



3S-WD-MB-H

Modbus Heated Wind Direction Sensor

USER MANUAL

USER MANUAL TABLE OF CONTENTS

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Waste Disposal



This symbol indicates that the product is subject to European Union regulations on separate waste disposal. This applies to both the product itself and any accessories bearing the same symbol. Such products must not be disposed of as unsorted household waste.



Note: SEVEN reserves the right to make changes on this document without prior notice.

1. Introduction

The Modbus Heated Wind Direction Sensor is part of the SEVEN meteorological sensor series, which comprises professional, intelligent measurement sensors with a digital interface for environmental and industrial applications such as PV plants.



Figure 1 - 3S-WD-MB-H



Figure 2 - 3S-WD-MB-H



Figure 3 - 3S-WD-MB-H

The Modbus Heated Wind Direction Sensor is a device used to measure horizontal wind direction. The measured wind direction data are transmitted to data loggers and receiver units via a 3-wire RS485 bus using the Modbus RTU protocol. It is equipped with a heating system to prevent the sensor surface from freezing in cold weather conditions.

Figure 1: Power is not connected.

Figure 2: Power and data are connected. If the internal aluminum temperature is above 10 °C, the heater does not activate and the blue LED is on.

Figure 3: Power and data are connected. When the internal aluminum temperature is 10 °C or below, the heater turns on and the red LED lights up; when the temperature reaches 20 °C, the heater turns off and the blue LED comes on.

SEVEN products use reliable, high-quality components to deliver accurate meteorological data in environmental and industrial applications. They are specifically designed to meet the requirements of PV plant monitoring systems.

2. Modbus Heated Wind Direction Sensor Installation

It is suggested that the system be operated at ground level to make sure that all components are working properly prior to installation. A general diagram of the progress of the installation steps is given below.

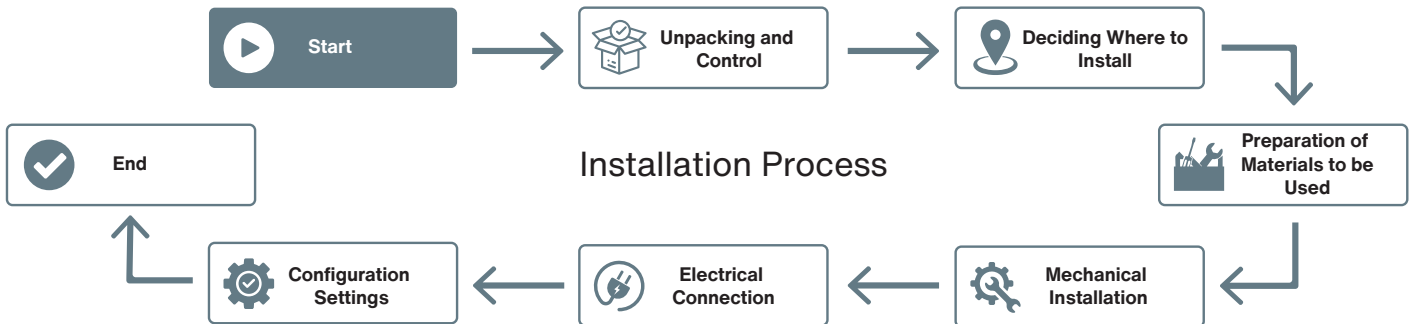


Figure 4 – Installation Process

2.1. Unpacking and Control

Upon receipt of the product, it must be carefully checked whether the package content is complete. SEVEN Sensor must be contacted if any of the components are missing, damaged or defective.

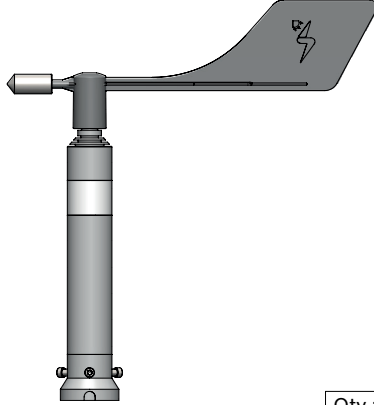
	
Qty : 1	Qty : 3
Modbus Heated Wind Direction Sensor	M5 x 10 mm Socket Head Cap Screw

Figure 5 – Packing List



Note: Quantity and content of the received material may be different based on the confirmed order.

2.2. Field Requirements and Considerations

Each site is different and has its own unique challenges. For this reason, the installation of the product may differ from site to site. First, it must be decided where the product will be installed. The Modbus Heated Wind Direction Sensor can be affected by obstructions and local topography.

The Modbus Heated Wind Direction Sensor should be placed no closer than 10 times the height of any obstruction.

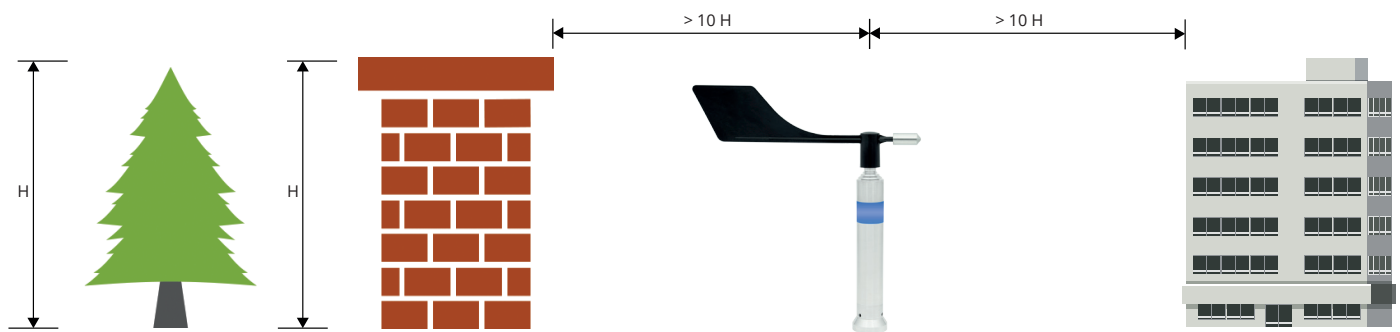


Figure 6 - Deciding Where to Install

If the Modbus Heated Wind Direction Sensor is to be mounted on a roof, it should preferably be installed on the side of the building facing the prevailing wind direction. When placing the Wind Direction Sensor on the mounting structure, attention must be paid to the north direction mark on the sensor, and it must be aligned to north with the help of a compass.



Figure 7 – Heated Wind Direction Sensor – North Direction Mark

The Modbus Heated Wind Direction Sensor must be mounted at a height of 2 metres above the ground. For rooftop projects, this height may be 1 metre. There should be no nearby obstructions that could affect the airflow, wind speed, or wind direction. When positioning the Modbus Heated Wind Direction Sensor, attention must be paid to the north direction mark, and it must be aligned to north with the help of a compass.

Free Airflow • The Heated Wind Direction Sensor must be installed in an open, unobstructed airflow area. • The Heated Wind Direction Sensor must be positioned at least 1 metre above the top level of the panel. • The N mark on the Heated Wind Direction Sensor	Obstacle Clearance If the Heated Wind Direction Sensor is not above the panel level: the horizontal distance between the obstacle and the sensor must be 10H. <i>Installation to the mounting structure</i>	Incorrect Installation The Heated Wind Direction Sensor must not be installed below the top level of the panel.
Vertical Alignment • The Heated Wind Direction Sensor must be installed in a fully vertical position. • Tilt tolerance: $\pm 0,2^\circ$	Obstacle Clearance If the Heated Wind Direction Sensor is on the mounting arm next to the panel: it must be at least 1 meter above the top level of the panel and at least 1 meter horizontally away from the panel edge. <i>Installation next to the panel</i>	Incorrect Installation • The panel surface must not be used as a reference when installing the Heated Wind Direction Sensor. • The Heated Wind Direction Sensor must not be installed under the panel.

Figure 8 - Correct and Incorrect Field Installation

2.3. Preparation of Materials to be Used in Installation

The materials needed during installation are provided by SEVEN. The user should only prepare the following hand tools and personal protective equipment.

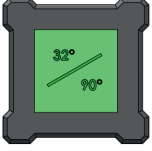
Materials		
		
Gloves	Tape Measure	Drill
		
4mm Allen Key	Spirit Level	Digital Inclinometer

Figure 9 - Materials to be Used in Installation

2.4. Installation

The 3S-WD-MB-H Modbus Heated Wind Direction Sensor is designed on the Plug & Run principle. Depending on the mounting method, it can be installed in two ways, ground mounting or pipe mounting. The installation can be easily completed by a qualified electrician by following SEVEN instructions.

2.4.1. Ground Mounting

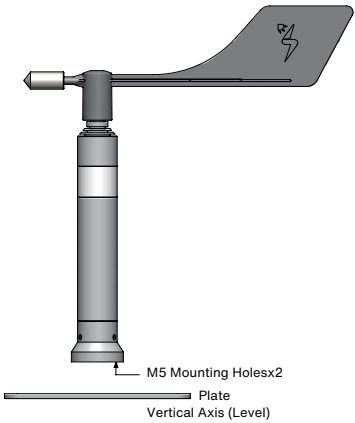
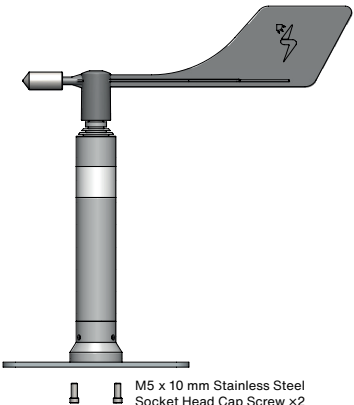
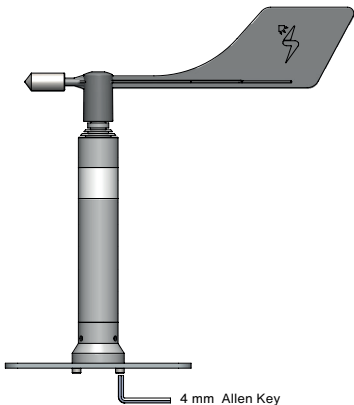
 M5 Mounting Holesx2 Plate Vertical Axis (Level) Step 1 - The Heated Wind Direction Sensor must be mounted on a plate placed on a level surface along the vertical axis. - The sensor must be strictly vertical.	 M5 x 10 mm Stainless Steel Socket Head Cap Screw x2 Step 2 The M5 screws must be fastened into the mounting holes on the bottom of the sensor.	 4 mm Allen Key Step 3 The screws must be tightened using a 4 mm Allen key.
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Figure 10 – Mounting Structure Installation – Ground Mounting

2.4.2. Pipe Mounting

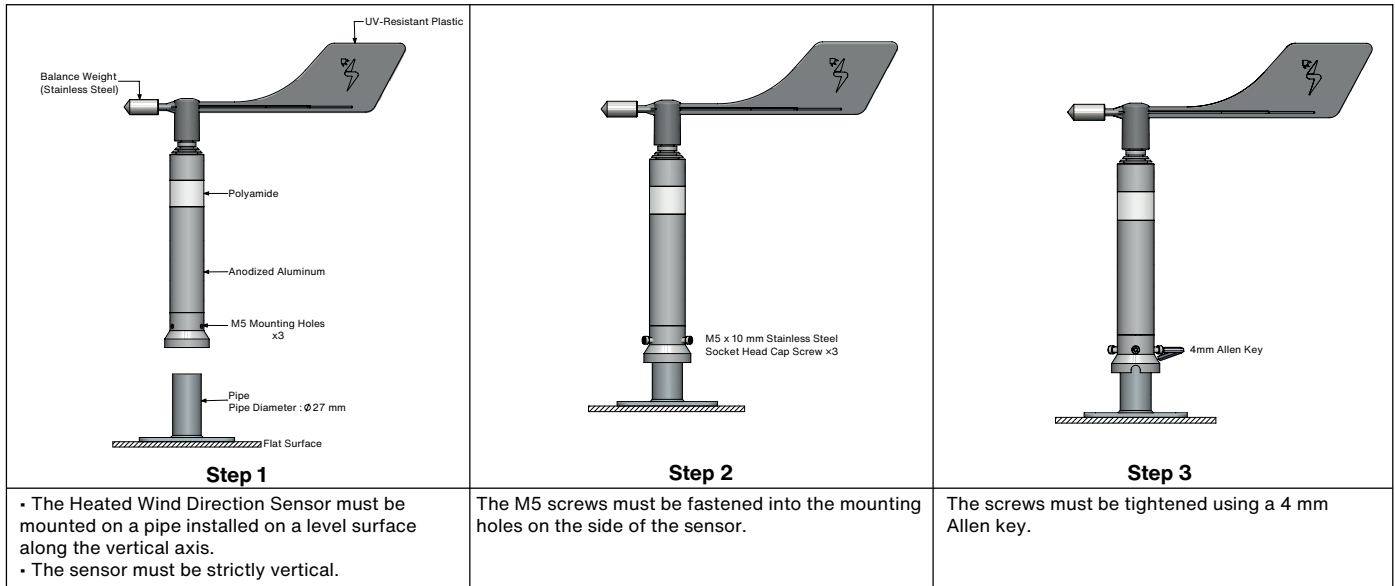


Figure 11 – Mounting Structure Installation – Pipe Mounting

2.5. Inspection and Maintenance

Periodically check the tightness of the fasteners, the condition of the wiring, any damage, deterioration, or disconnection of the sensors and electrical enclosures, signs of moisture or pests in the enclosures, loose cable connections, brittle fasteners, and any other potential problems.



Note: It is recommended to use thread-locking fluid for fasteners.

According to IEC 61724-1:2021, the monitoring system should be inspected at least annually and preferably at more frequent intervals.

3. Cable Connections

The supply voltage for the Modbus Heated Wind Direction Sensor is 18–30 V DC. Operation with a supply voltage of 24 V is recommended. The communication and power cable of the Heated Wind Direction Sensor should always be laid separately from AC/DC cables.



Note: The installation and electrical connections of SEVEN sensors should be carried out by a qualified electrician.

Wire Assignment for Power & Communication

RS485 A / Data (+)	Green
RS485 A / Data (-)	Yellow
Signal Ground	Red
Power (+)	Brown
Power (-)	White
Sensor Housing Ground (Earth GND)	Black

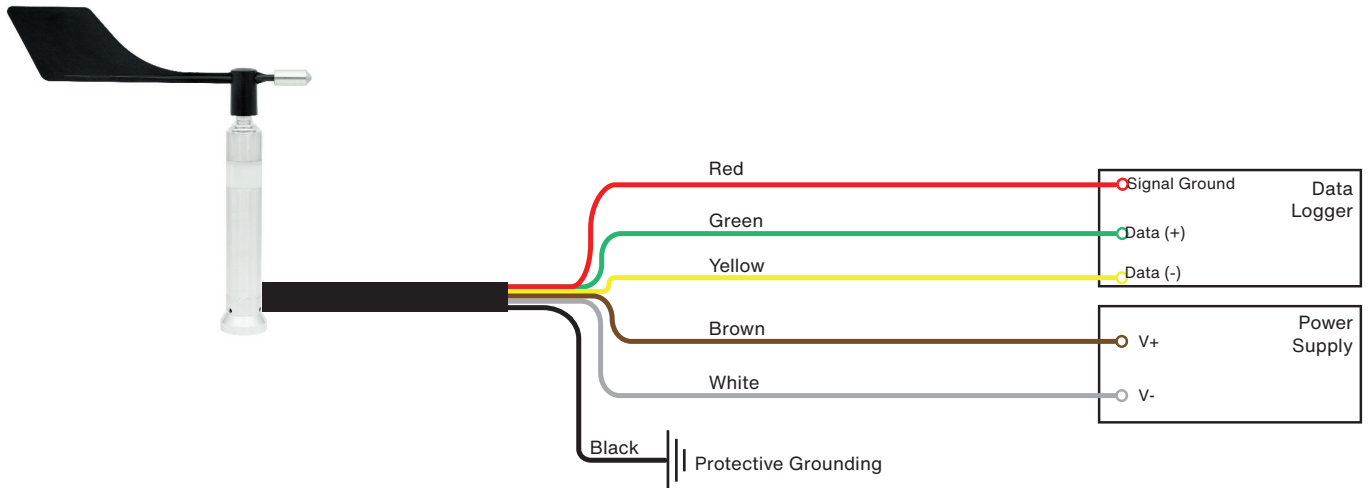


Figure 12 – Wire Assignment for Power & Communication

4. Configuration and Communication

After the Modbus Heated Wind Direction Sensor has been correctly installed and connected, the sensor starts measuring autonomously.

Attention must be paid to the following points:

- A measurement test must be performed on the Heated Wind Direction Sensor using the 3S-WD Configuration Tool, and its proper operation in the field must be verified.
- To ensure accurate wind measurement data, the Modbus Heated Wind Direction Sensor must be aligned to geographic north.
- If multiple Modbus devices are operated on the same network, a unique device ID must be assigned to each device.



Note: The 3S-WD Configuration Tool is used for the 3S-WD-MB-H Wind Direction Sensor model.

Follow SEVEN instructions to configure the Modbus Heated Wind Direction Sensor on data loggers.

4.1. 3S-WD-MB-H Configuration Tool

After connecting the communication cable, a Windows® PC is required to test communication and set the Modbus parameters on the Heated Wind Direction Sensor. Once the PC is ready, connect the USB-to-RS485 converter to a USB port on your computer.

For your computer to detect the USB-to-RS485 converter, the device must be defined as a serial COM port. If your computer does not have an RS485 port defined in this way, download the 'GUI User Manual' from the link below and update your driver.

http://sevensensor.com/files/d/en/3S-Wind_Direction_Sensor_Configuration_Tool_v1.0.pdf

4.2. Modbus Map

The Modbus addresses and features required to configure the Modbus Heated Wind Direction Sensor with systems such as data loggers are specified in the table below.

ID-Dec	ID-Hex	Parameter	Range	Resolution	Description
30052	0x34	Wind Direction	0...359,9°	0,1°	Horizontal Wind Direction

5. Contact Details

Please feel free to contact us if you face any difficulties during installation or configuration.

 **Address:** Pinarçay OSB Mahallesi 11. Cadde, No: 35, Corum Organize Sanayi Bölgesi 19200 Merkez/Corum

 **Phone:** +90 553 228 74 55

 **Email:** teknik@sevensensor.com

 **Website:** www.sevensensor.com