IC3D Digital Camera

The Leica IC3D Digital Camera (Leica Microsystems, Welzar, Germany), originally was developed for use with desktop laboratory microscopes. Th e IC3D has a dual 3.3 Megapixel sensors providing a resolution of 2088 1550 pixels.

More technical details regarding the camera can be found on the developer website (http://www.leica-microsystems.com/).

We found it to be compatible with the Leica surgical microscopes (Leica M520 MS2 ULY500), and with suitable adapters we have also used it with other brands of microscopes (Zeiss Pentero microscopes). Th e IC3D digital camera mechanically connects with the microscope eyepiece, sitting between the eyepiece and the objective lens.

IC3D is connected and powered through IEEE 1394a High Speed Serial Bus (also known as FireWire 400) to a desktop computer with the Planar SD2020 (Planar Systems Inc., Beaverton, Oregon, USA) monitor.

The Leica Stereo Viewer v1.2 (Leica Microsystems, Welzar, Germany) is used for operating the camera, although other digital Twain camera software can be used.

Th e IC3D camera is connected to the microscope before this is balanced and draped. At this point, the IC3D can be connected to the computer and tested without affecting the operating theatre workfl ow. Focusing is a crucial step in the whole procedure. The addition of the IC3D in-between the objective lens and main eyepiece aff ects the focus of the image seen through the latter. When the image is focused through the IC3D onto the computer screen, the image is out of focus through the eyepiece when set to 0 dioptres, necessitating calibration of the eyepieces to the surgeons individual sights.

Once the microscope and the IC3D camera have been focused, everything else is done entirely through the computer, including capturing images. A 2D image can be viewed on the computer screen in real-time allowing for adjustments of the systems visual fi eld and after image acquisition the image can be reviewed in 3D [1)].

1)
Barone DG, Ban VS, Kirollos RW, Trivedi RA, Bulters DO, Ribas GC, Santarius T. Alternative cost-effective method to record 3D intra-operative images: a technical note. Br J Neurosurg. 2014 Dec;28(6):819-20. doi: 10.3109/02688697.2014.931348. Epub 2014 Jun 27. PubMed PMID: 24971491.