Lockheed Martin – Keeping Track of Embedded Device Configurations

Overview
Lockheed Martin requested that the team replace the current method of tracking and storing software version numbers (visual labels) with an electronic system. Our team specifically implemented an electronic system using RFID over serial communication with the host device. We designed and programmed modules to interface with the host device over JTAG or serial communication and write the results to RFID.

Objectives
Create a device capable of reading metadata from a system and writing that metadata to a reprogrammable RFID chip. This will allow to easily keep track of a device’s or system’s versions.

Approach
- Spoke to Lockheed Martin to get exact project details and specifications
- Generated 3 options to complete the specified project problem
- Reviewed Lockheed Martin’s patent which is pending for the system we built
- No site visit was necessary to complete this project
- Multiple simulations were ran through Quartus II Software and Arduino Software for designs
- No models had to be created as we were able to get materials for a relatively low cost
- A working prototype was designed, programmed and working correctly
- Lots of testing and debugging was performed to bring our product to completion
- The model and results were validated by testing multiple inputs and receiving the correct outputs
- The results were a version string that was both readable and writeable to a RFID chip

Outcomes
- Unknown amount of savings due to sponsor’s privacy methods
- Manufacturing/production times were reduced by 50 hours as a result of this project
- The project reduced set up time, assembly time, tool wear, etc.
- Project resulted in a new system for them to track their product’s software versions
- Implications arose when our device was unable to interact with a JTAG configuration
- This implication was worked around used General Purpose Input/Output pins and ended up being a complete and working project