

SWQ - Smart Water Quality Monitor

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Integral Management of the Produced Water in Mature Fields

Water Quality Real Time Monitoring

The Real Time Smart Water Quality Monitor has been developed together with Ecopetrol, it allows continuous real time monitoring of multiple parameters to determine the water quality and the WQI (Water Quality Index). The continuous real time monitoring permit fast and effective decisions to maintain quality and optimize processing and cost.

The system includes a sensor module manufactured in a special oleo phobic material and sealed to hold up to 50psi and 60dC standard equipment. The module includes sensors and conditioning electronics, this module gets power from a remote panel using solar energy and radio communications to the HUB module. This module permits data storage, processing and communications with the node or sensor module and to the cloud database using internet in real time, or to the control room using 4-20 analog or ModBus digital standards.

The sensor module has been designed for multiple applications, the basic environmental and river monitoring includes conductivity, temperature and pH as a minimum. The disposal version has additional sensors, multiple turbidity using infrared measurement, oil suspended in water from 1 ppm based on capacitance sonde measurement. These sensors are in-house development. The injection water version has a DO sensor able to measure parts per billion. The conductivity sensor is accurate enough to determine the RAS index for agriculture.

The Smart Water Quality System integrates the multiple sensor measurements in tanks, pools, rivers, and flow lines (in development) with a field processing and communications module that allows Access to the information on real time for effective, cost effective and real time water management in mature fields and other applications.



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Applications

- Integral Real Time Water Quality based on physical parameters measurements in treatment plants and pools, injection plants, rivers, water reservoirs, water lines.
- Real time continuous measurement of water basic parameters: conductivity, temperature, pH, infrared turbidity, oil suspended in water, dissolved oxygen.
- Real time monitoring of disposal and potable water in water treatment plants, water processing plants, water residual plants
- Real time continuous monitoring of injection water in plants, tanks or lines to ensure injected water has minimum dissolved oxygen and turbidity or SST keeping a record and generating early alerts.
- Real time continuous remote monitoring of water quality for environmental control and assurance in rivers, lakes and reservoirs.
- Real time continuous water quality monitoring to ensure regulations/laws are in compliance

Advantages and benefits

- Integral, flexible, real time and continuous monitoring system of multiple parameters for water quality control, traceability and alerts.
- Integral sensor module for field conditions, submersible up to 50 feet using self-power for remote, isolated and difficult access areas
- Special manufacturing materials like non corrosive and oleophobic housing/transducers for field conditions and applications
- Field continuous and real time measurement of oil/grease suspended in water, conductivity and turbidity for SST using special transducers developed and patented by Ecopetrol ICP/JPT
- Remote measurement using the SWARM platform and system to connect to the cloud or local control systems thru the HUB
- Compact, sealed, intrinsically safe and self-powered sensor modules for remote areas, using wireless and radio communications
- Low operational cost and excellent relation cost-benefit with local technical support

Respuesta y Especificaciones Técnicas

Technical Specifications - General	
Parameter	Specifications and comments
Diameter	8" diam x 8.5" height std /16.5" max.
Material	ANSI 316/ POM Polyformadheyde
Max. Operating Temp.	0 a 65C
Max. Internal Elec. Temp.	0 a 85C Standard
Pressure Range	20 psia std con pH / 50 psia para DO y SST 1000 psia conductividad y grasas y aceites
Electrical Power	Self Solar (NODE/HUBI) o 24v DC (HUBI)
Voltages	24v regulated to a 12v/5v/3.3v
Communications	RS 232, 4-20 std, ModBus (Ethernet)
Monitor Step	Programmable, minimum recommended 60 sec
Hazardous Area	Insintrically Safe

Technical Specifications - Specific	
Parameter	Specifications and comments
Temperature	0 - 200C - 0.1 dC minimo
Conductivity	0 a 2000 uS/cm
pH	4 a 12 std
SST	0 - 1000 NTU
SOW - Suspended oil water	0 - 100 ppm std / Min. 1 ppm
DO - Dissolved Oxygen Std.	0-100 % / 1 ppm minimo
DO - Dissolved Oxygen PPB	0-1000 ppb / 1 ppb minimo
Repetibility	TBD
Response to changes	TBD
Accuracy	TBD