

AN00005

### Magnum 6K Switches Connect Cargotec Port Security's Spreader Bar Radiation Verification System

An application about the Spreader Bar Radiation Verification System (SBRVS) for port security



**Increasingly, the US Federal Government is requiring technologies to detect illicit nuclear materials and radiological sources at the ports. Cargotec Port Security's (CPS) Spreader Bar Radiation Verification System (SBRVS), licensed from Innovative American Technology, Inc. (IAT), is a security solution that can prevent such radiological materials from entering U.S. borders. SBRVS has been awarded a "Qualified Anti-Terrorist Technology Designation (QATT)" by the Department of Homeland Security.**

SBRVS uses IAT proprietary modifications to commercial off-the-shelf (COTS) radiation sensors for detection and material identification. SBRVS deploys radiological and fissile material sensors onto the spreader bar of a container-moving gantry crane. SBRVS enables 100% verification of the containers transported between ports for hazardous radiological materials and verifies the shipping containers without affecting the flow of commerce and with minimal false positives and false negatives.

#### The Challenge

Cargotec needed to collect, digitalize, and process data in a network-linked controller, and analyze it for radiological and fissile substances. The detected materials would undergo spectral analysis, and then be compared to a database of known isotopes, including medical, industrial, special nuclear materials (SNM), and naturally occurring radiological materials (NORM). If the source is recognized as hazardous, an alarm is generated and the designated authority is notified. SBRVS-equipped stations are networked with a designated operations center for monitoring of all reporting stations and storing of collected data. GarrettCom hardened switches were selected to provide the managed Ethernet network for the SBRVS.

#### The System Description

The SBRVS features sensors deployed throughout the spreader bars on the gantry cranes as network elements across the distributed network and connected to the SBRVS Threat Identification System in a central location for data analysis.

Modular sensor modules and their associated electronics are configured to support gamma radiation detectors and neutron detectors. Data collected from the detectors is collected and forwarded to the Threat Identification System over a TCP/IP connection.

SBRVS is comprised of these sensor modules, a container identification system, local servers, client workstations, and the distributed data network.

Each sensor module is assigned an individual TCP/IP address to enable independent data access via its controller to each gamma detector interface, each neutron detector interface, and each IAT sensor electronics module.



Magnum 6K Switch in typical control box installation

## Belden Solution

### The Networking Solution

Each Magnum 6K Switch is connected to all of the sensor units located throughout the spreader bar. Each 6K Switch is also connected to an IOLAN Perle module where a signal is received for locking and unlocking the spreader. The 6K also connects to the IAT-BOP (Broadband Over Power) that allows for the communication to the main control, where another IAT-BOP connects to the Server, and then via wireless to the operation center of the port.

Each 6K Switch provides status, control information, and remote control while enabling high-speed Ethernet connections between radiation sensor module components and the data network deployed at the port. While all connections are currently 100Mb, the Magnum 6K allows for a range of Gigabit and fiber port modules to meet any future bandwidth and distance needs. MNS-6K security features including TACACs, Radius, VLANs and DHCP server are being utilized.

### About Magnum Products

**Magnum 6K Managed Switches** are highly configurable switches, providing modular slots for user selection of 100Mb, 10Mb, or Gigabit Ethernet fiber or copper ports. The Magnum 6K line is hardened for the harshest industrial environments. Many 6K Switches are convection cooled (such as the Magnum 6KQ used as part of the Cargotec Port Security solution). Power input choices include 24VDC, -48VDC, 125VDC, AC, and dual DC input for redundancy.

**MNS-6K Managed Network Software** provides the latest technology for switch management, network management and security. Based on network standards, it is easily integrated into existing networks, and features standards-based redundancy functionality and Secure Web Management (SWM) GUI. MNS-6K-SECURE is available for those customers demanding extra security in their networks. It includes SNMP client and SNMP server that provides synchronized time services for networks. Both MNS-6K and MNS-6K-SECURE now feature industry standard RSTP-2004 to support larger rings and meshes.

To learn more about GarrettCom's range of hardened and innovative industrial networking products, visit [www.belden.com](http://www.belden.com).



6K Switches Network Cargotec Port Security's SBRVS (typical cargo crane and spreader bar shown). Magnum 6K Switches located in control box. Switches connect to sensors located throughout spreader bar.

Belden, Belden Sending All The Right Signals, Hirschmann, GarrettCom, Tofino Security and the Belden logo are trademarks or registered trademarks of Belden Inc. or its affiliated companies in the United States and other jurisdictions. Belden and other parties may also have trademark rights in other terms used herein.