Hand Engine 2.2.0 Release Notes

StretchSense
A Sensor Holdings Limited Brand

New version	Hand Engine 2.2.0
Previous version	Hand Engine 2.1.0
Deprecated versions	Hand Engine 1.5.3
Release date	27/10/2022
Operating system	Windows 10, 64bit
Meaning of icons	+added, ^changed, !note, #fixed, -removed
Recommended	**FIRMWARE UPDATES** **Firmware for the MoCap Pro glove - SuperSplay model:** MoCap Pro SuperSplay glove firmware update 01.01.04 or higher Bluetooth Dongle firmware update 01.01.04 or higher Both are included in Launcher firmware bundle version SuperSplay Bundle 1.10 available in your account section of our website **Firmware for the MoCap Pro glove - Fidelity model:** MoCap Pro Fidelity glove firmware update 01.00.01 or higher Bluetooth Dongle firmware update 01.01.04 or higher Both are included in Launcher firmware bundle version Fidelity Bundle 1.1 available in your account section of our website **FIRMWARE UPDATE INSTRUCTIONS** **Firmware Update Process via Launcher (Beta)** • How to Update Your Mocap Pro Glove and USB Dongle Firmware via the StretchSense Launcher **Legacy Firmware Update Process** • Bootloader Recovery (if not using Launcher) • Glove Firmware Update Process • Dongle Firmware Update Process **OTHER UPDATES** **StretchSense Wi-Fi App** If using StretchSense Wi-Fi App then this will also require an update, which you can download from Google Play • StretchSense Wi-Fi (UDP) Link App version 1.19 or higher

1. Introduction

This document describes the new features, improvements and bug fixes included in software update 2.2.0 for *Hand Engine.* For in-depth guides on specific features please visit the *StretchSense Knowledge Base* https://get.stretchsense.com/knowledge. This release has a recommended firmware update and Wi-Fi App update. Please see above table under recommended for details

2. Major Changes

Hand Model Skin Tone Selector

+ Added the option for users to select from six skin tone options and one monochrome option for the hand model displayed in the viewport. This can be done on a per performer basis. The *Skin Tone Selector* options can be found next to the *Performer Name* in the viewport

! Skin tone options are purely for visualisation within the *Hand Engine* viewport and do not carryover to saved FBX files following recording

Pose Editor User Experience has been improved and Gizmo has been added to Pose Editor

+ Added the option on the 3D Viewport for users to turn the *Gizmo* on and off to allow for improved user experience when editing individual joints of poses. Users can still modify the individual joints via inputting values into the text fields

+ Added an undo button so that the user can revert changes made in either the text field or the Gizmo

! Making any updates to a pose on one hand will apply changes symmetrically to the opposite hand

+ Added the ability for users to delete custom poses and pose libraries directly from the *Advanced Calibration Window*. Previously, users had to delete entire custom pose libraries from the pose editor window and could not choose the individual poses they wanted to delete

Remapping

+ Added the ability to use existing remapping profiles for different FBX files. When loading in a new FBX file you can use the "*Use Profile Bone Map*" dropdown to load an existing profile you have saved. This change was made to allow users who are modifying bind poses for rigs with similar bone hierarchies to use a previously saved remap to save them from having to manually input each bone mapping for each new FBX

! Whenever you load in a new FBX file the Left and Right hand targets are reset to the root bone of the rig. There is a tooltip to remind users to make sure to set the correct Left and Right Hand Target when using an existing profile on a new FBX

+Added ability to delete existing remapping profiles from the "*Remapping Target*" dropdown in the *Performer View*

+Added remapping name validation which tests the length of the name and messages users if the *Remap Profile* name is greater than 62 characters. This is to prevent extending the boundaries of the UI element on the "*Remapping Target*" dropdown

+Improved dropdown design and arrows of *Remapping* user interface

3. Other Changes

User Interface

+ Added *Left Hand* and *Right Hand* header to *Advanced Calibration Window*

+ Added dynamic zoom of hand viewports when adding four or more performers to the *Stage View*

+ Viewport zoom in and out functionality has been removed in favor of improved orbital controls

+ A warning message will appear if you set a *Recording Location* that can't be written to

Key Poses and Trigger Events in External Software

+Added the ability to make use of key pose trigger in external software such as *Unreal* and *Unity* at key pose confidence of 0. This enables the use of trigger events without causing the animation output to snap to a pose. Users can define their own event logic by using the *Pose Conf* value, i.e. pose score (0-1), which streams to the *Unreal* and *Unity* plugins and can be used to create thresholds/limits to trigger events using user-defined poses

Sensor Diagnostics

+ Added *Diagnostics* window to allow users to access more detailed view of raw sensor data in real-time. This option is only available by request. Please contact support@stretchsense.com to activate it

! If you are using a floating license please let support know as there will be extra steps required to access these diagnostics

! Please see known issues for mislabeled sensors on *MoCap Pro SuperSplay* in diagnostics window

4. Bug Fixes

SD Card Recording with the Wi-Fi App

- Updated glove firmware for both *SuperSplay* and *Fidelity* to improve how Hand Engine receives start triggers for SD card recording from the Wi-Fi app

! Please download latest firmware from your StretchSense account here: https://stretchsense.com/my-account/

- Updated Wi-Fi App to improve how reconnections are managed to prevent timeouts
- Updated Wi-Fi App to fix bug writing to SD card if one device is disconnected
- Updated Wi-Fi App to prioritise write operations before reading other glove status commands

! Please download latest Wi-Fi app from Google Play store here: Google Play

SD Card Recording (General)

- Reduced lag in the viewport hand animation from up to 2 seconds down to a few frames. This lag was due to delay in the operations associated with the SD card trigger on the glove circuit. This never affected the recording itself, only the viewport animation
- Updated glove firmware for both *SuperSplay* and *Fidelity* fixes exFat file writing issue

Recording

- Fixed an issue when attempting to record to a networked hard drive

! You will need to ensure that you have access to write to this networked drive

User Interface

- Fixed an intermittent connectivity issue where gloves were successfully connected to *Hand Engine* but no data was streaming which resulted in the data rate remaining at 0Hz and no sensor activity being detected. Previously, restarting *Hand Engine* or unplugging and re-plugging *Bluetooth* dongles was a temporary fix
- Fixed an issue where if your *Remap Profile Name* is longer than 62 characters it will extend the boundaries of the UI element on the *Remapping Target* dropdown
- Added a warning to user that *Performer Name* and *Take Name* Fields can only contain whitelisted characters, which include: a-z, A-Z, 0-9 and/or _ - . ~ ! @ # $ % ^ & + ,
  - Disallowed windows reserved characters (*<, >, :, /, \, |, ?, *)* and international character sets in *Performer Name* and *Take Name* Fields to prevent file writing issues

! You will not be able to add a performer or start a recording if you have a *Performer Name* or *Take Name* using blacklisted characters. When this happens the buttons for these functions will be greyed out

File Playback

- Fixed an issue where if a user had a file source (.CSV file) loaded in *Hand Engine* and the file was deleted or moved by the user from the original location then *Hand Engine* would fail to open requiring deletion of config file to get *Hand Engine* to work. *Hand Engine* will now reset the source to "*Disconnected"* if it cannot find the previously loaded file source

Pose Editor

- Fixed an issue where deleting all the custom poses in a pose library would not remove the *Custom Pose Library* name in the *Pose Editor Window* and *Capture Tab* of the *Advanced Calibration Window*

5. Known Issues

User Interface

- On load, multiple previously connected USB COMPORT devices are restored in the source dropdown even if the USB dongles are not physically connected to the PC. These sources are not available to be connected to. However, if you reconnect these USB dongles to your PC you are able to be connect and calibrate
- Having "*Unstaged*" performers that have training data associated with them may extend the loading time of *Hand Engine*

Calibration

- If using multiple *Key Poses* in a calibration we recommend that the poses be dissimilar or at opposite joint angles to each other, i.e. *Fist* and *Paddle L* or *Thumb Up* and *Paddle.* This applies to all calibrations using *Key Poses*, including *Blend with Key Pose*, Express with Key Pose and *Tuned Express with Key Pose*
- Performance issues when using *Express Calibration:*
  - The *MoCap Pro SuperSplay* has overly sensitive index, ring and pinky splay
  - The *MoCap Pro Fidelity* has emphasised ring finger and thumb splay particularly in a *Paddle* pose
- At the end of an *Express Calibration* the hand animation may freeze for less than a second as the final model is trained
- When attempting an *Express Calibration* with Captured Poses in the *Advanced Calibration Window*. If you try to redo an *Express Calibration* the viewport hand animation may lag or freeze during the calibration process. This will not affect the final output of the *Express Calibration*

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.* Please see the Hand Engine 2.0 User Guide Section 15 on the *Knowledge Base* for detailed instructions: https://get.stretchsense.com/knowledge/hand-engine-user-guide-2.0
- 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: https://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

SD Card Recording

- Intermittent issue when recording to multiple performers with multiple gloves. It is possible for one or more gloves to run into a SD card writing error (glove indicator light will flash red during recording rather than the alternating blue and green which indicates successful SD card recording). We recommend ensuring SD card recording is occurring successfully by manually checking the indicator lights on the gloves when starting a new recording

! Successful recording is indicated by alternating blue green flashing while failed SD card recording is indicated by flashing red indicator

- Intermittent issue where a take folder on the SD card is missing if you start a new recording too soon after stopping a previous recording. When stopping a recording, we recommend waiting at least 3 seconds before attempting to start a new recording
- Intermittent issue where a *PXL/R*MetaSD_*PerformerName*.json file on the SD card is missing data (i.e. has a size of 0kB)

! The meta.json file is not required in Hand Engine 2.X and above for batch processing to work (unlike in 1.5.3). The meta.json file contains information on the take name, performer number, glove type, firmware, file name, date etc.

- If you record using an identical *Take Name* consecutively it is possible for folders on the SD card to be overwritten. The consequence is that the file suffix (number trailing file name) will be out of sync with the local recording. We recommend ensuring you are manually updating the *Take Name* with each new take

Remote Trigger Recording

- When triggering a recording from an external source, the take name set in the external software will not populate the *Take Name* field in *Hand Engine*. Please note, this is only a UI issue and the output folder where the recording is created will still have the correct Take Name saved

Floating License

- After installing the floating license server, clicking on activate will trigger an error message indicating the license cannot be activated. Please ignore this error message. To solve this close and reopen *Hand Engine* to load license lease from server. If you are still running into issues, reinstall floating license server and then close and reopen *Hand Engine* to load license lease from server. Please contact support@stretchsense.com if you continue to have issues

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*

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 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
- When using a wired connection, the *Timecode Jam Sync* indicator for the *MoCap Pro Fidelity* is not activating even when within an acceptable range of 2 frames

Sensor Diagnostics

- For the *MoCap Pro SuperSplay,* the glove sensors in the diagnostics window from column 4 (2-It) onwards are incorrectly labelled and offset by one position to the right
  - For reference:
    - 2-It = Wrist sensor
    - 2-Im - 3-Mt = Index sensors
    - 3-Mm - 4-Rt = Middle sensors

- 4-Rm - 5-Pt = Ring sensors
- 5-Pm - 6-W = Pinky sensors

Launcher

- *Hand Engine 2.2.0* cannot be launched by the *StretchSense Launcher Beta 0.7.4.* The *Launcher* can still be used for firmware updates