Dimensions

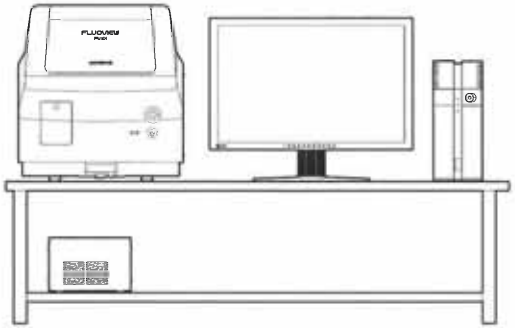

Table size (mm): 1400(W) · 800(D)
* Table is not available from Olympus. Avoid placing the controller directly on the floor.

Dimensions / Weight / Power consumption

Description	Model	Dimensions (mm)	Weight [kg]	Power consumption	Notes
FV10i-LIV main unit	FV10C-W3	470(W)×680(D)×505(H)	Approx 73	(Powered via FV10C-PSU)	Minimum installation clearance: top – 200 mm, back – 120 mm
FV10i-DOC main unit	FV10C-O3	470(W)×680(D)×495(H)	Approx 60	(Powered via FV10C-PSU)	Minimum installation clearance: top – 200 mm, back – 120 mm
Power supply unit	FV10C-PSU	230(W)×330(D)×150(H)	Approx 7.5	AC100-120/200-240V 50/60Hz 5.0A/2.5A	Minimum installation clearance: back – 150 mm
Controller	FV10C-CU	136(W)×380(D)×329(H)	Approx 8.5	AC 100-120/200-240V 50/60Hz 4.3A/1.8A	Minimum installation clearance: back – 150 mm
Display	FV10i-DISP	566(W)×209(D)×456 – 538(H)	Approx 10.6	AC 100-120/200-240V 50/60Hz 1.1A/0.55A	

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"OLYMPUS CORPORATION is FM553994/ISO9001 certified."
CLASS 1 Laser Product

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  Using it in a residential environment may affect other equipment in the environment.
- Windows is a registered trademark of Microsoft Corporation in the United States and other countries. All other company and product names are registered trademarks and / or trademarks of their respective owners.
- Monitor images are simulated.
- Specifications and appearances are subject to change without any notice or obligation on the part of the manufacturer.

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OLYMPUS®

Your Vision, Our Future

Confocal Laser Scanning Biological Microscope

FV10i

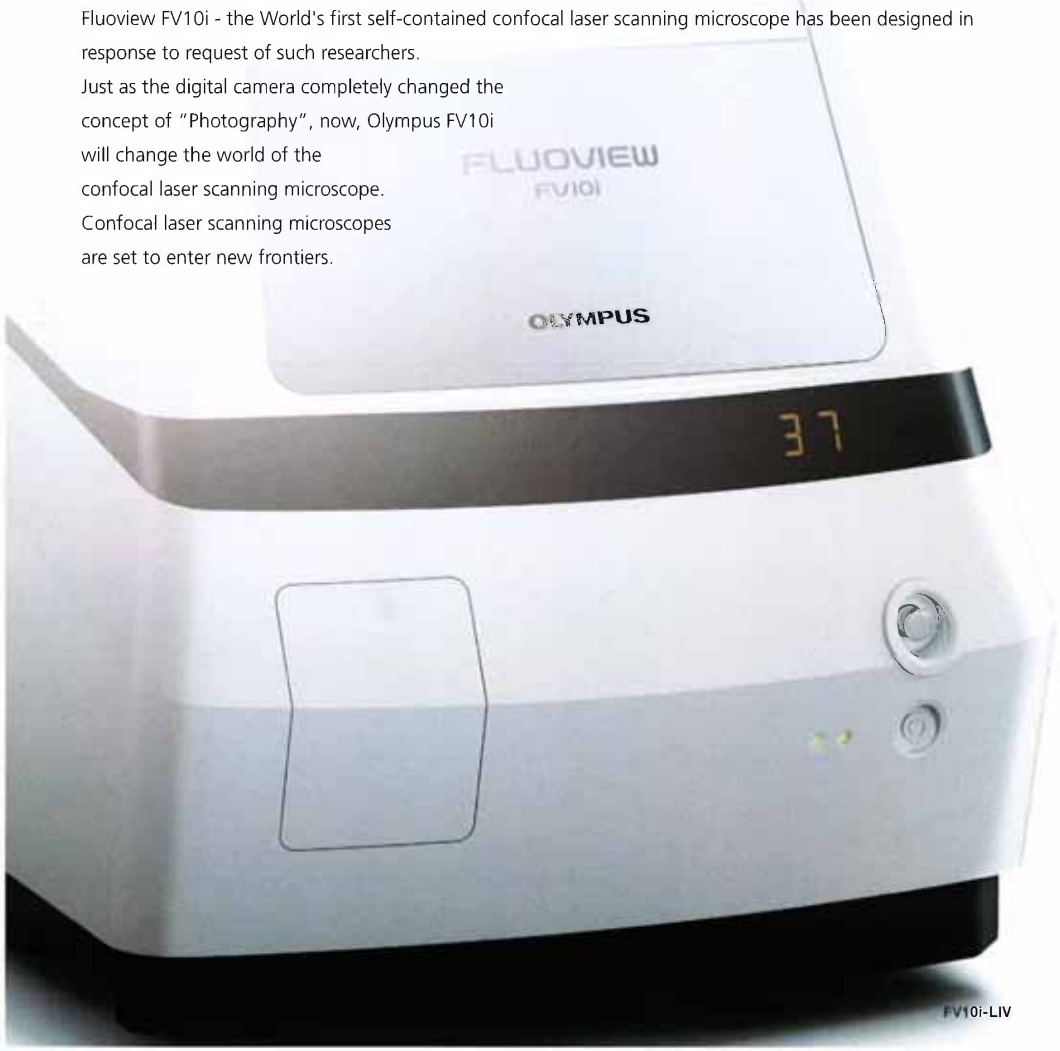
FLUOVIEW

UIS2
World-leading optics

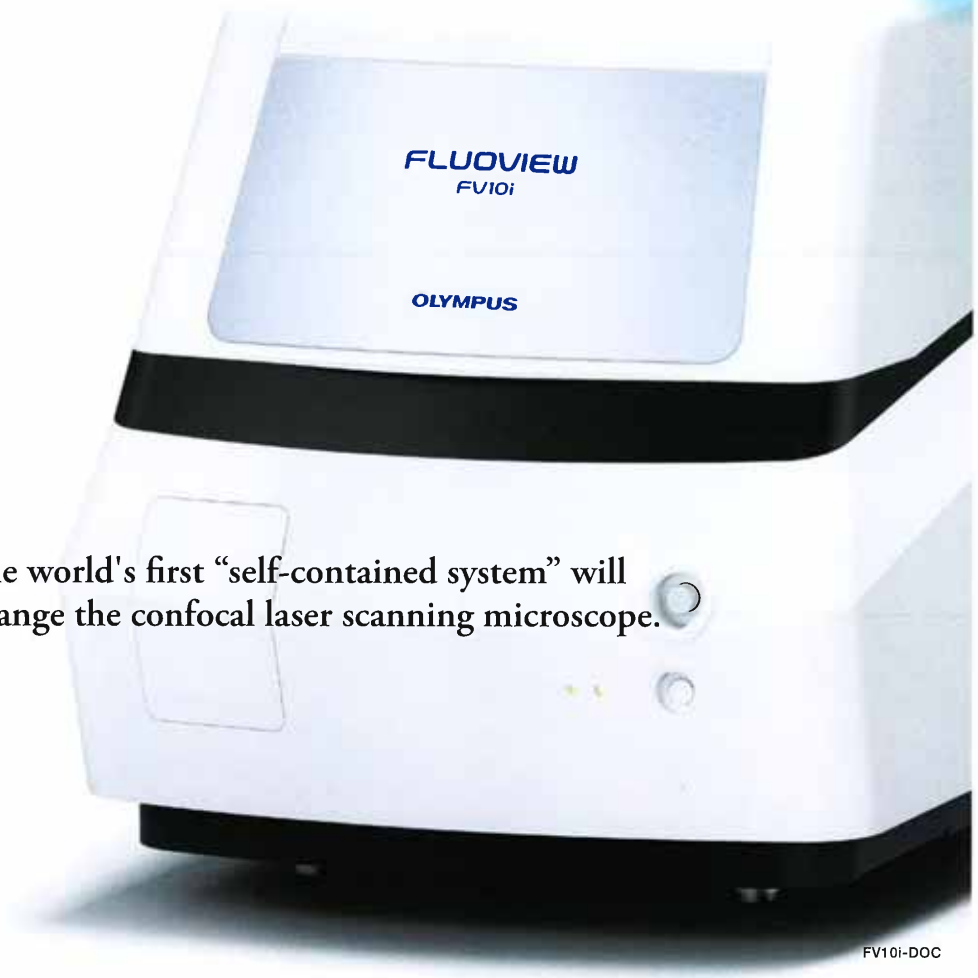
Quality Performance, Innovative Design

Designed to be the optimum equipment for achieving your experimental goals.

Of course, this process is the means to, not the end of research.
It follows that the confocal laser scanning microscope should be a user friendly and effective tool.
To make the best use of their time, we hope the biologist can focus first and foremost on their experiment.
Fluoview FV10i - the World's first self-contained confocal laser scanning microscope has been designed in response to request of such researchers.
Just as the digital camera completely changed the concept of "Photography", now, Olympus FV10i will change the world of the confocal laser scanning microscope.
Confocal laser scanning microscopes are set to enter new frontiers.



FV10i-LIV



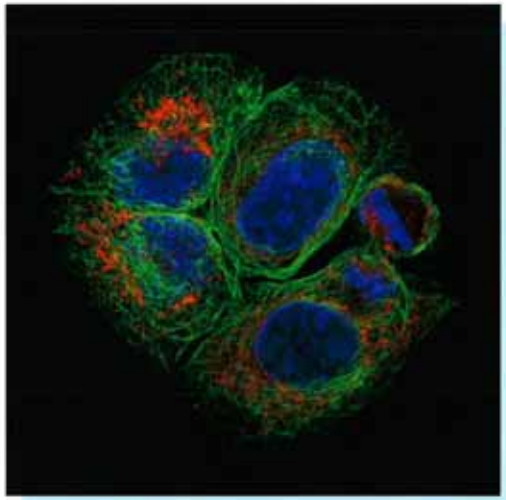
FV10i-DOC

The world's first "self-contained system" will change the confocal laser scanning microscope.

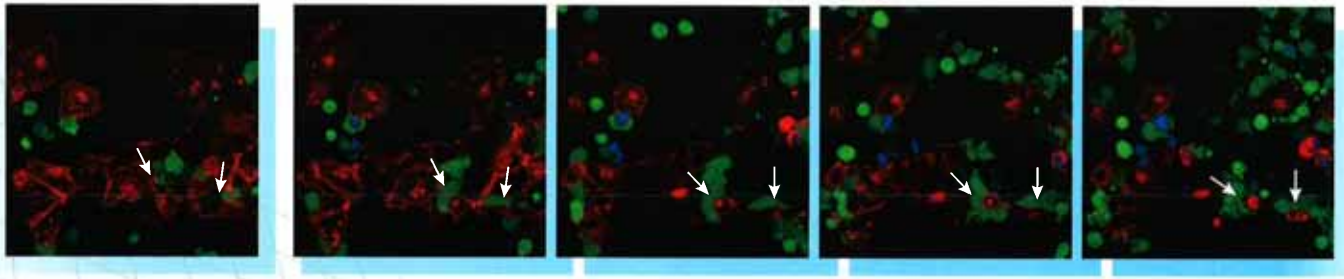
FV10i-LIV For live cell time-lapse imaging with an incubator and a water-immersion objective

FV10i-DOC For high-quality imaging with a high numerical aperture oil-immersion objective

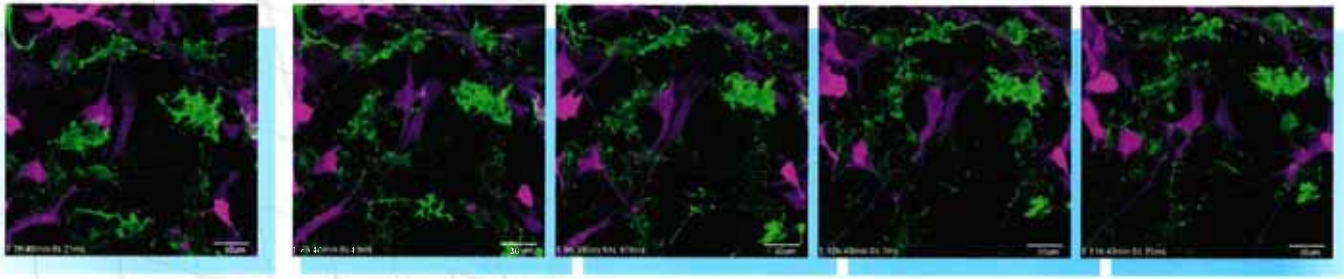
From multicolor to multi-area time-lapse images, the FV10i allows you to easily and efficiently capture the confocal images you really want to view.



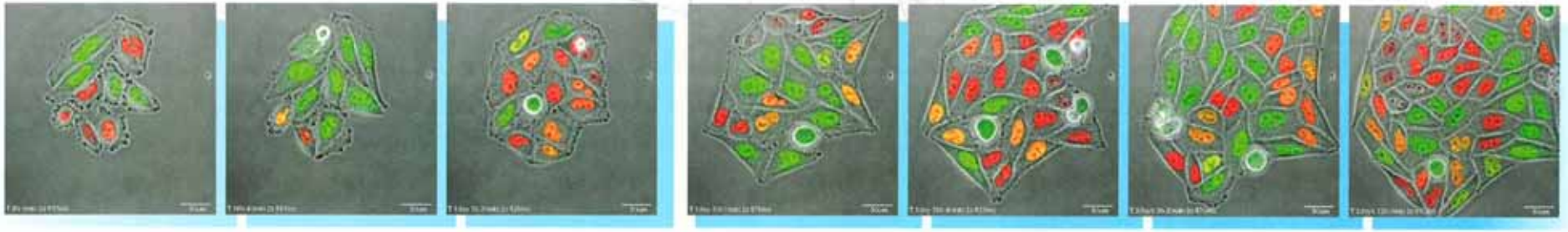
HeLa cells
Nucleus(DAPI), Microtubule(Alexa Fluor 488), Mitochondria(MitoTrackerRed)



Observation of Antibody-Dependent Cell-mediated Cytotoxicity
A human colorectal cancer Cell Line RPMI4788 was treated with antibody drug "Cetuximab" in the existence of ZeGreen expressing NK cells.
Cetuximab indued ADCC was observed by using FV10i.
Cetuximab(Alexa Fluor 647), NK cell(ZsGreen), Identify cell death(DAPI)
The image data courtesy of: Yuji Mishima Ph.D, Kiyohiko Hatake M.D.,Ph.D, Clinical Chemotherapy, Cancer Chemotherapy Center, Japanese Foundation for Cancer Research



Coculture of neural progenitor cells (Venus) and astrocytes (mRFP). Both cells were derived from adult rat hippocampus.*
The image data courtesy of: Hiroshi Hama Ph.D, Atsushi Miyawaki M.D.,Ph.D,
RIKEN Brain Science Institute Laboratory for Cell Function Dynamics, Life Function Dynamics, ERATO, JST



Growing HeLa cells expresses Fucci, a cell cycle indicator
(green nuclei, cells in S-G2-M phase: red nuclei, cells in G1 phase: yellow nuclei, cells in transition state from G1 to S phase).
The image data courtesy of: Asako Sakaue-Sawano Ph.D, Atsushi Miyawaki M.D.,Ph.D,
RIKEN Brain Science Institute Laboratory for Cell Function Dynamics, Life Function Dynamics, ERATO, JST

*The images with asterisk correspond to universal color design in consideration for persons with partial color blindness.

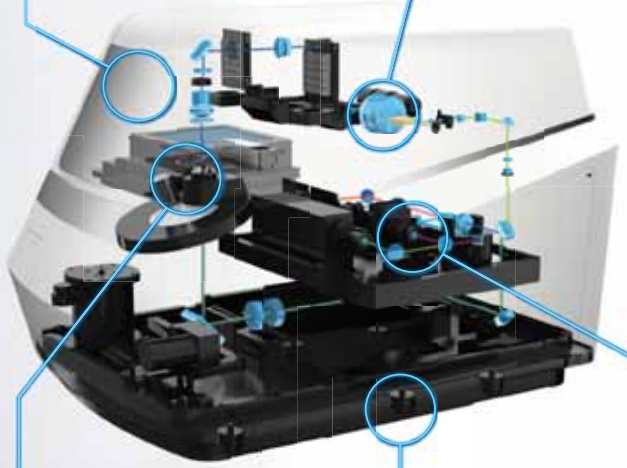
The whole conception of the FV10i is designed for the person who actually uses the microscope. The FV10i design is the worlds first self-contained confocal laser scanning microscope.

Dark room free

The Microscope body and light tight cover are integrally combined. You can use the FV10i with ease in a laboratory, unlike conventional confocal laser scanning microscopes which require a dark room.

Scanning unit

The system is equipped with a detector which automatically sets conditions in accordance with fluorescence dye on a scanning unit. Imaging can be performed in the condition that is most suited for each fluorescence dye.



Microscope function

The FV10i's excellent optical and mechanical modules are totally integrated. The FV10i can capture images from 10× to 600× magnification with 10×, 60× objectives and optical zoom.

Vibration isolation function

Equipped with built-in vibration insulators. A vibration isolation table is not required. You can install it directly on your experimental table.

Laser combiner

Equipped with four diode laser units, each unit utilizing a compact diode laser of longer life and power-saving compared to traditional confocal systems.

The FV10i is a self-contained confocal laser scanning microscope which can be installed at a small area, and used by anytime by anyone.

The biggest advantage of FV10i is its unique self-contained design. We have completely overhauled the design of the confocal laser scanning microscope which used to need various devices and complicated settings. We have made the FV10i a self-contained package integrated with all the necessary functions including incubator and laser combiner. In addition to the compactness of the unit, we have pursued ease of use with the microscope, including a vibration isolation function, and a light tight cover eliminating the need for a dark room. You can install the FV10i easily in a laboratory without having to prepare a dedicated room. The FV10i has the same functionality high end confocal laser scanning microscope users are accustom to. FV10i will completely change the relationship between biologists, their research and the confocal laser scanning microscope.

You can start efficiently capturing images right from the first day, with a new, automatic, operational feel.

Sample Setting

Set

Setting

Place a specimen, and select a fluorescence dye. The FV10i automatically selects the most suitable imaging conditions based on the fluorescence dye selection.

Map Image

Select

Image mapping menu

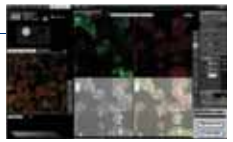
Just click a <Start> button, and a map image of the specimen is created automatically. Users can easily identify the point he or she wants to capture.

Observe

Capture

Image capturing

Through the sophisticated operating software, the image capture area or zoom magnification can be set quickly and then click of a button to complete image capturing.



Stress-free operation for every user.

Place a specimen on the stage and close the cover. These two steps complete the work of the user. After that, the sophisticated display offers clear and efficient operation. The selection of the imaging point, for example, which until now required experience and expertise, can be performed simply and speedily by anyone using the newly designed image mapping menu. Furthermore, automatic focus or automatic intensity adjustment allow the imaging conditions to be set up according to the type of specimen and observation mode, using advanced automatic functioning that is only possible with Olympus products.
In addition, the system is equipped with a navigation function that identifies the operational step of imaging procedure guiding the operator to the next appropriate operation. Our confocal laser scanning microscope provides a stress-free, comfortable operating enviroment even for first-time users.

Acquire Map Image

Image mapping tool

The map image is created automatically with one click of the button.
You can select the area you want to capture rather than having to search for it.

When the setting is completed, then click the <Start> button.

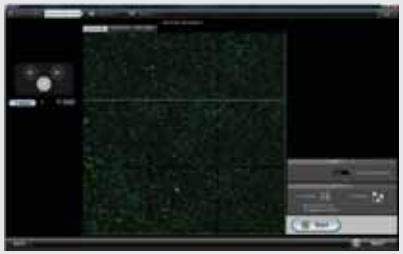
When loading of the specimen is completed, just click the <Start> button in the "Acquire Map Image" window. The creation of the map image of the specimen will begin automatically. With this bird's eye view of the cell, the user can quickly and easily select the imaging area he or she wants to capture.

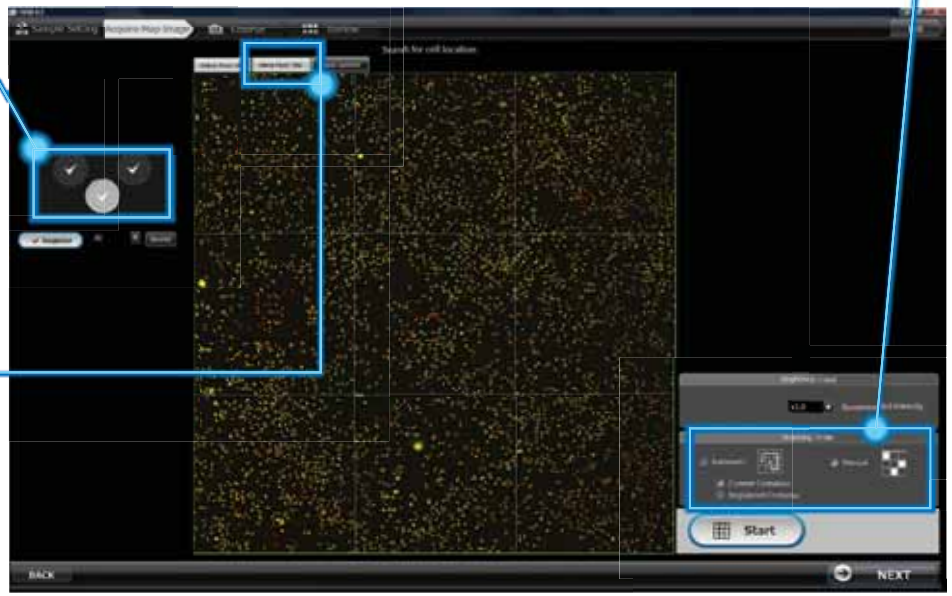
Mapping area selection

The area is displayed according to the type of specimen holder used, such as a 35mm dia. dish or glass slide. Clicking the area you want to scan will display the area on the "Map Image" screen. You can also change of the area with just a single click operation.

Fluorescence dye change

The display of the map image can be switched for each fluorescence dye. The images can also be overlaid with each other.





Scanning order setting

You can select one of the following two scanning orders. depending on the experimental requirements.

Automatic

A map image is automatically created from the center in a spiral pattern.
Even a first-time user can easily identify the confocal view area.

Manual

You can select the area that you want to view from the map at random. Selection is possible for a maximum 9 × 9 areas. Manual selection is more efficient, because the ROI (Region of Interest) can be narrowed down in advance.

*The maximum area varies in accordance to the specimen holder used.

Observe

Image capturing

No experience is required with the FV10i even for sophisticated confocal imaging.
The navigation function leads a first-time user to operate the FV10i perfectly.

You can zoom or frame the imaging area with use of sophisticated menus.

You can quickly choose the region you want to using the map image and live image screens. Setting the imaging area is performed easily and quickly with the intuitive operating system, utilizing zooming and point shifting. Furthermore, the system is equipped with user friendly navigation functions allowing even a first-time user to capture images with ease.

Observation mode selection

Five types of observation modes can be selected including time-lapse, Z-stack, and multi-area.

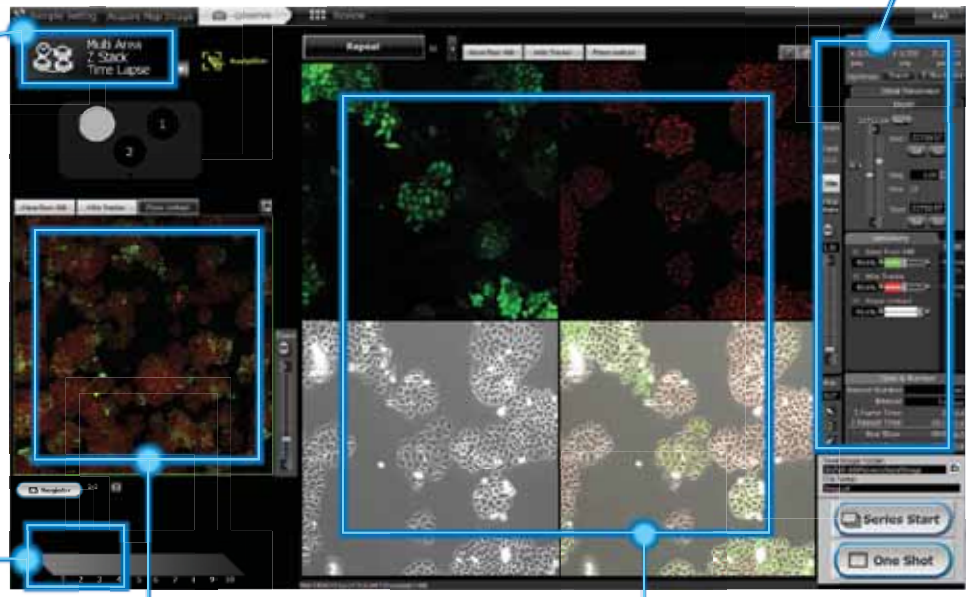
Time-lapse
In time-lapse mode, images are continuously acquired at predetermined intervals.

Z-stack
In Z-stack mode, images are repeatedly acquired in different focus positions. Three-dimensional images can be constructed.

Z-stack - time-lapse
The imaging which integrates Z-stack and time-lapse is possible.

Multi-area-time-lapse
Time-lapse imaging is performed automatically at pre-selected points.

Multi-area – Z-stack - time-lapse
The imaging where all three functions are performed.



Control screen

Imaging conditions can be set in detail with operation of various controllers. Main settings include:

- **Zoom**
- **Focus**
- **Laser output**
- **Photomultiplier sensitivity**
- **Time-lapse condition**

Multi-area setting

Register the areas for imaging in multi-area mode. You can set the appropriate imaging conditions for each area.

Map image

The image acquired in [Acquire Map Image] is displayed. You can choose a region for closer examination.

Live image

Displays the selected point on the left lower map image screen and determines the imaging area by using the framing and zooming functions. You can switch between the displays for each type of fluorescence dye.

Navigation function

You can efficiently capture images from the first day using the FV10i.

The system is equipped with a user friendly navigation function. Clicking the <Start> button in the Navigation function shows the operational procedure and highlights the operational button
Just follow the navigational guidance to easily complete your imaging.

The FV10i offers two types of products with high performance and function in a self-contained design.

Line up

Product line up

The system features easy-to-use time-lapse software and a build-in incubator.

FV10i-LIV

The system is equipped with water-immersion objectives which are optimally suited for time-lapse imaging of live cells with a simplified built-in incubator.
A culture pod is also available, allowing recirculation of the culture media.

FV10i-DOC

The best oil immersion phase 60X objective, with a numerical aperture of 1.35 enabling high-quality imaging.

[**FV10i-LIV**]

< Simplified built-in incubator >

The system has a simplified built-in incubator, allowing easy time-lapse imaging of live cells without losing valuable time in setting up equipment. The environment in the culture chamber is maintained at temperature - 37 degrees Celsius, humidity of - 90%, and CO_2 concentration of - 5%* . Time-lapse imaging up to a maximum of three days is supported.
* To maintain 5% of CO_2 in dish, injection of 6% CO_2 with 150ml/min is recommended.

< A dedicated culture pod is provided >

The system is provided with a dedicated culture pod for dia. 35mm glass bottom dishes. Recirculation of the culture media and addition of a medicinal solution during time-lapse is possible. In addition, the culture pod system can be autoclaved for sterilization.

< Stable time-lapse imaging >

Not only the incubator but also the surrounding air space is maintained at 37 degrees Celsius. Long-term time-lapse imaging is possible while maintaining cell activity.
*Fluctuation of ambient temperature may affect focusing stability.

< Water is automatically supplied to the water-immersion objective >

The newly developed automatic water dispensing system enables the FV10i to supply water to the top of the water-immersion objective. You can continue long term time-lapse imaging without worrying about insufficient immersion media. Water is supplied automatically when the objective is moved into the observation position.

< Detection of cover glass thickness and automatic adjustment of the correction collar >

The system is equipped with the capability to detect the thickness of the cover glass, allowing it to adjust the correction collar automatically, when using the water-immersion objective. This assures imaging is performed each time with optimal conditions.

< The system supports multi-area time-lapse >

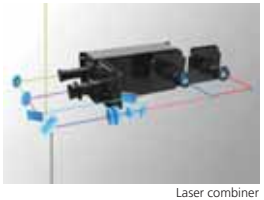
The system is equipped with a high precision motorized stage, and accurate imaging is possible through multi-area time-lapse. Ten point locations can be assigned within a single dish (well). For example, in the case of a dia. 35mm glass bottom dish, three dishes can be mounted, allowing a maximum of up to 30 locations to be captured.

The advanced optical performance that pursues high-definition confocal images

[FV10i-LIV/FV10i-DOC]

The system is equipped with 4 wavelength diode lasers.

The system is equipped with four (405/473/559/635nm) lasers. Multi-stained specimens can be imaged with up to four fluorescence dyes. Maintenance-free and power-saving diode lasers with longer operating lives are employed in all the laser units, and operate with low noise levels.



Laser combiner

Detector utilizes a newly developed spectrum method.

The detecting mechanism has two fluorescence channels, and one phase contrast channel. The fluorescent channels use a newly developed spectrum method comprising grating, beam splitter, and slit. In addition, they are equipped with the variable barrier filter function where the most suitable wavelength width is set automatically in accordance with the characteristics of the fluorescence dye.

Scanner

Two sequential modes.

The FV10i is equipped with two sequential modes. You can acquire images through line sequences without crosstalk in imaging with two fluorescence dyes, and with three or four dyes in frame sequences with the virtual channel function.

Objectives of 10× and 60× are mounted on the system.

The system is equipped with objectives of 10× and 60×. Zoom magnification can be changed continually from 10× to 600×. The most suitable imaging area can be set depending on size of the specimen.

High efficiency imaging is possible only with the Olympus FV10i-DOC functions.

[FV10i-DOC]

- The system is equipped with an original UPLSAPO–equivalent Olympus objective, which is intended to provide the best fluorescence observation performance available in the world for a 60X objective. The objective has a high numerical aperture of 1.35 enabling high resolution imaging.
- The FV10i motorized stage automatically moves to the oil supply position when switching to the oil-immersion objective, allowing oil to be supplied efficiently without removing the specimen.

Feature-rich functions to support efficient stress-free imaging .

[FV10i-LIV/FV10i-DOC]

Equipped with specimen holders

The system is equipped with specimen holders, usable for a dia. 35mm glass bottom dishes, glass slides, cover glass chambers (8 wells type), and well slide (8 wells type).
You can observe the specimen worry-free with the closed contamination-free plastic cover of a dia. 35mm glass bottom dish.

FV10i-LIV

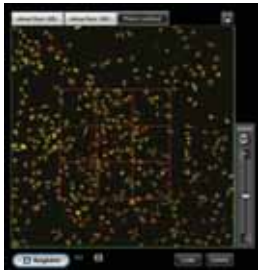
For three glass bottom dishes with 35mm diameter	For a glass slide	For one set of cover glass chamber (8 wells type)	For Well slide (8 wells type)	Culture pod (for a glass bottom dish with 35mm diameter)
				

FV10i-DOC

For a glass bottom dish with 35mm diameter	For a glass slide	For Well slide (8 wells type)
		

Capturing adjacent images in wide-field

Imaging of adjacent images 2×2 and 3×3 is possible. You can capture images of high-definition and wide-field of view.



HDD recording for storing large volumes of data

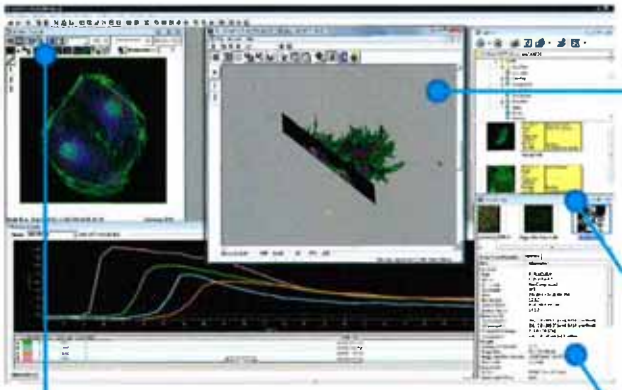
The microscope comes equipped with a HDD (hard-disk drive) recording function. The images captured are stored automatically in the HDD. Large volumes of data, such as those obtained from long-term time-lapse imaging can be stored. During imaging, editing/analysis of previously taken images is also possible.
You can specify an external HDD connected to a network for the destination, and you can view the saved images on a remote PC while performing separate imaging.

Software dedicated for exclusive use for Fluoview is provided to easily perform various editing / analysis operations.

Review

Editing / analysis software

Olympus original software for editing and analysis is provided as part of the standard specifications.
You can edit and analyze images taken by FV10i in various ways.



3D display function

The FV10i supports the Alpha Blend method and Maximum Intensity Projection method for 3D display function. Also, the system is equipped with various display functions which allows you to freely change the angle of 3D images and section the image at any spot.

Easy image searching

Thumbnail list is possible with the main screen. You can easily search for previous image data.

Data manager

The data manager displays thumbnails and various file information with clarity.

2D analysis tool

Background correction
Subtracts background.

Region Measurement
Measures the size and intensity of regions designated as ROI (Region of Interest).

Intensity Profile
Displays an intensity profile of regions designated with ROI or Line.

Histogram
Displays histogram of intensity values of region designated as ROI or Line

Series Analysis
Analyzes variation in intensity along the Z-axis / time- axis in regions designated with ROI or Line.

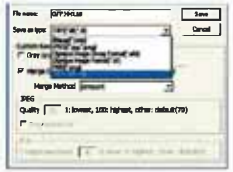
Line Series Analysis
Analyzes variation in intensity along the Z-axis / time- axis on a designated Line.

Co-localization
Analyzes in the degree of overlap of pixels at or higher than a level of certain intensity between two channels.

Ratio
Creates an image using the intensity ratio between two channels.

File input/output

OIF (Olympus Image format) is employed to store various parameter settings and images together. This software supports a wide range of well-used formats with high interchangeability including TIFF, BMP and JPEG.



Main specifications

		FV10i-LIV	FV10i-DOC
Laser light source	LD lasers:	405nm(17.1mW),473nm(11.9mW),559nm(15mW),635nm(9.5mW)	
	Modulation:	Continuously Variable by the LD direct modulation (0.1%-100%, 0.1% inclement) Line return period - laser OFF	
Scanning	Scanning method	2 galvanometer scanning mirrors	
	Scanning mode	Pixel size: 256 × 256 - 1024 × 1024 Scanning speed: 1.1 s / frame (for pixel size 512 × 512, High Speed scanning mode) Focusing scanning: High frame rate scan by Y- direction interlace scanning (×1, ×2, ×4) Dimension: XYT, XYZ, XYZT Rotation scanning: 0-359.9° in 0.1° increments	
Detection	Detector module	Fluorescence: 2 channels, Phase Contrast: 1 channel Variable barrier filter mechanism for fluorescence channel by diffraction grating and slit	
	Detection method	Analog integration detection by Photomultiplier	
	Pinhole	Single motorized pinhone Pinhole diameter: ø50-800µm automatic setting (adjustable to ×1.0, ×1.5, ×2.0, and ×2.5)	
	Field number	18	
	Optical zoom	10× objectives: 1× – 6× in 0.1× increments 60× objectives: 1× – 10× in 0.1× increments	
	Automatic Exposure	Automatic setting of the laser intensity and photomultiplier sensitivity to fluorescence intensity.	
Focus	Z-drive	Motorized focus Minimum increment: 0.01µm	
	Objectives	Exclusively designed 10× phase contrast objective / NA 0.4 (equivalent to UPLSAPO 10x) Exclusively designed 60× phase contrast water-immersion objective / NA 1.2 (equivalent to UPLSAPO 60× W) / with motorized correction collar Remote switching from software by electric revolver	Exclusively designed 10× phase contrast objective / NA 0.4 (equivalent to UPLSAPO 10x) Exclusively designed 60× phase contrast oil-immersion objective / NA 1.35 (equivalent to UPLSAPO 60× O) Remote switching from software by electric revolver
	Automatic focus (AF)	Automatic detection of interface between specimen and cover glass by laser reflection light detection Automatic detection of cover glass thickness and automatic setting of motorized correction collar	Automatic detection of interface between specimen and cover glass by laser reflection light detection
	Water supply	Automatic water supply and air cleaning mechanism for 60× Water-immersion objective	
	Oil supply		Manual As supporting mechanism, automatic moving of XY stage to oil supply position when switching to 60x
XY stage	XY driving method	Motorized XY stage module by stepping motor Minimum increment: 0.3µm	
	Specimen holder	Only the dedicated specimen holder can be mounted For three glass bottom dishes with 35mm diameter For a glass slide, For one set of cover glass chamber (8 wells type) For Well slide (8 wells type), Culture pod(for a glass bottom dish with 35mm diameter)	Only the dedicated specimen holder can be mounted For a glass bottom dish with 35mm diameter For a glass slide, For Well slide (8 wells type)
Incubator	Room environment	Temperature: 37+0.1°C,-0.5°C (can be switched off) Humidity: more than 90% CO_2 concentration: 5% (recommended), 1 – joint fitting (ø2mm) for exterior CO_2 adjustor	
	Heating method	Non-contact heating by resistive heater mounted on frame section	
Control device	Controller	Dedicated controller PC/AT-compatible OS: Windows Vista Business, 32 bit (English version), CPU: Intel Core2Duo 3.0GHz RAM: 2GB × 2, HDD: 500GB × 2, Special PCI-Express I/F board built-in, Optical drive: DVD-Multi drive built-in	
	LCD monitor	24 inch LCD monitor × 1, WUXGA (1920×1200)	
Main software feature	Image acquisition mode	Map image, one shot, time-lapse (XYT), Z-stack (XYZ), Z-stack time-lapse (XYZT), multi area time-lapse (Multi Area XYT), multi area Z-stack time-lapse (Multi Area XYZT)	
	Specimen setting	Automatic setting for fluorescence channel and laser according to Dye selected from Dye list	
	Map image acquisition	Automatic selection of map image of 3×3 – 9×9 fields according to 10× objective lens (The maximum area varies in accordance to the specimen holder used), and manual selection of map acquisition area	
	Multi area time-lapse	Automatic multi area time-lapse by motorized XY stage Setting for each registered point: Image size, scanning speed, cross talk reduction, pinhole diameter, rotation angle, galvano zoom, acquisition channel, laser power, PMT sensitivity, Z condition Maximum resister number: 10 items per one container Maximum interval time: one hour Maximum acquisition number of times: 3000 times per one point	
	Image acquisition area	Area appointment: All area, clipping square area (minimum area: 96 × 96 pixels)	
	Image display	Display by channel, overlapping display, image in progress review	
	Cross talk reduction	Line sequential action (2 channel), or frame sequential action (3 channel and 4 channel)	
	Acquisition image file type	OLYMPUS image format (OIF)	
	Image file type available for viewing	OLYMPUS image format (OIF, OIB), Multi-TIFF format (8/16 bit grey scale, index color, 24/32/48 bit color), JPEG, BMP, TIFF	
	Image editing	LUT: pseudo color setting, contrast adjustment, Comment: inputting graphic, text, scale etc., image extraction, combination	
	3D image construction	3D display: AlphaBrend method, Maximum intensity projection method 3D animation display, free orientation of cross section display	
	Image processing	Various types of image filter: Median, Enhanced Edge, etc. Calculations: inter-image, arithmetic and logical operation	
	Image analysis	Area and perimeter measurement, time-lapse measurement, colocalization analysis	
Room environment	Temperature	18-28°C(fluctuation ±2°C)	
	Humidity	30-80% (non condensing)	