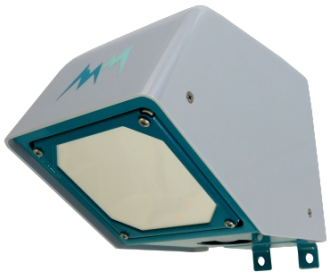

Non-Contact Discharge Radar RQ-30+

Non-contact discharge measurement by means of radar technology for open rivers

The RQ-30+ is a sensor for continuous discharge measurement of rivers, open channels and canals with known cross-section profile. The sensor uses innovative radar technology to measure velocity, water level and discharge. It enables reliable, non-contact measurement without the need for structural work in the water.

Features and advantages

- Contact-free radar method prevents soiling and damage, no sensor maintenance
- Automatic discharge calculation based on hydraulic model with multiple dynamic k-factors
- Sensor self-check with status and error output
- AI-based machine learning for compensation of environmental influences and early detection of errors
- 3-point velocity calibration certificate
- Advanced velocity diagnostics with spectrum display
- Discharge calculation inside the RQ-30+
- Water level and velocity sensor combined in one weather and vandalism proof housing
- Sommer Messtechnik ANR: advanced noise reduction system

Fields of application

The RQ-30+ enables discharge measuerment for rivers, streams, open channels and canals for which continuous monitoring is desired. Thanks to the non-contact radar technology the measuring equipment is not susceptible to contamination, debris or driftwood in the water. Furthermore, the non-contact measurement warrants very low maintenance and fail-safe operation especially during high water or flooding.

Implementation

The sensor can be simply mounted on bridges, on the roofs of closed canals or channel superstructures. The bed of the water should be as stable as possible in order to warrant consistent measurement. A visible swell must be evident on the surface of the water.

Measuring principle

The non-contact radar technology determines the water surface flow velocity using the Doppler frequency shift method and furthermore the water level is established by a travel time measurement. With known cross section profile the discharge Q of the water can then be calculated on basis of the continuity equation: $Q = v_m \cdot A(h)$

Technical details

General

- **Dimensions** 295 mm x 160 mm x 210,5 mm
- **Total weight** 5.4 kg
- **Protection class** IP 67
- **Power supply** 9... 30 V
- **Power consumption** at 12V standby approx. 1mA; active operation approx. 140mA
- **Operating temperature** -40…85 °C (-40…185 °F)
- **Lightning protection** integrated protection against indirect lightning with a discharge capacity of 0,6kW Ppp over voltage protection

Waterlevel measurement

- **Measurement range** 0 ... 15 m/ 0 ... 30 m
- **Resolution** 1 mm
- **Radar frequency** 80 GHz
- **Accuracy** ± 2 mm
- **Radar opening angle** 8° / 4°

Velocity measurement

- **Measurement range** 0.08 ... 16 m/s (depending on flow conditions)
- **Accuracy** +/- 0.01 m/s
- **Resolution** 1 mm/s
- **Direction recognition** +/-
- **Measurement duration** 5 ... 240 s
- **Measurement interval** 8 s ... 5h
- **Measurement frequency** 24 GHz (K-Band)
- **Radar opening angle** 12°
- **Distance to water surface** 0.50 ... 130m
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Automatic vertical angle compensation

- **Vertical inclination** measured internally
- **Accuracy** +/- 1°
- **Resolution** +/- 0.1°

Interface

- **Output** RS-485 ASCII or Modbus RTU, SDI-12, Analog output 4…20 mA (14 bit, max. load 250 ?), Digital output (low: 0 V, high: Vsupply, max. 1.5 A)
- **Digital interface** SDI-12; RS 485 or Modbus Protocol: various ASCII-protocols
- Output: water level, velocity and discharge, quality parameters
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