

# SMART EYE PRO

3D EYE TRACKING



SMART EYE<sup>®</sup>

SMART EYE IS A SWEDISH COMPANY COMMITTED TO PROVIDING THE MOST ADVANCED NON-INTRUSIVE EYE TRACKING EQUIPMENT, PRODUCING MEASUREMENTS WHERE NOBODY ELSE CAN. WE ARE EQUALLY COMMITTED TO MEASURING WITH THE GREATEST ACCURACY OVER THE BIGGEST VISUAL FIELD.

## Enhanced ease of use, flexibility, robustness and accuracy!

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### NEW FEATURES OF SMART EYE PRO

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Significantly increased ease of use and reduced start-up time

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- Fully automatic head tracking initialization.
- Increased rotations and translations

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Enhanced freedom for natural head movements

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- Algorithms have been improved scaling and head tilt movements.
- Auto Exposure of the cameras improves tracking for movements towards or away from the system (z direction). This especially simplifies setups where subjects are sitting at varying distances from the system.

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Increased gaze tracking area and availability

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- Improved algorithms reduce tracking restrictions. Only one eye visible in one camera is sufficient for tracking.
- Intelligent selection of the best eye clips in multi-camera set-ups, for achieving the best-possible tracking results.

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Robustness and stability of the tracking enhanced notably

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- The automatic head profiles are self-learning and improving over time.
- The gaze tracking algorithms take advantage of the information from all available cameras in a more intelligent way.

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### STANDARD FEATURES OF SMART EYE PRO

- 60 Hz or 120 Hz sampling rate
- Gaze accuracy of 0.5 degrees (in ideal conditions)
- Fully time-stamped output data
- Multiple data output streams via TCP, UDP, CAN Output or as a simple text log file that can be exported in to excel, Mat lab etc.
- Easy to use API for Integration requirements.
- Existing application interfaces: PST e-Prime, EGI Net Station, EyesDx MAPPs, Eyetelect Gaze Tracker, Noldus The Observer, MathWorks MATLAB
- Data output for both the head, left and right eye with over 145 data output values covering Gaze tracking, Head tracking (6DOF), Eyelid tracking, Pupilometry tracking, raw and filtered gaze, Blinks, Fixations, Saccades and more.
- 'Real World' 3D Tracking. The Smart Eye World Model Module allows you to build real 3D models of the experiment environment to detect gaze intersections with objects in that environment.
- WCS, "World Coordinate System" feature which makes it simple to transform output data to other coordinate systems.
- Camera Calibration in less than 15 seconds and Gaze calibration in less than 30 seconds
- Changeable camera lenses (4,5mm – 25mm) depending on participant distance from the cameras Smart Eye Pro.

# SMART EYE PRO

## SUITABLE APPLICATIONS



### Instrumented vehicle

Take advantage of the largest continuous field of view on the market and track human gaze during natural head movements. Due to Smart Eye's big head box, you won't lose tracking data. System configurable with the numbers of cameras required in your project. Works in bright sunlight and during total darkness.



### Simulators

Don't lose important data! Smart Eye Pro allows totally free head movements and fast participant set-up time. Easily add, subtract or reposition cameras to create the desired head box or visual field needed in your project. Smart Eye Pro is used in all kinds of simulators and integrated with many leading simulator manufacturers.



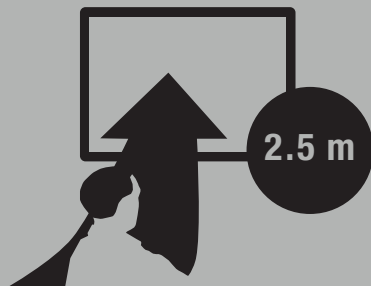
### Multi-Screen and Control Room

Why limit yourself to measuring on one screen at a time? Smart Eye Pro allows you to measure on up to 7-8 screens and a large projection surface in front of the screens. Get information about time spent on each screen, ROIs, heat maps etc.



### Single Screen

Easy to use, yet flexible enough to meet special customer needs. Can be equipped with 2-3 cameras for screens up to 42". Create heat maps, dynamic ROI's, gaze trails etc. With Smart Eye's or our partner's analysis software.



### Long Range

Allows studies in naturalistic environments on for example big screens, video games, displays walls, movies etc. By upgrading optics and the IR system it is possible to place the system up to 2,5 meters from the subject.



## TECHNICAL SPECIFICATIONS

Sampling rate	60 Hz (with up to eight cameras) / 120 Hz (with up to four cameras)
Field of view	90° - 360° (depending on number of cameras)
Head Box (freedom of head movement)	For a typical 2-camera screen measurement set-up (8mm lenses): 40 x 40 x 50. Adjustable with lenses and positioning of cameras.
Tracking Accuracy	Head: Rotation 0.5 degrees (under ideal conditions) Gaze: 0.5 degrees (under ideal conditions)
Output	TCP / UDP / CAN (optional)
Delivered Data (true 3D values)	Head orientation (6DOF), Eye position, Eye gaze, Pupil diameter, Saccades, Fixations, Blinks, Eyelid opening etc.
Recovery Time (Blink/Tracking Lost)	Typ. $\frac{1}{\text{frame rate}}$
Optimal Camera – Eye Distance	30 – 300 cm - adjustable with lenses and positioning of cameras.
Eyewear Compatibility	Glasses, contact lenses and sunglasses of non IR-type.
Calibration Mode	Flexible number of calibration points
Eye Tracking Principle	Pupil and Iris / Corneal Reflection and Head Model

# SMART EYE®

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