MONNIT®
CASE STUDY

Temperature Sensing Solution Keeps Aquaculture Thriving

Many table fare and exotic tropical fish species are raised in the controlled environments of aquaculture facilities or fish farms and fisheries. These companies make crucial contributions to economies and conservation worldwide by providing many high-value outcomes from food security to decorative enjoyment to economic development.

With the Internet of Thing's (IoT) growing popularity, aquaculture businesses can monitor water quality, temperature, fish health, and feeding patterns. Equipment and facility maintenance can also be predicted using IoT technologies. Facility access, water leaks, and building climate conditions can be tracked too.

Crystal Springs Fisheries, AKA LiveFishDirect.com, located in Draper, Utah, is a growing aquaculture business. The company houses:

- **Thousands of 30-gallon tanks**
- **Hundreds of round 200-gallon tanks**
- **Hundreds of square 300-gallon vats**

Most of the tanks and vats receive multiple daily freshwater changes from nearby Crystal Lake and a well. A geothermal spring feeds the 10-acre, 60-foot deep lake and naturally maintains an 80-degree temperature year-round.

Read how Monnit® helps Crystal Springs Fisheries remotely monitor water temperature using innovative and cost-effective solutions connected to the IoT.

Spoiler alert: The ROI is significant, considering Crystal Springs Fisheries has saved tens of thousands of dollars by monitoring water tank temperatures. They did it with data from fast-install IoT sensors. The solution is easily managed using an online dashboard on a smartphone or computer. Plus, alerts via email, text, or voice call.

Challenges

Crystal Springs Fisheries sells live African Cichlids, particularly Lake Malawi Cichlids, and other freshwater tropical aquarium fish and fish food. With unique access to geothermal water, which is warm and nutrient-rich, the aquaculture company can create extremely healthy fish with vibrant colors.

Company President Josh Davis told a Monnit representative that he was frustrated with a competitor's water temperature alerting product performing poorly. Controlling water temperature is one of the essential elements of producing an abundance of healthy, colorful, exotic freshwater fish and plants.

A potential issue with pumping the geothermal water into the fisheries' facilities is that it requires plumbing equipment to run constantly to ensure proper temperatures. Due to the running water, there is much higher humidity inside the greenhouses compared to the dry outside air.

The other manufacturer's temperature detecting device was:

- Vulnerable due to the environment's high humidity
- Malfunctioning when transmitting data
- Not alerting anyone to the potentially devastating effects of a temperature imbalance in tubs, runways, and sinks

While there was no harm to fish or facilities, Davis was very concerned when he learned of the failure. In case of an issue with the geothermal well, the hatchery uses generators to keep water temperature consistent and fish alive, but immediate action must be taken. He worried that the company could lose an entire hatchery in a few hours. He knows every second counts regarding alerts about water temperature.

Solution

Davis decided his company needed:

- A reliable temperature monitoring system to immediately alert him and his managers if temperatures in tanks, vats, sinks, tubs, and more fluctuated too far out of range
- A simple solution to install and use with high value in cost, features, and reliability

Davis chose an automated Monnit Remote Temperature Monitoring Solution to track temperatures and send alerts. A couple of key features with Monnit's solution stood out from previous systems he used.

The first feature is Monnit's industrial sensor housing—an IP65, NEMA 4X, CE-rated, sealed, and weatherproof enclosure. Monnit ALTA® Temperature Sensors work flawlessly in harsh environments. The high humidity and probes or leads sensing in water are not a problem. The second feature is Monnit's notification and alerting system, sending data communications to any Internet-enabled device.

Davis and his staff self-installed:

- Wireless, leaded ALTA Standard Temperature Sensors in various locations where spring water flowed into aquaculture facilities
- The iMonnit Sensor Management and Remote Monitoring Software for use on staff smartphones and computers—virtually anytime, anywhere
- An ALTA Cellular Gateway at one end of each greenhouse to protect and communicate data sent to and from sensors

Sensors send data wirelessly to the gateway, then the gateway aggregates the data and sends it to the iMonnit Software. The Temperature Sensors were set up in iMonnit to check and record temperatures every half hour. Davis set up notifications to alert staff via text if temperatures were outside of his preset limits, allowing staff to respond immediately.

Not only is Crystal Springs Fisheries staff able to receive notifications if the water temperature drops below safe levels, but they also receive alerts should the ALTA Gateway not be able to communicate with one of the sensors. While this situation would be rare on a Monnit IoT network, it provides staff with peace of mind.

Results

Crystal Springs Fisheries implemented sensors at their hatchery facilities and warehouse store for a fraction of the cost compared to other sensing and data reporting solutions. Monnit Sensors monitor hundreds of thousands of dollars worth of fish inventory, much of which could spoil in a few hours if the water temperature drops.

With the new Monnit Remote Monitoring Solution in place, Davis has around-the-clock monitoring with no more trips to check on inventory in the middle of the night.

ROI: Soon after using the Monnit Solution, Davis optimized his company's remote temperature monitoring and potentially saved thousands of dollars by avoiding temperature damage.

"Monnit's industrial sensors work perfectly in our hatchery where water and humidity have been a problem for other products we've used," says Davis. "Monnit's products are durable and reliable. I can sleep easy at night now, knowing that I'll be notified immediately if water temperatures at various locations in our hatchery or store need attention."

A Monnit Aquaculture Monitoring System Handles Fish and Facility Safety with Ease

1

Temperature Sensors

Measure a range of ambient air, internal and external equipment, and water temperatures from -40°C to +125°C (-40°F to +257°F) with a waterproof lead up to 100 feet. If the temperature exceeds your preset thresholds, you get an alert via text, email, or call.

2

Water Detection Puck Sensors

Drop an ALTA Wireless Water Detection Puck in ideal locations on a facility's floor to detect water at the first sign of a leak or pooling. Our puck takes an award-winning approach to monitor water's presence or absence in virtually any facility.

3

Humidity Sensors

Monitor relative humidity (RH) with a scientific-grade ALTA Humidity Sensor. The sensor measures RH with a +/- 3% accuracy (between 10–90% RH), temperature, and dew point in aquaculture, greenhouse, and more facilities.

4

Open - Closed Sensors

Maintain proper access across facilities by monitoring the status of doors, lids, or cabinets. ALTA Wireless Open-Closed Sensors use a switch and trigger magnet to detect status. Be alerted when a threshold in iMonnit changes.

5

Water Rope Sensors

Place an ALTA Wireless Water Rope Sensor along walkways, walls, foundations, and pipes to detect water and help prevent damage from leaks and flooding. Combine up to 10 extensions for up to 100 feet of the monitoring and protection you need.

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3400 South West Temple, Salt Lake City, UT 84115 • 801-561-5555 • monnit.com