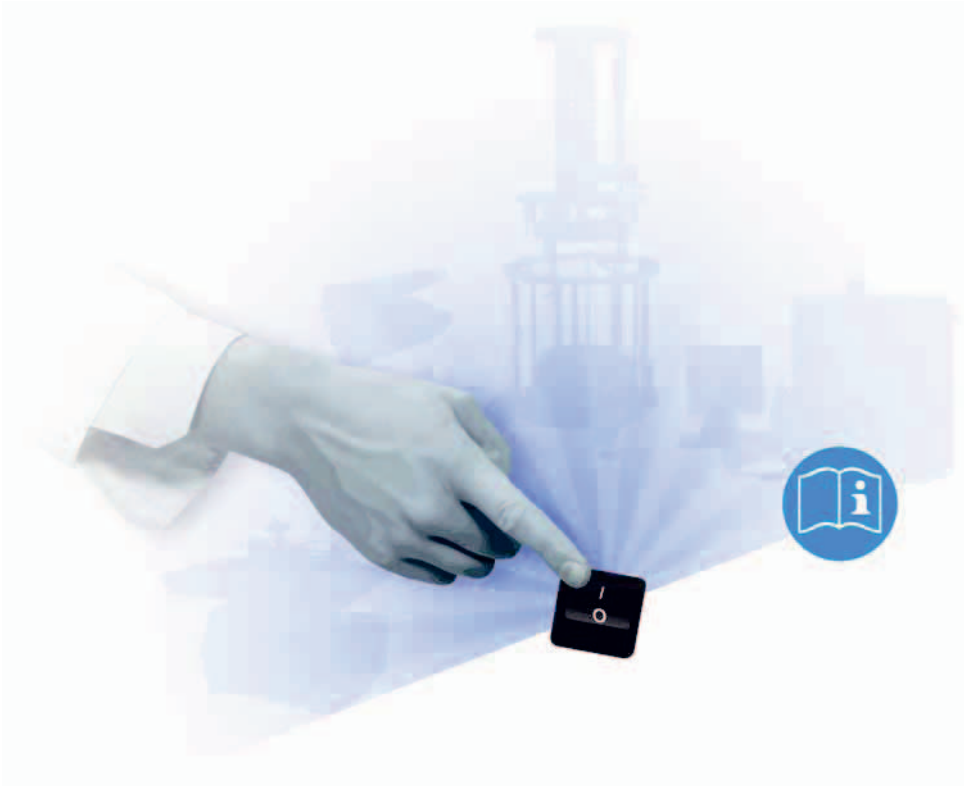
GE Healthcare

Storm™

Operating Instructions

Original instructions



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1 Introduction

Purpose of the Operating Instructions

The Operating Instructions provide you with the instructions needed to handle the Storm system in a safe way.

Prerequisites

In order to operate the Storm system safely and according to the intended purpose the following prerequisites must be met:

- You should have a general understanding of how the PC and Windows work.
- You must read the safety instructions in the user documentation.
- You should be acquainted with the use of general laboratory equipment and with handling of biological materials.

In this chapter

This chapter contains important user information and a general description of the Storm and its intended use.

1.1 Important user information

Read this before using the Storm

All users must read the safety instructions in the Storm user documentation before installing, using or maintaining the system.

Do not operate the Storm system in any other way than described in the user documentation. Otherwise, you may be exposed to hazards that can lead to personal injury and you may cause damage to the equipment.

Intended use

The Storm system is an optical scanner that produces digital images of radioactive of fluorescently labeled samples. The Storm system is intended for research use only, and shall not be used in any clinical procedures, or for diagnostic purposes.

Safety notices

These Operating Instructions contain WARNINGS, CAUTIONS and NOTICES concerning the use of the product, with meanings as defined below.

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.

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.

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

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 Storm system.

Manufacturing information

Requirements	Content
Name and address of manufacturer	GE Healthcare Bio-Sciences AB, Björkgatan 30, SE 751 84 Uppsala Sweden
Name and address of person responsible for Technical File	Peter Löwendahl, GE Healthcare, Björkgatan 30, SE 751 84 Uppsala Sweden
Name and ID of notified body	INTERTEK SEMKO AB, NB 0413
Place and date of declaration	Uppsala, Sweden, Nov. 2009

Requirements	Content
Identity of person authorized to sign Declaration of Conformity	See EC Declaration of Conformity

CE Conformity

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

International standards

Standard	Description	Notes
EN 61010-1, IEC 61010-1, UL 61010-1, CAN/CSA-C22.2 no. 61010-1	Safety requirements for electrical equipment for measurement, control and laboratory use	
EN 61326-1	EMC emissions and immunity requirements for measurement, control and laboratory use	Harmonized with 2004/108/EC
EN-ISO 12100-1	Safety of machinery – Basic concepts, general principles and design	Harmonized with 2006/42/EC
EN-ISO 14121-1, 14121-2	Safety of machinery – Principles of risk assessment	Harmonized with 2006/42/EC

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 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 or explicitly authorized by GE Healthcare.

Regulatory compliance of connected equipment

Any equipment connected to the Storm should meet the safety requirements of EN 61010-1/IEC61010-1 or relevant harmonized standards. Within the European Union, connected equipment must be CE marked.

1.3 The Storm system

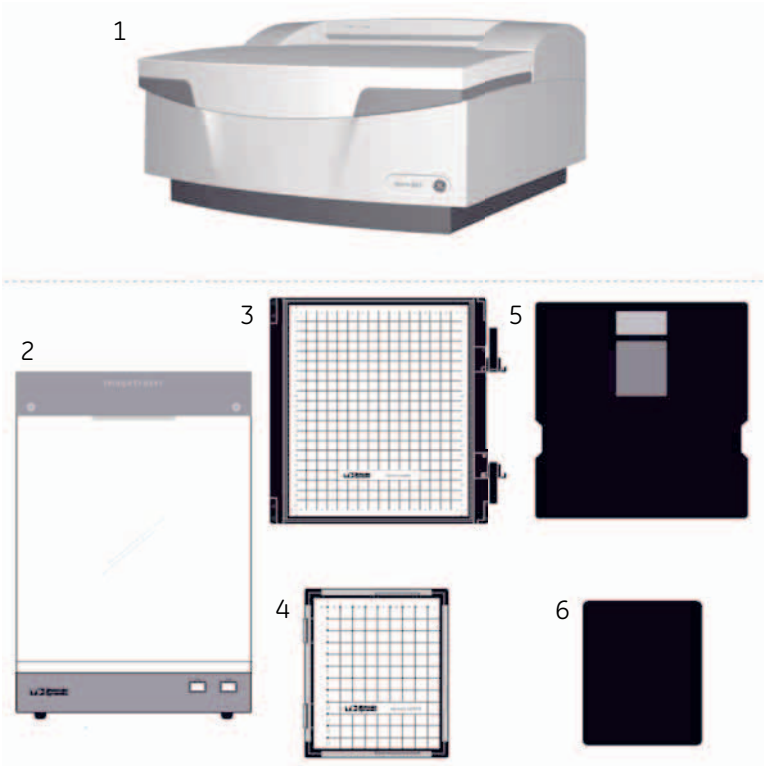
The Storm hardware components

The Storm hardware includes the following components:

- **Storm instrument—**Scans exposed Storage phosphor screens and (in most models) fluorescently labeled samples.
- **Storage phosphor screen—**Collects the image from radioactive samples.
- **Exposure cassette—**Holds the Storage phosphor screen in a light-proof environment.
- **Image eraser—**Erases Storage phosphor screens for reuse.

Additional accessories include a SCSI cable, a SCSI terminator, power cords, and tools.

The Storm instrument connects to a computer running the Microsoft™ Windows™ operating system.



No.	Description
1	Storm instrument
2	Image eraser
3	Exposure cassettes for mounted screens
4	Exposure cassettes for unmounted screens
5	Mounted Storage phosphor screen
6	Unmounted Storage phosphor screen

Storm instrument

The Storm system is an optical scanner that produces digital images of radioactive or fluorescently labeled samples.

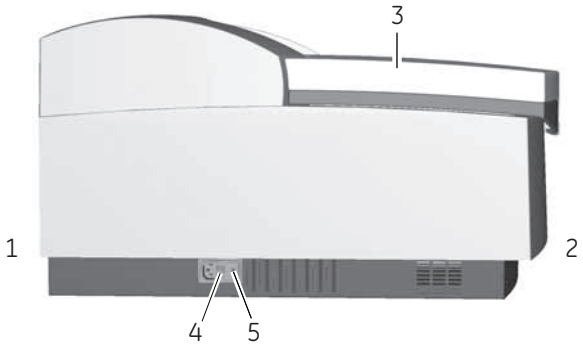


Figure 1-1. Main parts of the Storm instrument.

No.	Description
1	Back
2	Front
3	Sample lid
4	Power switch
5	Fuse holder

Image eraser

The Image eraser is used to erase Storage phosphor screens for reuse.

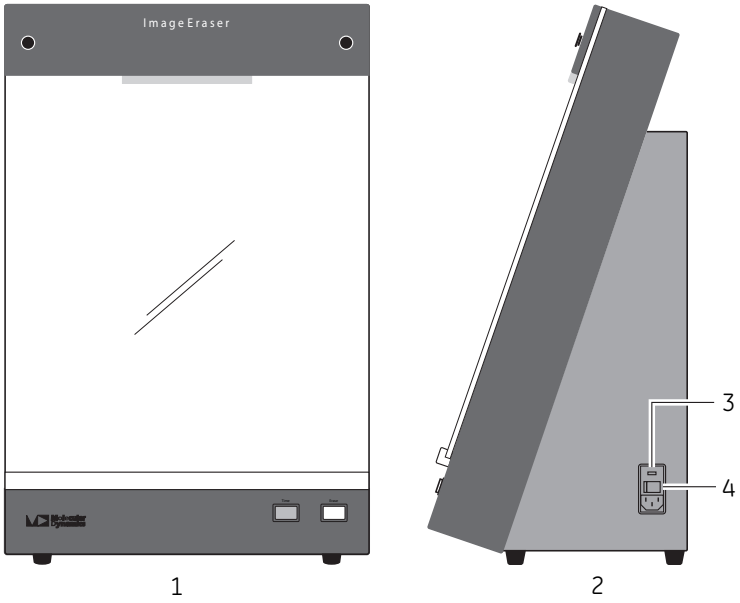


Figure 1-2. Main parts of Image eraser.

No.	Description
1	Front view
2	Side view
3	Fuse holder
4	Power switch

1.4 Control software

STORM Scanner Control software is a complete software for control and supervision of the Storm system. The software runs under the Microsoft Windows operating system.

2 Safety instructions

This chapter describes safety precautions, safety labels, emergency procedures and decommissioning information for Storm.

2.1 Safety precautions

Introduction

Before installing, operating or maintaining the system, 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.

General precautions

WARNING
Do not operate the Storm instrument in any other way than described in the Storm manuals.

WARNING
Operation and user maintenance of the Storm instrument should be performed by properly trained personnel only.

WARNING
Do not use any accessories not supplied or recommended by GE Healthcare.

NOTICE
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.

Personal protection

WARNING
Always use appropriate personal protective equipment during operation and maintenance of Storm system.

WARNING
Hazardous substances. When using hazardous chemical and biological agents, take all suitable protective measures, such as wearing protective glasses and gloves resistant to the substances used. Follow local and/or national regulations for safe operation and maintenance of the system.

Installing and moving the instrument

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

WARNING
Protective ground. The Storm instrument must always be connected to a grounded power outlet.

WARNING
Make sure that the instrument is placed on a stable flat bench with adequate space for ventilation.

WARNING
Access to power switch and power cord. The power switch must always be easy to access. The power cord must always be easy to disconnect.

WARNING
Supply voltage. Make sure that the supply voltage at the wall outlet corresponds to the marking on the instrument, before connecting the power cord.

CAUTION
Heavy object. The Storm instrument weighs approximately 75 kg. Two people are required to lift the system safely.

System operation

WARNING
Electrical shock hazard after spillage. If there is a risk that large volumes of spilled liquid may penetrate the casing of the Storm instrument, immediately switch off the instrument, disconnect the power cord, and contact an authorized service engineer.

WARNING
If the cover or doors of the Storm instrument become damaged, do not continue to use the instrument. Contact an authorized service engineer.

WARNING
Do not attempt to defate the safety interlocks on the sample lid or try to gain access to the interior of the instrument through any other opening. Exposure to laser light can cause injury. For example, viewing the laser light directly can cause blindness.

CAUTION
Class 3B Laser radiation when open and interlock defeated. Avoid exposure to the beam.

Maintenance

WARNING
Electrical shock hazard. All repairs should be done by service personnel authorized by GE Healthcare. Do not open any covers or replace parts unless specifically stated in the user documentation.

WARNING
Disconnect power. Always disconnect power from the instrument before performing any maintenance task.

WARNING
Do not perform maintenance or repair the equipment before the interlock switch is in the service position.

2.2 Laser-light safety

General

The Storm instrument is a Class I laser instrument that houses a Class IIIB laser and, under the specified operating procedures, does not allow operator exposure to laser light. The laser, with power up to 5 mW, is accessible in the interior of the instrument.

The safety interlocks in the Storm instrument are designed to prevent you from being exposed to the laser beam. If you open the sample lid while the scanner is in operation, the laser turns off.

WARNING
Do not perform maintenance or repair the equipment before the interlock switch is in the service position.

Interlock during service

Storm is provide with a mechanically locked interlock switch that deactivates the laser during service. Before servicing, loosen the locking bolt and lift the locking plate so that the interlock switch is easily accessible. Move the interlock switch into the service position, see *Figure 2-1* and *Figure 2-2*.

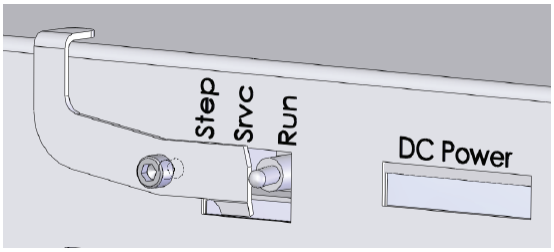


Figure 2-1. Interlock switch in normal position with Mechanical lock.

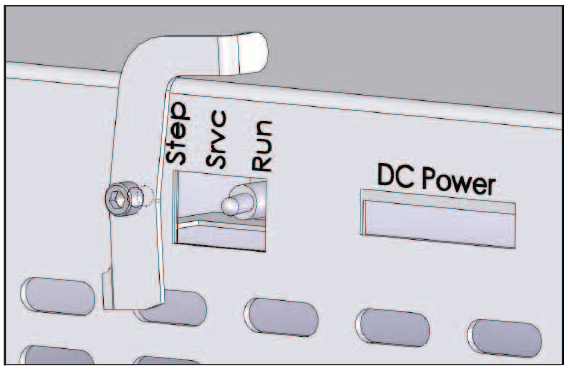
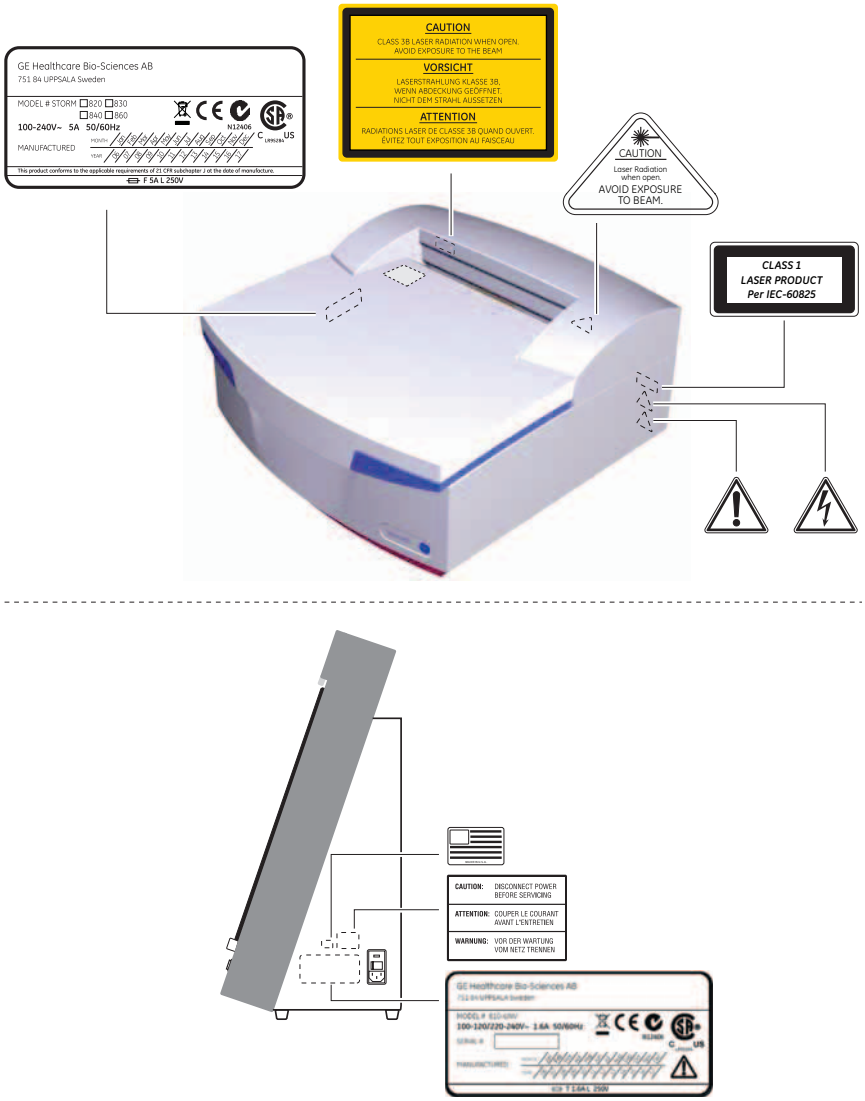


Figure 2-2. Interlock with mechanical lock loosened.

2.3 Labels

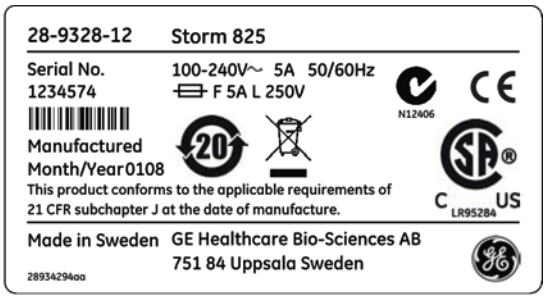
Location of labels

The illustration below shows the location of labels on the Storm instrument and Image eraser.



Storm instrument identification label

The illustration below shows an example of the serial number certification label that is attached to the Storm instrument. The label is located on the underside on the sample lid.



Laser-light warning labels

The labels shown below warn of exposure to laser light. They are located on the main cover of the Storm instrument, under the SCSI cover.

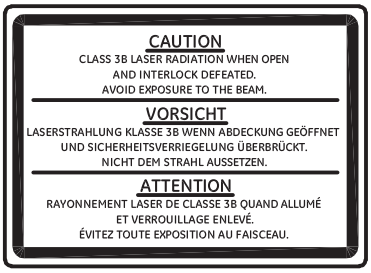
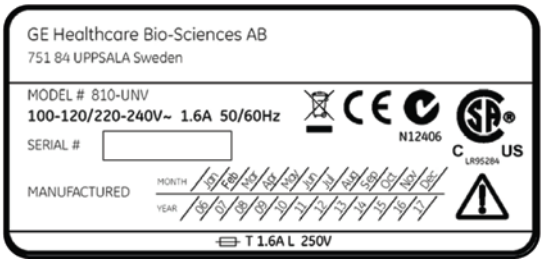
Label	Description
	The Storm instrument conforms to the international standard IEC-60825.
	**CAUTION!** Avoid exposure to the laser beam when the lid is open.
	**CAUTION!** Class 3B Laser product when open and interlock defeated. Avoid exposure to the beam. Do not attempt to defeat the safety interlocks on the sample lid or 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.

Image eraser identification label

The illustration below shows an example of the serial number certification label that is attached to the Storm instrument. The label is located on the right side of the Image Eraser.



Symbols used in safety labels

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

Labels concerning use of hazardous substances

Label	Description
	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.

2.4 Emergency procedure

This section describes how to do an emergency shutdown of the Storm instrument. This section also describes the result in the event of power failure.

Emergency shutdown

In an emergency situation, do as follows to stop the run:.

Step	Action
1	In the STORM Scanner Control, click ***CANCEL SCAN*** to abort the scan.
2	If required, press the power switch to the **OFF** position to turn the instrument off.

Power failure

The result of a power failure depends on which unit that is affected.

Power failure to...	will result in...
Storm instrument	• The run is interrupted immediately, 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	• The computer shuts down in an undefined state. • The run continues, but data cannot be saved.

2.5 Recycling information

The equipment shall be decontaminated before decommissioning and all local regulations shall be followed with regard to scrapping of the equipment.

Disposal, general instructions

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

Recycling of hazardous substances

Storm instrument contains hazardous substances. Detailed information is available from your GE Healthcare representative.

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 your equipment.

3 Installation

This chapter provides information regarding installation of the Storm system.

For detailed information on installation, see *Storm Installation Guide*.

3.1 Site requirements

Parameter	Requirement
Power supply	15 A, 100-120 V or 10 A, 220-240 V
Line frequency	50 to 60 Hz
Ambient temperature	15°C to 35°C
Placement	Stable laboratory bench
Humidity	10% to 95%, non-condensing

3.2 Transport

CAUTION
Heavy object. The Storm instrument weighs approximately 75 kg. Two people are required to lift the system safely.

Before moving the instrument:

1 In the ***STORM Scanner Control*** window, choose ***Park Head and Exit*** from the ***File*** menu.

2 Turn off the instrument, computer, and peripheral devices.

3 Disconnect the power cords and the SCSI connection(s).

4 Grasp the metal bottom of the system firmly.

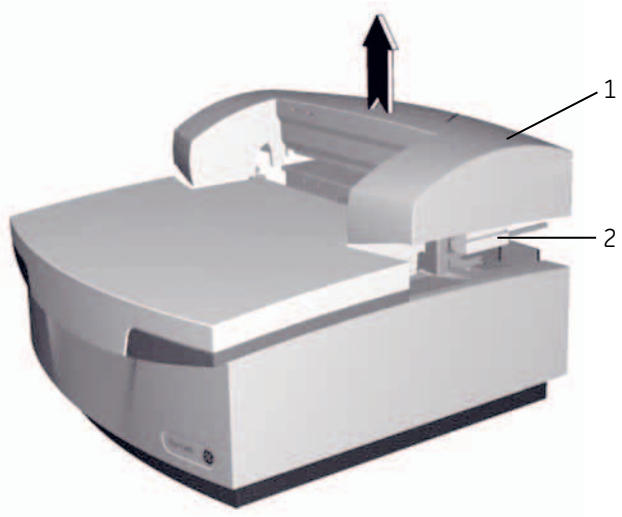
3.3 Unpacking

- Check the equipment for any apparent damage before starting installation.
- Document any damage carefully and contact your GE Healthcare representative.

3.4 Connections

Removing SCSI cover

On the Storm instrument, grasp the two forward extensions of the SCSI cover, pull upward, and then remove the cover.



No.	Description
1	SCSI cover
2	SCSI connector

Communication

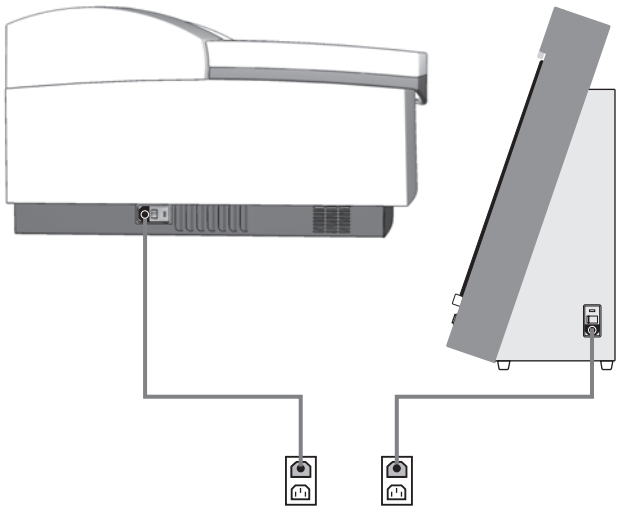
Connect a SCSI cable between the computer and the lower Storm SCSI port. Add a terminator after the last device in the SCSI chain.

NOTICE
Make sure the total length of all the SCSI cables (including the internal cables) does not exceed 6 m. (The cable length inside the instrument is 0.3 m.)

Electrical power

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

Connect the power cords of the Storm instrument and Image eraser to grounded power outlets specified in *Chapter 3.1 Site requirements, on page 23*.



4 Operation

This chapter provides basic instructions for working with Storm. For detailed instructions in English, see the Storm *User Manual*.

4.1 Operation overview

There are two scanning options for Storm instruments:

- Storage phosphor screen autoradiography
- Fluorescent scanning (available for Storm 845 and 865)

A workflow for performing a scanning is described in the table below.

Step	Action	Instructions in
1	Start the instrument and STORM Scanner Control	*Section 4.2*
2	Expose Storage phosphor screen to a sample	*Section 4.3* (Storage phosphor screen autoradiography option only)
3	Clean the instrument	*Section 4.4*
4	Place fluorescent sample or Storage phosphor screen in instrument	*Section 4.4*
5	Select scanning mode	*Section 4.4*
6	Set scanning parameters	*Section 4.4*
7	Scan sample or Storage phosphor screen	*Section 4.4*
8	After scanning procedures	*Section 4.5*

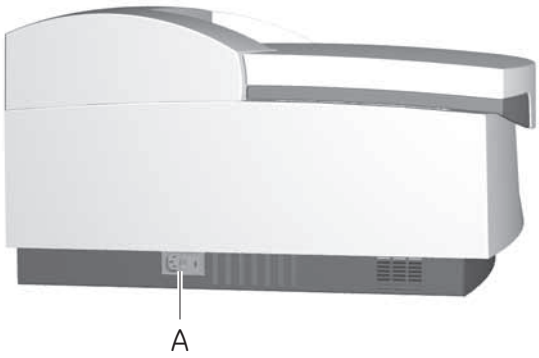
Principle

Performing Storage phosphor screen autoradiography is a two step procedure, first the Storage phosphor screen is exposed to the sample inside an Exposure cassette and, secondly, the Storage phosphor screen is scanned in the instrument. For information of available Storage phosphor screens and Exposure cassettes, see *Appendix A Accessories, on page 65*.

When scanning fluorescent samples the sample is placed inside the instrument.

4.2 Starting the instrument and STORM Scanner Control

1 Press the **Power** switch (A) on the lower left side of the instrument.



2 The power indicator light on the top of the instrument turns on and remains red during the self-test sequence, which takes about 45 seconds.

3 The power indicator light then turns green.

Note: *After you turn on the Storm instrument, wait approximately 15 minutes for the instrument to warm up before you start the first scan.*

4 Turn on peripherals, if present, according to the manufacturers' instructions.

5 Turn on the computer and monitor according to the manufacturer's instructions.

Note: *If the computer was already on when you turned on the Storm instrument, you must restart the computer*

6 Locate and double-click the STORM Scanner Control shortcut icon on the desktop or select STORM Scanner Control using the ***Start*** menu.

7 The ***STORM Scanner Control*** window appears.

4.3 Preparations before start

Sample recommendations

General sample handling recommendations

- Make sure the sample is free from dust and powder. Wear powder-free gloves when handling the samples.
- Dust and powder fluoresce and scatter light. This causes artifacts on the images and can interfere with the quantitation.

Storage phosphor screen sample handling recommendations

NOTICE
Do not use wet gels in combination with tritium (TR) screens.

NOTICE
Do not directly expose the Storage phosphor screen to wet chemicals of any kind, especially not to organic solvents.
Since organic solvents penetrate plastic, plastic wrap will not protect the Storage phosphor screens from organic solutions.

NOTICE
Neutralize alkaline denaturing gels and make sure the sample is free from acetic acid vapors and organic solvents.
These materials are harmful to the Storage phosphor screens and can penetrate plastic wrapping.

- Protect a general-purpose (GP) screen from contamination by separating a wet gel from the screen with a piece of plastic wrap or polyester film. Wrap the plastic wrap completely around the gel so that liquid cannot leak out.
  This precaution reduces screen contamination with minimum attenuation of the signal.
- Do not use scintillants or enhancers, such as PPO, EN3HANCE™, and Amplify™. These products interfere with the proper function of the screen.

Fluorescent sample handling recommendations

- Always rinse the gloves with distilled or tap water before handling the sample and before preparing the reagent.
- Handle filter solutions as follows
  - Remove dust particles by filtering all the stock solutions used to prepare the sample, sample matrix, and buffers.
  - Use clean, rinsed containers.
  - When diluting clean reagents to working concentration, use distilled water collected in a rinsed container so that you do not have to filter the solutions again.
  - If available use dust free reagents, such as fluorescent labels. They require no further filtration.
- Avoid fluorescent indicator dyes.
  Many of the commonly used electrophoresis tracking dyes fluoresce. Whenever possible, put the tracking dye in a separate lane. Alternatively, dilute the indicator dyes as much as possible.

- Avoid excessive exposure to light.
  Fluorochromes differ greatly in their sensitivity to light-induced degradation (photobleaching). When working with sensitive fluorochromes and fluorescently labeled samples, use low-light conditions.

Recommendation for selecting the label for the fluorescence scanning

- Blue-excited fluorescence
  Detects samples labeled with fluorochromes that have emissions longer than 520 nm. Use the Blue (450-nm) excitation setting on the Storm 865 and 845.
- Red-excited fluorescence
  Detects samples labeled with fluorochromes that have emissions longer than 650 nm. Use the Red (635-nm) excitation setting on the Storm 865.
- Dual-label fluorescence
  On the Storm 865, you can label the sample with two fluorochromes and create a multichannel image. Use the Blue (450-nm) excitation setting with a fluorochrome that has an emission longer than 520 nm. Use the Red (635-nm) excitation setting with a fluorochrome that has an emission longer than 650 nm.

Low-fluorescent sample handling recommendations

For fluorescent samples requiring high sensitivity or highly accurate quantitation, the material sources stated in *Table 4-1* have been tested and found to have low background.

Table 4-1. Material recommendations for low-fluorescent sample handling.

Material	Recommendation
Gels, general	Background fluorescence contributed by the gel matrix increases with gel thickness. Always use the thinnest gel practical for your experiment, especially for agarose gels. Make sure your glass plates are absolutely clean before you pour the gel. Grease and fingerprint oils from the plates can stick to the gel surface and attract dust and fluorescent dyes.
Agarose gels	Make sure the agarose is completely dissolved and well-mixed before pouring your gel. Also, avoid generating bubbles when mixing and pouring. Uneven agarose concentration and bubbles affect light scatter and can cause artifacts and interfere with quantitation.
Polyacrylamide gels	Polyacrylamide gels are usually clear and thin (less than 1 mm). The background contribution from the gel material is generally very low.
Solvents	Spectroscopic-grade solvents have the lowest autofluorescence.

Material	Recommendation
Membranes	You should scan a test piece of each type of membrane you plan to use and check that the background is low enough for your purposes.
Transparency support	To avoid contaminating the glass platen and sample lid, you can place a sample, such as a membrane, between two pieces of transparency material. For detailed instructions, see the *Storm User Manual*.

Prepare Storage phosphor screen for exposure

Note: *This section is valid only when performing Storage phosphor screen autoradiography.*

Recommendations for erasing screens

NOTICE
The Storage phosphor screen consists of a relatively soft matrix. Handle the screen on the edges or back only. Do not touch the white phosphor surface.

NOTICE
Wear powder-free gloves to avoid contaminating the screen with skin oils or powder.

NOTICE
Do not fold, roll, or gouge an unmounted screen.

- To avoid contaminating the screen or the Image eraser, make sure that both the screen and Image eraser are free from radioactive contamination before placing the screen on the Image eraser. (See *Sections 5.4 and 5.6*)
- Erase the screen immediately before exposure as well as after scanning. Cosmic radiation creates background on screens left unused for long periods of time.
- Erase the screen until the recorded signal is fully removed.
- Because a TR screen is not possible to decontaminate, protect the Image eraser and the screen from possible contamination by placing plastic wrap or polyester film between the TR screen and the Image eraser surface.

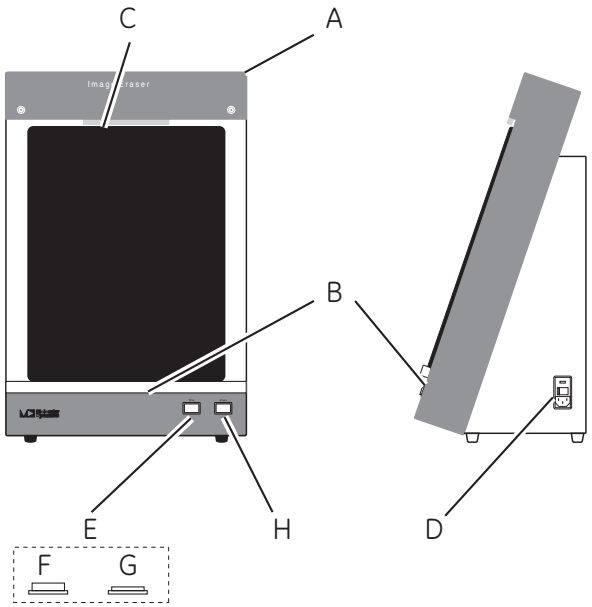
Preparation procedure

1 Clean the screen before exposure, see *Section 5.4 Storage phosphor screen, on page 54* for cleaning instructions.

2 Erase the screen.
The Image eraser is used to erase any residual signal from screens.

a) Hold the screen by its edges with the white side facing the Image eraser.

b) Place the screen on the Image eraser (A) and rest the screen on the lip (B) of the Image eraser.



c) To erase two small screens at once, suspend an unmounted screen from the clip at the top of the Image eraser (C).

NOTICE
Do not use the clip on a TR screen. The clip can damage the surface of the screen.

d) Turn the Image eraserImage eraser power switch on (D).

e) Set the Image eraser time by pressing the **Time** button (E).

- Select *Normal* (F) position (out) for standard samples. The Normal setting takes approximately 10 minutes.
- Select *Extended* (G) position (in) if the background or residual image is high (e.g., the original image contained readings of 104 counts and higher). The Extended setting takes approximately 20 minutes.

f) Press the **Erase** button (H).

3 Check for contamination of the screen between exposures or if the screen has not been used for several days.

a) Clean and erase the screen as described above.

b) Store the screen in a clean, light-tight box.

c) Provide enough time to register the contamination as an image on the screen.

d) After storage, scan the screen (see *Section 4.4 Performing a scanning, on page 37*) and examine the image.

- If contamination is still present, clean and erase the screen again and re-check for contamination.
- If no contamination appear on the image the screens is ready to use.

Storage phosphor screen exposure

Note: *This section is valid only when performing Storage phosphor screen autoradiography.*

Recommendations for storage phosphor screen exposures

- Use an Exposure cassette to expose the screen to the sample.
- Expose thick samples, such as wet gels or TLC plates which are too thick to fit in an Exposure cassette, together with a screen in a light-tight drawer or similar.
- To expose multiple samples on the same screen, make sure the samples have the same thickness.
- It is important to place the screen on the sample correctly the first time. Adjusting the position of the screen can result in a double exposure.
- If you must adjust the position, remove the screen and erase it.

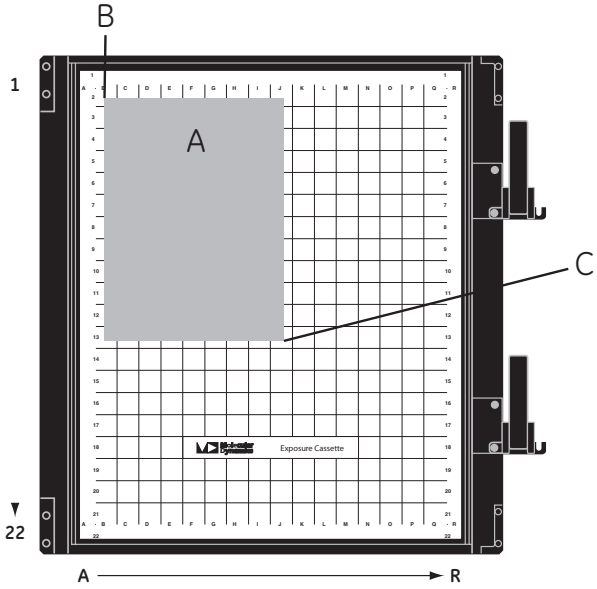
Exposure procedure

1 Select the Exposure cassette size and style that matches the storage phosphor screen you want to use with the sample, see *Appendix A Accessories, on page 65*.

NOTICE
Do not put uncovered wet gels in an Exposure cassette.

2 Use a damp cloth to clean the grid surface inside the Exposure cassette and remove any radioactive contamination.

3 Place the sample on the grid.

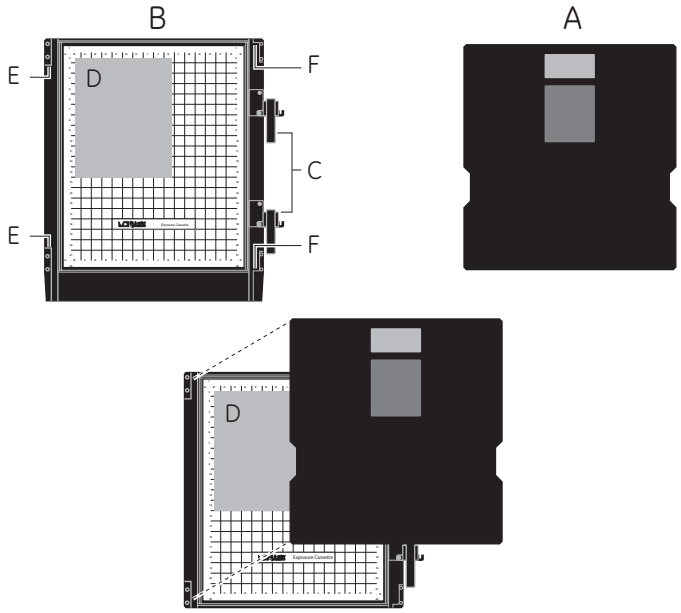


It is recommended to:

- place the sample (A) face up on the grid and in the upper left corner at least 1 cm from the edge of the screen (B).
- put the top of the sample (A) toward the top end of the cassette.
- If exposing multiple samples to one screen, place the samples close together.
- align the lanes and rows of the sample with the edges of the grid so that the scanned image will be straight.

4 Make a note of the coordinates of the upper left (B) and lower right (C) corners of the area you want to scan. The grid coordinates in the Exposure cassette match the coordinates in the Storm instrument.

5 Place a *mounted* screen (A) in an Exposure cassette (B)



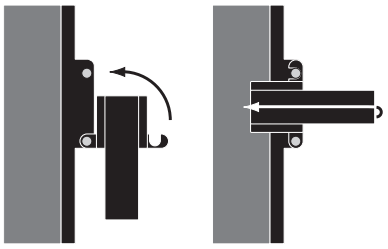
a) Make sure the clamp(s) on the cassette (C) are rotated out of the way.

b) The white side of the screen should face down, toward the sample (D).

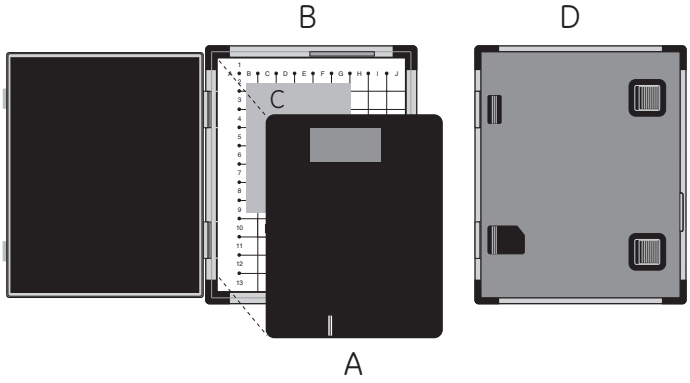
c) Place the edge of the screen into the groove (E) located along the side of the Exposure cassette opposite the clamp(s).

d) Gently lower the screen into place in the corner guides (F), making sure the screen fits into the guides correctly.

e) Close the Exposure cassette by rotating each clamp counterclockwise until it stops at the pin and then flipping the lever over to lock the screen into place.



6 Place an *unmounted* screen (A) in an Exposure cassette (B).



a) The white side of the screen should face down, toward the sample (C).

b) Gently lower the screen into place over the grid area in the cassette. The screen should be centered over the grid area and should lie straight and flat in the cassette

c) Close the Exposure cassette and press the lid shut until the lock clicks (D).

Sample Storage phosphor screen exposure

Note: *This section is valid only when performing Storage phosphor screen autoradiography.*

NOTICE
Condensation can destroy the screen. If you are exposing a screen to a frozen sample, place the screen in a sealed, dry environment, such as a sealed bag. After exposure, allow the screen to come to room temperature before removing it from the bag and scanning.

1 Perform Storage phosphor screen autoradiography at room temperature.

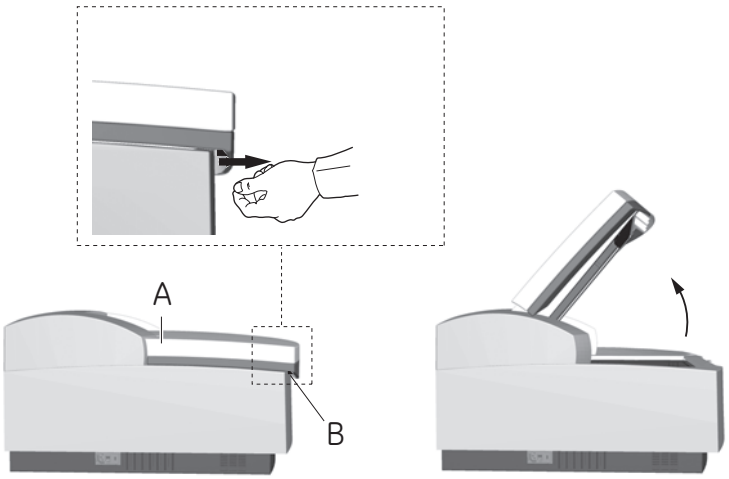
2 Estimate approximately one-tenth of the exposure time of an x-ray film when exposing Storage phosphor screens.

4.4 Performing a scanning

Note: *If radioactive samples are used the instrument should periodically be checked for contamination from radioactive samples. Check the glass platen and the surface of the inner lid according to Section Checking for contamination, on page 52.*

Load sample or Storage phosphor screen to instrument

1 Open the sample lid (A) by grasping the lid release under the center front of the sample lid (B) and pull the release forward until the lid opens. Raise the lid all the way.



2 Inspect and clean of the instrument before use.

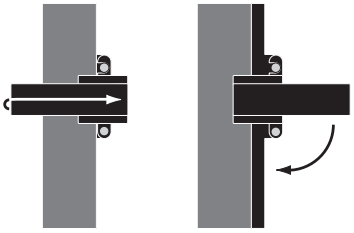
a) Clean the glass platens before and after every scanning, see *Section Cleaning, on page 52* for instructions.

b) Inspect and, if required, clean the sample lid inner surface according to *Section Cleaning, on page 52*.

3 *If performing* Storage phosphor screen *autoradiography:*
Place a screen in the instrument.

a) Open the latch on the Exposure cassette.

- For *mounted* screens—Flip the lever(s) on the cassette and then rotate the clamp(s) clockwise so that they no longer cover the screen.



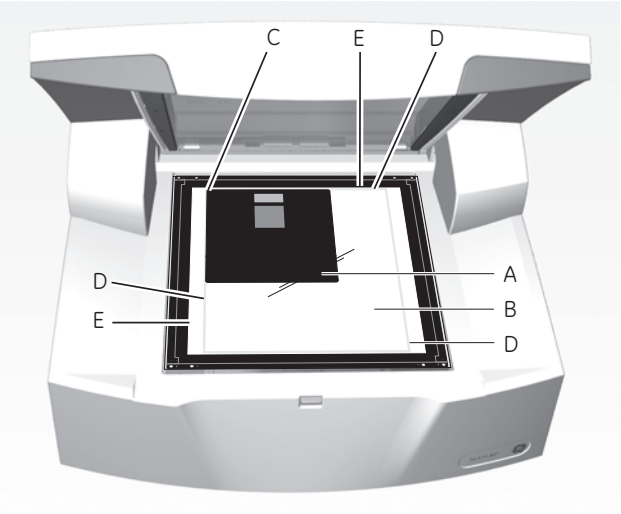
- For *unmounted* screens—Open the latch and raise the lid of the cassette.

b) Remove the Storage phosphor screen. If the sample sticks to the screen, gently peel off the sample.

Note: *To keep unmounted screens from moving and causing a double image, press down on one edge of the screen and then lift up the opposite edge of the screen.*

c) Protect the screen from direct light and proceed *immediately* to load the Storage phosphor screen into the scanner.

d) Load the Storage phosphor screen (A) on the instrument glass platen (B) with the white, phosphor side of the screen face down.



Align the upper left corner (C) of:

- Unmounted large or small screens:
  Align the top and left edges with the back and left etched lines (D) on the glass platen.
- Mounted large screens:
  Align the top and left edges of the metal plate with the inner edge of the black grid labels at the back and left edges of the glass platen (E).
- Mounted small screen
  Insert the L-shaped adapter by aligning the outer edge of the adapter with the inner edge of the black grid labels at the back and left edges of the glass platen (E). Next, align the top and left edges of the metal plate with the inner edges of the adapter.

e) Gently lower the screen on the glass platen.

Note: *An unmounted screen may not lie completely flat against the glass. When you initiate the scan, the instrument lowers the inner section of the lid to hold the screen flat.*

4 *If performing fluorescent scanning:*
Place a sample in the instrument.

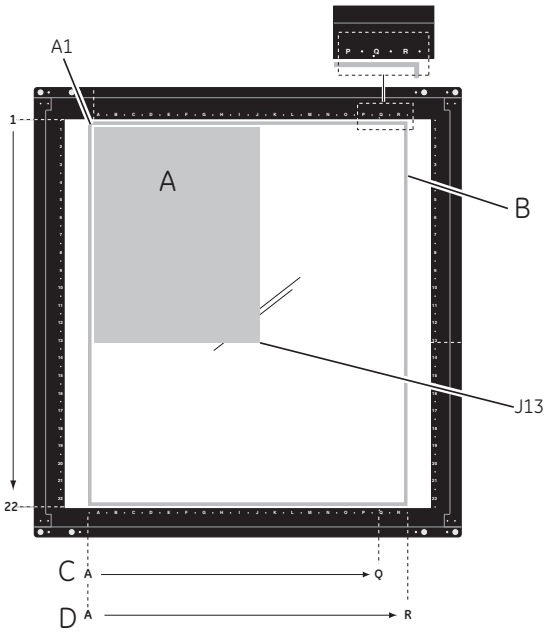
Note: *Make sure you place the sample in the correct position when you first set it down. Any fluorescent material left on the glass platen when you move the sample can result in a double image.*

Before you load a sample, determine how to position it on the glass platen:

a) Sample orientation.
Determine whether to place the sample face up or face down on the glass platen. The Storm system illuminates the sample and collects data from underneath the sample. Make a note of the orientation of the sample.

- For a one-sided, opaque sample (such as a membrane or TLC plate), place the sample face down.
- For a transparent sample (such as a polyacrylamide gel), place the sample either face up or face down.
- If the sample is physically uneven on one side (such as an agarose gel), place the smooth side down. This allows the sample to lie flat.

b) Sample position.



The sample (A) should be positioned near the upper left corner of the scan area. Each lettered or numbered grid segment is marked by two dots. For this example the grid coordinates are A1 and J13.

c) Maximum available scan area for:

- Blue-excited fluorescence
  Within the etched outline (B) on the glass platen except that the narrow segment (approximately 3 cm) to the right of the extra dot in section Q is not scanned by the Storm 865 and 845. (C)
- Red-excited fluorescence
  Within the etched outline (B) on the glass platen when scanning with the Storm 865 (D).

d) To record multiple samples during the same scan, place the samples close together. For good quality of results the samples should have the same thickness.

e) Align the lanes and rows of the sample with the edges of the grid on the glass platen so that the scanned image will be straight.

f) *Place a sample on the glass platen (for sandwich gels see step 4g):*
Hold the sample by the edges or use a clean plastic spatula (for gels) or forceps (for membranes) to handle the sample.
Gently lower the sample onto the glass starting at one edge.
Do not trap air bubbles under the sample or scratch the glass.

Note: *For wet samples, squirt a little buffer or distilled water on the glass platen. Make sure you wipe off the excess buffer or distilled water.*

Note: *Do not touch the glass platen or the part of the sample that will be read by the Storm instrument. Oil from fingerprints and powder from gloves, even thoroughly washed gloves can leave a print that can be detected.*

g) *Place a sandwich gel on the glass plate:*
Squirt approximately 0.5 to 2 ml of deionized water on the glass plate. Hold the sandwich gel by the edges lower the sandwich gel diagonally until the lower right corner of the gel rests on the glass plate. Do not trap air bubbles under the sample.

Note: *Do not touch the part of the sandwich gel that will be read by the Storm instrument. Do not touch the glass plate. Oil from fingerprints and powder from gloves, even thoroughly washed gloves, can leave a print that can be detected.*

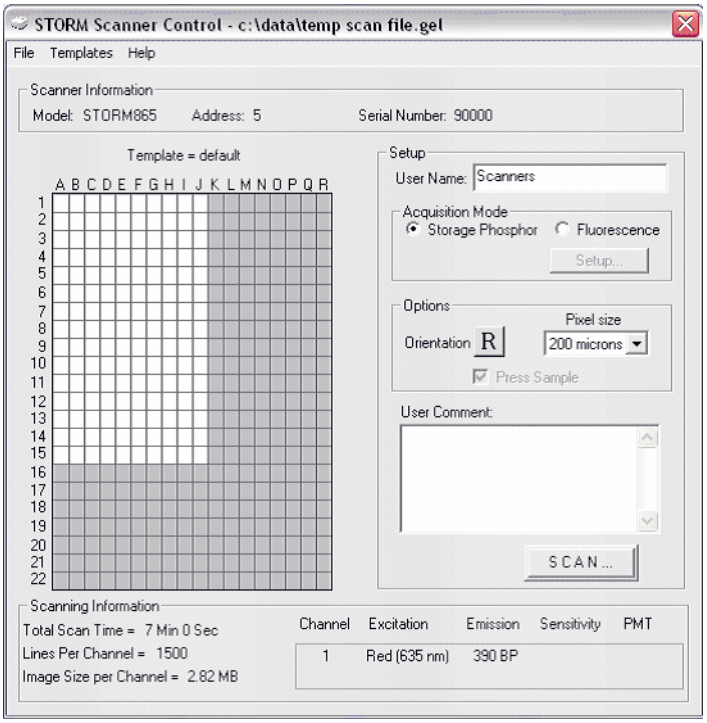
h) Make a note of the coordinates of the upper left and lower right corners of the area you want to scan (see step 4b in this instructions for an example). This information will be used when setting scanning area.

5 Close the sample lid and press it down until the latch clicks. The screen or sample is now ready for scanning.

Select scan parameters

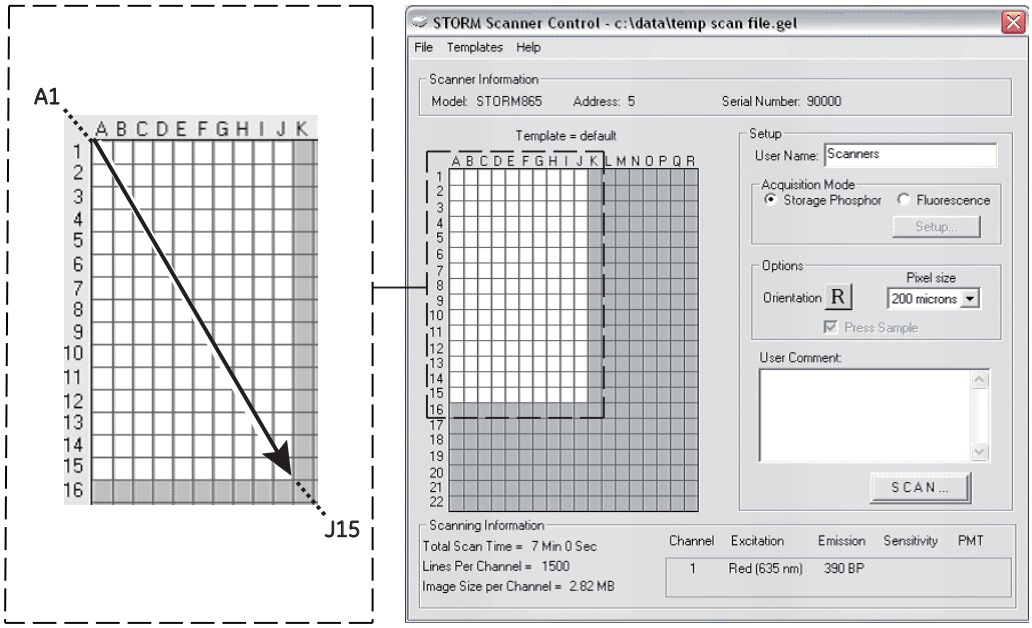
1 In the ***Setup:Acquisition Mode*** area of the ***STORM Scanner Control*** window click:

- ***Storage Phosphor*** to select Storage phosphor scan acquisition mode.
- ***Fluorescence*** to select fluorescence scan acquisition mode.



2 The grid in the ***STORM Scanner Control*** window allows you to select the scan area. The letter and number markings correspond to the markings in the Exposure cassette and on the glass platen of the Storm instrument.

The white rectangle on the grid designates the area to scan. Use either the current scan area or select a new one.



3 To select a new scan area:

a) Place the pointer in the grid square corresponding to the upper left corner of the area you want to scan (A1).

b) Drag the pointer to the grid square corresponding to the lower right corner of the area you want to scan (J15 in this example).

Note: *For blue-excited fluorescence, the maximum width of the scan area is from section A to the middle of section Q. You cannot scan a narrow strip along the right side of the grid.*

c) Release the mouse button. The scan area you selected appears in white.

4 Set sample orientation.

a) Click the ***Orientation*** button in the ***Set:Options*** area.

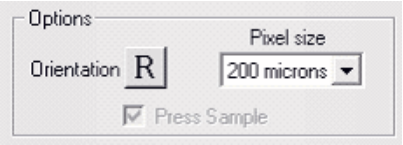
b) The orientation buttons appear.

Symbol	Sample orientation
R	The top of the sample is face up, toward the low-numbered end of the Exposure cassette.
R	The top of the sample is face up, toward the right side of the Exposure cassette.
R	The top of the sample is face up, toward the high-numbered end of the Exposure cassette.
R	The top of the sample is face up, toward the left side of the Exposure cassette.
R	The top of the sample is face down, toward the right side of the Exposure cassette.
R	The top of the sample is face down, toward the high-numbered end of the Exposure cassette.
R	The top of the sample is face down, toward the left side of the Exposure cassette.
R	The top of the sample is face down, toward the low-numbered end of the Exposure cassette.

c) Click the button that represents how you placed the sample in the Exposure cassette (Storage phosphor screen autoradiography) or on the instrument glass platen (fluorescent scanning).

d) During the scan, the STORM Scanner Control maps the pixels to display the image of your sample face up and top-end up.

5 Select pixel size:



Choose the pixel size from the ***Pixel size*** list in the ***Setup:Options*** area:

- For most standard electrophoresis samples:
  choose 200 microns, which provides the fastest scan time and the smallest image file size. The 200-µm pixel size produces 50 data points per cm and 100 data lines per grid square.
- For samples requiring high resolution (such as DNA sequencing):
  choose 100 microns. The 100-µm pixel size produces 100 data points per cm and 200 data lines per grid square.
- For samples requiring very high resolution (such as whole body autoradiography):
  choose 50 microns. The 50-µm pixel size produces 200 data points per cm and 400 data lines per grid square.

6 Optional for fluorescent samples: Select press sample parameter.
Tick the ***Press Sample*** check box if a sample that does not lie flat against the glass platen of the instrument, such as a dry membrane or filter paper, is to be scanned. The inner lid of the Storm instrument will go down to press the sample flat.

Note: *Do not select* ***Press Sample*** *if you are scanning wet membranes, wet gels, or soft samples. Pressing wet or soft samples can damage the instrument. In addition, pressing a soft sample can distort the scanned image.*

7 Optional: Enter user comments.

If desired, comments to the scan can be entered in the ***User Comment*** box in the ***Setup*** area. The comments are for reference only and do not affect the scan.

8 The ***Scanning Information*** area displays the approximate image file size, the approximate scan time, and the number of lines per channel.

9 STORM Scanner Control saves the scan parameters with the image. You can view, but not change, these parameters in analyzing software.

10 Optional: Use a template.
Using a template is a quick way to retrieve the scan parameters you use frequently. The template contains the scan parameters for the selected instrument, which include the grid area, scan acquisition mode, sample orientation, pixel size, and image analysis software. Comments in the ***User Comment*** box are not saved with the template. See Storm *User Manual* for instructions how to create and use a template.

11 Close the sample lid and press it down until the latch clicks. The sample or screen is ready to scan.

Starting the scan

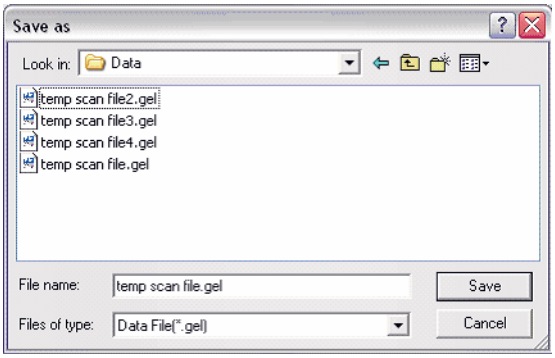
NOTICE
Never turn off the Storm instrument or disconnect the SCSI cable while scanning. You can severely damage the internal mechanism of the instrument.

Note: *Keep the sample lid closed while scanning. Opening the lid shuts off the light source, aborts the scan, and saves the data already collected.*

1 Make sure that the Storage phosphor screen is in place, the sample lid is shut, and all the parameters are correct in the ***STORM Scanner Control*** window.

2 Click the ***Scan*** button in the ***STORM Scanner Control*** window.

3 The ***Save As*** window appears.



a) Type a name for the scan in the ***File name*** box. STORM Scanner Control creates an image file and stores it using the Data File (.gel) type.

b) Optional: Change folder location of the file. Default folder is the ***Data*** folder.

Note: *Saving the scanned data to a folder located on a removable media disk drive can cause a loss of data. It is recommended to use a folder on the computer hard drive. Move the image file to the removable media after scanning is completed.*

c) Click ***Save*** to start the scan.
During the scan, the inner lid of the Storm instrument lowers to hold the screen flat against the glass platen of the instrument.

4 Monitoring the scan progress.
After you start the scan, the ***Scan in Progress*** window appears, and the green **Scan** indicator light on the top of the instrument blinks.
As the instrument scans the sample or screen, STORM Scanner Control displays the image in the ***Scan in Progress*** window and additional information.

- To abort the scan, click ***Cancel Scan*** in the ***Scan in Progress*** window.
  A message appears asking if the data file should be deleted.

4.5 Procedures after scanning

After scanning procedures

After scanning

1 STORM Scanner Control saves the image using the file name you selected in the ***Save As*** window.

2 The ***Scan in Progres***s window displays a ***Complete*** message.
Saturated data appear in red in the Scan in Progress window. If the image appears too saturated, you might not be able to analyze the image correctly.

Note: *Before repeating the scan, verify in analyzing software that the image is not too saturated to analyze.*

Note: *If scanning a Storage phosphor screen use a clean Storage phosphor screen to re-expose the original sample or to a new sample. since the scanning process destroys the signal on the used Storage phosphor screen. To avoid saturation of the data, expose the screen for a shorter time.*

3 The Scan indicator light on the Storm instrument turns off.

4 Open the sample lid on the instrument.

5 Remove the fluorescent sample or Storage phosphor screen.
Storage phosphor screens*:*

- Avoid touching the white side of the screen.
- To pick up a large mounted screen from the glass platen, use the small tabs attached to the metal back. If your screen does not have tabs or the tabs are damaged, contact GE Healthcare Technical Support.
- To lift a large mounted screen, pull up on the round tabs attached to the metal plate, and then slide a finger under the edge of the metal backing.

Fluorescent samples:

- Dispose of the sample using the established procedure in your laboratory.

6 Check the glass platen and sample lid for contamination and clean the glass platen and sample lid of the Storm instrument (see *Section 5.3 Storm instrument, on page 52*)

7 If Storage phosphor screen *autoradiography scanning:*
After each scan:

a) Remove the sample from the Exposure cassette and dispose of the sample using the established procedure in your laboratory.

b) Check the Storage phosphor screen for contamination (*Section Checking for contamination, on page 54*).

c) Clean the Storage phosphor screen (*Section Cleaning, on page 54*).

d) Erase the Storage phosphor screen (*Section Prepare Storage phosphor screen for exposure, on page 31*).

e) Check the Image eraser for contamination and clean the Image eraser (*Section 5.6 Image eraser, on page 55*).

f) *For Storage of* Storage phosphor screens.
Store screens after cleaning, decontamination (if required), and erasure:

- At room temperature.
- Away from sources of radiation, such as strong beta or gamma emitters or x-ray machines.
- In a protective box or in a clean Exposure cassette. Damaged screens are unusable and must be replaced.

g) Check the Exposure cassette for contamination and clean the Exposure cassette (*Section 5.5 Exposure cassette, on page 55*).

Analyzing or preprocessing the scanned image

Open the image of the sample to determine the quality of the scan using an analyzing software.

Turn off instrument and STORM Scanner Control

1 Select ***File:Exit*** to exit the STORM Scanner Control.
If you want to scan again, start the STORM Scanner Control as described (*Section 4.2 Starting the instrument and STORM Scanner Control, on page 28*).

2 Press the **Power** switch on the lower left side of the Storm instrument to the off position to turn off the Storm instrument.

Note: *You can continue to use the computer after you turn off the Storm instrument. However, if you want to use the instrument again, you must follow the procedures described in Section 4.2 Starting the instrument and STORM Scanner Control, on page 28.*

3 Save and close any open files in the computer.

4 Close all the running applications in the computer.

5 Turn off the computer.

6 Turn off any optional peripheral used according to the manufacturers' instructions.

5 Maintenance

This chapter provides instructions for routine maintenance and also a maintenance schedule. Regular maintenance of the Storm system is essential for reliable results.

5.1 General

Keep the instrument dry and clean. Wipe regularly with a soft damp tissue. Let the instrument dry completely before use.

WARNING
Disconnect power. Always disconnect power from the instrument before performing any maintenance task.

5.2 User maintenance schedule

Interval	Instructions/reference
Periodically	Check the instrument for radioactive contamination, see *Section 5.3*.
Before and after each scan	Clean the instrument, see *Section 5.3*.
	Check the Storage phosphor screen for contamination, see *Section 5.4*.
	Clean the Storage phosphor screen, see *Section 5.4*.
	Clean the Exposure cassette, see *Section 5.5*.
	Clean the Image eraser, see *Section 5.6*.

5.3 Storm instrument

Checking for contamination

Periodically, you should check the glass platen and the surface of the inner lid for contamination from radioactive samples.

To check the instrument for radioactive contamination, follow the instruction below.

1 Use a Storage phosphor screen that is erased and free from radioactive contamination.

2 Place the white side of the screen on the glass platen of the Storm instrument.

3 Leave the screen in the instrument overnight.

4 Scan the screen (*Section 4.4*).

- If an image that looks like a gel or blot appears in the ***Scan In Progress*** window, the instrument is contaminated.
- If a white or gray image appears, the image was probably created by background contamination and the instrument is not contaminated.

5 To decontaminate the instrument, follow the instructions below to clean the glass platen.

Cleaning

Clean the glass platen

Clean the glass platen according to this instructions before and after you scan each sample.

Recommendations:

- Wear powder free gloves to protect your hands and to avoid transferring oils from your hands onto the glass platen.
- Do not use window cleaners. They contain ingredients that can fluoresce.
- The use of acetone or the excessive use of ethanol can shorten the lifetime of the instrument.
- Protect the glass from scratches. Scratches interfere with accurate imaging and quantitation.

To clean the glass platen, follow the instruction below.

1 Grasp the lid release (*Fig 5-1 B*) under the center front of the sample lid (*Figure 5-1 A*) and pull the release forward until the lid opens. Raise the lid all the way.

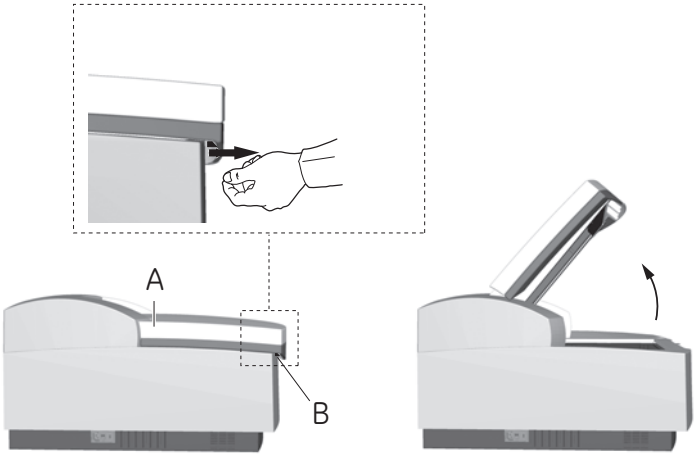


Figure 5-1. Opening sample lid.

2 (Optional) If the instrument has been used for fluorescent scanning and fluorescent material has come in direct contact with the glass platen, moisten a lint-free cloth with 10% hydrogen peroxide and wipe the glass several times.

3 Clean the glass with distilled water and a clean, lint-free cloth or paper. If visible spots remain, clean the glass first with 75% ethanol and then with distilled water.

Clean the sample lid

Under normal circumstances, the surface of the inner lid should not come in contact with contaminants. However, it is good laboratory practice to check the surface periodically for contamination. For example, you can perform a wipe test, or use the procedure that you used to check the glass platen (*Checking for contamination, on page 52*) except place the screen in the instrument with the phosphor side up.

If necessary, clean the surface with a damp (not saturated) cloth moistened with a small amount of distilled water. If visible spots remain, clean the surface first with 75% ethanol and then with distilled water.

NOTICE
Use liquid sparingly when cleaning, excess liquid may leak into the equipment and damage it. Use damp cloth only, do not pour or spray liquid onto the equipment.

Note: Wear gloves to protect your hands when cleaning the sample lid using 75% ethanol.

Note: To prevent liquid from seeping inside the lid or rolling down onto the glass platen, do not spray liquid on the lid.

5.4 Storage phosphor screen

Checking for contamination

Recommended to perform between exposures or if the screen has not been used for several days.

1 Clean and erase the screen (*Cleaning, on page 54* and *Preparations before start, on page 28*).

NOTICE
Before you erase the screen, check the Image eraser for contamination from radioactive samples. To clean the Image eraser, see *Cleaning, on page 54*.

2 Store the screen in a clean, light-tight box.

3 Provide enough time to register the contamination as an image on the screen.

4 After storage, scan the screen (*Section 4.4*) and examine the image.

- If contamination is detected clean and erase the screen again and re-check for contamination.
- If no contamination appear on the image the screens is ready to use.

Cleaning

GP and LE screens

Use a soft cotton cloth and an intensifying screen cleaner (for example, Kodak™ Intensifying Screen Cleaner). Follow the manufacturer's instructions.

Alternatively, use a small amount of alcohol and distilled water.

Do not use a powdered detergent. Any undissolved particles can scratch the surface of the screen.

1 This cleaning procedure removes dust, fingerprints, static electricity, and mild contamination from radioactive samples.

NOTICE
To avoid damaging the LE screen, make sure to dry the screen completely after cleaning the screen using an intensifying-screen cleaner.

TR screens

Use a gentle gas stream or soft brush to remove any particulate matter from the unprotected surface of the screen.

NOTICE
To avoid damaging the TR screen, do not expose the screen to liquids of any sort.

5.5 Exposure cassette

To protect the Exposure cassettes from contamination and damage, observe the following precautions and cleaning procedure:

- Do not place uncovered wet gels in the Exposure cassette. Wet gels can permanently contaminate the cassette. For information on using wet gels, see *Sample recommendations, on page 28*.
- Do not place sharp or heavy objects inside the cassette. A crease or dent in the cassette lining causes uneven pressure on the sample.
- Keep the foam inside the cassette dry.
- Immediately before placing the sample in the cassette, clean the grid surface of the cassette with a damp cloth moistened with a solution of totally rinsable laboratory detergent.

NOTICE
Use liquid sparingly when cleaning, excess liquid may leak into the equipment and damage it. Use damp cloth only, do not pour or spray liquid onto the equipment.

5.6 Image eraser

The surface of the Image eraser must be clean and free of radioactive contamination when you erase screens. Otherwise, the screens will be exposed to radioactive contamination during the erasure process.

To clean the Image eraser, follow the instruction below.

WARNING
Because the Image eraser uses high voltage, always turn off and unplug the Image eraser before cleaning the surface.

1 Turn off the Image eraser and disconnect the power cord.

2 Clean the surface of the Image eraser with a damp cloth moistened with a solution of totally rinsable laboratory detergent. Do not use powdered detergents. Any undissolved particles can scratch the surface of the Image eraser.

NOTICE
Use liquid sparingly when cleaning, excess liquid may leak into the equipment and damage it. Use damp cloth only, do not pour or spray liquid onto the equipment

3 Verify that the Image eraser surface is free from radioactive contamination.

4 Reconnect the power cord to a grounded mains outlet and turn on the Image eraser.

5.7 Replacement of fuses

General

WARNING
Disconnect power. Always disconnect power from the instrument before replacing fuses.

Refer to *Section 7.1 Specifications, on page 63* for information about the fuse types and rating.

WARNING
If a fuse requires repeated replacement, do not continue to use the instrument. Contact an authorized service engineer.

WARNING
For continued protection from fire hazard, replace only with same type and rating of fuse.

Changing fuses in the Storm instrument

You can use the Storm instrument with either a 220–240 V (230 V) power source or a 100–120 V (115 V) power source. The power supply in the instrument switches to the correct voltage automatically. The fuse box is located to the right of the power switch (*Storm instrument, on page 10*).

To change a fuse in the Storm instrument, follow the instruction below.

1 Turn off the Storm instrument and disconnect the power cord.

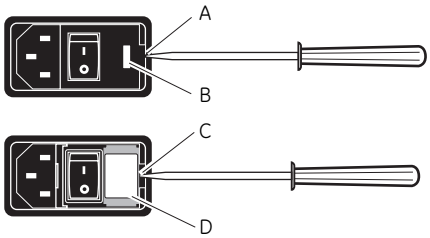


Figure 5-2. Opening the fuse box of the Storm instrument.

2 Place the end of the small flathead screwdriver into the small groove (*Fig 5-2 A*) to the right of the fuse window (*Fig 5-2 B*), and pry to open the fuse box.

3 Place the screwdriver in the small groove (*Fig 5-2 C*) to the right of the fuse holder (*Fig 5-2 D*) and pry out the fuse holder. When the holder is loose, pull it out of the fuse box.

4 One or both fuses might be blown. Replace the blown fuse(s) with new fuse(s) of the same type and rating. Fuse specifications are listed in *Section 7.1* and on the label located on the underside of the sample lid.

5 Insert the fuse holder into the fuse box.

6 Snap the cover of the fuse box back into place.

7 Reconnect the power cord and turn on the Storm instrument.

Changing fuses in the Image eraser

You can use the Image eraser with either a 220–240 V (230 V) power source or a 100–120 V (115 V) power source. The selected operating voltage of the Image eraser appears in the fuse window on the right side of the Image eraser, next to the power switch (*Image eraser, on page 11*).

To change a fuse in the Image eraser, follow the instruction below.

1 Turn off the Image eraser and disconnect the power cord.

2 Note the voltage (115 V or 230 V) showing in the fuse window (*Fig 5-3 A*).

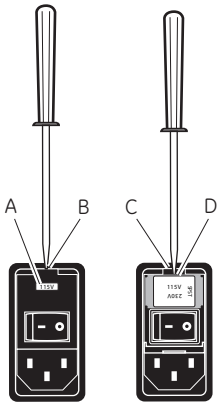


Figure 5-3. Opening the fuse box of the Image eraser.

3 Place the end of a small flathead screwdriver in the small groove (*Fig 5-3 B*) above the fuse window and pry to open the fuse box.

4 Place the screwdriver in the groove (*Fig 5-3 C*) on the upper edge of the fuse holder (*Fig 5-3 D*) and pry out the fuse holder. When the holder is loose, pull it out of the fuse box.

5 One or both fuses might be blown. Replace the blown fuse(s) with new fuse(s) of the same type and rating. Fuse specifications are listed in *Section 7.1* and on the label located on the unit.

6 Insert the fuse holder into the fuse box making sure the correct voltage rating for your power supply is right side up.

7 Snap the cover of the fuse box back into place. Check that the correct voltage rating for your power source appears in the voltage window. If the voltage is incorrect for your power source, remove the fuse holder, rotate the holder 180° so that the correct voltage rating is right side up, and reinsert the fuse holder.

8 Reconnect the power cord to a grounded mains outlet and turn on the Image eraser.

NOTICE
Before you turn on the Image eraser after you change the fuse, make sure that the correct operating voltage appears in the fuse window. Selecting the wrong voltage can severely damage the Image eraser.

5.8 Replacement of bulbs

The Image eraser contains four warm-white compact fluorescent bulbs. When any one of the bulbs fails, replace all four bulbs to provide uniform light intensity across the screen. To order replacement bulbs, contact GE Healthcare Technical Support or your local distributor (see the manufacturer part number on the bulb). See back cover for contact information.

NOTICE
If you are replacing the bulbs shipped with the Image eraser, you must order replacement bulbs and fixtures from GE Healthcare Technical Support. The bulbs shipped with the Image eraser are epoxied to the fixture to avoid damage during shipment. The replacement fixture and bulbs are not epoxied.

To replace the bulbs, follow the instruction below.

1 Turn off the Image eraser and disconnect the power cord.

2 Unscrew the two thumbscrews (*Fig 5-4 A*) that hold the clip support (*Fig 5-4 B*) and diffuser screen (*Fig 5-4 C*) in position.

3 Lift off the clip support and diffuser screen.

4 Unscrew the bulb and fixture from each receptacle (*Fig 5-4 D*).

5 Screw a new bulb and fixture into each receptacle.

6 Replace the front diffuser screen and clip support, and screw the two thumbscrews.

7 Verify in the fuse window that the fuse voltage is correct.

8 Connect the power cord to a grounded mains outlet and turn on the Image eraser.

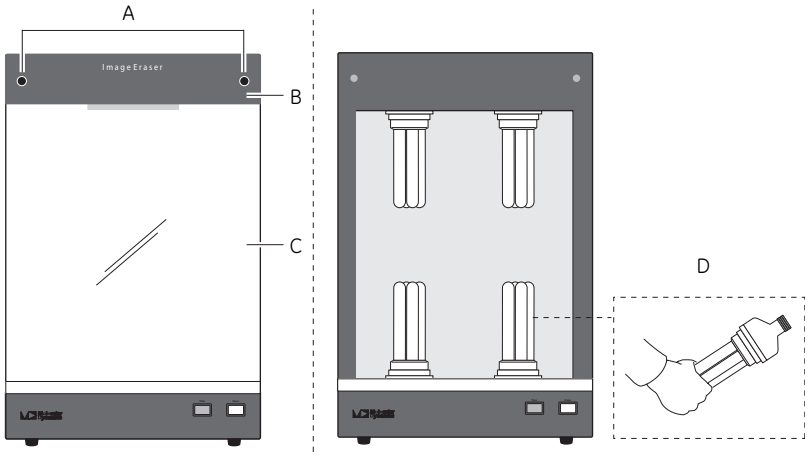


Figure 5-4. Replace bulbs in the Image eraser.

6 Troubleshooting

This chapter gives a brief guide of how to solve instrument-related problems that might occur when using Storm.

If you are experiencing problems that you cannot correct, contact your local service representative.

6.1 Power and communication

Error symptom	Possible cause	Corrective action
The power indicator lamp does not turn on	The instrument is not plugged in.	Plug in the instrument
	Faulty wall outlet.	Test the outlet or try another one.
	Fuses have blown.	Change the fuses, see *Section 5.7*.
The instrument is on but cannot communicate with the computer.	The computer was turned on before the instrument.	Make sure the instrument is turned on and then restart the computer.
	The SCSI cable is not properly plugged into all peripherals.	Check the connections to make sure they are plugged in and are securely fastened.
	Incorrect or too long SCSI cables.	Try another SCSI cable that you know is good. Not all SCSI cables are constructed the same. We recommend that you use only SCSI cables from GE Healthcare.
	The SCSI bus is not properly terminated.	Add the terminator as discussed in *Section 3.4*.

6.2 Scanning

Error symptom	Possible cause	Corrective action
The instrument does not scan, and a warning message displays, stating that the sample lid is up.	The sample lid is not completely closed.	Make sure you press the lid all the way down until the latch clicks.
During a scan, the ***Scan in Progress*** window remains unchanged for at least three minutes, and the pointer does not respond when you move the mouse.	The computer has stopped functioning.	Restart the computer using the manufacturer's instructions. Then open the STORM Scanner Control, reselect the scanner parameters, and start the scan again.
The software aborts a scan, and either— • The software displays the message: ***Scan aborted—hardware error, please try to scan again***, or a message that does not give instructions for resolving the problem. • The red scan indicator light blinks.	PC communication failed.	Restart the scan as follows: 1 Close the ***STORM Scanner Control*** window. Leave the computer on. 2 Turn off the power switch on the back of the Storm instrument. Wait a few seconds and turn it on again. 3 Open the STORM Scanner Control software, reselect the parameters, and rescan. If the problem occurs repeatedly, contact GE Healthcare Technical Support.

6.3 Image

For troubleshooting regarding image-related problems, please refer to *Storm User Manual*.

7 Reference information

7.1 Specifications

Parameter	Value
Ingression protection	IP 20
Supply voltage	15 A 100-120 VAC or 10 A 220-240 VAC, 50 to 60 Hz
Power consumption, Storm instrument	< 500 W
Power consumption, Image eraser	< 150 W
Fuse specification, Storm instrument	F 5A L 250 V
Fuse specification, Image eraser	T 1.6A L 250V
Dimensions, Storm instrument (h × w × d) [cm]	42 × 76 × 76
Dimensions, Image eraser (h × w × d) [cm]	63.5 × 42 × 32.5
Weight, Storm instrument [kg]	75
Weight, Image eraser [kg]	20
Acoustic noise level	< 70 dB A
Ambient temperature	15ºC to 35ºC
Relative humidity tolerance	10% to 95%, non-condensing

7.2 Literature

For further information regarding the Storm, refer to the following:

- *Storm User Manual*
- *Storm Installation Guide*
- *Storm Contents and Unpacking Instructions*

7.3 Ordering information

For ordering information visit www.gelifesciences.com/quantitative_imaging.

Appendix A Accessories

A.1 Storage phosphor screens

Storage phosphor screens detect the beta and gamma ionizing radiation from most isotopes. There are three types of Storage phosphor screens available:

- General-purpose (GP) storage phosphor screen
- Tritium (TR) storage phosphor screen

Table A-1. Available sizes and types of storage phosphor screens

Screen size	Screen type	
(cm)	General-purpose (GP)	Tritium (TR)
19 × 24	Not available	Mounted/unmounted
20 × 25 (small screen)	Mounted/unmounted	Not available
35 × 43 (large screen)	Mounted/unmounted	Not available

A.2 Exposure cassettes

In general, the Storage phosphor screens are exposed to a sample in an Exposure cassette. Four styles of Exposure cassettes are available:

- Small cassette for small mounted screens
- Small cassette for small unmounted screens
- Large cassette for large mounted screens
- Large cassette for large unmounted screens

For local office contact information, visit
www.gelifesciences.com/contact

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