Lab 1: Reading and Writing RFID Tags

11/22/10

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Name: ___________________________________________

34 pts. (Lab is 18 pts. and Prelab is 16 pts.)

1 Goal
The student will further develop concepts learned in the modules by reading and writing data on a tag and experimenting with tag orientation.

2 Assessment
A student should:

- Be able to read and write data on a tag
- Know that tag orientation affects read range

3 Equipment
- Reader with antenna, preferable a linear polarized antenna such as a patch antenna
- Antenna stand
- Tag stand
- Several tags
- PC to communicate with reader

4 Software
- Reader software

5 Prelab

5.1 Preparation
- Read the TagSense Help File for the reader available at the class website
- Review the TagSense documentation for the reader available at the class website
- Review the Gen2 specification

5.2 Prelab Questions
- Answer the Prelab Questions at the end of this document and turn them in before the lab.
6 Experiments

6.1 Experiment 1: Reading/Writing a Tag

6.1.1 Configuration

- Place a tag near the antenna of the reader and start the program that controls the reader.

- When using the TagSense Studio software, it is best to click on “polling” instead of using the default “continuous” mode that keeps reading tags. Click on poll when reading a new tag.

6.1.2 Exercise

- Read and record the EPC and TID model numbers of two tags. (1 pt. each)

  EPC1 in hex: _________________________________________________________________

  TID1 in hex:  _________________________________________________________________

  EPC2 in hex: _________________________________________________________________

  TID2 in hex:  _________________________________________________________________

- Rewrite/Change a tag’s EPC number. Record the EPC number below and show one of the instructors. (1 pt.)

  EPC in hex: __________________________________________________________________

- Determine and record the default Q value of the reader. (1 pt.)

  ___________________________________

- Determine the reader session that is being used by the reader. (1 pt.)

  ___________________________________

6.2 Experiment 2: Tag orientation

6.2.1 Exercise

- Use a tag that is easy to determine the antenna polarization. A tag that is long and thin will tend to have a more vertically polarized signal when the tag is oriented so that the longer measurement is up and down.

- Determine the best tag orientation for the maximum read range. Describe it. Is the antenna pattern vertical or horizontal? (2 pts.)

- Determine the best tag orientation for the minimum read range. Describe it. Is the antenna pattern vertical or horizontal? (2 pts.)
6.3 Experiment 3: Access and Kill Passwords

6.3.1 Exercise

- Find a tag in which you can read both the access and kill passwords. The tag should be labeled “readable password” or equivalent. (1 pt. each)
  
  o Write down the **access** password. ________________________________
  
  o How many bits is the **access** password? ________________________________
  
  o Write down the **kill** password. ________________________________
  
  o How many bits is the **kill** password? ________________________________
  
  o Does it seem strange that you can read the passwords? _________________

- Now, find a tag in which you cannot read the access password. The tag should be labeled “password protected” or equivalent. This tag had the access password “locked” or “permalocked” so that you cannot read the memory location where the access password is stored without a password. You will have to guess the password and enter it into the software. The first seven digits of the password are zero so that you can have a chance of guessing the password. (1 pt. each)
  
  o Write down the EPC of the tag. ________________________________
  
  o Write down the **access** password. ________________________________
7 Checklist

- Turn in answers to Prelab.
- Turn in answers to Experiments.
- Complete and turn in Feedback sheet.
- Notify instructor lab is complete.
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Feedback

- Complete this form after completing the lab exercises and turn it in to the instructor.
- **Do not put your name on the form** and keep it separate from the lab report.

- What did you like about the lab?

- What did you dislike about the lab?

- Make a suggestion on how to improve the lab.
Lab 1 Prelab Questions

16 pts.

Answer the following questions and turn them in before the lab.

1. Describe the main mistake that can damage a reader. (2 pts.)

2. How many bits are in the EPC of Gen2? (2 pts.)

3. How many bits are in the TID of Gen2? (2 pts.)

4. What is the suggested default Q value that is listed in the Gen2 specification? (2 pts.)

5. How many sessions does Gen2 define? Describe each of them. (8 pts.)