2PEM-100A

PRACTICE 3_1

Sampling Rate Change and Data Filtering

More information:

- https://2pem100a.blogspot.com/

More examples:

- https://github.com/vasanza/Matlab_Code/tree/Electrical-Systems-Simulation
- https://github.com/avbazurt/Simulacion_Sistemas_Electricos

Dataset:

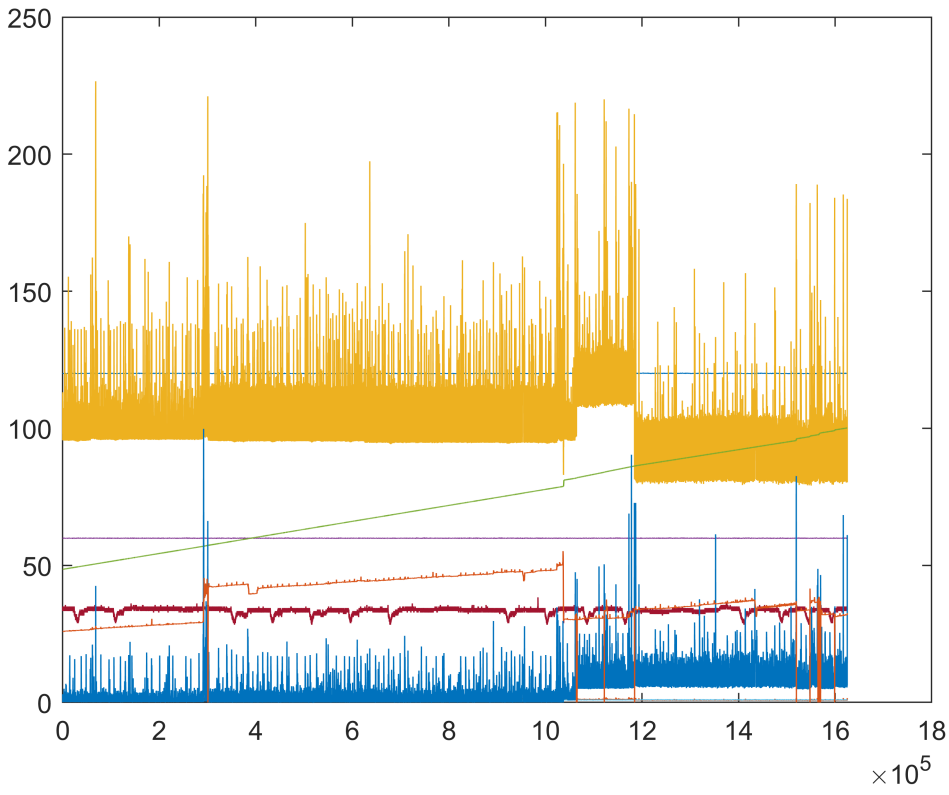
- http://ieee-dataport.org/8630

Technical information

- Sampling frequency: 4Hz (250mSeg)

1- Loading a .mat file

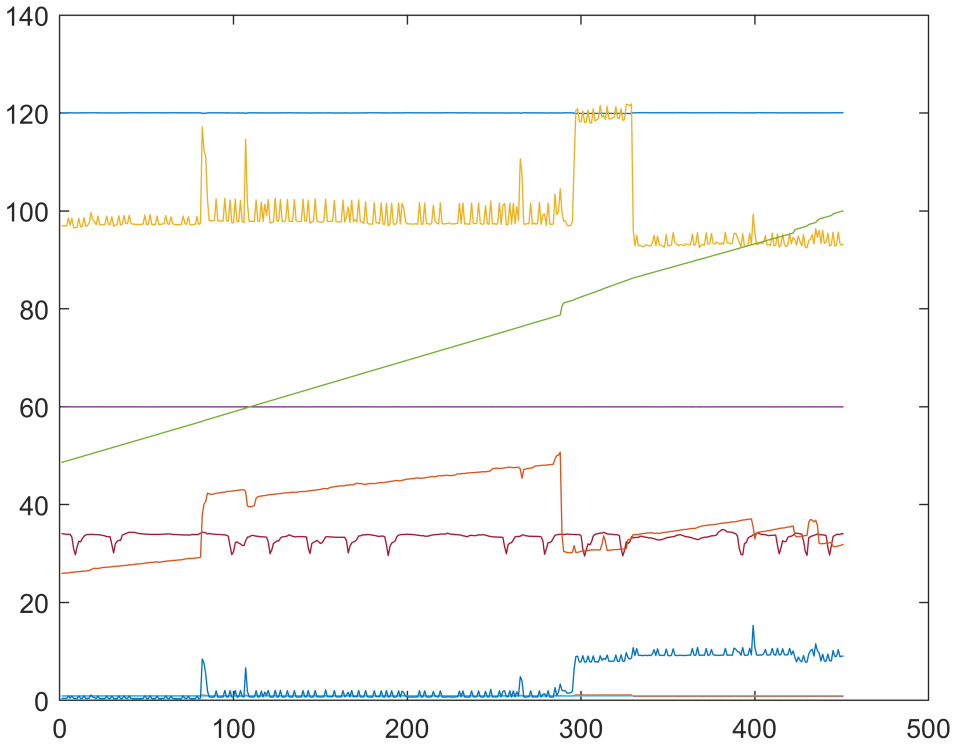
```
clear;clc;
path=fullfile('./dataset.mat');
data=load(path);%Load Raw Data
data=struct2cell(data);
data=data{1,1};%table
data=table2array(data(:,4:12));%array double
%Voltaje, Corriente, Potencia, Frecuencia, Energia, FP,Temp., CPU, RAM
plot(data);%datos originales
```



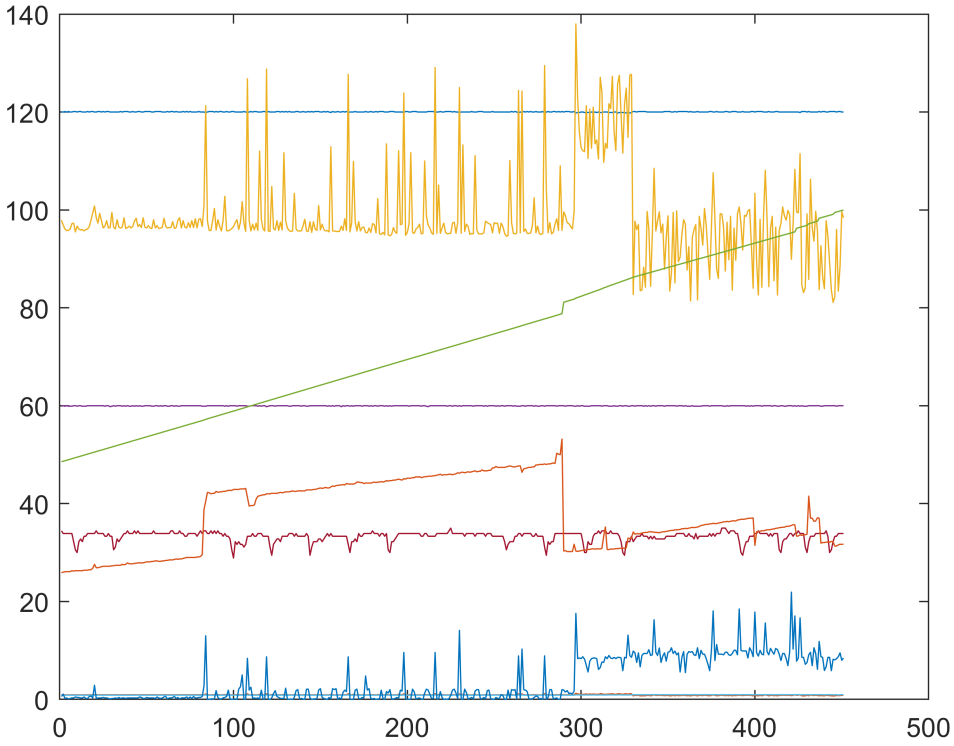
Example 1: Changing the sampling rate (4samples/sec -> 1sample/15min)

```
frecuencia=4;%Hz
minutos=15;%modificar la ventana temporal en minutos
ventana=frecuencia*60*minutos;%15min 3600 samples
datamean=[];datanomean=[];
for i = 1:ventana:length(data)-ventana
   datamean=[datamean;mean(data(i:i+ventana,:))];
   datanomean=[datanomean;data(i,:)];
end

plot(datamean);%datos en promedio cada 15min
```




```
plot(datanomean);%datos SIN promedio cada 15min
```



Example 2: Saving a .mat file

```
save('datamean.mat','datamean');
```

Example 3: Load file with 1sample / 15min sampling rate

```
clear;%borra el worskpace
clc;%borra el comand windiw
path=fullfile('./datamean.mat');
data=load(path);
data=struct2cell(data);
data=data{1,1};%table
plot(data);%datos originales
title('Energy consumption graph with sampling every 15 minutes');
legend('Voltage','Current','Power','Frequency','Energy','FP','Temp.','CPU','RAM');

xlabel('Samples every 15 minutes');
ylabel('Value per variable');
```