Project Proposal  
  
**Grenlec Environmental Monitor  
Data Interface Program Design**

*For*   
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*Prepared by*

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**Overview**

As part of Advanced Embedded project, I will be helping with Greneda Environmental Monitor project in collaboration with Grenlec utility company and TAMCC partners.

My contribution to the project is designing database interaction and user interface programs.

* Database interface - this program will interact with database folder structure to retrieve specific record list.
* User interface - this program will output graphs and charts based on selected data to the LCD of the environmental monitor.

**Design**

Database interface program:

* Program will accept one or two date arguments from command line.
* Spawn a process that will execute a search query for all files between specified dates, and redirect the output to a temporary file. (temp.dat)
* Main program will check a semaphore to determine a critical section that needs to be avoided.
* When the child process is finished, main program will get the file pointers from temporary file and iteratively rewrite the contents of each file into a new output file (output.dat).
* Remove temporary file created by the child process (temp.dat).

User interface program (dashboard):

* Program will serve a dynamic page on port 1880.
* The web page will have tabs for each type of transducer.
* Inside each tab real time transducer value, as well as graphs will be displayed.
* User will have an option of selecting range of dates for data representation.
* UI program will be able to launch a bash script that will retrieve data from the main system computer.

**Execution**

1. User input dates into node-RED dashboard UI program.
2. Program launches a bash script, that performs SSH connection with database computer.
3. During SSH session, script launches database program (database.c) with parameters provided by the user through the web dashboard.
4. Open completion, SSH session is closed.
5. The output file is copied using “scp” of “vsftp” commands.
6. Node-RED reads the contents of the output file and renders the data on a chart accordingly.

