



Eyestart

Getting Started with Eyetracking

The EYESTART is a complete eye tracking system that can assist researchers in a variety of applications.

The EYESTART:

1. Is based on a comfortable chinrest design for experiments necessitating restricted head motion
2. Provides an affordable solution for researchers with restricted budgets
3. Offers a fast and easy set up for participants
4. Is fully expandable to allow researchers with limited funding the ability to revise their system's optics while amortizing their initial investment
5. Measures, records and outputs pupillary responses
Offers a rugged system that can be operated by undergraduate students

The Eyestart

The EYESTART head mounted optical components are attached to an adjustable chinrest designed to accurately measure the participant's point of gaze and pupil diameter on a stationary (room fixed) scene space. The measurement is displayed as a cursor or set of crosshairs superimposed on the eye image showing the participant's field of view. This image may also be recorded digitally on the Series 6000 Interface PC or exported as a real time serial data stream to an external device. This chinrest provides a stable platform for the optics and is very comfortable for the participant.

Using bright pupil technology, the EYESTART delivers the illumination and image axis in a coaxial manner. The Retina acts as a reflector and returns a bright image that is the shape and size of the Pupil. The Iris and sclera appear much darker and the location of the pupil is defined by the contrast of the bright pupil and the surrounding dark area. The illuminator and camera optics are mounted on the chinrest.



Applied Science Laboratories
175 Middlesex Turnpike, Bedford MA 01730 USA

Tel.: (781) 275-4000 Fax: (781) 275-3388 www.asleyetracking.com Email: asl@asleyetracking.com



EYEHEAD™

Combining Head Tracking

The EYESTART includes the 50 or 60 HZ bright pupil optics module on the ASL famous forehead or cheekrest chinrest, the Series 6000 control unit, cables, eye and scene images displayed on monitors and operating and analysis software. The system is designed to quickly calibrate and track participants looking at one flat surface. The system includes the ASL Results software. ASL also offers Gazetracker and Interact Software Solutions. The real time data can also be exported to a variety of other statistical analysis software packages.

The EYESTART includes software for analyzing and displaying the collected data on static images. The ASL Results application allows the researcher to reduce data to a list of fixations. The parameters used to compare fixations can be adjusted to meet the researcher's definitions and interpretations of events. Other important features include the ability to plot scan path patterns, define areas of interest on the stimulus display as well as compute many statistical parameters.

Participants Calibration

Both the head apparatus and the chinrest can be adjusted in height to accommodate people with different statures comfortably. It is further recommended that a chair with adjustable height be used in order to further accommodate differences in participants.

The pivot arms holding the optic are easily adjusted to capture the participant's eye. Only minor adjustments between participants are necessary, if any, since the camera placement is restricted.

Quick and Easy Setup

The participant places their chin on the chinrest and allows their forehead to lean against the forehead rest bar. The Stabilization Rings are then rotated to restrict lateral motion.

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EYESTART – Forehead
Chinrest Option



EYESTART – Cheekrest
Chinrest Option



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The pivot arms holding the optic are easily adjusted to capture the participant's eye. Only minor adjustments between participants are necessary, if any, since the camera placement is restricted.

For applications that require the participant to provide verbal responses and/or to wear some type of head device (EEG cap), the EYESTART can be configured with our Cheekrest Chinrest.

The Chin cup can be easily removed to allow the participant to provide verbal responses during the eye tracking session.

The EYESTART will track participants with glasses and/or soft contact lens. Using ASL bright pupil technology, long eyelashes or mascara will not confuse the accuracy and quality of the eye tracking system's measurements.

System Components

In addition to the EYESTART optics attached to the chinrest, the EYESTART includes an ASL EYE-TRAC® 6000 control unit. The EYE-TRAC® 6000 Control Unit measures 3.25" h x 10.0" w x 10.25" d, weighs 4.5 lb. and includes an external 12V DC power supply. The control unit houses the processing board that receives video from eye and scene cameras, recognizes features in the video eye image and computes line of gaze, communicates with the Interface PC, controls the optics mechanism, and superimposes feedback outlines.

With the use of either a remote scene camera or a scan converter, the scene image that the participant is viewing is received by the ASL control unit and displayed on a second monitor.

The second monitor (scene) displays the scene images with a superimposed gaze cursor or crosshairs. The cursor can be in white or black eliminating the need to restrict backgrounds to one specific color.

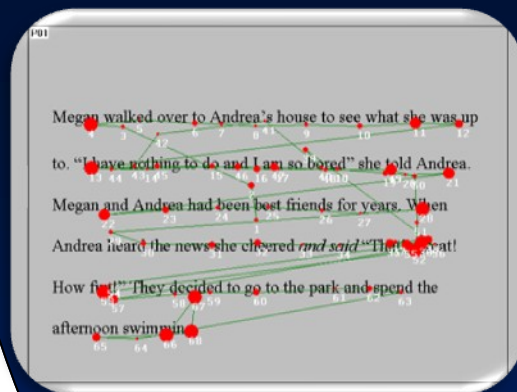
The scene monitor provides constant feedback of where the participant is looking. This video image can be recorded on an external video recording device or with a video

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One of the many graphic presentation images from ASL Results.



Scan path and fixations applied to stimulus display provided from ASL Results



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capture card on the eye tracking interface computer.

Technical Specifications of the EYESTART

Accuracy : 0.5 to 1.0 degrees

Resolution: 0.10 degrees

Visual Field for Pupil and CR tracking: +/-25° horizontal, +/-20°vertically

Visual Field for Pupil only tracking: +/-40° horizontal, +/-20°vertically

A computer (usually supplied by the user) serves as the user interface device and as a data-recording device. ASL supplies the Eye-Trac[®] 6 Interface program with the EYESTART system, which runs on this computer, and is a required part of the system.

Computer Requirements

Supported Operating Systems: Windows 98, Windows 2000, Windows XP.

Minimum processor speed: 900 MHz Pentium. Systems running Video Capture software for recording mpeg or avi files require minimum of 2.4 GHz CPU and 1 Gbyte of RAM. System does require at least one serial port (RS232).

Software Development Kit

Software Development Kit (SDK) is provided to each ASL user. The kit provides access to the eye tracker controller port, serial output and data files recorded by ASL interface programs. Kit includes libraries of sample codes for eprime, presentation, MATLAB, Visual Basic, C++ and Inquisit. Source code is available.

Versatility

The EYESTART can be upgraded to any of the ASL EYE-TRAC[®] 6 configurations. When upgraded, the EYESTART system can be configured to operate with desktop optics, head mounted optics, high speed optics, Virtual Reality HMD's, long range optics for the fMRI and MEG environments, and other custom applications.

Any data collected with the EYESTART will be compatible with the other configurations. Any custom programming, either on the presentation stimulus package or data analysis package, will also be compatible.

The allocation of both funding and resources for the EYESTART can easily be reinvested in future ASL configurations.

Additional Data Analysis Solutions

For analysis of video data, web pages, or software applications, ASL can provide Gazetracker software for analysis. For a demonstration copy of Gazetracker, please contact your local ASL representative.

ASL will provide an accurate and easy to use eye tracker, outstanding customer support, highly knowledgeable technical support and a system to meet your current and future needs.

Please contact an ASL representative for pricing and availability.

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