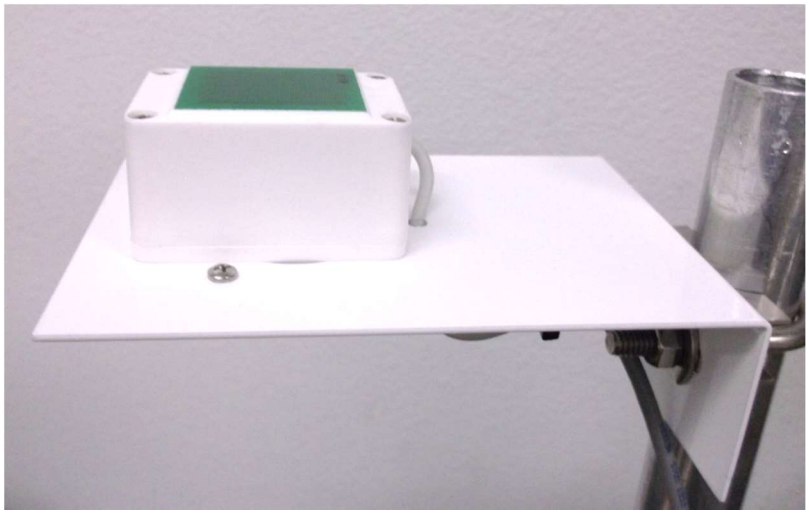
260-2593

User Manual

260-2593 Precipitation Detector



Phone (530) 823-7185
Email nova@novalynx.com **Website** www.novalynx.com

Receiving and Unpacking

Carefully unpack all components and compare to the packing list. Notify NovaLynx Corporation immediately concerning any discrepancy. Inspect equipment to detect any damage that may have occurred during shipment. In the event of damage, any claim for loss must be filed immediately with the carrier by the consignee. Damages to equipment sent via Parcel Post or UPS require the consignee to contact NovaLynx Corporation for instructions.

Returns

If equipment is to be returned to the factory for any reason, call NovaLynx between 8:00 a.m. and 4:00 p.m. Pacific Time to request a Return Authorization Number (RA#). Include with the returned equipment a description of the problem and the name, address, and daytime phone number of the sender. Carefully pack the equipment to prevent damage or additional damage during the return shipment. Call NovaLynx for packing instructions in the case of delicate or sensitive items. If packing facilities are not available take the equipment to the nearest Post Office, UPS, or other freight service and obtain assistance with the packaging. Please write the RA# on the outside of the box.

Warranty

NovaLynx Corporation warrants that its products are free from defects in material and workmanship under normal use and service for a period of one year from the date of shipment from the factory. NovaLynx Corporation's obligations under this warranty are limited to, at NovaLynx's option: (i) replacing; or (ii) repairing; any product determined to be defective. In no case shall NovaLynx Corporation's liability exceed product's original purchase price. This warranty does not apply to any equipment that has been repaired or altered, except by NovaLynx Corporation, or that has been subjected to misuse, negligence, or accident. It is expressly agreed that this warranty will be in lieu of all warranties of fitness and in lieu of the warranty of merchantability.

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1 FORWARD

Thank you for purchasing NovaLynx products. NovaLynx has been designing and manufacturing weather instruments since 1988. NovaLynx represents several well-known brands of quality manufacturers, including Gill Instruments, RM Young, Kipp & Zonen, and Vaisala. It is our hope that our products will meet all your monitoring requirements.

2 INTRODUCTION

The **260-2593 Precipitation Detector** is used to detect the onset of rainfall. The grid sensor activates an internal relay that can be used to automate other equipment or record rain events. A typical application would be to turn off or over-ride an irrigation system during rainstorms. Another utilization is to close skylights at the onset of rainfall.

Two LEDs indicate the status of the precipitation detector. A yellow LED indicates the unit is powered and ready to detect rain. A green LED indicates a rain event. The relay closes when the green LED is illuminated, and opens when moisture is no longer detected.

The precipitation detector is mounted on a bracket that is slightly angled so that excess moisture drains off. In addition, an internal heater helps dry the sensor grid which is on the top of the detector. These features help to define the end of a rain event and reduce false alarms caused by dew.

The Precipitation Detector can sense rain and slushy snow. The 260-2593 Precipitation Detector uses capacitive technology capable of detecting pure water, making it superior to sensors that rely on resistance techniques that don't work well unless the rain water is slightly conductive. The sensitivity is pre-set at the factory for normal conditions. For other situations, it is possible to adjust the sensitivity.

NovaLynx supplies an AC adapter to power the 260-2593 Precipitation Detector. If AC is not available, the unit can operate from any stable 12Vdc supply (>150mA).

3 SPECIFICATIONS

260-2593 Precipitation Detector	
Type	Capacitive grid sensor element
Active sensor surface	26 x 32 mm
Relay operation	Normally open dry contact (closes when rain is detected).
Relay rating	25 V @ 2.5 Amps max
Persistance	Relay remains closed as long the sensor is wet.
Heater	1 Watt (approx) heating element
Operating temperature	-15 °C to +60 °C (+4 °F to +140 °F)
Adjustment	Factory pre-set to average conditions. Multi-turn potentiometer (inside enclosure) may be used to increase or decrease sensitivity.
Enclosure	Waterproof
Power Requirements	12 VDC @ >150 mA
AC Adapter	100-240 VAC Input, 12 Vdc @ 1 Amp Output (indoor use only)
Cable	4 conductor 24 AWG shielded, 25 feet (7.6 meter)
Dimensions, enclosure	2.6" x 1.8" x 1" (65 x 45 x 36 mm)
Dimensions, overall	7" x 4" x 3" (18 x 10 x 8 cm)
Weight	1.3 lb (0.6 kg)
CE	The CE Marking identifies this product as complying with all relevant directives in the European Union (EU).

4 SITE SELECTION AND INSTALLATION

Select a location with good exposure to rainfall, away from trees or overhanging structures. Avoid mounting underneath overhead wires that might collect dew and drip water onto the sensor. Make sure there are no sprinklers in the area that could spray water onto the detector, causing false events.

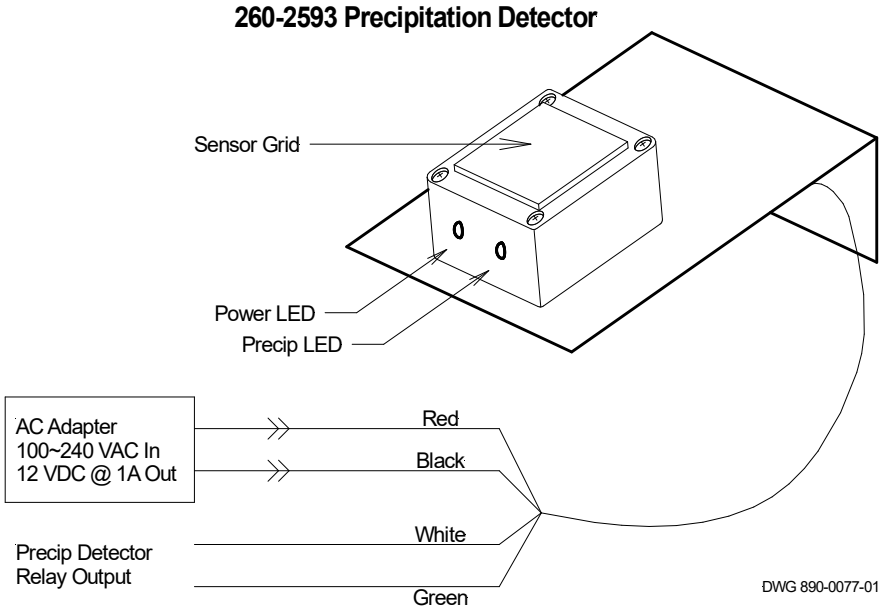
The **260-2593 Precipitation Detector** can be mast mounted (up to Ø 1 ¼"), or the U-bolt assembly can be removed and the bracket secured to a vertical flat surface. Two indicator LEDs are mounted on the front side of the detector enclosure. Mount the detector at a height that is convenient for viewing the LEDs, if possible.

Route the cable and secure it with cable ties. Provide a drip loop where the cable enters a building or enclosure. If using the AC Adapter (included) to power the detector, choose a receptacle that is enclosed or indoors, because the adapter is not rated for outdoor use and could be hazardous in wet environments.

5 WIRING

WARNING: Do not install the AC Charger outdoors unless a suitable waterproof enclosure is provided.

WARNING: Do not exceed the internal relay maximum electrical rating.



The internal relay is a dry-contact, normally open circuit. When connected to monitoring equipment, such as a logger, an open circuit represents no rain, and closed circuit indicates a rain event. The logger must supply a pull-up voltage to monitor the relay.

The sensor can be connected to over-ride an irrigation system, but the logic must be reversed.* In this case adding an external relay provides the correct logic as well as protecting the sensor.

The user connections to the internal relay are provided by the green and white wires. Polarity does not matter as the contacts are "dry" meaning not connected to an internal power source.

Do not exceed the maximum rating of the internal relay (25V @ 2.5 Amps max). If the load circuit requires a higher voltage or current, install an external relay of suitable coil and contact rating. If the input of the external relay is a DC coil (inductive), include a diode to clamp the kickback voltage. The AC Adapter (supplied) may be used to power both the detector and a relay (12Vdc input), provided the combined current is below 1 Amp. A clamping diode MUST be provided if the relay is inductive.

Power is supplied to the sensor on the red wire, and return ground is the black wire. The AC Adapter has been pre-wired to a quick disconnect to make installation simple.

** Some irrigation controllers have an input for connecting a precipitation detector. Check the instruction manual of the controller for details.*

6 OPERATION

Connect the AC Adapter to a power source. When power is connected, one LED on the front of the enclosure should glow YELLOW and remain on.

Sprinkle some water on the sensor grid on the top of the enclosure to simulate a rain event. The GREEN LED should turn on and you may hear a "click" indicating the relay closed. The GREEN LED should remain on as long as there is a significant amount of water on the grid sensor.

Sprinkle additional water on the sensor grid, and observe whether excess water runs off the grid. If the water puddles and will not run off it may be necessary to tilt the mounting plate down or bend it to the proper angle.

Check your monitoring equipment (logger, if used) to see that it registered the rain event. If using the detector to over-ride an irrigation, turn on some sprinklers, then drizzle water on the detector and verify that the irrigation system stops.

7 MAINTENANCE

Clean the grid sensor on the top of the precipitation detector periodically. Use clean water and a soft cloth to wipe off dust or other debris. Do not use abrasive cleaners on the sensor grid.

8 SENSITIVITY ADJUSTMENT

The **260-2593 Precipitation Detector** is factory-set for average rainfall conditions. Usually no adjustment is needed. However, should more or less sensitivity be desirable for a particular application, the sensitivity can be adjusted.

Remove the corner screws that secure the enclosure to the mounting plate. Remove the two screws on the bottom cover of the sensor housing and lift off the cover. The adjustment screw on the potentiometer will be visible inside the enclosure. Note that all other electronic parts are encapsulated in epoxy.

- Turn clockwise to DECREASE sensitivity
- Turn counter-clockwise to INCREASE sensitivity

The adjustment potentiometer is a multi-turn type. Resistance will be felt when the mechanical limit of the potentiometer is reached. Do not force the screw beyond the limit.

After making each adjustment, snap the cover onto the enclosure. Test the sensitivity by applying water to the sensor grid on the top of the enclosure. Repeat the process until the desired sensitivity is achieved. Avoid getting water inside the enclosure. Dry off any moisture carefully using a paper towel, then allow the unit to air-dry before replacing the cover and attaching it with the two screws removed earlier.

Install the sensor on the mounting plate and return the unit to service.

9 TROUBLESHOOTING GUIDE

TROUBLESHOOTING MATRIX	
Yellow LED does not glow	The sensor is not getting power. Make sure the electrical outlet is working - reset the GFCI if needed. Plug the AC Adapter into the outlet. Use a voltmeter to check the output of the AC Adapter - it should be supplying 12 Vdc.
Green LED does not glow	The green LED only glows when sufficient moisture collects on the grid sensor. Sprinkle water on the grid sensor and check whether the green LED turns on. If copious amounts of water does not cause the green LED to turn on, it may be possible to restore operation by adjusting the sensitivity. If adjusting the sensitivity does not restore operation, the sensor is damaged and must be replaced. The internal components are encased in epoxy and are not repairable.
The relay output is not working	The relay only operates (closes) when sufficient moisture collects on the grid sensor. Sprinkle water on the grid sensor and verify that the Green LED turns on. Check whether the relay is closed whenever the Green LED is on. Disconnect the relay output wires (white and green) from the monitoring device or control circuit. Connect a multimeter set to read ohms to the white and green wires. When the precipitation sensor is dry, the relay should be open and the resistance infinite. Apply water to the sensor grid while watching the meter. The reading on the meter should be near zero ohms when the relay closes. If the relay remains open, try adjusting the sensitivity to restore operation. Otherwise, the sensor is damaged and must be replaced.
The relay output is "always on"	Observe the green LED on the front of the precipitation detector enclosure. Verify the green LED is off when the grid sensor is dry, and turns green when there is water on the sensor. Disconnect the relay output wires from the monitoring device or control circuit. Connect a multimeter set to ohms and check the reading. When the precipitation sensor is dry the green LED should be off and the relay should be open and the resistance infinite. If the relay remains closed (zero ohms on the meter) when the green LED is off, then the relay contacts have fused and the precipitation sensor must be replaced. A relay damaged in this manner is not covered under warranty. Before installing a new unit be sure to reduce the voltage/current in the load circuit below the maximum rating of the internal relay. If power fluctuations in the load circuit are the culprit, install an appropriate surge suppressor.