



# Historic Library Offers Patrons 21st Century Services with wi4 Indoor Solutions

## Overview: Library in the Heartland of America

During the late 19th and 20th Centuries, Andrew Carnegie invested \$56 million of his own personal wealth in building over 2,000 libraries throughout the English-speaking world. His magnanimous gift was truly the beginning of the free public library system in the United States. Inspired by this generosity, a wealthy businessman and scholar bequeathed \$12,000 in 1885 to build a library in the great Midwestern state of Illinois. The library has grown along with development in the area. Today, it supports a community of nearly 10,000 citizens and is a distinctive research and learning center.

## The Challenge: Provide separate, secure broadband systems for public and private usage for library staff and patrons without compromising an historic 100-year-old building.

In 1912, a library building was constructed to serve this small rural community in western Illinois. Built in the traditional style of the day, the building consists of three floors. The main floor contains the heart of the library and houses over 47,000 volumes of information along with a computer resource center. The upper level contains historical archives and precious reference materials while the lower level contains records, files and storage. The library's broadband services were delivered via a partial T1 with speeds averaging 300 to 500 Kbps. Public access computers, library staff and other key city departments all shared the same T1, clearly creating a security issue. In addition, library officials were concerned that there was no system in place to safeguard unseen areas of the library.

## The Solution: A high-speed broadband network that preserved the integrity of this historical structure.

Motorola's Powerline Multi-Unit (MU) was the ideal solution for the library because of its ability to convert broadband signals of any kind, DSL, T1, E1, cable and satellite, into the HomePlug® protocol. No construction was required during system installation and patrons and library staff were able to continue activities without experiencing any inconvenience.

Using power lines for data communication is not a new concept. Until recently, however, there have been a number of technical and regulatory obstacles that have prevented the widespread deployment of this type of service. With new advancements in technology, these technical obstacles have been overcome. In particular, Motorola has enhanced Broadband over Powerline technology to make it suitable for providing a robust broadband access

## CUSTOMER PROFILE

### Company

Historic Midwestern Library

### Industry

Information science

### MOTOwi4™ Solution

- wi4 Indoor
- Powerline MU
- BPL technology

### Solution Features

- High-speed broadband connectivity
- Usage of wired infrastructure
- Preservation of building's structure with non-invasive installation

### Benefits

- Multi-use network for public access and public works
- Low cost, secure wireless broadband service
- Increased library usage
- New revenue stream

### About Powerline MU

Motorola's Powerline MU solution effectively transforms a building's electrical system into a modern, high-speed communications network. It is a low-cost, scalable, secure system that integrates wireless broadband, radio, Ethernet, networking, HomePlug and modem technologies to deliver high-speed data over existing power lines. The Powerline MU solution works in even the hardest-to-reach building environments.

### HomePlug Technology

The HomePlug Powerline Alliance is an organization that is developing in-the-home and to-the-home power line communications technology protocols. These are widely used in the industry and are contributing to the IEEE's standards development. HomePlug-compliant products use existing power lines as a path to send and receive high-speed data. Motorola's Powerline MU operates based on the 85 Mbps Turbo HomePlug protocol.

technology. The Powerline MU solution makes use of OFDM technology combined with robust modulation schemes to overcome the noisy and hostile environments present in low-voltage wiring systems. Furthermore, the system uses 56-bit DES encryption, modem registration and isolation for a robust security solution.

The library network makes use of a high-speed fiber link. The signal from the fiber link is converted to Ethernet and then carried to the Powerline MU Gateway, which is located in the basement electrical closet. The Gateway then converts the signal into the HomePlug protocol for transport across the library's existing electrical distribution network.

Physical installation of the library network was very simple and straightforward. Pre-work, including network planning and setup required less than two days to complete. Installation was certainly much less invasive to the building's infrastructure than cable or DSL. No drilling, cabling or wiring was required. The actual physical installation was accomplished in approximately four hours.

Each modem served by the Powerline MU Gateway is assigned to its own Virtual Local Area Network (VLAN) which prevents computers connected to the same transformer from having access to one another's data. The library also uses the Powerline MU system in concert with video surveillance cameras, located in sensitive areas of the library, to monitor the safety of the building and materials. Results are outstanding.

### The Benefits: Multiple use network, increased library usage, improved overall broadband experience, creation of new revenue stream and enhanced safety and security.

Through the usage of the Motorola Powerline MU solution, the library has succeeded at bringing advanced wireless communications to both patrons and library personnel. The benefits have been numerous. First, by creating a multi-use network that supports VLAN tagging to protect data streams among modems, the city's network is now safeguarded from hacking and unauthorized public access. Secondly, overall library usage has increased exponentially and the computer resource center is now in great demand. Initially, the public access computers were experiencing speeds up to 20 Mbps. The service provider installed bandwidth controllers to throttle back the actual speeds to a maximum of 4 Mbps. The broadband network also helped to increase revenue through the use of *For Fee* printing services. Finally, the library's precious archives and files are now safer from damage, theft and destruction thanks to the use of the video surveillance system. The Powerline MU system has given this 100-year-old building a newly modernized place to research, learn, entertain and communicate.



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