



IMPROVING HOSPITAL SAFETY

Benefits

- *The system prevents baby abduction from maternity wards while letting authorized personnel transfer babies between wards.*
- *All tag holders, including midwives/nurses, mothers, and infants, can be quickly located in real time.*
- *LONWORKS technology provides a smart, scalable solution that can be easily expanded to track hospital assets.*
- *The system's distributed intelligence allows the system to run even if the PC server is shut off.*

LONWORKS®-Based Security System Keeps U.K. Infants Safe and Sound

Infant abduction is a chilling reality. It's also the last thing a new mother wants to think about when she's a patient in a hospital maternity ward.

Norfolk and Norwich University Hospital (NNUH) is doing its part to keep its tiniest patients safe. After a series of alarming U.K. baby abductions in the early 2000s, NNUH, based in Norwich, England, decided it needed a reliable and flexible security system: one that would prevent maternity ward abduction while allowing authorized personnel to transfer babies between wards.

NNUH—which employs nearly 150 full-time midwives and delivers nearly 6,000 wee ones each year—hired medical equipment manufacturer Mediplan Ltd. to specify, install, and commission a new system. Working with several suppliers, Mediplan created the hospital's Baby Security System. It's based on Echelon control networking technology, an open, extensible architecture that lets control devices from multiple manufacturers interact with each other. The system uses wireless tags, and LONWORKS®-based readers, controllers, and software, to lock doors and alert hospital staff when it detects the unauthorized presence of a baby near a maternity ward exit. It also does this in the event of an attempted theft or a staff attack.

How It Works

All authorized maternity ward personnel wear special tags according to their user status (midwife/nurse, mother, or infant). Each tag has a unique ID. Tag holders can be easily located in real time, thanks to software that works in concert with readers embedded in the maternity ward's ceilings, wireless tag detectors installed in the ward's entrances and exits, and controllers. I/O modules monitor and control closed-circuit TV, buzzers, and lamps; they also sound alarms and automatically lock doors in an emergency. A Help button on the tags lets staff quickly respond to requests or emergencies.

The tags transmit their ID, motion status, and battery status to the readers. Each reader sends this information to a controller that has its own database. This controller, called the Local Processing Unit (LPU), makes decisions based on information registered by the firmware. The LPU is connected to two redundant servers (a PC and a LONWORKS-TCP/IP embedded controller). The tags send information every four seconds in IR and RF; if a tag is motionless, the information is sent every minute to save battery life.

The system's distributed intelligence lets the system run even if the PC server is shut off. Once configured, each LONWORKS device has a list of device addresses to which it sends event-generated information independent of the server. Each controller also has sophisticated firmware that lets it process the information, activate the surrounding devices, and keep logs in its memory. This makes the PC a server for other PC clients, and allows it to keep a database of people, alarms, and events for audit trails. The IP-based system was easily integrated into the hospital's existing Intranet. The LONWORKS devices are wired in separate segments, each in a free topology (FT) configuration. The system was configured using Echelon's LonMaker® for Windows.

"Echelon's technology and Mediplan's high-quality installation and technical help, along with our extensive knowledge of security systems and network technology, helped make this project a success," says Gabriel Garcia, Infranet Products Manager of CIAC, Paris, which supplied the controllers, I/O modules, touch screens, and easy-to-use software. CIAC is also leading LONMARK International's security task group.

Thanks to the extensibility of LONWORKS technology, the security system can be easily extended to track and protect valuable hospital assets, including medical equipment.

The Results

The Baby Security System, which is now installed in five National Health Services hospitals in the U.K., provides the highest level of maternity ward security for both NNUH staff and patients. Perhaps that's one of the reasons why the maternity unit at NNUH has been voted the best in the U.K. in BabyWorld new-mother surveys, based on its quality of care before, during, and after delivery.

The Customer

Norfolk and Norwich University Hospital
Norwich, England
www.nnuh.nhs.uk

The Integrator

Mediplan Ltd.
Sheffield, England
www.mediplan.net

The Challenge

Norfolk and Norwich University Hospital needed a reliable and flexible security system to prevent the abduction of infants from its maternity ward. The system needed to be a proven solution for security in large installations.

The Solution

A new Baby Security System, based on Echelon technology, uses wireless tags, and LONWORKS-based readers, controllers, and software, to alert hospital staff of the unauthorized presence of a baby near a maternity ward exit.