STEVENS
INSTITUTE of TECHNOLOGY
THE INNOVATION UNIVERSITY

Homework 7

April 12, 2013

CPE-322, Engineering Design VI

A collaborative effort on behalf of

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Paul Di Santi
Robert Stephenson
Stanley Switalski

I pledge my Honor that I have abided by the Stevens Honor System.

Takahiro Akiyama x_____

Paul Di Santi x_____

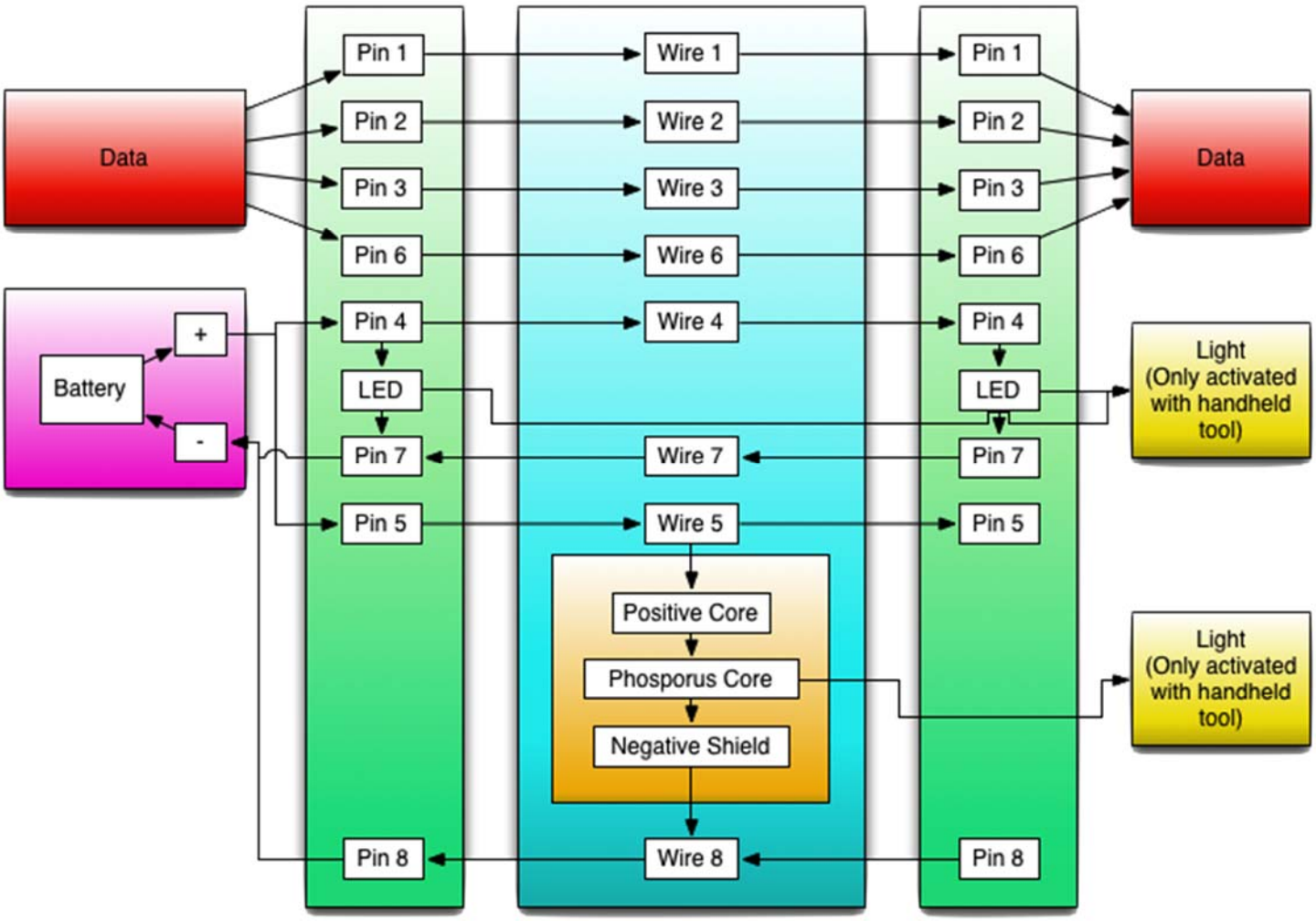
Robert Stephenson x_____

Stanley Switalski x_____

Section 1

Team Member	Takahiro Akiyama	Paul Di Santi	Robert Stephenson	Stanley Switalski
Percentage of Effort Towards Assignment	*25%*	*25%*	*25%*	*25%*

Section 2 – Implementation #1



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Starting with a fundamental function of our patch panel, data will be passed over pins 1,2,3,6 of the patch panel untouched by our added components. This is to ensure any impedance our LEDs may add will not corrupt the data.

The Light Activator will be composed of a simple battery. After plugged into an Ethernet port, it will pass voltage over the unused data pins. In order to maintain the IEEE 802.3af standard, the positive end of the circuit will be attached to pins 4 and 5. The negative end of the circuit will be attached to pins 7 and 8.

The LED, which is used to indicate corresponding ports, will be tied in parallel to pins 4 and pins 7. Maintaining the IEEE 802.3af standard, the positive lead will be connected to pin 4 and the negative lead connected to pin 7. Pins 4 and 7 will then be tied into the Ethernet cable which carries the signal/voltage to the corresponding drop or patch panel. Here the voltage will continue to flow into the corresponding LED and complete the circuit by returning the negative portion of the circuit over pin 7. If the customer has decided to only install our EL Ethernet wire, due to the nature of the patch panel, there will be an open circuit across pins 4 and 7 since there is no LED available to complete the circuit.

This same Light Activator will also activate the EL component, so long as the customer has decided to install our EL Ethernet wire. Much like how the LEDs are connected, the positive core of the EL shielding will be connected to pin 5 and the negative shield connected to pin 8. In the event that the customer has decided to only install the patch panel, due to the nature of the patch panel, there will be an open circuit across pins 5 and 8. As such, we will not need to worry about a short circuit.

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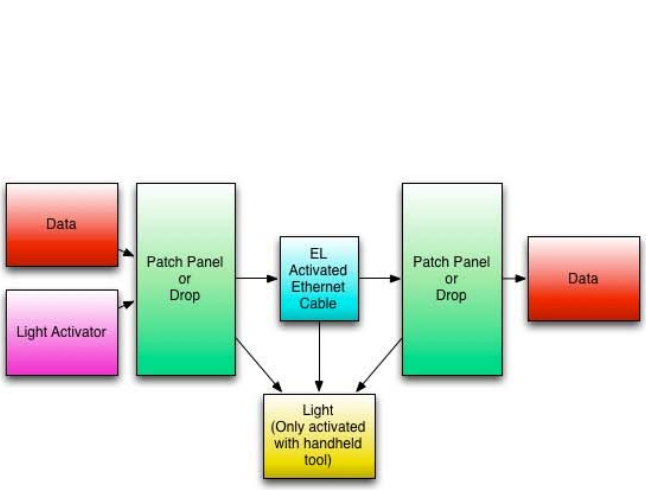
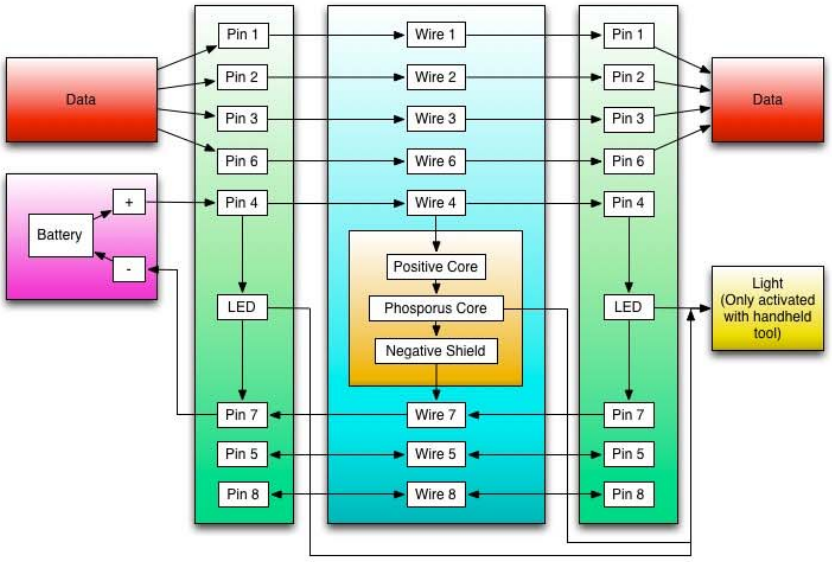
Section 3 – Implementation #2





The second implementation of the design is similar to the first except that it would require a proprietary patch panel in order to successfully activate the light at either end of the cable. Complying with the 802.3af POE standard, a battery (or other power source) will inject power through ports 4 and 6. When the proprietary tool goes to activate the ports on the patch panels, the power needed is drawn from the power source. Data is transported across the conventional pins 1, 2, 3, and 6.

Section 4 – Design Constraints & Ethical/Professional Responsibilities

Constraints

Some restraints that we will face during design include adhering to economic, environmental, health and safety, manufacturability and sustainability restraints. Economically our product needs to compete with products that may have less functionality but have been in use for years and have known reliability. The added cost of our products additional features must be minimalized to create the most enticement to change to our product. Our product is constrained by the environment that it is used in again as it must fit where there is existing equipment. This

creates a constraint on the size of the product, as the additional features will increase its size. The only Health and Safety's constraints on our product is that is must be as reliable or more reliable than existing products as we cannot know what systems our product will be used in. Manufacturing constraints on the products can be a subset of its economic and sustainable qualities. The product must have ease of manufacturing while having a lost cost as to keep the overall cost down while not negativity affecting its sustainability.

Ethical Responsibilities

The responsibilities associated with our product is to ensure that is made in accordance with the industry standard for the EL wire and patch panels embedded with LEDs. The product must be cost effective as well as reliable to ensure customers will purchase our product over generic wires or patch panels.

Section 5 – SWOT Analysis and Conclusion

Based on the fact that implementation #2 needs more proprietary pieces of equipment in order for successful operation which would increase costs and complicate installations for the end users, the team believes that implementation #1 would be best suited to be produced and brought to market. Insuring customer satisfaction is a huge priority and implementing a less sophisticated and more adaptable design would be a step to achieving that goal.

Strengths	***Weaknesses***
Takes advantage of current 802.x standards Easily integrated into most networks Less proprietary parts needed	When installing alongside current deployed hardware, unforeseen problems may occur. Using many proprietary parts guarantees less possibility of failure
Opportunities	***Threats***
Opportunity to create a well-established position in the market and allow for future opportunities with other innovative networking products	Competition Possible modification of IEE 802.x standards