AgriFlo® XCi

Measure agricultural water and wastewater flows and monitor vital farm operations

Full pipe flow measurement
MACE Insert Velocity Sensor

- ✔ *Doppler ultrasonic insert sensor with MASP Technology*
- ✔ *Easy to install in existing pipework through a 2" ball valve*
- ✔ *Works great in dirty water and animal waste*
- ✔ *No moving parts, no blockages, no worries*
- ✔ *Minimal straight run requirements*
- ✔ *Completely submersible design (IP68)*

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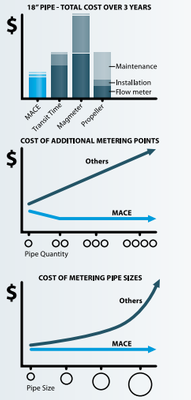
An In-Situ Company

AgriFlo XCi

The AgriFlo XCi can be used to monitor vital farm equipment and on-farm sensors. Use the versatility of AgriFlo XCi to monitor inputs as diverse as: irrigation flows; farm wastewater flows; water quality; dam levels; soil moisture; pump and engine management systems.

AgriFlo XCi is easy to install, easy to use and virtually maintenance free. Utilizing state of the art MACE Doppler ultrasonic velocity sensors, AgriFlo has no moving parts and provides minimal obstruction to the flow. MACE Doppler ultrasonic velocity sensors excel in trash laden water and animal waste which means that the meter stays in service longer without time-consuming repairs.



Cost effective flow metering

MACE offers the flexible, true value metering solution. When comparing flow meters, consider the TOTAL COST of the flow meter, installation & ongoing maintenance.

- In similar sized pipes, AgriFlo XCi is significantly cheaper than other comparable high quality solutions.
- AgriFlo XCi is easily installed into existing pipework whether above or below ground - no expensive fittings or re-routing.
- A typical single pipe installation can be completed by two people in under two hours.
- Because AgriFlo XCi has no moving parts and the sensor cannot foul, there are virtually no ongoing maintenance costs.
- Connect up to five flow sensors to a single AgriFlo XCi to reduce your cost per metering point even further. Significant savings for pump stations with more than one pipe.

Ready-to-Go straight out of the box

The MACE AgriFlo XCi includes a data logger, LCD display, solar regulator, battery, multiple cards (application dependent) all in one ruggedized weatherproof enclosure. No more hunting around for bits and pieces. In most cases you can be up and monitoring in just a couple of hours.

Remote configuration, diagnostics and data retrieval with MACE WebComm

- The MACE 4G WebComm Card enables the AgriFlo XCi device to automatically upload internally logged data to HydroVu Data Services or other FTP servers.
- Powered by and housed in the XCi device, the integrated WebComm Card enables real-time data communication over GSM cellular networks.
- Access data through the free WebComm Server for simple data viewing and remote configuration. Or use the HydroVu platform for advanced visualization and APIs for data export to any platform.
- SMS/email alert subscription service available.

Easily connect In-Situ sensors

- Plug 'n' play In-Situ sensors with an SDI-12 card
  - Aqua TROLL 600 multiparameter sonde
  - Aqua TROLL (depth/EC/temp.) sensors
  - Level TROLL (depth/temp.) sensors
- Support up to 10 sensors per SDI-12 card
- Powerful SDI-12 setup utility

True average velocity measurement

MACE velocity sensors use continuous wave Doppler ultrasound to measure the speed of dirt, bubbles and other particles in the stream flow. ***MACE Doppler ultrasonic sensors "see" particles in water just like turning on a flashlight in fog.***

In a full pipe, electromagnetic or mechanical insertion devices "see" a golf ball sized velocity profile and then use complex algorithms to calculate velocity. By contrast, MACE Doppler ultrasonic velocity sensors utilizing MACE Advanced Signal Processing (MASP) technology *"see"* across the entire stream profile to give a true average velocity.

Multiple cards for multiple sensor applications

The AgriFlo XCi (multiple card interface) allows the user to efficiently monitor an array of irrigation flow and vital on-farm sensors. It's a smart packaged monitoring solution that provides remote data access with alerts and alarms. It's also telemetry-ready for effective low cost control and rapid response. Users can install any combination of the MACE cards shown, in the five available card slots. Choose the right card/s for your application to tailor the AgriFlo to your exact farm requirements now and in the future.

Doppler Card

This card supports one MACE Doppler ultrasonic sensor.

I/O Card

This card supports seven sensor inputs and four control outputs including 4-20mA, voltage and digital.

The card also supplies 12V to power your add-on sensors.

Pulse I/O Card

This card powers (+5VDC or + 12VDC) a single pulsing flow sensor and provides a pulse output.

This allows AgriFlo XCi the ability to sense pulses from non-MACE flow sensors.

SDI-12 Master Card

This card provides AgriFlo XCi with the ability to control/log In-Situ and 3rd party SDI-12 compliant sensors.

FloSI Card

SCADA

This card provides an SDI-12 or ModBus output to interface AgriFlo XCi to SCADA systems.

WebComm Card

Remote Access

Provides AgriFlo XCi the ability to remotely configure the device and run diagnostics as well as upload internal logged data to a web-based data server via GSM/4G cell networks.

Doppler Ultrasonic Insert Velocity Sensor

For use in full pipes or partially full pipes (when used in conjunction with an EchoFlo depth sensor).

Doppler Ultrasonic Velocity Sensor

ZX SnapStrap mounted, velocity sensor for use in full pipes or open channels (when used in conjunction with a depth sensor).

Doppler Ultrasonic Area/Velocity Sensor

ZX SnapStrap mounted, combined velocity and depth sensor for use in partially full pipes or open channels.

Add-on Sensors

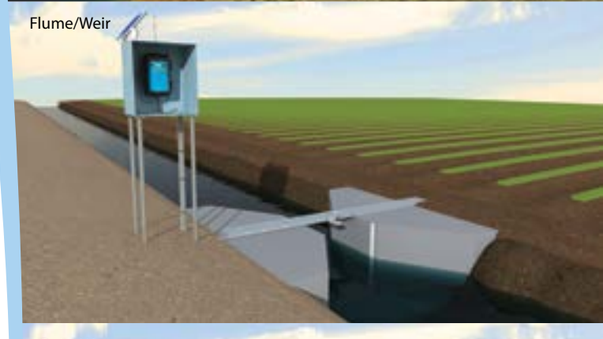
AgriFlo XCi can be configured to monitor a diverse range of farm sensors and devices. For example:

- Engine management systems (eg. RPM, temperature, pressure)
- In-Situ Aqua TROLL 600 multiparameter sonde
- EC/pH/rainfall sensors
- Pond/dam level measurement

Solutions using AgriFlo XCi

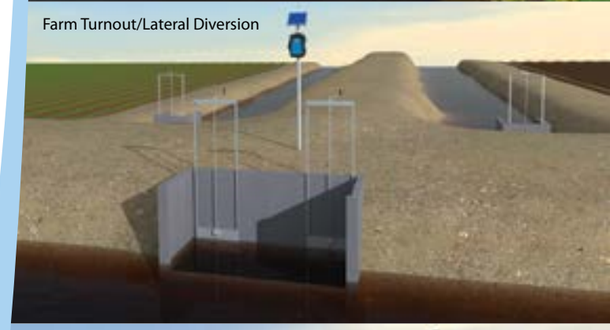
River Pump Station

Flume/Weir



Dairy Waste

Farm Turnout/Lateral Diversion



Ground Water Pivot Irrigation

AgriFlo XCi Specifications

GENERAL

Weight	Approx. 5 kg (11 lbs)
Dimensions	365 mm (H) x 260 mm (W) x 170 mm (D) 14.4 in. (H) x 10.2 in. (W) x 6.7 in. (D)
Enclosure rating	IP66
Enclosure material	UV stabilized polycarbonate
Operating temperature (with internal battery installed)	-15 to +50° C (5 to 122° F)
Operating temperature (with internal battery removed and external power used)	-20 to +65° C (-4 to 150° F)
Backlit display	16 character x 2 line alphanumeric LCD
Program memory	2 Mb flash (sufficient for 600,000 discrete readings)
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 months - parts and labour guarantee

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	4 m (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 5 to 55° C (41 to 130° F)
Resolution	1 mm (0.04 in.)
Overrange	60 m (200 ft.) without damage
Min. operating depth	20 mm (0.79 in.)

VELOCITY MEASUREMENT

Method	Submerged Ultrasonic Doppler
Range	±0.025 to ± 8.0 m/s (±0.08 to ± 26 ft/s)
Resolution	1 mm at 1.0 m/s (0.04 in. at 3.3 ft/s)
Accuracy	±1% up to 3.0 m/s (±1% up to 10 ft/s)
Urethane sensor cable	9 mm (D) up to 50 m (L) (0.35 in. (D) up to 164 ft. (L))
Min. operating depth	40 mm (1.57 in.)
Max. operating temperature	60° C (140° F)

DOPPLER INSERT VELOCITY SENSOR

For use in full pipes or partially full pipes (when used in conjunction with an EchoFlo depth sensor)	
Pipe size	0.1 to 2.54 m (4 in. to 100 in.) diameter
Process fitting	2" BSP or 2" NPT
Max. process fitting pressure[1]	1034 kPa (150psi)
Max. operating pressure[2]	253kPa (37psi)
Shaft dimensions	330 mm (L) x 20 mm (D) 13 in. (L) x 0.8 in. (D)
Head dimensions	45 mm (D) x 25 mm (H) 1.8 in. (D) x 1 in. (H)
Wetted materials	Nickel plated brass and epoxy
Pipe intrusion area	11.25 cm^2 (1.74 in^2)

*1 The pipe **must be de-pressurized** prior to insertion or removal*

*2 The stream flow may be suitable for Doppler ultrasonic flow measurement in pressures >253kPa (37psi) if it contains **at least** 100 parts per million of suspended solids that are >75 microns in size.*

DOPPLER AREA/VELOCITY SENSOR

ZX SnapStrap mounted, combined velocity and depth sensor for use in partially full pipes or open channels	
Pipe size	0.15 to 2.54 m (6 in. to 100 in.) diameter
Max. channel width *	3 m (10 ft.)
Dimensions	125 mm (L) x 50 mm (W) x 20 mm (H) 5 in. (L) x 2 in. (W) x 0.79 in. (H)
Wetted materials	PVC, Alumina ceramic and epoxy
Pipe intrusion area	8.6 cm^2 (1.33 in^2)

DOPPLER VELOCITY SENSOR

ZX SnapStrap mounted, velocity sensor for use in full pipes or open channels (when used in conjunction with a depth sensor)	
Pipe size	0.15 to 2.54 m (6 in. to 100 in.) diameter
Max. channel width *	3 m (10 ft.)
Dimensions	125 mm (L) x 50 mm (W) x 17 mm (H) 5 in. (L) x 2 in. (W) x 0.67 in. (H)
Wetted materials	PVC and epoxy
Pipe intrusion area	8 cm^2 (1.24 in^2)

** MACE Doppler ultrasonic sensors **will** operate in wider channels, but a reliable stream gauging **must** be performed for best system accuracy.*

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 contract submittals 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.

DISTRIBUTOR:

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