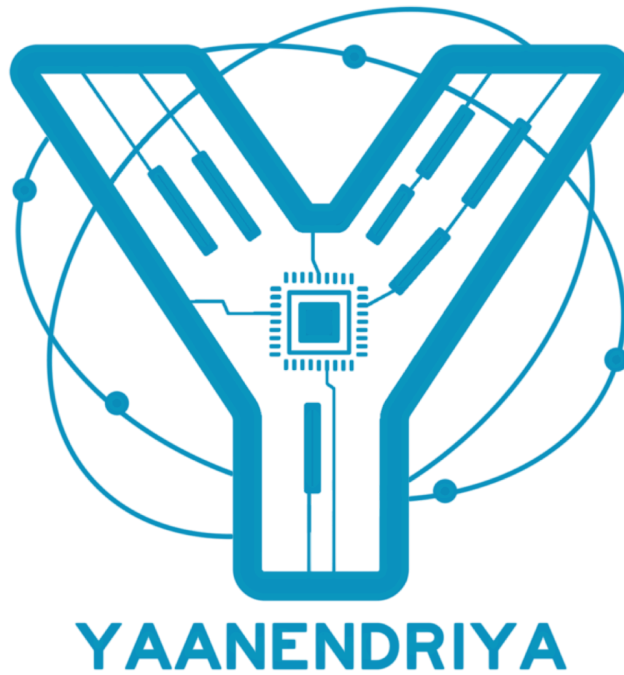




Data Sheet

YDx M CB-1-E 6-DoF VRU & IMU Module

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YDx M CB-1-E 6-DoF VRU & IMU Module



YDx-M CB-1-E is a compact, robust 6-DoF VRU engineered for precise static roll and pitch estimation. It integrates a 3-axis accelerometer and 3-axis gyroscope with Yaanendriya's YSS Fusion to deliver stable, repeatable orientation outputs in a small form factor.

Designed to be cost-effective and configurable for static and low-dynamics use-cases, YDx-M CB-1-E balances sensor selection with a fusion pipeline tuned to manage noise and drift for consistent leveling performance. Each unit is calibrated, optimized, and tested in-house, and is supported by documentation, SDKs, and tooling so customers can integrate quickly and tune outputs to their system needs.

Applications

- Industrial Monitoring: Machine base leveling, Equipment cabinet/base leveling, Stand/platform leveling checks.
- Construction & Civil: Ramp/floor slope verification, Formwork/platform leveling checks, Door/window frame installation leveling.
- Energy & Utilities: Solar panel rough tilt setup, Rooftop equipment leveling (HVAC/utility boxes), Mounting-structure leveling checks.
- Robotics & Automation: Docking-station base leveling, Static sensor mount leveling (camera/LiDAR stand), Fixture/stand leveling in work cells.
- Consumer: Tripod/camera leveling aid, RV/caravan leveling assist, Appliance/fitness-equipment leveling (washer/treadmill).



High Performance IMU Sensor

VRU performance

Static Roll/Pitch(rms)	0.8 °
Static Roll/Pitch accuracy	< 1.0 °
Dynamic Roll Pitch	1.3 °
Startup Time	500 ms
Max Output Rate	200 Hz
RPY Latency	10 ms

Performance Specifications

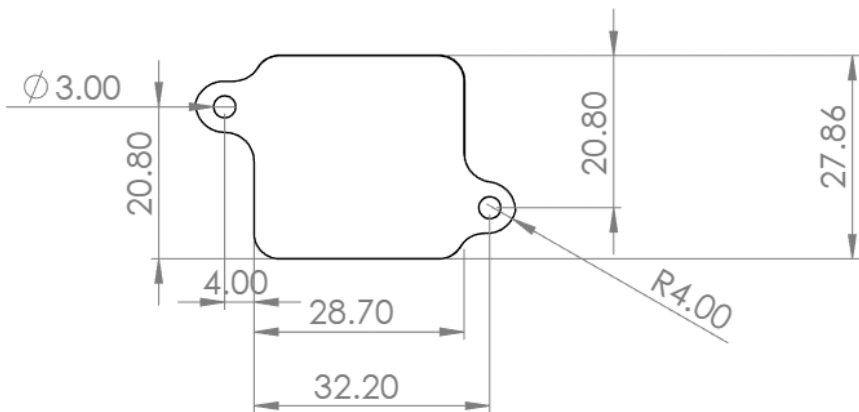
Accelerometer

Parameter	Minimum	Typical	Maximum	Units
Operating range		±8		g
Non Linearity		±2 %		FS
Noise Density		170	180	µg/√Hz
Output Rate	10		200	Hz (User Config)
Resolution		0.24		mg
Alignment Error		±0.25 °		Degree

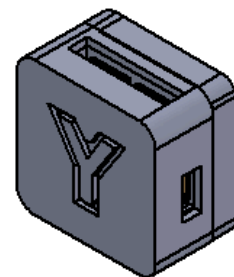
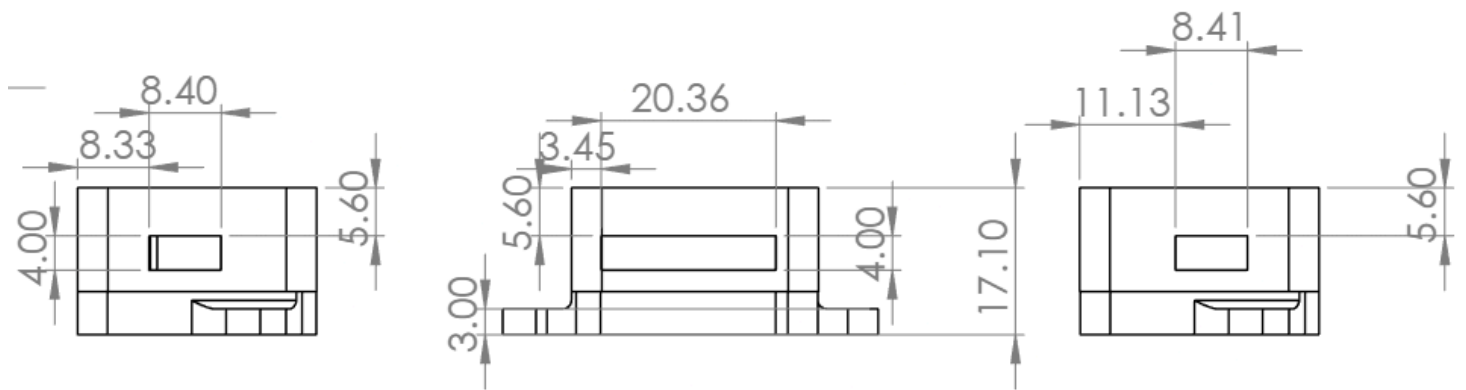
Gyroscope

Parameter	Minimum	Typical	Maximum	Units
Operating range		±500		g
Non Linearity		±0.07 %		FS
Noise Density		75	11	mdps/√Hz
Output Rate	10		200	Hz (User Config)
Resolution		17.50		mdps
Alignment Error		±0.25 °		Degree

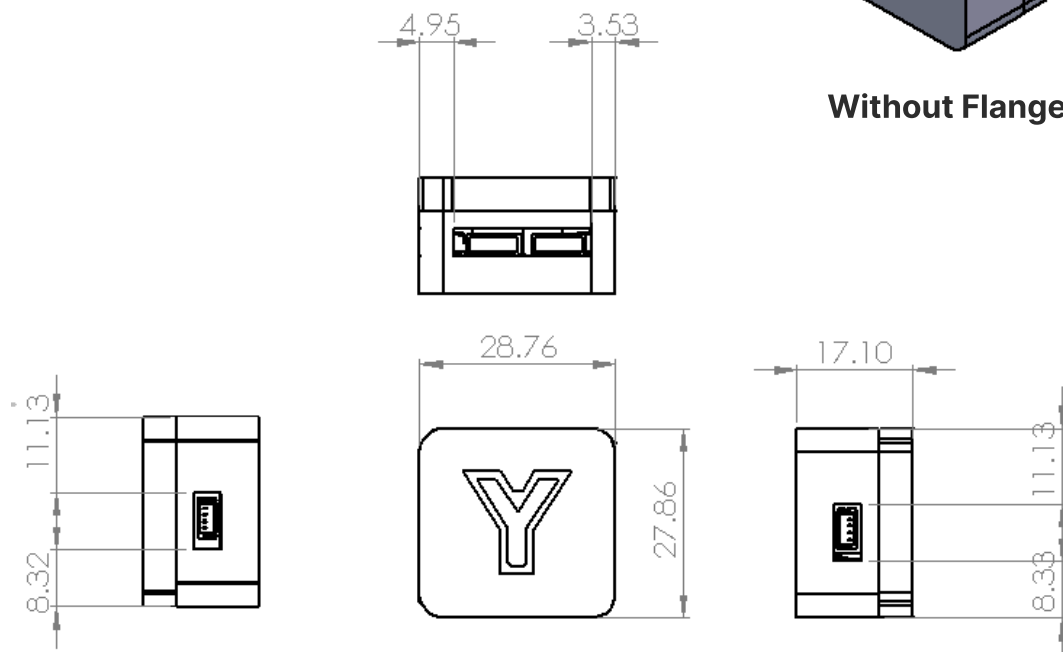
Mechanical Casing



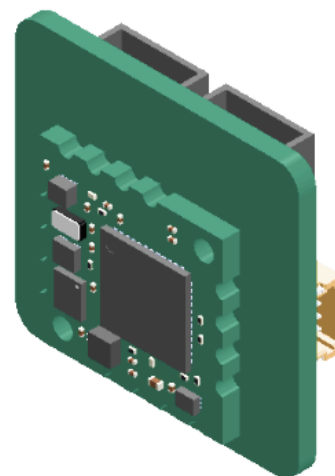
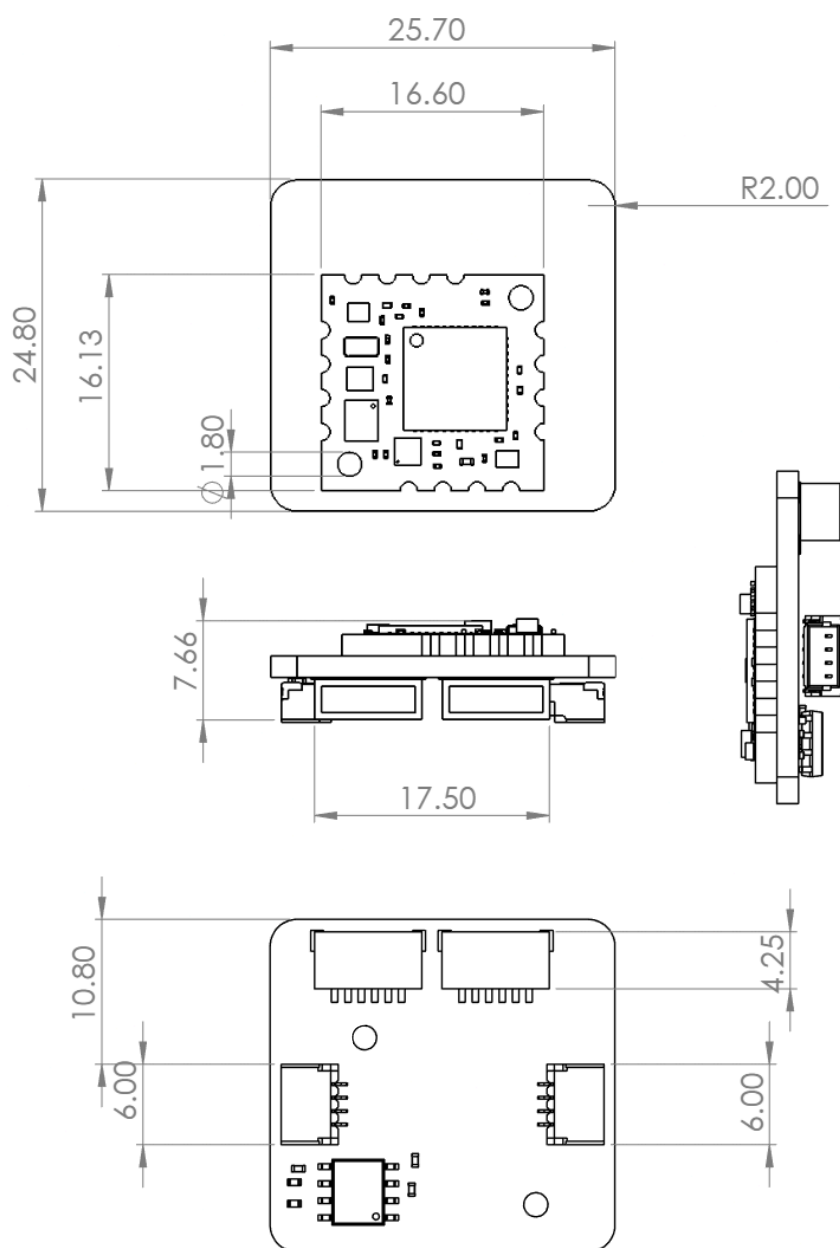
With Flanges



Without Flanges



PCB



Mechanical Specifications

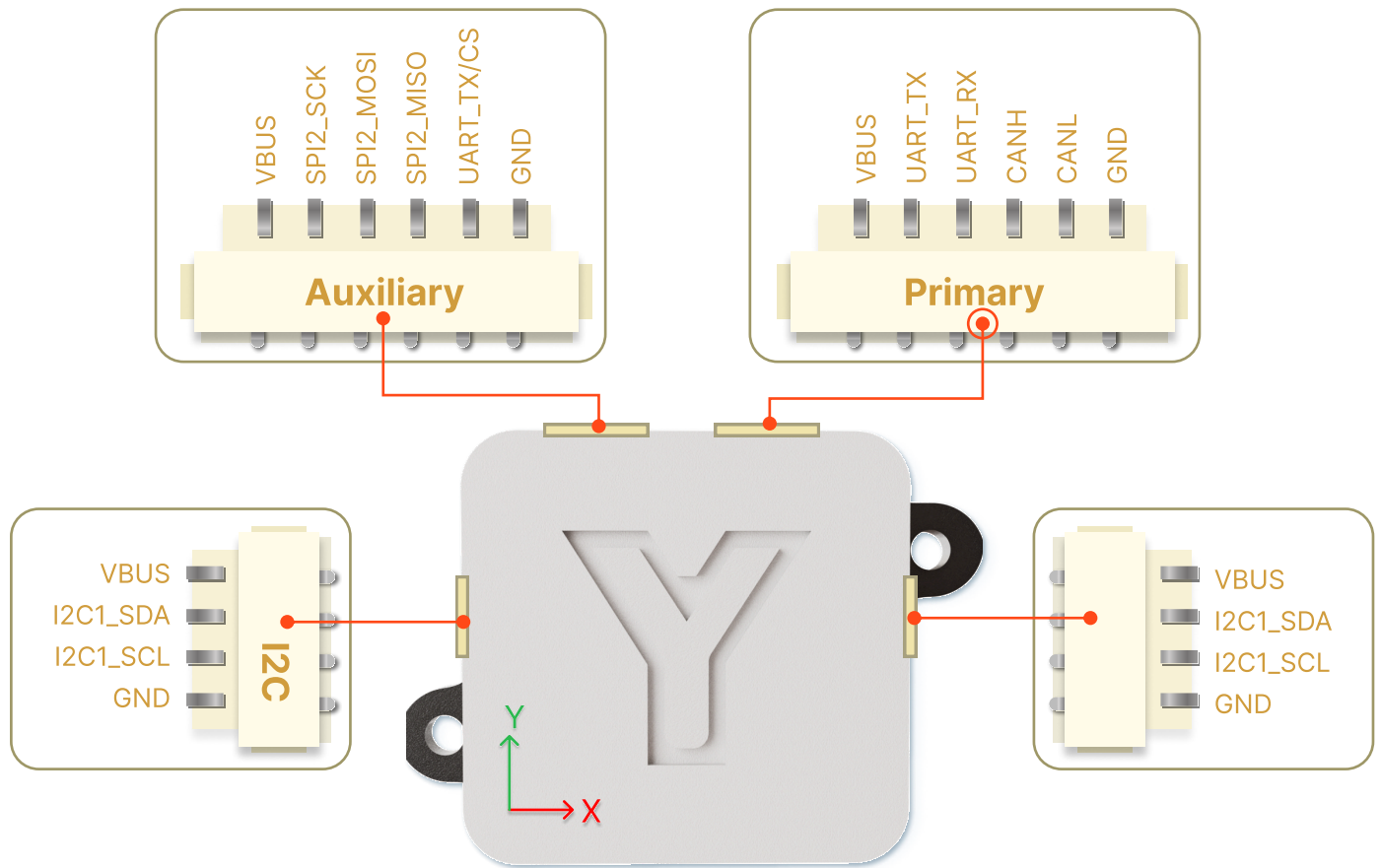
Weight	Without Case: 3.70 grams With Case: 14 grams
Dimensions (mm) L x W x H	Without Case: 25.70 × 24.80 × 7.66 With Case without mounting flange: 28.76 × 27.86 × 17.10 With Case with mounting flange: 43.70 × 27.86 × 17.10
IP Rating	No IP Rating
Operating Temp	<60 °C

Electrical Specifications

Electrical

Parameter	Minimum	Typical	Maximum	Units	Remarks
Average Current Consumption (with Carrier Board)		60		mA	All peripherals enabled
Peak Current Consumption			100	mA	All peripherals enabled, transient load <100msec
Operating Temperature (Electrical)	-10		60	C°	Ambient Electrical Unity
Supply Voltage(VDD)	4.60	5	5.40	V	5.0V ±8%
IO Voltage	3.18	3.30	3.42	V	3.3 V ± 3.5%
Power Supply Ripple (VDD)			180	mV p-p	Maximum allowable ripple, beyond this measurement stability is not guaranteed.

Pinout Diagram



Case Top View

Communications & I/O

Multiple Communication Protocol UART, CAN, SPI, I2C

With Additional Transceiver Supports USB, RS232, RS422, RS485



INSTALLATION, HANDLING & INTEGRATION GUIDELINES

YDx-M CB-1-E – High Precision 6-DoF VRU & IMU

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. Vibration Considerations

The YDx-M CB-1-E is designed for use in vibration-prone environments when properly integrated.

Rigid mounting without compliant vibration isolation is recommended in most applications. Improper isolation can introduce resonance and degrade sensor fusion performance.

If isolation is required, isolate the source of vibration, not the sensor module.

Excessive random vibration (typically > 3 g RMS for 20s) may saturate accelerometers and reduce navigation accuracy.

3. 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.

4. 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.

5. Calibration & Long-Term Use

The YDx-M CB-1-E is factory calibrated.

Under normal conditions, no periodic recalibration is required.

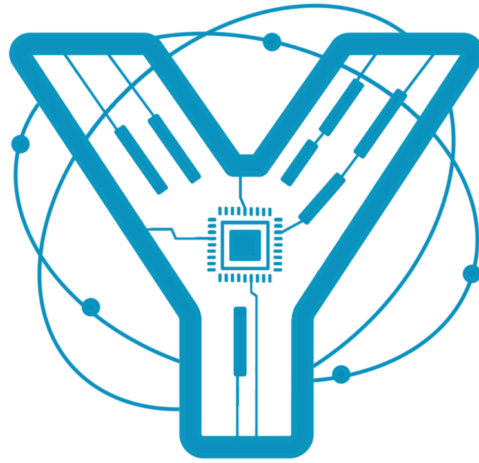
6. Electrical Interface & Cabling

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.



YAANENDRIYA

Reach Us

sales@yaanendriya.com

+91 98453 64002

**Artgarage (ARTPARK, IISc),
177, HMT Colony, HMT Staff Quaters,
HMT Estate, Jalahalli, Bengaluru,
Karnataka 560013**



www.yaanendriya.com