Deep Focus Module

Software Module for Creating Images with Extreme Depth of Field

Deep Focus is a so called "z-stacking" or "focus stacking" software module for the QuickPHOTO software suite. This module creates images with extreme depth of field, which cannot be achieved by a standard use of optical microscopes. The Deep Focus module can be used in conjunction with stereomicroscopes as well as with other types of optical microscopes for observation in transmitted or reflected light. The module is also suitable for macro-imaging. The whole process can be automated using a module for motorized focusing.

Standard image with only the bottom level in focus

Image with extreme depth of field composed by Deep Focus module

The Procedure of Creating Images with Extreme Depth of Field Consists of:

1. **Capturing of "Slices" Intended for Composition**
   First the "slices" (images with different focus distances) are acquired. Each image contains different parts of a specimen well focused.
2. **Composition by the Deep Focus Module**
   Only the well-focused areas are used from each of the "slices" by the Deep Focus module. The resulting completely focused image is composed from these well focused areas. Possible shifts and scale changes between slices are compensated automatically.

Automation of the Composition Process:

The whole process of creating the digital images with extreme depth of field can be automated by the use of an optional module for motorized focus control or a motorized microscope.

The automated procedure is following:

First, focus the microscope to the bottom part of the specimen and set the lower limit of the focus range. Then focus the microscope to the highest part of the specimen and set the upper limit of the focus range. Then just set the required number of slices or a step between them, click the Start button and wait for the completely focused image.

Supported Motorized Devices:

- **CB-ZM** - module for motorized focus control for optical microscopes
- several types of motorized focus drives and microscopes

Examples of Composed Images:

Minimal System Requirements:

- QuickPHOTO CAMERA, QuickPHOTO MICRO or QuickPHOTO INDUSTRIAL program in version 2.3 or higher
- Computer of the following minimal parameters:

Processor	Operating Memory	Operating System
Single-core 2.4 GHz or multi-core processor	1 GB	Microsoft® Windows® XP(SP3)/Vista/7/8/10