

DCS-120 MACRO



Confocal Scanning FLIM System for Macroscopic Objects

Confocal scanning principle

Fast scanning by galvanometer mirrors

Excitation by two ps diode lasers or tuneable ps laser

Detection in two spectral or polarisation channels

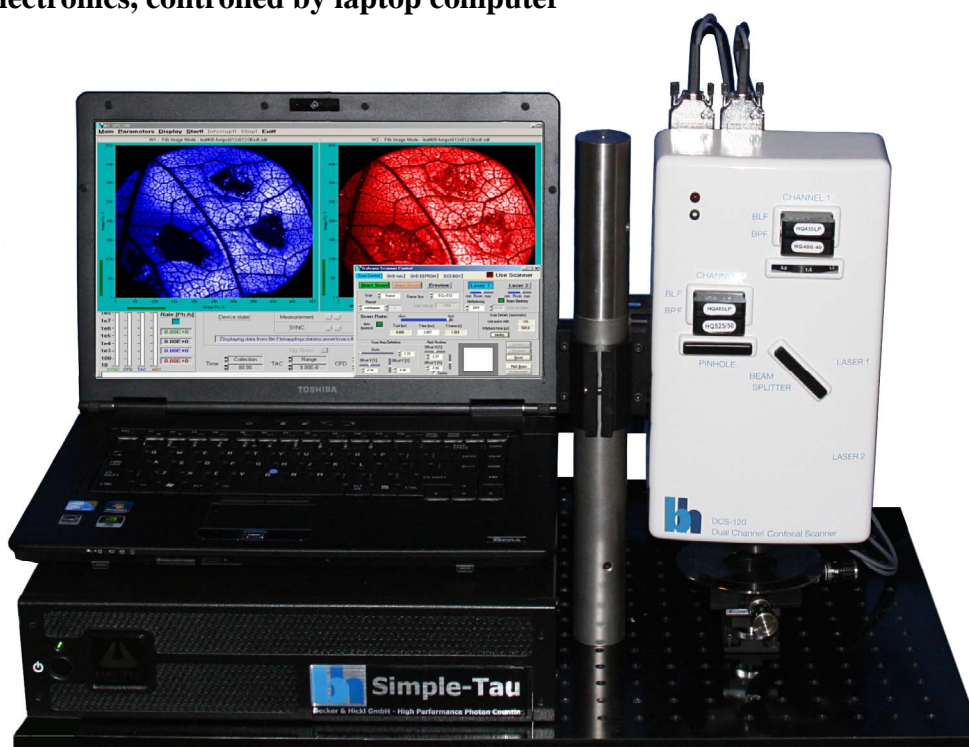
Recording by bh's multidimensional TCSPC technique

High-throughput dual-channel parallel TCSPC architecture

High-efficiency GaAsP hybrid detectors

Phosphorescence (PLIM) function included

Compact electronics, controlled by laptop computer



Scan field up to 15 mm diameter

Pixel numbers from 16 x 16 to 2048 x 2048

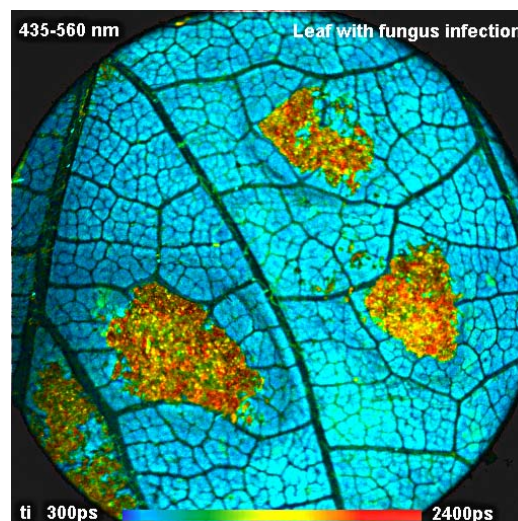
Fast preview function

Interactive scanner control

Easy selection of scan field

Beam-stop function for single-point measurement

Single, double, or triple-exponential data analysis



More than 18 years experience in multi-dimensional TCSPC. More than 1300 TCSPC systems worldwide.

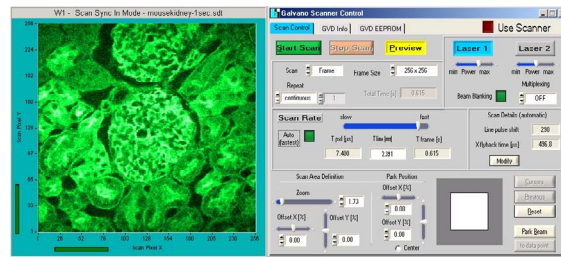
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Fast Preview Function

Intensity images displayed in 1 s intervals

Easy focusing and sample positioning

Easy selection of scan region

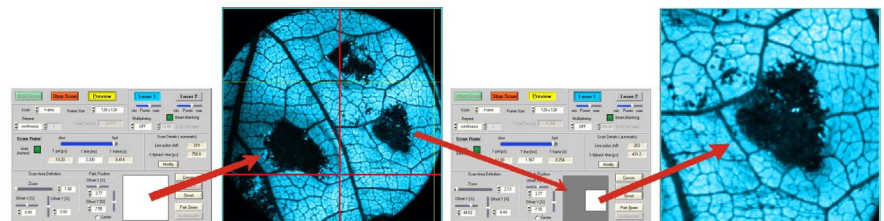


Interactive Scanner Control

Change of scan region and zoom factor via scanner panel or via image cursors

Direct user interaction during fast preview

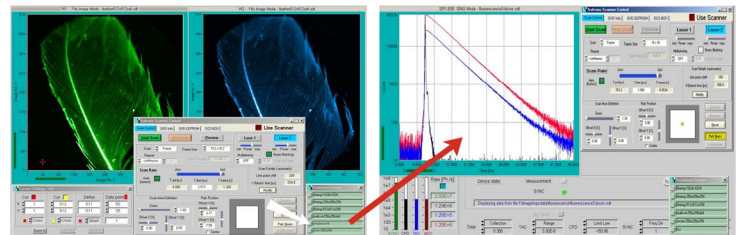
No stop of scanner required



Easy Change of Instrument Configuration

Select system configuration from list of 'Predefined Setups'

Change instrument configuration on a single mouse click



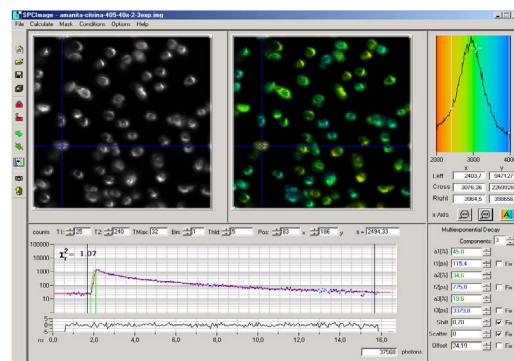
SPCImage Data Analysis

Single, double, and triple-exponential decay analysis

Display of lifetimes, amplitudes, intensities or ratios of decay parameters

Histograms of lifetimes, amplitudes, intensities or ratios

Direct interaction with SPCM instrument software



Optispec Data Analysis

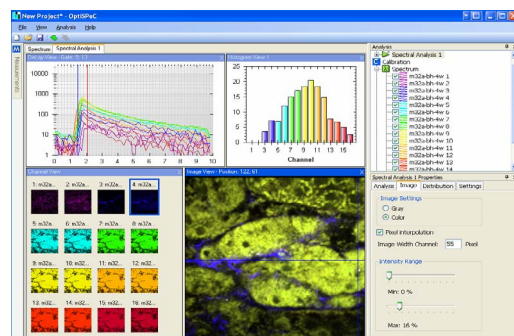
Automatic processing of multi-spectral FLIM data

Automatic processing of time-series FLIM data

Single, double, and triple-exponential decay analysis

Global fitting of selected parameters

Direct interaction with SPCM instrument software



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System Components

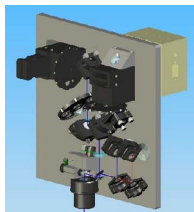
Diode Lasers



Available Wavelengths
 Repetition rates
 Pulse width
 Intensity control, electronic
 Beam correction optics
 Fibre coupling
 Power delivered into fibre:
 Multiplexing
 Beam blanking

375 nm, 405 nm, 440 nm, 473 nm, 488 nm, 510 nm
 20 MHz, 50 MHz, 80 MHz, CW
 typ. 60 ps
 1:10
 Beam-profile and astigmatism correction
 Single-mode, into Point-Source fibre
 405 nm: 1 mW, 440 nm: 0.4 mW, 473 nm: 0.4 mW, 488 nm: 0.4 mW
 Pixel by pixel, line by line, or frame by frame
 During x and y flyback, via bh GVD-120 scan controller

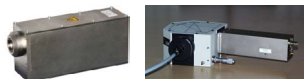
Scanner



Laser inputs
 Laser power regulation, optical
 Laser beam combiner
 Scanner
 Main beamsplitter
 Secondary beamsplitter
 Pinholes
 Filters

Point-Source Kineflex push-and click fibre manipulator
 Attenuators, 1:1 to 1:50
 Dichroic mirror
 Close-coupled galvanometer mirrors
 Dichroic 420 nm, 450 nm, 490 nm, 405/473 nm
 80:20 mirror
 Beamsplitter wheel. Dichroics 510 nm, 560 nm, polarising beamsplitter,
 100% channel 1, 100% channel 2. Other dichroics on request
 From approx. 0.5 AU to 10 AU ¹⁾
 Filter sliders, standard filters LP 435, LP 485, BP 480/40, BP535/30, BP 620/60

Detectors



GaAsP hybrid detectors
 Standard PMTs
 High-speed MCP-PMTs
 Multi-wavelength detector
 Detector control

HPM-100-40 hybrid PMT modules. IRF width 130 ps²⁾
 PMC-100-1 or -20 cooled PMT modules. IRF width 180 ps²⁾
 R3809U-50 MCP PMTs, IRF width 70 ps²⁾
 bh MW FLIM detector. Please see individual data sheet.
 Gain, cooling, overload shutdown, via bh DCC-100 detector controller

TCSPC Modules



1 SPC-150 TCSPC module
 2 SPC-150 TCSPC modules

Single-channel FLIM systems with one HPM-100-40, one PMC-100, or one
 multispectral FLIM detector
 Dual-channel FLIM systems with two HPM-100-40, two PMC-100, or two
 multispectral FLIM detectors
 High-speed FLIM systems

Scanner Control



Scan controller
 Generation of scan signals
 Image size
 Max. scan rate, time/frame
 Zoom factor
 Beam blanking
 Laser multiplexing
 Beam park function
 Scan control software
 Galvo driver amplifier

bh GVD-120 (single-slot PCI module)
 Hardware, digital signal synthesis
 16 x 16 to 2048 x 2048
 128x128: 0.32s, 256x256: 0.6s, 512x512: 1.5s ³⁾
 1:1 to 1:10⁴⁾
 During flyback, on / off selectable
 Pixel by pixel, line by line, or frame by frame
 any location within scan area
 Integrated in standard SPCM TCSPC software
 bh GVP-120

Electronics box and system computer



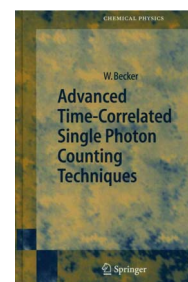
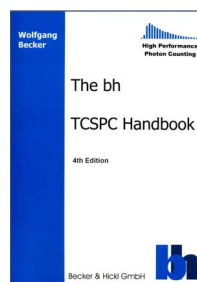
Lap-top PC with
 PCI-extension box

Extension box contains:
 1 or 2 SPC-150 TCSPC modules
 1 GVD-120 scan controller
 1 DCC-100 detector controller
 SPC, GVD, and DCC modules installed in standard PC

1) depends on microscope lens used
 2) Includes pulse width of ps diode laser
 3) maximum scan rate depends on zoom factor
 4) useful zoom range depends on microscope

Literature

- [1] DCS-120 Confocal Scanning FLIM systems, User handbook, www.becker-hickl.com
- [2] The bh TCSPC Handbook, 4th edition (2010), www.becker-hickl.com
- [3] W. Becker, Advanced Time-correlated single photon counting techniques. Springer 2005
- [4] The HPM-100-40 hybrid detector. Application note, available on www.becker-hickl.com



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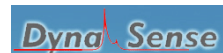
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