CAS DATALOGGERS

Monitoring the Storage of Semen for Artificial Fertilization

Accsense Wired A2-05 Ethernet Temperature Dataloggers

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CAS DataLoggers recently provided the temperature monitoring system for a farmer breeding cows via artificial insemination methods to guarantee optimum fertility and herd quality while avoiding the cost of keeping or borrowing a stock bull. To ensure high fertility rates, the farmer kept a supply of bull semen stored at the required temperatures and ready for implantation. In cases where the storage time wouldn't exceed 4 days, the semen could be kept at 22°C (71.6°F) to maintain its viability and used fresh, being about 10% more viable than after having been deep-frozen. If storage longer than 4 days was required, the semen was preserved in a liquid nitrogen chamber which needed to remain at a constant ultra-low temperature of -210°C (-346°F). For successful artificial fertilization to occur, the deep-frozen semen needed to be thawed prior to implantation and maintained at 25°C (77°F) for a maximum of about 2 days. In the occasional event of a container leak, the nitrogen escaped in gas form and failed to maintain the deep-freeze temperatures without showing any visual indication of the problem--the semen would be rendered infertile, but the farmer would implant the semen anyway without knowing that this was the case. As a result, his breeding cows failed to fall pregnant and the farmer fed his livestock without the expected outcome and financial benefit, so it became paramount to carefully control storage temperature conditions. Therefore the customer needed a wired datalogging solution capable of connecting to an E1-25 Type T thermocouple for extreme low-temperature measurements and which offered high-accuracy readings, customizable alarm capabilities, and supported Power over Ethernet for simple setup and hassle-free operation.

The farmer installed an **Accsense Wired A2-05 Ethernet Temperature Datalogger**, a LAN-wired temperature monitor designed for monitoring medical refrigerators, freezers, incubators, and in cryogenic storage with connections for external RTD and thermocouple sensors. For storing this deep-frozen material, it was most effective to monitor the area around the bottom of the tank where any escaping nitrogen would fall, being heavier than air, and significantly lower the temperature beneath. Mounting the data logger to a nearby wall, the farmer then connected the pod's 2 external RTD temperature probes directly under the liquid nitrogen tank to detect temperature changes from any escaping nitrogen. An E1-25 type T thermocouple measuring at -200°C to +150°C (-328°F to +302°F) was then inserted directly into the LN2 tank's vapor chamber and connected to the monitor.

This advanced temperature monitoring and alarm system featured sophisticated alarm capabilities with alert messaging. Using Power over Ethernet technology to decrease the number of wires required for installation, setup was completed by simply connecting the logger directly into the network. Each monitor included a power adapter and Ethernet cables for a lower cost and easier maintenance compared to traditional wiring. In case of a power failure or network connection loss, the Accsense system could keep running for 6 hours on its internal lithium battery, during which the datalogger would

continue to buffer data. During outages, the pods could store up to 256 data points or until connection was restored.

Personnel used the pods to access both live and historic data and to set local and remote alarms to trigger whenever cryogenic or the external probes' temperatures went out of specification. Alarm levels and contacts could be sent by phone, email, and text message, offering unmatched convenience. Users could also login using any Web browser to view data and setup alarms, to retrieve reports and graphs or to modify the system's configuration from anywhere Internet connection was available.

The farmer benefited in several ways from installing the Accsense A2-05 Ethernet Temperature Datalogger underneath his LN2 cryogenic storage tank. The wired datalogging pods performed highly-accurate temperature monitoring, offered advanced alarming features, and automatically sent all the data to secure servers for viewing and backup. This evidence helped the farmer to obtain financial compensation from his insurance company. In the event of a nitrogen leak, the datalogger's external RTD sensors immediately registered a dramatic drop in temperature at the base of the chamber and sent out a phone alert, providing an effective early warning system when semen viability had been jeopardized by a leaking container. Additionally, the dataloggers supported Power over Ethernet for simple installation and setup, and personnel soon became knowledgeable in every aspect of the system's operation. The cost-effective Accsense temperature pod entirely replaced the farmer's old alarm systems, increasing safety measures and decreasing response times. The farm experienced an increased fertility in its livestock, which in turn led to savings in feed and labor costs.

For more information on the Accsense A2-05 Ethernet Temperature Datalogger, other wired and wireless Accsense monitoring systems, or to find the ideal solution for your application-specific needs, contact a CAS Data Logger Applications Specialist at (800) 956-4437 or visit the website at www.DataLoggerInc.com.

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