

Microscope With Automatic Controls

July 9 2004

Modern optical microscopes are high-tech devices with complex functions and operations. So that not just specialists can get the best out of these advanced instruments, Leica have produced a microscope which automatically selects the optimal combination of optical components.

Many modern items of equipment can do too much. It is not only when operating a video recorder or a mobile phone that you can quickly end up in the depths of some menu full of unclear functions. New features are overlooked, and even useful standard functions are often neglected - and this applies to optical microscopes too. For a long time now these magnifying instruments have incorporated a selection of contrast modes for transparent or opaque samples. Non-transparent ones are viewed using direct light. To use the various modes, lots of lenses, apertures and filters have to be selected and skillfully combined. "You have to be an expert to coax the best image out the microscope," affirms Christian Knoll, designer and engineer at the Fraunhofer Institute for Industrial Engineering IAO.

Leica have made things simpler with their new "DM5000 B" instrument: Its electronic control system links up all the interdependent optical components. The user decides on a contrast mode and the microscope automatically selects the matching optical components and their settings. "A microscope normally has lots of levers and switches, which the user has to operate by hand," explains Knoll. "For the fully automatic device we have developed a central user interface: 80 percent of the functions can be controlled by using a touch-screen in the base of the instrument." No standards existed for this type of control, however, and so the

research scientists also designed the structure of the operating menus. Here they had to deal with such problems as which symbols would be best for a language-independent system, or what happens if the user makes mutually incompatible entries. They tested the intelligibility of the control system and pictograms on people in Germany, France, the USA and Japan.

“Our aim was to let the device tell the user what it can do,” states Knoll. The research scientists therefore designed the menu in such a way that it always indicates the settings which are compatible with the mode currently selected and which other modes are available. In this way researchers can optimize the observation conditions for unknown specimens. The settings can then be saved and automatically retrieved later for further or similar investigations. Routine measurements in particular can be carried out more quickly, because even users who are not familiar with the microscope achieve optimal results after a short introduction.

Source: [Fraunhofer-Gesellschaft](#)

Citation: Microscope With Automatic Controls (2004, July 9) retrieved 19 April 2024 from <https://phys.org/news/2004-07-microscope-automatic.html>

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