Operation Manual

Notices and Conventions

The information herein is based on the experience and knowledge relating to the subject matter gained by the manufacturer prior to publication. No patent license is granted by this information. The manufacturer reserves the right to change this information without notice, and makes no warranty, express or implied, with respect to this information. The manufacturer shall not be liable for any loss or damage, including consequential or special damages, even if loss or damage is caused by the manufacturer's negligence or fault.

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

Important:
Important highlights critical policy information that affects how you use this manual and this product.

CAUTION:
Caution points out a potentially hazardous situation which, if not avoided, might cause minor or moderate injury.

Compliance and Safety Information

See the *Safety Manual*.

CAUTION:
If you witness or become aware of a potential safety issue with this equipment, take the appropriate safety measures and report this to your qualified service representative immediately.

Any serious incident that may occur in relation to this device should be reported to the manufacturer and the national competent authority.

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4 Film Technical Information

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Publication History

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 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.

1	**Top cover**. Covers the processor rollers. The top cover is interlocked.
2	**Display screen**. Your interface to the imager. Provides status and error information.
3	**Right cover**. Protects sensitive electronic equipment. The right cover is only accessed by service personnel.
4	**Film supply cover**. Covers the film supply, which 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
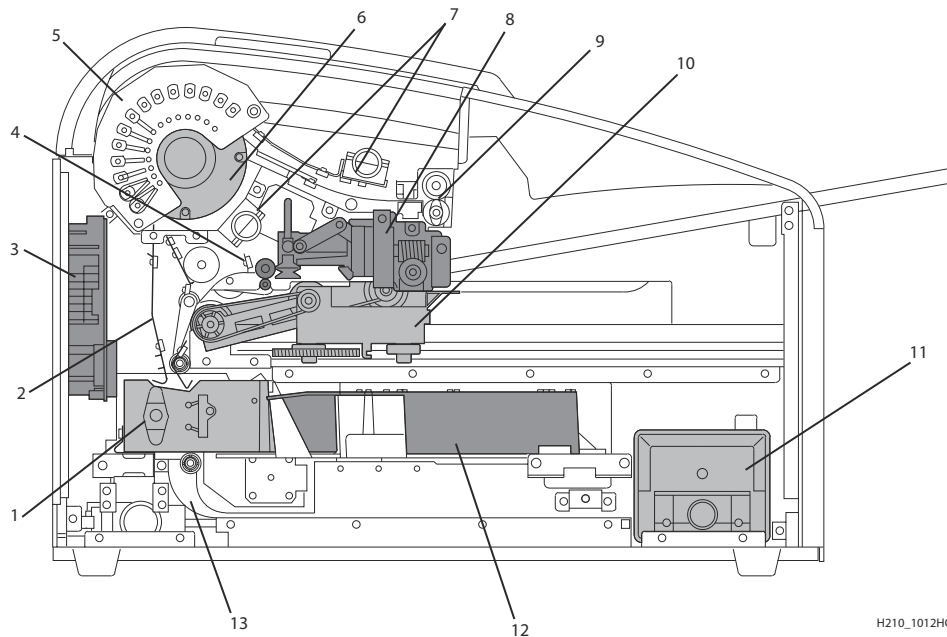
1   **Exposure transport**. Moves the film past the scanning laser beam.

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

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

4   **Feed rollers**. Move the film through the 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 imager is not printing, the cover is closed over the film cartridge to protect the film from light.

11   **Deodorant 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 Imager Works

The imager receives, processes, manages, and prints the images on film. The 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 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 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 imager to override information that comes from the image source.

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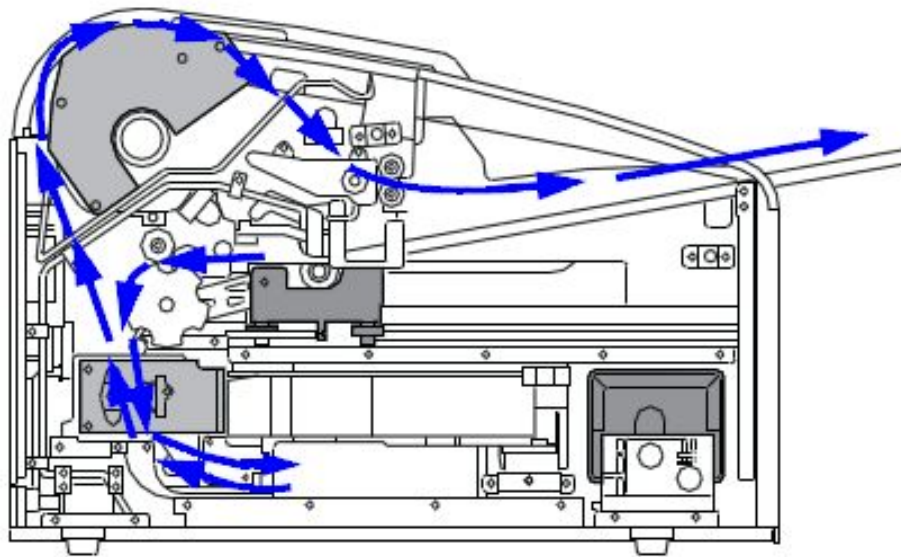
Each time the imager receives a print request, the following print sequence occurs. The blue arrows show the film path.

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 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 imager to automatically adjust image processing parameters using Automatic Image Quality Control (AIQC) to produce an optimal image. The imager adjusts these parameters each time it prints a calibration film.

A calibration film is printed when:

- A film cartridge is inserted in the imager with film of a new lot number.
- You request a calibration film at the display screen or the Web Portal.
- A film cartridge is inserted into the imager for which a current calibration is not stored.

Related tasks

Calibrate the Imager for the Installed Film

Configure and Monitor the System (Using the Web Portal)

The Web Portal is your interface to additional features. From a personal computer on the network, you can view and manage the 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.

Related concepts

Access More Functionality with the Web Portal

Installation, Setup, and Safety

Installation and setup for the imager must be performed by a qualified service provider. Contact a qualified service provider with any questions.

Ensure that the printing system is installed in a secure location to protect privacy rights if required by local regulations.

See the *Safety Manual*, available on the publications disc, for instructions to safely use the system and for agency compliance.

2 Basic Operating Tasks

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

- Turn the power on (|) and off (0).
- Load the 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.

You also may access the Web Portal to perform additional configuration, optimize image quality, or do troubleshooting tasks.

Related concepts

Access More Functionality with the Web Portal

Related information

Laser Imager Maintenance and Troubleshooting

Understanding the Display Screen

The display screen communicates the status of the imager.

Symbol or code	Description
Top left of the display screen: 	Error or status code. The 3-digit code displays when the error or status condition is present. If the imager is on and a 3-digit code does not display, the imager is operating normally. If a different film size has been requested than what is installed, the requested film size displays. When the imager is starting, a countdown displays the number of minutes until the imager will be ready to print (for example, -4 means 4 minutes until the imager will be ready to print).
Lower left of the display screen: 	Film count. Displays the number of films that are remaining in the film cartridge. The loaded film size also displays in this location. If a blue number does not display while the imager is powered on, the film cartridge is not inserted (or not fully inserted) into the imager.
Power 	When the symbol is green, the power is on and the imager is ready to print. The symbol flashes while the imager is while processing, calibrating, or making a test print. When the symbol is yellow, the imager is not ready to print. Examples are when the 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. Calibration might be needed if the symbol is on and code 624, 631, or 632 appears.
Pause 	During normal operation, the symbol is off. (See exceptions in the note below.) 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. **Note:** The Pause symbol is on while the imager is processing images or test prints and during calibration.

Symbol or code	Description
Film Size	When the symbol appears, the requested job requires a different film size.
	You can also cancel all pending print jobs that require an unavailable media size.
Restart	Restart the imager. An error code also displays.
Film Jam	Film is jammed. The error code confirms the film jam and gives direction on where to find the film inside the imager.
Maintenance	Preventive maintenance is required. Check the error code to learn what action to take.

Related tasks
Load a Different Film Size to Match a Print Request
Calibrate the Imager for the Installed Film
Delete Pending Jobs
Restarting the Imager

Related reference
Film Jam Indication and Areas

Related information
Laser Imager Maintenance and Troubleshooting
Preventive Maintenance

Turning the Power On and Off

1. To start the imager, press the power switch on the back of the imager to on (|).

2. Wait as the imager warms up.

    The warm-up period might last up to 30 minutes. The display screen shows the progress as the imager becomes ready to print.

    Figure 1: A countdown to zero (0) indicates how soon the imager will be ready to print. The power symbol flashes yellow while the imager warms up.

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

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

    Figure 2: In this example, the green power symbol means "ready." The film count is 125. You can calibrate the film cartridge if necessary.

Emergency Shutdown or Power Loss

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

Restarting the Imager

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

Figure 3: The error code indicates the error condition. You may want to check the Troubleshooting chapter or the Quick Reference Card to identify the error.
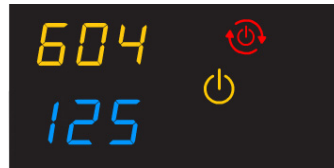
1. Press the power switch on the back of the imager off (0).

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.

Film Cartridge Information

Film Count

The film count displays on the imager display screen.

Figure 4: In the example, 125 indicates a full film cartridge.

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.

Figure 5: In the example, "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 Flashes "0"

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

Figure 6: When the film count is "0," you must replace the film cartridge before you can print again.

Related tasks

Insert a New Film Cartridge

Insert a New Film Cartridge

Prerequisites:

Before you load 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.

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

2. Open the film supply.

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

4. Discard the removed cartridge.

5. Insert the new film cartridge. Align the cartridge with the label facing up and the perforations (1) to the front. Set the leading edge (2) on the cartridge guides (3), and then slide the film cartridge into the imager to engage the detents (4) in the bottom of the cartridge.
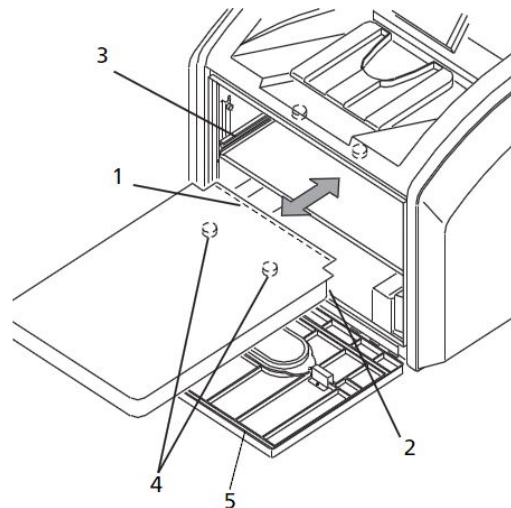
6. Close the film supply (5).

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

Load 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.

Figure 7: The requested film size (in this example, "35" and then "43") flashes. The Film Size symbol indicates that you must change the film size. In this example, load 35 x 43 cm (14 x 17 in.) film. 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.
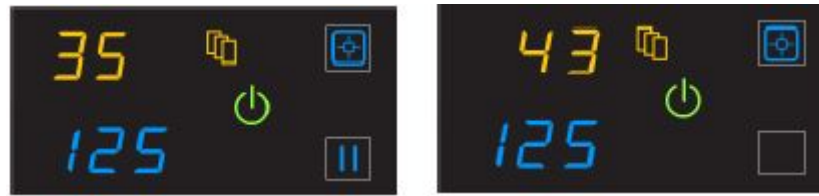
1. If the Pause symbol is on, press it and wait until it turns off.

2. Open the film supply.

3. Hold the edges of the film cartridge and lift the cartridge out of the film supply.

4. Store the removed film cartridge.

5. Insert the new film cartridge:
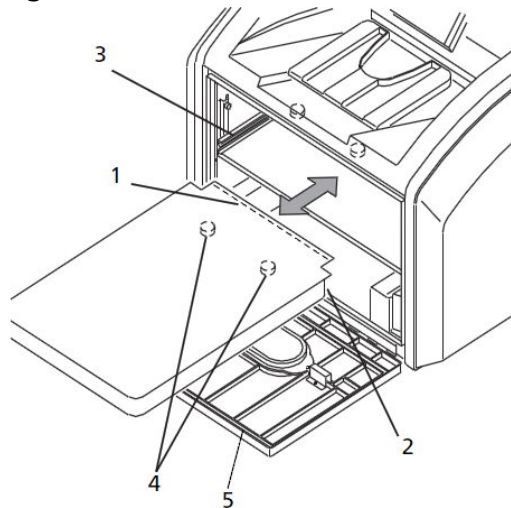
   a. Align the cartridge with the label facing up and the perforations (1) to the front.

   b. Set the leading edge (2) on the cartridge guides (3).

   c. Slide the film cartridge into the imager to engage the detents (4) in the bottom of the cartridge.

6. Close the film supply (5).

7. Check that the display screen changes to reflect the new film size.

Delete Pending Jobs

You might cancel all the pending print requests if the wrong media has been selected. To cancel all print requests, press and hold the Film Size symbol for five seconds.

Figure 8: Press the yellow Film Size symbol for five seconds.
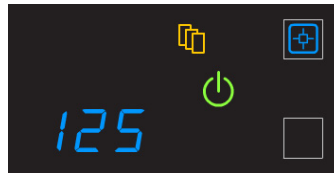
Note:

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

Make a Test Print

Note:

You can make additional test prints at the Web Portal.

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

   Figure 9: Press the two symbols on the right side at the same time for five seconds.
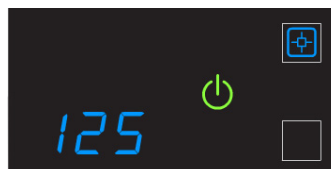
2. Press and then release the Calibration and Pause symbols.
   The symbols flash until the test print is complete.

Calibrate the Imager for the Installed Film

In normal operating conditions, it is not necessary to calibrate the 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.

1. Press the symbol to start the calibration.

   Figure 10: The Calibrate symbol is in the upper right.
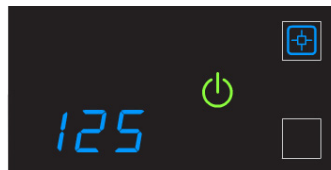
   The Calibration and Power symbols both flash while the calibration is in progress.

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. An error code will display. When a calibration error occurs, it might be necessary to address the error before you can continue printing.

Related reference

Error Indicators on the Display Screen

Open or Remove a Cover

You can open or remove the imager's top cover, left cover, and film supply. The covers are protected with an interlock mechanism to keep the imager from printing when they are open. The imager is not operational when an interlock is open.
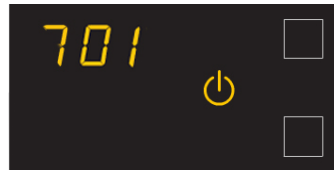
Code 701 alerts you that a cover and an interlock are open, and internal power has been removed from the operator accessible areas.

You might open the top cover or left cover to search for film jams.

Related reference

Film Jam Indication and Areas

Access More Functionality with the Web Portal

The Web Portal is your interface to additional features. From a personal computer on the network, you can view and manage the imager's connections, 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.
- Diagnostic utilities, including backup and restore.

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

The following requirements are for the network and browser used to access the Web Portal:

- 10/100 Mbps Ethernet
- Imager with WINDOWS operating system: MICROSOFT WINDOWS INTERNET EXPLORER 6, sp1 or above
- Imager with LINUX operating system:

  - MICROSOFT WINDOWS INTERNET EXPLORER 11
  - GOOGLE CHROME, 76.0.3809.100
  - MOZILLA FIREFOX, 64.0.2

Note:

If you need help to determine if your imager is running on WINDOWS or LINUX operating system, contact the service representative who installed the imager.

Access the Web Portal - WINDOWS

1. On a desktop or laptop computer, start WINDOWS INTERNET EXPLORER (IE).

   Note:

   IE 6, 7, and 8 have been qualified with the imager. See the note below step 3 if using a newer version of IE.

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

   Note:

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

3. Press [Enter] or click **Go**.

   The Web Portal opens to the **Device Status** (Home) screen.

- The **Device Status** screen shows general status, the number of print jobs queued, the number of jobs waiting for film, and the film count for each cartridge.
- The left panel provides the links to all other areas of the Web Portal.

Note:

If you are using a newer version of WINDOWS INTERNET EXPLORER (IE), place the IE window into compatibility view to correct any potential viewing issues. After you have opened the IE window, click the Compatibility View toolbar button.
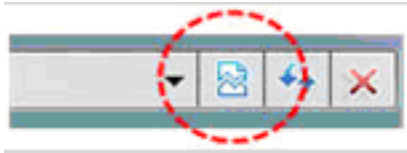
If the icon is not on the toolbar, select **Compatibility View settings** from the **Tools** menu. At the **Compatibility View Settings** dialog, click **Add** to move the website to the lower field and enable compatibility view. Click **Close** and wait for the IE window to refresh.

Access the Web Portal - LINUX

1. On a desktop or laptop computer, open a browser.

Note:
The following browsers have been qualified with the imager:

- MICROSOFT WINDOWS INTERNET EXPLORER 11
- GOOGLE CHROME, 76.0.3809.100
- MOZILLA FIREFOX, 64.0.2

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

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

3. Press [Enter] or click **Go**.

The Web Portal opens to the **Device Status** (Home) screen.

- The **Device Status** screen shows general status, the number of print jobs queued, the number of jobs waiting for film, and the film count for each cartridge.
- Links to the other areas of the Web Portal are under the **Menu** drop-down list.

3   Laser Imager Maintenance and Troubleshooting

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

- *Overview: Status and Error Messages and Codes*—Review this overview for information about where and when the messages and codes appear.
- *Preventive Maintenance*—Learn how to respond to the Maintenance symbol.
- *Error Indicators on the Display Screen*—Learn about the amber and red error symbols
- *Using the Web Portal to Gain More Information on Errors*—Learn how and why to access the Web Portal.
- *Subsystem Error Codes and Messages*—Refer to this section for error codes and messages.
- *Condition Codes*—Refer to this section for all condition codes.
- *Film Jam Indication and Areas*—See instructions to locate and correct jammed films.
- *Display Screen is Not Functional*—Learn what to do if the display screen is not responding.
- *Call for Support*—Learn how to get help.

Overview: Status and Error Messages and Codes

The 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 when appropriate. View the codes:

- **At the imager's display screen,** on the center right. 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 imager's display screen due to the limited size of the display screen.

Related concepts

Using the Web Portal to Gain More Information on Errors

Preventive Maintenance

Note:

These conditions are also reported at the Web Portal.

About the Filter

Important:

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 filter traps potential odors that are generated in the imager during film processing. The filter must be replaced after 15,000 prints. Keep at least one new filter available to replace the used filter when needed.

Replace the Filter

When the filter must be replaced, the display screen shows the error code 449 and the Maintenance symbol.
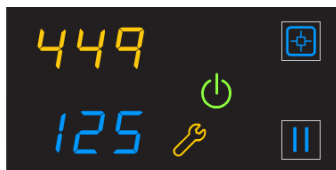
1. Open the film supply.

2. Remove the deodorant filter by lifting it up and pulling it forward.

H210_1016AC
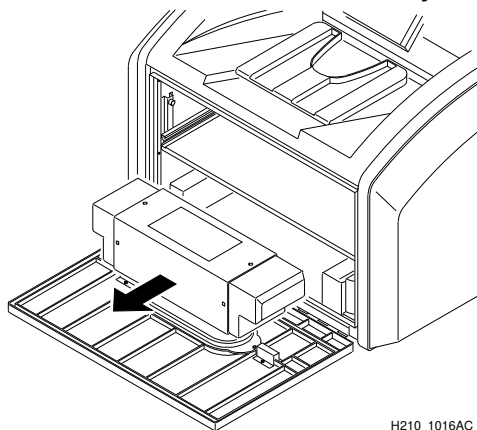
3. Install a new deodorant filter.

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 imager needs a preventive maintenance service call, the 550 code and Maintenance symbol appear:
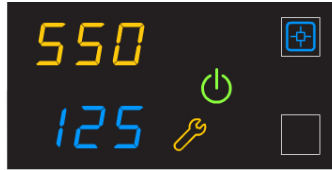
When the 550 code displays, contact a qualified service provider.

Error Indicators on the Display Screen

The 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 amber:
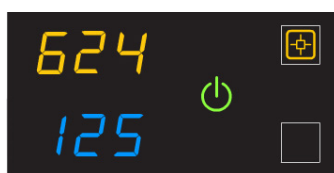
The most common cause is a film-related problem. Depending on the cause, you may be able to keep printing, but the imager may not be optimally calibrated.

Required Restart

When the red Restart symbol appears, you must restart before the laser imager can continue to print.
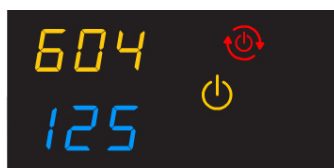
Use the power switch on the back of the imager to power the imager off and then back on. If the error does not clear, contact a qualified service provider.

Film Jams

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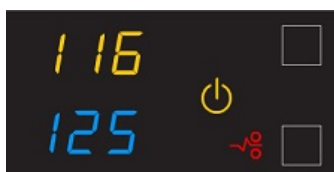
Related reference

Film Jam Indication and Areas

Using the Web Portal to Gain More Information on Errors

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

About 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.

Related concepts

Access More Functionality with the Web Portal

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	WARNING	BAD SUPPLY MGZ
	PRINTER DOWN		CALIBRATION ERR
	PROC DOWN		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.

Printer Status	Display Screen	Web Portal	DICOM Status	Description
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.

Film Cartridge State	Display Screen	Web Portal	Description
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.
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.

Related tasks
Calibrate the Imager for the Installed Film

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.
Offline	Status code: 704 Power symbol is green	DICOM Offline	The laser imager cannot accept any DICOM job requests. Restart the laser imager.

Related tasks

Load a Different Film Size to Match a Print Request

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. 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. 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. If the error persists, call for service.
003	10003	MIS: Image Buffer Error	Restart the laser imager. If the error persists, call for service.

Display Screen	Web Portal	Web Portal Message	Action
015	10015	MIS: Database Error	Restart the laser imager. If the error persists, call for service.
910	10910	MIS: MCS Communication Failure	Restart the laser imager. 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.
154	20154	MCS: Internal Communications Failure	Restart the laser imager. If the error persists, call for service.
155	20155	Incompatible MCS Printer Configuration for Hardware	Restart the laser imager. If the error persists, call for service.
156	20156	Incompatible Software Versions Installed	Restart the laser imager. If the error persists, call for service.
209	20209	Laser Imager Opened During Self Test	Close the cover. Restart the laser imager. If the error persists, call for service.
449	20449	none	Change the deodorant filter.
550	20550	none	Call service for preventive maintenance.
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.

Display Screen	Web Portal	Web Portal Message	Action
915	20915	Internal Image Data Transfer Failed	Restart the laser imager. If the error persists, call for service.
919	20919	Internal Image Data Render Failed	Restart the laser imager. 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	Clear the jam.
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. Then reinsert the 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.

Display Screen	Web Portal	Web Portal Message	Action
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. Then reinsert the 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. If the error persists, call for service.
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. Then reinsert the film cartridge into the laser imager. If the error persists, call for service.
624	21624	Film Supply: Film Calibration Failure	Calibrate again. If the error still displays, install a new film cartridge. If the error still displays, restart the laser imager. 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 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 or install another film cartridge.

Display Screen	Web Portal	Web Portal Message	Action
922	25922	RF Tag: Internal Diagnostic Failure	Restart the laser imager. If the error persists, call for service.
323	26323	Film Jam in Area 2	Clear the jam.
324	26324	Film Jam in Area 2	Clear the jam.
325	26325	Film Jam in Area 2	Clear the jam.
326	26326	Film Jam in Area 2 or 3	Clear the jam.
543	26543	Film Jam in Area 3	Clear the jam.
544	26544	Film Jam in Area 3	Clear the jam.
123	27123	Optics: Internal Hardware Failure	Restart the laser imager. If the error persists, call for service.
601	27601	Optics: Calibration Failed	Restart the laser imager. If the error persists, call for service.
604	27604	Optics: Calibration Failed	Restart the laser imager. If the error persists, call for service.
607	27607	Optics: Calibration Failed	Restart the laser imager. If the error persists, call for service.
611	27611	Optics: Internal Hardware Failure	Restart the laser imager. If the error persists, call for service.
646	27646	Optics: Internal Hardware Failure	Restart the laser imager. If the error persists, call for service.
650	27650	Optics: Internal Hardware Failure	Restart the laser imager. If the error persists, call for service.
501	28501	Processor: Internal Hardware Failure	Restart the laser imager. If the error persists, call for service.

| Display Screen	Web Portal	Web Portal Message	Action
509	28509	Processor Warm-up Failure	Restart the laser imager. If the error persists, call for service.
510	28510	Processor: Internal Hardware Failure	Restart the laser imager. If the error persists, call for service.
551	28551	Processor Heater Failure	Restart the laser imager. If the error persists, call for service.
554	28554	Processor Over Temperature	Restart the laser imager. If the error persists, call for service.
924	29924	Densitometer: Internal Diagnostic Failure	Restart the laser imager. If the error persists, call for service.
925	29925	Densitometer: Internal Diagnostic Failure	Restart the laser imager. If the error persists, call for service.
931	29931	Densitometer: Internal Communications Failure	Restart the laser imager. If the error persists, call for service.
935	36935	Local Panel: No Communications from MCS	Restart the laser imager. If the error persists, call for service.

Related concepts

550 Code and Maintenance Symbol

Related tasks

Restarting the Imager
Load a Different Film Size to Match a Print Request
Replace the Filter
Calibrate the Imager for the Installed Film
Clear Film Jam Code 116 / Jam in Area 1
Clear Film Jam Code 323 / Jam in Area 2
Clear Film Jam Code 324 or 325 / Jam in Area 2
Clear Film Jam Code 326 / Jam in Area 2 or 3
Clear Film Jam Code 543 or 544 / Jam in Area 3

Film Jam Indication and Areas

Jam Areas

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. Check the code to locate the jammed film.
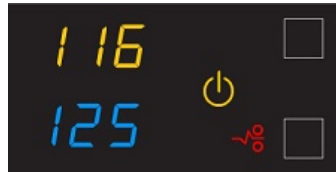
Note:

These errors are also reported at the Web Portal.

Figure 11: Film Jam Areas
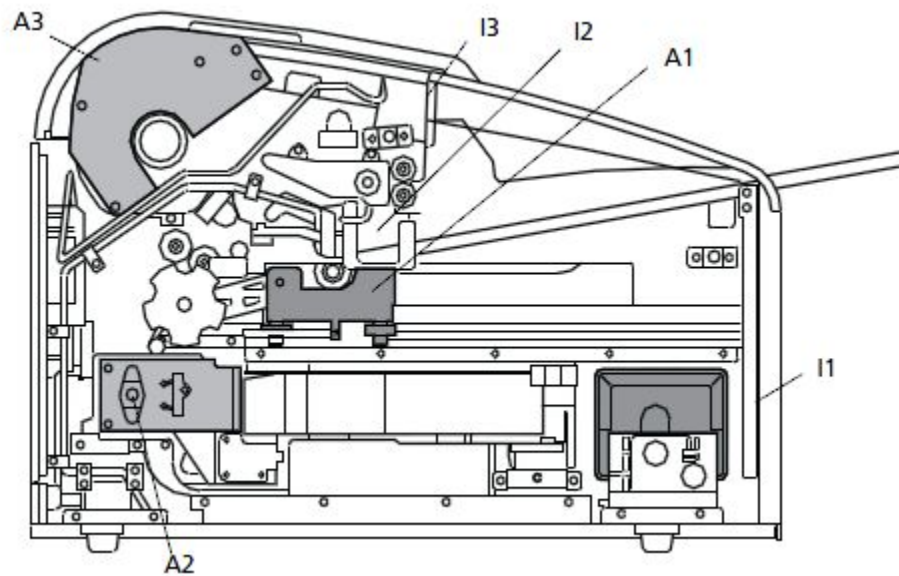
Jam Areas	Description	Interlocks	Description
A1	Film supply	I1	Film supply
A2	Film path	I2	Left cover
A3	Processor / densitometer	I3	Top cover

Roller Knobs

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

Figure 12: Knobs for manual film removal
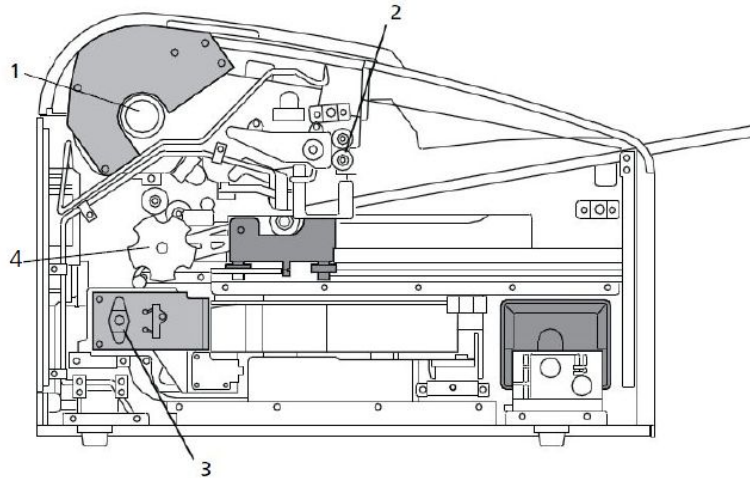
Item	Description
1	Processor drum knob
2	Exit roller knob
3	Exposure transport knob
4	Manual rollback knob

Clear 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 imager.

3. Look in Area 1 (the film supply) and remove any film.

4. Reinsert the film cartridge in the laser imager.

Related reference

Film Jam Indication and Areas

Clear 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.

Related reference
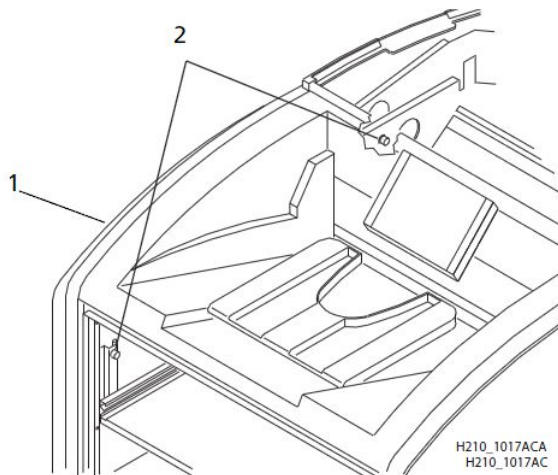Film Jam Indication and Areas

Clear Film Jam Code 324 or 325 / Jam in Area 2

> **Note:**
> This error displays as code 26324 or 26325 at the Web Portal.

1. If the Pause symbol is on, press it and wait until it goes off.

2. Remove the left cover (1):

a. Open the film supply.

b. Remove the top cover.

c. Turn the knurled knobs (2) by hand.

3. Reach into Area 2 and remove any film.

4. If the film is not loose, carefully turn the exposure transport knob clockwise to remove the film from the rollers.

5. Reinstall the covers.

Related reference

Film Jam Indication and Areas

Clear 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 processor drum knob and the exit roller knob clockwise until a film exits the laser imager.

5. If a film does not exit:

a. Reach into Area 2 and remove any film.

b. If the film is not loose, carefully turn the exposure transport knob clockwise to remove the film from the rollers.

6. Reinstall the covers.
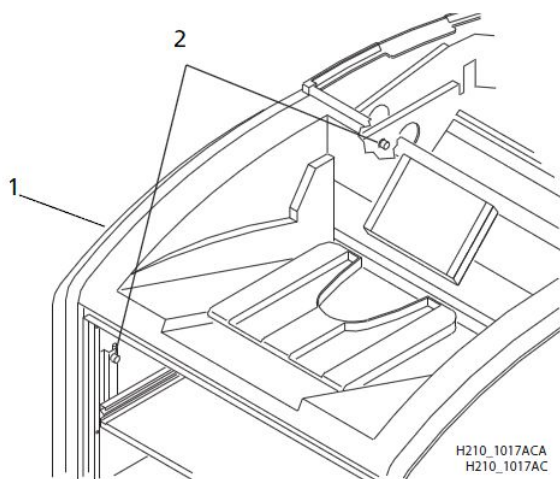
Related reference

Film Jam Indication and Areas

Clear Film Jam Code 543 or 544 / Jam in Area 3

Note:
This error displays as code 26543 or 26544 at the Web Portal.

1. Remove any film that is jammed from the exit tray.
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. Remove the left cover:
   a. Open the film supply.
   b. Turn the knurled knobs by hand.
5. Rotate the exit roller handle clockwise until a film exits the laser imager.
6. Pivot the heat shield open and check for any jams.
7. Rotate the processor drum knob and remove any jams.
8. Reinstall the covers.

Related reference
Film Jam Indication and Areas

Display Screen is Not Functional

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

Call for Support

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

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

4 Film Technical Information

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

Spectral Sensitivity of the Film

The Laser Imaging Film is infrared sensitive and has been sensitized to the infrared laser diode of the 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.
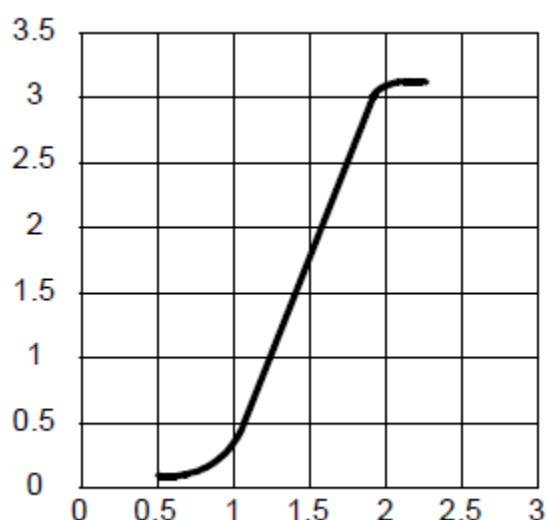
Film Image Quality

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 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.

Table 1: 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.

Undeveloped Film Handling and Storage

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 (4–24 °C, or 39–75 °F) and properly shielded from X-rays, gamma rays, or other penetrating radiation.

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

Hands must be clean, dry, and free of lotions. Handle film carefully by the edges to avoid physical strains such as pressure, creasing, or buckling.

Developed Film Handling and Archival

Handling the Laser Imaging Film requires reasonable care. However, prolonged exposure to intense light or excessive heat (equal to or greater than 54.4 °C or 130.0 °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 the 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 the light boxes are exceptionally hot (equal to or greater than 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 (180.0 °F).

With dry technology, a small amount of final development occurs when the film exits the 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).

Processed film should be stored within the temperature range of 16–27 °C, or 60–80 °F, and at 30–50 % RH. Developed films may be stored at higher temperatures; however, prolonged exposure to higher temperatures will reduce the number of years the film can be effectively archived.

Odor Dissipation

Dry technology eliminates nearly all processing odors. While some odors are produced during the development process, they pose no known adverse health risks. Processing odor levels are further reduced by non-hazardous, disposable filters in the imager. The filters trap most odors and prevent them from dissipating into the work environment. To help maintain optimum performance, the filters require periodic replacement. The imager requires no special venting.

Heat Dissipation

The imager uses 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.

Film Recycling

According to the U.S. 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

This section identifies the system specifications and the site requirements to operate the imager.

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 lb)	73 kg (160 lb)

Operating Requirements

- Allow 31 cm (12 in.) clearance around the top, sides, and back of the imager. This space is required to let the imager perform normal operator functions.
- The table or counter must be level (within 1°) and capable of supporting the imager's weight. The surface of the counter or table must extend beyond the imager dimensions by at least 31 cm (12 in.). In addition, there must be space in front of the imager to allow access in the event of a service call.
- The recommended table or counter height is 71–76 cm (28–30 in.).
- Place the imager in an area with good ventilation. A small, confined room is not recommended.
- Avoid placing the imager in direct or excessive sunlight (for example, near a large window) or in an environment with dust, dirt, or airborne chemicals.

Environmental Requirements

Temperature

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

Relative Humidity

- Operating: 20–85 % RH, non-condensing
- Storage: 10–90 % RH, non-condensing

Altitude

-30 m (-98 ft) to 3,000 m (9,843 ft) above sea level

Surface Levelness

The surface where the imager is placed 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 (8.0 ft) of the imager.

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

Network Requirements

The purpose of connection to an external network is for reception of DICOM images/data. The intended information flow is the DICOM image from modality to printer, and the intended routing is based on the local area network that supports DICOM protocol.

The external network shall be 10/100Base-T or 1000Base-T Ethernet network, providing DICOM print service based on DICOM protocol as a DICOM printer.

To ensure network security, a network firewall shall be utilized and kept up to date, and the network integrator shall ensure that only the necessary network ports are opened for remote access.

⚠️ **CAUTION:**

Connection of the equipment to an external network that includes other equipment could result in previously unidentified risks to patients, operators, or third parties.

The person responsible for the maintenance of this equipment shall identify, analyze, evaluate and control these risks according to IEC 80001-1:2010.

After the initial installation, subsequent changes to the network to which this equipment is connected could introduce new risks and require additional analysis. Typical changes may include but are not limited to:

- Changes in the network configuration
- Connection of additional items to the network
- Disconnection of items from the network
- Update or upgrade of equipment connected to the network

Publication History

Revision	Date	Reason for Change
A	2011-03-31	First release
B	2013-04-01	Updates for UL 3rd edition and corporate updates
C	2017-11-17	Updated the operating requirements. Updated the network requirements.
D	2021-02-05	Changed the frequency to replace the filter to 15,000 prints, updates to symbols and template, added "Rx only". Moved manual conventions to preface and added statement about reporting incidents. Added additional browsers to access the Web Portal with LINUX-based laser imaging systems. Deleted references to installation as customers do not install this laser imaging system.