CalPlug Plug Load Simulator (PLSIM)

Version 1.2

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1. Purpose: PLSIM 1.2 provides a rapid way to tabulate the consumption of devices in multiple states of operation based on timed operation. An XML database file (formatted in PLSIM 1 Extended Database file format) provides a device list along with the energy use parameters in multiple states of use. In addition to energy usage as a mean, median measured energy usage and 1 standard deviation values are provided to allow possible calculation deviation magnitude to be estimated. In addition, if THD(I) information is provided for devices, the noise estimate as a function of time can be shown on a per-device basis.
2. Setup:

[Need to add this in here and be clear!]

1. Usage:
   1. General Workflow: The PLSIM 1.2 program is divided into two components. The “Scheduler” reads in the XML database and the user selects the devices to work with. Next the user provides a schedule for usage for a simulated period. The user must enter the run time of each device for each period, where the lowest common period is used. For example if two devices are modeled for 10 minutes, and device 1 is in state 1 for 10 minutes, and device 2 is in state 1 for 5 minutes, and state 2 for 5 minutes. This would be entered as:  
      5 minutes🡪 Device 1 (state 1)  
      5 minutes🡪 Device 1 (state 1)  
      5 minutes🡪 Device 2 (state 1)  
      5 minutes🡪 Device 2 (state 2)  
      Once the entire schedule is entered, then the scheduler is exited. As the scheduler exits, it will generate three files. The first file is a “run\_params” which is a binary (Pickle) file that contains all the hierarchical information for the devices simulated, a “run\_perams.cfg” file which is a human readable orphan file used to view the relative contents of what is contained in the binary version of this file, and a “test\_group.csv” file that contains the schedule information that was entered.  
      Next the user would run the “CalculationEngine”. This program reads in the “run\_params” and the “test\_group.csv” files and performs calculations on them. After calculations are complete, console output is displayed, graphs are generated, and a “graph\_file.csv” is also generated. This file contains the contents of the graphs for external plotting.
   2. Customized workflow: A user can generate a template schedule then modify carefully using a text editor. For a given set of devices, run length, and states used, the scheduler file can be modified for the time each modeled state is in use. Devices and states cannot added removed or the total length changed, only the time each state within that period is active. If a modified schedule file is pushed to the Calculation Engine with its corresponding objects file, a simulation using the modified data can be calculated.