

Fumigating Flour Silos Using Real-Time Temperature Monitoring

T&D Real-Time Temperature Monitoring Dataloggers

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Bay State Milling
Where change cultivates opportunity.

CAS DataLoggers recently provided the real-time wireless data logging solution for the Bay State Milling Company in Indiantown, Florida, a food processing company serving Central and South Florida producing baking flour in bulk and packaged products. The flour mill's stringent Integrated Pest Management Program (IPM) ensured that the plant's superior wholesome products were not contaminated with insects. As part of its IPM program, the mill regularly used a powerful industrial-strength fumigant to fumigate its flour storage silos and processing buildings, which was extremely effective but very temperature sensitive. During deployment, the fumigant needed to be kept at temperatures greater than 85°F (29°C) for a period of twenty-four hours. However, with the plant's equipment shut off for the fumigation process, the flour silos and processing buildings cooled down rapidly and the temperature fluctuated as a result of ambient weather conditions. To combat the loss of heat, the mill was able to add supplemental heat from unit heaters. In order to control internal temperatures, the mill had to have contracted personnel suited in protective gear enter the buildings to manually read the interior temperatures and adjust the unit heaters. Therefore, an efficient real time extended temperature monitoring solution for the flour bins and interior building spaces was needed. Keeping this requirement in mind, the mill began searching for a wireless temperature monitoring solution that would allow personnel to view readings in real-time from outside the buildings. What made this application especially difficult was the reinforced concrete construction of the five story flour silos and processing building.

Bay State Milling Company installed **6 T&D RTR-501 Wireless Temperature Data Loggers** enclosed in canvas bags inside each flour silo; the bags were then lowered by rope about halfway down into the 50 ft. deep bins. **2 T&D RTR-500 Wireless Data Logger Network Base Stations** were used for a higher frequency so they could daisy-chain with the loggers, acting as Repeaters to extend their range. The data was collected far outside of the concrete silos and processing buildings using a **T&D RTR-500DC Wireless Data Logger Handheld Data Collector** which accompanied an engineer on his rounds to check the loggers' real-time readings.

Each RTR-501 wireless datalogger measured and recorded their bin's temperature using an internal temperature sensor providing optimum waterproof and dustproof protection with a measuring range of -40°F to 176°F (-40°C to 80°C) and an average accuracy of $\pm 0.5^\circ\text{C}$. Featuring an LCD display and a water resistant case, the data loggers measured in both Celcius and Fahrenheit at a measurement display resolution of 0.1°C onto a large-capacity 16,000 point memory. Additionally, the loggers came with

options for screw terminals or wall mounts and had a wireless communication range of up to 500 feet (150 meters). Utilizing a low-energy consumption design, each logger included a lithium battery with a life of about 10 months and which could be upgraded to last about 4 years of operation.

The temperature data could be accessed in several different ways: via USB, GSM technology, via LAN or the handheld data collector, which proved to be the most convenient method. The wireless base units could download one RTR-501 remote unit at full logging capacity (16,000 readings) in about two minutes, or act as Repeaters. Even from outside the reinforced concrete silo walls and processing buildings, the handheld data collector was able to pick up the loggers' real-time data from about 200 ft. away, all the way across the mill's parking lot. Software was included with the base stations for automated download and real-time monitoring as well as email alarm.

By registering the RTR-500 as a base unit, operators downloaded recorded data and current readings from the remote units at a set interval and sent the data via e-mail to specified addresses or by FTP to a server such as T&D's WebStorage Service, carrying out monitoring of current readings and/or warnings as well as sharing the data via a PC web browser. Up to 20 groups of remote units could be registered to a single base unit, providing easy and efficient management. If the set upper or lower limits were exceeded, a warning report email containing vital details could be sent to up to four specified addresses.

The 500DC portable data collector monitored, managed, started and stopped recording, graphing all the data from the remote units for immediate on-the-spot checking of the building's temperature data without the need for a computer. The collector wirelessly gathered the data at set intervals to monitor current readings and status from each of the remote units inside the silos without anyone having to go in and manually gather them, saving a great deal of time and removing the safety risk presented by the still-active fumigant. The collector was able to simultaneously manage a large number of remote units, storing up to 15 units of data from the RTR-501 dataloggers on its easy-to-read LCD display. If necessary, the remote units could also be grouped to register even more, with a maximum number of 7 groups of 32 remote units each. The RTR-500DC also eliminated the need for any troublesome preparation such as having to create a network environment or to carry out wiring. The collector's LCD backlit display let the engineer easily read the data even in the dark. The simple dial made operation easy, with a quick menu structure enabling intuitive operation onsite.

Bay State Milling Company benefited in several key ways following the installation of the T&D wireless real-time monitoring system. Most importantly, personnel were able to check the temperatures in the flour silos and the interior spaces within the process buildings with the handheld data collector instead of having to rely on manual means. Together these sophisticated devices formed a practical and cost-effective solution for the mill's temperature monitoring application, and the dataloggers' compact and

lightweight design meant they could fit easily in the bags or be placed just about anywhere in the plant. The remote data allowed mill personnel to efficiently manage the efficacy of the fumigant's deployment.

Bay State Milling Company's Plant Manager, Mr. Bill Raiola, commented on the convenience of the T&D wireless system: "We were all very pleased to have the real-time data, especially considering where the devices were located inside the flour silos. Our engineer was even able to collect the temperature readings from as far as 200 feet away from the silos and buildings."

Check out additional T&D dataloggers at <http://dataloggerinc.com/manufacturers/TandD/19/>.

For further information on the T&D RTR-501 Wireless Temperature Data Loggers and RTR-500 Wireless Base Stations, the RTR-500DC Wireless Handheld Data Collector, 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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