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NEUROSPEC
Research Neurosciences

VISIONTRAK

## DESKTOP REMOTE EYE TRACKING

VisionTrak™ Desktop 300, designed by ISCAN Inc., is a remote binocular eye tracking system that is used to collect pupil size, eye movement parameters and eye point of regard data from human subjects. This system allows the subject to be seated comfortably without the use of a chin rest while the researcher controls the data collection process at a separate console. Both eyes are viewed using a specialized remote infrared (IR) video camera system. Distinctive system features allow for quick and accurate data collection and analysis for a variety of applications and environments.

DESKTOP 300
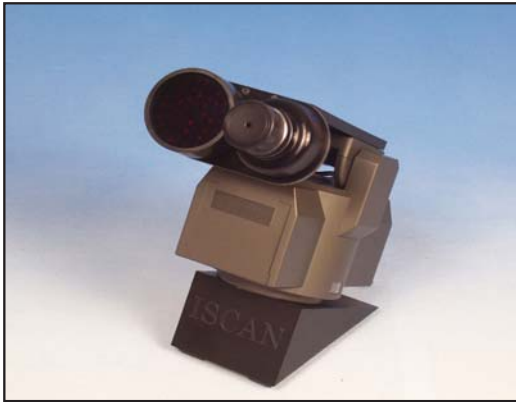
▶ APPLICATIONS

▷ **Vision Research**

▷ **Psycho-visual Experiments**

▷ **Drug or Alcohol Response Testing**

▷ **Reading and Language Studies**

▷ **Advertising Research**

▷ **Driving Research**

▷ **Handicapped Communication**

▷ **Website Evaluation**

FEATURES

Freedom of Head Movement
With nothing attached to the head, the subject can move within an X, Y, Z envelope of approximately a cubic foot.

Easy and Flexible Setup
System set-up and subject calibration are both simple and flexible. VisionTrak Desktop 300 is fully functional under dark or bright ambient lighting conditions, with a wide range of subject acceptance including eyeglasses, sunglasses, contact lenses or drooping eyelids.

Camera Control 300 System
The integrated pan/tilt system is used to direct the camera and automatically follows the subject's eye. The solid state IR illuminator is imperceptible to the subject, and well below OSHA intensity limits. Camera focus control is easily adjustable.

Binocular Eye Imaging/Tracking
Robust dark pupil tracking methodology automatically distinguishes the pupil from other dark shadows or eyelashes in the eye images. The system has an effective sub-pixel resolution of 1500H x 2000V for both pupil and corneal reflection position measurements, and true, real-time standard 60Hz or optional high speed 120Hz/240Hz data update rate.

Data Collection
Real-time, fully operator-configurable scrolling graph displays of the data are included with provisions for analog, digital and serial auxiliary data inputs and outputs. Once collected, data can easily be reviewed, exported or stored directly on the system. The system offers operator and subject video point-of-regard overlay display outputs. Typical point of regard accuracy is better than one-half degree over 25 degree horizontal and ±20 degree vertical range.

Data Calibration
All data collection and calibration procedures are performed from the operator's console using simple eye angle calibration procedures with built-in fixation monitoring. The system uses easy visual point-of-regard calibration using either 5 or 9 calibration points. These selectable point-of-regard calibration models use both pupil and corneal reflection.

Data Analysis
Sophisticated, optional point-of-regard analysis software automates post collection analysis of a variety of pupil and eye movement parameters. The software allows the recorded parameters to be displayed as raw data in tabular and graphical formats. This system provides automatic computation of average, maximum, minimum and standard deviation of any recorded parameter.

VISIONTRAK DESKTOP

SYSTEM COMPONENTS

HARDWARE

VisionTrak Desktop 300 Imaging System

This system features an integrated solid state, low-level infrared illuminator and infrared sensitive eye imaging camera. The illumination is invisible to the subject. The camera and illuminator assembly is mounted on a pan/tilt platform which automatically follows the movement of the subject's head to keep the eyes in the center of the camera's field of view. This auto-follow mode is effective within a ± 6 inch horizontal by ± 6 inch vertical by ± 6 inch forward-and-back range of the subject's head movement, as long as the subject remains facing the stimulus area. Subject-to-camera distance may be adjusted over a range of 18-36 inches.

Eye Tracking Processor

The eye tracking processor automatically tracks the center of a subject's pupils, the reflection from the corneal surfaces, and measures pupil size, all in real-time. Horizontal and vertical crosshairs automatically center themselves over the pupil and corneal reflection to indicate proper tracking of the two targets. Calculation of the eye landmarks is accomplished in real-time with a transport delay of only a single video frame.

Monitors and Cables

VisionTrak Desktop 300 System includes a Pentium® based computer system, SVGA color LCD monitor keyboard and mouse. There are two on-screen videos on the computer monitor; one displays the eye images and the other displays the scene image with superimposed point-of-regard.

Auto Calibration Processor

The autocalibration processor accurately calculates the subject's point-of-gaze with respect to a scene being viewed by using the raw eye position. A scene video camera, VCR output or converted computer display output provides the scene information input to the autocalibrator. An on-screen 24-hour clock is used for video frame-by-frame analysis of the output data.

SYSTEM OVERVIEW

VisionTrak Desktop 300 is a specially designed combination of mechanical, electronic and optical components enabling the operator to easily acquire a clear, in-focus image of the subject's eyes with a remote camera. This assembly is setup on a table or desk in front of the subject and the operator can easily control the focus of the eye imaging system.

SOFTWARE

Data Acquisition, Control and Analysis

The Raw Eye Movement Data Acquisition Software (DQW) for Windows® XP allows the operator to completely control the data acquisition process with instrumentation control, data recording, and review features. This program allows eye imaging and tracking to be monitored for any subject from the operator's console. Calibrated or raw eye movement and auxiliary data can be output in real-time to other devices. The software includes provisions for file storage in native binary and ASCII formats along with complete data review capabilities.

Auxiliary Outputs, Inputs and Syncrinization

Standard system - 4 TTL inputs
4 TTL outputs
3 Analog outputs

System Upgrades and Options

The following upgrades and options are currently available for the VisionTrak Desktop 300 System:

High Speed Remote Eye Imaging Systems Upgrade > **Sample rates up to 240Hz**

Head Tracking Systems > **Monitor subject head movements**

Auxiliary Data Input and Output Cards > **Additional analog or digital data collection or output**

Advanced Point-of-Regard Analysis Software > **Analyze fixations of multiple subjects at once**

Scene Camera > **Allows correlation of point-of-regard to the subjects field of view**

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