Carestream

CARESTREAM Vita Flex CR System
User Guide

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CARESTREAMCR Systems User Guide

Use of Manual

CARESTREAM CR Systems are designed to meet international safety and performance standards. Personnel operating the unit must have a thorough understanding of the proper operation of the system. This manual has been prepared to aid medical and technical personnel to understand and operate the system. Do not operate the system before reading this manual and gaining a clear understanding of the operation of the system. If any part of this manual is not clear, please contact your Carestream representative for clarification

Authorized European Representative

EC REP

Carestream Health France

1, rue Galilee

93192 NOISY-LE-GRAND CEDEX

France

Importer for European Union

Carestream Health Netherlands B.V.

Bramenberg 12

3755 BZ Eemnes

The Netherlands

CARESTREAM is a trademark of Carestream Health, Inc.

Carestream Health, Inc.

150 Verona St.

Rochester, NY 14608

CE 0086

United States

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6 Maintain and Clean the System (Cassette, Screen & Roller Cleaning)

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1 About this Guide

Welcome to the Carestream CR System User Guide. This guide provides detailed explanations on how to set up, use and maintain your CR System.

Icons Used in this Guide

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

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

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

Time for Procedure

5 Minutes

10 Minutes

15 Minutes

Required Tools

Extraction Tool

No Tools Required

Hygienic Gloves

Carestream X-OMAT Screen Cleaner

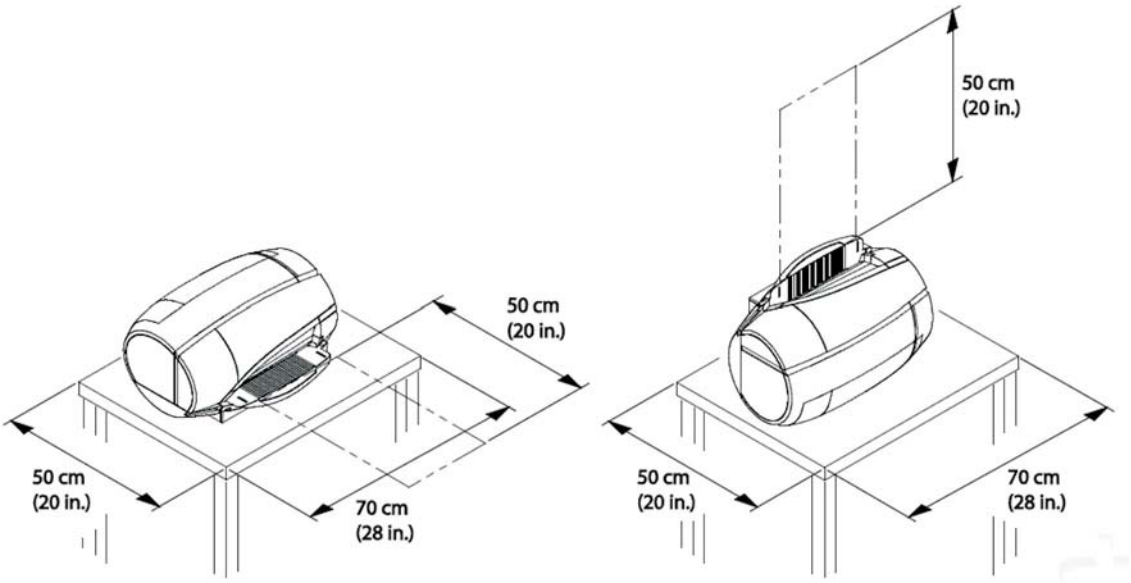
2 Site Preparation

Site Preparation

Before installing the CR system, make sure your site meets the following requirements:

Work Area

- Prepare a table with a flat stable surface and without wheels.
- Make sure you have enough free space around the work area.



Power Requirements

Make sure you have at least three wall power outlets to connect the following equipment:

- CR system
- Monitor
- Computer

Using extension cords or power strips is not recommended.

Computer

For the computer specifications, refer to the Specifications for the CARESTREAM Vita Flex CR System 6K9765 located on the documentation DVD that is included with the system.

Internet Access

It is recommended to have internet access to the computer of the system during installation for license activation. However, license activation can be completed from another computer, using email. Email instructions are provided in the Quick Reference Guide.

It is required to have internet access to the computer of the system for remote access to and from the system, after the installation.

Electromagnetic Immunity

Guidance and manufacturer's declaration - electromagnetic immunity			
The VITA FLEX CR is intended for use in the electromagnetic environment specified below. The customer or the user of the Scanner should assure that it is used in such an environment.			
Immunity test	**IEC 60601 test level**	**Compliance level**	**Electromagnetic environment - guidance**
Electrostatic discharge (ESD) IEC 61000-4-2	±6 kV contact ±8 kV air	±6 kV contact ±8 kV air	Floors should be wood, concrete or ceramic tile. If floors are covered with synthetic material, the relative humidity should be at least 30%.
Electrical fast transient/burst IEC 61000-4-4	±2 kV for power supply lines ±1 kV for input/output lines	±2 kV for power supply lines ±1 kV for input/output lines	Mains power quality should be that of a typical commercial or hospital environment.
Surge IEC 61000-4-5	±1 kV line to line ±2 kV line to earth	±1 kV line to line ±2 kV line to earth	Mains power quality should be that of a typical commercial or hospital environment.
Voltage dips, short interruptions and voltage variations on power supply lines IEC 61000-4-11	< 5% U_T (> 95% dip in U_T) for 0.5 cycle 40% U_T (60% dip in U_T) for 5 cycles 70% U_T (30% dip in U_T) for 25 cycles <5% U_T (> 95% dip in U_T) for 5 sec.	<5% U_T (> 95% dip in U_T) for 0.5 cycle 40% U_T (60% dip in U_T) for 5 cycles 70% U_T (30% dip in U_T) for 25 cycles < 5% U_T (> 95% dip in U_T) for 5 sec.	Mains power quality should be that of a typical commercial or hospital environment. If the user of the CR System requires continued operation during power mains interruptions, it is recommended that the CR System be powered from an uninterrupted power supply.
Power frequency (50/60 Hz) magnetic field IEC 61000-4-8	3 A/m	3 A/m	Power frequency magnetic fields should be at levels characteristic of a typical location in a typical commercial or hospital environment.
Note: U_T is the AC mains voltage prior to application of the test level.			

Guidance and manufacturer's declaration - electromagnetic immunity			
The Vita Flex system is intended for use in the electromagnetic environment specified below. The customer or the user should assure that it is used in such an environment.			
Immunity test	**IEC 60601 test level**	**Compliance level**	**Electromagnetic environment - guidance**
			Portable and mobile RF communications equipment should be used no closer to any part of the CR System, including cables, than the recommended separation distance calculated from the equation applicable to the frequency of the transmitter.
			Recommended separation distance
Conducted RF IEC 61000-4-6	3 Vrms 150 kHz to 80 MHz	3 Vrms	d = 1.17 ÷P
Radiated RF IEC 61000-4-3	3 Vrms 80 MHz to 2.5 GHz	3 v/m	d = 1.17 ÷P 80 MHz to 800 MHz
			d = 2.33 ÷P 800 M Hz to 2.5 GHz
			where P is the maximum output rating of the transmitter in watts (W) according to the transmitter manufacturer and d is the recommended separation distance in meters (m).
			Field strengths from fixed RF transmitters, as determined by an electromagnetic site survey*,should be less than the compliance level in each frequency range†.
			Interference may occur in the vicinity of equipment marked with the following symbol: 
Note 1: At 80 MHz and 800 MHz, the higher frequency range applies. Note 2: These guidelines may not apply in all situations. Electromagnetic propagation is affected by absorption and reflection from structures, objects and people.			

* Field from fixed transmitters, such as base station for radio (cellular/cordless) telephones and land mobile radios, amateur radio, AM and FM radio broadcast and TV broadcast cannot be predicted theoretically with accuracy. To assess the electromagnetic environment due to fixed RF transmitters, an electromagnetic site survey should be considered. If the measured field strength in the location in which the Scanner is used exceeds the applicable RF compliance level above, the Scanner should be observed to verify normal operation. If abnormal performance is observed, additional measures may be necessary, such as reorienting or relocating the Scanner.

† Over the frequency range 150 kHz to 80 MHz, field strengths should be less than 3 v/m.

Recommended separation distance between portable and mobile RF communications equipment and the VITA FLEX CR

The VITA FLEX CR is intended for use in an electromagnetic environment in which radiated RF disturbances are controlled. The customer or the user of the CR System can help prevent electromagnetic interference by maintaining a minimum distance between portable and mobile RF communication equipment (transmitters) and the CR System as recommended below, according to the maximum output of the communications equipment.

W Rated maximum output power of transmitter	m Separation distance according to frequency of transmitter		
	150 kHz to 80 MHz d = 1.17÷P	80 MHz to 800 MHz d = 1.17÷P	800 MHz to 2.5 GHz d = 2.33÷P
0.01	0.117	0.117	0.233
0.1	0.37	0.37	0.737
1	1.17	1.17	2.33
10	3.7	3.7	7.36
100	11.7	11.7	23.3

For transmitters rated at a maximum output power not listed above, the recommended separation distance d in meters (m) can be estimated using the equation applicable to the frequency of the transmitter, where P is the maximum output power rating of the transmitter in watts (W) according to the transmitter manufacturer.

Note 1: At 80 MHz and 800 MHz, the separation distance for the higher frequency range applies.

Note 2: These guidelines may not apply in all situations. Electromagnetic propagation is affected by absorption and reflection from structures, objects and people.

3 CR System Overview

The CR System is designed for medical professionals to read phosphor CR screens. The system includes:

- CARESTREAM IMAGE SUITE Software (or approved third party compatible software)
- Plug and play USB2 interface
- Optional screens and cassettes in the following standard sizes:20 x 25 cm (8 x 10 in.); 25 x 30 cm (10 x 12 in.); 35 x 35 cm (14 x 14 in.); 35 x 43 cm (14 x 17 in.); 24 x 30 cm.

Note
From this point on, the Carestream CR System will be referred to as "CR System."

Safety and Regulatory Information

Caution
To avoid physical injuries to yourself or damage to the scanner, do not open the scanner covers and do not try fixing or adjusting any of the internal parts. Perform only user service and maintenance procedures specified in this document.

Note
For safety information, refer to **Vita Flex Safety and Regulatory Guide (6k7821)**

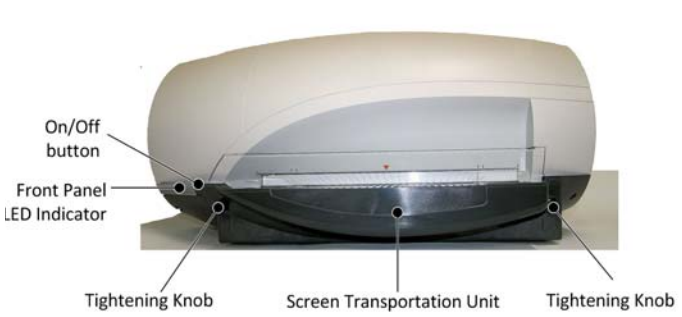
CR System Operational Principles

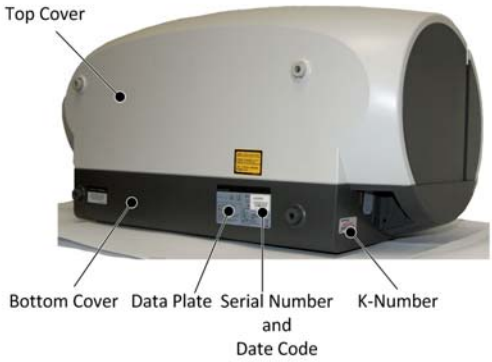
The CR System is a digital imaging system used for image acquisition and processing of static projection radiography images. The System utilizes a phosphor screen with energy storage capability as an X-ray image receptor.

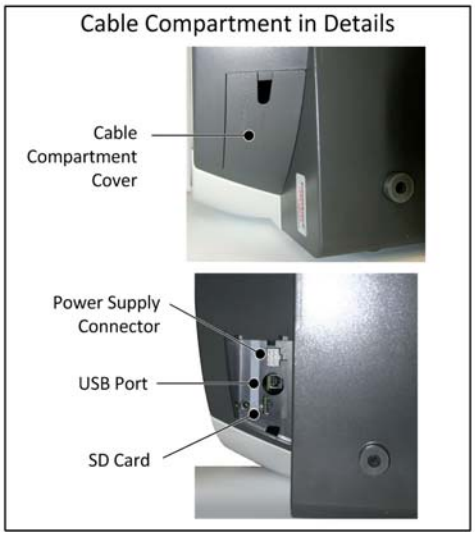
After exposure, a laser beam stimulates the phosphor screen, creating luminescence (blue light) proportional to the local X-ray exposure. The luminescence signal is captured by a Photo Multiplier Tube (PMT), digitized, and processed for review.

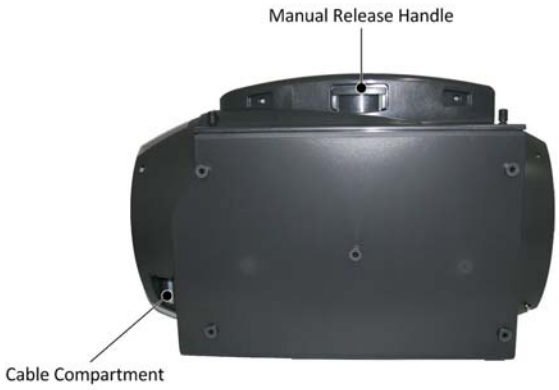
The System enables you to read a storage phosphor screen quickly and erase it for the next exposure.

CR System Components Overview









System LED Indicator

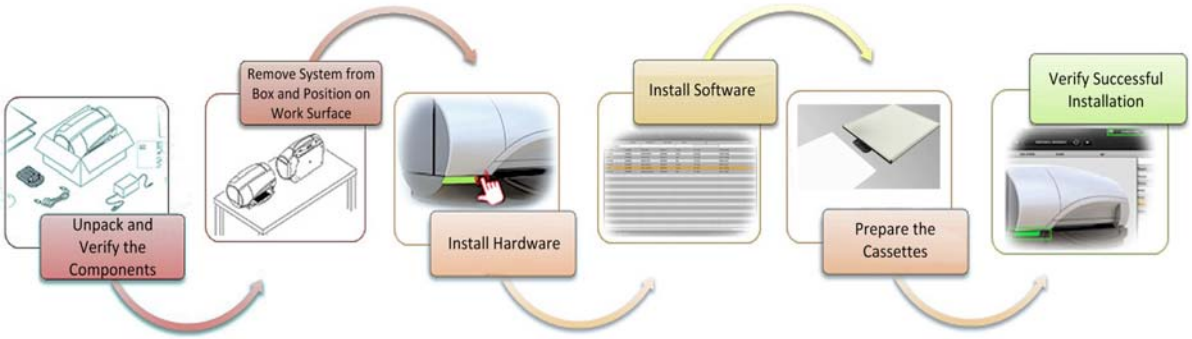
The below table shows status indicator colors and their meaning:

System Status	LED
Powering up and Homing	Orange
Ready for Scan	Steady Green
Scanning	Blinking Green
Error	Blinking Orange
No communication	Blinking Green and Orange

4 Install the CR System

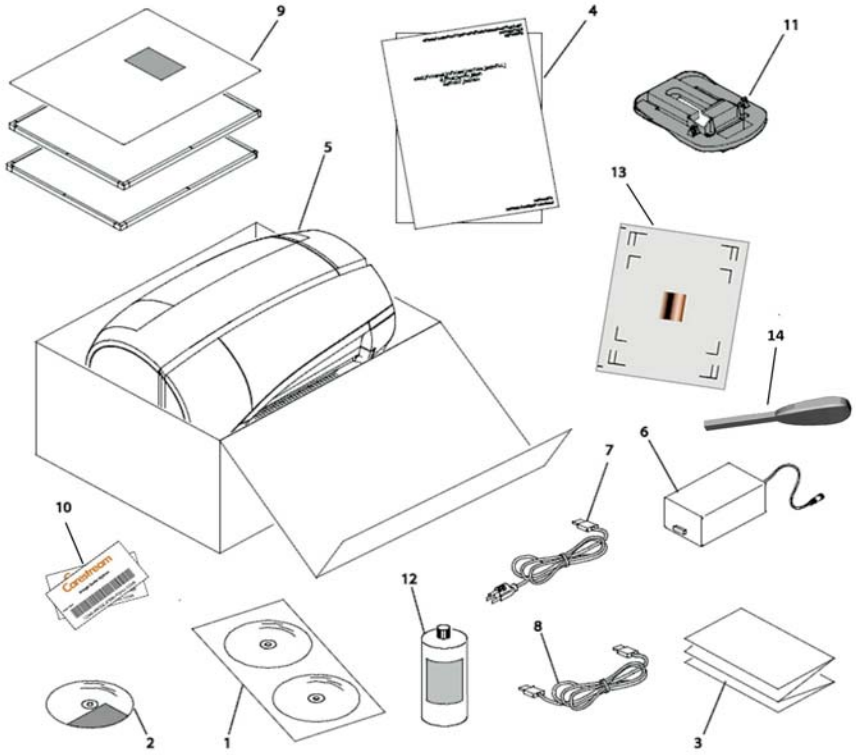
Prepare System for Installation

Installation Work Flow



Unpack the System

Unpack the box and verify that the following components are in the box:



1	Training and Documentation DVD package	8	USB cable
2	Image Suite SW DVD and Documentation DVD	9	Cassettes and screens
3	Quick Reference Guide for the CR system installation	10	Software License Card(s)
4	Safety and Regulatory Guide for the Vita Flex CR system	11	Screen extraction tool
5	CR system	12	X-OMAT screen and rollers cleaning fluid
6	Power supply	13	ATP phantom
7	Power cord	14	Cover removal tool (for cable compartment cover)

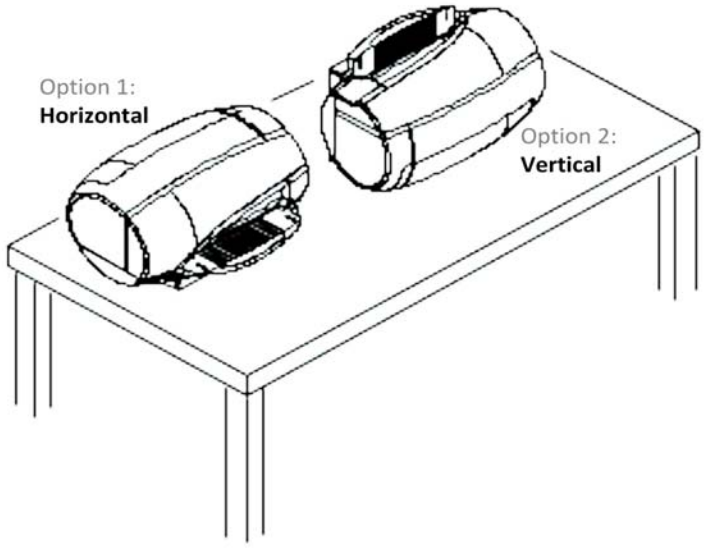
Remove the System from the Box

Two people are required to remove the system from the box.

Position the CR System

Place the CR system on a flat surface according to the following requirements:

- The CR System should be placed on a flat stable surface.
- The CR System can be placed in either horizontal or vertical orientation - it will scan in either orientation.



Hardware Installation

Prerequisites:

Make sure that the power source for the system is in the range of 100V AC- 240V AC 1.5 A

Note

For optimal results it is recommended that the light level in the room is less than 500 lux to minimize the imaging plates exposure to light. Avoid placing the scanner beneath windows or sources of direct, strong light

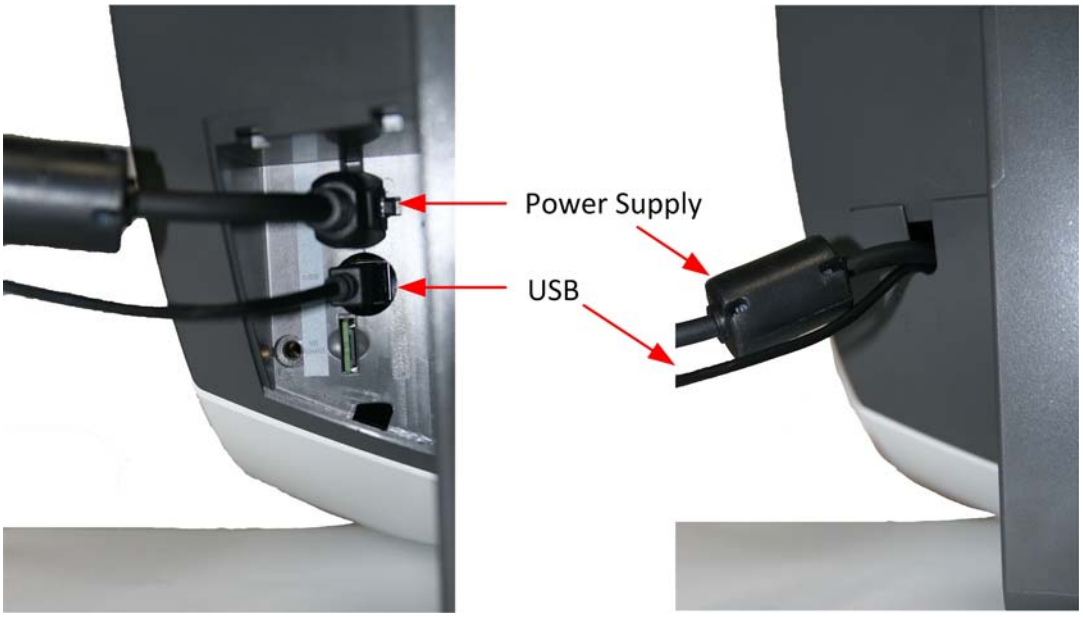
For more information on ambient operating condition requirements, see the VITA FLEX Safety and Regulatory Guide

Important

The CR system should be positioned so that there is always easy access to the mains power supply

1. Place the CR System on a stable flat surface and turn it onto its back to gain access to the service door at the rear of the scanner.
2. Open and remove the cable compartment cover located in the rear of the scanner. Use the cover removal tool.

3. Connect the main power cable and the USB cable to the scanner and close the cable compartment cover.



Note

This unit shall be powered by external dedicated AC/DC adapter, model name MENB1121A2451F02 by SL Power/AULT. This adapter is part of unit.

Note

You Must close the door to the power supply, if you do not close the door to the power supply properly, there is a risk of light penetration resulting in loss of image quality.

4. Plug the USB cable into your computer.
5. Plug the power supply into the Mains wall socket.
6. Press and hold the power button until the LED indicator is orange.

Note

The LED indicator will blink green until the system and software installation is complete. When the installation is complete and communication is established, the LED will be solid green.

Image Suite Software Installation

To operate the system, it is required to install image acquisition software. This chapter provides explanations on how to install Image Suite version 4.0 software.

Note

For installation instructions of image acquisition software other than Image Suite, refer to relevant software company documentation.

1. Insert Image suite installation CD into the PC and follow the setup wizard:
2. In the Login window, type User Name **admin** and Password **1234**.
3. When logging into Image Suite for the first time, you are required to change the password. Change the password to **123456**.

Note

For further information refer to the Image Suite Installation Instructions for the Image Suite V4 Software, 6M1562 provided electronically on the Image Suite Documentation CD. You can also refer to the Quick Reference Guide for the CARESTREAM Vita Flex CR System Installation, 6M1492, that is included with the system.

Configure Cassette Size

By default, the scanner is set up to work with the following cassette sizes:

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

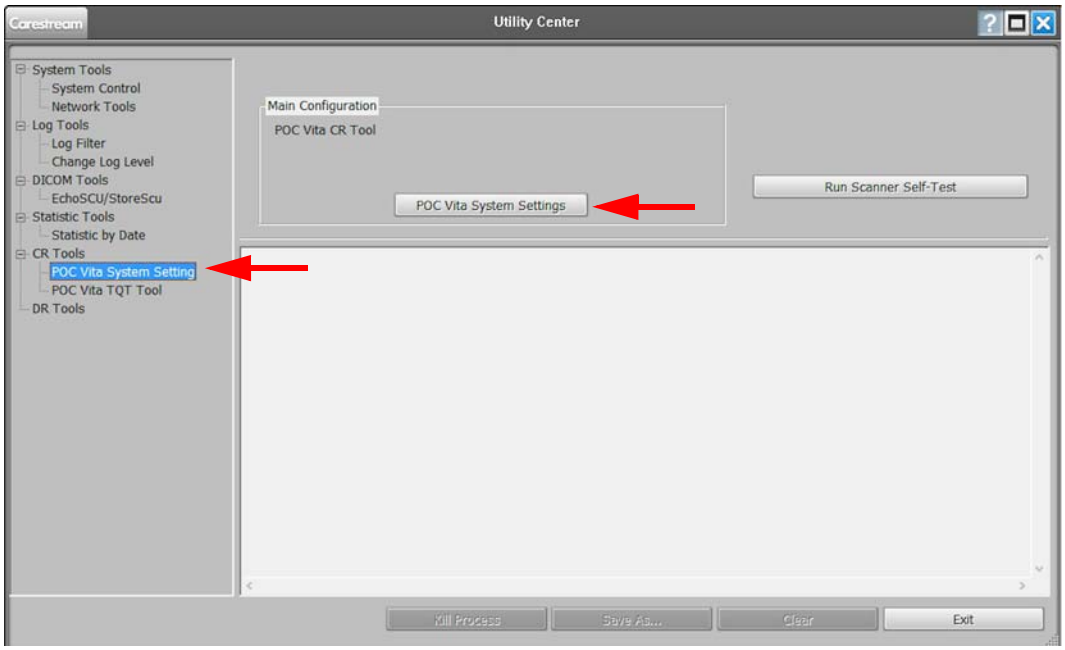
Therefore, no changes in scanner settings are required for these cassette sizes.

To use **24 x 30 cm** cassette size instead of 25 x 30 cm (10 x 12 in.) cassette size, scanner settings need to be updated as specified in the following steps:

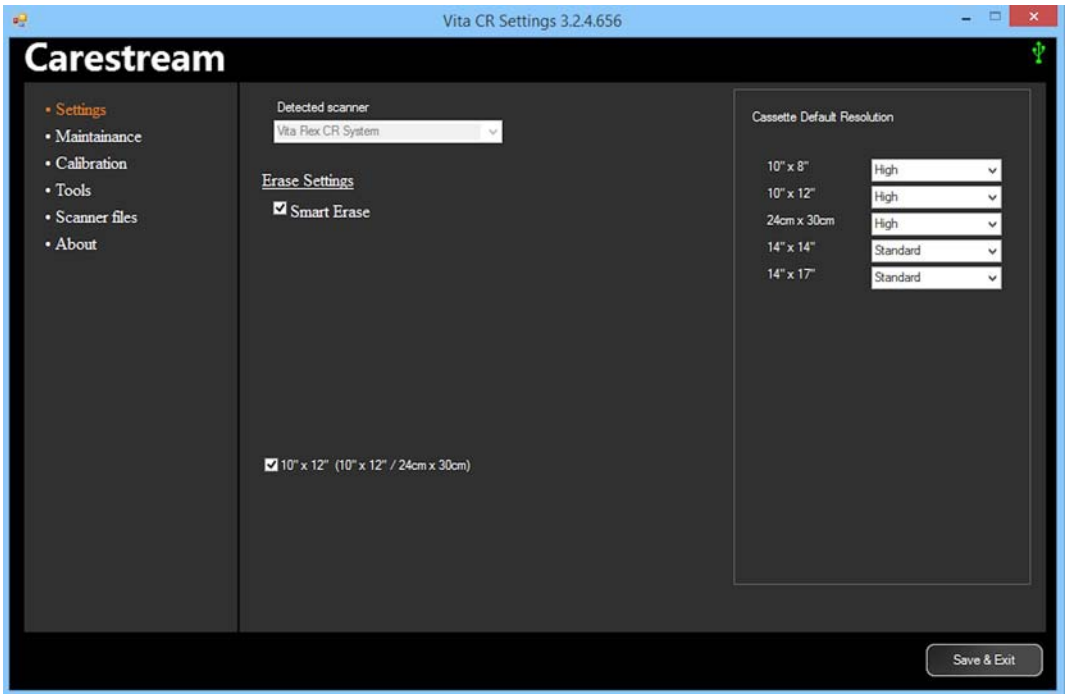
1. Exit the **Image Suite** software.
2. On the desktop, click the **Image Suite Utility Center** icon.

3. In the Login window that appears, type **User name** (**admin**) and **Password** (**123456**).

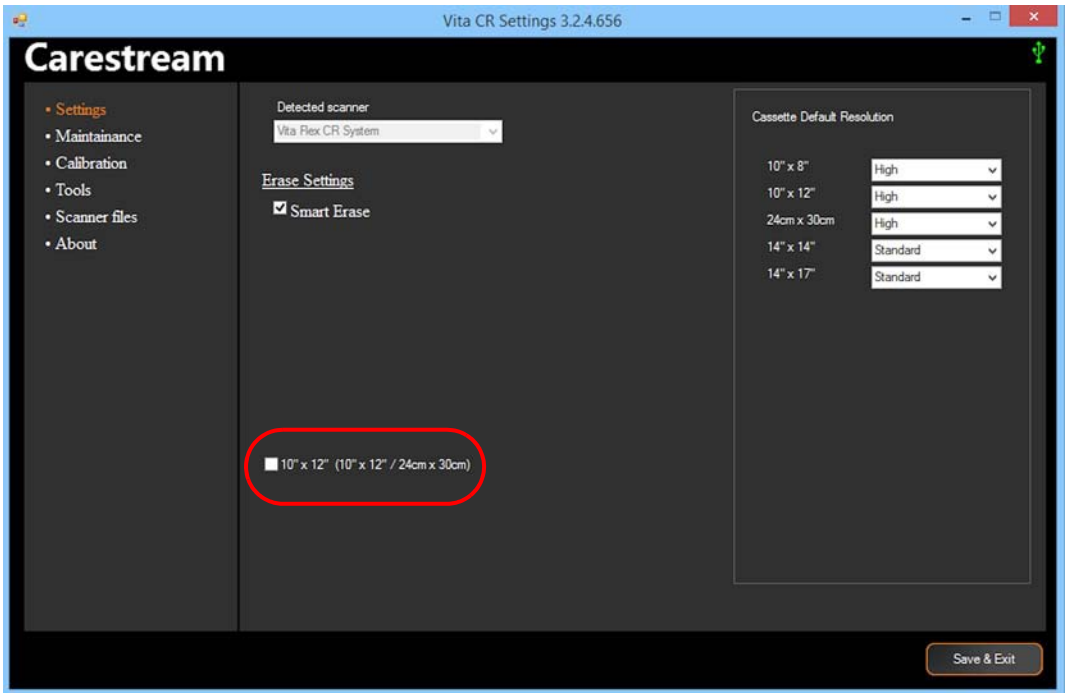
4. From the Utility Center side menu, select **CR Tools** >>**POC Vita System Settings** >>**POC Vita System Settings.**



The **Vita CR Settings** window with the default scanner settings appears.



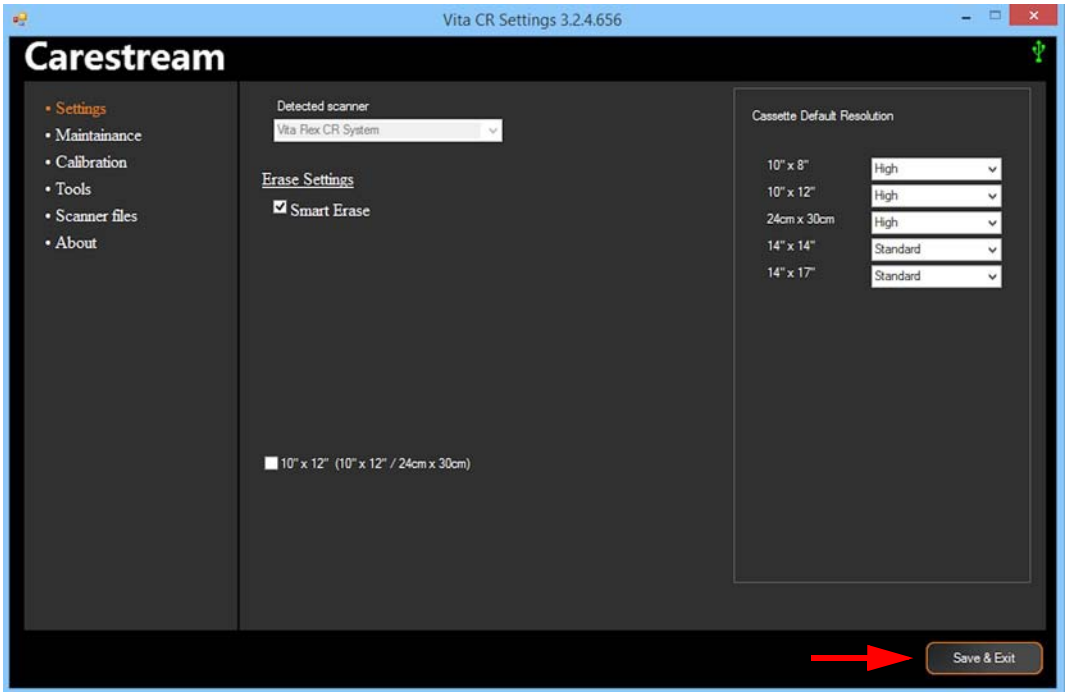
5. Clear the 10” x 12” (10” x 12”/ 24cm x 30cm) check box to set up the scanner to work with 24 cm x 30 cm cassettes.



Note

To set up the scanner to work with 10" x 12" (25 cm x 30 cm) cassettes again, select the **10" x 12" (10" x 12"/ 24cm x 30cm)** check box.

6. Click **Save & Exit** to save the settings and close the **Vita CR Settings** window.



The scanner is now set up to work with 24 cm x 30 cm cassettes.

Prepare the Cassettes

Screens and cassettes are supplied separately. It is required to insert a screen into the cassette before using it in the system. Use the following procedures to insert a screen into a cassette.

Prerequisites:

Remove the screens and cassettes from their packaging.

Clean the screen, see Clean the Cassettes and Flexible Phosphor Screens

1. Slide the edge of the extraction tool (PN SK250056) over the back edge of the cassette.

2. Pull the tool down until it enters the slots in the back of the cassette.

3. With the extraction tool in place, fully insert the screen into the cassette.

Note

Make sure that the screen is inserted correctly into the cassette:

- The white side of the screen (phosphor side) should face the front side (gray) of the cassette.
- The black side of the screen should face back side (black) of the cassette (with label as shown above).

4. Pull up the release lever and remove the extraction tool.

5. Apply the screen type label, provided with the screen, to the back side of the cassette. Write down the installation date on the label.

Note

Applying the human skeleton label, provided with the screen, is optional.

Acceptance Test Procedure

The Acceptance Test Procedure (from this point on will be referred as ATP) confirms that the CR system was not damaged during shipment and is ready to begin patient testing.

Note

This test is mandatory. If not performed, a warning message will appear requesting to perform the test.

Access ATP

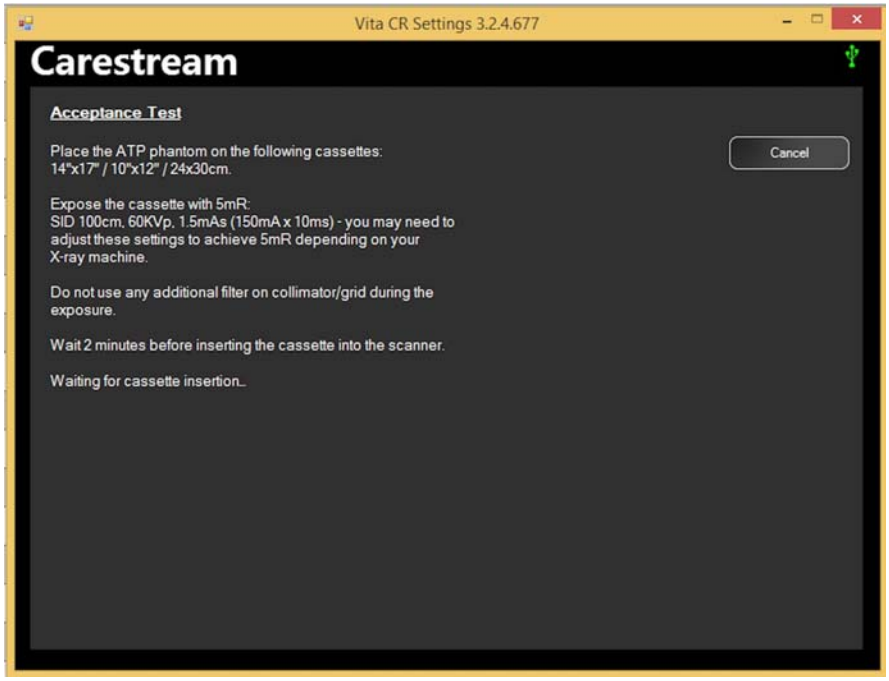
1. From the desktop of the Image Suite computer, click the I**mage Suite 4.0** icon to open the Image Suite application.

2. In the Login window that appears, type **User name** (**admin**) and **Password** (**123456**).

3. On the header bar of the Image Suite application, click the **Help** menu button.
4. From the displayed Help menu, select **Launch Acceptance Test**.

Run ATP

1. The **Acceptance Test** window appears with the ATP instructions. Follow the displayed instructions.



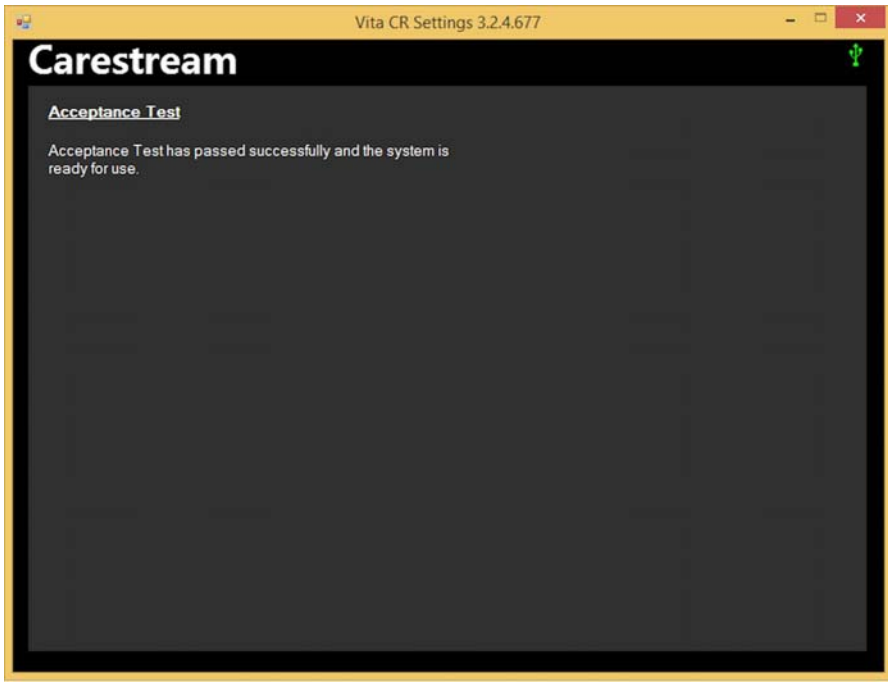
2. Place the ATP phantom on one of the following cassettes: 14 x 17 in./10 x 12 in./24 x 30 cm.
3. Properly align the edges of the phantom with the edges of the cassette.

4. Expose the cassette with the phantom to a dose of 5 mR using x-ray settings: 60KVp, 1.5mAs, SID = 1.0 m. (40 in.).

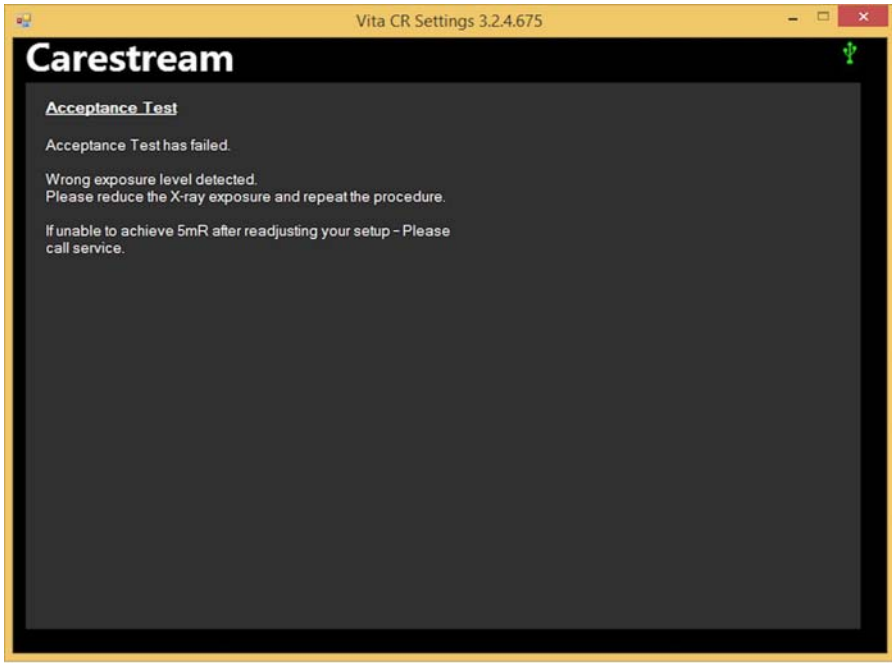
Note

If a dosimeter is available, use it for fine-tuning the X-ray to achieve 5 +/- 1 mR, before exposing the cassette.

5. Insert the exposed cassette into the scanner.
   Phosphor screen is automatically loaded and scanned.
6. After the scan is complete, the Acceptance Test results are displayed:
   - If the Acceptance Test succeeds, the system is ready for use.



   - If the Acceptance Test fails, follow the instructions displayed on screen and readjust the exposure level. Then, perform the Acceptance Test again.



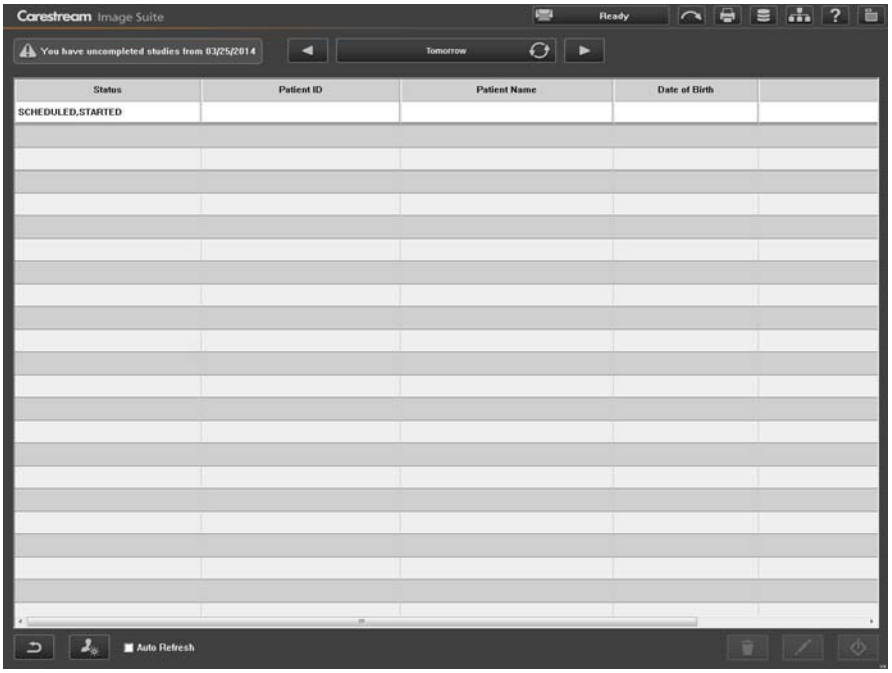
End of the Acceptance Test Procedure.

5 Use the CR System

Log In to Image Suite

1. On the desktop, click  **Carestream Image Suite**.
2. The **Login** window opens.

3. Type your **User name (admin)** and **Password (123456)** and click **Login**. Carestream Image Suite opens



Note

The next chapters provide information only on basic operations using the Image Suite software, such as scan, abort and erase. For more information, refer to the software Help that can be accessed via the Help button on the Notification Bar.

Scan a Cassette with CR System

Prerequisites:

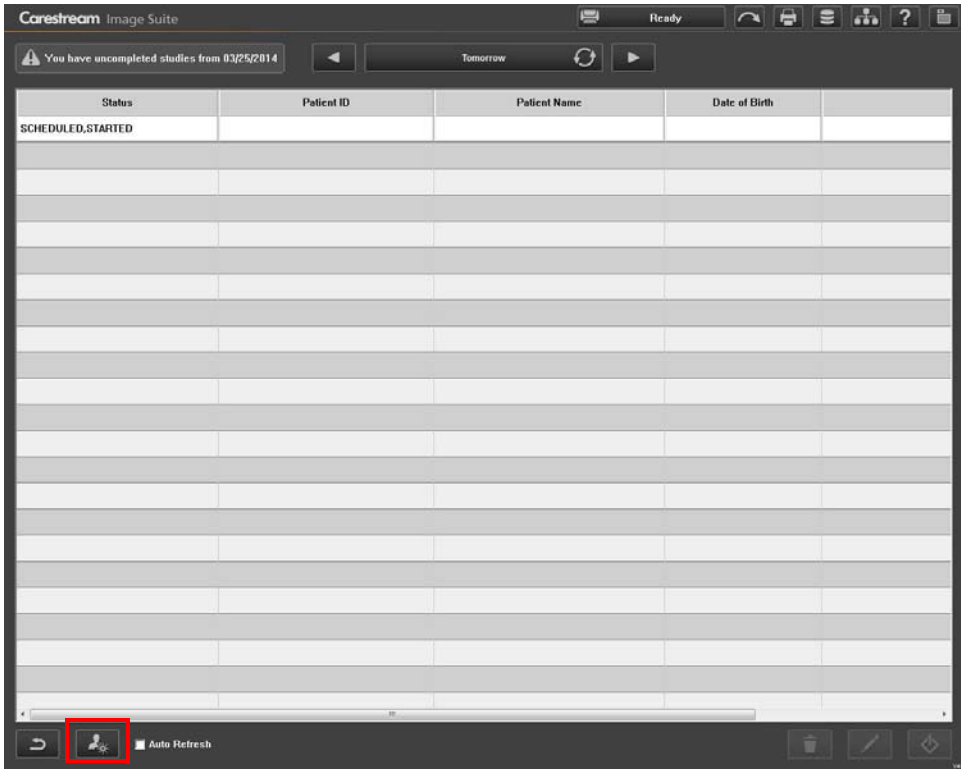
Important

During the scan, do not disconnect the scanner, the USB or power supply cables and do not press the **On/Off** button. Doing so may result in loss of data.

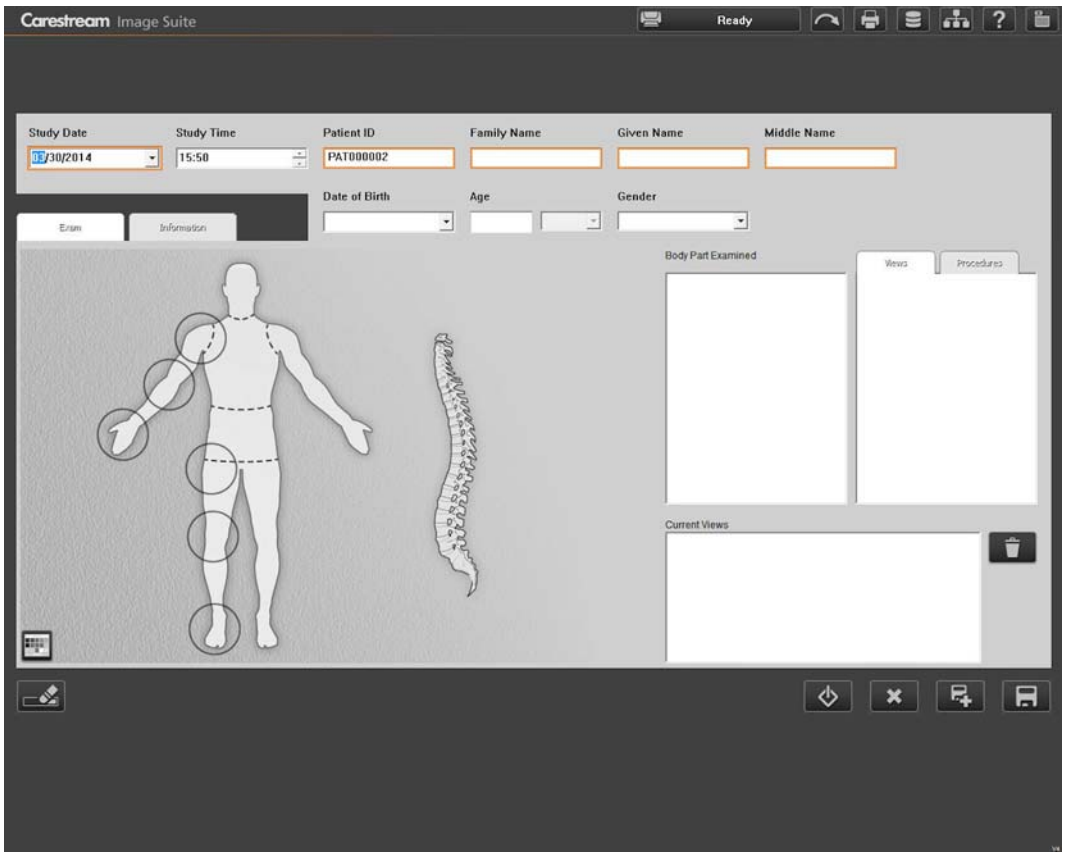
1. Log in to Image Suite.

   The **Work list** screen opens.

2. Click **New Patient**.

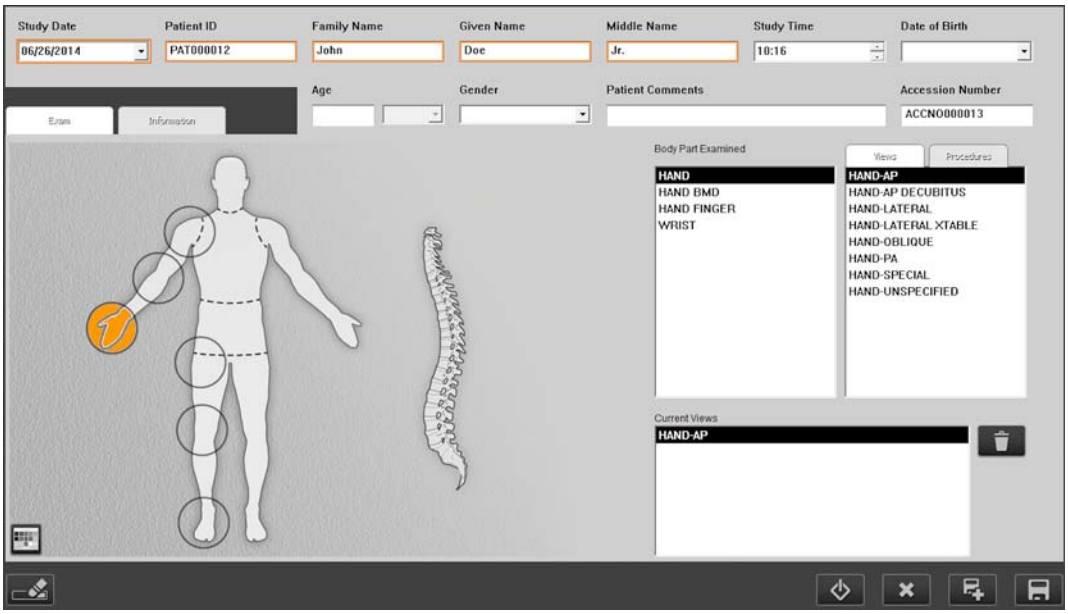


The Patient window opens



3. Fill out the following fields:
   a. Study Date
   b. Patient ID
   c. Family Name
   d. Given Name
   e. Middle Name

4. Select a body part.



5. In the **Views** drop down list, select a view.

6. Click  **Start**.

7. Expose a patient body part with the desired dose on any supported cassette size.

Note

If you are using Image Suite for the first time, it is recommended that you expose a phantom or any metal object in order to get familiar with the system before clinical use.

8. Insert the cassette into the scanner until the cassette locks into place with:
   a. The gray side up
   b. The open edge (with the red arrow) toward the scanner
   c. The cassette centered exactly in the scanner slot

The screen is then pulled automatically into the scanner and scanning begins. After the scan is complete, the screen is automatically erased and the scanned image appears on screen.

Note

9. Click the green check mark to approve the image.
10. Click the **End Study** icon to end the study.

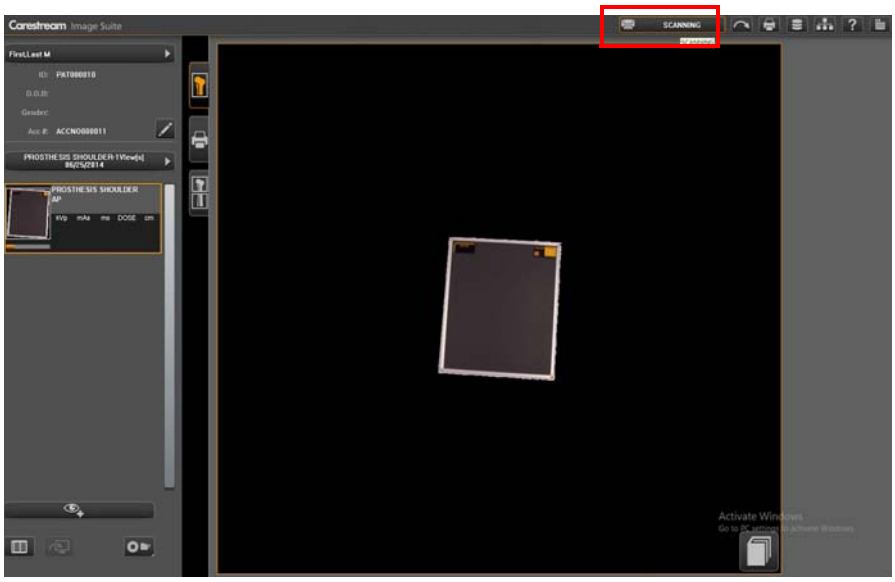
Abort Scan

Abort operation will stop the scan and eject the cassette. Perform the abort only if you are sure this operation is necessary (for example, an unexposed cassette was inserted by mistake).

Caution

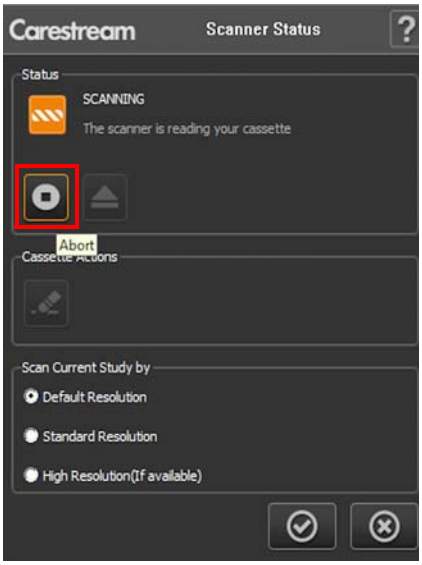
Performing abort during the scan cycle will result in loosing data. Be sure you are aware of the consequences.

1. While the scan is in progress, click the **Status** button

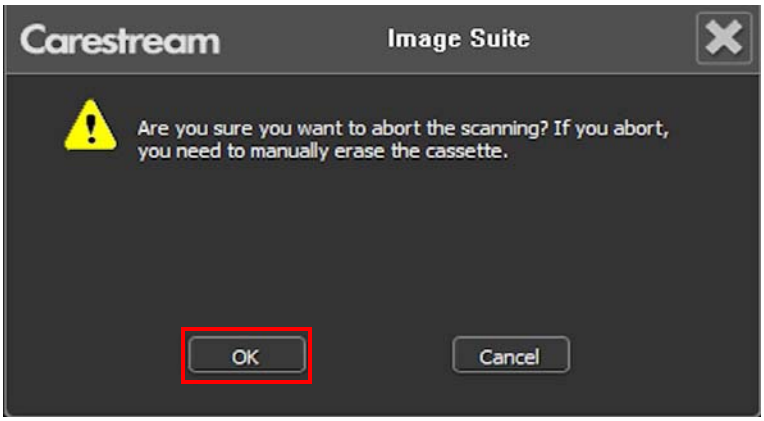


The **Scanner Status** window appears.

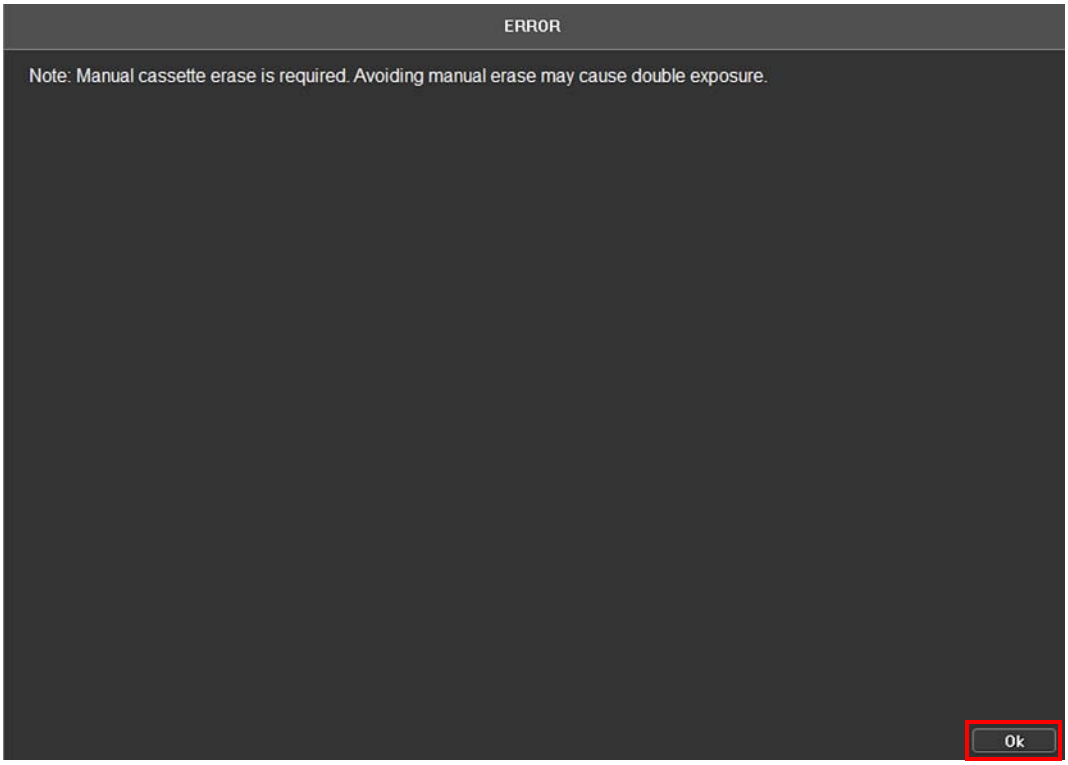
2. Click the **Abort** button.


Carestream
Scanner Status
Status
SCANNING
The scanner is reading your cassette
Abort
Cassette Actions
Scan Current Study by
Default Resolution
Standard Resolution
High Resolution(If available)

3. In the Image Suite dialog box that appears, click **OK** to confirm the action.



4. Click OK to complete the abort operation.



Note

Be aware that you may need to perform a manual erase of the cassette. Manually Erase the Cassette.

Manually Erase the Cassette

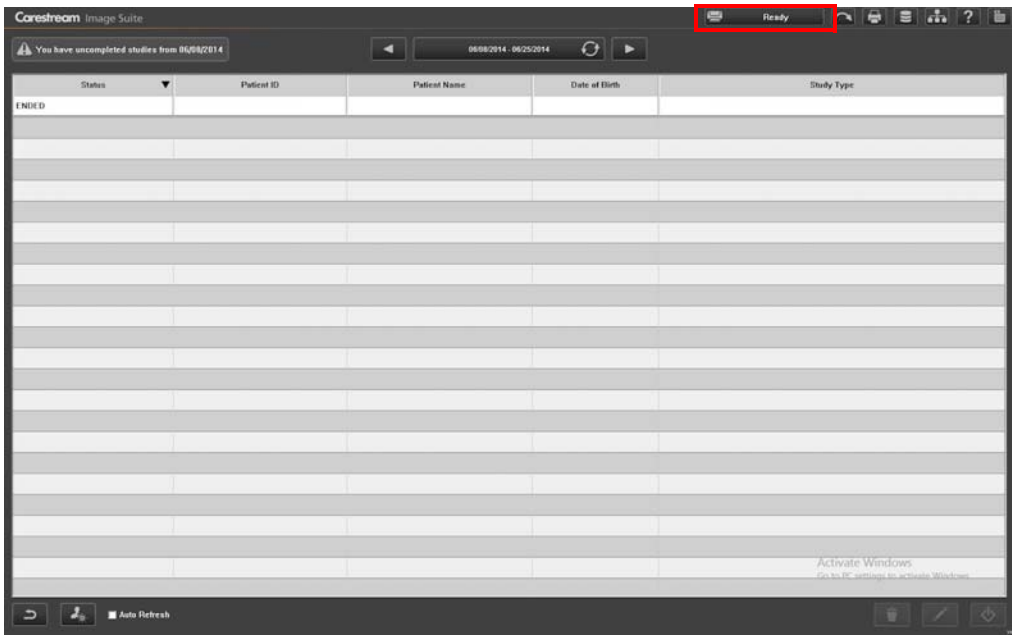
Note

Normally, after the scan is complete, the screen is automatically erased and manual erase is not required. If, for any reason, you wish to perform manual erase (for example, the screen was not in use for a long period of time), perform the following procedure.

Note

The alternative for manual erase, is performing a normal scan cycle at the end of which the screen will be automatically erased.

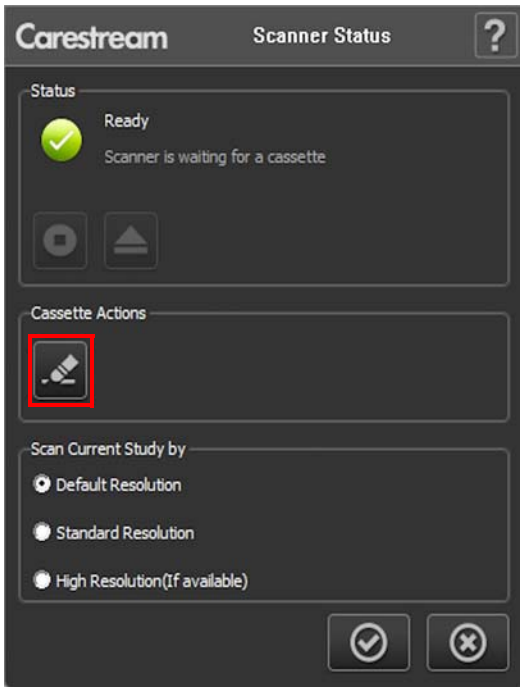
1. On the Scanner Status dialog panel, make sure the displayed status is **Ready**.



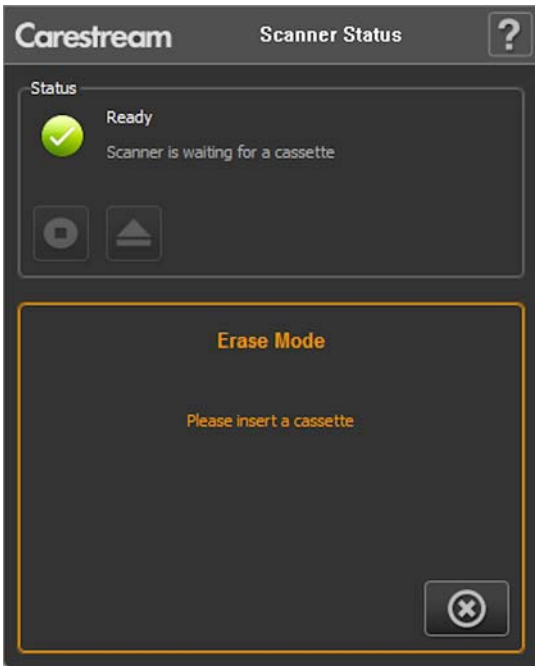
2. Click the status button (Ready).

   The **Scanner Status** window appears.

3. Click the **Erase Mode** button.

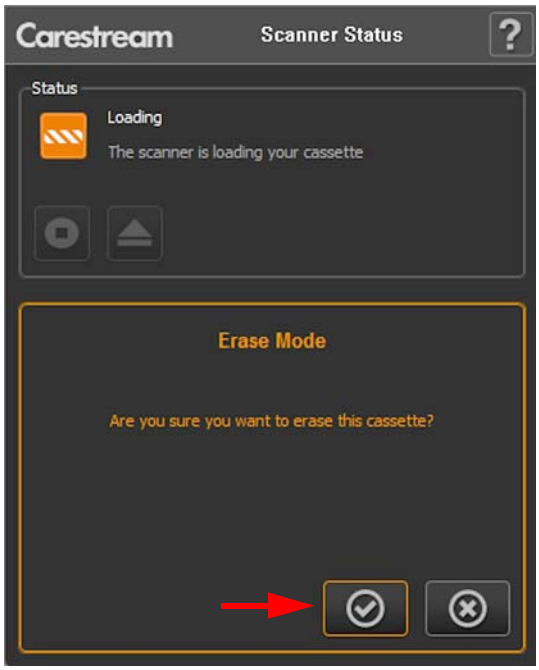


4. Insert the cassette into the scanner.

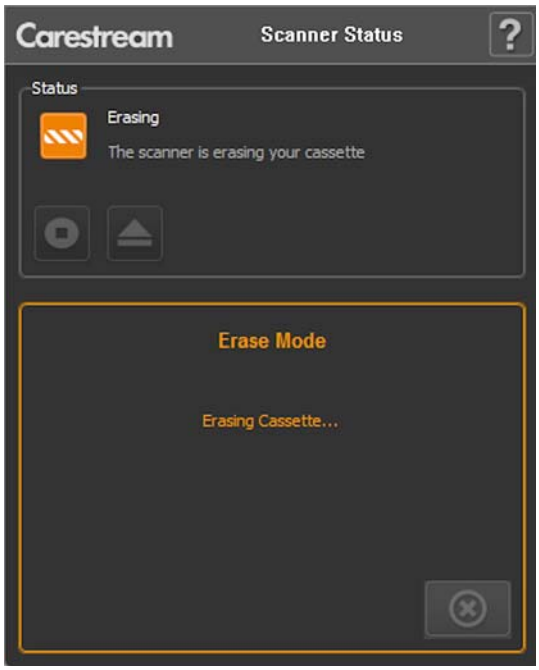


The cassette is loaded and user confirmation for the action is required.

5. Click the check mark button to confirm the action.



6. Scanner performs the erasing of the cassette.



After the erasing is complete, scanner returns to the initial erasing mode state.

7. Two options are available to continue:
   - If you want to continue with erasing process, insert another cassette and perform steps 4 - 6.
   - To exit the Erase mode, click the exit button to return to the initial Scanner Status window, and then click exit button again to exit the Scanner Status window.

6 Maintain and Clean the System (Cassette, Screen & Roller Cleaning)

Clean the Rollers

The rollers need cleaning every 1000 cycles or when there is visible dirt that effects the image quality.

Prerequisites:

Note
When cleaning rollers, it is recommended to clean also the screens.

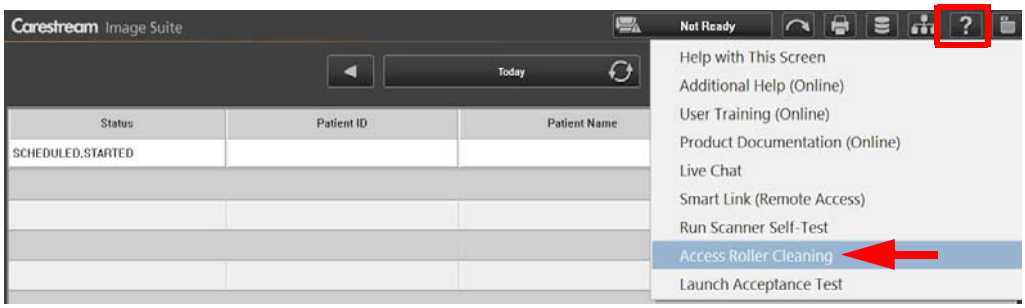
Read and follow the instructions in the manufacturer's Material Safety Data Sheet (MSDS) prior to use.

Cleaning Materials

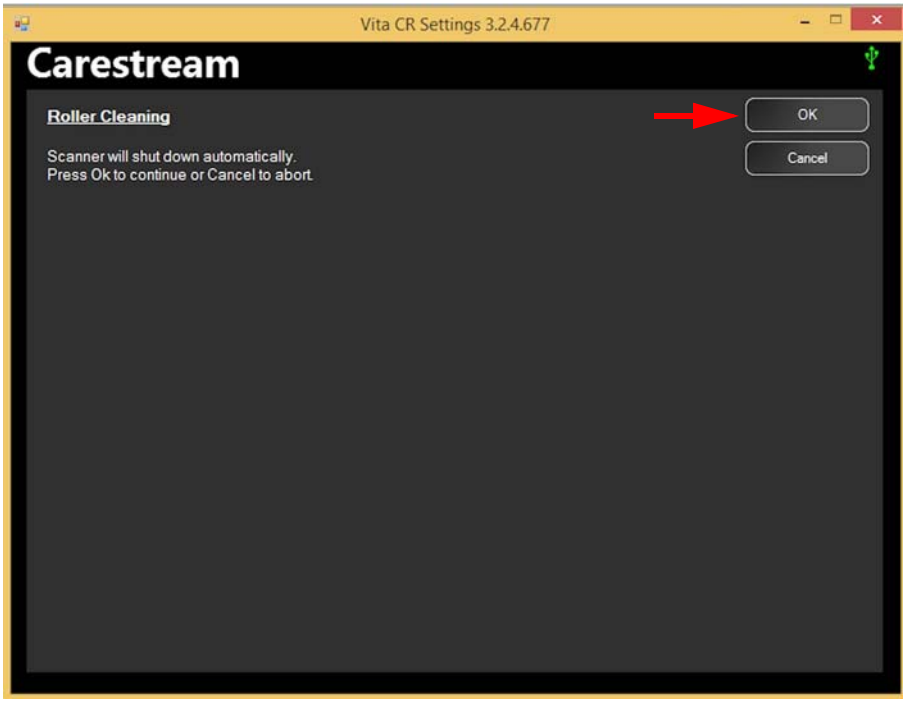
- Several soft, lint-free cloths
- Carestream X-OMAT Screen Cleaner CAT number 845-4977 (473 mL/ 16 Fluid Ounces) or CAT number 103-0428 (177 mL/ 6 Fluid Ounces).

Caution
Cleaning materials other than those recommended can contain chemicals that cause visible or hidden damage to the rollers.
Never use isopropyl alcohol (isopropanol, rubbing alcohol) to clean the rollers.

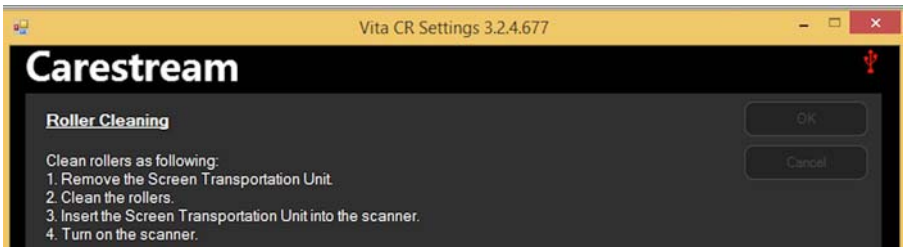
1. On the header bar of the Image Suite application, click the **Help** menu button
2. From the displayed Help menu, select **Access Rollers Cleaning**.



3. Click **OK** to shut down the scanner and continue with cleaning procedure.



4. Follow the instructions displayed on screen.



   a. Disconnect the power supply cable from the Mains wall socket.
   b. Remove the Screen Transportation Unit, See Remove the Screen Transportation Unit

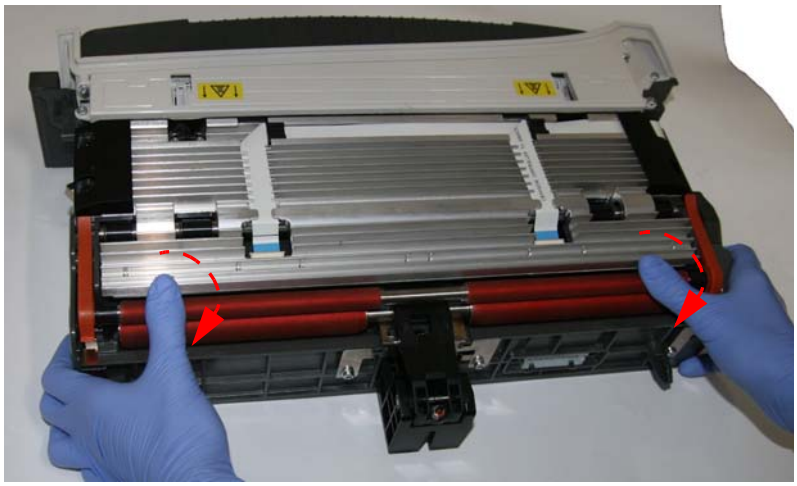
Caution

When you remove the Screen Transportation Unit, be careful not to touch the erase LED heat sink which may be very hot and have sharp edges.
Do Not insert your fingers between the cassette opening and the door.

c. Thoroughly wipe the rollers' surface with Carestream X-OMAT screen cleaner.

d. Rotate the rollers and wipe the visible surface, until the entire rollers surface is clean.

.



Note

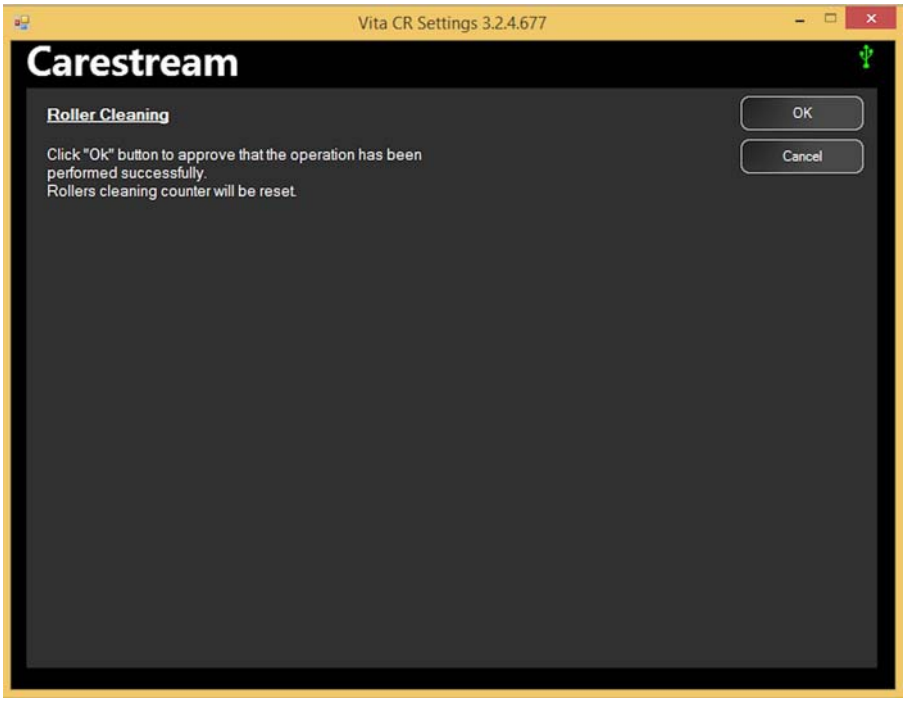
Before inserting the Screen Transportation unit into the system, ensure that the rollers are dry.

e. Install the Screen Transportation Unit into the system, See Install the Screen Transportation Unit

f. Connect the power supply.

g. Press and hold the power button for 1 second.

5. Click **OK** to approve the performed procedure and to reset the counters and then exit the **Utilities Center** software.



Note

If you click **Cancel**, the counters will not be reset and cleaning messages will appear for the next 100 cycles.

Confirm the Rollers Function

1. Switch on the system and verify that the LED on the Scanner is green and that your imaging software shows that the Scanner status is **OK**.
2. Insert an unexposed 35.6 x 43.2 cm (14 x 17 in.) cassette, or if unavailable, any other size cassette and perform a scan.
3. Verify that the cycle completes without error.

Clean the Cassettes and Flexible Phosphor Screens

Remove a Phosphor Screen from the Cassette

Prerequisites:


Read and follow the instructions in the manufacturer's Material Safety Data Sheet (MSDS) prior to use.

Cleaning Materials

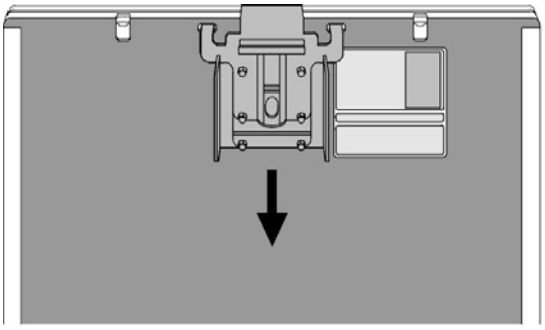
- Several soft, lint-free cloths
- Carestream X-OMAT Screen Cleaner CAT number 845-4977 (473 mL/ 16 Fluid Ounces) or CAT number 103-0428 (177 mL/ 6 Fluid Ounces).

Caution

Cleaning materials other than those recommended can contain chemicals that cause visible or hidden damage to the rollers.
Never use isopropyl alcohol (isopropanol, rubbing alcohol) to clean the rollers.

1. Slide the edge of the extraction tool (PN SK250056) over the back edge of the cassette.

2. Pull the tool down until it enters the slots in the back of the cassette.



3. Push the slider on the cassette upwards.

   A centimeter of the screen sticks out of the cassette.

4. Gently pull out the rest of the screen.

Clean the GP-2 Phosphor Screens

Under normal use, the GP-2 Phosphor Screens will eventually show wear. Screen wear can result in image artifacts. This wear may occur from abrasion of the protective overcoat or damage to the surface of the screen.

Prerequisites:

Read and follow the instructions in the manufacturer's Material Safety Data Sheet (MSDS) prior to use.

Cleaning Materials

- Several soft, lint-free cloths
- Carestream X-OMAT Screen Cleaner CAT number 845-4977 (473 mL/ 16 Fluid Ounces) or CAT number 103-0428 (177 mL/ 6 Fluid Ounces).

Caution

Cleaning materials other than those recommended can contain chemicals that cause visible or hidden damage to the screen or cassette and could result in immediate or future image artifacts. Never use isopropyl alcohol (isopropanol, rubbing alcohol) to clean screens or cassettes.

Important

Failure to routinely clean the screens with a recommended solution may create the following result:

- The screen may not move smoothly from the cassette into the reader, causing an error message.
- The screen may not fully return to the cassette at the end of the cycle, preventing the cassette from latching; no error message appears.
- Image artifacts may appear.

1. Dampen the cloth with a small amount of screen cleaner.

Caution

Do not pour screen cleaner directly onto the screen.

2. Wipe the screen thoroughly, one side at a time, applying pressure to remove persistent contaminations if necessary.
3. Wipe the screen thoroughly dry on both sides with a dry cloth.

Caution

Do not leave the screen to air dry.

Never insert a phosphor screen into a cassette unless the screen and cassette are thoroughly dry.

Load a Phosphor Screen into the Cassette

1. With the extraction tool in place, hold the screen with the white (phosphor) side down and insert the screen so that the dark side is facing the cassette label.
2. Hold the cassette vertically and make sure the screen is fully inserted into the cassette.
3. Pull up the release lever and remove the extraction tool.

Note

If you insert the screen incorrectly:

- The screen may not feed properly from the cassette, causing an error message.
- An exposed image might not be processed.

- The screen may fall out of the cassette.

Disinfect the Equipment, Cassettes, and Screens

Prerequisites:

If the equipment or cassette/screen is visibly contaminated with blood or bodily fluids, remove the blood/bodily fluids followed by intermediate-level disinfection as indicated prior to use.

Disinfecting Materials

Read and follow the instructions in the manufacturer's Material Safety Data Sheet (MSDS) prior to use.

Several soft, lint-free cloths

- For scanner and cassettes—a 1:10 bleach and water solution (one part of 5.25% sodium hypochlorite to 10 parts water)
- For screens—a commercially-prepared equivalent solution of diluted bleach that contains no materials that can cause screen damage.

Cleaning and Disinfection Method: Scanner and Cassettes

1. Dampen the cloth thoroughly with a small amount of the bleach and water solution.

Caution
Do not pour solution directly onto the scanner or cassette.

2. Wipe the scanner or the cassette thoroughly, one side at a time, applying pressure to remove persistent contaminations if necessary.
3. Wipe the scanner, or the cassette thoroughly dry.

Caution
Do not leave to air dry.

Postrequisites:

Note
Be sure all external and internal surfaces are thoroughly dry before reassembling and returning the screens and cassettes to use.

Disinfection Method: Screens

1. Dampen the cloth with a small amount of diluted bleach solution.

Caution
Do not pour solution directly onto the screen.

2. Wipe the screen thoroughly, one side at a time, applying pressure to remove persistent contaminations if necessary.
3. Wipe the screen thoroughly dry.

Caution
Do not leave to air dry.

Postrequisites:

Note
Be sure all external and internal surfaces are thoroughly dry before reassembling and returning the screens and cassettes to use.

Disposal and Recycling of Cassettes and Screens

Screen Disposal

Due to the presence of barium, the screen may be considered a hazardous or special waste at the end of its useful service life. For disposal or recycling information, contact your local authorities.

Cassette Disposal and Recycling

The CR cassette contains lead. Disposal of lead is regulated due to environmental considerations. For disposal or recycling information, contact your local authorities.

For More Information

For more information concerning these products, inside the United States call Carestream Inc. at 1.800.328.2910. Outside the U.S., contact the Customer Support Center in your country.

7 CR System Service Procedures

CR System has been designed to be very reliable and does not need servicing in normal use. The service procedures in this manual are for the user to clean and maintain the system. Perform only maintenance procedures intended for the user and specified in this chapter.

Important

When doing the procedures in this document, you must use safe work practices and wear the correct personal protective equipment (for example, safety eyewear) according to your company's standard operating procedures

Parts Replacements Table

The below table provides a list of replacement parts with their part numbers and pictures. In case you need to replace one of the listed parts, use the provided part number to order the required part.

Part Number	Picture	Description
SK000455		USB cable—See, Replace the Power Supply and USB cables
SK000463		Power Supply cable—See, Replace the Power Supply and USB cables

Part Number	Picture	Description
SK000450		Screen Transportation Unit—See, Remove the Screen Transportation Unit
SK000483		SD card—See, Replace the SD Card
SK000484		USB & PS Door (cable compartment cover)—See, Replace the Cable Compartment Cover
SK000482		Vita Flex CR Replacement System —Replacement instructions are provided with the replacement system.

Replace the Screen Transportation Unit

Remove the Screen Transportation Unit

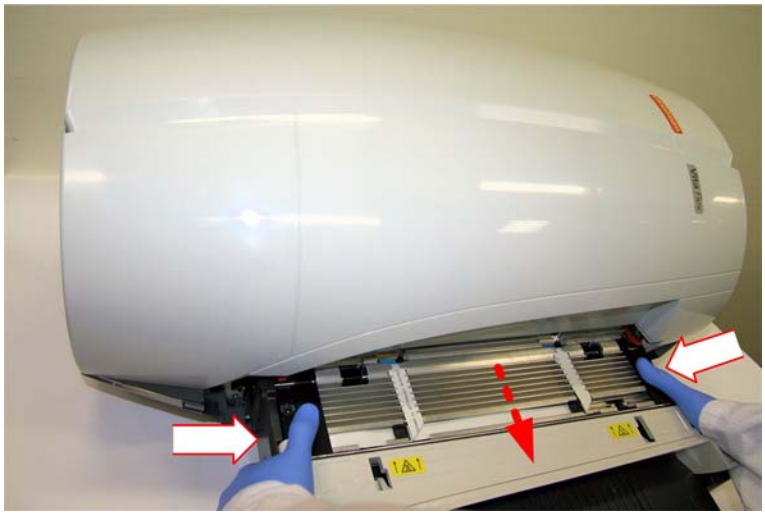
1. Press the On/Off button to switch off the scanner and ensure that the LED power indicators are off.
2. Disconnect the power supply cable from the Mains wall socket.

Caution

When removing the Screen Transportation Unit, after disconnecting the power supply cable, wait for 10 minutes to allow the scanner to cool down and be careful not to touch the erase LED heat sink which may be very hot and have sharp edges.
Do Not insert your fingers between the cassette opening and the door.
Do Not get your fingers caught between the loader and the screen transportation unit

3. Release the two tightening knobs.

4. Holding the plastic handles, remove the Screen Transportation Unit.



Caution

Do Not insert your fingers between the cassette opening and the door.
Do Not get your fingers caught between the loader and the screen transportation unit

Install the Screen Transportation Unit

1. Insert the Screen Transportation Unit, and secure the two tightening knobs.
2. Connect the power supply cable to the Mains wall socket.
3. Switch on the system and verify that the LED on the Scanner is green and that your imaging software shows that the Scanner status is **OK**.

Confirm the Scanner Function after Replacing Screen Transportation Unit

1. Perform the System Self Test to make sure system functions properly. See Run System Self Test
2. Perform the Acceptance Test Procedure to make sure the image acquisition functions properly. See Acceptance Test Procedure
3. Open your imaging software.
4. Scan an unexposed 35.6 x 43.2 cm (14 x 17 in.) cassette, or if unavailable, any other size cassette.
5. Verify that the cycle completes without error.

Replace the Power Supply and USB cables

Remove the Power Supply Cable

1. Press the On/Off button to switch off the scanner and ensure that the LED power indicators are off.

Note

You must make sure that the LED power indicators are off before any service or maintenance procedures.

2. Unplug the power supply from the Mains wall socket.
3. Turn the scanner onto its back.
4. Remove the cable compartment cover at the rear of the CR System. See Remove the Cable Compartment Cover

Caution

Check that the power supply is not hot before touching it. If the power supply malfunctions, it may get very hot.

5. Disconnect the power supply cable and the USB cable.

Note

Make sure that you release the clip before trying to remove the main power connector.

Install the Power Supply Cable

1. Connect the power supply cable and the USB cable to the CR System.

Note

You Must close the door to the power supply, if you do not close the door to the power supply properly, there is a risk of light penetration resulting in loss of image quality

2. Install the cable compartment cover at the rear of the CR System. See Install the Cable Compartment Cover
3. Plug the power supply into the Mains wall socket
4. Switch on the CR System by pressing the On/Off button.

Important

Make sure that you install the door at the rear of the CR System. If you do not install the door at the rear of the CR System, light can penetrate the system and affect image quality.

Replace the Cable Compartment Cover

Parts Required

SK000484 Cable Compartment Cover

Tools Required

- Flat head screwdriver
- Cover removal tool

Remove the Cable Compartment Cover

1. Press the On/Off button to switch off the scanner and ensure that the LED power indicators are off.
2. Disconnect the power supply cable from the mains wall socket.
3. Remove the cable compartment cover using cover removal tool.

Install the Cable Compartment Cover

1. Install new cable compartment cover and make sure the Power Supply cable and USB cables are properly inserted into the cover groove.

2. Connect the power supply cable to the Mains wall socket.
3. Press the On/Off button to switch on the scanner.

Replace the SD Card

SD card contains system licenses. It is very rare that the SD card malfunctions. In case it is lost or you are instructed by Service to replace the SD card, perform the below procedure.

Parts Required

SK000483 SD Card

Tools Required

- Flat head screwdriver

Remove the SD Card

1. Press the On/Off button to switch off the scanner and ensure that the LED power indicators are off.
2. Disconnect the power supply cable from the mains wall socket.
3. Remove the cable compartment cover. See Remove the Cable Compartment Cover
4. Using flat head screwdriver, slightly press on the SD card to remove it from slot, and then manually remove the SD card.

SD Card Location

Using flat head screwdriver, press on SD card

Manually remove SD card

Install the SD Card

1. Insert the new SD card into its slot in cable compartment. Pay attention to the SD card direction:

2. Connect the power supply cable and USB cable to the scanner
3. Install the cable compartment cover. See Install the Cable Compartment Cover
4. Connect the USB cable to the work station computer.
5. Connect the power supply cable to the Mains wall socket.
6. Press the On/Off button to switch on the scanner.

Confirm the Scanner Function after Replacing the SD Card

1. Perform the System Self Test to make sure system functions properly. See Run System Self Test
2. Perform the Acceptance Test Procedure to make sure the image acquisition functions properly. See Acceptance Test Procedure
3. Open your imaging software.
4. Scan an unexposed 35.6 x 43.2 cm (14 x 17 in.) cassette, or if unavailable, any other size cassette.
5. Verify that the cycle completes without error.

8 Troubleshooting the CR System

General Failures

Symptom	Possible Cause	Solution
Scanner does not turn on, front panel LEDs are off.	• Power supply is not connected to the scanner. • Power supply is not connected to the wall socket. • Power supply failure.	• Connect the power supply to the scanner and to the wall socket. • Replace the power supply.
Front panel LEDs are blinking in orange and the status in the Image Suite notification bar is **Not Ready**.	• USB cable is not connected. • Failure of the USB port on the PC. • Scanner driver is not recognized by Windows.	• Verify that the USB cable is connected to the PC. • Connect the USB cable to a different USB port on the PC, preferably on the rear of the PC. • Restart Windows.
Front panel LEDs are blinking in orange and the status in the Image Suite notification bar is **Ready**.	The Screen Transportation Unit is not present or is not properly secured.	1. Insert the Screen Transportation Unit into the scanner and secure the knobs properly. 2. Short-press the On/Off button to reset the scanner.
Newer scanner embedded files are available, please update the scanner files	Embedded files of the scanner hardware are not up to date and do not match required files in the software.	1. Exit the Image Suite software. 2. On the desktop, double-click the Utility Center icon. 3. Log in to the system (username: admin, password: 123456). 4. From the CR Tools options menu, select POC Vita system settings. 5. From the Maintenance menu, select Update Scanner's Embedded Files. 6. Click Update.

Symptom	Possible Cause	Solution
The cassette cannot be ejected	• Power supply failure. • The Screen Transportation Unit does not function properly. • A screen is jammed inside the CR System.	1. Short-press the On/Off button to reset the scanner. 2. Release the cassette using the Manual Release Handle. 3. Verify that there is a phosphor screen in the cassette. 4. Verify that there is no screen jammed in the scanner: 5. Disconnect the scanner from the power supply. 6. Remove the Screen Transportation Unit. 7. Visually inspect and make sure there is no screen jammed in the scanner. 8. Replace the Screen Transportation Unit.

System Self Test Failures

Symptom	Possible Cause	Solution
System self test could not proceed since scanner is not connected.	• USB cable is not connected to the scanner and/or PC, or the PC is turned off. • Power supply is not connected to the scanner and/or is not connected to the power supply. • Power supply failure.	• Verify that the USB cable and power supply cable are properly connected. • Verify that the scanner is turned on. • Verify that the power supply cable is connected to the wall socket.
Screen Transportation Unit cable is disconnected.	• Screen Transportation Unit is not properly inserted and secured to the scanner. • Screen Transportation Unit failure.	• Fully insert the Screen Transportation Unit into the scanner and secure the knobs properly. • Short-press the On/Off button to reset the scanner. • Replace the Screen Transportation Unit.
Screen Transportation Unit test has failed.	• There is no phosphor screen in the cassette. • The screen is jammed in the system. • Cassette was not released from the Screen transportation Unit. • Screen Transportation Unit failure.	1. Verify that there is a phosphor screen in the cassette. 2. Verify that there is no screen jammed in the scanner: Disconnect the scanner from the power supply. Remove the Screen Transportation Unit. Visually inspect and make sure there is no screen jammed in the scanner. 3. Replace the Screen Transportation Unit.
System-Self-Test license is unavailable	The SD card does not contain the license for running System Self Test.	Contact Service to purchase the license.

Acceptance Test Procedure Failures

Symptom	Possible Cause	Solution
Need to perform System Acceptance Test	• Software was installed/reinstalled, but the Acceptance Test Procedure was not performed. • Service procedure,,such as part replacement and/or recalibration, was performed by qualified technician.	Perform the Acceptance Test Procedure.
Test failed due to "Wrong angle detected".	ATP phantom was not properly aligned with the edges of the cassette.	Properly align the edges of the ATP phantom with the cassette edges.
Test failed due to "Wrong exposure level detected".	Measured Average Pixel Value (APV) is not within the accepted range of 5 +/- 1mR.	Readjust the X-ray settings according to the displayed instructions:
Acceptance test has failed. Please call Service.	The acceptance test has failed for a reason other than wrong exposure dose or phantom misalignment.	• Verify that the phosphor screen is clean and undamaged. • Verify that the excessive light has not penetrated the system: Power supply and USB door is properly closed. No direct light source is pointed toward the scanner. Light level in the room is below 500 lux. • Call Service.

Error Messages

Note

The first two digits of the error message indicate the error type. If the first two digits are **70**XXX, the occurred error is System error. If the first two digits are **80**XXX, the occurred error is related to Screen Transportation Unit.

Note

The below table provides possible causes and common solutions to the listed errors. After trying the provided solutions, perform the System Self Test to make sure the system functions properly. Run System Self Test

Symptom	Possible Cause	Solution
Error 41, 42, 45 Cassette was ejected due to time-out. You may insert cassette again to perform a scan.	The cassette was ejected due to two minutes timeout.	• Manually eject the cassette from the scanner, using the manual release handle under the Screen Transportation Unit. • Short-press the On/Off button to reset the scanner. • Verify that the scanner status is Ready, before inserting the cassette and scanning.

Symptom	Possible Cause	Solution
Error 43/44 Loading Screen process was stopped (Error 43). Unloading Screen process was stopped (Error 44).	Scanner failed to properly load/ unload the screen.	1. Short-press the On/Off button to eject the cassette and reset the scanner. 2. Verify that the scanner status is Ready and the front panel LED is green. If the error persists, perform the following steps: 1. Disconnect scanner from the power supply. 2. Remove the Screen Transportation Unit. 3. Visually inspect that there is no screen jammed in the scanner. 4. Insert the Screen Transportation Unit into the system. 5. Connect the system to the power supply. 6. Power up the scanner and verify that the scanner status is Ready and the front panel LED is green. If the error persists, perform the following steps: 1. Operate the System Self Test to diagnose the problem. 2. Call Service for further instructions.
Error 53 Scanner cannot operate.	USB transfer problem.	1. Verify that the USB cable is not damaged and is properly connected. 2. Verify that the USB terminal on the Main Controller Board is not damaged.
Error 70 Cassette release failure. Manually remove the cassette.	Cassette release failure.	1. Manually remove the cassette. 2. Remove the Screen Transportation Unit and verify there is no screen jammed in the scanner. 3. Remove the screen from the cassette and verify that the screen is not damaged or bent on its edges.

Symptom	Possible Cause	Solution
Error 71 Scanner cannot operate. Tray not present or not inserted properly.	Screen Transportation Unit is not present or is not properly inserted.	1. Insert the Screen Transportation Unit into the scanner and properly secure the knobs. 2. Short-press the On/Off button to reset the scanner.
Error 72, **73, 74, 77** Scanner cannot operate.	One of the sensors in the Screen Transportation Unit is in wrong position.	1. Verify that there is a screen in the cassette. 2. Verify that there is no screen jammed in the cassette. 3. Verify that knobs properly secure the Screen Transportation Unit to the CR system. 4. Short-press the On/Off button to reset the scanner.
Error 80 Scanner cannot operate.	Embedded files on the Tray Board are not up to date.	Call Service for the instructions.
Error 83, 84 Loading/Unloading Screen process was stopped.	Screen loading/unloading process was incomplete due to one of the following: • Screen is slipping in rollers. • There is a dirt on screen. • The screen is damaged. • The cassette is damaged. • Screen Transportation Unit failure.	To check if the problem is caused by the screen or cassette: 1. Clean the rollers. 2. Clean the screen. 3. Check if the problem occurs with a different cassette. If so, the problem is caused by the cassette. To check if the problem is caused by failure in Screen Transportation Unit: 1. Verify that knobs properly secure the Screen Transportation Unit to the CR system. 2. Short-press the On/Off button to reset the scanner.
Error 86, 87, 88, 91. 92, 93, 94 Scanner cannot operate.	Erase unit is not properly functioning.	Replace the Screen Transportation Unit.

Symptom	Possible Cause	Solution
Error 89 Cassette is not properly secured, in order to eject the plate insert the cassette first.	• The inserted cassette was not properly locked and the loading of the screen started. • Cassette was manually released during scan cycle and screen is still present in the scanner.	If the cassette is locked, perform the following steps: 1. Click OK on the error message. The screen is ejected. Note that the screen has not been erased. 2. Perform a scan again. If the cassette is not locked, perform the following steps: 1. Verify that the screen is present in the cassette. 2. If not, insert the cassette into the Scanner and click OK. The screen is ejected into the cassette. Note: If you are unable to insert the cassette, short-press the On/Off button to restart the scanner, and then reinsert the cassette.
Error 101 Scanner cover is not in place.	Scanner cover was removed and not properly secured when returning it back into position.	Qualified technician is required to position and secure scanner cover.
Error 109 Laser in off position, scanned image will be lost!.	Internal part failure	1. Run the System Self Test to diagnose the problem. 2. Call Service for further instructions.
Error 7900 Loading Screen process was stopped.	Screen is slipping between the rollers due to dirt on the rollers.	Clean the rollers and the screens.
Error code may vary Power up failure.	Internal cable is disconnected.	1. Operate the System Self Test to diagnose the problem. 2. Call Service for further instructions.

Symptom	Possible Cause	Solution
Error code may vary Scanner cannot operate.	General error	1. Short-press the On/Off button to eject the cassette and reset the scanner. 2. Verify that the scanner status is Ready and the front panel LED is green. If the error persists, perform the following steps: 1. Disconnect scanner from the power supply. 2. Remove the Screen Transportation Unit. 3. Visually inspect that there is no screen jammed in the camera. 4. Insert the Screen Transportation Unit into the system. 5. Connect the system to the power supply. 6. Power up the scanner and verify that the scanner status is Ready and the front panel LED is green. If the error persists, perform the following steps: 1. Operate the System Self Test to diagnose the problem. 2. Call Service for further instructions.

Image Failures

Symptom	Possible Cause	Solution
Exposure index does not match the exposure dose.	• X ray generator does not function properly • System is not properly calibrated.	• X ray generator should be tested by the qualified service engineer. • Recalibrate the scanner (contact Service for further information).
Loss of data (full or partial image)	• Scanner is disconnected from the USB during the scan. • Scanner is disconnected from the power supply during the scan. • External devices other than the scanner or printer, connected to the PC (such as cell phone charger, mp3 player and etc.).	1. Short-press the On/Off button to reset the scanner. 2. Properly secure the USB and power supply connectors. 3. Verify that in the notification bar, the status is Ready and the front panel LED is green.
Double exposure	• Excessive exposure over 40 mR • Exposure over 10 mR without selecting the Smart Erase option. • Erase lamp failure or working at reduced power.	1. Erase the cassette twice before the next use. 2. Enable the Smart Erase option. 3. Activate System Self Test to diagnose the problem. 4. Contact Carestream Service.
Vertical line artifacts	• Scanner was touched or moved during the scan. • Scanner is not positioned on a stable surface. • Environmental interference by external device (such as cell phone). • External devices other than the scanner or printer, connected to the PC (such as cell phone charger, mp3 player and etc.).	• Make sure the scanner is not moved or touched during the operation. • Make sure the scanner is positioned on a flat stable surface. • Make sure the work environment complies with the requirements specified in the **Site Preparation** chapter.

9 System Self Test

Test System Hardware using System Self Test

System Self-Test is an automatic diagnostics tool that can assist in troubleshooting the system malfunctions.

Access System Self Test

Option1: From the Image Suite Software

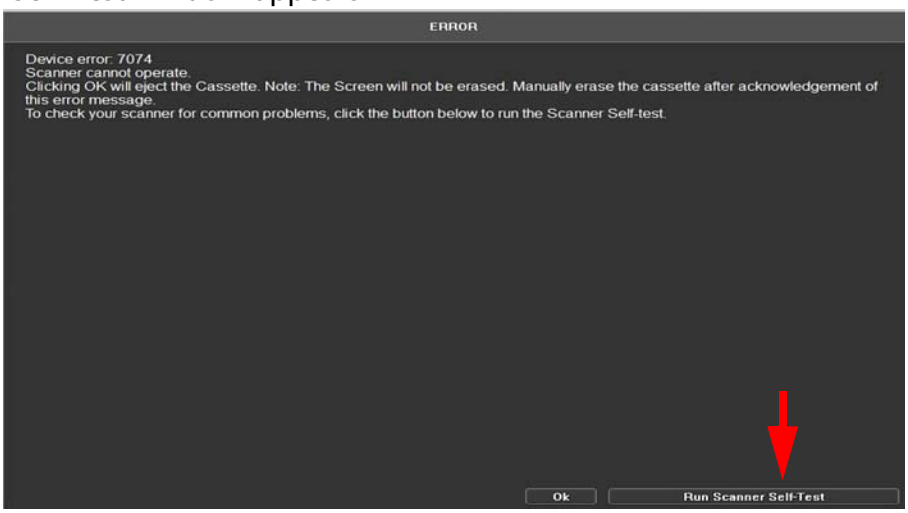
1. On the header bar of the Image Suite application, click the **Help** menu button.
2. From the displayed Help menu, select **Run Scanner Self-test**.

The System Self Test window appears.

Option 2: From Software Error Message

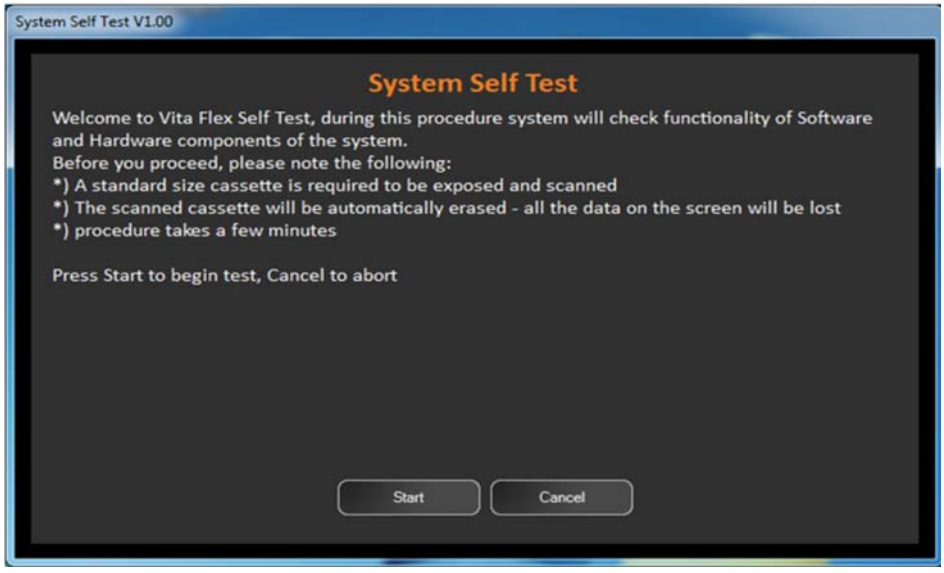
In the ERROR window, click **Run Scanner Self-Test**.

The System Self Test window appears.

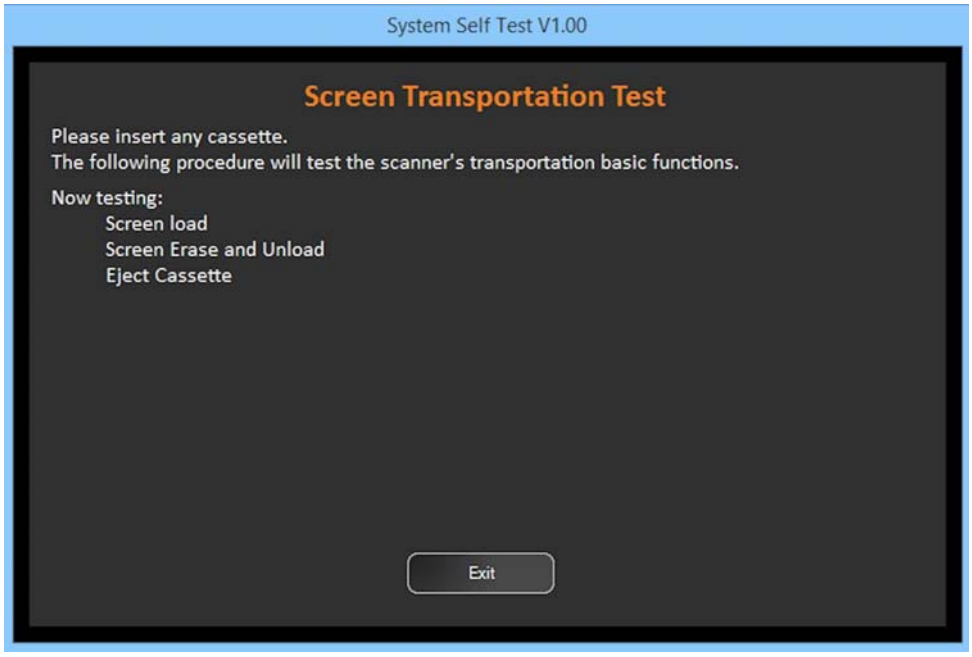


Run System Self Test

1. In the System Self Test window that appears, click **Start**.



After the check is completed, the Screen Transportation Test window appears.



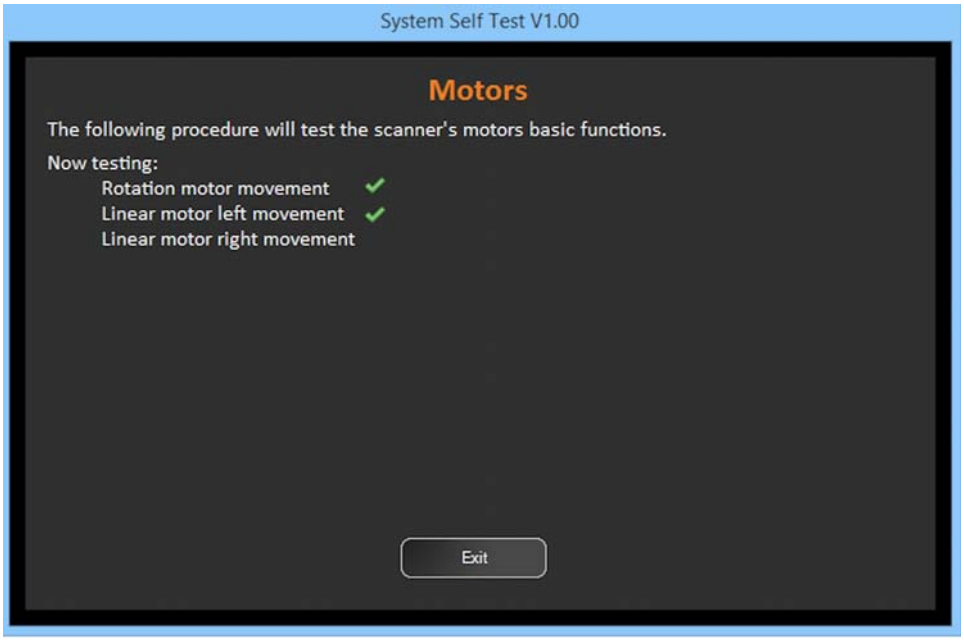
System silently checks the internal components of the scanner. The check may take a few seconds.

2. Insert an unexposed any size cassette into the scanner.

   System performs an automatic test of the screen transportation unit. A green check mark appears next to each tested function.

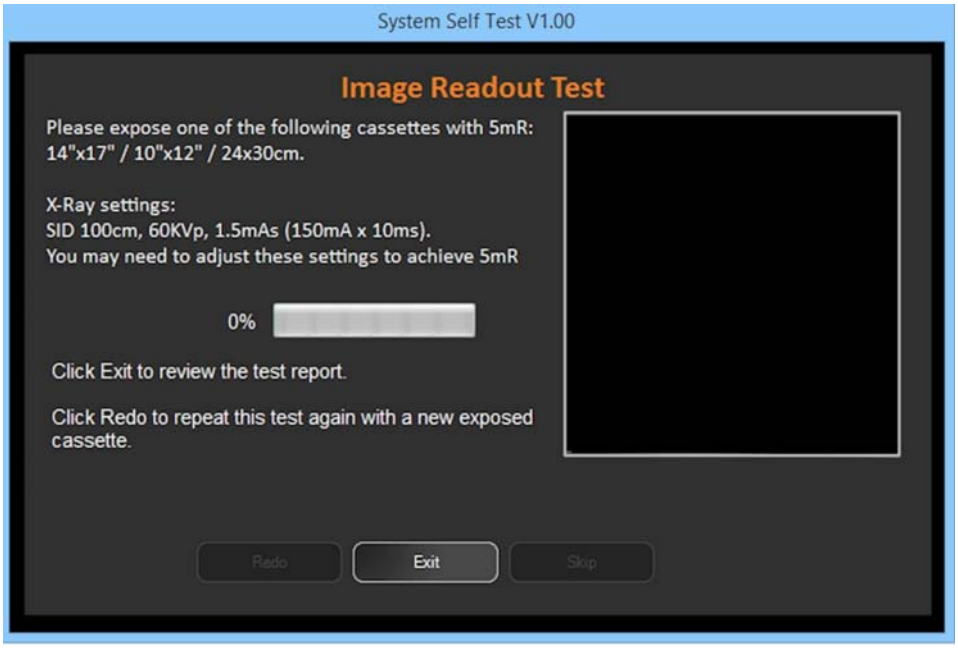
3. System performs Motors test.

   A green check mark appears next to each tested function.

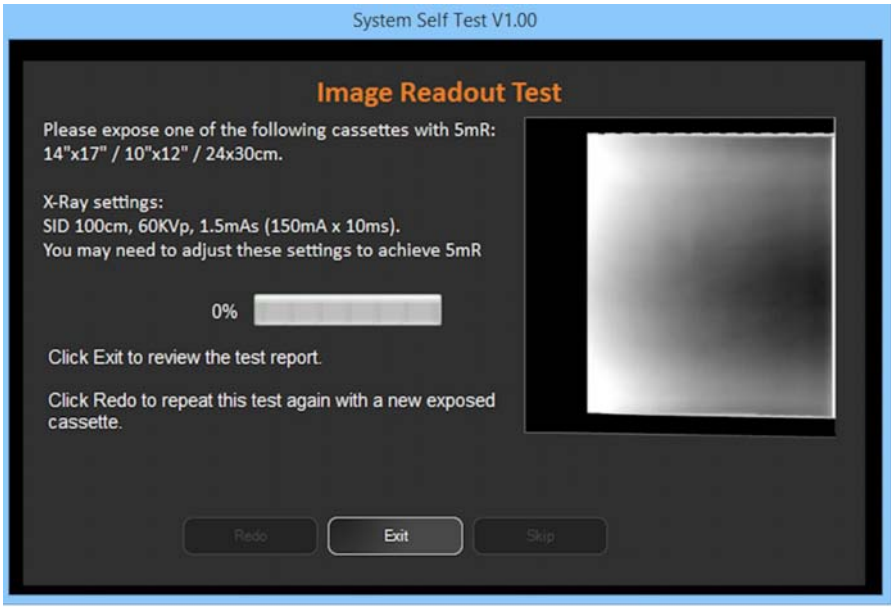


4. Expose one of the following cassettes: 14 x 17 in./10 x 12 in./24 x 30 cm. to a dose of 5 mR using x-ray settings: 60KVp, 1.5mAs, SID = 1.0 m. (40 in.). Then, insert the cassette into the system.

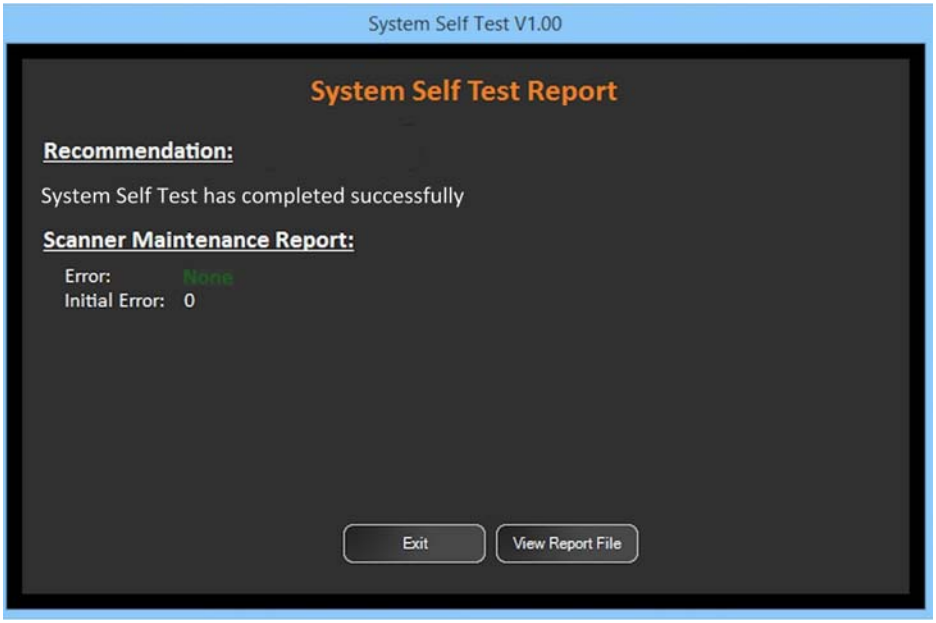
   The Image Readout Test starts.



5. When the progress bar reaches 100%, the test status is indicated by a green check mark (meaning the test succeeded) or by a red cross (meaning the test failed). Do one of the following:
   - If the test succeeded, click **Exit** to view the System Self Test Report.
   - If the test failed, click **Redo** to perform the Image Readout Test again, or exit to view the System Self Test Report.

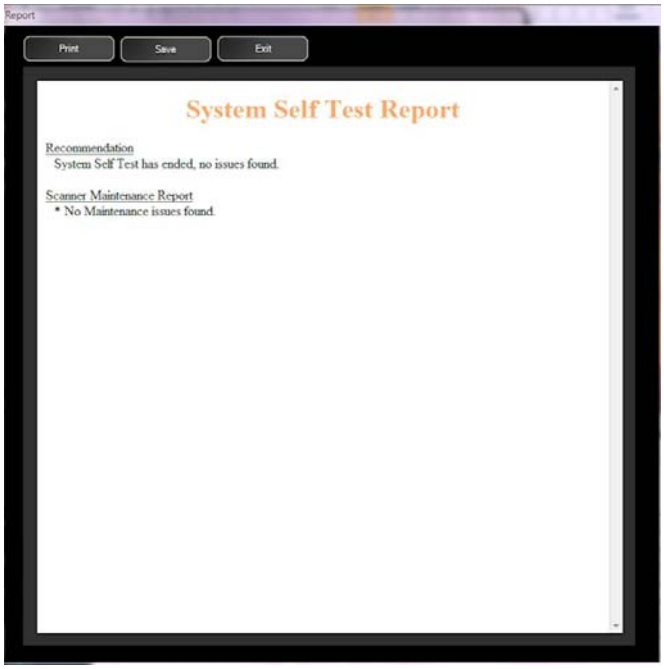


6. After the Image Readout test is complete, the System Self Test Report window appears showing the test reports.



If a success report is displayed (no detected errors), the system functions properly.

7. Click **View Report File** to view/print/save the generated basic report.



8. Click **Exit** to exit System Self Test.

10 System Specifications

Physical Specifications

Weight	25 kg (55 lb)
Dimensions (W x D x H)	68.0 x 34.0 x 45.0 cm (26.7 x 13.4 x 17.7 in.)
Screen Type	Flexible GP2 Phosphor Screen
Product Positioning	Horizontal or Vertical
Dynamic Range	0 < 40 mR
Electric Rating	100 - 240 V AC, 50 - 60 Hz
Maximum Power Consumption	120 W
Power Consumption While in "Stand-by"	42 W
Heat Dissipation While in Operation	330 BTU/H (97 W)

Erase Specifications

Erase Range	0 < 40 mR
Erase Time	7 < 80 sec (depending on screen exposure)

Storage and Operation Environments

	Operation	**Transport/Storage**
Ambient temperature	+5 to + 45°C (+41 to + 113°F)	-23 to + 66°C (-10 to + 150 °F)
Relative humidity	25 - 81%	10 - 86%
Atmospheric pressure	700 - 1060 hPa	

Publications History

Publication Date	Publication No.	Changed Pages	File Name	Notes
2014-10-02	6K7304			First release
2014-10-20	6K7304			Revision