



# myoRESEARCH 3.14

## *User Manual*

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**CE Mark:** This symbol indicates the clearance to market this product in the European Community.

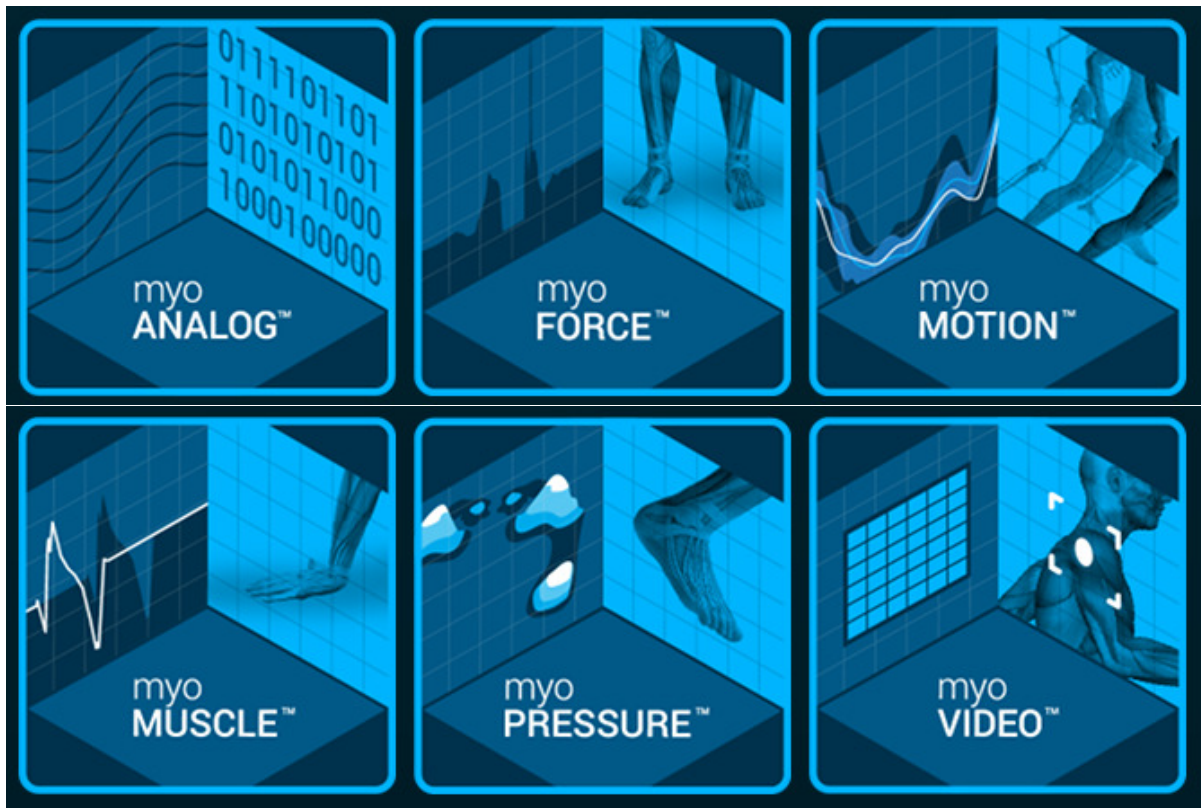
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## 2 Introduction

The myoRESEARCH software suite (also known as MR3) fully integrates between the different software module options. Therefore, all software modules share the same basic menu operations. These operations are detailed within this manual.

For additional software tools, options, and suggestions for best practices, see [www.noraxon.com/courses](http://www.noraxon.com/courses).



## 3 Computer Requirements

The following computer system specifications are required for optimal use of Noraxon's myoRESEARCH® software platform and modules and must be met for any multi-device MR3 installation. Computer systems sold and shipped by Noraxon will meet or exceed these specifications, and software compatibility is warrantied for three months after the date of the Sales Quote. These specifications are subject to change without notice; please always check with your Noraxon salesperson for your particular use case.

**Processor:** Intel® Core™ i7 or i5 Processor (8th generation, PassMark score 10000 or better)

**Memory:** 16 GB RAM

**Primary Hard Drive:** 256 GB SSD (M2 NVMe, larger capacity optional)

**Secondary Hard Drive:** 1 TB SSD or 7200 rpm HDD (recommended for database)

**Graphics processor:** A GPU with PassMark score 3000 or better is required. An Nvidia Quadro P600 or GTX1050 GPU or better is recommended.

**OpenGL:** Version 4.3 or higher

**Camera:** Noraxon NiNOX or Logitech C930e equivalent if the camera is to be used as a reference/tracking camera

**USB:** A minimum of 2 USB3.0 ports.<sup>1,2</sup>

*When using NiNOX™ cameras, Noraxon USB cables must be used. Each pair of NiNOX Cameras require a separate USB 3.0 controller.*

**O/S:** Windows 10 64-bit

### Recommended computers for multi-device systems:

- Laptop: Dell Precision 3530 (i7 CPU, 16 GB RAM, and NVIDIA Quadro P600) *(up to 2 NiNOX™ cameras)*
- Desktop: Dell XPS 8930 (i7 CPU and NVIDIA GTX1060) *(up to 4 NiNOX™ cameras)*

### NOTES:

- Refer to the *Portable Lab Quick Start Guide* for additional settings when using a Portable Lab system.
- Noraxon recommends use of an external hard drive for data backup.
- Although your computer may have the hardware indicated above, Noraxon highly recommends that you update your graphic board drivers using the manufacturer's website.

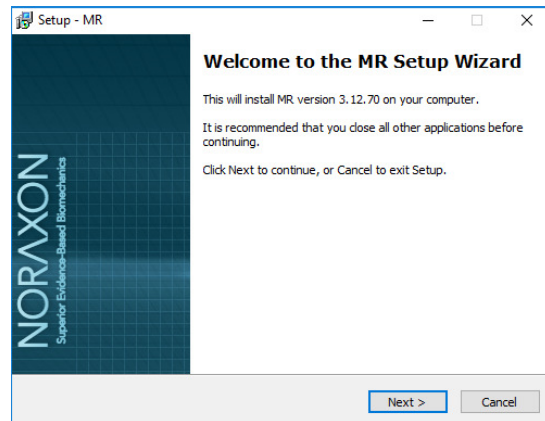
<sup>1</sup> One port is needed for each Noraxon device to be connected, a Noraxon provided USB hub can be used to add ports. Note when combining myoVideo and myoPressure more than one USB controller may be required.

<sup>2</sup> Note the cable length limit is 5 meters for USB 2.0 and USB 3.0. Longer lengths can be accommodated using Noraxon provided active extension cables or USB hubs.

## 4 Software Installation

### 4.1 Installation

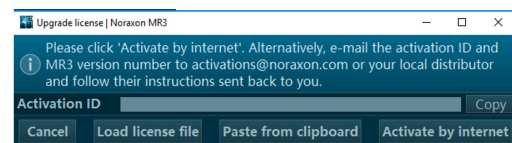
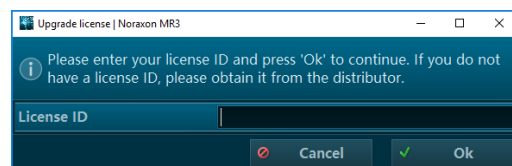
1. Insert the MR3 USB flash drive into the PC
2. A menu will automatically pop up
3. Click on the Noraxon installation file and follow the Wizard's instructions



### 4.2 Activation

The installed companion software must be *activated* before unrestricted use is possible.

1. Open MR3
2. A dialog box will indicate how many more times MR3 can be opened
3. Click on "Activate"
4. Enter the License ID provided on your USB flash drive and press "OK"
5. If you have an internet connection, click Activate by Internet for immediate activation
6. Alternatively, email the provided activation ID to [activation@Noraxon.com](mailto:activation@Noraxon.com) Noraxon Support will email or respond by phone with the Activation Code. Enter the provided Activation Code to remove any restrictions on use.



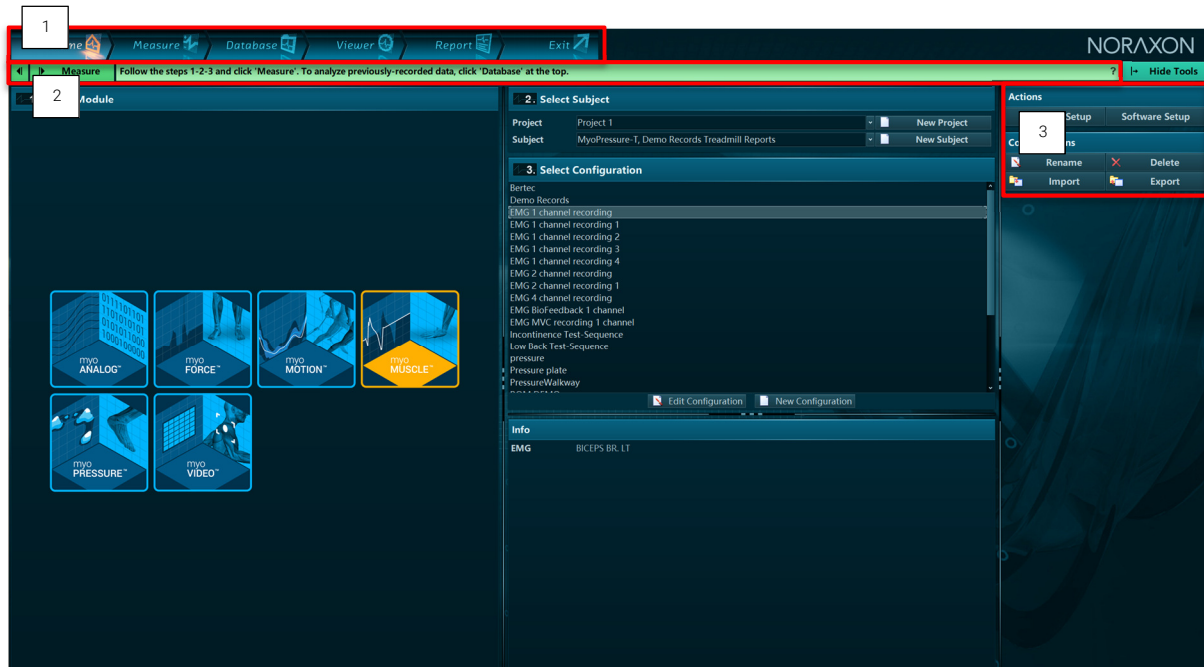
### 4.3 Updates

1. Perform a backup of the data folders to a separate drive as a precaution.
2. Click on the Patch/Update link provided in the email or as given on the [Noraxon website](#).
3. Download the Patch/Update file.
4. To install the Patch/Update, click "Run" on the dialog box. No password is required.

## 5 Software Features Overview

### 5.1 General Software Navigation

Three major interface components are available on all screens.



#### 1. Main software navigation bar

Move between the stages of data collection by clicking through the options.

#### 2. Green instruction line with main action button

Follow the instructions to operate to the next step in the workflow

#### 3. Tool bar

The available options or settings for each screen are displayed here.

Select **Hide Tools** or **Show Tools** to display or retract this tool bar.

### 5.2 Multi-device integration capabilities

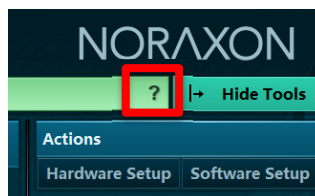
Your purchase of MR3 includes the software modules that correspond with your hardware purchase. The software modules you have access to will display on the Home screen. You will need to configure the hardware you intend to use in MR3 by following the Hardware Setup process described in the corresponding Hardware User Manuals. Once each device is configured in Hardware Setup, you can use it within a given measurement configuration. All devices will automatically be time synchronized with use of the Noraxon myoSYNC device.



## 5.3 Help System

### Within software help

Context specific help information is available by clicking the question mark.



## 5.4 Importing, Exporting, Streaming, and Backing up Data

The basics of importing and exporting records with MR3 can be found in section 8.4 of this User Manual. For more detailed information and a step-by-step guide to perform each of these functions visit [www.noraxon.com/courses](http://www.noraxon.com/courses).

## 6 Home

Before the MR3 software can take and store measurements, you must configure the installed software through the Hardware and Software setup and prepare the recording configurations for the measurement. These functions are available from the Home screen.

### 6.1 Hardware Setup

#### 6.1.1 Insert and Configure Hardware

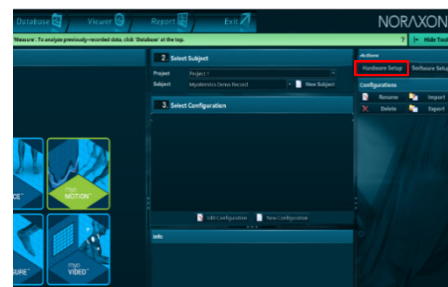
This step is only needed when new devices are being added to the software or a change to the hardware configurations is needed.

##### Step 1

Connect all measurement devices to the PC.  
Power them on.

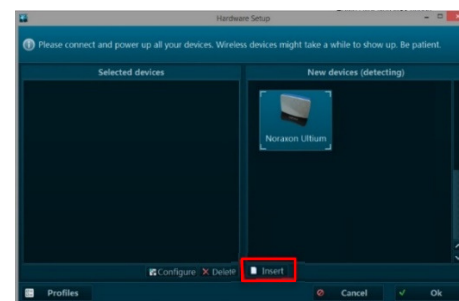
##### Step 2

Select **Hardware Setup**



##### Step 3

Drag and drop (or select **Insert**) to move the hardware of interest to the Selected devices window from the New devices window.



##### Step 4

Select **Configure** to access device specific settings and individual sensor detection.

Each device has a specific Configuration menu.  
Consult the corresponding Hardware User Manual  
for the specific hardware configuration  
procedures for your device.

##### Step 5

Select **Ok** to exit Hardware Setup.

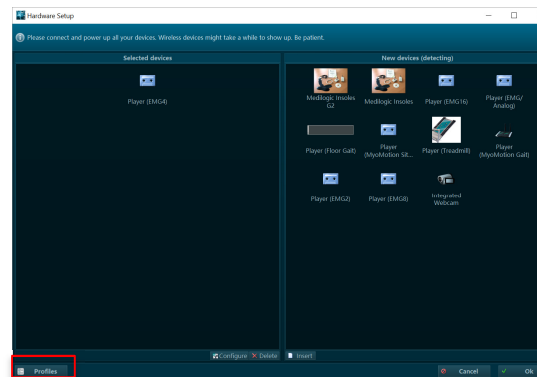
#### 6.1.2 Save Hardware Profiles

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Multiple hardware profiles can be saved. This allows specific hardware setups and device configurations to be saved for later use. This is very useful if more than one EMG and biomechanical sensors are combined in certain multi-device setups.

### Step 1

Select **Hardware Profiles** within the Hardware setup to view saved hardware configurations.

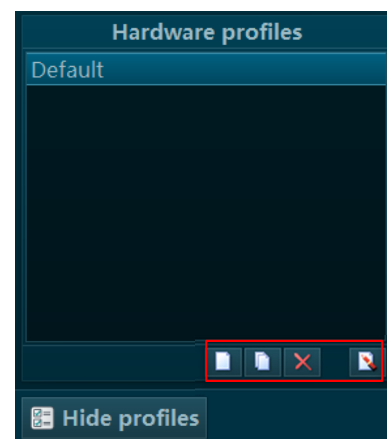


### Step 2

To create a new profile, copy, delete, or rename an existing profile select the corresponding tool at the bottom of the Hardware profile window.

Functions from left to right:

- Create a new item (Profile)
- Copy a selected item (Profile)
- Delete marked item(s)
- Rename marked item

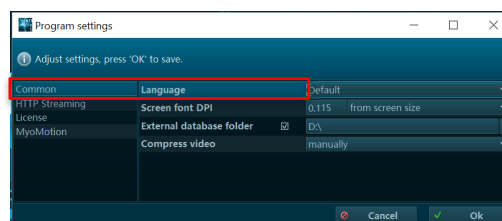


## 6.2 Software Setup

In the Software setup you can access general software settings as well as some module specific functions. The basic settings needed to operate the software are described here. For additional information for the complete list of setting options see information provided at [Noraxon.com/courses](http://Noraxon.com/courses).

### 6.2.1 Changing the language

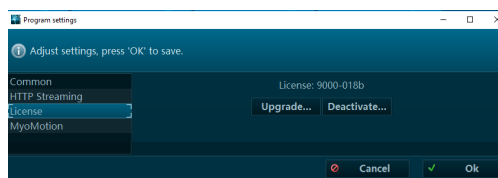
**Language** allows you to change the language. The default language is the language of your installed Windows Operating system. There are four languages currently supported by MR3: English, German, Chinese, and Japanese.



### 6.2.2 Finding your license number

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The software and each purchased module within is license protected. If you wish to upgrade your existing license with a new module (e.g. if a myoMUSCLE-only license needs to be upgraded to also include the myoVIDEO module), click **Upgrade** and follow the on-screen instructions.



### 6.2.3 myoMotion Software Settings

This section is only operational for the myoMotion 3D inertial sensor system. Ignore it in case of using other systems without the myoMotion sensors. See the myoMotion User Manual for specifics.

## 6.3 Setup for a new measurement

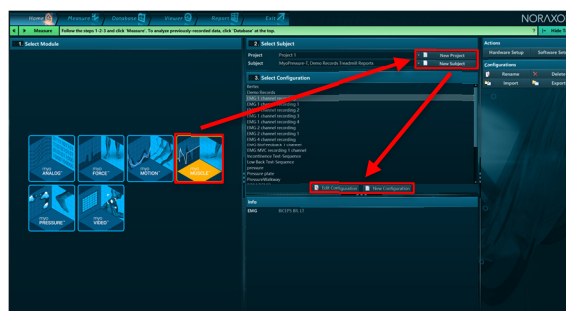
### Step 1

Within the Home screen, click on the software module icon that corresponds with the devices in your measurement.

Create a **New Project** or select an existing project.

Create a **New Subject** or select an existing subject.

Select the configuration you would like to measure within. If you need to make changes or view the devices within a configuration select **Edit Configuration**. Or select **New Configuration** to create a new measurement configuration.

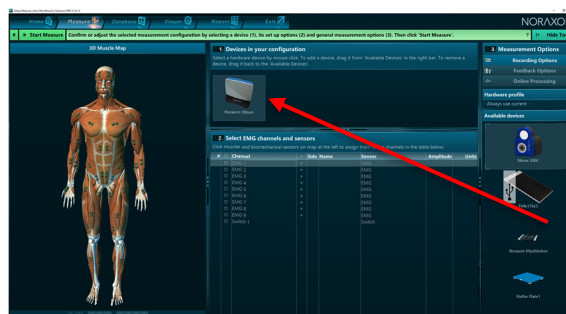


### Step 2

Insert the devices to be used for the measurement into the configuration by dragging a device in from the list of **Available Devices**.

Use the sensor list to select or deselect the number of sensors and/or measurement channels to be used within the configuration.

Each system has a variety of unique measurement settings and option. Refer to device specific Hardware User Manual for the details for each system.



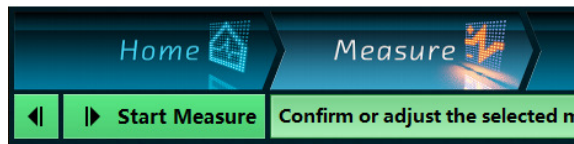
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### Step 3

Save the configuration.

To save your configuration you have two options:

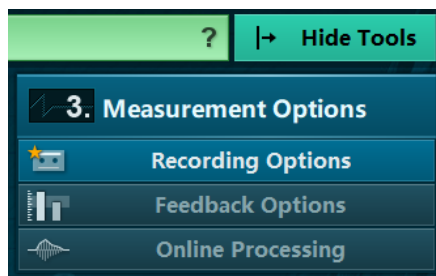
- Select **Home**. This will return you to the Home screen. And prompt you to save or discard the configuration changes.
- Select **Start Measure**. This will move you to the Measurement screen and save your configuration changes.



## 6.4 Measurement Options Tool Bar

Within the Edit Configuration window you can edit advanced measurement options.

To learn more about operating one of these advanced settings visit [www.Noraxon.com/courses](http://www.Noraxon.com/courses).



## 7 Measure

### 7.1 Record a Measurement

To record a measurement or view your data in live mode make sure you have first set up your measurement configuration. These steps are outlined in Section 6 of this manual.

#### Step 1

Following subject and measurement configuration setup procedures, select **Measure** to move to the measurement screen.



Prior to starting a recording determine if your measurement devices require specific calibration steps. See the device's corresponding Hardware User Manual for an overview. If required, perform the appropriate calibration procedures.

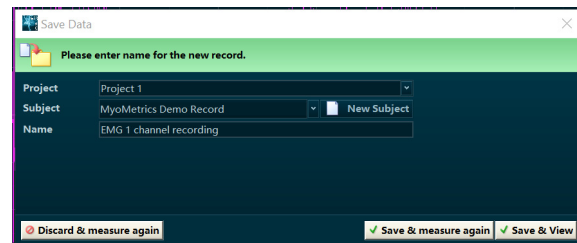
#### Step 2

Check the signals from the sensors and, if acceptable, follow the steps in the green tool bar.



#### Step 3

Discard & measure again or type in record name and select one of the **Save** options.



### 7.2 Actions Toolbar

#### 7.2.1 Measurement setup

This will bring you back to the **Edit Configuration** window where you can make a change to your configuration or select a specialty **Measurement Option**. To learn more about operating one of these advanced settings [www.noraxon.com/courses](http://www.noraxon.com/courses).

#### 7.2.2 Case Sensitive Measurement Tools

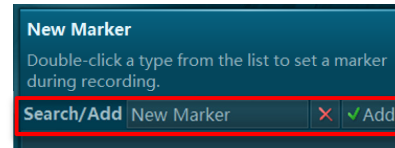
Depending on the hardware you are using you will see a variety of unique measurement tools. Make sure to reference your device Hardware User Manual for more information on operating each tool.

### 7.2.3 New Marker – Real Time Marker Menu

With this menu you can create marker names and manually mark or comment on events in your recording.

#### Step 1

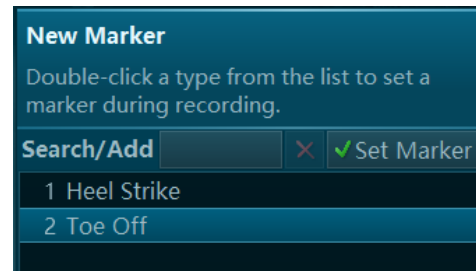
Enter a marker name and press **Add** to add it to the list of available markers



#### Step 2

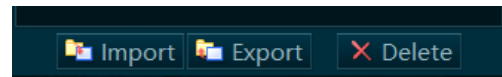
When recording, the **Add** button changes to **Set Marker** button.

To place a special marker type in your recording, first click on the desired marker type in the list then click on the **Set Marker** button in marker menu. An acoustic beep will confirm when a marker is placed in the recording. Alternatively, the keyboard Enter button can be pressed to set a marker.



#### Additional Option

Import, Export, and Delete buttons allow you to edit or import/export the list of markers (from or to other MR3-versions).



### 7.2.4 Screen layout

This list of tools will allow you to customize the format in which your data is displayed while on the Measurement tab (the live or real-time data display).

The options along the right side will allow you to act on the screen layout as a whole. The options on the left allow re-organization of the signals displayed in each window.

Screen Layout	
All in one tab	Copy
Group by device	Paste
Group by location	Save
Group by pair	Load

Individual signals can be relocated by clicking + holding the signal header (the channel title) and dragging it to the desired location or tab.

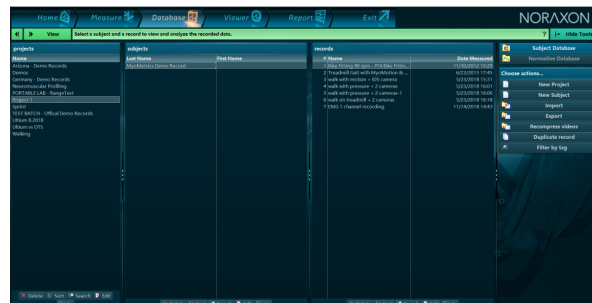
## 8 Database

The Database screen manages all functions related to data file management such as selection, editing, exporting, and importing.

### 8.1 Database File Organization

The Database file system is organized in a hierarchical system as follows.

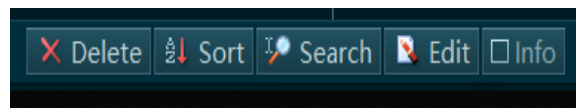
1. Projects
  - a. Subjects
    - i. Records



### 8.2 Database List Functions

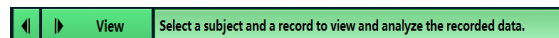
At the bottom of each level of the database you will find a series of functions that allow for typical operating procedures within the Database screen, such as:

- Search (Use to quickly find a subject in a large database)
- Edit (Use to change or add information stored at each level of the database)
- Info (Use to view available information on a project, subject, or record)



### 8.3 Selecting a Record to View

To select a record to view either double click on the record of interest or select **View**.

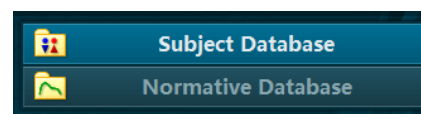


### 8.4 Database Tools

#### 8.4.1 Database Type

##### Subject Database

When Subject Database is selected you will see all projects, subjects, and records saved locally.

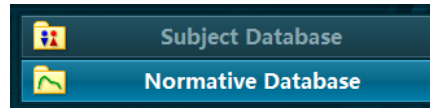




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### Normative Database

This database contains all normative data records that were compiled via the **Add to Normative** function in the Report screen.



The normative sample files included in your purchase of MR3 are not meant to be used for any medical diagnosis or similar purposes. It only serves as an educational example on how to use or operate normative data.

For more information on the basics of using the Report function in MR3, see section 10 of this User Manual.

### 8.4.2 Actions

Several additional actions are available in the Tool window of the Database screen. See a description of each below.

- **New Project**
  - o Create a new project in your database. Similar process to creating a new project from the Home screen.
- **New Subject**
  - o Create a new subject in your database. Similar process to creating a new subject from the Home screen.
- **Import**
  - o Import records from external locations such as previous MR software version or backup data from external hard drives or network folders.
- **Export**
  - o Export data in native format to an **external location** on your PC or to another **Subject** or **Project** in your same MR3 database.
  - o Export data in a different format; e.g. CSV file
- **Recompress videos**
  - o Reduces file size of collected raw video.
- **Duplicate record**
  - o Produces a replica of the record.
- **Filer by tag**
  - o Allows for quick searching for pre-tagged records.

When transferring data from one instance of MR3 to another, it is necessary to use the import/export "to/from external location" to achieve proper format for the data transfer or backup.

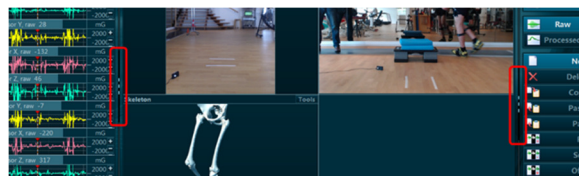
## 9 Viewer

Data loaded into the record Viewer screen will display in the same channel layout scheme that was used for recording. Within the Viewer screen you can inspect the quality and details of a record, apply signal processing, place markers for analysis period definition, and select additional Play Mode settings.

### 9.1 Main display features of the Viewer

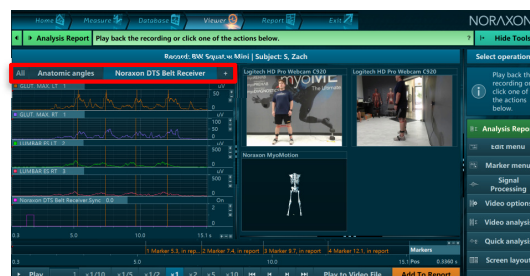
#### Splitter Lines

Use the splitter lines to increase or decrease the size of the windows displayed in the Viewer to accommodate your preferences.



#### Device Tabs

For multi-device recordings, toggle between the tabs on the left side window to view available channels by device.



#### Video/Animation windows

Video recordings and devices with animations (e.g. 3D motion, pressure, force-vector overlay) will display playback visuals in the Video/Animation window.



#### Timeline

The record timeline and playback options are located at the bottom of the Viewer screen.



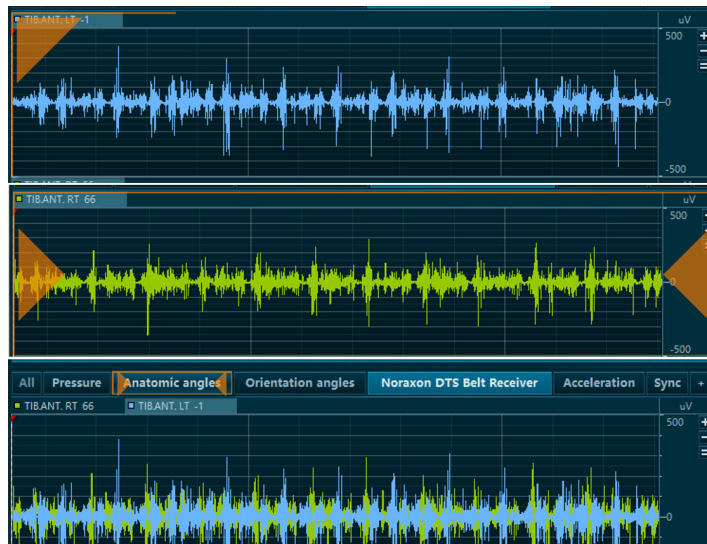
#### Signal Channels (edit options)

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By double clicking or clicking/holding/dragging you can change the location of each signal.

The double click will expand the data into its own window (and will go back to where it was when you exit this window). By clicking on the header, holding the mouse click, and dragging the header around, you can drop it to 3 different locations.

1. Dropping it while there is one orange arrow at the top left of a signal plot means the channel you are moving will end up stacked above the current channel in view.
2. Two orange arrows, one at each end, means the data will be overlaid on top of the existing data.
3. You can also drop the header in one of the tabs above to move the signal into a new group of channels.



## 9.2 Select Operation (Viewer Tools)

The “Smart” Right-Hand Toolbar is meant to make editing data in the viewer more user-friendly and accessible. It changes based on selections in the Viewer screen to display the corresponding features for the module (MyoMotion, MyoMuscle, MyoForce, MyoVideo) selected in the Viewer.

This overview will show the basic features of the Edit Menu and the basic functionality of the toolbar upon initial view.

This is the initial view of the toolbar in the Viewer. Click Show Tools in the top right if the toolbar does not appear.

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**Analysis Report** – this is a button that does the same thing as the Analysis Report on the top left of the screen.

**Edit menu** – Allows for modification of record channels.

**Marker menu** – allows the user to edit and add markers to the record.

**Signal Processing** - allows signal processing to be done on signals such as smoothing, integration, ECG reduction (EMG products), filtering, rectification, and time offset.

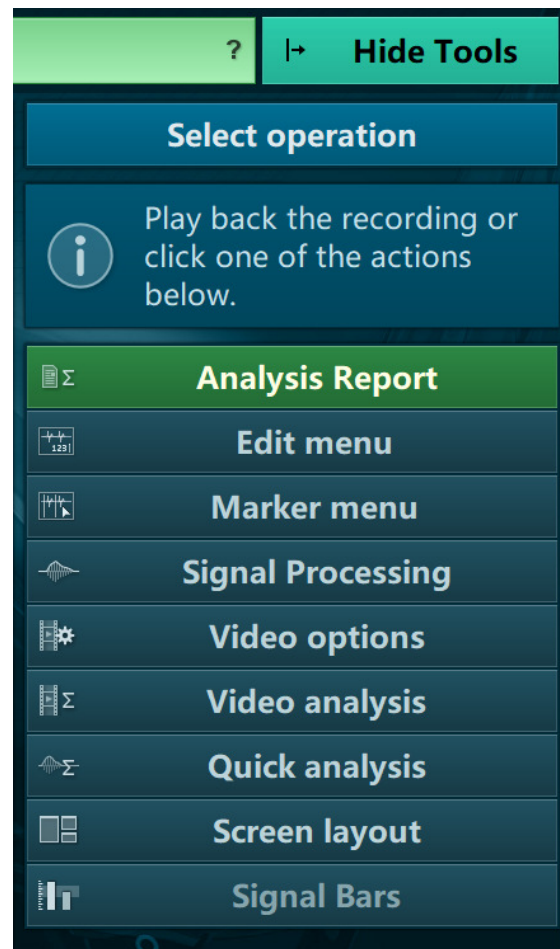
**Video options** – allows the user to save or copy the current picture, export only the reference video, and change the setting in the viewer (name of camera, font size).

**Video analysis** – requires the myoVideo software module. allows all video analysis options available in MyoVideo such as marker angle tracking.

**Quick analysis** – allows a quick report of selected channels with a visual of the channel, and mean, peak, and min values. These can additionally be edited using the Edit Report tools.

**Screen layout** – allows the user to change the layout of the screens in the Viewer easily according to groups or hardware used.

**Signal bars** –allows a quick visualization of real time data by turning the channels into a bar graph that rises and falls according to a channel unit (N, mV, etc.).



## 10 Report

Several pre-installed reports are available for use within the Report screen. To access the Report screen, first open a record from the Database.

Reports are sorted in seven major tab sections. The accessibility of these tabs is dependent upon the equipment and modules installed.

- **myoMUSCLE** (Essential, Clinical, Master) – for all myoMUSCLE EMG and sensor records
- **myoMOTION** – for all myoMOTION based 3D kinematic records
- **myoPRESSURE** – for all pressure related records
- **myoVIDEO** – for myoVIDEO 1 and 2 video camera records
- **MyoForce** – for 3D force plate jump analysis
- **Quick Analysis** – default report for the Viewer based Quick Analysis

## 11 Support

### 11.1 Submitting Technical Support Requests

A Support Request can be submitted using the online form available at this link:

<https://www.noraxon.com/support-learn/support-request/>

Provide all information requested by the form including a **detailed** description of the problem being experienced and your telephone number or e-mail address.

### 11.2 Website Link to FAQ

Answers to frequent questions can be found at Noraxon's Frequently Asked Questions (FAQ) website page at this link:

<https://www.noraxon.com/support-learn/technical-support/faqs/>

Other educational material is available at this link:

<https://www.noraxon.com/support-learn/technical-support/>