



Runway Visual Range (RVR) Integrated or Standalone

allweatherinc

Overview

Combining the Model 8365 Dual-Technology Visibility Sensor with a high-accuracy Ambient Light Sensor (ALS), AWI's Runway Visual Range system measures the transparency of the atmosphere and calculates its extension coefficient. Runway Visual Range (RVR) values are determined by integrating the measurement of the runway light intensity with the extension coefficient.

Using both direct-attenuation and forward-scatter technologies, the 8365 can perform airborne particle-size measurements once available only from a transmissometer, while having the reliability and cost-effectiveness of a forward-scatter visibility sensor. Its precision and full compliance with ICAO recommendations makes it ideal for applications such as aviation and meteorological studies requiring high performance and reliability, from CAT I to CAT IIIb airports, along with aeronautical MOR and SYNOP measurements.

Accuracy by Design

Accurate measurement of visibility in all weather conditions, including heavy precipitation, fog, snow, smoke, and blowing sand, is limited in other sensors. Two-headed forward-scatter visibility sensors that rely solely on light scattering techniques are blind to certain size airborne particles that do not reflect light. By measuring both the light attenuation and light scattering at the same time, the 8365 Visibility Sensor computes ratio-metric values to derive the most accurate answer.

This measuring process cancels several variables during calculation and ensures that the visibility measurement is not affected by contaminants on the lenses, or by temperature effects on the emitters and electronics.



By having two direct-attenuation and two scatter values for every measurement, the 8365 Visibility Sensor does not have to depend on absolute measurements to be the most accurate sensor available today. This advantage means that measurements are independent of the effects of the environment, thereby maximizing accuracy, reducing recurring calibration, and minimizing maintenance requirements.

Scientifically Valid Chain of Calibration

Every 8365 Visibility Sensor is calibrated through a scientifically valid chain of reference. The response of the calibration device can be clearly traced to the "FAA golden standard transmissometer" at the FAA testing facility. This standard was established in direct comparison during certification of the sensor for aviation-quality measurements.

Extensive Self-Diagnostics

If one of the heads should fail the four-head configuration allows for continued operating with only three sensor heads. Built-in test (BIT) functions report the sensor head failure so that appropriate maintenance can be scheduled. The BIT functions also monitor power supply voltages, heater status, and indications of abnormal operation.

RVR Integrated or Standalone

When purchased along with a complete AWOS system the RVR is integrated and becomes a key part of the overall meteorological display system. However, if only RVR data are needed in one or more locations, AWI can configure a complete standalone application including an integrated display.

SENSORS

SPECIFICATIONS

Performance	
Measurement Range	33 ft to 50 miles (10 m to 80 km)
Accuracy	±2% distance ≤1.35 mi. (≤2 km) ±10% distance >1.35 mi. (>2 km)
Measurement Type	MOR or Extinction Coefficient
Averaging Intervals	3, 5, or 10 min
Measurement Units	miles or km
Operating Principle	Dual Technology - direct attenuation and forward-scatter
Light Source	Infrared LED (865 nm ± 35 nm)
Detector	Silicon Photodiode
Principal Scatter Angle	35 degrees
Serial Output	RS-485 or RS-232
Output Interval	Programmable: Interrogate, 10 s, 1 min, or 10 min
Baud Rate	Programmable: 300, 1200, 2400, 4800, or 9600 bps
RVR	
Output Interval	10 – 120 seconds
Averaging Intervals	1, 2, and 10 minutes
Trend	1, 2, and 10 minutes
Daytime Algorithms	Koschmeider's Law
Nighttime Algorithms	Allard's Law
Reporting Range	0 - 6000 ft. (0-2000 m)
Supported Sensors	1 – 16
Power Requirements	
Supply Voltage	115 V AC, 60 Hz 240 V AC, 50–60 Hz with M488174 220 V Kit
Max. Current Consumption	1.773 A
Environmental	
Operating Temperature	-40 to +140°F (-40 to +60°C)
Storage Temperature	-67 to +140°F (-55 to +60°C)
Relative Humidity	5–100%, noncondensing
Wind	up to 120 knots (220 km/h)
Hail	up to 0.5" (1.3 cm) dia.
Ice Buildup	up to 0.5"/h (1.3 cm/h)
Elevation	-100 to 10,000 ft ASL (-30 to 3030 m ASL)

ORDERING INFORMATION

Part Number	Description
8365-C	Dual-Technology Visibility Sensor, 115 V AC; includes sensor assembly & control unit.
M403326-00	Day/Night Sensor Kit
M488171-01	Ambient Light Sensor Kit (required)
83359-A	Runway Light Setting Interface; 220 V AC
M488173-01	Unistrut Mounting Hardware (control unit)
M488317-00	Galvanized Mounting Pipe Kit
M488150	Grounding Kit
M488174	220 V AC Conversion Kit
11903	Backup Battery Kit
T600503-00	Signal Cable, specify length
M492557	Power Cable, specify length
M104744	Calibration Paddle
M488175	Handheld Terminal Kit

DIMENSIONS & WEIGHTS

Sensor Assembly	61" L × 19" W × 21" H (155 cm × 48 cm × 53 cm)
Controller Assembly	14" W × 16" H × 6" D (30 cm × 36 cm × 15 cm)
Weight	74 lb (33 kg)
Shipping Weight	135 lb (61 kg)

U.S. Patent 5,373,367 Multiple Angle and Redundant Visibility Sensor
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All Weather Inc.

www.allweatherinc.com

Phone: 916-928-1000
USA Toll Free: 800-824-5873
Fax: 916-928-1165

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