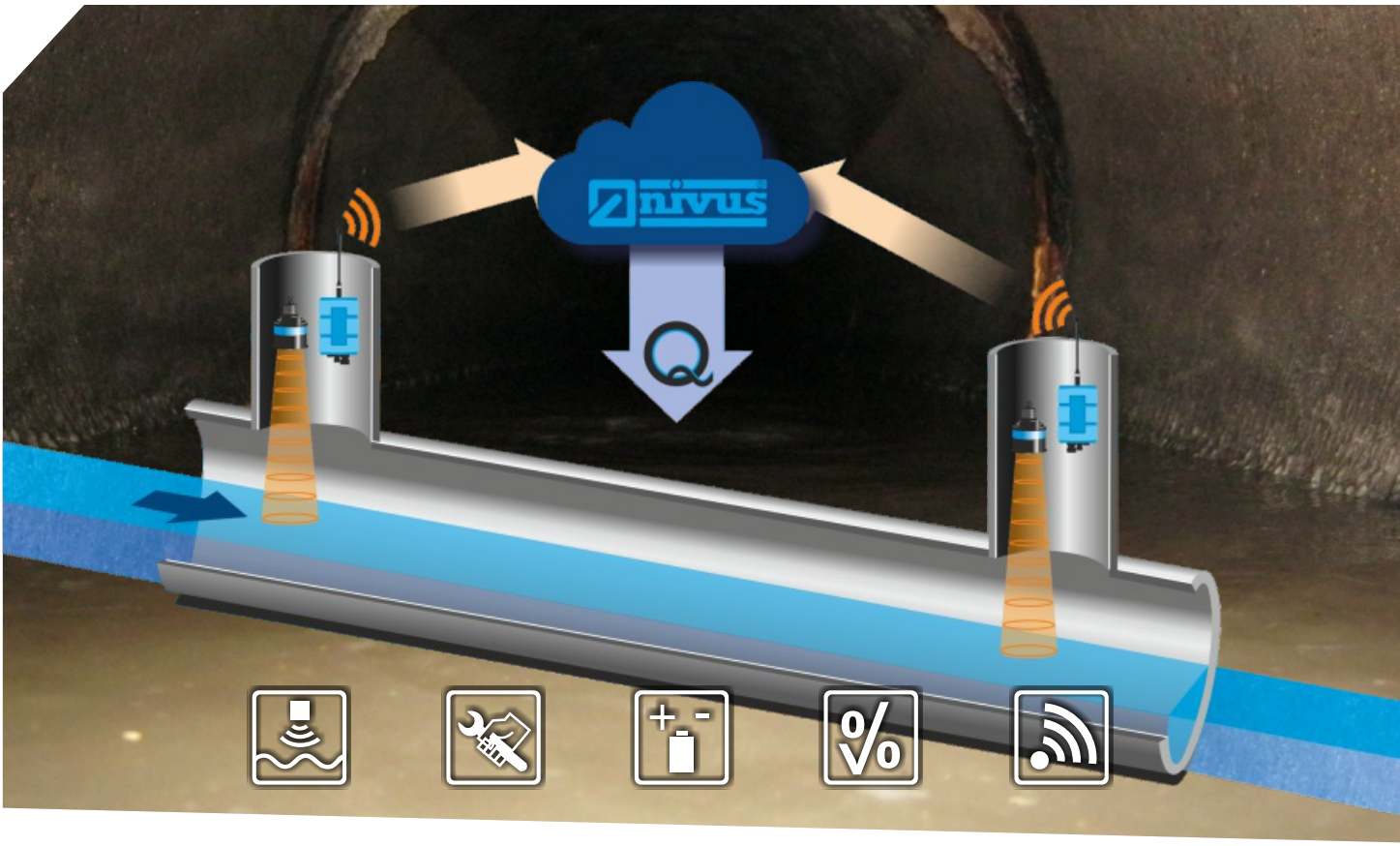
NivuSmart Q

Smart Flow Metering for part filled Pipes and Channels



Flow metering using two parallel flow measurements

- Contactless measurement
- Low maintenance
- Accurate method (calibration using cross correlation; <2% deviation)
- Detects negative flow
- Detection of backwater and free discharge

NivuSmart Q is a new measurement method for flow rate detection using two parallel level readings. The levels are measured in a known distance, e.g. by measuring in two consecutive shafts within a sewer system.
The NIVUS exclusive metering system is putting geometrical conditions (such as slope, diameter and width of a channel etc.) and latest hydraulic flow models in relation to each other.

By using site-specific equations it is possible to compute flow rates with a remarkably high accuracy. The accuracy is comparable to other non-contact flow measurement systems. Calibrating the system provides an extra increase in accuracy.

The System

Level measurements and GPRS data loggers are battery-powered.
The level readings are transmitted automatically to a centralised data management system.

- Independent from mains power
- Easy installation
- Long-life high performance battery
- Automatic and reliable data transmission
- Contactless
- Easy integration into SCADA or measurement data evaluation
- Ex version available

Project Implementation

NIVUS offers NivuSmart Q as a complete package. We provide site assessment, installation of the measurement system, commissioning as well as monitoring from one single source.

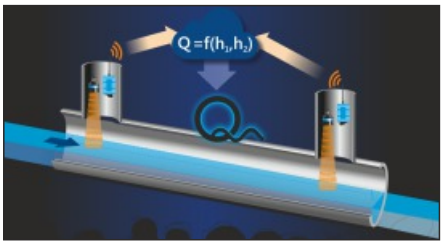
You can therefore be sure that all required conditions are in place.

- ✓ Determination of (appropriate) measurement site
- ✓ Measuring of the site geometry
  (distance h1 and h2, channel diameter, slopes etc.)
- ✓ Measuring of level scenarios in the application and hydraulic analysis
- ✓ Creation of site-specific equations for flow rate calculation
- ✓ Installation of parallel level measurements (h1 and h2)
- ✓ Application of equations for level measurements
- ✓ Testing and verification

Typical Applications

- Measurement sites featuring difficult maintenance conditions
- If it is not possible to install the measurement system in the channel, such as in glass fibre reinforced pipelines
- If there is no mains power or communication infrastructure available
- Redundant flow metering

You can find the NivuSmart Q info video on www.nivus.com



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The Development

The NivuSmart Q flow measurement method is based on hydraulic findings. The project was initiated in the 2000s by Professor José Vazquez of the University of Strasbourg.
As a part of this project many studies (Vazquez et al., 2006; Isel et al., 2012; Dufresne et al., 2014) and master theses (Montandon, 2005; Solliec, 2006) as well as a PhD thesis (Isel, 2014) have been published. The measurement method of the University of Strasbourg is legally protected. NIVUS are exclusive licence holder.

Our Test Measurement

One of our test measurements was performed in the „Mühlgasse“ inflow in Leingarten, Germany. Between both NivuSmart Q level measurements an ultrasonic cross correlation system using a PCM Pro was installed as reference measurement.
The parallel level measurements were installed within 2 hours. Measuring the level scenarios of the application took 3 days.
Four more days were needed to create the application-specific equations. Regular measuring operation started 2 weeks after installation of the metering system.

Geometry

- Concrete pipe DN 700
- Slope 0.32%
- Distance between level measurements 134 m

Deviation to reference measurement

- Uncalibrated 5 – 10%
- After calibration < 2%