

# Lighting Automation System

## Major Lighting OEM Raises the Bar in Residential/Commercial Automation Systems

How do you design a game-changing residential/commercial automation system that is easy to use, easy for the contractor to install and set up, seamlessly integrates with third party devices, and is affordable?

The answer: *Very carefully!*

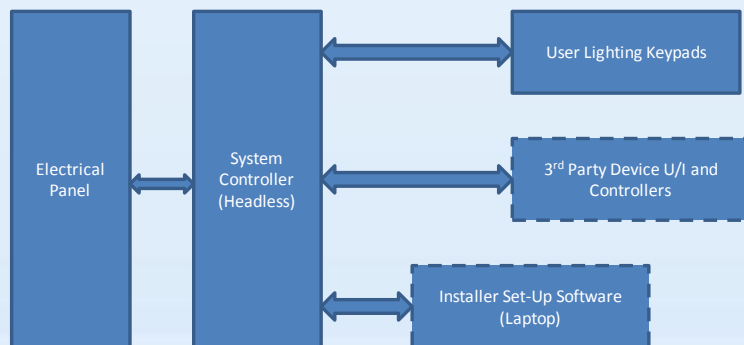
That was the challenge that a major lighting OEM gave to TrygTech's engineering staff. The goal was to develop and deliver a system that allows intelligent communication between smart keypads, intelligent third party devices, a microprocessor based system controller, and the residential/commercial electrical panel. Maximizing system flexibility allowing simple integration into both residential and commercial scenarios was a key design requirement.

### Situation

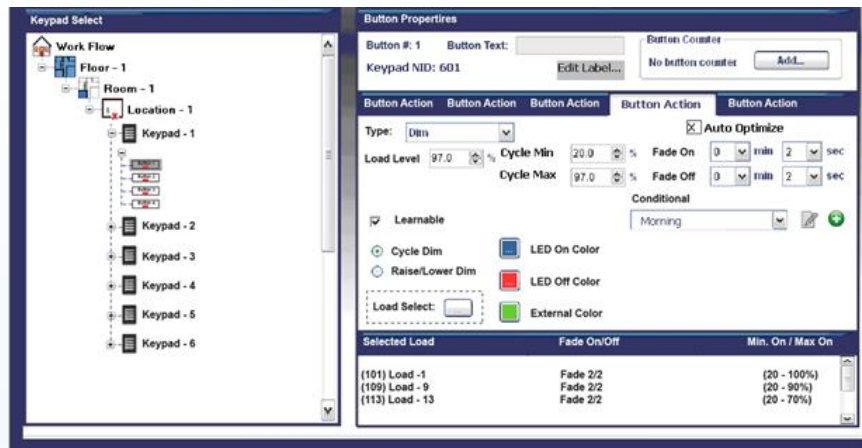
A major lighting OEM wanted a residential/commercial automation system that could be installed in a lighting showroom and purchased by a home or business owner. The system had to be "state-of-the-art" to reflect their reputation in the market. It also had to be intuitive and simple to use so that their lighting dealers could understand the system and make a sale. As the residential/commercial automation market is rapidly growing, the OEM wanted to get to market quickly.

### Solution

The key to success was the development of an automation system architecture that maximized communication between the system components. Multiple bus structures and communication formats are used including Ethernet, CAN bus, RS232 and proprietary protocols. The system controller directly interfaces to the high voltage lighting components which reside in the residential/commercial electrical panel. Third party devices include fans, HVAC, window shades, and swimming pool controls.



The user lighting keypads include LED colors displays for each of the individual lighting buttons as well as a LED display for the entire keypad. The functionality of each button is configurable to allow for different rates and levels of dimming per click. Intelligence is built into the system allowing the buttons to "learn" when in dimming mode. This allows lights to come on at previously stored dimming levels.



For ease of installation and set up, a laptop interface to the system allows the installer to optimize the system for a specific home or business. This is where preferences for lighting color schemes and control methodology are set up with a simple menu system as shown above. It also offers a convenient way to upgrade the system software and provide a system status check.

The brains of the automation system reside in the system controller. This headless intelligent device is based on an Intel PXA270 processor and uses the Windows CE 5.0 operating system. This allows the device to be extremely compact, have efficient memory management, and use standard communication system protocols. These standard protocols ensure ease of integration with third party devices such as thermostats and home alarms.

The powerful design of the system controller allows the OEM to deliver advanced functionality to the user. One example of this is vacation mode. In vacation mode, the software replays two weeks of selected commands to make the house look occupied. The mode will repeat after the two weeks is up. The system controller also supports the use of an astronomical clock which allows the system to automatically adjust for daylight savings time and sunrise and sunset based on latitude, longitude and zip code.

## Benefits

TrygTech's design team developed and delivered a fast, small, and efficient automation system that met the OEM's requirements. By using standard communications protocols, powerful development tools, open APIs, and efficient project management, TrygTech was able to speed up the OEM's design schedule. This also makes it easy to integrate additional third party devices in the future.

## About TrygTech

TrygTech's software and hardware designs seamlessly connect smart embedded devices with business intelligence solutions. Using these designs, device OEMs deliver products with smaller footprints, faster boot times, longer battery life, secure connectivity, and real-time performance. TrygTech solutions are used in mobile devices, home/industrial automation, network appliances, healthcare solutions, kiosks, and advanced technology applications.