



# Aurora User Guide

Version 10.0



## **Aurora User Guide**

Version 10.0.0

May 31, 2022

Copyright © 2022 Smart Eye AB. All rights reserved.

### **Smart Eye AB**

Första Långgatan 28B

413 27

Gothenburg

Sweden

[www.smarteye.se](http://www.smarteye.se)

# Contents

<b>1</b>	<b>Introduction</b>	<b>1</b>
1.1	Intended use	1
<b>2</b>	<b>Software and System Requirements</b>	<b>2</b>
2.1	System requirements	2
2.2	Compatible software	2
<b>3</b>	<b>Aurora Hardware</b>	<b>3</b>
3.1	What's in the box	3
3.2	Product care	3
<b>4</b>	<b>Setup</b>	<b>4</b>
4.1	Software installation	4
4.2	Mounting the eye tracker on a display	5
4.3	Create an eye tracker setup	6
4.3.1	Display setup	6
4.3.2	Phone setup	7
<b>5</b>	<b>Maintenance</b>	<b>8</b>
5.1	Upgrade firmware	8
5.2	Upgrade frame rate	8
<b>6</b>	<b>Support</b>	<b>10</b>
6.1	Troubleshooting	10
6.2	IR light interfering with other systems	10
6.3	Customer support	10
	<b>Appendix A Safety and Compliance</b>	<b>11</b>
A.1	Compliance	11
A.2	Operating Temperature	11
	<b>Appendix B Technical Specifications</b>	<b>12</b>

## 1 Introduction

The Smart Eye Aurora is an eye tracker designed to deliver insights wherever you are. The small size of the Aurora makes it easy to switch between different displays and projects, without compromising on the performance. If your needs change in the future, the existing Aurora can be upgraded to deliver higher framerate.

This manual contains useful information about the Aurora eye tracker, ranging from safety and compliance to product care. It also contains information about the mounting procedure and software setup. If any questions or difficulties arises, do not hesitate to contact the support.

### 1.1 Intended use

The Aurora is primarily designed for fixation-based eye tracking on displays, such as laptops. The Aurora works well in all indoor illumination conditions, and offers precise and accurate tracking on displays up to 24". In addition to eye tracking, the Aurora also delivers precise head tracking and eyelid tracking.

The Aurora is designed for collaboration, and can be integrated with other sensors and bio-measuring systems.



Smart Eye Aurora eye tracker

## 2 Software and System Requirements

### 2.1 System requirements

Operating System	Windows 10 Creators Update (version 1703) or newer
RAM	4 GB
CPU	Quad core 6th generation Intel Core or Intel Xeon processor or newer
Camera Interface	USB-C
Maximum Display Size	24" (16:9 aspect ratio)

### 2.2 Compatible software

iMotions	<a href="http://www.imotions.com">www.imotions.com</a>
----------	--------------------------------------------------------

## 3 Aurora Hardware

### 3.1 What's in the box

---

Aurora eye tracker

---

Two Chem Pad™ wipes for cleaning the mounting area

---

Two mounting brackets with tape

---

Safety and setup info note

---

Textile travel bag

---

USB-C cable, 2 m

---

### 3.2 Product care

The front glass of the eye tracker needs to be clean in order to ensure optimal tracking. If dirt or dust ends up on the front glass, the eye tracker has to be cleaned in a correct manner.

To clean the front glass use a dry microfiber cloth intended for cleaning cameras, camera lenses, or eyeglasses and carefully wipe the front glass. If unsupported cleaning methods are used the eye tracker might be damaged.

**Warning!** Do *not* use alcohol to clean the front glass, as it may damage the eye tracker!

## 4 Setup

This section describes the steps needed to setup your eye tracker. Install required software, mount the eye tracker and create a setup in the Smart Eye Setup tool.

### 4.1 Software installation

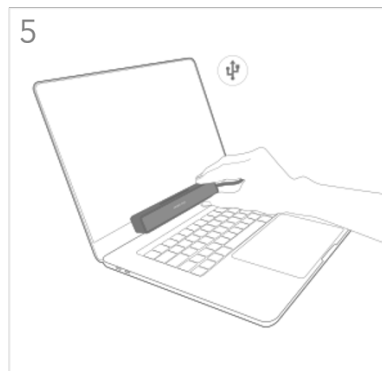
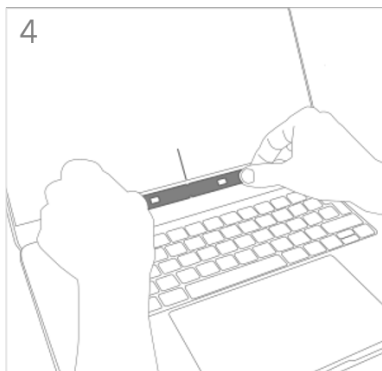
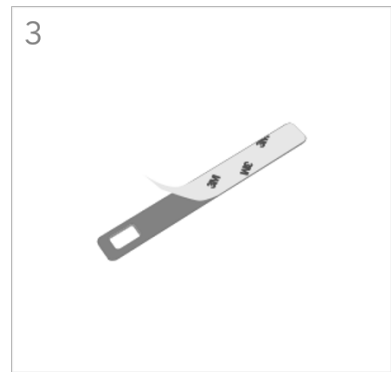
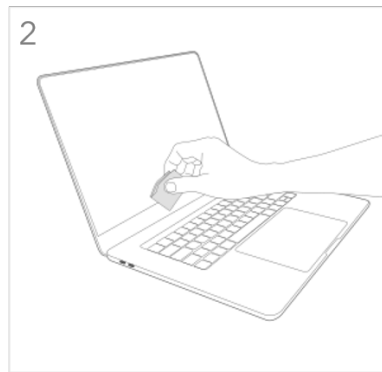
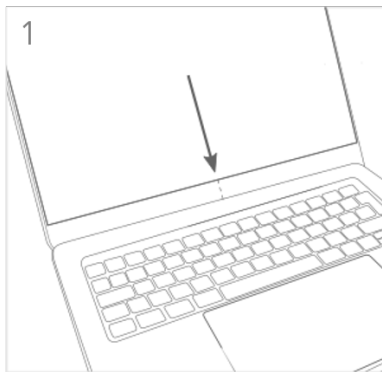
The software Smart Eye Tracker needs to be installed before using your eye tracker. Follow the installation steps below.

1. Launch the Smart Eye Tracker installer by double clicking it.
2. Click the *Install* button to start the installation.
3. A *User Account Control* window will be opened, click *Yes* to continue.
4. A *Windows Security* window will be opened, click *Install* to install eye tracker drivers. The installation may take a while.
5. Click the *Close* button when the installation has finished to exit the installer.

## 4.2 Mounting the eye tracker on a display

The mounting bracket and Chem Pad™ wipe can be found in the box. To mount the eye tracker follow the steps below:

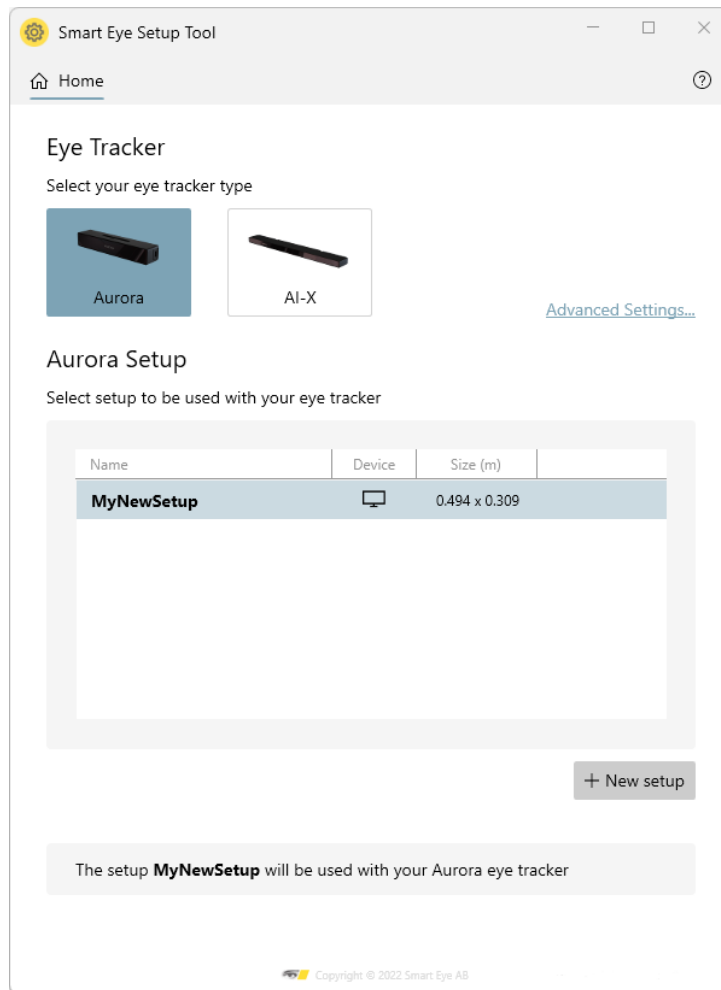
1. Find the center of the lower display edge by marking manually or by using the center marker in the Smart Eye Setup Tool.
2. Clean the mounting area around the center with the Chem Pad™ wipe.
3. Remove the adhesive tape cover from the bracket.
4. Align the center of the bracket with the center of the lower display edge. Make sure the bracket is straight. Press and hold for 30 seconds.
5. Attach the eye tracker to the bracket and connect the eye tracker to the computer using the supplied cable. If the cable is of type USB-A, make sure to connect it to a USB 3.0 port on the computer.





## 4.3 Create an eye tracker setup

1. Run the Smart Eye Setup Tool. The Smart Eye Setup Tool is found in the Windows Start Menu.

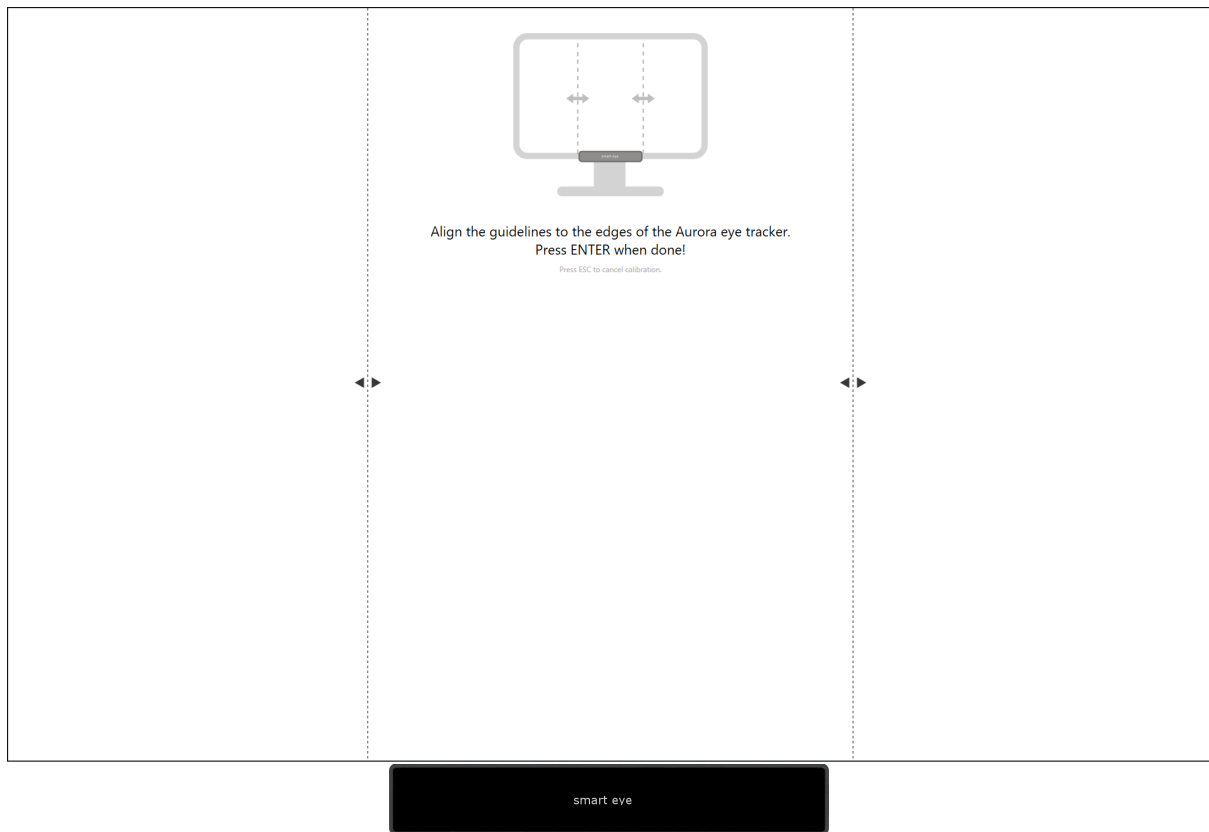


Smart Eye Setup Tool

2. Select your eye tracker.
3. Create a new setup by pressing the *New Setup* button.
4. Select your device type and press *Next*. Follow the steps in the section of the chosen device below.

### 4.3.1 Display setup

1. Specify on which display your eye tracker is mounted (if you have a single display setup, this step is not necessary). Click the *Identify* button if you are not sure which display your eye tracker is mounted to. To be able to identify your display a unique letter will be shown on each display connected to your computer.
2. Click the *Next* button. A full screen window will be opened on the display that your eye tracker is mounted to.



Setup window

3. Setup your eye tracker by aligning the dashed lines to the edges of the eye tracker. Confirm the setup by pressing *Enter*.
4. Check that the size in the setup summary matches the size of the selected display.
5. Enter a file name for your setup and press *Finish*. The setup has now been saved and the Smart Eye Setup Tool can be closed.

#### 4.3.2 Phone setup

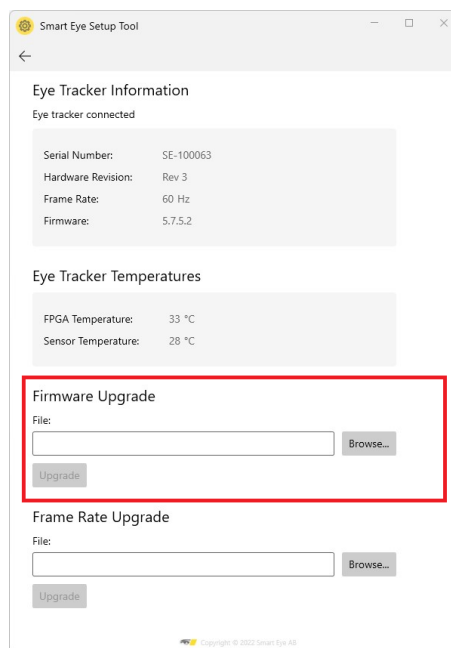
1. Enter measurements of your phone and press *Next*.
2. Check that the size in the setup summary matches the size of your phone.
3. Enter a file name for your setup and press *Finish*. The setup has now been saved and the Smart Eye Setup Tool can be closed.

## 5 Maintenance

### 5.1 Upgrade firmware

The firmware of the Aurora eye tracker may at times require upgrading to improve performance and stability of the Aurora eye tracker. Aurora firmware images are provided as *.auimg* files, and are written to the eye tracker using the Smart Eye Setup Tool. To perform a firmware upgrade, follow the steps below.

1. Open the Smart Eye Setup Tool (found in the Windows start menu).
2. Select Aurora as eye tracker and open the *Advanced Settings...*
3. Connect the Aurora eye tracker to a USB-C port on the computer (if not already done so). Verify that eye tracker information is updated with values from the eye tracker.



Advanced Settings: Firmware Upgrade

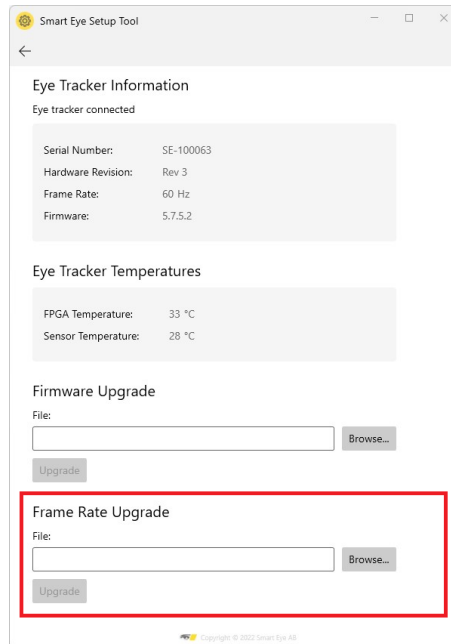
4. Select the firmware file (*.auimg*) containing the new firmware and press the Upgrade button.
5. Wait for the firmware upgrade to complete. Note that this may take several minutes.

**Warning! DO NOT** unplug the Aurora eye tracker during the firmware upgrade! Doing so may render the eye tracker unusable.

### 5.2 Upgrade frame rate

The Aurora eye tracker can be upgraded to deliver a higher frame rate. To perform a frame rate upgrade, follow the steps below.

1. Open the Smart Eye Setup Tool (found in the Windows start menu).
2. Select Aurora as eye tracker and open the *Advanced Settings...*
3. Connect the Aurora eye tracker to a USB-C port on the computer (if not already done so). Verify that eye tracker information is updated with values from the eye tracker.



Advanced Settings: Frame Rate Upgrade

4. Select the frame rate upgrade file (*.aulock*) and press the Upgrade button.
5. Wait for the frame rate upgrade to complete.

**Warning! DO NOT** unplug the Aurora eye tracker during the frame rate upgrade! Doing so may render the eye tracker unusable.

## 6 Support

In this section you will find information about troubleshooting and support.

### 6.1 Troubleshooting

This section presents solutions to problems that you may encounter when using the eye tracker. If your problems persist or if you don't find any solution here, please contact support.

#### **I can't install Smart Eye Tracker.**

Make sure you have admin rights on the computer where you attempt to install Smart Eye Tracker.

#### **The laptop goes to sleep when I connect the eye tracker to the bracket.**

The eye tracker contains a magnet to make sure it attaches to the magnetic holder. Some laptop models also have a magnet in the lid to make sure the computer sleeps when the lid is closed. Change the setting so the computer stays awake even when lid is closed. This setting is found in the *Power Options* menu in the *Control Panel*.

#### **There seems to be problem with the connection to the eye tracker.**

Try unplugging the eye tracker and plugging it in again. Other programs might interfere with the eye tracker connection. Make sure Microsoft Teams and similar programs are not running.

#### **The framerate is low or fluctuates.**

Make sure that the computer is connected to a power source and that a high performance Windows power plan is used. The power plan can be set in the *Power Options* menu in the *Control Panel*. Create a new power plan and make sure the high performance option is chosen.

### 6.2 IR light interfering with other systems

The infrared illumination emitted from the IR-flashes of your eye tracker may interfere with other systems that contains infrared sensors such as video cameras, motion capture systems, fNIRS equipment and others. There are measures that can be taken to eliminate or reduce the interference. Please consult Smart Eye support if you are experiencing this issue.

### 6.3 Customer support

If you need any help or support with your eye tracker, please contact your sales representative or retailer.

## Appendix A Safety and Compliance

### A.1 Compliance

The statements in this section apply to the Aurora eye tracking device.

---

Safety standards:	IEC 62368
	IEC 62471

---

Declaration of conformity:	EU Directive 2014/30/EU (EMC)
	EU Directive 2011/65/EU (RoHS)

---

### A.2 Operating Temperature

The Aurora eye tracker has been tested at normal operating conditions during a 24 hours period with an ambient temperature of 25 degrees. After approximately one hour of use the device reaches a stable temperature which is maintained until the tracker is turned off. The maximum temperature on the outside of the device was T degrees during the test. The Aurora eye tracker is designed with a good margin to operate at a temperature of T degrees and neither the function nor the lifespan of the product is adversely affected. The temperature T degrees is not harmful to the user, although the device may be experienced as unexpectedly warm to the touch.

---

Eye tracker sampling rate	T ( <i>maximum temperature</i> )
60 Hz	40 degrees
120 Hz	43 degrees
250 Hz	47 degrees

---

## Appendix B Technical Specifications

Sampling Rate	60, 120 and 250 Hz
Headbox (Freedom of head movement)	50 x 40 cm at 65 cm distance
Operating Distance	50 - 80 cm
Accuracy	0.3 degrees (typ.)
Precision	0.1 degrees (typ.)
Output Data	Gaze origin, gaze point, pupil diameter, eyelid opening, head position and rotation, real-time time stamp  All outputs as binocular data with associated quality index
Time Stamp Precision	1 $\mu$ s
Synchronization	8-bit markers*
Head Pose Recovery Time	1 frame (immediate)
Blink Recovery Time	1 frame (immediate)
Gaze Recovery Time	1 frame (immediate)
Latency	25 ms (60 Hz), 17 ms (120 Hz), 12 ms (250 Hz)
Eye Tracking Principle	Dark pupil and corneal reflection
Maximum Display Size	24" (16:9 aspect ratio)
Operating Environment	Indoor (all illumination conditions)
Size	146 x 24 x 27 mm (width x height x depth)
Weight	162 g
Cable Length	2 m (up to 8 m with additional hardware**)
Camera Interface	USB-C
Mount Type	On display (with mounting plate)
Operating System	Windows 10
Accessories	External Processing Unit, Aurora Expansion Box

\* Requires Aurora Expansion Box Accessory

\*\* Cable length limited to 2 m for Aurora 250 Hz connected to Expansion Box