



Digital stereo visualisation for ophthalmology



CO-OBSERVATION - SLIT LAMP IMAGING - SURGICAL SKILLS TRAINING - DRY LAB - WET LAB - MIGS TRAINING

## SLIT LAMP IMAGING SYSTEM

A full HD stereo camera within the optical system of a slit lamp enables glasses-free stereoscopic viewing through the DRV along with the ability for 3D video/image capture. Captured imagery can be played back in stereo on the DRV or in mono on a regular monitor.

The DRV delivers a widescreen digital stereo 3D image. Interfaced with the slit-lamp microscope, the DRV enables real time stereoscopic co-observation of the patient examination delivering superb image quality, depth and magnification parity with the optical image.

#### **Slit Lamp Biomicroscopy**

A difficult skill to learn and to teach. In clinical practice, slit-lamp cameras have been shown to accelerate the learning curve for slit-lamp examination skills. Due to issues with exposure and a lack of stereoscopic image, it's often difficult to capture meaningful training materials.

By connecting the slit-lamp microscope to the DRV, observers can view or capture the real-time video feed in 3D for an immersive experience.

#### Slit Lamp Teaching

The 3D camera system within a slit-lamp can output a stereoscopic video in real time to a DRV, facilitating high-fidelity training and an accelerated learning curve for clinical skills. For an immersive training experience, the DRV can output in stereo to multiple DRV's or to 2D or 3D monitors for presentation purposes. Whether demonstrating or supervising, procedures can be observed in real-time or recorded in 3D for later review.

**אגכ** 



"The quality of the DRV stereo image is superb. The high resolution emulates the slit lamp image well and concurrent real-time viewing of clinical findings in true 3D for both trainee and observer is unique. What's more the observer does not require 3D glasses to view, the DRV image presents a "floating" 3D image in front of the system."

#### Dan Lindfield, BM MRCOphth PGCME FRCOphth

**Royal Surrey County Hospital** 



The DRV-MZ1 combines a digital stereo display with a microscope which brings significant benefits over conventional table top microscopes. Its ergonomic design improves operator comfort, enabling users to practice for longer periods.

Sub-speciality procedures for glaucoma, retina, cataract and corneal surgery can be rehearsed and refined to ensure competence and confidence.

A significant benefit of the DRV-MZ1 is that it facilitates high quality video recording. Captured video recordings are of the same view as what was seen by the operator, which differs from conventional table top microscopes where the recorded video often suffers from low refresh rate and disparity of the field of view, focus and colour rendition, when compared to the view that is seen by the operator.

### Minimally Invasive Glaucoma Surgery Training

The design of the zoom microscope module allows adjustment of the viewing angle which, combined with an engineered holder to mount the model eye, simulates the position and angle of a patient's eye for trainees to practice their surgical skills, for example trabeculotomy and canaloplasty.

Through the use of the DRV-MZ1 trainees in the Glasgow based surgical simulation suite are reaping the dual benefits of optical stereo microscopy and advanced digital technology in a single system. The DRV-MZ1 provides impressive levels of simulation by delivering fully immersive 3D visualisations with outstanding perception of depth.

Vision

**DRV** 

David Lockington, MB BCh BAO (Hons) FRCOphth PhD

**Gartnaval Hospital** 

# SURGICAL TRAINING

#### **Surgical Skills Training**

Traditionally, a trainer would supervise performance by viewing a monoscopic image via a teaching tube or by watching a digital image on a mono screen. Viewing only one channel means not only an absence of stereo depth for the trainer, but also raises the risk of important information being missed.

The DRV transforms teaching capabilities as work can be comfortably supervised in stereo and, by swapping seats, a trainer can easily demonstrate techniques. Connecting multiple DRV's in series allows for larger training sessions, all with stereo viewing.

# **TECHNICAL INFORMATION**



#### **Tele-Ophthalmology**

DRV's can be connected side-by-side via twin HDMI cables, or streamed across continents over networds, for real-time collaborativve analysis of data or remote consultation and Hub & Spoke teaching. All in 3D stereo.

#### **Glasses-free visualisation**

The TriTeQ<sup>3</sup> technology behind DRV's stereo image presentation overcomes the need for polarised glasses by projecting independent optical channels to the user's eyes. One channel for the left eye, the other for the right. Each channel presents the image from a slightly different angle which replicates our natural stereo vision and perception of depth.

DISPLAY HEAD		
Resolution	1920 x 1080 per ch	
Image Size on concave mirror	400 x 225 mm i 16:9 aspect rati	
Digital Zoom	2x	
Working distance (maximum)	182 mm	
INPUTS		
Power Supply	100 - 240 VAC 50 /	
OUTPUTS		
Image Capture	USB 2.0	
Video Capture	HDMI cable to an ex video capture ca	
Connection to external 2D/3D monitor	HDMI	
Connection to second or multiple DRVs	100 - 240 VAC 50 / USB 2.0 HDMI cable to an ex video capture ca HDMI HDMI daisy cha / Wi-Fi connection	
STAND		
Counterbalanced stand with 150 mm vertical travel		
Fully adjustable sub-stage illumination	Optional	
ZOOM MODULE		
Module with 10:1 optical zoom and fully adjustable surface illumination		
WEIGHT		

#### DRV-MZ1 optical data

Objective Lens	Zoom Range	Working Distance 'A'	Field of View at MAX. zoom	Field of View at MIN. zoom
0.33x	6.1x - 61x	182 mm	6.5 mm / 3.7 mm	65 mm / 37 mm
0.4x	7.4x - 74x	138 mm	5.4 mm / 3.0 mm	54 mm / 30 mm
0.5x	9.3x - 93x	93 mm	4.3 mm / 2.4 mm	43 mm / 24 mm

SCM003	
Image Sensors	1 / 2.8"
Channel Resolution	1920 x 1080 (per channel)
Pixel Size	2.9 μm
Colour Depth	8 bit
Power Source	5 V via USB
Power Consumption	4.9 W
Video Transmission Method	2 x HDMI
Frame Rate	60 fps
Aperture Control	Yes
Beam Splitter Ratio	70% Eyepieces - 30% Camera
Power and Video Ports	Located on bottom of Camera
Dimensions (L x W x D)	234 x 120 x 80 mm

