

# VELOCITY TRANSMITTER

High performance velocity transmitter designed for use as a system component in open channel and part-filled pipe applications.



## benefits and features

**Powerful, easy to use** PC software simplifies transmitter commissioning

**Quick to install** - no weirs or flumes

**Velocity measurement** from 10mm/S up to 5m/S

**High sensitivity** extends applications to 'clean' water

**Streamlined velocity probe** eliminates fouling and reduces flow disturbances

**Real-time processing of velocity signals** thereby reducing power consumption

**Smart power saving mode** - intelligent use of power saving which automatically reduces the measurement time for high flow velocities and high signal qualities and increases the measurement time for low velocities and low signal qualities

**Sophisticated ultrasound** processing ignores spurious signals

**Ultrasound signal quality monitor** confirms measurement integrity

**Distances up to 500 m** from system unit to velocity sensor



## measurement principle

Mainstream uses the area-velocity method to give a continuous or time sample measurement of fluid flow. Mainstream uses a streamlined probe that operates immersed in the flowing liquid. The velocity probe transmits ultrasound into the liquid to create a zone of inspection. Bubbles and solid particles carried through this zone by the flow, even when present in only minute quantities, reflect ultrasound back to the probe. Only high quality signals containing verified velocity information is used, thereby ensuring measurement integrity.

This measured frequency shift in the ultrasound signals gives flow velocity. The verified velocity signals produce a histogram of the flow velocities. Analysing this histogram gives the mean flow velocity.

Liquid level is measured by a submerged pressure transmitter or ultrasonic sensor. The flow cross-sectional area is deduced from the liquid level measurement and the stored description of the channel or pipe cross section. The flow rate is the flow velocity multiplied by the flow cross-sectional area.

## applications

- Effluent Monitoring
- Waste Water Treatment
- Industrial Flow Measurement
- Irrigation Channels & Canals
- River/Stream Flow Measurement
- Water Distribution
- Sewer Flow Measurement - Inflow & Infiltration, CSO Monitoring
- Portable and Fixed-site Flow Measurement with Weirs & Flumes
- Velocity Probe Mounting Hardware

## mainstream's communicator data

- Intuitive point-and-click user interface with pull-down menus and Communicator's dynamic/distinctive button bar for flowmeter configuration, diagnostics and real-time displays
- Real time display of measurements and velocity histogram
- Backup and restore of the Mainstream configuration



# MAINSTREAM VELOCITY TRANSMITTER

## communicator data

### PRODUCT FEATURES

#### VELOCITY MEASUREMENT

<b>Transducer Type :</b>	Submerged ultrasonic sensor containing signal generator, transmitter, receiver and decoder electronics
<b>Method :</b>	Phase Coherence time delay measurement determines the time for tracers carried by the flow to travel a fixed distance (~ 0.75 mm)
<b>Velocity Range :</b>	-5 m/s to -10 mm/s and 10 mm/s to 5 m/s
<b>Resolution :</b>	Better than 1 mm/s
<b>Measurement Integrity :</b>	Ultrasound signal quality monitor gives the percentage of the measurement time that the received ultrasound signal contains useful velocity information
<b>Smart Power Saving :</b>	Each velocity measurement is based on the same quantity of information. Automatically reduces the measurement time for high flow velocities and high signal qualities and increases the measurement time for low velocities and low signal qualities

#### DERIVED MEASUREMENTS

<b>4:20mA Output :</b>	Velocity Power Supply and Quality Signal
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#### POWER SUPPLIES

<b>Power Inputs :</b>	Connectors for external 12V and 24V supplies
<b>External 12V supply :</b>	Connection for external 12V
<b>External 24V supply :</b>	Connection for external 24V (required if using 4:20mA output)
<b>Power Supply Monitor :</b>	Power monitoring circuits track supply status. Supply voltages can be viewed via the UI

#### COMMUNICATIONS

<b>Local :</b>	RS232 and USB compatible interface with automatic baud rate detection. Supports 1200, 2400, 4800, 9600, 14400, 19200, 38400, 57600 and 115200 baud
<b>Remote :</b>	Optional external SDI or MODBUS adapter
<b>Software :</b>	Mainstream Communicator UI software for system configuration, diagnostics, real-time measurement. Display and data retrieval. Mainstream Communicator runs on PC platforms under Windows 2000, XP, Vista, 7, 8, 8.1 and 10 with data transmission from device to PC, for data control, processing and export

#### MEASUREMENT UNITS AND FORMATS

<b>Velocity :</b>	Selectable from mm/s, cm/s, m/s, in/s, ft/s, ft/min
<b>Display Format :</b>	Independently configurable display format for each measurement. Options are integer, fixed point with 1 to 6 decimal places, and scientific (E-format). Display defaults to scientific format if data cannot be correctly represented in selected format
<b>4:20mA Outputs:</b>	One 4:20 mA output. Configurable to selected measurands

### PRODUCT HARDWARE

#### VELOCITY SENSOR

<b>Materials :</b>	Streamlined µPVC moulding and polyurethane cable
<b>Dimensions :</b>	105 mm long x 50 mm wide x 20 mm high
<b>Cable :</b>	8 mm diameter polyurethane cable with Aramid strain cord. Breaking load 45 kg. Minimum static bend radius 52 mm
<b>Weight :</b>	1 kg including standard 10 m cable length
<b>Maximum Cable Length :</b>	500 m
<b>Environmental Protection :</b>	Totally encapsulated to IP 68
<b>Operating Temperature :</b>	-10°C to 80°C
<b>Minimum Operating Depth :</b>	30 mm

#### SYSTEM UNIT

<b>Materials :</b>	Ultra pure cast aluminium
<b>Dimensions :</b>	220 mm wide x 120 mm deep x 80 mm high
<b>Weight :</b>	1.5 kg
<b>Environmental Protection :</b>	Enclosure is IP67. Electronic assembly is encapsulated to IP68
<b>Operating Temperature :</b>	-10°C to 70°C