ΨScientifica

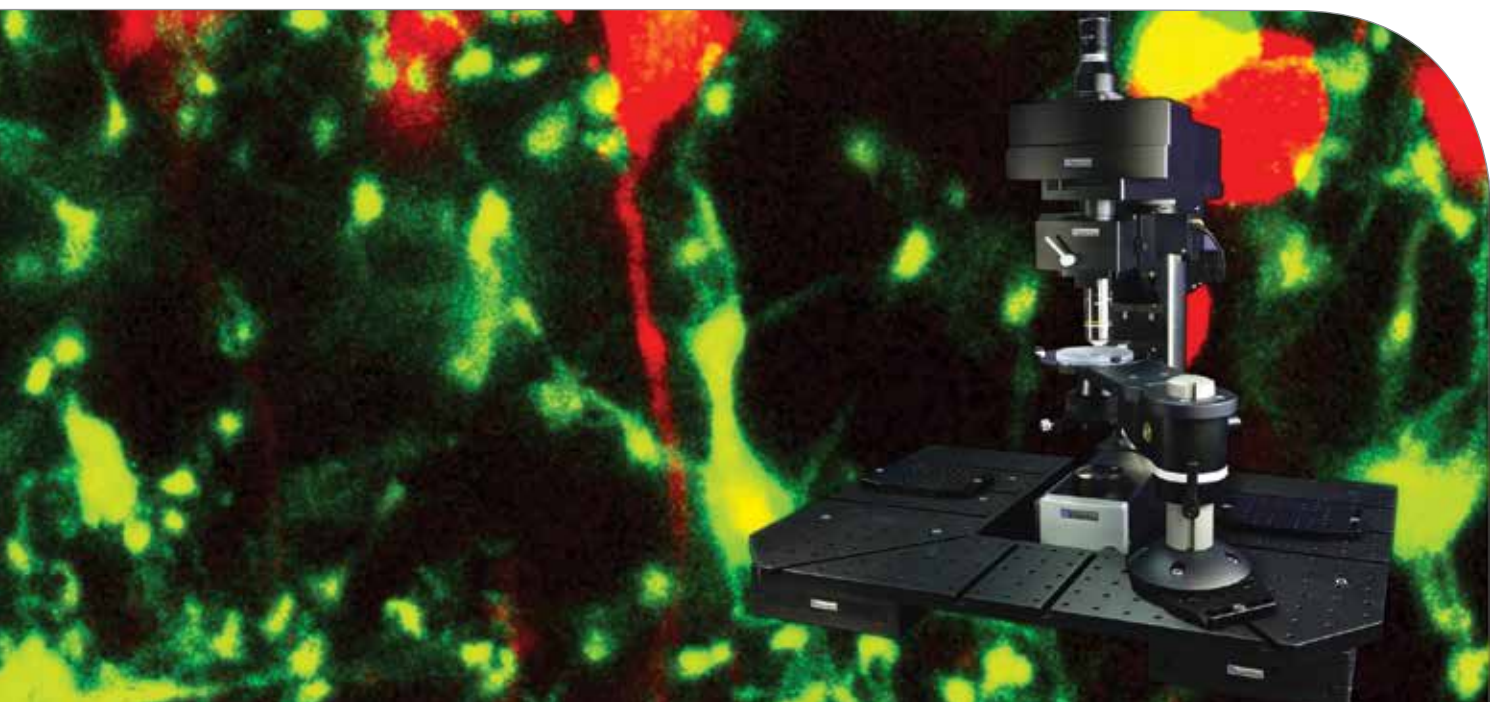**Experts in Electrophysiology & Imaging**

Multiphoton Imaging Systems

## Award-winning optical innovation

www.multi-photon.com
www.scientifica.uk.com

Deeper imaging for new insights

Multiphoton imaging creates possibilities for visualising fine structures in deep tissue and provides optical sectioning (non-linear excitation) at diffraction limited resolution. By scanning over a wide area it is possible to collect data simultaneously from up to several hundred cells.

Often viewed as an exclusive technique requiring significant funding and support expertise, Scientifica's award-winning system overcomes these constraints and is ideal for electrophysiology integration.
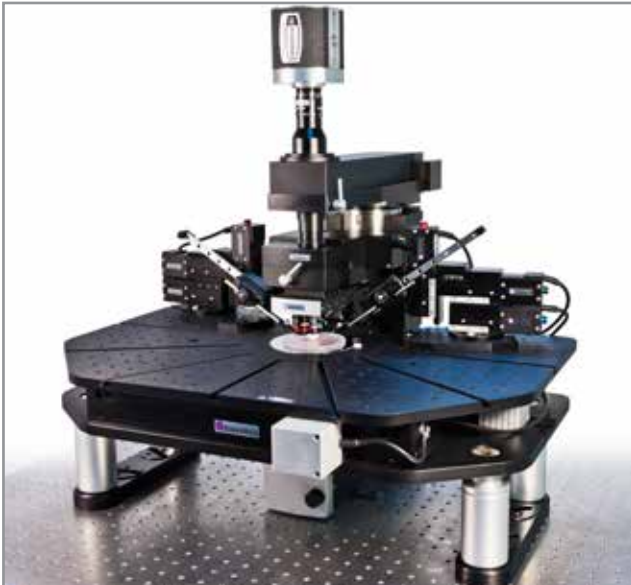
Multiple software options

The Multiphoton Imaging Systems can be fully integrated with a range of freely available software solutions including Scientifica's open-source 'SciScan' software.

SciScan includes all necessary functionality but is also designed to allow users fluent in LabView to easily write custom modules. These can interact with SciScan's core code without compromising the software.

Superior image quality and depth

An optimised optical design creates high-quality images with impressive homogeneity across the field of view thanks to minimised vignetting (i.e. a drop in fluorescent signal at the edges of the image). The XY galvanometers are positioned separately and feature a unique relay lens system for accurate laser positioning.

The PMTs are situated close to the objective back aperture, with a fixed-position collection lens helping to achieve maximum photon collection even at the widest scan angle.

Modular design - solid engineering

Scientifica's approach to multiphoton microscopy is to provide users with a modular assembly that can evolve in line with future experimental needs. Built around the established SliceScope Microscope with outstanding optics and a unique removable substage (for *in vivo* studies), the systems are compatible with a wide range of imaging techniques and accessories.

Versatile - a cost-effective solution

An investment of this size should meet immediate experimental needs, whilst maintaining the versatility to accommodate long-term research plans. Scientifica's systems allow for easy switching between *in vitro* and *in vivo* studies for additional functionality whilst maintaining upgradeability.

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Imaging structure and function of the nervous system workshop

Cold Spring Harbour
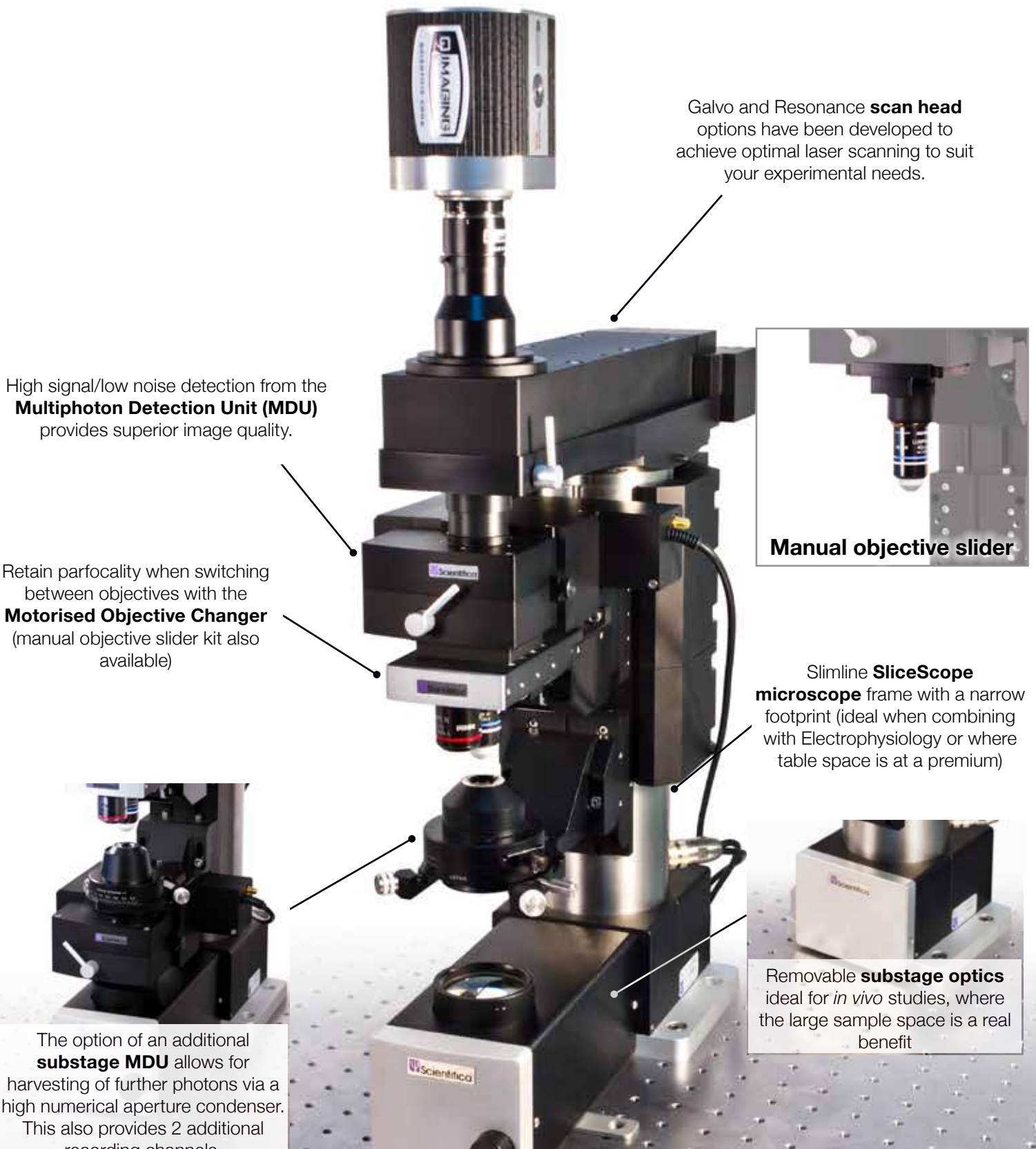

900 μm imaging depth
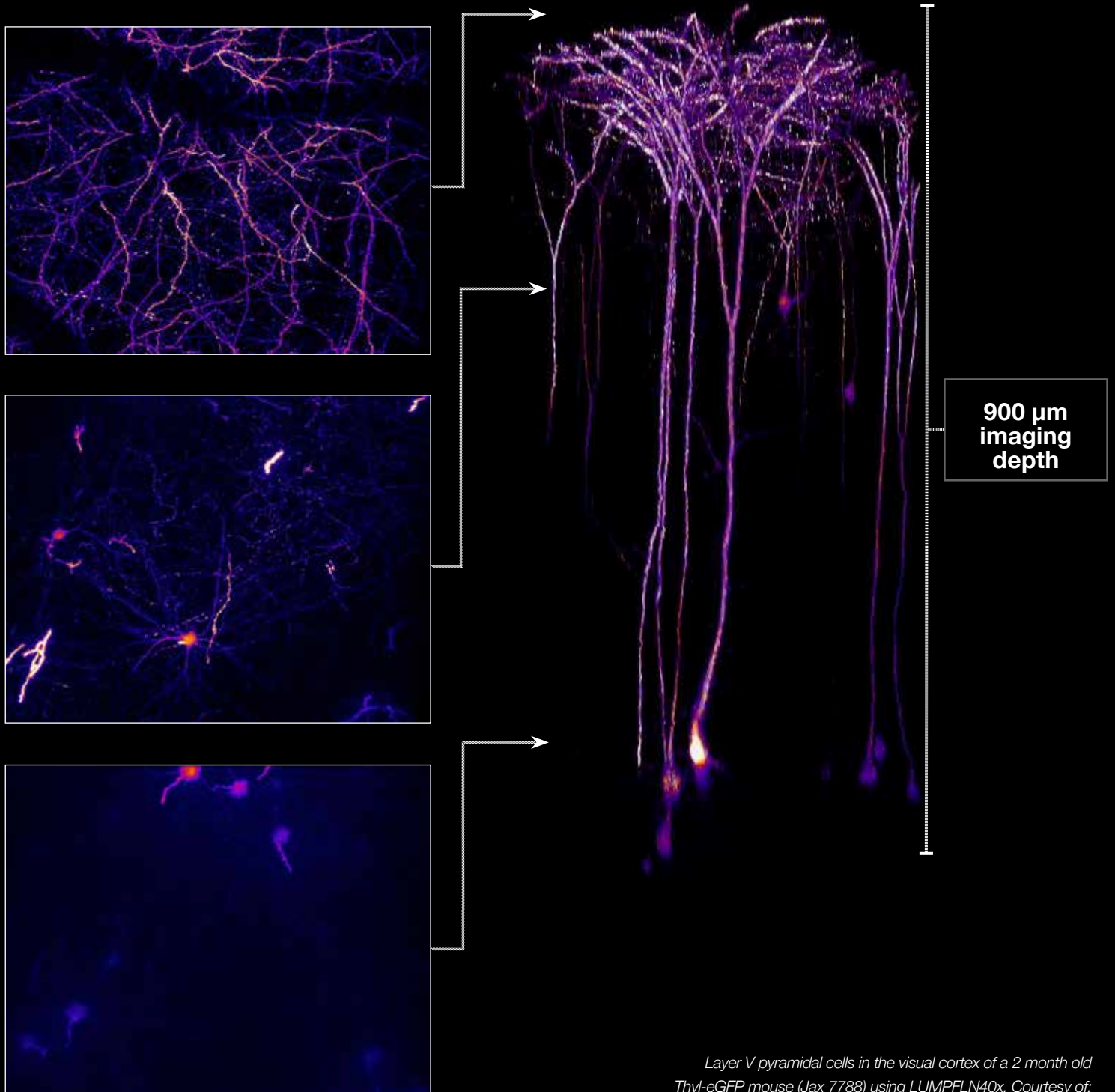
Layer V pyramidal cells in the visual cortex of a 2 month old Thy1-eGFP mouse (Jax 7788) using LUMPFLN40x. Courtesy of:
Kate Smith - Feinberg School of Medicine, Northwestern University
Javi Munoz-Cuevas - Gallo Research Center, UCSF

Complete systems or DIY solutions, you choose.
The system appeals to researchers wanting a fully-working ready-to-image microscope or customised 'DIY' components, for bespoke multiphoton applications.

Modular design - based on solid engineering

Key modules

Galvo and Resonance **scan head** options have been developed to achieve optimal laser scanning to suit your experimental needs.

High signal/low noise detection from the **Multiphoton Detection Unit (MDU)** provides superior image quality.

Manual objective slider

Retain parfocality when switching between objectives with the **Motorised Objective Changer** (manual objective slider kit also available)

Slimline **SliceScope microscope** frame with a narrow footprint (ideal when combining with Electrophysiology or where table space is at a premium)

The option of an additional **substage MDU** allows for harvesting of further photons via a high numerical aperture condenser. This also provides 2 additional recording channels.

Removable **substage optics** ideal for *in vivo* studies, where the large sample space is a real benefit

Specially designed launch optics for accurate laser delivery and alignment are also available from Scientifica – please contact a sales representative for more information.

Versatile - a cost-effective solution

Have a complete system ready for use or build it yourself

Whether you are looking for provision of a fully-operational system or key components to integrate into a current development project - Scientifica has a solution.

All Scientifica's quotes provide a complete bespoke solution, with no hidden costs. From the laser to the sample plate, all components are included as required. Scientifica can also provide launch optic configurations to suit any size antivibration table.

Seeing the future

When a significant investment in hardware is made, it is important to consider present and future needs.

By selecting Scientifica's open-source, modular approach, any rig can be developed over time to meet specific criteria.

Expensive one-size-fits-all approaches tend to be limited to current technology and may not be flexible enough for longer-term ambitions.

Existing SliceScope users have an easy and cost-effective upgrade path to the latest developments in multiphoton imaging.
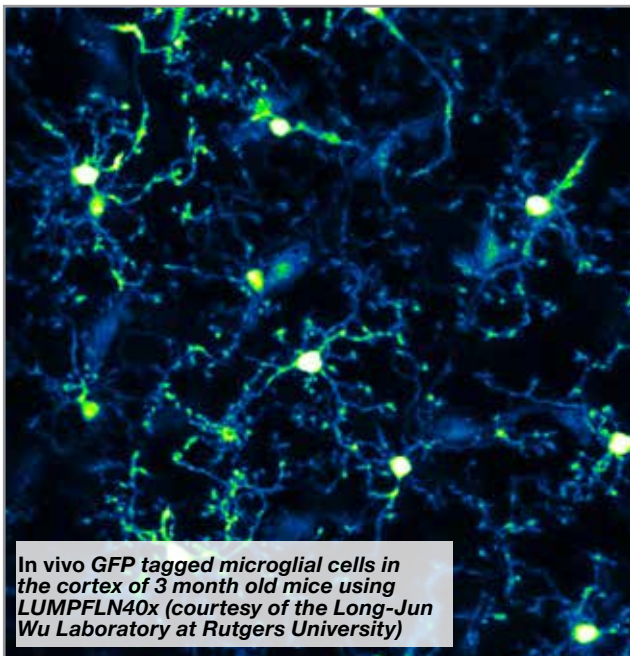
Multiphoton Imaging System with substage optics removed for *in vivo* applications

In vivo GFP tagged microglial cells in the cortex of 3 month old mice using LUMPFLN40x (courtesy of the Long-Jun Wu Laboratory at Rutgers University)

Already own a laser?
Capitalise on your investment by splitting the laser beam between two rigs. This way, you can double your capacity without doubling your costs, for higher throughput.

www.scientifica.uk.com

Precise scanning - The Scientifica Scan Head
Compact and flexible scanning

Scientifica's Galvo and Resonant scan heads have been developed to achieve optimum imaging across the entire field of view.

They provide fast, high-resolution scanning parameters to monitor rapidly occurring biological processes and imaging of the smallest structures.

Scan Head (highlighted)

Efficient, high-resolution imaging

Imaging the finest details across the whole field of view is possible thanks to the unique relay lens. This ensures the X-mirror is imaged precisely onto the Y-mirror, which is then perfectly imaged onto the objective back aperture. This avoids wobbling of the expanded beam at the objective back aperture, regardless of the scanning angle.

Systems without a relay lens may suffer from vignetting, leading to a drop in fluorescence at the edges of the image, as illustrated below. These optics also ensure a uniform spot size is always achieved for visualising the smallest structures across the entire scan field.
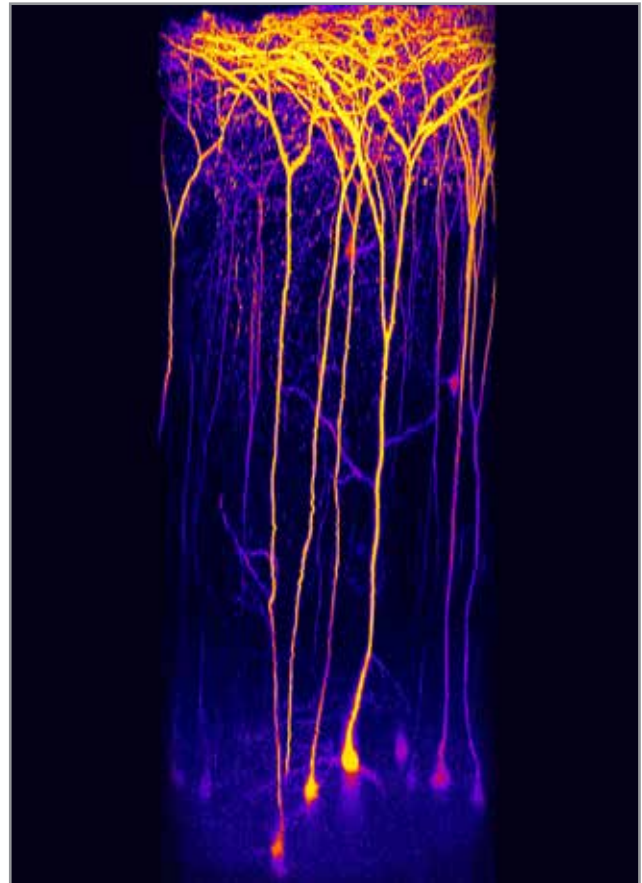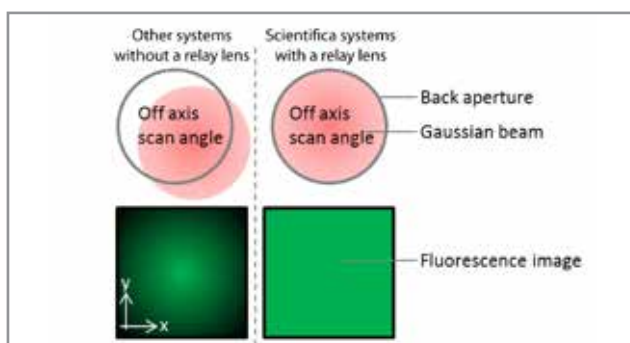

Optical design

Optimal resolution is achieved with a range of multiphoton objectives. Scientifica offer a range of RMS, M25, M27 and M32 threaded objectives. Perfectly suited for combining multiphoton imaging and electrophysiology, due to their provision of sufficient working distances (up to 3.3 mm). The N.A. (numerical aperture) of up to 1.0 also helps researchers to image incredibly fine structures.

All optical elements are coated for 1100nm infrared light, allowing the use of long excitation wavelengths, without any change in performance.

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Versatile and customisable

In order to provide the most versatile system for capturing images, with the highest resolution and quality, both Scientifica scan heads employ industry-leading galvanometers from Cambridge Technology.

The Galvo system uses two Cambridge Technology 3 mm galvonometer mirrors, whilst the Resonant scan head comes with an 8 KHz scan mirror combined with a 3 mm galvonometer mirror.
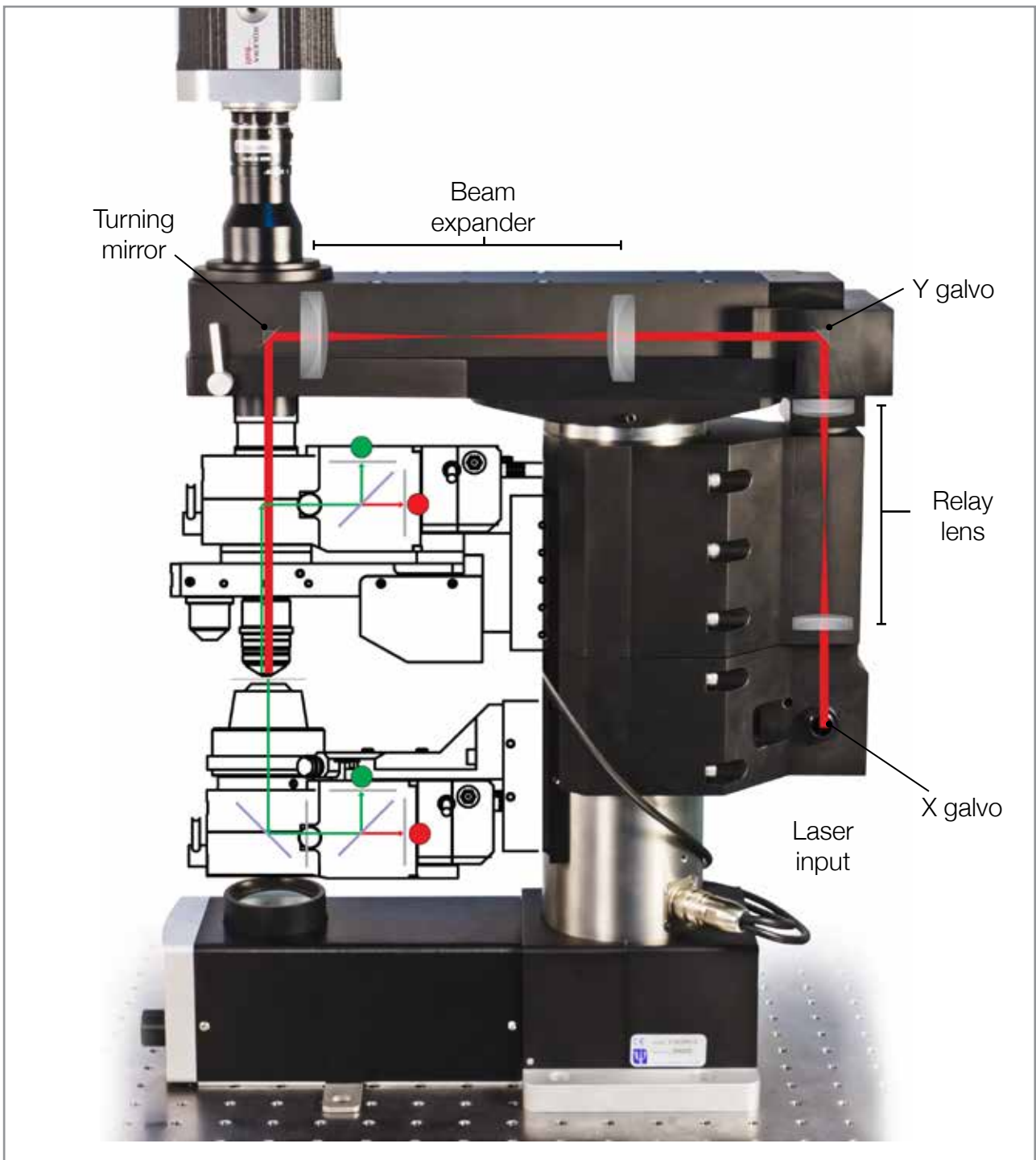
Galvo Scanning

In the "galvo" system, two galvanometer scan mirrors (one for each axis) direct the laser beam to any xy position within the field of view.

Galvanometers offer the benefit of variable scanning speeds, adjustable for individual applications. This means that rather than relying on averaging to improve signal-to-noise ratios, a reduced scan speed can achieve the same cell image morphology results while decreasing a sample's exposure to laser light. This reduces bleaching and tissue damage[1].

These scan mirrors facilitate frame rates of up to 4 frames per second (at 512 x 512 pixels) this can be increased by reducing the resolution (e.g. 15 fps at 128 x 128 pixels) while maintaining a freely rotatable field of view. Highly flexible scan patterns such as arbitrary line scans, spiral scans or patterned point scanning (e.g. for uncaging experiments) to suit a large variety of applications, can all be achieved.

[1] *Fritjof Helmchen & Winfried Denk, Deep tissue two-photon microscopy, Nature Methods Vol.2 No.12 - December 2005*

Resonance Scanning

Scientifica's multiphoton system can also be fitted with a resonant scanner to acquire faster frame rates over the entire field of view.

This option is tailored to the large back aperture objectives so that 30 frames per second can be achieved at a resolution of 512 x 512 pixels. This enables researchers to monitor activity in a large population of cells.

Resonant scanning systems are a popular choice for two-photon calcium imaging using genetically encoded indicators (e.g. GCaMP) or other functional dyes (e.g. OGB-1, Fura-2).

Acoustic Isolator Unit
This dramatically reduces the audible noise created by the resonant motor movement without affecting performance.
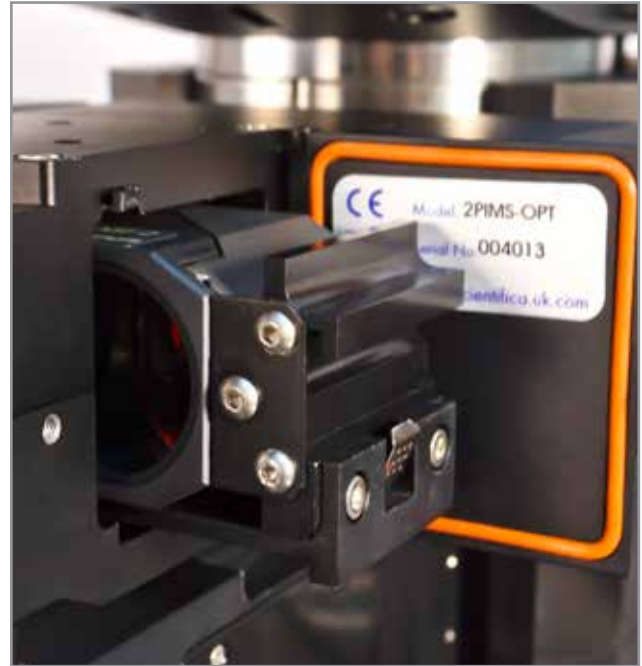
Superior image quality - Multiphoton Detection Unit
Super-efficient light collection

Scientifica's Multiphoton Detection Unit (MDU) is optimised for the collection of valuable photons by using customised optics, mechanics and noise-reducing electronics.

MDU (Highlighted)

High signal, low noise

A high signal-to-noise ratio is achieved thanks to the careful design of Scientifica's custom preamplifier and high-voltage power supply.

The MDU has been specifically designed to minimise background noise and maximise signal quality.

Fast filter exchange

Combining dyes is often a requirement in multiphoton imaging and the exchange of emission filters and dichroics is made easy with the MDU.

A standard filter cube is fitted to a dovetail slider which can easily slide in and out of the MDU, preparing the setup for the next set of experiments (see image above).

Purpose built optics for improved images

In order to improve image quality and prevent shading in the corners of the image, a custom designed, extra-large fixed position collection lens is sited very close to the objective back aperture. This allows photon collection even at the widest scan angles.

The distance between the collection lens and objective back aperture remains fixed. This means no matter how deep the sample is imaged, collection will always be optimal.

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Protect your investment

The sensitivity of PMTs will degrade if exposed to unsuitable light sources. The MDU has been fitted with electronic safety features and shutters to protect against damage, prolonging the performance and lifetime of the PMT.

Capture more photons - above & below the sample

Scientifica aim to achieve brighter signals by maximising light collection.

By providing above stage collection optics (MDU), as well as the option of substage detection, it is possible to collect more photons and image more dyes. In addition, a wide range of objectives and condensers can be used.

Collection optics are optimised for collection from large and small back aperture objectives (RMS, M25, M27 and M32 thread adapters available).

Scientifica's substage MDU, uses a condenser with a high N.A. (up to 1.4). This capitalises on the large field of view of the condenser, for maximum collection efficiency.

Large back aperture

Scientifica's large back aperture scan head has been manufactured and optimised to work with a range of low magnification, high numerical aperture objectives.

Monitor activity deeper into a sample with objectives that collect more of the scattered photons generated when imaging at depth.

The unique scan head optics enable overfilling of objectives with a back aperture of up to 20mm, ensuring maximum resolution.

Commonly used objectives include: Nikon 16X and 25x, Olympus 20x and 25x.

Electrophysiology applications

Integrated design for demanding research

The SliceScope can be combined with stages and manipulators that can all be controlled to work together - acting as one. This results in ease-of-use, improved productivity and future proofing for your potential research needs. Designed to meet the unique demands of electrophysiologists, the slim frame and small footprint offer maximum opportunity for additional equipment and provide extra room when space is limited.
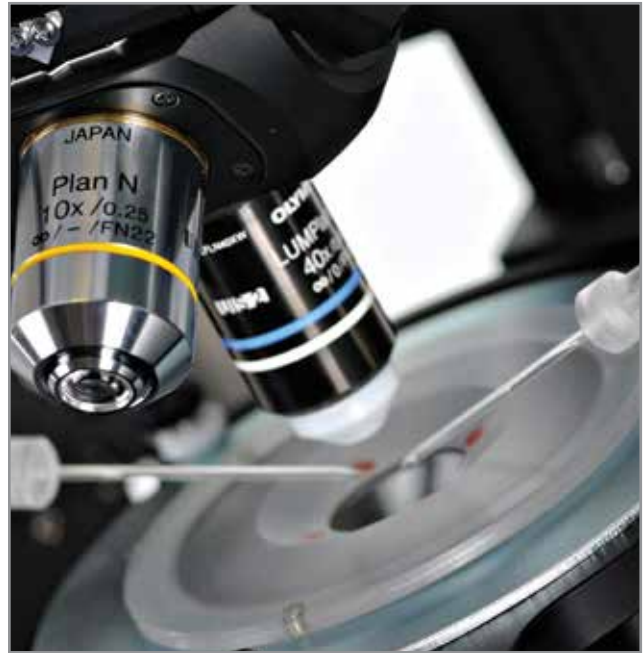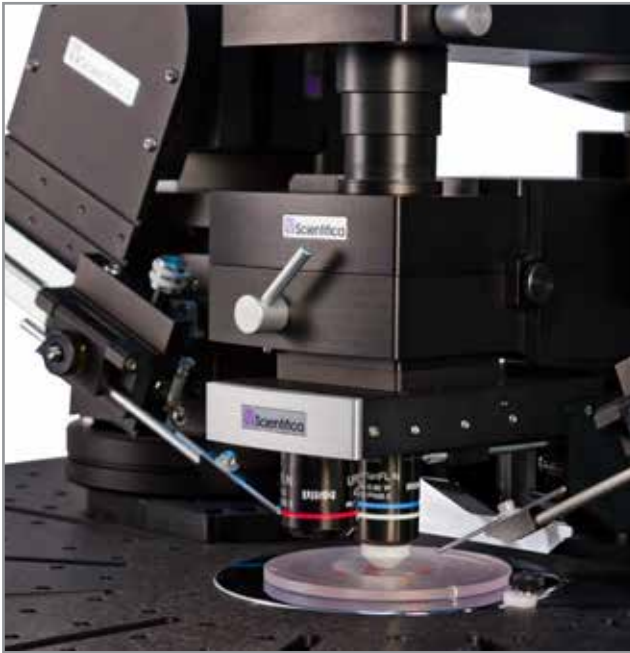
Both the objective and condenser are motorised, enabling focusing with fingertip remote control.

The microscope's compatibility with industry-leading optics means users can incorporate oblique contrast, DIC, Dodt contrast and epiflourescence techniques easily.

Electrophysiology is often used to investigate neuronal signalling and characteristics, and when combined with multiphoton imaging is able to measure and control neuronal signals with high spatial resolution and genetic specificity. Combining these two techniques is revolutionising neuroscience research.

Compact design

Scientifica's SliceScope platform and multiphoton components are remarkably compact allowing ample sample access for up to six micromanipulators. Similarly, the slimline design of the Scan head reduces the space restrictions placed on the surrounding equipment, opening up even more research opportunities.

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In vivo and *in vitro* - both options in one

Scientifica's long-standing approach of designing equipment to be as flexible and modular as possible dovetails beautifully with the new multiphoton capability. The SliceScope and its associated mounting equipment can easily be reconfigured by the user between *in vivo* and *in vitro* experiments, making the investment both flexible and future-proof.

Multiphoton system with base plate in *in vivo* configuration

Multiphoton Imaging System with substage optics removed for *in vivo* applications

A cost-effective approach

A unique feature of the SliceScope microscope is its removable substage optics. This means that a single Scientifica multiphoton rig can accommodate both *in vitro* and *in vivo* studies. This cost-effective approach, maximises the use of the laser and makes the system ideal as a shared resource between groups.

The *in vivo* configuration provides additional space needed for complex setups such as trackballs, treadmills and sensory stimulation systems.

The low-level Scientifica Motorised Moveable Base Plate provides an adaptable mounting surface. A simple exchange between *in vivo* and *in vitro* sample holders, together with removing the substage optics is all that's required to reconfigure between techniques.

The Motorised Movable Top Plate (MMTP) translation platform is also compatible with our multiphoton systems.

Tiltable Objective Mount

The Tiltable Objective Mount can be used with a number of different objectives for off axis imaging of regions that are positioned on the side of an awake animal's brain.

It can be fitted with a PIFOC so that the user can move the objective along its axis for fast volume scanning (enabling the activity of a number of cells to be captured) and to allow z-stacking for accurate morphological image capturing.
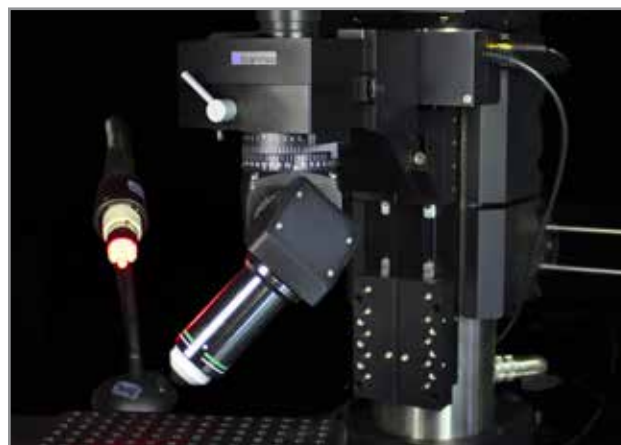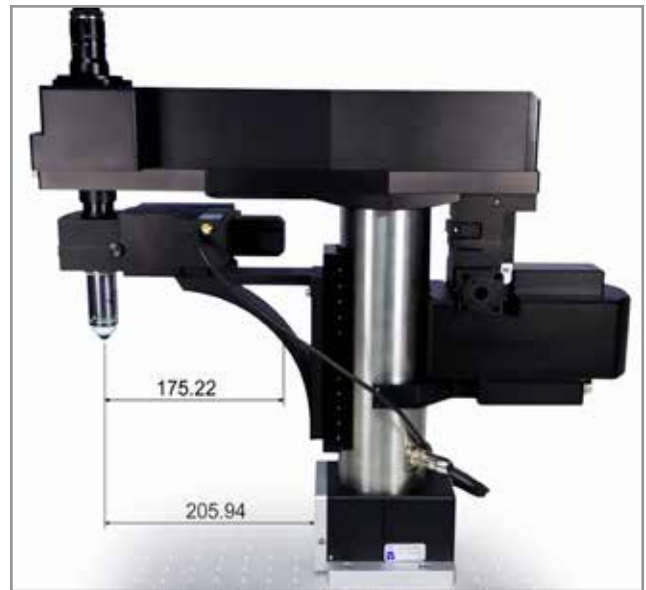
In vivo multiphoton imaging

The VivoScope

The VivoScope is the ideal solution for complex two-photon *in vivo* behavioural studies.

This version of the Scientifica scan head module has been designed to add additional room for your research animal and additional equipment without affecting many of the benefits of the original Multiphoton Imaging Systems.

In Vivo Behavioural Studies

When carrying out behavioural studies there is often a struggle for space.

The VivoScope creates additional space by extending the distance between the light path and the microscope frame (205.94 mm up from 130 mm), whilst retaining most of the benefits of the original Multiphoton Imaging Systems.

This extra distance has been achieved without compromising the stability of the microscope and with the same travel of the Multiphoton Detection Unit in the z-focus (25 mm).

The increased space provided by the VivoScope enables the use of larger *in vivo* samples, linear or spherical treadmills, large stereotaxic frames and other virtual reality set-ups.

Moveable Periscope

Attaching the periscope to the y-axis plate of the microscope XY stage ensures that you can move the stage in both X and Y axes, allowing microscope movement around a fixed position sample.

This removes the need for a motorised movable base plate when carrying out *in vivo* studies, creating additional space for your sample and more complex virtual reality set-ups.

When combined with the VivoScope this creates even more room beneath the microscope.
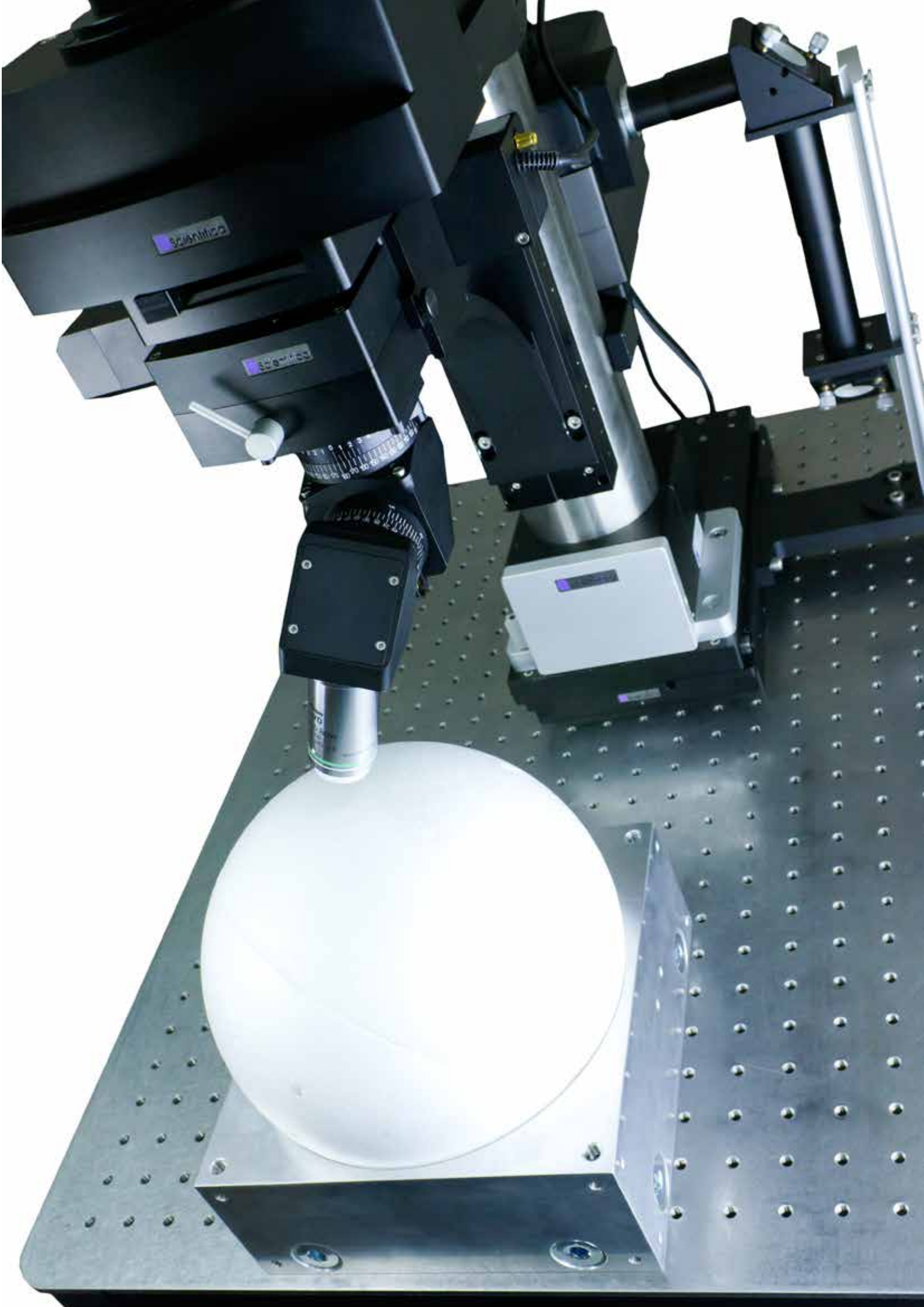
Upgrade an existing SliceScope Microscope

Scientifica's SliceScope Microscopy system has been designed specifically for the electrophysiology market. Perhaps you are an electrophysiologist planning to do multiphoton imaging in the future? Why not future proof your investment by procuring the SliceScope now.
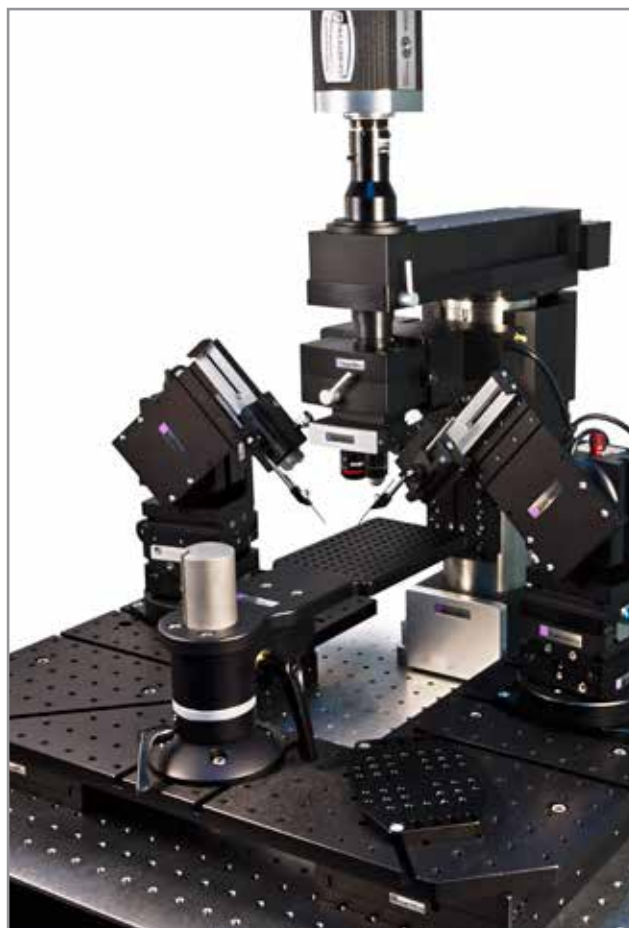

SliceScope

Why the SliceScope is a good investment:

- Fully motorised for hands-free operation

- Allows for placement of multiple manipulators/other equipment – due to unique, slim profile

- Solid construction - making it a great foundation for building on

- 2 systems in one - switch between *in vivo* and *in vitro*

- Compatible with optogenetic and uncaging studies (including Scientifica's LASU system)

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The SliceScope has been designed to be modular, yet versatile. It is rapidly becoming an industry standard for electrophysiology and imaging research. The SliceScope combines easily with Scientifica's Multiphoton Imaging System.

Multiphoton Imaging System

**Why it's easy to upgrade the SliceScope to a Multiphoton Imaging System:**

• Current SliceScopes are designed to be upgraded with the Multiphoton Detection Unit (MDU) and scan head

• Add above stage and/or substage detection units to maximise the harvesting of photons (from up to four channels)

• Choose from the Scientifica scan head or receive advice on integrating an existing option

• All quotes are clear and inclusive - no hidden costs

SciScan - Scientifica's fully supported solution
Multifunctional, easy-to-use software

SciScan is an open source and modular, multiphoton image acquisition software package. It is specifically designed to work with, but not limited to, Scientifica's multiphoton product range.

Written in LabVIEW for easy customisation, the clear and intuitive interface is designed to be quick and simple to use, whilst maintaining powerful functionality.
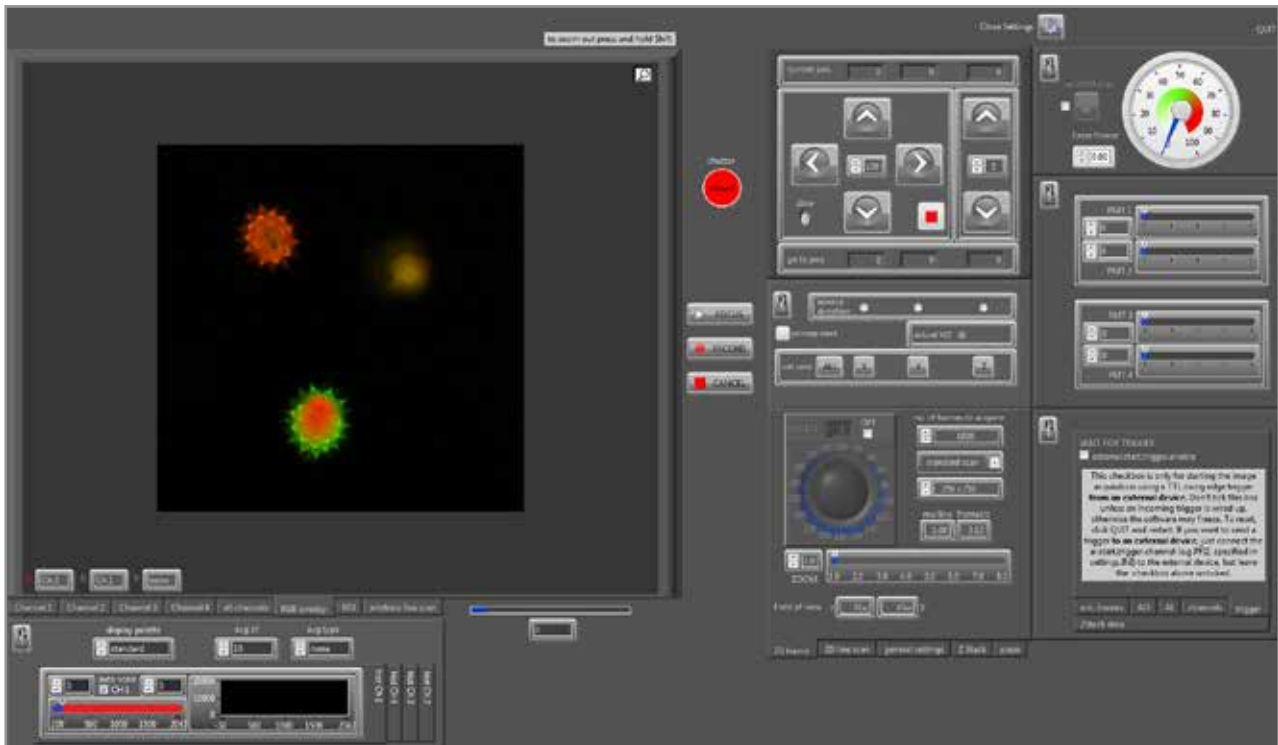

Application flexibility

By designing and building this software in-house Scientifica are able to respond quickly to customers specific experimental needs and can implement new functionality as a direct result of users requests.

SciScan can be used for both *in vivo* and *in vitro* imaging applications and offers control of both galvo and resonant scanning systems with options for: volume scanning, arbitrary line scanning (galvo scanning only) and region of interest (ROI) monitoring.

The software can also control peripheral equipment including: Pockels Cells, piezo objective positioners, XY stages and microscope focus drives.


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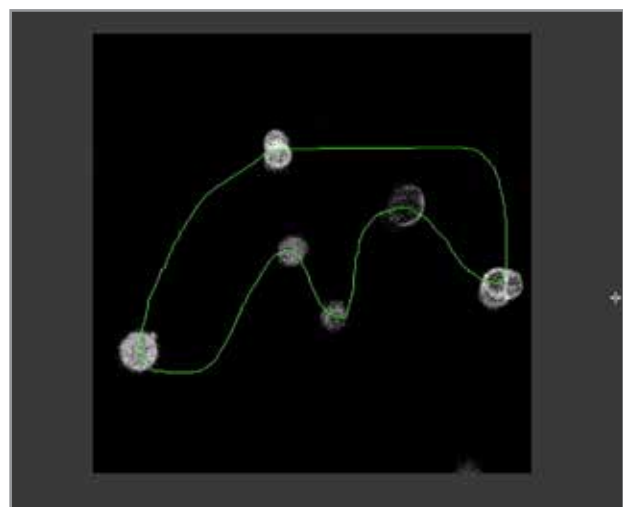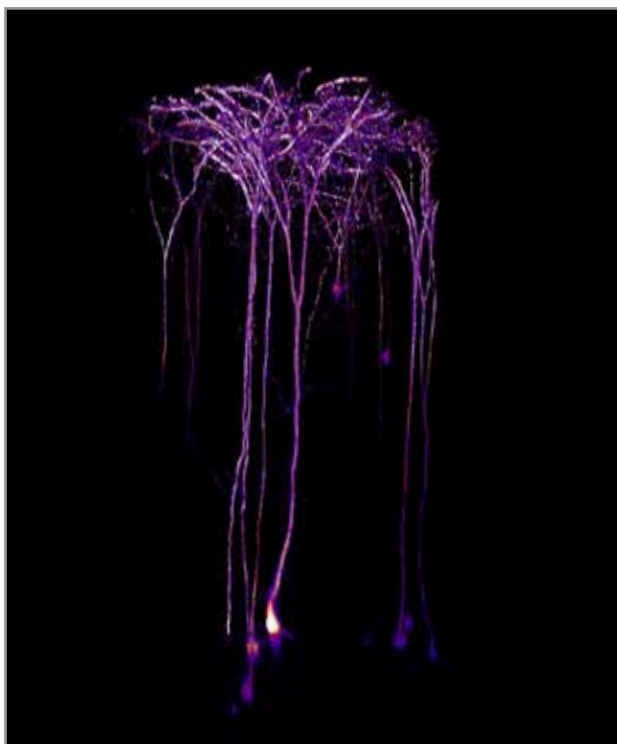
Fast Z Stacking

With the addition of a piezo objective positioner, SciScan is capable of carrying out volume scanning for the acquisition of functional data in three dimensions.

SciScan allows you to carry out fast z-axis scans in two ways. Firstly, by stepping between imaging planes and acquiring a frame, and secondly, in the unique zig-zag scan configuration.

This pattern drives the objective at a constant velocity through the sample, avoiding unnecessary settling times which can be problematic with large objectives.
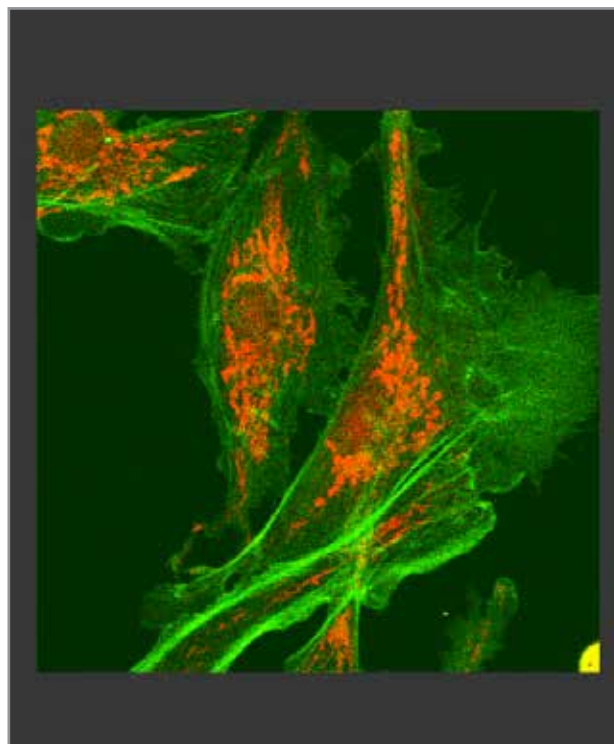
This method captures oblique planes through a volume and gathers data that may be missed between planes when using the traditional arrangement.

The capture speeds of each z stack depend upon the piezo drive fitted and the size of the volume required. As an example, using the zig-zag configuration in a 200 μm^3 volume it is possible to collect 5 data points per cell per second.

Using another software package?
Talk to the Scientifica team. A set of control commands are freely available for integration into your software.
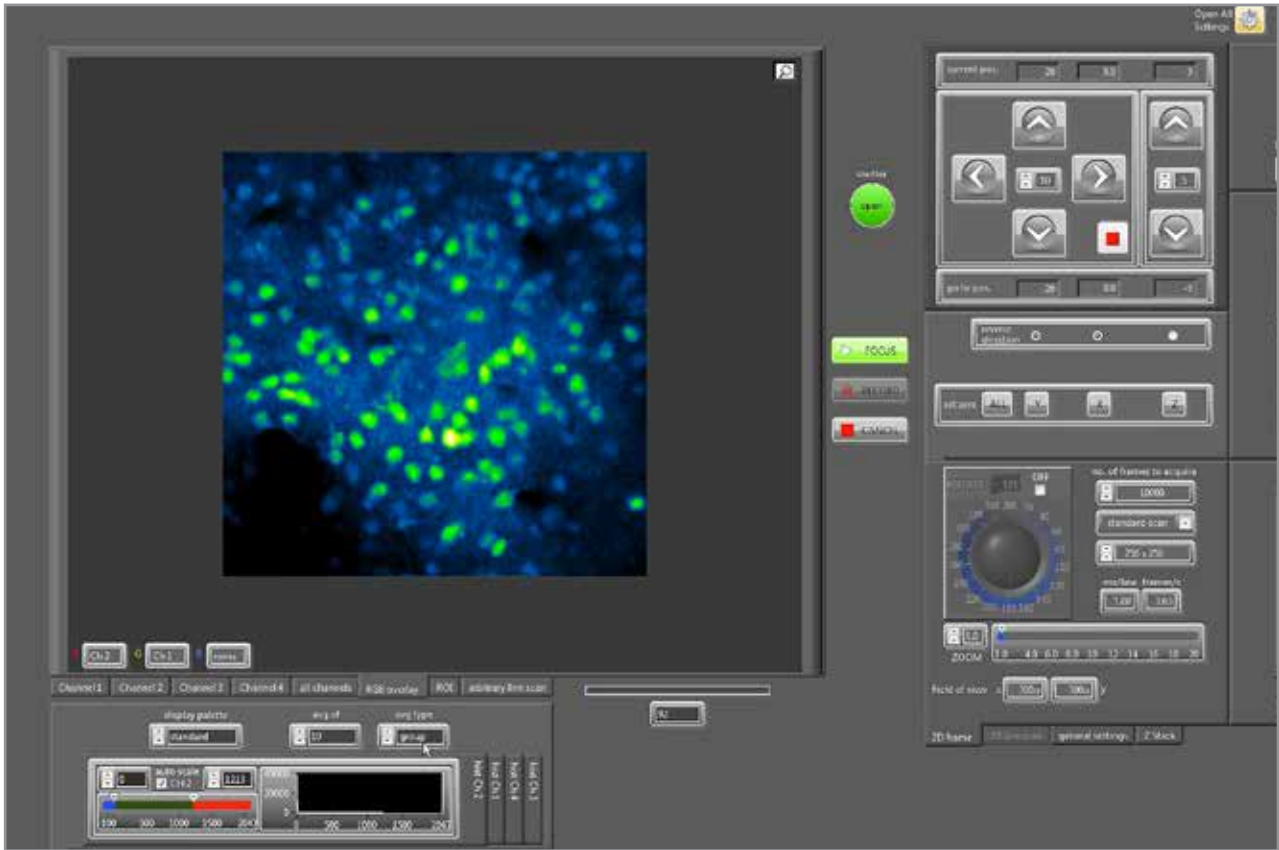
SciScan - Benefits:

Free (a LabVIEW licence is required)

Unlimited and open source – this software is fully supported and will continue to be developed with customers – so changes can be made as research changes and technology develops

Modular - only use the modules you need and have the ability to add new or custom modules as required

User friendly – designed with the user in mind, and in collaboration with scientists in the field, the interface is clear and easy to use

Can control galvanometer and resonant scan mirrors – with options for volume scanning, arbitrary line scanning and region of interest monitoring

Written in LabVIEW for easy customisation

Suitable for *in vivo* and *in vitro* imaging applications

Simple integration of peripheral equipment including: Pockels Cell, piezo objective positioner, PMT gain, XY stage and microscope focus drive

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Other open-source software options

The Scientifica Multiphoton Imaging System is designed to make the most of recent collaborative software development.

As well as capitalising on the benefits that a free exchange of ideas within the community can bring, using open-source software is a cost-effective choice that ensures your rig can stay abreast of current developments without further expenditure. It also enables the development of new functionality, should the research demand it.
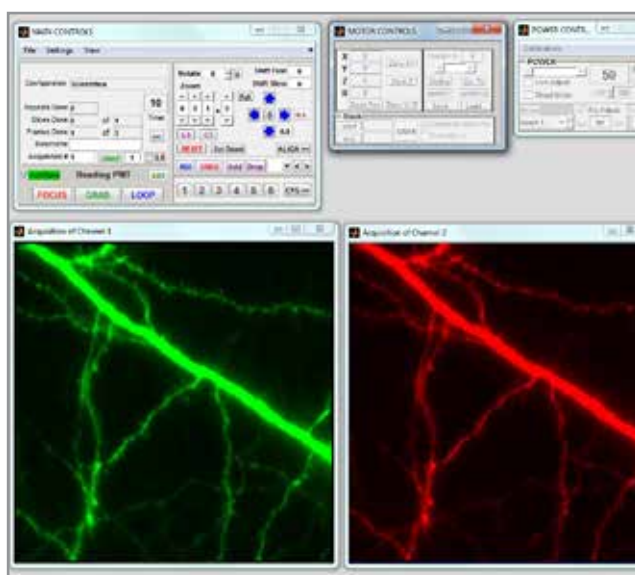
Scanimage - Benefits:

Cycle mode

Acquisition length control and loop acquisition status

Acquisition start controls: focus, grab, snapshot modes and external triggering

Control of ROI scan parameters: zoom, shift, rotation and angle multipliers

Graphical selection of ROI and access ROI controls (v3.8)

Full motor control including: setting and reading the position of primary and secondary stage controllers, z-stack acquisition controls, stage panning controls and interactive specification of stack start & end points

Comprehensive power control including optional Pockels Cell power control during image acquisition.

Setting scanning configuration, including: pixel resolution, line scan speed, angular range, bi-direction or saw-tooth scanning

XY stage and microscope focus drive

Fully integrated into ScanImage 5 for resonant systems
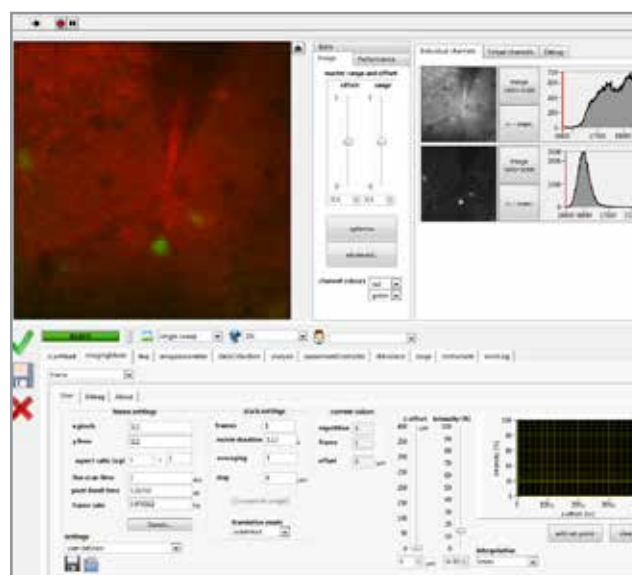
HelioScan - Benefits:

Hardware components and software functionality are encapsulated in exchangeable, software components, which are independently configurable

Scanning options include:
- Frame scanning, tilted frame scanning
- 1D single point scanning
- 2D straight and arbitrary line scanning, random access pattern scanning (AOD only)
- 3D spiral scanning (galvo only) and high-speed volume scanning (resonant only)

Supports a variety of scanning hardware, including:
- Galvanometer mirrors
- Acousto-optic deflectors (AODs)
- Resonant scanners   - Cameras

Software supports FPGA and DAQ based hardware that enables intelligent and fast signal acquisition. FPGA logic can be programmed using LabVIEW

Triggers can also be configured to synchronise with existing electrophysiology software, so that HelioScan runs as a "master" or "slave"

In vivo calcium imaging - Dr Simon Schultz
Collaboration with Imperial College London

Dr Schultz has been using multiphoton imaging since 2003, integrating this complementary field of imaging with classic electrophysiological studies. He now combines these techniques within his laboratory team to explore the complex patterns of neuronal interaction within the neocortex and cerebellum. This enables them to describe patterns of signal propagation and neural response to sensory information.
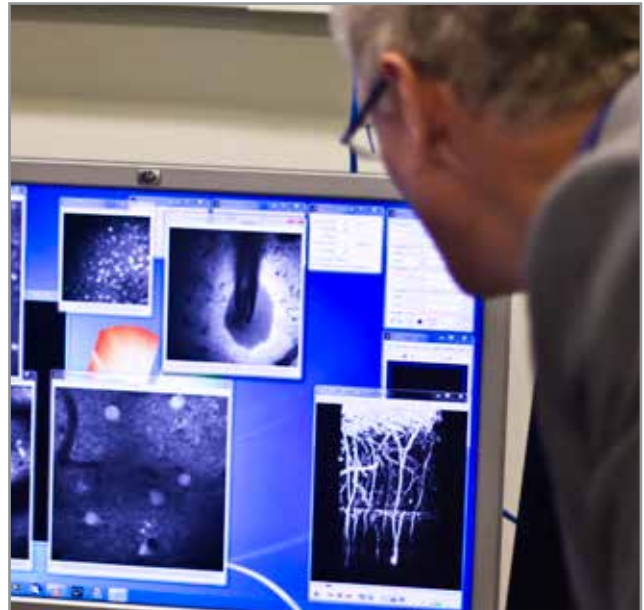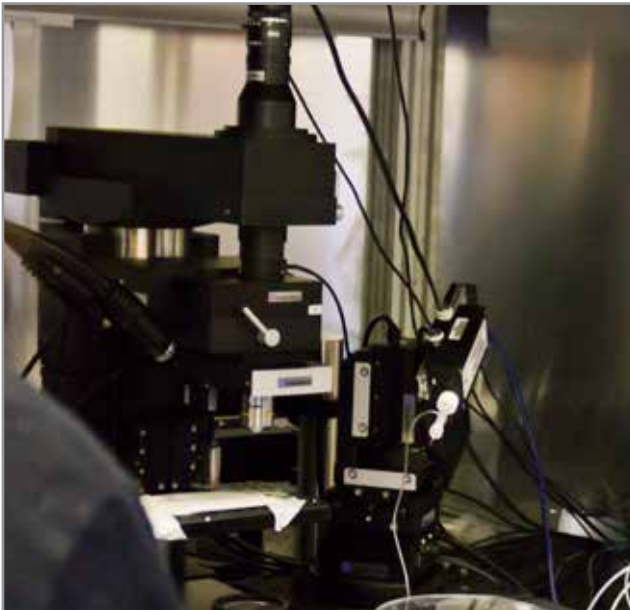
Individual labeling - deep within the brain

Dr Schultz's work aims to describe the inbuilt circuits for repair and plasticity within the brain, helping to understand how the nervous system solves parallel information processing problems. These insights lead to the development of therapeutic benefits for brain disorders or traumatic injury.

Two-photon imaging allows his team to label individual elements deep within the brain and target these cells for electrophysiological recordings.

He describes one of the main advantages of multiphoton imaging as the ability to spatially and discretely identify a neuron's signal within the cortical circuit, i.e. to actually see the signal within its place of origin. This is a powerful demonstration of the precise optical sectioning offered by this technique.

Scientifica have been collaborating with the Schultz laboratory since March 2012, integrating their research needs into the development of the Multiphoton Imaging System.

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Two-photon FLIM - Dr Kim Dore *(Professor Malinow Lab)*
Collaboration with the University of California

Dr Dore chose Scientifica's adaptable Multiphoton Imaging System to meet the distinctive demands of her research. She uses two-photon fluorescence lifetime imaging microscopy (FLIM) to monitor synaptic protein interactions within living neurons; exploring synaptic plasticity and amyloid-beta induced synaptic dysfunction.

University of California, San Diego (UCSD) at the Professor Robert Malinow Lab, Center for Neural Circuits and Behavior

PMT detection

FLIM detection
(custom modification)
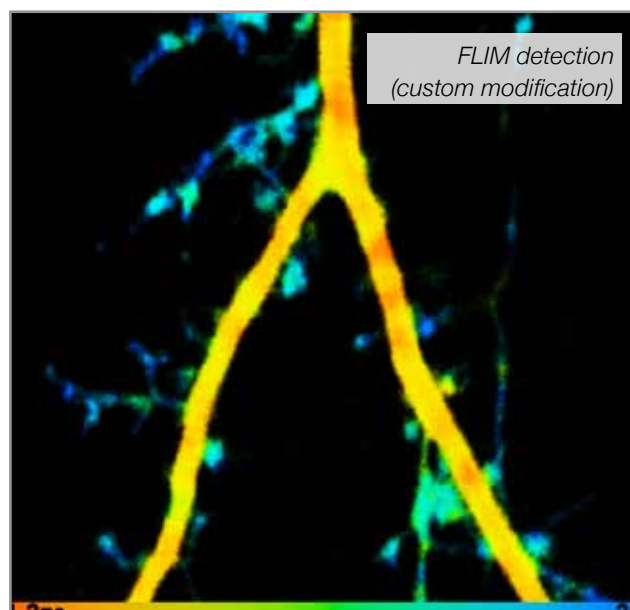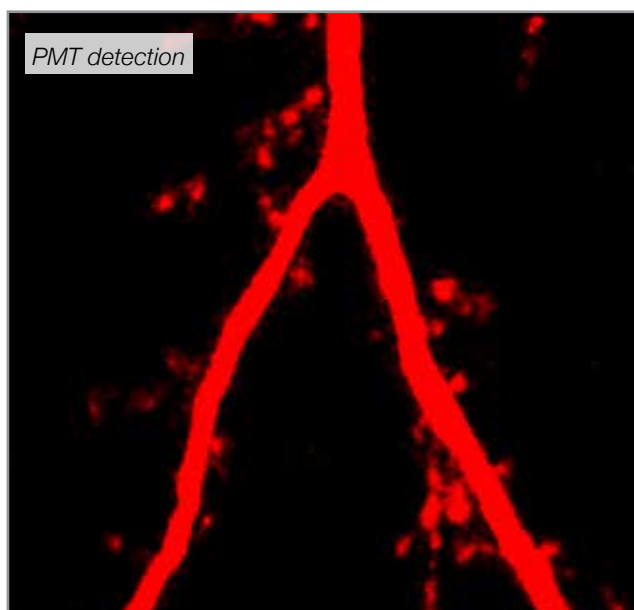
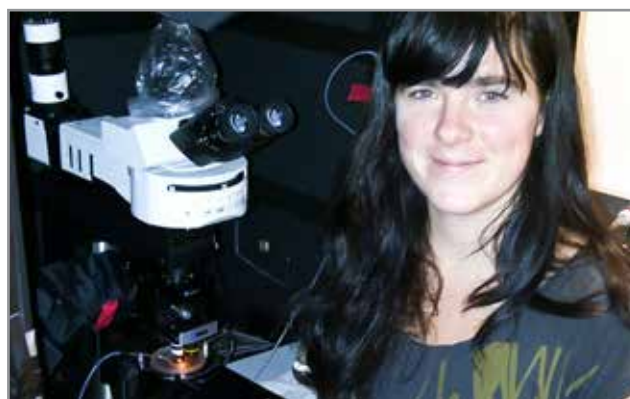### Modified design - for unique demands

Dr Dore needed a cost-effective galvo-scanning two-photon microscope. She selected Scientifica's Multiphoton Imaging System because as Kim stated, it was *"very competitive in terms of price and versatility."* She was carrying out a variant of two-photon imaging known as FLIM:

"The simple design improved the detection efficiency by positioning the detectors very close to the microscope objective. More importantly, the Scientifica staff agreed to modify the design of the multiphoton module to accommodate a different detector needed for our FLIM experiments. The microscope is very efficient in terms of detection sensitivity. Also, the system can scan the samples pretty rapidly, which helps the reduction of phototoxicity and photobleaching."
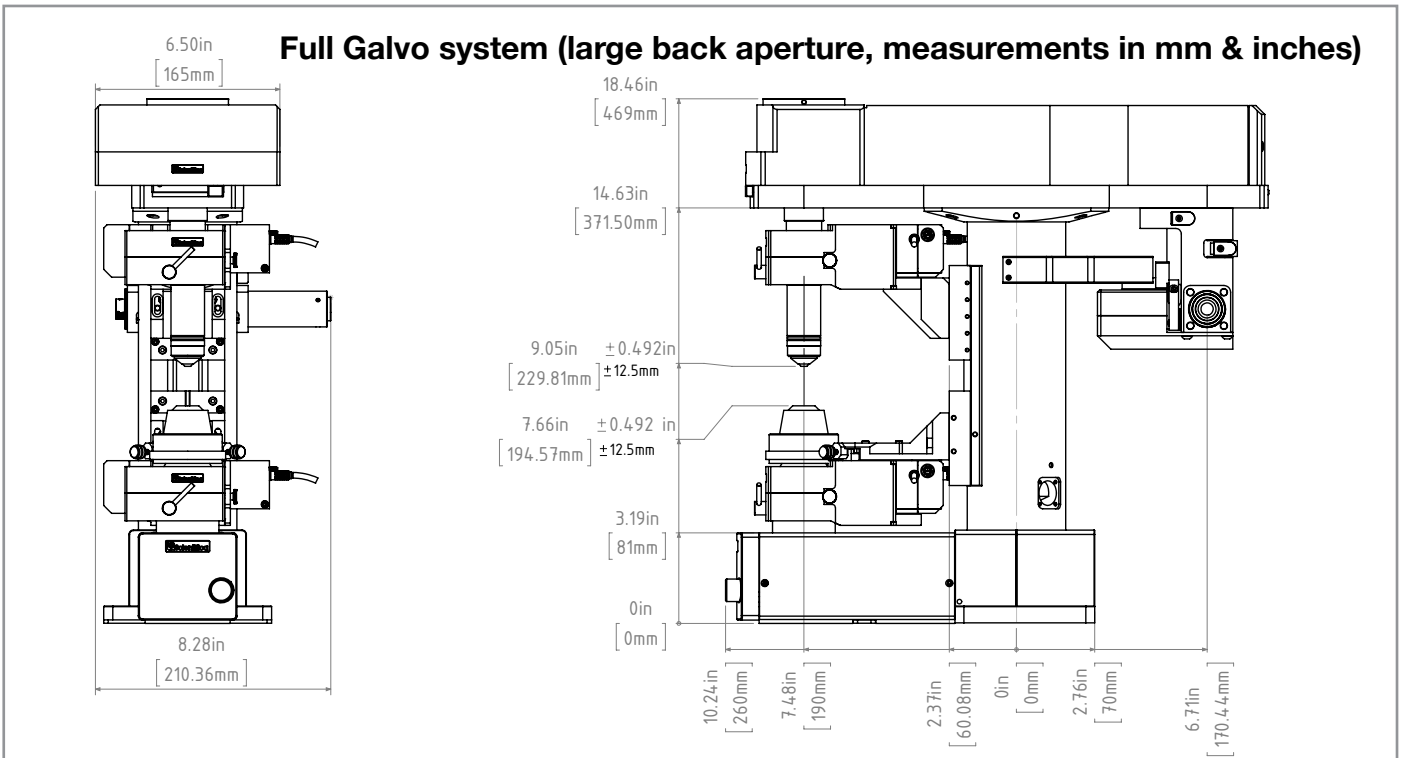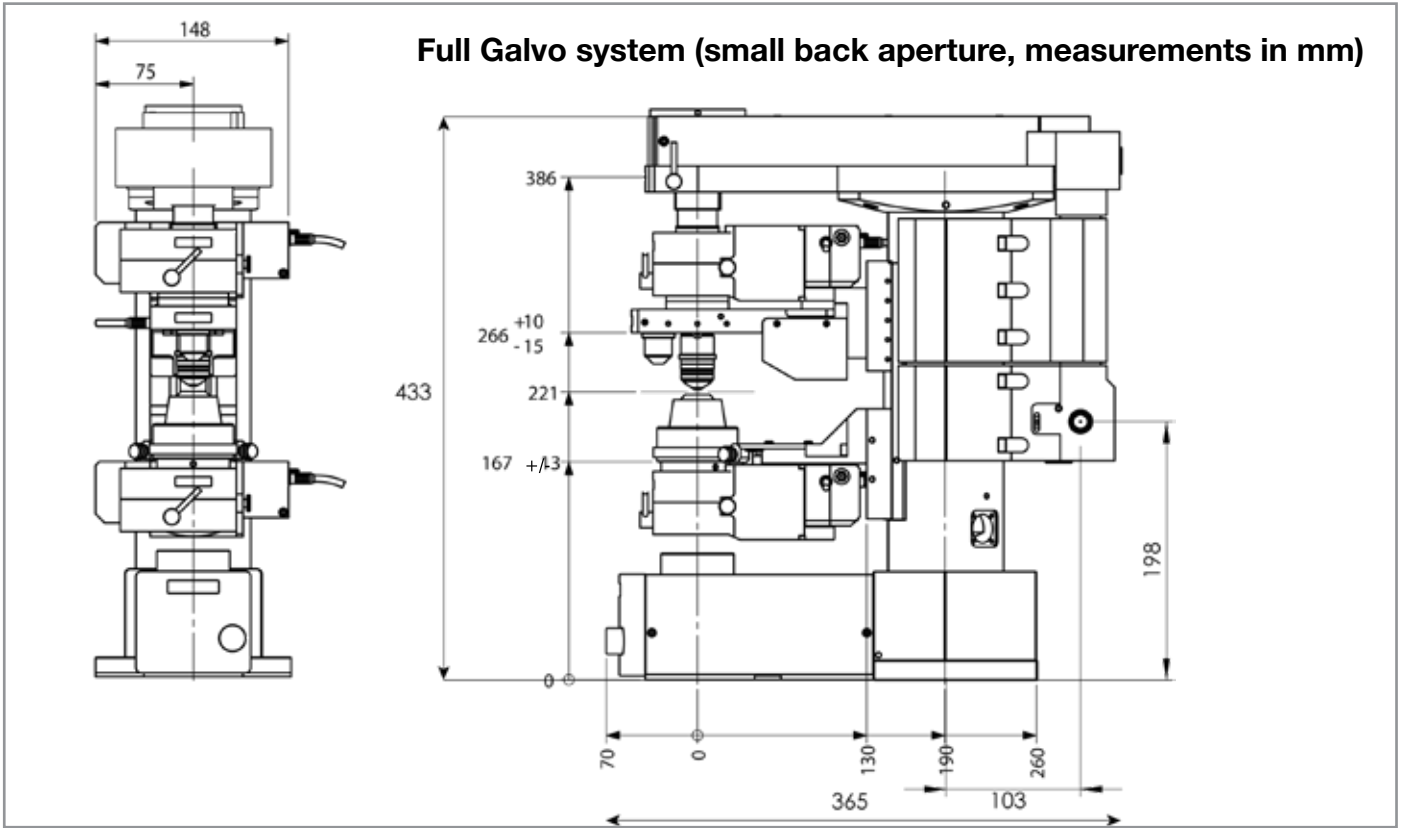
She also took advantage of Scientifica's complete integration with the ScanImage open-source software solution.

Live two-photon imaging of a 12 DIV cultured hippocampal neuron expressing Td-tomato and the membrane receptor EphB2 tagged with GFP at the N-terminus.

The red channel is a cytoplasmic marker and shows the volume of the imaged dendrite. The green channel shows both the lifetime of the quenched green fluorescent protein present in the Td-tomato dimer (short lifetimes) and of EphB2-GFP lighting up the regions with high surface ratio (high lifetimes).

Schematics

Full Galvo system (small back aperture, measurements in mm)

Full Galvo system (large back aperture, measurements in mm & inches)

Full Resonant system (measurements in mm)

Dimensions shown: 165, 82.50, 465.65, 386, 465.75, 266 +10 -15, 221, 167 +13, 282.64, 70, 130, 190, 260, 170.44, 495

VivoScope (measurements in mm & inches)

Dimensions shown: 165mm / 6.50in, 473.50mm / 18.64in, 150mm / 5.91in, 473.50mm / 18.64in, 376mm / 14.80in, 236.14mm ±12.5 / 9.30in, 171mm / 6.73in, 0mm / 0.00in, 0mm / 0.00in, 205.94mm / 8.11in, 272.94mm / 10.75in, 512.13mm / 20.16in

Technical specifications

Microscope

Frame	Scientifica SliceScope Pro - fully motorised in X, Y, Z, and condenser
Motorisation	Ultra-fine (20 nm resolution) stepper motor for objective and condenser focus. Repeatable step size of 0.5 μm. 4 mm/second maximum speed
Epifluorescence	Compatible with Olympus and specific Nikon epifluorescence components (please specify if needed)
Transmitted illumination	Brightfield and/or infrared illumination
Contrast techniques	DIC, Dodt gradient contrast, oblique contrast (depending on multiphoton configuration)

Galvo Scan head

Optimised objectives	Small back aperture version - <9mm Large back aperture version - <20mm
Galvanometers	Cambridge Technology 8315KL with 3 mm X and Y mirrors which are separated with a 1:1 imaging relay
Max scan speed	BiDi scanning: 0.5 ms/line - 4 fps @ 512x512 pixels; 32 fps @ 512 x 64 pixels Saw-tooth scanning: 1 ms/line - 2 fps @ 512 x 512 pixels; 15 fps @ 512 x 64 pixels
Field of view	Approx 300 μm squared with 40x objective & 700 μm with 20x objective
Scan control	Saw-tooth, bi-directional (ScanImage only), horizontal line scan, arbitrary 2D line scan (HelioScan only), Z-stacks
Scan Rotation	360 degree rotation
Zoom control	1 - 20x

Multiphoton Detection Unit

Number of channels	One or two PMT-based detector modules with two PMTs each containing integrated high-voltage supply, active voltage divider, preamplifier and 1.25 MHz low-pass filter
Detector types	R9880U series or GaAsP detectors
Angular collection	+/- 5 degrees maximum from 20 mm objective, +/- 3.5 degrees from 24 mm objective
Objective max exit aperture	20 mm diameter
Laser/visible dichroic mirror	Factory-fitted 665 nm long-pass dichroic
Laser blocking filter	Factory-fitted 680 nm short-pass dichroic

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Technical specifications

Resonant Scan head

Optimised objectives	Large back aperture version - <20mm
Galvanometers	Cambridge Technology 8kHz resonant scanner and 8315KL with 3 mm Y mirrors which are separated with a 1:1 imaging relay
Max scan speed	8kHz scanner – 32 fps @ 512x512 pixel to 256 fps @ 512x64 pixels
Field of view	8kHz scanner – ~600 μm with 16x objective
Zoom control	1 - 8x

Multiphoton Detection Unit

Number of channels	One or two PMT-based detector modules with two PMTs each containing integrated high-voltage supply, active voltage divider, preamplifier and 20 MHz low-pass filter
Detector types	R9880U series or GaAsP detectors
Angular collection	+/- 5 degrees maximum from 20 mm objective, +/- 3.5 degrees from 24 mm objective
Objective max exit aperture	20 mm diameter
Laser/visible dichroic mirror	Factory-fitted 665 nm long-pass dichroic
Laser blocking filter	Factory-fitted 680 nm short-pass dichroic

Associated components available from Scientifica

Multiphoton Launch Optics
Multiphoton Laser Splitting Module
Multiphoton Alignment Pack
Multiphoton Workstation
Multiphoton Moveable Periscope

Warranty & support

Scientifica's success is founded on supplying superior support and application of our significant manufacturing experience. We would therefore really value the opportunity to understand your applications better and to offer no obligation advice on equipment, configurations and compatibility.

The standard warranty for all Scientifica designed and manufactured goods is two-years. However, Scientifica's Multiphoton Imaging system, includes components from other companies, which offer a twelve-month warranty. For an extended warranty on the full system (including some external companies) please contact your Scientifica representative. All warranties cover defects in manufacturing and materials. In this unlikely event, Scientifica will manage the repair and replacement of all components.

Our team of customer support engineers is dedicated to providing you with the very best advice and support, should you experience any difficulties with our products. With all products we offer a complete installation support service.

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