Zhangzi Island, Dalian City, China

A year-round tourist destination that combines tourism, resorts, recreation, entertainment, ocean sports and shopping, with hundreds of thousands of visitors over the holiday season

Top tourist destination deploys Motorola's Wireless Remote Network Monitoring System for real-time, efficient video surveillance and enhanced visitor security

BACKGROUND

To the east of the city of Dalian in the Liaoning Province of China, nestled at the northern part of the Yellow Sea, Zhangzi Island is surrounded on all sides by water – with a pleasant climate, fresh air and beautiful scenery. The town's total land area of 14.95 square kilometres is made up of four islands - Dalian Island, Dahao Island, Xiaohao Island and, Zhangzi Island itself. Though small compared to other tourist destinations, Zhangzi Island is popular with visitors arriving by sea. The island attracts travellers all year round, peaking over the New Year holidays.

With China's preparation for the 2008 Beijing Olympics underway, Dalian's municipal government has undertaken greater efforts to promote local products and services – including street renovations and an extensive marketing campaign. As a result, tourism is flourishing.

The rising volume of visitors means protecting the safety of travellers and preventing accidents have become more and more important. The island's surveillance infrastructure has come under more exacting demands. To meet higher performance expectations, the Zhangzi Island Public Security Bureau decided to deploy a wireless network monitoring system using Motorola's world-leading Canopy products.

MARKET CHALLENGE

When building a dedicated wired network, limitations usually encountered are special environments (such as mountainous and wide open areas) and work complexity (some require onsite ditch-digging, which destroys surface environment and involves lengthy procedures for cable laying). Thanks to advanced multimedia and Internet technologies, today's video surveillance systems are able to offer more advanced functions and higher quality over wireless broadband networks.

Wireless video, audio and data transmission equipment provides for faster installation, convenient maintenance and easy expandability, while avoiding the limitations of a wired network.

Wireless broadband network video monitoring systems play a vital role in a government's overall operations. Law enforcement and security personnel need accurate, clear and real-time video intelligence from surveillance points back to the monitoring centre. With the right surveillance system and software, personnel can now immediately respond to situations right as they happen.

Motorola's wireless broadband network transmits video, audio and data via point-to-point and point-to-multipoint wireless link equipment thus integrating voice monitoring, police reporting, data storage and lookup, and centralized video system management.

The network equipment is compact in size (often avoiding the cost of dedicated towers) and rich in functionality. It provides ease of use, installation and network administration.

THE SOLUTION

High Performance Video Monitoring Stations with Remote Capability

Based on the needs of Zhangzi Island's Public Security Bureau, the system was designed around a wireless monitoring network, with 17 monitoring points strategically located at each important site around Xiaohao Island. Video streams of people and vehicle lanes are collected by monitoring equipment to deliver real-time monitoring of the most important locations in the scenic area of Xiaohao Island.

Each camera has independent access to the monitoring system's wireless network, over which data, voice and video are transmitted to the Public Security Bureau's command centre at Xiaohao Island. A server simultaneously stores real-time video from 17 monitoring points and instantly displays emerging situations on a large screen.

The camera system supports authorized remote surveillance over the Internet, although the rate of video and data transmission is dependent on the speed of the Internet connection. An authorized user can instantly view full-quality real-time video from any network point on the island.

Integrated Camera and Network Base Station

The front-end equipment is a high-speed spherical camera and a portable cabinet used to integrate the power source. It converts a real-time video feed into a digital video stream which can be transmitted over a wireless broadband network. The networked spherical integrated camera is currently the world's most advanced digital video surveillance device. It boasts high image quality, high resolution, automatic focus and aperture, and custom bitrate settings that can be preset according to each customer's needs.

The wireless network base station can be installed at the top of an existing mobile tower, hence saving the cost of building a new dedicated tower. Motorola's 5.8GHz wireless equipment does not interfere with telecom operators' equipment.

Wireless Broadband Transmission

Motorola's wireless broadband network products include wireless subscriber modules, central access point clusters, and a cluster management module (CMM2) to ensure omni-directional signal coverage and data synchronization. Due to the complex island terrain, wireless radio wave transmission on Zhangzi Island is greatly affected.

When obstructions are encountered, signal router stations were built at locations (such as a high point) to establish a routing connection with a few remote stations, thus providing good signal transmission.

In this solution, 20Mbps point-to-point BH (BH20) equipment was deployed, to ensure signal transmission quality and bandwidth. The command centre is situated at the Xiaohao Island Public Security Bureau with a monitoring centre that includes a video management server and a large video monitoring screen. The video management server uses specialised surveillance software and management programs that control the video streams coming from each monitoring point. An authorization method is used to manage user access privileges, and to send the video via data processing equipment to a large screen for monitoring and management.

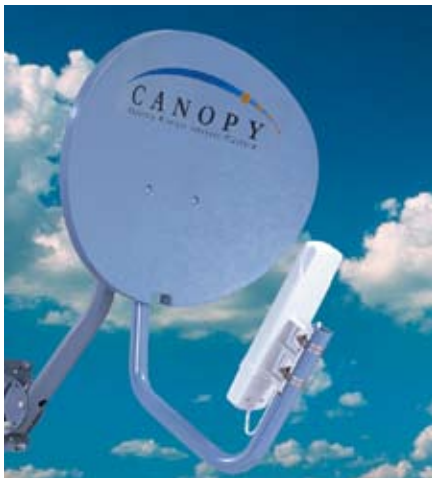
Monitoring and Management Software

The monitoring centre has simultaneous control of 17 cameras. This system can provide real-time surveillance on 16 screens, pan/tilt/zoom camera controls, programmable recording plans, and manual recording. It can record 24/7 and capture individual video signals from each camera, making it easier to search and playback recorded video. With this system, security personnel can clearly see all situations in real-time as they occur at the monitored locations. Users can simultaneously switch between video streams at will while recording the video from all monitoring points. The system uses advanced digital processing technology that allows the user to replay previous information without affecting normal recording in progress. It can also use the snapshot function to increase the resolution of an image, and backup or print important information. This will be beneficial to the storage and management of important records as evidence or for future preventive measures.

Warranty, After-Sales Service and Training

As the design of the wireless monitoring system was implemented based on ISO9000 and the design requirements of the project, it fully met the needs of the Zhangzi Island Public Security Bureau. In addition, Motorola provides life-long, high-quality after-sales service to the Zhangzi Island wireless video monitoring project. Because this implementation involves remote locations, to ensure the normal operation of the system, a project agent in Dalian provides rapid first-response for any problems if they arise.

Motorola also provides specialized training for users. Operational and technical training are conducted by our specialized personnel for system users and maintenance personnel.



CANOPY SOLUTION ADVANTAGES

1. Long Distance, Reliable Transmission
Canopy provides great bandwidth even in long distance transmissions. The maximum transmission distance of the Canopy 10/20Mbps feedback modules is 56 kilometers, a benchmark that other similar products have found hard to measure up to.

2. Compact Size, Easy Installation
Canopy devices are compact and highly integrated - no indoor rack-mounted equipment is needed, thus eliminating the need for a machine room necessary for other systems. Canopy installation, testing and debugging is simple and time-saving, as all network administration and problem-diagnosing functions are embedded.

3. High Speed, Stable Bandwidth
The throughput of the Canopy system used here is 10Mbps, with effective speed of 7Mbps in point to point mode and 6.2Mbps in point to multi-point mode. The system increases the throughput in the heavy loading cases, which ensures that the system bandwidth remains stable regardless of the number of users and the average load.

The system is able to dynamically control the bandwidth via the Bandwidth Administration Management module, as well as support the dynamic updating of the encryption key to enhance the encryption functions.

4. First Class Service and Support
Canopy users can enjoy good service whenever and wherever they need it, as Motorola service networks have been set up across China.

In order to meet application needs and to keep the costs of building the system to a minimum, the Zhangzi Island Wireless Video Monitoring solution was designed with the following principles in mind:

- **Standardization:**
  The wireless network video monitoring system should transfer video and other communications over a standards-based digital IP network.

- **Expandability:**
  Because new requirements for video monitoring and communication are continually developing, the system was designed such that only the front-end equipment would have to be augmented, without adding extra core backhaul equipment.

- **Usability and Reliability:**
  The solution is based on a thorough assessment of the RF environment, geography and peak bandwidth requirements. The installed equipment also uses a stable and proven embedded operating system which reduces the possibility of breakdowns.

- **Ease of Assembly and Maintenance:**
  The chosen wireless network solution is easy and quick to install, with a very small footprint and no cables buried underground or routed along hard-to-reach routes.

MOTOROLA CANOPY Motorola Wireless Broadband Platform MOTOWI4™

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