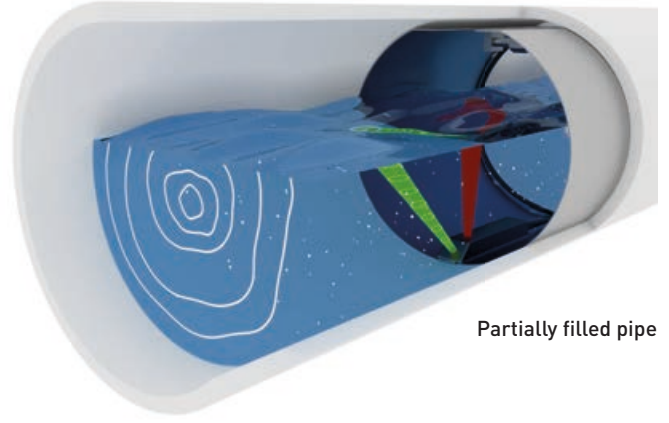


# Flow meter for pipes & open channels

Q-Eye PSC MT  
Datasheet







Partially filled pipe

# Waste Water





# Q-Eye PSC MT

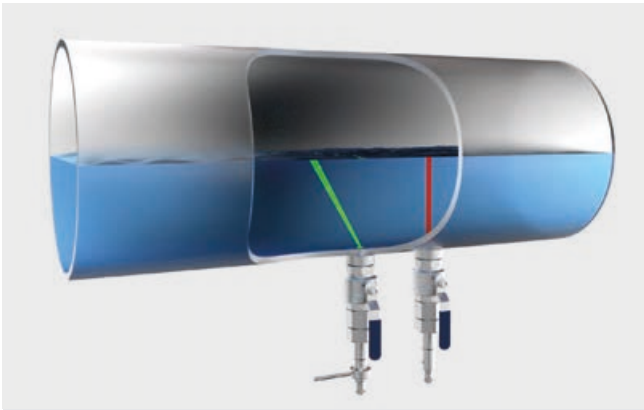
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The Q-Eye PSC MT permanent velocity area flow meter is designed for applications in full or partially full pipes 100-2000 mm (4-80 inches) in diameter, or open channels with flow depths 40-2000 mm (1,5-80 inches).

It uses advanced "Doppler profiling technology" to directly measure velocity profiles making it the best choice for sites with non-uniform, rapidly changing, backwatered, near zero, negative or reverse flow conditions. This eliminates the need for on-site calibration, thereby reducing significantly the cost of installation.

Combined with an integral upward looking ultrasonic or a secondary external pressure sensor (optional) for determining the depth, the meter is using a numerical model for averaged velocity in the entire cross section and the continuity equation to calculate flow.

The system can be equipped with up to 4 analog inputs, up to 4 analog outputs, 2 digital outputs and 4 relays.

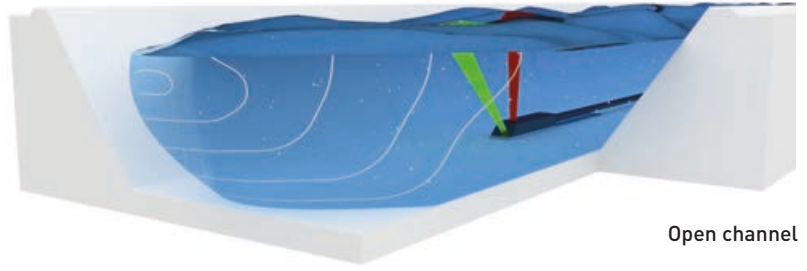


Flow meter  
Q-Eye PSC MT (Sensor – Insertion Type)



Flow meter  
Q-Eye PSC MT (Sensor – Mouse Type)





Open channel

# Channels





## The Q-Eye PSC MT is ideal for permanent flow monitoring and studies/surveys:

- Wastewater collection systems (Infiltration studies, hydraulic model calibration, event notification, long term trend analysis)
- Combined sewer systems (Characterize combined sewer overflow (CSO) impacts)
- Wastewater treatment facilities (Influent measurement, real-time process control, effluent measurement)
- Irrigation channels (Supply management)
- Industrial flows (Flow measurement, process optimization)
- Storm water runoff monitoring



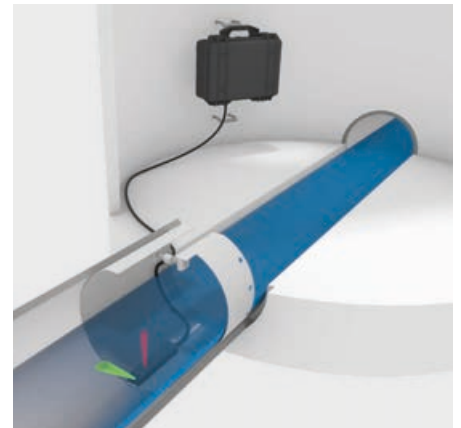
## Profiling Technology

Pulsed wave Doppler systems use a transducer that transmits short acoustic pulses. The received echo is range-gated to provide velocity measurements selectively from a small segment along the acoustic beam, step by step over the entire velocity profile.

Reflections of particles in other areas do not have any influence on the velocity measurement. Additionally the 1 MHz sensor provides higher data resolution by detecting smaller particles.

## Data Transmission

Automatic data transmission via GPRS communication is an option and can be used worldwide. The logged data can be sent to any host computer (FTP-Server) or to the GWF web-based cloud solution at a user-selectable frequency (typically 4 times a day, once a day or once a week). Alternatively, WLAN and Ethernet are available.



Installation in manhole, Q-Eye PSC Pro portable

### Web-based data logging

enables real-time remote access to our web-based graphing and analysis platform that provides 24/7 web access to data collected with your flow meter.

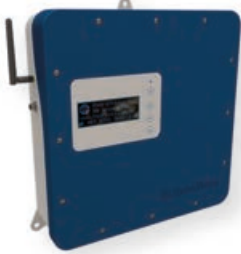


# Technical Information

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## Q-Eye PSC MT

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Transmitter

Q-Eye PSC MT is a major improvement in open channel flow measurement. It's the latest entry in the family of high accuracy metering products. This flow computer incorporates all of the required algorithms and software to ensure accuracy and repeatability. The IP65 (NEMA 4X) compact flow display computer has a 4 x 20 alphanumeric

LCD display and a 4 button keypad. All configuration data and measured and calculated data are stored inside an 16 GB Micro-SD card. It controls the measurements, calculates the flow rate and provides freely programmable current outputs, status alarm, frequency outputs and totalizer readings.

## Software (WLAN)

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Parameterization of the measurement site and data visualization is easily possible using the standard web-browser of your already existing smartphone, tablet PC or notebook – there is no need for any

additional software or App. The interface is graphical and menu-driven for rapid commissioning. Your flow meter can be accessed from anywhere – anytime 24/7.

## Sensors

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Insertion Type

Low Profile  
Velocity Area Sensor

The submersible depths and velocity sensor which measures only 15 x 25 x 108 mm is the smallest sensor of this type currently available. A low profile means less interference, which results in more accurate velocity measurements, especially in low-flow situations. The insertion sensor

is used, when the pipe is accessible from the outside only. For use in full pipes or partially full pipes when used in conjunction with an ultrasonic pressure depth sensor. These sensors can be installed into existing pipework through an 2" ball valve.

## Mounting Systems

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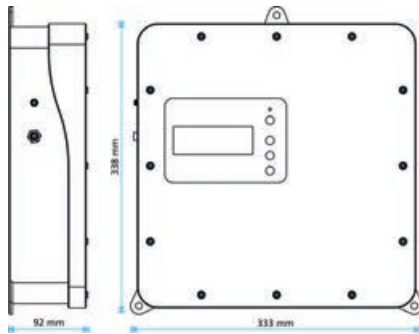
Mounting plate, spring ring and scissors rings

All sensors can be attached to a mounting plate, spring and scissors rings to install the sensors in minutes and reducing time in the manhole. The sensor is first attached to a carrier and can then slide onto any of the compatible mounting systems. This maintains a height, suitable for measuring flow rates and velocities at very low water levels. To install the sensors in rectangular, trapezoidal or earthen channels, we recommend the sensor mounting plate. Stainless steel spring rings simplify sensor installation in cylindrical pipes. 6 standard diameter

sizes from 200 mm (8 inches) to 600 mm (24 inches) are available. You can install the sensor and fasten the cable to the downstream edge of the ring in place before you enter the manhole. The self-expanding device is tight by expanding the band for a friction fit inside the pipe. The adjustable scissors ring is installed in large diameter pipes from 500 mm (20 inches) to 1450 mm (57 inches) in diameter. It consists of a base section, one or more pairs of extensions to fit the size of the pipe and a scissors mechanism.

# Technical Data

## Transmitter



### Q-Eye PSC MT Specifications Transmitter

Sensor	1 x velocity 1 x water level
Frequency	1 MHz
Number of cells	max. 18 cells (Q-Eye PSC MT Pro)
Display	4 lines, 20 characters
Keyboard	4 keys
Datalogger	16GB Micro SD card
Communication	RS-485, Modbus (RS-232 or RS-485), WLAN, GPRS, Ethernet 10/100 Mbps
Inputs	max. 4 x 4-20 mA, 2 x digital
Outputs	max. 4 x 4-20 mA, 4 x Relay, 2 x digital
Power supply	85-260 V <sub>AC</sub> (48-60 Hz) or 9-36 V <sub>DC</sub>
Approval	IP 65
Enclosure	ABS, wall mounted

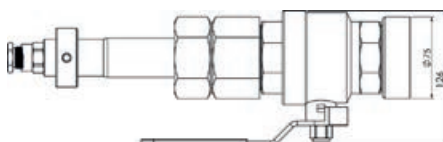
## Sensor – Mouse Type



### Area Velocity Sensor

Sensor	1 x velocity 1 x water level
Frequency	1 MHz
Range	velocity $\pm 5,3$ m/s water level (ultrasonic) 0,04 - 1,3 m expandable via external 4-20 mA sensor
Accuracy	$\pm 1\%$ of measured value for v and h (ultrasonic) $\pm 2\%$ for flow
Cable length	10 m incl. (max. 80 m)
Particle concentration	> 50 ppm
Material	Epoxy
Protection class	P68 (NEMA 6P)
Dimensions	108 x 25 x 15 mm (L x B x H)

## Sensor – Insertion Type



### Insertion Sensor

Sensor	1D velocity for full-filled pipes incl. 2" ball valve
Frequency	1 MHz
Range	$\pm 5,3$ m/s (velocity)
Accuracy	< 0,5% FS (for v > 1 m/s) < 0,5% FS $\pm 0,0025$ m/s (for v < 1 m/s)
Cable length	10 m incl. (max. 80 m)
Material	Stainless steel
Dimensions	diameter: 2", length: 350 mm



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26.10.2018 – EPe60101

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## Flow meter for pipes & open channels



Q-Eye PSC Pro portable  
Datasheet

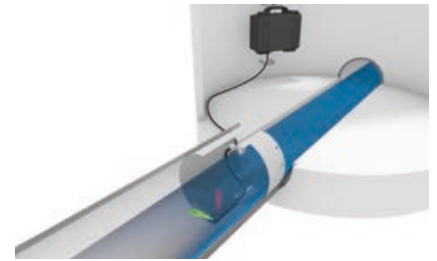




# Q-Eye PSC Pro portable

The Q-Eye PSC Pro portable velocity area flow meter is designed for mobile flow monitoring of slightly to heavily polluted media in full or partially full pipes or open channels.

It uses advanced Doppler profiling technology to directly measure velocity profiles making it the best choice for sites with non-uniform, rapidly changing, backwatered, near zero, negative or reverse flow conditions. This eliminates the need for on-site calibration, thereby reducing significantly the cost of installation.



Temporary installation in manhole



Flow Meter  
Type Q-Eye PSC Pro portable

Information on the level, velocity, flow, signal strength and battery can be taken at regular intervals between 1 minute and 60 minutes. In case of an event, the logging can be set automatically to one minute. Variable logging intervals assure maximum information about an exceptional event - while saving power and data capacity under normal conditions. This meter will log the data (16 GB) for more than one year. In addition the flow meter can control a sampler in a flow-proportional sampling mode by means of a pulse output.

## Profiling Technology

By developing the PSC technology GWF managed to improve older Doppler methods like Continuous Wave or Pulsed Wave Doppler. When compared against the simple cross-correlation method (determination of specific patterns in the flow) the PSC technology allows for a measurement in considerably more cells with a cell size of only a few millimeters and measures the velocity profile with a much higher resolution. By means of a special correlation technology in signal processing, it is possible to measure flow velocity profiles very close to the sensor (low water level), as well as in big distances to the sensors (high water level). This makes the sensor suitable for both shallow waters and applications with higher water levels.

## The Q-Eye PSC Pro portable is ideal for temporary flow monitoring studies/surveys:

- Wastewater collection systems  
(Infiltration studies, hydraulic model calibration, event notification, long term trend analysis)
- Combined sewer systems (Characterize combined sewer overflow (CSO) impacts)
- Wastewater treatment facilities  
(Influent measurement, real-time process control, effluent measurement)
- Irrigation channels (Supply management)
- Industrial flows  
(Flow measurement, process optimization)
- Storm water runoff monitoring

In contrast to the Spectral-Correlation method, the simple cross-correlation method does not measure velocity until several cm (5-6 cm) away from the sensor. In addition, the maximum distance is limited to as little as 1m due to noise in the medium (weak patterns for higher distances).

Also, in a sensor based on the PSC method, no complex and vulnerable electronic needs to be built in, making it possible to keep the sensor small and less influenced by temperature fluctuations (due to different extension coefficients of sensor using and built-in electronic).

## Data Transmission

Automatic data transmission via GPRS communication is an option and can be used worldwide. The logged data can be sent to any host computer (FTP-Server) or to the GWF web-based cloud solution at a user-selectable frequency (typically 4 times a day, once a day or once a week).





# Technical Information

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## Transmitter

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The flowmeter comes in an IP67 case ready for use in harsh environments e.g. the use in sewer networks. The instrument can be read out without opening the case by simply activating WLAN transmission. No need to connect any cable for data download or configuration! Neither cable, nor app or software are

needed to connect the transmitter with your already existing laptop, smart-phone or tablet. All components of the flowmeter are powered by 2 redundant batteries. Those batteries are hot swappable so they can be changed during operation. Optionally to the integrated modem, a LAN connection is available.

## Velocity

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Low Profile Velocity Area Sensor

The submersible depth and velocity sensor, which measures only 15x20x108 mm is the smallest sensor of its type currently available. A low profile means less interference, which results in more

accurate velocity measurements, especially in low-flow situations. The chemically resistant, encapsulated sensor resists oil and grease and eliminates the need for frequent cleaning.

## Level

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Air ultrasonic



Pressure Sensor

The ultrasonic downlooking sensor provides non-contact level measurements. The sensor deflector plate guarantees minimal dead band and resists condensation. Redundant level measurements in combination with pressure sensor and/or the depth and velocity sensor.

The external pressure sensor is the latest generation of fully submersible high performance sensor (accuracy +/-0,1% FS) for measurement of hydrostatic levels. The slim line stainless steel body incorporates many enhanced features to provide reliable and long term accurate level measurements. In addition, a full range of related accessories simplifies installation, operation and maintenance.

## Mounting Systems

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Mounting plate, spring ring and scissors rings

All sensors can be attached to a mounting plate, spring and scissors rings to install the sensors in minutes and reducing time in the manhole. The sensor is first attached to a carrier and can then slide onto any of the compatible mounting systems. This maintains a height, suitable for measuring flow rates and velocities at very low water levels. To install the sensors in rectangular, trapezoidal or earthen channels, we recommend the sensor mounting plate. Stainless steel spring rings simplify sensor installation in cylindrical pipes. 6 standard diameter

sizes from 200 mm (8 inches) to 600 mm (24 inches) are available. You can install the sensor and fasten the cable to the downstream edge of the ring in place before you enter the manhole. The self-expanding device is tight by expanding the band for a friction fit inside the pipe. The adjustable scissors ring is installed in large diameter pipes from 500 mm (20 inches) to 1450 mm (57 inches) in diameter. It consists of a base section, one or more pairs of extensions to fit the size of the pipe and a scissors mechanism.

## Cloud data logging

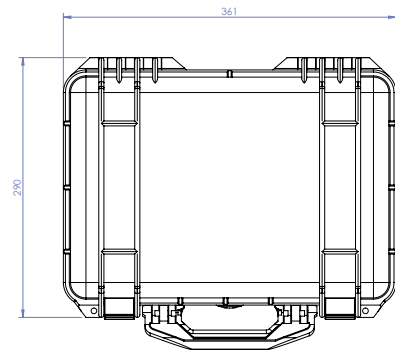
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Cloud data logging enables real time remote access to our web-based graphing and analysis platform that provides 24/7 web access to data collected with your flow meter.

# Technical Data

## Transmitter

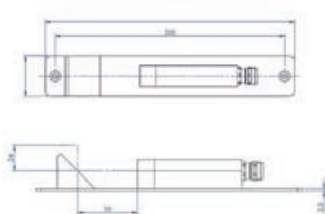


Transmitter & Battery	
LC Display	4 lines, 20 characters
Keyboard	4 keys
Memory	16 GB Micro SD card
Communication	WLAN, Ethernet RJ45 / LAN (option)
Modem	integrated
Inputs	max. 2 x 4-20 mA
Outputs	1 x external power supply
Power supply internal	2 x rechargeable batteries, hot swappable
Power supply external	possible via 24 V <sub>DC</sub>
Protection class	IP 67
Case material	HPX resin
Dimensions	290 x 361 x 165 mm

## Sensor



Area Velocity Sensor



Air Ultrasonic Sensor  
downlooking

	Area Velocity Sensor	Air Ultrasonic Sensor
Sensor	1 x velocity 1 x water level	ultrasonic, downlooking
Frequency	1 MHz	
Range	velocity $\pm 5,3$ m/s water level (ultrasonic) 0,04 - 1,3 m expandable via external 4-20 mA sensor	80 - 1200 mm
Accuracy	$\pm 1\%$ of measured value for v and h (ultrasonic), $\pm 2\%$ for flow	1% of measuring range
Cable length	max. 80 m	
Particle concentration	> 50 ppm	
Material	Epoxy	stainless steel, PBT
Protection class	IP68 (NEMA 6P)	IP67
Dimensions	108 x 25 x 15 mm (L x B x H)	
Weight	1 kg (incl. 10 m cable)	
Output		4-20 mA

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