

Water Quality Monitoring

The most often monitored components are:

COD	BOD	TOC	hydrocarbons
pH	temperature	redox	conductivity
dissolved oxygen	particles	iron	manganese
heavy metals	phosphates	nitrites	NH₃
phenols	sulphates	toxicity	sodium
cyanides	H₂S	hydrazine	silicates
chlorine	level measuring	coagulants distribution	AOX

ECM promotes the following applications by its instruments:

- surface water
- drinking water production
- waste water treatment plants
- sewerage systems
- water in technological processes
- underground water
- waste storage monitoring

The new revolutionaly immersion flow spectrometric analyser that is assigned for a wide range of continual, processing or portable applications. This maintenanceless instrument operates on optical principle and does not need any chemicals, calibration and interventions. It covers concentrations ranging from micrograms up to grams per a liter.

The usual applications are:

- organic pollution monitoring expressed as COD, TOC, BOD, oil in water, turbidity, colour, nitrites, nitrites, etc.
- warning systems against to terroristic attacks for distribution of drinking water. Instrument during several seconds records even an extremely low concentration of toxic components.
- mineral-oil reduction monitoring
- water purity monitoring for technological processes (pharmaceutical production, boiler water...)

The instruments for process level monitoring, temperature and conductivity of underground water with possibility of data recording or data transferring.



ECM ECO Monitoring

Environmental & Process Monitoring instrumentation & systems



The submersion miniature analysers of pH, ORP, DO, conductivity, turbidity, chlorophyll, penetration of photosynthetic radiation, nitrates, ammonia, and chlorine.

Monitoring of pH, conductivity and dissolved oxygen for waste water treatment plants.



The calorimetric, titrating and potentiometric analysers for pollution monitoring by using methods which are in compliance with standard laboratory procedures.

The online refractometers for monitoring of concentration of optional compounds in water solutions (acids, sugar, lithium, etc.).



The combined analyzer for on-line monitoring of total nitrogen, nitrite, total phosphor and phosphates.



The toxicity and BOD analysers using respirometrical methods.

The portable and stationery water and sludge samplers with sample extraction to chilled bottles with possibility setting of optional procedures (including self-draining procedure).



The heavy metal analysers from trace concentrations on level of ppb up to high concentrations in technological sludges.

The analysers of toxicity and content of water grass in drinking water using methods which are in compliance with standard water methods. All instruments use digital technology of image detection.



ECM ECO Monitoring

Environmental & Process Monitoring instrumentation & systems



The instruments for automatic distribution of coagulants and flocculants. Instruments for optimisation of water modification for drinking and technological purposes.

CLO₂ modification of drinking and technological water. Equipment allows considerable energetic savings because there is not necessity of water heating on temperature above 70 °C to protect multiplying of legionella bacteria.



Analyse of COD, oil, AOX, TOC, TN by methods which allow excellent accord with standard laboratory procedures.

Flow, pressure and temperature monitoring using instruments which are optimized for various operating conditions.



The CH₄, CO, O₂ analysers in bio gases in version for precise and safety analyses of explosive samples.

The biogas heat value analysers allow by mixing with earthgas to set the composition of gas to be in accordance with parameters of used energetic devices.



The portable instruments for monitoring of explosive and toxic gas concentrations which allow safety maintenance and operation of devices where is risk of leakage of dangerous gas components.

On-line wastewater analyzers

Total Nitrogen Analyzer



Unique Selling Points

- Equimolar response
- Measurement of TN in complex matrices with high concentration of Salts
- Low consumption of chemicals
- No need for calibration / Easy to use
- Low operational costs
- Combination with TP measurement possible**

Applications

- Influent monitoring
- Compliance monitoring
- Process control

Total Phosphorus Analyzer



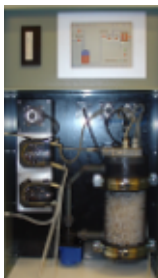
Unique Selling Points

- Quantitative recoveries, even for complex samples
- Advanced wet-chemical oxidation technique
- Pre-calibrated, ready-to-analyze
- Low investment & cost of ownership
- Combination with TN measurement possible**

Applications

- Effluent monitoring
- Influent monitoring
- Process monitoring

Toxicity Analyzer



Unique Selling Points

- Continuous use of real sludge from the WWTP for measurement
 - Same pH
 - Same temperature
 - Ongoing measurement even in case of toxicity
- Direct Toxicity measurement by using respiration rate(mgO₂/l.h) instead of O₂ concentration
- Time selectable Toxicity cycle
- Combination with BOD_{st} measurement possible**

Applications

- Influent monitoring
- Early warning system

BOD_{st} Analyzer



Unique Selling Points

- Continuous use of real sludge from the WWTP for measurement
 - Same pH
 - Same temperature
 - Ongoing measurement even in case of toxicity
- Direct BOD measurement by using respiration rate(mgO₂/l.h) instead of O₂ concentration
- Time selectable BOD_{st} cycle
- Combination with Toxicity measurement possible**

Applications

- Influent monitoring
- Process monitoring
- Overload prevention monitoring

BODst and Toxicity Analyzer (Also available as LAB version)



Unique Selling Points

- ❑ Continuous use of real sludge from the WWTP for measurement
 - Same pH
 - Same temperature
- ❑ Ongoing measurement even in case of toxicity
- ❑ Direct BOD / Toxicity measurement by using respiration rate instead of concentration
- ❑ Time selectable BODst / Toxicity cycle

Applications

- ❑ Influent/Effluent monitoring
- ❑ Early warning system
- ❑ Overload prevention monitoring
- ❑ Better process performance

SV, SVI & Vs Analyzer



Unique Selling Points

- ❑ Up-stream settler control (action can be taken many hours before problems occur in the settler)
- ❑ Simulates the settler performance
- ❑ Optimisation of flocculant dosage
- ❑ On-line, continuous monitoring of SV, SVI & Vs (each 30 minutes)
- ❑ Easy-to-operate (touchscreen)
- ❑ *Also unique research & batch instrument*

Applications

- ❑ Automated polymer addition
- ❑ Continuous monitoring of Vs, SV, SVI, dSV

Total (Organic) Carbon Analyzer



Unique Selling Points

- ❑ Reliable technology (Mass flow controlled UV-heated persulphate method)
- ❑ Industrial PLC/PC platform for maximum reliability
- ❑ UV-reactor designed for maximum oxidation efficiency
- ❑ Automatic calibration, validation & cleaning
- ❑ Field-proven technology (up-time > 98%)
- ❑ Oversized cabinet allows easy maintenance from front side

Applications

- ❑ Effluent monitoring
- ❑ Influent monitoring

VFA, Alkalinities and Bicarbonates Analyzer



Unique Selling Points

- ❑ Algorithm-based analyzer for the fast determination of VFA, bicarbonates and alkalinities
- ❑ Continuous control of your anaerobic process
- ❑ Compatible on-line alternative to lab GC analysis
- ❑ On-line results every 10 minutes
- ❑ Easy-to-operate, maintenance-friendly
- ❑ Low cost of ownership

Applications

- ❑ Optimization of your anaerobic wastewater treatment plant

Mainstream

Ultrasonic Area-Velocity Flowmeter for Open Channels and Part-filled Pipes

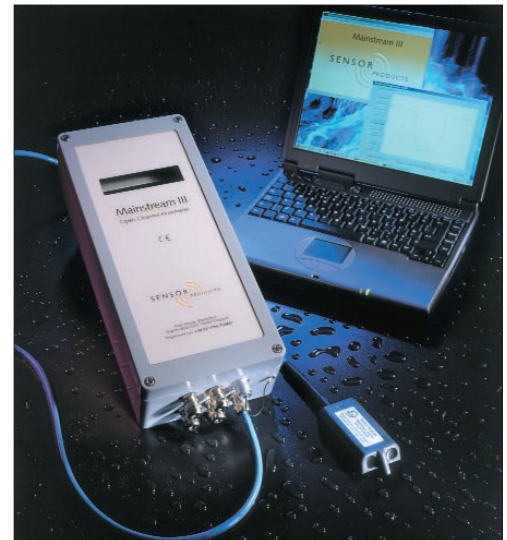
For liquids from 'clean' water to raw sewage, in channels from 150mm to 3m, Mainstream flowmeters ensure accuracy, reliability and low cost of ownership

Applications

- Effluent Monitoring
- Waste Water Treatment
- Industrial Flow Measurement
- Irrigation Channels
- River/Stream Flow Measurement
- Water Distribution

Features and Benefits

- Quick to install - no weirs or flumes.
- Bi-directional flow measurement for forward and reverse velocities from 10 mm/S up to 5m/S.
- Streamlined velocity probe eliminates fouling and reduces flow disturbances.
- High sensitivity extends applications to 'clean' water.
- Powerful, easy to use PC software simplifies flowmeter commissioning.
- Sophisticated ultrasound processing ignores spurious signals.
- Ultrasound signal quality monitor confirms measurement integrity.
- High capacity data logger for permanent records of level, velocity and flow rate.
- Opto-isolated switch outputs for alarms and controls.
- Optional 4:20 mA outputs for telemetry and control systems.
- Optional modem for dial-up access and internet connectivity.
- Available in intrinsically safe format.



Fixed Installation Flowmeter

Mainstream uses the area-velocity method to give a continuous measurement of fluid flow.

Suitable for any liquid containing bubbles or suspended solids, even in minute quantities, the velocity probe detects reflected ultrasound.

Signals from the probe are analysed using Phase Coherence Processing (patents pending).

Phase Coherence Processing only accepts signals containing verified velocity information. The percentage of signal accepted is the signal quality. A high signal quality confirms the integrity of the measurement.

The verified velocity signals produce a histogram of the flow velocities. Analysing this histogram gives the mean flow velocity.

The liquid level is measured by a submerged pressure transmitter or ultrasonic sensor.

Flow cross-sectional area is deduced from the liquid level measurement and a stored description of the pipe or channel cross-section.

The flow velocity is multiplied by the flow cross-sectional area to give the flow rate, and integrated to give the total discharge.

Mainstream Product Specification

With flexible interface options and easy to use Mainstream Communicator software, the Mainstream flowmeter is simple to customise for your application

System Unit

Rugged aluminium housing for permanent installation.

Dimensions 360 mm high x 160 mm wide x 90 mm deep. Weight 4 kg.

Environmental protection to IP65. IP68 available.

Velocity Probe

Streamlined μ PVC moulding. Dimensions 105 mm long x 50 mm wide x 20 mm high. Cable exit and pressure sensor mounting at rear. Reinforced cable – standard length 10 m, maximum length 500 m.

Intrinsically safe option to EEx ia IIC T5(-20°C to +40°C)/T4(-20°C to +80°C).

Level Sensor

Stainless steel pressure transmitter with desiccant protected atmospheric reference.

Sensor interface fully compatible with alternative level sensors providing 4:20 mA signals.

Measurement Display

Large character LCD configurable for most engineering units. Display sequence is user selectable from date, time, level, flow cross-sectional area, signal quality, flow velocity, flow rate, quantity of flow in last hour and total flow quantity.

LCD legend available in various languages.

Local Communications

RS232 compatible local serial port. Automatic error detection protocol.

PC Software

Windows 98, Me, 2000 and XP compatible Mainstream Communicator software included with each flowmeter.

Intuitive point-and-click user interface for flowmeter configuration, diagnostics and real-time displays.

Features include graphical interface to input the pipe/channel cross-section, simple level sensor calibration procedure, real time displays of measurements and velocity histogram, facilities for remote diagnostics, plus backup and restore of Mainstream configuration.

Data Logger

Integral data logger with recording rate configurable for 30 seconds, 1, 2, 3, 5, 6, 10, 12, 15, 20, 30 or 60 minute intervals. Facility to organise logged data into daily records with user selectable start time.

Logger capacity approximately 250,000 measurements corresponding to more than 6 months data at 2 minute intervals.

Logger incorporates data compression for rapid data retrieval using Mainstream Communicator software. Recorded measurements output in spreadsheet compatible format.

Switch Outputs

Two opto-isolated switch outputs, each rated at 60V ac/dc and 250 mA maximum current.

Switches independently programmable to open or close at a user defined level, ultrasound signal quality, velocity or flow rate. Switches also configurable to generate pulses to indicate a user defined flow quantity.

4:20 mA Outputs (Optional)

Four opto-isolated 4:20 mA outputs transmitting level, ultrasound signal quality, velocity and flow rate information with user defined scaling. Outputs may be operated in active mode using integral isolated 24V dc supply or in passive mode powered by external measurement loop.

Integrated PSTN Modem with Internet Connectivity (Optional)

Integrated modem gives access to all Mainstream Communicator software features via dial-up connection.

Automatic dial-out and delivery of logged data to any specified email address without user intervention.

Warns if the liquid level, velocity or flow rate is outside user specified operating limits.

Generates a request for service should the integrated diagnostics detect a reduction in flowmeter performance.

Power Supply

Nominal 24V dc (18 to 30V) at 200 mA maximum current (optional 4:20 mA outputs operating in active mode).

Auxiliary 12V dc input for low power (battery) applications and uninterruptable operation. Low power operating modes down to 2 Ah per month.

Performance

Bi-directional velocity measurement with better than 100:1 turndown ratio. Velocity measurement range from 10 mm/S to 5 m/S. Resolution 1 mm/S. Guaranteed no zero offset or drift.

Level measurement conversion accuracy better than 0.05% of full scale.

Flow measurement accuracy depends on installation and operating conditions. Typically better than 2% in evaluation trials.

Mainstream Portable

Ultrasonic Area-Velocity Flowmeter for Open Channels and Part-filled Pipes

For liquids from 'clean' water to raw sewage, in channels from 150mm to 3m, Mainstream flowmeters ensure accuracy, reliability and low cost of ownership

Applications

- Effluent Monitoring
- Waste Water Treatment
- Industrial Flow Measurement
- Irrigation Channels
- River/Stream Flow Measurement
- Water Distribution

Features and Benefits

- Quick to install - no weirs or flumes.
- Bi-directional flow measurement for forward and reverse velocities from 10 mm/s up to 5 m/s
- Streamlined velocity probe eliminates fouling and reduces flow disturbances.
- High sensitivity extends applications to 'clean' water.
- Powerful, easy to use PC software simplifies flowmeter commissioning.
- Sophisticated ultrasound processing ignores spurious signals.
- Ultrasound signal quality monitor confirms measurement integrity.
- High capacity data logger for long term records of level, velocity and flow rate.
- Opto-isolated switch outputs for alarms and controls.
- Optional modem for dial-up access and internet connectivity.



Portable Flowmeter

Mainstream uses the area-velocity method to give a continuous or time sampled measurement of fluid flow.

Suitable for any liquid containing bubbles or suspended solids, even in minute quantities, the velocity probe detects reflected ultrasound.

Signals from the probe are analysed using Phase Coherence Processing (patents pending).

Phase Coherence Processing only accepts signals containing verified velocity information. The percentage of signal accepted is the signal quality. A high signal quality confirms the integrity of the measurement.

The verified velocity signals produce a histogram of the flow velocities. Analysing this histogram gives the mean flow velocity.

The liquid level is measured by a submerged pressure transmitter or ultrasonic sensor.

Flow cross-sectional area is deduced from the liquid level measurement and a stored description of the pipe or channel cross-section.

The flow velocity is multiplied by the flow cross-sectional area to give the flow rate, and integrated to give the total discharge.

Mainstream Product Specification

*Competitively
priced and
simple to
install, the
Mainstream
portable
flowmeters are
the ideal
solution for
high quality
data collection*

System Unit

Case body ultra high impact structural copolymer polypropylene.

Highly resistant to chemical attack.

Protection classified to IP65. Case meets MIL-STD 4150-H.

Dimensions 270 mm wide x 250 mm deep x 180 mm high. Weight 5 kg.

Operating temperature range - 10° C to 70° C.

Velocity Probe

Streamlined µPVC moulding. Dimensions 105 mm long x 50 mm wide x 20 mm high.

Cable exit and pressure sensor mounting at rear.

Reinforced cable- standard length 10 m, maximum length 500 m.

Intrinsically safe option to EEx ia IIC T5 (-20°C to +40°C)/T4(-20°C to +80°C).

Level Sensor

Stainless steel pressure transmitter with desiccant protected atmospheric reference.

Sensor interface fully compatible with alternative level sensors providing 4:20 mA signals.

Measurement Display

Large character LCD configurable for most engineering units. Display sequence is user selectable from date, time, level, flow cross-sectional area, signal quality, flow velocity, flow rate, quantity of flow in last hour and total flow quantity.

LCD legend available in various languages.

Local Communications

RS232 compatible local serial port. Automatic error detection protocol.

PC Software

Windows 98, Me, 2000 and XP compatible Mainstream Communicator software included with each flowmeter.

Intuitive point-and-click user interface for flowmeter configuration, diagnostics and real-time displays.

Features include graphical interface to input the pipe/channel cross-section, simple level sensor calibration procedure, real time displays of measurements and velocity histogram, facilities for remote diagnostics, plus backup and restore of Mainstream configuration.

Power Supply

Built in 12V 7Ah rechargeable battery for up to three months endurance. External 12V and 24V power inputs for extended endurance.

Data Logger

Integral data logger with recording rate configurable for 30 seconds, 1, 2, 3, 5, 6, 10, 12, 15, 20, 30 or 60 minute intervals. Facility to organise logged data into daily records with user selectable start time. Logger capacity approximately 250,000 measurements corresponding to more than 6 months data at 2 minute intervals.

Logger incorporates data compression for rapid data retrieval using Mainstream Communicator software.

Recorded measurements output in spreadsheet compatible format.

Switch Outputs

Two opto-isolated switch outputs, each rated at 60V ac/dc and 250 mA maximum current.

Switches independently programmable to open or close at a user defined level, ultrasound signal quality, velocity or flow rate. Switches also configurable to generate pulses to indicate a user defined flow quantity.

Integrated Modem with Internet Connectivity (Optional)

Integrated modem gives access to all Mainstream Communicator software features via dial-up connection.

Automatic dial-out and delivery of logged data to any specified email address without user intervention.

Warns if the liquid level, velocity or flow rate is outside user specified operating limits. Generates a request for service should the integrated diagnostics detect a reduction in flowmeter performance.

Performance

Bi-directional velocity measurement with better than 100:1 turndown ratio. Velocity measurement range from 10 mm/S to 5 m/S. Resolution 1 mm/S.

Guaranteed no zero offset or drift.

Level measurement conversion accuracy better than 0.05% of full scale. Flow measurement accuracy depends on installation and operating conditions. Typically better than 5% in evaluation trials.