



Client › United States Antarctic Program

The Challenge:

Help the United States Antarctic Program's McMurdo Station develop a system for securely monitoring its microwave landing system (MLS), which was installed on the ice-shelf and sea-ice runways to support safer aircraft operations.

The Solution:

Incorporate the Lantronix SLC to enable two levels of wireless reporting: one for air traffic controllers in the single tower and one for electronics crews on the ground.

The Result:

The McMurdo MLS, utilizing a wireless/LAN network monitoring interface, received FAA certification as an approved landing system in 2005 after successful testing at Williams Airfield in 2004.

“The SLC met our security requirements from the beginning. With every firmware update, Lantronix has stayed ahead of the curve, giving me the confidence that aircraft are able to land safely and securely.”

Kent L. Colby,
Manager Technical Projects,
McMurdo Area Directorate

The Challenge: Flying Blind in the Antarctic

Established in December 1955, McMurdo Station is the logistics hub of the United States Antarctic Program (USAP), which comprises scientists studying the Antarctic along with the operations personnel who support them. The Station is built on the bare volcanic rock of Hut Point Peninsula on Ross Island, and large, ski-equipped LC-130 aircraft provide transportation for supplies and personnel. Three separate landing strips serve these inter- and intra-continental flights, including the Williams Field skiway and the Pegasus airfield on the Ross Ice Shelf, and a sea-ice runway that is only available during the coldest months. Due to the Antarctic's extreme environmental conditions, all three landing strips are in a constant state of motion.

In 2004, the National Science Foundation (NSF) acquired a microwave landing system (MLS) from the Federal Aviation Administration (FAA) for the purpose of supporting safer aircraft operations on the ice-shelf and sea-ice runways. Unfortunately, the MLS required a number of modifications, not the least of which was incorporating a precise monitoring and reporting system for air traffic controllers and ground personnel. “Obviously we needed a wireless capability,” says Kent Colby, Manager of Technical Projects for the McMurdo Area Directorate and a member of Raytheon Polar Services. “It's impossible to bury 5,000-10,000 feet of wire in the ice.”

Rather than build a wireless capability from the ground up, the subcontractor for the MLS' software design recommended a console server to provide an interface between the legacy serial reporting system and the networked environment. When the subcontractor suggested the Lantronix SLC, Colby, who had used Lantronix products with great success in the past, readily agreed.

The Solution: Lantronix Enables Secure Monitoring

The Lantronix SLC serial console server provides easy, secure administration and management of IT equipment from anywhere, any time. The three runways at McMurdo Station use spread spectrum radios to link to a web page-launched console client, with no proprietary software required. Air traffic personnel can easily monitor all three runways on one screen and are better equipped to bring aircraft in safely. “The SLC really simplified the reporting system for us,” says Colby, “but security was also a concern.”

The SLC provides integrated security features, such as SSL and SSH for data encryption, and firewall capabilities that reject connection attempts and/or block ports. In fact, the SLC was the first console server with a NIST-certified AES encryption. According to Colby, “The SLC met our security requirements from the beginning. With every firmware update, Lantronix has stayed ahead of the curve.” Colby was also impressed with the SLC’s durability. “The SLC is relatively unaffected by atmospheric conditions, which was a key specification for us.”

The Results: The McMurdo MLS Is Flying High with SLC

The McMurdo MLS received FAA certification as an approved landing system in 2005 after successful testing at Williams Airfield in 2004. The system provides two levels of monitoring: Level 1 is an interface for air traffic controllers that uses multicolored lights to indicate changes in system configurations due, for instance, to ice movement; Level 2 is a more sophisticated interface that provides more detailed information to ground electronics staff, allowing them to understand why system parameters change and to determine appropriate action to take to resolve any issues.

The McMurdo MLS is operational approximately four months out of the year. When the airstrips are down, the system is put on standby; firmware upgrades are performed during the no-fly season. Raytheon Polar Services employs Lantronix products in several other systems at McMurdo Station, and Colby affirms that Lantronix products will always be his first choice when developing future systems.

About the United States

Antarctic Program

The National Science Foundation (NSF) manages U.S. scientific research in Antarctica through the United States Antarctic Program (USAP). The USAP’s goals are: to understand the Antarctic and its associated ecosystems; to understand the region’s effects on, and responses to, global processes such as climate; and to use Antarctica’s unique features for scientific research that cannot be performed elsewhere. Raytheon Polar Services exists specifically to meet the needs of the NSF Office of Polar Programs, and in particular to provide operational support to the USAP.

For more information, visit usap.gov or rpsc.raytheon.com.

For more information on the Lantronix SLC product line, go to www.lantronix.com/slc

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