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DONGKER INA260

DONGKER INA260 Voltage Power Sensor Module User Manual

Model: INA260

1. Introduction

The DONGKER INA260 is a high-precision voltage, current, and power sensor module designed for measuring DC electrical parameters. It offers a versatile solution for monitoring bus voltages up to +36VDC and currents up to 15A with high accuracy, making it suitable for various industrial and scientific applications. This manual provides essential information for the proper setup, operation, and maintenance of your INA260 module.

2. Key Features

- **Ultra-High Precision:** Integrated 2 milliohms (0.002 ohms), 0.1% shunt resistor for accurate measurements.
- **Wide Measurement Range:** Measures bus voltages up to +36VDC and currents up to 15A (with internal shunt).
- **High Resolution:** Current measurement resolution of 1.5 mA with a 16-bit internal ADC.
- **Flexible Configuration:** Supports both high-side and low-side current measurement.
- **Logic Compatibility:** Compatible with 3V or 5V logic systems.
- **I2C Interface:** Transmits data in an easy-to-use format via I2C communication.
- **Compact Design:** Small form factor (23x23mm) for integration into various projects.

3. Product Overview

The INA260 module integrates the INA260 sensor chip, a precision shunt resistor, and necessary components for I2C communication. It comes with an 8-pin male header for easy connection to your system.

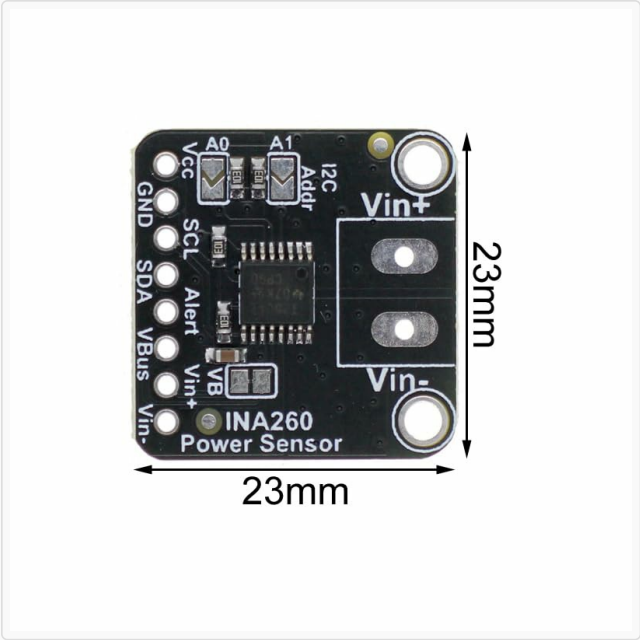


Figure 1: Top view of the INA260 module showing dimensions (23mm x 23mm) and pin labels.

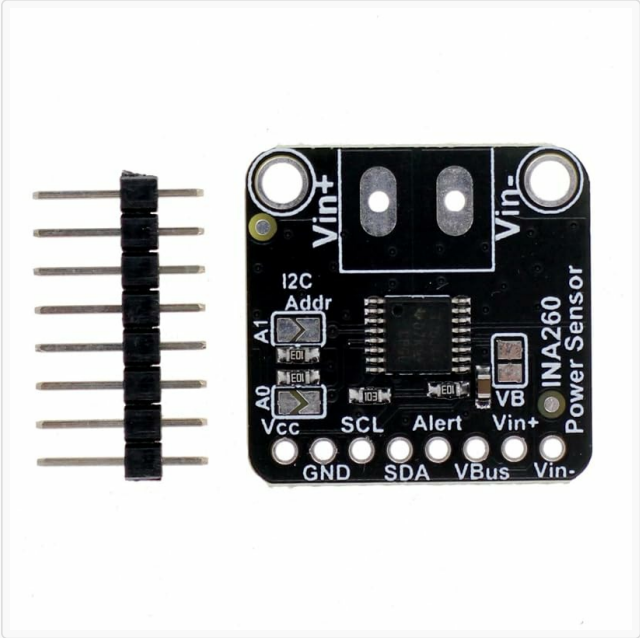


Figure 2: Top view of the INA260 module with the included 8-pin male header, highlighting the Vcc, GND, SCL, SDA, Alert, VBus, Vin+, and Vin- pins.

Pinout Description

- **Vcc:** Power supply for the module (3V or 5V).
- **GND:** Ground connection.
- **SCL:** I2C Clock line.
- **SDA:** I2C Data line.
- **Alert:** Alert output pin (configurable).
- **VBus:** Bus voltage sense input.
- **Vin+:** Positive input for current shunt.
- **Vin-:** Negative input for current shunt.
- **A0, A1:** I2C address selection pins.

4. Setup Instructions

Follow these steps to properly set up your INA260 module:

1. **Power Connection:** Connect Vcc to your 3V or 5V power supply and GND to the system ground. Ensure your logic level matches the Vcc supply.
2. **I2C Connection:** Connect SCL and SDA pins to the corresponding I2C clock and data lines of your microcontroller or host system.
3. **Current Measurement Configuration:**
    - **High-Side Configuration (Default):** For measuring current on the high side, connect the positive terminal of your load to Vin+ and the negative terminal of your load to Vin-. The VBus pin should be connected to the positive side of the voltage bus (V+). The module typically has a jumper connecting V+ and VBUS by default for this configuration.
    - **Low-Side Configuration:** To measure current on the low side, you may need to cut the jumper connecting V+ and VBUS on the module (if present). Then, connect the VBUS pin directly to the voltage bus you wish to monitor. Connect Vin+ and Vin- in series with the load on the low side.
4. **I2C Address Selection:** The INA260 has configurable I2C addresses using the A0 and A1 pins. Refer to the INA260 datasheet for specific address configurations if you need to change the default.

5. Operating Instructions

Once the module is connected, you can begin reading voltage, current, and power data via the I2C interface. You will need to use appropriate software libraries or write custom code for your microcontroller to communicate with the INA260.

1. **Initialization:** Initialize the I2C communication on your host system and configure the INA260 registers for desired measurement modes (e.g., continuous measurement, averaging).
2. **Reading Data:** Read the bus voltage, shunt voltage, and power registers from the INA260 via I2C. The INA260 automatically calculates current from the shunt voltage and power from the bus voltage and current.
3. **Data Interpretation:** Convert the raw digital readings from the INA260 registers into meaningful units (Volts, Amperes, Watts) using the scaling factors provided in the INA260 datasheet.

The INA260 can continuously measure and provide data for bus voltage, current, and calculated power, offering a comprehensive view of your system's electrical consumption.

6. Maintenance

The DONGKER INA260 module is a robust electronic component. Minimal maintenance is required to ensure its longevity and accurate performance:

- **Keep Dry:** Avoid exposure to moisture or liquids, which can damage the electronic components.
- **Cleanliness:** Keep the module free from dust and debris. Use a soft, dry brush or compressed air for cleaning if necessary.
- **Handle with Care:** Avoid physical shock or excessive force on the module or its pins.
- **Environmental Conditions:** Operate the module within its specified temperature and humidity ranges.

7. Troubleshooting

If you encounter issues with your INA260 module, consider the following troubleshooting steps:

- **No Power:** Verify that Vcc and GND connections are correct and that the power supply is providing the correct voltage (3V or 5V).
- **No I2C Communication:**
  - Check SCL and SDA connections for continuity and correct polarity.
  - Ensure pull-up resistors are correctly implemented on the I2C lines (typically 4.7kΩ).
  - Verify the I2C address of the INA260 module.
- **Incorrect Readings:**
  - Double-check your current measurement wiring (high-side vs. low-side).
  - Ensure the load is within the specified current and voltage limits of the module.
  - Verify your software's data interpretation and scaling factors.
  - Confirm that the VBUS pin is correctly connected to the bus voltage for accurate voltage readings.
- **Module Not Responding:** Disconnect power, wait a few seconds, and reconnect. If the issue persists, inspect for any visible damage.

8. Specifications

Parameter	Value
Input Voltage (Vcc)	DC 3.0V - 36V (for bus voltage measurement)
Logic Voltage Compatibility	3V or 5V
Maximum Measurable Current (with internal shunt)	15A
Absolute Maximum Current Rating	36A
Current Resolution	1.5 mA
Integrated Shunt Resistor	2 milliohms (0.002 Ω), 0.1% tolerance
ADC Resolution	16-bit
Interface	I2C
Module Dimensions (L x W)	23mm x 23mm (approx. 0.79 x 0.79 inches)

9. Package Contents

The DONGKER INA260 Voltage Power Sensor Module package includes:

- 1 x INA260 Voltage Current Power Sensor Module
- 1 x 8-Pin Male Header

10. Warranty and Support

For warranty information or technical support, please refer to the DONGKER official website or contact your retailer. Keep your purchase receipt for warranty claims.

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