



SwiftWing EDGE-M9 GNSS & Compass Module

Professional Multi-Constellation GNSS Navigation Module

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SKU: SW-EDG-M9N-01

Product Page: <https://swiftwingtech.io/product/swiftwing-edge-m9n-gnss-compass/>

Product Overview

The SwiftWing EDGE-M9N is a professional-grade GNSS and compass module designed for UAVs, autonomous vehicles, robotics platforms, marine systems, surveying applications and embedded navigation systems.

Built around the u-blox NEO-M9N GNSS receiver and LIS3MDL 3-axis digital magnetometer, the EDGE-M9N delivers reliable positioning, accurate heading information, fast satellite acquisition and robust operation in challenging RF environments.

The module combines a premium Taoglas 25 × 25 mm ceramic patch antenna, external MAX2659 low-noise amplifier (LNA), dedicated SAW filtering, optimized 35 × 35 mm ground plane and supercapacitor-assisted GNSS backup retention to provide dependable

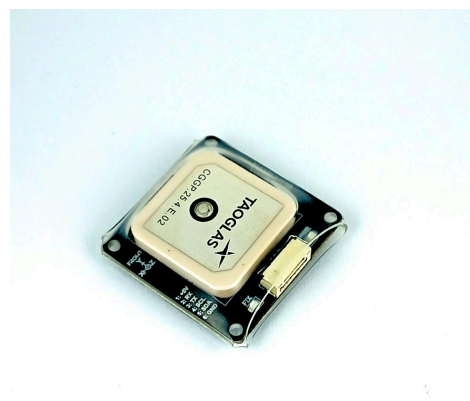


Figure 1: SwiftWing EDGE-M9

navigation performance for professional UAV and robotics applications.

Designed for compatibility with flight controllers, companion computers and embedded systems, the EDGE-M9N provides precise positioning and heading information for autonomous navigation and flight control systems.

Professional RF Front-End

- ✓ Taoglas 25×25 mm Patch Antenna
- ✓ MAX2659ELT External LNA
- ✓ SAFEB1G57KE0F00R15 SAW Filter
- ✓ Supercapacitor Backup
- ✓ Resettable Fuse Protection

Key Features

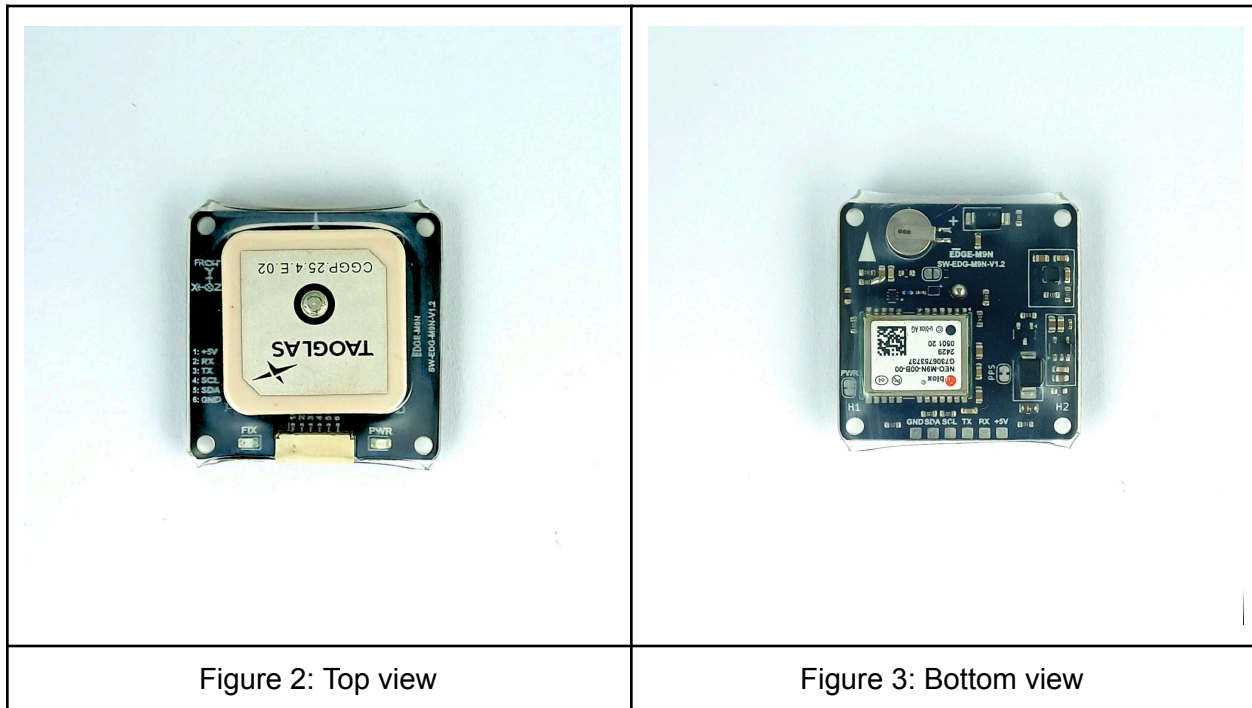
- u-blox NEO-M9N GNSS receiver
- LIS3MDL 3-axis digital magnetometer
- Premium Taoglas CGGP.25.4.E.02 ceramic patch antenna
- External MAX2659ELT low-noise amplifier (LNA)
- External SAFEB1G57KE0F00R15 SAW filter
- Concurrent multi-constellation GNSS reception
- GPS, GLONASS, Galileo, BeiDou, QZSS and SBAS support
- RF interference monitoring and jamming detection support
- GNSS spoofing detection support
- Supercapacitor-assisted GNSS backup retention
- Resettable input protection fuse
- Navigation update rates up to 25 Hz
- Standard JST-GH 6-pin interface
- Compact 35 × 35 mm footprint
- Optimized for PX4 and ArduPilot automatic GPS configuration

Typical Applications

- Multirotor UAVs

- Fixed-Wing UAVs
- VTOL Aircraft
- Autonomous Ground Vehicles
- Marine Robotics
- Survey and Mapping Systems
- Companion Computer Navigation Systems
- Research and Development Platforms
- Embedded GNSS Applications

Product Views



Professional RF Front-End Architecture

The EDGE-M9N incorporates a dedicated RF signal chain engineered to improve GNSS reception quality and reduce susceptibility to RF interference.

RF Signal Chain

Taoglas 25 × 25 mm Ceramic Patch Antenna → SAFEB1G57KE0F00R15 SAW Filter → MAX2659ELT Low-Noise Amplifier → u-blox NEO-M9N GNSS Receiver

RF Design Features

- Premium Taoglas ceramic patch antenna

- External low-noise amplifier
- Dedicated SAW filtering
- Optimized 35 × 35 mm ground plane
- Enhanced weak-signal reception
- Improved out-of-band interference rejection
- Improved operation near telemetry radios, wireless communication equipment and video transmitters

This architecture improves signal quality before it reaches the GNSS receiver, helping maintain reliable positioning performance in RF-dense environments.

GNSS Performance

Parameter	Specification
GNSS Receiver	u-blox NEO-M9N
GNSS Type	Multi-Constellation GNSS
Frequency Band	L1
Horizontal Position Accuracy	2.0 m CEP (Typical)
Maximum Navigation Rate	Up to 25 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, RTCM 3.x
Recommended UART Baud Rate	115200 bps

Supported GNSS Constellations

GNSS System	Support
GPS	Supported

GLONASS	Supported
Galileo	Supported
BeiDou	Supported
QZSS	Supported
SBAS	Supported

The NEO-M9N supports concurrent reception of multiple GNSS constellations, improving satellite availability and positioning reliability.

Open-Sky Static and Dynamic Testing

- Up to 28 satellites used in navigation solution
- Average HDOP approximately 0.6
- Typical receiver-reported horizontal accuracy approximately 1.1 m
- Stable 3D fix maintained throughout testing
- Reliable PPS synchronization verified
- Stable navigation solution maintained during movement
- Reliable satellite tracking throughout testing
- No loss of navigation solution observed
- Consistent positioning performance verified

Advanced Signal Integrity Features

RF Interference Monitoring

The NEO-M9N 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 M9 platform.

Features include:

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

Compass Specifications

Parameter	Specification
Magnetometer	LIS3MDL
Type	3-axis Digital Magnetometer
Interface	I ² C
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 + I ² C
Connector Type	JST-GH 6-pin
Backup Retention	Integrated Supercapacitor for improved hot-start performance and temporary GNSS data retention
Input Protection	Resettable Fuse

Environmental Specifications

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

Mechanical Specifications

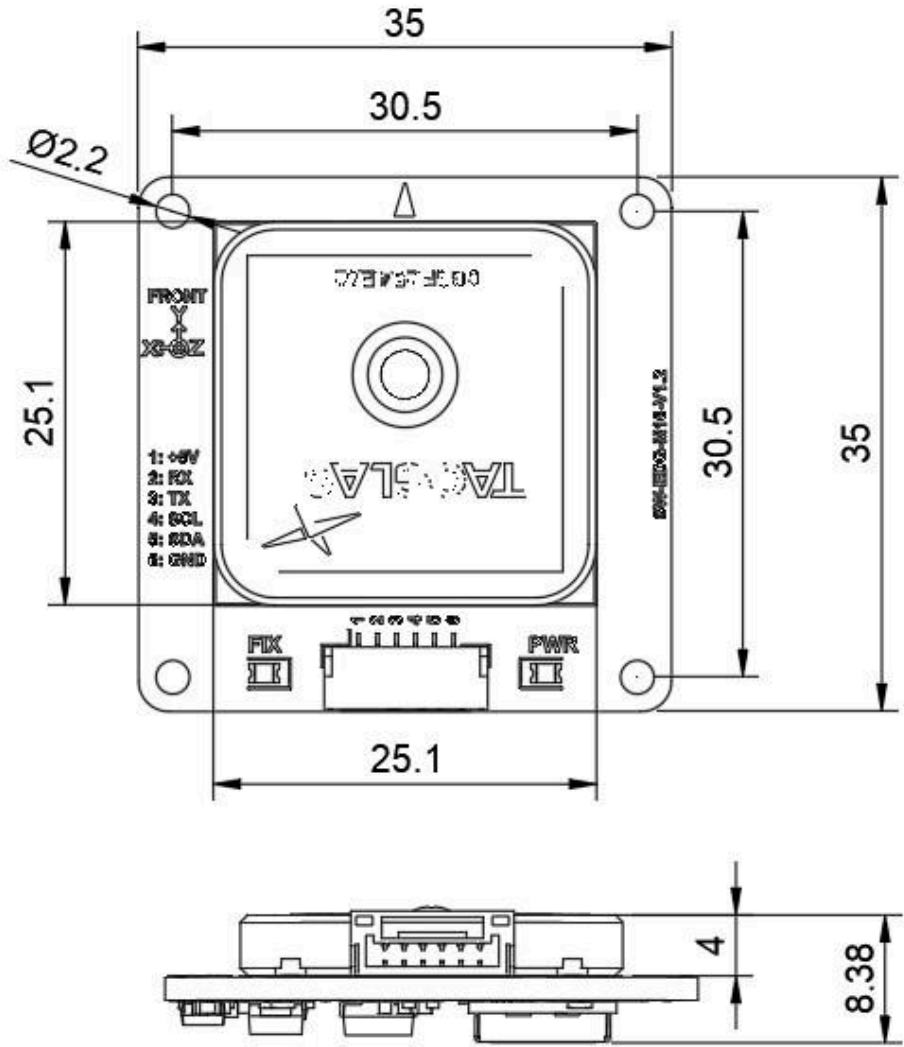


Fig: PCB Dimensions (in mm)

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	19 g
Protection	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.

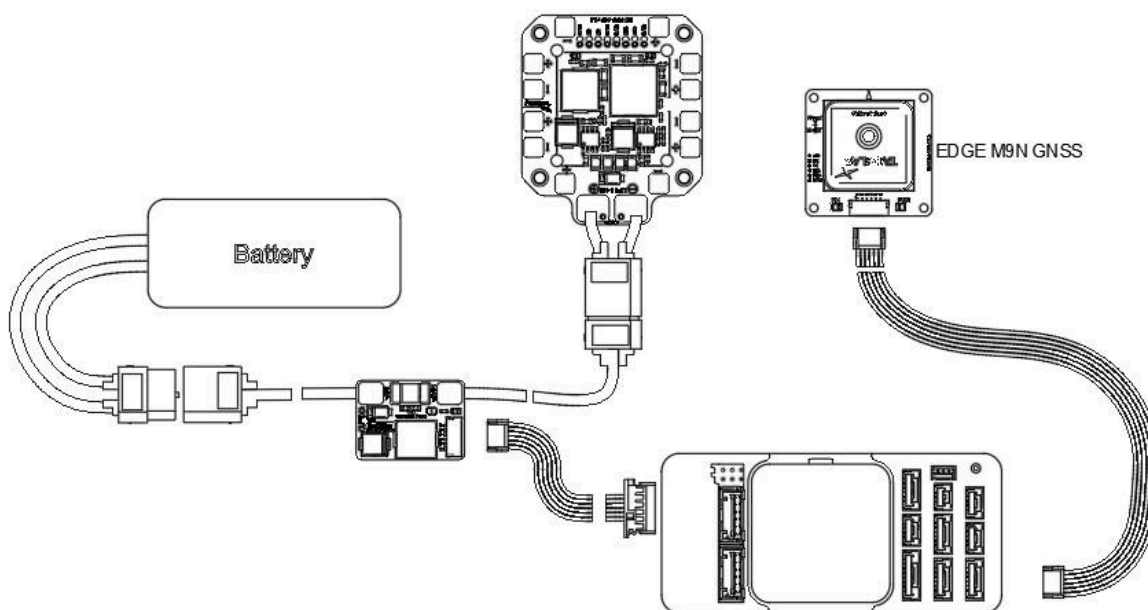
Connector Pinout

JST-GH 6-Pin Interface

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

6	GND
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Typical System wiring diagram



Compatibility

The EDGE-M9N is compatible with flight controllers, companion computers, robotics platforms and embedded systems supporting standard UART GNSS and I²C compass interfaces.

Validated with:

- PX4
- ArduPilot

Compatible With

- PX4
- ArduPilot
- INAV
- Betaflight (GPS functionality)
- Other systems supporting UART GNSS and I²C compass interfaces

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-M9N 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-M9N GNSS & Compass Module	SW-EDG-M9N-01

Manufacturer Information

Manufacturer: SwiftWing Robotics
Product Category: GNSS Modules
Model: SwiftWing EDGE-M9N GNSS & Compass Module
SKU: SW-EDG-M9N-01

Product Page:

<https://swiftwingtech.io/product/swiftwing-edge-m9n-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