

AquaControl & AquaMix

For Moisture Measurement in Mixers

By **SCALE-TRON**



Hard wearing, fast, accurate and reliable

AquaControl measures the moisture of the material in your mixer and controls the water to optimize the moisture or slump, ensuring high quality in your final product while eliminating the frustration and cost of wasted batches. The **AquaMix** microwave sensor is free of the errors found in alternative methods and gives very fast response, allowing its internal signal processing to eliminate the variations caused by rapid mixing and obtain a stable reading with very little delay. AquaControl controller uses the same touch screen and PLC hardware as the BatchTron series batch controllers, giving it the reliability and ease of use that you expect from Scale-Tron products.

Three modes of operation are built into AquaControl software, allowing you to choose an operating sequence that is optimized for your types of products as well as your mixer.

AquaControl can be connected to the Internet, allowing on-line fault diagnosis, training and software upgrades at any time.

Consistent moisture, batch after batch

Moisture variations can alter your product's color, workability and strength. AquaControl is the professional solution to this problem. Manufactured and serviced in North America with instant on-line support.

CONTROL FEATURES

- PLC & Touch screen with multi-language graphic user interface is exceptionally reliable as well as easy to learn and use.
- Standard off-the-shelf parts for easy replacements.
- Connection to Internet allows fault diagnosis and software upgrades.
- No separate external switches or lamps to create maintenance problems – all controls are on-screen.
- On-screen setup and calibration adjustment.
- Separate PC software for AquaMix, should you need moisture indication only.

THREE MODES OF OPERATING SOFTWARE

- **MasterMix** gives highest speed and greatest mixer output for plants where the mixer is running batches back to back. Handles dry or wet cast equally well. Requires accurate calibration.
- **MicroMix** does not require a water meter or scale. It is useful for dry cast mixes, plus some types of SCC, when production speed is not as critical. Does not require accurate calibration, easier to manage. Applicable in lower throughput applications where the mixer usually stands idle between batches.
- **Fast MicroMix** feeds most of the water by meter or scale, then uses the moisture reading to dispense the final water. Equal in speed to MasterMix and does not require accurate calibration. Useful for dry-cast mixes, plus some types of SCC.

TWO MIXERS, ONE CONTROLLER

The two-mixer version of AquaControl combines hardware and software for two mixers into the one package, saving on the cost of a second controller. Ideal for 2-mixer plants.

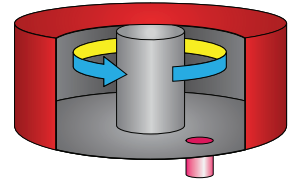


Call us to discuss your requirements. We can show you how to save money and time while improving your product's quality. Our 40 years experience in batch and moisture control systems allow us to not only provide the best control system for your plant but to build AquaMix right into the batch controller for even more savings. Talk to us about it.

INSTALLATION IN MIXERS

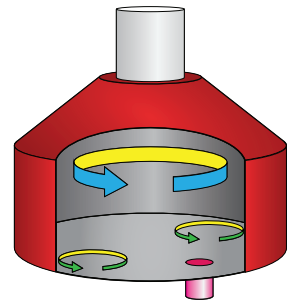
Pan or Turbine mixers

Sensor mounts through floor, away from water outlets and about 1/3 of the distance from outer wall to central hub.



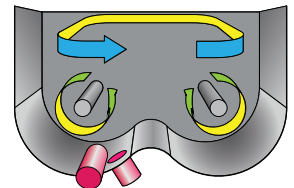
Planetary or Countercurrent mixers

As for pan mixers above sensor positioned 1/3 of the radius from outer wall.



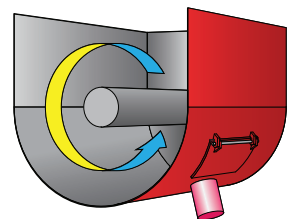
Twin shaft mixers

Sensor is positioned on mixer floor near end wall or on end wall, away from discharge door



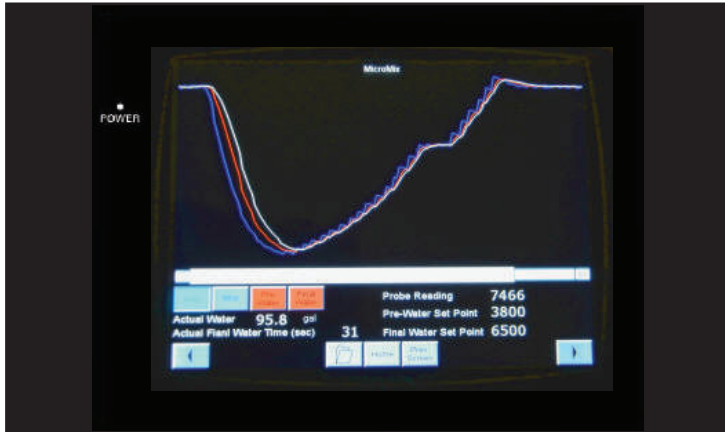
Spiral Blade or Ribbon mixers

Below discharge door in central location.



Rotating pan mixers

“Glider” mount allows sensor to ride on top surface of material, compacting it and ensuring best accuracy with varying batch sizes. Sensor is lifted when not reading.



AquaControl's touch screen displays the moisture as mixing proceeds, allowing you to see the whole mixing process at a glance. Screen buttons override automatic operations, allowing you to pause or finish the process yourself if necessary.

DIGITAL SIGNAL PROCESSING

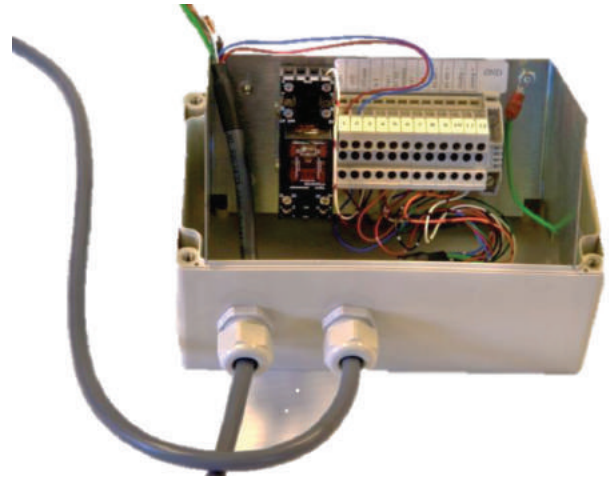
The sensor signal first passes through a peak reading stage to eliminate air void effects behind the paddles. Then it is averaged, to eliminate any cyclical variations. Finally, a "low pass filter" smooths the signal, which is fitted into a "window" based on a minimum time within accuracy limits. When the signal fits the window, your measurement is within your needs for your product.

SETUP AND OPERATION

The setup screens are password protected and user-friendly, allowing you to quickly set up the system to suit your mode of operation as well as to optimize your speed and accuracy goals. Operation as a stand-alone system requires entry of your formula number and pressing the "GO" button. If you have a separate batching controller, the formula and start commands can be passed by serial communication between the two controllers. The AquaControl controller signals the end of the water sequence, to allow you to quickly continue, as well as any error messages to help you to track down the problem.

SENSOR CONNECTIONS

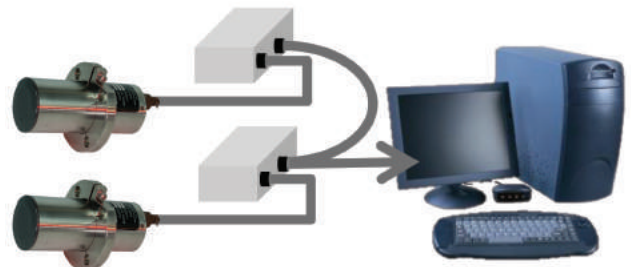
AquaMix's junction box is designed for easy connection; lift out the cable terminal block completely to make connections and slide it back in when complete. All connections are through large, easy to use labeled terminals and include serial RS232 and RS485, analog output and power. Box is fully sealed, plastic construction.



Analog connection method, useful for PLCs and control systems. AquaMix's sensor has advanced filtering built-in, enabling you to connect directly to control systems without the need for specialized software.



Digital connection method, useful for PC's and control systems running Modbus protocol. Use USB to RS232 converter for single sensor or USB to RS485 converter for multiple sensors.

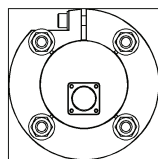
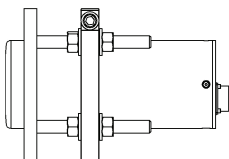


SENSOR FEATURES

- Microwave measurement is accurate; unaffected by temperature or admixtures.
- Sensor measuring method and output are linear.
- Fully sealed stainless steel body.
- Silicon Nitride faceplate is the hardest material after diamond. Wear is a thing of the past; typical life is 10 years or more with normal materials and operation.
- Adjustable mounting assembly can be welded to the body of pan, single shaft and twin shaft mixers.
- "Glider" mount available for rotating pan mixers.
- 10 sets of calibration parameters for different materials or special mix designs.
- Advanced filtering gives stable measurement and fast settling.

SENSOR SPECIFICATIONS

Measuring range:	0 – 20% moisture, pre-calibrated for use with standard concrete mix designs.
Temperature:	Internal temperature sensor readable through serial interface.
Analog output:	0 – 20 or 4 – 20 mA. 0 – 10 volt etc. by use of external resistor.
Digital RS232 and RS485 connections:	Bidirectional, industry standard protocol and command structure supports up to 16 sensors on the same RS485 line.
RS232/RS485 display and setup:	Windows software displays readings and allows access to setup and calibration menus.
Calibration sets:	Up to 10 separate mix designs.
Power:	11 to 30 volts DC, 100 mA max.
Alarm outputs:	Alarm outputs: Four open collector transistors to drive relays or PLC inputs.
Temperature range:	Full accuracy 0 – 50 °C, 32 – 120 °F. Reduced accuracy 0–80 °C, 32–175 °F.
Construction:	Powder coated steel, IP65 / NEMA-4
Sensor size:	89 mm x 226 mm (3.50" x 8.88")
Mount:	152mm (6.00") square



SYSTEM SPECIFICATIONS

Control PLC:	Omron
Touch screen:	Omron 7" TFT colour
Outputs:	120 V relays, contacts rated 2A, 24 VDC or 250 VAC
Inputs:	24 VDC only. Optional relays available for AC operation.
Connection to external batch controller:	Discrete start/complete handshake plus serial RS232 command line where this is available.
Programming and diagnostics:	Via RS232 serial connection to Internet - connected PC.
Formula memory:	800 formulas max.
Reading speed:	Over 100 readings per second.
Power:	100 to 240 VAC, universal power supply.
Temperature range:	Operating 0 – 55 °C (32 – 130 °F).
Construction:	Powder coated steel, NEMA-4
Controller size:	508 x 508 x 216 mm (20" x 20" x 8.5").
Shipping weight:	With sensor and mount 36 kg (80 lb).

SYSTEM COMPONENTS

AquaMix sensor:	Digital microwave system.
Cable / connector:	3, 6, 15 m (10, 20, 50 ft) and custom length.
Junction box :	2257, Connections for power plus analog and digital outputs.
Mounting assembly:	Flange plus weldable mounting to fit pan, planetary, twin-shaft and ribbon mixers. Glider mount for rotating pan mixers.
AquaControl controllers:	Single mixer version. Two mixer version.
Water valves:	Full range of valve sizes to match all mixers for both main and dribble feed.
Water meter:	Badger pulse reading meters in sizes from ½" to 2" and 3" mag-flow meter.

CUSTOMIZATION

AquaControl is a PLC-based system, allowing it to be easily customized for different applications. Call us for further details.

SCALE-TRON

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