

Emerson Smart Wireless Transmitters Monitor River Water Temperatures at Lenzing Fibers

Emerson's Smart Wireless Rosemount® transmitters monitor temperatures of water extracted from and returned to the local river.

Emerson Process Management has successfully applied its Smart Wireless solution to monitor river water temperatures at the Lenzing Fibers mill in Heiligenkreuz, Austria. Installation of the wireless temperature transmitters provides a cost effective and highly reliable solution for the company to meet government environmental regulations related to the temperature of water discharged into rivers and watercourses.



Lenzing Fibers is part of the Lenzing Group and based in Austria. The Lenzing Group is the world's largest producer of cellulose fibre, using beech wood from managed sustainable forests as its raw material. Over 60,000 tonnes are produced annually at Lenzing Fibers, primarily for the textile industry. Typical end products are clothing and home textiles. Lenzing Fibers also produces other special fibres for hygiene and technical applications.

Lenzing Fibers believe that adopting innovative technologies and putting major investment into environmental protection has made them the quality, technology and environmental leader for man-made cellulose fibres. As well as their raw material coming from a sustainable source, the company's environmental protection policies and equipment are highly evolved. High environmental standards enable them to have a minimal impact on the area surrounding their sites as well as enabling them to stay ahead of local, national and European environmental regulations.

At its Heiligenkreuz mill and integrated fibre plant near the Hungarian border, Lenzing Fibers uses water drawn from the River

Lafnitz for cooling purposes within the plant. Following its use within the facility, the water is returned to the river. Although the returned water is completely clean, during the process the temperature is raised slightly. Local environmental regulation requires that any water returned to the river must not be more than 3 degrees Celsius higher than the water extracted. In addition the regulation stipulates that the company must maintain a constant check and record of the water temperature at both inlet and outlet points.

Because the nearest control room is situated about 200 meters from the river, this presented a problem in terms of connecting the remote temperature sensors back to the control system. Lenzing Fibers was faced with an expensive measurement solution if it was to use wired temperature transmitters. Cabling would need to be installed over large distances and across open ground where providing cable containment and protection would be expensive.

"Because of the distance of the river from the control room and the fact that the general public are free to walk by the river, we would have had to dig a trench for the cabling and this would have been very expensive. The cost of installing wireless is much lower and has made this project possible." Wolfgang Gotzi, Head of Automation Department, Lenzing Fibers.

Prior to the regulation being introduced, Lenzing were already monitoring the water temperatures manually involving daily visits to the river. However to meet the environmental regulation there was a need to improve the reliability of the results and for these measurements to be easily stored and be made readily available for inspection. By implementing a solution that enabled online measurements, Lenzing Fibers were presented with an opportunity to reduce operations costs by eliminating the number of trips to the field (river) and to streamline the reporting.

A live demonstration of the Emerson Smart Wireless self-organising network convinced Lenzing Fibers that the technology would be suitable for their application and they purchased five Emerson Smart Wireless

transmitters and a wireless gateway for their temperature measurement task.

Emerson's Smart Wireless solution is based on transmitters that can act as a router for other nearby devices, passing messages along until they reach their destination. If there is an obstruction, transmissions are simply re-routed along the network until a clear path to the Smart Wireless gateway is found. As conditions change or new obstacles are encountered in a plant, such as temporary scaffolding, new equipment, or a parked lorry, these wireless networks simply reorganise and find a way to get their signals through. All of this happens automatically, without any involvement by the user, providing redundant communication paths and better reliability than direct, line-of-sight communications between individual devices and a receiver. This self-organising technology optimises data reliability while minimising power consumption. It also reduces the effort and infrastructure necessary to set up a successful wireless network.

The temperature of the river water at the extraction point is measured using a Rosemount® temperature sensor. This is connected to Emerson's Rosemount Wireless 648 transmitter positioned well above the water line to protect it from unusually high water levels. A similar setup exists 200 metres downstream at the outlet point where water is returned to the river. A third transmitter, a further 200 metres after the return point, provides the water temperature after remixing. A fourth transmitter is currently used as a weather station and is situated by a nearby lake that is used as a cooling water reserve. This device acts as a repeater and provides additional paths for the self-organising network ensuring the highest possible communication reliability.

"The Emerson technology was both easy to install and integrate and has been extremely reliable in terms of data transfer. When all the transmitters were in place the network offered us a communications reliability of 100%, which is very impressive. We are currently looking at other applications where Smart Wireless can be applied." said Gotzi.

The Smart Wireless network is integrated into Lenzing Fibers' existing control system via the wireless gateway. The gateway is attached to an external wall of the pump station control room which is located near the inlet measurement point. The other two transmitters are situated between 200 and 400 meters from the gateway. The standard range of the transmitters is about 200 metres, but the Smart Wireless self organising network extends the range. The gateway is connected to the existing control network via an RS-485 serial connection and then the temperature information from all the transmitters is fed back into a data historian in order to meet the environmental regulations.

Lenzing Fibers is currently using an Emerson RS3 control system within the main plant as well as Emerson's AMS® Suite of software applications. AMS Suite: Intelligent Device Manager is used to manage the new Smart Wireless devices, enabling the technicians to configure the devices, run diagnostic checks and monitor alarms and alerts. AMS Suite is also used to manage and store calibration information.

"The wireless transmitters have removed the need for visits to the river to take manual temperature readings." said Gotzi. "By moving to an online measurement and recording system it is enabling staff to turn their attention to other maintenance and operating tasks."

Smart Wireless has provided Lenzing with a cost effective measurement solution requiring no signal cabling and fast site deployment. Immediate measurement and trending of the water temperature could be made and results stored to comply with the environmental regulations. Furthermore the technology offered them both the ease of installation and the reliability of connection that they needed.



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