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NS002 Wi-Fi Hardware and Connectivity - Troubleshooting Guide

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Content

Introduction

Welcome to the official troubleshooting guide for the Nanoprecise NS002 sensor—your compact and intelligent partner in predictive maintenance.

Designed for effortless deployment, the NS002 sensor is an easy to install device that delivers high-precision condition monitoring by capturing six critical parameters: vibration, acoustic emission, temperature, humidity, magnetic flux, and RPM. While the sensor is engineered for reliability and ease of use, understanding its components and connectivity behaviors is essential for optimal performance in the field.

This guide is here to help you:

- Understand the sensor's hardware layout and functions.
- Interpret LED indicators for quick diagnosis.
- Follow proper procedures for powering, maintaining, or replacing the sensor battery.
- Troubleshoot connectivity and hardware issues with confidence.

Whether you're installing the NS002 for the first time or diagnosing a connectivity issue, this guide provides practical, field-ready insights to help you resolve issues efficiently and keep your assets protected from unplanned downtime.

Need more information or assistance? Reach out to us at customer-success@nanoprecise.io or click the button in your dashboard for setup guidance or troubleshooting tips.

Let's get started.

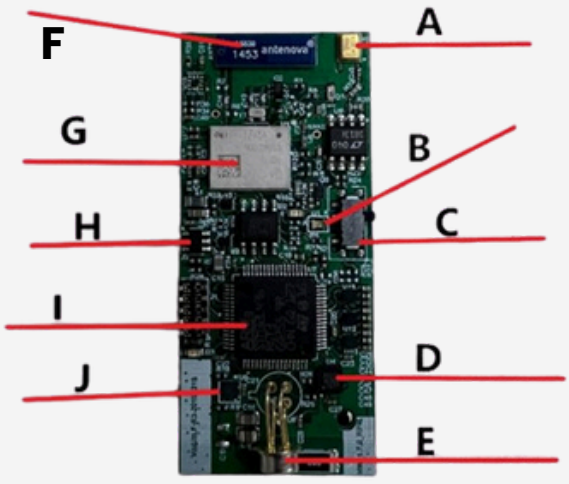
Sensor Hardware Overview

Referencing the figure below, the NS002 sensor is a sensor capable of measuring the following parameters via a combination of onboard sensors:

- RPM
- Vibration
- Temperature
- Humidity
- Acoustic Emission
- Magnetic flux

The sensor itself is made up of a single PCB board, called the A board. The A board consists of the following:

- 6 sensors to measure the above-mentioned parameters
- Power On-Off switch
- A board LED which consists of the colors green, amber, and red, blinking in different patterns
- CR123A battery attached to the back of the board
- A battery clip securing the battery in place



- A - Acoustic emission sensor
- B - Main A board LED (Red, Amber, Green)
- C - Power, On-Off switch
- D - Accelerometer
- E - IR Temperature sensor
- F - Wi-Fi Antenna
- G - WiFi + Imp003 module allowing for 2.4GHz Wi-Fi connectivity.
- H - Flux sensor
- I - STM32 Microprocessor
- J - Humidity and Temperature Sensor.

Sensor Quick Install

To ensure the most successful install possible, please follow the below steps:

- Ensure that Electrostatic Discharge gloves are worn while handling the PCB board.
- If there's no risk of static electricity, just make sure your hands are completely dry before opening the sensor cap.
- Unscrew the cap in an counter-clockwise motion.
- Ensure that the sensor is blinked up to the correct Wi-Fi credentials. This is usually done by Nanoprecise prior to delivery, however if no network credentials were configured, then please follow the manual blink-up section in the DIY user app guide.
- Ensure that the sensor is at an acceptable range (50mt line of sight variable based upon interference) from the Wi-Fi access point, to optimize sensor connectivity.
- Power the sensor on, by turning the power switch upwards.
- Note the various blinking patterns that the main board LED will display. The various patterns are:
  - Sensor will blink red for a couple of seconds as soon as it is powered on.
  - Sensor will start blinking a combination of red and amber, indicating that it has found the network and is gathering IP address information, as well as preparing the sensor for connection.
  - Sensor will blink green, indicating a successful Wi-Fi connection.
- Once the sensor has connected, please slowly put the cap back on the sensor, ensuring that the power button is not accidentally pushed down, leading to the powering down of the sensor

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The image below shows the various blinking patterns for the LED and what each pattern means

Wi-Fi & Ethernet Connection Patterns

Geting IP Address	500ms	250ms	250ms	Repeat								
Resolving Server Name	500ms	250ms	250ms	Repeat								
Connecting to Server	500ms	500ms	500ms	250ms	Repeat							
Connected to Server	500ms	500ms	Repeat									
Proxy Address or Port Incorrect	500ms	500ms	250ms	250ms	250ms	250ms	Repeat					
Proxy Credentials Rejected	500ms	500ms	250ms	250ms	250ms	250ms	250ms	Repeat				

Hardware Troubleshooting

If the sensor is not powering on or has powered off suddenly

- Ensure that the power switch has not been manually switched off.
- Ensure that the power switch is not damaged and can move freely between “on” and “off”.
- If power switch is on and the sensor’s LED is not blinking, ensure that the positive and negative terminals of the sensor are contacting the respective terminals of the battery, as shown in the figure.
- If the above is in order, then remove the battery and measure the voltage. If the voltage is below 2.7V, contact Nanoprecise (support@nanoprecise.com) for a battery replacement.

Visual representation of terminals contacting the battery

If the sensor is not reading the correct temperature values

Ensure that the IR sensor is positioned correctly, with the bottom of the IR sensor pointing downwards and through the hole.

Visual representation of the correct orientation of the IR sensor

Base of the sensor is not secure, or sensor is wobbling

Ensure that the two base screws are present and secured tightly.
Also, check that the sensor is firmly mounted and that the surface beneath it is clean. If the sensor was moved or interacted with, make sure it has been reinstalled in the exact same position. A secure connection is critical for accurate readings and consistent performance.

Visual of the base of the sensor, showing the screws tightly secured.

Dirt and debris leaking inside the sensor.

Ensure that the O-ring is properly in place at the inner base of the sensor, as this ring provides a strong seal to prevent dust, debris, and other environmental elements from entering the inner sensor enclosure. Please also ensure that the sensor housing is closed securely and tightly.

Visual representation of the sensor with the housing secured tightly

Connectivity Troubleshooting Via onboard LED

If the sensor is not powering on or has powered off suddenly

The NS002 sensor has an onboard LED that can display various lights in various patterns, to assist the user in understanding the connectivity status of the sensor. The various lights are:

- Red.
- Amber
- Green

The various blinking patterns can indicate what the sensor is trying to do and can help the user debug on the field what the potential issues are. Outlined below are the various blinking patterns of the sensor, and what each pattern means:

- Sensor is blinking Amber: If the sensor is only blinking amber, that means that there are no Wi-Fi credentials embedded within the sensor. To resolve this issue, the user must blink up the Wi-Fi credentials using the Nanoprecise DIY app.
- Sensor is blinking Red and Amber: If the sensor is blinking red and amber, that means that Wi-Fi credentials are embedded within the sensor, and the sensor is attempting to locate the network and connect.
- If the sensor continues to blink red and amber without connecting, then:
    - Ensure that the Wi-Fi credentials blinked up to the sensor are correct.
    - Ensure that the access point has the same credentials as the ones blinked up on the sensor.
    - Ensure that the access point is within acceptable range of the sensor, to allow the sensor to connect.

Sensor is blinking Red only

If the sensor is only blinking red, that means that the sensor has found the network and is attempting to initialise a connection. If the sensor is unable to initialise a successful connection (indicated by a green LED), then:

Ensure that the access point is within acceptable range for the sensor to connect.
Ensure that there are no firewall or IT protocols preventing the sensor from connecting.

Additional note:
Be aware that environmental changes, such as the installation of new equipment, relocation of nearby objects, or use of temporary storage, can affect Wi-Fi strength and signal reliability. These changes may lead to unexpected connectivity issues if not accounted for.