FUJIFILM
I&I – Imaging & Information

Life Science

HIGHLY VERSATILE BIO-IMAGING SYSTEM

FLA-7000

A multi-functional, high-performance, compact bio-imaging system with enhanced modularity to meet your life science needs

http://lifescience.fujifilm.com

A system with a unique and revolutionary technology. FLA-7000, a modular image analyzer, with high-speed and high-resolution image scanning functions.

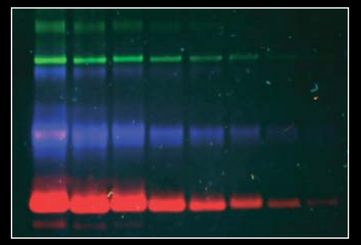
The FLA-7000 is the result of new developments made to our proven FLA series scanners.
For the first time, the system combines high-resolution and high-speed detection without any compromise to sensitivity. With the newly designed scanning unit, Fujifilm was able to increase the homogeneity and the sensitivity of the detection method. Radioisotope images, fluorescent images including near-IR images, and digitized images (gel documentation images) can now be captured on the unit by choosing among five different lasers to meet your needs.

HIGHLY VERSATILE BIO-IMAGING SYSTEM

FLA-7000

473nm 532nm 635nm 650nm 670nm

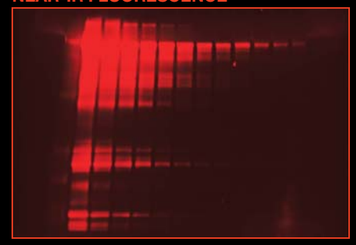
FLUORESCENCE



Multiplexed fluorescent protein SDS-PAGE

Sample: Green: Cy™3 labeled BSA (laser: 532nm/filter: 0580)
Blue: Cy™2 labeled Carbonic anhydrase (laser: 473nm/filter: Y520)
Red: Cy™5 labeled Lysozyme (laser: 635nm/filter: R670)/PMT-1

NEAR-IR FLUORESCENCE



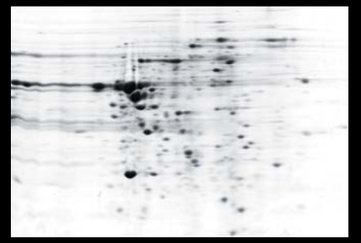
Alexa Fluor®680 labeled Western Blot

Sample: Mouse IgG/Density: 10ug, 5ug, 2ug, 1ug, 500ng, 200ng, 100ng, 50ng, 20ng, 10ng, 5ng, 2ng/Excitation wavelength: 670nm/Filter: R710/PMT-2, 1000V/Pixel size: 50µm

NEAR-IR FLUORESCENCE

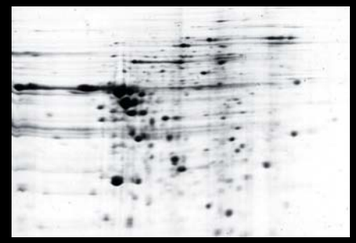
DY-682 labeled Western Blot

Sample: BSA/Primary antibody: Monoclonal Anti-BSA antibody produced in Mouse/Secondary antibody: DY-682-Goat anti-Mouse IgG/Excitation wavelength: 670nm/Filter: R710/PMT-2, 1000V/Pixel size: 50µm



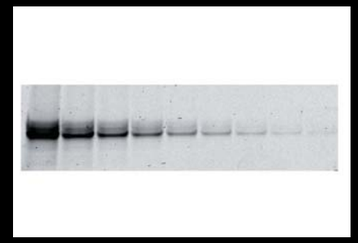
CBB stained 2D gel electrophoresis of Saccharomyces cerevisiae

1st dimension: Low pH isoelectric electrophoresis kit (Nacalai Tesque, Inc.)/2nd dimension: 17% low BIS SDS-PAGE/Sample: Saccharomyces cerevisiae/Excitation wavelength: 650nm/Filter: R710/PMT-2, 500V/Pixel size: 50µm/Data: courtesy of Yoshihiro Yamamoto, Industrial Technology Center, Kyoto Municipal Industrial Research Institute



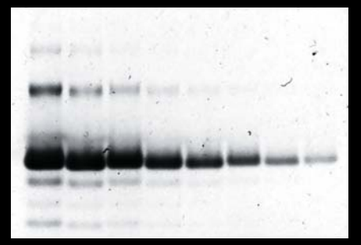
SYPRO® Ruby stained 2D gel electrophoresis of Saccharomyces cerevisiae

1st dimension: Low pH isoelectric electrophoresis kit (Nacalai Tesque, Inc.)/2nd dimension: 17% low BIS SDS-PAGE/Sample: Saccharomyces cerevisiae/Excitation wavelength: 473nm/Filter: 0580/PMT-2, 500V/Pixel size: 50µm
Data: courtesy of Yoshihiro Yamamoto, Industrial Technology Center, Kyoto Municipal Industrial Research Institute



PAGE of Cy™3 labeled primer

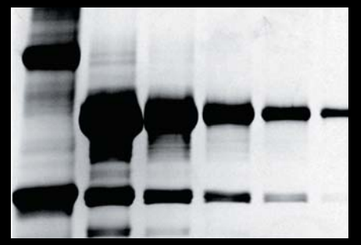
Sample: Cy™3 labeled primer/Density: 500fmol, 200fmol, 100fmol, 50fmol, 20fmol, 10fmol, 5fmol, 2fmol, 1fmol/Excitation wavelength: 532nm/Filter: 0580/PMT-1, 800V/Pixel size: 50µm



PAGE of Cy™5 labeled Lysozyme

Sample: Cy™5 labeled Lysozyme/Density:356ng, 178ng, 89ng, 44.5ng, 22.3ng, 11.1ng, 5.6ng, 2.8ng/Excitation wavelength: 635nm/Filter: R670/PMT-1, 500V/Pixel size: 100µm

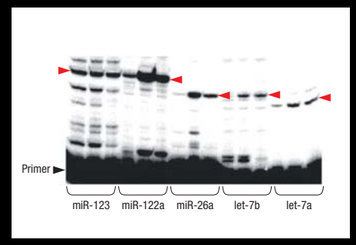
DIGITIZING



Silver-stained protein by SDS-PAGE

Sample: BSA/Density: molecular-weight marker, 3µg, 1µg, 300ng, 100ng, 30ng/Excitation wavelength: 473nm/Filter: Y520/PMT-1, 500V/Pixel size: 50µm

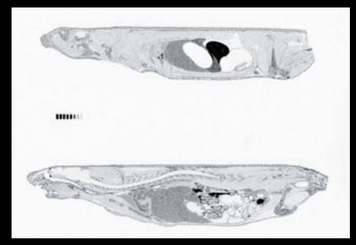
RADIOISOTOPE



Detection of micro RNAs by primer extension method

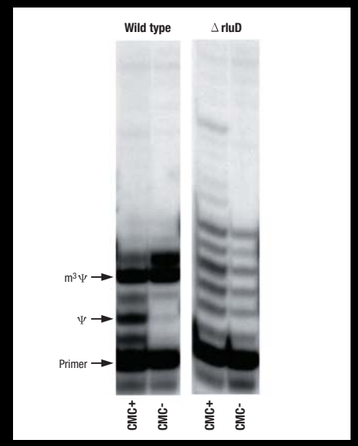
Micro RNAs in total RNAs derived from mouse liver were detected by primer extension method. 5'-^{32}P labeled oligo DNA (15 mer) complementary to each micro-RNA was used as a primer.
Arrows indicate signals of cDNAs terminated at 5' end of micro RNAs.

Sample: mouse total RNA/Nuclides: ^{32}P/Exposing time: one night/Excitation wavelength: 650nm/Filter: B390/PMT-1/
Data: courtesy of Graduate School of Engineering, the University of Tokyo Tsutomu Suzuki, Ph.D., Tomomi Orito



Whole body autoradiography to analyze metabolism of ^{14}C labeled compound

Nuclides: ^{14}C/IP: BAS-MS2040/Excitation wavelength: 650nm/Filter: B390/PMT-1/Sensitivity: S10000/Pixel size: 50µm/
Data: courtesy of Institute of Whole Body Metabolism

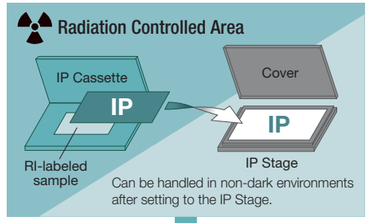


Detection of modified bases in RNAs by primer extension method

Primer extension analysis of *E. coli* 23S rRNA which was treated with or without CMC(*N*-cyclohexyl-*N'* - β -(4-methylmorpholinium) ethycarbodiimide *p*-tosylate) to detect pseudouridine (Ψ) (left panel). As a control (right panel), the same analysis was performed against *E. coli* strain in which rluD (RNA-pseudouridylase) was depleted. $m^3\Psi$ stands for 3-methyl pseudouridine.

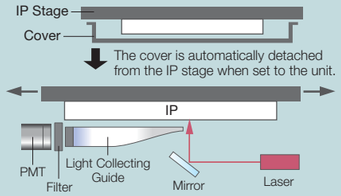
Sample: ribosome RNA/Nuclides: ^{32}P/IP: BAS-MS2040
Exposing time: one night/Excitation wavelength: 650nm/Filter: B390/PMT-1/Sensitivity: S10000/Pixel size: 50µm
Data: courtesy of Graduate School of Engineering, the University of Tokyo Tsutomu Suzuki, Ph.D., Naomi Hirabayashi

Your configuration – selectable among five different lasers



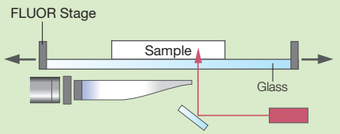
The system can be expanded to use various analysis methods by the adoption of modular components. The mountable laser beams are: red (650nm) for radioisotope (RI), blue (473nm), green (532nm), red (635nm), red (650nm), and near-IR (670nm) for fluorescence, and blue (473nm) and green (532nm) for digitizing.
Choose among five different lasers to configure your scanner according to your needs. A choice of two PMTs (photomultiplier tubes) enables optimal detection of blue, green and red fluorescence (using Bi-alkali PMT) and green and red to near-IR fluorescence (using Multi-alkali PMT).

RADIOISOTOPE



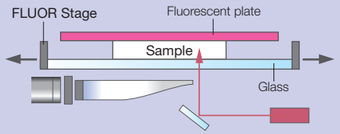
A radioisotope-labeled sample image can be captured with high throughput and high sensitivity using Fujifilm's unique proprietary technologies: integrated Imaging Plate technology and high-speed detection technology (Light Collecting Guide).

FLUORESCENCE



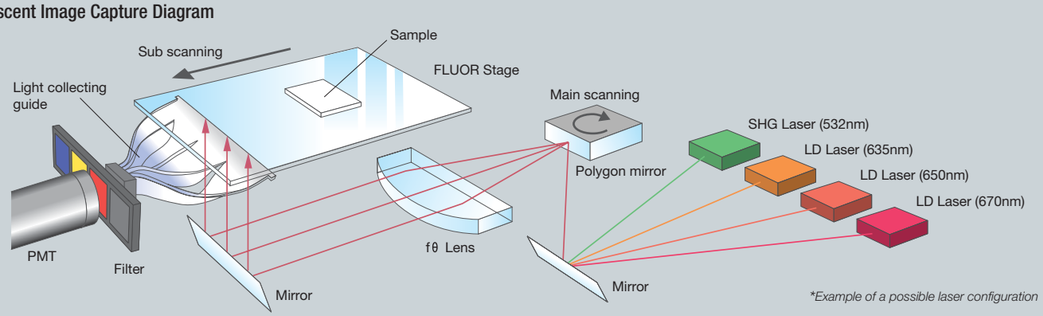
A maximum of four lasers are optionally available for use with the following: LD473nm, SHG532nm, LD635nm, LD650nm and LD670nm. This enables the system to be upgraded to cover a wider variety of fluorescent dyes including near-IR.

DIGITIZING



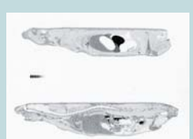
Digitizing is the process of generating digital images from analog images of CBB-stained gels or silver-stained gels. Able to scan gel sample (gel documentation) using fluorescent plates to detect separated fragments caused by intensity differences of emitted fluorescence, and capture digitized images of silver-stained gel, CBB-stained gel, and other gel samples.

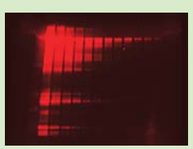
Fluorescent Image Capture Diagram

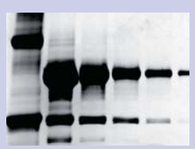


*Example of a possible laser configuration

Analyzing







Erase (IP data)

The IP data can be erased and IP is used repeatedly.

Enhanced scanning speed

The FLA-7000 uses a unique light-collecting-guide technology which enables the scanning of a 24cm × 40cm area at a pixel size of 50μm and at a speed of 2 minutes 30 seconds (in Quick Mode), which is even faster than our proven FLA-3000.
The scanning speed can be switched between Standard mode and Quick mode.

Pixel size	Image area	
	24 × 25 (cm)	24 × 40 (cm)
25μm	3 min.	4.5 min.
50μm	2 min.	2.5 min.
100μm	1 min.	1.5 min.

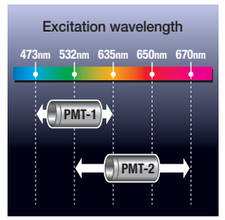
Quick mode

High sensitivity and high resolution features

In addition to the high-sensitivity fluorescence detection function which is available on the previous model and the IP technology which has a sensitivity of more than 100 times of X-Ray films, the FLA-7000 has improved laser power and light collecting efficiency. As a result, high-sensitive RI image detection of the previous model has now been greatly enhanced and incorporated into the FLA-7000. Pixel sizes of 25μm, 50μm, 100μm, and 200μm are also selectable.

Two PMTs for a broad range of fluorescence detection from blue to near-IR

The choice between two types of Photomultiplier Tubes (PMT) enables optimal fluorescent detection of samples. The PMT-1 (Bi-alkali PMT) is ideal for the detection of shorter wavelengths like blue, green, and red while the PMT-2 (Multi-alkali PMT) is ideal for the detection of longer wavelengths from green and red to near-IR.



Can be set in non-dark environments

The exposed IP can be carried around even in non-dark environments with the use of the IP stage. The cover is automatically detached from the IP stage the moment it is set to the FLA-7000.

Use of commercially available 2-inch filters

The FLA-7000 allows the easy exchange of standard optical filters that cut laser beams and allow only emitted fluorescence to pass. Filters for frequently used fluorescent reagent detection are optionally available. In addition, the commercially available 2-inch rectangular filters (thickness 3mm–8mm) can also be used for your needs.

Improved operability and maintainability

The FLA-7000 has enhanced expandability, reading speed, sensitivity and resolution. Also, it is easy to operate and maintain.
The system is equipped with a mechanism to set the membrane used in the fluorescent Western Blotting analysis firmly to the FLUOR stage without curling.
The waterproof FLUOR stage is easily detachable and can be cleaned with water, thus ensuring a clean condition.

Reading/Analysis Software for Windows and Macintosh

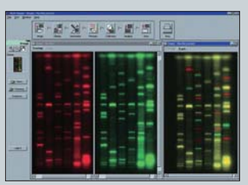
The FLA-7000 comes with the standard Image Reader software. The Science Lab analysis software is also available as an option. Versatile image analysis can be performed by these software. In addition to the Windows version, their Macintosh version is also available for a number of researchers who use Macintosh.

Application software

Image Reader for FLA-7000

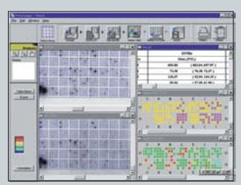
The Image Reader is a basic software for capturing images. Settings such as the excitation wavelength, filter, reading range, gradation, and pixel size can be easily and speedily set.

Science Lab Software



The Science Lab software is available for general-purpose analysis. This software has such basic functions as image profile quantitation, electrophoresis analysis, image processing (rotation, trimming, pseudo coloring, superimposing, negative-positive reversing, etc.), and annotation. The commercially available software for 2D protein analysis is recommended.

Array Gauge (for Windows only)



The Array Gauge is a software for processing microarrays used in gene analysis. Desired analysis data can be obtained by simply selecting the template that matches the membrane array chip and positioning the image accordingly. This software allows accurate measurements of the level of gene expression.

SPECIFICATIONS

Detection modes	RI, Fluorescence, Near-IR Fluorescence, Digitizing
Excitation wavelengths	473nm, 532nm, 635nm, 650nm, 670nm
Nuclides for RI image detection	^{14}C, ^{32}P, ^{33}P, ^{35}S, ^{3}H, Neutron, etc.
Dynamic range	Five/Four orders of magnitudes changeable, Bit Depth: 16bits (gray scale: 65,536)
Scanning size	IP max; 20 (W) × 40 (D) cm, Fluorescence max; 24 (W) × 40 (D) cm
Pixel size	25µm, 50µm, 100µm, 200µm
Filters	Standard filters for IP; Excitation of blue dye Y520; Excitation of green dye O580; Excitation of red dye R670; Excitation of near-IR dye R710
Interface	USB 2.0
Operating system	Windows®/Mac™ OS
Dimensions	940 (W) × 556 (D) × 360 (H) mm
Weight	ca. 62 kg
Supply voltage	AC100-240V ± 10%
Power supply frequency	50/60Hz
Operating conditions	Temperature: 15-30°C, Humidity: 30-70% RH (non-condensing)
Power consumption	ca. 0.3kVA

EXAMPLE OF FLUORESCENT DYES DETECTED WITH FLA-7000

473nm

Reagent name	Ex.(nm)	Em.(nm)	Filter
Cy™2	489	506	Y520
FITC	494	520	Y520
SYPRO® Ruby	450	610	Y520, O580
SYPRO® Orange	472	570	Y520
ECL plus™	430	503	Y520
SYBR® Green I	494	521	Y520
SYBR® Green II	492	513	Y520
SYBR® Safe	502	530	Y520
SYBR® Gold	495	537	Y520
FAM™	490	520	Y520
AlexaFluor®488	495	519	Y520
ECF™	430	560	Y520
DY-485LX®	485	560	Y520

532nm

Reagent name	Ex.(nm)	Em.(nm)	Filter
Cy™3	550	570	O580
EtBr	518	605	O580
ROX™	535	567	O580
HEX™	535	553	O580
TAMRA™	542	568	O580
AlexaFluor®546	556	573	O580
DY-520LX	520	664	O580
DY-547	557	574	O580

635nm

Reagent name	Ex.(nm)	Em.(nm)	Filter
Cy™5	649	670	R670
AlexaFluor®633	632	647	R670
DY-647	652	673	R670

650nm

Reagent name	Ex.(nm)	Em.(nm)	Filter
CBB	—	—	R710

670nm

Reagent name	Ex.(nm)	Em.(nm)	Filter
AlexaFluor®680	679	702	R710
DY-682	690	709	R710

ACCESSORIES

Imaging Plates

- **BAS-MS 2025/2040**
  BAS-MS with water resistance and high sensitivity
- **BAS-SR 2025/2040**
  BAS-SR with water resistance and high resolution
- **BAS-TR 2025/2040**
  BAS-TR for Tritium detection
- **BAS-ND 2025/2040**
  BAS-ND for Neutron detection

PMT

Radioisotope
LD650 and PMT-1 are recommended. PMT-2 is also available.

Fluorescence
- **PMT-1**
  Bi-alkali type for LD473, SHG532, LD635
- **PMT-2**
  Multi-alkali type for SHG532, LD635, LD650, LD670

Note: For SHG532, PMT-1 is more sensitive than PMT-2.

IP Stage

Suitable for reading of various Imaging Plates.

FLUOR Stage

Suitable for fluorescent samples including gel or membrane.
(Fluorescent plate is included)

IP Eraser 3

Applicable up to 40 × 46 cm size.

2-inch Filter

2-inch rectangle filters; B390 (for IP reading), Y520, O580, R670, R710.

Membrane Weight

A specially designed plate to prevent a membrane set on the FLUOR stage from curling.

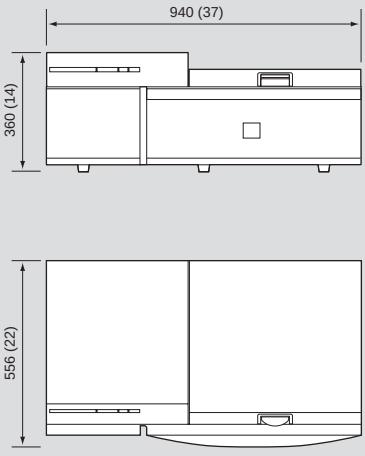
Laser

• LD 473 • SHG 532 • LD 635 • LD 670

Note: LD650 is already installed.

DIMENSIONS

Unit: mm (in.)



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TÜV SÜD ISO 9001

FUJIFILM

Fuji Photo Film Co., Ltd. 26-30, Nishiazabu 2-Chome, Minato-ku, TOKYO 106-8620, JAPAN, Tel: +81-3-3406-2201, Fax: +81-3-3406-2158 · E-mail: sginfo@fujifilm.co.jp
Fujifilm Medical Systems U.S.A., Inc. 419 West Avenue, Stamford, CT 06902, U.S.A, Tel: +1-203-324-2000 ext.6112 (1-800-431-1850 ext.6112 in the U.S.), Fax: +1-203-351-4713 · E-mail: SSG@fujimed.com
Fuji Photo Film (Europe) GmbH Heesenstr. 31, 40549 Dusseldorf, Germany, Tel: +49-211-5089-174, Fax: +49-211-5089-9144 · E-mail: lifescience@fujifilmeurope.de
Fuji Photo Film (U.K.) Ltd., Unit 12 St Martins way, St Martins Business Centre, Bedford, MK42 OLF, U.K, Tel: +44-1234-245291, Fax: +44-1234-245293 · E-mail: lifesciences@fuji.co.uk
Fuji Photo Film (China) Investment Co., Ltd. 31st floor, Hong Kong New World Tower, No. 300 Huai Hai Zhong Road, Shanghai, P.R China, Tel: +86-21-3302-4655 ext.363, Fax: +86-21-6384-3322 · E-mail: wgxiang@fujifilm.com.cn