

## Senior Design Project Data Sheet

Project #	Project Name	Project Track	Project Family
P10044	Smart LAP-BAND Phase 3	Biomedical Systems & Technologies	Assistive Devices
Start Term	Team Guide	Project Sponsor	Doc. Revision
20092	Prof. George Slack	QUANTUM Technology Associates, Inc.	

## Project Description

### **Project Background:**

The LAP-BAND Adjustable Gastric Banding System is a gastric banding system that helps patients gradually lose and control their weight by reducing the amount of food their stomach can hold at one time. The name "LAP-BAND" comes from the minimally invasive surgical technique (laparoscopy) and the silicone gastric band placed around the top of the upper part of their stomach. The LAP-BAND System uses soft, pre-curved, 360 degree inflation area that distributes pressure evenly on the stomach. The system also has a fill volume so the surgeon can adjust after installation.

### **Problem Statement:**

To reduce the size so the Smart LAP-BAND is safe to be fully placed within the body as well as developing proper wireless communication. This will allow the Smart LAP-BAND to be completely internal and reduce the patients discomfort during adjustments.

### **Objectives/Scope:**

- Find a pump/electronics that is expectable in size while still meeting required parameters.
- Setup wireless communication between pump, pressure sensors and other components to a user interface.
- Ensure that the new hardware will be safe for the patient.
- Ensure there is no interference with existing port and use the port as a mechanical backup.

### **Deliverables:**

- Improved concept selection of pump/motor to meet the customer needs.
- New schemes for mechanical and electrical diagrams and layout of designs.
- A functioning prototype.

### **Expected Project Benefits:**

- Decrease discomfort of patient during adjustments
- Improve current design
- Make the design easy to use for doctor and surgeon

### **Core Team Members:**

- Gabrielle Bartlett – Project Manager
- Oyuna Myagmar – Lead Mechanical
- Yonathon Tulu – Lead Electrical
- Joesph Sisson
- Albert Sze
- Adam Clark

## Strategy & Approach

### **Assumptions & Constraints:**

- Work achieved by previous team will accurately simulate banding needs
- Meeting difficult customer needs
- Transmitting certain signals may be a constraint
- Previous design can be miniaturized and wireless communication can be used to control the system

### **Issues & Risks:**

- Understanding of project
  - Customer Needs (Meeting specs)
  - Design space for system
- System Requirements
  - Safety considerations
  - Long-term sustainability
  - Meeting required parameters
- Available Resources
  - Parts Availability
  - Testing/Lab Time