

1. Project Descriptive:

| | |
|----------------|---|
| Title: | Modbus to DNP3 Gateway Device |
| Group Members: | Joshua Daly Daniel Doherty Mac Lightbourn Joseph Wilkerson |
| Sponsor: | M.P. Electronics |

2. Project Narrative:

Our group was discussing many different ideas for the project but decided on Modbus to DNP3 Gateway Device for a multiple reasons. First and foremost the project offered a challenged for everyone in the group, it allowed us to leave our comfort zone and learn in a real world environment. In addition, because everyone in the group is getting ready to move into industry soon the real world experience is invaluable. Another draw of this project was that because we have two electrical engineers and two computer engineers we were looking for a project that had a balance of both circuit designs as well as software development which this will encompass.

The main goal of this project is to design a device with a universal connectivity that can be added to an existing lift station controller and allow it to transmit via an Ethernet signal. The objective is to make the hardware reliable, durable and portable. The software should be efficient, resilient and self-testing. Overall the device needs be able to convert the serial signal that the lift stations currently use to an Ethernet signal that would allow efficiency as far and the sending and receiving data as well as the ability to turn the "slave" device into the "master" to send important data. It also should be able to timestamp all the data and store it in memory until it is successfully sent. We would like it to have secure authentication as well.

3. Project Specs

| | |
|--------------------------------|---|
| Case Size | 4" x 4" x 2" |
| Case Requirements | Must attach to a rail |
| Input Voltage | 12 V at 35 W |
| Battery Backup | 5 hours Powers: Memory to store data Sends signal to notify of power disruption |
| Ports | 2 x Ethernet 1 x Serial |
| Data Transmission Success Rate | 90% success on first transmission |
| Data Security | 128-bit SSL Encryption |
| Operation Temperature | |

4. Project Block Diagram

Attached.

5. Project Finances

| Qty | Item # | Description | Unit Price | Discount | Line Total |
|-----|--------|-------------------------------|----------------|-----------|------------|
| 1 | | 12-Volt DC Power Supply | 39.99 | | 39.99 |
| 3 | | Circuit Board | 35.00 | | 105.00 |
| 1 | | Serial Connector | 1.00 | | 1.00 |
| | | Miscellaneous Electrical Part | 250.00 | | 250.00 |
| 2 | | Ethernet connector | 1.00 | | 2.00 |
| 1 | | Aluminum Case | 100.00 | | 100.00 |
| | | | | | |
| | | | Total Discount | | |
| | | | | Subtotal | 497.99 |
| | | | | Sales Tax | 29.88 |
| | | | | Total | 527.87 |

The project will be funded solely by the sponsor, they intent to use the completed design in their current realm of business.

6. Project Milestones

- 9/11/2012 - Project Accepted
- 9/18/2012 - Project Specifications Formally Defined
- 10/30/2012 - All Calculations Completed
- 11/25/2012 - Senior Design I Paper Completed
- 1/20/2012 - Full Breadboard designs Completed
- 1/31/2012 - Designs Finalized and sent for board printing
- 3/1/2012 - Prototype finished
- 3/20/2012 - Initial Testing Finished
- 4/1/2012 - Final Testing Finished
- 4/5/2012 - Senior Design Project Finished and turned over to sponsor.

Legend:
 DEF: Definition of the Project
 RES: Research in area's the project will encompass
 DES-S: Design of the Serial communication board.
 DES-E: Design of the Ethernet communication board.
 SFT: Software design
 CAD: Case Design
 Prot: Prototyping of the design
 Test: Testing of design

