

# FloPro

Series 3

Measure water quantity and quality, your total monitoring solution

- Measures flow practically anywhere
- Flexible monitoring and control
- High accuracy with NO moving parts
- Low cost of ownership



Measure water quantity and quality.  
Your total monitoring solution.



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

**mace**

Water Monitoring Solutions

## How does it benefit me?

### Measures flow practically anywhere

- Same insertion sensor will measure in full pipes 4" to 100" diameter
- Same strap mount sensor will measure in partially full pipes 6" to 100" diameter
- Open channel flow
  - regular and irregular cross-sections
- Optional sensors for hazardous locations

### Flexible monitoring and control

- Use multiple 3rd party water quality sensors
  - pH
  - Conductivity
  - Dissolved oxygen
- Up to four optional I/O card slots
- Multi-channel data logging (2Mb RAM)
- Use multiple 3rd party water quantity sensors
  - Downward looking ultrasonic depth sensor
  - Insert electromagnetic
  - Paddle wheels
  - Transit time

### High accuracy with NO moving parts

- Works great in dirty water
- Works great in turbulent streams
- Reliable under difficult hydraulic conditions
- No more blocked pipes

### Low cost of ownership

- Economical to purchase and install
- Single unit with up to five sensors
- No moving parts – virtually maintenance-free
- No pipe blockages – less field maintenance

### Total stream profile measurement

- True average stream velocity
- No point velocity measurements
- Less straight run requirement

### Versatile straight run requirements

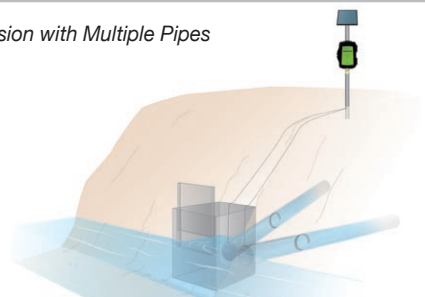
- Only eight total diameters of straight run
- FloPro can "look" upstream or downstream
- Different sensor styles – versatile mounting options

### Telemetry ready

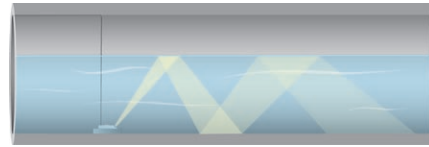
- ModBUS
- SDI-12
- GSM/GPRS modem

## Where can I use it?

Lateral Diversion with Multiple Pipes

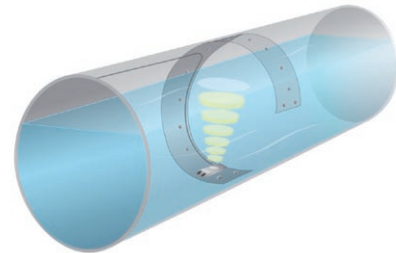


## How does it work?



### Velocity

- Measured using continuous wave Doppler ultrasound
- Sound wave measures the speed of dirt, bubbles and other particles across the whole stream profile to calculate a true average velocity.



### Integral Depth

- Integral hydrostatic ceramic depth sensor measures the "weight" of the water above it and converts it to a depth.
- Mounting versatility is the key. This style of depth sensor can be mounted on the channel bottom or on the side, away from sand & silt.



### Electronics module

- Real-time digital display of data channels
- Integral data logger
- Solar or mains power versions



**4** STANDARD Control Outputs

**7** STANDARD Sensor Inputs

## Plug 'n' play expansion



- MACE CardBus system with five slots
- Standard I/O card supports seven sensor inputs and four outputs
- MACE FloSI telemetry interface - ModBUS, SDI-12
- FloPro Series3 is expandable to a maximum of five I/O cards.

- Telemetry
- Water Sampler
- Programmable Logic Controller (PLC)

Dissolved Oxygen (DO) Sensor

Downward Looking Ultrasonic Sensor

Rain Gauge

Conductivity Sensor

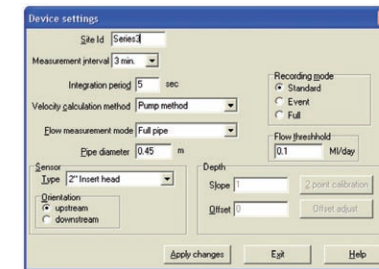
H<sub>2</sub>O Quality Multi-probe

pH Sensor



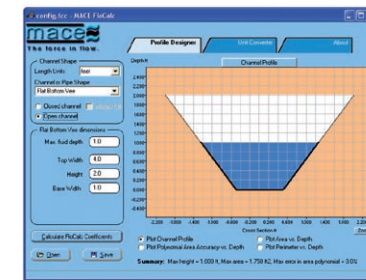
### Sensors

- 2" NPT insertion sensor
- Strap mount velocity only or combined velocity/depth sensor



### FloCom+ Software

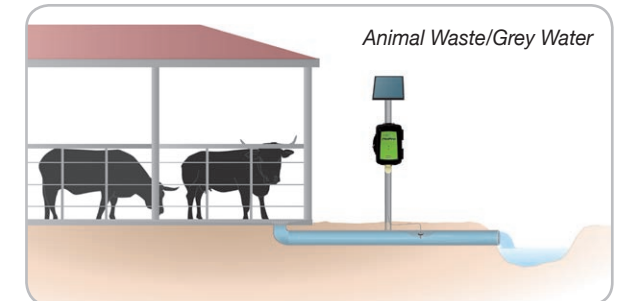
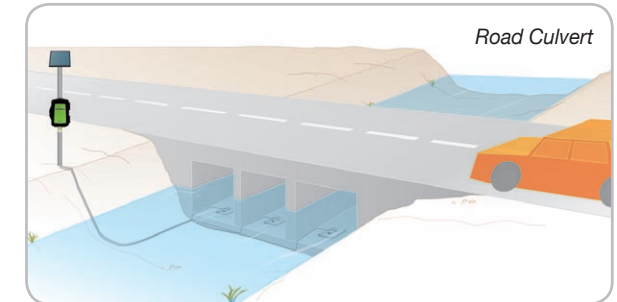
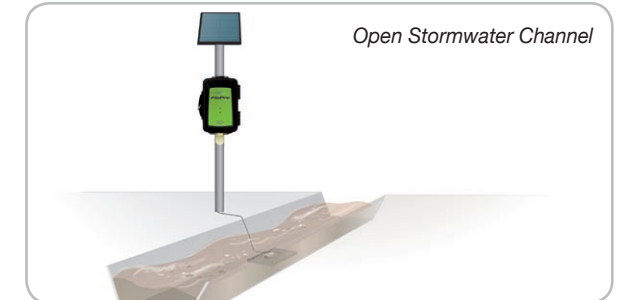
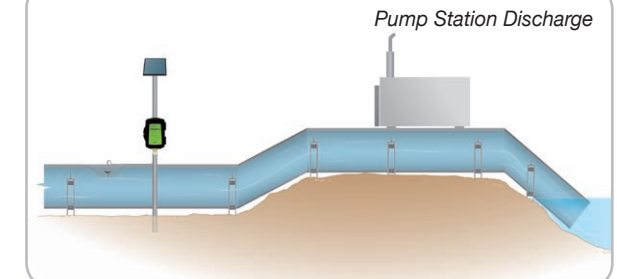
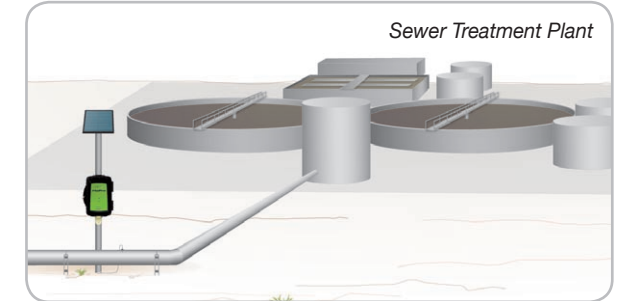
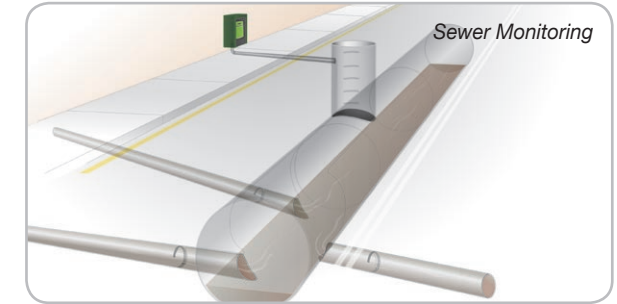
- Free to user
- Easy to use
- Configure, download, diagnostics



### FloCalc Software

- Free utility for drawing complex channel shapes
- Powerful CAD-style interface
- Handy user conversion tools

## Where can I use it?



# FLOPRO SERIES 3 SPECIFICATIONS

## GENERAL

Weight	11 lbs
Dimensions	14.2" (H) x 10.2" (W) x 6.7" (D)
Enclosure rating	IP66
Enclosure material	UV stabilized polycarbonate
Operating temperature (with internal battery installed)	5 to 122 degrees Fahrenheit
Operating temperature (with internal battery removed and external power used)	-4 to 150 degrees Fahrenheit
Flow display	16 character x 2 line alphanumeric LCD with backlight
Program memory	2 Mb flash
Power	Internal 12Volt 7.2Ah battery with external solar panel or mains charger
Units of measure	User definable (metric/US)
Application software	FloCom+ PC software for system configuration, data downloading and velocity profile testing. Minimum system requirements – Windows XP
Factory backup	24 month parts and labour guarantee

## DOPPLER FLOW SENSOR INPUT CARD

Doppler velocity	One standard Doppler velocity card included Optionally, up to four additional MACE velocity only or combined MACE velocity/depth sensors (velocity card required for each)
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## PULSE INPUT/OUTPUT CARD (OPTIONAL)

Digital input	1 x Frequency input, range 0-1000Hz, accuracy 0.5Hz
Switched sensor power	+5 VDC (50mA limit) or +12VDC (1A limit)
Digital output	1 x voltage free contact, 10Hz

## TELEMETRY OPTIONS

Telemetry options	Optional MACE FloSI card supports MODBUS, SDI-12, RS232, RS485. Optional MACE Modem Comms card
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## Don't need to measure Flow? use the HydroMace 3000

- Integrated solution - includes logger, solar regulator and battery all in one weather proof enclosure.
- Powerful easy to use Windows software for painless configuration
- Supports up to 5 Input / Output (IO) cards
- Easily installed into existing HydroMace 2000 sites

## DEPTH MEASUREMENT:

Method:	Ceramic pressure transducer with large flat sensing diaphragm which allows straight, undeflected flow over the sensing area to reduce drawdown effects at high stream velocities and provides for self cleaning with an impervious Alumina ceramic surface.
Full scale range:	13 ft above the transducer face
Accuracy:	0.2% of full scale at constant temperature in a static stream. 1% of full scale over a stream 41 to 130 degrees Fahrenheit
Resolution:	0.04"
Overrange:	200 ft without damage

## VELOCITY MEASUREMENT

Method:	Submerged Ultrasonic Doppler
Range:	±0.08 ft/sec to ± 26ft/sec
Resolution:	0.04" at 3.3ft/sec
Accuracy:	±1% up to 10ft/sec
Sensor cable:	PVC 0.35" diameter up to 164ft long
Approvals:	Optional intrinsically safe (IS) sensor with IS sensor barrier

## INSERT SENSOR (VELOCITY ONLY)

Shaft dimensions:	13" long x 0.8" diameter
Head dimensions:	1.8" diameter X 1" high (2" NPT thread)
Pipe intrusion area:	1.75 inch <sup>2</sup>

## STRAP MOUNT SENSOR (VELOCITY ONLY OR COMBINED VELOCITY/DEPTH)

Dimensions:	5" length x 2" wide x 0.63" high
Pipe intrusion area:	1.25 inch <sup>2</sup>

## INPUTS/OUTPUTS PER CARD

One I/O Card Standard. Expandable to maximum of five I/O cards

Analogue inputs (per card)	2 X 4-20mA inputs, 12 bit resolution, accuracy 0.5% of full scale 2 X Voltage inputs (0-2.5V or 0-30V)
Analogue outputs (per card)	2 X 4-20mA outputs, 12 bit resolution, accuracy 0.5% of full scale
Digital inputs (per card)	2 X Frequency inputs, 16 bit resolution, range 0 – 16383Hz 2 X Counter inputs, range 0 – 10Hz
Digital outputs (per card)	2 X digital/pulse outputs, open collector referenced to GND, range 0 – 10Hz
Power Outputs (per card)	12Volt switched power output for 3rd party sensor power

NOTE TO END USERS: THESE SPECIFICATIONS ARE SUBJECT TO CHANGE AT ANY TIME WITHOUT NOTICE. MACE TAKES NO RESPONSIBILITY FOR THE USE OF THESE FIGURES. PLEASE CONSULT MACE FOR THE LATEST SPECIFICATIONS BEFORE USING THEM IN TENDER SUBMISSIONS OR THIRD PARTY QUOTES ETC. MACE RESERVES THE RIGHT TO CHANGE SPECIFICATIONS WITHOUT PRIOR WARNING. ALL QUOTED FIGURES ARE BASED ON TEST CONDITIONS AND ARE SUBJECT TO VARIATION DUE TO SITE CONDITIONS.

## What instrument do I need?

## FloPro Series 3    AgriFlo Series 3    HydroMace 3000

Log ALL configured channels (e.g. depth, velocity, total, pH etc.)	Yes	Yes	Yes
Accepts MACE Doppler flow sensor cards	Yes (up to 5)	Yes (up to 5)	No
Accepts MACE Input/Output cards	Yes (up to 5)	No	Yes (up to 5)
Accepts MACE FloSI (ModBus/SDI-12) telemetry card (FloSI outputs per SDI-12 protocol V1.3)	Yes	Yes	Yes
Accepts MACE Pulse Input/Output cards	Yes (up to 5)	Yes (up to 5)	Yes (up to 5)
Accepts MACE Modem Comms card	Yes	Yes	Yes

Part No. 825-311 Rev. 1.1

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