

Xqscvqwfa HWT3100-485

Xqscvqwfa HWT3100-485 PNI Fluxgate Magnetometer User Manual

Military-Grade 3-Axis Electronic Compass Geomagnetic Sensor

1. INTRODUCTION

This manual provides detailed instructions for the installation, operation, and maintenance of the Xqscvqwfa HWT3100-485 PNI Fluxgate Magnetometer. This device is a military-grade, 3-axis electronic compass geomagnetic sensor designed for high-precision heading angle output and magnetic field measurement. It features robust construction and advanced sensing capabilities for various industrial and scientific applications.

2. PRODUCT FEATURES

- **Military-Grade Accuracy:** Provides precise heading angle output.
- **3-Axis Magnetic Field Output:** Measures magnetic fields across X, Y, and Z axes.
- **High Resolution and Precision:** Designed for accurate and detailed measurements.
- **Strong Anti-Interference Ability:** Resistant to magnetic-field interference.
- **Digital Output:** Provides data in a digital format, including ASCII output.
- **SPI Interface:** Standard communication interface for data transmission.
- **Wide Voltage Input:** Operates with a 5-36V power supply.
- **IP67 Protection:** Aluminum shell provides protection against dust and water immersion up to 1 meter for 30 minutes.
- **Short Recovery Time:** Quickly returns to stable operation after disturbances.
- **Easy to Install:** Designed for straightforward integration into systems.

3. SPECIFICATIONS

Parameter	Value
Model	HWT3100-485
Voltage Input	5-36V
Interface	SPI

Measurement Axes	Triple-axis (X, Y, Z)
Baud Rate	9600 (default), 115200, 460800
Output Rate	0.1Hz - 100Hz
Weight	1.76 ounces (approx. 50g)
Dimensions	1.18 x 0.79 x 0.39 inches
Protection Rating	IP67

4. SETUP

4.1 Unpacking and Inspection

Carefully unpack the HWT3100-485 sensor and inspect it for any visible damage. Ensure all components are present.



Image 1: The HWT3100-485 Fluxgate Magnetometer sensor. This image shows the compact, rectangular black housing of the sensor with its integrated cable.

4.2 Electrical Connection

Connect the sensor to your system using the provided cable. Refer to the pinout diagram for correct wiring:

- **VCC:** Power supply input (5-36V)
- **RX:** Receive data line (SPI)
- **TX:** Transmit data line (SPI)

- **GND:** Ground



Image 2: Close-up view of the HWT3100-485 sensor showing the pinout labels (VCC, RX, TX, GND) next to the cable connection. The image clearly displays the X, Y, Z axis indicators on the sensor body.

Ensure the power supply is within the specified 5-36V range. Incorrect voltage can damage the device.

4.3 Mounting

Mount the sensor securely in the desired orientation. The sensor includes indicators for X, Y, and Z axes on its body to assist with proper alignment for accurate heading and magnetic field measurements.

5. OPERATING INSTRUCTIONS

5.1 Power On

Once connected, apply power to the VCC and GND pins. The sensor will initiate and begin data acquisition.

5.2 Data Communication (SPI)

The HWT3100-485 communicates via an SPI interface. Configure your host controller (e.g., microcontroller, computer with an SPI adapter) to match the sensor's baud rate. The default baud rate is 9600, with options for 115200 and 460800.

5.3 Reading Data

The sensor outputs digital data, including 3-axis magnetic field values (X, Y, Z) and heading angle. Data can be received in ASCII format. Refer to the sensor's communication protocol documentation (if available from the manufacturer) for specific data packet structures and commands.

High precision Three-axis magnetic field output

Three-axis magnetic output, heading angle output



Image 3: Screenshot of a software interface displaying high-precision three-axis magnetic field output and heading angle. The image illustrates how the sensor's data can be visualized and processed.

5.4 Output Rate

The sensor's output rate can be configured from 0.1Hz to 100Hz, allowing for flexible data acquisition based on application requirements.

Fluxgate Sensor

Heading angle out | military-grade accuracy
Magnetic-field interference-resistant



ASCII
output



Cascade



High
resolution



Low noise



Image 4: Visual representation of key features including ASCII output, cascade capability, high resolution, and low noise, highlighting the sensor's advanced functionalities.

6. MAINTENANCE

6.1 Cleaning

Periodically clean the exterior of the sensor with a soft, dry cloth. Avoid using harsh chemicals or abrasive materials that could damage the housing or labels.

6.2 Environmental Protection

The HWT3100-485 features an IP67 protection rating, making it suitable for various harsh test environments. It is resistant to daily splashing and can operate in rainy conditions. The sensor can withstand immersion in water up to 1 meter for a duration of 30 minutes. However, prolonged exposure to extreme conditions or corrosive substances should be avoided to ensure longevity.

IP67 protection

Using aluminum shell, suitable for various harsh test environments, Daily splashing or working on rainy days will not be affected, and the duration of soaking in water can be up to 30 minutes



Image 5: The HWT3100-485 sensor shown in a water environment, illustrating its IP67 protection against water ingress. This highlights its suitability for outdoor or challenging conditions.

6.3 Storage

When not in use, store the sensor in a dry, clean environment away from direct sunlight and extreme temperatures.

7. TROUBLESHOOTING

• No Data Output:

- Check power supply connections (VCC, GND) and ensure voltage is within 5-36V.
- Verify SPI interface wiring (RX, TX).
- Confirm host controller's baud rate matches the sensor's configured baud rate.

• Inaccurate Readings:

- Ensure the sensor is mounted securely and not subject to excessive vibration.
- Check for strong magnetic interference sources near the sensor.
- Verify the sensor's orientation matches the expected axis definitions.

- **Intermittent Connection:**

- Inspect cable for damage or loose connections.
- Ensure proper grounding of the sensor and host system.

8. WARRANTY AND SUPPORT

The Xqscvqwfa HWT3100-485 PNI Fluxgate Magnetometer comes with **Lifetime Technical Support**. For any technical assistance, troubleshooting, or inquiries regarding the product, please contact Xqscvqwfa customer support. Refer to your purchase documentation for contact details.

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