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# Quick Start Tutorial



## Data Acquisition Software



- Insert your Nor-DAQ CD into the CD-ROM drive of your computer
- Using Windows Explorer, click on the drive letter for your CD-ROM drive.
- Open the directory "Nor-DAQ" and double click on the "Disk1" folder.
- In the "Disk1" folder, find and double click the "setup.exe" file.
- Follow the InstallShield instruction. Unless you have a specific issue with directory and program group names, you can accept all the default values presented during installation.
- When finished, close all programs and re-boot your computer.
- Upon successfully re-booting, double click on the Nor-DAQ icon that is now on your desktop.
- When prompted for the password, enter "trial14days" and click OK.
- That's it!!! You now have 14 days to learn how Nor-DAQ can add to your data acquisition capabilities.

## HOW DOES IT WORK?

**EMG** – The collection of EMG is done in the same manner as all of Noraxon's software. While specifically formatted for Noraxon EMG hardware, Nor-DAQ is able to record simultaneously up to 16 channels of any analog data. The program works with specific A/D (Analog-to-Digital) PC cards that convert the EMG and other waveforms into 12-bit digital signals. These signals are stored in the computer in a simple binary format that can be exported with minimal effort. The files are structured so that the data can be easily extracted for use in the analysis software of your choice.

### DATABASE

When you first start Nor-DAQ, you arrive at the Database screen. This screen is the "jumping off" point of the program. From here, you can record a new measurement, view a previously recorded measurement, create and edit patient and measurement comments, and export files. The structure of the database file is 2 tiered consisting of Patients and Measurements. Creating a new patient is as simple as entering a name. You can add as much or as little detail as you wish to identify your subject. When you highlight a Patients name, every one of that patient's recording is listed under Measurements. When you highlight a particular measurement file, the details of that recording are shown to the left, including the time/date, length of measurement, file size, sampling frequency as well as any comments or notes made about that recording.

To review a measurement and to place/move markers, the measurement is highlighted and the "View" button is clicked.

### VIEWER

Clicking on the "View" button takes you to the Measurement Viewer screen. The EMG signals are displayed on the screen. Initially, the entire EMG measurement is displayed. In the center of the bottom of the screen, the elapsed time from the beginning of the measurement to the point of the current cursor position is displayed. Also, in the center of each channel of EMG you will see the amplitude value of the signal at that particular time.

## **ZOOMING**

There are numerous controls for zooming in and out and increasing and decreasing the amplitude scale. The UP ARROW (↑) on each EMG channel will allow you to view one channel at a time. There is Scale Zoom (+ & -) for individual channels and Scale Zoom (All+ & All-) for all channels together. Zooming in the time domain is done using Zoom+, Zoom-, and Whole buttons. Zoom+ will zoom in around the cursor position. Zoom- will zoom out around the cursor position. And Whole will display the entire EMG signal. Another way to zoom around a portion of the EMG signal is to select it first. Click the mouse to position the cursor at the start of the portion you wish to zoom. While holding the mouse button, drag the cursor to the end of the region you wish to look at. You will see that the selected portion turns black. Now, if you click the Zoom+ button, the selected portion will fill the screen. Clicking the mouse again on any part of the EMG signal will deselect the portion, returning the background color to white.

## **MARKING & PRINTING**

To place a marker, you simply position the cursor at the time in the EMG that designates some event in the recording and either double-click with the mouse or click the "Mark" button. You will notice that a number appears under the cursor. This number is how the marker is identified. Each time you create a new marker, all the markers are renumbered so that they are in numeric order from left to right. Associated with each marker is a marker label. If you do not type a marker label in the text box before you hit the "Mark" button, it will automatically use the default label of "Marker". You can change that label by positioning the cursor over the marker until the "Mark" button changes to "Rename". Then simply change the label and hit the "Rename" button. The "Delete" button is only active when the cursor is placed over a marker. Clicking the "Delete" button will remove the marker and renumber all the remaining markers.

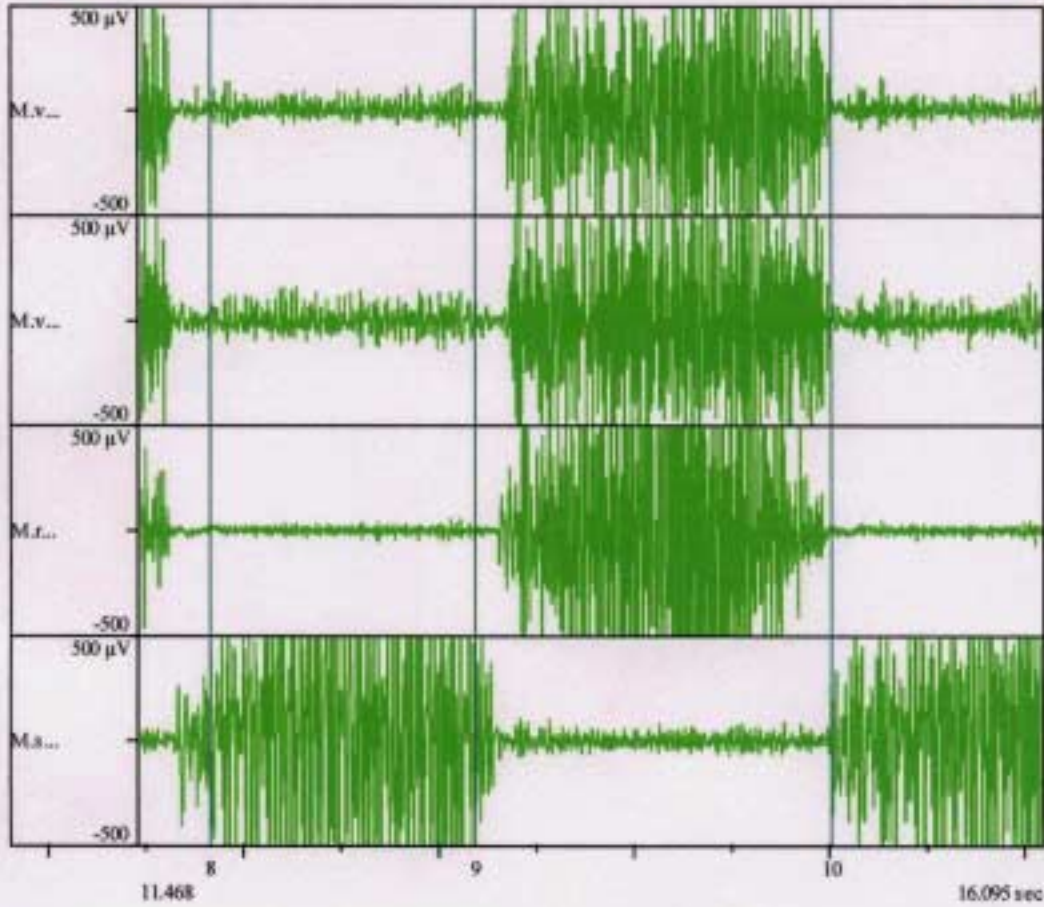
The printing function will create a report that shows the EMG signal that is currently displayed in the Viewer. The following page shows how a typical report will look.

Each frame shows the number and label of the associated marker as well as the time reference.



Patient information  
 First name: DEMO  
 Last name:  
 Sex: Male  
 Born: 02.01.1964

Measurement information  
 Name: Coordinat.  
 Date: 02.09.2000 17:56:44  
 Duration: 34.755 sec  
 Frequency: 1000 Hz



Record comments:

Time, sec	M.vast.med., μV	M.vast.lat., μV	M.rect.fem., μV	M.sem.tend., μV
11.830	5	61	22	-161
13.188	27	37	10	-205
15.011	-10	-10	5	195

## MEASURE SETUP

Clicking on the "Measure" button on the top menu bar will bring you to the Measurement Configuration screen. This is where you define the parameters of the measurement. You can choose an existing patient or create a new patient. The default sampling frequency is 1000 Hz and can be changed simply by typing in a different value. Checking the "Set test time" box will allow you to have a pre-defined measurement time. The sweep speed setting determines how quickly the EMG signals "sweep" across the screen. The lower the number, the quicker the signal will go from right to left.

### CHANNELS

In order to choose which channels you want to record, you have to define them under "Type". Double-click in the "Type" box next the channel you wish to record. Choose the appropriate type. EMG is for raw (bi-polar) signals. IEMG is for integrated (positive value) signals. You can create new channel types by going into the "Options" menu at the top of this screen. Double-clicking on the "Amplitude" box will allow you to change your amplitude scaling. This is the scaling that the display will be set to upon the start of your measurement. You will be able to change that setting once you begin recording if it needs to be adjusted. The "View" and "Rec" checkboxes will determine which signals will be viewed and which will be recorded respectively. You are able to load and save your configuration settings so that you do not have to manually change them between different measurement setups.

## MEASURING

Once everything is configured, you can begin your measurement by clicking the "Start" button. The EMG signals appear on the left side and sweeps across. The display of the signals can be adjusted much like in the Measurement Viewer screen. The (+, -, ↑) symbols are used in the same way. The yellow dot (●) can be pressed to calibrate a single channel. The checkmark (√) when depressed allows that particular channel to be calibrated during a global calibration (see below). The Zoom+ and Zoom- buttons adjust the amplitude scaling for all channels at once. The Faster and Slower buttons adjust the sweep speed of the EMG signals.

## **RECORDING**

Before you begin to record, it is important to calibrate the EMG signals. The yellow ruler just below the video screen should be clicked right before you start your recording before the subject begins a movement. To start recording the measurement, click the red dot (●) at the bottom of the screen. The EMG signals will turn from green to red. This indicates that you are now recording data. The elapsed time is displayed on the bottom center of the screen. Marking is performed in the same fashion as in the Measurement Viewer screen. When you click on the "Mark" button, you will see a line on the EMG signals indicating that you have successfully placed a mark. Once again, if you do not insert a name into the text box next to the "Mark" button, the default marker label of "Marker" will be used. Of course, this label can be changed later in the Measurement Viewer. You can pause the recording by clicking the Pause (||) button under the video window. You will notice that the EMG signals again turn green indicating that the recording has ceased. Clicking the Pause (||) button again will resume the recording. Once you have completed your measurement, click the Stop (■) button. A dialog box will appear and ask you to type a name for your measurement. If you click "Discard", the file will not be saved.

## File Export and Data Structure

The saved files can be exported in ASCII format using the copy measurement function. This will allow you to view the data in standard spreadsheet and statistical programs.

The file structure for the data has been designed to make extraction of data simple.

All files are located in the C:\Program Files\Noraxon\NorDAQ folder.

All data is located in the "Data" folder. Each Patient has its own folder under the data folder. For a patient named "Test", the folder name located under the data folder is "Test". Within the patient folder are all the measurements associated with that patient. Also, the *comments.txt* file contains the patient comments for that patient. The *contents.ini* file contains the patient information for that patient.

Each measurement folder is labeled with "mea" followed by 4 numbers. Within each "mea" folder are the *contents.ini* file which contains the measurement description including markers, the *comments.txt* file which contains the measurement comments, and the \*.*dat* files which contain the EMG data in binary format (one file for each channel).

Internally, all dates are in DD.MM.YYYY HH:MM:SS format. All numbers have a decimal point (.), the measuring system is metric. The binary data are kept in raw int16 format without any headers (all description information is in the *contents.ini* files), each actual value is calculated as  $\text{in16\_value} \times \text{scale} + \text{base}$ , the fields "scale" and "base" are defined for every channel in the *contents.ini* file.

# Contact Noraxon

Now that you've had a chance to experience Nor-DAQ, please don't hesitate to call us, email us or visit our web site. We will be more happy to answer your questions and provide any additional information that you might need.

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