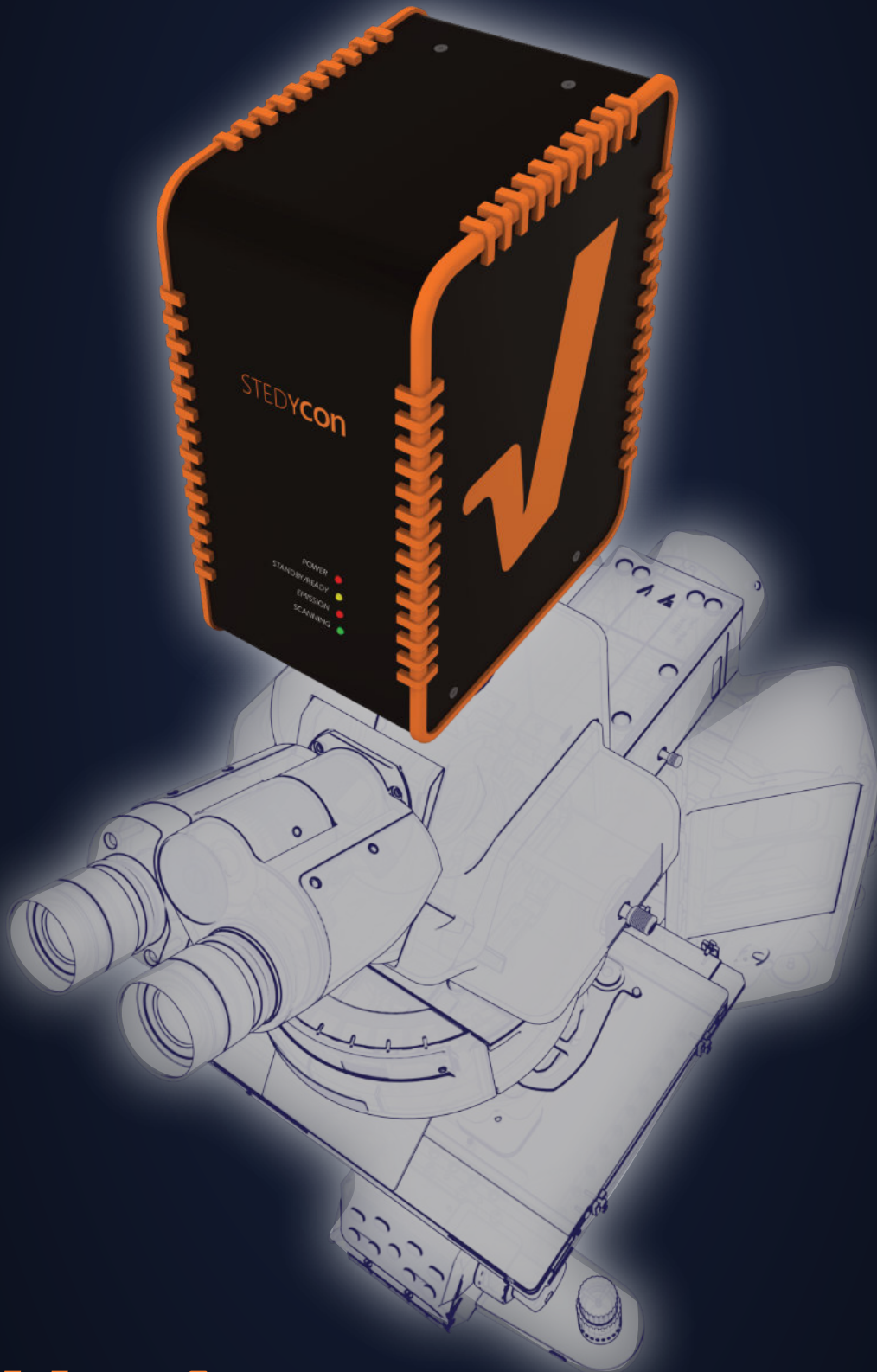
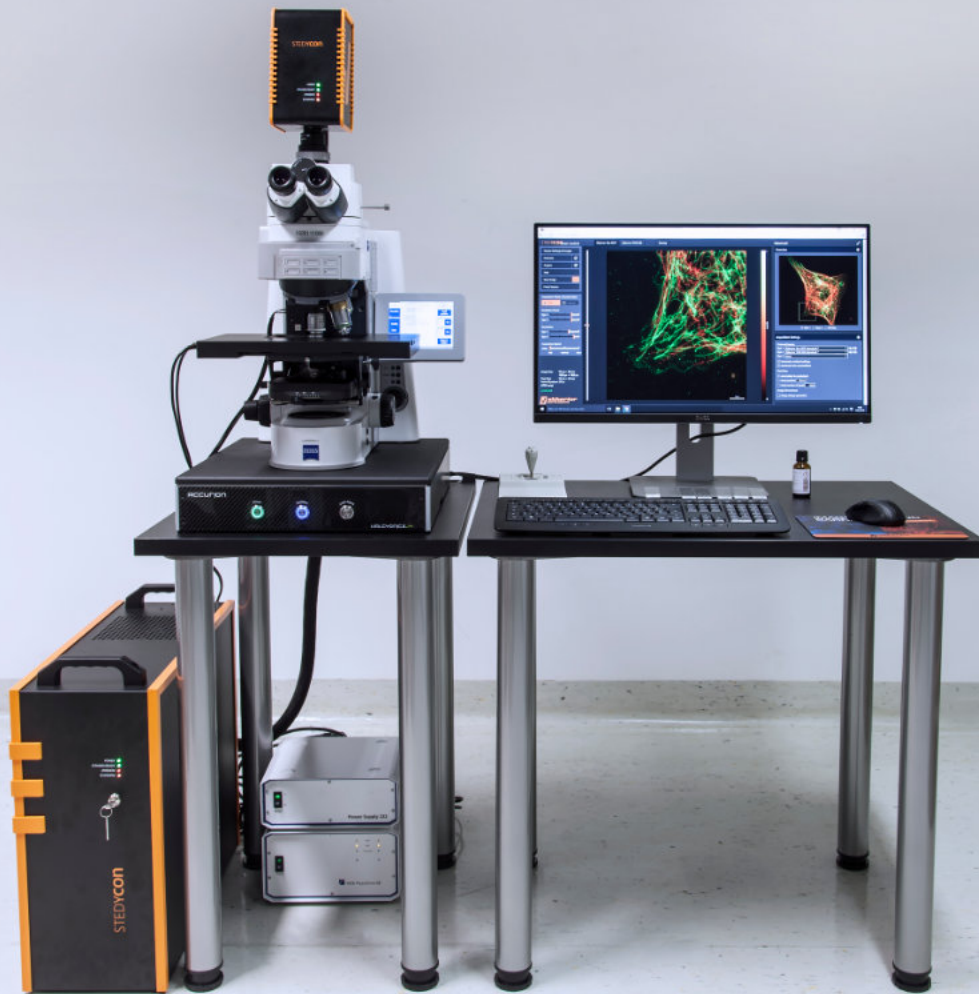


STEDYcon





The STEDYCON is a completely new class of nanoscope. It converts your existing conventional epifluorescence microscope into a powerful multicolor confocal and STED system. At the same time, it is incredibly compact and can be used by anyone. The STEDYCON has a top-notch 2D STED performance, with a resolution of about 30 nm. It is extremely compact, it comes at the size of a standard camera, and is installed within minutes.

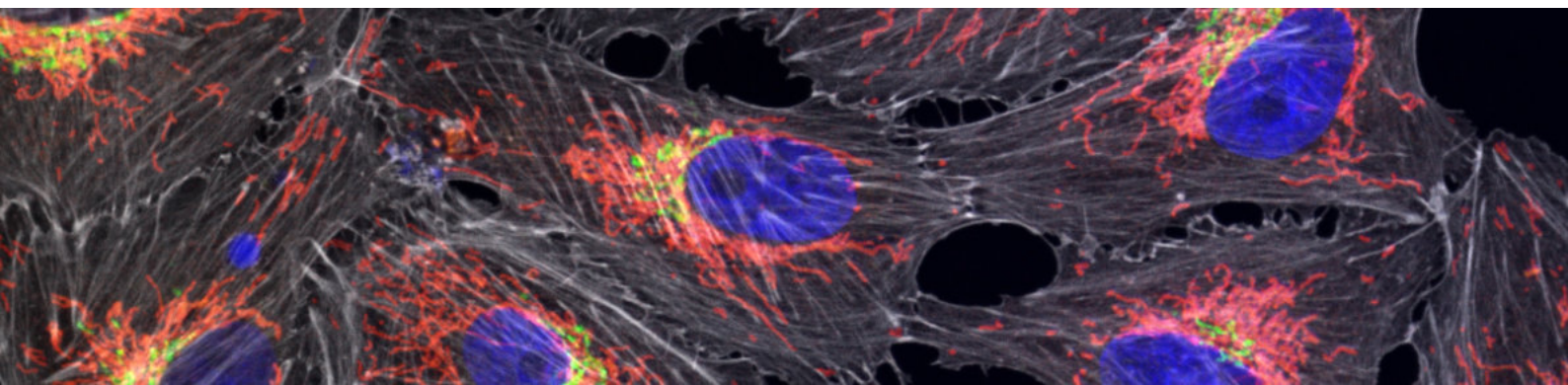
The laser beams of the STEDYCON are aligned by design as provided by its patent-protected 'easySTED' optical arrangement. All laser beams travel through the same fiber and are not separated as in other STED microscopes. Thereby the STEDYCON is alignment free!

Get your STED image at the push of a button, no post-processing is necessary - what you see is what you get. The STEDYCON works on all microscope bodies, no need to invest in a full confocal system, just recycle your already existing widefield microscope.

Feel free to explore this brochure, and don't hesitate to contact us for questions or testing of the STEDYCON.

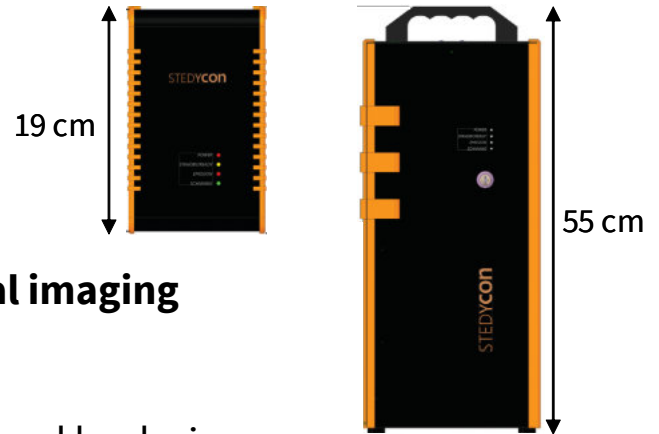
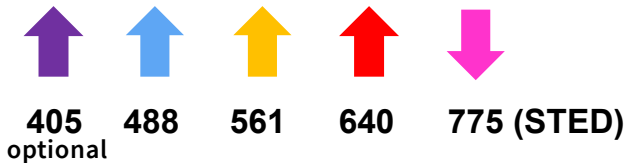
Yours sincerely,

Abberior Instruments GmbH



Specifications

✓ Pulsed lasers



✓ 2-color STED imaging / 4-color confocal imaging

✓ 2D STED resolution < 40 nm

✓ Easy - STED geometry all lasers are aligned by design

✓ Gated detection

✓ Detection 2 single-photon counting APDs

- ✓ red fluorescence
- ✓ green & blue fluorescence

✓ QUAD beam scanner 90 μm x 80 μm with 100x objective line frequency up to 800 Hz

✓ Pinhole 1.1 Airy unit with 100x objective

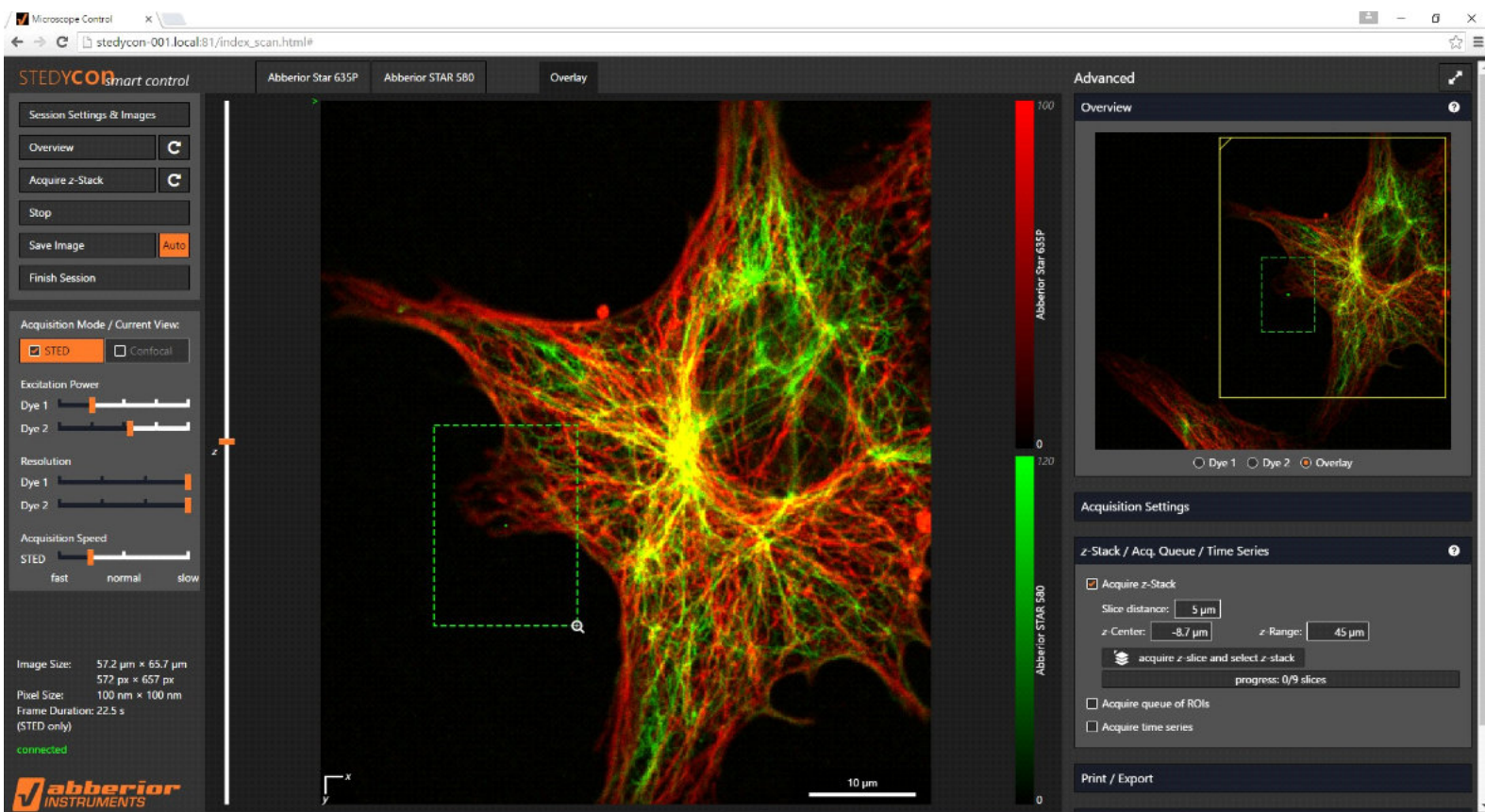
✓ 3D sectioning capability z-focusing piezo drive

✓ Imaging options xyz, ROI queues, field of view rotation, time series

✓ Upgrade with Fluorescence Lifetime Imaging unit



Software



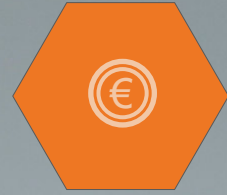
The STEDYCON can be controlled via Abberior Instruments STEDYCON smart control, a web-browser-based graphical user interface. STEDYCON smart control was designed from scratch to provide the highest possible usability completing the overall STEDYCON concept of easy installation, intuitive usage, and maintenance-free operation. Beginners can image with super-resolution within minutes. Smart control runs on every device with a modern web browser like Windows-based PCs, Linux-based PCs, Apple PCs or even tablets.

- ✓ **Intuitive operation**
- ✓ **3 clicks** from zero to your STED image
- ✓ **Only minutes of training** for confocal and STED imaging
- ✓ **Browser-based software**, platform independent
- ✓ **Image acquisition** in xy, xyz, xyzt, ROI queues, time series
- ✓ **Analysis software package** with line profiles, resolution fitting
- ✓ **Imaging mode** is line-interleaved for different channels



STEDYCON

POWER ●
STANDBY/READY ●
EMISSION ●
SCANNING ●



**BUDGET
FIT**



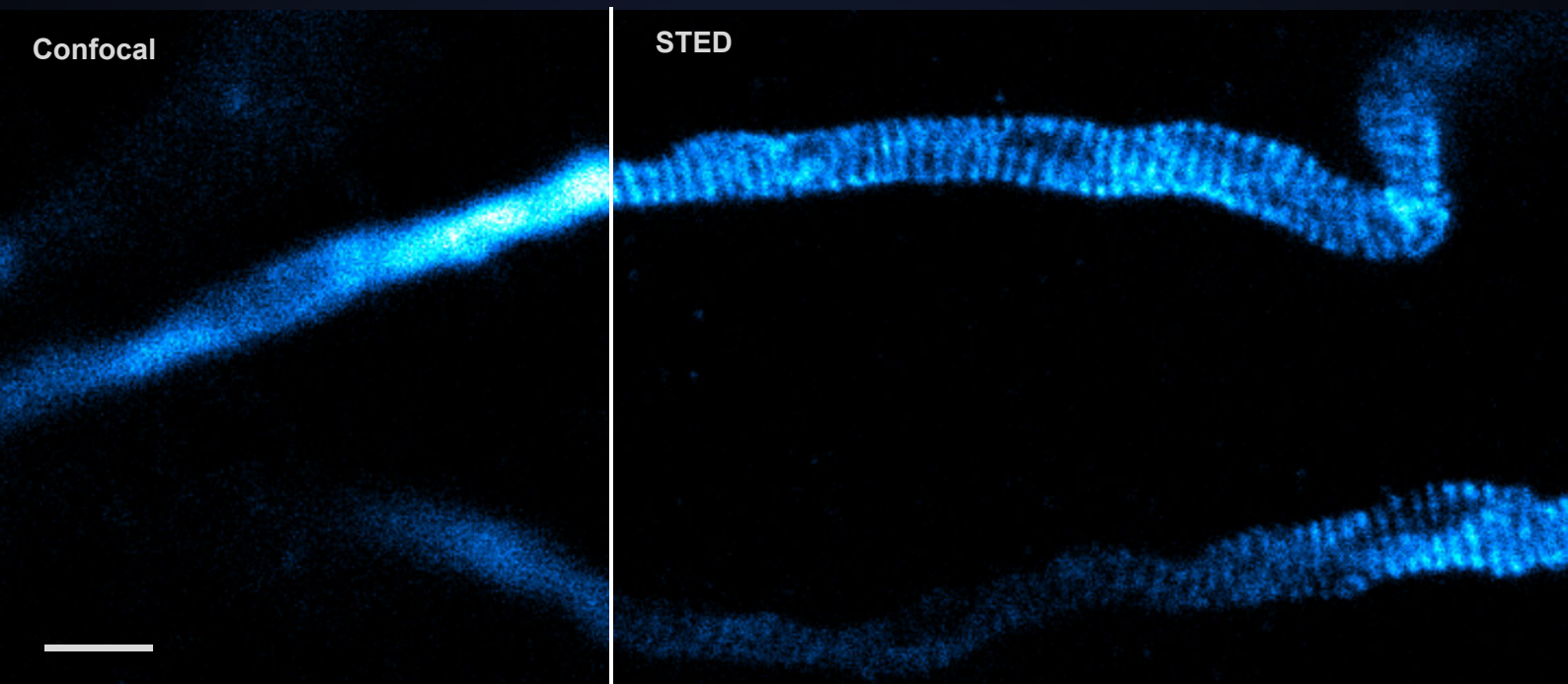
**FOR
ANYONE**



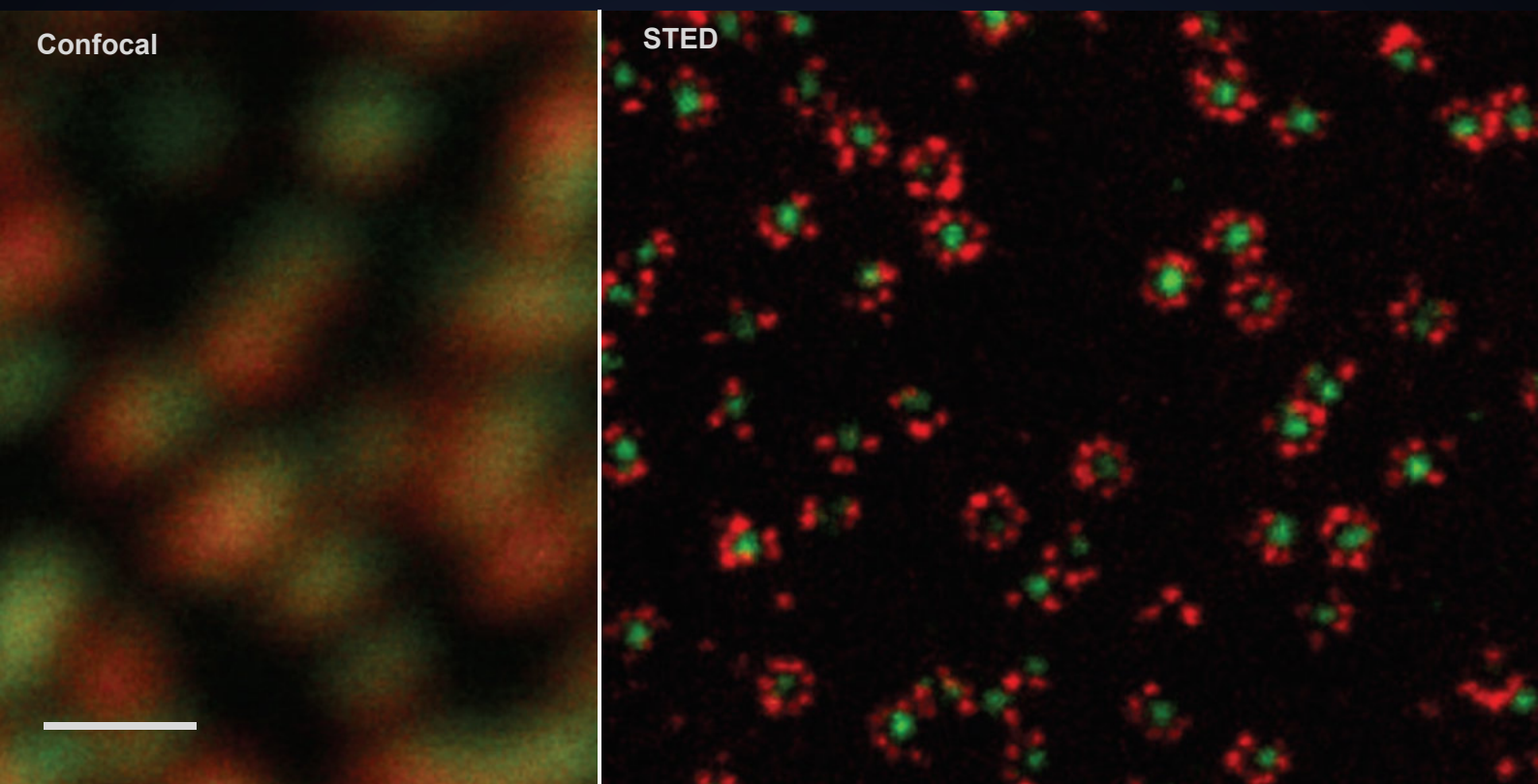
**TOP
IMAGES**

1026111080

Images







β IV-spectrin labelled with Alexa594. 20 μ m cryo-section of mouse neocortex. Sample kindly provided by Dr. Maren Engelhardt, Institute of Neuroanatomy, Medical Faculty Mannheim, Heidelberg University. Shown are raw data. Images were acquired by a STEDYCON on a Zeiss Axioimager. Scale bar: 1 μ m.



Two subunits of the nuclear pore complex were immunolabelled using antibodies against gp210 and antibodies with multiple specificities (PAN4/5) and secondary antibodies coupled to Abberior STAR580 and Abberior STAR635P. Shown are raw data. Images were acquired by a STEDYCON on a Nikon Eclipse NI. Scale bar: 500 nm.

Dyes

Abberior Instruments and its sister company Abberior bundle their expertise to provide the best dyes for your STED experience. Abberior's STAR and LIVE dyes are excellent for high quality STED imaging at highest resolutions.

	confocal imaging		STED imaging	
Exc	 405 optional	 488	 561	 640
Dyes	DAPI Hoechst Alexa 405	STAR 488 Alexa 488 Oregon Green Atto 488 FITC	STAR 580 STAR 600 Alexa 594 Atto 594 Atto 590 Cy3	STAR RED STAR 635P STAR 635 Atto 647N Atto 633
fixed imaging				
live imaging	CFP	GFP YFP	Live 580 Atto 590	SiR

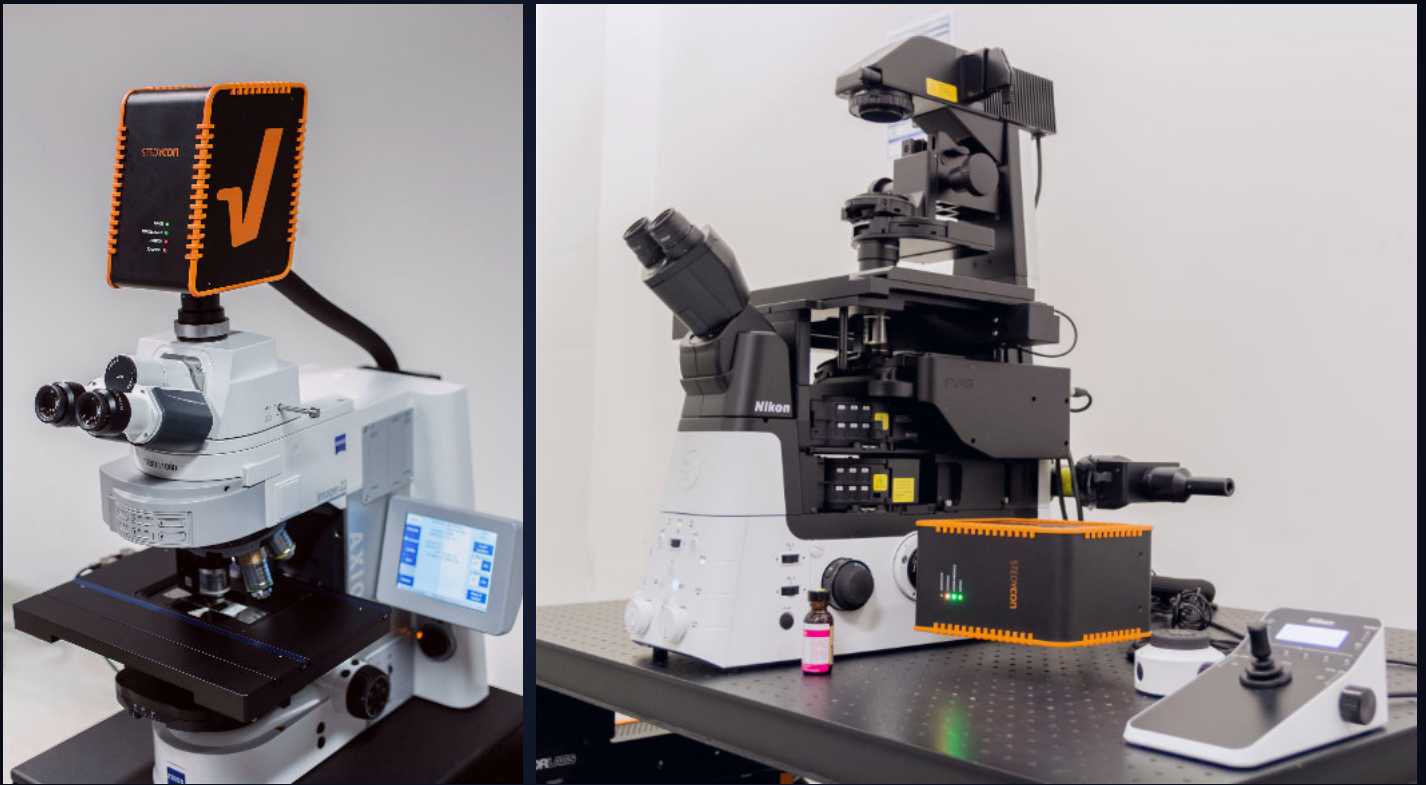
For confocal imaging only, any dyes that fit the spectrum can be chosen for 561 nm and 640 nm excitation. For STED imaging, please refrain from using blinking dyes such as Alexa647 or Cy5, as they start blinking under high laser powers.

Mounting

Standard mounting media are suitable for STED imaging. Abberior mounts are optimized for best resolution and lowest bleaching STED imaging. Two different mounting media are available from Abberior: Abberior mount solid is an aqueous mounting medium designed for confocal and super-resolution microscopy. Abberior mount liquid is designed for 3D confocal and super-resolution microscopy.

For any questions regarding dyes or mounting, please contact Abberior directly:

Compatibility



The STEDYCON is compatible with all microscope stands that have a free 100% 1x camera port (C-mount). Inverted as well as upright microscope bodies can be upgraded by the STEDYCON. Laser safety will be adjusted by us depending on the microscope body.

The STEDYCON has been successfully tested with many microscope bodies, among others in the following configurations

- ✓ **Upright microscope bodies**
Zeiss Axio Imager Z2, Nikon NiE, Olympus BX53, Leica DM2500 ...
- ✓ **Inverted microscope bodies**
Zeiss Axio Observer, Nikon TiE, Nikon Ti2, Olympus IX83/73, Leica DMI6000 ...
- ✓ **Objectives**
Zeiss 100x/1.46, Zeiss dip-in 60x/1.0, Olympus 100x/1.4, Nikon 100x/1.45 lambda series, Leica 100x/1.4 ...

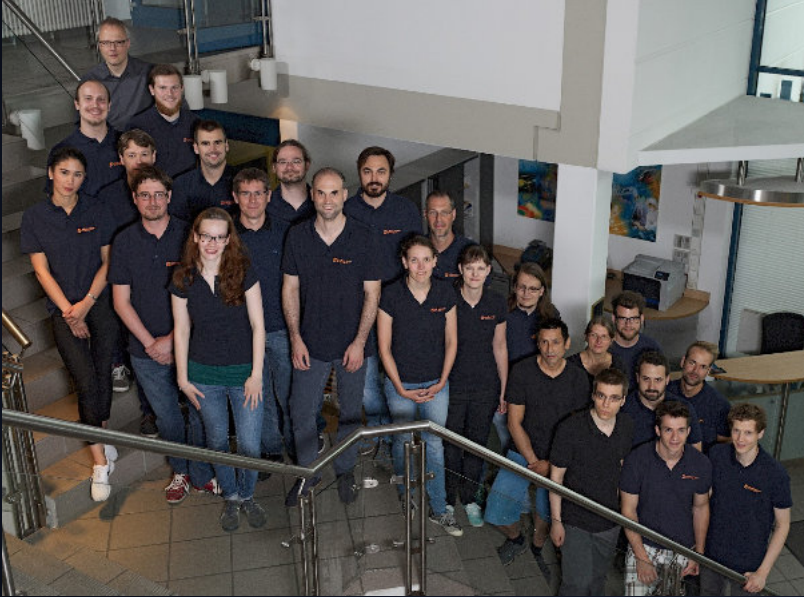
Check out our video:

Follow along with the incredibly quick installation of a STEDYCON super resolution microscope, uncut. We go from opening the box to the first super-resolution STED image in under three minutes.



Company

Abberior Instruments GmbH is a spin-off from Prof. Stefan W. Hell's group at the Max Planck Institute in Göttingen, Germany. Founded in 2012, Abberior Instruments GmbH is now a leading innovator, developer and manufacturer of cutting-edge super-resolution STED and RESOLFT microscopes, designed and built by the inventors of the methods.



The Abberior Instruments GmbH Team in our headquarters in Göttingen (Germany).

The Abberior Instruments headquarters are located in Göttingen, Germany. Our company is constantly expanding, with company locations in Heidelberg (Germany), Basel (Switzerland), Jupiter (Florida, USA) and Cambridge (Massachusetts, USA).

Why work with us?

- ✓ Connect with the **inventors of STED and RESOLFT**
- ✓ Get the **best resolution**
- ✓ Want something special? We **customize your system** to your needs!
- ✓ Short development cycles: stay **cutting-edge** with us

Abberior Instruments, the award winning company:



Literature

STED microscopy

Hell, S. W. (2007) "Far-Field Optical Nanoscopy" *Science* 316, 1153-1158

Dyba, M., S. Jakobs, S. W. Hell (2003) "Immunofluorescence stimulated emission depletion microscopy" *Nature Biotechnol.* 21, 1303-1304

Dual color STED microscopy

Göttfert, F., C. A. Wurm, V. Mueller, S. Berning, V. C. Cordes, A. Honigmann, S. W. Hell (2013) "Coaligned Dual-Channel STED Nanoscopy and Molecular Diffusion Analysis at 20 nm Resolution" *Biophys. J.* 105, L01-L03

Time-gating & STED microscopy

Vicidomini, G., G. Moneron, K. Y. Han, V. Westphal, H. Ta, M. Reuss, J. Engelhardt, C. Eggeling, S. W. Hell (2011) "Sharper low-power STED nanoscopy by time gating" *Nature Meth.* 8, 571-573

STED microscopy in neurobiology

D'Este, E., D. Kamin, C. Velte, F. Göttfert, M. Simons, S. W. Hell (2016) "Subcortical cytoskeleton periodicity throughout the nervous system" *Scientific Reports* 6, 22741, doi:10.1038/srep 22741

Berning, S., K. I. Willig, H. Steffens, P. Dibaj, S. W. Hell (2012) "Nanoscopy in a Living Mouse Brain" *Science* 335, 551

STED microscopy in cardiology

Kohl, T., V. Westphal, S. W. Hell, S. E. Lehnart (2013) "Super-resolution microscopy in heart - Cardiac nanoscopy" *J. Mol. Cell. Cardiol.* 58, 13-21

STED microscopy in mitochondrial biology

Jans, D. C., C. A. Wurm, D. Riedel, D. Wenzel, F. Stagge, M. Deckers, P. Rehling, S. Jakobs (2013) "STED super-resolution microscopy reveals an array of MINOS clusters along human mitochondria" *PNAS* 110, 8936-8941

Kukat, C., K. M. Davies, C. A. Wurm, H. Spahr, N. A. Nonekamp, I. Köhl, F. Joos, P. Loguerico Palosa, C. Bae Park, V. Posse, M. Falkenberg, S. Jakobs, W. Köhlbrandt, N.-G. Larsson (2015) "Cross-strand binding of TFAM to a single mtDNA molecule forms the mitochondrial nucleoid" *PNAS* 112, 11288-11293

STED microscopy in virology

Chojnacki, J., T. Staudt, B. Glass, P. Bingen, J. Engelhardt, M. Anders, J. Schneider, B. Müller, S. W. Hell, H.-G. Kräusslich (2012) "Maturation-Dependent HIV-1 Surface Protein Redistribution Revealed by Fluorescence Nanoscopy" *Science* 338, 524-528

Live cell STED microscopy

Bottanelli F., E. B. Kromann, E. S. Allgeyer, R. S. Erdmann, S. Wood Baguley, G. Sirinakis, A. Schepartz, D. Baddeley, D. K. Toomre, J. E. Rothman and J. Bewersdorf (2016) Two-colour live-cell nanoscale imaging of intracellular targets. *Nat. Commun.* 7:10778 doi: 10.1038/ncomms10778

Butkevich, A. N., G. Y. Mitronova, S. C. Siedenstein, J. L. Klocke, D. Kamin, D. N. H. Meineke, E. D'Este, P.-T. Kraemer, J. G. Danzl, V. N. Belov, S. W. Hell (2016) "Fluorescent Rhodamines and Fluorogenic Carbopyronines for Super-Resolution STED Microscopy in Living Cells" *Angew. Chem. Int. Ed.* 55, 3290-3294

Details

STED Laser 775 nm

Wavelength	(775 ± 1.5) nm
Operating mode	pulsed
Repetition rate	40 MHz
Output power	1.25 W
Pulse duration	~1 ns

CW Diode Laser 405 nm (optional)

Wavelength	(405 ± 5) nm
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Pulsed Diode Laser 488 nm

Wavelength	(485 ± 5) nm
Repetition rate	40 MHz
Pulse duration	< 150 ps (80 ps typ.)

Pulsed Diode Laser 561 nm

Wavelength	(561 ± 2) nm
Repetition rate:	40 MHz
Pulse duration:	< 150 ps (80 ps typ.)

Pulsed Diode Laser 640 nm

Wavelength	(638 ± 4) nm
Repetition rate	40 MHz
Pulse duration	<150 ps (110 ps typ.)

Resolution

Imaging resolution, STED <40 nm , typically 30 nm
 Depending on objective lens and dyes used
 Measured using 40 nm Crimson fluorescent beads

QUAD Scanner

Scanning field	approx. 90 µm x 80 µm for 100x/1.4 NA oil objective
Scanning frequency	up to 800 Hz
Frame rate	512 x 512 px up to 1.1 frames/s

Software

Browser-based, operational on PC, Mac or tablet
 Imaging modes xy, xyz, xyt, xyzt, xyp, xyzp, xyztp for up to 4 colors in line-interleaved scanning mode
 Includes auto-save function

Detection Path

Detector 1	APD
Filterset 1	650 nm – 700 nm
Detector 2	APD
Filterset 2	501 nm – 552 nm, 578 nm – 627 nm
Time-gating for confocal and STED	

Fixed Pinhole

- 1.1 Airy units for 100x 1.4 oil-immersion objective
- 1.7 Airy units for 63x 1.4 oil-immersion objective
- 1.2 Airy units for 63x 0.95 air objective
- 1.5 Airy units for 63x 1.2 water-immersion objective

z-Piezo

Pifoc fast axial nanopositioner and scanner for microscope objectives included
 Different z-piezo stages can be controlled by the STEDYCON - ask us!

Laser Safety

Provided by us depending on the microscope body, mandatory

Installation Requirements

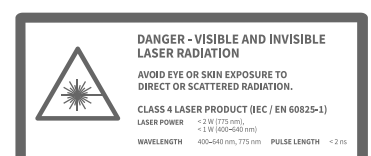
Antivibration table	recommended
Computer	PC or Mac, 8 GB RAM
Temperature	(23 ± 2)°C
Voltage	100 - 240 VAC, 47 - 63 Hz
Current	≥ 10 A fuse

Dimensions

STEDYCON head	11 cm x 20 cm x 20 cm
STEDYCON supply unit	22 cm x 55 cm x 60 cm
Total weight	~ 40 kg

Upgrades

Fluorescence Lifetime Imaging Unit - ask us!



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