



# Hand Engine 2.0.0 Release Notes

<b>New version</b>	Hand Engine 2.0.0
<b>Previous version</b>	Hand Engine 1.5.3
<b>Deprecated versions</b>	Hand Engine 1.4.0
<b>Release date</b>	14th July 2022
<b>Operating system</b>	Windows 10, 64bit
<b>Meaning of icons</b>	+added, ^changed, !note, #fixed, -removed
<b>Requirement</b>	<p><b>Hand Engine 2.0.0 requires:</b></p> <p><b>FIRMWARE UPDATES</b>  <b>Firmware for the MoCap Pro glove - SuperSplay model:</b></p> <p>MoCap Pro SuperSplay Glove firmware update 01.01.03 or higher</p> <p>Bluetooth Dongle firmware update 01.01.04 or higher</p> <p>Both are included in Launcher firmware bundle version SuperSplay Bundle 1.9 available in your account section of our website.</p> <p><b>Firmware for the MoCap Pro glove - Fidelity model:</b></p> <p>MoCap Pro Fidelity Glove firmware update 01.00.00 or higher</p> <p>Bluetooth Dongle firmware update 01.01.04 or higher</p> <p>Both are included in Launcher firmware bundle version Fidelity Bundle 1.0 available in your account section of our website.</p> <p><b>FIRMWARE UPDATE INSTRUCTIONS</b>  <b>Firmware Update Process via Launcher (Beta)</b></p> <ul style="list-style-type: none"> <li>• <a href="#">How to Update Your Mocap Pro Glove and USB Dongle Firmware via the StretchSense Launcher</a></li> </ul> <p><b>Legacy Firmware Update Process</b></p> <ul style="list-style-type: none"> <li>• <a href="#">Bootloader Recovery (if not using Launcher)</a></li> <li>• <a href="#">Glove Firmware Update Process</a></li> <li>• <a href="#">Dongle Firmware Update Process</a></li> </ul> <p><b>OTHER UPDATES</b>  If using StretchSense Wi-Fi App then this will also require an update</p> <p><b>StretchSense Wi-Fi (UDP) Link App version 1.18 or higher</b></p> <p><a href="#">Google Play Download Link</a></p> <p><b>Plugins</b>  <i>MotionBuilder</i> Plugin has been updated to 01.00.20. Please download from your account page</p>

## 1. Introduction

This document describes the new features, improvements and bug fixes included in software update 2.0.0 for *Hand Engine*. For in-depth guides on specific features please visit the *StretchSense Knowledge Base* <https://get.stretchsense.com/knowledge>

## 2. Major Changes

### ***New and Previous Generation Glove Support***

- + Support for the new generation *MoCap Pro Fidelity Glove*
- + Backwards compatibility support for *MoCap Pro SuperSplay Glove*

### ***User Interface Redesign***

+ The *User Interface* has been completely redesigned and now displays up to six performers simultaneously. New workflows allow users to get setup as quickly as possible with an emphasis on the *Express Calibration* feature.

+The *User Interface* has been broken out into three distinct views: *Stage View*, *Focused Performer View* and *Advanced Calibration View*

1. *Stage View*: View all staged performers at once (up to six) and view simple diagnostic information for each performer such as the *Data Sample Rate*, *Sensor Activity Indicator*, *Battery Life*, *SD Card Presence*, *Timecode Jam Sync* status, *Streaming* status, and glove and dongle *Firmware Information*.
2. *Focused Performer View*: Focus in on a specific performer. This is where you go to connect gloves, run an express calibration, access advanced calibration options, setup streaming and view glove timecode. Can be accessed by clicking the *Focus Performer* button when multiple performers are 'staged' (added).
3. *Advanced Calibration View*: This view is made up two tabs; *Capture* and *Hand Training*. *Capture* is where you can capture poses to add to or tune your calibration. *Hand Training* is where you can configure your calibration, choosing whether to include your *Express Calibration* as a base and which, if any, pose based calibration options to include.

### **Stage Controls**

+ *Stage Controls*, which can be found at the bottom of the screen in the *Stage View* and *Focused Performer View*, allow you to manage performers, start, stop and browse recordings and manage your timecode source.

+ Performers can be staged to the *Stage View* and unstaged (removed) from the *Stage View* by ticking or unticking the checkbox associated with each performer in the *Staged* column of the *Performers* section on the left of the *Stage Controls*.

+ Staged performers are active performers and therefore, recordings will be made for each glove on each active performer when recording.

! A maximum of 6 performers can be staged simultaneously (depending on the number of performers permitted in your license).

! The stage view will modify the interface layout based on how many performers are staged.

+ Users can now edit take names, browse recordings, set recording location and set SD card options from the *Recording* section in the middle of the *Stage Controls*.

+ Users can access *Timecode* source settings directly from the *Timecode* section on the right of the *Stage Controls* and the *Master Timecode* is displayed in the center in the *Recording* section for easy viewing.

### **Performer Management**

+ Performer management has been simplified and now has its own section under the *Stage Controls* labelled *Performers*. The user can create and store calibrations for multiple performers. Before connecting gloves, you will need to create and stage a new performer under the *Stage Controls*

+ Next to performer names on the viewport, users can associate a color (using a color picker) with each performer for easier identification in *Stage View*

### **Connecting gloves**

+ Connecting gloves has been simplified to a dropdown menu where you can select from all available *StretchSense* input sources (Bluetooth wireless connection or wired USB connection)

+ You can also select the network port (for connecting to the *StretchSense Wi-Fi Bridge App*) or file source (for playing back a raw file)

! To play back a raw file you need to have an active calibration. You can import the calibration in the *Hand Training* tab of the *Advanced Calibration* window. For the recording to playback correctly it will require the original calibration that was used to record the file

### **Advanced Calibration Window**

+ All pose-based calibration has been moved to the *Advanced Calibration* window

+ The *Capture* tab is where you can manually capture poses from pose libraries, which you can access from the *Select Pose Library* dropdown menu

+ From the *Capture* tab you can import and export *Pose Libraries* you have created in *Hand Engine* and access the pose editor to make new poses to add to new or existing pose libraries

+ The *Hand Training* tab is where you can view, edit and delete your *Captured Poses*

^ *Output Mode* has been replaced by a single *Train* button. Now you configure your calibration using the *Include Express Mode* toggle, and by choosing which poses you want to include using the *Blend* or *Key Pose* checkboxes. Once you have selected the desired parameters click the *Train* button to apply those changes. To make any changes to your calibration re-click the *Train* button to apply the new parameters.

! *Hand Engine* will train the model based on your calibration configuration choices and will determine which *Output Mode* is detected. For example, if only the *Express* toggle is checked, *Express Mode* will be detected. Or if *Express* is unchecked and poses are checked in the blend column, *Blend Mode* will be detected. And so on.

! You can set global *Key Pose Settings* such as *Transition Animation* and *Duration* after the glove has been trained.

## **2. MoCap Pro Fidelity Specific Changes**

+ The *MoCap Pro Fidelity* gloves use a unique *Express Calibration* model that takes advantage of the ten additional sensors it has compared to the *MoCap Pro SuperSplay*. This *Fidelity*-specific *Express Calibration* model has improved distal joint performance and finger touch performance compared to the *SuperSplay* model.

+ New poses included in the *Expert* and *Finger Touch (Fidelity)* pose libraries take full advantage of the *MoCap Pro Fidelity* glove's extra sensors, providing superior fidelity of movement in finger distal joint animation.

+ The *MoCap Pro Fidelity* also has extra wrist sensors that can be used to reduce 'noise' (unwanted finger movement) when there is a significant amount of wrist movement introduced during a performance, as you may encounter with scenes with props such as swords or axes. When a *MoCap Pro Fidelity* glove is detected by *Hand Engine* extra *Wrist Settings* appear in the *Hand Training* tab which can be used to dampen the impact of wrist movement

+ The higher the *Wrist Dampening* factor the slower the user's wrist movement or rotation needs to be to activate finger movement reduction

+ *MoCap Pro Fidelity* gloves come with onboard SD card storage of 64GB. You can access stored files on the SD card by plugging the *MoCap Fidelity* glove into a Windows PC and putting the glove in *Storage Mode* by holding the power button for 3+ seconds until the light changes from **blinking blue** to **solid green**. The glove will now be accessible as a *USB Drive* in *File Explorer*. To go back to normal operation of the glove press the power button once and LED will return to blinking blue.

### 3. Other Changes

#### **Express Calibration**

- *Express Calibration* tutorial has been removed.

^ Default *Express Calibration Duration* has been extended from 15 seconds to 20 seconds to improve usability for first time users.

- *Express Calibration Tuning* using *Blend Poses* has been removed. This will be reintroduced in next *Hand Engine* update.

! *Express Calibration* with *Key Poses (Hybrid express)* is still available.

#### **Manual Calibration**

- *Group Calibration* has been removed.

- *Pose Calibration Timer* has been removed.

#### **FBX Recording**

+ Users no longer need to select whether they want to record to *Hands Only FBX* or *Full Body Skeleton* in *Settings*. By default recording in *Hand Engine* now creates FBX files for separate left and right hands and *Full Body Skeleton* for each active performer, stored in a single take folder.

^ Setting the recording location is now more accessible. Recording location is now set from the *Stage Controls* rather than the *Settings* menu.

+ In *Settings* menu users can now choose to record to FBX starting at key frame 0 or to start at the current timecode value (the default option in previous versions of *Hand Engine*).

#### **Remote Triggering**

+ In *Settings* when a user defines a remote trigger source (*Vicon*, *OptiTrack*, *Xsens*, or *Qualisys*) the default port for those systems is chosen as the triggering port. The user can change this to a custom port if needed.

- Use remote trigger system take location when remote trigger recording has been deprecated.

#### **SD Card Recording**

+ Triggering SD Card recording is now a global setting in the *Recording* tab of the *Stage Controls* rather than set per device. You can set *Hand Engine* to record to SD card by setting the dropdown under SD Card to '*Triggered by Record*'.

! 'Triggered by Record' is the default option

#### **IBatch Processing of SD Card Files**

^ *Batch Processing* functionality has been rebuilt.

- Batch processing "*Raw files recorded via SD card*" toggle has been removed.

^ Batch processing of SD card files in *Hand Engine* now requires you to bulk copy the SD CSV files from the microSD storage on your glove to the corresponding local capture folder that will serve as the *Input Folder* for the *Batch Process* function. By default this is *C:\Users\Public\Documents\StretchSense\Hand Engine\Captures*

! When a local capture folder contains both the locally recorded CSV raw files and the CSV raw files from the SD card, the *Hand Engine Batch Process* function has a preference for SD recorded CSV raw files and will ignore the locally recorded CSV raw files

! Please refer to the *Knowledge Base* for more detailed information on the process

#### **Remapping**

^ *Remapping Setup* window has been reworked and improved so that the user can setup both the left and right hand remap of a target character in a single *Remapping Target Profile*.

+ The saved *Remapping Target Profile* can be applied in the *Advanced Calibration* window of each glove for a single performer.

! A device has to be connected for a *Remapping Target Profile* to be able to be applied in the *Advanced Calibration* window.

### **Pose Editing**

+ Pose editing has been reworked into its own workflow in the newly created *Pose Editor* window.

### **Session State**

^ *Save*, *Load* and *Restore* sessions have been removed and now the previous state of *Hand Engine* is saved automatically so you can pick up where you left off.

### **Notifications**

+ Notification and error messaging system has been revamped to be more visible and accessible to users when completing actions in the *Hand Engine* user interface.

### **Diagnostics**

+ You have the ability to follow the console logs in real time. See Help>Follow Logs.

- Sensor bar graphs for each individual sensor have been removed.

### **Viewport**

- Toggle *Viewport Hands* functionality has been removed.

### **Plugins**

^ *MotionBuilder* plugin has been updated to 01.00.20 to reflect changes in *Hand Engine*. All other plugins for *Unreal Engine*, *Maya* and *Unity* remain unchanged and will operate as with previous versions of *Hand Engine*.

## **4. Known Issues**

### **Calibration**

- For *Hybrid Mode* to work a minimum of two poses need to have *key* selected. For best results, we recommend having at least three poses with *key* selected and that these three poses be dissimilar or at opposite joint angles to each other, i.e. *Fist* and *Paddle L* or *Thumb Up* and *Paddle*. In situations where the desired result only requires one or two poses, you can effectively mute the extra poses you add by setting the *confidence levels* for those poses to zero.
- Performance issue with the *MoCap Pro SuperSplay* with the pinky splay being overly sensitive when using *Express Calibration*.
- At the end of an *Express Calibration* the hand animation may freeze for less than a second as the final model is trained.

### **Streaming**

- If streaming from *Xsens MVN* to *Unreal Engine 5* via *MVN LiveLink*, we suggest setting up finger streaming from *Hand Engine 2.0.0* into *MVN* after the *MVN LiveLink* connection has already been established in *UE5*. If you attempt to setup streaming from *Hand Engine 2.0.0* to *MVN* before setting up the *MVN LiveLink*, it is possible to run into an issue where the *MVN LiveLink* will not connect in *UE5*.
- Depending on the memory of your PC, streaming on more than 5 performers (10 pairs of gloves) into *Unity*, *MotionBuilder*, or *Unreal Engine* can lead to drops in performance quality. Please see the bottom of the *Hand Engine* webpage for minimum PC requirements: <http://stretchsense.com/solution/hand-engine/>.

### **Recording**

- When recording via a wireless connection (i.e. Bluetooth dongle or Wi-Fi app) there will be a 1 second keyframe gap in the *FCurve* within the first 2 seconds of the recorded FBX file.
- When recording is triggered, if you are also recording to SD card (i.e. SD Card Recording set to "Triggered by Record") there will be a delay in the hand animation in the viewport of up to 2 seconds. This is due to a delay in the operations associated with the SD card trigger on the Glove circuit. This does not affect the recording itself, only the viewport.

### **File Playback**

- *File Playback* with an *Express Calibration* is only possible when a minimum of 1 pose has been captured i.e. at least one pose must be checked in the *Blend* column of the *Hand Training* tab in the *Advanced Calibration View*.

### **Importing Express Calibrations**

- When importing a calibration that only contains *Express Calibration* (and no captured poses), you will need to capture a single pose (any pose) before you can click the *Train* button. You can then deselect this pose from the *Blend* column and click *Train* a second time to return to your imported *Express Calibration*.

### **Wi-Fi App**

- Depending on your PC specifications, phone specifications and Wi-Fi network latency, it is possible to run into performance issues when using the Wi-Fi app for 4 or more performers. The Wi-Fi app continues to receive regular updates so please keep up to date with the latest available version on [Google Play](https://play.google.com/store/apps/details?id=com.stretchsense.handengine) and keep up to date with the Knowledge Base for recommendations on setup when using the Wi-Fi app: <https://get.stretchsense.com/knowledge/how-to-setup-a-wi-fi-bridge-using-an-android-phone-doc-5030-preview-feature>.

**Wired Connection**

- SD card recording is not possible when using a wired connection for the *MoCap Pro SuperSplay* and *MoCap Pro Fidelity*. We recommend setting this to “off” when using the wired connection.
- When using a wired connection, the *MoCap Pro SuperSplay* will disconnect when recording is stopped if SD card record is set to “Triggered by Record”. We recommend setting this to “Off” when using a wired connection. This issue will be fixed in a future glove firmware update to the *MoCap Pro SuperSplay*.
- The *Timecode Jam Sync* indicator for the *MoCap Pro Fidelity* is not activating in wired connection even when within an acceptable range of 2 frames. This will be fixed in a future glove firmware update to the *MoCap Pro Fidelity*.

**Launcher**

- *Hand Engine 2.0.0* can not be launched by the *StretchSense Launcher Beta 0.7.4*. The *Launcher* can still be used for firmware updates.