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LOYTEC Building Automation Integrated with the IoT Increases the Value of Smart Buildings

As the Internet of Things (IoT) technology matures, a building automation management system comes down to more than just the control of air-conditioning, lighting, security and other building subsystems. The IoT cloud and connectivity along with OT (Operational Technology) and IT (Information Technology) can be integrated into a total solution for a building automation management system and increase the value of smart buildings.

LOYTEC, a subsidiary of Delta that has long been an expert at supporting complete, open, and standard communication protocols, has a comprehensive building automation product portfolio ranging from I/O devices to cloud-ready building control and management systems. More recently, by integrating into the controller Node-RED, which is used by many cloud platforms and IoT gateways, it allows users to use only a single controller without additional IoT gateways to easily connect to different building systems and external cloud platforms, creating greater synergies for intelligent control and management.

Through Node-RED, the system can quickly connect to any cloud service platforms including that of Amazon and Google. By using real-time weather information connected to the Internet, for instance, it can perform forecast-based air conditioning control, lighting control, and improve indoor air quality. It can also upload the field data of a building to cloud service platforms for analysis to further formulate appropriate building automation control strategies. For example, one can optimize equipment operation settings by identifying equipment with major energy consumption based on the results of an energy consumption data analysis. Another application scenario is to use Google Calendar to schedule and control equipment operations so that certain building equipment automatically starts and stops according to a user's daily routine. Such smart building functionalities improve operation efficiency and cut down on unnecessary energy consumption.

For another potential scenario where an office building employs LOYTEC solutions, the controller that supports Node.JS and Node-RED not only can connect to IoT-ready devices with networking functions such as projectors, people-counting web cameras, and the keycard entry system, but also can integrate the internal meeting room reservation system to achieve meeting room automation control in one go. For example, employees can reserve a meeting room through the meeting room reservation system. When it is time for the meeting to start, employees can access the meeting room with their keycards and the room will be powered on with the room equipment automatically entering into meeting mode to reduce contact control. When the web camera detects that a certain number of people are present, it will turn on the air conditioning equipment to ensure good indoor air quality and protect the health of the personnel.

Web-based IoT interface devices include multimedia projectors, audio-visual systems, smart TVs, and smart luminaires. LOYTEC can integrate the operation of all of these IoT-enabled multimedia devices. Without using additional computer equipment, users can easily control these devices through applications such as Sonos® sound system, Philips Hue lights, or Alexa and related devices, and have them configured into the building automation system or touch panel.

Through a wireless network, mobile phones with Bluetooth can also serve to control environments intelligently when connected to the IoT. For example, a LOYTEC multi-sensor with the Bluetooth beacon function and DALI communication protocol can detect the movements of a person entering a meeting room, an office, or a hotel room. It can then use the Bluetooth communication function of the mobile phone to directly connect to L-DALI Lighting Control or L-ROC Room Control integrated by the multi-sensor and control the lighting, air conditioning equipment, or other IoT-enabled equipment such as audio systems and Internet TV in the area on the web-based operation interface and perform customized, contact-free area control. When the multi-sensor detects the absence of personnel in the designated area, the lighting and air conditioning in the area can automatically shift to standby or automatically turn off, saving energy.

In terms of network security, LOYTEC's solution features built-in OpenVPN technology for a virtual private network (VPN) service to provide secure IP communication transmission. This allows all VPN-certified devices, including personal handheld devices and computers to access and use, even from external networks, existing communication protocols such as BACnet, KNX, Modbus, LonMark and other building equipment, to make secure remote access and control more convenient.

LOYTEC devices can also use OpenVPN technology as part of the VPN service. In VPN settings, the device uses VPN authentication to connect to the VPN server. VPN provides a secure network channel to transmit IP-based communication. If a VPN server is paired with a public IP address, the VPN device can be accessed without a public address. This provides another secure NAT transfer method and makes secure remote access and control very easy.

In this day and age, IoT technology along with innovative cloud software solutions can provide building managers and owners with new options for smarter, more cost-effective, and safer building management. Delta's IoT-based building management platform merges IT and OT into the network segment architecture to meet personal needs for environments and optimize the operating efficiency of building equipment, thereby enhancing the value of buildings.