EVTSCAN RS-TRA-N01-AL

EVTSCAN RS-TRA-N01-AL Solar Radiation Sensor Instruction Manual

Model: RS-TRA-N01-AL

1. Product Overview

The EVTSCAN RS-TRA-N01-AL Solar Radiation Sensor is a high-accuracy pyranometer designed for precise measurement of total/global solar radiation. Utilizing a thermopile sensor element, it provides reliable data for various applications including meteorology, solar energy system optimization, and PV monitoring. This sensor features robust construction, temperature compensation, and RS485 digital output for seamless integration into existing systems.

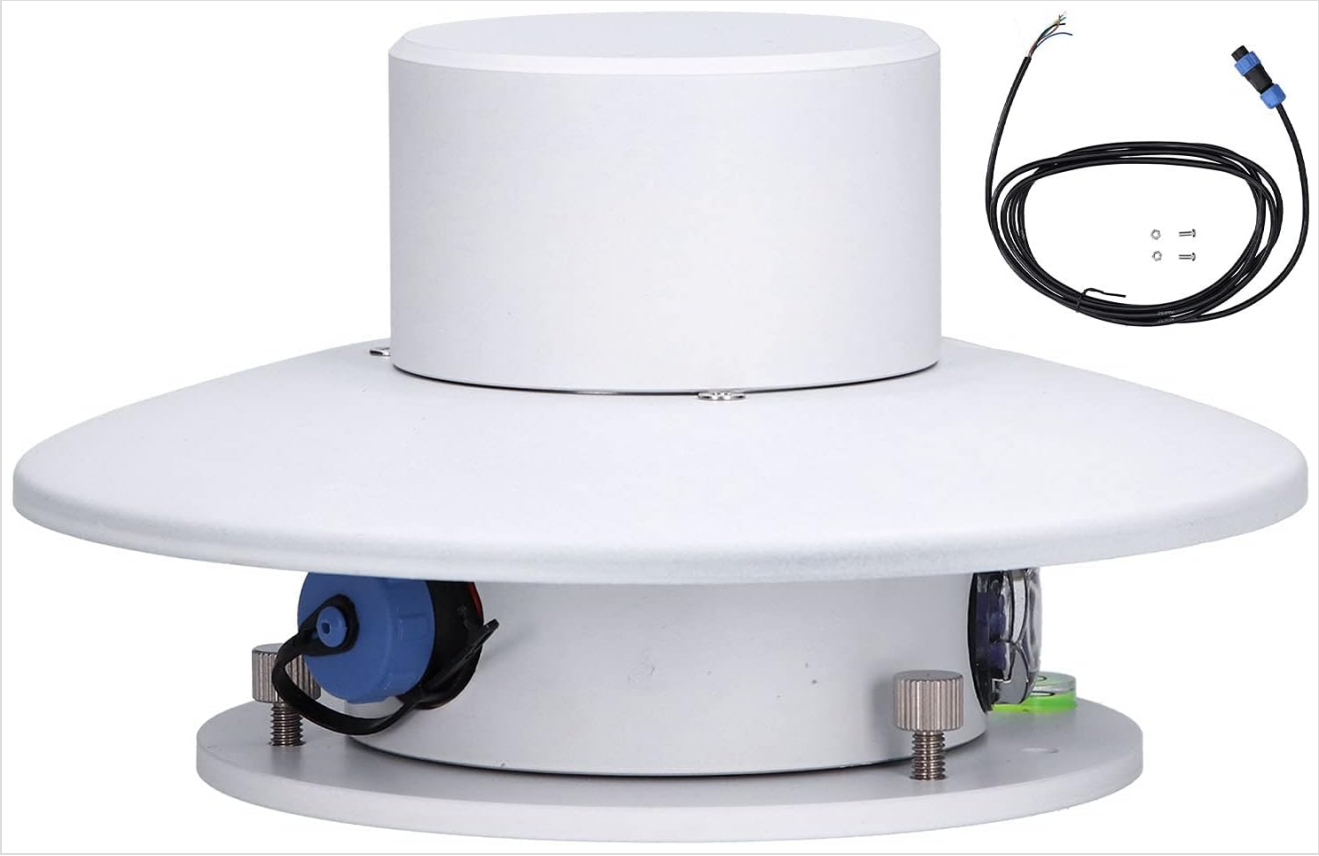


Figure 1: EVTSCAN Solar Radiation Sensor with connection cable and mounting screws. This image displays the EVTSCAN Solar

Radiation Sensor, a white, disc-shaped device with a cylindrical top, alongside its connection cable and two sets of screws and nuts for mounting.

2. Package Contents

Please verify that all items are present and in good condition upon unpacking:

- 1 x EVTSCAN Solar Radiation Sensor (Model: RS-TRA-N01-AL)
- 1 x Connection Line
- 1 Bag x Accessories (2 x Screws, 2 x Nuts)
- 1 x English Manual

Figure 2: Connection cable and mounting hardware. This image shows the black connection cable with exposed wires on one end and a blue connector on the other, accompanied by two screws and two nuts, which are included accessories for the sensor.

3. Specifications

Parameter	Value
Item Type	Sun Radiation Sensor (Pyranometer)
Housing Material	Aluminum
Sensor Element	Thermopile
Dome Material	Double Glass Inner Dome + Aluminum Outer Dome
Sensitive	7-14 $\mu V \cdot W^{-1} \cdot m^2$
Accuracy	±3%
Measurement Range	0-2000W/m²
Spectral Range	0.3~3μm
Response Time (99%)	≤30s
Data Output	RS485 digital output (standard RTU protocol)
Installation	Horizontal Mounting
Temperature Compensation	Yes
Power Supply Range	10V-30V DC
Power Consumption	0.8W
Working Temperature	-40℃~60℃
Working Humidity	0%~100%RH
Internal Resistance	About 250-400Ω
Corresponding Error of Direction	≤±30W/m²
Temperature Response Error	≤±8% (-40℃-+40℃)
Resolution	1W/m²
Spectral Selectivity	≤±10%
Cosine Response Error	≤±5%
Tilt Response Error	≤±2%
Item Weight	Approx. 1074g / 2.35 lbs
Item Dimensions (Width x Height)	Approx. 15.5cm x 8.5cm / 6.1in x 3.3in

4. Safety Information

- Ensure the power supply voltage is within the specified range (10V-30V DC) to prevent damage.
- Do not attempt to disassemble or modify the sensor, as this may void the warranty and cause malfunction.
- Handle the sensor with care, especially the glass domes, to avoid breakage.
- Install the sensor in a location free from excessive vibration or physical impact.
- When wiring, ensure proper polarity and secure connections to prevent electrical hazards.

5. Setup and Installation

5.1 Mounting the Sensor

The sensor is designed for horizontal mounting. Choose a location that provides an unobstructed view of the sky, free from shadows cast by buildings, trees, or other structures, especially during critical measurement periods.

1. Identify a stable, level surface for installation.
2. Use the provided screws and nuts to securely fasten the sensor to the mounting surface. Ensure the sensor is level to maintain measurement accuracy.

5.2 Wiring Instructions

The sensor uses an RS485 digital output with a standard RTU protocol. Refer to the following wiring diagram and pin assignments:

- **Power Supply:** Connect the sensor to a 10V-30V DC power source.
- **RS485 Data Lines:** Connect the RS485 A and B lines to your data acquisition system or controller.

Note: Specific wire colors and their corresponding functions should be detailed in the included English Manual. Always cross-reference with the physical product's wiring labels if available.

Figure 3: RTU 485 Communication Protocol in use. This image shows the sensor integrated into a larger weather monitoring system, with two individuals observing data on a laptop, illustrating the use of the RTU 485 communication protocol for data acquisition.

6. Operating Instructions

Once installed and wired, the sensor will begin measuring solar radiation. Data is transmitted via the RS485 interface using the standard RTU protocol.

6.1 Data Acquisition

To read data from the sensor, your data acquisition system or controller must be configured to communicate using the RS485 RTU protocol. Consult the documentation for your specific data logger or controller for details on configuring RS485 communication and interpreting RTU registers.

6.2 Temperature Compensation

The EVTSCAN RS-TRA-N01-AL sensor features built-in temperature compensation, which automatically adjusts measurements to maintain accuracy across its specified operating temperature range (-40°C to 60°C). This ensures reliable readings even in extreme environmental conditions.

Figure 4: Temperature Compensation Feature. This image visually represents the sensor's temperature compensation feature, showing it in a hot environment with a thermometer, emphasizing its ability to maintain accuracy across varying temperatures.

7. Maintenance

Regular maintenance ensures optimal performance and longevity of your solar radiation sensor.

- **Cleaning the Domes:** Periodically inspect the outer and inner glass domes for dust, dirt, or other obstructions. Gently clean the domes with a soft, damp cloth and mild detergent if necessary. Avoid abrasive materials that could scratch the glass.
- **Connection Check:** Annually inspect all electrical connections for corrosion or looseness. Ensure all wiring is secure.
- **Physical Inspection:** Check the sensor housing for any signs of damage or wear.

Figure 5: Multi-level Protection Design. This diagram highlights the protective design of the sensor, detailing the outer glass cover to block air convection, an inner glass cover to block infrared radiation, a general protective cover, and a sunshade board to prevent interference and ensure accurate measurements.

8. Troubleshooting

If you encounter issues with your sensor, refer to the following common problems and solutions:

- **No Data Output:**
  - Check power supply: Ensure the sensor is receiving 10V-30V DC power.
  - Verify wiring: Confirm RS485 A and B lines are correctly connected and secure.
  - Check communication settings: Ensure your data acquisition system's RS485 settings (baud rate, parity, stop bits) match the sensor's default or configured settings.
- **Inaccurate Readings:**
  - Clean the domes: Dust, dirt, or moisture on the glass domes can affect readings. Clean them as described in the Maintenance section.

    - Check for obstructions: Ensure no objects are casting shadows on the sensor.
    - Verify mounting: Confirm the sensor is mounted horizontally and is level.

9. Applications

The EVTSCAN RS-TRA-N01-AL Solar Radiation Sensor is suitable for a wide range of applications:

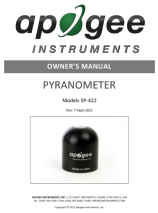
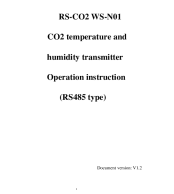
- Meteorological monitoring
- Solar energy system optimization
- Photovoltaic (PV) monitoring
- Scientific research
- Agriculture
- Building materials aging studies
- Atmospheric pollution monitoring

Figure 6: Wide Range of Applications. This collage demonstrates the broad utility of the sensor across different fields such as solar energy, meteorology, agriculture, building materials aging, and atmospheric pollution monitoring.

10. Warranty and Support

EVTSCAN products are designed for reliability and performance. For specific warranty details, please refer to the warranty card included with your product or contact EVTSCAN customer support. For technical assistance, troubleshooting, or further inquiries, please reach out to your vendor or EVTSCAN directly.

Related Documents - RS-TRA-N01-AL

	Renke RS-TBQ-N01-* Total Solar Radiation Transmitter User Manual Type 485 User manual for the Renke RS-TBQ-N01-* Total Solar Radiation Transmitter (Type 485). This document details product features, technical specifications, installation procedures, wiring diagrams, software configuration, Modbus-RTU communication protocol, register addresses, troubleshooting steps, and maintenance guidelines.
	Campbell Scientific SMP10 Pyranometer Manual: Solar Radiation Measurement Comprehensive guide to the Campbell Scientific SMP10 Pyranometer, covering specifications, installation, wiring, Modbus and analog programming, maintenance, troubleshooting, and safety. Ideal for solar resource assessment and environmental monitoring.
	RS-FSXCS-N01-* Ultrasonic Integrated Weather Station User Manual | Shandong Renke Comprehensive user manual for the RS-FSXCS-N01-* ultrasonic integrated weather station. Details technical specifications, installation guides, communication protocols (ModBus-RTU), software configuration, troubleshooting, and contact information from Shandong Renke Measurement and Control Technology Co., Ltd.
	Apogee SP-422 Pyranometer Owner's Manual Owner's manual for the Apogee SP-422 pyranometer, detailing its specifications, installation, operation, maintenance, troubleshooting, and warranty. Covers Modbus RTU communication for solar radiation measurement.
	RS-CO2 WS-N01 CO2 Temperature and Humidity Transmitter Operation Manual Detailed operation instructions for the RS-CO2 WS-N01 transmitter, covering product features, technical parameters, installation, configuration software, communication agreement (Modbus-RTU), register addresses, troubleshooting, and device specifications.
	Alpina Watches: Warranty and Operating Instructions Manual Comprehensive warranty and operating instructions for Alpina watches, covering model details, care, maintenance, and international warranty information. Includes guides for various models like AL-235, AL-240, and more.