

**OLYMPUS**<sup>®</sup>

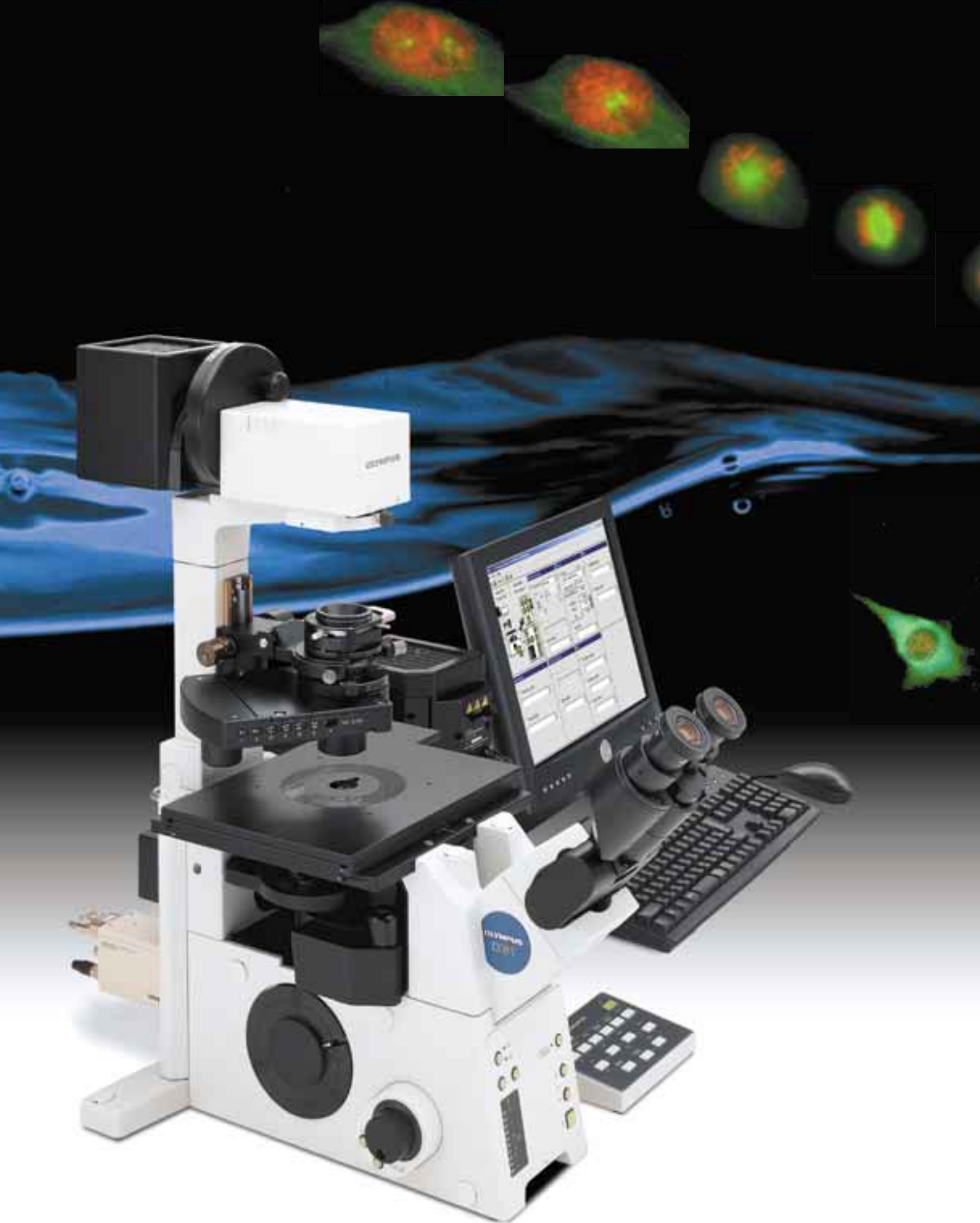
MOTORIZED  
INVERTED SYSTEM MICROSCOPE

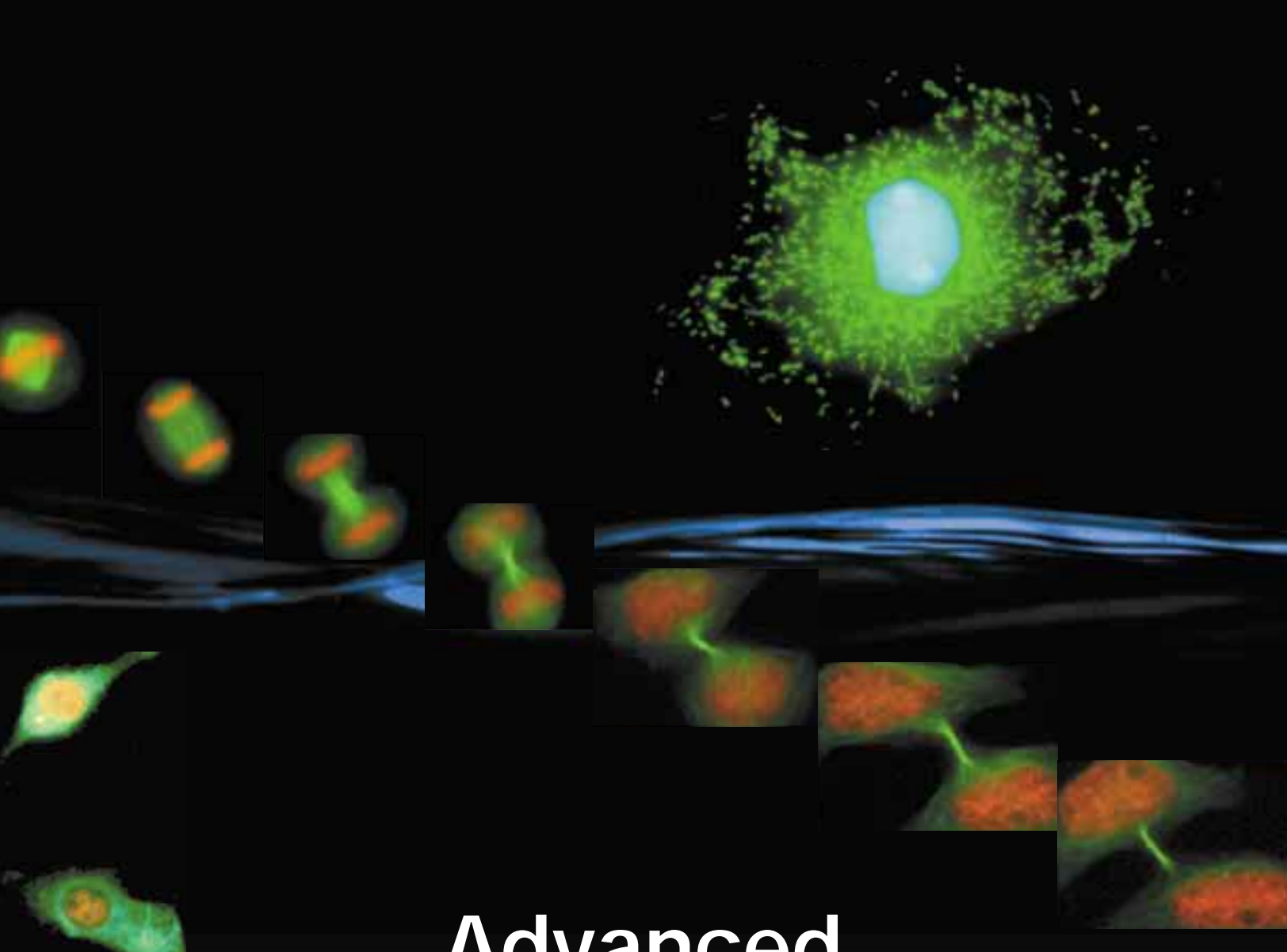
**IX81**  
IX2 SERIES

*Automated Platform for  
Live Cell Imaging*

*UIS*  
UNIVERSAL  
INFINITY SYSTEM







# Advanced, fully motorized system for superior performance.

The IX81 is Olympus' most advanced motorized microscope, providing high standards of observation, measurement and functional operation. A V-shaped optical path, improved fluorescence illuminators and further expanded UIS optics provide excellent performance for research applications. A modular system of motorized accessories allows for complete customization to individual research needs. Multi-dimensional analyses can be performed automatically or even remotely via computer control. Additionally, the IX81 features numerous input and output ports allowing the use of several light sources and detectors. The IX81 is the optimum imaging platform for research and automation.

*\*Note:*

*UIS optics: The original Olympus infinity-corrected optical system. This system expresses the superb Olympus optical technology, provides high resolution, high contrast images and the flexibility to meet current and future applications.*

# A flexible motorized platform for automated system solutions.

## A selection of independent motorized units for convenient operation.

All major microscope functions can be motorized, including focus, illumination, objectives and optical path selection. The motorized units for the IX81 can be operated via a remote handset or buttons on the microscope body. All controls are close to the operator's hand, maximizing user comfort while minimizing needed bench space.

## Computer control for routine and research applications.

All motorized functions are also controllable via computer. Imaging software can be used to facilitate microscope operations ranging from routine to complex. Buttons on the microscope body and remote handset can be programmed for custom operation.



## Motorized universal condenser/ IX2-LWUCDA

6 turret positions allow brightfield, phase contrast and DIC observations. Also accepts 32mm filters.



## Handset/U-HSTR2

A remote handset controls all motorized functions via a convenient and programmable interface.



## Focus handle/U-FH

The remote focus handle duplicates the feel and function of the microscope's focus knobs. Additional controls include fine/coarse focus selection, lamp on/off, shutter open/close, and camera vs. visual observation.



## System controller/IX2-UCB

All motorized units are powered by this external system controller. Included is an RS232C connection for PC commands and expansion slots for future system upgrades.



## Microscope front panel

Easy to use buttons allow selection of light path, focus fine/coarse switchover, light intensity and lamp on/off control. Two auxiliary buttons can be custom programmed. Includes LED lamp intensity meter.

- Light path selector
- Auxiliary buttons
- Fine/Coarse
- Transmitted light intensity control
- Transmitted light ON/OFF





**Motorized shutter/IX2-SHA**

Can be mounted in both transmitted and reflected light paths.



**Motorized filter wheel/  
U-FWR and U-FWO**

6 filter positions  
(32mm or 25mm diameter).



**Motorized sextuple revolving nosepiece**

Included with microscope frame.

**Motorized fluorescence cube turret/  
IX2-RFACA**

6 fluorescence filter cube positions.



**Internal motorized focus drive**

0.01  $\mu\text{m}$  minimum step size.

**Objective escape and  
zero-return buttons**

Moves objective to lower focus limit.  
Allows setting of default focus position.

\* Equipped on each side of microscope frame.



Escape button

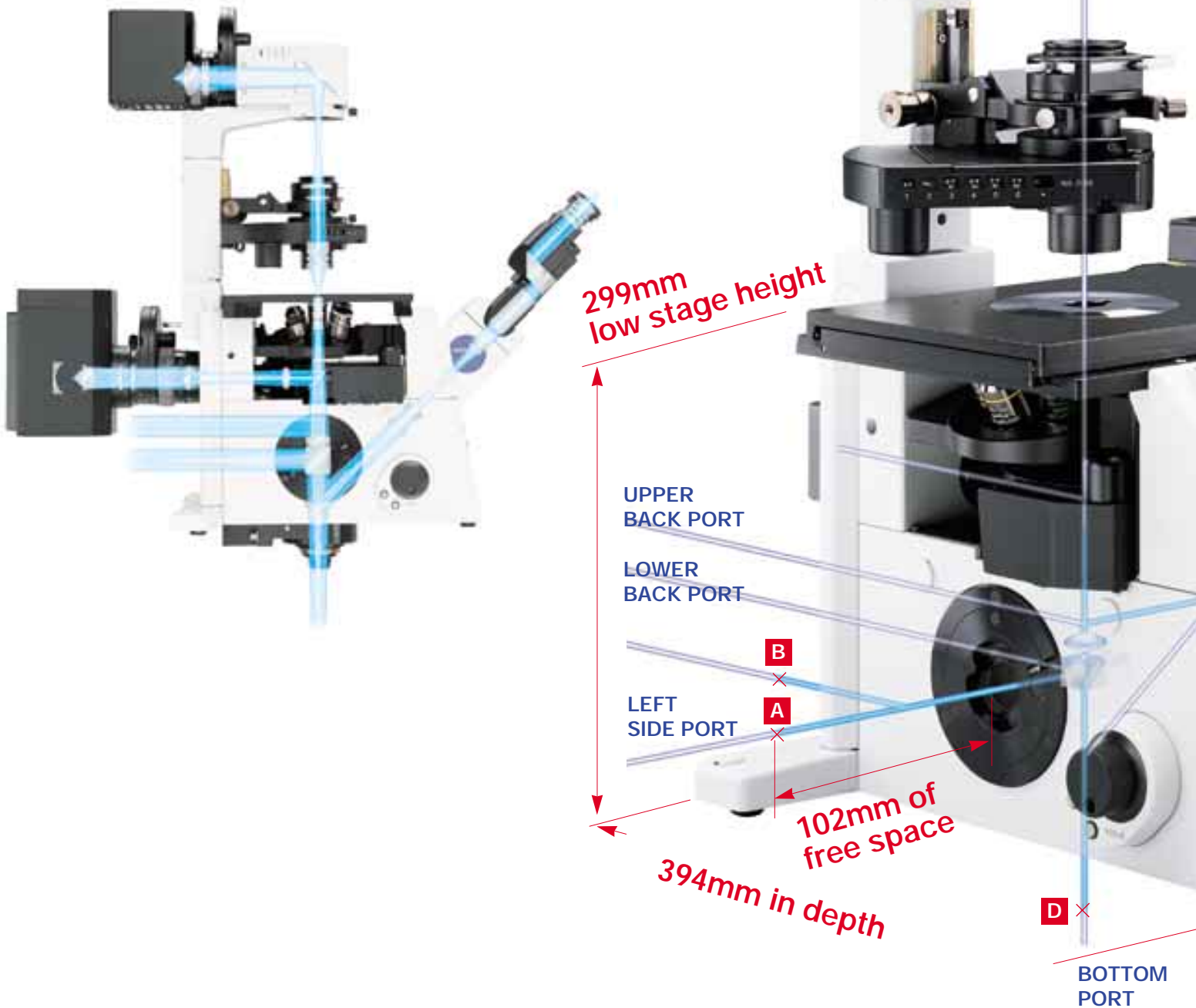
Return to memory position button

**Motorized bottom port unit with C-mount/  
IX2-TVRAC**



# Unique two-tiered multi-port design offers input/output system flexibility and application support

The IX frame begins with 6 input/output ports for a wide variety of light sources or cameras. The unique Olympus design allows up to four ports to have simultaneous access to the primary image, without relay lenses, providing cameras with the highest quality image, free of aberrations. Two-tiered multi-port design maximizes flexibility while maintaining a 299mm low stage height. The compact and rigid frame requires a minimum amount of bench space, easily accommodates external equipment and remains stable during extended observations. Over 100mm of free space is available at the left side port between the frame and the primary image, easily allowing for adaptation of instrumentation for individual research requirements.



**A B C D**

**Primary images are obtainable from all 4 ports simultaneously**



**BINOCULAR PORT**

**C**  
**RIGHT SIDE PORT**

### LEFT SIDE PORT (Primary Image)

**A B**

For film or CCD camera systems. Double port tube allows the attachment of two cameras (both primary images). Also accepts Olympus confocal scan units.



U-DPCAD double port tube

### RIGHT SIDE PORT (Primary Image)

**C**

Used for connecting an additional light source or CCD camera.



IX2-RSPC  
Right side port attachment with C-mount

### BOTTOM PORT (Primary Image)

**D**

Well suited for extremely sensitive low light level imaging.



IX2-TVR bottom port adapter  
+ CCD camera

### UPPER BACK PORT (Primary Image)

Used for connecting an additional light source or CCD camera.

### LOWER BACK PORT (Primary Image)

For the attachment of large bodied items such as cooled CCD cameras or confocal scan units.



### BINOCULAR PORT

CCD camera mount via side port intermediate tube.



GX-SPU  
side port  
intermediate  
tube

# High quality images meet the demands of advanced analytical applications.

## *New fluorescence accessories for improved sensitivity*

Improvements in the performance of the UIS optical system have resulted in sharper, clearer images. Two reflected light fluorescence illuminators are now available.

- An L-shaped illuminator includes centerable aperture and field stops with convenient controls close to the user. L-shape also permits the mounting of a large bodied camera to the back port.
- A straight illuminator designed for maximum intensity provides the brightest possible images.



A variety of fluorescence filter cubes are available. Up to 6 cubes can be installed in the motorized turret, with easy selection via the remote handset. An optional DIC filter cube incorporates an analyzer and allows automatic switching between DIC observation and fluorescence.

### **Rectangular field stop/IX2-RFSS**

### **Pinhole field stop/IX2-RFSPOT**

Flexible field stop options IX2-RFSS rectangular field stop module or IX2-RFSPOT pinhole field stop module can be mounted into the



L-shaped illuminator for improved illumination control during fluorescence imaging or photobleaching experiments.

(Available autumn 2002)

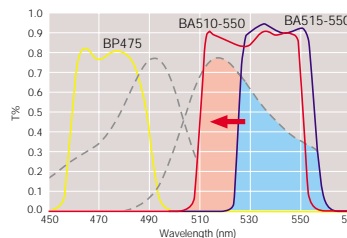
### **GFP, CFP, YFP Filter Cubes**

Fluorescence performance has been improved with high efficiency coatings minimizing signal crossover. Filter sets are optimized for



specific fluorochromes such as GFP, CFP and YFP. All Olympus filter cube housings incorporate anti-reflective materials that minimize stray light .

(Available autumn 2002)



The new IBA cube has a capability to maximize deflection of GFP emission.

### **Long working distance objectives/LUCPLFL40x**

Accommodating vessel thicknesses from 0-2mm with a correction collar mechanism that maintains objective focus during adjustment.



Correcting for different vessels is fast and simple. Lens design for 340nm transmission allows these objectives to be used for UV fluorescence applications such as FURA-2.

## *High quality images of living cells*

The IX2-LWUCDA motorized universal condenser enables standard brightfield, phase contrast and DIC observations. Three series of DIC prisms are available for optimum contrast enhancement with a wide variety of specimens. Standard prisms are best for most



observations, while High Contrast (HC) prisms provide maximum contrast for thin specimens, and High Resolution (HR) prisms provide maximum detail with thicker specimens.

## *Optimum images for Microinjection*

Relief Contrast Condenser provides long working distance (W.D. 45mm) for injector access and a high numerical aperture (N.A. 0.5) for excellent images with plastic dishes. With a long working distance and high N.A. Phase contrast and DIC are also possible.

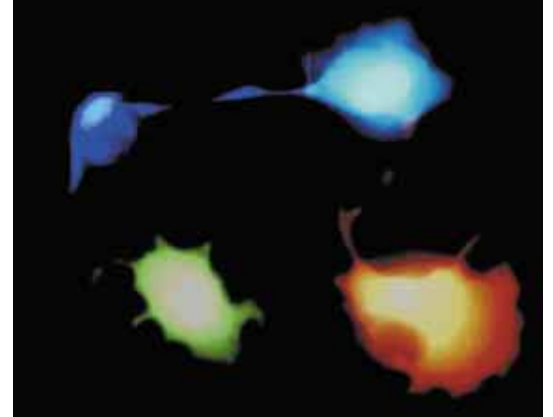


Unique Relief Contrast objectives feature rotatable modulators for consistent shading for all magnifications.



## ***Computer controlled multi-color and time-lapse applications***

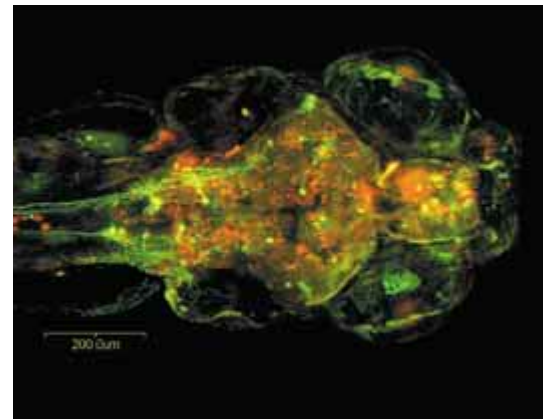
Motorized precise internal Z-drive, objective nosepiece and accessories allow multi-dimensional, multi-spectral imaging via a computer. A thermally and structurally stable frame design combine to create an ideal system for long term time-lapse and deconvolution observations.



## ***Fully automatic confocal system to meet a wide range of needs***

The Fluoview confocal scan unit can be attached to the back port, leaving ample space for manipulators and electrophysiological equipment. Combining the IX81 with the Fluoview FV500 provides a fully capable, multi-channel, motorized system. Both confocal and fluorescence observation equipment can be attached simultaneously, and port changing can be performed automatically.

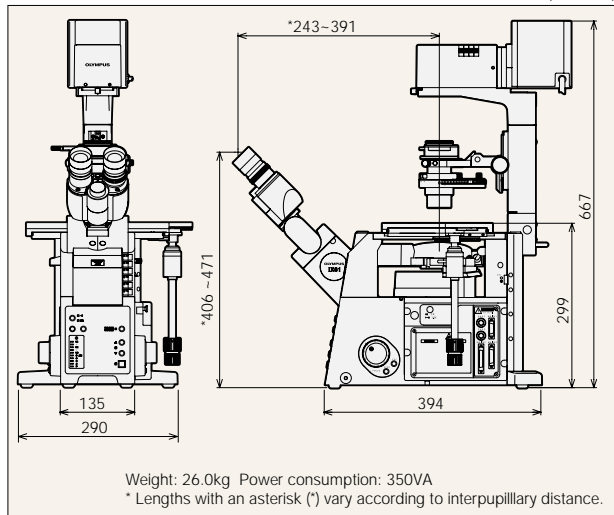
\*Special microscope body available for Fluoview.



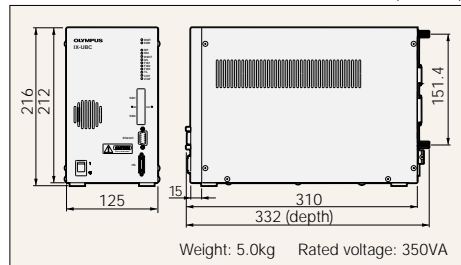
## IX81 specifications

|                                   |  |   |  |
|-----------------------------------|--|---|--|
| Microscope body                   | Revolving nosepiece                        |   | Sextuple motorized with objective lens retraction in PC mode, simple waterproof mechanism incorporated   |
|                                   | Focus                                      |   | 9mm stroke (from stage surface, 7mm upward and 2mm downward), fine/coarse switchable focusing knobs (minimum graduation: 0.1µm), objective lens escape/return buttons and return to memory position buttons (each side of microscope frame)  |
|                                   | Primary image port                         |   | Lower port (standard left side port: S1F 100% or S8F 80%, or optional lower Back port selectable, 2-step light path selection), Upper port when built-in magnification changer 1x/1.6x is replaced (optional right side port or upper back port selectable, 2-step light path selection), Bottom port (option) |
|                                   | Frontal operation                          |   | Light path selector button, Transmitted light intensity control buttons and light ON/OFF switch button, Fine/Coarse focus selector button, TTL Pulse control switch (auxiliary) buttons  |
| Transmitted light illuminator     | 100W transmitted light illumination pillar | IX2-ILL100  | Pillar tilt mechanism (30° inclination angle, with shock decreasing mechanism), Condenser holder (with 50mm stroke, swing-in/out mechanism), Field iris diaphragm adjustable, 4 filter holders (ø45mm, t=6mm or less)  |
|                                   | External power supply unit                 | IX2-UCB   | Auto voltage selector (100V / 200V), RS232C interface for PC operation, IX2-BSW driver software  |
| Observation tube                  | Tilting binocular tube                     | U-TBI90   | 35-85° continuous angle adjustable (eyepoint height range: 406mm-471mm), interpupillary distance adjustable between 50-76mm, diopter adjustment function, erect image, F.N. 22   |
|                                   | Binocular tube                             | U-BI90CT  | Built-in focusing telescope, interpupillary distance adjustable 50-76mm, diopter adjustment function, F.N. 22  |
|                                   |  | U-BI90  | Interpupillary distance adjustable 50-76mm, diopter adjustment function, F.N. 22   |
| Trinocular tube                   | TR30H+IX-ATU                               | 3 step optical path selectable (observation: straight port = 100:0, 20:80, 0:100), interpupillary distance adjustable 50-76mm, diopter adjustment function, F.N. 22 |  |
| Stage                             | Cross stage with flexible right handle     | IX2-SFR   | 50mm(X) x 50mm(Y) stroke, stage insert plate exchangeable (ø110mm)   |
|                                   | Cross stage with short left handle         | IX-SVL-2  | 50mm(X) x 43mm(Y) stroke, stage insert plate exchangeable (ø110mm)   |
|                                   | Plain stage                                | IX2-SP  | 232mm(X) x 240mm(Y) stage size, stage insert plate exchangeable (ø110mm)   |
|                                   |  | IX-MVR  | Mechanical stage to be used with IX2-SP, 130mm(X) x 85mm(Y) stroke   |
|                                   | Narrow plain stage                         | IX2-KSP   | 160mm(X) x 240mm(Y) stage size, stage insert plate exchangeable (ø110mm)   |
|                                   |  | CK40-MVR  | Mechanical stage to be used with IX2-KSP, 120mm(X) x 78mm(Y) stroke  |
| Gliding stage                     | IX2-GS                                     | Upper circular stage 360° rotatable, 20mm(X/Y) travel   |  |
| Condenser                         | Motorized long working distance universal  | IX2-LWUCDA  | Motorized turret with 6 position slots for optical devices (3 positions each for ø30mm and ø38mm), aperture iris diaphragm adjustable, N.A. 0.55 / W.D. 27mm   |
|                                   | Long working distance Relief Contrast      | IX2-MLWCD   | 4 positions for optical devices (for ø50mm, Relief Contrast optical devices rotatable), aperture iris diaphragm adjustable, N.A. 0.5 / W.D. 45mm   |
|                                   | Ultra long working distance                | IX-ULWCD  | 4 positions for optical devices (for ø29mm), aperture iris diaphragm adjustable, N.A. 0.3 / W.D. 73mm  |
|                                   | Water immersion DIC                        | IX2-DICD+IX2-TLW  | Single position for optical device (include two optical device holders), 40 injection pipette or electrode insertion angle, aperture iris diaphragm adjustable, N.A. 0.9 / W.D. 3.7mm  |
| Eyepiece                          |  | WH10x   | High eyepoint, F.N. 22   |
|                                   |  | WH10x-H   | High eyepoint, diopter adjustment function, F.N. 22  |
| Reflected light fluorescence unit | Fluorescence illuminator                   | IX2-RFAL  | L-shaped design with exchangeable F.S. and A.S. modules, two filter holder sliders (2 positions, ø32mm, t=6mm or less)   |
|                                   |  | IX2-RFA   | Straight design with field iris diaphragm, filter holder slider (2 positions, ø32mm, t=6mm or less)  |
|                                   | Fluorescence cube turret                   | IX2-RFACA   | Motorized turret with 6 positions, built-in shutter  |
|                                   | Light source                               |   | 100W HBO lamp housing and HBO transformer, or 75WXBO lamp housing and XBO transformer  |

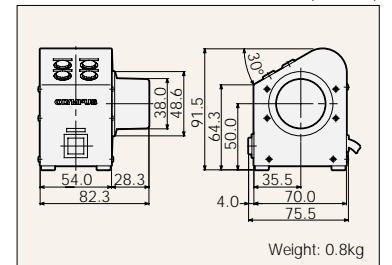
## IX81 dimensions



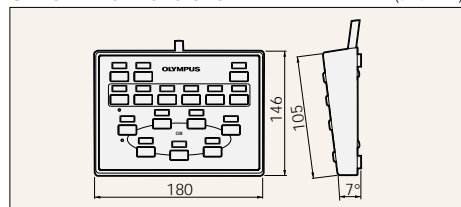
## IX2-UCB dimensions



## U-FH dimensions



## U-HSTR2 dimensions



Photos courtesy of : Dr. Hiraoka, Cell Biology Group Leader, Kansai Advanced Research Center, Communications Research Laboratory (P1-2 time-lapse)  
Pr. Yasuhiro Kamei, Pr. Shunsuke Yuba, Institute for Molecular and Cellular Biology, Osaka University  
(P8 below, coexpression of EGFP and DsRed in a Zebrafish embryo, extended focus image of 10µmX28 slice)

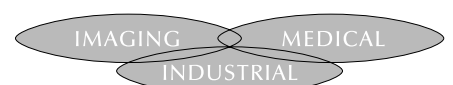
Specifications are subject to change without any obligation on the part of the manufacturer.



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