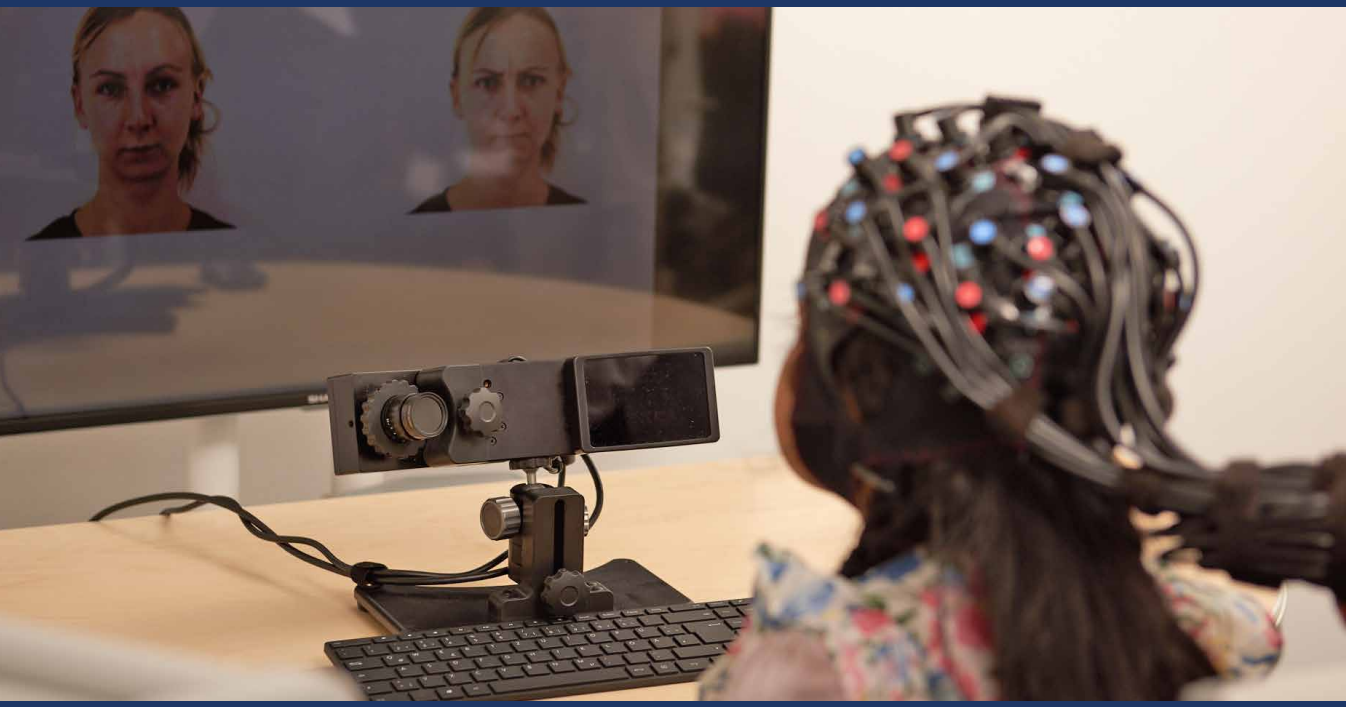
EyeLink®
1000 PLUS



Multiple Eye Tracking Solutions in One

FAST, ACCURATE, RELIABLE EYE TRACKING

SR Research
EyeLink®

THE EYELINK® 1000 PLUS EYE TRACKER

The EyeLink 1000 Plus is the world's fastest, most accurate, and most precise eye tracker. It is a uniquely flexible system, allowing researchers to customize their configuration for specific eye tracking scenarios.

Key Features

- » Outstanding spatial accuracy and resolution
- » Up to 2000Hz binocular eye tracking
- » Separate head-fixed and head free-to-move operating modes
- » The only eye tracker that allows seamless operation across environments from the behavioral laboratory to MRI to MEG to EEG and more
- » Access eye position data with <1.4 msec delay for gaze-contingent tasks
- » Interoperable camera mounting options (e.g., Desktop Mount, Arm Mount, Tower Mount, etc.) specialized for specific eye tracking scenarios
- » Interchangeable lenses, allowing the experimenter to trade off the size of allowable head movement against sample-level noise in Remote, head free-to-move mode

The EyeLink 1000 Plus is a high-performance measurement device that establishes the technical benchmarks that all video-based eye trackers strive to achieve.

One Camera, Many Different Eye-Tracking Solutions

The EyeLink 1000 Plus camera has been designed specifically for eye tracking and interchangeably fits into different mounts that illuminate the eyes and position the camera in different ways to allow a flexible range of applications. From head free-to-move remote eye tracking with EEG, to tracking with fMRI or for high precision head-stabilized tracking, the same Core System (Host Computer and Camera) is used. The Core System can include either a Workstation or a Laptop Host PC for portability.

EyeLink 1000 Plus Feature Summary

	Key Specifications	Head Supported	Remote (Head Free-to-Move)
EyeLink 1000 Plus Core System EyeLink 1000 Plus Camera and Workstation or Laptop Host PC	Sampling Rate	2000 Hz Monocular 2000 Hz Binocular	1000 Hz Monocular 1000 Hz Binocular
	Accuracy	Down to 0.15° (0.25 - 0.50° typical)	0.25 - 0.50° typical
	Resolution	0.01° RMS 0.05° Microsaccade resolution	0.05° RMS 0.25° Saccade resolution
	Real-time Data Access	M = 1.4 msec (SD < 0.2 msec) @ 2000 Hz	M = 2.2 msec (SD < 0.3 msec) @ 1000 Hz
	Data Output	X, Y, and Pupil Size	
	Host PC	Workstation or Laptop Host PC	
	Participant Setup	Very simple and easy. Typically less than 2-5 minutes.	
Choose from a range of different mounts, tailored for your eye tracking tasks. Different infrared wavelengths available to minimize visibility or track in the dark.	**Mounting Options**		
	Desktop Mount	• Easy to transport • Track with the head free-to-move or with head supported • No electronics near the participant's head • Binocular or monocular eye tracking supported • Configurable 32° x 25° trackable range	
	Binocular Tower Mount	• Fast and easy setup • Ideal for close-up stimuli, touchscreens and reaching • 60° x 40° trackable range	
	LCD Arm Mount	• Bring the stimulus to the participant • Ideal for infant tracking or patients in a hospital bed • Configurable 32° x 25° trackable range	
	Long Range Mount	• Ideal for MRI or MEG • 60 - 150 cm eye-to-camera distances	
	Primate Mount	• Ideal for non-human primate tracking • 60° x 40° trackable range	
The EyeLink 1000 Plus camera can be upgraded to allow extra functionality.	**Camera Upgrades**		
	Remote (Head Free-to-Move)	A default Desktop or LCD Arm mount system can be transformed into a Binocular 1000 Hz Remote Head Free-to-Move eye tracker that does not require head stabilization	
	2000Hz	EyeLink 1000 Plus is capable of sampling binocularly at up to 2000 Hz with the head stabilized, and 1000 Hz with the head free-to-move when the Remote Camera Upgrade is present	

Outstanding Technical Support

Every EyeLink 1000 Plus includes perpetual technical support at no additional cost or hidden annual fees. Our Research Support Specialist team spans two continents. They understand eye tracking research, and they understand your need for fast assistance. Our support team is dedicated to helping you collect high-quality data for publication.

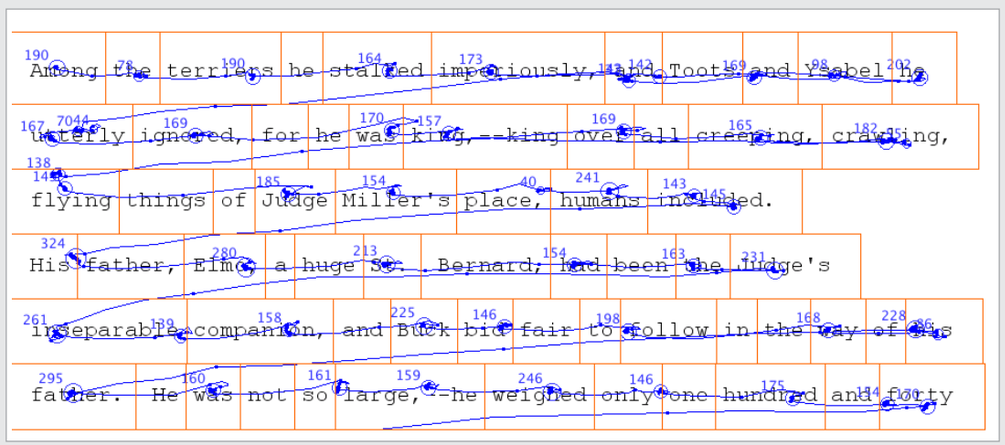
Powerful Software

SR Research provides a range of software to assist users in working with the EyeLink 1000 Plus. SR Research Experiment Builder is a full-featured experiment delivery system designed to assist in quickly creating eye tracking paradigms. EyeLink Data Viewer allows quick visualization of the data and the creation of data reports that are formatted for import to statistical analysis programs. Both packages run under Windows and macOS. Data Viewer also runs under Linux. SR Research WebLink is a powerful Windows application that allows EyeLink users to track eye movements while participants view and interact with dynamic media such as websites, online games, and computer software. See pages 14-19 for details.

All EyeLink eye tracking systems operate with the same application-programming interface for easy transitions between eye trackers and modes of eye tracking.

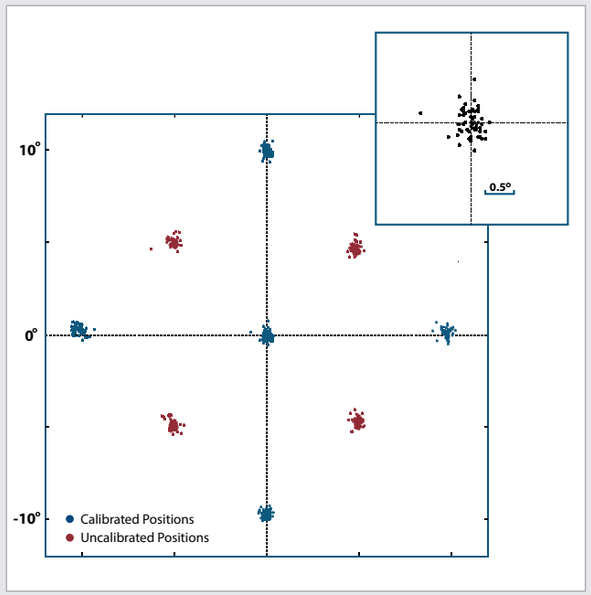
Free Software Development Kits (SDKs):

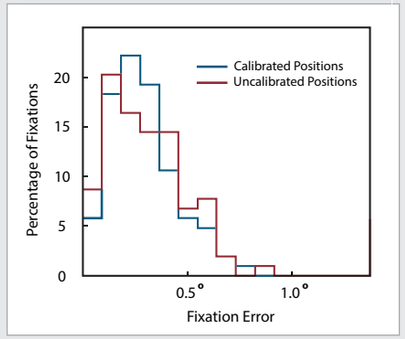
- Available for Windows, macOS, and Linux
- Enables integration with third-party hardware and software
- SDKs include easy-to-follow examples written in C, C#, Python (Psychopy and OpenSesame), NBS Presentation, E-Prime, MATLAB and Psychtoolbox, and LabView



Reading data showing interest areas automatically generated by Experiment Builder software, with eye traces and fixations overlaid using EyeLink Data Viewer.

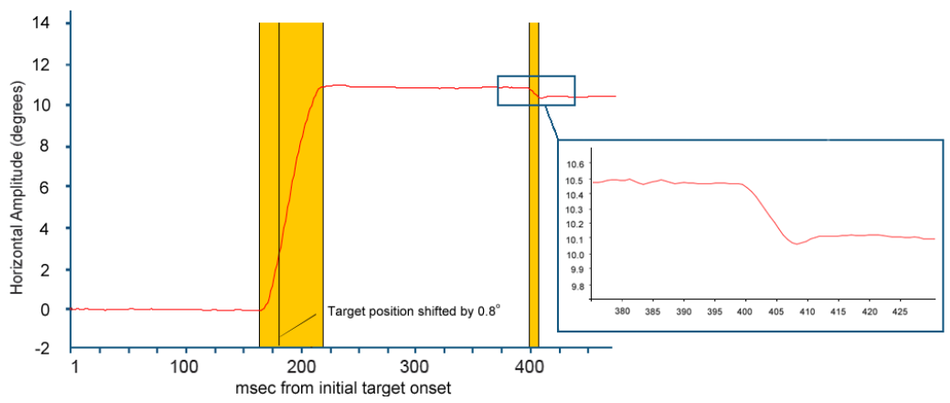
Fixation Accuracy (Head Stabilized)





Repeated target fixations to nine screen locations recorded with the EyeLink 1000 Plus with the head stabilized. The inset plot represents an enlarged view of the fixation distribution around the center target position. On the right is a fixation error histogram demonstrating the tight fixation accuracy distribution (Mean = 0.33°, Median = 0.29°, and Standard Deviation = 0.20°).

Saccade Resolution



The EyeLink 1000 Plus has outstanding real-time access to high resolution data. Here, the participant made a saccade to a peripheral target that was moved by 0.8° about 21 msec after the saccade was initiated. A 0.33° corrective saccade lasting 8 msec occurred in the direction of the target position change.

Remote Camera Upgrade

Key Features

» Make your EyeLink 1000 Plus the most accurate remote, head free-to-move eye tracker available
» Consistent sampling rate at up to 1000 Hz binocularly
» 0.5 degree average accuracy
» 2 msec blink recovery time
» Access eye position data with a 2.2 msec delay
» 40 × 40 cm (horizontal × vertical) head box at a 70 cm camera distance
» Extends functionality of the Desktop Mount or LCD Arm Mounts

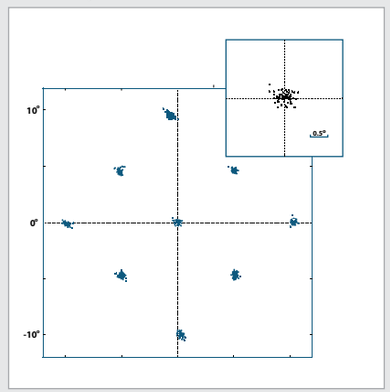
The Remote Camera Upgrade is designed for areas of eye tracking research where head stabilization is not desirable (e.g., EEG, TMS or for use with infants, children and special populations), but high accuracy and resolution are still important. With the Remote Camera Upgrade and the Desktop or LCD Arm Mount, the EyeLink 1000 Plus can be switched between head supported and remote operating modes in under a minute.

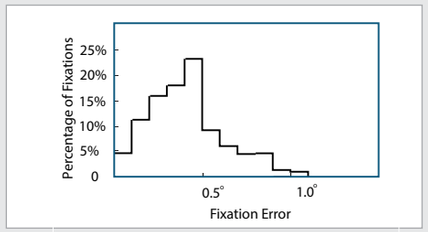
Head distance is accurately measured at up to 1000 Hz using a small target sticker allowing head compensation even during blinks, and providing an extremely fast 1 msec blink recovery time.

With true 1000 Hz binocular recording, the Remote Camera Upgrade provides reliable fixation, saccade, and blink event onset times and durations. The real-time data access and consistent temporal resolution make it the ideal head-free remote eye tracker for gaze-contingent and gaze-controlled applications.

Fixation Accuracy (Remote, Head Free-to-Move)

Accuracy was assessed without a head support using the Remote Camera Upgrade. Repeated target fixations to nine screen locations resulted in the low error levels demonstrated by the fixation error histogram below (Mean = 0.41°, Median = 0.40° and Standard Deviation = 0.22°). The inset plot is an enlarged view of the fixation distribution around the center target position. See Page 4 for analogous data using head-stabilized tracking.





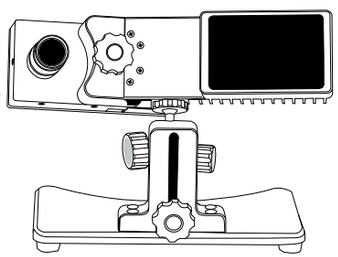
MOUNT OPTIONS

Desktop Mount

Key Features

» Remote Camera Upgrade, allowing Head Free-to-Move tracking
» Monocular and binocular high-speed, high-precision recording
» No electronics near participant's head (no EEG interference)
» Optimal camera-to-eye distances between 40 and 70 cm
» Can track gaze while participants view any computer monitor, projection screen or wall
» 32° horizontal x 25° vertical trackable range
» 940 nm illuminator available for dark adapted environments

Our most popular mounting option for the EyeLink 1000 Plus, the Desktop Mount typically sits just below the tracked area the participant is viewing, whether it is a monitor, projection screen or wall. Since the EyeLink 1000 Plus camera and the infrared illuminator are 40-70 cm from the participant, no electronics need to be near the participant's head, making it the perfect mount for EEG.



The EyeLink 1000 Plus with the Desktop Mount can be used with a head support as an ultra high resolution system, or without a head support as a highly accurate head free-to-move eye tracker (Remote Camera Upgrade sold separately).

Pupil Size Accuracy – Desktop and Tower Mounts

Pupil size data are available with every data point collected by the EyeLink 1000 Plus. To evaluate the level of accuracy obtained in pupil size measures, dots between 2.0 and 5.0 mm in diameter were laser printed, and the pupil area was measured for each. The diameter of each dot in system units was computed, and the percentage difference in reported diameter compared to the expected difference for each dot was:

```
5 mm (118 pixels - 125.53% of 4 mm) - 2652 area - 51.4976 diameter - 125.60% for +0.07% error
4 mm ( 94 pixels - 100.00% of 4 mm) - 1681 area - 41.0000 diameter - 100.00% for  0.00% error
3 mm ( 71 pixels -  75.53% of 4 mm) -  964 area - 31.0483 diameter -  75.73% for +0.20% error
2 mm ( 47 pixels -  50.00% of 4 mm) -  435 area - 20.8567 diameter -  50.87% for +0.87% error
```

Measurement error is below 1% with under 0.2% error for 3 mm or greater sizes.

The second test was to see how well the system picked up smaller changes, so we used 4 dots of 4.1, 4.0, 3.9 and 3.8 mm and compared the reported sizes in relation to the 4.0 mm standard:

```
4.1 mm (96 pixels - 102.13% of 4 mm) - 1758 area - 41.9285 diameter - 102.26% for +0.13% error
4.0 mm (94 pixels - 100.00% of 4 mm) - 1680 area - 40.9878 diameter -  99.97% for -0.03% error
3.9 mm (92 pixels -  97.87% of 4 mm) - 1611 area - 40.1373 diameter -  97.90% for +0.03% error
3.8 mm (90 pixels -  95.74% of 4 mm) - 1537 area - 39.2046 diameter -  95.62% for -0.12% error
```

Tower Mount

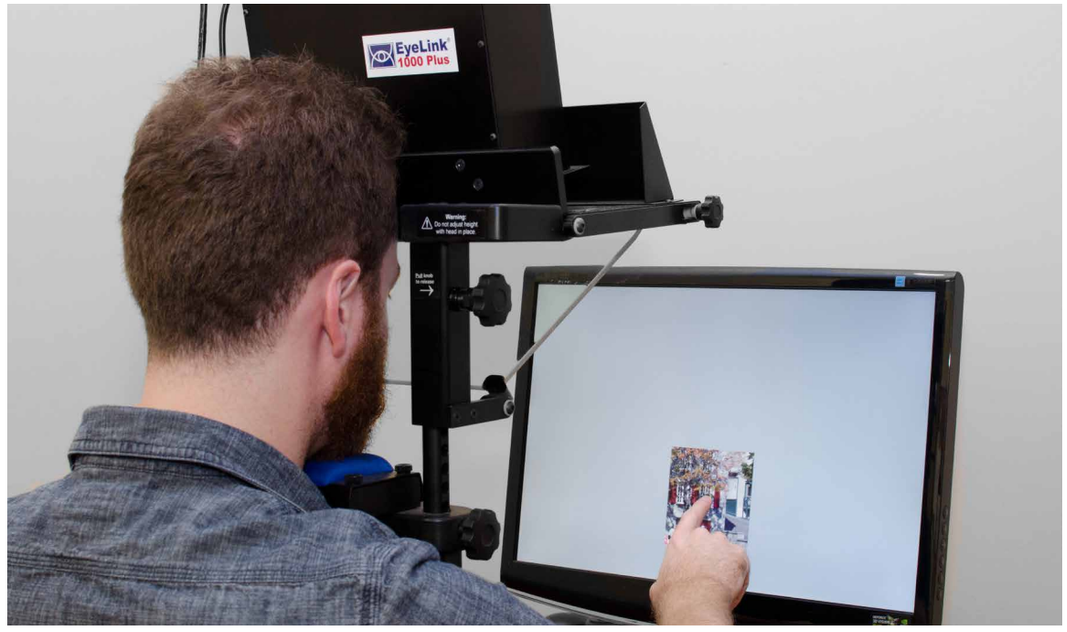
Key Features

» Binocular or monocular 2000 Hz high-speed, high-precision recording
» Large 60° horizontal x 40° vertical trackable range
» Integrated high quality headrest; chinrest usage is optional
» Useful for experiments that use a touch screen monitor or require pointing, writing or drawing
» 940 nm illuminator ideal for dark adapted environments

The Tower Mount for the EyeLink 1000 Plus uses an infrared hot mirror to maximize the field of view. The mirror is transparent to visible light but reflects the infrared light used to illuminate the participant's eye.

Since the camera views the eye from above, participants are free to use their arms in tasks such as reaching to a touch screen monitor. Ask us how to customize the Tower Mount for pointing, writing, or drawing applications.

The EyeLink 1000 Plus camera can be easily detached from the Tower Mount and transferred to any other mount.



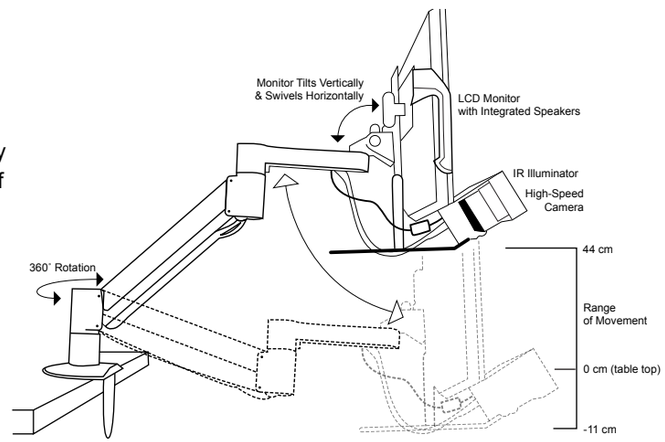
Arm Mount

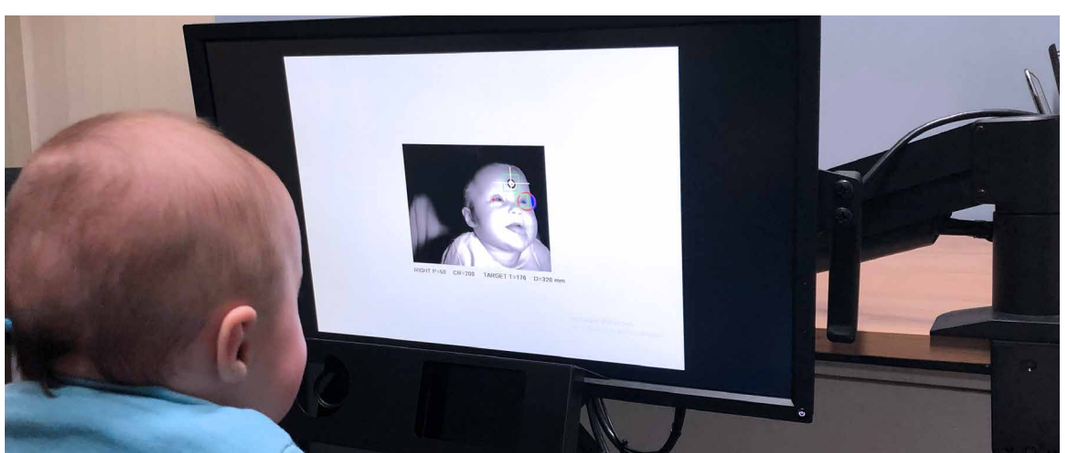
Key Features

» Easily position the eye tracker and integrated LCD monitor in front of the participant
» Supports the Remote Camera Upgrade, allowing Head Free-to-Move tracking
» Perfect for tracking infants or patients from the bedside
» 32° horizontal x 25° vertical trackable range above the camera
» 940 nm illuminator available for dark adapted environments or infant research

The EyeLink 1000 Plus LCD Arm Mount is an easily-positioned hydraulic arm holding an LCD monitor with the camera and illuminator mounted beneath it. The entire eye tracking apparatus and display can be easily moved into place in front of the participant.

Combined with the Remote Camera Upgrade, this solution is ideal for reaching viewers in difficult-to-record positions or where head stabilization is simply not desirable.





Primate Mount

Key Features

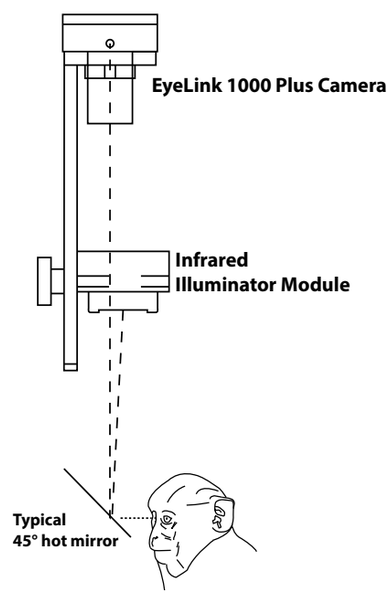
» Binocular or monocular 2000 Hz high-speed, high-precision recording
» Large 60° horizontal x 40° vertical trackable range
» 910 and 940 nm illuminators available for low visibility
» Camera-to-eye distances between 35 and 45 cm
» Analog output option provides simple replacement for existing coil setups
» Digital gain and offset adjustments of data from the Host Software

The Primate Mount for the EyeLink 1000 Plus system holds the camera and an infrared illuminator in a compact bracket that is typically affixed to a vertical surface such as a primate chair. An infrared reflecting hot mirror is used to project the viewer's eye to the camera. This allows accommodation of a wide range of unique viewing setups within very small space requirements. The higher wavelength 940 nm illuminator minimizes the visibility to non-human species.

The EyeLink 1000 Plus eye tracker outputs eye position and pupil size data in either digital or analog formats. Both outputs can be linearly calibrated using the built-in offset and gain adjustments. The gain and offset adjustment states can be saved and reloaded at a later date, allowing for easy switching between participants.

It is also possible to calibrate the participant using our built-in calibration procedures for non-linear data calibration.

Many non-human primate researchers use our Desktop Mount. This approach has a fast and easy setup that does not require the use of a hot mirror or any custom mounting to the chair. See Key Features of the Desktop Mount on Page 6.



MRI and MEG Long Range Eye Tracking

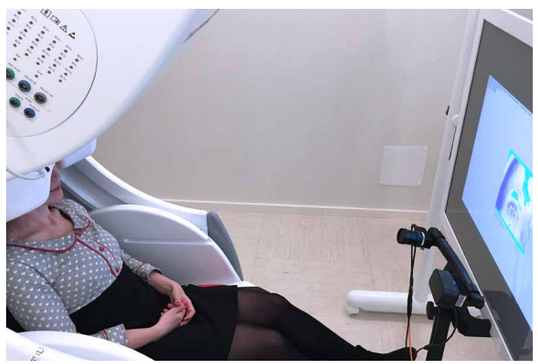
Key Features

» The EyeLink 1000 Plus is the most accurate and lowest noise eye-tracker for MRI and MEG
» Seamless software operation and identical interface for laboratory and scanner eye-tracking
» Every EyeLink 1000 Plus is dual-use in MRI and behavioral laboratory with appropriate mounts
» A Fiber Optic Camera Head extends the EyeLink 1000 Plus for use in MRI and MEG
» Supports high-speed (up 2000 Hz monocular), high-precision recording with < 0.5° error
» Long camera-to-eye distances between 60 and 150 cm
» Compatible with multiple head coils and scanners
» 32° x 25° trackable range
» 940 nm illuminator available for dark adapted environments

With the addition of a Fiber Optic Camera Head, Long Range Illuminator, and appropriate accessory components, the core 1000 Plus can be used in MRI and MEG settings, where it is the world's most accurate and highest spatial and temporal resolution eye tracker.

A range of specialized Long Range mounts position the Camera Head and Long Range Illuminator for tracking in these sensitive environments. Installation is relatively easy and between-participant setup is typically very quick.

The EyeLink 1000 Plus for MRI operates optimally when positioned on the head-side of the participant with an out-of-bore screen or our own in-bore back-projection screen. Based on your site's operating environment we will recommend the optimal set of components.



Installations with CTF, Elekta, 4D Yokohama and other MEG manufacturers.

Compatible with a wide range of MRI scanner models, including:

- Philips Achieva
- Siemens Prisma, Trio, Skyra, Verio, Allegra, Magnetom and Terra 7T systems
- GE Signa and Discovery series
- Bruker and other MRI manufacturers

Works with multiple head coils, including:

- Siemens 8, 12, 20, 32, and 64 channel head coils
- Philips 32 channel head coil
- GE 32 channel head coil
- Nova Medical head coils

Inquire about your scanner, head coil and MRI eye tracking needs, and we will propose solutions.

MRI Tray Mount with Back Projection Screen

Key Features

» Rests in end of scanner bore supported by bed rails
» Holds optional high-quality back projection screen
» Compatible with out-of-bore projection screens or LCD displays
» Screen-holder available for user-supplied screen
» Optimally positions EyeLink 1000 Plus Fiber Optic Camera Head and Illuminator mounting bar
» Easily removed when not in use

EyeLink 1000 Plus Tray Mounts are inserted into the head-side of the bore where they hold both the eye tracker and an optional high-quality back-projection screen. The entire apparatus is easily inserted or removed from the bore.

Tray Mounts with screens are available for the Philips Achieva, and Siemens Prisma, Trio, Verio and Skyra scanners.

Screen Clamp Mount and Stand

Key Features

» General purpose Long Range Mount
» Allows lateral adjustment of the eye tracker without disrupting the visual display
» Can be clamped to many user-supplied out-of-bore back-projection screens
» Ready to be affixed to an optional stand
» Easily removed when not in use

The Screen Clamp Mount is a Long Range Mount for MRI or MEG.

In MRI the Mount clamps to an optional Aluminum Stand and positions the eye tracking hardware outside of the bore where it is easily accessed and adjusted.

In MEG the Screen Clamp Mount affixes directly to the bottom of an Elekta or user-supplied back-projection screen.

Other MRI and MEG solutions exist - ask us (sales@sr-research.com) about your setup!

ADDITIONAL EQUIPMENT

Additional Host Computer

Key Features

» A complete EyeLink 1000 Plus Host computer, with all necessary cabling
» Choose from a Laptop or a Workstation PC
» Useful for tracking in multiple settings
» Cost effective – one eye tracker can be easily used at different locations

With multiple Host PCs, you can easily move the camera and mount between eye-tracking locations. Or if you have multiple mounts, move only the camera!

Example scenarios:

- A Workstation Host PC could be set up in a behavioral laboratory and another one could be stationed in an MRI control room, requiring only the camera to be transported between sites
- A Laptop Host PC could be used for school, hospital, or home visits while leaving a Workstation Host PC setup in the lab

Stimulus Presentation Hardware

SR Research can provide highly optimized Display PCs with known timing properties. These computers are provided as a service to our customers and come preconfigured with SR Research software allowing high performance for even the most demanding tasks.

All of our Desktop Display PCs have:

- ASIO hardware for +/- 2 msec audio synchronization accuracy under Windows
- Under 2 msec visual synchronization with appropriate monitors
- Parallel port hardware options for TTL synchronization with other devices
- An extra Ethernet Port dedicated and configured for the EyeLink
- Windows 10

In addition to Display PC hardware, SR Research can provide monitors with known timing properties (up to 240 Hz vertical refresh rates) that are ideal for gaze-contingent paradigms.

Please inquire about the hardware we have available.

SR Research Head Support

Key Features

» Robust, high quality design and manufacturing
» Clamps on top of the table so there is no interference with participant's legs
» Allows separate adjustment of chin position in depth, or remove chin or forehead support components completely
» Ideal for Eye Tracking, Psychophysics, or any Psychology experiment

The SR Research Head Support is an extremely sturdy, high quality chin and forehead rest suitable for use in any behavioral research laboratory. It was specially designed for the EyeLink 1000 Plus in head-supported modes and forms the base of the Tower Mount.

Importantly, the chin support can be adjusted in depth for extra comfort and better head positioning. The design of the head support allows for use of just the chin rest if desired (e.g., useful for EEG experiments in which you want to avoid putting pressure on the frontal electrodes), or just the forehead rest (e.g., useful for tasks involving speech production).

Analog Card (for Workstation Host PC)

Key Features

» Converts the x, y and pupil size data into analog voltages
» Consistent and accurate analog time base, with very little inter-sample jitter
» Digital input/output can be used for synchronization with external devices

The X and Y gaze data and pupil size are sent out every sample (up to 2000 Hz) in a programmable range between +/- 10 volts. The Analog Card also features digital input/output capabilities, which can be used for TTL triggering and synchronization of the digital eye data file with external devices. The analog output option is only available for the Workstation Host PC.

Training Services

Key Features

» Installation and commission of standard hardware
» Software training tailored to individual research goals
» You decide how large of an audience to include

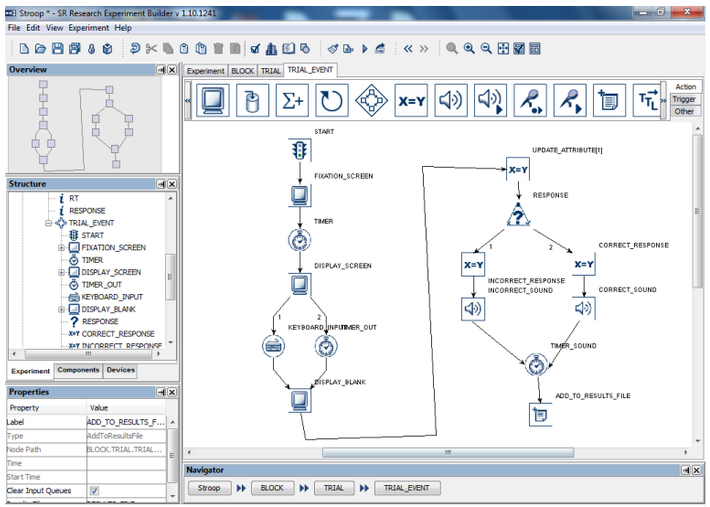
We provide custom virtual training services, during which one of our highly qualified Research Support Specialists will help you set up your eye tracker. The training session is tailored to your research goals and can include creation of an Experiment Builder project, detailed instruction in setting up and calibrating participants, and integrating your eye tracker with biometric devices. You decide who comes for the training and the size of the audience.

EXPERIMENT BUILDER

SR Research Experiment Builder is a graphical programming environment for creating computer-based psychology and neuroscience experiments. All EyeLink eye trackers are supported, as well as several button boxes, touchscreens, EEG devices and more. The software can also be used to run studies that collect behavioural data only. It is capable of delivering complex visual and auditory stimuli, and dealing with hardware devices with extremely high levels of temporal precision.

Key Features

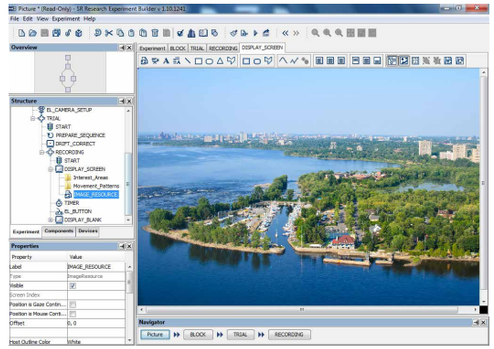
» Cross-platform compatible for Windows (32-bit and 64-bit) and macOS
» Graphical User Interface supports drag and drop experiment programming
» Easy-to-use hierarchical experiment creation interface
» Conditional branching and looping for flexible experiment flow control
» Millisecond precise timing of video, audio, TTL and response devices
» Gaze-contingent stimulus control (e.g. for moving window, and boundary crossing paradigms)
» Built-in screen editor for manipulating text, image, and video resources
» Built-in data source (stimulus list) editor to specify the parameters of individual trials
» Automatic generation of interest areas for text
» Multi-language / Unicode support throughout the application
» Direct integration with a range of EEG / fNIRS and other biometric recording devices
» Advanced support for EyeLink eye trackers and seamless integration with Data Viewer software
» Add custom Python code to extend experiments as desired



Powerful and Intuitive Experiment Creation Tools

With a built-in data source (stimulus list), powerful randomization options, conditional branching and looping capabilities, Experiment Builder is simple enough for a novice user but rich enough to handle the most advanced experimental paradigms.

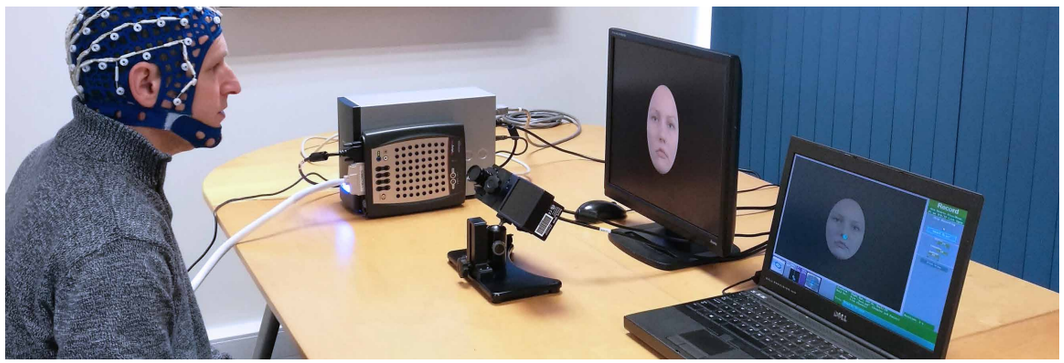
Python data structures and commands can be incorporated into the GUI interface to allow for increased flexibility. Advanced users can even program entire experimental procedures using custom Python scripts.



Built in Biometric Device Integration

Experiment Builder provides templates for integrating your eye tracking task with a wide range of other biometric recording devices:

- Direct integration with Net Station devices using Experiment Control Interface
- Direct integration with Brain Products EEG using Remote Control Server
- Support for Neuroscan EEG equipment (running Curry software)
- Support for the Biosemi devices and USB trigger interface
- Biometric TTL action to send TTLs of fixed duration to a wide range of other biometric recording devices



Experiment Builder requires a license, but a free demo version is available from our support forum (www.sr-support.com). Experiment Builder includes many sample projects (e.g., text presentation, smooth pursuit, gaze-contingent window, Stroop task) and a comprehensive user manual that describes how these examples were created. Many additional example paradigms and software updates are available through our support website.

WEBLINK

SR Research WebLink is a powerful software solution that allows EyeLink users to track eye movements while participants view and interact with dynamic media such as websites, PDF files, scene camera, online games, and computer software. It is ideal for performing usability testing and also perfect for running simple “slideshow” experiments with image and video stimuli.

Key Features

» A simple and intuitive drag and drop interface for the rapid creation of tasks

» Powerful screen recording that captures dynamic screen events and changes as an mp4 video file

» Synchronization between the screen capture video recording and eye-tracking data for easy analysis in Data Viewer

» The ability to record all key presses and mouse clicks

» The ability to record video and audio of the participant via a webcam

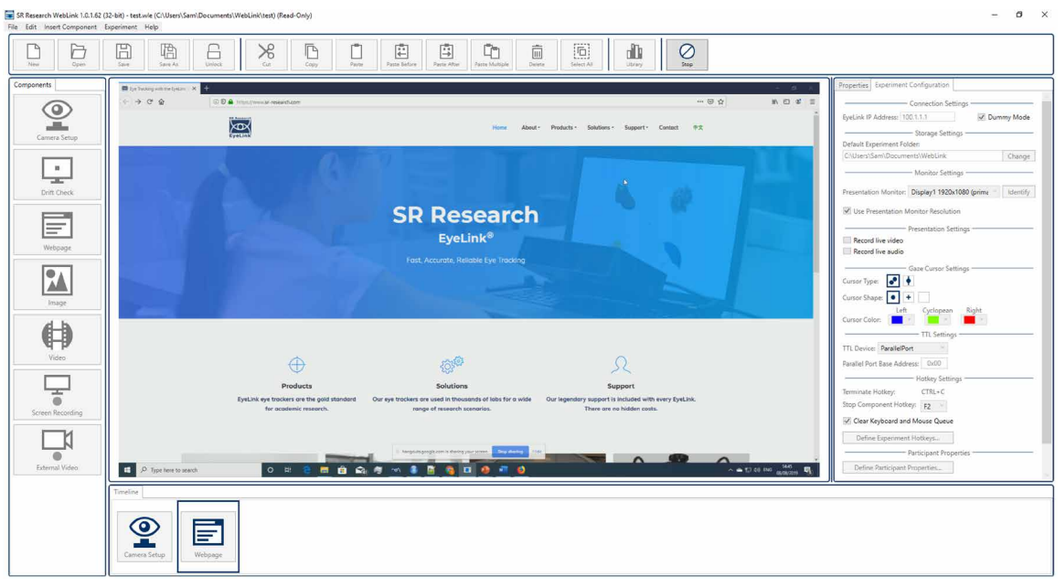
» Hotkeys which can be used to send messages into the eye tracking recording or send TTLs to synchronize with other recording equipment and experimental devices

» Dual monitor capabilities that provide live gaze feedback and facilitate task control during the recording session

» Stimulus randomization in the Timeline or Repetition Sequence

» Advanced features such as listening to external messages or streaming online samples through socket connection

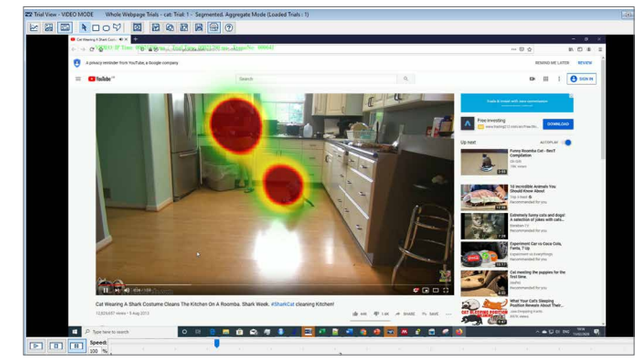
» Compatible with all EyeLink eye trackers

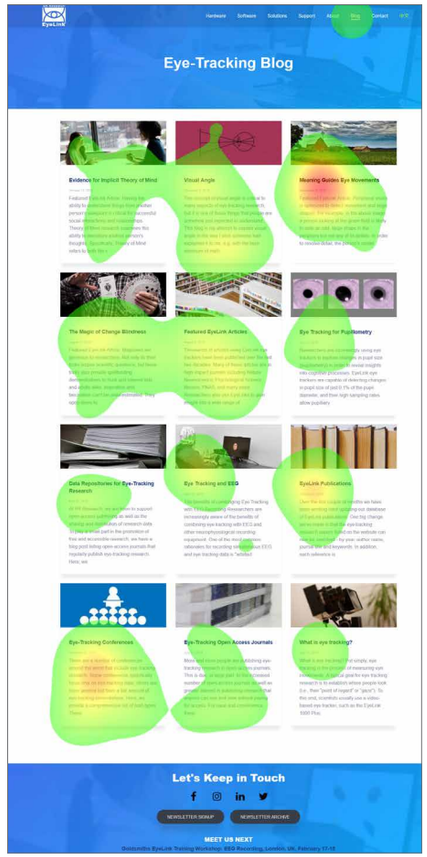


WebLink for Website Research

WebLink has a number of features that make it particularly suitable for studies in which users browse websites. In combination with our analysis software Data Viewer (see pages 18-19), WebLink allows users to:

- Capture websites using Firefox or Chrome browsers
- Capture the entire webpage content as a single image for offline analysis and creation of interest areas and heat maps
- Capture dynamic website content (e.g. video and audio) with .mp4 screen recording
- Simultaneously record live video/audio from participant to capture reactions / verbal responses
- Capture browser navigation and history (URL or local address for offline webpages) – allowing data to be automatically grouped by webpage in Data Viewer
- Perform automatic scroll compensation of samples and events during analysis in Data Viewer

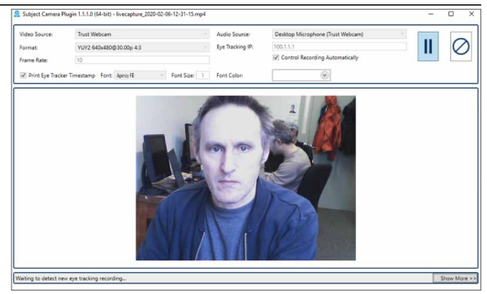




Participant Camera Plugin

The Participant Camera Plugin allows users to capture data from a webcam or other video input. The video feed is recorded as an .mp4, and the timestamp from the EyeLink Host PC is overlaid on each frame of the video, allowing it to be synchronized with the eye tracking data at the analysis stage.

The Participant Camera Plugin does not require a license to run.



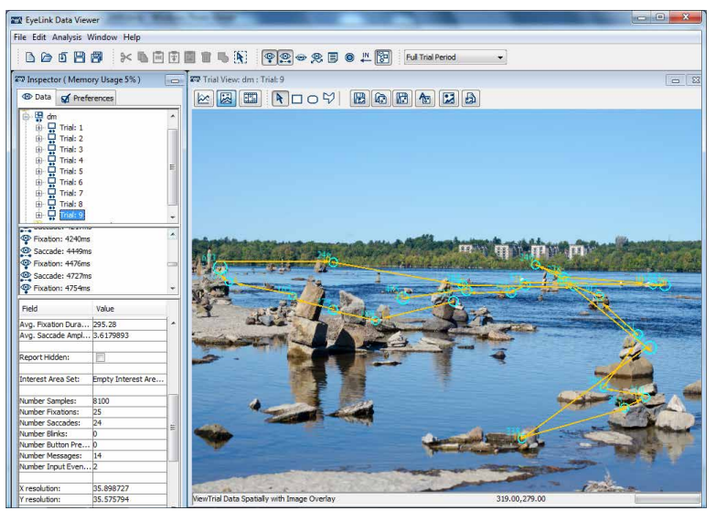
DATA VIEWER

EyeLink Data Viewer is a powerful yet intuitive software package that can be used for viewing, filtering, and processing gaze data recorded with EyeLink eye trackers. Several different viewing options provide convenient ways to visualize and inspect both temporal and spatial aspects of eye movement recordings.

The software provides a range of analysis tools that can be used to generate tab-delimited summary reports based on interest areas, fixations, saccades, time bins or samples. Data Viewer runs on Windows, macOS and Linux.

Key Features

» Multiple Data Visualization Modes:
  » Animation Playback View shows a movie of the trial with eye movements overlaid (including bee-swarm for multiple trials)
  » Spatial Overlay View superimposes saccade and fixation scanpath over an image
  » Temporal Graph View supports visualization of eye data over time
  » Supports both static and dynamic interest areas (rectangular, elliptical, or freeform polygons)
» Generate static or dynamic heat maps for selected trials or groups of trials
» Output eye sample, fixation, saccade, interest area, or trial-based reports for statistical analysis
» Output Time Series (binning) reports for Visual World / Dynamic tasks
» Calculate hundreds of dependent measures including most common reading measures
» Create interest periods for temporal data filtering
» Highly integrated with SR Research Experiment Builder, WebLink, E-Prime, PsychoPy, Psychtoolbox and other stimulus presentation solutions



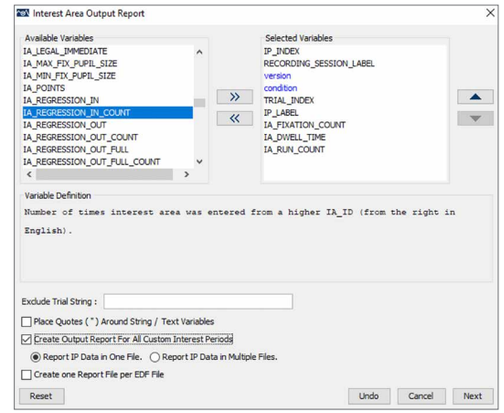
Powerful Reports

Data Viewer allows multiple data files to be loaded into a single viewing session, meaning that visualization graphics and data reports can be created for entire experiments.

Data Viewer can create output reports that contain information at the Trial, Interest Area, Fixation, Saccade, or even Sample level.

Aggregate/Summary eye movement and interest area statistics can be derived across recording data under the same condition.

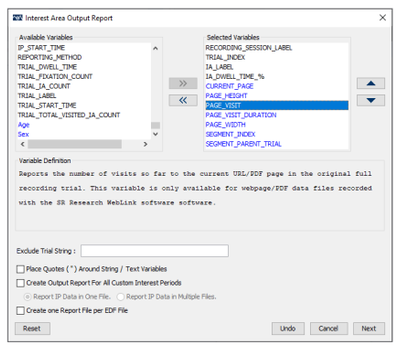
Each report type provides a wide range of variables, both basic and advanced, including many dependent measures used in reading research, such as regression count.

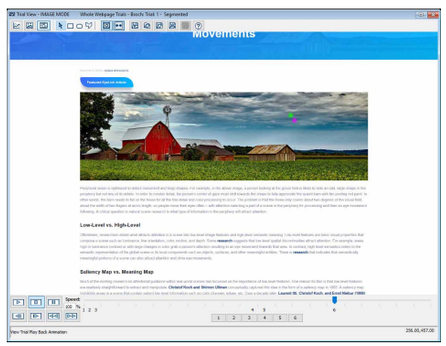


Data Viewer – WebLink Integration

Key Features

» Automatic trial segmentation based on the webpage URL
» Trials browsing the same webpage URL can be grouped together
» A timeline in the Animation and Spatial Overlay views facilitating navigation between different URLs within a recording trial
» Allows playing back the recorded trial over the entire image captures of the webpages, or over the saved video recording to view dynamic content
» Automatic scroll compensation for eye events and samples
» Output scrolling and mouse clicks data in reports
» Additional trial condition and report variables pertaining to webpage tracking





EyeLink® 1000 Plus Technical Specifications

EyeLink 1000 Plus						
	Binocular Tower	Primate	Desktop	Arm Mount	Long Range	Remote Option
Sampling Rate[1]	Monocular or Binocular 250, 500, 1000, 2000 Hz					Monocular or Binocular 250, 500, 1000 Hz
Eye Tracking Principle[2]	Pupil with CR	Pupil-only Pupil with CR	Pupil with Corneal Reflection (CR)			
Average Accuracy[3]	Down to 0.15° (0.25 - 0.5° typical)					0.25 - 0.5° typical
Saccade Event Resolution	0.05° microsaccades					0.25°
Spatial Resolution[4]	0.01°					
Noise with Participants[3] Filter (Off/Normal/ High)	1000 Hz (monoc & binoc): 0.02°/ 0.01°/ 0.01° 2000 Hz (monoc): 0.03°/ 0.02°/ 0.01° 2000 Hz (binoc): 0.04°/ 0.02°/ 0.02°					25 mm lens 500 Hz: 0.03°/ 0.02°/ 0.01° 1000 Hz: 0.05°/ 0.03°/ 0.01° 16 mm lens 500 Hz: 0.06°/ 0.03°/ 0.01° 1000 Hz: 0.08°/ 0.04°/ 0.02°
End-to-End Sample Delay[5]	M = 1.34 msec, SD = 0.20 msec @ 2000 Hz M = 1.97 msec, SD = 0.39 msec @ 1000 Hz					1000 Hz: M = 2.19 msec, SD = 0.30 500 Hz: M = 3.29 msec, SD = 0.58
Blink Recovery Time	1.0 msec @ 1000 Hz 0.5 msec @ 2000 Hz					2 msec @ 500 Hz 1 msec @ 1000 Hz
Pupil Detection Model	Centroid or Ellipse Fitting					Ellipse Fitting
Pupil Size Resolution[3]	0.1% of diameter					0.2% with 16 mm lens 0.1% with 25 mm lens
Gaze Tracking Range	60° horizontal X 40° vertical		Customizable - 32° horizontal X 25° vertical			
Allowable Head Movement	±25 mm horizontal or vertical					35 x 35 cm at 60 cm 40 x 40 cm at 70 cm (horizontal x vertical)
Optimal Camera-Eye Distance	Fixed at 48 cm	30-45 cm	40-70 cm		60-150 cm	40-70 cm
Glasses Compatibility	Good		Excellent			Good
Infrared Wavelength	940 nm	910 or 940 nm	850 to 940 nm			
Online Event Parsing	Fixations / Saccades / Blinks / Fixation Updates					
EDF File and Link Data Type	Gaze, Raw, and HREF eye position data/Pupil size/Online events/Buttons/Messages/Digital inputs					
EDF File and Link Data Type	Eye position gaze cursor superimposed on static image or position traces with camera images and tracking status					
Safety and Certifications[6]	IEC 60950-1:2005 (2nd Ed.) + Am 1:2009 IEC 60825-1:1993 + A1:1997 + A2:2001 IEC 62471:2006 (1st Ed.) UL 62368-1:2014 Ed.2, CSA C22.2#62368-1:2014 Ed., FDA 21 CFR laser products, under Laser Notice No. 50. Fiber Optic Link: Class 1 laser product, IEC 60825, CFR 21,850 nm, multimodal duplex fiber, LC connector.					

Specifications are subject to change without notice. Availability of some features depends on options purchased.

EyeLink® eye trackers are intended for research purposes only and should not be used in the treatment or diagnosis of any medical condition.

[1] Long range mount tracks up to 1000 Hz binocularly and 2000 Hz monocularly.

[2] Pupil-only tracking mode is available for use in head fixed conditions.

[3] Measured with real participant fixations.

[4] Unfiltered data measured with an artificial eye.

[5] Time from physical event until first registered sample (unfiltered) is available via Ethernet or Analog output.

[6] Applies EyeLink 1000 Plus components (GL, OC, FL-890, FL-940, DM-890, DM-940, AM-890, AM-940, PM-910, PM-940)

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Fast, Accurate, Reliable Eye Tracking

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