

Wireless pH Monitoring of Storm Water Runoff and Final Effluent

BENEFITS

- Lower cost for remote sites
- Reduce technician workload
- Improve environmental compliance



BACKGROUND

Wireless pH instrumentation is appropriate in several applications in the power industry. The principal benefit of a migration to wireless technology from more traditional copper cable is cost reduction. A wireless network requires none of the cable, conduit, or switching hardware which represent the largest expense in most plant networks. This enables plant operators to measure process parameters in areas which would be prohibitively expensive to wire, such as runoff collection ponds and final effluent streams.

Rosemount Analytical's wireless transmitters are based on the HART 7.0 (WirelessHART™¹) standard which incorporates a number of features to make the network robust and secure. Each device in the network can serve as a router for the traffic of other devices within radio range. This means that each transmitter need not have direct radio line-of-sight to the gateway, but need only connect to at least one other device in the network. Since each transmitter is typically in communication with several of its peers, it will have redundant transmission pathways should one of them become blocked. All data transmissions are protected by encryption and key rotation is automatically handled by the gateway. Devices must be authenticated by a network control system before they are permitted to operate. Because WirelessHART is an open standard, Rosemount Analytical's transmitters seamlessly integrate with the Emerson Smart

Wireless family of devices as well as those of third parties who adhere to the WirelessHART standard.

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Wireless transmitters are well suited to measurement points which are remote from the plant itself. The principal concern for remote site monitoring is assuring that the transmitters have adequate radio visibility to a gateway or to other networked devices that can relay traffic on their behalf.

The Environmental Protection Agency requires plants to monitor the pH of final effluent streams and typically mandates that grab samples be taken at least weekly for laboratory analysis. The pH of the effluent must be controlled between 6 and 9, usually by caustic treatment in surge tanks or settling ponds prior to final discharge to surface water bodies. An online pH sensor with wireless transmitter can provide feedback on the efficacy of the treatment program without the expense of running cables or the additional workload of collecting grab samples. The transmitter may be set to take measurements infrequently, subject to the requirements of regulations, greatly extending battery life. This is especially beneficial to coal-fired plants since rainwater leachate from exposed coal piles can be quite acidic.

¹ WIRELESSHART is a trademark of the HART Communication Foundation.

INSTRUMENTATION

The model 6081 is a wireless pH transmitter that can be paired with any Rosemount Analytical pH sensor. Power is supplied by an internal power module, which typically requires replacement every 4 - 6 years, depending on duty cycle and ambient temperature.

The model 6081 is designed to work with the Model 1420 wireless gateway. The 1420 supports up to 100 simultaneous devices and is compatible with any fully compliant HART 7.0 device.

6081 pH Wireless Transmitter

- Integrates seamlessly into WirelessHART compliant networks including all Emerson Process Management Smart wireless instrumentation.
- Long life power module.
- NEMA 4X / IP66 enclosure.



1420 Wireless Gateway

- Secures data with advanced encryption and key management techniques.
- Resists interference by automatically selecting channels and employing spread spectrum transmissions.
- Supports WirelessHART diagnostic and control communications.



Model 399 General Purpose pH/ORP Sensor

- Convenient, economical one-piece disposable design
- Sealed, durable Tefzel^{®2} construction
- Double reference junction resists poisoning



² Tefzel is a registered trademark of E.I. du Pont de Nemours and Company.

Emerson Process Management

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