Specimen Plate Diagnostics

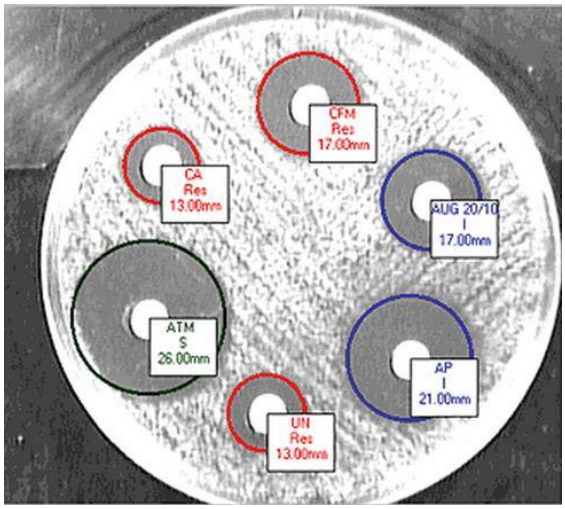
MIL and Meteor-II used to develop new imaging system for rapid reading and diagnosis of specimen plates

To facilitate the reading and diagnosis of microbiological specimen plates, a UK-based company has developed a new imaging system using Matrox Imaging Library (MIL) software and the Meteor-II PCI frame grabber.

For over 30 years, the company has developed and marketed consumables and instrumentation for microbiology. The company, with over 70 distributors world-wide, now employs about 200 people at its Liverpool, UK manufacturing site and other locations in France, Germany and South Africa.

The system consists of three software modules for carrying out different types of diagnostic tests. In the classic disc diffusion test, nutrient agar (gel) is inoculated with an organism isolated from a patient sample. Antibiotic discs are then placed on the nutrient surface to diffuse their contents into the gel. Each antibiotic will kill the organism within a certain radius from the centre of the disc. By measuring the diameter of the antibiotic spread on a look-up table, it can be determined which drug will best treat the infection.

The entire application is written in Visual Basic and makes comprehensive use of Matrox Imaging Library (MIL). The program directs the machine to locate the exact centre of the discs on each plate, reading around the zone edge 60 times. The result of each scan is color-coded on screen - red is resistant, blue is intermediate and green is sensitive. The program then calculates and displays the millimetric dimensions of the antibiotic effectiveness and delivers the interpretation.



A test plate that has been analysed by MIL

The control, image capture and processing functions of this system are based on a Dell PC, running Windows '95 - to ensure consistent quality and reliability - while the standard camera used is a monochrome PAL composite analog unit.

Observing the system at work, discs where the bacterial or viral spread is barely visible to the naked eye become crystal clear when viewed on screen. This is made possible by specially developed image enhancement in the capture and processing of each disc. The functionality of the application is a result of the close interaction between the hardware and software.

MIL's ability to do thresholds, binarize images, carry out convolutions and histogram equalizations, plus a multitude of other functions, gave the MAST development team the freedom to try out a much wider variety of system solutions than otherwise possible. Using prototyping software such as

Matrox Inspector to build up scripts, potential solutions could be tested very rapidly and then just as rapidly built into the software from the scripting process.

Meteor-II transition

The system is based on a Matrox Meteor-II capture board, to which the team was able to port much of the development work previously carried out on a Matrox Meteor. This in itself was a considerable improvement on previous development experience, when another supplier's board became obsolete and necessitated extensive re-coding for its replacement.

For more information, please contact us at info@clearviewimaging.co.uk

Original article courtesy of Matrox Imaging.