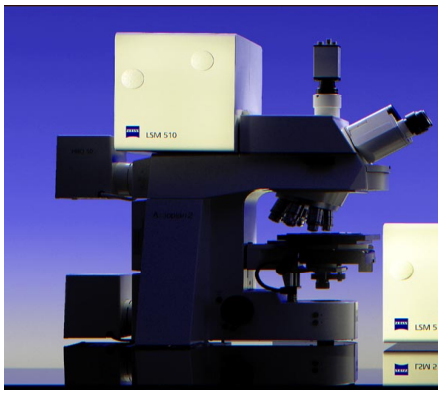
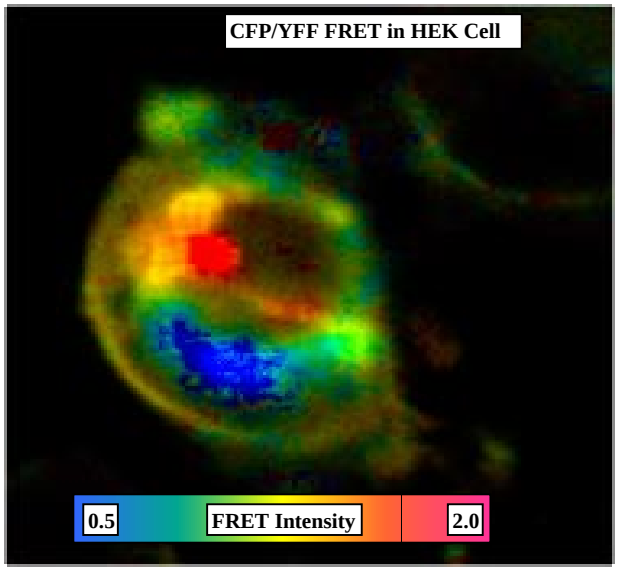
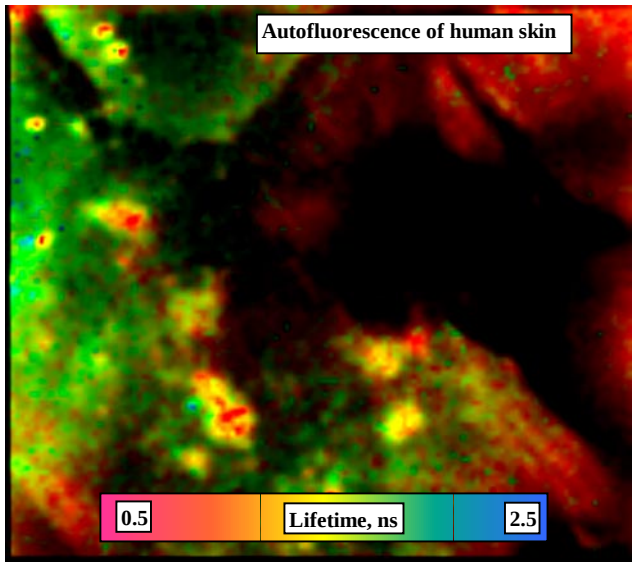
Lifetime Upgrade Kit for Zeiss LSM-510

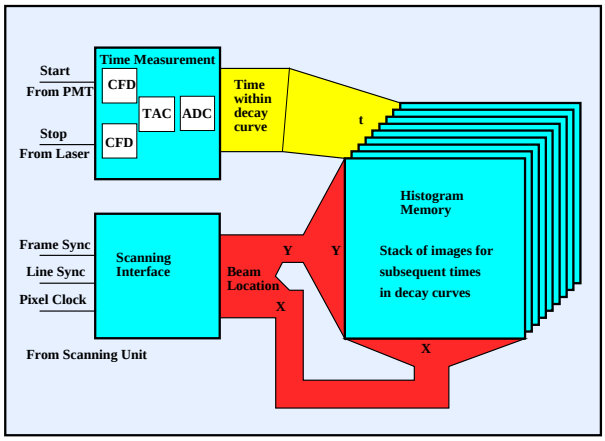
Fluorescence lifetime imaging with ps resolution
Two-photon excitation
Non descanned detection
Ultra-high sensitivity due to TCSPC technique
Zoom and image rotation functions of LSM-510 applicable
FRET experiments
Fluorescence quenching
New fluorescence probes based on lifetime changes
Separation of fluorophores by lifetime
Autofluorescence

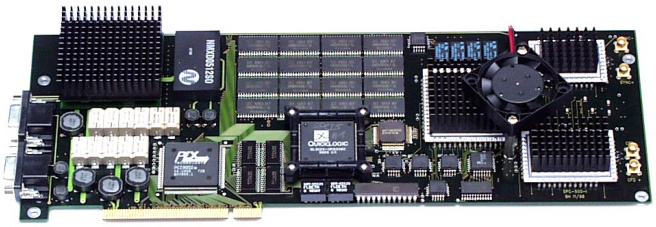






The setup employs an advanced multi-dimensional TCSPC technique featuring high count rate, near-ideal counting efficiency, and multi-wavelength capability. It contains the usual building blocks (CFDs, TAC, ADC) in the 'reversed start-stop' configuration together with a scanning interface and a large histogram memory integrated on a single PC board. For each photon the TCSPC module determines the time within the fluorescence decay function and the location within the scanning area. These values are used to address a histogram memory in which the events are accumulated. Thus, in the memory the distribution of the photon density over X, Y, and the time within the fluorescence decay function builds up. The result can be interpreted as a two-dimensional (X, Y) array of fluorescence decay curves or as a sequence of fluorescence images for different times (t) after the excitation pulse.



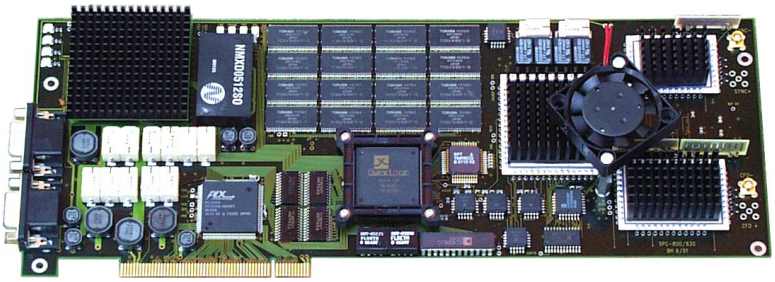


Requirements to LSM-510 Microscope
LSM-510 NLO with Ti:Sa Laser
Axiovert or Axioplan version
NDD switch box installed

Becker & Hickl GmbH
Nahmitzer Damm 30
12277 Berlin, Germany
Tel. +49 30 787 56 32 Fax +49 30 787 57 34
info@becker-hickl.com www.becker-hickl.com

US Representative:
Boston Electronics Corp
91 Boylston Street, Brookline.
Massachusetts 02445 USA
Tel: (800) 347 5445 or (617) 566 3821, Fax: (617) 731 0935
www.boselec.com tcspc@boselec.com

LSM 510 NLO FLIM Upgrade Kit

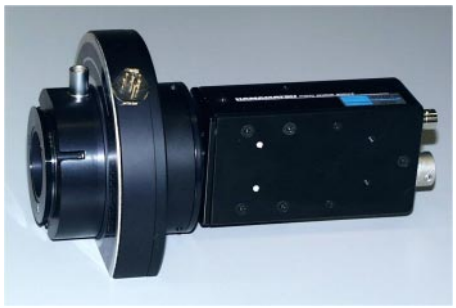


SPC-830 TCSPC module

DCC-100 detector controller

Detector Options

PMC-100 / M-SHUT-Z-NDD
Detector / shutter assembly
Cooled PMT
IRF width 150 to 180 ps
For lifetimes down to 100 ps
Dark counts typ. 20 to 50 s^{-1}
PMC-0: 300 to 650 nm
PMC-1: 300 to 820 nm
Length 135 mm [1)]
Gain control via DCC-100
Overload shutdown via DCC-100
no external components



H7422-40 / M-SHUT-Z-NDD
Detector / shutter assembly
Cooled GaAsP PMT
IRF width 300 to 350 ps
For lifetimes down to 200 ps
Dark counts typ. 20 to 80 s^{-1}
300 to 690 nm, ultra-high sensitivity

Length without cables 195 mm [1)]
Gain control via DCC-100
Overload shutdown via DCC-100
HFAC-26-2 preamplifier

R3809U / M-SHUT-Z-NDD
Detector / shutter assembly
Multichannel plate PMT
IRF width < 30 ps
For lifetimes down to 20 ps
dark counts typ. 100 to 500 s^{-1}
R3809U-52: 180 to 650 nm
R3809U-50: 180 to 820 nm
Length without cables 195 mm [1)]
Gain control via DCC-100
Overload shutdown via DCC-100
HFAD-26-01 preamplifier
FuG HCN-14-3500A HV power supply

1) Depending on the microscope configuration, space contstaints may preclude the use at one of the detector ports of the NDD switch box

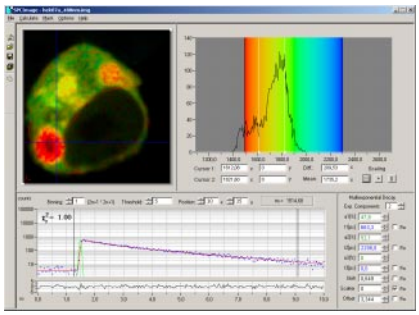
Dual Wavelength Operation

HRT-41 Router

Simultaneous operation of two PMC-100, H7422, or R3809U detectors attached to the outputs of the Zeiss NDD switch box

Uses BH's patented simultaneously recording multi-detector TCSPC principle

FLIM Data Analysis



SPCImage Data Analysis

Single and multi exponential decay analysis

Lifetime in pixels displayed as colour

Lifetime distribution

FRET intensity by double-exponential analysis of donor decay function

For more information please download or call for

SPC-134 through SPC-830 TCSPC modules, Manual and TCSPC compendium
Upgrading TCSPC laser scanning microscopes with the SPC-730 and SPC-830 TCSPC imaging modules
W. Becker, A. Bergmann, Lifetime imaging techniques for optical microscopy
W. Becker, A. Bergmann, Detector assemblies for picosecond microscopy
DCC-100 manual
SPCImage manual
SPC-830, DCC-100, PMC-100, HFAC-26 and HFAD-26 data sheets

Becker & Hickl GmbH
Tel. +49 30 787 56 32 Fax +49 30 787 57 34
info@becker-hickl.com www.becker-hickl.com