

Attendees: Chad, Kayden, Hatem, Majed, Dr. Li, Dr. Johnson, Stephanie McDaid

Action Items For Review:

AI:42 Chad

Use SPI to read encoder. Isolate encoder and microprocessor voltages. Provide position and radial frequency to the PID algorithm. **In progress.** I haven't made progress on this as I am dealing with a mini-back crisis. Doc shot me with steroids and muscle relaxers (super strong ones, apparently) today, so hopefully I can get back to normal soon. 3/3/16 The majority of the action item was complete for the design review except the system did not work. Two suggestions were made. #1 make the microprocessor clock continuous and #2 Try pull up/pull down resistors on the CEREBOT developed clock. I am ready to test both of these this weekend. If neither work... I may have to buy different hardware. 3/10/16 I have tested both of the suggested fixes. Neither of them improved the encoder reading situation. I plan on trying to develop my own clock and read a input port as a final measure before ordering a new RS485 driver.

AI:43 Kayden **Complete - just need to resolve some physical layer issues**

Edit existing driver to be MODBUS compliant. (Google a modbus driver for the pic). Complete an initial communication with the VFD. **In progress** Mark Bayton of SEL loaned Kayden and RS485 bus analyzer. The analyzer had the MODBUS RTU protocol built in. Kayden used the tool to read his implementation of the MODBUS. The tool confirmed that his implementation is perfect. However, the VFD still reports UART errors when he tries to write to it. At this point, Kayden plans to contact ABB to see if they have further suggestions for him.

Lab Time Goals

Review goals for lab on Sunday Evening:

Chad

- Implement serial communication using only timer interrupts and port read/writes.
- Develop SPI driver to read the encoder and report the absolute shaft position.
 - Did this, but it didn't work. However, since I couldn't clock the encoder with the microprocessor, I haven't even tried to debug this yet.
- Calculate shaft RPM based upon encoder readings. **Step above is a prerequisite.**
- Get with Kayden and start designing the PID driver. **Not started**

Majed

- Work towards developing our finalized models. Majed spoke to the Flash team about using their generator model so we have a standard model.
- Also, the VFD needs to be configured to run open loop so that they can calculate inertia on the system.
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Hatem

- Inertia characterization and generator model.
- Work on updating the WIKI page.

Kayden

- Kayden will contact ABB technical support to ask for direction on a path forward.

Goals for completion prior to Capstone

I (Chad) took some license when writing these. They are entirely up for discussion and buy in from the whole team. If someone feels that they are too ambitious, we can remove things.

- I. Functional MODBUS
 - A. Write to fieldbus controller
 - B. Start and stop the system
- II. Read Encoder
 - A. Publish absolute encoder position
 - B. Publish shaft RPM in rad/sec
- III. Complete RSCAD tutorials
 - A. Run models from prior design team
 - B. Research book provided by Dr. Johnson to identify our model
- IV. Connect load to system
 - A. Switch in and out different loads
 - B. Collect data and publish on system response

Team discussed these as goals. No objections have been made. Will pursue these until decided otherwise.

New minutes:

Discuss final report content and timeline for getting it done.

Discuss goals for completion prior to capstone day.

Majed asked about a good poster example. Dr. Johnson suggested the poster right outside of the power lab. The doubly fed induction generator was suggested as the best. Another is directly across from Dr. Frenzel's office.

March 08:

DFMEA (Design Failure Mode Effective Analysis) Chad and Kayden

Log Books Individual

Portfolio Majed

3/10/16

Byte-Back Team Agenda / Minutes

Wiki page Hatem

Slides for the Poster Day to Kayden by Monday Night

Citizenship form Individual

Learnings from the design review

Kayden: Asked for reference to help him with MODBUS. This led to an engineer named Mark Payton. He hooked Kayden up with a mini signal analyzer that is designed to help debug MODBUS.

Majed and Hatem: 411L Dr. Fischer says we need open loop control so that the VFD makes no response to frequency changes. Then switch the load and read the changes again.

RTDS needs an inertia measurement. Hatem and Majed will work on getting this done as well. Basically, Dr. Law is our required resource to get this step done.

New AI's

AI:47 Kayden

Send Stephanie the credentials for the team google page.

AI:48 Hatem

Move all the google drive documents to the WIKI page.

AI:49 All

All supporting documents, like software, documentation, data sheets, needs to be compiled and provided as a project summary even if they don't end up on the WIKI page.