Wireless In-Flight Cabin Equipment

Overview
The airline industry is ever searching for new ways to eliminate downtime and streamline their productions. Installation of miles and miles of wires, the weight that they create, and maintenance to fix faulty equipment are enormous issues for the industry. The premise of this project is to reduce communication wiring by implementing wireless connections between airplane components.

Objectives
Our team set out to eliminate communication wires from in flight cabin equipment by creating wireless devices through schematics. To control each one of these separate terminals, an Android application was designed and created to test and demonstrate the wireless capabilities.

Approach
- We met with Videon Central, Inc. and gathered some ideas about their ideas and requirements
- Several concepts and ideas about how to implement the Z-Wave tech. were formulated
- Research on these devices and technologies showed there are no existing patents or designs remotely similar to this project concept
- Several times we met with Videon to check in and ensure we properly interpreted their intentions
- Schematics for each device (overhead panel, fluorescent light controller, etc.) were then formed using Altium, a circuit design software
- Work began on designing the Android Application, simulated on a virtual machine
- Began constructing the mock-up airplane cabin as seen below, which would house the devices
- Upon completion of the components, application, and mock-up, we installed and tested the simulated airplane cabin wireless Z-Wave environment
- Results were to expectations, with the tablet being able to actively control cabin equipment such as adjusting light levels, cancelling call buttons, etc.

Outcomes
- After removing communication wires, miles of wire are reduced
- Not only does this save fuel from reduced weight, it also reduces installation time greatly
- Maintenance is almost eliminated by this, as it is as simple as attached a power cable, and plug and play
- This project used Z-Wave, which is a low power node based wireless system