7-IN-1 Weather Sensor with RS485 Interface and Modbus Protocol

Model: WN69LP



Manual

Model:WN69LP

https://s.ecowitt.com/NK1UJG

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1. Features

The **WN69LP** is a wired **RS485 version** of the WS69 7-in-1 weather sensor. By removing the solar panel and wireless RF module, the device now features a direct RS485 interface, specifically designed for seamless integration into professional **data acquisition systems** and industrial PLC environments.

- **Integrated Measurement:** Captures outdoor temperature, humidity, wind direction, rainfall, wind speed, UV, and light intensity in a single unit.
- **Enhanced Sensing:** Upgraded with a high-precision thermo-hygro-barometer sensor for comprehensive atmospheric data.
- **Professional Reliability:** Features a wired connection for stable data transmission, eliminating RF interference and range limitations.
- **Industry Standard:** Supports **Modbus protocol** for easy communication with third-party controllers and monitoring software.

2. Overview

2.1 Package Contents

Item	Quantity
WN69LP Sensor Unit	1
User Manual	1
RS485 Communication Cable (2m)	1
USB-to-RS485 Connector	1
U-Bolts and Mounting Hardware	1 Set

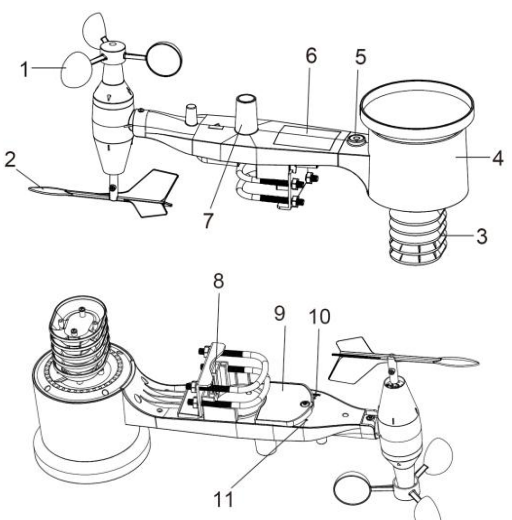


Figure 1 Sensor package assembly components

1. Wind speed cups	7. Light sensor and UV sensor
2. Wind vane	8. U-Bolts
3. Thermo-hygrometer sensors	9. Battery compartment door
4. Rain collector	10. Reset button
5. Bubble level	11. LED (red) to indicate data transmission

Table 1 Sensor package assembly component list

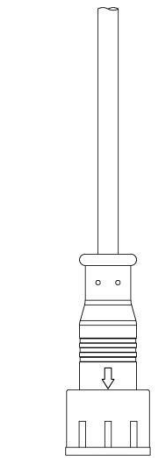
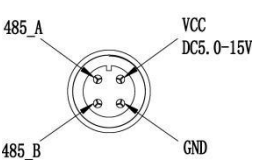
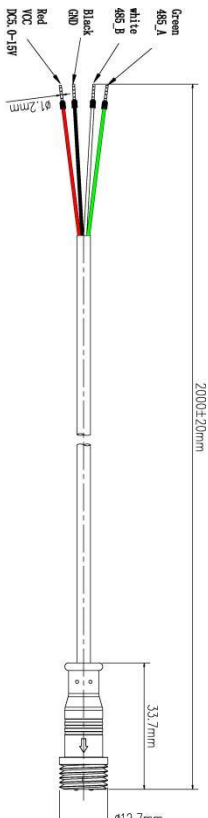
Cable pin definition	Extension cable pin definition
 	

Table 2

3. Setup Guide

3.1 Power up

The device's power supply is RS485 power's line between 6 ~ 24.0 V. Do not attempt to install batteries.

Power-On and Restart Procedure:

- When the device is powered on or the RESET button is pressed, the **red LED indicator located at the bottom of the sensor module** will stay lit for 3 seconds. After that, the LED will only flash when the module receives a command from the host and sends a response packet.
- If the LED is not observed during startup, the startup signal may have been missed. In this case, press the "Reset" button again at any time to restart the device and trigger the LED signal.
- When performing a power cycle (disconnecting and reconnecting power), ensure a minimum interval of 3 seconds between power off and power on to allow the sensor to reset properly.

3.2 Device Testing: PC Software Usage Instructions

Download the PC software. You can use the USB-to-RS485 connector(included) to test the device and verify whether it is functioning properly.

1. Connect the USB-to-RS485 interface to the device.
2. Follow the steps and click accordingly.

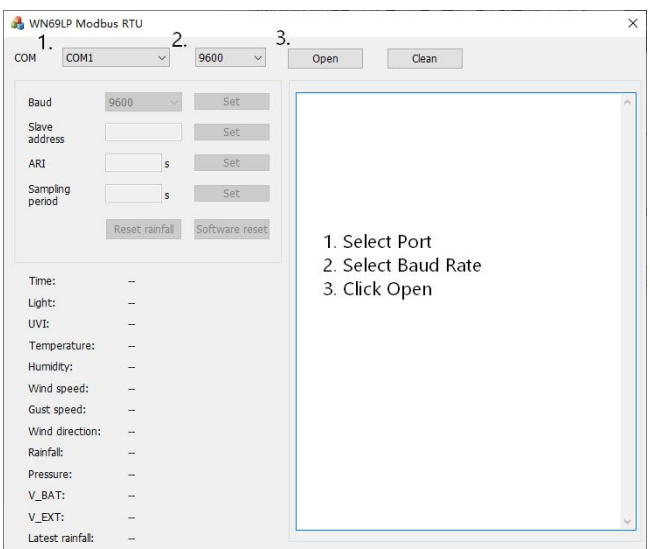


Figure 2 Device Testing

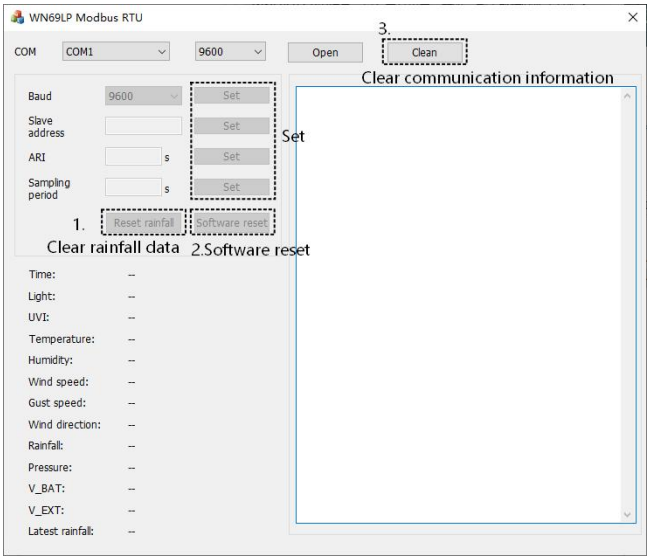


Figure 3 Setting details

3.3 Modbus Protocol Details

The WN69LP operates as a Modbus Slave device. For specific register maps, baud rate settings, function codes, and detailed command structures, please refer to the separate technical document:
"Ecowitt RS485 Modbus RTU Protocol Specification for WN69LP Series".

4. Mounting

4.1 Site Survey

Perform a site survey before installing the weather station. Consider the following:

You must clean the rain gauge every few months and change the batteries every 2-3 years. Provide easy access to the weather station.

Avoid radiant heat transfer from buildings and structures. In general, install the sensor array at least 5’ or 1.52m from any building, structure, ground, or roof top.

Avoid wind and rain obstructions. The rule of thumb is to install the sensor array at least four times the distance of the height of the tallest obstruction. For example, if the building is 20’ or 6.10m tall and the mounting pole is 6’ or 1.83m tall, install the sensor array 4 x (20 – 6)’ = 56’ or 4 x (6.1-1.83)=17.08m away.

Mount the sensor array in direct sunlight for accurate temperature readings.

Installing the weather station over sprinkler systems or other unnatural vegetation may affect temperature and humidity readings. We suggest mounting the sensor array over natural vegetation.

Wireless Range. Radio communication between receiver and transmitter in an open field can reach a distance of up to 330 feet or 100 meter, providing there are no

interfering obstacles such as buildings, trees, vehicles and high voltage lines. Wireless signals will not penetrate metal buildings. Under most conditions, the maximum wireless range is 100' or 30m.
Radio Interference. Computers, radios, televisions and other sources can interfere with radio communications between the sensor array and console. Please take this into consideration when choosing console or mounting locations. Make sure your display console is at least five feet or 1.52 meter away from any electronic device to avoid interference.

4.2 Warnings and Cautions

- Any metal object may attract a lightning strike, including your weather station mounting pole. Never install the weather station in a storm.
- If you are mounting the weather station to a house or structure, consult a licensed electrician for proper grounding. A direct lightning strike to a metal pole can damage or destroy your home.
- Installing your weather station in a high location may result in injury or death. Perform as much of the initial check out and operation on the ground and inside a building or home. Only install the weather station on a clear, dry day.

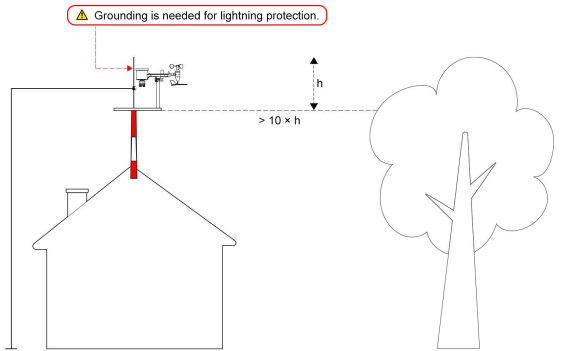


Figure 4 Grounding protection

Note:
Sensor damage, due to lack of grounding-protection agai nst lightning ESD discharge, is not covered by warranty .

4.3 Mounting on a pole

You can attach a pipe to a permanent structure and then attach the sensor package to it (see Figure 10).
The U-Bolts will accommodate a pipe diameter of 1-2 inches (pipe not included).

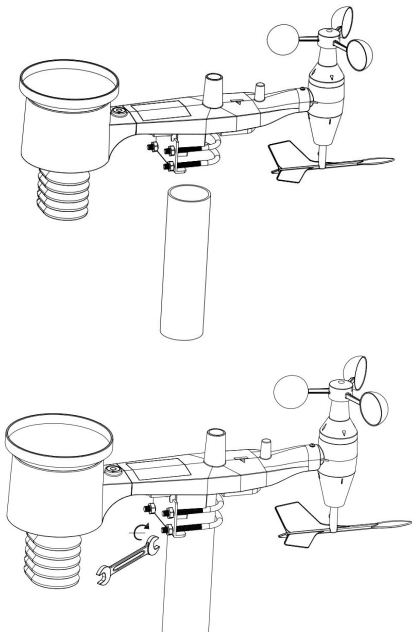


Figure 5 Sensor package mounting diagram

4.4 Vertical confirmation

(1) Ensure the Mounting Pipe is Vertical

Make sure the mounting pipe is vertical, or very close to it. Use a level if needed.

(2) Place the Sensor Package on the Mounting Pipe

Place the sensor package on top of the prepared mounting pipe. The U-Bolts should be loose enough to allow this, but loosen the nuts as necessary. Once placed, hand-tighten all four nuts, taking care to do so evenly. **Do not use a wrench yet!**

(3) Align the Sensor Package

Now you will need to align the whole package in the proper direction by rotating it on top of the mounting pipe as needed. Locate the arrow labeled “WEST” on top of the sensor package, right next to the light sensor. Rotate the entire sensor package until this arrow points due west. To achieve proper alignment, it is helpful to use a compass (many cell phones have a compass application). Once aligned correctly, lightly tighten the bolts a little more (use a wrench) to prevent further rotation.

(4) Check the Bubble Level

Now look at the bubble level. The bubble should be fully inside the red circle. If it is not, wind direction, speed, and rain readings may not operate correctly or accurately. Adjust the mounting pipe as necessary. If the bubble is

close but not quite inside the circle, and you cannot adjust the mounting pipe, you may need to experiment with small wooden or heavy cardboard shims between the sensor package and the top of the mounting pole to achieve the desired result (this will require loosening the bolts and some experimentation).

(5) Final Step

Make sure you check, and correct if necessary, the westerly orientation as the final installation step. Then, tighten the bolts with a wrench. Do not overtighten, but ensure that strong wind and/or rain cannot move the sensor package.

4.5 Orientation to WEST & Note for Northern and Southern Hemispheres

Note:

The orientation to WEST is necessary for two reasons. Secondly it causes a zero reading for wind direction to correspond to due NORTH, as is customary. This orientation is correct for installations in the northern hemisphere. If you are installing in the southern hemisphere, the correct orientation to achieve the same optimal positioning is to have the “WEST” arrow

actually point due EAST! This has the side effect, however, of lining up the 0 reading of the wind direction with SOUTH. This needs to be corrected using a 180-degree offset in the calibration settings.

5. Specification

Model	WN69LP
Name	Outdoor Sensor array with built-in: Thermo-hygrometer / Rain Gauge / Wind Speed Sensor/ Wind Direction Sensor, Light and UV sensor, air pressure sensor, RS485
Dimensions	475×118×207(mm)
Weight	634(g)
Material of Plastic Casing	PC+ABS
Temperature Metering Range	-40° C to 60° C(-40℉ to 140℉)
Temperature Metering Accuracy	±1° C (± 1.8° F)

Temperature Metering Resolution	0.1° C (0.2° F)
Humidity Metering Range	1%RH to 99%RH
Humidity Metering Accuracy	±5%RH
Humidity Metering Resolution	1%RH
Rainfall Metering Range	0mm to 9999mm
Rainfall Metering Accuracy	± 10%
Rainfall Metering Resolution	0.3 mm (for volume < 1,000 mm); 1 mm (for volume ≥ 1,000 mm
Wind speed Metering Range	0 to 50 m/s
Wind speed Metering Accuracy	± 1 m/s (speed < 10 m/s) ± 10% (speed ≥ 10 m/s)
Wind speed Metering Resolution	0.1m/s

Wind Metering Interval	2s
Gust wind speed	Maximum wind speed recorded in the past 16 seconds
Wind direction Metering Range	0° to 359°
Wind direction Metering Accuracy	± 15°
Wind direction Metering Resolution	1°
Light Metering Range	0Klux to 300Klux
Light Metering Accuracy	±25%
Light Metering Resolution	0.1Klux
UV Metering Range	1 to 15
UV Metering Accuracy	±2
UV Metering Resolution	1
Data reporting Interval	About 16 seconds
Operating Temperature Range	-40° C to 60° C(-40℉ to 140℉)

Protection Rating	IP44
Power Supply	DC12V/1A Power adapter (not included)

Table 3

6. Warranty Information

We disclaim responsibility for any technical error or printing error or the consequences thereof.
All trademarks and patents are recognized.
We provide a 2 years limited warranty on this product against manufacturing defects or defects in materials and workmanship.
This limited warranty begins on the original date of purchase, is valid only on products purchased, and only to the original purchaser of this product. To receive warranty service, the purchaser must contact us for problem determination and service procedures.
This limited warranty covers only actual defects within the product itself and does not cover the cost of installation or removal from a fixed installation, normal set-up or

adjustments, or claims based on misrepresentation by the seller, or performance variations resulting from installation-related circumstances.

Manufacture: Shenzhen Fine Offset Electronics Co., Ltd.
Address: 4/F, Block C, JiuJiu Industrial City, Shajing Town, Baoan District, Shenzhen City, China

7.FCC

This device complies with part 15 of the FCC Rules. Operation is subject to the condition that this device does not cause harmful interference (1) this device may not cause harmful interference, and (2) this device must accept any interference received, including interference that may cause undesired operation.
Changes or modifications not expressly approved by the party responsible for compliance
could void the user's authority to operate the equipment.
NOTE: This equipment has been tested and found to comply with the limits for a Class B digital device, pursuant to Part 15 of the FCC Rules. These limits are designed to provide reasonable protection against harmful interference in a residential installation. This equipment generates, uses and can radiate radio frequency energy and, if not installed and used in accordance with the instructions, may cause harmful interference to radio communications. However, there is no guarantee that interference will not occur in a

particular installation.
If this equipment does cause harmful interference to radio or television reception,
which can be determined by turning the equipment off and on, the user is encouraged to try to correct the interference by one or more of the following measures:
-- Reorient or relocate the receiving antenna.
-- Increase the separation between the equipment and receiver.
-- Connect the equipment into an outlet on a circuit different
from that to which the receiver is connected.
-- Consult the dealer or an experienced radio/TV technician for help.
To maintain compliance with RF Exposure guidelines, This equipment should be installed and operated with minimum distance between 20cm the radiator your body: Use only the supplied antenna.

IC Caution:
English:
This device contains licence-exempt transmitter(s)/receiver(s) that comply with Innovation, Science and Economic Development Canada's licence-exempt RSS(s). Operation is subject to the following two conditions:
1. This device may not cause interference.
2. This device must accept any interference, including

interference that may cause undesired operation of the device.

French:

L'émetteur/récepteur exempt de licence contenu dans le présent appareil est conforme aux CNR d'Innovation, Sciences et Développement économique Canada applicables aux appareils radio exempts de licence. L'exploitation est autorisée aux deux conditions suivantes :

1. L'appareil ne doit pas produire de brouillage;
2. L'appareil doit accepter tout brouillage radioélectrique subi, même si le brouillage est susceptible d'en compromettre le fonctionnement.

8. Contact Us

8.1 After-sales Service

Order Issues:

If you encounter any missing or incorrect shipments of Ecowitt products purchased, please reach out to the respective platform's customer service from the store where you bought the product for assistance.

Usage Inquiries:

Our product is continuously changing and improving, particularly online services and associated applications. To download the latest manual, and additional help, and for any issues related to product usage feel free to contact our

customer support team at support@ecowitt.com.We are committed to providing assistance and resolving any concerns you may have.

8.2 Stay in Touch

Ask questions, watch setup videos, and provide feedback on our social media outlets.
Follow Ecowitt on Discord,Facebook,YouTube and Twitter.



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