

Aoleaby WN90LP

Aoleaby WN90LP Modbus RTU Anemometer User Manual

Model: WN90LP

1. INTRODUCTION

This manual provides detailed instructions for the installation, operation, and maintenance of the Aoleaby WN90LP Modbus RTU Anemometer. This device is designed for accurate measurement of various environmental parameters, including wind speed, wind direction, light intensity, UV index, temperature, and humidity, utilizing the Modbus RTU communication protocol.

Please read this manual thoroughly before using the product to ensure proper function and longevity.

2. PRODUCT OVERVIEW

The Aoleaby WN90LP is a compact, multi-sensor weather instrument. It integrates an ultrasonic wind sensor, light and UV sensor, and a thermo-hygrometer into a single unit. Its robust design makes it suitable for various outdoor and industrial applications.



Figure 2.1: Front view of the Aoleaby WN90LP Modbus RTU Anemometer. This image shows the main body of the sensor unit, including the ultrasonic wind sensor at the top and the stacked plates of the thermo-hygrometer sensor below.

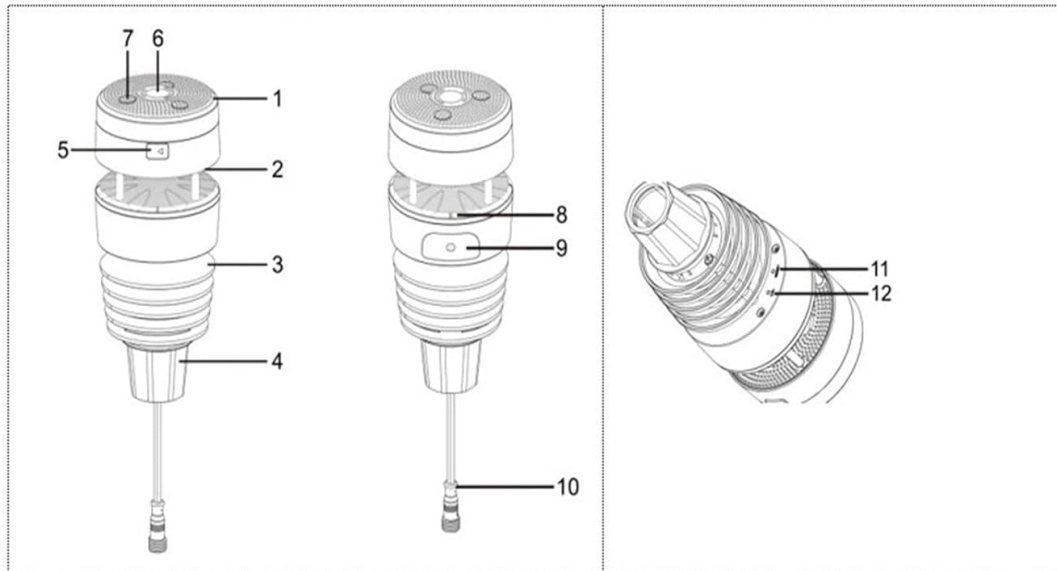


Figure 2.2: Top-down view of the Aoleaby WN90LP sensor. This perspective highlights the top surface of the device, showing the integrated solar panel area (if applicable) and the overall compact design.

Key Features:

- Compact design for easy installation.
- High accuracy for wind speed and direction, temperature, humidity, light, and UV measurements.
- Modbus RTU communication protocol.
- Rugged construction suitable for harsh environments.
- Multiple output signals to meet various application requirements.

Component Identification:



1. Solar Panel (not included)	7. Hapitac Rainfall sensor
2. Ultrasonic wind sensor	8. NORTH alignment indicator
3. Temperature & humidity sensor	9. Battery compartment
4. Fixed Bolt (Mounting on a pole with 1 inch diameter)	10. cable connector
5. USB port (Factory use only)	11. Reset button
6. Light & UV sensor, LED indicator	12. Calibration button (factory use only)

Figure 2.3: Diagram illustrating the main components of the Aoleaby WN90LP sensor.

Table 2.1: Component Descriptions

No.	Component	Description
1	Solar Panel	(not included in this model, typically for power)
2	Ultrasonic wind sensor	Measures wind speed and direction.
3	Temperature & humidity sensor	Measures ambient temperature and relative humidity.
4	Fixed Bolt	For mounting on a pole with a 1-inch diameter.
5	USB port	(Factory use only)
6	Light & UV sensor, LED indicator	Measures light intensity and UV index, includes an LED indicator.
7	Hapitac Rainfall sensor	(Rainfall sensor, though not explicitly listed in product description, it's on the diagram)
8	NORTH alignment indicator	Used for correct directional alignment during installation.

No.	Component	Description
9	Battery compartment	For power source (if applicable, product description mentions AA Battery).
10	Cable connector	For data and power connection.
11	Reset button	Resets the device.
12	Calibration button	(Factory use only)

3. SETUP AND INSTALLATION

3.1 Unpacking

Carefully remove the WN90LP sensor from its packaging. Inspect for any signs of damage during transit. Retain all packaging materials for future transport or storage.

3.2 Mounting the Sensor

1. Select a suitable location for mounting the sensor. The location should be free from obstructions that could interfere with wind flow or sunlight, ensuring accurate readings.
2. The sensor is designed to be mounted on a pole with a 1-inch diameter using the fixed bolt (Component 4).
3. Securely attach the sensor to the pole, ensuring it is level.
4. Align the sensor using the NORTH alignment indicator (Component 8) to ensure correct wind direction measurements.

3.3 Wiring and Connection

The WN90LP sensor uses a 4-wire cable for connection. Ensure correct wiring to avoid damage to the unit or connected equipment.

- **Black wire:** GND (Ground)
- **Red wire:** USB A (D+)
- **Yellow wire:** USB B (D-)
- **Green wire:** VDD (5V Power Supply)

Connect the cable connector (Component 10) to the appropriate Modbus RTU interface or data logger.

3.4 Power Supply

The device requires a 5V power supply (VDD). The product description also mentions AA Battery, which implies an internal battery compartment (Component 9) for backup or primary power depending on the specific configuration. Ensure the power source is stable and within the specified voltage range.

4. OPERATING INSTRUCTIONS

4.1 Initial Power-Up

Once the sensor is correctly installed and wired, apply power. The device should begin collecting data immediately. The LED indicator (part of Component 6) may provide status feedback.

4.2 Data Acquisition via Modbus RTU

The WN90LP communicates using the Modbus RTU protocol. Refer to the Modbus communication

protocol documentation (not included in this manual) for details on register addresses and data formats for reading sensor values.

- **Sensor Reporting Interval:** The sensor reports data every 8.8 seconds.
- Ensure your Modbus master device is configured to communicate with the WN90LP at the correct baud rate and parity settings.

4.3 Resetting the Device

If the device is not responding or requires a restart, use the Reset button (Component 11). Pressing this button will restart the sensor's internal system.

5. MAINTENANCE

Regular maintenance ensures the accuracy and longevity of your Aoleaby WN90LP sensor.

- **Cleaning:** Periodically clean the exterior of the sensor, especially the ultrasonic wind sensor area and the light/UV sensor, to remove dust, dirt, or debris that could affect readings. Use a soft, damp cloth. Do not use abrasive cleaners or solvents.
- **Inspection:** Regularly inspect the mounting and cabling for any signs of wear, corrosion, or damage. Ensure all connections are secure.
- **Battery Check (if applicable):** If using AA batteries for power, check their condition periodically and replace them as needed.
- **Obstruction Check:** Ensure no new obstructions (e.g., growing vegetation, new structures) are interfering with the sensor's measurement area.

6. TROUBLESHOOTING

Common Issues and Solutions:

- **No Data Output:**
 - Check power supply (VDD) to ensure it is connected and providing 5V.
 - Verify wiring connections (GND, D+, D-, VDD) are correct and secure.
 - Confirm Modbus master settings (baud rate, parity, stop bits) match the sensor's configuration.
 - Try pressing the Reset button (Component 11).
- **Inaccurate Readings:**
 - **Wind:** Ensure the sensor is mounted in an unobstructed location and correctly aligned to North (Component 8).
 - **Temperature/Humidity:** Verify the sensor is not exposed to direct heat sources or excessive moisture beyond environmental conditions.
 - **Light/UV:** Clean the sensor surface (Component 6) if dirty. Ensure no shadows are cast on the sensor.
- **Intermittent Data:**
 - Check cable integrity for damage or loose connections.
 - Ensure power supply is stable and not fluctuating.
 - Minimize electromagnetic interference from other devices.

If issues persist, contact Aoleaby customer support for further assistance.

7. SPECIFICATIONS

The following table outlines the technical specifications and measurement ranges for the Aoleaby WN90LP Modbus RTU Anemometer.

Measurement	Range	Accuracy	Resolution
Wind speed	0~40m/s	<10m/s, +/-0.5m/s ≥10m/s, +/-5%	0.1M/S
Wind direction	0~359°	<2m/s, ±10°, ≥2m/s, ±7°	1°
Rain	0 – 9999 mm	± 10%	0.1mm
Temperature	-40~60°C (-40°F - 140°F)	±0.3°C or ± 0.6°F	0.1°C or 0.1°F
Humidity	1~99%	±3.5%	1%
Light	0~200Klux	±15%	10Lux
UVI	1~15	±2	1
Air pressure	300-1100hPa	+/-3hpa	1

Figure 7.1: Detailed specifications table for the Aoleaby WN90LP sensor, including measurement ranges, accuracy, and resolution for various parameters.

Table 7.1: Measurement Specifications

Measurement	Range	Accuracy	Resolution
Wind speed	0~40 m/s	<10m/s, +/-0.5m/s; ≥10m/s, +/-5%	0.1 M/S
Wind direction	0~359°	<2m/s, ±10°; ≥2m/s, ±7°	1°
Rain	0~9999 mm	±10%	0.1mm
Temperature	-40~60°C (-40°F~140°F)	±0.3°C or ±0.6°F	0.1°C or 0.1°F
Humidity	1~99%	±3.5%	1%
Light	0~200KLux	±15%	10Lux
UVI	1~15	±2	1
Air pressure	300-1100 hPa	±3 hPa	1

General Specifications:

- **Model Number:** WN90LP
- **Sensor Reporting Interval:** 8.8 seconds
- **Connection:** 4-wire cable (GND, D+, D-, VDD)
- **Power Type:** 5V DC (AA Battery mentioned, likely for internal backup or specific configurations)
- **Max Measuring Temperature:** 50°C - 69°C (Note: This range is as provided in the source description)
- **Dimensions:** Approximately 9cm (width) x 20.5cm (height)
- **Weight:** 1.32 Pounds (approx. 0.6 kg)



Figure 7.2: Diagram showing the approximate dimensions of the Aoleaby WN90LP sensor.

8. WARRANTY AND SUPPORT

For warranty information, technical support, or service inquiries, please contact Aoleaby customer service. Keep your purchase receipt and product serial number handy when contacting support.

Manufacturer: Aoleaby

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