**Team Varitronics**

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**Key Metrics and Target Values**

- Viewing Angle – 180º
- Viewing Distance – 100 ft
- System Range - 50 ft

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**Concept Generation-Selection**

- **Wireless Protocol**
  - Choices between BlueTooth, Wi-Fi, Dash 7, Zigbee. Zigbee was chosen as the most reliable and efficient protocol
- **Case Designs**
  - Packaging needed for wireless modules as well as circuitry components. Case was chosen to enable proper visibility.

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**Detailed Design**

- **Circuitry**
  The circuit uses steady state relays to control the lights.

- **Programming**
  The programming will use swarm networking from the nodes to the server to relay signals in a manner depicted in the flow chart below.

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**Performance Validation**

- **Wireless communication between modules using Z-Location Engine**
  - Capable of >50 ft system range, including disturbances
- **Case that houses all electrical components efficiently**
  - Visible light up to 100 ft, and a greater than 180º viewing angle

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**Varitronics-Background**

Varitronics is a company that produces and installs non-verbal nurse-to-doctor call systems. They incorporate the use of lights to communicate a signal. The company has been a supplier of these systems for more than 30 years.

**Project Goal**
Make the hardwired call systems transfer signals wirelessly.

**Benefits**
- Quick Installation-no need to run wires from room to room
- More robust system-further programming allows for flexibility
- Cheaper installation
  - Current cost per room to install: $1000
  - New cost per room to install: ~$400

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**The Solution:** Texas Instruments Zigbee Development Kit

- The wireless modules can be programmed individually for various input and output commands.