



revolutionizing
the world of
microscopy

RoboticScope

HEAD-GESTURE CONTROLLED 3D VISUALIZATION



BHS Technologies RoboticScope® is distributed in the BeLux by:



DUOMED

Enter a new era of true digital surgical microscopes with the RoboticScope

RoboticScope, the new and innovative way for your visualization.

At BHS Technologies, we view things differently. So, we developed a microscope that gives the surgeons their freedom back. The RoboticScope combines the concept of a traditional microscope with the advantages of a completely new digital system. With the RoboticScope and our Head-Mounted Display (HMD), we detach the surgeons from the microscope. Hence, releasing them from constraints of a typical microscope. This gives back total freedom in posture, position and perspective to the surgeons. The RoboticScope uses state of the art robotics technology

to precisely guide the camera system above the surgical field, without the need of the surgeons' hands. Everything controlled by intuitive head gestures. Reach perspectives with ease and have the real-time, high-resolution, 3D imagery right where it is needed: in front of the surgeons eyes. This enables the surgeon to keep their most essential instruments - their hands and eyes - on the surgical field while enjoying complete ergonomic freedom. Sounds like the future? With the RoboticScope it is the present.



Head-Mounted Display

We are putting the visualization right where surgeons need it: in front of their eyes. With the RoboticScope, the surgical field is always in view while still allowing the switch between micro- and macroscopic tasks with ease.



Ease of Perspectives

Surgeons can switch and choose between perspectives or even find and work in extreme angles with ease. All, while surgeons are still completely free in their working posture.





Scan to see the RoboticScope at work!



Enhanced Ergonomics

Our technology detaches surgeons from the microscope, to provide freedom in choosing the best working position that fits their individual ergonomic needs. Think of the advantages in posture and potentially avoided physical problems.



Head Gesture Control

The complete functionality of the RoboticScope can be controlled with easy to use and intuitive head gestures. Surgeons don't have to put down their tools anymore.



A system for your benefit.

Camera Unit

- × Merged 4K resolution (4928 x 2056 px)
- × Produces and transports a high quality 3D live image from the surgical field to the HMD
- × 2x LED lightning
- × 11x zoom lens
- × Absolute magnification 2.7 - 30.1 x

ArcView

- × Additional optical redirection system (+ 45°)
- × Extended Range of viewing angles

6-Axis Robotic Arm

- × Precision ± 0.03 mm
- × Max. range 1840 mm
- × Enables exact movements of the camera, even viewing the smallest structures

3D-Joystick

- × To position or fine-tune viewing angle of the camera head over the surgical field



Head-Mounted Display

- × Presents a live view of the surgical field
- × Enables hands-free control of the visualization system and offers undistracted focus on the surgical field
- × Integrated eyepiece lifting mechanism, to switch between micro- and macroscopic views
- × It is well balanced, carries two 4:3 displays (2x 1600 x 1200 px) – matching human discernible visual acuity



Footswitch

- × Single button footswitch to activate User Interface for control input
- × Safety Feature set up as a dead man's switch





Digital System

- × Provides the option to keep the system up to date
- × Enables optimized troubleshooting via remote support

Touch Screen

- × User Interface for unsterile device control, e.g. assistant control
- × To display the surgical field for the OR staff
- × To prepare the RoboticScope along an easy to follow guide

Connection Panel

- × Interface for input and output of the RoboticScope
 - × 2x HMD, 2x HDMI IN, 1x Footswitch, 1x LAN, 1x DisplayPort OUT, 1x Microphone IN, 1x USB, 1x Power- & 1x Earth connection
 - × Connect with external screens for effortless observation by OR staff; standard 3D displays are supported

Scan to find all detailed technical data online.





Enhanced Ergonomics

As the surgeons are working detached from the RoboticScope, they are free to choose their preferred working posture. Together with the HMD, surgeons do not have to worry where to look, as everything is in sight.

The RoboticScope allows the surgeons to be completely immersed into the surgical field, while keeping a comfortable working position. Whether sitting, standing or in the posture that feels or works best. In case the surgeon wants to switch their posture, they are completely free to move at

any point during a surgery. Switching between a micro- or macroscopic procedure is simple. With an upwards head nod, the surgeons can raise the eyepieces. And with a simple tap on the footswitch, they may continue microscopically.



Full flexibility

Put the HMD on, sit straight, relax the shoulders – and let the robotic arm do the work. Choose the Orbit Mode and reach angles that used to be hard or even impossible to reach.

Collaboration

Share the view with a second HMD, e.g. for assistance or supervision.

Personalizable

The HMD is easily adjusted to fit the surgeon. Insert different pad sets, adjustable to head size, eye distance or diopter in fine increments.



Head-Mounted Display

Our patented Head-Mounted Display (HMD) is the main control device to operate all main functions of the RoboticScope.

Directly in front of the surgeons' eyes, the HMD carries 2 digital micro displays to bring a real-time 3D image where it is needed. Furthermore, it is THE interface for surgeons to control not just the robot and/or camera, but for all important functions of the RoboticScope, easily with head gestures.

Intuitively change perspective, zoom, focus, snap pictures or videos. Switch directly between previously saved perspectives, adjust light intensity and more. All of the features are provided via our User Interface in the HMD. Surgeons can do all this without removing their hands out of the surgical field.

Access the entire set of functions through our User Interface, that is shown and described on the next page. Simply press the footswitch to activate the User Interface in the HMD, then navigate and choose the desired function. Once completed, release the footswitch and the setup will remain until the surgeon actively adjusts.

DualView

Redefining teamwork in microsurgery

DualView also provides the benefits of the RoboticScope to the assisting surgeon. With our advanced digital image processing, the assisting surgeon receives the same high-quality images as the lead surgeon – just observed from their natural perspective.

All while enjoying the same ergonomic advantages and full positioning freedom around the patient.

DualView is the ideal feature for teamwork: whether for the surgery at hand, teaching, or supervising purposes. As the lead surgeon is in control of the RoboticScope, so the assisting surgeon is aware of the next steps, they can easily view the User Interface of the lead surgeon with their Assist HMD. If necessary, the assisting surgeon can always lift or lower the eyepieces independently from the Lead HMD to switch between micro- or macroscopic view.



Head Gesture Control

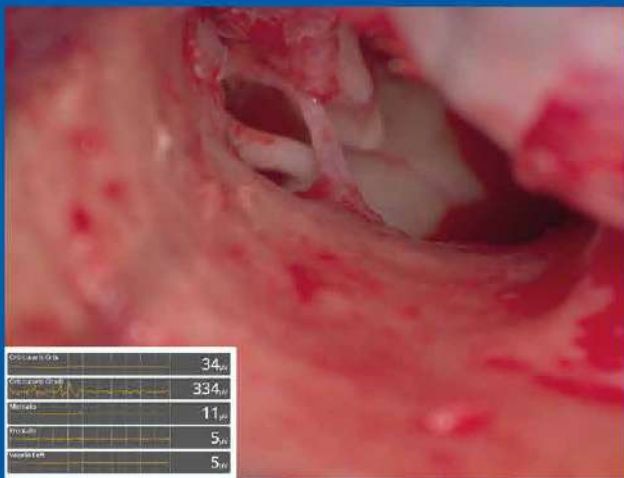
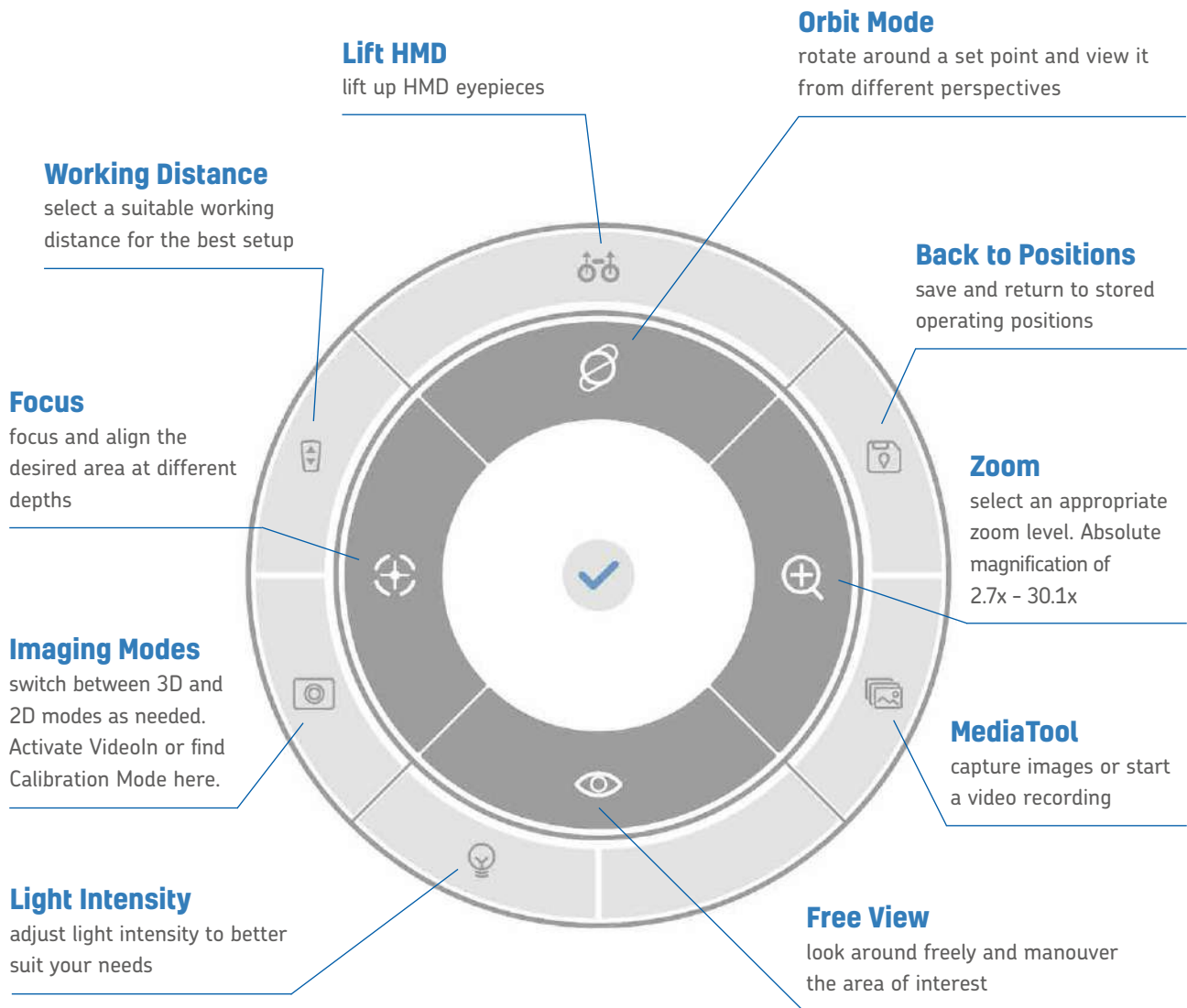
The intuitive User Interface of the RoboticScope makes it easy to select and control all functions, with the RoboticScope all features are just a head nod away.

Make all adjustments to the RoboticScope with the HMD through simple and intuitive procedures. Change the magnification, perspective or any other setting, easily - step by step.

To control the RoboticScope, all the surgeons have to do is to raise or lower their head, or simply turn their head left or right. With these head movements, the surgeons can control the robotic arm as well as navigate in the User Interface to select the functions needed.

At any given time, the surgeons are able to maintain an ergonomic, comfortable working posture.

The User Interface in the HMD is clustered in a way to support an efficient workflow. The inner function ring provides all crucial tools to operate the RoboticScope. Further secondary features are situated in the outer function ring.



VideoIn

Attach an external, standard HDMI video source and have the stream displayed picture-in-picture in the HMD.

Stream external video input in the HMD

As soon as the HDMI input is attached, the streaming, position, and the size of the input in the HMD can be activated and controlled with familiar head gestures.



Ease of Perspectives

The 6-axis robotic arm enables precise 3D movements of the camera unit over the surgical field. Providing the ultimate freedom in the choice of perspectives.

With a precision of ± 0.03 mm, the RoboticScope ensures that any change in perspective, even while viewing the smallest structures, can be chosen or adjusted with highest precision. By using light and intuitive head gestures, the surgeons can define direction and speed of the movement. Therefore, easily change the operating perspective, all completely hands-free.

With the RoboticScope, viewing angles that could potentially be difficult to reach or work in with a traditional microscope, can not only be found, but maintained with ease for extended periods of time.

Predominantly for ENT, plastic- and neurosurgical needs, we created a new and innovative system for visualization.

Made in Austria: our optics are developed and meticulously assembled directly in our headquarters in Innsbruck.



Free View

With Free View, the surgeons can oversee and/or explore the surgical field freely, until they find their point of interest.



Orbit Mode

With the Orbit Mode, the point of interest is kept centered, allowing the surgeons to maneuver/orbit freely around this point, to get the perspective they want.



Zoom & Focus

Adjust or move the focal point between different depths or switch between different zoom levels for the optimal view.



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