

Fresh Fish Thanks to JUMO

Digital sensors monitor water quality for transporting juvenile fish

Fish is one of the most popular foods in the world and demand has been increasing for years. Each German eats around 15 kg of fish every year and this statistic rises to as much as 90 kg for each Icelander. However, many areas of the world's oceans now suffer from overfishing so that rearing fish on an industrial scale is becoming more and more important. The world's largest producer of sea bream and sea bass is located in Turkey. It relies on JUMO technology to monitor the water quality when transporting fry.

The Turkish company employs 2,500 people and produces more than 40,000 metric tons of fish each year, which is exported to more than 55 countries. In the process, the fry are moved in water tanks on trucks from the rearing area to the aquacultures. It's a journey of some 1,500 kilometers across Turkey, which means that the fry are on the road for two to three days. It goes without saying that the water quality and, in particular, the oxygen content need to be monitored constantly in such grueling conditions.

The JUMO team in Turkey faced a challenging task, as the temperature and oxygen concentration had to be monitored across eight tanks in each truck at the same time. In addition to providing the measured values, alarm messages also needed to be transferred to the cab to notify the driver if limit values were exceeded or undershot. Furthermore, all readings needed to be accessible on a smartphone at any time.

JUMO was able to win over the customer by providing an all-in-one solution. The JUMO ecoLine O-DO sensors measured the oxygen concentration and the temperature. This digital optical sensor distinguishes itself by providing measurements that are particularly low-drift, low-maintenance, and stable in the long term. The JUMO ecoLine O-DO saves the calibration data and calibration history straight to the head of the sensor. This enables simple on-site "Plug and Play". The robust sensor housed in a stainless steel case operates across a measuring range from 0 to 20 mg/l and can be used in a temperature range from 0 to 60 °C. Its titanium design is resistant to corrosion from high salt concentrations and is therefore ideal for use in seawater.

The JUMO digiLine system was also used. This is a bus-compatible connection system for digital sensors that gives users the ability to build intelligent sensor networks. With JUMO digiLine, a diverse range of sensors can be connected with one another for liquid analysis purposes. Merely a single digital signal line runs to an evaluation unit or controller such as to the JUMO AQUIS touch or the JUMO mTRON T automation system. This enables more efficient and faster cabling of plants in which several parameters need to

be measured simultaneously at various locations, which in turn reduces the costs.

The modular, compact JUMO AQUIS touch P multichannel measuring device for liquid analysis was used to evaluate the data. So one single device covers the "measuring, controlling, recording, and displaying" tasks. For this purpose, two analysis parameters can be directly connected and three more can be connected as standard signals. It is even possible to connect six digital analysis parameters with the JUMO digiLine system. Digital interfaces enable additional eight external measured values to be supplied. The parameters are displayed on a 3.5 inch color monitor with touchscreen on which the operation and settings of the device are handled.

Tamper-proof data recording was ensured by the JUMO LOGOSCREEN 600. This paperless recorder combines JUMO's long-standing experience with a new control and visualization concept. The ICON-based system in most cases only requires a maximum of three "touch movements" to display the requested process data.

Multiple versions of the JUMO LOGOSCREEN 600 are available for process data recording. The compact design with a mounting depth of 119 mm (including connecting plug) permits insertion even in control cabinets with little depth. Thanks to the FDA-compliant data recording and manipulation detection, the JUMO LOGOSCREEN 600 is perfectly suited to this application.

The challenge of ensuring data retrieval on a smartphone was mastered with the JUMO Device App. It ensures that the user always has mobile access to their process data. All current readings as well as alarm and event lists from selected JUMO devices can be viewed.

All the applied components were fitted and configured in control cabinets on-site by JUMO engineers. The JUMO Device App was also set up and parameterized. The whole system worked faultlessly from the very first trip, impressing the customer with its simple operation and excellent reliability.





Fig. 1-4: Fish transportation



Fig. 5: JUMO digiLine system with JUMO AQUIS touch



Fig. 6: JUMO ecoLine O-DO oxygen sensor



Fig. 7: JUMO LOGOSCREEN 600 paperless recorder