User's Guide

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5 Specifications

1   Overview

The Laser Imaging System is a continuous-tone laser imager with an internal photothermographic film processor. Heat, rather than photo chemicals, is used to develop the film. This easy-to-use and reliable laser imager provides high quality prints. Use the prints from this system for:

- Diagnostic purposes to determine patient treatments
- Referral, sharing, or educational purposes

The system receives and prints from image sources such as medical electrical equipment (modalities) and workstations over the network. You can send print jobs simultaneously from multiple image sources. The open design lets you connect to modalities of all types and vendors.

IMPORTANT: *Install the printing system in a secure location to protect patient privacy rights if required by local regulations.*

1   **Top cover**. Covers the processor rollers. The top cover is interlocked.

2   **Display screen**. Your interface to the laser imager. Provides status and error information.

3   **Right cover**. Protects sensitive electronic equipment. The right cover is interlocked and is only accessed by service personnel.

4   **Film supply**. Install film cartridges here. Supports four film sizes.

5   **Left cover**. You might remove the left cover to clear an occasional film jam. The left cover is interlocked.

6   **Power switch**. The power switch is on the back.

7   **Exit tray**. Extend the exit tray to hold large film (35 x 43 cm, or 14 x 17 in.) as it finishes printing. It can hold up to 50 processed sheets of film.

Major internal assemblies

H210_1012HC
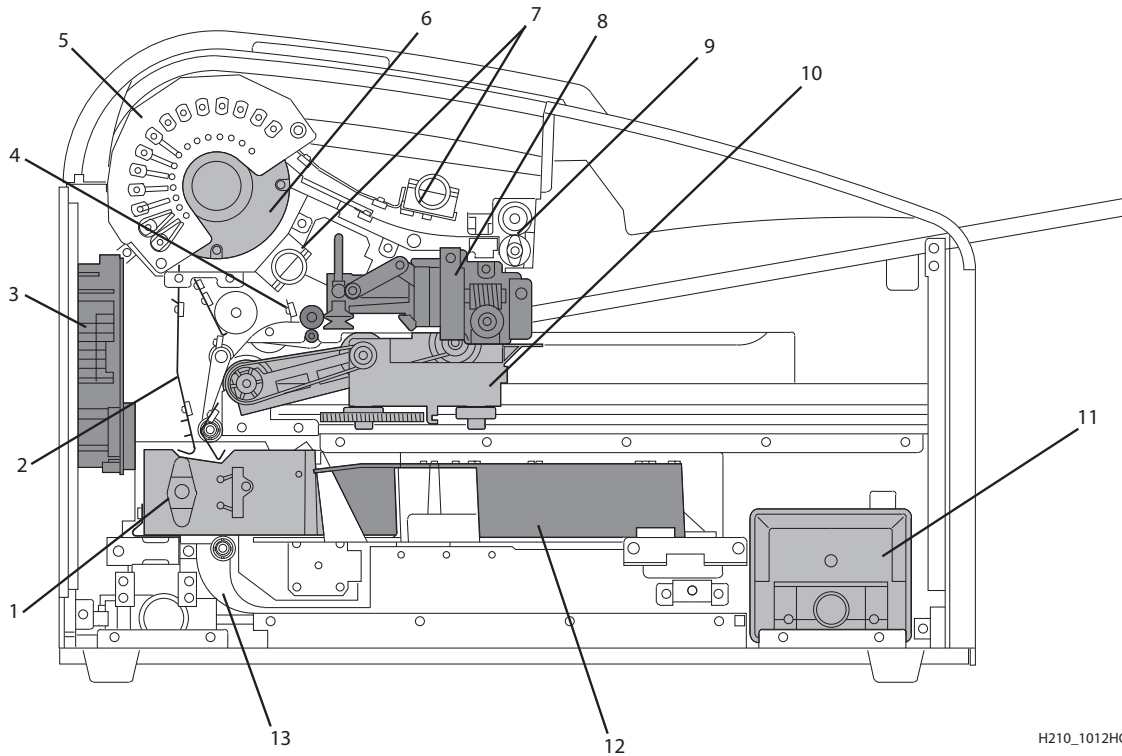
1 **Exposure transport**. Moves the film past the scanning laser beam.

2 **Transport guides**. Orient and center the film while moving the film from the supply to the imaging portion of the laser imager.

3 **DICOM Raster Engine (DRE)**. A computer board that receives, processes, and manages the images.

4 **Feed rollers**. Move the film through the laser imager.

5 **Processor rollers**. The processor uses heat to develop the image written onto the film by the laser in the optics module. The rollers move the film through the processor assembly, holding the film against the processor drum.

6 **Processor drum**. Provides the heat that processes the image on the film.

7 **Airflow manifolds**. Remove heat and processing odors from the processor assembly.

8 **Pickup assembly**. Lifts a single sheet of film from the supply cartridge and feeds it into the rollers.

9 **Exit rollers**. Moves the film from the processor area to the exit tray.

10 **Rollback assembly**. Rolls the film cartridge cover back so the pickup assembly can lift the film. When the laser imager is not printing, the cover is closed over the film cartridge to protect the film from light.

11 **Charcoal filter**. Absorbs the odors caused by heat processing.

12 **Optics module**. Writes the image onto the film while the film is moved through the exposure transport.

13 **Accumulator**. The film feeds into the accumulator as it is imaged. When imaging is complete, the film is sent from the accumulator up to the processor assembly where the heat is applied to process the image.

How the laser imager works

The laser imager receives, processes, manages, and prints the images on film. The laser imager has limited storage to hold a small number of digital images. As images are received for printing, they are stored in memory, placed in a sequential print queue, and are printed in order. The laser imager can continue to accept incoming print jobs even if temporarily unable to print (if the film supply is empty, etc).

During normal operation, the laser imager requires very little attention. It prints automatically in response to print requests from the configured image sources. Information sent with the images by the image source, such as film type and size and image quality settings, is applied unless you set the laser imager to override information that comes from the image source.

Print sequence
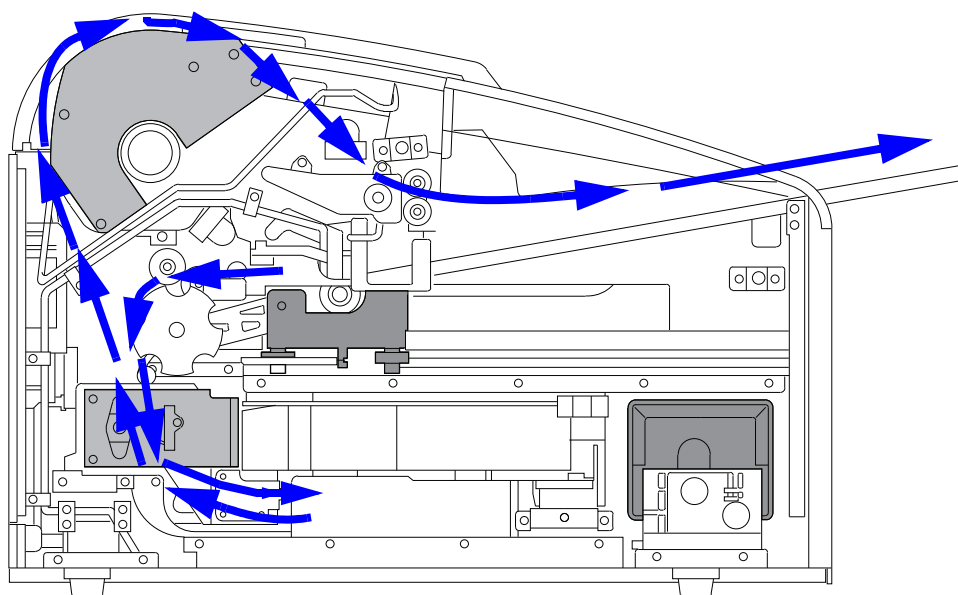
Each time the laser imager receives a print request, the following print sequence occurs. The blue arrows show the film path.

1. Suction cups in the pickup area lift a single sheet of film out of the supply cartridge and feed the film into the transport rollers.

2. The transport rollers move the film down into the exposure transport area.

3. The film moves down during imaging (as the optics module writes the image onto film), reverses direction at the conclusion of imaging, and then the film moves up into the processor.

4. As the film passes over the processor drum, the heat generated by the drum develops the film.

5. The exit rollers move the developed film to the exit tray.

Film sizes

The laser imager supports four sizes:

- 35 x 43 cm (14 x 17 in.)
- 28 x 35 cm (11 x 14 in.)
- 25 x 30 cm (10 x 12 in.)
- 20 x 25 cm (8 x 10 in.)

For the specific films that are supported, see the Publications Cover Page.

Automatic image quality and processing

An internal densitometer enables the laser imager to automatically adjust image processing parameters (Automatic Image Quality Control, or AIQC) to produce an optimal image. The laser imager adjusts these parameters each time it prints a calibration film.

A calibration film is printed when:

- The film tray is inserted in the laser imager with film of a new lot number.
- You request a calibration film at the display screen or the Web Portal. For more information, see .
- A film cartridge is inserted into the laser imager for which a current calibration is not stored.

Configuring and monitoring the system (using the Web Portal)

The Web Portal is your interface to additional features. In addition to the installation and setup of your system, you can view and manage the laser imager's connections over the network, configure features, view error messages, and access general status information at the Web Portal. You can also check film count, film size, and film type.

For more information, see .

Enhancing serviceability with remote monitoring

Remote Management Services is set up through the Web Portal, and is designed to enhance efficient system serviceability and simplify analytical and service processes through the monitoring of your equipment. Additionally, this simplifies the service process by providing qualified service personnel with faster, easier, and more complete access to the operational history of each system.

Remote Management Services provides the following for the laser imager:

- Ability to monitor and diagnose error conditions without introducing "downtime"
- Firewall-safe, Internet transmission of machine data, while complying with patient confidentiality regulations
- Minimal effort to set up communication
- Flexibility to facilitate specific configurations at each site

Agency compliance

See the Safety Manual.

User guide conventions

The following special messages emphasize information or indicate potential risks to personnel or equipment.

NOTE: Notes provide additional information, such as expanded explanations, hints, or reminders.

IMPORTANT: *Important notes highlight critical policy information that affects how you use this guide and this product.*

⚠ **CAUTION:**

Cautions point out procedures that you must follow precisely to avoid damage to the system or any of its components, loss of data, or corruption of files in software applications.

DANGER: DANGER IDENTIFIES PROCEDURES THAT YOU MUST FOLLOW PRECISELY TO AVOID INJURY TO YOURSELF OR OTHERS.

⚠ **LASER WARNING:**

Laser warnings warn personnel that access to laser radiation is possible and all personnel must avoid direct exposure to the beam.

2 Basic Operating Tasks

During normal operation, the laser imager receives and automatically prints images sent by modalities over a network. Very little interaction is required. You may do the following:

- Turn the power on (|) and off (0).
- Load film cartridges.
- Monitor the display screen for status and operating conditions.

Sometimes it will be necessary to perform preventive maintenance, filter replacement, and other corrective actions such as a restart. (See "Chapter 3 Maintenance and Troubleshooting".)

You also may access the Web Portal to perform additional configuration, optimize image quality, or do troubleshooting tasks. (See page 2-10.)

Understanding the display screen

The display screen communicates the status of the laser imager.

Symbol or code	Description
Top left of the display screen: **888**	Error or status code. The 3-digit code displays when the error or status condition is present. See "Chapter 3 Maintenance and Troubleshooting" for a complete list of the codes and how to resolve them. If the laser imager is on and a 3-digit code does not display, the laser imager is operating normally. If a different film size has been requested than what is installed, the requested film size displays. See "Loading a different film size to match a print request" on page 2-7.
Lower left of the display screen: **125**	Film count. Displays the number of films that are remaining in the film cartridge. The loaded film size also displays in this location.
Power	When the symbol is green, the power is on and the laser imager is ready to print. The symbol flashes while the laser imager is processing. When the symbol is yellow, the laser imager is not ready to print. Examples are when the laser imager is warming up or when the film cartridge is empty.
Calibrate	Press to initiate film calibration. The symbol flashes while the calibration is in process. See "Calibrating the laser imager for the installed film" on page 2-9.
Pause	During normal operation, the symbol is off. When the film cartridge cover is open, the symbol is on. To avoid exposing the film to light, do not open the film supply until the symbol is off. If the Pause symbol is on, you can press the symbol to temporarily pause printing. Any jobs in progress finish printing, then the film cartridge cover closes. Wait until the Pause symbol is off for cartridge replacement, etc.
Film Size	When the symbol appears, the requested job requires a different film size. See "Loading a different film size to match a print request" on page 2-7. You can also delete a print request. See "Deleting pending jobs" on page 2-8.
Restart	Restart the laser imager. An error code also displays. See "Restarting the laser imager" on page 2-4.
Film Jam	Film is jammed. The error code confirms the film jam and gives direction on where to find the film inside the laser imager. See "Film jams" on page 3-4.
Maintenance	Preventive maintenance is required. Check the error code to learn what action to take. See "Preventive maintenance" on page 3-2.

Turning the power on and off

To start the laser imager, press the power switch on the back of the laser imager to on (|). Wait as the laser imager warms up. The warm-up period might last up to 30 minutes. The display screen shows the progress as the laser imager becomes ready to print.

Warming up

A countdown to zero (0) indicates how soon the laser imager will be ready to print
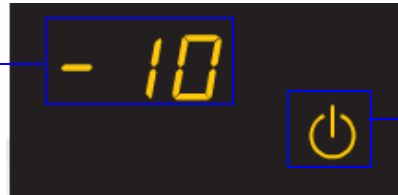
The power symbol is yellow and flashing while the laser imager warms up

The warm-up period varies depending on the amount of time the laser imager has been off and the ambient temperature. During warm-up, the laser imager can receive and store images but cannot print films.

When the laser imager reaches operating temperature, the display screen changes to show that the system is ready to print, and the laser imager prints images that were received during the warm-up period.

Ready to print

You can calibrate the film cartridge if necessary

Green power symbol means "ready"

Film count

Emergency shutdown or power loss

In the event of a power loss, or if an emergency requires an immediate shutdown of the laser imager, films in process will not be completed. However, when power is restored, the laser imager will restart. After warming up, the laser imager automatically reprints any films that were in process when the power was interrupted.

Restarting the laser imager

If the laser imager encounters an error that is usually corrected with a restart, the display screen shows the Restart symbol.

The error code indicates the error condition. You may want to check the "Troubleshooting" chapter or the Quick Reference Card to identify the error.
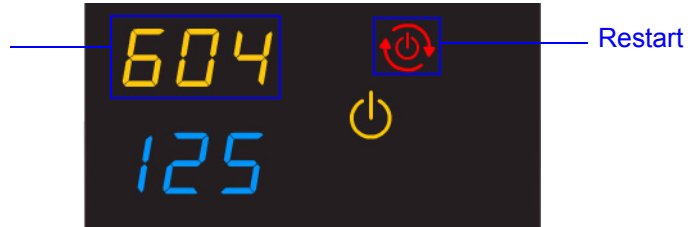
Restart

1. Press the power switch on the back of the laser imager off (0).
2. Press the power switch on (|).

   If the error does not clear with after the restart, it might be necessary to contact a qualified service provider.

Working with film cartridges

Checking film count

The film count displays on the laser imager display screen.

Film count
125 indicates a full cartridge
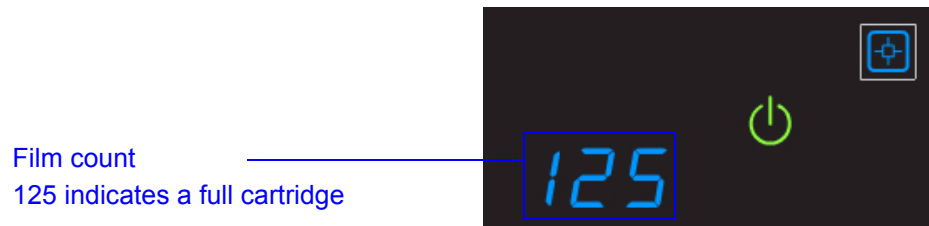
Checking the size of the loaded film

The film size displays in the same location as the film count. The display screen alternates between the film count and the size of the loaded film.

Film size

"35" indicates the 1st dimension of the film cartridge. For example, "35" then "43" appears if 35 x 43 cm film is loaded. Then the film count displays again.
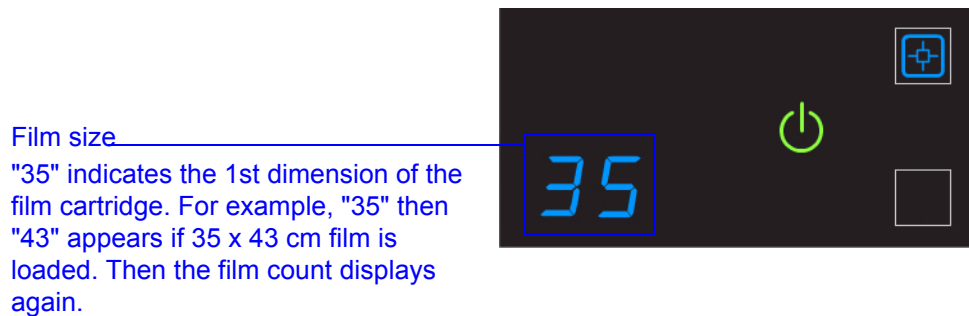
Film count is flashing "0"

When the film cartridge is empty, the film count flashes "0" and the power symbol is yellow, which indicates that the laser imager cannot print. Replace the film cartridge with a new one with the appropriate size film. See .

When the film count is "0", you must replace the film cartridge before you can print again

Inserting a new film cartridge

Before you insert a new film cartridge, make sure that the Pause symbol is off. During normal operation, the symbol is off. When the film cartridge cover is open, the symbol is on. To avoid exposing the film to light, do not open the film supply until the Pause symbol is off.

If the Pause symbol is on, press the symbol to close the film cartridge cover.

Make sure the Pause symbol is **off** (not illuminated) before you insert a new film cartridge.

Pause symbol is on   Pause symbol is off

1. Open the film supply. Hold the edges of the film cartridge and lift the empty cartridge out of the film supply.

2. Discard the removed cartridge.

3. Insert the new film cartridge. Align the cartridge with the label facing up and the perforations to the front. Set the leading edge on the cartridge guides, and then slide the film cartridge into the laser imager to engage the detents in the bottom of the cartridge.

Cartridge Guide

Perforations

Detents

Leading Edge
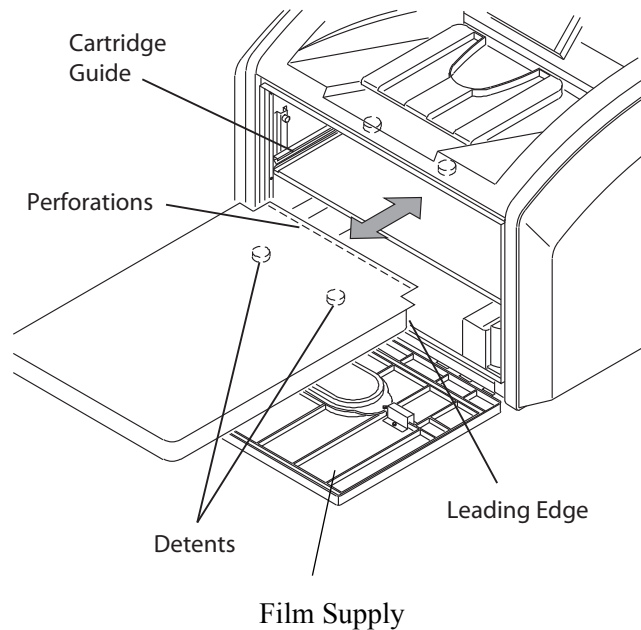
Film Supply

4. Close the film supply.

5. Check that the display screen changes to reflect the new film count.

Loading a different film size to match a print request

If a print request requires a different film size, the requested film size flashes on the display screen. Change the installed film to match the print request.
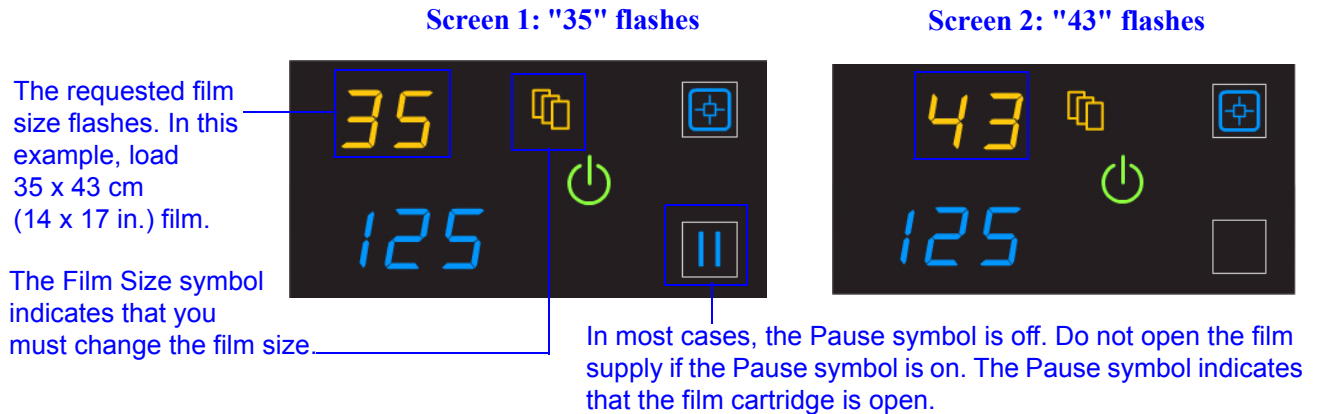
Screen 1: "35" flashes   **Screen 2: "43" flashes**

The requested film size flashes. In this example, load 35 x 43 cm (14 x 17 in.) film.

The Film Size symbol indicates that you must change the film size.

In most cases, the Pause symbol is off. Do not open the film supply if the Pause symbol is on. The Pause symbol indicates that the film cartridge is open.

1. If the Pause symbol is on, press it and wait until it goes off.
2. Open the film supply. Hold the edges of the film cartridge and lift the cartridge out of the film supply.
3. Store the removed film cartridge.
4. Insert the new film cartridge. Align the cartridge with the label facing up and the perforations to the front. Set the leading edge on the cartridge guides, and then slide the film cartridge into the laser imager to engage the detents in the bottom of the cartridge.

Cartridge Guide

Perforations

Detents

Leading Edge
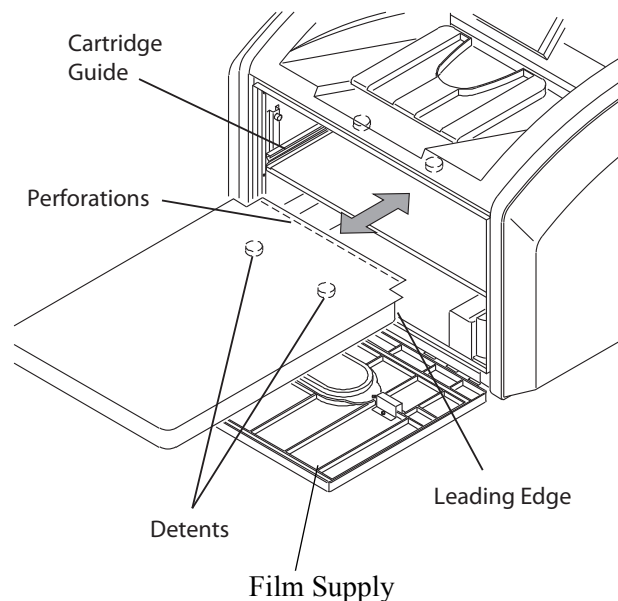
Film Supply

5. Close the film supply.
6. Check that the display screen changes to reflect the new film size.

Deleting pending jobs

To cancel all print requests, press and hold the Film Size symbol for five seconds. All print requests are deleted from the queue.

Press this symbol for five seconds
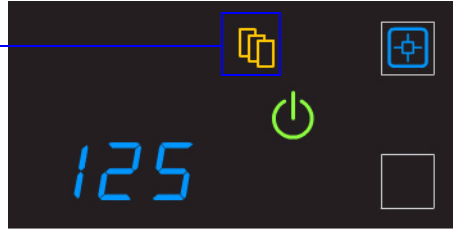
NOTE:

- A print request that cannot be printed is automatically deleted from the laser imager. This situation could be caused by invalid parameters from the modality, etc.
- If a job is not printable, the laser printer will eject a blank film into the exit tray.

Making a test print

NOTE: You can make additional test prints at the Web Portal. For more information, see "Accessing the Web Portal" on page 2-10.

Make a SMPTE test from the laser imager to check that you can print.

Press these two symbols at the same time for five seconds
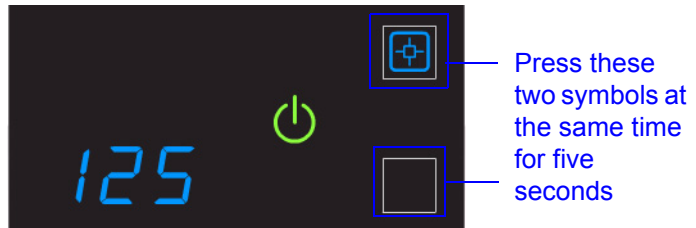
Press and then release the Calibration and Pause symbols. The symbols flash until the test print is complete.

Calibrating the laser imager for the installed film

In normal operating conditions, it is not necessary to calibrate the laser imager for the film. Run a calibration when:

- Code 001 appears on the display screen.
- A calibration error occurs, indicated by codes 624, 631, or 632 on the display screen.
- A "Not Calibrated" message appears on the Web Portal Home screen.

The calibration initiates a test print with a step wedge pattern. The pattern has a series of 21 step wedges of increasing optical density.

Press to calibrate the laser imager for the installed film
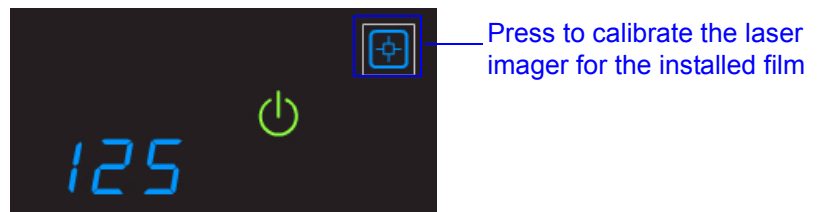
1. Press the symbol to start the calibration. The Calibration and Power symbols both flash while the calibration is in progress.
2. When the symbols stop flashing, the calibration is complete.

NOTE: If the Calibration symbol turns from blue to yellow, there was a problem with the calibration process. See "Calibration error" on page 3-3.

Opening or removing a cover

You can open or remove the laser imager's top cover, left cover, and film supply. The covers are protected with an interlock mechanism to keep the laser imager from printing when they are open, to keep you safe.

Code 701 alerts you that a cover and an interlock are open, and internal power to the laser imager is turned off.

A cover is open
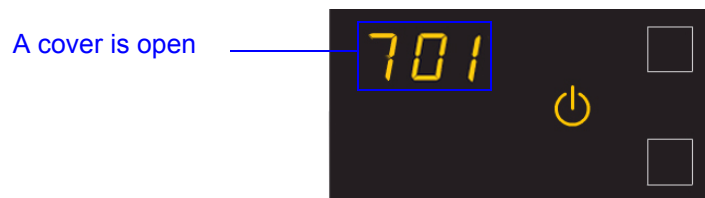
You might open the top or left cover to search for film jams. For more information, see "Correcting film jams" on page 3-14.

Using the Web Portal to access additional functionality

The Web Portal is your interface to additional features. In addition to the installation and setup of your system, you can view and manage the laser imager's connections over the network, configure features, view error messages and access general status information at the Web Portal. You can also check film count, film size, and film type.

Troubleshooting tools include:

- Optimization of image quality for modalities.
- Retrieval of logs, statistics, and system status.
- Diagnostic utilities, including backup and restore.

The Web Portal provides an online Help system and a user's guide to assist you.

Accessing the Web Portal

To access the Web Portal, use a desktop or laptop computer that is connected to the network.

1. On a desktop or laptop computer, start WINDOWS Internet Explorer (version 6, 7, or 8).

2. In the address field, type: http://<laser imager's IP address>

NOTE: If you do not know the IP address, check with your network administrator or the person who installed the laser imager.

3. Click **Go**.

   The main window for the Web Portal shows the general status, the number of print jobs queued, the number of jobs waiting for film, and the film count.

   The center panel displays the screens where you view and perform tasks. Online help is available by selecting **Documentation** from the left panel, and the Help icon provides context-sensitive Help for fields and pages.

   The left panel also provides the links to all other screens.

NOTE: If you are using WINDOW Internet Explorer 8, place the Internet Explorer window into compatibility view. After you have opened the IE8 window, click the Compatibility View toolbar button. This will correct some potential viewing issues with IE 8. If the icon is not on the toolbar, select Compatibility View from the Tools menu.
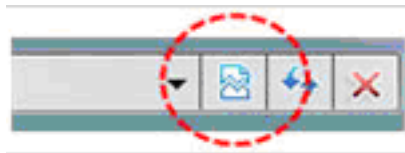
3   Maintenance and Troubleshooting

Use the information in this chapter to keep the laser imager in the best condition and to correct minor problems.

Overview: Status and error messages and codes

The laser imager detects errors and other conditions and reports them to you in multiple ways. Some conditions require your action. This section provides a list of the codes, explains the condition, and provides recommended actions where appropriate. View the codes:

- At the laser imager's display screen, on the top left. The display screen reports 3-digit codes.

  Some codes are associated with symbols on the display screen, such as the Film Jam symbol, to help you quickly understand the condition.

- At the Web Portal. Access the Web Portal using your personal computer, keyboard, and mouse to gain more information about the errors and conditions. Using the Web Portal is optional but you may find it useful. The Web Portal can report more information than the laser imager's display screen due to the limited size of the display screen. See "Using the Web Portal to gain more information on errors" on page 3-5.

Preventive maintenance

NOTE: These conditions are also reported at the Web Portal.

Replacing the filter

⚠ **CAUTION:**

In the U.S., exhausted filters are considered to be non-hazardous waste according to the US Environmental Protection Agency Resource Conservation Recovery Act (RCRA). Municipality owned and licensed solid waste management facilities are an appropriate disposal option. Contact your local or state solid waste authorities to determine if additional disposal requirements apply. In other regions, contact local or regional solid waste authorities for proper disposal guidance.

The charcoal filter controls processing odors in the laser imager. The filter in the laser imager must be replaced after 7500 prints. Keep at least one filter available to be ready to replace it when needed.

When the filter must be replaced, the display screen shows the error code and the Maintenance symbol:

Code 449 indicates that the filter must be replaced

The system requires maintenance
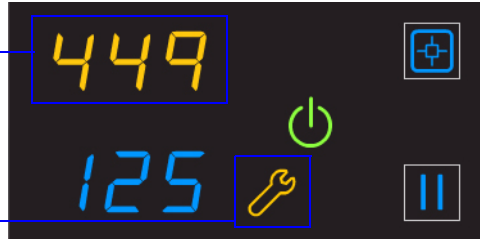
1. Open the film supply.
2. Remove the charcoal filter by lifting it up and pulling it forward.

Charcoal Filter

H210_1016ACA
H210_1016AC
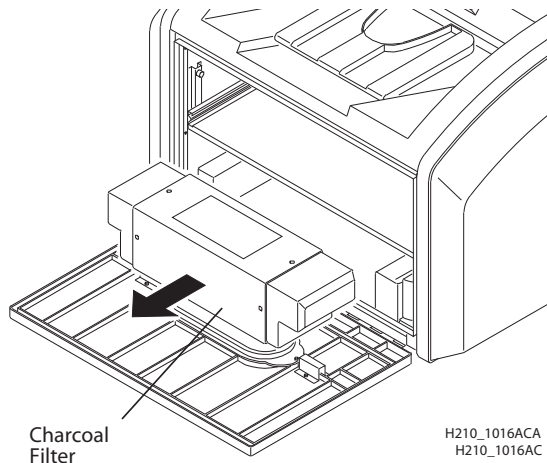
3. Install a new charcoal filter.

4. Close the film supply.

5. To reset the laser imager for the new filter and to clear the Maintenance symbol, press and then release the Maintenance and Calibrate symbols at the same time.

550 code and Maintenance symbol

If the laser imager needs a preventive maintenance service call, the 550 code and Maintenance symbol appear:

Code 550 indicates that the laser imager requires a service call

The system requires maintenance
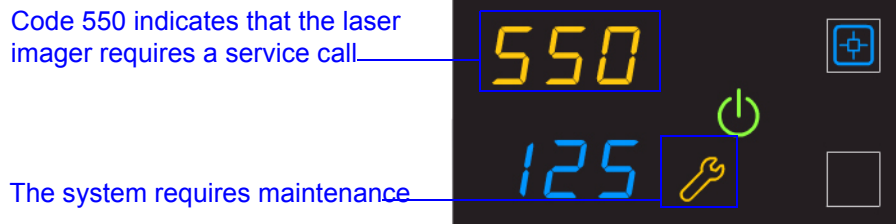
When the 550 code displays, contact a qualified service provider.

Error indicators on the display screen

The laser imager can detect errors and other conditions that require a response. Some errors or abnormal conditions are reported on the display screen in the form of condition codes and symbols.

NOTE: These errors are also reported at the Web Portal.

Calibration error

When the calibration has failed, the display screen shows a 624, 631, or 632 error and the Calibrate symbol is yellow:

Yellow symbol indicates that the calibration failed
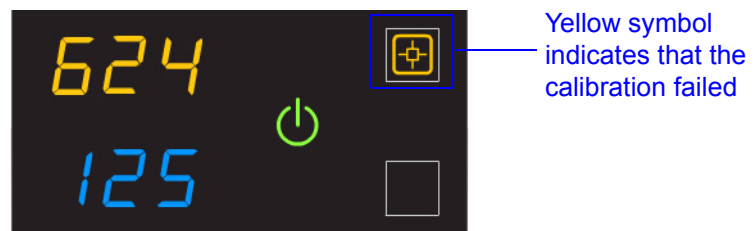
The most common cause is a film-related problem. Depending on the cause, you may be able to keep printing, but the laser imager may not be optimally calibrated.

Required restart

When the Restart symbol appears, you must restart before the laser imager can continue to print.
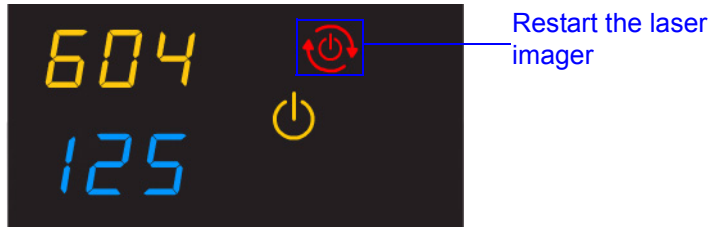
Restart the laser imager

1. Press the power switch on the back of the laser imager off (0).
2. Press the power switch on (|).
3. If the error does not clear, contact a qualified service provider.

Film jams

When the Film Jam symbol appears, you must clear the jam before the laser imager can continue to print.

Film jam symbol
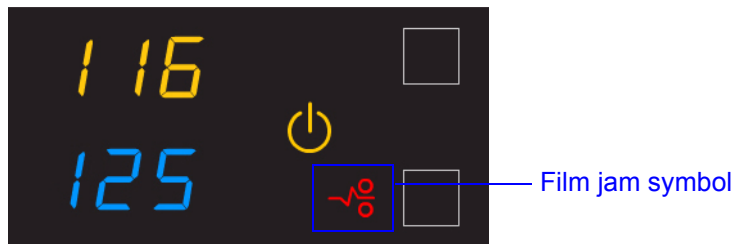
See "Correcting film jams" on page 3-14 for instructions.

Using the Web Portal to gain more information on errors

The Web Portal is your interface to additional functions on the laser imager. You can view and correct error messages and access general status information at the Web Portal.

To access the Web Portal, see "Using the Web Portal to access additional functionality" on page 2-10.

Understanding the codes on the Web Portal and the Display Screen

The 3-digit error and status codes on the display screen are reported at the Web Portal as 5-digit codes. The last three digits on the Web Portal codes match the three digits on the display screen. For example, code 701 on the display screen is the same as code 20701 on the Web Portal. Use the information in this section to understand the information at the display screen and/or at the Web Portal and to respond appropriately.

Subsystem error codes and messages

Use the information in this section to interpret the codes and messages that appear on the display screen and at the Web Portal.

DICOM (Digital Imaging and Communications in Medicine)

In response to a DICOM printer N-GET status request from a modality, a printer status message and a printer status info message are returned to the requesting service class user (SCU). Every error has an associated printer status info message. If more than one error exists when a printer N-GET request is received, a status message is sent in response, according to an established priority. The table shows the DICOM printer status and info message.

Printer Status	Printer Status Info	Printer Status	Printer Status Info
FAILURE	ELEC DOWN PRINTER DOWN PROC DOWN	WARNING	BAD SUPPLY MGZ CALIBRATION ERR CHECK PRINTER COVER OPEN EMPTY MEDIASZ MEDIATP FILM JAM FILM TRANS ERR PROC INIT PRINTER INIT PRINTER OFFLINE

Printer

Printer Status	Display Screen	Web Portal	DICOM Status	Description
Cover is open	Code: 701 Power symbol is yellow	20701: Cover Open	WARNING / COVER OPEN	The top cover is open or one of the side panels may be off. The laser imager is not ready to print.
Failed	Power symbol is yellow	Failed	See Condition Code	An error has occurred that prevents printing.
Cartridge closure is requested	Power symbol is green and/or flashing Pause symbol is on	Not Ready	Not Applicable	The laser imager completes any prints in progress before closing the cartridge cover.
Offline	Power symbol is yellow	20704: Printing Disabled	WARNING / PRINTER OFFLINE	The laser imager has been disabled and does not have a network connection.
Printing	Power symbol is green and flashing	Printing	NORMAL	The laser imager is currently printing films.
Ready	Power symbol is green Film count displays	Ready	NORMAL	The laser imager is online and the processor has reached operating temperature.
Self-test	Power symbol is yellow and flashing Code and film count are replaced by dashes	Self-test	WARNING / PRINTER INIT	This occurs when power is first applied to the laser imager.
Service Mode	Status code: 700 Power symbol is yellow	20700: Service Mode	WARNING / PRINTER OFFLINE	The service switch is enabled. The laser imager is not ready to print.
Warming	Power symbol is yellow and flashing Number of minutes count down until ready	Warming=xx	WARNING / PROC INIT	The processor is warming up and will not be ready to print for xx minutes.

Film Cartridge

Film Cartridge State	Display Screen	Web Portal	Description
Failed	Power symbol is yellow Pause and Calibrate symbols are off Film count is replaced by dashes	Failed	An error has occurred that affects normal operation. This film cartridge is currently not usable. Reinsert the cartridge. If error reoccurs, insert a new film cartridge.
Calibrating	Power symbol is green and flashing Pause symbol is on Calibrate symbol is blue and flashing	Calibrating	A calibration is in progress for the film cartridge.
Film cartridge is empty	Power symbol is yellow Pause and Calibrate symbols are off Film count is flashing "0"	Empty and/or sheet count of 0	The film cartridge is inserted but the sheet count is 0. Insert a new cartridge.
Manual mode	Status code: 002 Power symbol is green Calibrate symbol is yellow	AIQC Off (with normal tray information)	The film in this cartridge does not meet AIQC standards. However, the laser imager prints if ready.
Invalid film cartridge	Power symbol is yellow Pause and Calibrate symbols are off Film count is replaced by dashes	Invalid Film Tray	There is a film cartridge in the film supply but it does not contain a liner/RF tag. Install a new film cartridge.
Ready	Power symbol is green Calibrate symbol is on	Normal Tray Info	The film cartridge is ready for use.
Requires calibration	Power symbol is yellow Calibrate symbol is on	Requires Calibration	The film cartridge must be calibrated before the laser imager can print. See "Calibrating the laser imager for the installed film" on page 2-9.
Film cartridge is not detected	Power symbol is yellow Pause and Calibrate symbols are off Film count is blank	No Film Tray	The film cartridge is not fully inserted in the laser imager. Insert the cartridge.
Not ready	Various	Not Ready	When the conditions are corrected, the laser imager can print.

Film Cartridge State	Display Screen	Web Portal	Description
Cartridge closure is pending	Power symbol is green Calibrate symbol is off Pause symbol is on	Pause Requested	You pressed the Pause button, but the rollback has not started because films are still moving through the laser imager. When the closure is complete, the Pause symbol is off. At this time, you can remove the film cartridge.

Job Manager

Job Manager Status	Display Screen	Web Portal	Description
Active	Not Applicable	Shows how many print requests have been initiated.	The laser imager is accepting DICOM job requests and film is available for all current jobs.
No Media	Power symbol is green Film Size symbol is yellow The required film size is shown on the display screen	Shows how many jobs with this status are in the job queue.	The laser imager is accepting DICOM job requests but film of the correct size and type is not available for at least one current job. See "Loading a different film size to match a print request" on page 2-7.
Offline	Status code: 704 Power symbol is green	DICOM Offline	The laser imager cannot accept any DICOM job requests. Restart the laser imager.

Condition codes

Condition codes are shown on the display screen in the order in which they are generated. If there is more than one code associated with the current condition of the laser imager, the first code is shown on the display screen for six seconds, while other codes in the list display for three seconds as the list is cycled. You can also view these codes and messages at the Web Portal.

Display Screen	Web Portal	Web Portal Message	Action
004	01004	MIM Core: Internal Software Error	Restart the laser imager. See page 2-4. If the error persists, call for service.
200	04200	MIM Core: Disk Full	Load the requested film type and size for jobs that are waiting for media. See "Loading a different film size to match a print request" on page 2-7. If the error persists, call for service.
400	06400	MIM Core: Image Page Error	Resend the print job from the image source. If the error persists, call for service.
410	06410	MIM Core: Image Rendering Error	Resend the print job from the image source. If the error persists, call for service.
411	06411	MIM Core: Image Data Error	Resend the print job from the image source. If the error persists, call for service.
420	06420	MIM Core: Internal Software Error	Resend the print job from the image source. If the error persists, call for service.
430	06430	MIM Core: Internal Software Error	Resend the print job from the image source. If the error persists, call for service.
001	10001	MIS: Internal Software Error	Restart the laser imager. See page 2-4. If the error persists, call for service.
003	10003	MIS: Image Buffer Error	Restart the laser imager. See page 2-4. If the error persists, call for service.
015	10015	MIS: Database Error	Restart the laser imager. See page 2-4. If the error persists, call for service.
910	10910	MIS: MCS Communication Failure	Restart the laser imager. See page 2-4. If the error persists, call for service.
006	20006	Disconnected or faulty network cable	Check and reconnect the network cable on both ends. If the error persists, call for service.

Display Screen	Web Portal	Web Portal Message	Action
154	20154	MCS: Internal Communications Failure	Restart the laser imager. See page 2-4. If the error persists, call for service.
155	20155	Incompatible MCS Printer Configuration for Hardware	Restart the laser imager. See page 2-4. If the error persists, call for service.
156	20156	Incompatible Software Versions Installed	Restart the laser imager. See page 2-4. If the error persists, call for service.
209	20209	Laser Imager Opened During Self Test	Close the cover. Restart the laser imager. See page 2-4. If the error persists, call for service.
449	20449	none	Change the charcoal filter. See "Replacing the filter" on page 3-2.
550	20550	none	Call service for preventive maintenance. See "550 code and Maintenance symbol" on page 3-3.
700	20700	none	The laser imager is inoperable. If the error persists, call for service.
701	20701	none	Close the cover.
704	20704	none	The network connection to the laser imager has been lost. Restart the laser imager.
705	20705	none	The laser imager is restarting (for example, during a software update). Wait until the restart is complete.
706	20706	none	A shutdown that was initiated remotely is complete. Restart the laser imager.
915	20915	Internal Image Data Transfer Failed	Restart the laser imager. See page 2-4. If the error persists, call for service.
919	20919	Internal Image Data Render Failed	Restart the laser imager. See page 2-4. If the error persists, call for service.
002	21002	none	No action. The error may remain until the film cartridge is empty. The film cartridge is operating in manual mode and AIQC is off.
116	21116	Film Jam in Area 1	See "Film jam code 116 / Jam in Area 1" on page 3-15.

Display Screen	Web Portal	Web Portal Message	Action
118	21118	Film Supply: Internal Hardware Failure	If the Pause symbol is on, press it to cover the film cartridge. When the Pause symbol stops flashing, remove the film cartridge from the laser imager. Then reinsert the film cartridge into the laser imager. If the error persists, call for service.
119	21119	Film Supply: Internal Hardware Failure	If the Pause symbol is on, press it to cover the film cartridge. When the Pause symbol stops flashing, remove the film cartridge from the laser imager. Then reinsert the film cartridge into the laser imager. If the error persists, call for service.
125	21125	Film Supply: Internal Hardware Failure	If the Pause symbol is on, press it to cover the film cartridge. When the Pause symbol stops flashing, remove the film cartridge from the laser imager. Then reinsert the film cartridge into the laser imager. If the error persists, call for service.
139	21139	Film Supply: Unable to Identify Film Cartridge	If the Pause symbol is on, press it to cover the film cartridge. When the Pause symbol stops flashing, remove the film cartridge from the laser imager. Insert a different film cartridge into the laser imager. If the error persists, call for service.
145	21145	Film Supply: Unsupported Film Type	The laser imager does not support the loaded film type. Install a cartridge with a supported film type. If the error persists, call for service.
146	21146	Film Supply: Unsupported Film Size	The laser imager does not support the loaded film size. Install a cartridge with a supported size. If the error persists, call for service.
175	21175	Rollback Failed to Engage Cartridge	If the Pause symbol is on, press it to cover the film cartridge. When the Pause symbol stops flashing, remove the film cartridge from the laser imager. Insert a different film cartridge into the laser imager. If the error persists, call for service.
177	21177	Film Cartridge Failed to Close	Open the film supply. Manually close the film cartridge, using the manual rollback knob, to prevent the film from fogging. See page 3-15. If the error persists, call for service.

Display Screen	Web Portal	Web Portal Message	Action
178	21178	Rollback Failed to Leave Home	If the Pause symbol is on, press it to cover the film cartridge. When the Pause symbol stops flashing, remove the film cartridge from the laser imager. Insert a different film cartridge into the laser imager. If the error persists, call for service.
624	21624	Film Supply: Film Calibration Failure	Calibrate again. See "Calibrating the laser imager for the installed film" on page 2-9. If the error still displays, install a new film cartridge. If the error still displays, restart the laser imager. See page 2-4. If the error persists, call for service.
631	21631	Film Supply: Film Calibration Failure - Dmin Outside Target	The minimum density of the film is too high. Calibration results for this film are outside the normal range. Printing will continue with these parameters. If the prints are not optimal, do the calibration procedure again (see page 2-9) or install another film cartridge.
632	21632	Film Supply: Film Calibration Failure - Dmax Outside Target	The maximum density of the film is lower than the target density. Calibration results for this film are outside the normal range. Printing will continue with these parameters. If the prints are not optimal, do the calibration procedure again (see page 2-9) or install another film cartridge.
922	25922	RF Tag: Internal Diagnostic Failure	Restart the laser imager. See page 2-4. If the error persists, call for service.
323	26323	Film Jam in Area 2	See "Film jam code 323 / Jam in Area 2" on page 3-16.
324	26324	Film Jam in Area 2	See "Film jam code 324 or 325 / Jam in Area 2" on page 3-16.
325	26325	Film Jam in Area 2	See "Film jam code 324 or 325 / Jam in Area 2" on page 3-16.
326	26326	Film Jam in Area 2 or 3	See "Film jam code 326 / Jam in Area 2 or 3" on page 3-17.
543	26543	Film Jam in Area 3	See "Film jam code 543 / Jam in Area 3" on page 3-18.
544	26544	Film Jam in Area 3	See "Film jam code 544 / Jam in Area 3" on page 3-18.
123	27123	Optics: Internal Hardware Failure	Restart the laser imager. See page 2-4. If the error persists, call for service.
601	27601	Optics: Calibration Failed	Restart the laser imager. See page 2-4. If the error persists, call for service.
604	27604	Optics: Calibration Failed	Restart the laser imager. See page 2-4. If the error persists, call for service.

Display Screen	Web Portal	Web Portal Message	Action
607	27607	Optics: Calibration Failed	Restart the laser imager. See page 2-4. If the error persists, call for service.
611	27611	Optics: Internal Hardware Failure	Restart the laser imager. See page 2-4. If the error persists, call for service.
646	27646	Optics: Internal Hardware Failure	Restart the laser imager. See page 2-4. If the error persists, call for service.
650	27650	Optics: Internal Hardware Failure	Restart the laser imager. See page 2-4. If the error persists, call for service.
501	28501	Processor: Internal Hardware Failure	Restart the laser imager. See page 2-4. If the error persists, call for service.
509	28509	Processor Warm-up Failure	Restart the laser imager. See page 2-4. If the error persists, call for service.
510	28510	Processor: Internal Hardware Failure	Restart the laser imager. See page 2-4. If the error persists, call for service.
551	28551	Processor Heater Failure	Restart the laser imager. See page 2-4. If the error persists, call for service.
554	28554	Processor Over Temperature	Restart the laser imager. See page 2-4. If the error persists, call for service.
924	29924	Densitometer: Internal Diagnostic Failure	Restart the laser imager. See page 2-4. If the error persists, call for service.
925	29925	Densitometer: Internal Diagnostic Failure	Restart the laser imager. See page 2-4. If the error persists, call for service.
931	29931	Densitometer: Internal Communications Failure	Restart the laser imager. See page 2-4. If the error persists, call for service.
935	36935	Local Panel: No Communications from MCS	Restart the laser imager. See page 2-4. If the error persists, call for service.

Correcting film jams

When film is jammed, the display screen indicates a jam and an error code that provides guidance on where to check for the jammed film.

NOTE: These errors are also reported at the Web Portal.

Check the code to know where to find the jammed film

Film Jam symbol
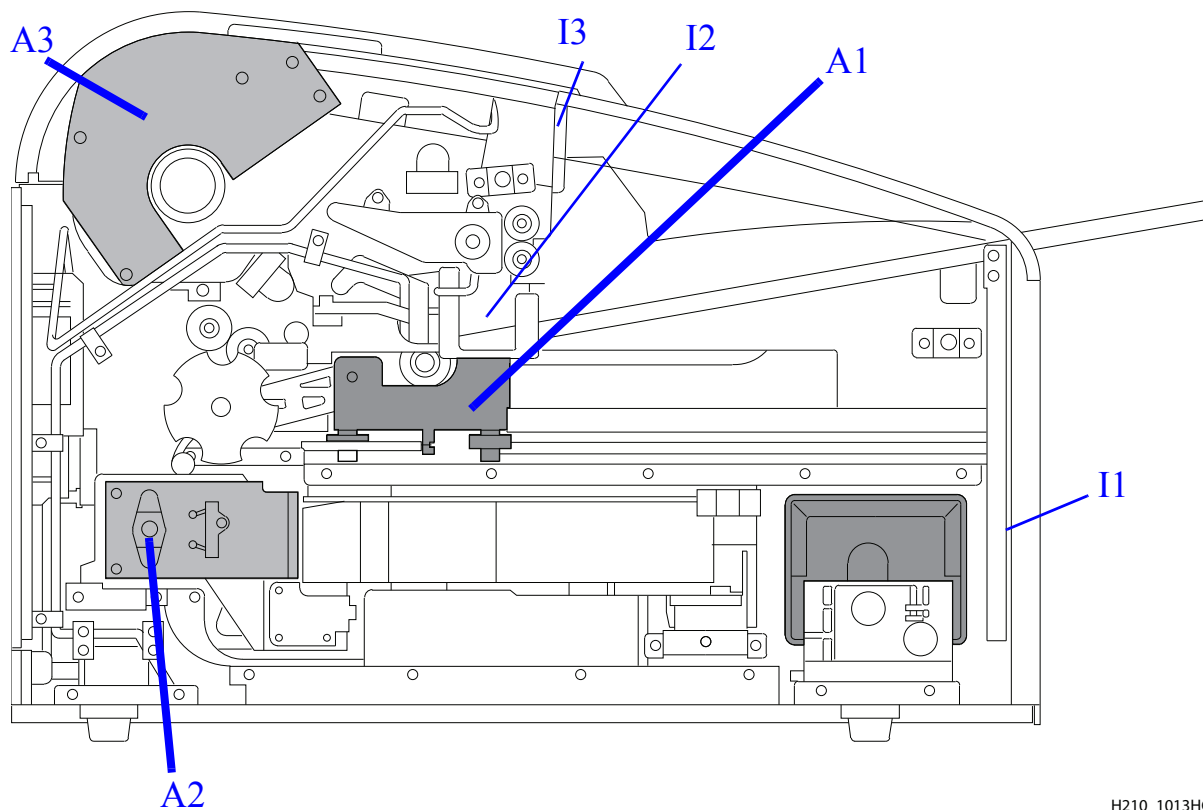
Film Jam Areas

H210_1013HC

Jam Areas	Description
A1	Film supply
A2	Film path
A3	Processor / densitometer

Interlocks	Description
I1	Film supply
I2	Left cover
I3	Top cover

For some jams, you can remove the film by turning a knob to move the film out of the laser imager. See details in the film jam instructions.

Knobs for manual film removal

Manual rollback knob

Exit Roller Knob

Front of laser imager

Exposure Transport Knob
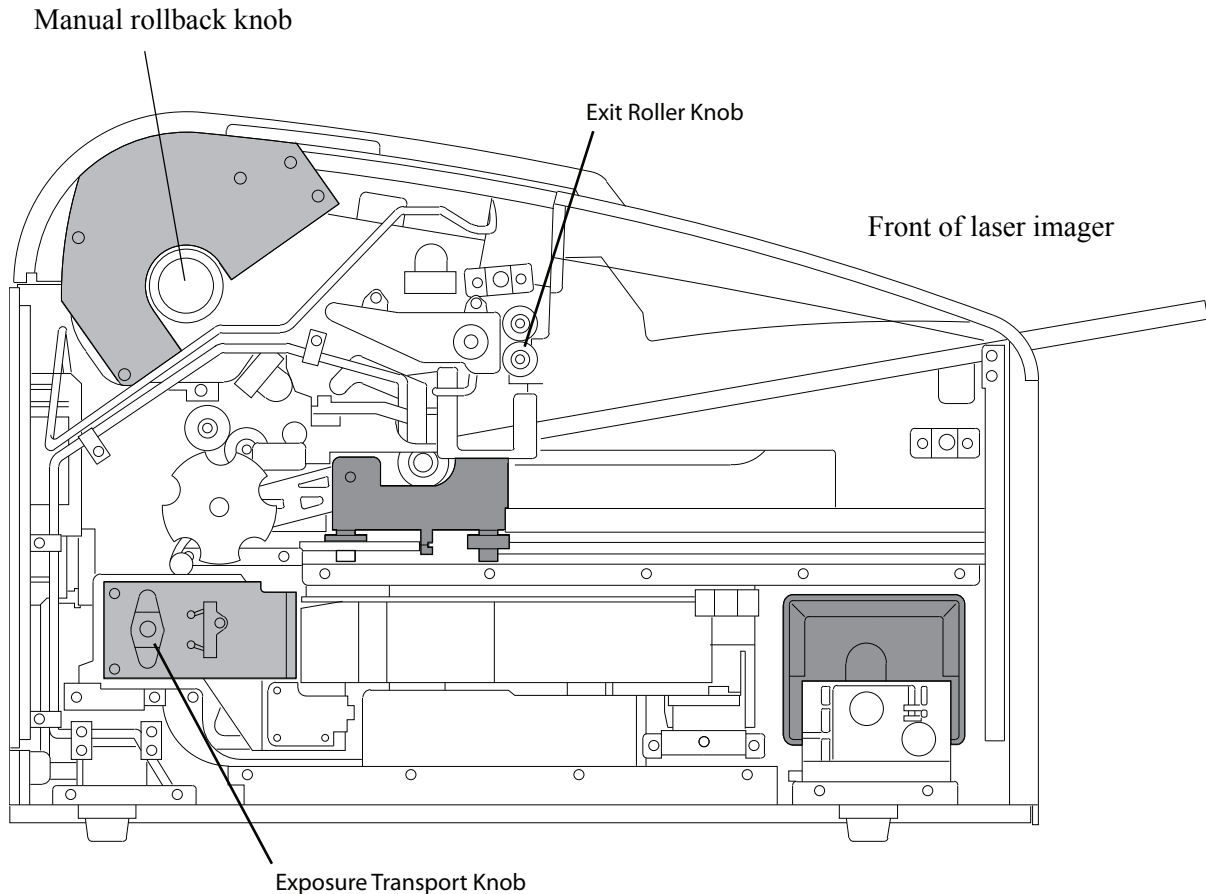
H210_1013HAB

Film jam code 116 / Jam in Area 1

NOTE: This error displays as code 21116 at the Web Portal.

1. If the Pause symbol is on, press it and wait until it goes off.
2. Open the film supply and remove the film cartridge from the laser imager.
3. Look in Area 1 (the film supply) and remove any film. See page 3-14 for the film jam areas.
4. Reinsert the film cartridge in the laser imager.

Film jam code 323 / Jam in Area 2

NOTE: This error displays as code 26323 at the Web Portal.

1. If the Pause symbol is on, press it and wait until it goes off.
2. Open the film supply.
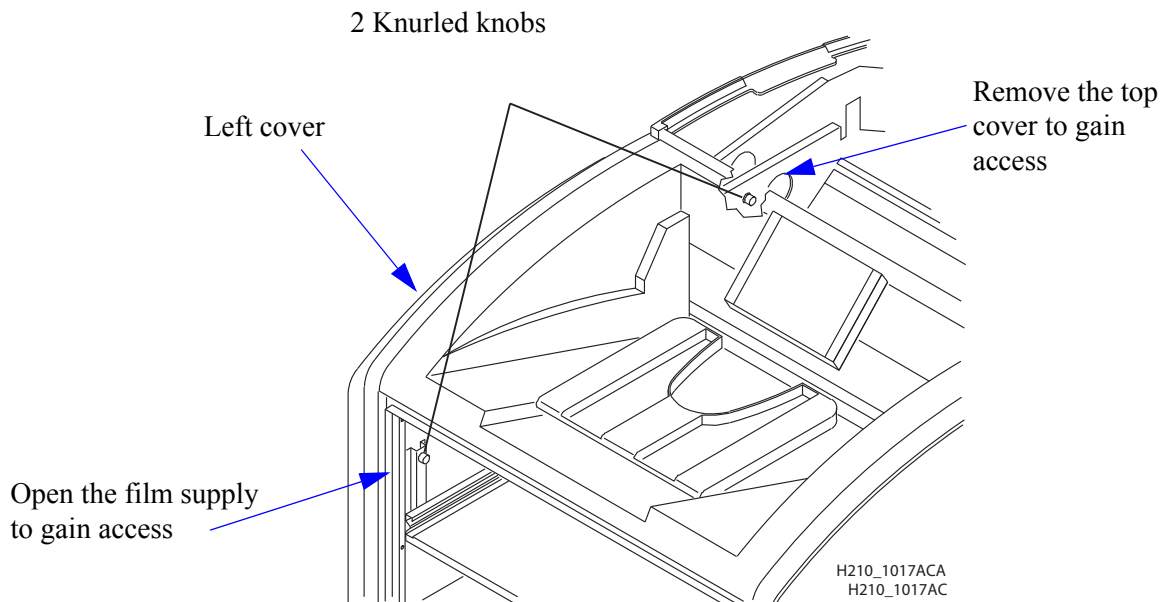3. Check that the film cartridge is closed. If it is not closed, carefully close the cartridge cover.
4. Remove any loose film near, in, or partially in the film cartridge.
5. Close the film supply.

Film jam code 324 or 325 / Jam in Area 2

NOTE: This error displays as code 26324 or 26325 at the Web Portal.

2 Knurled knobs

Left cover

Remove the top cover to gain access

Open the film supply to gain access

H210_1017ACA
H210_1017AC

1. If the Pause symbol is on, press it and wait until it goes off.
2. Remove the left cover:
   a. Open the film supply.
   b. Remove the top cover.
   c. Turn the knurled knobs by hand.
3. Reach into Area 2 and remove any film. See page 3-14 for the film jam areas.
4. If the film is not loose, carefully turn the exposure transport knob clockwise to remove the film from the rollers. See page 3-15 for the location of the knob.
5. Reinstall the covers.

Film jam code 326 / Jam in Area 2 or 3

NOTE: This error displays as code 26326 at the Web Portal.

1. If the Pause symbol is on, press it and wait until it goes off.
2. Remove the top cover.
3. Remove the left cover:
   a. Open the film supply.
   b. Remove the top cover.
   c. Turn the knurled knobs by hand.
4. Rotate the exit roller knob clockwise until a film exits the laser imager. See page 3-15 for the location of the knob.

2 Knurled knobs

Left cover

Remove the top cover to gain access

Open the film supply to gain access

H210_1017ACA
H210_1017AC
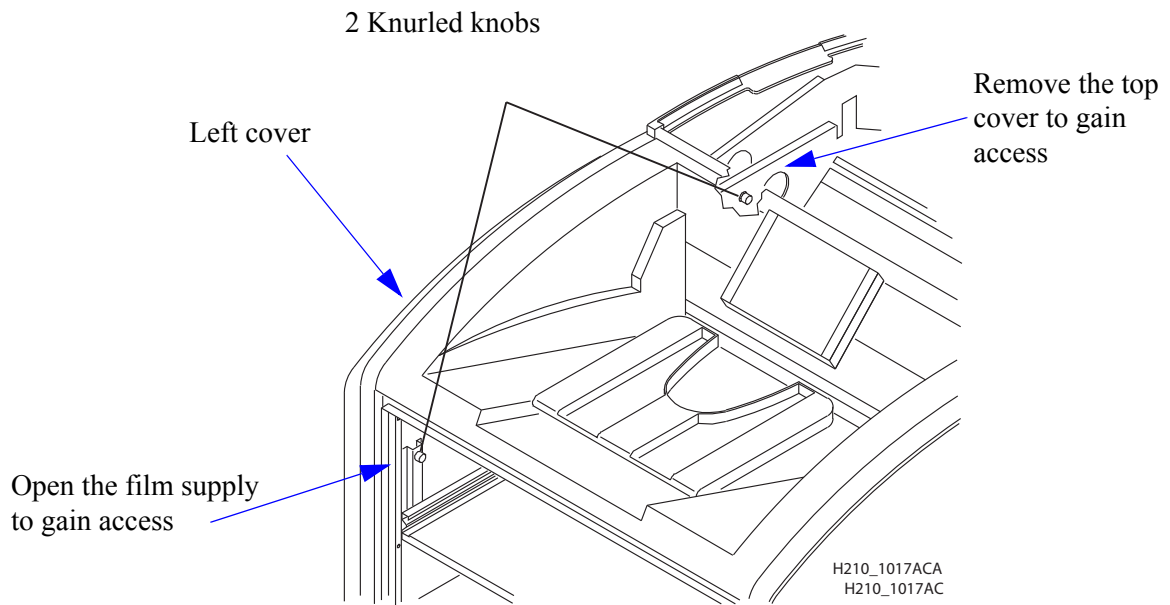
5. If a film does not exit:
   a. Reach into Area 2 and remove any film. See page 3-14 for the film jam areas.
   b. If the film is not loose, carefully turn the exposure transport knob clockwise to remove the film from the rollers. See page 3-15 for the location of the knob.
6. Reinstall the covers.

**Film jam code 543 /
Jam in Area 3**

This error displays as code 26543 at the Web Portal.

1. If the Pause symbol is on, press it and wait until it goes off.
2. Open the top cover.
3. Remove the left cover:
    a. Open the film supply.
    b. Remove the top cover.
    c. Turn the knurled knobs by hand.
4. Rotate the exit roller handle clockwise until a film exits the laser imager. See page 3-15 for the location of the knob.
5. Reinstall the covers.

**Film jam code 544 /
Jam in Area 3**

This error displays as code 26544 at the Web Portal.

1. Remove any film that is jammed in the exit tray. See page 3-14 for the film jam areas.
2. If the Pause symbol is on, press it and wait until it goes off.
3. Open the top cover and remove any films.
4. Close the top cover.

Display Screen is not functional

If the display screen is not responding, use the power switch on the laser imager to turn power off, and then on. If the display screen is still non-responsive, turn the laser imager off and contact a qualified service provider.

Calling for support

If you cannot correct a condition and need help, call for support. Have the following information ready when you call:

- Model number
- K-number
- Error code from the display screen and/or code and error message from the Web Portal

4   Film Technical Information

General description

This section describes the characteristics of Laser Imaging Film, not the operation of the laser imager. The Laser Imaging Film is a high-resolution, infrared-sensitive, photothermographic film designed specifically for the Laser Imager.

Spectral sensitivity

The Laser Imaging Film is infrared sensitive and has been sensitized to the infrared laser diode of the laser imagers. When handled according to instructions on the daylight-load film package, safelights are not needed. If you remove undeveloped film from the daylight-load package, you will need a darkroom setting and a green safelight.

Relative Log Exposure (Example)
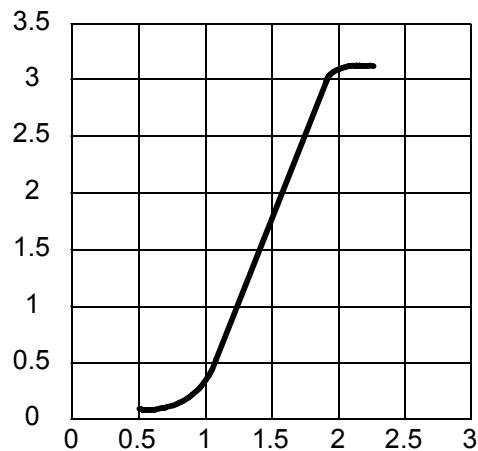
Image quality

The Laser Imaging Film delivers diagnostic-quality, continuous-tone images along with sharp alphanumerics and optimum contrast. This high-quality, silver-based film provides health care providers with the same diagnostic information they are accustomed to viewing — including the spatial resolution, contrast, and gray levels. Because it is a totally dry imaging process, there is no image quality variability due to wet chemistry.

Environmental impact

Tests show that the Laser Imaging Film is not considered hazardous to the environment. As a result, you can develop, recycle, and dispose of film with less impact on the environment than if you were using wet-developed silver halide films.

Laser Imaging Film US Environmental Regulations Comparison					
	Wet (Silver Halide) Film				Dry Film
	Developer	Fixer	Wash	Film	Film
Product Regulations					
OSHA MSDS	Required	Required	Not required	Not required	Provided
DOT	Hazardous	Hazardous	No limits	No limits	No limits
Use permits	Local	Local	None	None	None
Disposal* Regulations					
EPA	Hazardous	Hazardous	No	No	No
DOT	Hazardous	Hazardous	No	No	No
There is no SUPERFUND liability with dry Laser Imaging Film. * State and local laws vary. Consult appropriate regulations or authorities prior to disposal.					

Storing and handling undeveloped film

To achieve consistent results up to the expiration date indicated on the film package, the Laser Imaging Film must be stored in a cool, dry place (5° to 25° C, or 41° to 77° F) and protected from radiation and chemistry fumes.

The film can withstand short-term temperature spikes (up to 35° C, or 95° F) for several hours during transit without any significant effect on film quality or performance. Transit temperatures above 35° C (95° F) will gradually diminish shelf life.

Handling developed film

Handling the Laser Imaging Film requires reasonable care. Spills, humidity, and other moisture typically have no significant effect on developed films. However, prolonged exposure to intense light or excessive heat (54.4° C or 130° F) for more than three hours may cause some gradual darkening of images. Leaving films in vehicles in hot climates for extended periods of time is not recommended.

For best results, store film in sleeves when not being reviewed. The Laser Imaging Film can be left on a light box for more than 24 hours. In extreme cases in which light boxes are exceptionally hot (49° C, or 120° F), the manufacturer recommends removing them prior to eight hours of continuous exposure.

Take care when using spotlight viewing for more than 30 seconds because temperatures near the light source may exceed 82.2° C (180° F). Use in slide projectors is not recommended due to the high temperatures generally found in these devices.

With dry technology, a small amount of final development occurs when the film exits the laser imager and is initially exposed to ambient or view-box lighting. This is virtually undetectable and has no effect on image quality (typically 0.02 change in density). This small density increase is uniform and permanent upon full exposure of the film under normal handling conditions (room light or view box).

Archiving developed film

The Laser Imaging Film has been tested and can be archived for more than 100 years when stored at American National Standards Institute (ANSI) recommended storage conditions (25° C or 77° F). Developed films may be stored at higher temperatures; however, that may reduce the number of years the film can be stored. For example, storing films at a constant elevated temperature of 32.2° C (90°F) may reduce archive capability to 30 years.

Exposing to moisture

The Laser Imaging Films typically withstand humidity, spills, and other forms of water without any significant effect on image quality or film integrity. If needed, film can be cleaned with a clean, damp cloth.

Dissipating odor

Dry technology eliminates virtually all unpleasant odors. While some low-level odors are produced during the development process, they pose no known adverse health risks. Processing odor levels are further reduced by a non-hazardous, recyclable filter in the laser imager. This filter traps most low-level odors and prevents them from dissipating into the work environment. To help maintain optimum performance, the filter requires periodic replacement. The laser imagers require no special venting.

Dissipating heat

The laser imagers use controlled heat to develop the Laser Imaging Film. The heat has virtually no effect on the air temperature of the work area. The amount of heat dissipated into an area during a day is typically less than the heat generated by two to four 100-watt light bulbs.

Recycling film

According to the Environmental Protection Agency (EPA) standards, the Laser Imaging Film is not considered hazardous and requires no special disposal procedures. However, the film does contain silver and polyester that may be recovered by using one of several recycling processes.

5 Specifications

Equipment specifications

	Unpacked	Packed
Height	47 cm (19 in.)	74 cm (29 in.)
Width	61 cm (24 in.)	79 cm (31 in.)
Depth	66 cm (26 in.)	85 cm (34 in.)
Weight	54 kg (120 lbs)	73 kg (160 lbs)

Operating space requirements

Allow 5 cm (2 in.) clearance around the top, sides, and back of the laser imager. This space is required to let the laser imager perform normal operator functions. For service functions, allow 15 cm (6 in.) clearance around the laser imager.

Environmental requirements

Temperature
- Operating: 15° to 33° C (59° to 91° F)
- Storage: -40° to 55° C (-40° to 131° F)

Relative humidity
- Operating: 20% to 85% RH, noncondensing
- Storage: 10% to 90% RH, noncondensing

Altitude
- 30 m (100 ft) below sea level to 3,048 m (10,000 ft) above sea level

Surface levelness
- The countertop/floor must be level within 1°.

Environmental effects

- Acoustical Noise:
  - Less than 55 dB at 1.5 m during idle or standby
  - Less than 75 dB momentary at 1 m during normal operation

Power requirements

A power cord is provided with this equipment. All countries must use an Agency-approved power cord with a plug type suitable for the country of use. Contact a qualified dealer for help.

Connect the equipment to a power source that is suitable for the voltage and current ratings shown on the rating label. The single-phase power source, with grounding, must be provided within 2.5 m (8 ft) of the laser imager.

The wire must be insulation-rated for 600 V (ac). A dedicated line is recommended.

Network requirements

The laser imager receives digital images from medical imaging devices (modalities) over a 10/100Base-T or 1000Base-T Ethernet Network.

Publication History

Revision	Date	Reason for Change
A	2011-03-31	First release