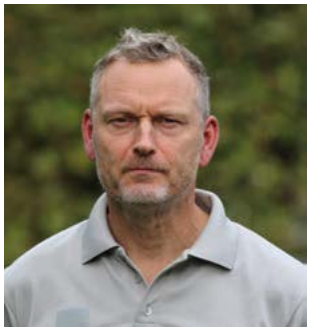
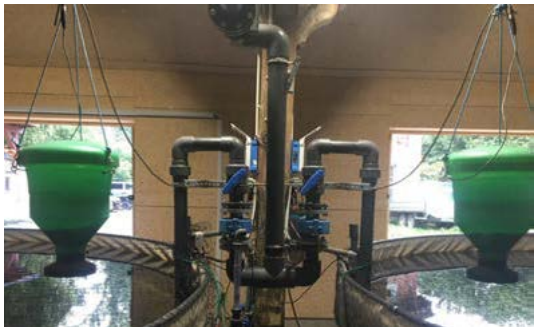
Monitoring water quality in fish farms

Digitalizing fish farming in the Petite Camargue Alsacienne



Olivier Sommen, farm manager



Atlantic salmon farming platform

The imperial fish farms in the Petite Camargue Alsacienne breed juvenile salmon to repopulate the waters of the Upper Rhine, in partnership with a number of French and Swiss organizations. The period leading up to spawning is crucial for the spawning populations, which must have optimal temperature and oxygen conditions.

"We needed measuring sensors to monitor the recirculated water circuit, and a system for managing measurement data with alarms to indicate threshold breaches or other issues."

Olivier Sommen,
Farm manager
Petite Camargue Alsacienne

Welcome to the Petite Camargue Alsacienne salmon farm!

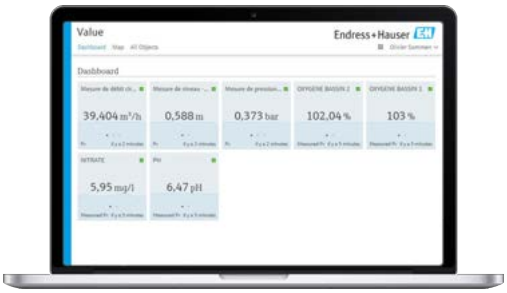
Backround

Since the 1950s, the number of Atlantic salmon has decreased significantly due to deteriorating water quality and an increase in the number of dams built. However, in 1991, the International Commission for the Protection of the Rhine (ICPR) launched a program to reintroduce the migratory species. As a partner of the cross-border program „Rhine 2040", the Petite Camargue Alsacienne fish farm breeds Atlantic salmon to repopulate the Rhine and its tributaries. Every year, 300,000 eggs are incubated and the juveniles released into the natural environment. The challenge to further develop its activities, the farm initiated a project to build a maturation and breeding platform to run alongside its existing infrastructure. The aim of this temperature-controlled breeding platform is to guarantee optimal spawner fertility and minimize losses from uncontrolled breeding. Endress+Hauser France offered its expertise to help the farm create an innovative customized solution. The solution comprised a system for monitoring the quality of the recirculated water in the breeding platform's enclosures. Find out how Endress+Hauser integrated its latest measuring sensor and intelligent data management technologies in the project.

Our solution

Endress+Hauser installed a measuring system to meet the requirements for monitoring the quality of recirculated water in the enclosures. Each water quality parameter is analyzed: oxygen level, pH, temperature, nitrate content, as well as the physical parameters of the recirculation circuit, for example the water flow rate in the pipe and the water pressure and level in the recovery tank. This measurement data is

then sent to a local management system which allows it to be viewed on site and text message alarms issued if upper/lower thresholds are breached or parameters found to be faulty.



Measured values accessible remotely via the Netilion Value web interface

Added value

In an environment undergoing large-scale digitalization, and as a partner to the fish farming project, Endress+Hauser digitalized access to all measurement data on the site as an add-on to the proposed solution. The measured values and sensor condition are transmitted wirelessly via digital gateways (Edge Device SGC400 and SGC200), and can be accessed remotely using the Netilion digital platform, an Endress+Hauser IIoT solution. The Netilion Value platform can be accessed from the internet, and the farm managers have expressed complete satisfaction with its intuitive, practical features which enable real-time monitoring of the water quality in the enclosures. This added functionality enhances site safety and guarantees optimal living conditions for the salmon in the enclosures.

Environmental strategy

The partnership between the fish farm and Endress+Hauser will bolster the Atlantic salmon reintroduction program and, over the longer term, help to restore a viable fish population in the natural environment. In 2020, more than 200 adult salmon were recorded at the observation station in Iffezheim. These reintroduction measures show clearly the progress being made in terms of the Rhine‘s ecological continuity. The aim is to achieve a natural balance in the migratory species by 2040.

List of equipement installed :

- **Oxymax COS61D** dissolved oxygen sensors to enable continuous oxygenation of the fish in each enclosure and the hatchery
- **Viomax CAS51D** nitrate sensor to indicate the level of water pollution and monitor the efficiency of the mobile biofilter to identify the device, check its condition, use assistants and get reports
- **Orbipac CPF81D** pH sensor to monitor carbon dioxide degassing of the water and maintain the water’s chemical balance
- **Promag W 400** magmeter to monitor the circuit’s flow rate
- **Promag W 400 0xDN** magmeters for even distribution of water in each enclosure
- **Cerabar PMP51B** pressure sensor to measure the water pressure in the pipe downstream of the pumps
- **Micropilot FMR10** level measuring sensor to monitor the water level in the recuperation tank
- **Liquiline CM444 and CM442** transmitters for local display of the data from the physical/ chemical analysis sensors
- **Memograph RSG45** recorder for local display of all measurement data and SMS alarms for threshold breaches and other issues
- **Edge Device SGC400 and SGC200** digital gateways to send measurement data to the Netilion Cloud and for remote accessing of data via Netilion Value

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