

# Monocular System

## Specification

Tracking Method	Infrared video. Dark pupil. Monocular or binocular options.
Software	PC
Measurement principle	The user can select between three methods: Pupil only, corneal reflection only, or both together.
Accuracy*	Approximately 0.25° - 1.0° visual arc
Parallax Error Correction	Parallax error correction provided in the binocular system for viewing distances different from the original calibration distance.
Spatial resolution*	Approximately 0.15° visual arc
Temporal resolution	selectable by the user between 60 Hz and 30 Hz.
Head Movement	Unlimited
Scene Camera	Default camera is: Color, diagonal=70°, horizontal=56°, vertical=42°
Pupil size resolution	Measures pupil height and width to better than 0.03 mm instantaneous (no averaging).
Calibration	<p>Calibration is performed relative to the pixels of the CCD array, not the image content. This is analogous to calibrating relative to the CRT screen and not the image displayed on it.</p> <p>For accurate position of gaze, calibration is required only once per subject. New subject setup time approximately 5 minutes. Calibration settings can be stored and reused each time a subject returns.</p> <p>Easy Slip Correction feature and re-presentation of stray calibration points.</p>
Auto threshold	The program scans over the video image for the pupil and / or for the corneal reflection. The luminance threshold for discriminating these can be adjusted. The auto threshold feature provides good threshold levels automatically. Little or no manual adjustment required.
Blink suppression	Automatic blink detection and suppression.
Data recorded	<p>Eye data: X, Y position of gaze, pupil height and width, ocular torsion, delta time, total time, and fixation durations.</p> <p>Asynchronous records include: Synchronization markers, key presses, data from other programs.</p> <p>Data is stored in ASCII files.</p>
Real-time communication	<p>Same computer: Software Developers Kit (SDK) supplies everything you need for seamless interface between ViewPoint and your program. This includes: DLL with shared memory, .h and .lib files plus sample source code written in C Language.</p> <p>Serial port:</p>

Sends eye data packets and asynchronous packets equivalent to information in ASCII data files at rates of up to 56K.  
Receive real time data from other programs and store it asynchronously into data files.

**AnalogOut option:**

Selectable unipolar or bipolar voltage ranges: +/- 10, 5, 2.5  
Selectable data items: position of gaze (x,y), pupil (h,w), velocity (dx,dy), and raw pupil, glint or vector data. TTL capabilities. 2, 4 or 8 channel options.

**TTL in/out option:**

Eight TTL input channels are interfaced to place marker codes into the *ViewPoint* data file or to trigger instructions.

Eight TTL output channels that can indicate for example when the position of gaze is inside *ViewPoint* region of interest areas ROI-0 to ROI-7.

**Ethernet:**

full real-time synchronization across machines via the ethernet.

**Real-time display**

Gaze position and fixation duration displayed over scene image as the subject views it.

Real-time pen plots of X and Y position of gaze, velocity, ocular torsion, pupil width and pupil aspect ratio etc.

**System requirements:**

OS: Windows XP, Vista  
Machine: 2.8 GHz Pentium 4 or higher  
Athlon XP 2800+ or higher

**OEM Support**

The *ViewPoint* software can be configured to accommodate a wide variety of OEM hardware. Resolution and accuracy will then depend on the OEM camera and hardware configuration.

