August 22, 2012

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Professional Development Program - Electronics

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Dear ECE402 Team:

Welcome to the Ingersoll Rand sponsored ECE402 section! We are excited to meet you all and to get started with the project!

The project will use our Quiet Electric Latch (QEL), which is an electrified exit device that is engineered to be quieter than a typical exit device. Currently, the QEL is an offline device with a basic two-wire connection for power. We would like to see this device brought online through Internet Protocol (IP) and Power over Ethernet (POE) as well as a method to view the QEL’s current state and settings from a remote location, such as a mobile application.

Don Baker, Vice President of Engineering – Americas, and I will be on campus 5 September. We would like to introduce ourselves and the project. Would your team be available sometime between 2:00-6:00pm? Professor Swabey is working to locate a room for us to use.

We are looking forward to the semester and seeing the creative solutions your team comes up with! As the semester progresses, do not hesitate to reach out to me with questions or comments you have about the project or any other matter.

Sincerely,

Ryne Rayburn

PDP Electronics

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# Abstract

This document will give information about the project and serve as the project overview. The project objectives will be defined, such as developing a mobile application, and background information will be provided. References to the QEL device will be provided for project support, including links and embedded documents. Roles and expectations will be discussed.

# Introduction

For the project, you will work to bring a QEL device from its current architecture of offline to an online architecture where it will be accessed remotely using IP. We will ask that you also change the way it is powered to support POE.

Our goal is to give you a taste of industry and how projects are managed outside the classroom. We will do our best to give timely responses and provide information needed to complete the project. Our role and expectations will be as if we are your manager and are defined below.

# Our Role

Throughout the project, our role is to act as your manager, providing answers to questions and resources in a timely manner. We realize you have deadlines to meet and want to be sure to enable productivity. We will also be sure to give you constructive criticism and honest feedback on the project status at reviews and any other time it is asked of us to do so.

# Your Role

Within industry, there are several engineering teams that work to accomplish projects. These teams are usually small, consisting of engineers that work on individual projects that are then brought together to benefit the team project. Your team will serve as our engineering team to accomplish the project.

Just as we will provide honest feedback to you, we encourage you to be active in your communications with us. Every good manager and team relationship has an open communication line so that the team can get the information and resources needed from its manager. In return, the manager gets a completed project and it is delivered to the market on time.

Remaining flexible is a must. In industry, projects are continually changing to meet market demands. This is reflected in project goals and timelines. Being flexible allows you to role with the changes and to develop a project that meets the customers’ demands.

# Expectations

Our expectations are simple- we expect you to accomplish the objectives for the project.

# Project Background

Currently, our QEL device has a two-wire connection to power the onboard electronics. These onboard electronics include a PCB holding our firmware logic and a stepper motor to retract the exit device. The firmware logic controls the stepper motor and uses various algorithms to control the speed and force of retraction, as well as retry attempts if it detects it failed to retract the exit device. More information can found on the [QEL website](http://www.vonduprin.com/whats_new_QEL.asp).

For the project, we would like you to develop a new PCB to replace the firmware logic PCB. POE should be used to power the device and IP should be used to control the exit device retraction. To interact with the QEL, a mobile application should be developed.

# Project Objectives

We have picked objectives we feel your team should reach to demonstrate the overall goal of the project. Outside of these objectives, we would like your team to propose a 2-4 more objectives. The objectives you propose can be ones you feel will add benefit to the project or just something you find interesting and want to attempt.

Main Objectives:

1. Design a new PCB to utilize IP/POE
   1. PCB will interact with external world and stepper motor
2. Develop a mobile application to communicate with the QEL
   1. Display QEL Status (not retracted/retracted)
   2. Control QEL Retraction
   3. Note: Mobile Application platform can be chosen by the team
3. Use POE as the main power source
4. Develop a way to retract the device using Near Field Communication (NFC)
   1. Note: this should act as a credential-reader relationship, i.e., if you present a NFC device to a NFC reader & the device is a valid user, the QEL retracts

Student Objectives

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4. \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

# Support Materials

[QEL Website](http://www.vonduprin.com/whats_new_QEL.asp) 

**Note: The below documents are confidential. The below documents shall not be distributed to individuals not working on the project and shall not be displayed for public use.**

 