High Speed Binocular Eye Tracking System

ASL Model H-BN6 is a complete eye tracking system for use in situations where the subject can wear lightweight, head mounted optics and must have unrestricted freedom of movement. It includes all necessary equipment to begin work immediately. The system control units is compact in size. The optics are lightweight and mounted on an adjustable headband. The scene is recorded with a color camera that can be mounted on the headband or on a fixed tripod. The images from the eye and scene cameras are displayed on three external 9" monitors. ASL EYEPOS operating software and EYENAL off-line data analysis software programs are provided for installation on a PC or laptop computer.

◎ Data Output

The Model H-BN6 is designed to measure a subject's eye line of gaze with respect to the head. The measurement is displayed as 2 cursors or sets of cross hairs designated L and R superimposed on the image from the scene camera. A videotape of this image can be created as a permanent record and used for data analysis.

Recorded data include time, x and y eye position coordinates, and pupil diameter. External data events/marks can be recorded along with the eye tracker data. If the Model H-BN6 includes the optional magnetic head tracker, head position and orientation are also recorded.

Model H-BN6 EYEPOS operating software provides the system operator with the ability to enter calibration and subject data, and specify the operating parameters of the Model H-BN6. EYEPOS also converts the eye tracker data records into ASCII format for transmission to other computers or for off-line spreadsheet analysis. Data are available directly from the Model H-BN6 control units through a serial port (RS232). The Model H-BN6's interface PC can be connected to an Ethernet network, permitting data analysis from remote locations.

◎ Data Analysis Software

EYENAL data analysis software is a set of off-line analysis programs for displaying and processing eye position and pupil diameter data that have been recorded with the Model H-BN6. EYENAL programs identify fixations, plot scan patterns, let the user define areas of interest on the stimulus scene, tabulate pupil diameter and compute various statistical parameters.

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◎ EYEHEAD Integration

When combined with an optional head tracking device and ASL's EYEHEAD integration software, the Model H-BN6 can also measure a subject's eye line of gaze with respect to stationary surfaces in the environment. Data files generated contain the identification numbers of the surfaces being viewed (maximum of 20 surfaces can be defined), line of sight coordinates on that surface, distance from the eye to the surface being viewed, and pupil diameter. These data files can be analyzed by the EYENAL programs.

◎ Additional Features

The Model H-BN6 binocular system can be used as two separate monocular head mounted systems, when not being used in the binocular mode. The only additional requirement is a second head band and mounting bracket. In situations where the subject is to have considerable freedom of movement, a mobile configuration is available. In situations where it is not desirable for the subject to wear head mounted optics, and where complete freedom of movement is not required, the Model H-BN6 can be configured with a remote optics accessory, both monocular and binocular.

SPECIFICATIONS

◎ Control Unit:

Dimensions (H/W/D): 3 in/9.75 in/10.25 in
Weight: 4.25 lbs
Power: 100-240 VAC
25 watts
Display: 9 inch b&w monitors for eye and scene cameras

◎ Head mounted optics:

Binocular System:
Sampling and Output Rates: 120 Hz, 240 Hz or 360 Hz w/no loss of resolution
Measurement principle: pupil-corneal reflection
System accuracy: 0.5 degree visual angle
Resolution: 0.25 degree visual angle
Head movement: unlimited
Visual range: 50 degrees horizontally, 40 degrees vertically
Weight (includes headband, 2 optics modules, 2 monocles and scene camera assembly): 20 oz or 567 grams

◎ Included equipment:

Binocular System:
2 Series 6000 Control Units
Headband Mounted Optics
Head Mounted Scene Camera (color)
Display Monitors (x3), black & white
EYEPOS operating software
EYENAL data analysis software

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