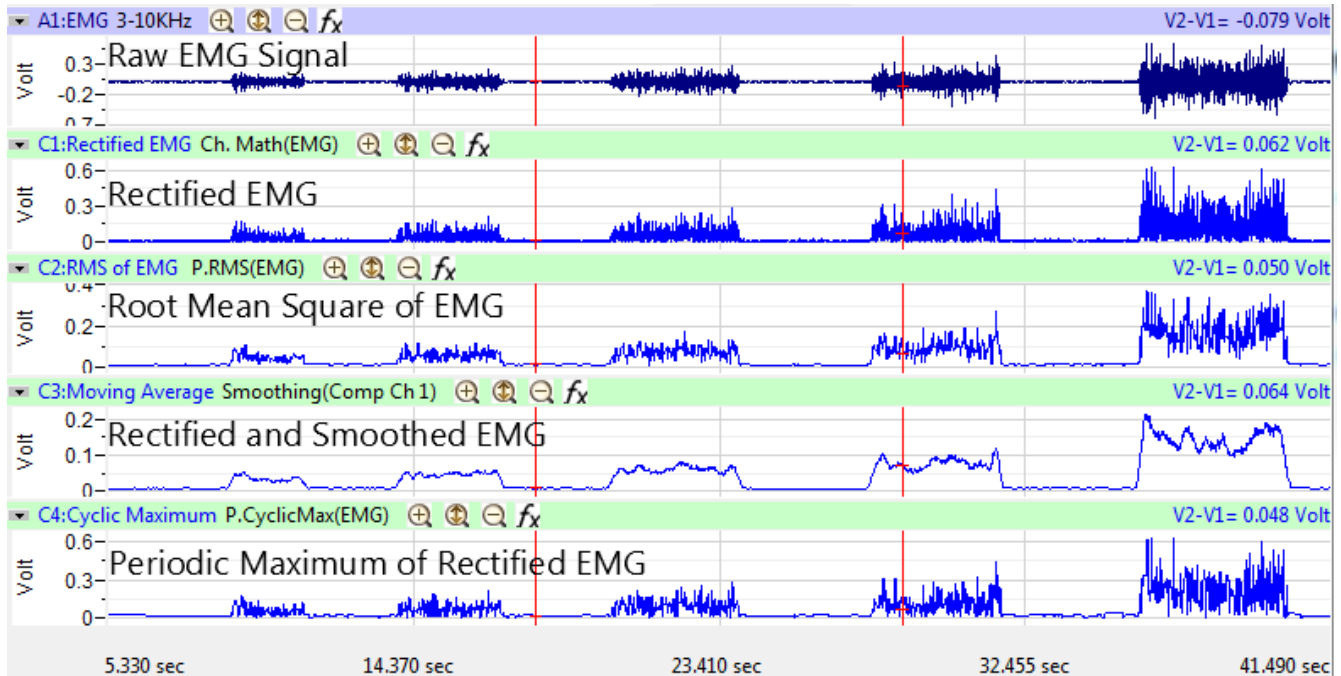


LabScribe has various built-in analysis to simplify EMG analysis.

Time Domain Analysis



Recified EMG Data:

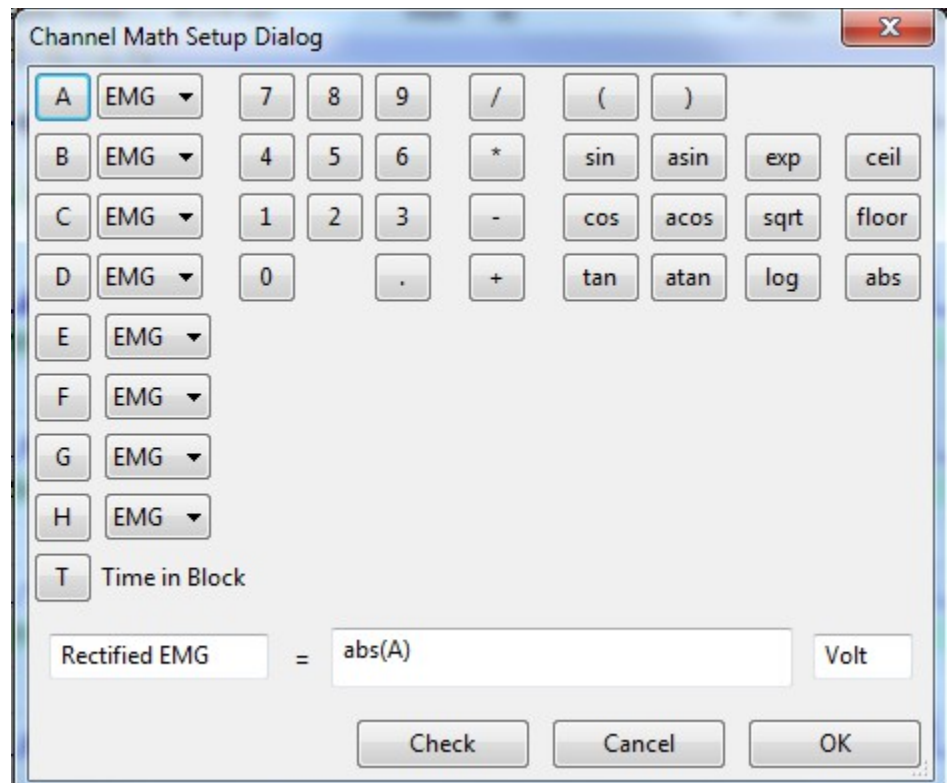
To rectify a channel, Click on the Channel's add Function button



Choose Channel Math.

Choose the Channel to be rectified, as the A channel.

Type in $abs(A)$ in the function text area. Then click OK.



RMS (Root Mean Square):

To calculate the RMS of a channel, Click on the Channel's add Function button

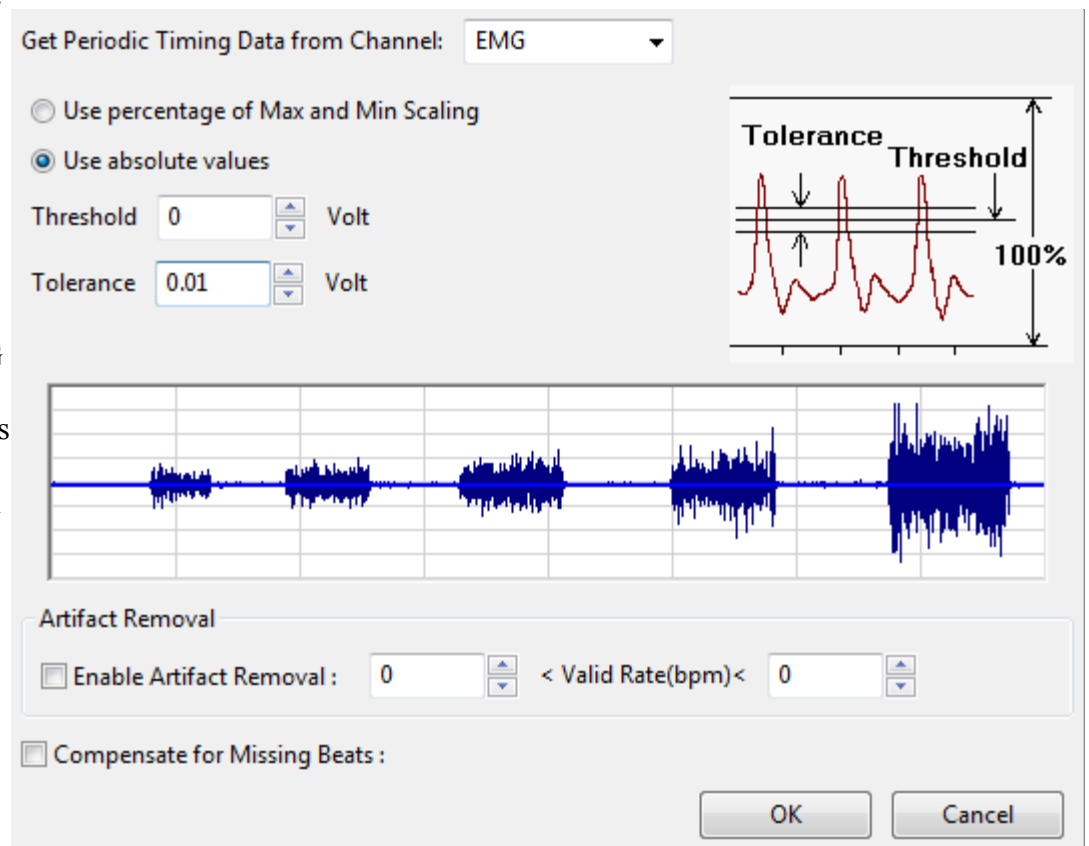


Choose Periodic

Choose RMS.

Set the Threshold and Tolerance. Since EMG data is AC coupled, we can use Absolute values for the threshold and tolerance. Also we can set the Threshold at Zero.

The raw EMG data values are squared and then the square root is calculated.



Envelope EMG Data:

To Calculate the Envelop of the EMG cygnal we have 2 options:

- 1) Smoothing the Rectified Data
- 2) Calculating the Periodic (cyclic) maximum for each cycle of the EMG

Smoothing the Rectified Data:

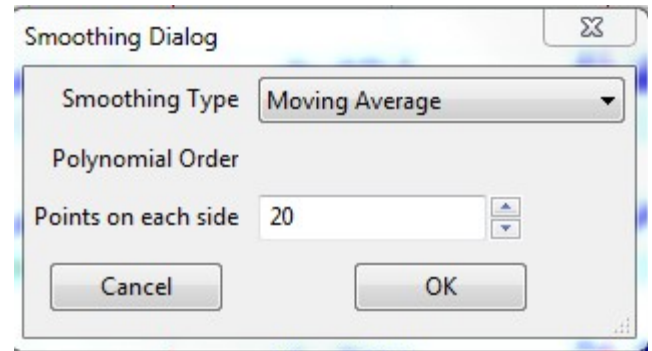
To Smooth the Rectified EMG signal. Click on the Channel's add Function button of the Rectified EMG channel.




Choose Smoothing

Choose the smoothing type, as Moving Average.

Choose the number of points for the moving average.

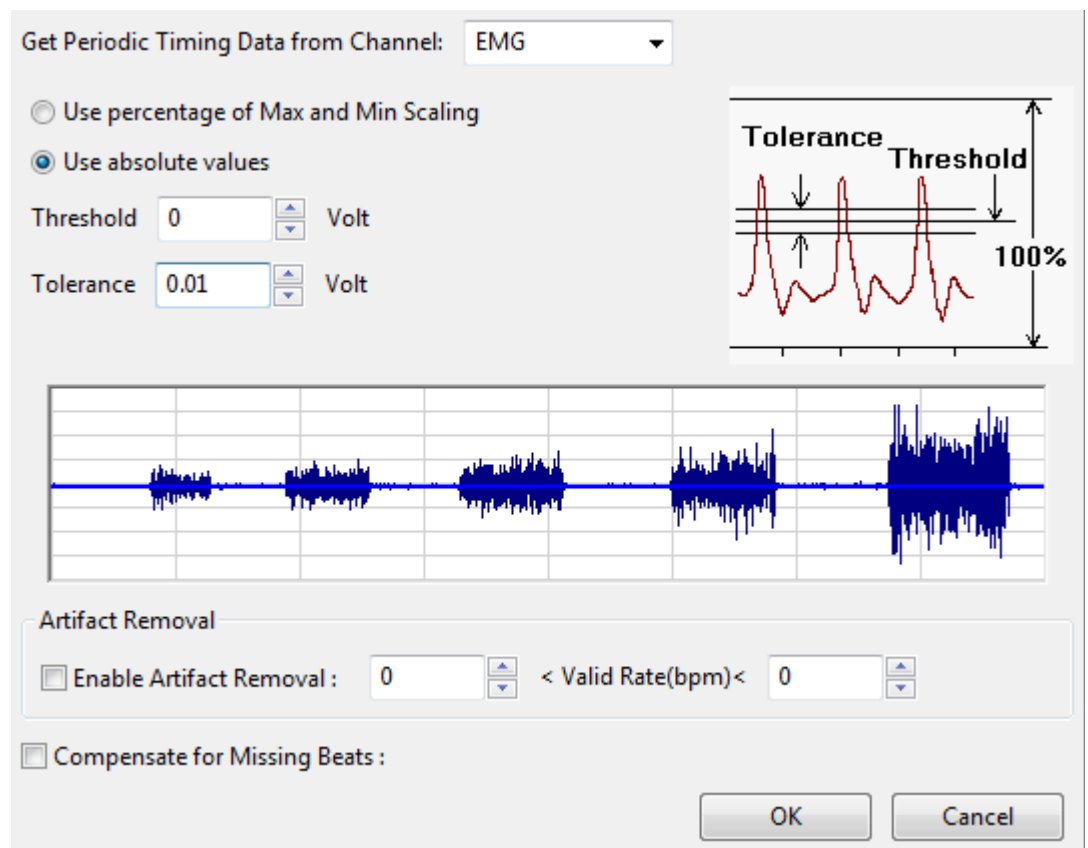


Cyclic Maximum of EMG :

To Smooth the Rectified EMG signal. Click on the Channel's add Function button of the  EMG channel.

Choose Periodic, then Cyclic Maximum.

Set the Threshold and Tolerance as in the RMS setup.



Filtering:

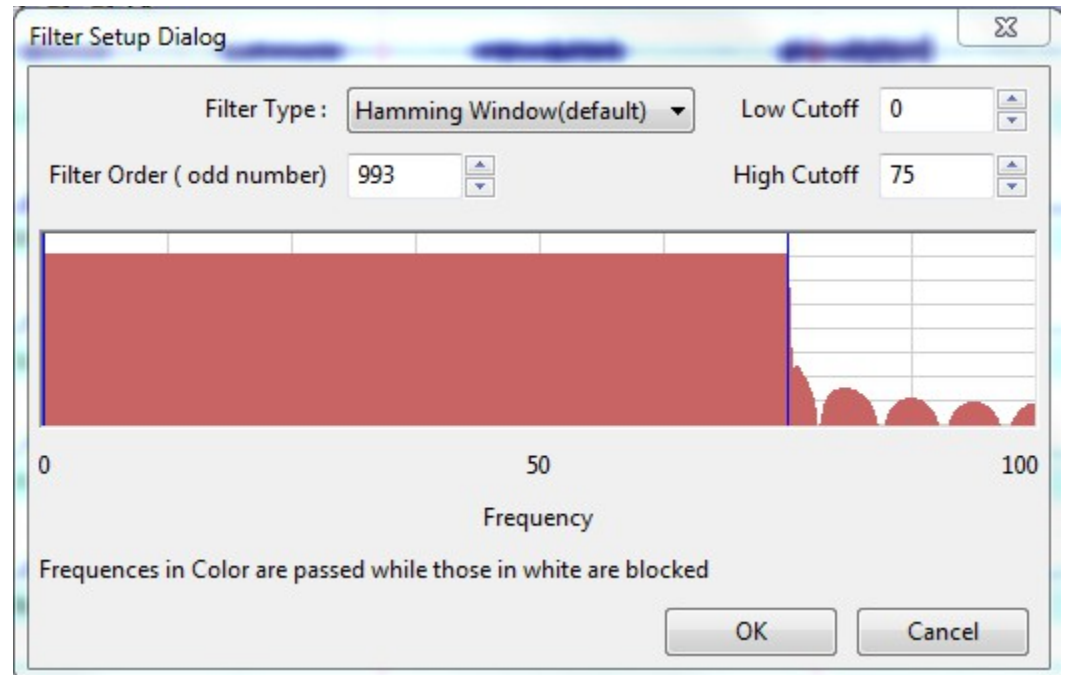
User Defined Filter can be applied to the Rectified EMG signal,

To Filter the Rectified EMG signal. Click on the Channel's add Function button of the EMG channel.

Choose Filter.

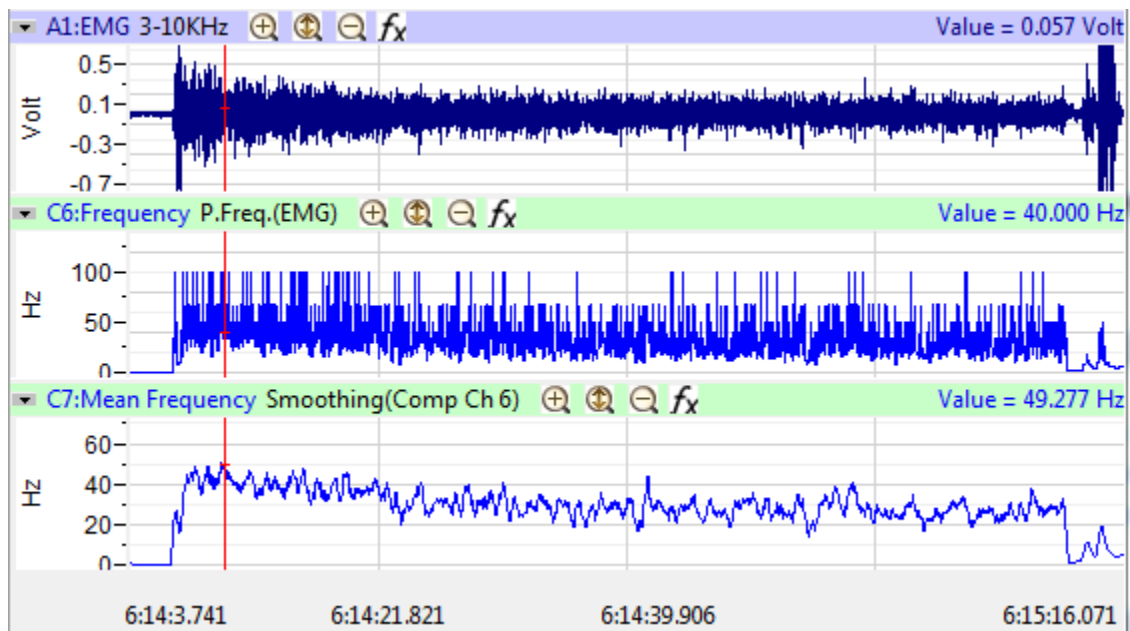
Choose FIR Filter.

Set the filter cutoff's and the type of filter,



Mean Frequency:

Mean Frequency of the EMG signal decreases with time during a task that induces Fatigue.



To calculate the Mean Frequency, we first need to calculate the Frequency of the EMG signal.

Click on the EMG Channel's add Function button.

Choose Periodic and Frequency.

The Periodic frequency dialog setup is similar to the RMS setup.

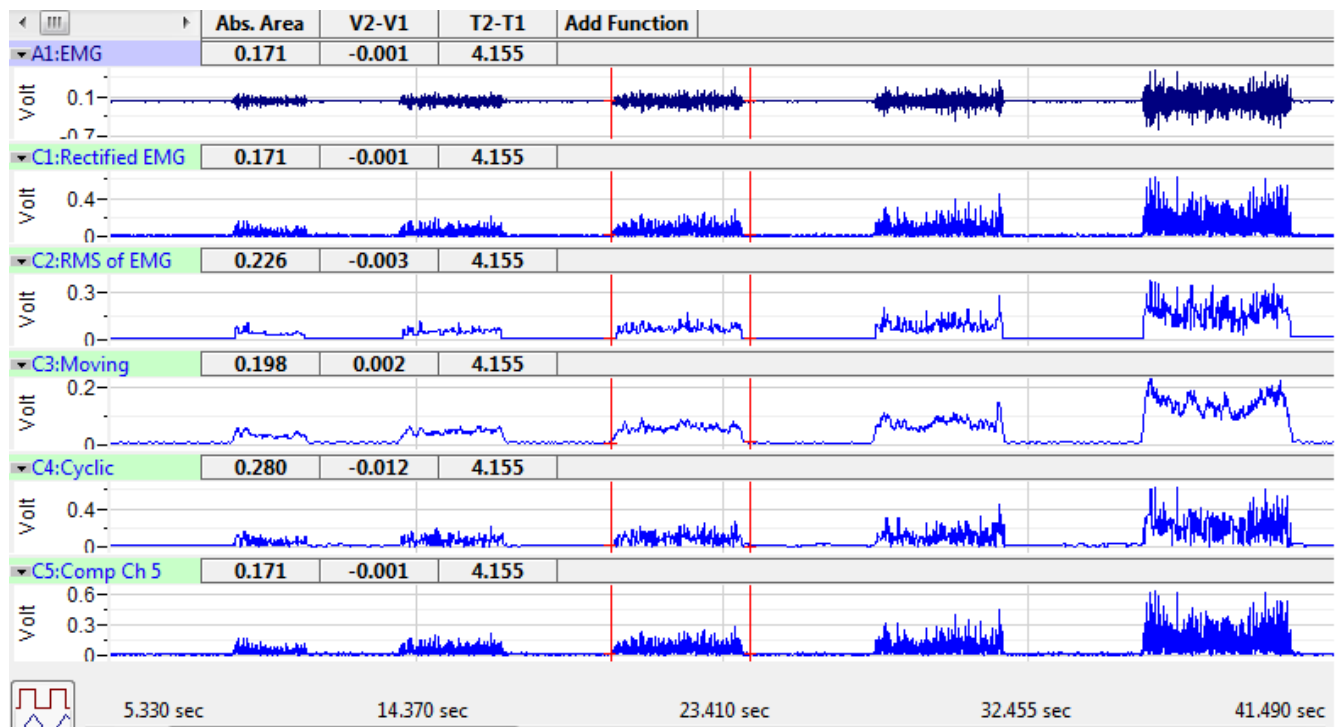
Then Click on the Periodic Frequency Channel's Add Function Button.

Choose Smoothing

and setup the smoothing channel.

We now have a channel that is the mean of the Frequency of the EMG signal.

Absolute Area Under The Curve:



In the Analysis window various measurements can be performed on the EMG data as well. Such as calculating the Absolute Area under the curve between the 2 cursors.

Frequency Domain Analysis:

LabScribe can perform Spectral Analysis of the EMG signal.

Power Spectral Density can be calculated by squaring the Fourier transform of the selected segment.

This gives a measure of the power that each frequency contributes to the EMG signal.

EMG Analysis

