

WEATHER STATION

INSTALLATION GUIDE



WS-360-TCP
Weather Station

Hunter®

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Introduction

The sensor assembly has been designed to offer durability and serviceability. This sleek design is 33" (84 cm) high and weighs just over 7 lb (3.1 kg). It's the most accurate, durable, and easiest-to-install weather station available.

Getting Started

Before permanently installing your system, set it in the same room as your receiving device. Turn the system on and confirm successful communication.



SCAN
for help

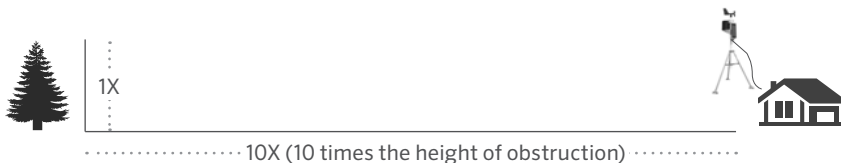


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product?**

Choosing a Location

The best location for your weather station is one that is free of obstructions and at an elevation high enough to prevent interference to the anemometer (wind sensor) from nearby trees or buildings.

The station should be no closer to an obstruction than 10 times the obstruction's height.



Installation

Mounting Options

The mounting mast included with your sensor assembly has an outside diameter of 1.69" (42.7 mm) and an inside diameter of 1.31" (33.4 mm). The length of the mast is 18" (45.7 cm). There are many ways to mount the system utilizing the mast.

Mono Mount

The mono mount and tripod are the most common methods of mounting. The mounting mast can be placed over another pipe, into another pipe, hose-clamped to a pipe or post, or drilled and through-bolted to a surface.

Regardless of how you mount the system, the bottom of the electronics enclosure should not extend more than 12" (20 cm) or less than 7" (17.8 cm) above the support of the mounting mast. The reason for this is the stability of the tipping bucket rain gauge; unintended movement may cause inaccurate rainfall counts.

The station should be free of obstructions or heat-absorbing items and should have a clear line of sight between the station and the receiving device.

Mono Mount



Tripod Mount

Ensure the distance between the bottom of the control box and the tripod is no less than 7" (17.8 cm) and no more than 12" (20 cm).

Tripod Mount



Roof Mount

When roof-mounting the sensor assembly, the unit should be mounted toward the edge of the roof (preferably on the prevailing wind side of the building). It should be installed at least 2.5' (76 cm) above the roofline. Avoid locating the station near any heat sources such as chimneys or vents. The anemometer may be separated from the station and mounted separately, if necessary, to ensure that it is adequately free from interference.

Mount Spacing

No less than 7" (25 mm)
No more than 12" (305 mm)



Installation

Installation Steps

1. Secure the support tube in the desired mounting apparatus as described above. Slide the WS-360 Station down over the necked-down section of the support tube until seated and the slot lines up with the retaining screw. Tighten the screw.
2. Rotate the station until the solar panel faces TRUE SOUTH in the Northern Hemisphere or TRUE NORTH in the Southern Hemisphere. Once positioned correctly, ensure that the support tube is secure and unable to rotate.
3. Adjust the solar panel for optimum performance by tilting it to the appropriate angle and locking it into place with the bracket located behind it.
4. Turn the system on by pulling the switch toward the solar panel.



Maintenance

Depending on the location of your system, the rain gauge may periodically get clogged with dirt, leaves, or other debris. When this happens, your rainfall data will appear significantly lower than other totals in your area or cease to record altogether. Clean the rain gauge as follows:

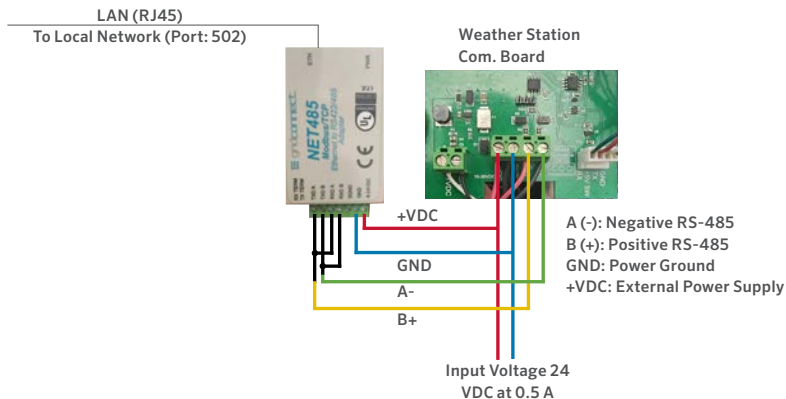
1. Loosen the 4 screws holding the collector portion onto the base of the rain gauge.
2. Twist the collector counterclockwise and remove it.
3. Observe the cotter pin holding the plastic screen in place. Straighten the cotter pin legs to remove it along with the plastic screen.
4. Clear debris from the screen, collector drain, and white dipper assembly.
5. Visually inspect the small circuit board located beneath the white dipping assembly.
6. Place the screen and cotter pin back in place and bend the cotter pin legs up and around the inlet as they were before. If they are not bent up and away from the tipper mechanism, they will prevent a complete tip.
7. Replace the collector and tighten the 4 screws.

Connection

Modbus® TCP/RTU Converter Connection

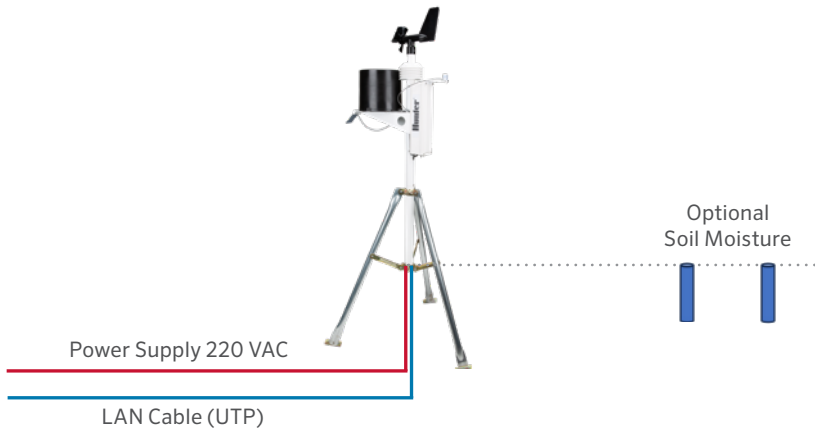
To connect a weather station Modbus converter, ensure proper communication between the weather station and the Modbus network using the following connection diagram:

WEATHER STATION CONNECTION DIAGRAM

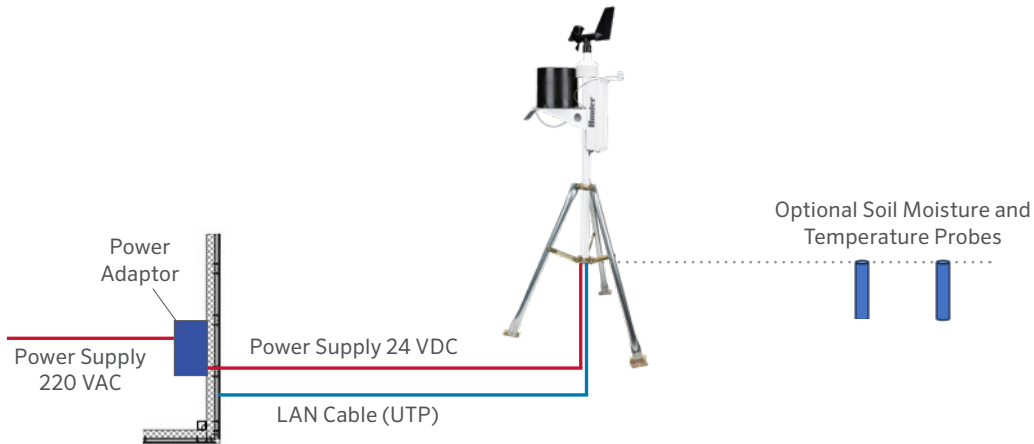


Connection Diagram

**WEATHER STATION CONNECTION DIAGRAM
(Option 1)**



WEATHER STATION CONNECTION DIAGRAM (Option 2)



Methods of Assigning the IP Address

The unit's IP address must be configured before a network connection is available. You have several options for assigning an IP to your unit.

Method	Description
Device Installer	You manually assign the IP address using a Graphical User Interface on a PC attached to the network.
Telnet	You manually assign the IP address and other network settings at a command prompt using a UNIX or Windows-based system. Only one person at a time can be logged into the configuration port (port 9999). This eliminates the possibility of several people simultaneously attempting to configure the unit.

IP Address

Your weather station must have a unique IP address on your network. The systems administrator generally provides the IP address and corresponding subnet mask and gateway. The IP address must be within a valid range, unique to your network, and in the same subnet as your PC.

IP Address:

Subnet Mask:

Gateway:

Configuration

DHCP

The unit ships with a default IP address of 0.0.0.0, which automatically enables DHCP.

Provided a DHCP server exists on the network, it will provide the unit with an IP address, gateway address, and subnet mask when the unit boots up.

AutoIP

The unit ships with a default IP address of 0.0.0.0, which automatically enables Auto IP within the unit. AutoIP is an alternative to DHCP that allows hosts to automatically obtain an IP address in smaller networks that may not have a DHCP server. A range of IP addresses (from 169.254.0.1 to 169.254.255.1) has been explicitly reserved for AutoIP-enabled devices. The range of Auto IP addresses is not to be used over the internet.

If your unit cannot find a DHCP server, and you have not manually assigned an IP address to it, the unit automatically selects an address from the AutoIP reserved range. Then your unit sends out a (ARP) request to other nodes on the same network to see whether the selected address is being used.

- If the selected address is not in use, then the unit uses it for local subnet communication.
- If another device is using the selected IP address, the unit selects another address from the AutoIP range and reboots. After reboot, the unit sends out another ARP request to see if the selected address is in use, and so on.

AutoIP is not intended to replace DHCP. The unit will continue to look for a DHCP server on the network. If a DHCP server is found, the unit will switch to the DHCP server-provided address and reboot.

Note: If a DHCP server is found, but it denies the request for an IP address, the unit does not attach to the network but waits and retries.

AutoIP can be disabled by setting the unit's IP address to 0.0.1.0. This setting enables DHCP but disables AutoIP.

Static IP Configuration

Network Settings

Network Mode:

IP Configuration

Obtain IP address automatically

Auto Configuration Methods

BOOTP: Enable Disable

DHCP: Enable Disable

AutoIP: Enable Disable

DHCP Host Name:

Use the following IP configuration:

IP Address:

Subnet Mask:

Default Gateway:

To configure the Static IP settings:

1. On the Network Settings, click on Use the following IP Configuration.
2. Insert the IP address, Subnet mask, and Default Gateway.
3. When you are finished, click the OK button.

Configuration

Serial Settings

Port Settings

Channel: Interface:

Baud Rate: Data Bits: Parity: Stop Bits:

Flow Control Out: Delay before Transmit (1): ms Hold after Transmit(4): ms

Flow Control In: Wait til Active (2): Delay after Active (3): ms

Modem Control Out:

Modbus

Protocol: RTU ASCII Character Timeout: ms (0=auto)

Tx Delay after Rx: ms Message Timeout: ms

To configure the channel's serial settings:

1. On the main menu, click Serial Settings (under Channel 1) to display the Serial Settings window.
2. In the Protocol field, enter RS485 2-wire.
3. Select Modbus RTU.
4. When you are finished, click the OK button.

Configuration

Modbus/TCP Connection Settings

Connection Settings

Connect Protocol
Protocol: **Modbus/TCP Server attached to slave(s)** ▼

Advanced Server Settings

Modbus/TCP Port: Queue Multiple Modbus/TCP Requests: Yes No

Fixed Slave Address: (0=MB/TCP header) Allow Modbus Broadcast: Yes No

Use Bridge Error Codes (DAN/OBR): Yes No
Swap 4x/Dx access to get 3x/Tx: Yes No

Swap Holding Reg (4x) access to Input Reg (3x) after offset: (0 to disable)

Swap Coil Status (0x) access to Input Status (1x) after offset: (0 to disable)

(Example: read of 40102 maps to 30002 if you enter 100)

Preset Automated Scan Table (optional)

No.	Unit Id (1-255)	Register Type	Offset	Count (1-124)	Frequency (ms)	
0	<input type="text" value="60"/>	<input type="text" value="Holding Reg (4x)"/> ▼	<input type="text" value="1"/>	<input type="text" value="23"/>	<input type="text" value="1000"/>	<input type="button" value="Remove"/>
1	<input type="text"/>	<input type="text"/> ▼	<input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="button" value="Remove"/>
2	<input type="text"/>	<input type="text"/> ▼	<input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="button" value="Remove"/>
3	<input type="text"/>	<input type="text"/> ▼	<input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="button" value="Remove"/>
4	<input type="text"/>	<input type="text"/> ▼	<input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="button" value="Remove"/>
5	<input type="text"/>	<input type="text"/> ▼	<input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="button" value="Remove"/>
6	<input type="text"/>	<input type="text"/> ▼	<input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="button" value="Remove"/>
7	<input type="text"/>	<input type="text"/> ▼	<input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="button" value="Remove"/>
8	<input type="text"/>	<input type="text"/> ▼	<input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="button" value="Remove"/>
9	<input type="text"/>	<input type="text"/> ▼	<input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="button" value="Remove"/>

To configure the channel's serial settings:

1. On the Protocol, select Modbus/TCP server.
2. In the Modbus TCP Port field, enter 502.
3. In the Fixed Slave address, enter 60.
4. In the Preset Automated Scan table, enter 60 Unit ID, Holding Reg, Offset 1, 23 in Count and 1000 ms frequency.
5. When you are finished, click the OK button.

Holding Register	Item	Type	Units	Scale Factor	Contents
0	Manufacturer	uint16	N/A	-	"RW" (0 x 5257)
1	Model	uint16	N/A	-	"S0" = MK-III, "S1" = AgroMet, "S2" = PVmet
2	Version	uint16	N/A	-	0 x 0170, "01" Map Version, "70" Firmware Version
3	Air Temperature	int16	Degrees C	-1	Measured
4	Humidity	int16	%	1	Measured
5	Pressure	int16	hPa	-1	Measured
6	Wind Speed	int16	m/s	-1	Measured
7	Wind Direction	int16	Degrees	1	Measured
8	Wind Speed 5 Min Avg	int16	m/s	-1	Measured
9	Wind Direction 5 Min Avg	int16	Degrees	1	Measured
10	Wind Gust (5 Min)	int16	m/s	-1	Measured
11	Wind Gust Direction	int16	Degrees	1	Measured
12	Rainfall	int16	Counter	1	Measured
13	Aux Temperature 1	int16	Degrees C	-1	Measured

Configuration

Holding Register	Item	Type	Units	Scale Factor	Contents
14	Aux Temperature 2	int16	Degrees C	-1	Measured
15	Soil Moisture 1	int16	kPa	1	Measured
16	Soil Moisture 2	int16	kPa	1	Measured
17	Soil Moisture 3	int16	kPa	1	Measured
18	Solar Irradiance 1	int16	W/m2	1	Measured
19	Solar Irradiance 2	int16	W/m2	1	Measured
20	UV Index	int16	N/A	1	Measured
21	Leaf Wetness	int16	%	1	Measured
22	Battery Voltage	int16	Volts	-2	Measured

FCC Compliance Notice

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, you are encouraged to try to correct the interference by taking 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 of which the receiver is connected.
- Consult the dealer or an experienced radio/TV technician for help.

This device complies with part 15 of FCC rules. Operation is subject to the following two conditions:

1. This device may not cause harmful interference.
2. This device must accept any interference received, including interference that may cause undesired operation.

Changes or modifications not expressly approved by Hunter Industries could void the user's authority to operate this device. If necessary, consult a representative of Hunter Industries Inc. or an experienced radio/television technician for additional suggestions.

The following statement is applicable when irrigation controller is used with accessory Wi-Fi device: This equipment complies with FCC radiation exposure limits set forth for an uncontrolled environment. In order to avoid the possibility of exceeding the FCC radio frequency exposure limits, human proximity to the antenna shall not be less than 7.9" (20 cm) during normal operation.

This equipment complies with the IC RSS-102 radiation limits set forth for an uncontrolled environment. This equipment should be installed and operated with a minimum distance of 7.9" (20 cm) from all persons.

Compliance

Innovation, Science and Economic Development Canada (ISED) Compliance Notice

This device contains licence-exempt transmitter(s)/ receiver(s) that comply with Innovation, Science and Economic Development Canada's licence-exempt RSS(s).

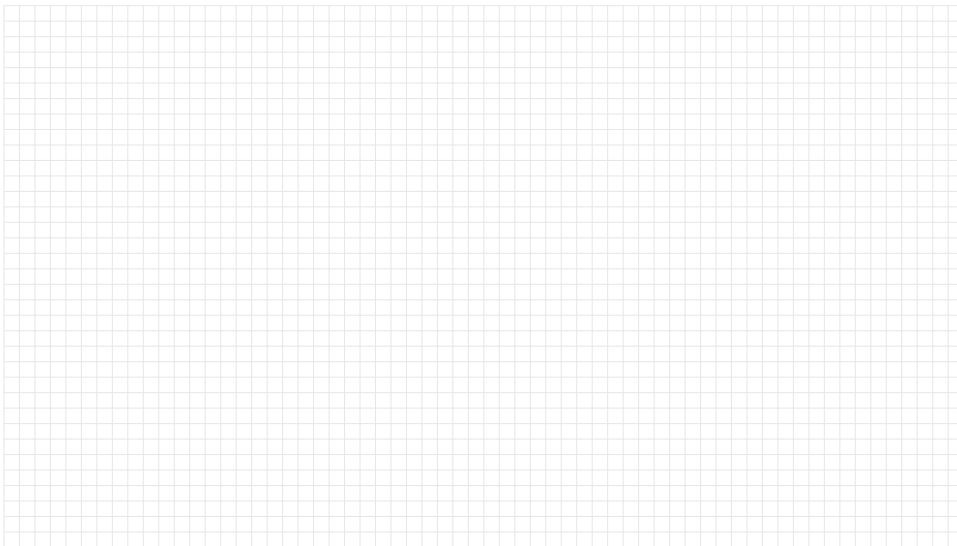
Operation is subject to the following two conditions:

1. This device may not cause interference, and
2. This device must accept any interference, including interference that may cause undesired operation of the device.

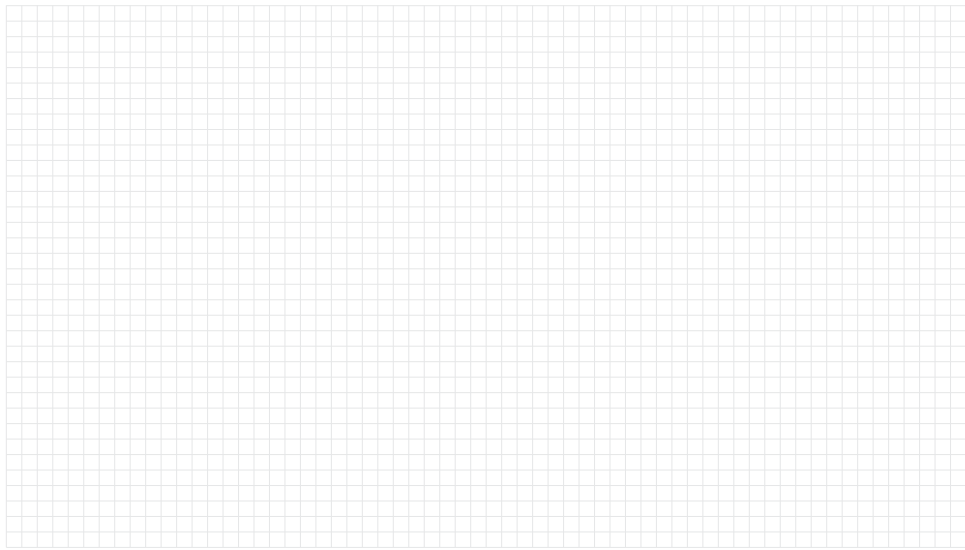
Le présent appareil est conforme aux CNR d'Innovation, Sciences et Développement économique Canada applicables aux appareils radio exempts de licence.

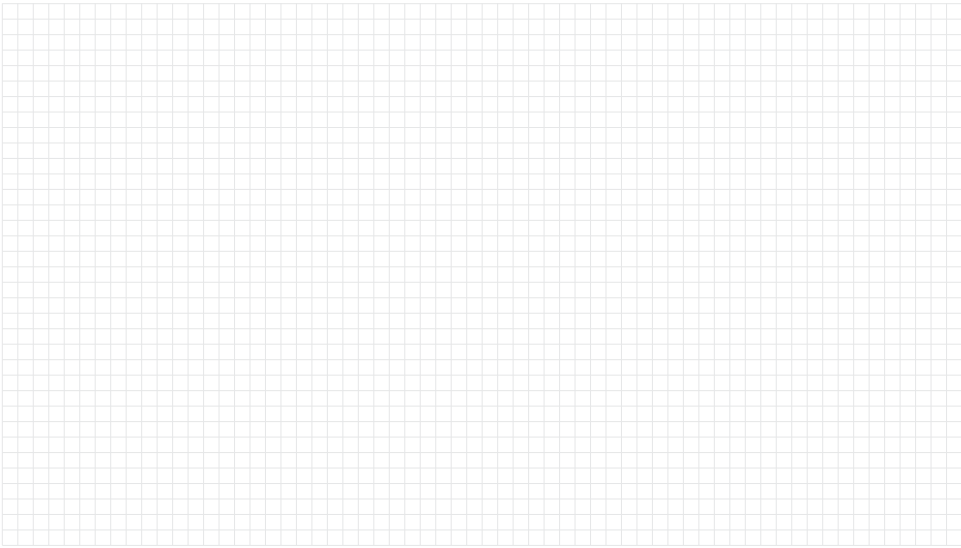
L'exploitation est autorisée aux deux conditions suivantes :

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



Notes





Helping our customers succeed is what drives us. While our passion for innovation and engineering is built into everything we do, it is our commitment to exceptional support that we hope will keep you in the Hunter family of customers for years to come.



**Denise Mullikin, President,
Landscape Irrigation and Outdoor Lighting**

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