



MCS

MOM Computer System and Software

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The MOM Computer System (MCS) includes the software package MScan. This program has been designed to seamlessly control two-photon imaging using conventional or resonant scanners while incorporating photostimulation and electrophysiology. While designed exclusively for use with the MOM microscope, it is also compatible with other two-photon platforms. The MCS is designed to take on complex experiments in deep-tissue intravital imaging. Its intuitive user interface is easy to use. The MCS package and the MOM together form a formidable tool to understand the most complex issues in neuroscience, immunology or oncology. Importantly, you will find in MCS the same standard of technical excellence that is the hallmark of all Sutter Instrument products.

The MScan 2.0 software has been developed to simplify the many tasks inherent in complicated imaging experiments. MScan 2.0 is extensively multithreaded to take advantage of multicore processors. This ensures reliability and user interface responsiveness. Furthermore, MScan is multiuser based to facilitate sharing of a MOM microscope with MCS among experimenters. Experimenters can then send their data to other workstations for analysis. The MCS analysis program [MView](#) is available for free download on the Sutter Instrument website.

MCS includes a windows 7 workstation, National Instruments data acquisition boards, a USB camera and a USB controlled MPC-200. The National Instruments boards included are a PCI-6110 board for imaging, a PCIe-6353 board for control of imaging and photostimulation laser power and a PCIe-6321 board for electrophysiology. The package is a turnkey system as all data acquisition boards and software come installed within the workstation.

An important feature in MScan is the ability to do bidirectional frame scanning with sub-pixel line offset adjustment. Conventional two-photon frame scanning has involved unidirectional scanning. In these scenarios, data is only recorded when sweeping in one direction across the sample. To increase the rate of data acquisition, it is then necessary to steer the laser beam back to the origin of the scan as quickly as possible to begin the subsequent line. As galvanometric scanners are most taxed and most likely to be damaged during these high-frequency movements, bidirectional scanning both increases the speed at which frames can be recorded and decreases the likelihood of damage to expensive galvanometers.

FEATURES

- Large-scale, high-resolution, deep-tissue mapping
- Multispectral, high-speed, functional optical imaging
- Resonant scanning capable with imaging rates to 30 frames per second
- Photostimulation while imaging through the same optical pathway ("photostimaging")
- Two-photon microscopy and concurrent electrophysiology with computer-controlled placement of electrodes by Sutter micromanipulators

COMMON APPLICATIONS

- Two-photon imaging
- Deep tissue imaging
- Neurophysiology
- Immunology
- Embryology

TECHNICAL SPECIFICATIONS

Dimensions *(subject to change)*

CPU

20.5 in x 8.25 in x 20 in | 52 cm x 21 cm x 51 cm

Monitor

26 in x 10 in x 19 in | 67 cm x 24 cm x 48 cm

Weight *(subject to change)*

CPU

31 lbs | 14 kg

Monitor

15 lbs | 7 kg

Electrical

115/ 230 Volts

50/ 60 Hertz power line

RoHS compliant



US PRICES > MCS SYSTEM

International prices vary by country. Please contact your local distributor or Sutter Instrument for a quotation. Prices subject to change without notice.

Catalog Number	Description	Price
MOM-MCS*	System includes preinstalled MCS2.0 software, Windows 7 workstation, data acquisition boards, USB camera	\$ 19,045

** Must be used with MOM systems equipped with MOM-DAQ, MPC-200 and ROE-200*

US PRICES > MCS COMPONENTS

Catalog Number	Description	Price
MOM-DAQ	MOM data acquisition system (includes NI 6110E PCI board)	\$ 5,645
MPC-200-ROE	Includes MPC-200 controller and ROE-200	\$ 3,900

NOTE: The MOM-MCS communicates with the MPC-200 controller via the USB port for control of X, Y, and Z movement. It is not compatible with the MP-285 controller. Please contact Sutter for more information.

RELATED PRODUCTS

[MOM - Movable Objective Microscope](#)

PRODUCT INFORMATION

[Download Sales Flyer](#)

TECHNICAL INFORMATION

IMAGING MODES

- XY movie - Real-time continuous zoom and rotation, 1° increment
- XZ movie - Requires Z-piezo nanopositioner
- Timelapse
- Stack - Synchronized Z focus and power modulation (linear or exponential)
On-line averaging
- Fast stack - Fast XYZT time series when used with Z-piezo nanopositioners
Synchronized Z focus and power modulation (linear or exponential)
- Line scan - User-drawn trajectory with arbitrary orientation and position
- Region scan - User-designated collections of points, lines, rectangles, ellipses or polygons
Unlimited number of regions
- Photostimulation scan - User-designated collections of points, lines, rectangles, ellipses or polygons
For each region, user can set:
 - Dwell time per pixel
 - Laser intensity
 - Duty cycle to output trains of light in the region

3-D MAP WINDOW

- Stores multispectral frames or stacks in a 25 x 25 x 25 mm 3-D world in objective coordinates

FUNCTIONAL IMAGING

- Real-time display of averaged intensities of regions of interest (ROIs) in scrolling plot
 - ROIs can be rectangles, ellipses or polygons
 - Unlimited number of regions
 - Automatic selection of the same region in other channels (useful for FRET)

ANALOG INPUTS

IMAGING FEATURES

- 4 imaging channels with independent gains and user-adjustable pixel duration
- Bidirectional line scan with sub-pixel line offset adjustment
- User or TTL triggered

CONTROL OF IMAGING POWER

- Dedicated fast analog output (sub-microsecond response time) to control laser intensity via Pockels cell allowing beam blanking on scan turnabout

POWER MEASUREMENT

- Interfaces with an optical laser power meter for accurate, real-time measurement of laser power to the preparation

FOCUS CONTROL

- Full XYZ control of objective placement with Sutter Instrument MPC-200

PHOTOSTIMULATION

- Dedicated fast analog output (sub-microsecond response time) to control laser intensity via:
 - Pockels cell

PHOTOSTIMAGING

- Photostimaging is photostimulation during imaging. Photostimaging can be enabled during an XY movie, line scan or region scan
Photostimaging requires a photostimulation laser (i.e. an ultrafast laser coupled to a Pockels cell or an analog-controlled blue-green diode laser) sharing the imaging pathway with the imaging laser via a dichroic mirror

INTEGRATED DEVELOPMENT ENVIRONMENT

- Rich object model to control hardware, fully compatible with ActiveX

- 8 analog channels, up to 250 kHz continuous acquisition rate

SOFTWARE STIMULATOR

- Ideal to interface electrical or optogenetic stimulators
 - 2 analog out channels
 - 8 digital out lines

TARGETED PATCH-CLAMPING

- Support for one Sutter Instrument micromanipulator
Control of two more micromanipulators with additional MPC-200 controller

CELLULAR AMPLIFIER CONTROL

- Automatic real-time scaling of inputs via telegraph gain
Supports Axon Instruments AxoClamp 900A, Axopatch 200B and Multiclamp 700B

Automation

MCS DATA FILES

- Designed with GLP (Good Laboratory Practice) compliant header, visible from Windows shell
Contain imaging data, analog data and snapshots from CCD focusing cameras
Standar tags and custom tags, querable Automation interface

DATA FILE MANAGEMENT

- Semi-automatic backup of data files at the end of a session at up to two different locations (i.e. thumb drive, network disk...)

BLOGGABLE NOTEBOOK

- Automatic log of events accessible via the built-in web browser