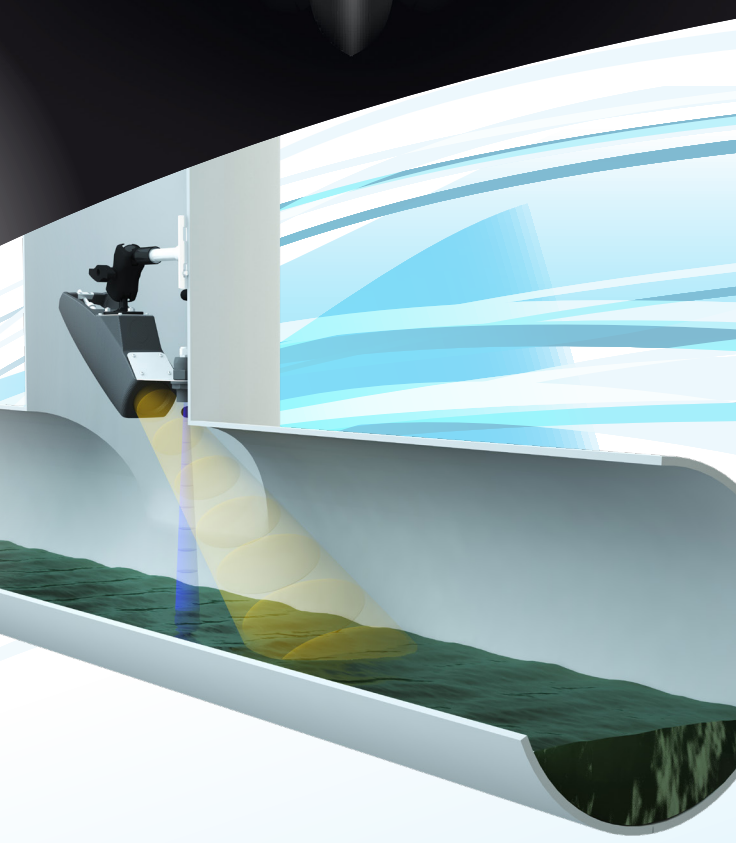
RAVEN-EYE 2®

NON-CONTACT RADAR FLOW MEASURING SYSTEM

THE REVOLUTIONARY FLOW METER!



FLOW-TRONIC nv

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THE REVOLUTIONARY FLOW METER!

The RAVEN-EYE® is the newest non-contact RADAR area/velocity flow meter for open channel flow measurements from Flow-Tronic. It combines state of the art non-contact radar measuring technology which measures flow from above the water surface with easy integration into existing SCADA or telemetry systems.

The RAVEN-EYE® has been designed for flow measurement in municipal wastewater and storm water sewers and easily adapts to a wide range of applications. Being positioned above the water surface, the RAVEN-EYE® avoids thereby all problems (grease, fouling, corrosive liquids) associated with traditional flow meters where the sensor is immersed in the fluid.

➜ Installation

The flexibility of the system and the wide range of mounting equipment make it really easy to install the sensor without specific engineering works and is ideal for retrofitting. The RAVEN-EYE® can be mounted in an existing manhole or under a bridge avoiding personnel to have contact with the flow.

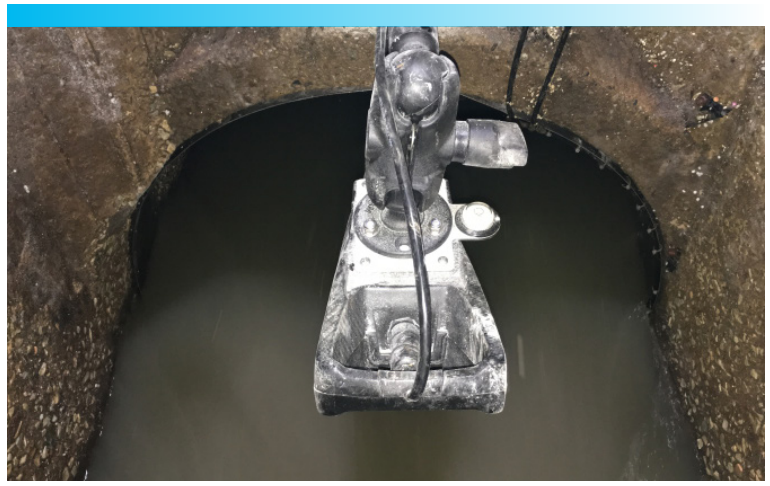
➜ Surcharge Conditions

The RAVEN-EYE® can be combined with optional surcharge velocity sensors and depth sensor in case a continuous measurement is required when the flow changes from open channel flow to surcharged flow conditions.

➜ No Maintenance

Maintenance is completely removed as the sensor is not in contact with the flow. The RAVEN-EYE® builds on years of experience measuring sewer flows, the sensor is totally sealed, no joints, seals, screws or washers are used. It's rated to IP68 which means it withstands surcharge events and aggressive atmospheres. Internal sensors monitor and report the condition or "health" of the system (auto-diagnostic system).

The combination of these benefits and virtually zero maintenance requirements, give the user a very low "Cost of Ownership".



Main benefits

- ➜ Accurate flow measurement
- ➜ Cost-effective
- ➜ Portable or stationary version available
- ➜ Non-contact: the sensor is positioned above the water surface
- ➜ Easy installation
- ➜ Robust IP68 (PU) enclosure
- ➜ Totally sealed sensor: no joints, seals or screws
- ➜ Developed for field applications
- ➜ Velocity distribution analysis & self-learning technology for average velocity calculation
- ➜ For channels from 4" and upwards
- ➜ Easy integration with SCADA, PLC or telemetry systems
- ➜ Perfect solution for difficult flow conditions: high solids content, high temperature, shallow and caustic flows, high velocities and large open channels
- ➜ No maintenance
- ➜ Auto-diagnostic system

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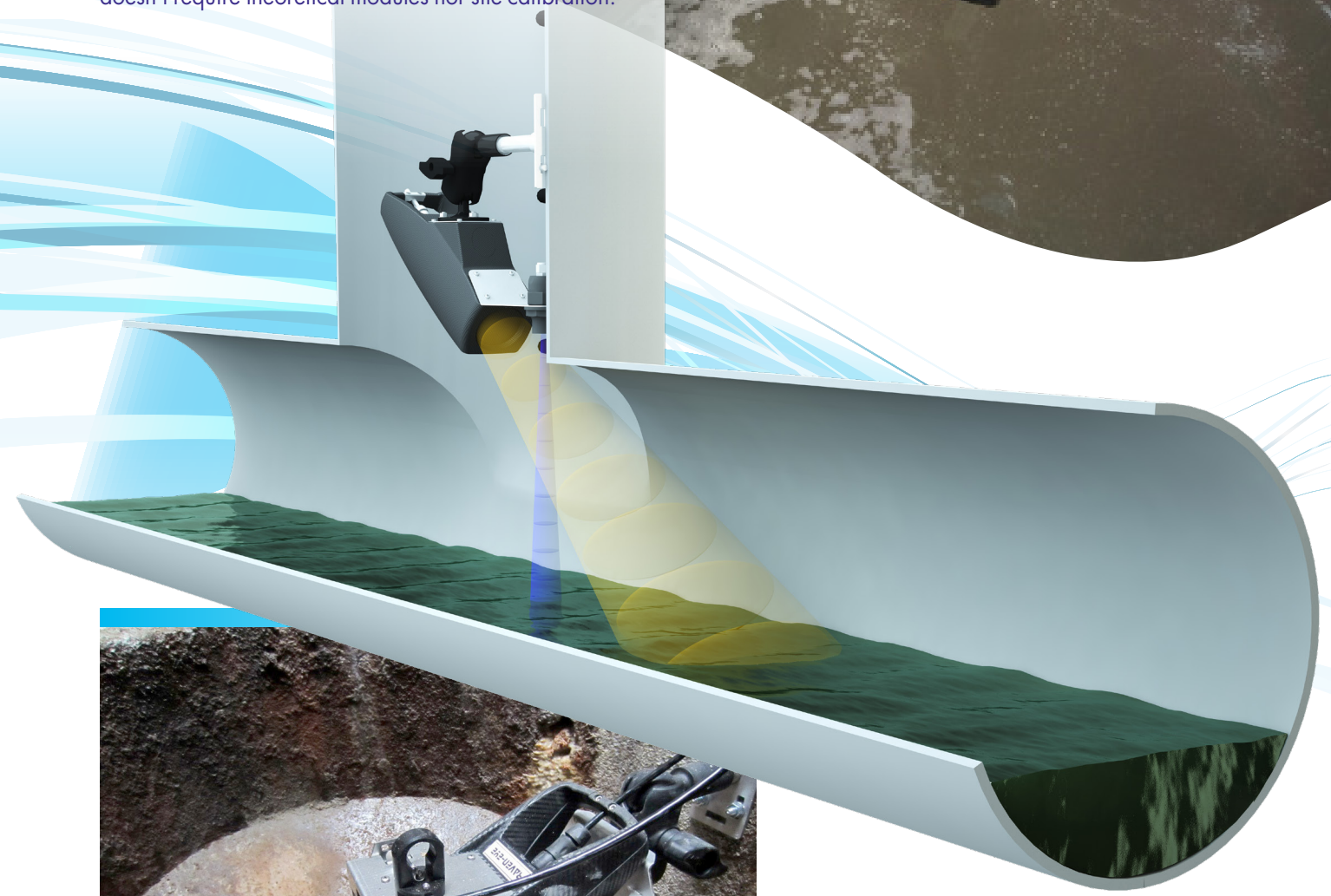
How does it work ?

The RAVEN-EYE® is mounted above the water surface and measures the flow velocity at the water surface using a pulse wave radar and the flow depth with a level sensor (ultrasonic, radar or pressure). The flow rate is calculated applying the continuity equation:

$$Q = \bar{v} \times A$$

During each measurement cycle, the RAVEN-EYE® makes thousands of individual velocity measurements which are analyzed and processed into an extremely accurate average velocity measurement reading using a dedicated digital signal processor making real-time spectral analysis. Average velocity is calculated within the sensor by analyzing the surface velocity distribution and using a self-learning technology that doesn't require theoretical modules nor site calibration.



Applications

Sewer/Channel Networks Monitoring

- Large sewer channels
- Capacity studies
- Combined sewer overflow (CSO) studies
- Inflow & infiltrations studies
- High velocity flows
- Discharge

Wastewater Treatment Plants

- Flow to treatment
- Discharge
- Plant effluent
- Storm discharge
- Process flow control

Industry & Hydropower

- Plant effluent
- Process waste water
- Flows with high solid contents
- Cooling water
- Industrial compliance monitoring
- Caustic & corrosive flows

Rivers, Channels & Irrigation

- Storm water monitoring & compliance
- Climate & hydraulic engineering
- Storm water basins calculations
- Permanent measurements of surface water

Technical specifications

General

Size (HxWxL)	7.2" x 5.5" x 16.6"
Weight	6.61 lb (without cable, level sensor and mounting accessories)
Materials	Enclosure: Polyurethane (PU), stainless steel
	Cable: Polyurethane jacketed
Cable Lengths	3, 66, 99 or length as needed up to 984 ft
Protection	IP68/NEMA 6P
Certifications	CE, ATEX (option)
Temperature Range	Operating: -22 to 158 °F
	Storage: -22 to 176 °F
Power Required	Input voltage: 4 to 26 VDC
Outputs	1 passive analog 4-20 mA (velocity only)
Communication	RS-485 (serial MODBUS ASCII open protocol) for use with PLCs
	RS-485 (proprietary protocol) for use with IFQ series or RTQ-Logger series
	Field interchangeable: Automatic recognition between stationary or portable units
Flow Accuracy	±5% of reading (typical : assumes pipe is 0 to 90% full)

Flow Measurement Method

Conversion from surface velocity to average velocity by analyzing surface velocity distribution using a self-learning technology that doesn't require theoretical modules nor site calibration.

Conversion of water level and pipe size to fluid area.

Multiplication of fluid area by average velocity to obtain the flow rate.

Velocity Measurement

Method	Non-Contact Radar Doppler
Measurement Range	±0.26 ft/s to ±29.53 ft/s
Measurement	Bi-directional
Accuracy	±0.5% of reading ±zero stability
Zero Stability	±0.06 ft/s
Minimum Velocity	0.26 ft/s (depending on flow conditions)

Optional Combined Level Measurement (Ultrasonic)

Technology	Non-Contact Ultrasonic Pulsed Echo
Measurement Range	0.00 to 5.74 ft (with ULS-02)
	0.00 to 18.86 ft (with ULS-06)
Accuracy	±0.2% of reading (with ULS-02), ±0.3% of reading (with ULS-06)
	Includes non-linearity + hysteresis
Temp. Error	Max. 0.04 %/K
Resolution	0.003 ft

Optional Combined Level Measurement (Radar)

Method	Non-Contact Pulsed Radar
Range	0.00 to 49.2 ft
Accuracy	±0.006 ft of reading
Resolution	0.003 ft

Optional Separate Level Measurement

Method	Any 4-20 mA loop powered sensor