



POWERLINK

Sowing the seeds of success

Farmers around the world are using artificial insemination to breed their livestock faster and more efficiently. This also reduces costs for purchasing, feeding and caring for additional livestock. Using artificial insemination allows farmers to know exactly when their livestock was bred, and they can time the farrowing season as required.

Boar farm laboratories use special packaging machines to package semen into specialized breeding bags and ship them to the breeding farmers shortly after packaging. The laboratories are typically quiet and very clean places and need machines that fit that environment. ReproQuest, Inc. located in Fitchburg, Wisconsin, is a Veterinary bio-tech company specializing in high-tech, effective semen extension media for artificial insemination in domestic livestock and is the largest supplier of swine extension media in the U.S. The company

offers a full line of products to support the artificial insemination industry, including extension media, lab equipment including microscopes, spectrophotometers and mixing vats as well as the packaging media and equipment.

Increased performance with POWERLINK

The RQ800 packaging system is used to package individual doses of boar semen that are used at swine farms for »

artificial insemination of sows. For this packaging system ReproQuest decided to switch to an integrated solution with fieldbus technology and a motion control solution with integrated controller and driver. "By integrating the Ethernet-based POWERLINK fieldbus, we were able to significantly increase the performance of our packaging system," explains Reid Formo, design engineer at ReproQuest. In the design phase, the main goal was to develop a product that was cost effective, yet employed current technology and allowed for further expansion to new and advanced features such as a check weigher, ink jet printer or radio frequency identification.

The utilization of an Ethernet-based fieldbus structure enabled them to integrate advanced motion into the packaging machine while keeping the wiring structure and control hierarchy simple. "We were also able to simplify the layout so that we now have the entire control package contained within the housing of the table-top machine," Formo adds.

Exact dosing in a sterile environment

The RQ800 packaging system fills specialized breeding bags used for artificial insemination. 750 bags are produced using a single sheet of film. The bags are fed off the roll and onto a servo-driven indexing belt. The bags are

separated as they enter the system and the top of each bag is opened to make room for the filling needle. At the filling station, the needle enters and the non-contact peristaltic pump powered by an additional servo motor fills the bag to a specific volume. Then the bags are hermetically sealed using a thermal sealer operated using PID temperature control. In a final step, each bag is labeled with detailed dosage information.

Machines previously had less precision and simple interfaces that did not allow the operator to fully interact with the machine and monitor all of the processes during operation. "Our new machine has fast cycle times for dose volumes ranging from 70 to 90 milliliters with a tolerance of $\pm 0.5\%$. The new controller solution allows us to achieve up to 35 doses per minute," says Formo. "A decisive factor for us was that the machine had to be quiet and very clean. These are two criteria that are especially important in a laboratory environment." For this reason ReproQuest decided to switch from a pneumatic solution to one using B&R servo drives, which reduces noise while allowing for speeds up to 35 cycles per minute.

The new packaging system also features a completely open design, facilitating easier clean-up and sterilization. Easy maintenance was another very important factor for ReproQuest, as labs typically don't have full maintenance departments on-site.

B&R servo technology: Quiet yet powerful

The new packaging system uses a custom designed Power Panel with a POWERLINK interface, an X20 I/O rack, ACOPOSmicro servo controller with two 8LVA motors, one XV module and X67 I/O modules. The modules include analog inputs, digital inputs, digital outputs, SSR outputs and an X67 block using serial communication. The servo motors combine both speed and accuracy, and they allow ReproQuest to customize the machine with different pumps to accommodate the end user's desired speed. Formo adds: "The servo motors are quiet and generate less heat running the pumps at 35 doses per minute than did the stepper motors. The X67 modules enabled us to keep the wiring neat and sealed to aid in the cleaning of the machine. The XV module enabled us to effectively place our pneumatic valves on the fieldbus and eliminated the need for



The ACOPOSmicro drive system ensures precise movements on the ReproQuest packaging machine.



The X67 System is well-suited to work in a hygienic laboratory environment.

discrete wiring from the X20 module." The ACOPOSmicro controller allowed ReproQuest to integrate advanced servo functionality into a very tight package so that the machine can accurately control pumps capable of processing more than 1,800 doses per hour.

A Power Panel is used to input label information and directly communicates with the label printer, which eliminates the hassle of computer-printer communication issues and simplifies maintenance and setup. Similar systems rely on a separate industrial computer to communicate with the printer. All operating parameters, including label and batch information, can be seen on the display. A batch log is also created for each batch. Using the Ethernet connection, the batch log can be automatically sent to a network location and be used by a management program or for documentation purposes. "Implementing B&R's Power Panel with integrated HMI and PLC was a great plus for our system because we can provide the operator with all of the information they need to operate and monitor processing on the machine," explains Formo. ■

ReproQuest

Industry: Packaging industry
Location: Fitchburg, WI (USA)

www.ReproQuest.com

News

Open Automation Conferences 2011 in India

The central themes of the Open Automation Technology Conferences 2011 were how companies not only can reduce costs, but simultaneously increase productivity through the use of open technologies and standards such as POWERLINK and openSAFETY for automation in the manufacturing sector. The conferences took place July 21-22 in Coimbatore and Chennai in India. ■

International textile market leaders present their B&R solutions

With more than 1,200 exhibitors and over 100,000 visitors, the ITMA exhibition – held only once every four years – was a resounding success. This year's event took place at the Fira de Barcelona convention center in Spain, where visitors had the opportunity to experience firsthand the absolute latest product innovations and trends in the textile industry. In addition to numerous small and medium-sized companies, major players in the industry such as Rieter (Switzerland), Santoni (Italy), Tonello (Italy), Starling (Austria), LIBA (Germany), Pacific Mechatronic (China) and Prashant GAMATEX (India) were also on hand to present their latest machine solutions.

In addition to highlighting their own innovative PC and drive technology, the B&R booth also detailed advanced energy and safety concepts while underlining the advantages offered by condition monitoring.

The next ITMA will take place in 2015 in Milan, Italy. ■