skyle

From **ii** Inclusive Technology

Skyle 2 for iPad Pro
User Manual

Contents

Skyle 2 for iPad

**Thank you for choosing Skyle 2 for iPad.**

Skyle 2 for iPad is an eye tracker designed for iPad Pros of the 3rd to 5th generation. With the Skyle software and AssistiveTouch from Apple, the complete iPad Pro can be controlled contactless. If you want to integrate Skyle into your own application, you are free to use the public API. You can find it at **www.github.com/eyev-de**

What's in the box
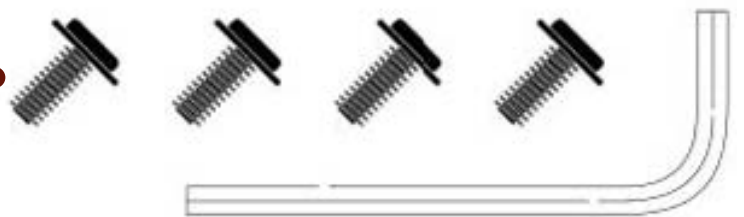
1x Skyle 2 eye tracker attached to iPad Case.

1x USB PD Hub.
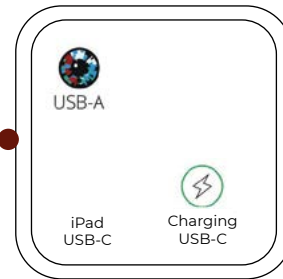
6x Housing screws with Torx/Hex/Allen Key

4x Screws for VESA-Mount with Torx/Hex/Allen Key.

1x USB-C to USB-A cable.

Technical Specifications

Supply voltage	5V DC
Current consumption	0.9 A
Sampling rate	18 Hz (max. 30Hz)
Accuracy	1° - 2°
Eye tracking mode	Binocular
Operating distance	45 – 65cm
Dimensions	(L) 282.5 x (W) 42.5 x (H) 39mm
Device Compatibility	iPad Pro 12.9" 3rd to 5th Generation
Mounting possibilities	VESA 75 Standard

Please note: Inclusive Technology reserves the right to make modifications, improvements, corrections, or other changes without further notice to this document and any product described herein.

This product is not authorised for use as critical components in life support devices or applications, where the use can be reasonably expected to result in significant injury to the user.

Getting Started

This chapter describes the basic setup of the eye control and the installation of the software.

Assembly

1. The Skyle 2 eye tracker is already attached to the housing on delivery. A cable that leads to the iPad is also attached to the case. The housing consists of two parts that are supplied already assembled.
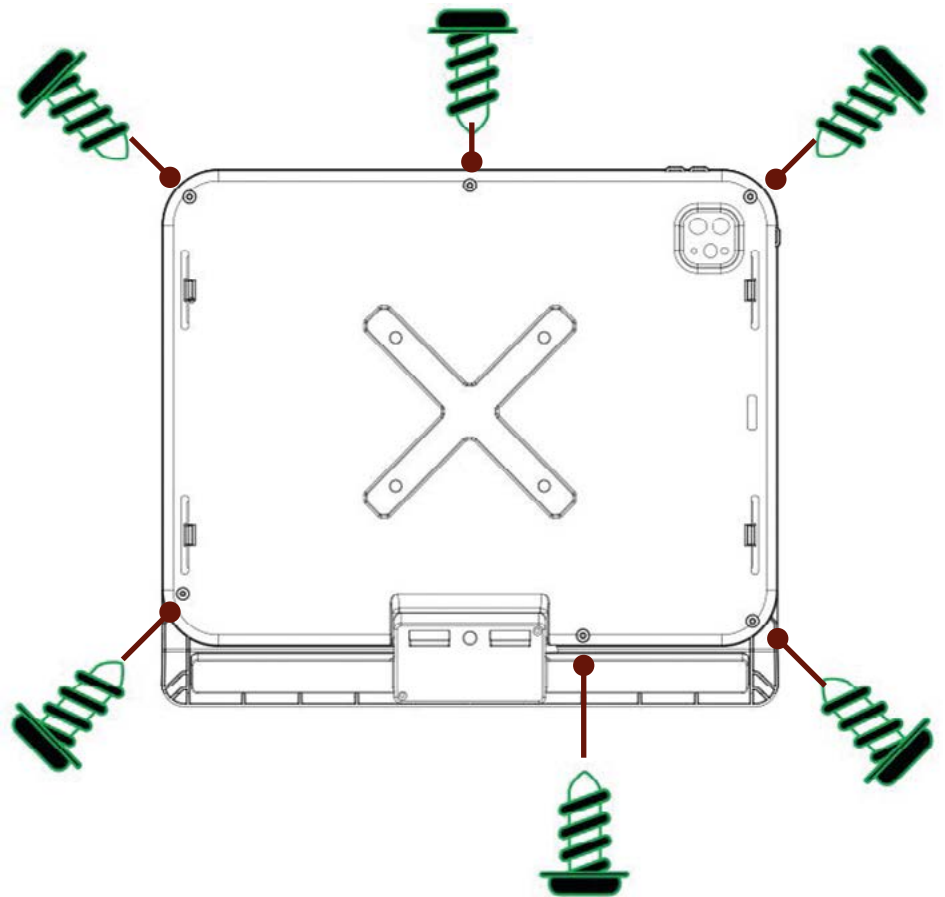
Please carefully loosen the green marked snaps and remove the front in the red marked direction.
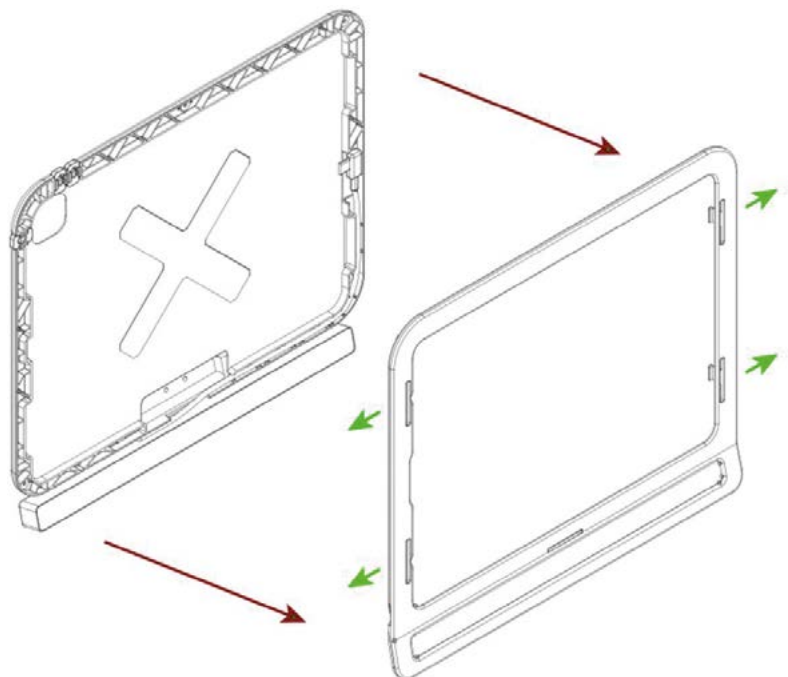
2. Place the iPad into the back pane and connect the USB-C cable to your iPad.
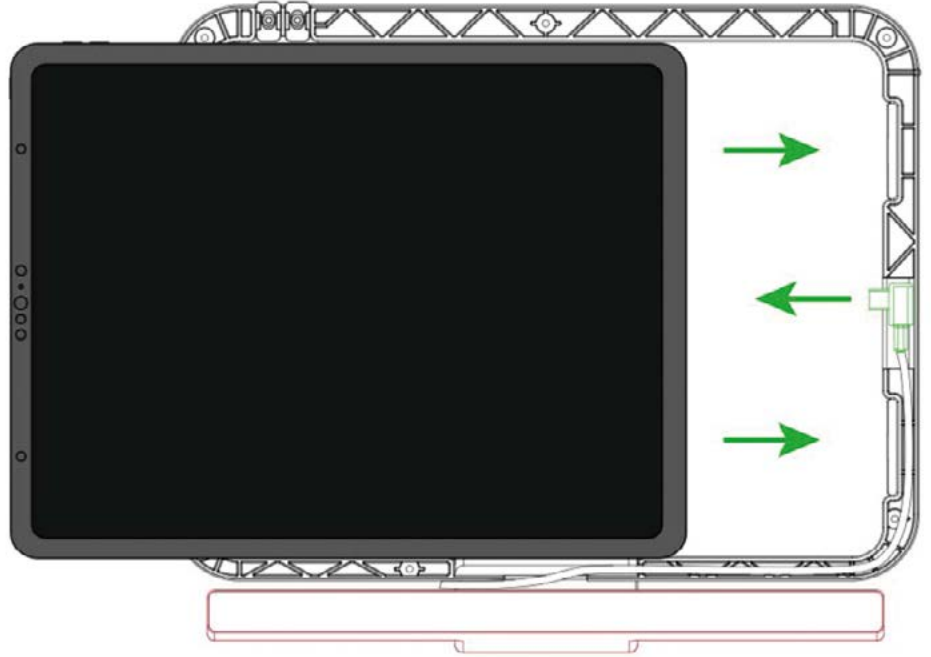
3. Place the front panel on the iPad. Make sure the clips snap into place, flip the case and apply the screws.

Connect the eye tracker

The included hub has 2 USB-C ports. All important ports are marked. One USB-C port is for the **USB-C cable** coming out of the case, which is connected to the iPad. The other **USB-C port** can be used for simultaneous charging.

The included **USB-A to USB-C cable** is connected to the hub with the USB-A end. The USB-C end is connected to Skyle 2.
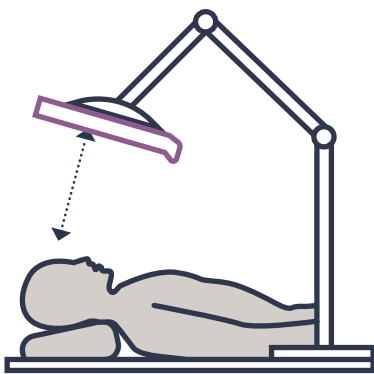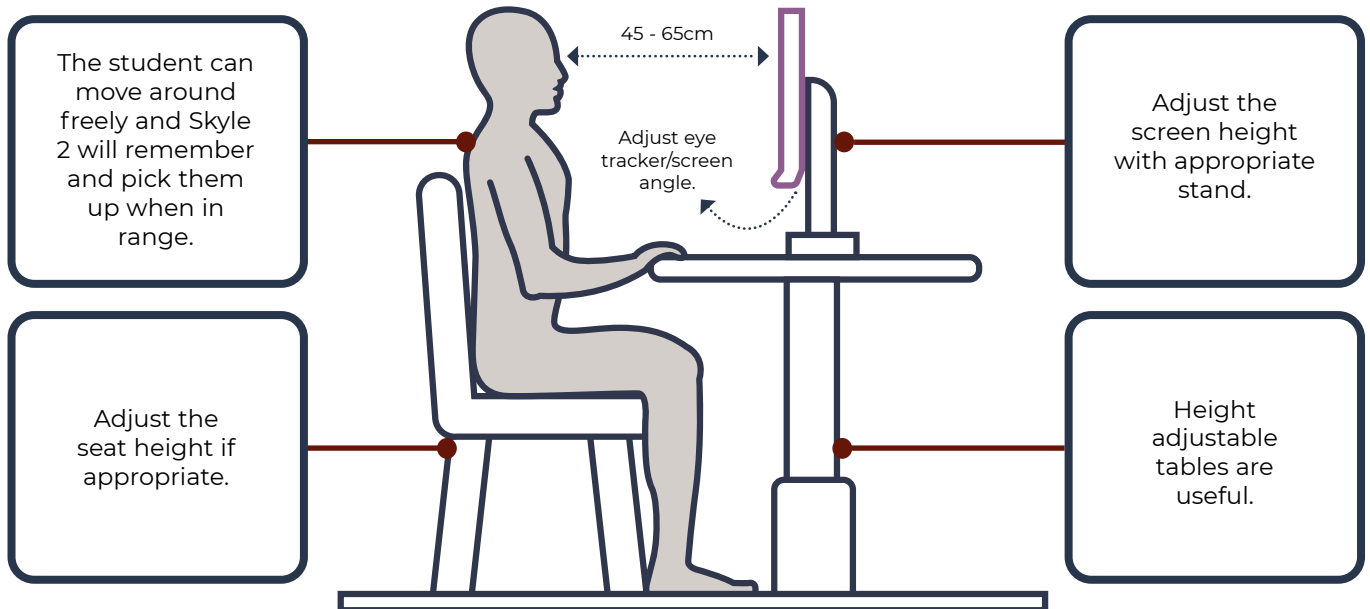
The hub can now be attached to the case with the already attached adhesive Velcro®.

Hub

USB-A

iPad
USB-C

Charging
USB-C

USB-A to
USB-C

iPad
USB-C

Charging
USB-C
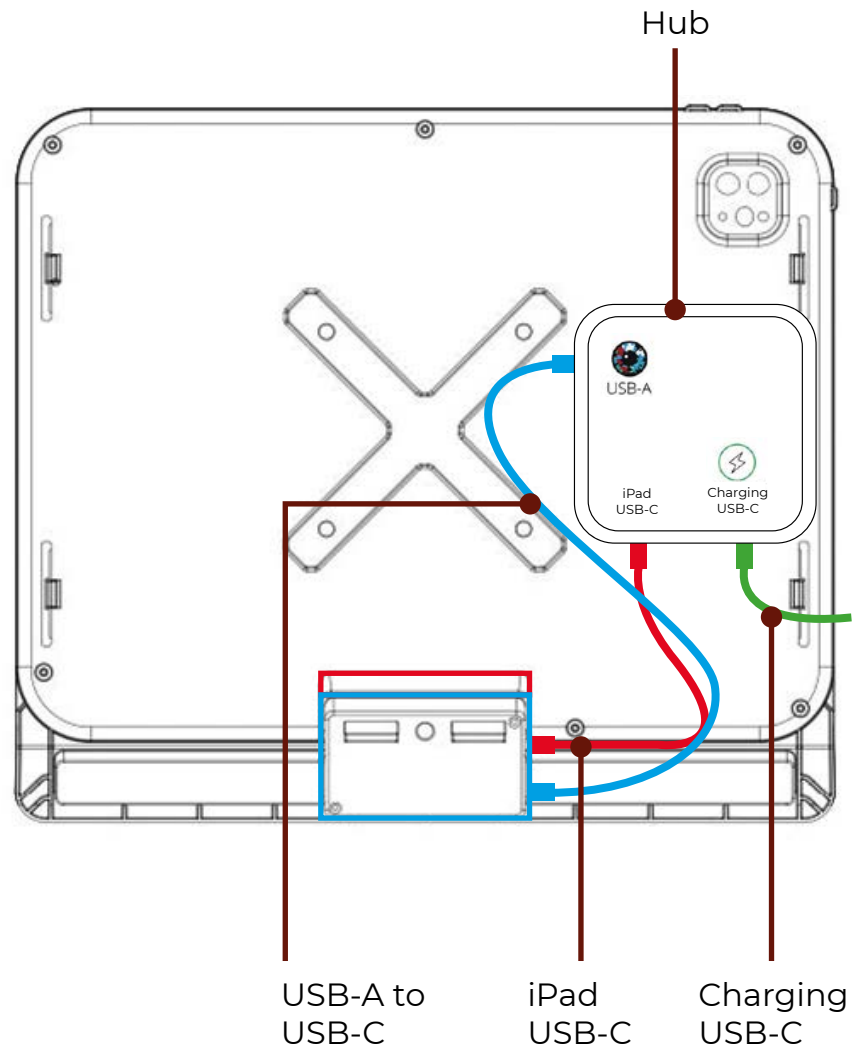
How to position your students

As with any access device, correct positioning of equipment and student is essential in getting the most out of Skyle 2. Good seating and positioning guidelines, that your Occupational Therapists will be able to advise you on, are where to start. Use the student's own supported seating system as appropriate or in any position where the student is comfortable, relaxed and able to see the screen easily. The Skyle 2 camera will need to have a good view of the student's eyes in order to track them accurately.

Here are a few positioning guidelines;

The student can move around freely and Skyle 2 will remember and pick them up when in range.

45 - 65cm

Adjust eye tracker/screen angle.

Adjust the screen height with appropriate stand.

Adjust the seat height if appropriate.

Height adjustable tables are useful.

Reclined positioning

You may need to mount the screen above the student using specialist mounts e.g. floor mount.

Tilted head positioning

If student's head is normally tilted, you can tilt the screen and tracker to match.

Positioning correctly

The eye gaze tracker software will let you know if the student is positioned correctly or not.

Students wearing glasses

Lots of eye trackers work with most lenses (some specialist lenses can be tricky).

Watch out for frames obscuring the student's eyes.

Lighting Conditions

The student and tracker may struggle to see in bright light conditions. Watch out for reflections off lenses and other screens interfering.

Skyle X App

The App can be used to calibrate the controller or customize the appearance. With AssistiveTouch you are able to control the iPad's mouse cursor without physical contact.

Installation

The Skyle X App for iPad can be downloaded here: **https://apps.apple.com/us/app/skyle-x/id1570826111**

Download and install the "Skyle X" application on your iPad from the link above or the QR code. This App is required for the user-specific calibration of the eye tracker.

The App also offers the possibility to display the camera feed of the eye control to carry out an optimal positioning. The details of the software are described in the following chapters.
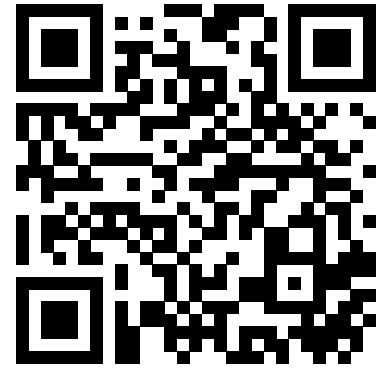
Setup

The Skyle X App will display instructions on first load to set up AssistiveTouch on your iPad. These instructions must be followed to enable eye tracking.
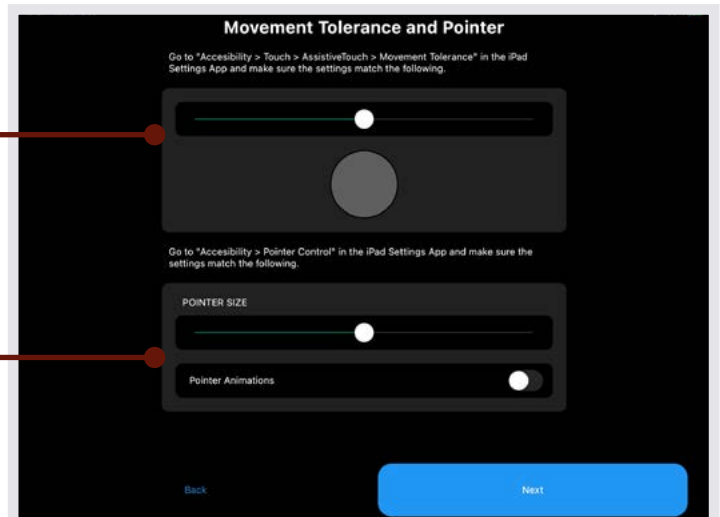
Go to "General > Trackpad & Mouse" in the iPad Settings App and make sure the settings match the following.

Go to "Accessibility > Touch > AssistiveTouch" in the iPad Settings App and make sure the settings match the following.
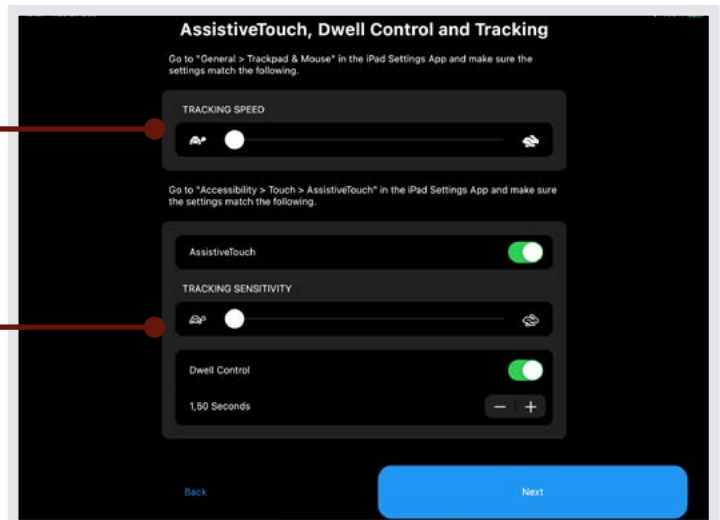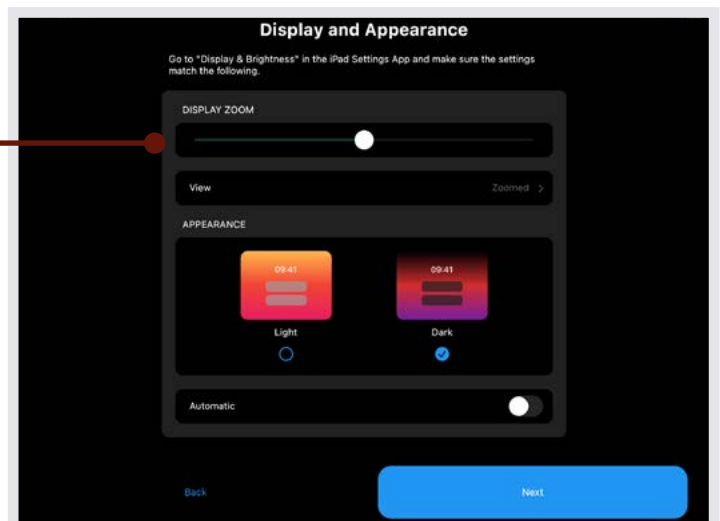

Go to "Accessibility > Touch > AssistiveTouch > Movement Tolerance" in the iPad Settings App and make sure the settings match the following.

Go to "Accessibility > Pointer Control" in the iPad Settings App and make sure the settings match the following.


Go to "Display & Brightness" in the iPad Settings App and make sure the settings match the following.

Please Note: You can only enter the menu "Trackpad & Mouse" if the Skyle 2 is connected.

Stream

The stream can be viewed for correct positioning and important settings can be made here. Settings are explained in more detail in the following sections. Exit will minimise the Skyle X App enabling you to control your iPad.
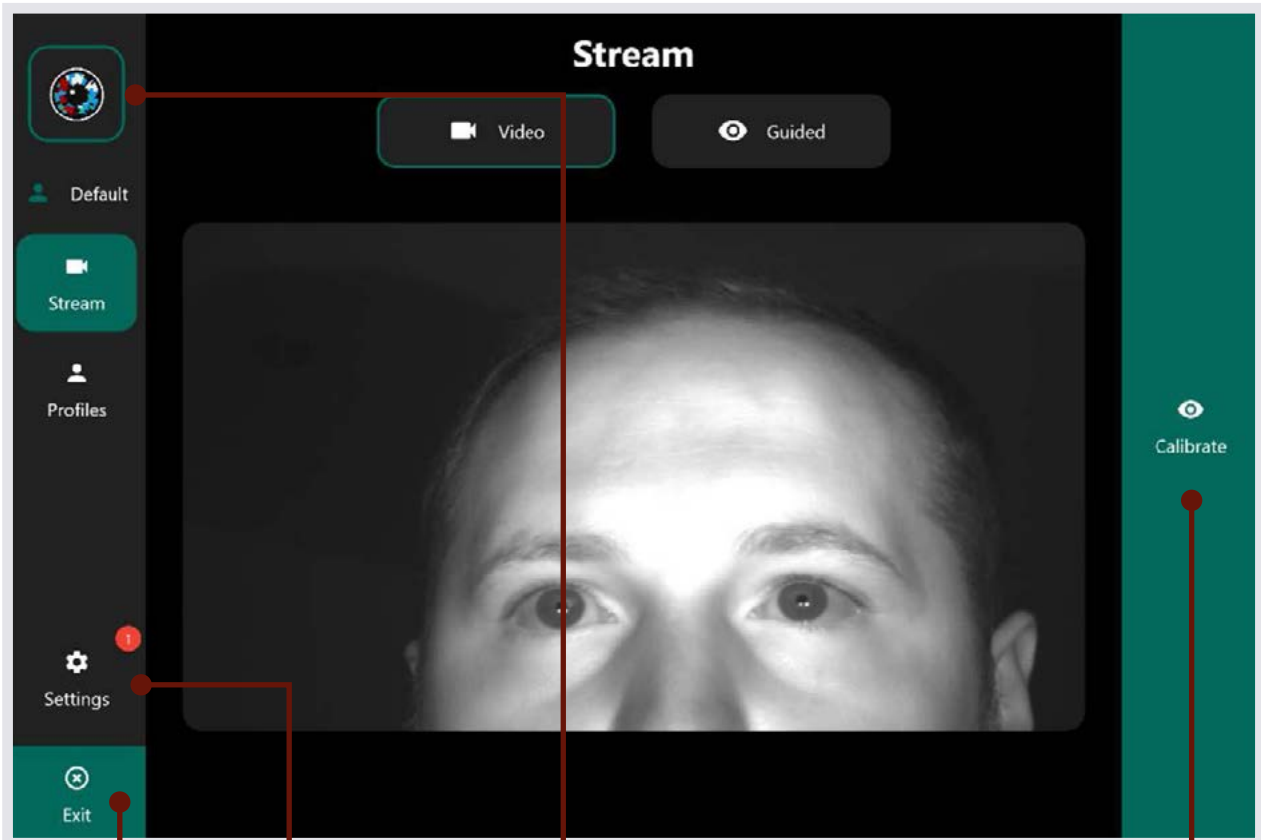

| Exit | Settings | Skyle status indicator | Calibrate |

Positioning

If the eye tracker is ready for use, eye movements are converted into mouse positions. If not, make sure that the user is positioned correctly. This means that the built-in camera must recognize your eyes completely.

To do this, open "Stream > Video". The pupil and the two white reflections in the eye must be clearly visible and sharp.

The optimal position is when the user is positioned parallel to the screen surface and the eyes are centered on the video stream. The recommended distance is ~60cm.

Pupil

Glint 1   Glint 2
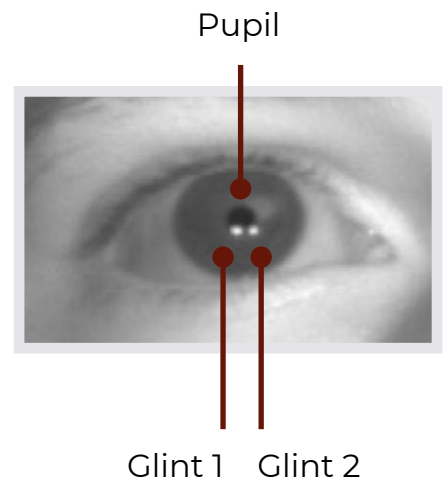
The video stream is turned on by default, but it can also be turned off or toggled so that only a simplified guided display with assistance is shown.
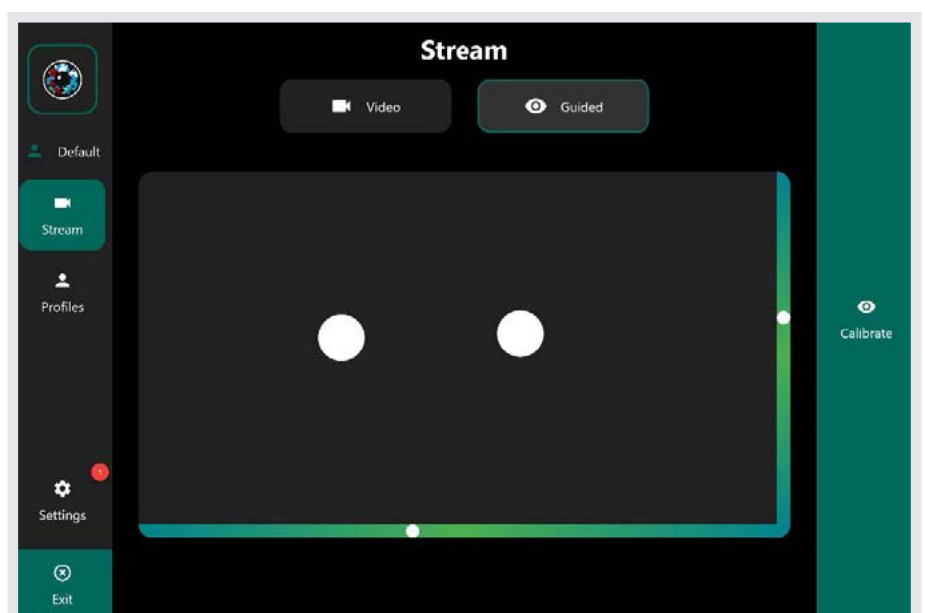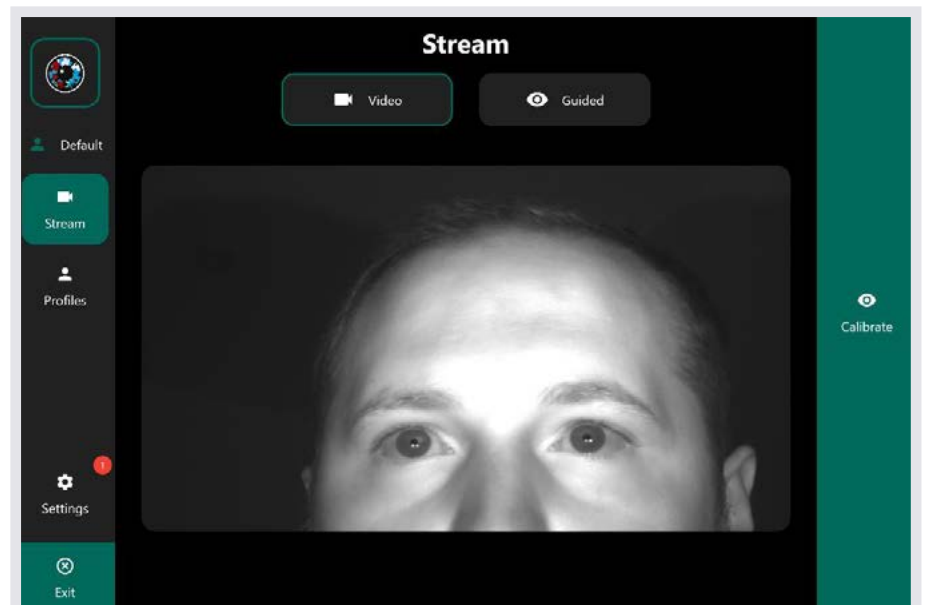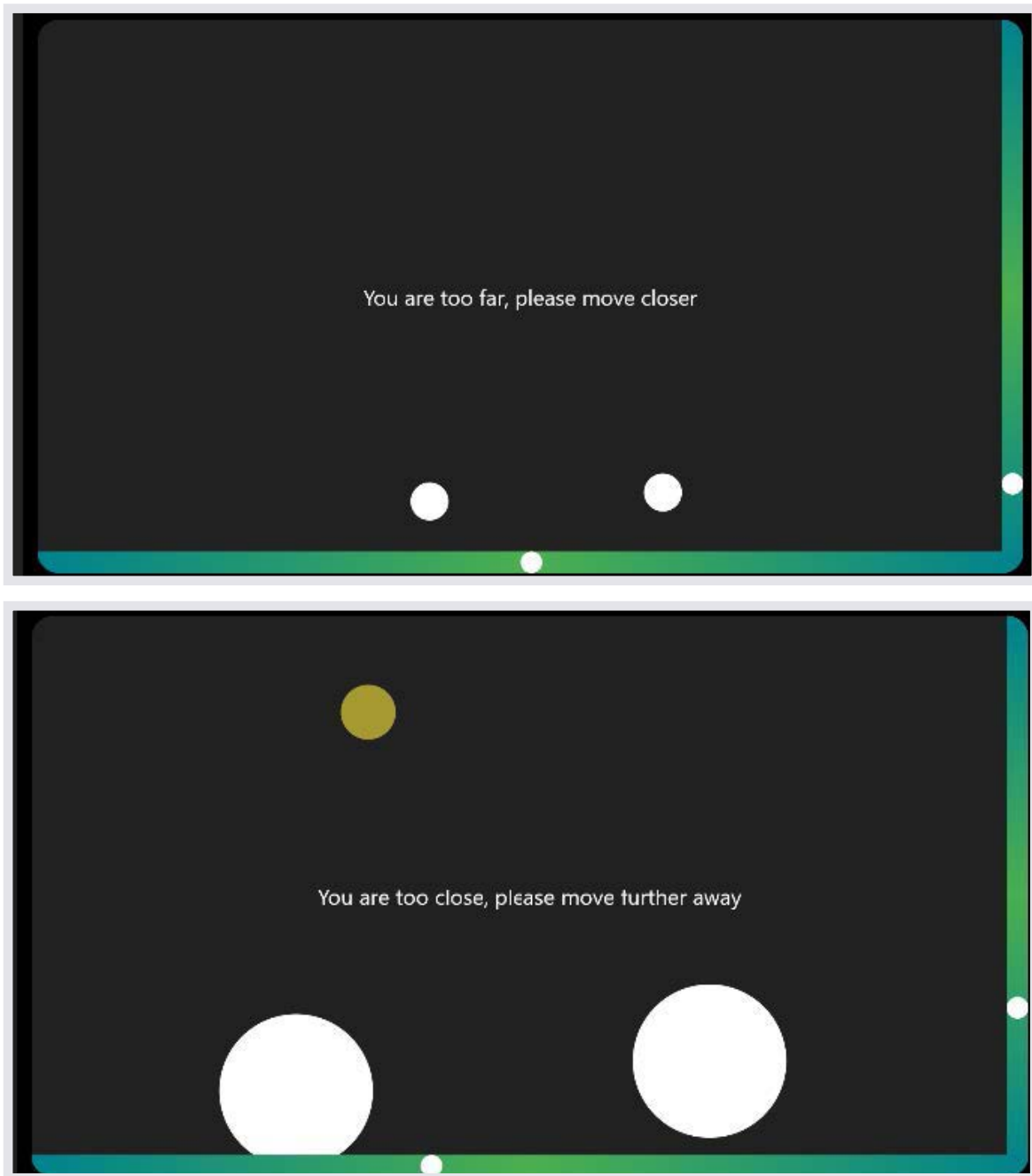
Calibration

Each eye is unique and must therefore be calibrated to control the iPad.
The calibration can be started directly on the start page of the App.

| Stepped calibration | User's gaze | User's eye positioning | Chosen calibration | Record test data |
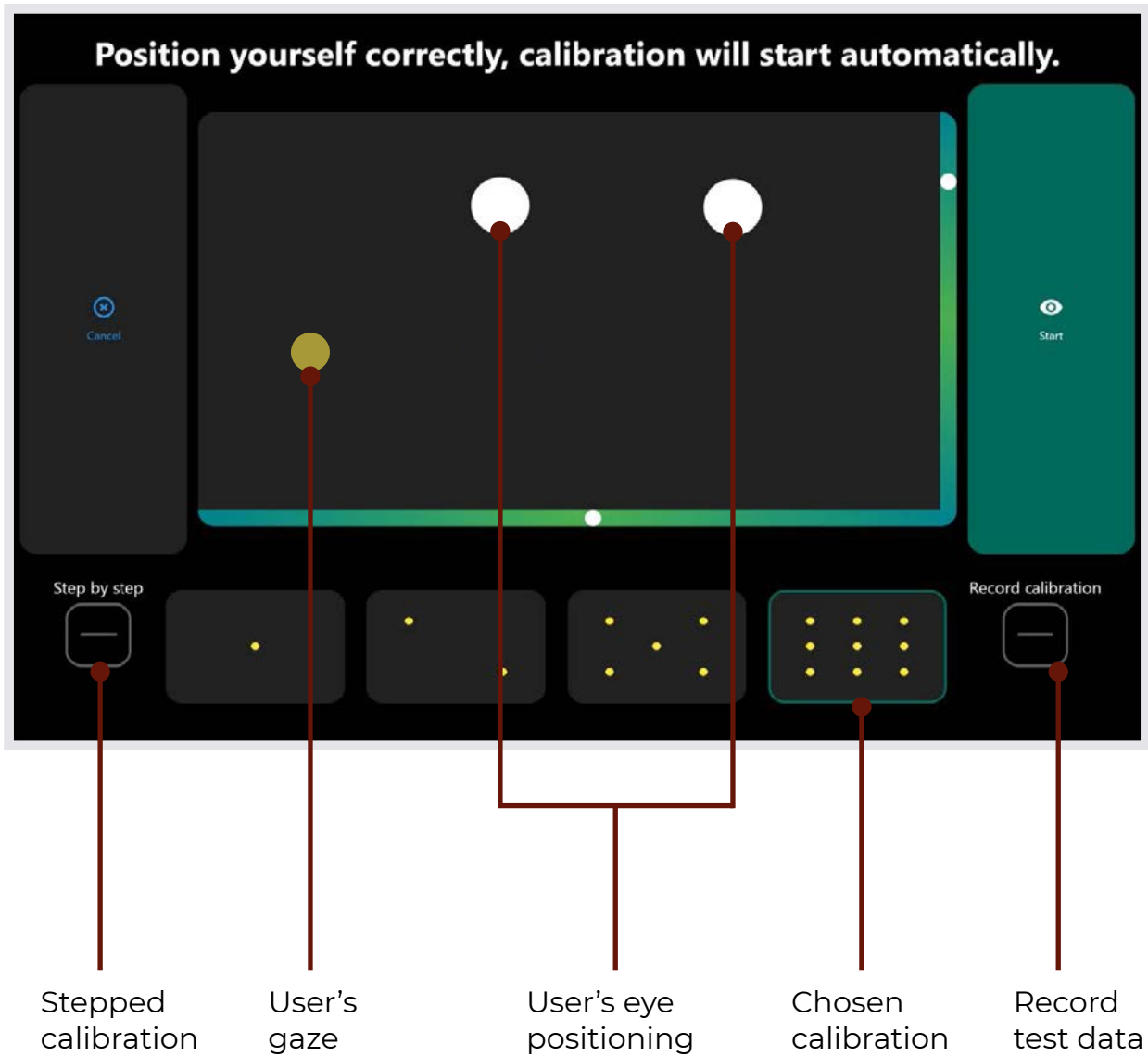
Before a calibration is started, it is possible to select how many points are to be used for the calibration. A higher number of points takes longer, but usually achieves more accurate results.

* For emerging eye gaze users a 1 or 2 point calibration is recommended.

Please make sure that the positioning is correct. If you are too close or too far away, this will be displayed. The bar on the right and bottom indicate whether the user is centered both horizontally and vertically.


Calibration starts automatically as soon as a correct position is kept for a certain time.

* Calibration can also be started instantly by selecting "Start".

Once this is done, the cursor jumps to 1-9 different positions which the user must focus on. Please focus on the center of the circle. The appearance of the cursor can also be on customised in the App settings.

Once the calibration is finished, these points are displayed on the screen. Please check in this step if the accuracy is satisfactory or repeat the calibration. When nothing is detected, the calibration will end after a timeout of 100 seconds and uses the previous calibration profile.
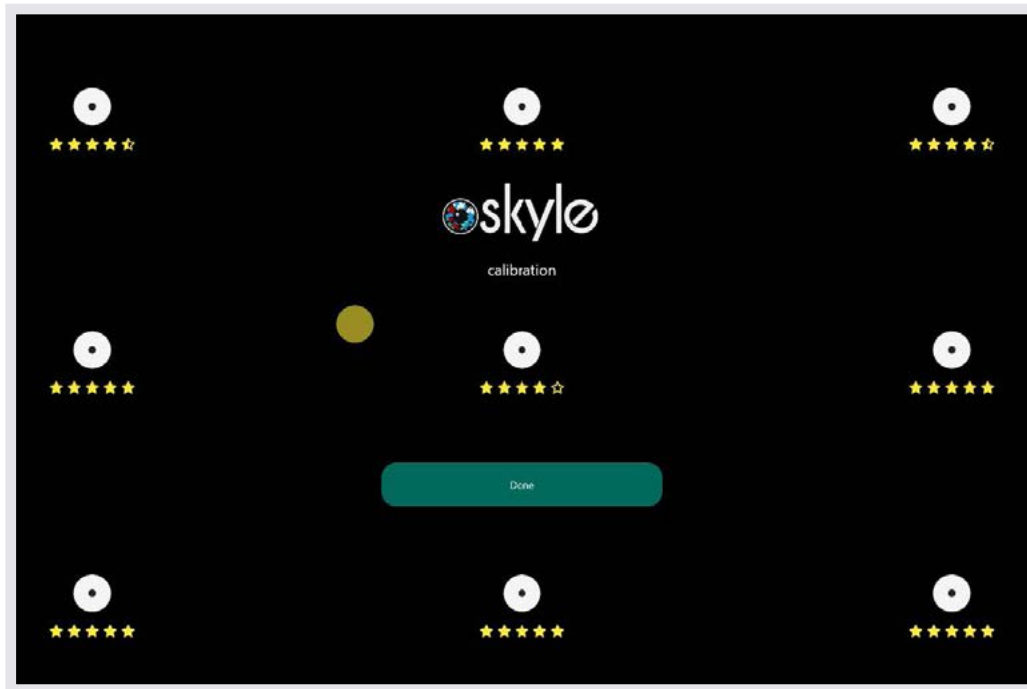
In the App Settings you can switch the standard calibration method between a 1-, 2-, 5- and 9-point calibration.
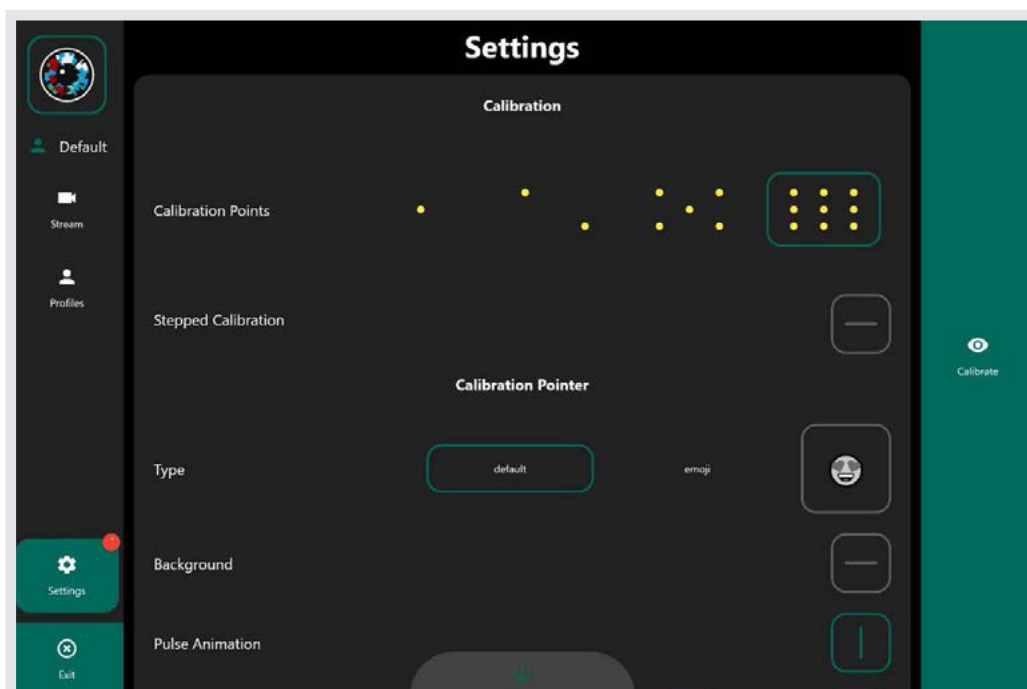
Additional Features

Step by Step Calibration / Stepped

The calibration can also be done step by step, when a touch of the screen advances the calibration point. You can activate this option under "Settings -> Calibration".

Help to improve the eye tracking algorithm

If "Record Calibration" is activated, test data is uploaded after completion of a calibration. This is used to improve the eye tracker.

Profiles

Profiles can be created for each individual accessing Skyle 2 for iPad Pro. Profiles can be used to store respective calibrations and personalise filter settings and sensitivity.
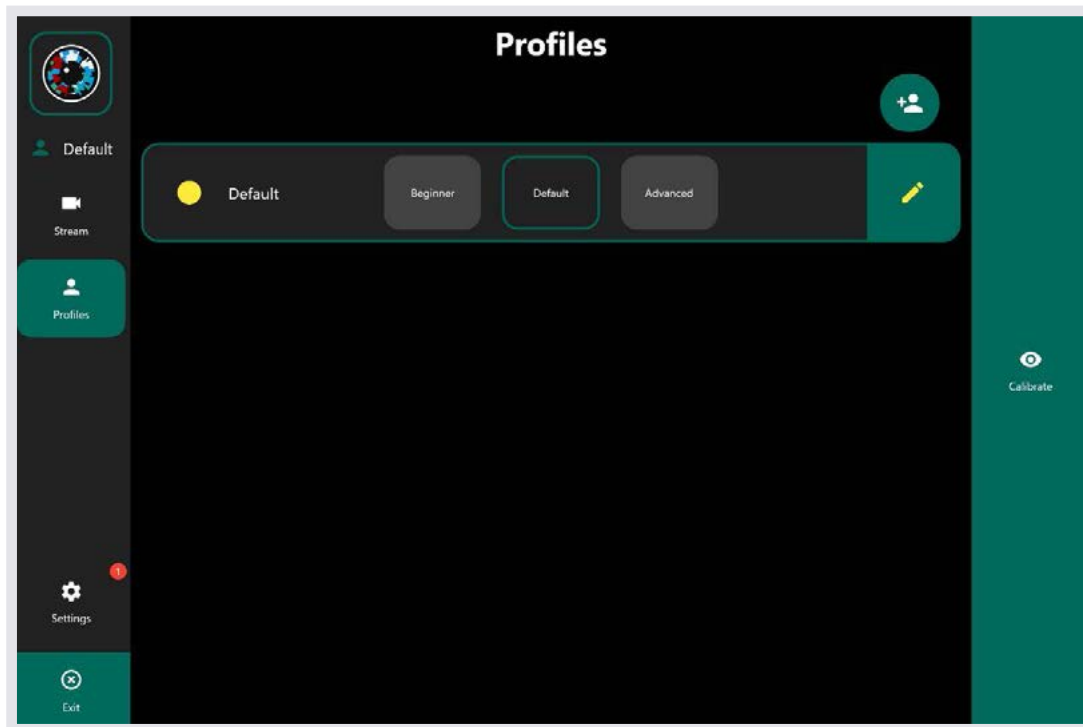
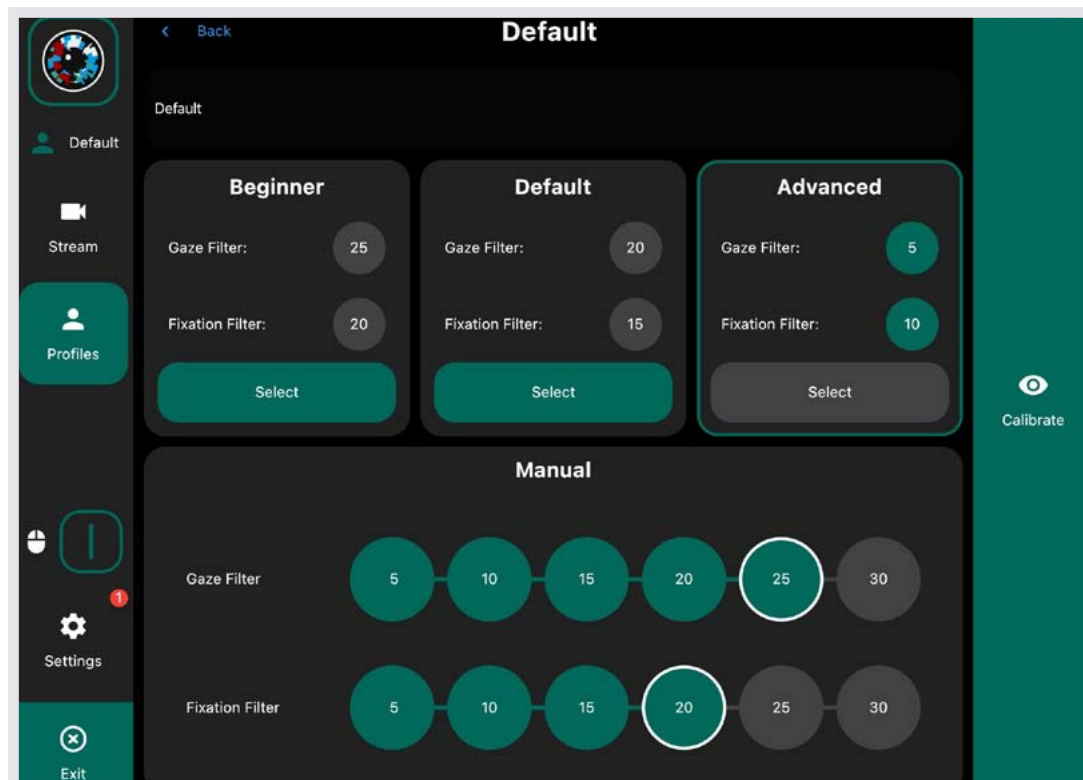The Gaze Filter determines the tracking speed and smoothness of the user's gaze point. The Fixation Filter adjusts the steadiness of the gaze point when a fixation is taking place.

Gaze Selection

These settings affect the behaviour of the dwell control.

UI uses Gaze Selection

The "UI uses Gaze Selection" setting enables/disables the user's ability to make selections in the Skyle X App using their gaze. This feature can only be toggled using touch, and not with dwell selection; To avoid accidentally disabling the ability to make interactions using gaze selection in the Skyle X App. This feature cannot be changed if a users eye's are detected.
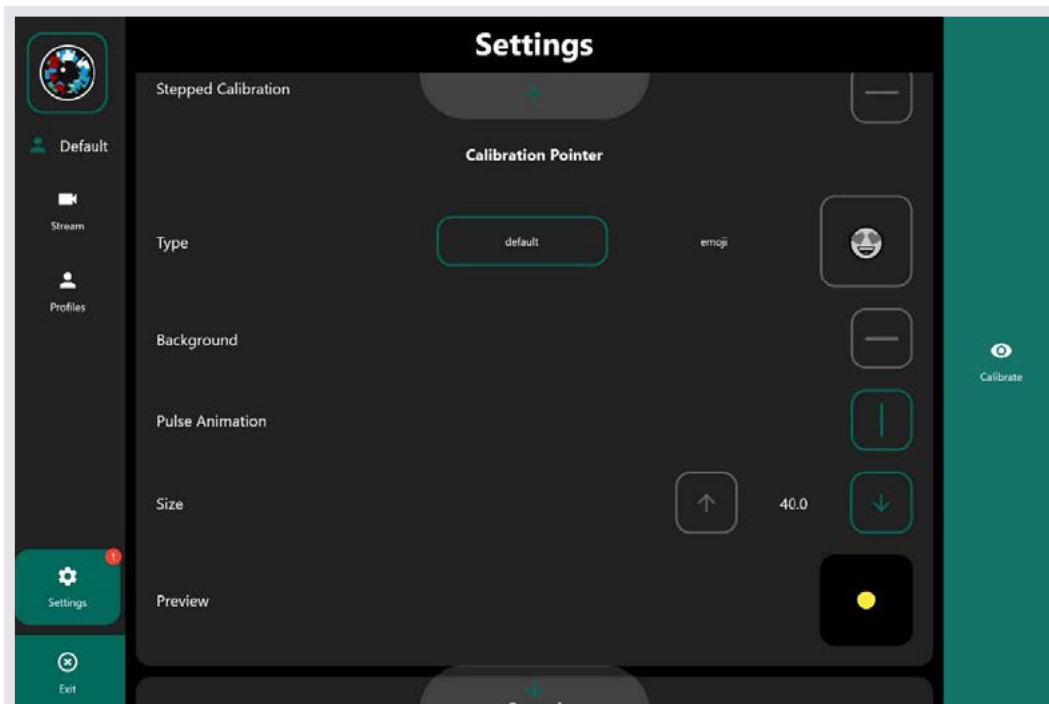
Dwell time and Scroll Speed

The dwell time determines the time a user must gaze at an option before a selection is made. This setting affects the dwell time in the Skyle X App only.
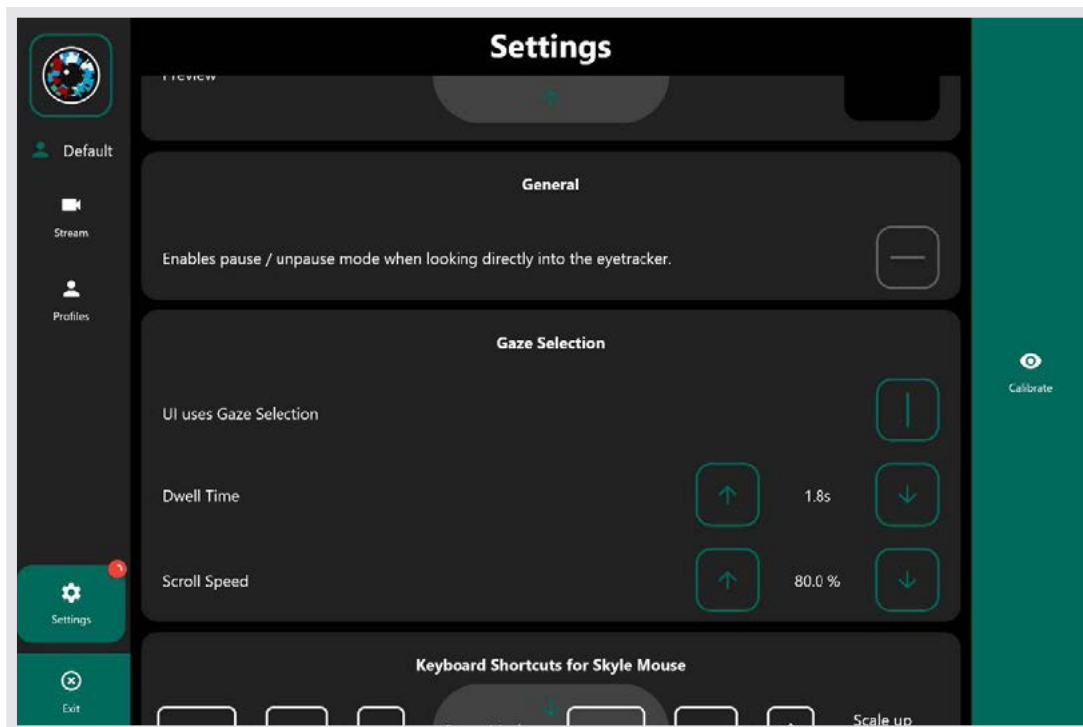
Calibration Pointer

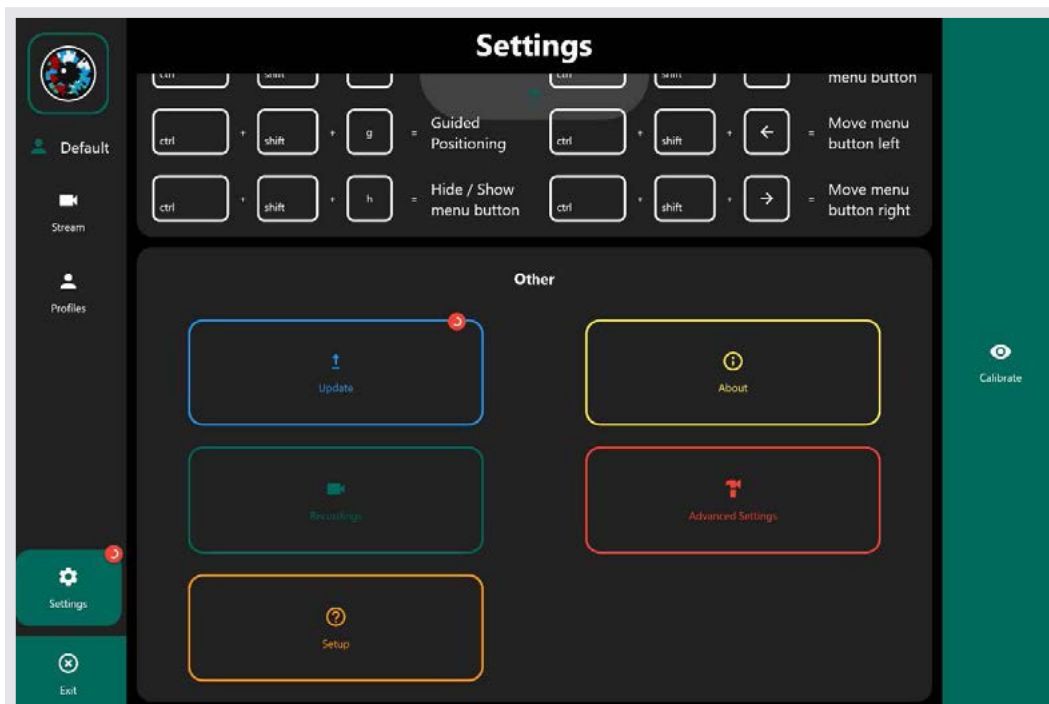The animation pointer during a calibration can also be adjusted to the user's needs. All changes are visible in the preview.
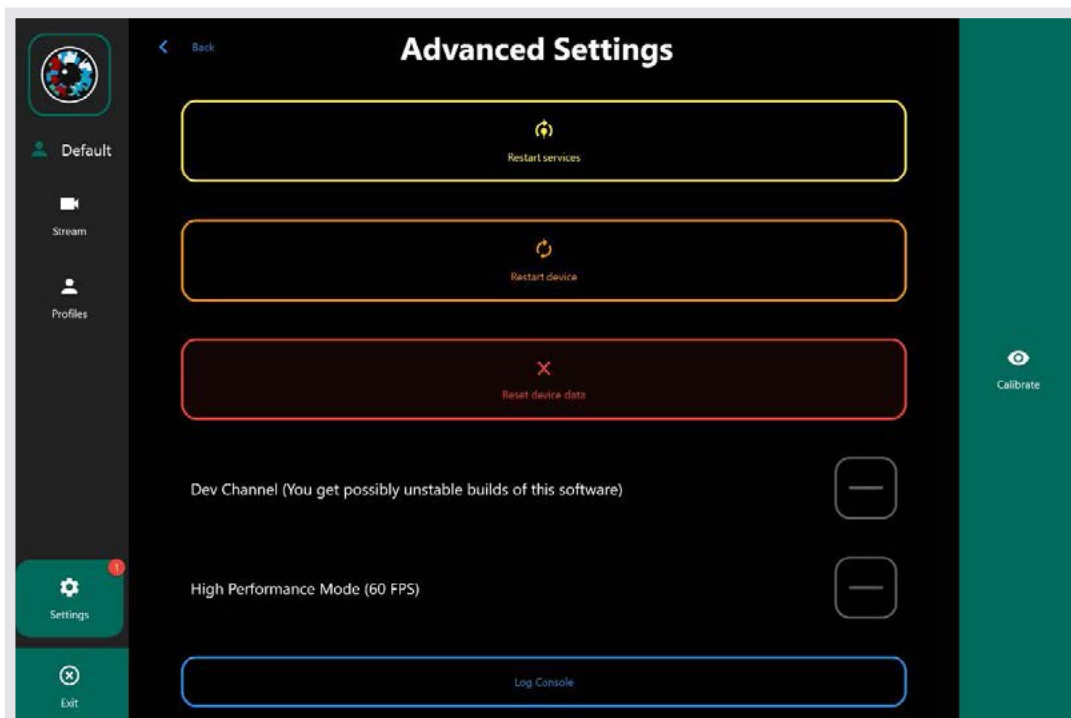

Update

Updates for the eye control can be installed via the App. If a new update is available, a small red dot will appear in the left corner The update can now be found in the settings under "Update".

If an update has been installed, the eye control will restart itself.

Advanced Settings

The advanced settings allow soft or hard reboot and factory reset.

Improvement

If you're having issues, test data can be collected to improve the quality of the eye control. A 9-point calibration is performed during the collection ("Calibration-> Recording calibration").

The test data recorded during this process can then be checked and sent off. If you want your data to be deleted, please send an email with the corresponding character string, which you can find in the App under "Settings -> Recordings".

Safety Instructions

Please observe the safety instructions supplied with the device.

Skyle 2 Troubleshooting

"Skyle eye tracker undetected, please reconnect" error message displayed in Skyle X App

- Check eye tracker is connected properly to hub and the hub is connected to the iPAD - **See page 6** for more details.
- If the iPad charging cable was connected when the iPad was turned on, disconnect the cable and wait 30 seconds for the eye tracker to power on and connect. Then reconnect the iPad charging cable if required.

See Page 6 for more details.

Eyes not displaying in positioning guide

- Check that the plastic protective film has been removed from the eye tracker.
- Check the LED's lights are lighting up on the eye tracker.
- Check if the eye tracker is plugged into the hub.

Mouse cursor not accurate

- Accuracy issues are often due to poor positioning or the environment the eye tracker is being used in.
- Sit approximately 45 – 65 cm (about an arm's length) away from the device.
- Avoid any light shining directly onto the eye tracker i.e., avoid using it facing a window.
- Adjust the angle so the user can see the reflection of their own eyes in the eye tracker.

See Page 7 for more details.

Erratic mouse cursor movement

Check iOS Settings

- Accessibility > Touch > AssistiveTouch > Tracking Sensitivity is set to the lowest value.
- General > Trackpad & Mouse > Tracking Speed is set to the lowest value.

See Page 9 for more details.

If you require any further assistance please visit
www.inclusive.co.uk/technical-support/product-list/skyle-for-ipad-pro

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