

GODIYMODULES Mod-INA333-002

GODIYMODULES INA333 Low Power Precision Instrumentation Amplifier Module

Model: Mod-INA333-002

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1. INTRODUCTION

The GODIYMODULES INA333 is a low-power, precision instrumentation amplifier module designed for various electronic sensing and DIY projects. It features low offset voltage, low drift, and low noise, making it suitable for applications requiring high accuracy and stability. This manual provides essential information for the proper setup, operation, and maintenance of your INA333 module.

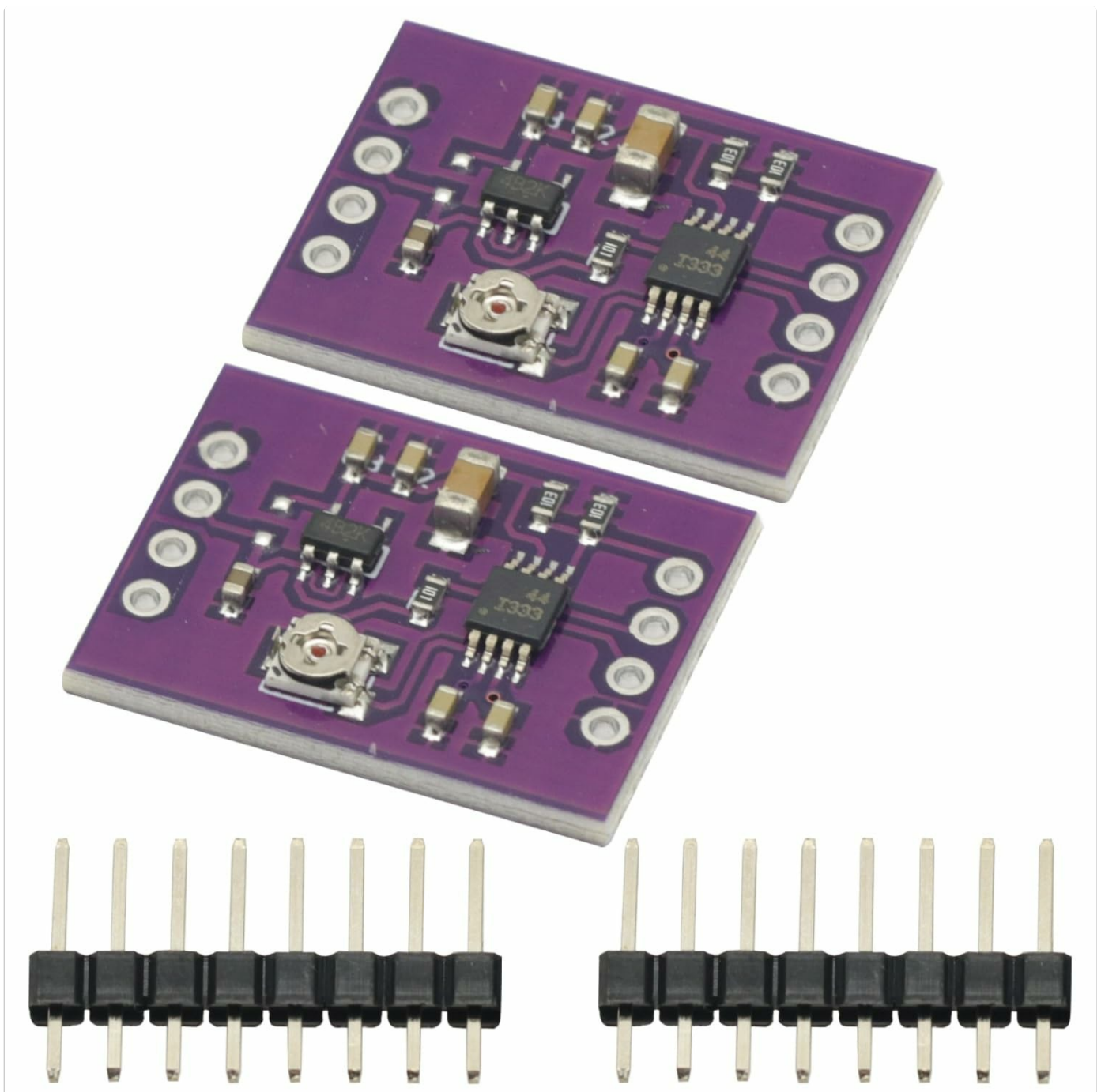


Figure 1: INA333 Low Power Precision Instrumentation Amplifier Module.

2. KEY FEATURES

- Low-power, precision instrumentation amplifier.
- Low Offset Voltage: 25 μV (Maximum) at $G \geq 100$.
- Low Drift: 0.1 $\mu\text{V}/^\circ\text{C}$ at $G \geq 100$.
- Low Noise: 50 nV/ $\sqrt{\text{Hz}}$ at $G \geq 100$.
- Wide Supply Range: +1.8V to +5.5V.
- Integrated 3 operational amplifier design.

3. WHAT'S IN THE BOX

Your package should contain the following items:

- 2 x INA333 Low Power Precision Instrumentation Amplifier Modules.
- Associated pin headers for connection.



Figure 2: Two INA333 modules and pin headers included in the package.

4. TECHNICAL SPECIFICATIONS

Parameter	Value
Model	Mod-INA333-002
Brand	GODIYMODULES
Amplifier Type	Instrumentation Amplifier
Number of Channels	3 (Operational Amplifiers)
Minimum Supply Voltage	1.8 Volts (DC)
Maximum Supply Voltage	5.5 Volts (DC)
Low Offset Voltage	25 μ V (Max, $G \geq 100$)
Low Drift	0.1 μ V/ $^{\circ}$ C ($G \geq 100$)
Low Noise	50 nV/ $\sqrt{\text{Hz}}$ ($G \geq 100$)

5. SETUP & INSTALLATION

This section details the steps for connecting and setting up your INA333 module. Ensure all power is disconnected before making any connections.

5.1 Pinout Diagram

The INA333 module features several pins for power, input, output, and reference voltage. Refer to the pinout diagram below for proper identification.



Figure 3: Pinout of the INA333 module. Key pins include VREF, VOUT, 3.3V, GND, VCC, VIN-, and VIN+.

- **VCC:** Power supply input (+1.8V to +5.5V).
- **GND:** Ground connection.
- **VIN+:** Non-inverting input for the differential signal.
- **VIN-:** Inverting input for the differential signal.
- **VOUT:** Amplified output voltage.
- **VREF:** Reference voltage input for the output. Typically connected to GND for a unipolar output or a specific voltage for bipolar output.
- **3.3V:** Onboard 3.3V regulator output (if applicable, check schematic for details).

5.2 Basic Connection Diagram

The following schematic illustrates a typical connection for the INA333 module. This diagram provides a general guide for

integrating the module into your circuit.

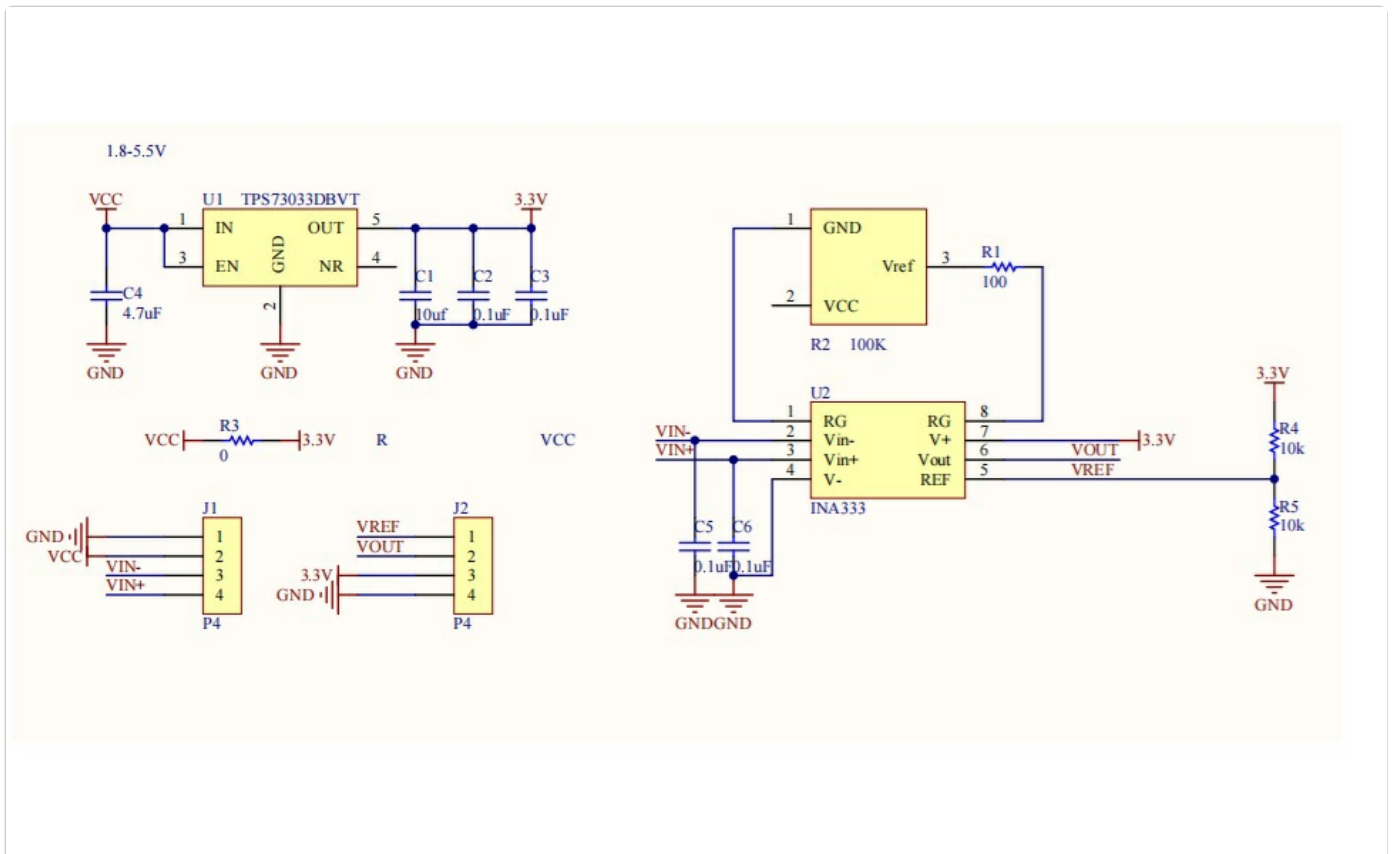


Figure 4: Basic schematic diagram for the INA333 module, showing power, input, and output connections.

For detailed circuit implementation and gain configuration, refer to the full schematic diagram and the INA333 datasheet from Texas Instruments.



Figure 5: Detailed circuit diagram of the INA333 module, including the TPS73033DBVT regulator and INA333 IC connections.

6. OPERATION

The INA333 module is designed to amplify small differential signals with high precision. Its operation primarily involves providing power, input signals, and setting the gain.

6.1 Power Supply

Connect a stable DC power supply within the range of +1.8V to +5.5V to the **VCC** and **GND** pins. Ensure the power supply is clean and free from excessive noise to maintain the amplifier's precision.

6.2 Input Signal Connection

Connect your differential input signal to the **VIN+** and **VIN-** pins. The INA333 is optimized for measuring small voltage differences between these two points, rejecting common-mode noise.

6.3 Output Voltage

The amplified output signal is available at the **VOUT** pin. The output voltage range will depend on the supply voltage and the reference voltage (**VREF**).

6.4 Gain Adjustment

The gain of the INA333 is set by an external resistor, typically labeled RG. The module includes a potentiometer (visible in Figure 6) which allows for adjustable gain. Rotate the potentiometer using a small screwdriver to adjust the amplification factor according to your application's requirements. Refer to the INA333 datasheet for the precise gain formula and resistor values.



Figure 6: Top view of a single INA333 module, highlighting the potentiometer used for gain adjustment.

7. MAINTENANCE

The INA333 module is a robust electronic component designed for long-term operation with minimal maintenance. Follow these guidelines to ensure its longevity:

- **Keep Clean:** Avoid dust, dirt, and moisture accumulation on the module. Use a soft, dry brush or compressed air for cleaning if necessary.
- **Handle with Care:** Electronic components are sensitive to electrostatic discharge (ESD). Handle the module by its edges and use appropriate ESD precautions.
- **Proper Storage:** Store the module in a dry, cool environment, away from direct sunlight and extreme temperatures.
- **Avoid Overvoltage:** Ensure the supply voltage and input signals do not exceed the specified maximum ratings to prevent damage.

8. TROUBLESHOOTING

If you encounter issues with your INA333 module, consider the following troubleshooting steps:

- **No Output/Incorrect Output:**
 - Verify power supply connections (VCC and GND) and ensure the voltage is within the +1.8V to +5.5V range.
 - Check input signal connections (VIN+ and VIN-) for proper polarity and continuity.
 - Ensure the VREF pin is correctly connected (e.g., to GND for unipolar output).
 - Adjust the gain potentiometer to see if the output changes.
- **Excessive Noise in Output:**
 - Ensure your power supply is stable and filtered.
 - Check for proper grounding of the module and your sensor.
 - Keep input signal wires short and shielded if possible.
 - Verify that the operating environment is free from strong electromagnetic interference.
- **Module Not Powering On:**
 - Double-check all power connections.
 - Measure the voltage at the VCC pin to confirm it is receiving power.
 - Inspect the module for any visible damage or short circuits.

If these steps do not resolve the issue, please contact customer support for further assistance.

9. SUPPORT & WARRANTY

For technical support, product inquiries, or warranty information, please refer to the seller's contact details on the platform where you purchased this product. Keep your purchase receipt or order number handy for faster service.

GODIYMODULES is committed to providing quality electronic components. While specific warranty terms may vary by region and retailer, we strive to ensure customer satisfaction. Please reach out to your point of purchase for detailed warranty policies.

