LAMPIRAN

SCRIPT MATLAB PENGAMBILAN DATA BANTALAN NORMAL

```
%Script to run data acquisition using National Instrument NI 9234
%Created: Oct 2016, Tunggul Panji Wicaksono

clear;
clc;
close all;


tic;

s = daq.createSession('ni');
s.DurationInSeconds = 5;
Dur = s.DurationInSeconds;
s.Rate = 25600;
s.addAnalogInputChannel('cDAQ1Mod1', 'ai0', 'Accelerometer');
%s.addAnalogInputChannel('cDAQ1Mod1', 'ai1', 'Accelerometer');
%s.addAnalogInputChannel('cDAQ1Mod1', 'ai2', 'Accelerometer');
s.addAnalogInputChannel('cDAQ1Mod1', 'ai3', 'Voltage'); % Tachometer
%s.addAnalogInputChannel('cDAQ1Mod2', 'ai0', 'Microphone');
%s.addAnalogInputChannel('cDAQ1Mod2', 'ai1', 'Microphone');

s.Channels(1).Sensitivity = 97.60E-3; %mV/g Type 4507B serial:11165
%s.Channels(2).Sensitivity = 95.83E-3; %mV/g Type 4507B serial:11026
%s.Channels(3).Sensitivity = 99.56E-3; %mV/g Type 4507B serial:10984
%s.Channels(4).Sensitivity = 94.50E-3;
%s.Channels(5).Sensitivity = 9.40E-3;  %mV/Pa Model 130B40 serial:41741
%s.Channels(6).Sensitivity = 8.60E-3;  %mV/Pa Model 130B40 serial:41842

for i=1:50

data = s.startForeground();          % start recording vibration data
data_ch1 = data(:,1);
data_ch2 = data(:,2);
%data_ch3 = data(:,3);
%data_ch4 = data(:,4);
%data_ch5 = data(:,5);
%data_ch6 = data(:,6);

rootname = 'E:\Pengambilan_Data_TA';      % drive tujuan dan nama file
extension = '.mat';                                % ekstension utk nama file
namafile = [rootname,'SignalBearing',num2str(i),extension];
```

```
data_all = [data_ch1 data_ch2 ];
eval(['save ', namafile ,' data_all']);

pause(3)
pesan = ['Acquiring and saving data at loop number: ',num2str(i)];
disp(pesan)
end

toc
```

rootname : diganti tempat yang digunakan untuk menyimpan file.

BANTALAN RUSAK JAMAK (*MULTI-FAULTS*)

```
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%s.addAnalogInputChannel('cDAQ1Mod1', 'ai2', 'Accelerometer');
s.addAnalogInputChannel('cDAQ1Mod1', 'ai3', 'Voltage'); % Tachometer
%s.addAnalogInputChannel('cDAQ1Mod2', 'ai0', 'Microphone');
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for i=1:50

data = s.startForeground();          % start recording vibration data
data_ch1 = data(:,1);
data_ch2 = data(:,2);
```

```
%data_ch3 = data(:,3);
%data_ch4 = data(:,4);
%data_ch5 = data(:,5);
%data_ch6 = data(:,6);

rootname = 'E:\Pengambilan_Data_TA';      % drive tujuan dan nama file
extension = '.mat';                                % ekstension utk nama file
namafile = [rootname,'Multi-Faults',num2str(i),extension];
data_all = [data_ch1 data_ch2 ];
eval(['save ', namafile ,' data_all']);

pause(3)
pesan = ['Acquiring and saving data at loop number: ',num2str(i)];
disp(pesan)
end

toc
```

SCRIPT DOMAIN WAKTU, DOMAIN FREKUENSI, DAN SPEKTRUM ENVELOPE BANTALAN NORMAL

```
clear
clc
close all

%load('C:\Users\Berli\Documents\Kuliah Monitoring\Sem1
2016_17\Bearing_fault\Outer_race_fault_29hz.mat');
load('E:\Pengambilan_Data_TA\BearingNormal\Set12\Pengambilan_Data_TABe
aringNormal10.mat');
%y=data_all(:,1);
y=data_all(:,1);
sampling_rate=25600; %kecepatan sampling Hz
recording_time=5;   %waktu perekaman data (recording time)
L=sampling_rate*recording_time;  %panjang data (length of signal)


NFFT = 2^nextpow2(L); % Next power of 2 from length of y
Y = fft(y,NFFT)/L;
f = sampling_rate/2*linspace(0,1,NFFT/2+1);


% plot amplitude time domain
figure
plot(y(1:1*25600))
title('1200 rpm')
xlabel('time (milliseconds)')
ylabel('Amplitudo (A)')
```

```
% Plot single-sided amplitude spectrum.
figure
plot(f,2*abs(Y(1:NFFT/2+1)))
title('(a) 1200 rpm Normal')
xlabel('Frequency (Hz)')
ylabel('Amplitudo(A)')
axis ([0 1200 0 0.4])

%analy=hilbert(data_all(:,2));
analy=hilbert(data_all(:,1));
y=abs(analy);
NFFT = 2^nextpow2(L); % Next power of 2 from length of y
Y = fft(y,NFFT)/L;
f = sampling_rate/2*linspace(0,1,NFFT/2+1);

figure
plot(f,2*abs(Y(1:NFFT/2+1)))
title('1200 rpm')
xlabel('Frequency (Hz)')
ylabel('Amplitudo(A)')
axis ([0 1200 0 0.9])
```

SCRIPT DOMAIN WAKTU, DOMAIN FREKUENSI, DAN SPEKTRUM ENVELOPE BANTALAN KONDISI RUSAK JAMAK (*MULTI-FAULTS*)

```
clear
clc
close all

%load('C:\Users\Berli\Documents\Kuliah Monitoring\Sem1
2016_17\Bearing_fault\Outer_race_fault_29hz.mat');
load('E:\Pengambilan_Data_TA\MultiFaults\Set12\Pengambilan_Data_TAMultiF
aults10.mat');
%y=data_all(:,1);
y=data_all(:,1);
sampling_rate=25600; %kecepatan sampling Hz
recording_time=5;   %waktu perekaman data (recording time)
L=sampling_rate*recording_time;  %panjang data (length of signal)


NFFT = 2^nextpow2(L); % Next power of 2 from length of y
Y = fft(y,NFFT)/L;
f = sampling_rate/2*linspace(0,1,NFFT/2+1);


% plot amplitude time domain
```

```
figure
plot(y(1:1*25600))
title('1200 rpm')
xlabel('time (milliseconds)')
ylabel('Amplitudo(A)')

% Plot single-sided amplitude spectrum.
figure
plot(f,2*abs(Y(1:NFFT/2+1)))
title('(b) 1200 rpm Rusak')
xlabel('Frequency (Hz)')
ylabel('Amplitudo(A)')
axis ([0 1200 0 0.5])

%analy=hilbert(data_all(:,2));
analy=hilbert(data_all(:,1));
y=abs(analy);
NFFT = 2^nextpow2(L); % Next power of 2 from length of y
Y = fft(y,NFFT)/L;
f = sampling_rate/2*linspace(0,1,NFFT/2+1);

figure
plot(f,2*abs(Y(1:NFFT/2+1)))
title('(c) 1200 rpm Rusak')
xlabel('Frequency (Hz)')
ylabel('Amplitudo(A)')
axis ([0 2000 0 1.7])
```