

YAAANENDRIYA

Data Sheet

YPS E L1 GNSS + Compass Module

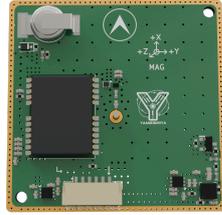
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YPS E L1 GNSS + Compass Module



The YPS Essentials module is a high-performance L1 GNSS solution built on the u-blox NEO-M9N platform through UART communication, delivering meter-level position accuracy and ultra-fast acquisition times. It supports simultaneous reception of GPS, GLONASS, Galileo and QZSS offering excellent satellite visibility even in closed environments. With more satellites in view, YPS can select the best signals to ensure accurate and reliable position fixes, even in urban canyons and dense environments. Equipped with the IST8310 3-axis digital compass over I²C communication, the YPS Essentials module provides reliable heading information for attitude estimation and navigation. This provides a high-performance magnetometer with low noise, high linearity and high sensitivity.

YPS is carefully tuned for the L1 band using a dual-filter design with integrated biasing. This makes the module robust against strong RF interference, allowing stable performance even when co-located with high-power devices like cellular modems or telemetry radios. It incorporates the high gain 25×25×4 antenna which gives high efficiency and optimal Signal to Noise ratio.

The onboard u-blox platform also includes advanced spoofing and jamming detection, enabling the system to alert the host processor and take countermeasures when signal threats are detected. ⁽¹⁾

Drone-Compatible and Plug & Play

The YPS Essentials module follows the standard GPS + Compass pinout used in most drone autopilots, including full plug-and-play compatibility with Pixhawk systems. This ensures seamless integration with popular flight control stacks like PX4 and ArduPilot.

⁽¹⁾ ⚠ Note: Firmware upgrades and configurations are supported across various use cases; however, firmware updates are not available when deployed in ARDUPILOT/PX4/BETAFLIGHT based drone applications.

Applications

- Resilient navigation for drones, robots, vehicles using multi band GNSS.
- Fleet and Asset tracking with fewer dropouts in tough environments.
- Timing and synchronization for Telecom industrial networks time stamping.
- Geofencing and compliance logging with reliable position history.



High Performance GNSS

Key Highlights

Model	U-Blox M9N
Magnetometer	IST8310
Constellations Supported	GPS, Galileo, Glonass, BeiDou, QZSS
Communicates over UART for GNSS and I ² C for the Compass	
Antenna size of 25×25×4 mm	

Specifications

YPS E Specifications

GNSS Features

GNSS bands	BeiDou, Galileo, Glonass, GPS, QZSS
Oscillator (Internal)	TCXO

Antenna

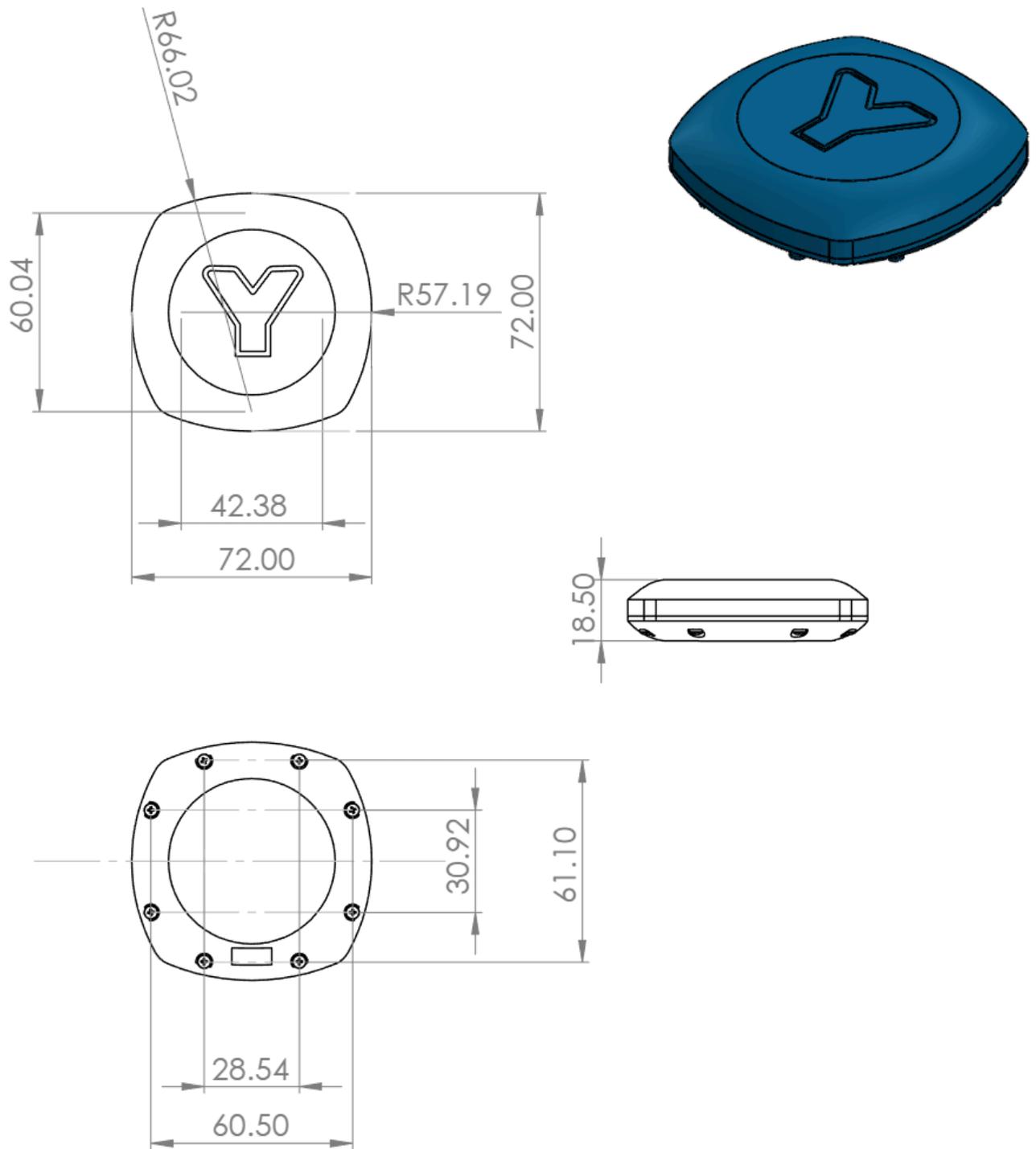
Size	25×25×4 mm
Make	Taoglas

Message format (GNSS)	UBX / NMEA
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Environmental data, quality & reliability

Maximum temperature	60°C
Minimum temperature	-10°C

Mechanical Casing



Mechanical Specifications

Weight	46 grams
Dimensions (mm) L x W x H	72 × 72 × 18.50
IP Rating	No IP Rating
Operating Temp	<60°C

Electrical Specifications

Power Supply Requirements

The YPS E module should be powered from the regulated 5 V output of the flight controller. If an external BEC is used, the following requirements should be met to ensure reliable operation and optimal RF performance:

- Output voltage must be maintained within 4.8 V to 5.5 V
- The supply shall be low-noise, as excessive ripple or conducted noise can degrade GNSS sensitivity and tracking performance.
- In-house validation has demonstrated that a peak-to-peak ripple of up to 250 mV on the 5 V rail does not result in measurable degradation of GNSS and Magnetometer performance.

Electrical

Parameter	Symbol	Minimum	Typical	Maximum	Units	Notes
Supply Voltage	V _{in}	4.80	5.00	5.50	V	Regulated input
Power Supply Ripple	VRIPPLE	----	----	250	mV _{p-p}	Validated in-house
IO Voltage Level	V _{IO}	3.18	3.30	3.42	V	3.30 V ± 3.50%

Electrical Interface – Cable Length and Signal Integrity

The YPS module and associated interfaces have been validated using a 15cm cable length under nominal operating conditions.

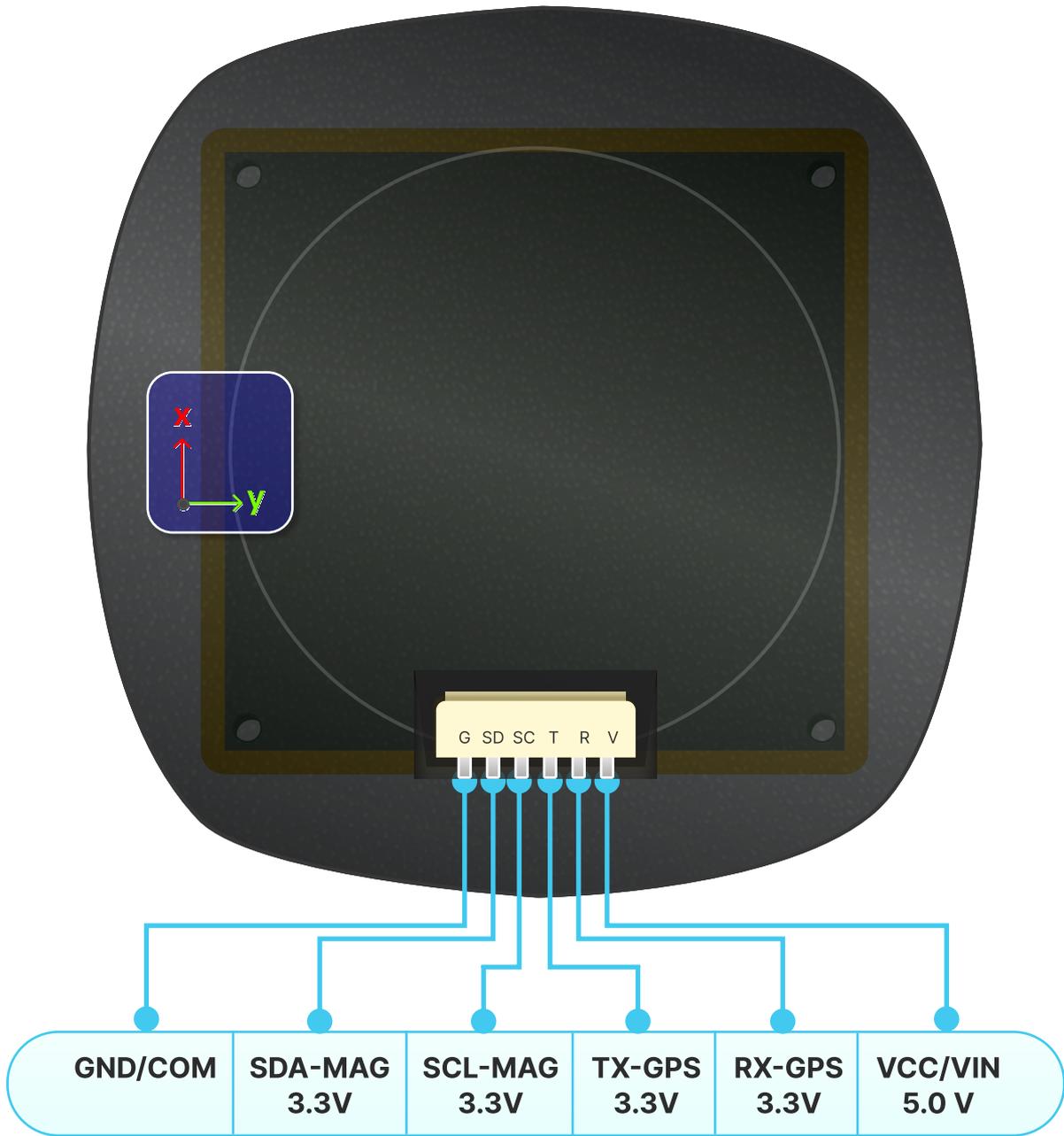
For cable lengths exceeding this value, the following considerations apply:

- Increased cable length may introduce signal reflections, potentially resulting in corrupted data.
- Series termination resistors may be added on the interface board to improve signal integrity.
- Some flight controllers integrate termination resistors internally; verify before adding external components.

Recommended Series Termination vs Cable Length

Cable Length	Recommended Series Resistance
≤ 15 cm	Not required
16–30 cm	68–100 Ω
30–40 cm	150–220 Ω
> 40 cm	Evaluate per interface, SI analysis recommended

Pinout Diagram



Communications & I/O

Communication Protocol

UART 3.3V (GNSS), I2C 3.3V (Compass)

INSTALLATION, HANDLING & INTEGRATION GUIDELINES

YPS E L1 GNSS + COMPASS MODULE

1. Mechanical Mounting & Alignment

Accurate mechanical mounting is essential for achieving specified sensor performance.

- Mount the module on a rigid, flat and mechanically stable surface.
- Recommended fasteners: M3 screws with controlled torque.
- Recommended fastener type: Nylon or Brass Screws.
- Avoid over-tightening to prevent mechanical stress and bias shifts.

2. Magnetic Environment Considerations

- Magnetic disturbances can significantly affect heading accuracy.
- Keep the module away from electric motors, high-current conductors, transformers, inductors and ferromagnetic materials.
- Static magnetic interference may be compensated through magnetometer calibration only if the interference source is rigidly fixed relative to the sensor.
- Dynamic magnetic fields caused by time-varying currents or rotating machinery cannot be reliably compensated.
- Route power and motor cables away from the module and avoid current loops near the sensor.

3. Electrical Interface & Cabling

- Use short, shielded cables and ensure proper grounding.
- Keep signal lines separated from high-power cables.
- Follow all specified voltage, current and logic-level requirements.
- Improper cabling may introduce noise, communication errors or permanent damage.

4. Environmental Protection

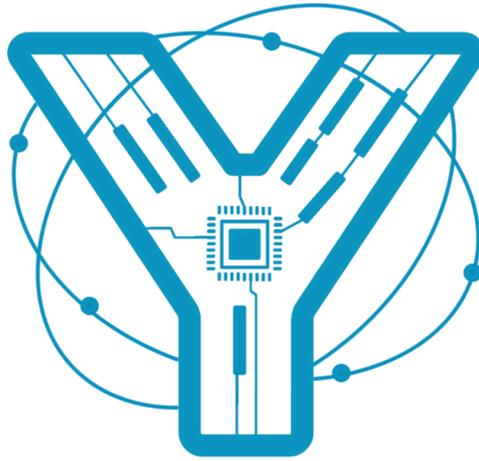
The module is intended for embedded integration. Environmental sealing against dust, moisture and condensation must be provided at the system level.

- Ensure operation within the specified temperature and humidity limits.
- Avoid direct exposure to water, conductive dust, or corrosive environments.

5. Electrostatic Discharge (ESD) Handling

The module contains ESD-sensitive electronic components.

- Keep the module in anti-static packaging until installation.
- Follow standard ESD handling practices (grounded wrist straps, ESD-safe work surfaces).
- Avoid touching connector pins and exposed circuitry.
- Do not hot-plug the module unless explicitly supported by the system design.



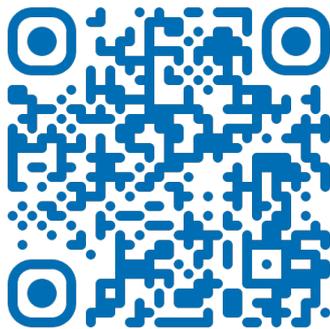
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