GE Healthcare
Life Sciences

Typhoon™ FLA 9500

User Manual

Table of Contents

1 Introduction

About this chapter

This chapter contains important user information, and a general description of Typhoon FLA 9500 and its intended use.

In this chapter

This chapter contains the following sections:

1.1 Important user information

Read this before using Typhoon FLA 9500

All users must read this entire manual to fully understand the safe use of Typhoon FLA 9500.

Intended use

Typhoon FLA 9500 is a versatile laser scanner for biomolecular imaging applications, including the following:

- sensitive and quantitative measurement of radioisotopic labels
- 2D DIGE

- visible single channel and multiplex fluorescence (ECL Plex™ Western blotting systems)
- near infrared fluorescence (optional)
- colorimetric stains (e.g., Coomassie™ blue and silver-stained gels)

Safety notices

This user documentation contains WARNINGS, CAUTIONS and NOTICES concerning the safe use of Typhoon FLA 9500. 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 9500 system.

Manufacturing information

The table below summarizes the required manufacturing information. For further information, see the EC Declaration of Conformity document.

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

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

International standards

This product fulfills the requirements of the following standards:

Standard	Description	Notes
EN 61010-1, IEC 61010-1, UL 61010-1, IEC 61010-2-081, CAN/CSA-C22.2 No. 61010-1	Safety requirements for electrical equipment for measurement, control, and laboratory use	EN 61010-1 harmonized with 2006/95/EC
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	EN 61326-1 harmonized with 2004/108/EC
EN ISO 12100	Safety of machinery, general principles for design, risk assessment and risk reduction	
EN 60825-1, IEC 60825-1	Safety of laser products	
USA 21 CFR, Chapter I, Subchapter J, Part 1040.10 Laser Products	Safety of laser products	

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.

International regulations

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.*

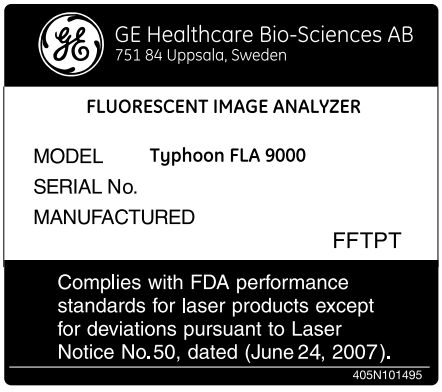
This Class A digital apparatus complies with Canadian ICES-003. Cet appareil numerique de la class A est conforme a la norme NMB-003 du Canada.

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 meets the laser radiation safety requirements specified in the Code of the Federal Regulations (21 CFR, Chapter 1, Subchapter J).

This equipment is a class 1 Laser Product (IEC60825-1:2007/EN60825-1:2007).



Any four out of the five lasers in the following table can be installed in Typhoon FLA 9500:

Laser and class	Wavelength	Maximum power
LD laser, class 3B	473 nm	25 mW (CW)
LD laser, class 3B	532 nm	10 mW (CW)
LD laser, class 3B	635 nm	110 mW (CW)

Laser and class	Wavelength	Maximum power
LD laser, class 3B	685 nm	55 mW (CW)
LD laser, class 3B	785 nm	130 mW (CW)

Note: *The beam divergence of all laser modules is collimated.*

Regulatory compliance of connected equipment

Any equipment connected to the Typhoon FLA 9500 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 9500 laser scanner

- Imaging of gel, membrane, etc. dyed or labelled with various fluorescent dyes at high sensitivity and high resolution.
- Features very high sensitivity, wide dynamic range, high linearity, and high resolution.
- Reusable storage phosphor screens.

1.4 Typhoon FLA 9500 Control Software

System requirements

Parameter	Minimum requirement
Operating system	Microsoft™ Windows™ XP Professional SP3 (32-bit) *or* Microsoft Windows Vista™ Business SP2 (32-bit) *or* Microsoft Windows 7 Professional (32-bit)
Internal memory	1 GB
Processor	Intel Core 2 Duo processor
Hard drive	80 GB
Monitor resolution	1280 × 1024 pixels

Parameter	Minimum requirement
Other requirements	One USB 2.0 port DVD-ROM drive

Overview of the main window

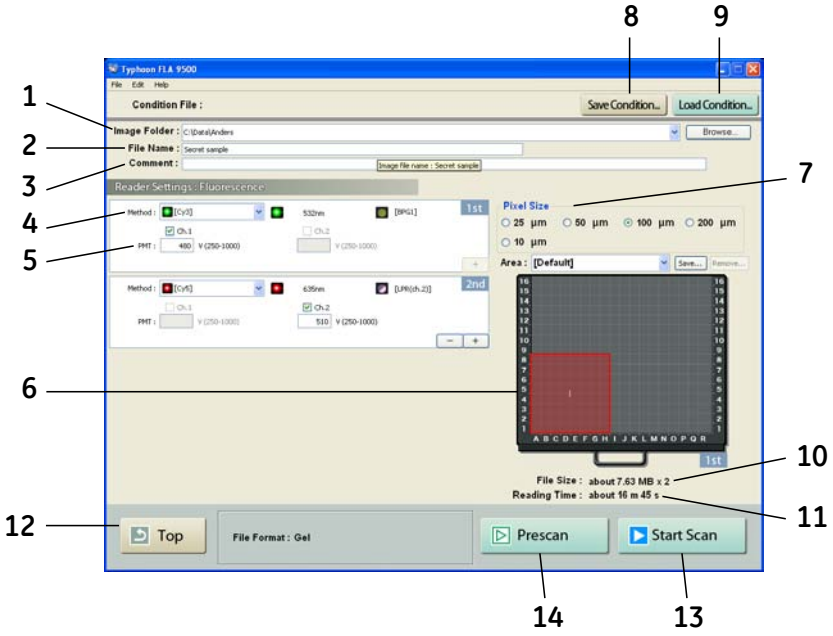
The Typhoon FLA 9500 Control Software is used to control, use and supervise the Typhoon FLA 9500.

Part	Function
1	***2D DIGE*** button: click to read a 2D DIGE sample.
2	***Phosphorimaging*** button: click to read a storage phosphor screen.
3	***Fluorescence*** button: click to read a fluorescent sample.
4	***Digitization*** button: click to perform digitization.
5	***Chemiluminescence*** button: click to read a chemiluminescent sample.
6	***Method*** button: click to register or erase a combination of laser and filter.

Part	Function
7	***Filter Module***: click to change or register a filter.
8	***Preferences***: click to select file format and correction mode.
9	***Filter***: displays the loaded filters.
10	***Laser***: displays the status of the loaded laser units.
11	***PMT***: displays the status of the loaded photo-multiplier tube.

Overview of the reader settings windows

Phosphorimaging, fluorescence, chemiluminescence and digitization

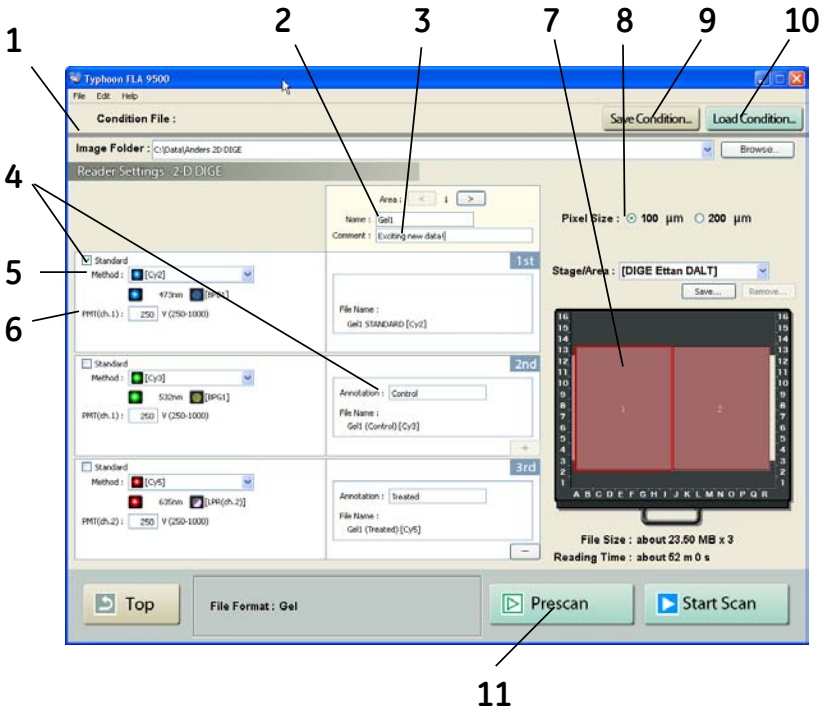


Part	Description
1	***Image folder:*** specify where to save the file after the reading.
2	***File Name:*** enter the name of a file to save image data.

Part	Description
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 four scans can be performed in a row, all with individual methods. The following buttons are available only in fluorescence mode.  Click to increase the number of scans  Click to decrease the number of scans
5	***PMT:*** set the voltage of the photo-multiplier tube. The higher the value, the higher the sensitivity.
6	Set the scanning area. 1 Select a method 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	***Save Condition...***: click this button to save the current reading conditions in a file, if desired. For details, refer to the *Save condition, on page 88* in the User Manual.
9	***Load Condition...***: click this button to load previously saved reading conditions, if desired. For details, refer to the *Load condition, on page 88* in the User Manual.
10	***File Size***: the estimated size of the result data file is presented.
11	***Reading Time***: the estimated time required for the scan is presented.
12	***Top***: return to the main window.

Part	Description
13	***Start Scan***: start the scan. The sample must be loaded before starting a scan.
14	***Prescan***: perform a quick scan at a resolution of 1000 µm.

2D DIGE



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. Use the **<** and **>** buttons to change between file area one and two.
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. A separate comment can be entered for file area one and two.

Part	Description
4	***Annotation:*** enter a description of the function of the image. The annotation is added to the file name of the image. If the ***Standard*** checkbox is checked STANDARD will be used as the annotation of the file name. Only one scan can be checkmarked as standard.
5	***Method:*** set the method to use in the scan. Up to three scans can be performed in a row, all with individual methods.  Click to increase the number of scans  Click to decrease the number of scans
6	***PMT:*** set the voltage of the photo-multiplier tube. The higher the value, the higher the sensitivity.
7	Set the scanning area. 1 Select a method 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.
8	***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.
9	***Save Condition...***: click this button to save the current reading conditions in a file, if desired. For details, refer to the *Save condition, on page 88* in the User Manual.
10	***Load Condition...***: click this button to load previously saved reading conditions, if desired. For details, refer to the *Load condition, on page 88* in the User Manual.
11	***Prescan***: Click to quickly prescan the sample at a resolution of 1000 µm.

2 Safety instructions

About this chapter

This chapter describes safety precautions and emergency shutdown procedures for Typhoon FLA 9500. The labels on the system and information regarding recycling are also described.

In this chapter

This chapter contains the following sections:

2.1 Introduction

The Typhoon FLA 9500 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.

WARNING

Do not allow liquids, flammable materials or metallic objects to get into the Typhoon FLA 9500. This may result in fire or electric shock.

Turn off the power switch, unplug the equipment from the power outlet, then contact you local GE Healthcare representative.

CAUTION

Do not scratch or drop parts containing glass such as lenses, filters or lights.

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.

CAUTION

Wear gloves, protective glasses and a lab coat or similar when disposing of the Typhoon FLA 9500.

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

Never cancel the interlocks in this instrument, 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 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.

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 21*.

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 Installing and moving

WARNING

The Typhoon FLA 9500 instrument must always be connected to a grounded power outlet.

WARNING

Do not block the ventilation inlets or outlets on the system.

WARNING

Power cord. Only use power cords delivered or approved by GE Healthcare.

WARNING

Heavy object. Because of the significant weight of Typhoon FLA 9500, great care must be taken not to cause squeeze or crushing injuries during movement. Use suitable lifting equipment when moving the unit.

CAUTION

- Do not connect any USB devices other than the Typhoon FLA 9500 to the computer in which the Typhoon FLA 9500 Control Software is installed.
- Use only the Typhoon FLA 9500 Control Software during reading.
- Only use IEC/UL 60950 approved computers.

2.9 Operation

CAUTION

Do not open the lid or filter door while the device is in operation. Injury could result.

2.10 Maintenance

WARNING

Do not attempt to modify the equipment, or fire and electric shock could result.

WARNING

Do not use excessive amounts of liquids for cleaning the Typhoon FLA 9500, this may result in product malfunction or electric shock.

CAUTION

Wear gloves to prevent direct contact with chemical substances.

CAUTION

Take care when connecting the power supply cable. Do not tug on the cable, and do not handle the connection plugs with wet hands.

CAUTION

Connect the computer hardware on the same power circuit, otherwise the equipment may be influenced by electrical nosie.

CAUTION

Turn off the power switch and remove connecting cables before moving the equipment.

CAUTION

Turn the power switch off before cleaning the inside of the equipment.

CAUTION

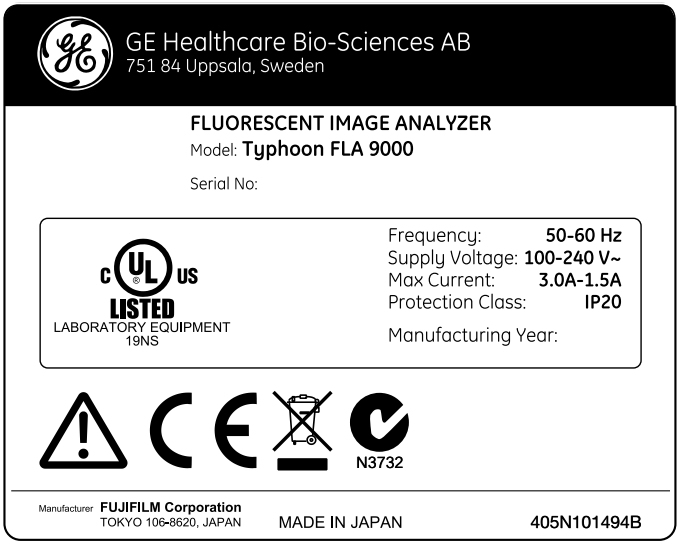
Unplug the equipment if it will not be used for an extended period.

2.11 Labels on Typhoon FLA 9500

Typhoon FLA 9500 serial number

The Typhoon FLA 9500 serial number is located on a label on the back of the instrument.

The label design for the Typhoon FLA 9000 series is shown below.



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.
	The system is certified by a Nationally Recognized Testing Laboratory (NTRL). A NRTL is an organization that the Occupational Safety and Health Administration (OSHA) has recognized as meeting the legal requirements in USA title 29 of the Code of Federal Regulations (29 CFR) Part 1910.7.

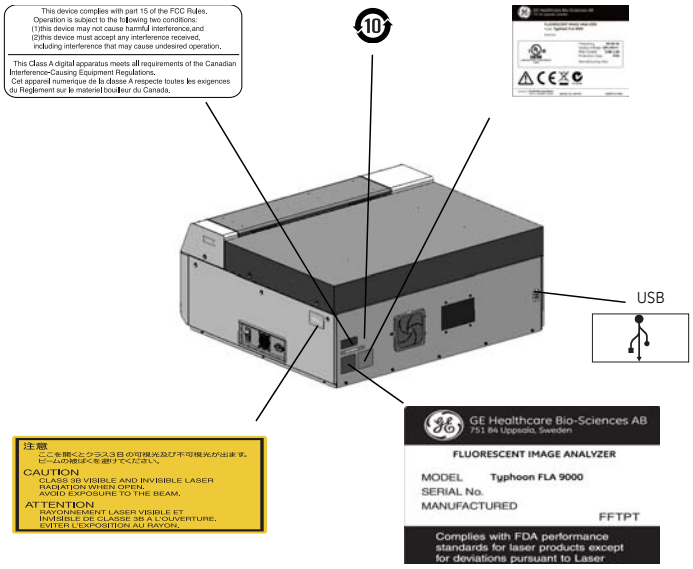
Labels concerning use of hazardous substances

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.
	This symbol indicates that the product contains hazardous materials in excess of the limits established by the Chinese standard SJ/T11363-2006 Requirements for Concentration Limits for Certain Hazardous Substances in Electronics.

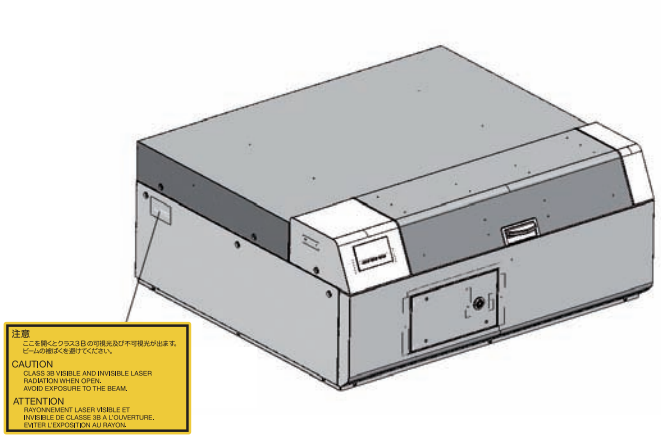
Labels concerning laser light

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.

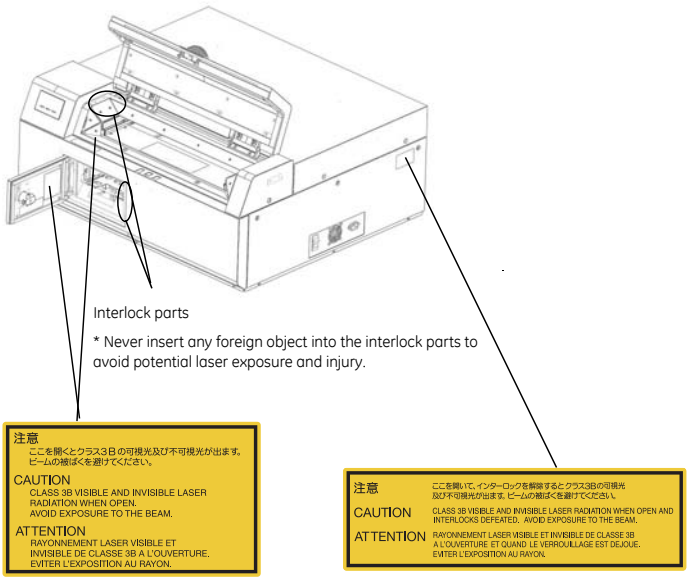
Labels on rear and right side of Typhoon FLA 9500



Labels on left side of Typhoon FLA 9500



Labels inside the Typhoon FLA 9500



2.12 Emergency procedures

This section describes how to do an emergency shutdown of the Typhoon FLA 9500 instrument. The section also describes the results of a power failure.

Emergency shutdown

Step	Action
1	Click the ***Stop*** button in the Typhoon FLA 9500 Control Software.
2	Turn off the Typhoon FLA 9500 by pressing the power switch on the right 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 9500 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 9500 Control Software	• The computer shuts down immediately. • The run continues, but no data is saved.

2.13 Recycling and disposal

General instructions for disposal

When taking the Typhoon FLA 9500 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.

Disposal of electrical components

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 the equipment.

3 System configuration

About this chapter

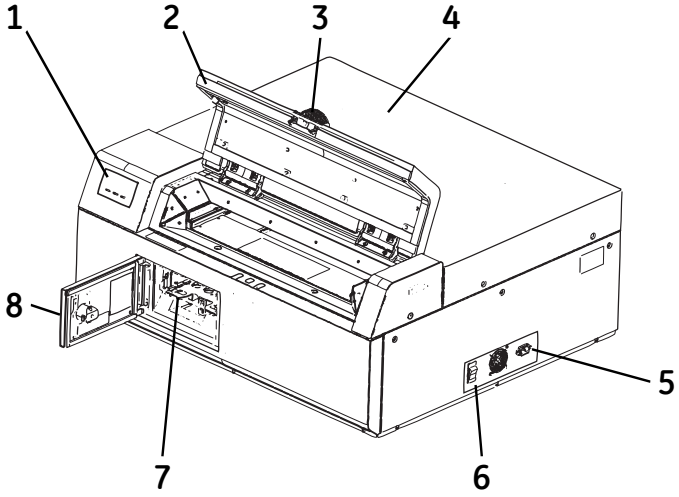
This chapter provides an overview of the technical properties of Typhoon FLA 9500.

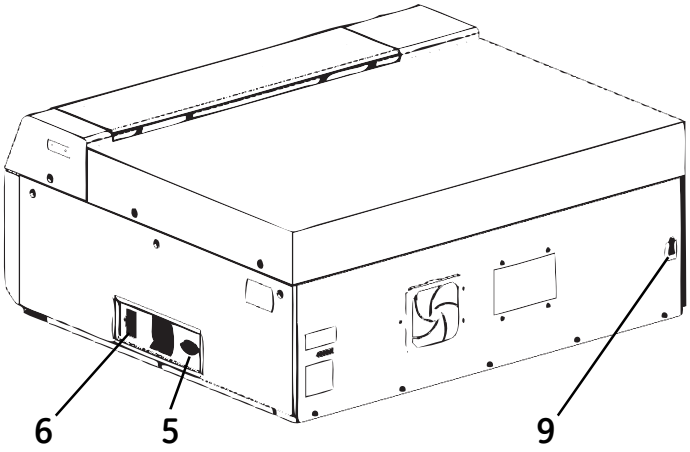
In this chapter

This chapter contains the following sections:

3.1 Parts and functions

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



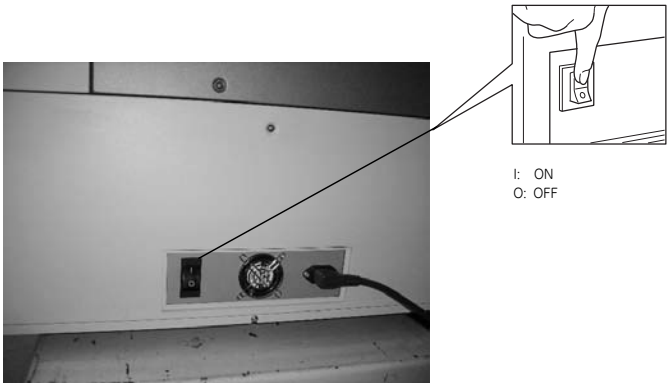


Part	Function
1	Indicator lamps
2	Lid
3	Handle
4	Instrument cover
5	Power cord connector
6	Power switch
7	Filter holder
8	Filter door
9	USB connector

3.2 Instrument body

Power switch

The power switch is located on the right side of the Typhoon FLA 9500.

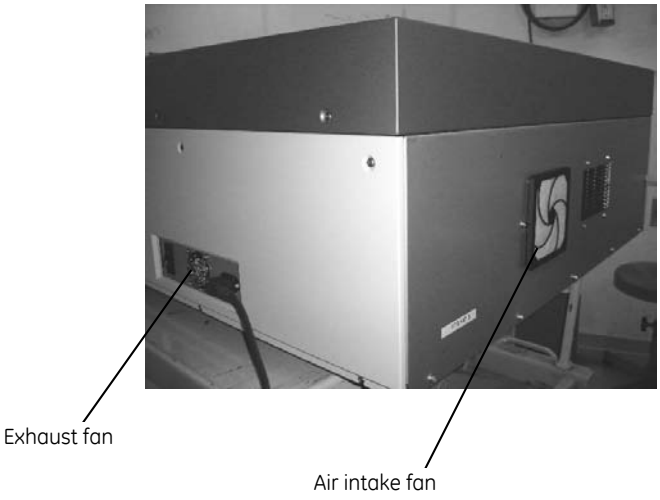


Cooling fans

The instrument has cooling fans in two places (shown below) in order to prevent the internal temperature from rising.

CAUTION

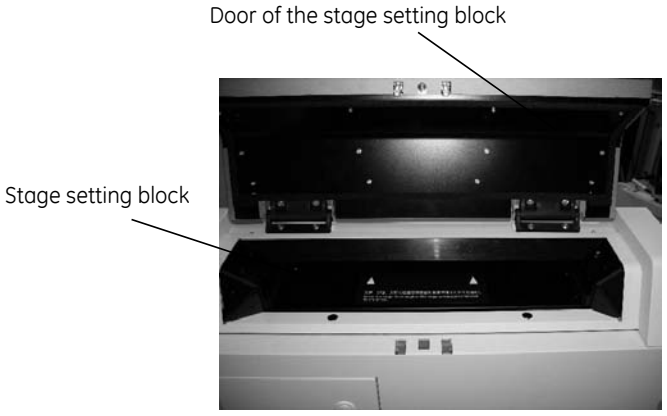
Do not block the cooling fans. If they are blocked, the instrument may malfunction.



Indicator lamps

Three indicator lamps indicate the instrument status.

Stage setting block

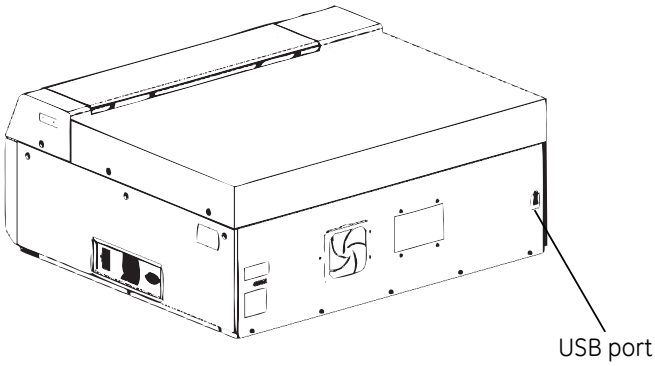


Filter module

The filter module is located behind the filter door.

USB port

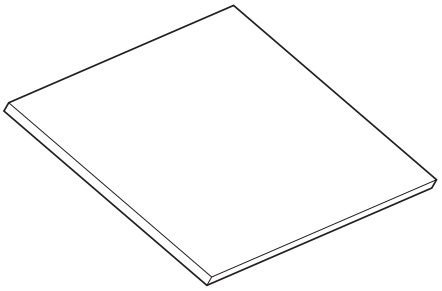
The USB port is located on the rear side of Typhoon FLA 9500.



3.3 Accessories

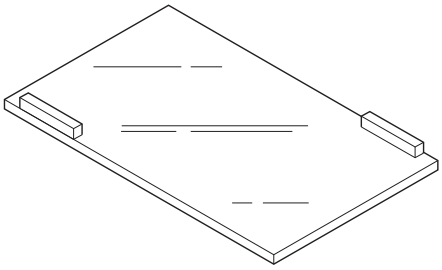
Digitization plate (included)

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.



Membrane weight (included)

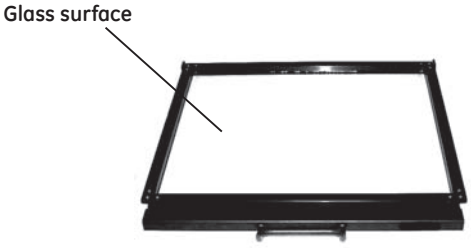
The membrane weight is used to hold thin fluorescent samples flat against the Fluor stage.



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.



LF glass plate stage (included)

The LF glass plate stage is used to read one or two DIGE gels. Place the gel with glass directly on the 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.

Titer plate (TP) plugin (included)

The TP plugin is used when reading titer plate samples.

Glass slide holder (included)

When the TP plugin is used on the Multi stage, place the sample glasses in the glass slide holder.

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.
- Flip the phosphor stage over.
- Place the phosphor stage in Typhoon FLA 9500.

Power cord (included)

Typhoon FLA 9500 uses a special AC power cable. Be sure to use power cables specified in service manuals or by service personnel.

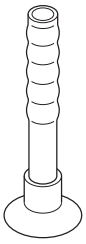
USB cable (included)

The USB cable is used to connect Typhoon FLA 9500 to a computer.

Suction rod (optional)

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. For details on use see *Placing the storage phosphor screen on the phosphor stage, on page 77*.



Suction rod

4 Installing and moving Typhoon FLA 9500

About this chapter

This chapter provides information to enable users and service personnel to unpack, install and transport Typhoon FLA 9500.

CAUTION

Only authorized service personnel is allowed to install Typhoon FLA 9500. Contact your local GE Healthcare representative for help and advice.

In this chapter

This chapter contains the following sections:

4.1 Site requirements

Note: *The Typhoon FLA 9500 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

Parameter	Requirement
Placement	Stable, horizontal surface. Do not place in direct sunlight or in brightly lit places.
Ambient temperature	+10°C to +30°C
Humidity	30% to 70%, non-condensing
Maximum altitude	2000 m above sea level

4.2 Initial delivery inspection

Upon receiving Typhoon FLA 9500:

- 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 9500 in an environment according to *Appendix B Specifications, on page 137* until the product is unpacked and installed.

4.3 Transporting Typhoon FLA 9500

WARNING

Heavy object. Because of the significant weight of Typhoon FLA 9500, great care must be taken not to cause squeeze or crushing injuries during movement. Use suitable lifting equipment when moving the unit.

CAUTION

Typhoon FLA 9500 must be secured before long distance transports. Contact GE Healthcare for help and advice before transporting Typhoon FLA 9500 long distances.

The Typhoon FLA 9500 weighs approximately 97 kg, use suitable lifting device to move the instrument.

Precautions before moving the instrument

Step	Action
1	Turn off the Typhoon FLA 9500.
2	Turn off the computer and any peripheral devices.
3	Disconnect the power cords and the USB connection.

4.4 Connections

CAUTION

Only authorized service personnel is allowed to install Typhoon FLA 9500. Contact your local GE Healthcare representative for help and advice.

Communication

Step	Action
1	Connect a USB cable to the USB port on the rear side of the Typhoon FLA 9500.
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 9500 to the computer in which the Typhoon FLA 9500 Control Software is installed.
- Use only the Typhoon FLA 9500 Control Software during reading.
- Only use IEC/UL 60950 approved computers.

Electrical power

Connect the power cord of the Typhoon FLA 9500 to a grounded power outlet.

WARNING

Use only power cords delivered or approved by GE Healthcare.

5 Installing Typhoon FLA 9500 Control Software

About this chapter

This chapter provides required information to enable users to install the Typhoon FLA 9500 Control Software.

In this chapter

This chapter contains the following sections:

5.1 Administrator privileges required

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

5.2 Installation sequence

Software installation is performed in the following sequence:

1 Install the USB control driver

2 Install the USB function driver (Windows XP only)

3 Install the Typhoon FLA 9500 Control Software

5.3 Install Typhoon FLA 9500 Control Software (Windows XP)

Before you begin

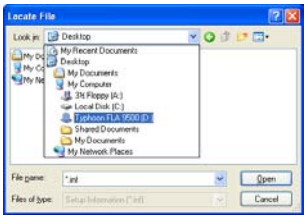
Log in using a Windows account with administrator privileges.

Install the USB Control Driver (Windows XP)

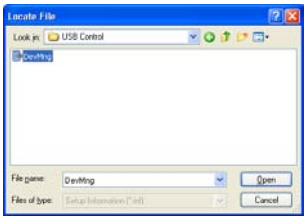
Step	Action
1	Disconnect Typhoon FLA 9500 from the computer.
2	Open the control panel and select ***Printers and Other Hardware***.
3	Click ***Add Hardware*** to open ***Add hardware wizard***.
4	Click the ***Next*** button in ***Add hardware wizard***.
5	Select ***Yes, I have already connected the hardware*** and click the ***Next*** button.
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.

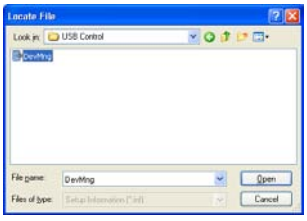
Step	Action
9	Click the ***Have Disk*** button in the ***Add hardware wizard***.
10	Insert the Typhoon FLA 9500 Control Software DVD and click the ***Browse*** button.
11	Select to install the driver from the Typhoon FLA 9500 Control Software DVD.



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.

Step	Action
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 9500 with a USB cable and turn the power switch of the Typhoon FLA 9500 to **ON**. 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 DVD.
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 9500 Control Software (Windows XP)

Step	Action
1	Insert the Typhoon FLA 9500 Control Software DVD.
2	Locate and double-click the file ***Typhoon FLA 9500.exe***.
3	In the ***Typhoon FLA 9500 - 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.
5	Select destination folder in the dialog:  • Click the ***Next*** button to install the software at the default folder ***C:\Program Files\GE Healthcare\Typhoon FLA 9500***. • 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 9500 Control Software.

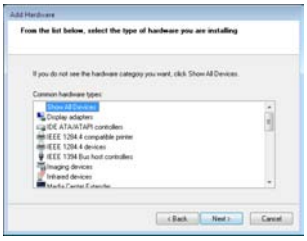
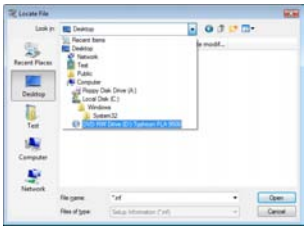
5.4 Install Typhoon FLA 9500 Control Software (Windows Vista)

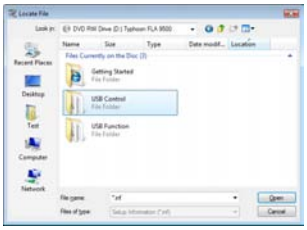
Before you begin

Log in using a Windows account with administrator privileges.

Install the USB Control Driver (Windows Vista)

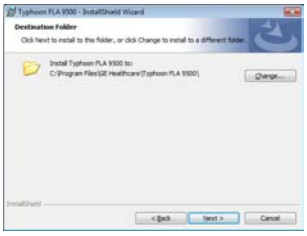
Note: *During software installations, you may be asked to confirm your actions in a dialog with the text* ***Windows needs your permission to continue****. Enter an administrator password, if prompted, then click* ***Continue*** *to proceed with the installation.*

Step	Action
1	Disconnect Typhoon FLA 9500 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.
6	Select ***Show All Devices*** and click the ***Next*** button. 
7	Click the ***Have Disk*** button.
8	Insert the Typhoon FLA 9500 Control Software DVD and click the ***Browse*** button.
9	Select to install the driver from the Typhoon FLA 9500 Control Software DVD. 

Step	Action
10	Select the ***USB Control*** folder and click ***Open***. 
11	Select the file ***DEVMNG.INF*** 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 clicking ***Install this driver software anyway***. 
16	Click the ***Finish*** button in the ***Add Hardware*** wizard to complete the installation.

Install Typhoon FLA 9500 Control Software and 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	Insert the Typhoon FLA 9500 Control Software DVD.
2	Locate and double-click the file ***Typhoon FLA 9500.exe***.
3	In the ***Typhoon FLA 9500 - 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\GE Healthcare\Typhoon FLA 9500***. • Click the ***Change*** button to install to a different folder.
6	Click the ***Install*** button.
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***.

Step	Action
8	Click ***Install this driver software anyway*** in the ***Windows Security*** dialog. 
9	Click the ***Finish*** button. The installation of Typhoon FLA 9500 Control Software is now completed.
10	Connect the computer and the Typhoon FLA 9500 with the USB cable.

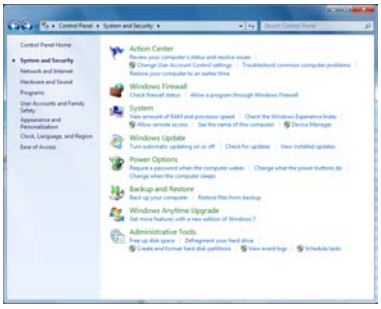
5.5 Install Typhoon FLA 9500 Control Software (Windows 7)

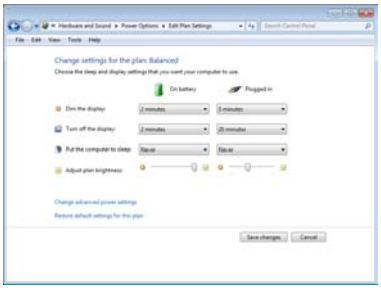
Before you begin

Log in using a Windows account with administrator privileges.

Disable the computer sleep function

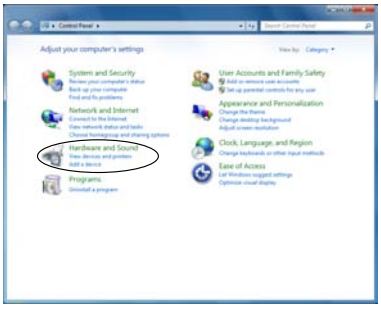
In order to prevent scanning errors, the computer should be set to never sleep as described below.

Step	Action
1	Open the ***Control Panel*** and click ***System and Security***. Click ***Change when the computer sleeps*** below ***Power Options***. 

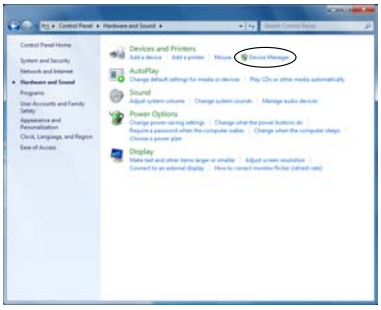
Step	Action
2	Select ***Never*** in the drop-down menu by ***Put the computer to sleep***, then click ***Save changes***. 

Installation of the USB Control Driver (Windows 7)

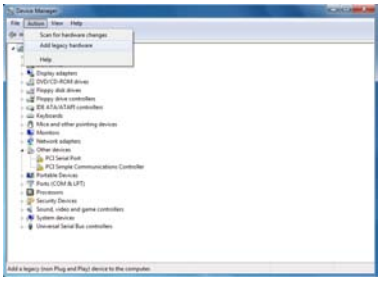
Note: *During software installations, you may be asked to confirm your actions in a dialog with the text* ***Windows needs your permission to continue****. Enter an administrator password, if prompted, then click* ***Continue*** *to proceed with the installation.*

Step	Action
1	Disconnect Typhoon FLA 9500 from the computer.
2	Open the control panel and click ***Hardware and Sound***. 

Step	Action
3	Click ***Device Manager*** under ***Devices and Printers***.

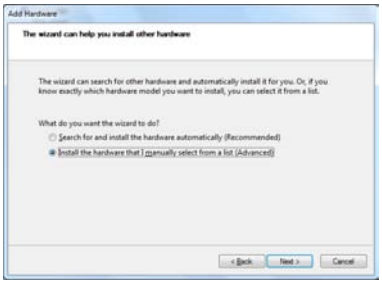


4	Click on the top node in the details pane. Select ***Action:Add legacy hardware***.

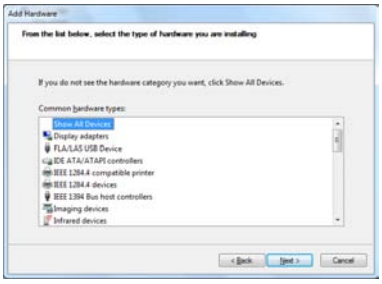


5	In the ***Add Hardware*** dialog, click the ***Next*** button.

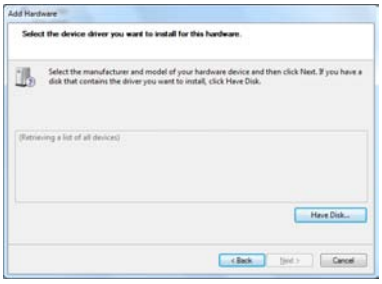
Step	Action
6	Select ***Install the hardware that I manually select from a list (Advanced)*** and click the ***Next*** button.



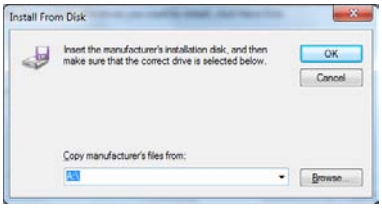
7	Select ***Show All Devices*** and click the ***Next*** button.



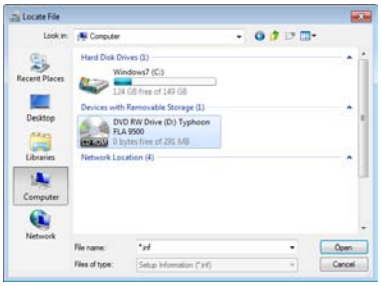
8	Click the ***Have Disk*** button.



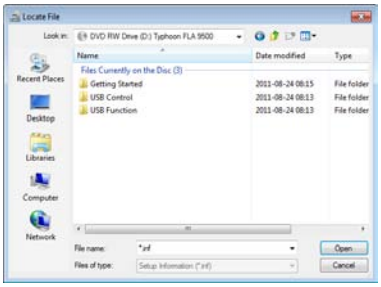
9	Insert the Typhoon FLA 9500 Control Software DVD and click the ***Browse*** button.



Step	Action
10	Select to install the driver from the Typhoon FLA 9500 Control Software DVD.



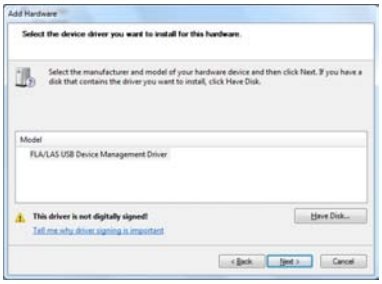
11	Select the ***USB Control*** folder and click the ***Open*** button.



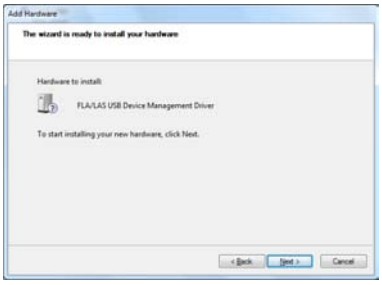
12	Select the file ***DEVMNG.INF*** and click the ***Open*** button.

13	Click the ***OK*** button in the ***Install from disk*** dialog.

Step	Action
14	Click the ***Next*** button in the ***Add Hardware*** wizard.

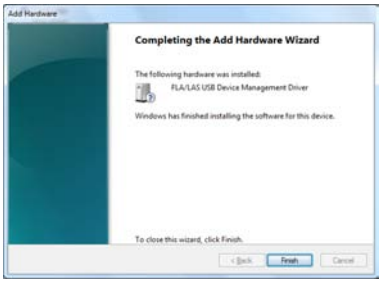


15	Click the ***Next*** button once again.



16	The following warning is displayed. Proceed by clicking ***Install this driver software anyway***.

17	Click the ***Finish*** button in the ***Add Hardware*** wizard to complete the installation.

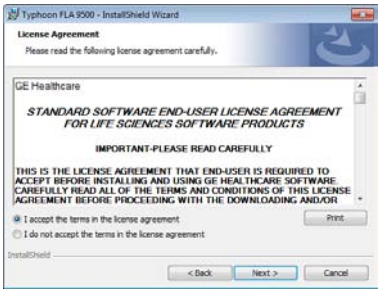


Installation of the Typhoon FLA 9500 Control Software and USB function driver (Windows 7)

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.*

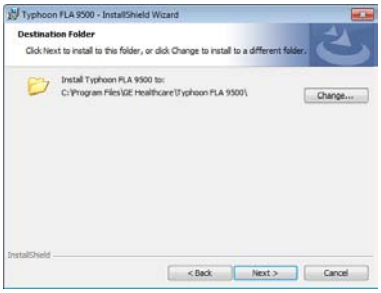
Step	Action
1	Insert the Typhoon FLA 9500 Control Software DVD.
2	Locate and double-click the file ***Typhoon FLA 9500.exe***.
3	In the ***Control Software - InstallShield Wizard*** dialog, click the ***Next*** button.

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.



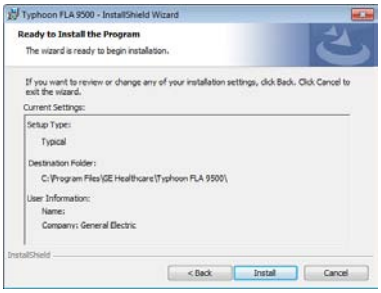
Select ***I accept the terms in the license agreement*** and click the ***Next*** button.

Step	Action
5	Select the destination folder in the dialog:



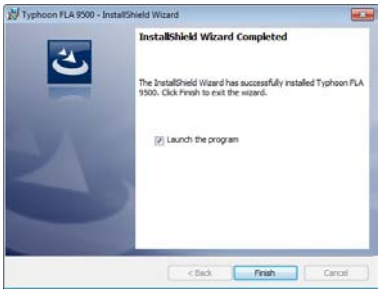
- Click the ***Next*** button to install the software at the default folder ***C:\Program Files\GE Healthcare\Typhoon FLA 9500***.
- Click the ***Change*** button to select a different location.

6 Click the ***Install*** button.



7 If User Account Control (UAC) is enabled in Windows 7, a dialog displays the message ***An unidentified programs wants access to your computer***. Click ***Allow***.

8 Click ***Install this driver software anyway*** in the ***Windows Security*** dialog.

Step	Action
9	Click the ***Finish*** button to complete the installation. 
10	Connect the computer and the Typhoon FLA 9500 with the USB cable.

6 Uninstalling and upgrading Typhoon FLA 9500 Control Software

About this chapter

This chapter provides required information to enable users to uninstall and update the Typhoon FLA 9500 Control Software.

In this chapter

This chapter contains the following sections:

6.1 Administrator privileges required

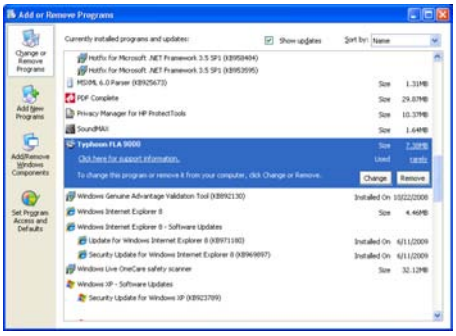
All tasks related to software installation require a computer account with administrator privileges.

6.2 Uninstalling Typhoon FLA 9500 Control Software under Windows XP

Before you begin

Log in using a Windows account with administrator privileges.

Uninstall Typhoon FLA 9500 Control Software

Step	Action
1	Open the control panel and select ***Add or Remove Programs***.
2	Select **Typhoon FLA 9500** and click the ***Remove*** button.
	
3	Confirm the uninstallation by clicking ***Yes*** when prompted.

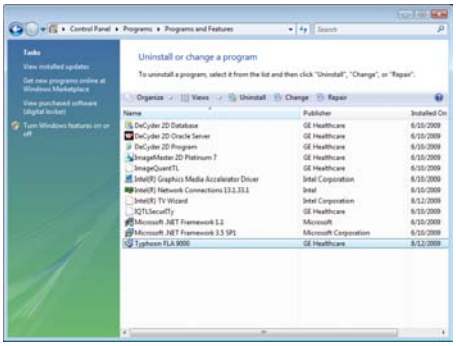
Note: *Correction files created during calibration, such as shading data, are required by the Typhoon FLA 9500 Control Software. They are not deleted during the uninstallation, and remain in the Data folder of Typhoon FLA 9500 Control Software folder.*

6.3 Uninstalling Typhoon FLA 9500 Control Software under Windows Vista

Before you begin

Log in using a Windows account with administrator privileges.

Uninstall Typhoon FLA 9500 Control Software

Step	Action
1	Open the control panel and Select ***Uninstall a program*** under ***Programs***.
2	Select ***Typhoon FLA 9500*** 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***.

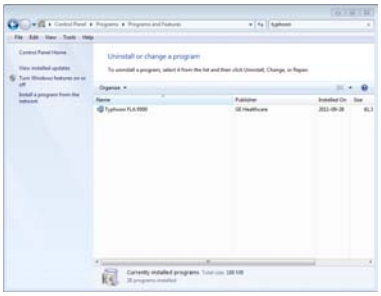
6.4 Uninstalling Typhoon FLA 9500 Control Software under Windows 7

Before you begin

Log in using a Windows account with administrator privileges.

Unintall Typhoon FLA 9500 Control Software

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

Step	Action
2	Select Control Software and then click ***Uninstall***. 
3	Confirm the uninstallation by clicking ***Yes*** when prompted.
4	If User Account Control (UAC) is enabled in Windows 7, a dialog displays the message ***An unidentified program wants to access your computer***. Click ***Allow***.

6.5 Upgrading Typhoon FLA 9500 Control Software

Step	Action
1	Uninstall the current version of Typhoon FLA 9500 Control Software.
2	Install the new version of Typhoon FLA 9500 Control Software. Follow the instructions in the installation chapter of Getting started with Typhoon FLA 9500.

7 Operation

About this chapter

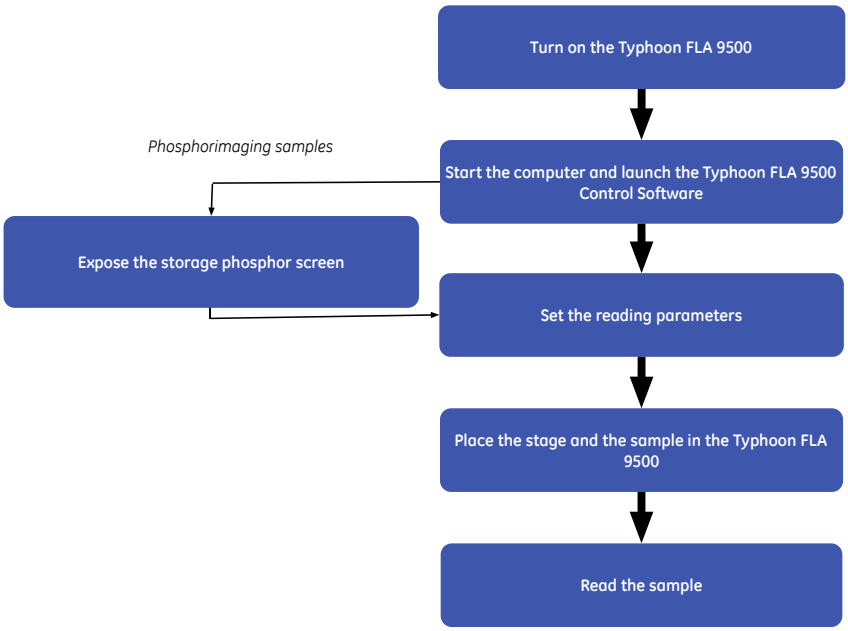
This chapter contains the information required to operate Typhoon FLA 9500.

In this chapter

This chapter contains the following sections:

7.1 Operation overview

Using Typhoon FLA 9500 comprises a series of steps outlined below. Detailed explanations are provided in subsequent chapters.



7.2 Preparations before starting Typhoon FLA 9500

Checklist before starting Typhoon FLA 9500

- Typhoon FLA 9500 is placed on a sturdy, horizontal surface.
- Typhoon FLA 9500 is connected to a grounded wall outlet.
- Typhoon FLA 9500 is connected to the computer with a USB cable.
- The air intake fan on the rear side of Typhoon FLA 9500 is unobstructed.
- The air exhaust fan on the left side of Typhoon FLA 9500 is unobstructed.
- Typhoon FLA 9500 is not placed in direct sunlight or in a brightly lit place.

- There are no objects on top of Typhoon FLA 9500.
- There is no stage in the stage rack.

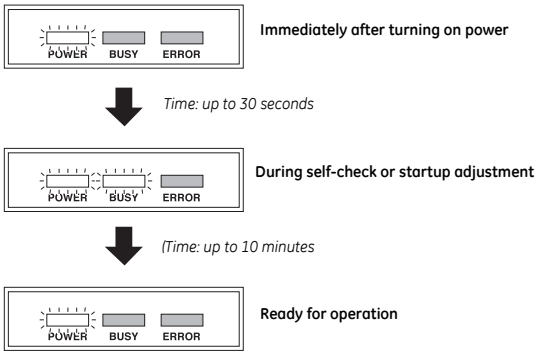
7.3 Starting Typhoon FLA 9500 and Typhoon FLA 9500 Control Software

Start Typhoon FLA 9500

CAUTION

Do not insert a storage phosphor screen in Typhoon FLA 9500 before turning on the machine. If a storage phosphor screen is detected during the self-diagnosis of the Typhoon FLA 9500, 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 right side of the instrument to the "I" position.
2	When the instrument is turned on, the On/Off conditions of the indicator lamps change as shown below.



Start Typhoon FLA 9500 Control Software

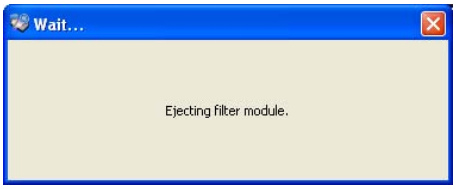
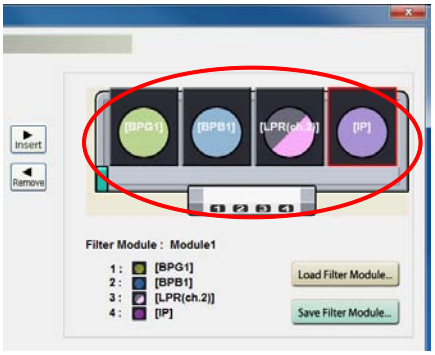
Step	Action
1	Make sure that Typhoon FLA 9500 has completed the warm-up, after which only the power lamp on the upper left panel on the front of the Typhoon FLA 9500 is lit.
2	Start Typhoon FLA 9500 Control Software from the ***Start*** menu, or use the desktop shortcut.
3	The main window of the Typhoon FLA 9500 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 9500. Please check connection and power.
Warm-up	Typhoon FLA 9500 is in self-diagnosis. Please wait.
Ready	The unit is ready to use.

Check the installed and registered filters

Make sure that the filters installed in Typhoon FLA 9500 are registered correctly in Typhoon FLA 9500 Control Software.

Step	Action
1	Click the ***Filter Module*** button in the main window.  The following status message appears.  Wait until the message is closed before proceeding to the next step.
2	Note the list of currently registered filters. 

Step	Action
3	Press the button on the filter change door.

4	Open the filter change door by pulling the knob.

5	Check that the set of currently installed filters matches the set of filters noted in step 2.

If the registered and installed filter sets match

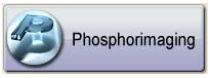
- Close the filter module door.
- Click the ***OK*** button in the ***Filter Module Settings*** window.

If the registered and installed filter sets DO NOT MATCH

- Change the installed or registered filters as required, following the instructions in *Chapter 10 Filter module settings, on page 102*.
- Close the filter module door.
- Click the ***OK*** button in the ***Filter Module Settings*** window.

7.4 Selecting the reading mode

Click the button that corresponds to the desired reading mode.

To...	Click this button
Read a fluorescent sample	
Read a chemiluminescent sample	
Read a phosphorimaging sample	
Read a digitization sample	
Read a 2D DIGE sample	

7.5 Setting the reading conditions

Set the reading conditions by following the instructions in *Chapter 8 Reading conditions, display parameters, and other settings, on page 84*.

7.6 Placing the object to be scanned on the stage

CAUTION

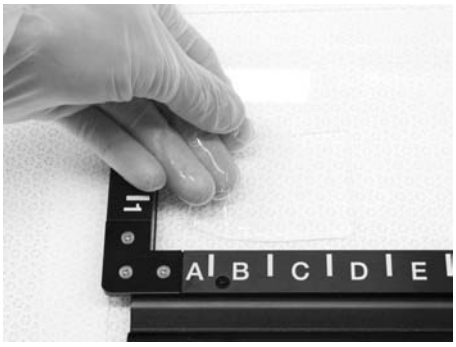
Always wear gloves, protective glasses and a lab coat or similar when handling samples.

Placing a gel sample on the Fluor stage

Note:

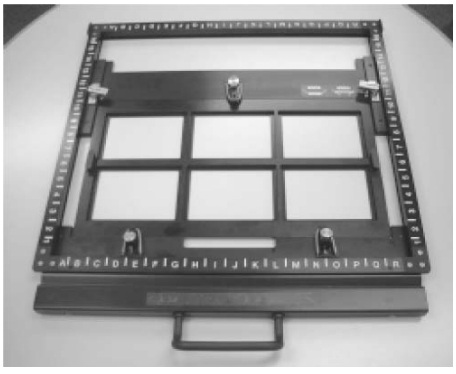
- *The sample must not be thicker than 30 mm. For solutions, the maximum height is 4 mm.*
- *Make sure there are no bubbles or gaps on the contact surface.*

Step	Action
1	Place the sample on the Fluor stage.

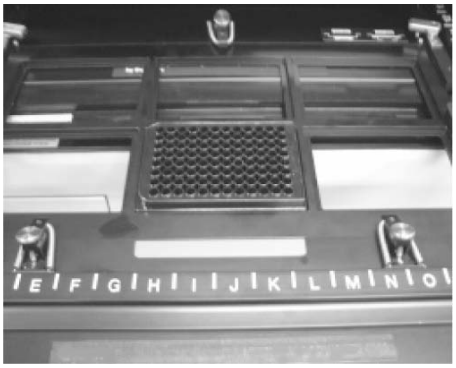


Placing a titer plate on the Multi stage

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



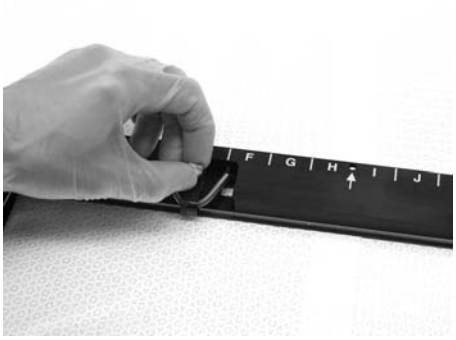
Step	Action
2	Place the titer plate in the desired position in the titer plate frame.



Placing a gel sample with glass on the Multi stage

Step	Action
1	Place a gel sample with glass on the Multi stage.
2	Carefully fold down the spring-loaded glass holders on the glass.

Step	Action
3	Tighten the screws on the glass holders as necessary.



Placing a DIGE gel on the LF glass plate stage

Step	Action
1	Place one or two DIGE gels on the LF glass plate stage.

2	Fasten each glass with the front and rear glass holders.
3	Press down each glass holder and tighten the screw.

Placing a chemiluminescent sample on the Fluor stage

Place the sample on the Fluor stage with the chemiluminescent side face down.

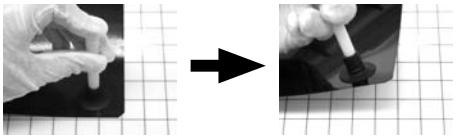
Note: *To reduces the effect of physical vibrations place a membrane weight on top of the* ***membrane samples****.*

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

Step	Action
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. 

7.7 Placing the stage in Typhoon FLA 9500

Placing the Fluor or Multi stage in the Typhoon FLA 9500

Step	Action
1	Open the lid of the Typhoon FLA 9500.

Step	Action
2	Place the stage on the Typhoon FLA 9500 with the printed side of the frame facing up.

3	Press the stage all the way in.

4	Close the lid.

Placing the LF glass plate stage in the Typhoon FLA 9500

Step	Action
1	Open the lid of the Typhoon FLA 9500.

Step	Action
2	Place the LF glass plate stage in the scanner. 
3	Push the LF glass plate stage in until it stops.
4	Close the lid.

Placing the phosphor stage in Typhoon FLA 9500

Step	Action
1	Open the lid of the Typhoon FLA 9500.
2	Position the phosphor stage with the storage phosphor screen face down. 
3	Push the phosphor stage inwards until it stops.
4	Close the lid of the Typhoon FLA 9500.

7.8 Prescan the sample (optional)

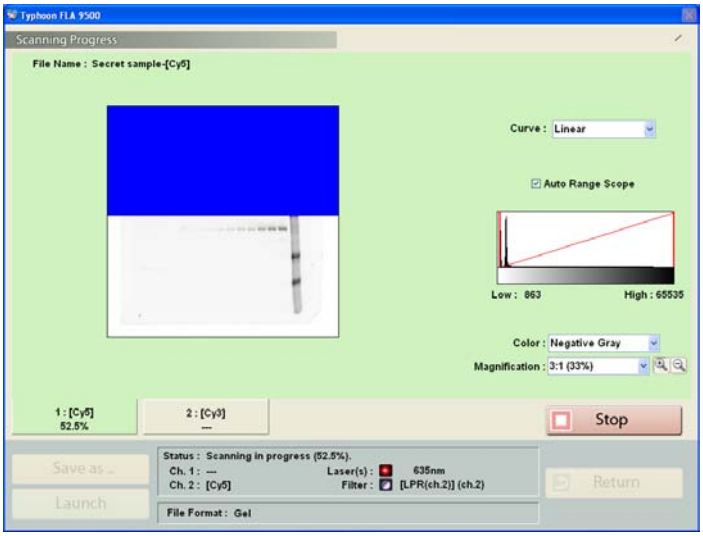
Note: *The prescan feature is not available in the phosphorimaging mode.*

Step	Action
1	Click the ***Prescan*** button. The sample is read at low resolution, and the result is displayed in the program window of Typhoon FLA 9500 Control Software.
2	Adjust the display parameters if desired. Follow the instructions in *Section 8.2 Display parameters explained, on page 93*.
3	Click ***Return*** to return to the ***Reader Settings*** screen.

After the prescan, adjust the PMT as required to improve the results of the regular scan.

7.9 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.*

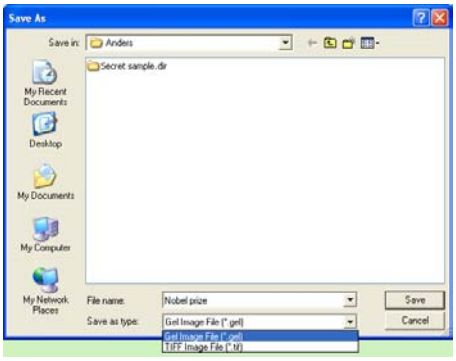
7.10 Adjusting the display parameters

Step	Action
1	Adjust the display parameters if desired. Follow the instructions in *Section 8.2 Display parameters explained, on page 93*.
2	Click ***Return*** to return to the ***Reader Settings*** screen.

7.11 Saving the image data using a different file name

The image or images that are produced during a reading are automatically saved under the name and directory that is given in the reader settings window. After the reading it is also possible to save a copy of the image or images using the ***save as*** option, see instructions in the table below.

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



Multiple readings

A dialog box with the options ***Save active image only...*** or ***Save all images...*** opens when the ***Save as...*** button is clicked.

Click on the ***Save active image only...*** button to save the image that is currently in view, or click on the ***Save all images...*** button to save all the images from the reading.

2 Type a file name in the ***File name:*** field.

Note:

Annotations given to the sample in the 2D DIGE reader settings window are not included in the save as option.

Step	Action
3	Select a file format in the ***Save as type:*** drop-down list. **Multiple readings** When all images are saved the files can be save as separate files in tif format or in gel format with a ds file in a folder for multiple images.
4	Save the image file by clicking the ***Save*** button.

7.12 Viewing the image file in the analysis application

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

Note: *If no analysis application is registered in Typhoon FLA 9500 Control Software, the **Launch** button is grayed out and inactive. If desired, register or change the analysis application.*

7.13 Turning off Typhoon FLA 9500

Step	Action
1	Turn off Typhoon FLA 9500 by pressing the power switch on the right side of the instrument body.

8 Reading conditions, display parameters, and other settings

About this chapter

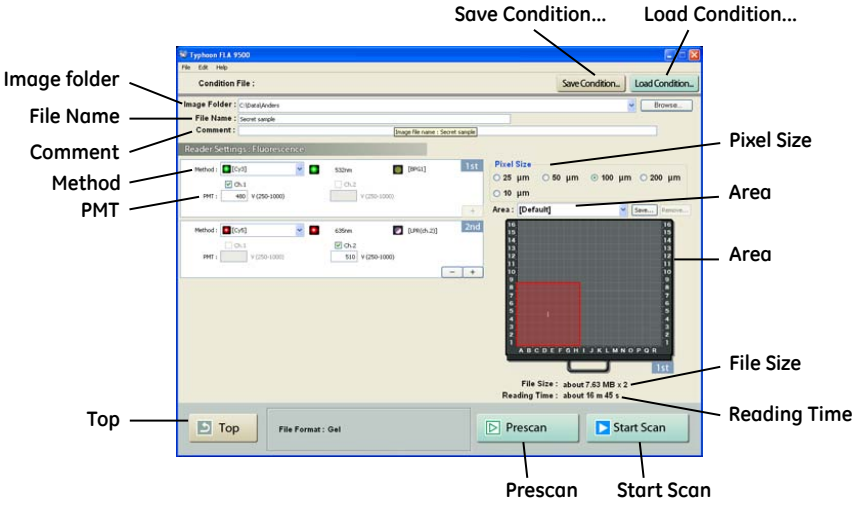
This chapter contains the information required to configure Typhoon FLA 9500.

In this chapter

This chapter contains the following sections:

8.1 Reading conditions explained

Phosphorimaging, fluorescence, chemiluminescence and digitization



2D DIGE

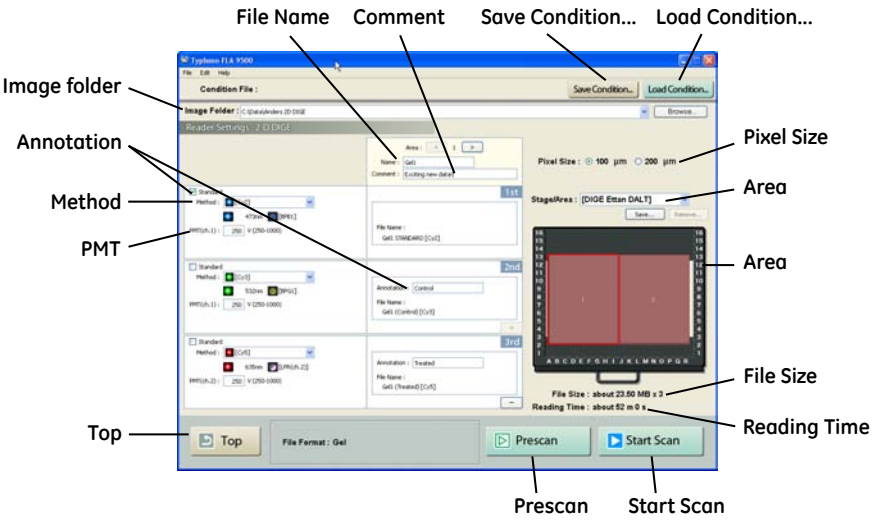


Image folder

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.*

2D DIGE mode

Use the < and > buttons to change between file area 1 and 2.

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.

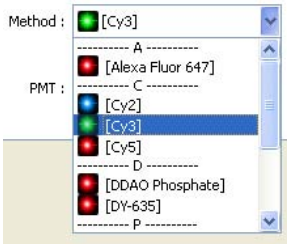
Annotation

Enter a description of the function of the image. The annotation is added to the file name of the image.

If the ***Standard*** checkbox is checked, STANDARD will be used as the annotation of the file name. Only one scan can be checkmarked as standard.

Method

Set the method to use in the scan.

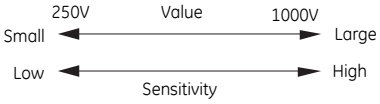


From the pull-down menu, select the method that corresponds with the sample. The selected laser and filter combination is displayed on the right.

In fluorescent mode, up to four 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 and 2D DIGE mode)


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.

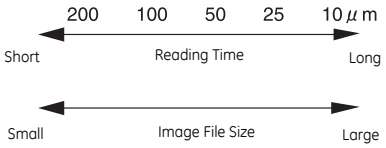
Load a set of stored conditions by selecting it in the list, then click ***OK***.

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 five types. A sample with a smaller pixel size can be analyzed in finer detail.



The 10 µm-pixel size processing is conducted by applying Bi-cubic algorithm to the images read at 25 µm-pixel size. Therefore, computer processing after reading may take a longer time than image reading time.

Bi-cubic: Using the densities of 16 lattice points around (u_0, v_0), cubic interpolation is done.

$$f(u_0,v_0) = \sum_k \sum_l f(u_k,u_l)\, c(u_k-u_0)\, c(v_l-v_0)$$

Here (u_k, v_l) is a lattice point around (u_0, v_0) and interpolative coefficient c(x) is defined linearly.

$$c(x) = \begin{cases} 1 - 2|x|^2 + |x|^3 & 0 \le |x| < 1 \\ 4 - 8|x| + 5|x|^2 - |x|^3 & 1 \le |x| < 2 \\ 0 & 2 \le |x| \end{cases}$$

Function c(x) is a piecewise three-dimensional polynomial approximation of function sinx/x that is valid for the sampling theorem for continous signals.

Area

Select the stage which will be used in the scan. The scanning area below the list box changes to reflect the selection.

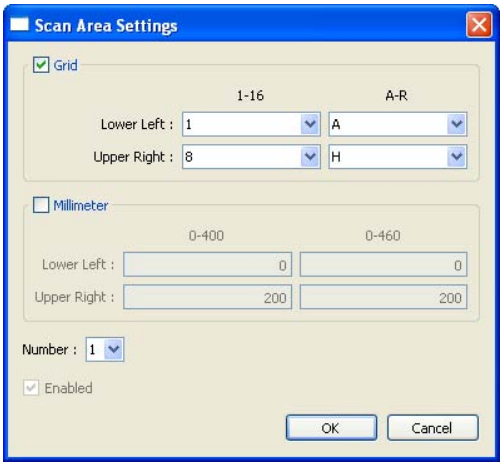
Scanning area

Displays the area or areas to be scanned as red boxes. A gray box indicates a scanning area that has been disabled. A disabled scanning area will be omitted from scanning until it is enabled again.

- **Change the size of a scanning area: C**lick and drag the edges of the red box with the mouse.
- **Change the position of a scanning area**: Click and drag the red box with the mouse.
- **Add a new scanning area:** Click an empty area on the image of the stage or titer plate plugin.
- **Delete a scanning area**: Select the scanning area and press the **Delete** key on the computer keyboard.

Right-click a scanning area to display a menu with additional settings.

Menu choice	Description
Enabled	Enable or disable the individual scanning area. A tick mark indicates that the scanning area is enabled and will be included in the scan. ***Note:*** *A disabled scanning area is omitted from the next scan, but is still available for future use.*
Duplicate	Define a new scanning area with the same height and width as the original scanning area.
Renumber	Assign a new number to the scanning area. ***Note:*** *Changing the number of one scanning area renumbers all other scanning areas as well.*
Remove...	Delete the scanning area. Confirm the deletion by clicking ***Yes*** in the dialog box that opens.

Menu choice	Description
Setting...	Opens the dialog box ***Scan Area Settings***, where the size and position of the scanning area can be finely tuned. 

<table>
<tr><th>Menu choice</th><th>Description</th></tr>
<tr><td></td><td>
<table>
<tr><th>Part</th><th>Function</th></tr>
<tr><td>Grid</td><td>Check to set the size by the positions dictated by the grid on the stage. The maximum and minimum values are displayed above the list boxes.
Set the position of the lower left corner by changing the list box values in the row Lower Left.
Set the position of the upper right coner by changing the list box values in the row Upper Right.
Note:
This option is available for the Fluor stage only.</td></tr>
<tr><td>Millimeter</td><td>Check to set the size in millimeters. The maximum and minimum values are displayed above the list boxes.
Set the position of the lower left corner by changing the list box values in the row Lower Left.
Set the position of the upper right coner by changing the list box values in the row Upper Right.</td></tr>
<tr><td>Number</td><td>A submenu with eligible numbers for scanning areas. Select a number to assign it to the scanning area.
Note:
Changing the number of one scanning area renumbers all other scanning areas as well.</td></tr>
<tr><td>Enabled</td><td>Check this box to enable the scanning area. Uncheck the box to disable the scanning area.</td></tr>
</table>
</td></tr>
</table>

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.

Prescan button (not available in phosphorimaging mode)

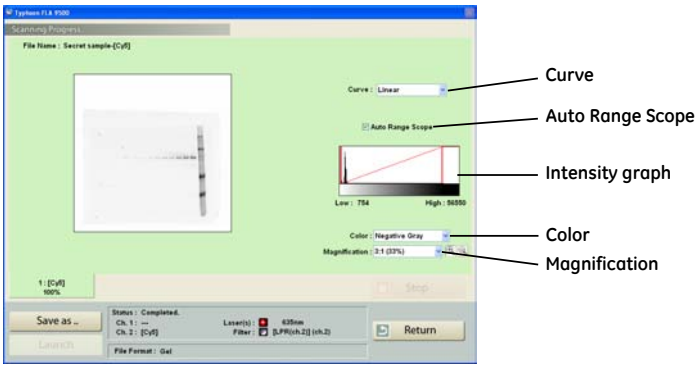
Click this button to perform a quick scan at a resolution of 1000 µm.

Use the prescan feature to optimize the scan area and the PMT settings for the signal intensity of the current sample. Prescanning the sample is quicker than performing a regular scan, especially if the pixel size is small.

Start Scan button

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

8.2 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.

Color

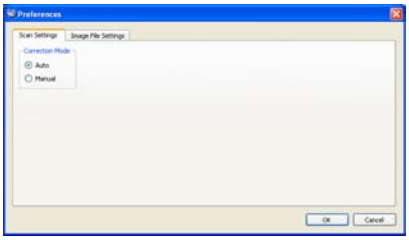
Select which colors to use to display the data in the display area.

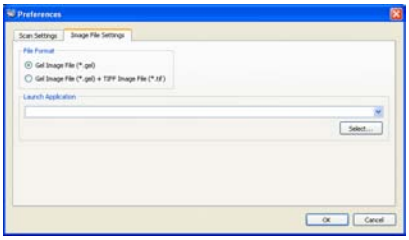
Setting	Description
Negative Gray	Applies gradation based on white to the Low side and based on black to the High side.
Positive Gray	Applies gradation based on black to the Low side and based on white to the High side.
Red	Applies gradation based on black to the Low side and based on red to the High side.
Green	Applies gradation based on black to the Low side and based on green to the High side.
Blue	Applies gradation based on black to the Low side and based on blue to the High side.
Color32	Applies 32 gradation steps from blue on the Low side and to red on the High side.

8.3 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 9500, or contact GE Healthcare.*
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.

9 Registering, editing and deleting methods

About this chapter

This chapter contains the information required to register, edit and delete a method.

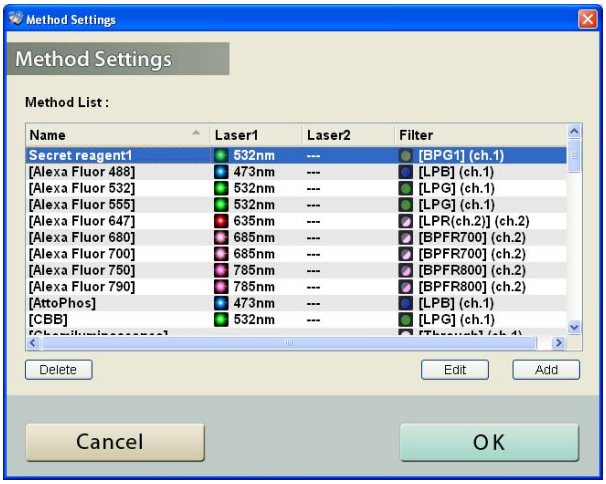
Note: *Method settings are registered by a serviceman upon installation. Under normal circumstances, it is not necessary to change these settings.*

In this chapter

This chapter contains the following sections:

9.1 Registering a new method

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



2	Click the ***Add*** button. The following dialog box appears.

3	Tick the checkboxes next to ***Channel 1:*** or ***Channel 2:*** to select a PMT (photomultiplier tube) to use. Select both channels when using a two-channel filter.

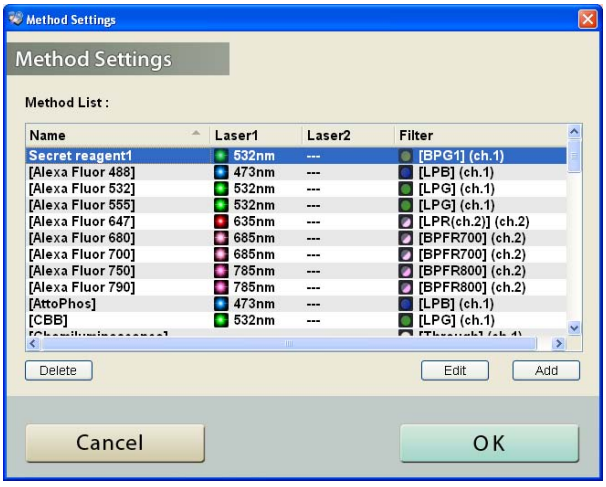
Step	Action
4	Enter a name for the combination in the ***Name:*** field.
5	Select the type of laser in the ***Laser 1:*** or ***Laser 2:*** drop-down lists. You may select lasers which are not currently loaded.
6	Select the type of filter in the ***Filter:*** drop-down list. You may select a filter which is not currently loaded.
7	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.*

9.2 Editing a method

Note: *Default methods cannot be edited. 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 edit.

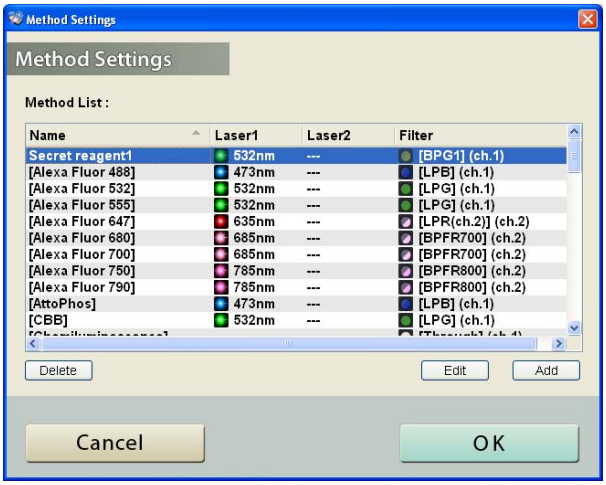
Step	Action
3	Click the ***Edit*** button. The following dialog box appears.

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.

9.3 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 ***Secret reagent1***.)

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.*

10 Filter module settings

About this chapter

This chapter contains the information required for changing the filter module settings. It also contains information on using third-party filters.

In this chapter

This chapter contains the following sections:

10.1 Introduction

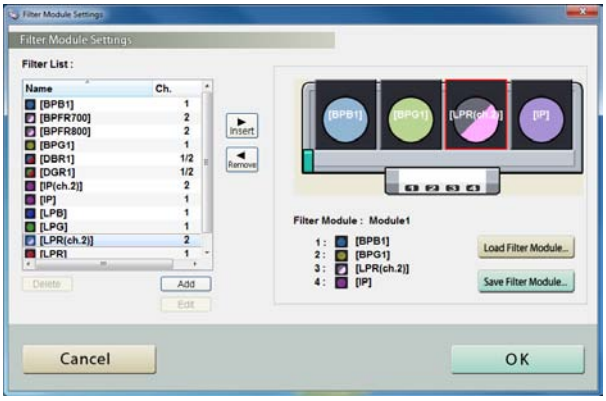
Filter module settings are registered by a serviceman upon installation. Under normal circumstances, it is not necessary to register these settings.

When a filter is changed in the filter module of Typhoon FLA 9500, the new or changed filter must be registered in the Typhoon FLA 9500 Control Software. A filter which has not been registered can not be used for analysis and is not displayed in the Typhoon FLA 9500 Control Software.

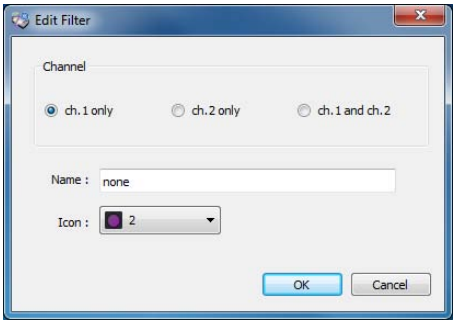
10.2 Registering a new filter name

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

The ***Filter Module Settings*** window appears.



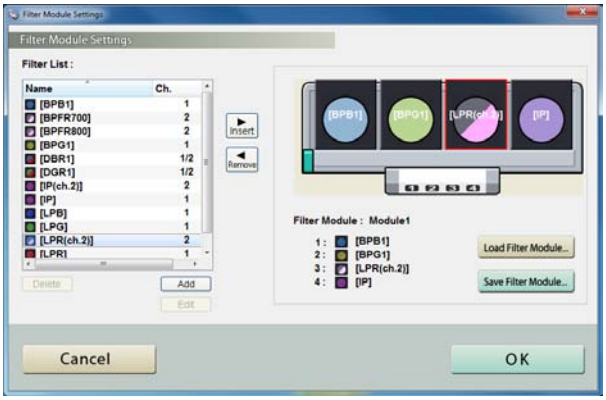
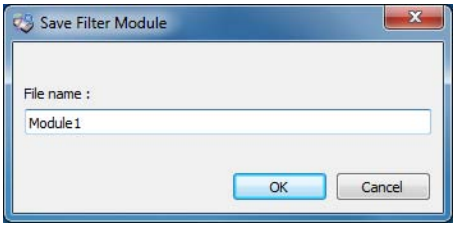
2	Click the ***Add*** button. The following dialog box appears.



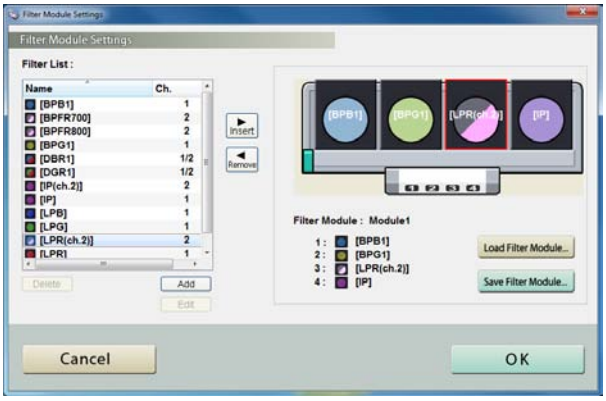
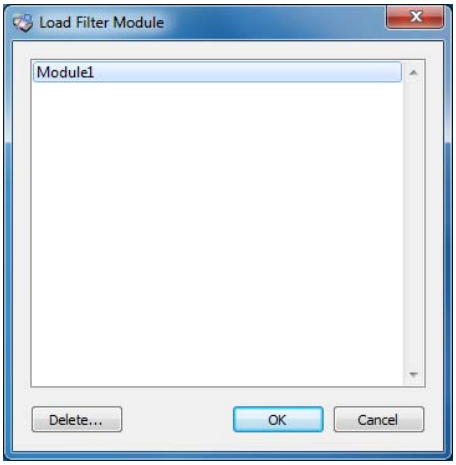
3	Type the filter name in the ***Name:*** field.
4	Select an icon in the ***Icon:*** drop-down list.
5	Select which PMT to use. • ***ch. 1 only***: Only the first PMT will be used. • ***ch. 2 only***: Only the second PMT will be used. • ***ch. 1 and ch. 2***: Both PMTs will be used.
6	Finalize the filter addition by clicking the ***OK*** button.

Step	Action
7	Click the ***OK*** button to return to the main window.

10.3 Saving a filter combination

Step	Action
1	Click the ***Filter Module*** button in the main window.  The ***Filter Module Settings*** window appears. 
2	Click the ***Save Filter Module...*** button. The following dialog box appears. 
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.

10.4 Loading a filter combination

Step	Action
1	Click the ***Filter Module*** button in the main window.  The ***Filter Module Settings*** window appears. 
2	Click the ***Load Filter Module...*** button. The following dialog box appears. 
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 from the scanner, 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.

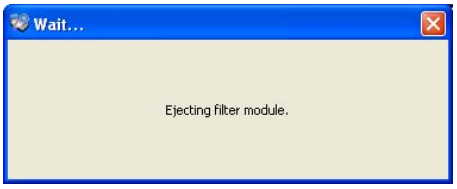
10.5 Installing and replacing filters

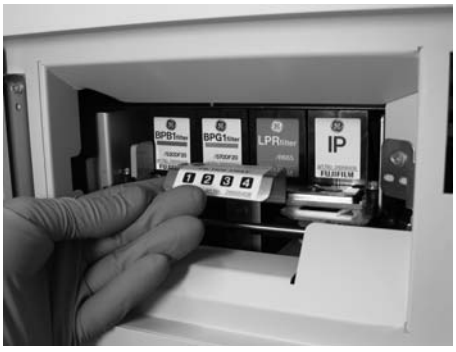
Replacement and installation sequence

Replacement or installation of a filter is performed in the following sequence:

1. Remove the filter module from the scanner.
2. If replacing a filter, remove the filter to be replaced from the filter module.
3. Install the new filter in the filter module.
4. Place the filter module in the scanner.
5. Register the filter change in the Typhoon FLA 9500 Control Software.

Remove the filter module from the scanner

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

Step	Action
2	Press the button on the filter change door. 
3	Open the filter change door by pulling the knob. 
4	Grip the metal tab and pull the filter module straight out. 

Remove and install filters in the filter module

Step	Action
1	Pull the green locking lever to the left.

2	Tilt the filter backwards and pull it out from under the metal lip.

3	Place the new filter under the rear metal lip, and lower the front edge of the filter.
4	Push the green locking lever to the right. Make sure all filters are locked.

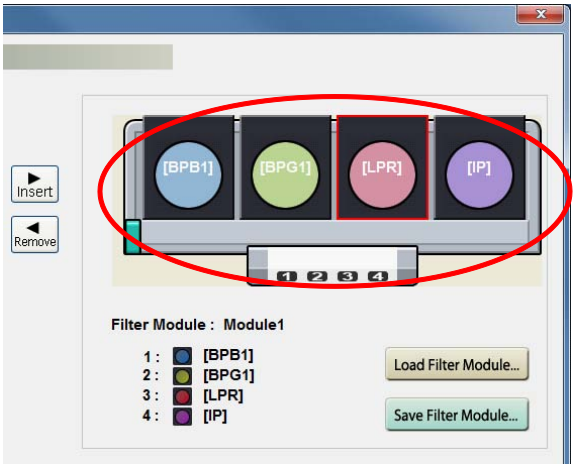
Place the filter module in the scanner

Step	Action
1	Open the filter change door. 
2	Insert the filter module in the filter module holder. 
3	Close the filter change door.

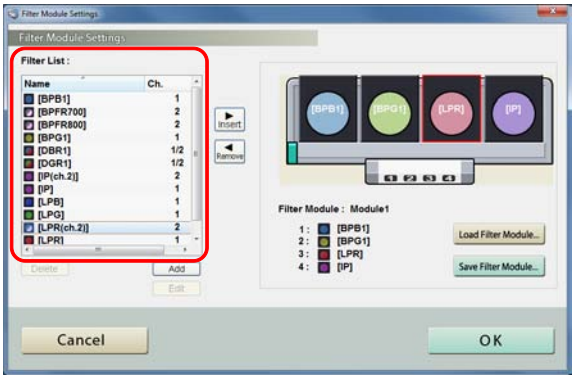
Register the filter change in Typhoon FLA 9500 Control Software

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

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



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



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

Tip:

You can also click and drag the filter from ***Filter List*** to the desired filter position.

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

10.6 Using filters from third party suppliers in Typhoon FLA 9500

About this section

In this section the information required for preparing a filter expansion box with third-party supplier filters is provided.

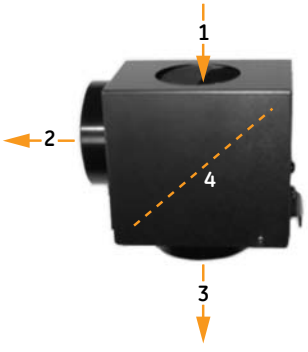
In this section

This chapter contains the following sections:

10.6.1 Introduction

Filters from third party suppliers can be used in Typhoon FLA 9500 by using a filter expansion box (optional). The software allows you to use several kinds of filters.

Two channels can be used in Typhoon FLA 9500, channel 1 and channel 2. The figure below show how the light flows through the filter expansion box for channel 1 (arrow 1 and 3), and channel 2 (arrow 1 and 2). To use channel 2 a rectangular mirror needs to be installed in the filter expansion box (item 4 in the figure below).



Part	Function
1	Incoming light from the light source.
2	Channel 2, light out.
3	Channel 1, light out.
4	Rectangular mirror

10.6.2 Prepare filter expansion box when using channel 1

Items required

- Filter expansion box
- 25 mm filter

Prepare filter expansion box

The following procedure describes how to prepare the filter expansion box with third-party filters using channel 1.

Step	Action
1	Place the filter expansion box on a stable surface.

Step	Action
2	Remove the two filter holders by turning them counterclockwise.

(In this image, the lower filter holder contains a dummy filter.)

3	Unscrew and remove the filter rings from the filter holders.

(In this image, the dummy filter is at the bottom left.)

Step	Action
4	Place a 25 mm diameter filter in the loading part. 
5	Place the ring on the filter in the filter holder. 
6	Insert the filter holders in the openings of the the filter expansion box and tighten them. 

10.6.3 Prepare filter expansion box when using channel 2

Items required

- Filter expansion box
- Rectangular mirror for the filter expansion box
- 25 mm filter
- Small Phillips screwdriver

Prepare filter expansion box

The following procedure describes how to prepare the filter expansion box with third-party filters using channel 2.

Step	Action
1	Place the filter expansion box on a stable surface.

Step	Action
2	Remove the two filter holders by turning them counterclockwise.

(In this image, the lower filter holder contains a dummy filter.)

3	Unscrew and remove the filter rings from the filter holders.

(In this image, the dummy filter is at the bottom left.)

Step	Action
4	Place a 25 mm diameter filter in the loading part.

5	Place the ring on the filter in the filter holder.

6	Unscrew and remove the four small screws on the outside of the cover.

Step	Action
7	Pull off the cover and place it to one side.

Step	Action
8	Unscrew and remove the two screws fixing the mirror and mirror holder.

Step	Action
9	Lift out the mirror holder.

10	Insert a mirror.
11	Place the mirror holder in the filter expansion box, then insert and tighten the screws.
12	Attach the cover and tighten screws.

Step	Action
13	Insert the filter holders in the openings of the the filter expansion box and tighten them.

11 About Storage phosphor screens

About this chapter

This chapter contains information on the Storage phosphor screens.

In this chapter

This chapter contains the following sections:

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 9500 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 and 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 9500 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.

Set the exposure time

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

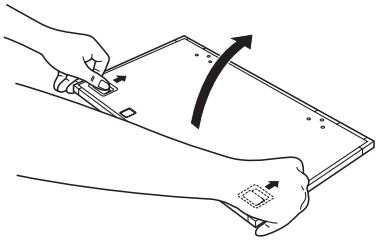
Note: *The exposure time of the Storage phosphor screen is approximately one twentieth of the time required for X-ray film. Take this into consideration when setting the initial exposure time.*

Tip: *For increased image quality, minimize the time between exposing the Storage phosphor screen and reading it with the Typhoon FLA 9500.*

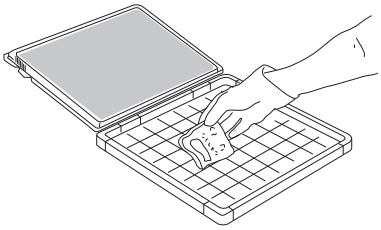
11.5 Exposing the storage phosphor screen

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.*

Step	Action
3	Open the top cover of the cassette. Unlock the cassette by sliding the buttons on both sides up.



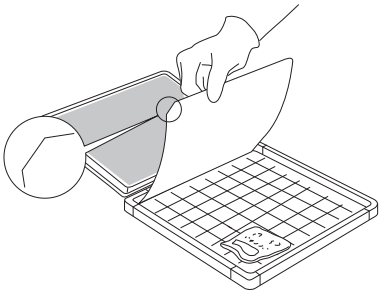
4	Place the sample on the cassette. Make sure that the sample surface faces up.



Note:

Keep the radio imaging sample away from the edge of the Storage phosphor screen. Otherwise, the recorded data may become corrupted.

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

About this chapter

This chapter contains information to enable users to clean, maintain, and store Typhoon FLA 9500.

Cleaning the outside of Typhoon FLA 9500

WARNING

Do not use excessive amounts of liquids while cleaning the Typhoon FLA 9500, this may result in product malfunction or electric shock.

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 9500, it will require periodical calibration. When the Typhoon FLA 9500 is switched on, it automatically executes calibration. You do not need to do a manual calibration if the Typhoon FLA 9500 is used at least once a month.

CAUTION

Activate the Typhoon FLA 9500 at least once every 30 days to execute calibration. This calibration ensure that the SHG laser operates properly. Failure to calibrate the Typhoon FLA 9500 every 30 days reduces the lifespan of the SHG laser.

Operation procedures:

1 Turn on the Typhoon FLA 9500 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 9500 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 9500.

13 Troubleshooting

About this chapter

This chapter describes various problems that can foreseeably occur with the Typhoon FLA 9500 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 9500 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 9500. Please check connection and power.	The scanner is not detected. **Countermeasure:** Check that the scanner is turned on and connected to the computer.
Error: Please restart Typhoon FLA 9500.	The scanner needs to be restarted. **Countermeasure:** Switch of the power button of Typhoon FLA 9500, wait 15 seconds and switch it on again.
The system is not for phosphorimaging. Recommended method for phosphorimaging [Phosphor]: 635 nm - [IP]	The current scanner settings are inappropriate for the current scanning mode. The laser and/or filter settings do not match the selected scanning mode. **Countermeasure:** Make sure that the correct laser and filter combination is installed in the scanner. If necessary, change the filter. Follow the instructions in *Section 10.5 Installing and replacing filters, on page 106*. Click the ***Method*** button and select a different method. If the required laser is not installed, contact your GE Healthcare representative.
The system is not for digitization. Recommended methods for digitization [CCB] : 532 nm - [LPG], [Silver Stain] : 473 nm - [LPB]	
The system is not for chemiluminescence. Method for chemiluminescence [Chemiluminescence] no lasers - [Through]	
No methods are available.	No method is defined. **Countermeasure:** Click the ***Method*** button and create a method to use for scanning.

Errors and warnings in the *Filter Module Settings* window

Error message	Meaning and countermeasure
Please enter a filter name.	The filter has no name. **Countermeasure:** Type a name in the ***Name*** field.

Error message	Meaning and countermeasure
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.
The filter is in use and cannot be deleted.	The filter is being used and can therefore not be deleted. **Countermeasure:** Select a different filter to use before deleting the current one.
No methods are available.	No methods are available for scanning. **Countermeasure:** Register new methods in the Typhoon FLA 9500 Control Software.
The filter module is currently in use and cannot be deleted.	The filter module is being used and can therefore not be deleted. **Countermeasure:** Select a different filter module to use before deleting the current 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 available methods is 100.	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.

Error message	Meaning and countermeasure
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
Typhoon FLA 9500 imager is running self-diagnosis mode. Please wait.	The self-diagnosis of Typhoon FLA 9500 is running. **Countermeasure:** Wait until the self-diagnosis is finished, the proceed with the scan.
Typhoon FLA 9500 is not ready to scan. Please wait a moment and try again.	The scanner is not ready to scan. **Countermeasure:** Wait for one minute, then try to scan again.
A laser error was detected. Use other lasers.	There was an error with the laser. **Countermeasure:** Try to scan again. **Countermeasure:** Restart the instrument and Typhoon FLA 9500 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 250-1000.	The PMT voltage setting is outside the permitted range. **Countermeasure:** Type a PMT voltage value between 250 and 1000 in the ***PMT*** field.

Error message	Meaning and countermeasure
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.
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

Symptom	Meaning and countermeasure
No image data was scanned.	The sets of registered and installed filters do not match. **Countermeasure:** Change installed filters or register other filters in Typhoon FLA 9500 Control Software as necessary.
The bands in the image are very weak.	

Error message	Meaning and countermeasure
The scan was stopped because of overexposure. 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.
The scan 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.

Error message	Meaning and countermeasure
A scanner error was detected. Please restart Typhoon FLA 9500 imager and Scanner Control Software. ***Sense Key : xxxx*** ***Error Code : yyyy***	An error occurred during scanning. **Countermeasure:** Try to run the scan again. Contact your GE Healthcare representative if the problem persists.
A warning occurred during the scanning process.	See above.

Appendix A Default sample detection methods

473 nm laser

Reagent name	Excitation wavelength	Emission light wavelength	Filter
Alexa Fluor™488	495	519	LPB
AttoPhos™	482	560	LPB
Cy™2	489	506	LPB, DBR1, BPB1
DY-485XL	485	560	LPB
ECL Plus™	420	460	LPB
EGFP	489	508	LPB
FAM™	490	520	LPB
FITC	494	520	LPB, DBR1
Flamingo™	512	535	LPB
Pro-Q™Emerald488	510	520	LPB
Qdot 605	-	603	LPG
Qdot 655	-	655	LPR
Qdot 705	-	702	LPR
Qdot 800	-	792	LPR
SYBR™ Gold	495	537	LPB
SYBR Green I	494	521	LPB
SYBR Green II	492	513	LPB
SYBR Safe™	502	530	LPB
SYPRO™ Orange	472	570	LPB
SYPRO Ruby	450	610	LPG
SYPRO Orange	490	640	LPG

532 nm laser

Reagent name	Excitation wavelength	Emission light wavelength	Filter
Alexa Fluor 53X	532	554	LPG
Alexa Fluor 555	553	568	LPG
Cy3	550	570	LPG, DGR1, BPG1
Deep Purple™	528	591	LPG
DY-520XL	520	664	LPR
EtBR	518	605	LPG
HEX™	535	553	LPG
HNPP	550	562	LPG
Pro-Q Diamond	555	580	LPG
RITC	554	577	LPG
ROX™	535	567	LPG
SYPRO Red	547	631	LPR
TAMRA™	542	568	LPG

635 nm laser

Reagent name	Excitation wavelength	Emission light wavelength	Filter
Alexa Fluor 647	653	669	LPR
Cy5	649	670	LPR, DBR1, DGR1
DDAO Phosphate	634	665	LPR
DY-635	647	671	LPR

685 nm laser

Reagent name	Excitation wavelength	Emission light wavelength	Filter
Alexa Fluor 680	679	702	BPFR700

Reagent name	Excitation wavelength	Emission light wavelength	Filter
Alexa Fluor 700	689	700	BPFR700
Cy5.5	675	694	BPFR700
DY-676	674	699	BPFR700
DY-682	690	709	BPFR700
IRDye™ 680	683	710	BPFR700
IRDye 700	689	700	BPFR700
Krypton™ Infrared	690	718	BPFR700

785 nm laser

Reagent name	Excitation wavelength	Emission light wavelength	Filter
Alexa Fluor 750	746	775	BPFR800
Alexa Fluor 790	784	814	BPFR800
DY-781	783	800	BPFR800
IRDye 800	778	806	BPFR800

Appendix B Specifications

Scanning specifications

Parameter	Data
Scanned image size	40 × 46 cm
Pixel size	10, 25, 50, 100 or 200 µm and a 1000 µm prescan
Gradation bit depth	16-bit
Dynamic range	Five orders of magnitude
Image capacity	• 3510 MB (10 µm) • 561.52 MB (25 µm) • 140.35 MB (50 µm) • 35.09 MB (100 µm) • 8.77 MB (200 µm)
Detection sensitivity	• Storage phosphor screen ^{14}C: Detectable to 0.9 dpm/mm^2. • Fluorescent: DNA/SYBR-Green 7 pg/band • Enzyme-multiplied fluorescence sensitivity: pBR328/AttoPhos 100 fg/spot

Dimensions & weight

Unit	Dimension (mm, w×d×h)	Weight (kg)
Reading block	900 × 800 × 400 (projections not included)	97
Storage phosphor screen cassette	460 × 430 × 20	Approx. 2.5
Phosphor stage	502 × 538 ×45	Approx. 2.5

Unit	Dimension (mm, w×d×h)	Weight (kg)
Multi stage	502 × 538 ×45	Approx. 2.8
Fluor stage	502 × 538 ×45	Approx. 2.3
FLA Image Eraser	603 × 512 × 164	14.5

Power supply

Parameter	Data
Input voltage	100 to 240V~ (AC), single phase
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°C to +30°C Humidity: 20% to 75% RH (no dew condensation)
Non-operating conditions	Temperature: -10°C to +40°C Humidity: 20% to 70% RH (no dew condensation)
Transportation & storage temperature	Temperature: -25°C 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 into Typhoon FLA 9500 after exposure.
Where to use	Indoor use only, out of direct sunlight or brightly lit surroundings.

Parameter	Data
Maximum altitude for use	2000 m above sea level
Overvoltage category	Transient overvoltage category II
Applicable rated pollution degree	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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imagination at work

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