

Application Note

Coda Utilized to Save Lives

Blood banks around the world collect, process and store large volumes of blood and its components for use by hospitals and other medical care facilities. Since the handling and storage of blood is highly regulated by government and international standards, storage equipment must be properly tested and certified before it can be used.

BloodSource, a non-profit company located in Northern California, has been serving the medical community and providing blood to patients for over 60 years. This blood center collects, tests, and processes blood from its donors. BloodSource now supplies blood to nearly 40 hospitals in Northern and Central California and beyond. As one of the premier blood centers in the world, BloodSource is also affiliated with domestic and international medical and blood banking organizations.



BloodSource storage chamber

BloodSource's over 1,800-square-foot storage facilities must be kept at a cold, constant temperature to maintain product freshness, potency and purity. The U.S. Food and Drug Administration (FDA) and the American Association of Blood Banks (AABB) have strict guidelines for blood storage and perform audits to ensure that the regulations are being followed. Besides, BloodSource has a quality control team that regularly inspects and tests storage containers.

The storage containers are constantly monitored using a system comprised of a PC-based program, computers (nodes), and temperature probes. If a probe detects a temperature that is outside the acceptable range, an alarm will notify staff members who can troubleshoot the problem with the storage container or transport the blood products to another suitable container.

BloodSource expanded its storage facilities by adding three new coolers and three new freezers ranging in size from 400 to 3,200 cubic feet. The temperature of the coolers could only vary $\pm 1^\circ\text{C}$ throughout while the freezers could fluctuate $\pm 2^\circ\text{C}$.

To build and test the new storage chambers, BloodSource commissioned N2GenII, inc., an engineering/service group that specializes in providing and maintaining thermal environments. N2GenII partnered with m+p international to design the temperature monitoring system for the coolers and freezers.

The new measurement system consists of m+p international's turnkey Coda (**C**ontinuous **d**ata **a**cquisition) software and two thermocouple/voltage measurement instruments.

Each instrument enables the user to measure up to 32 points of temperature and 16 points of voltage in the storage room. This large number of temperature points allows slight variations in room temperature to be identified quickly. Voltage measurements increase safety by monitoring the performance of circulation fans and making sure that the entrance door has been closed.



Coda alarm monitoring

The Coda software provides a full-featured alarm monitoring capability for all active channels. This increases user confidence in the system and reduces the amount of operator oversight. When an alarm condition is met, Coda not only displays the alarm condition and notifies the operator, but the time and duration of the out-of-tolerance condition are fully logged. In fact, all user interaction is logged and available for analysis.

The new monitoring system was an especially attractive solution for BloodSource because the Coda system is readily available without customization, making it easy to support. The system also enables users to monitor multiple locations at the same time without waiting to start the validation process on the next cooler or freezer. Thanks to this flexibility, testing/validation of the new storage chambers was completed in only 12 days instead of 24.

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