

ECE 480 Design Team 3 Progress Report
Power-over-Ethernet for Wireless Home Automation
Sponsored by Texas Instruments

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Sponsor Feedback

On October 2nd, the team presented our design ideas and proposal to our project sponsor Texas Instruments. In this we provided our understanding of the design and described possible methods of implementation to successfully complete the project. We were able to provide a Visio diagram that demonstrated basic connectivity and specific parts that would be required for correct functionality. We received feedback by Jim Reinhart and Reed Hinkel. Both Jim and Reed were extremely positive and they were pleased with our interpretation of the design. This green light to our conceptual design was exactly what the team was looking for. We were also lucky enough to receive all of the parts from Texas Instruments within a business week after they approved of our design.

Jim and Reed suggested that we focus more on implementing the core ideas for the design rather than worrying about embedded details. For this they wanted us to focus on the Power over Ethernet (PoE) implementation and low power wireless integration. Our TI contacts also inquired on whether we can provide them with a detailed schematic of our planned connections between parts. We are hoping to provide them with such a document within the next week or so. Upon doing so, if we receive further confirmation that we are continuing down the correct path, we can move forward to other aspects of the project. This includes but is not limited to the rigorous amount of coding required for the sensors to communicate with the main board and interoperability of the microcontroller and the web server.

Current Status of Project

Currently, the team is working on the hardware design phase of the project. We will be ordering the wireless sensor and power supply on Sunday, November 1st. To expedite the design and test phase of our project, we will use power supplies in the lab (serially connected) to create a proper voltage input for early testing of the design. Once the hardware components are connected appropriately, we will immediately beginning the coding of both the LM3S-8962 microcontroller and the CC2430's 8051 microcontroller. This will be accomplished by utilizing both StellarisWare and IAR software tools. We hope to be coding the microcontrollers by the second week of November to allow ample time to adjust any inconsistencies we find in our preliminary testing. The status of the design of our system is better understood then analyzing the progress of the power management and embedded coding for our board.

Power Management

For this aspect of the project our focus is to finish the PoE implementation into our system and provide specific voltages to our on-board chips. For the PoE, we have all the required parts to connect and deliver power through Category-5 Ethernet cable, our next step is to test the power levels and deliver separate voltages to two different components on our board. By the beginning of November we expect to have multiple DC-DC converters in our design to provide the necessary voltages to our microcontrollers.

Embedded Coding

TI has provided development kits to test and monitor out 8962 microcontroller. We have connected the device to a computer and have begun initial testing of the chip by accessing the

registry and reading and writing values. Our next step will be monitor changes in the USART for connection with the wireless SoC. We have downloaded applications to flash and program the wireless SoC and testing this with working sensors will be something we expect to achieve by the middle of November.

Expected Budget

Quantity	Item	Cost
2	PSE Module	Provided by Sponsor
2	PoE PD Module	Provided by Sponsor
2	ZigBee Radio Transceivers	Provided by Sponsor
2	LM-3S-8962 Microcontroller	Provided by Sponsor
1	+48V Power Supply	\$53.12
1	Wireless Sensor	\$138.00
	Resistors, Capacitors, Diodes	Provided by MSU
	PCB Fabrication	\$??
	Total Cost	\$192.12 + PCB Fabrication