navigation Module

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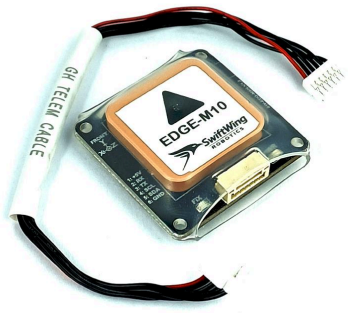
SKU: SW-EDGE-M10-01

Product Page: https://swiftwingtech.io/product/swiftwing-edge-m10-gnss-compass/

Product Overview

The SwiftWing EDGE-M10 is a professional-grade GNSS and compass module designed for UAVs, autonomous vehicles, robotics platforms, marine systems, and embedded navigation applications.



Built around the u-blox MAX-M10S GNSS receiver and LIS3MDL 3-axis digital magnetometer, the EDGE-M10 delivers reliable positioning, fast satellite acquisition, accurate heading information, and robust operation in challenging RF environments.

The module combines a high-performance 25 × 25 mm ceramic patch antenna, optimized 35 × 35 mm ground plane, and an additional external SAW filter to enhance GNSS reception and improve resistance to out-of-band RF interference.

Leveraging the advanced signal processing capabilities of the u-blox M10 platform, the EDGE-M10 provides dependable navigation performance for flight controllers, companion computers, robotics systems, and embedded applications requiring precise GNSS positioning and heading information.

Figure 1: SwiftWing EDGE-M10

Key Features

- u-blox MAX-M10S GNSS receiver
- LIS3MDL 3-axis digital magnetometer
- Concurrent multi-constellation GNSS reception
- GPS, Galileo, BeiDou, QZSS, GLONASS and SBAS support
- u-blox Super-S signal processing technology
- RF interference monitoring and jamming detection support
- GNSS spoofing detection support
- 25 × 25 mm ceramic patch antenna
- Optimized 35 × 35 mm GNSS ground plane
- Additional external SAW filter
- Enhanced RF interference rejection
- Supports navigation update rates up to 10 Hz
- Optimized for PX4 and ArduPilot automatic GPS configuration
- Standard JST-GH 6-pin interface
- Compact 35 × 35 mm footprint

Typical Applications

- Multirotor UAVs
- Fixed-wing UAVs
- VTOL Aircraft

- Autonomous Ground Vehicles
- Marine Robotics
- Survey and Mapping Systems
- Research and Development Platforms
- Companion Computer Navigation Systems
- Embedded GNSS Applications

Product Views

	
Figure 2: Top view	Figure 3: Bottom view

GNSS Performance

Parameter	Specification
GNSS Receiver	u-blox MAX-M10S
GNSS Type	Multi-Constellation GNSS
Frequency Band	L1
Horizontal Position Accuracy	1.5 m CEP (Typical)
Maximum Navigation Rate	Up to 10 Hz
Cold Start Time	Typical 28 s

Hot Start Time	Typical 1 s
Tracking Sensitivity	-167 dBm
Reacquisition Sensitivity	-160 dBm
Cold Start Sensitivity	-148 dBm
Supported Protocols	UBX, NMEA
Recommended UART Baud Rate	115200 bps

Field Validation Results

- Up to 32 satellites tracked during field testing
- Typical receiver-reported horizontal accuracy: 0.3–0.6 m under open-sky conditions
- Typical receiver-reported vertical accuracy: 0.6–1.2 m under open-sky conditions
- Stable operation verified during stationary and vehicle testing
- Validation testing included:
    - Stationary open-sky testing
    - Vehicle-based dynamic testing

Advanced Signal Integrity Features

u-blox Super-S Technology

The MAX-M10S receiver incorporates u-blox Super-S technology designed to improve positioning performance in challenging environments and with compact antenna systems.

Benefits include:

- Improved dynamic positioning accuracy
- Enhanced operation in partially obstructed environments
- Improved signal tracking performance
- Reliable operation with compact GNSS antennas

RF Interference Monitoring

The u-blox M10 platform continuously monitors the RF environment and can detect abnormal interference conditions.

Capabilities include:

- RF interference monitoring

- Continuous-wave (CW) jamming detection
- GNSS signal quality monitoring
- RF status reporting

GNSS Spoofing Detection Support

The receiver supports GNSS signal integrity monitoring and spoofing detection capabilities provided by the u-blox M10 platform.

Features include:

- Abnormal GNSS signal detection
- Signal integrity monitoring
- Spoofing event reporting support

RF Front-End Architecture

The EDGE-M10 incorporates a carefully optimized RF architecture designed for reliable GNSS operation in demanding RF environments.

RF Design Features

- 25 × 25 mm ceramic patch antenna
- Optimized 35 × 35 mm ground plane
- Additional external SAW filter
- Reduced susceptibility to nearby RF transmitters
- Enhanced rejection of out-of-band interference
- Improved operation near telemetry radios, wireless communication equipment and other RF sources

The additional external SAW filter provides supplementary filtering of unwanted RF signals before they reach the GNSS receiver, helping maintain reliable positioning performance in RF-dense environments.

Compass Specifications

Parameter	Specification
Magnetometer	LIS3MDL
Type	3-axis Digital Magnetometer

Interface	I²C
Compass Function	Integrated Heading Reference

Orientation

The arrow printed on the module indicates the forward direction.

For optimal compass performance, install the module with the arrow aligned to the vehicle's forward axis.

Electrical Specifications

Electrical characteristics measured under nominal operating conditions unless otherwise specified.

Parameter	Specification
Input Voltage	4.75 V – 5.5 V
Nominal Voltage	5 V
Communication Interface	UART + I²C
Connector Type	JST-GH 6-pin
Backup Retention	Integrated Supercapacitor for improved hot-start performance and temporary GNSS data retention

Environmental Specifications

Parameter	Specification
Operating Temperature	-40°C to +85°C
Storage Temperature	-40°C to +85°C

Mechanical Specifications

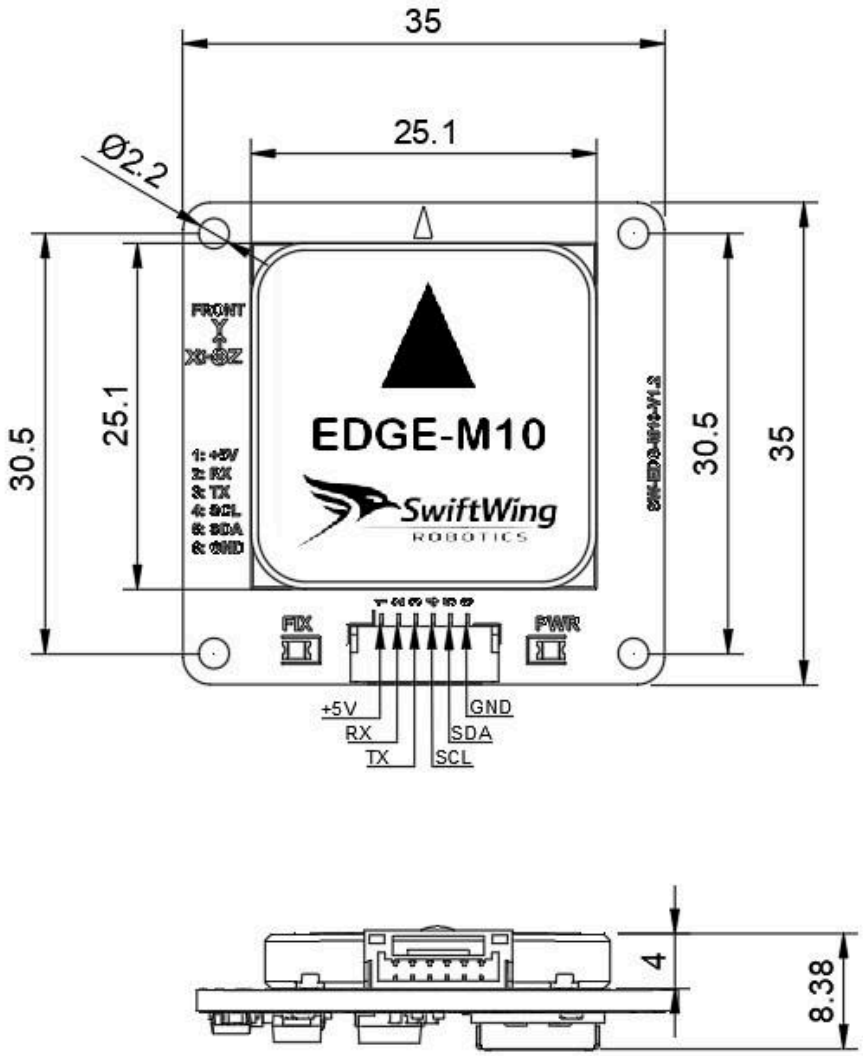


Fig: PCB Dimensions (in mm)

Parameter	Value
PCB Size (L x W)	35 mm × 35 mm
Module Height	~8.4 mm
Mounting Pattern	30.5 mm × 30.5 mm

Mounting Hole Size	M2
Antenna Size	25 mm × 25 mm
Weight	17 g
Enclosure	Transparent Heat Shrink

Status Indicators

LED	Function
Red LED	Power Indicator
Green LED	PPS Indicator

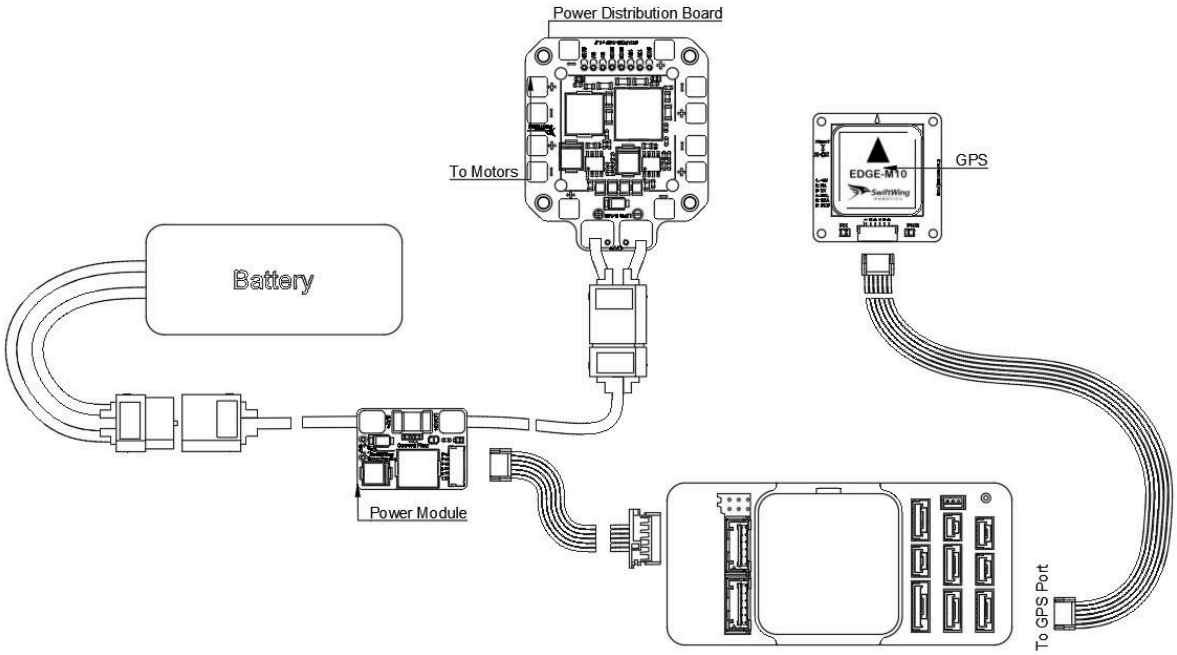
The PPS LED flashes at 1 Hz when GNSS timing synchronization is active.

Connector Pinout

JST-GH 6-Pin Interface

Pin	Signal
1	+5V
2	RX
3	TX
4	SCL
5	SDA
6	GND

Typical System wiring diagram



Compatibility

The EDGE-M10 is validated with: PX4, ArduPilot, INAV, Betaflight (GPS functionality)

Supported communication protocols include:

- UBX
- NMEA
- UART GNSS Interface
- I²C Compass Interface

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.

What’s in the Box

- 1 × SwiftWing EDGE-M10 GNSS & Compass Module

- 1 × JST-GH 6-pin Female to JST-GH 6-pin Female Cable (15 cm)

Ordering Information

Product Name	SKU
SwiftWing EDGE-M10 GNSS & Compass Module	SW-EDGE-M10-01

Manufacturer Information

Manufacturer: SwiftWing Robotics
Product Category: GNSS Modules
Model: SwiftWing EDGE-M10 GNSS & Compass Module
SKU: SW-EDGE-M10-01

Product Page:
https://swiftwingtech.io/product/swiftwing-edge-m10-gnss-compass/

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
v1.0	Jun, 2026	Initial Release