

# MICROFLOW-i

## Non-Contacting Loop Powered Liquid Velocity Sensor

### The water industry's solution to event duration measurement in combined sewer overflows.

Pulsar's MicroFlow-i delivers accurate, repeatable velocity measurement for liquid flow, either as an individual sensor or by providing HART communication protocol or a 4-20mA loop powered signal into a SCADA system.

It's lightweight, compact design makes installation simple, especially within confined spaces, and requires no interruption to normal operational flow.

#### **MicroFlow-i Options**

The MicroFlow range has been specified and designed to meet the demanding requirements of today's process flow measurement applications. The unit is positioned above and at 45 degrees to the flow and measures flow velocity.

The standard RS485 version is Ex mb certified for use in zones 1 and 2, and the 2 wire loop-powered version with HART protocol is intrinsically safe (Ex ia) for Zone 0.

#### **MicroFlow-i Communication**

The 2-wire version can be used in digital HART mode or as a 4-20mA loop-powered device. The MicroFlow-i can be set up using a HART modem with either proprietary HART software such as PACTware, or MicroFlow HART PC software.

#### **Cable Lengths & Brackets**

Standard cable lengths 10 m (32 ft), 20 m (65 ft), 30 m (98 ft) available.



### THE RIGHT METER FOR

- Event Duration Measurement
- Combined Sewer Overflows
- Open Channel Flow Monitoring
- Remote Locations
- Velocity Area Solutions

The MicroFlow-i should be installed directly above the flow with the axis at 45 degrees to the flow to be measured, we have a range of brackets available that will assist with installation angles.

#### **Event Duration Measurement for Combined Sewer Overflows**

Event Duration Measurement (EDM) in Combined Sewer Overflow (CSO) applications has, rightly, become a significant focus for our water operators.



MicroFlow-i Measuring Flow Velocity

Management of pollution under flood conditions is a significant challenge and, with ever more demanding monitoring regimes, operators have implemented thousands of CSO monitoring installations and thousands more are planned, with data logging and level measurement to record spill events. Looking beyond CSO, there are good reasons to monitor flow throughout the wastewater network to identify problem areas, alert maintenance teams, and generate corrective action.

Level is only one part of the equation, as we can now add velocity sensors that are above a channel to measure the flow velocity.

Measuring velocity using a non-contacting technique is a very complex challenge analytically and has only really become realistic with the faster processors now available to instrumentation designers. Pulsar uses a technique called Refracted Spread Spectrum Analysis (RSSA). In Pulsar's MicroFlow-i product, a pulse is fired at the liquid surface, producing a mass of reflections from the full width of the channel, a single transducer handling channels up to 1.5 m (4.92 ft) width and multiple transducers working together for wider applications, applying the RSSA algorithms to analyze and integrate the received signals, then 'slicing' them for real-time analysis and velocity calculation.

### Service & Installation

Our award-winning products are favored worldwide due to their reliability and easy menu-driven set-up.

All products from Pulsar Measurement are designed to be easily installed and set up, but if you are unsure of your installation, our service engineers are ready to assist you. From telephone and web support to onsite commissioning and on/off-site product training, we will ensure that you get the most out of your product and sales experience with Pulsar Measurement.

If you are unsure of your application requirements or which product is right for you, our technical teams can advise you on the best solution to your application and technology requirements, making sure that you get the most accurate and reliable readings every time.

For more information on our service offerings, please visit the website or contact one of our head offices.



The MicroFlow-i and dBi low powered sensors for CSO Network Monitoring.

## Technical Specifications

### PHYSICAL: MOUNTING OPTION SPECIFIC

<b>Sensor Body Dimensions:</b>	90 mm D x 140 mm H (3.54 in x 5.51 in)
<b>Weight:</b>	Nominal 1 kg (2.2 lb)
<b>Sensor Body Material/Description:</b>	Valox 357
<b>Transducer Cable Extensions:</b>	2-core screened
<b>Maximum Separation:</b>	Up to 1,000 m (3,280 ft)
<b>Mounting Connection:</b>	Via 1" BSP back mounted thread or 20 mm (0.79 in) via supplied adaptor. Optional mounting bracket available from Pulsar
<b>Mounting Angle:</b>	45° optimal and mounted at the center line of the channel with a clear uninterrupted view

### ENVIRONMENTAL

<b>Enclosure Protection:</b>	IP68
<b>Max. &amp; Min. Temperature (Electronics):</b>	-20 °C to +60 °C (-4 °F to +140 °F)
<b>CE &amp; Radar Approvals:</b>	Listed in the Certificate of Conformity within the manual.
<b>ATEX Approval:</b>	Ex II 1 G D, Ex ia IIC T4 Ga, Ex ia IIIC T135°C Da (Directive 2014/34/EU)

### PERFORMANCE

<b>Velocity Range:</b>	0.2 m/s to 6 m/s (0.66 ft/s to 19.7 ft/s)
<b>Operational Range:</b>	Up to 3 m H
<b>Accuracy:</b>	The greater of +/- 0.5% or 0.05 m/s (0.16 ft/s)
<b>Optimal Installation:</b>	Install at an angle of 45° in line with the flow. More information is provided within the manual — see the 'Locating the MicroFlow-i sensor' section
<b>Max. Channel Width per Sensor:</b>	1.5 m (4.92 ft)
<b>Radar:</b>	K-Band (ISM)
<b>Transmitter Power:</b>	<15 dBm
<b>Beam Width:</b>	20° inclusive
<b>Wake-up Time:</b>	Typically 4 seconds warm (<12 hours from last start-up)

### OUTPUTS

<b>Communication:</b>	HART compatible, 4-20mA loop powered
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### PROGRAMMING

<b>PC Programming:</b>	MicroFlow-i HART PC via HART modem
<b>Programming Security:</b>	Via passcode
<b>Programmed Data Integrity:</b>	Via non-volatile memory
<b>PC Setup &amp; Monitoring Software:</b>	Compatible with Windows 7/8/10

### SUPPLY

<b>Operating Voltage:</b>	10-28 V DC
<b>Power Consumption:</b>	<ul style="list-style-type: none"> <li>Start-up = 20mA</li> <li>Average current = 60 µA per hour when one velocity measurement is performed every 15 minutes</li> </ul>

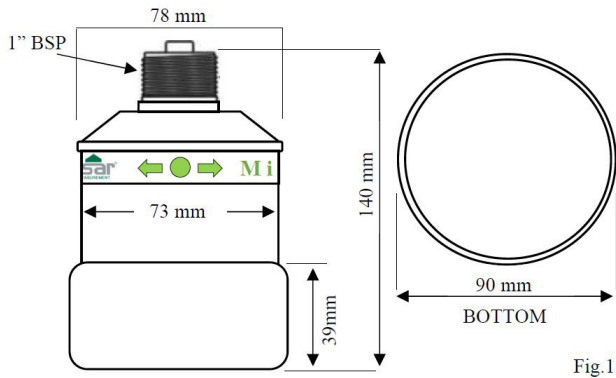


Fig.1

MicroFlow-i Drawing

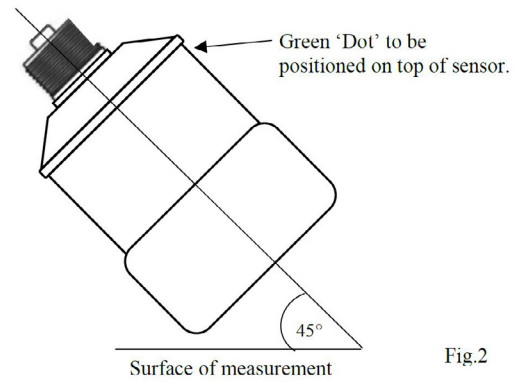


Fig.2

MicroFlow-i Mounting Drawing

## Delivering the Measure of Possibility

Pulsar Measurement offers worldwide professional support for all of our products, and our network of reps and distributors all offer full support and training. Our facilities in Malvern, UK and Largo, USA are home to technical support teams who are always available to answer your call or attend your site when required. Our global presence, with direct offices in the UK, USA, Canada, and Malaysia allow us to create close relationships with our customers and provide service, support, training, and information throughout the lifetime of your product.

By taking a step forward in echo processing technology, Pulsar Measurement addresses applications previously thought to be beyond the scope of ultrasonic measurement. This technology improves signal processing at the transducer head which has made it possible to increase resistance to electrical noise, enabling the transducer to 'zone in' on the true echo.

For more information, please visit our website:

[www.pulsarmeasurement.com](http://www.pulsarmeasurement.com)



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