GE Healthcare

Typhoon™ FLA 7000

User Manual

Table of Contents

1 Introduction

In this chapter

This chapter contains important user information, and a general description of Typhoon FLA 7000 and its intended use.

1.1 Important user information

Read this before using the Typhoon FLA 7000

All users must read this entire manual to fully understand the safe use of Typhoon FLA 7000.

Intended use

Typhoon FLA 7000 is a fast laser scanner optimized for quantitative phosphorimaging, ECL Plus Westerns, visible fluorescence and gel documentation.

Typhoon FLA 7000 is intended for research use only, and shall not be used in any clinical procedures, or for diagnostic purposes.

Safety notices

This user documentation contains WARNINGS, CAUTIONS and NOTICES concerning the safe use of Typhoon FLA 7000. See definitions below.

Warnings

WARNING

WARNING indicates a hazardous situation which, if not avoided, could result in death or serious injury. It is important not to proceed until all stated conditions are met and clearly understood.

Cautions

CAUTION

CAUTION indicates a hazardous situation which, if not avoided, could result in minor or moderate injury. It is important not to proceed until all stated conditions are met and clearly understood.

Notices

NOTICE

NOTICE indicates instructions that must be followed to avoid damage to the product or other equipment.

Notes and tips

Note: *A Note is used to indicate information that is important for trouble-free and optimal use of the product.*

TIP: A tip contains useful information that can improve or optimize your procedures.

Typographical conventions

Software items are identified in the text by ***bold italic*** text. A colon separates menu levels, thus ***File:Open*** refers to the ***Open*** command in the ***File*** menu. Hardware items are identified in the text by **bold** text (e.g., **Power** switch).

1.2 Regulatory information

This section lists the directives and standards that are fulfilled by the Typhoon FLA 7000 system.

Manufacturing information

Requirements	Content
Name and address of manufacturer	GE Healthcare Bio-Sciences AB, Björkgatan 30, SE 751 84 Uppsala Sweden
Name and ID of notified body	INTERTEK SEMKO AB, NB 0413
Place and date of declaration	Uppsala, Sweden, Sept. 2009
Identity of person authorized to sign Declaration of Conformity	See EC Declaration of Conformity

International standards

This product fulfills the requirements of the following standards:

Standard	Description	Notes
EN 61010-1, IEC 61010-1, UL 61010-1, IEC 61010-2-81, CAN/CSA-C22.2 No. 61010-1	Safety requirements for electrical equipment for measurement, control, and laboratory use	
EN 61326-1 VCCI Class A FCC Part 15 B Class A ICES-003 Class A	EMC emissions and immunity requirements for electrical equipment for measurement, control and laboratory use	Harmonized with 2004/108/EC
EN-ISO 12100-1, 12100-2	Safety of machinery - Basic concepts, general principles for design	Harmonized with 2006/42/EC
EN-ISO 14121-1, 14121-2	Safety of machinery - Principles of risk assessment	Harmonized with 2006/42/EC
EN 60825-1, IEC 60825-1	Safety of laser products	Harmonized with 2006/95/EC
USA 21 CFR, Chapter I, Subchapter J, Part 1040.10 Laser Products	Safety of laser products	

CE Conformity

This product complies with the European directives listed in the table, by fulfilling the corresponding harmonized standards. A copy of the Declaration of Conformity is available on request.

Directive	Title
2006/42/EC	Machinery Directive (MD)
2006/95/EC	Low Voltage Directive (LVD)
2004/108/EC	ElectroMagnetic Compatibility (EMC) Directive

CE Marking

CE

The CE marking and the corresponding Declaration of Conformity is valid for the instrument when it is:

- used as a stand-alone unit, or

- connected to other CE marked GE Healthcare instruments, or
- connected to other products recommended or described in the user documentation, and
- used in the same state as it was delivered from GE Healthcare, except for alterations described in the user documentation.

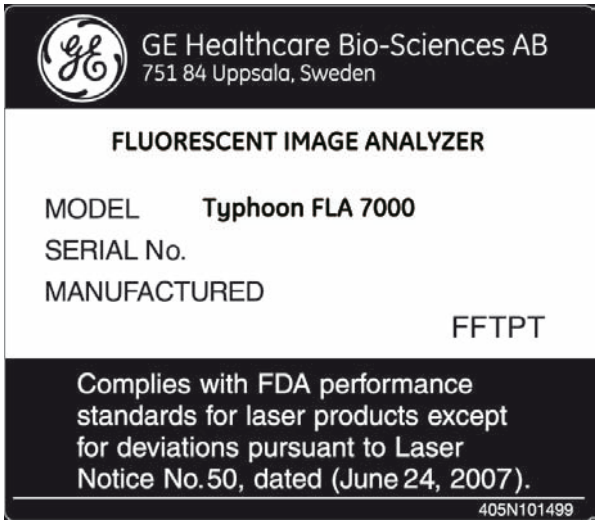
Note: *This equipment has been tested and found to comply with the limits for a Class A digital device, pursuant to Part 15 of the FCC Rules. These limits are designed to provide reasonable protection against harmful interference when the equipment is operated in a commercial environment. This equipment generates, uses, and can radiate radio frequency energy and, if not installed and used in accordance with the instruction manual, may cause harmful interference to radio communications. Operation of this equipment in a residential area is likely to cause harmful interference in which case the user will be required to correct the interference at his own expense.*

This Class A digital apparatus complies with Canadian ICES-003. Cet appareil numerique de la class A est conforme a la norme NMB-003 du Canada.

Note: *This is a class A product. In a domestic environment this product may cause radio interference in which case the user may be required to take adequate measures.*

Laser standards

This instrument is a Class 1 (IEC60825-1: 2001) laser product.



The following lasers can be installed in Typhoon FLA 7000:

Laser and class	Wavelength	Maximum power
LD laser, class 3B	473 nm	20 mW (CW)
SHG laser, class 3B	532 nm	10 mW (CW)
LD laser, class 3B	635 nm	45 mW (CW)
LD laser, class 3B	650 nm	80 mW (CW)

Regulatory compliance of connected equipment

Any equipment connected to the Typhoon FLA 7000 should meet the safety requirements of EN 61010-1/IEC 61010-1, or relevant harmonized standards. Within EU, connected equipment must be CE marked.

1.3 The Typhoon FLA 7000 laser scanner

The compact Typhoon FLA 7000 is an image analyzer that offers high performance, multifunctionality, and high-speed reading. Benefits include:

- Detection of high-sensitivity autoradiographs using storage phosphor screens.
- Four lasers and multiple filters enable the use of a variety of fluorescent dyes and detection methods.
- Data is aquired through high resolution, sensitivity and wide range linearity.
- Compatibility with various types of samples, for example fluorescent labels, fluorescent dyes, CBB stain, silver stain, X-ray film, and storage phosphor screens.

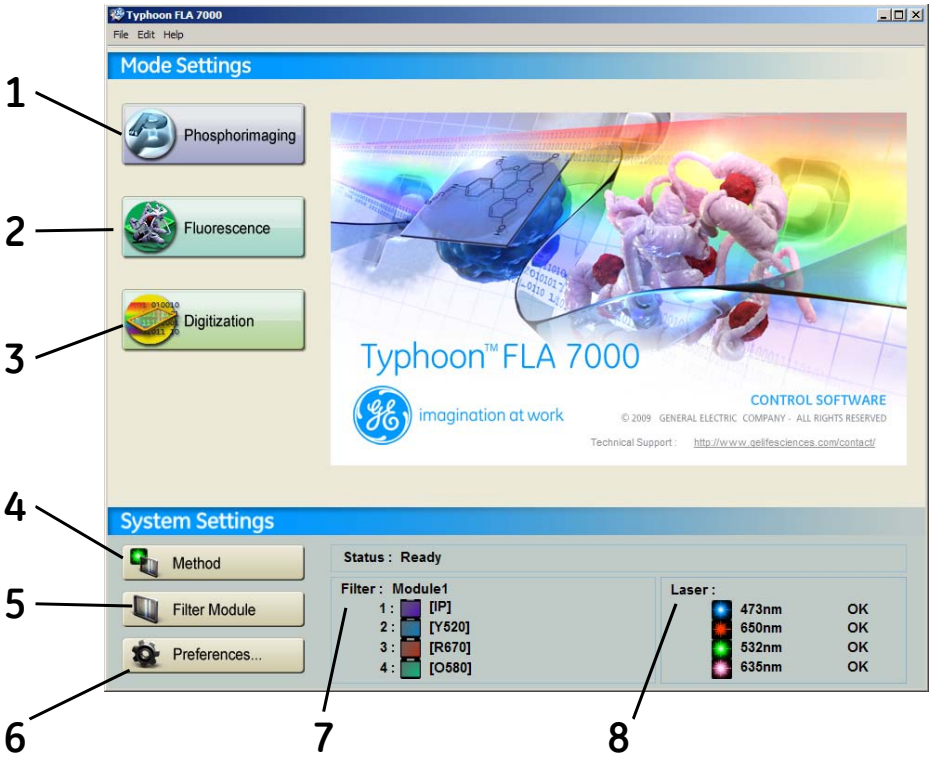
1.4 Typhoon FLA 7000 Control Software

System requirements

Parameter	Minimum requirement
Operating system	Windows™ XP™ Professional SP2 or later *or* Windows Vista™ Business SP 1 or later
Internal memory	1 GB
Processor	Intel Core 2 Duo processor
Hard drive	80 GB
Monitor resolution	1280 × 1024 pixels
Other requirements	One USB 2.0 port DVD-ROM drive

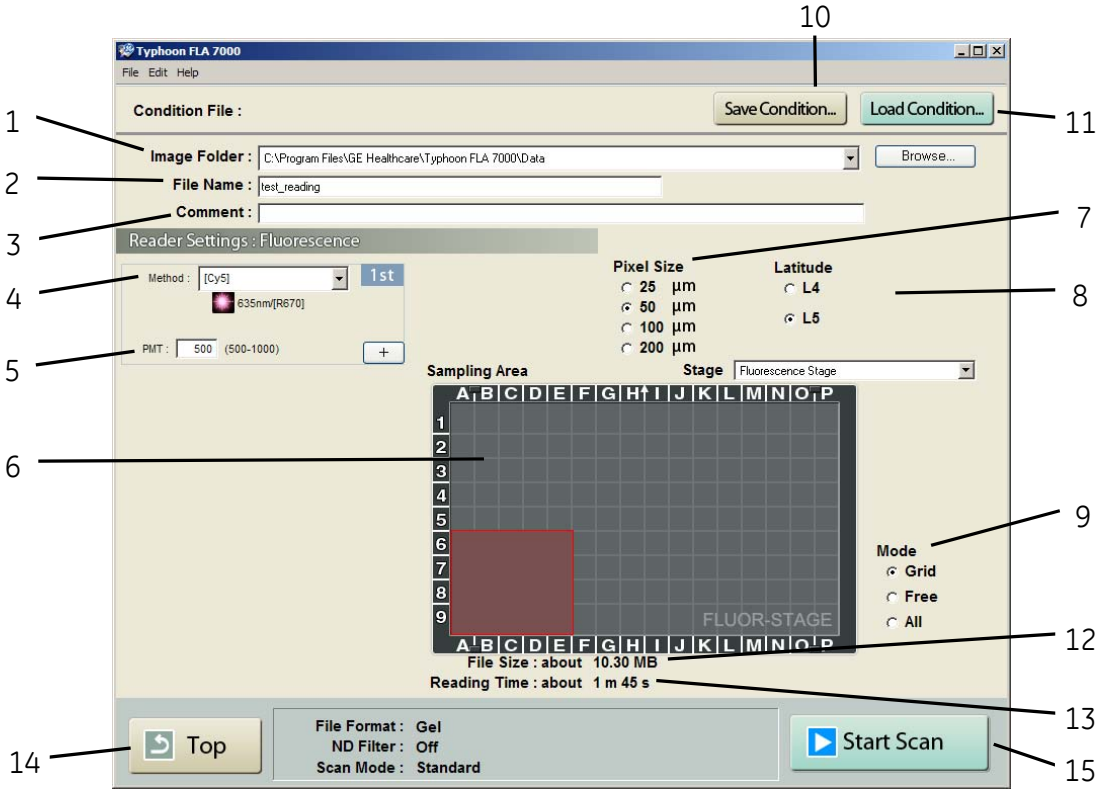
Overview of the main window

The Typhoon FLA 7000 Control Software is used to control, use and supervise the Typhoon FLA 7000.



Part	Function
1	***Phosphorimaging*** button: click to read a storage phosphor screen
2	***Fluorescence*** button: click to read a fluorescent sample
3	***Digitization*** button: click to perform digitization
4	***Method*** button: click to register or erase a combination of laser and filter.
5	***Filter Module*** button: click to change or register a filter.
6	***Preferences*** button: click to set the image file format, scan mode, correction mode and to enable or disable the ND filter.
7	***Filter***: displays the loaded filters.
8	***Laser***: displays the status of the loaded laser units

Overview of the reader settings window



Part	Description
1	***Image folder:*** specify where to save the file after the reading.
2	***File Name:*** enter the name of a file to save image data.
3	***Comment:*** enter an optional comment. The comment is embedded in the file where the image is saved, and can be viewed with the analyzing software.
4	***Method:*** set the method to use in the scan. Up to 4 scans can be performed in a row, all with individual methods.
5	***PMT:*** set the voltage of the photo-multiplier tube. The higher the value, the higher the sensitivity. + Click to increase the number of scans − Click to decrease the number of scans

Part	Description
6	Set the scanning area. 1 Select a stage in the drop-down menu. 2 Drag the red square to the desired position of the scanning area. 3 Drag the sides of the red square as needed to adjust the size of the scanning area.
7	***Pixel Size:*** set the pixel size. Choose a **small** pixel size for **high quality** images. Note that a small pixel size setting increases the reading time and the size of the image file.
8	***Latitude***: Specify the dynamic range. • ***L5*** provides a larger detectable range than ***L4***. • ***L4*** provides a finer density gradation, if the signals of the sample areas are in the correct range.
9	***Mode***: Specify the mode for the reading area borders. • Select ***Grid*** to limit the borders to the grid lines. • Select ***Free*** for an arbitrary area. • Select ***All*** to use the entire Fluor stage as the reading area.
10	***Save Condition...***: click this button to save the current reading conditions in a file, if desired. For details, refer to the User Manual.
11	***Load Condition...***: click this button to load previously saved reading conditions, if desired. For details, refer to the User Manual.
12	***File Size***: the estimated size of the result data file is presented.
13	***Reading Time***: the estimated time required for the scan is presented.
14	***Top***: return to the main window.
15	***Start Scan***: start the scan. The sample must be loaded before starting a scan.

2 Safety instructions

2.1 Introduction

The Typhoon FLA 7000 is powered by mains voltage and is used to image samples that may be hazardous. Before installing, operating or maintaining the equipment, you must be aware of the hazards described in the user documentation. Follow the instructions provided to avoid personal injury or damage to the equipment.

2.2 General precautions

WARNING

Do not use the equipment if smoke, strange noises or strange odors can be perceived, or if the equipment becomes unusually hot. This may result in fire or electric shock.

Stop using immediately, turn off the power switch and unplug the equipment from the power outlet. Contact your local GE Healthcare representative to request repair.

WARNING

Do not damage the power supply cord by bending, twisting, heating or allowing them to become pinned under the equipment. Using damaged power cords could result in fire or electric shock.

If the power supply cords are damaged, contact your local GE Healthcare representative for replacements.

WARNING

Do not place the equipment on unstable tables or on inclined surfaces, as the equipment could be dropped or fall, resulting in injury.

2.3 Personal protection

CAUTION

Always wear gloves, protective glasses and a lab coat or similar when handling samples.

CAUTION

Always wear cotton gloves when handling storage phosphor screens.

2.4 Laser safety

WARNING

Never detach the inner cover screwed to this instrument. If it is detached, laser beam may leak with a risk of loss of vision.

CAUTION

Using procedures or adjustments other than those specified in this manual may result in hazardous exposure to laser radiation.

2.5 Radiation safety

Radiation safety

This instrument is not equipped with any radioisotope (RI) or radiation generating unit, and is therefore not regulated by radiation hazard prevention laws. However, the instrument is capable of reading Storage phosphor screens which may be polluted by radioisotopes (RI).

CAUTION

If radioisotope (RI) pollution occurs, stop use of the instrument immediately and follow the instructions of your radiation administrator.

2.6 Radiation hazard prevention

Controlled area

Paragraph 1 of Article 1 of the Law Enforcement Rules for Prevention of Radiation Hazards due to Radioisotope and so forth (Prime Minister's Office ordinance No. 56) defines the controlled area as "a place where the dose equivalent related to external radiation exceeds the dose equivalent determined by the Director General of the Science and Technology Agency (hereinafter referred to as the Director General), the concentration of radioisotope in the air exceeds the concentration determined by the Director General, or the radioisotope density on the surface polluted by radioisotope exceeds the density determined by the Director General."

Limit of superficial pollution

Paragraph 3 of Article 4 of Notice No. 15 of the Science and Technology Agency that determines the quantity, etc. of radiating isotope specifies that the density of radioisotope on the surface polluted by radioisotope must be one tenth of the density defined in Article 8.

Article 8 and Table 3 of this Notice define the limits as shown below:

1 Superficial density of radioisotope that radiates alpha rays: 4 Bq/cm^2

2 Superficial density of radioisotope that does not radiate alpha rays: 40 Bq/cm^2

Installation site of instrument

This instrument is capable of reading not only Storage phosphor screens but also fluorescent pigment label samples (non-RI method). Therefore, it is recommended that the user should install it outside the controlled area and use RI-indicated samples without contacting them with Storage phosphor screens directly.

However, as described above, the Storage phosphor screen surface may be polluted by radioisotope (RI), depending on the sample condition, since the instrument sticks the sample to the ^{3}H-compatible Storage phosphor screen surface and exposes it in an auto-radiography experiment of the ^{3}H label sample.

When a sample is in direct contact with a Storage phosphor screen, it is generally known that the sample for making an auto-radiogram contains a relatively small quantity of radioisotope. However, the degree of superficial pollution of the Storage phosphor screen is greatly influenced by the dryness of the sample and dose of radioisotope in an experiment and may exceed the limits mentioned in *Limit of superficial pollution , on page 15*.

When the instrument reads a Storage phosphor screen with a polluted non-exposure area, it may be polluted. The degree of such superficial pollution greatly differs with users' operation conditions. Superficial pollution may exceed the limit mentioned above.

Note: *As mentioned above, install this instrument in the RI controlled area if the user uses RI-indicated samples that will be in direct contact with Storage phosphor screens.*

Removal from the controlled area

If it is necessary to move the instrument and its laboratory, which were installed and have been used in the controlled area, from the controlled area, make sure that the degree of the superficial pollution is below the limits mentioned in Limit of superficial pollution above.

2.7 Electric safety

WARNING

Do not use the equipment with a power supply other than that recommended. Fire and electric shock could result.

WARNING

Do not use the equipment within or near a sink, or in humid or dusty environments. Fire and electric shock could result.

WARNING

Connect the power supply directly to a grounded wall power outlet. The use of extension cords or multiple loads on one electrical outlet could result in fire and electric shock.

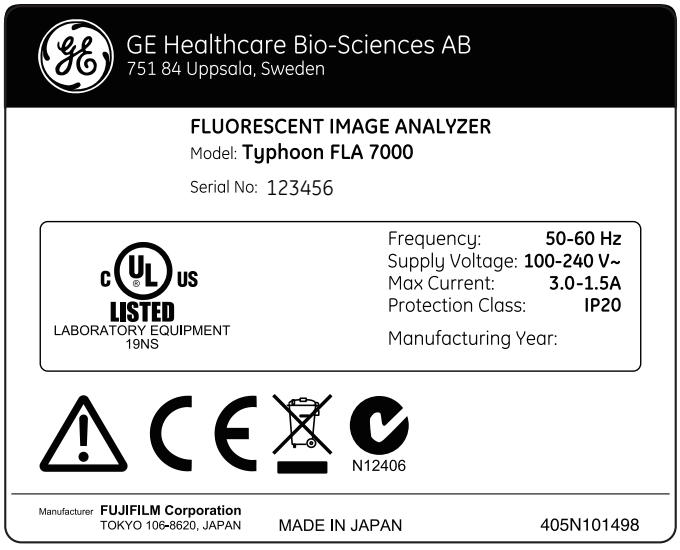
CAUTION

Do not use the same power supply as that of large equipment such as an air conditioner or centrifuge. Malfunction could result.

2.8 Labels on Typhoon FLA 7000

Typhoon FLA 7000 serial number

The Typhoon FLA 7000 serial number is located on a label on the back of the instrument.



Symbols used in safety labels

Label	Meaning
	**Warning!** Read the user documentation before using the system. Do not open any covers or replace parts unless specifically stated in the user documentation.
	The system complies with the requirements for electromagnetic compliance (EMC) in Australia and New Zealand.
	The system complies with applicable European directives.

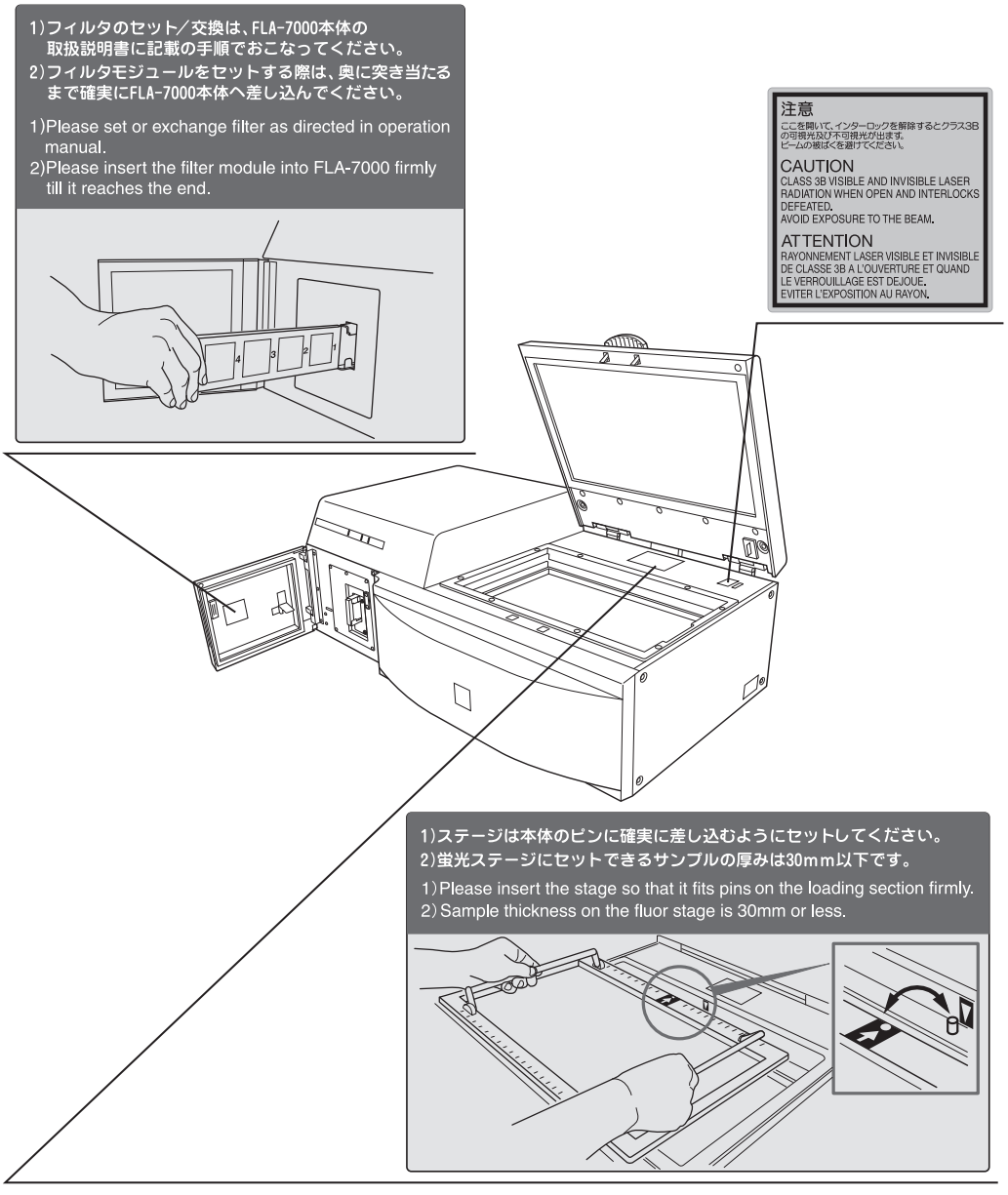
Labels concerning use of hazardous substances

Label	Meaning
	This symbol indicates that the waste of electrical and electronic equipment must not be disposed as unsorted municipal waste and must be collected separately. Please contact an authorized representative of the manufacturer for information concerning the decommissioning of equipment.

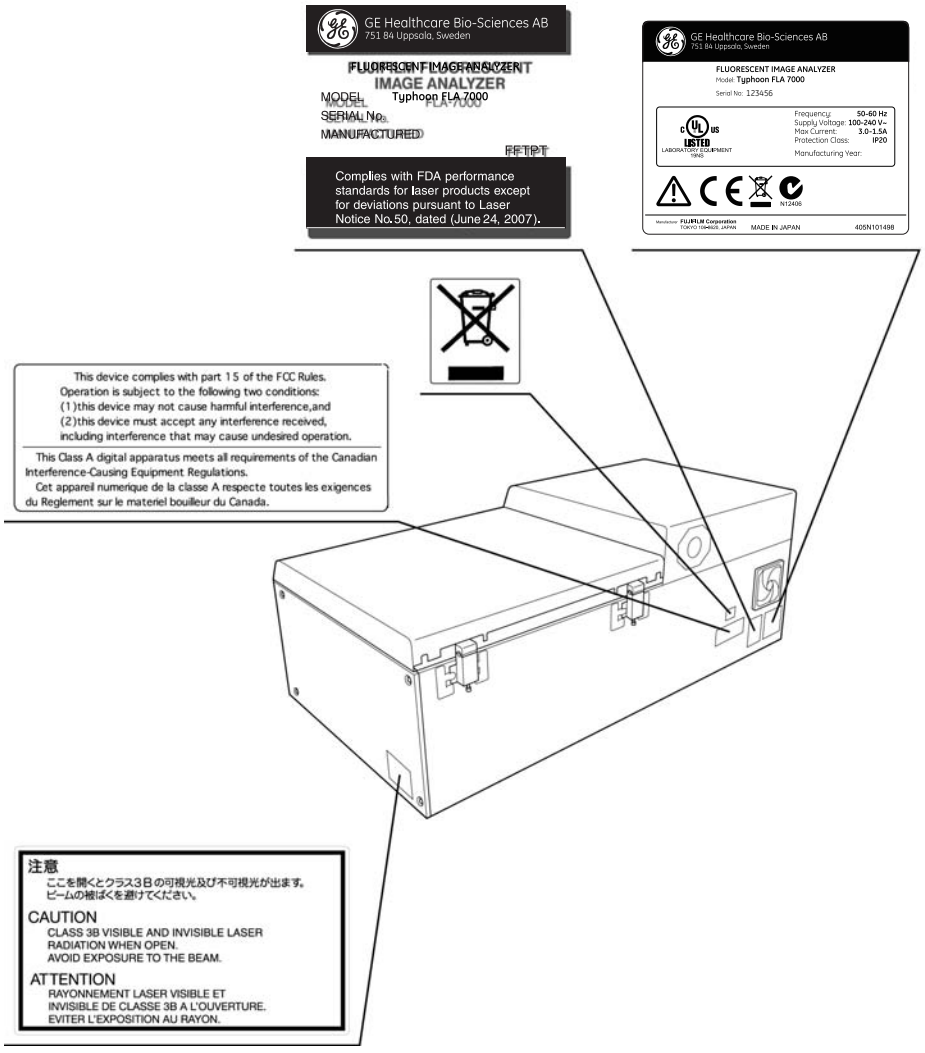
Labels concerning laser light

Label	Meaning
	**CAUTION!** Avoid exposure to the laser beam when the lid is open.
	**CAUTION!** Class 3B Laser product when open and interlock defeated. Avoid exposure to the beam. Do not attempt to defeat the safety interlocks under the sample lid or behind the filter door, or otherwise try to gain access to the interior of the instrument through any other opening. Exposure to laser light can cause injury. Viewing the laser light directly can cause blindness.

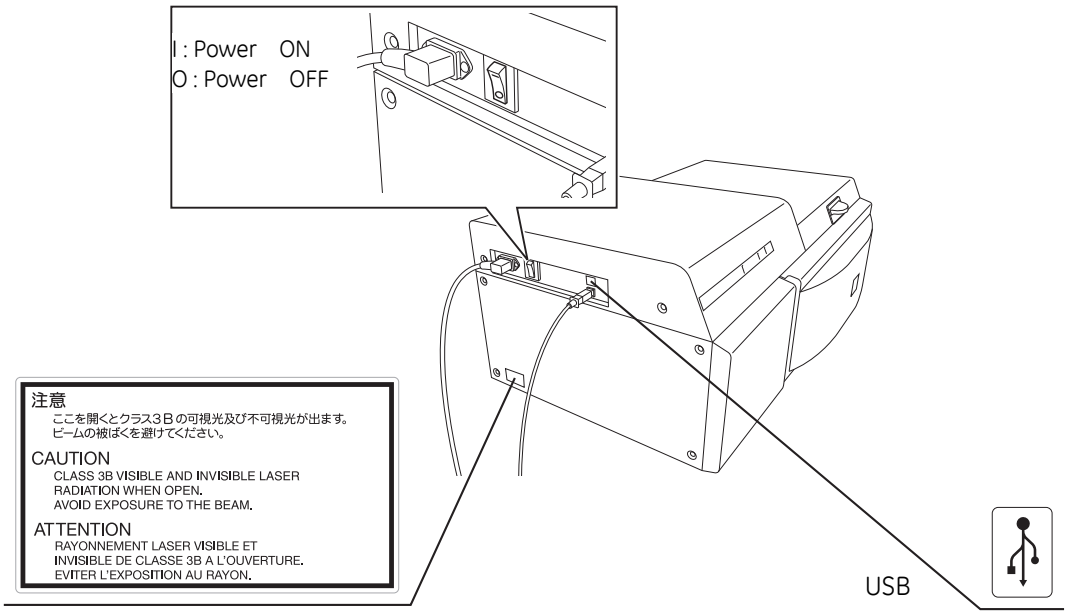
Labels at the front of Typhoon FLA 7000



Labels at rear of Typhoon FLA 7000



Labels on left side of Typhoon FLA 7000



2.9 Emergency procedures

This section describes how to do an emergency shutdown of the Typhoon FLA 7000 instrument. The section also describes the results of a power failure.

Emergency shutdown

Step	Action
1	Click the ***Stop*** button in the Typhoon FLA 7000 Control Software.
2	Turn off the Typhoon FLA 7000 by pressing the power switch on the left side of the instrument body.
3	Disconnect the power cord from the power outlet.

Power failure

The results of a power failure depends on the unit or units affected.

Unit affected by power failure	Results
Typhoon FLA 7000 instrument	• The reading is interrupted immediately. The instrument is in an undefined state. • The data collected up to the time of the power failure is available in the file created when starting the scan.
Computer running the Typhoon FLA 7000 Control Software	• The computer shuts down immediately. • The run continues, but no data is saved.

2.10 Recycling and disposal

General instructions for disposal

When taking the Typhoon FLA 7000 out of service, the different materials must be separated and recycled according to national and local environmental regulations.

Specific instructions for disposal

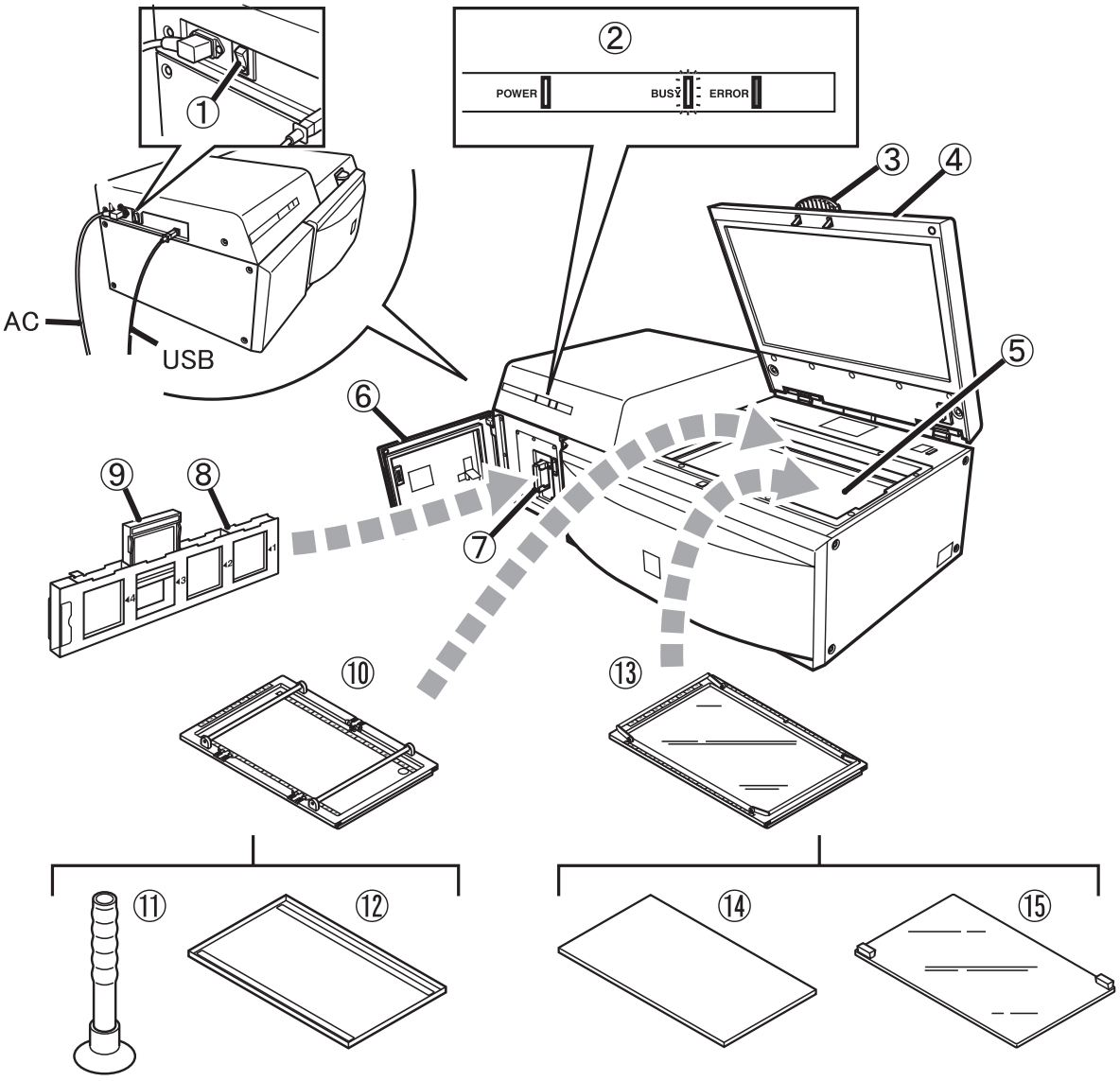
Measure the superficial radio isotope pollution of the instrument body and storage phosphor screen as mentioned in the radiation hazard prevention section of the User Manual.

If the pollution level exceeds the limit, dispose of the instrument body as radioactive waste. Otherwise, dispose of the materials according to applicable laws and regulations for disposal of industrial waste.

3 System configuration

3.1 Parts and functions

The parts and their functions are explained separately in this chapter.



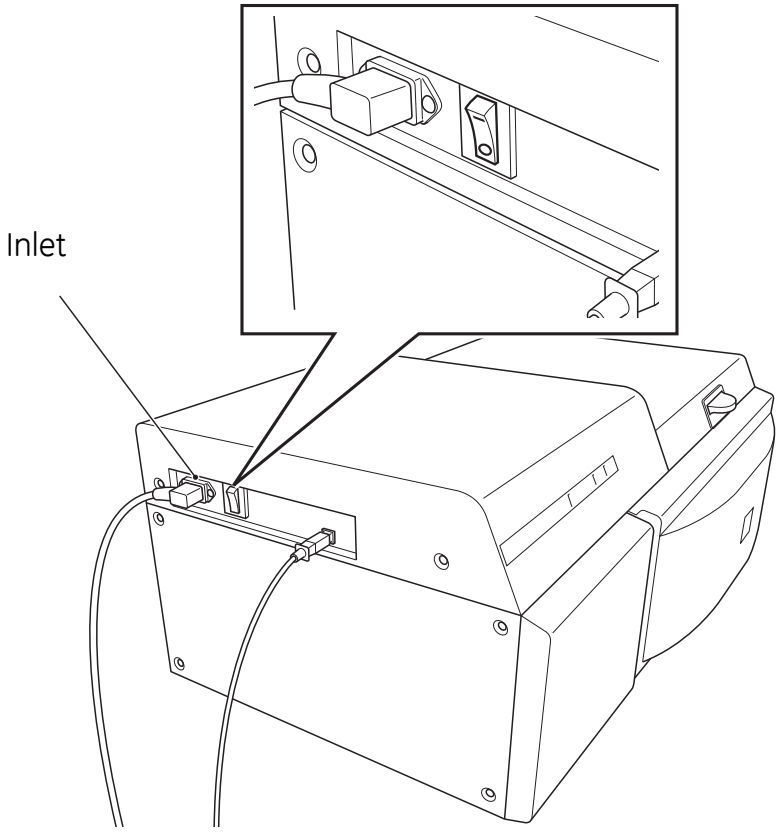
Part	Function
1	Power switch, located between the AC connector and the USB connector
2	Indicator lamps

Part	Function
3	Knob
4	Lid
5	Setting block
6	Filter change door
7	Filter module slot
8	Filter module
9	Filter
10	Phosphor stage
11	Suction rod
12	Protection cover for storage phosphor screen
13	Fluor stage
14	Digitizing fluorescent plate
15	Membrane weight (included in Fluor stage)

3.2 Instrument body

Power switch

The power switch is located on the left side of the Typhoon FLA 7000.

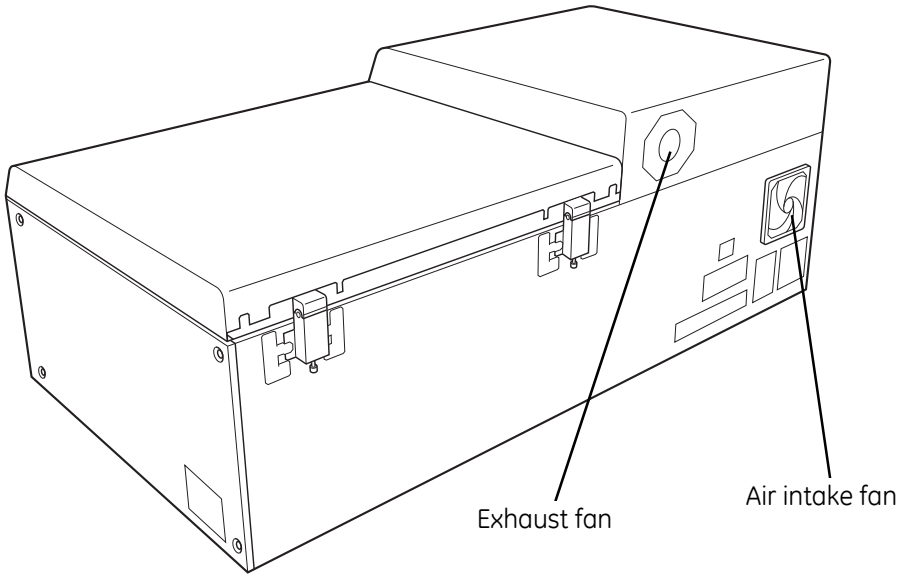


Cooling fans

The instrument has two cooling fans on the back side.

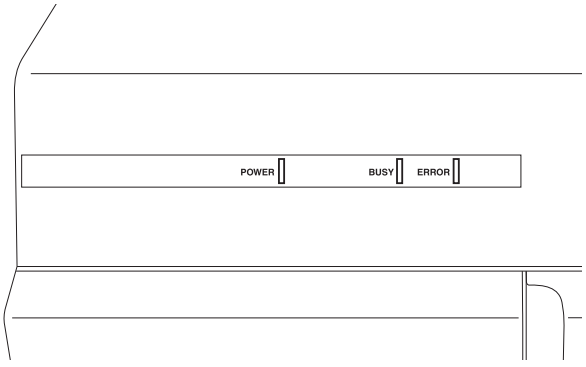
CAUTION

Do not block the cooling fans with a wall or objects. If they are blocked, the instrument may become damaged.

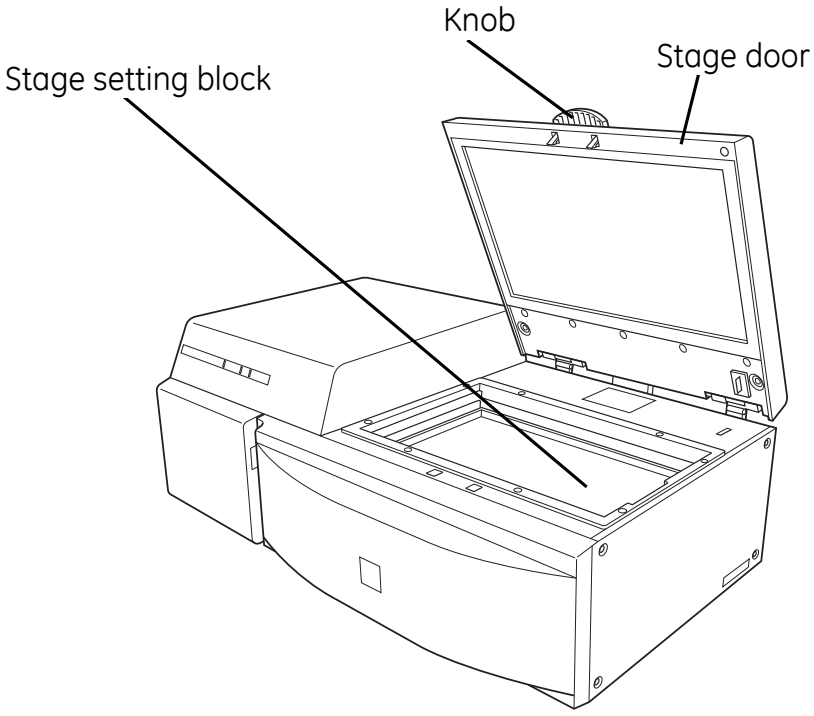


Indicator lamps

Three indicator lamps indicate the instrument status.

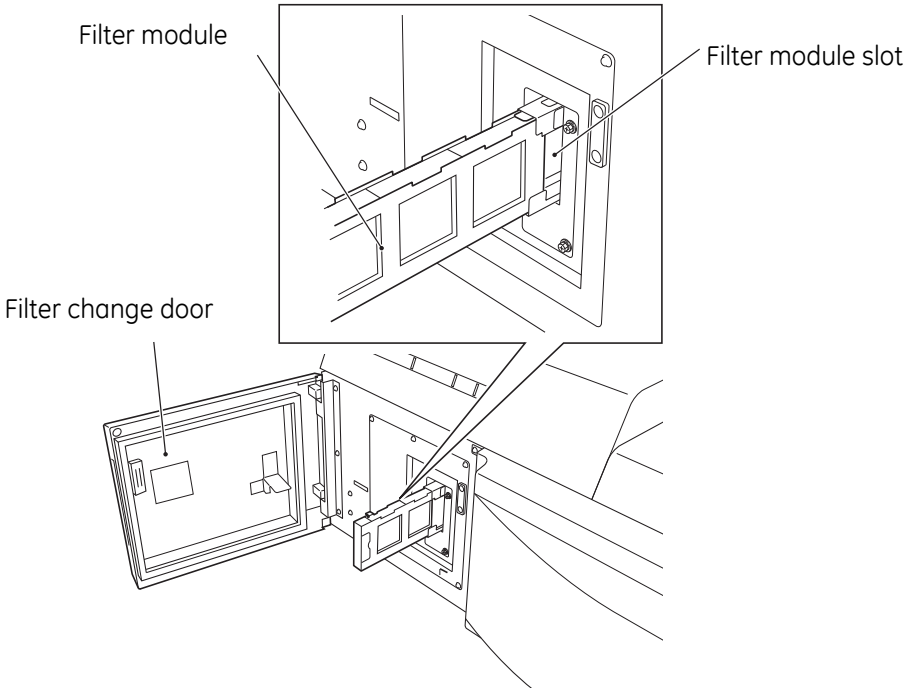


Stage setting block



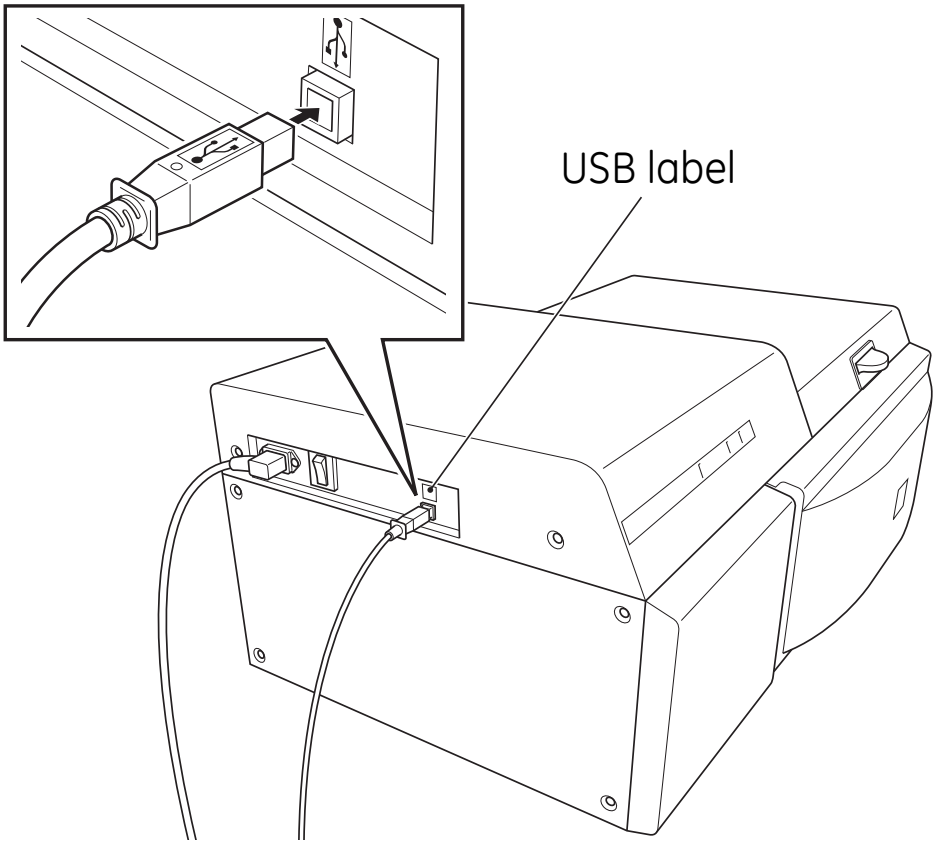
Filter module

The filter module is located behind the filter door.



USB port

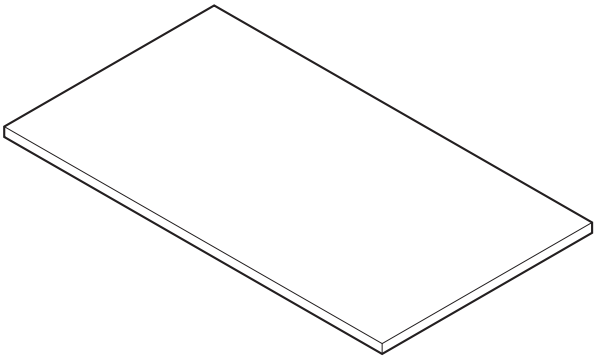
The USB port is located on the left side of Typhoon FLA 7000.



3.3 Accessories

Digitization plate (included)

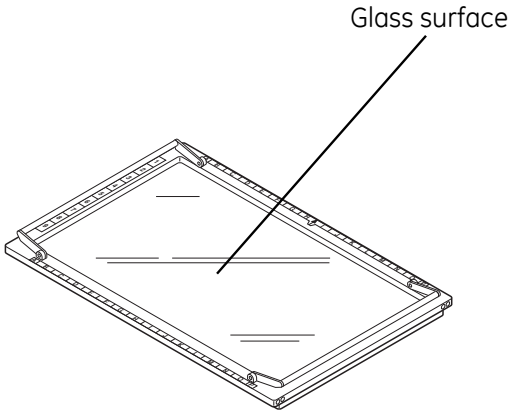
The digitization plate is a fluorescent plate that emits light when exposed to a laser beam. This plate is used when the digitization mode is used.



Fluor stage (included)

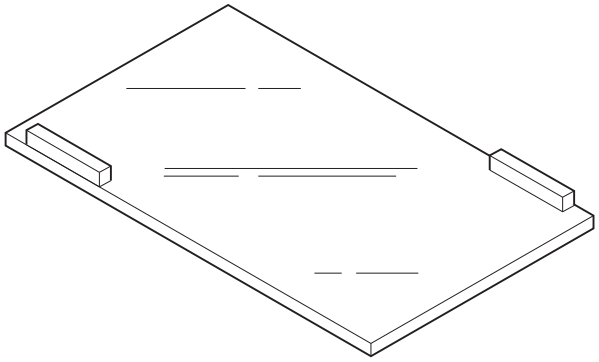
The Fluor stage is used to read gels or membranes.

- Place the gel or membrane directly on the glass of the Fluor stage.
- Place the Fluor stage in the instrument.



Membrane weight (included)

The membrane weight is used to hold thin fluorescent samples flat against the Fluor stage.



Multi stage (included)

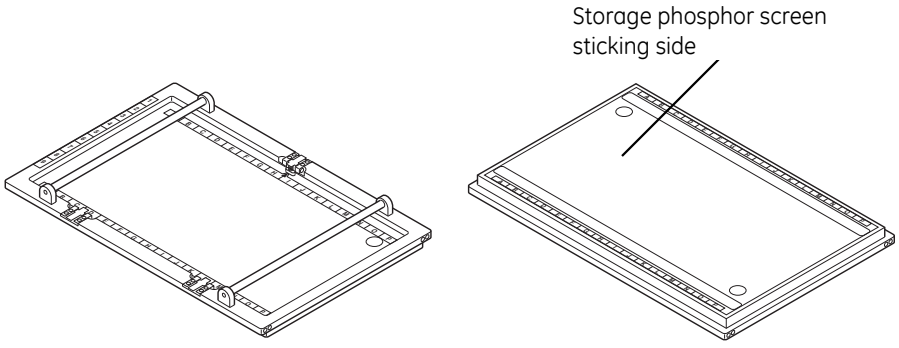
The Multi stage is used to read gels with glass (gel merely supported by glass) or titer plates.

- Place the gel with the glass plate directly on the Multi stage, or place a titer plate on the titer plate plugin attached to the instrument.
- Place the titer plate on the Multi stage.

Phosphor stage (included)

The phosphor stage is used when reading storage phosphor screens. The stage is magnetic to hold storage phosphor screens.

- Place the phosphor stage upside down on a flat surface.
- Place the storage phosphor screen on the phosphor stage, with the reading surface facing away from the phosphor stage.
- Place the protective cover on top of the storage phosphor screen.
- Flip the phosphor stage over.
- Place the phosphor stage in Typhoon FLA 7000.



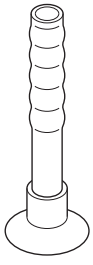
Power cord (included)

Typhoon FLA 7000 uses a special AC power cable. Be sure to use power cables specified in service manuals or by service personnel.

Suction rod (included)

The suction rod is used to lift up or place the the storage phosphor screen on the phosphor stage.

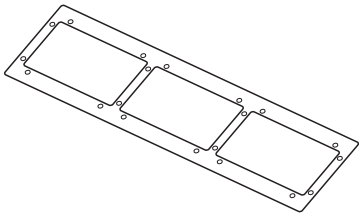
Press the suction rod against the storage phosphor screen. Place a finger on the end of the suction rod, then lift up the storage phosphor screen. Release the finger to release the storage phosphor screen.



Suction rod

Titer plate (TP) plugin (included)

The TP plugin is used when reading titer plate samples.



USB cable (included)

The USB cable is used to connect Typhoon FLA 7000 to a computer.

4 Installing and moving Typhoon FLA 7000

> **CAUTION**
> Only authorized service personnel is allowed to install Typhoon FLA 7000. Contact your local GE Healthcare representative for help and advice.

4.1 Site requirements

Note: *The Typhoon FLA 7000 is intended for indoor use only.*

Parameter	Requirement
Power supply	100 to 240 V AC, 3.0 to 1.5 A
Line frequency	50 to 60 Hz
Placement	Stable, horizontal surface out of direct sunlight
Ambient temperature	+10 to +30°C
Humidity	20 to 75%, non-condensing
Maximum altitude	2000 m above sea level

Initial delivery inspection

Upon receiving Typhoon FLA 7000:

- inspect the package for external damages
- check that all items in the packaging list are included.

Should you find any external damages, or if any items on the packaging list are missing, notify the delivery company and contact GE Healthcare for further advice.

Store Typhoon FLA 7000 in an environment according to *Appendix B Specifications, on page 89* until the product is unpacked and installed.

4.2 Transporting Typhoon FLA 7000

CAUTION
Typhoon FLA 7000 must be secured before long distance transports. Contact GE Healthcare for help and advice before transporting Typhoon FLA 7000 long distances.

The Typhoon FLA 7000 weighs approximately 62 kg and requires at least two persons to lift and move.

Precautions before moving the instrument

Step	Action
1	Turn off the Typhoon FLA 7000.
2	Turn off the computer and any peripheral devices.
3	Disconnect the power cords and the USB connection.

4.3 Connections

CAUTION
Only authorized service personnel is allowed to install Typhoon FLA 7000. Contact your local GE Healthcare representative for help and advice.

Communication

Step	Action
1	Connect a USB cable to the USB port on the left side of the Typhoon FLA 7000.
2	Connect the other end of the USB cable to a USB port on the computer.

CAUTION
- Do not connect any USB devices other than the Typhoon FLA 7000 to the computer in which the Typhoon FLA 7000 Control Software is installed.
- Use only the Typhoon FLA 7000 Control Software during reading.

Electrical power

Connect the power cord of the Typhoon FLA 7000 to a grounded power outlet.

WARNING

Use only power cords delivered or approved by GE Healthcare.

5 Installing Typhoon FLA 7000 Control Software

Administrator privileges required

All tasks related to software installation or uninstallation require a computer account with administrator privileges.

5.1 Installation sequence

Software installation is performed in the following sequence:

1 Install the USB control driver

2 Install the USB function driver

3 Install the Typhoon FLA 7000 Control Software

5.2 Install Typhoon FLA 7000 Control Software under Windows XP

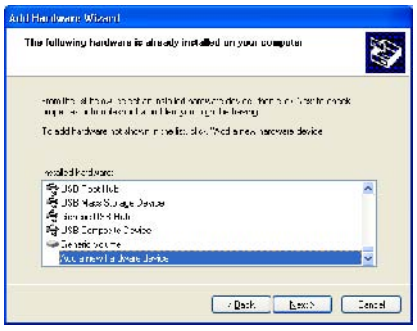
Before you begin

Log in using a Windows account with administrator privileges.

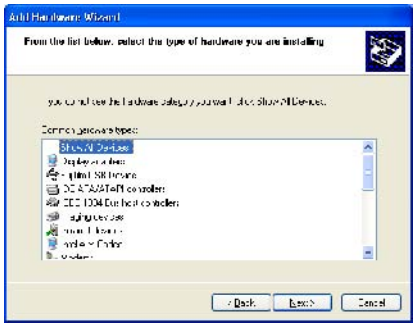
Install the USB Control Driver (Windows XP)

Step	Action
1	Disconnect Typhoon FLA 7000 from the computer.
2	Open the control panel and select ***Printers and Other Hardware***.
3	Click ***Add Hardware*** to open ***Add hardware wizard***.
4	Click the ***Next*** button in ***Add hardware wizard***.
5	Select ***Yes, I have already connected the hardware*** and click the ***Next*** button.

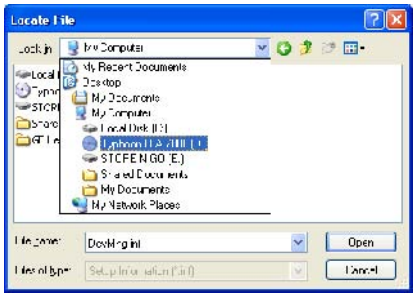
Step	Action
6	Select ***Add a new hardware device*** and click the ***Next*** button.



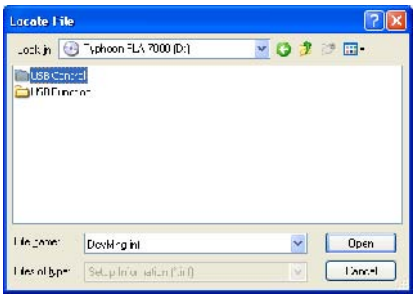
7	Select ***Install the hardware that I manually select from a list [Advanced]*** and click the ***Next*** button.
8	Select ***Show All Devices*** and click the ***Next*** button.



9	Click the ***Have Disk*** button in the ***Add hardware wizard***.
10	Insert the Typhoon FLA 7000 Control Software CD and click the ***Browse*** button.
11	Select to install the driver from the Typhoon FLA 7000 Control Software CD.



Step	Action
12	Open the ***USB Control*** folder.



13	Select the ***DevMng.inf*** file and click the ***Open*** button.

14	Click the ***OK*** button in the ***Install from disk*** dialog.
15	Click the ***Next*** button in the ***Add hardware wizard***.
16	Click the ***Next*** button again.
17	Click the ***Continue Anyway*** button in the ***Hardware Installation*** dialog.

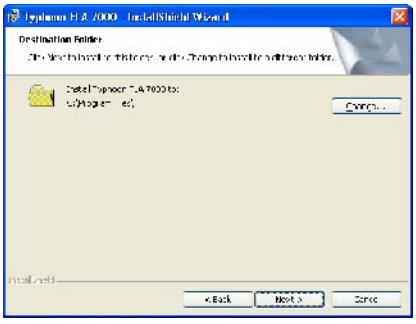
18	Click the ***Finish*** button to complete the driver installation.

Install the USB function driver (Windows XP)

Step	Action
1	Connect the computer and the Typhoon FLA 7000 with a USB cable and turn **ON** the power switch of Typhoon FLA 7000. The scanner is automatically detected by the computer.
2	In the ***Found New Hardware Wizard*** dialog, choose ***No, not this time***. 
3	Click the ***Next*** button in the ***Found New Hardware Wizard*** dialog.
4	Insert the installation CD.
5	Select ***Install the software automatically (Recommended)***.
6	Click the ***Next*** button in the ***Found New Hardware Wizard*** dialog.
7	Click the ***Finish*** button to complete the installation.

Install Typhoon FLA 7000 Control Software (Windows XP)

Step	Action
1	Insert the Typhoon FLA 7000 Control Software CD.
2	Locate and double-click the file Typhoon FLA 7000.msi.
3	In the ***Typhoon FLA 7000 - InstallShield Wizard***, click the ***Next*** button.
4	Read the license text. If the license agreement is not acceptable please contact a GE Healthcare representative, see back cover of this manual for contact information. Select ***I accept the terms in the license agreement*** and click the ***Next*** button.

Step	Action
5	Select destination folder in the dialog:  • Click the ***Next*** button to install the software at the default folder ***C:\Program Files***. • Click the ***Change*** button to install to a different folder.
6	Click the ***Install*** button in the installation dialog.
7	Click the ***Finish*** button to finish the installation of Typhoon FLA 7000 Control Software.

5.3 Install Typhoon FLA 7000 Control Software under Windows Vista

Before you begin

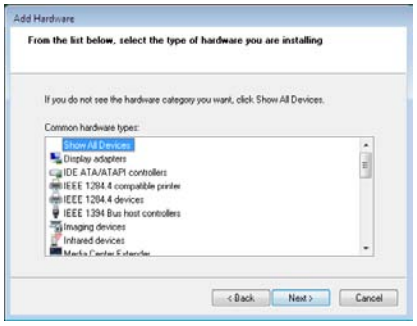
Log in using a Windows account with administrator privileges.

Install the USB Control Driver (Windows Vista)

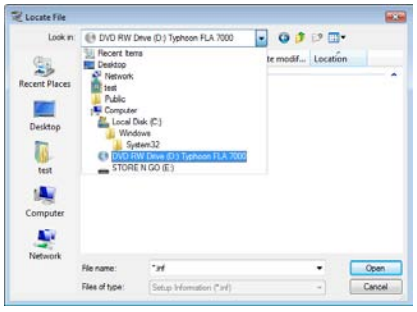
Note: *During software installations, you may be asked to confirm your actions in a dialog with the text* ***Windows needs your permission to continue****. Enter an administrator password, if prompted, then click* ***Continue*** *to proceed with the installation.*

Step	Action
1	Disconnect Typhoon FLA 7000 Control Software from the computer.
2	Open the control panel and click ***Classic View*** in the upper left corner.
3	Open ***Add Hardware***.
4	In the ***Add Hardware*** dialog, click the ***Next*** button.
5	Select ***Install the hardware that I manually select from a list (Advanced)*** and click the ***Next*** button.

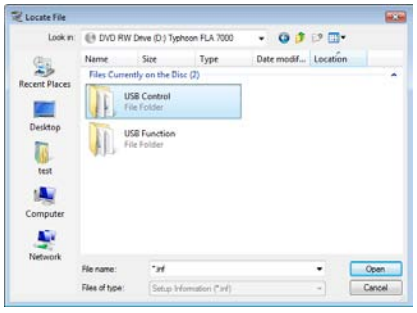
Step	Action
6	Select ***Show All Devices*** and click the ***Next*** button.

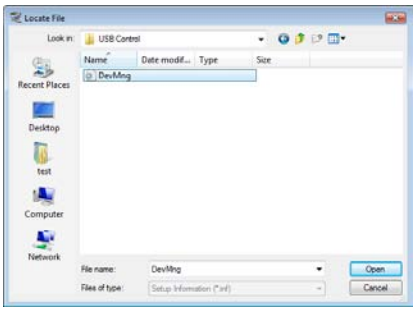


7	Click the ***Have Disk*** button.
8	Insert the Typhoon FLA 7000 Control Software CD and click the ***Browse*** button.
9	Select to install the driver from the Typhoon FLA 7000 Control Software CD.



10	Select the ***USB Control*** folder and click ***Open***.

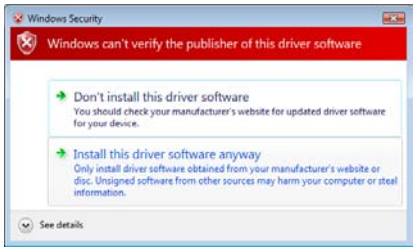


Step	Action
11	Select the file ***DevMng*** and click the ***Open*** button. 
12	Click the ***OK*** button in the dialog ***Install from disk***.
13	Click the ***Next*** button in the wizard ***Add hardware***.
14	Click the ***Next*** button once again.
15	The following warning is displayed. Proceed by cliking ***Install this driver software anyway***. 
16	Click the ***Finish*** button in the ***Add Hardware*** wizard to complete the installation.

Install the USB function driver (Windows Vista)

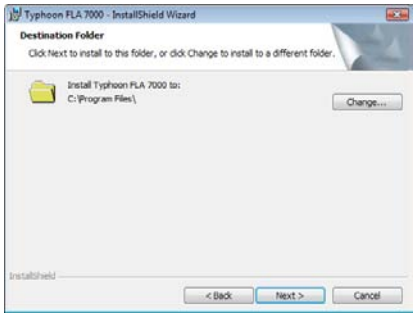
Note: *During software installations, you may be asked to confirm your actions in a dialog with the text* ***Windows needs your permission to continue****. Enter an administrator password, if prompted, then click* ***Continue*** *to proceed with the installation.*

Step	Action
1	Connect the computer and the Typhoon FLA 7000 with a USB cable and turn **ON** the power switch of Typhoon FLA 7000. *Result:* The scanner will automatically be detected by the computer and the Plug and Play function in Windows Vista starts.
2	In the ***Found New Hardware*** dialog, select ***Locate and install driver software (recommended)***.
3	Insert the Typhoon FLA 7000 Control Software CD when prompted and click the ***Next*** button in the ***Found New Hardware*** dialog.

Step	Action
4	Select ***Install this driver software anyway***. 
5	A successful installation message appears. Click the ***Close*** button.

Install Typhoon FLA 7000 Control Software (Windows Vista)

Note: *During software installations, you may be asked to confirm your actions in a dialog with the text* ***Windows needs your permission to continue****. Enter an administrator password, if prompted, then click* ***Continue*** *to proceed with the installation.*

Step	Action
1	Insert the Typhoon FLA 7000 Control Software CD.
2	Locate and double-click the file Typhoon FLA 7000.msi.
3	In the ***Typhoon FLA 7000 - InstallShield Wizard*** dialog, click the ***Next*** button.
4	Read the license text. If the license agreement is not acceptable, please contact a GE Healthcare representative. See the back cover of this manual for contact information. Select ***I accept the terms in the license agreement*** and click the ***Next*** button.
5	Select destination folder in the dialog:  • Click the ***Next*** button to install the software at the default folder ***C:\Program Files***. • Click the ***Change*** button to install to a different folder.
6	Click the ***Install*** button.

Step	Action
7	If User Account Control (UAC) is enabled in Windows Vista, a dialog displays the message ***An unidentified program wants access to your computer***. Click ***Allow***.
8	Click the ***Finish*** button. The installation of Typhoon FLA 7000 Control Software is now completed.

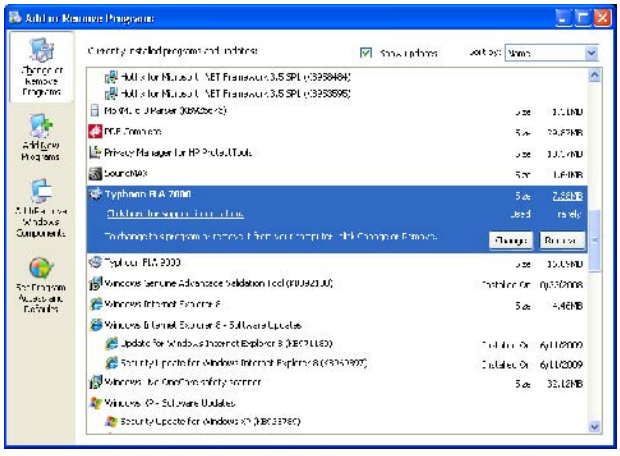
6 Uninstalling and upgrading Typhoon FLA 7000 Control Software

Before you begin

Log in using a Windows account with administrator privileges.

Uninstalling Typhoon FLA 7000 Control Software under Windows XP

Step	Action
1	Open the control panel and select ***Add or Remove Programs***.
2	Select **Typhoon FLA 7000** and click the ***Remove*** button.

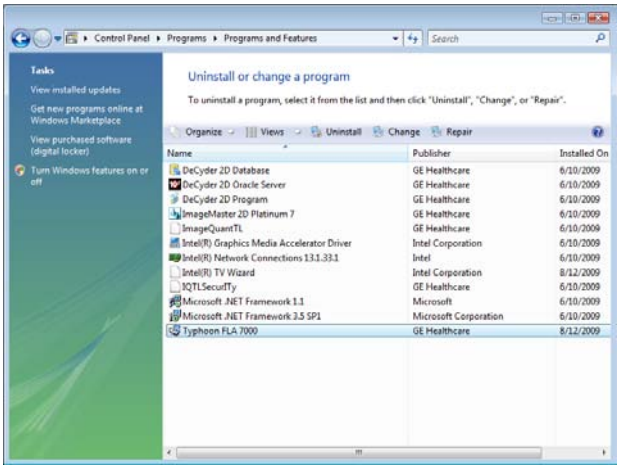


Step	Action
3	Confirm the uninstallation by clicking ***Yes*** when prompted.

Note: *Correction files created during calibration, such as shading data, are required by the Typhoon FLA 7000 Control Software. They are not deleted during the uninstallation, and remain in the Data folder of Typhoon FLA 7000 Control Software folder.*

Uninstalling Typhoon FLA 7000 Control Software under Windows Vista

Step	Action
1	Open the control panel and Select ***Uninstall a program*** under ***Programs***.

Step	Action
2	Select ***Typhoon FLA 7000*** and then click ***Uninstall.*** 
3	Confirm the uninstallation by clicking ***Yes*** when prompted.
4	If User Account Control (UAC) is enabled in Windows Vista, a dialog displays the message ***An unidentified program wants access to your computer***. Click ***Allow***.

Upgrading Typhoon FLA 7000 Control Software

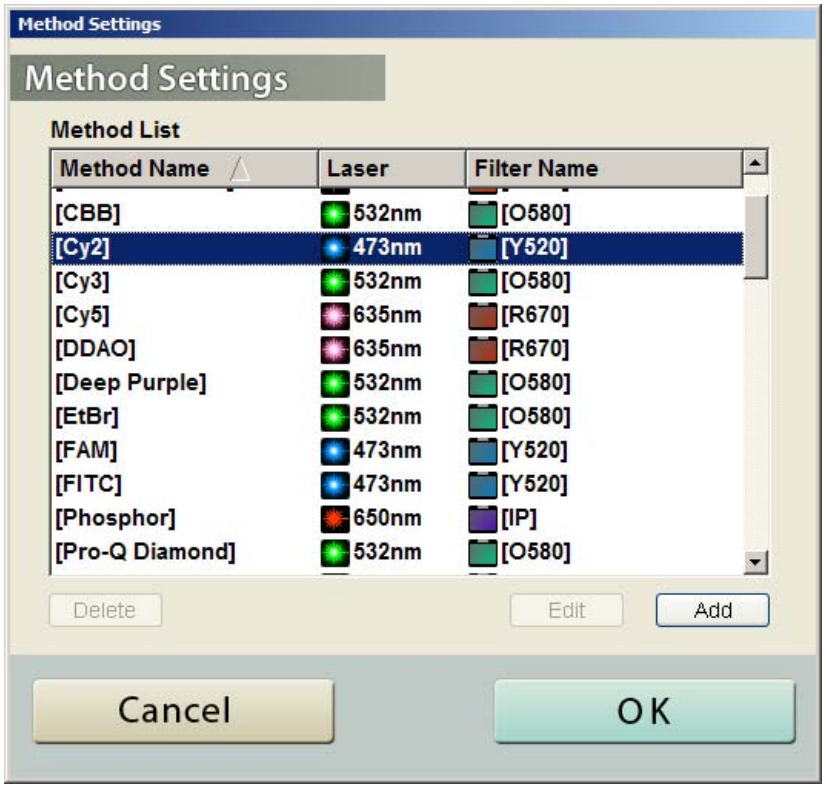
Step	Action
1	Uninstall the current version of Typhoon FLA 7000 Control Software.
2	Install the new version of Typhoon FLA 7000 Control Software. Follow the instructions in the installation chapter of Getting Started.

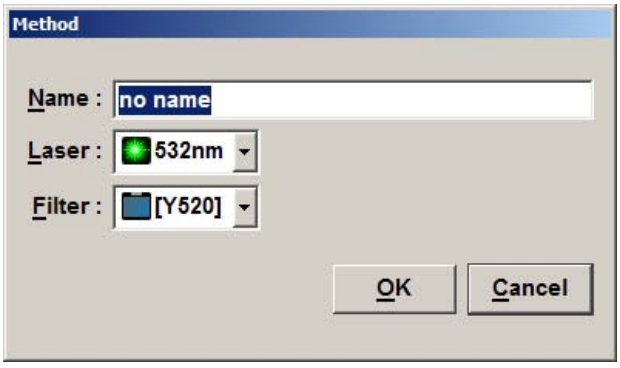
7 Registering, editing and deleting methods

Note: *Method settings are registered by a serviceman upon installation. Under normal circumstances, it is not necessary to change these settings.*

7.1 Registering a new method

Step	Action
1	Click the ***Method*** button in the main window. The ***Method Settings*** dialog box appears.

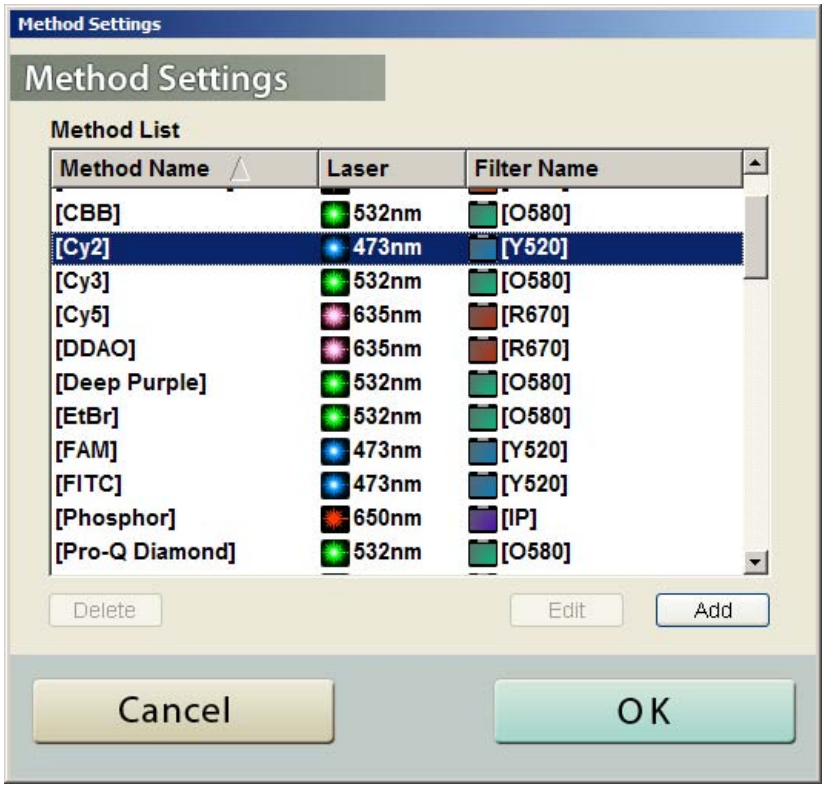


Step	Action
2	Click the ***Add*** button. The following dialog box appears. 
3	Select a laser in the ***Laser:*** drop-down box. You can select lasers that are not currently loaded.
4	Select a filter in the ***Filter:*** drop-down box. You can select filters that are not currently loaded.
5	Type a name in the ***Name:*** field.
6	Click the ***OK*** button. The list in the ***Method Settings*** window now contains the new method with the selected laser and filter combination.

Note: *Methods containing lasers or filters that are not currently loaded cannot be selected in the* ***Reader Condition*** *screen.*

7.2 Editing a method

Step	Action
1	Click the ***Method*** button in the main window. The ***Method Settings*** dialog box appears.



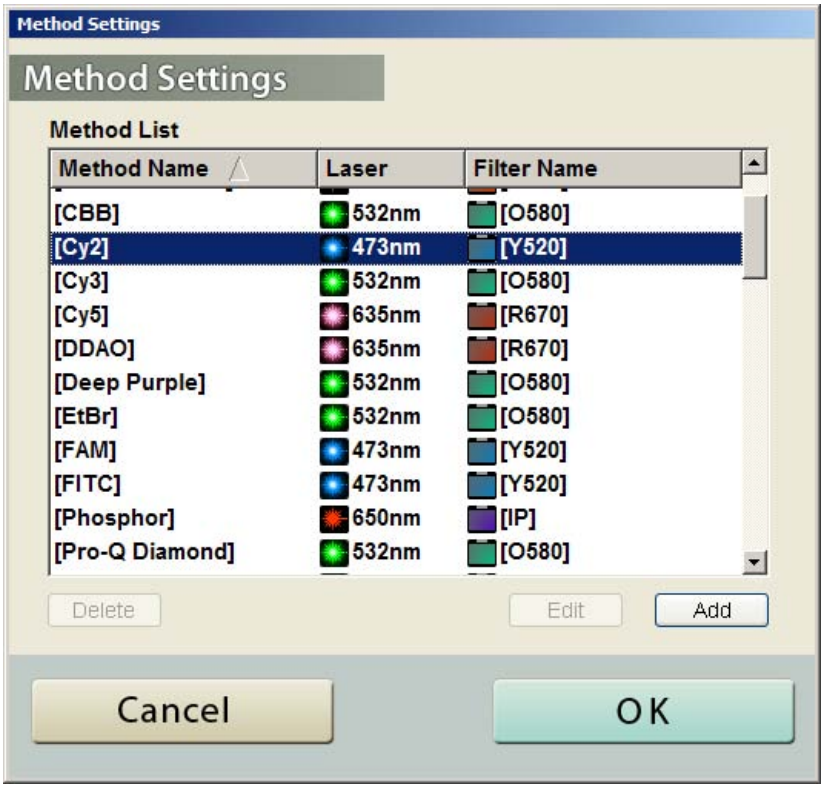
2	Select the desired method to edit.
3	Click the ***Edit*** button.
4	Enter the desired changes.
5	Click the ***OK*** button.
6	Finalize the changes by clicking the ***OK*** button in the ***Method Settings*** dialog box.

Note: *Default methods cannot be edited. Names of default methods are surrounded by [square brackets].*

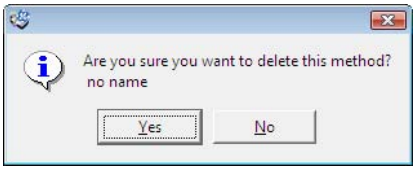
7.3 Deleting a method

Note: *Default methods cannot be deleted. Names of default methods are surrounded by [square brackets].*

Step	Action
1	Click the ***Method*** button in the main window. The ***Method Settings*** dialog box appears.



2	Select the desired method to delete.
3	Click the ***Delete*** button.
4	Click the ***Yes*** button. A confirmation dialog appears. (In the screenshots below, the method name given is ***no name***.)



5	Finalize the changes by clicking the ***OK*** button in the ***Method Settings*** dialog box.

Note: *To undo the filter deletion, click the **Cancel** button in the Method Settings dialog box. Click **Yes** in the dialog box that appears, see below.*

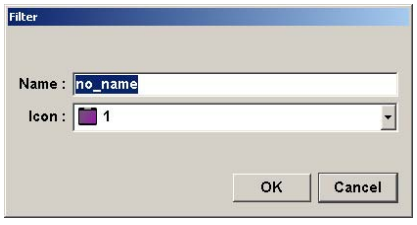
8 Filter module settings

Introduction

Filter module settings are registered by a serviceman upon installation. Under normal circumstances, it is not necessary to register these settings.

When a filter is changed in the filter module of Typhoon FLA 7000, the new or changed filter must be registered in the Typhoon FLA 7000 Control Software. A filter which has not been registered can not be used for analysis and is not displayed in the Typhoon FLA 7000 Control Software.

8.1 Registering a new filter name

Step	Action
1	Click the ***Filter Module*** button in the main window. 
2	Click the ***Add*** button. The following dialog box appears. 
3	Type the filter name in the ***Name:*** field.
4	Select an icon in the ***Icon:*** drop-down list.
5	Finalize the filter addition by clicking the ***OK*** button.
6	Click the ***OK*** button to return to the main window.

8.2 Saving a filter combination

Step	Action
1	Click the ***Filter Module*** button in the main window. 

Step	Action
2	Click the ***Save Filter Module...*** button.
3	Type a name for the filter combination in the ***File name:*** field.
4	Click the ***OK*** button.
5	Click the ***OK*** button to return to the main window.

8.3 Loading a filter combination

Step	Action
1	Click the ***Filter Module*** button in the main window. 
2	Click the ***Load Filter Module...*** button.
3	Select a filter module to load in the ***Load Filter Module*** dialog box.
4	Click the ***OK*** button.
5	Click the ***OK*** button to return to the main window.

CAUTION

When removing the filter module, make sure to click the ***Filter Module*** button and remove the filter module after the window changes to the ***Filter Settings*** window.

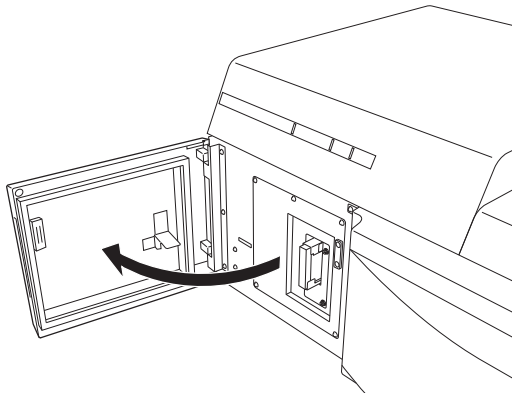
If the filter module is forcefully removed, the area where the filter comes in contact with the PMTs may be damaged.

8.4 Installing and replacing filters

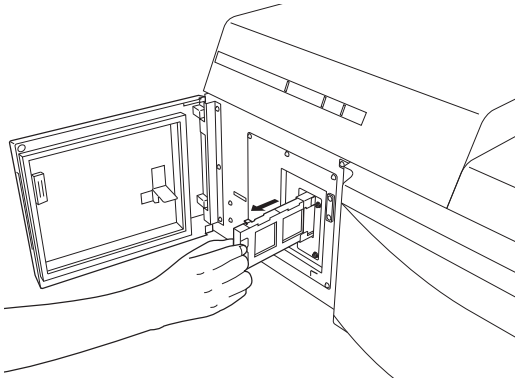
Remove the filter module from the scanner

Step	Action
1	Click the ***Filter Module*** button in the main window.  A status message appears. Wait until the message is closed before proceeding to the next step.

Step	Action
2	Open the filter change door.

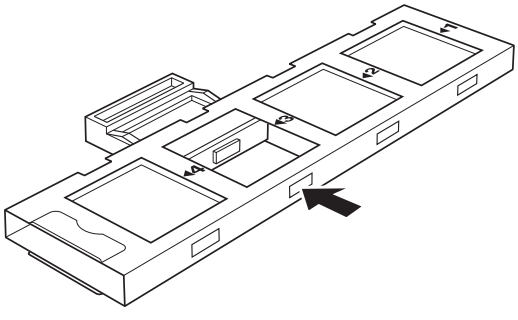


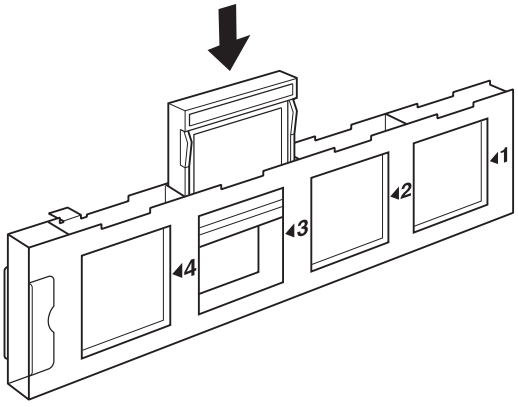
Step	Action
3	Pull filter module straight out.



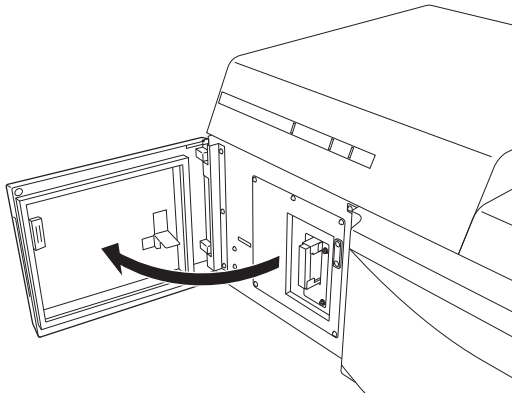
Remove and replace filters in the filter module

Step	Action
1	Press the notch on the bottom of the filter module and pull out the filter.

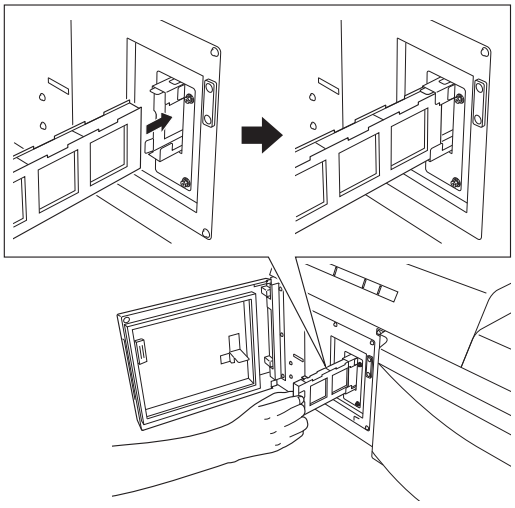


Step	Action
2	Place the new filter in the filter module.  Push the new filter in until it locks in place.

Place the filter module in the scanner

Step	Action
1	Open the filter change door. 

Step	Action
2	Insert the filter module in the filter module holder.

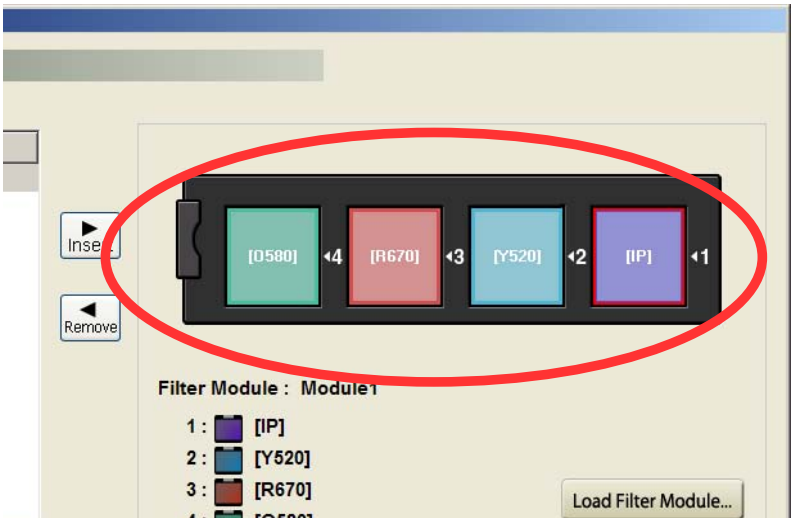


Step	Action
3	Close the filter change door.

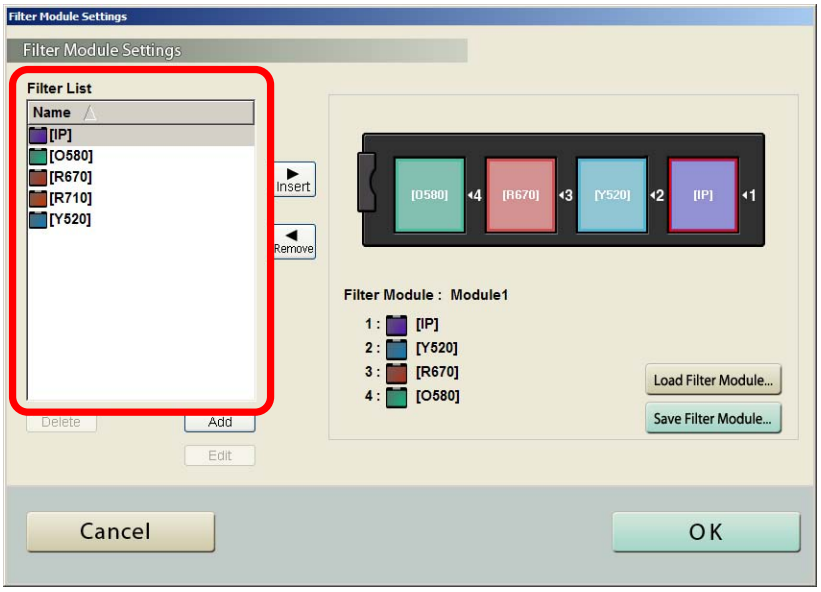
Register the filter change in Typhoon FLA 7000 Control Software

Step	Action
1	Click the ***Filter Module*** button in the main window.

Step	Action
2	Click the desired filter position on the filter tray.



Step	Action
3	Select the filter to be registered from ***Filter List***.



4	Click the ***Insert*** button to register the filter.

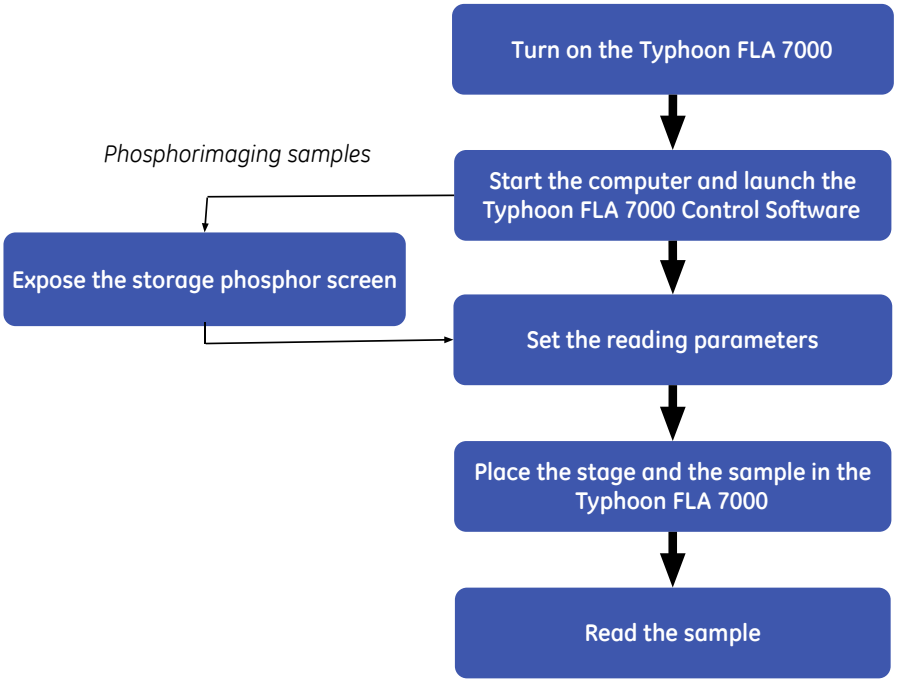
TIP: You can also drag the filter from ***Filter List*** to the desired filter position.

5	Click the ***OK*** button.

9 Operation

9.1 Operation overview

Using Typhoon FLA 7000 comprises a series of steps outlined below. Detailed explanations are provided in subsequent chapters.



9.2 Preparations before starting Typhoon FLA 7000

Checklist before starting Typhoon FLA 7000

- Typhoon FLA 7000 is placed on a sturdy, horizontal surface.
- Typhoon FLA 7000 is connected to a grounded wall outlet.
- The air intake fan on the rear side of Typhoon FLA 7000 is unobstructed.
- The air exhaust fan on the rear side of Typhoon FLA 7000 is unobstructed.
- There are no objects on top of Typhoon FLA 7000.

- There is no stage in the stage rack.

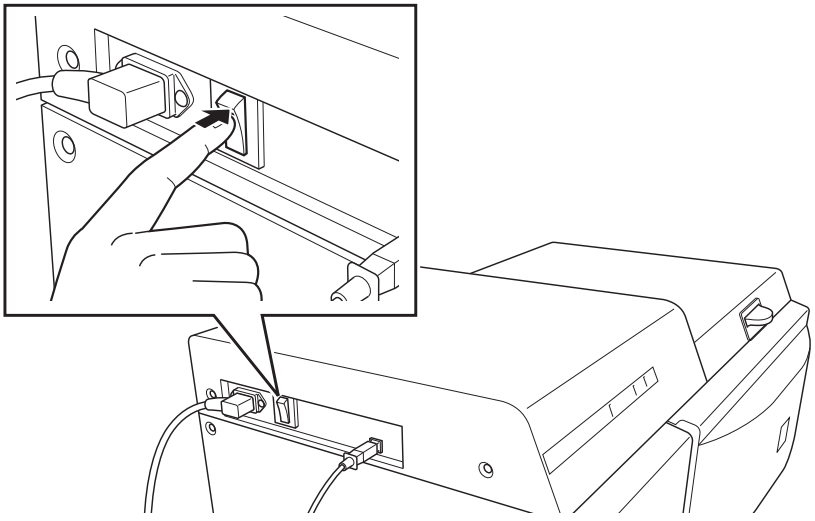
9.3 Starting Typhoon FLA 7000 and Typhoon FLA 7000 Control Software

Start Typhoon FLA 7000

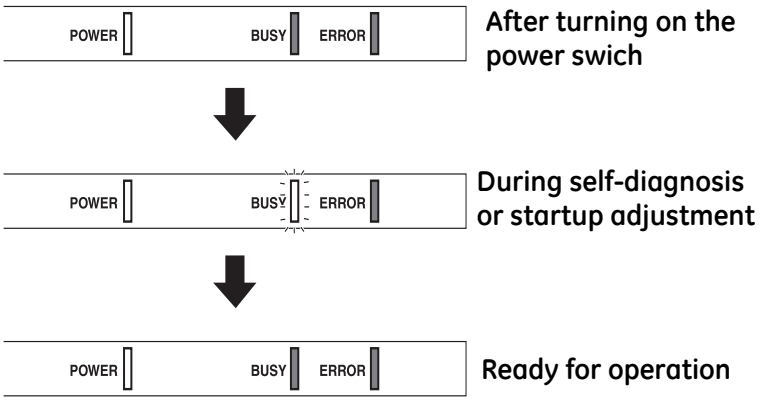
CAUTION

Do not insert a storage phosphor screen in Typhoon FLA 7000 before turning on the machine. If a storage phosphor screen is detected during the self-diagnosis of the Typhoon FLA 7000, the sensitivity of the storage phosphor screen may deteriorate and reduce the quality of the scanned data.

Step	Action
1	Push the power switch on the left side of the body to the "**I**" position.



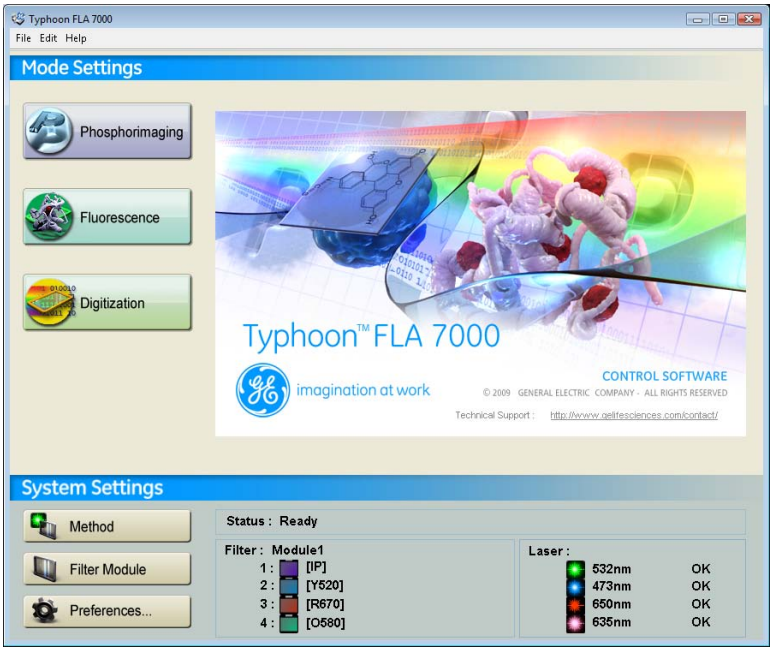
Step	Action
2	When the power switch is turned on, the indicator lamps change as shown below.



Start Typhoon FLA 7000 Control Software

Step	Action
1	Make sure that Typhoon FLA 7000 has completed the warm-up, after which only the power lamp on the upper left panel on the front of the Typhoon FLA 7000 is lit.
2	Start Typhoon FLA 7000 Control Software from the ***Start*** menu, or use the desktop shortcut.

Step	Action
3	The main window of the Typhoon FLA 7000 Control Software is displayed.



The condition is displayed in the ***Status*** area of the main window. Status messages are as follows:

Message	Explanation
Disconnected	Cannot recognize Typhoon FLA 7000. Please check connection and power.
Warm-up	Typhoon FLA 7000 is in self-diagnosis. Please wait.
Ready	The unit is ready to use.

9.4 Selecting the reading mode

Click the button that corresponds to the desired reading mode.

To...	Click this button
Read a fluorescent sample	
Read a phosphorimaging sample	
Read a digitization sample	

9.5 Setting the reading conditions

Set the reading conditions by following the instructions in *Chapter 10 Reading conditions, display parameters, and other settings, on page 69*.

9.6 Placing the object to be scanned on the stage

CAUTION

Always wear gloves, protective glasses and a lab coat or similar when handling samples.

Placing a gel sample on the Fluor stage

Note:

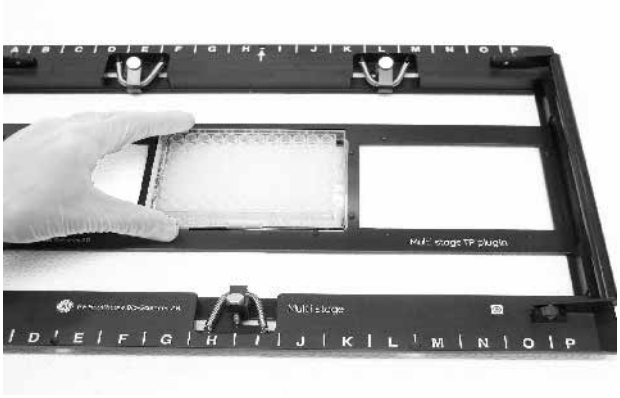
- *The sample must not be thicker than 30 mm. For solutions, the maximum height is 4 mm.*
- *Make sure there are no bubbles or gaps on the contact surface.*

Step	Action
1	Place the sample on the Fluor stage.

Placing a titer plate on the Multi stage

Step	Action
1	Place the titer plate frame on the Multi stage.

2	Place the titer plate in the desired position in the titer plate frame.

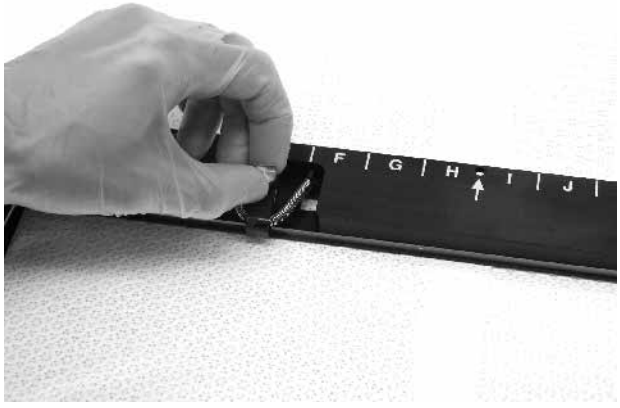


Placing a gel sample with glass on the Multi stage

Step	Action
1	Place a gel sample with glass on the Multi stage.

Step	Action
2	Carefully fold down the spring-loaded glass holders on the glass.

3	Tighten the screws on the glass holders as necessary.

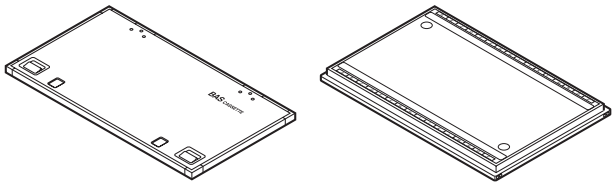


Placing the storage phosphor screen on the phosphor stage

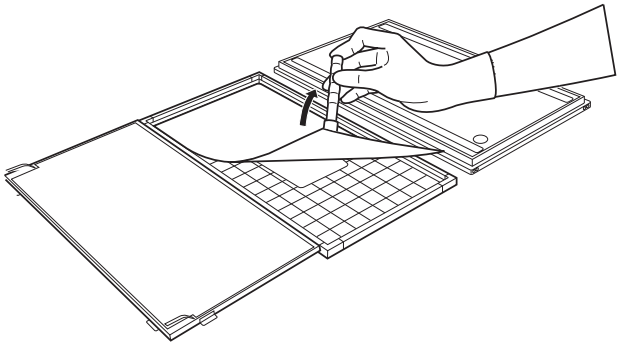
CAUTION
Always wear cotton gloves when handling storage phosphor screens.

Step	Action
1	Turn down the lighting in the room.

Step	Action
2	Place the cassette with the exposed storage phosphor screen next to the phosphor stage.



3	Pick up the storage phosphor screen and move it to the phosphor stage.



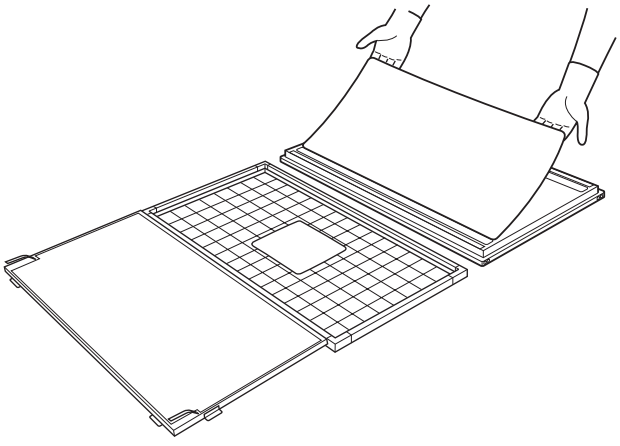
1 Press one end of the suction rod against the storage phosphor screen.

2 Cover the other end of the suction rod with a finger.

3 Lift up the storage phosphor screen by the suction rod, and place the storage phosphor screen on the phosphor stage.

4 Release the storage phosphor screen by releasing your finger from the suction rod.

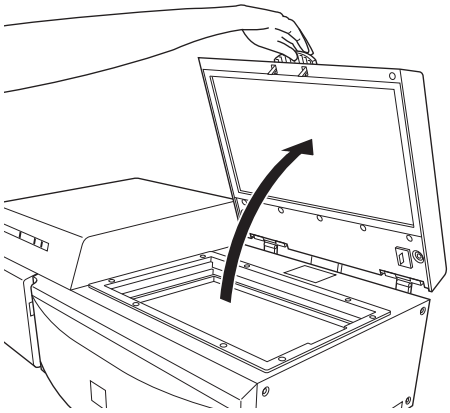
4	Place the storage phosphor screen on the back of the phosphor stage, with the white or blue reading surface of the storage phosphor screen facing up.



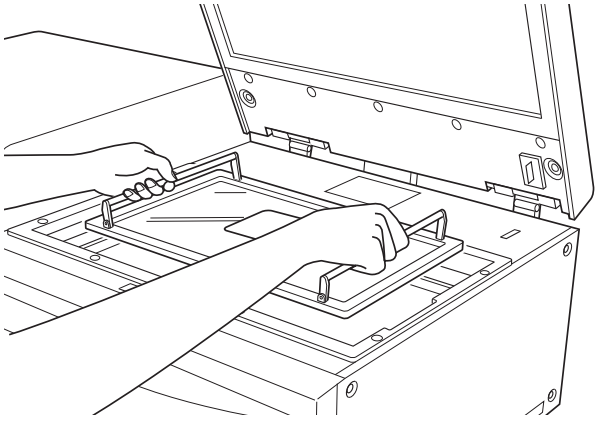
9.7 Placing the stage in Typhoon FLA 7000

Placing the Fluor or Multi stage in the Typhoon FLA 7000

Step	Action
1	Pull the knob up and open the lid.



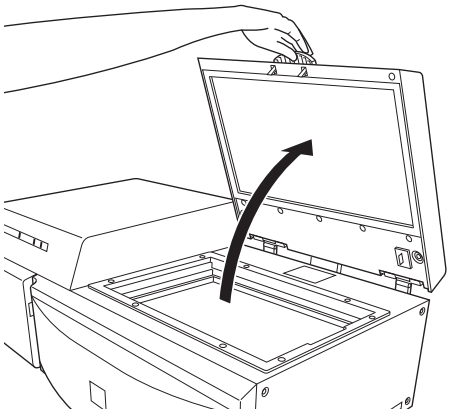
2	Position the stage so that the black triangle mark is aligned with the corresponding mark on the setting block. Fit the setting block pin in the hole of the stage.



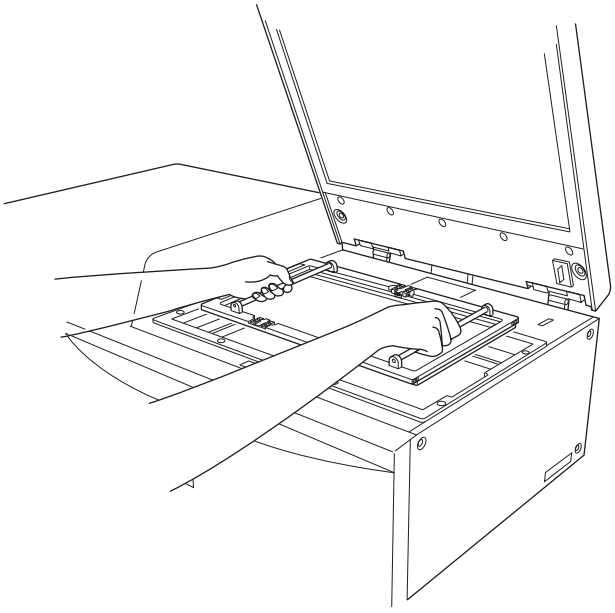
3	Pull the knob up and close the lid.

Placing the phosphor stage in Typhoon FLA 7000

Step	Action
1	Pull the knob up and open the lid.



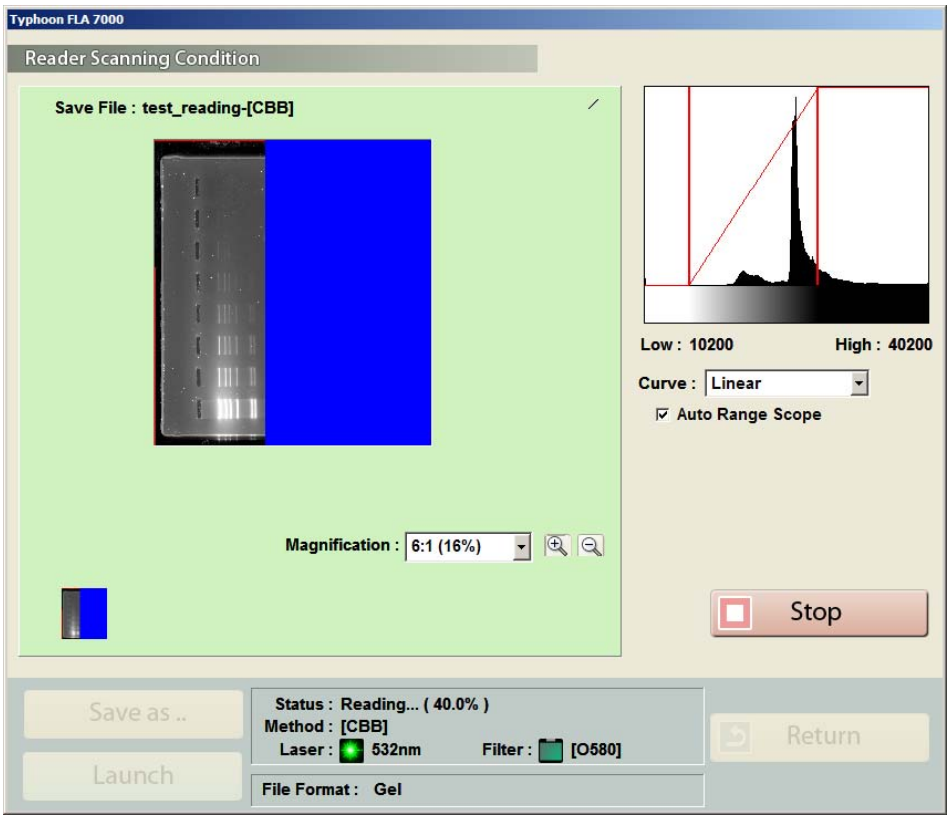
2	Position the stage so that the black triangle mark is aligned with the corresponding mark on the setting block.



3	Fit the setting block pin in the hole of the stage.
4	Pull the knob up and close the lid.

9.8 Scanning the sample

Click the ***Start Scan*** button to start reading the sample. The scanning progress window opens.



Note: *If you click the **Stop** button during reading, the part that has not been read yet will be saved as an image with a data value of 0 (light intensity of 0).*

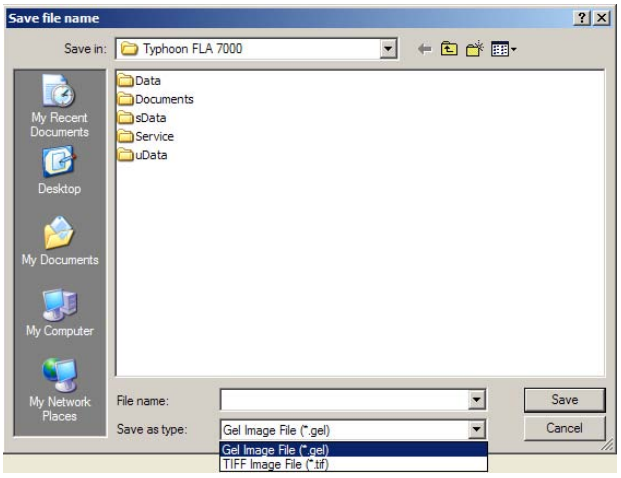
Note: *When you click the **Stop** button, the reading is aborted. You cannot start reading again from the location where reading stopped.*

9.9 Adjusting the display parameters

Step	Action
1	Adjust the display parameters if desired. Follow the instructions in *Section 10.2 Display parameters explained, on page 72*.
2	Click ***Return*** to return to the ***Reader Settings*** screen.

9.10 Saving the image data using a different file name

Step	Action
1	After scanning the sample, click the ***Save as...*** button. The following dialog opens.



2	Type a file name in the ***File name:*** field.
3	Select a file format in the ***Save as type:*** drop-down list.
4	Save the image file by clicking the ***Save*** button.

9.11 Viewing the image file in the analysis application

Click the ***Launch*** button in the to open the image file in the registered analysis application.

Note: *If no analysis application is registered in Typhoon FLA 7000 Control Software, the* ***Launch*** *button is greyed out and inactive. If desired, register or change the analysis application.*

9.12 Turning off Typhoon FLA 7000

Step	Action
1	Turn off Typhoon FLA 7000 by pressing the power switch on the left side of the instrument body.

10 Reading conditions, display parameters, and other settings

10.1 Reading conditions explained

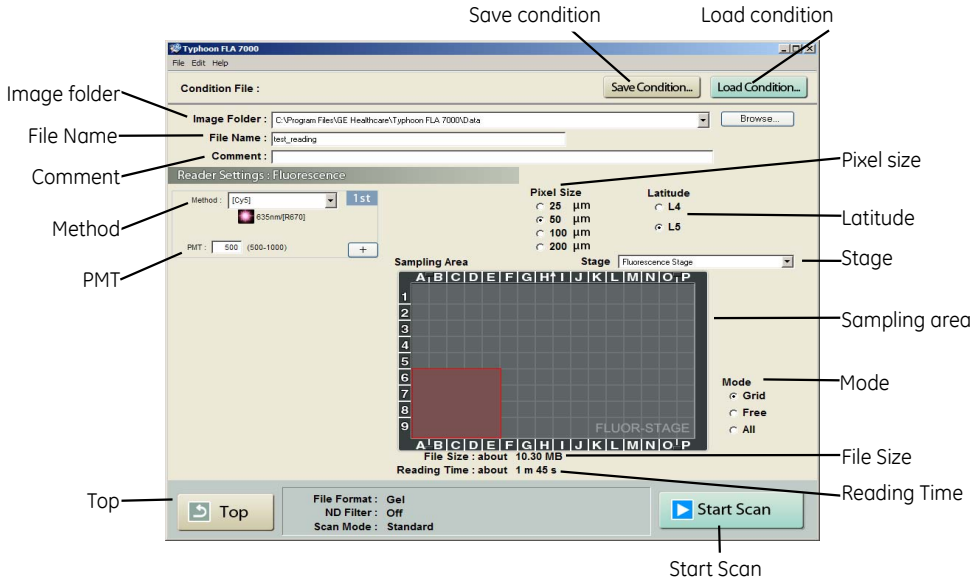


Image folder

Specify where to save the file after the reading.

Note: *When reading more than once and reading of 1ch/2ch is implemented simultaneously, a folder with a name set by File Name is created automatically at the specified position and the image data will be saved in the folder.*

File Name

Enter the name of a file to save image data. This field is mandatory in order to start reading a sample.

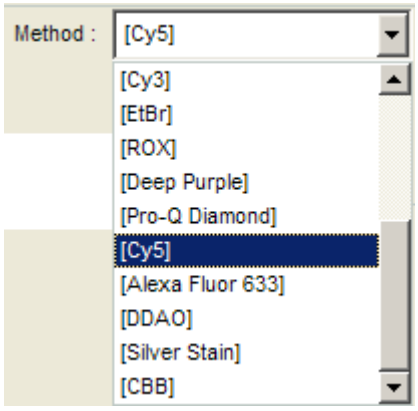
Note: *The method name is automatically added to the specified name and is saved to a file.*

Comment

Enter an optional comment. The comment is embedded in the file where the image is saved, and can be viewed with the analyzing software.

Method

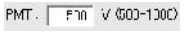
Set the method to use in the scan.



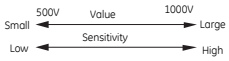
From the pull-down menu, select the method that corresponds with the sample. The selected laser and filter combination is displayed below the menu.

In fluorescent mode, up to 4 scans can be performed in a row, all with individual methods.

PMT



You may set the voltage to be applied to the photo-multiplier tube (PMT) as an integral value within the predetermined range. The larger the value is, the higher the sensitivity.



Plus and minus buttons (fluorescent mode only)

Click to increase the number of scans

Click to decrease the number of scans

Top button

Click this button to return to the main window.

Save condition

Click this button to save the current conditions settings to a file.

Save the current conditions by clicking ***Save Condition...*** A text dialog opens. Enter a name for the conditions in the text field and click ***OK*** to save.

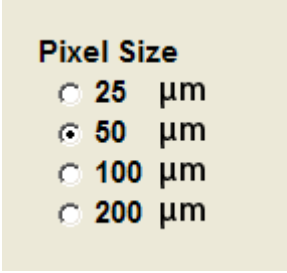
Load condition

Click this button to load previously saved conditions. Clicking the button opens a dialog box with a list of previously saved condition sets.

Load a set of stored conditions by selecting it in the list, then click ***OK***.

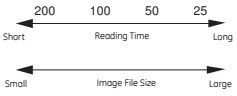
Remove a set of stored conditions by selecting it, then click ***Remove...*** Confirm the removal by clicking the ***Yes*** button in the next dialog box.

Pixel size



Set the pixel size for reading.

Click to select from one of the four types. A sample with a smaller pixel size is analyzed in finer detail.



Latitude

This setting specifies the dynamic range. The dynamic range that can be detected is larger with L5 than with L4. If the signals of the sample are in the L4 range, the density gradation is represented in more detail if L4 is selected.

Stage

Select the stage which will be used in the scan. The image under ***Sampling Area*** changes to reflect the selection.

Sampling area

Displays the area or areas to be scanned as red boxes.

- Change the size of the area or areas to be scanned by clicking and dragging the edges of the red box with the mouse.
- Change the position of the area or areas to be scanned by clicking and dragging the red box with the mouse.

Mode

Sets the selection behavior of ***Sampling area***.

Setting	Description
Grid	The sampling area is increased or decreased in steps corresponding to the grid of the stage or the positions of the titer plate plugin.
Free	The sampling area is increased or decreased in a stepless fashion.
All	The sampling area is expanded to the whole readable surface of the stage or titer plate plugin is selected.

File Size

This area displays the estimated size of the image file as determined by the current settings.

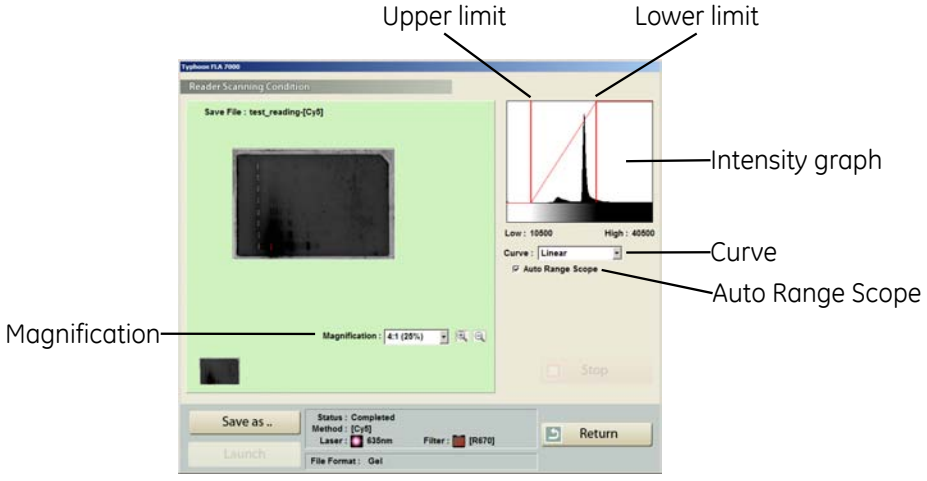
Reading Time

This area displays the estimated reading time as determined by the current settings.

Scan button

Click this button to start scanning the sample or samples using the current reading conditions.

10.2 Display parameters explained



Magnification

Select a ratio to zoom in and out of the display area.

If the magnification is high, scroll bars appear on the right and bottom edges of the display area. Use these scrollbars to view different parts of the display area.

There are several ways to zoom in and out of the display area, see the table below.

Zooming in	Zooming out
Click the **+** magnifying glass symbol and left-click the display area	Click the **+** magnifying glass symbol and right-click the display area
or	**or**
Click the **-** magnifying glass symbol and right-click the display area	Click the **-** magnifying glass symbol and left-click the display area
or	**or**
select a magnification ratio further down the ***Magnification*** drop-down list.	select a magnification ratio further up the ***Magnification*** drop-down list.

Intensity graph

The intensity graph displays the intensity levels of the image in histogram format.

The ***Low*** and ***High*** values below the graph correspond to the range of light intensities displayed. These values are displayed in the graph as vertical red lines. To display a larger or smaller interval of light intensities, drag the lines using the mouse to adjust the ***Low*** and ***High*** values.

Curve

Select the type of tone curve used in the intensity graph.

Setting	Description
Exponential	The light intensities are displayed using an exponential tone curve.
Linear	The light intensities are displayed using a linear tone curve.
Sigmoid	The light intensities are displayed using a sigmoid (S-shaped) tone curve.

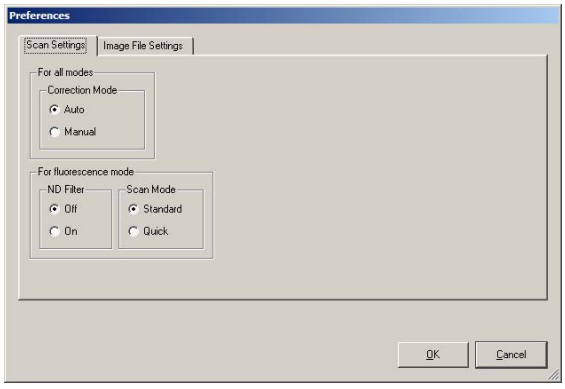
Auto Range Scope

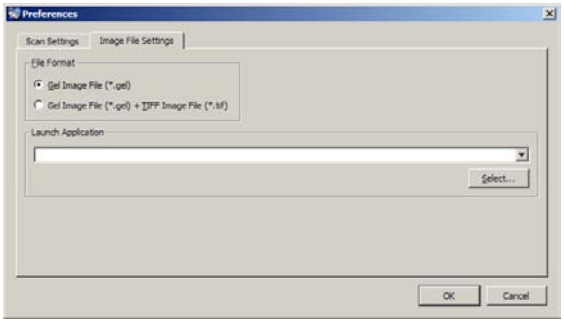
Check this option to automatically adjust the range of light intensities for optimum display results.

10.3 Other settings

Preferences

Click the ***Preferences...*** button in the main window to display a tabbed dialog box, where various options related to sample reading can be viewed and changed. Not all options are relevant in all scanning modes.





Setting	Description
Correction Mode	***Auto***: Use specific image shading correction data that were adjusted in accordance with each laser. ***Manual***: The correction method must be selected individually in the ***Reader Settings*** window. ***Note:*** *The correction mode settings list is registered by a serviceman. Please contact the dealer where you purchased Typhoon FLA 7000, or contact GE Healthcare.*
ND Filter	Enables the use of an ND filter to adjust the light intensity. Use the ND filter if the signal from the sample is very strong. Select ***On*** to enable the ND filter. Select ***Off*** to disable the ND filter.
Scan Mode	Determines the scanning speed. ***Standard*** Mode: 200 µm/210 s, 100 µm/210 s, 50 µm/330 s, 25 µm/450 s. ***Quick*** Mode: 200 µm/150 s, 100 µm/150 s, 50 µm/210 s, 25 µm/330 s.

Setting	Description
File Format	Determines the file format used to save the reading data. ***Gel Image File (*.gel)***: The standard file format is a .gel file which contains square root encoded pixel data. ***Gel Image File (*.gel) + Tiff Image File (*.tif)***: In combination with a .gel file, a read image can also be saved in TIFF file format. For TIFF files, image data type is always set to Linear format.
Launch Application	Contains the path to the application used to analyze the data. Select the analysis application by clicking the ***Select...*** button. Then browse to the software executable and click ***OK***.

User account specific settings

Changes to the settings in the ***Preferences*** dialog affect only the current Windows user account. Changes made using a different user account do not affect the current user account.

11 About storage phosphor screens

11.1 Introduction

The Storage phosphor screen is a radiation energy memory type, two-dimensional sensor, which has an image recording layer consisting of polyester base material densely coated with accelerated phosphorescent fluorescent material of fine crystals.

- Exposure

  A Storage phosphor screen accumulates and stores radiation energy while it is exposed. It is exposed in close contact with an RI sample in a cassette like X-ray film.

- Scanning

  The recording surface of an exposed Storage phosphor screen is scanned with a laser beam inside Typhoon FLA 7000 and emits fluorescent light according to the exposure level. A photo-multiplier tube (PMT) detects the fluorescent light and converts it into electric signals. A radiation image recorded on the Storage phosphor screen during exposure is read as digital image information at the maximum resolution of 25 µm per pixel (40 pixels/mm) and recorded in the analyzer unit.

- Erasure

  You may reuse a general-purpose Storage phosphor screen by erasing an after-image.

11.2 Compatible storage phosphor screens

Storage phosphor screens with magnetic layers for sticking on the phosphor stage are usable.

11.3 Handling precautions

Check the exposure environment

NOTICE

Avoid exposing storage phosphor screens in places where the environmental radiation may be increased, for example rooms with concrete walls or in basements.

Do not stack cassettes during exposure.

Wear gloves

CAUTION

Always wear cotton gloves when handling storage phosphor screens.

Use a suction rod when taking the storage phosphor screen out of the cassette. Prying the storage phosphor out may result in the edge peeling off, making the storage phosphor screen unusable.

Handle the storage phosphor screen carefully

- Do not scratch or bend the storage phosphor screen.
- Keep the storage phosphor screen free from dust.

Protect the storage phosphor screen from water and volatile solvents

- Dry the sample thoroughly before exposing it.
- Wrap wet samples in plastic film and make sure that no liquid exits. Use double layers if the sample contains volatile solvents.
- If water enters the Storage phosphor screen, the sensitivity of the storage phosphor screen is reduced.
- Volatile solvents may deform the protective film on the storage phosphor screen.

Protect exposed storage phosphor screens from light

Protect exposed storage phosphor screens from light until the reading is finished.

Store the storage phosphor screen correctly

Remove the storage phosphor screen from the Typhoon FLA 7000 main unit when not in use. Store the storage phosphor screens in a horizontal position, protected from moisture.

11.4 Preparing the storage phosphor screen

Procure necessary tools and items

Prepare by acquiring the following items:

- Storage phosphor screen cassette
- Radio isotope labeled samples
- Gloves
- Plastic film
- Soft, lint-free tissues
- Ethanol

Clean the storage phosphor screen and the cassette

Clean the surface of the storage phosphor screen and the inside of cassette with a soft tissue to remove dust and stains.

Erase the storage phosphor screen

The FLA Image Eraser can erase the storage phosphor screen in around 15 minutes, if it is not overly exposed. For details, refer to the *FLA Image Eraser User Manual*.

Dim the lighting

- Dim the ambient light to 20 lux or less before opening or moving the storage phosphor screen without a cover.
- Protect the phosphor stage with the protective cover when removing an exposed storage phosphor screen from the cassette and placing it on the Phosphor stage.

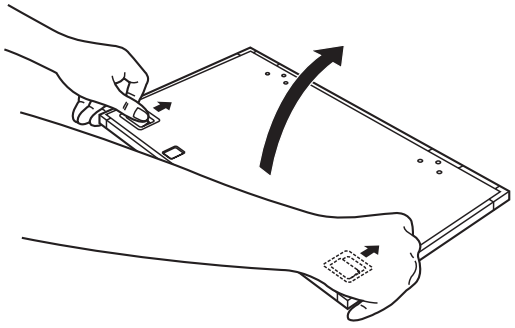
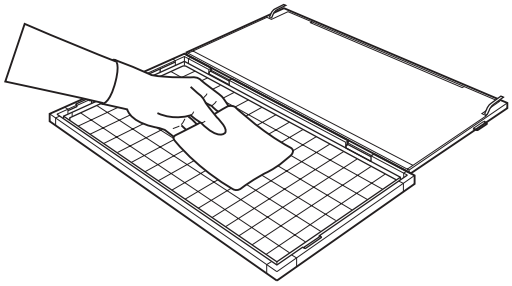
Set the exposure time

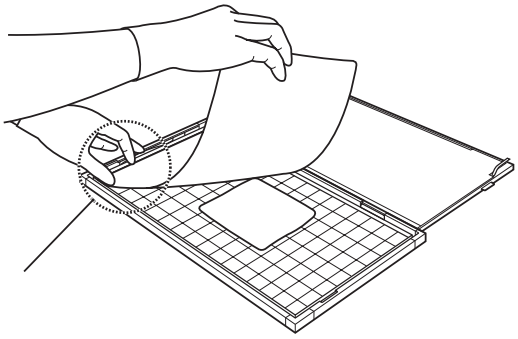
Set the exposure time so that the exposure finishes right before the reading starts.

Note: *The exposure time of the storage phosphor screen is approximately one twentieth of the time required for X-ray film. Take this into consideration when setting the initial exposure time.*

TIP: For increased image quality, minimize the time between exposing the storage phosphor screen and reading it with the Typhoon FLA 7000.

11.5 Exposing the storage phosphor screen

Step	Action
1	Erase the storage phosphor screen completely.
2	Wrap the radio isotope sample with plastic film. Make sure not to wrinkle the wrapping film. ***Note:*** *When using a tritium storage phosphor screen to detect tritium, place the sample directly on the storage phosphor screen. A tritium storage phosphor screen can be used only once.*
3	Open the top cover of the cassette. Unlock the cassette by sliding the buttons on both sides up. 
4	Place the sample on the cassette. Make sure that the sample surface faces up.  ***Note:*** *Keep the radio imaging sample away from the edge of the storage phosphor screen. Otherwise, the recorded data may become corrupted.*

Step	Action
5	Place the storage phosphor screen in the cassette, with the exposure surface of the storage phosphor screen facing the sample. Make sure that the notch of the storage phosphor screen is in the front left corner of the cassette as shown below. 
6	Close the cover of the cassette. Press on the cover until it clicks into place.

12 Maintenance

Cleaning the outside of Typhoon FLA 7000

Clean the outside with a moist soft cloth and a mild detergent. Wipe afterwards with a dry soft cloth.

Maintenance of the SHG laser

If you use the SHG laser in the Typhoon FLA 7000, it will require periodical calibration. When the Typhoon FLA 7000 is switched on, it automatically executes calibration. You do not need to do a manual calibration if the Typhoon FLA 7000 is used at least once a month.

CAUTION

Activate the Typhoon FLA 7000 at least once every 30 days to execute calibration. This calibration ensure that the SHG laser operates properly. Failure to calibrate the Typhoon FLA 7000 every 30 days reduces the lifespan of the SHG laser.

Operation procedures:

1 Turn on the Typhoon FLA 7000 and the computer.

2 Wait until warm-up and self-diagnosis is completed, and the scanner is ready. Only the power lamp on the upper left panel is lit. The automatic calibration has now been performed.

3 Turn off the Typhoon FLA 7000 and the computer.

Cleaning the stage

CAUTION

Wear gloves to prevent direct contact with chemical substances.

Step	Action
1	Remove the stage from the main body of the instrument.
2	Wipe the stage with a sponge moistened with a fluorescence-free neutral detergent.
3	Thoroughly rinse the stage with water and dry with a lint-free cloth.
4	Place the stage in the main body of the instrument.

Storing the Fluor or Multi stage

Store the Fluor or Multi stage in the original packaging when they are not in use. **DO NOT** store stages inside Typhoon FLA 7000.

13 Troubleshooting

This chapter describes various problems that can foreseeably occur with the Typhoon FLA 7000 Control Software. Suggestions of possible countermeasures are given.

Do the following if an error occurs.

Step	Action
1	Take note of the error code and error message on the monitor.
2	Turn off the power to Typhoon FLA 7000 and the computer, then turn them on again after about ten seconds.
3	Try to perform the action again. If the error persists, contact your GE Healthcare representative.

General errors and warnings

Error message	Meaning and countermeasure
Failed to open User Manual. Please note that a PDF reader (e.g. Adobe Reader) is needed.	The software required to read the online PDF documentation is missing. **Countermeasure:** Install software for viewing PDF documents.
Failed to open End-User License Agreement. Please note that a PDF reader (e.g. Adobe Reader) is needed.	
Failed to open Getting Started. Please note that a PDF reader (e.g. Adobe Reader) is needed.	
The disk capacity is insufficient.	The available disk space is insufficient. **Countermeasure:** Free up disk space on the computer. **Countermeasure:** Store the data on a different disk.
No disk space.	See above.

Errors and warnings in the main window

Error message	Meaning and countermeasure
Cannot detect Typhoon FLA 7000. Please check connection and power.	The scanner is not detected. **Countermeasure:** Check that the scanner is turned on and connected to the computer.

Errors and warnings in the *Filter Module Settings* window

Error message	Meaning and countermeasure
Filter module has not been set up. Click the filter module button to set up the filter module.	The filter module is not installed or properly configured. **Countermeasure:** Install the filter module. See *Section 8.4 Installing and replacing filters, on page 52*.
Please enter a filter name.	The filter has no name. **Countermeasure:** Type a name in the ***Name*** field.
The filter name has already been used. Please change the name.	The name of the filter is being used for another filter. **Countermeasure:** Choose another name for this filter, or change the name for the filter already having this name.
The maximum number of the filters you can register is 50. Please delete an unnecessary filter before registeringa a new filter.	No more filters can be stored in the software. **Countermeasure:** Delete a filter before storing a new one.

Errors and warnings in the *Method Settings* window

Error message	Meaning and countermeasure
Please input a method name.	No name has been assigned to the method. **Countermeasure:** Type a method name in the ***Name*** field.
The maximum number of the methods is 50.	The maximum number of methods are stored. No more methods can be registered. **Countermeasure:** Use an existing method, or delete a method before registering a new one.
This method name has been already used. Please change the name.	The assigned name is being used by a different method. **Countermeasure:** Type a different name in the ***Name*** field.

Errors and warnings in the *Reader Settings* window

Error message	Meaning and countermeasure
Failed to retrieve image data from the scanner. Check the scanner connection.	There was a problem transferring data to the computer. **Countermeasure:** Check the scanner connection to the computer.
Cannot detect Typhoon FLA 7000. Please check connection and power.	The scanner was not detected by the computer. **Countermeasure:** Check that Typhoon FLA 7000 is properly connected. Follow the instructions in *Chapter 4 Installing and moving Typhoon FLA 7000, on page 33*.
Typhoon FLA 7000 imager is running self-diagnosis mode. Please wait.	The self-diagnosis of Typhoon FLA 7000 is running. **Countermeasure:** Wait until the self-diagnosis is finished, the proceed with the scan.
A laser error was detected. Please retry the scan, or contact service.	There was an error with the laser. **Countermeasure:** Try to scan again. **Countermeasure:** Restart the instrument and Typhoon FLA 7000 Control Software, then try to run the scan again. **Countermeasure:** Scan using a different laser.
Please select image folder.	No image folder is selected. **Countermeasure:** Select an image folder by clicking the ***Browse...*** button and navigating to a suitable folder.
Please input a file name.	No name has been assigned to the image file. **Countermeasure:** Type a name in the ***File Name*** field.
Please set PMT Voltage value to 500-1000.	The PMT voltage setting is outside the permitted range. **Countermeasure:** Type a PMT voltage value between 500 and 1000 in the ***PMT*** field.
Please give a name to the condition.	No name was given to a condition before saving. **Countermeasure:** Type a name in the ***Condition Name*** field.
Failed to retrieve image data from the scanner. Check the scanner connection.	The image data could not be retrieved from the scanner. **Countermeasure:** Check that the scanner is properly connected to the computer, then try to run the scan again. **Countermeasure:** Disconnect all other USB devices from the computer and run the scan again. **Countermeasure:** Restart the computer and Typhoon FLA 7000 Control Software, then try to run the scan again.

Error message	Meaning and countermeasure
The stage is not properly inserted. Please insert the stage in its correct position.	The stage is not properly inserted. **Countermeasure:** Insert the stage properly.

Errors and warnings in the scan progress window

Error message	Meaning and countermeasure
Overexposure error occurred. Set a lower PMT voltage.	The scanned image was overexposed due to a high PMT voltage setting. **Countermeasure:** Decrease the PMT voltage in the ***Reader Settings*** window.
Scanning stopped because the door was opened.	The door was opened during the scan. **Countermeasure:** Close the door and scan the image again. Do not open the door until the scanning is finished.
The combination of the laser and filter might be inappropriate. Check the laser and filter.	The selected method may be inappropriate. **Countermeasure:** Select another method, or edit the method to suit the current application.
A scanner error was detected. Please restart Typhoon FLA 7000 imager and Scanner Control Software. ***Sense Key : %1H*** ***Error Code : %2H(%3H)***	An error occurred during scanning. **Countermeasure:** Try to run the scan again. Contact your GE Healthcare representative if the problem persists.

Appendix A Default sample detection methods

473 nm laser

Method name	Filter type
Cy™2	Y520
FITC	Y520
SYBR™ Green	Y520
SYPRO™ Ruby	O580
SYPRO Orange	Y520
FAM™	Y520
Alexa Fluor™488	Y520
Digitize473	Y520

532 nm laser

Method name	Filter type
Cy3	O580
EtBR	O580
ROX™	O580
Deep Purple™	O580
Pro-Q™ Diamond	O580
Digitize532	O580

635 nm laser

Method name	Filter type
Cy5	R670
Alexa Fluor 633	R670

Method name	Filter type
DDAO	R670

650 nm laser

Method name	Filter type
Phosphorimaging	IP
CBB	R710

Appendix B Specifications

Wavelengths supported

- 473 nm
- 532 nm
- 635 nm
- 650 nm

Filter types supported

IP (imaging plate), included

O580, included

R670, included

Y520, included

R710 (optional accessory)

Scanning specifications

Reading mode	Scanned image size
Storage phosphor screen:	20 cm x 40 cm maximum (18 cm x 36 cm valid field angle)
Fluorescent:	24 cm x 40 cm maximum (22 cm x 36 cm valid field angle) (238 mm x 398 mm setting size)
Digitization:	24 cm x 40 cm maximum (22 cm x 36 cm valid field angle) (238 mm x 398 mm setting size)

Parameter	Data
Pixel size	25, 50, 100 or 200 µm (selectable)
Gradation	16-bit
Dynamic range	Five orders of magnitude

Parameter	Data
Maximum image capacity	307.2 MB (25 µm)/ 76.8 MB (50 µm) 19.2 MB (100 µm)/ 4.8 MB (200 µm)

Dimensions & weight

Unit	Dimensions (mm, w x d x h)	Weight (kg)
Reading block	940 x 556 x 360 (projections not included)	62
Storage phosphor screen cassette	227.5 x 427.5 x 15	Approx. 1
Phosphor stage	429 x 283 x 35	Approx. 2
Fluor stage	429 x 283 x 35	Approx. 1
Multi stage	429 x 283 x 33	Approx. 1.3
FLA Image Eraser	603 x 512 x 163	14.5

Note: *The Reading block is a standard unit. The other units are optional.*

Power supply

Parameter	Data
Input voltage	100 to 240V~ (AC)
Allowable variations in voltage	±10%
Frequency	50 to 60 Hz
Rated current	1.5 to 3.0 A

Environmental conditions

Parameter	Data
Operating conditions	Temperature: +15 to +30°C Humidity: 30 to 70% (no dew condensation)

Parameter	Data
Non-operating conditions	Temperature: -10 to +40°C Humidity: 20 to 70% (no dew condensation)
Transportation & storage conditions (within 96 hours)	Temperature: -25 to +70°C Humidity: 10 to 80% (no dew condensation)
Heat radiation	151 W/h (reader block + FLA Image Eraser)
Lighting	It is recommended to lower the lighting level to about 20 lux when moving a sample from the cassette onto the Phosphor stage after exposure. 20 lux is the brightness level at which most people can read newspaper-sized text after he/she becomes accustomed to the brightness.
Location of use	Indoor use only
Maximum altitude for use	2,000 m above sea level
Overvoltage category	Transient overvoltage category II
Applicable Pollution Rating	Pollution Degree 2

Noise levels

Parameter	Data
Noise	70 dB (A) or lower
Degrees of protection provided by enclosure	IP20

For local office contact information, visit
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