



LON Technology Ensures Patient Safety and Saves Energy at Ximará Geriatric



When architect Rafael Vale decided to make the Ximará Geriatric nursing home a sustainable, green complex he turned to Echelon's LON technology for inspiration. The 1400-square-meter building is nestled in the verdant and temperate Galicia region of northwest Spain, and Vale wanted to maximize the structure's orientation toward the sun by using solar panels and intelligent building automation. He envisioned a reliable building automation system (BAS) that would help ensure timely medical assistance and care for the home's elderly residents and optimize energy use in the complex. And he wanted the entire system to be managed and accessible through a user-friendly interface.

The Solution

System integrator Cogaprel, S.L. of Pontevedra, Spain, integrated a BAS based on LON technology – an open, extensible architecture that lets control devices from multiple manufacturers interact with each other. The flexibility of LON based systems lets integrators easily tailor solutions to customers' needs.

All building subsystems at Ximará Geriatric are now integrated and accessible, including heating,

ventilation, and air conditioning (HVAC), indoor and outdoor lighting, medical emergency, fire/safety, security, and irrigation.

Cogaprel developed and installed management software to control the BAS. The nursing home staff accesses and monitors the entire facility through a user-friendly interface on an Apple iMac computer that requires no previous technical knowledge.

Saving Energy Naturally

The solution manages and controls the building's lighting through LON enabled light sensors and an Echelon *i.LON*® 100 e3 Internet Server. Using the server's automated scheduling program, lighting can be adjusted based on the time of day, the amount of natural light available, and the lighting needs of the residents.

The LON system also saves energy by connecting all the windows in the building to an automated motor that opens and closes them, providing natural daylight as well as ventilation. The motorized windows can be set open to various widths to allow uniform temperature and air circulation throughout the building. The motors also manage the window blinds according to weather conditions and season. In addition, solar panels are used in conjunction with the HVAC system to naturally heat the complex.

"The LON based system has significantly reduced our energy use," said Vale, who also owns Ximará. "It has enabled us to save 40 % in air conditioning and 25 % in heating, all the while maintaining comfortable humidity and temperature levels in the rooms, avoiding sharp changes in temperature which can affect the residents' health."

Residents enjoy a bio-garden that is watered by a LON based irrigation system with three watering settings. The smart irrigation system includes a seven-day calendar that can be programmed for each day of the week, and for specific plots in the garden. The system also uses outside temperature and humidity data to automatically adjust irrigation and thus, conserve water. For example, on rainy days, the system will not water the garden.

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i.LON 100 Internet Server Ensures Patient Safety

Patient safety is a critical issue in the nursing home. The facility's alarm system for medical emergencies and fire/security issues allows staff to respond quickly to alerts. Vale and Cogaprel decided to use the *i.LON 100 e3* Internet Server because of its high reliability. "The *i.LON* Internet Server operates autonomously; it works even if the iMac is shut off or if the system fails," says Jorge Rodriguez, Managing System Integrator at Cogaprel. "It also lets us remotely operate and maintain the system."

Each room is equipped with two emergency alarms. When patients need immediate help, they pull an alarm located on their bed's headboard or in the bathroom. This activates the *i.LON* Internet Server's alarm function, which turns on a blinking light above the patient's door to help nurses immediately locate the resident. It also sends a silent notification to the on-duty nurse's mobile phone, including information on the source of the alarm, a map of the facility, and the room location. In addition, the server sends e-mails to two different addresses for logging purposes. After attending to the situation, the nurse deactivates the patient's alarm by pushing the second alarm located in each room. The deactivation alarm sends information to the server, which shuts off all activated alarm functions and sends two new e-mails to record the response, date, time, and resolution of the emergency.

Technical alarms work in the same way. The building has emergency alarms located on the walls, and the *i.LON* Internet Server reacts to different alarms accordingly. For example, when the fire alarm is activated, the server automatically signals the window motors to close the windows, turn on the lights, and unlock the exit doors to let patients and staff quickly evacuate the facility. To disable technical alarms, the staff uses the iMac interface to reset the alarm to Sleep mode.

The LON system also monitors and maintains the water level in a large tank that Vale keeps on the premises specifically for fire-fighting use. Because Ximar is located in the tiny village of Salceda de caselas, it is important to maintain the 14,500 gallons of water in the tank for back-up emergency use, especially during the summer when forest fires can occur.

"The alarm system has dramatically reduced our staff's medical assistance reaction time," says Luz Paz, Geriatric Director of Ximar. "The entire system not only eases the nurses' workload but also provides a level of independence for our elderly residents, while ensuring the highest level of care."

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