

Telkonet Government Systems NMCI Symposium Abstract Submission

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Telkonet, Inc. is the leader in designing, manufacturing and deploying high-performance powerline carrier (PLC) technology products that utilize a facility's existing electrical wiring to distribute secure data, voice and video communications. The Telkonet® PlugPlus™ family of networking and internetworking products offers a cost-effective alternative to the challenges of hardwired and wireless local area networks (LANs) while maintaining wired-equivalency security. Built upon widely accepted algorithms and implementing a virtual hub-and-spoke network architecture, Telkonet's PLC products secure the transmission of data via the use of configurable encryption keys. Telkonet PlugPlus products are designed for use in commercial and residential applications, including multi-dwelling units and the hospitality and government markets. The Telkonet system can be implemented more quickly and less expensively than adding dedicated wiring and is superior to wireless systems in areas where security is a paramount concern.

Powerline Communications (PLC) Overview

PLC Technology

Powerline communications (PLC) technology enables the transmission of data over existing electric wires within a building by utilizing the powerline infrastructure within the building as a physical transport media. Since PLC uses existing electrical wiring, it is not necessary to install new, dedicated wiring or cabling – a major benefit to older or historic buildings where sensitive environmental issues, expensive deployment costs or architectural preservation may be a concern. Similarly, in shipboard environments such as Aircraft Carriers, where limited space, inadequate access and heavy fortification have proven challenging to the deployment of cost-effective wired and wireless infrastructure, Telkonet's PLC systems empower the data network already in place to deliver connectivity using a portion of the sixteen hundred miles of existing wiring.

Telkonet and PLC

The Telkonet PlugPlus system is a robust system for commercial applications, scalable to hundreds of users. It is ideal for large and/or challenging installations, such as hotels, apartment complexes, and military facilities, which demand a high degree of reliability, service and security.

The Telkonet solution uses three components to deliver the networking signal in a facility. The Telkonet Gateway is connected via standard Ethernet to an existing network. The Telkonet Gateway converts the incoming signal to a power line carrier (PLC) signal. The PLC signal from the Telkonet Gateway is secured using triple keys DES encryption standard and injected into the building's electrical system using one or more Telkonet Couplers, which are wired directly to the electrical panels in the building. The network signal is accessed throughout the building by plugging a Telkonet iBridge™ into an electrical outlet and accessing the Ethernet port on the Telkonet iBridge. The Telkonet iBridge can be plugged into any available outlet, so users can access the network from virtually any electrical outlet in any room, for maximum convenience.

Major components of a Telkonet PlugPlus™ system network include the following:

Router	A device that serves as a bridge between the Internet and the internal Telkonet network, directing information packets to their proper destination.
Telkonet Gateway	A Telkonet-proprietary device that takes the incoming network signal from the router and generates a signal suitable for distribution over power lines in the building.
Telkonet Coupler	A Telkonet-proprietary device connected to the Telkonet Gateway via coaxial cable that is used to inject the power line signal at a specific breaker panel or meter bank. A Telkonet Coupler is installed at each breaker panel or meter bank, providing power to an area of the building requiring network access via the Telkonet solution.
Telkonet iBridge™	A simple, Telkonet-proprietary single-port intelligent bridge which converts the power line signal into Ethernet for the end user. This device provides the link between the PLC network and the end user's computer. It may be plugged into any outlet in the building supported by the Telkonet power line communication network.

Advantages of Telkonet PLC for NMCI

PLC delivers flexibility.

By using existing electrical wiring in a building, facility or shipboard environment as the basis for connectivity to distribute data and high-speed Internet access, PLC provides a high degree of flexibility. Virtually every electrical outlet becomes a network port.

PLC overcomes physical and operational challenges.

There are no limitations with PLC technology. The age of the facility, its physical size, how it was constructed (for example, a high degree of concrete or steel, asbestos, etc.) is not an issue. Installation is quick and simple. There is no need for a time-consuming analysis of network element placement. Installation can typically be completed in one day, without any disruption to everyday activities.

PLC delivers secure and reliable data transmission.

The Telkonet Gateway uses encryption on the PLC network to provide wired-equivalency security. Network access requires a physical connection as well as prior knowledge of the configurable network encryption key. The Gateway management interface allows the network administrator to control access options for each iBridge. Data integrity is insured by a robust protocol that guarantees packet delivery across the PLC network. In the unlikely event that the NEK is compromised, the network administrator can immediately upgrade all authorized iBridges on the network. Security is further enhanced by precluding access to the Gateway management interface from the PLC network, unless explicitly configured.

Telkonet in the Field

The Telkonet PlugPlus system has been deployed throughout several vertical markets including hospitality, multi-dwelling and the government/military space. On the hospitality and multi-dwelling side, high-speed Internet access (HSIA) has quickly become one of the most requested amenities for guests and tenants. Telkonet's PLC products, now deployed in over 30 U.S. States, offer owners and operators the opportunity to add considerable value to their properties by providing high-speed Internet access (HSIA) to virtually every electrical outlet in a building or facility. Similarly, the Chicago Housing Authority (CHA), the third largest public housing system in U.S., has deployed Telkonet's PLC system to

offer HSIA and voice services to residents at a fraction of the cost of traditional hardwired and wireless networking solutions.

In 2003, Telkonet installed a complete PLC network aboard an active Office of Naval Research (ONR) vessel at the U.S. Naval Academy. Within a few hours, every electrical outlet on the ship became a network access point for ship personnel to manage various tasks and duties aboard by using the ship's existing electrical infrastructure to foster the data network. A similar project is planned for deployment aboard an active Navy Aircraft Carrier and other highly fortified ship-born assets. Telkonet is also working closely with the U.S. Army Corps of Engineers to install and validate a comprehensive IP-enabled security and surveillance system designed to monitor physical assets within their portfolio. Other pilots are planned and/or underway at various Navy and Army facilities on the east coast.