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Carestream

CS 7600



User Guide

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Notice

CARESTREAM 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 guide has been prepared to aid dental professionals to understand and operate the system. Do not operate the system before reading this guide and gaining a clear understanding of the operation of the system. If any part of this guide is not clear, please contact your Carestream Health representative for clarification.

WARNING: Read the "Safety, Regulatory and the Technical Specifications User Guide" and make sure you observe all the Warnings and Cautions before using the CS 7600.

The CS 7600 is intended for digital dental radiography using an imaging plate (storage phosphor screen) for radiographic diagnostic intraoral images.

The CS 7600 in addition, optionally provides the Scan & Go technology to enable dental practitioners prior to acquisition to record the dental imaging plates with exam acquisition data.

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This document is originally written in English.

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CS 7600 complies with Directive 93/42/CEE relating to medical equipment.

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1 Conventions in this Guide

Conventions in this Guide

The following special messages emphasize information or indicate potential risk to personnel or equipment:



WARNING: Warns you to avoid injury to yourself or others by following the safety instructions precisely.



CAUTION: Alerts you to a condition that might cause serious damage.



Important: Alerts you to a condition that might cause problems.



Note: Emphasizes important information.



Tip: Provides extra information and hints.

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2 CS 7600 System Overview

Introduction

> **Note:** The CS 7600 is intended for dental professionals. You are required to have training to use the CS 7600.

CS 7600 is a scanner system for intraoral X-ray exposed imaging plates.

The CS 7600 is intended for digital dental radiography using an imaging plate (storage phosphor plate) for radiographic diagnostic intraoral images. The CS 7600 system is used to scan and review intraoral dental X-ray images. When scanning the X-ray exposed imaging plate a digital image is previewed on the scanner's LCD and saved to the scanner's internal memory. After scanning, the scanner erases the imaging plate and ejects it. The imaging plate is ready for re-use.

The exam acquisition's scanned image is sent over the network to the workstation's image Acquisition interface. Using the image Acquisition interface the image is processed and reviewed.

The image Acquisition interface sends the images to the Dental Imaging Software, which archives the acquired images.

The scanner connects directly to the network, or is connected peer-to-peer to the workstation.

The scanner can be optionally placed on a desk/counter top or mounted on a wall, using a special shelf (adapter).

The system is composed of the following elements:

- CS 7600 scanning device (page 4)
- Smart imaging plates (page 6)
- Scan & Go device (optional, page 9)

> **Note:** The scanner is supplied with a separate viewing and archiving software package: *Dental Imaging Software*, approved by Carestream Health.

> **Note:** The CS 7600 User Guide is also provided as a PDF file on the supplied CD-ROM.

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CS 7600 Components Overview

Scanner Overview

The CS 7600 scanner performs the functions necessary for scanning and acquiring images from the imaging plates.

Figure 1 CS 7600 Front View



1 3.5" QVGA color LCD (320 X 240 pixels, landscape matrix)

2 Function buttons for scanner use and menu navigation

3 On/Off button + LED power indicator
On/Off button functions:
- Turn scanner On: press for 1 second
- Turn scanner Off (close application and files and then turn off): press for 2 seconds

4 Base

5 Intraoral imaging plates tray

6 Detachable insertion panel. The CS 7600 makes use of three insertion panel sizes according to the inserted imaging plates size (0, 0–3, or 4).

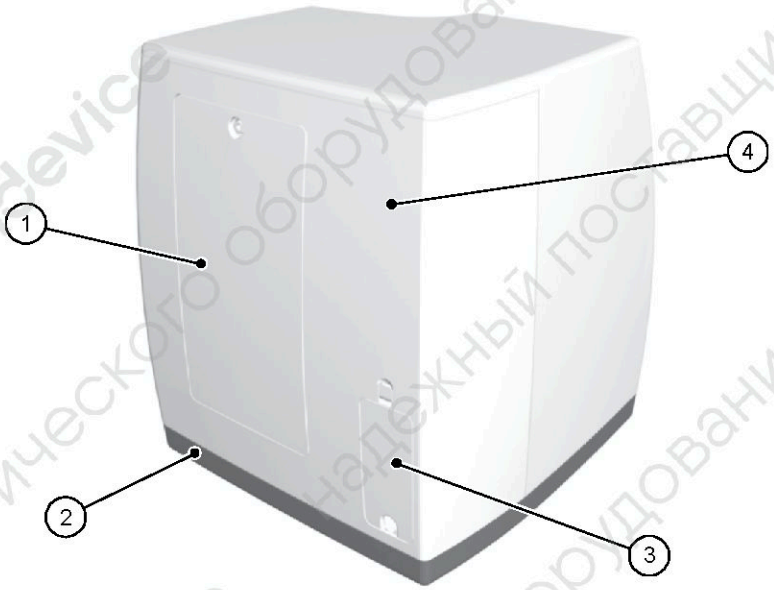
7 Front cover

8 Back covers

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Figure 2 CS 7600 Rear View



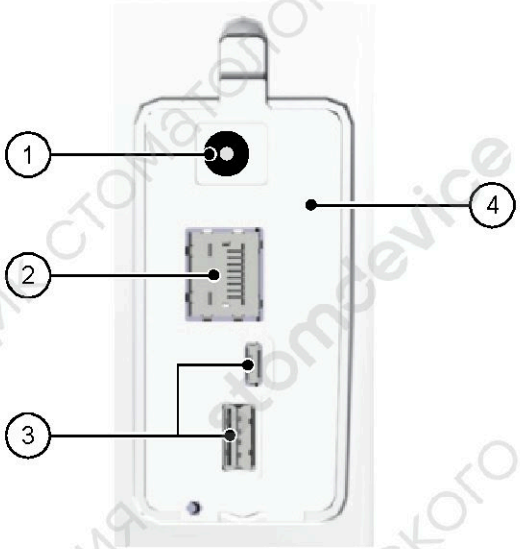
1 Service door

2 Base

3 Cables compartment for power supply connection and interface ports (RJ-45 Ethernet port)

4 Back cover

Figure 3 Cables Compartment in Detail



1 Power supply inlet

2 RJ-45 Ethernet port (Ethernet activity LEDs: yellow indicates speed, green indicates that the ethernet is connected)

3 Service ONLY ports

4 Compartment cover

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Smart Imaging Plates Overview

The CS 7600 works with five imaging plate sizes: 0 to 4. The scanned image file size depends on the imaging plate size and the scanning resolution set by the user.

The smart function of the imaging plates is utilized when using the Scan & Go device.

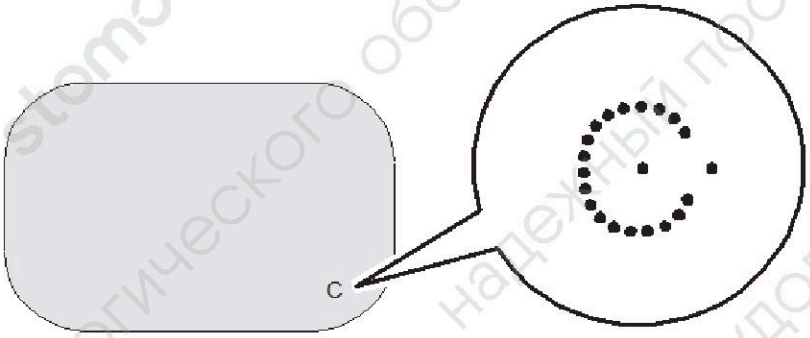
Table 1 Intraoral Imaging Plate Sizes

Size	Illustration	Application
0		Periapical exam (Pediatric dentistry)
1		Bitewing exam (Pediatric dentistry)
2		Periapical exam (Adult)
3		Bitewing exam (Adult)
4		Occlusal exam

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The imaging plate has two sides: the active side for capturing the X-ray image and the inactive side. The active side of the imaging plate includes an orientation mark ‘c’ to facilitate accurate positioning within the patient’s mouth. The inactive side has a printed dot that corresponds to the location of the orientation mark on the active side. This dot is visible through the transparent hygienic sheath and is also helpful for positioning the imaging plate correctly in the patient’s mouth.



Active side



Inactive side

Important: Use only Carestream imaging plates and hygienic sheaths!

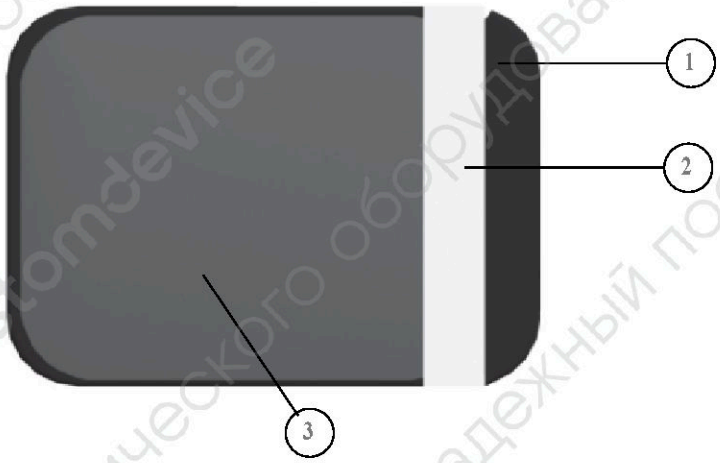
Hygienic Sheaths

For each imaging plate size there is a corresponding one-time use, disposable, hygienic sheath for preventing cross contamination. The transparent side allows you to see the orientation mark for positioning the imaging plate correctly in the patient’s mouth while the opaque side protects the active side of the inserted imaging plate from light damaging effects. The foam strip is a stopper which prevents inserting the hygienic sheath by mistake into the scanner (as long as the insertion direction is correct).

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Figure 4 Hygienic Sheath (front view)



1 Adhesive strip (for sealing the hygienic sheath)

2 Foam stopper

3 Sheath, transparent on one side and with a light protection barrier on the other side

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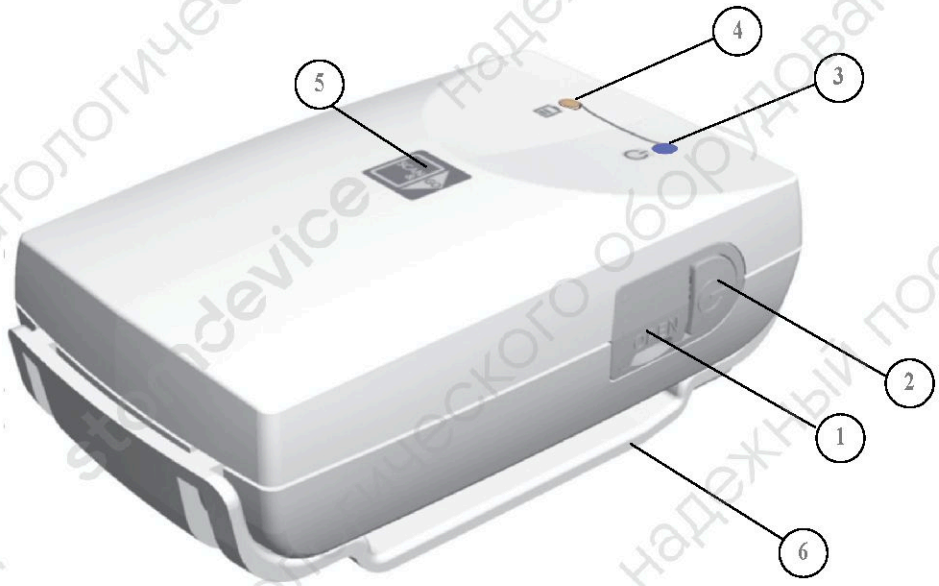
Scan & Go Overview

Scan & Go is an optional device that enables you to link the imaging plate to a specific exam acquisition (for example, patient) prior to acquisition.When the plate is inserted into the scanner, the information which was tagged onto the plate is retrieved by the scanner and the imaging plate is scanned automatically according to this information (resolution, target workstation, etc). Scanned images are then routed automatically to the correct workstation, associated to the correct exam acquisition and placed in the correct frame in the CS 7600 image Acquisition interface.

Scan & Go Generation 1 (Models Released before June 2012)

Scan & Go Generation 1 (models released before June 2012) have a rechargeable battery, accessible from the panel at the back of the device.

Figure 5 Scan & Go device, Generation 1 (before June 2012)



1 USB 2.0 port

2 On/Off button

3 On/Off/Recording LED status indicator (blue)

- Turning On/Off, 3 short flashes
- Standby (intermittent flashing)
- Recording data to the imaging plate (successive short flashes)

4 Battery LED status indicator (amber):

- Charging (static light)
- Low battery (successive short flashes)
- (light Off) battery charged

5 Recording surface for imaging plate

6 Mounting adapter

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Scan & Go Generation 2 (Models Released from June 2012)

A second generation of Scan & Go device is available from June 2012. The following improvements have been made to the second generation Scan & Go device:

- Faster scanning - Approximately 1/4 sec instead of 1 sec
- No battery - Therefore no need for charging
- No on off switch - Turns on automatically when the USB is connected

Figure 6 Scan & Go device, Generation 2 (after June 2012)



1 USB 2.0 port

2 On/Off/Recording LED status indicator (blue)

Power Up: One Flash & Beep (Internal FW)

Beacon: Flashes blue every few seconds when the image Acquisition interface is open (Not during Tagging)

Tagging OK: One flash (long) & 1 bleep (long)

Tagging Fail: One Red flash (long) & 1 bleep (long)

3 Connected to USB: LED status indicator (green)

4 Recording surface for imaging plate

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Connecting the Scan & Go Device



To connect the Scan & Go:

Connect the USB cable to the computer and to the USB port on the Scan & Go device.

- Scan and Go Generation 1, the right LED illumines amber, the left LED flashes blue to indicate that it is ready for use.
- Scan and Go Generation 2, the right LED flashes green three times, the left LED illumines green continuously and the device bleeps three times to indicate that it is ready for use.

Scanner Shelf

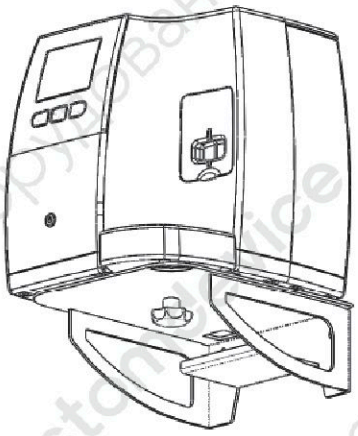
The CS 7600 can be optionally mounted on the wall using a shelf bracket.

The CS 7600 is attached to the shelf by a single central tightening nut.

For more information on Scanner Shelf Installation, see document HT014_20111006_EN



Scanner Shelf



Scanner on Shelf

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3 Software Overview

Computer System Requirements

Important: It is MANDATORY to check that the computer system configuration is compatible with the computer minimum system requirements specified in the Safety, Regulatory & Technical Specifications User Guide. If necessary, update your computer system configuration.

General Software Overview

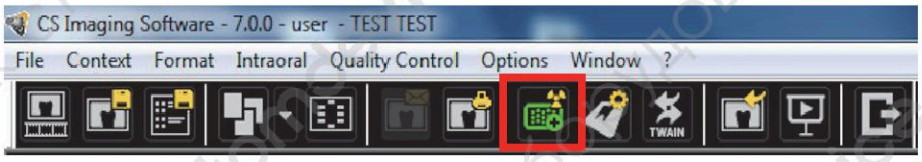
The CS 7600 intraoral imaging system operates with the following software:

- Dental Imaging Software
  - Single Image Acquisition Interface. See "Single Image Acquisition Interface Overview" on page 13.
  - Full Mouth Series (FMS) Acquisition Interface. See "Full Mouth Series (FMS) Acquisition Interface Overview" on page 14.
- CS 7600 Image Acquisition Software
  - Full Mouth Series (FMS) Acquisition Interface. See "Full Mouth Series Image Acquisition Interface" on page 28.

Single Image Acquisition Interface Overview

You can acquire individual images using the Carestream (CS) Imaging Software.

Figure 1 CS Imaging with Active CS 7600 Scanner Connected



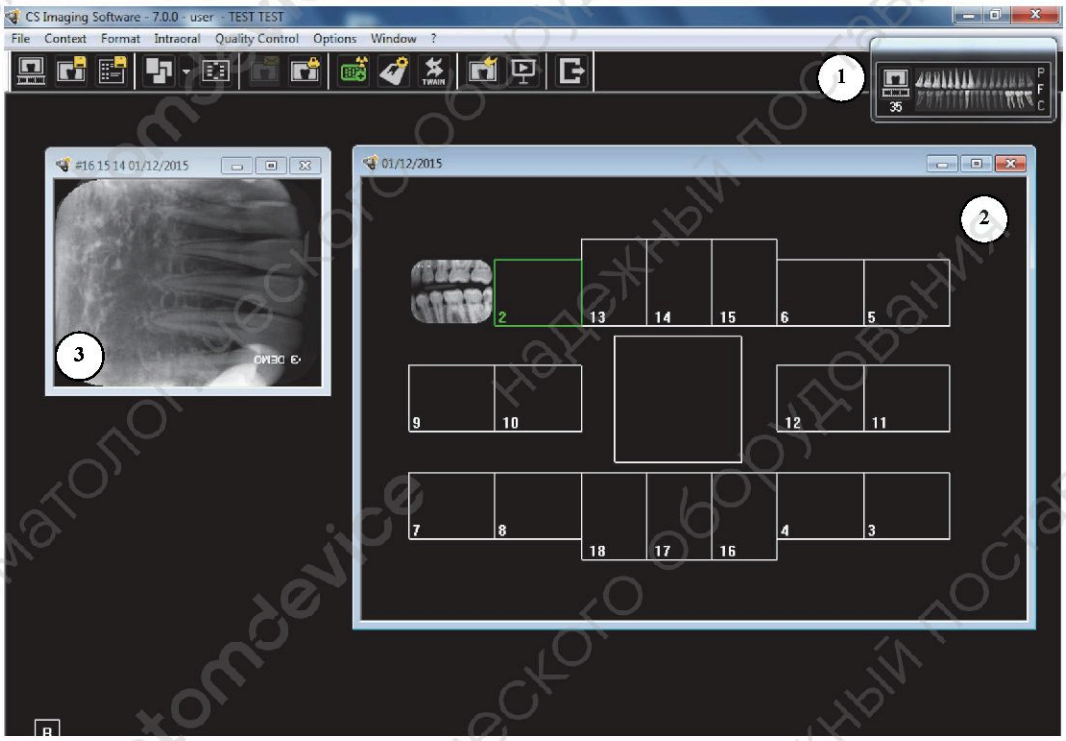
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Full Mouth Series (FMS) Acquisition Interface Overview

The Full Mouth Series (FMS) is a static representation of the mouth of the patient using a series of intraoral images. The images are placed in fixed numbered frames.

Figure 2 CS Imaging Software FMS Acquisition Interface

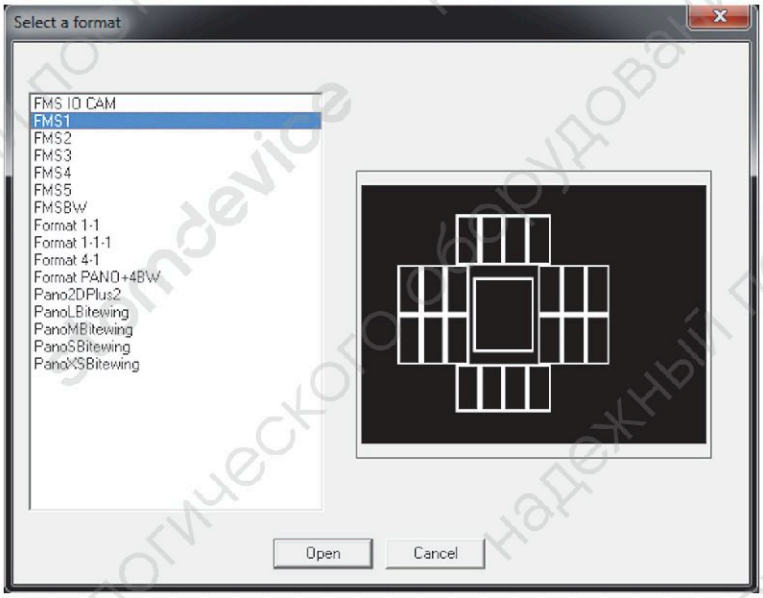


1. **Dental arch:** Highlights the acquisition zone.
2. **FMS template:** Displays frame templates for acquisition.
   - Green highlight: Frame ready for new acquisition
   - Blue highlight: Frame in the revue and retake mode. This mode interrupts the automatic acquisition sequence.
3. **Preview screen:** Displays the currently acquired image.

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Figure 3 FMS Select a Format



Select a Format enables you to select FMS template options to select for acquisition. You can modify existing templates and create new templates (see the ***Carestream Dental Imaging Software Online Help***).

Note: Only FMS templates for CR images can be used. Using other FMS will cause images not to be displayed.

Figure 4 Control Panel



Control Panel: enables you to adjust the brightness and contrast of the image. For more information on Control Panel functions, see the ***CS Imaging Software Online Help.***



Optiview:Maps pure black to blue and pure white to green, leaving other shades unchanged.

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Negative: Displays the image as a photo negative.



Colors #1: Maps pure black to blue and pure white to red.



Colors #2: Maps middle-gray to orange and leaves pure white and pure black in their original states.



CS Adapt Library: Opens the CS Adapt Library software that allows to manage your filters.



Adapt - Unfiltered Perio: Enhances the display of periodontal tissue.



Adapt - Unfiltered Endo1: Enhances contrast at the canals and roots (produces brighter images).



Adapt - Unfiltered DEJ1: Optimizes contrast at crowns, amelo-dentinal junctions, and roots (produces brighter images).



Adapt - OptimizedContrastEndo: Enhances contrast at the canals and roots.

Figure 5 Intraoral Toolbar



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INTRA toolbar: enables you to adjust the image display. For more information on Intraoral toolbar functions, see the ***Carestream Dental Imaging Software Online Help.***



Highlight: click to optimize contrast within a region of interest.



Measurements: click to draw measuring lines on the image.



Flip: click to rotate the image by 180° clockwise..



90° rotation: click to rotate the image by 90° clockwise.



Acquisition correction: click to create a mirror image of the original image.



Edit annotations: click to open the image in an annotations editor.



Display annotations: click to display any annotations on the image. Click again to hide the anotations.



Pseudo - 3D: click to display gray scale levels as height values.



Relief filter: click to enhance the outlines of the shapes in an image by displaying the image in relief mode.



Isodensity dots: click to apply color to pixels of the same bone density.



Densitometric analysis: click to analyze bone density.



Caries Detector: click to open the Logicon Caries module for detecting interproximal caries.

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Dental Imaging Software Main Toolbar





Scanner Status Indicator: shows the status of the active scanner. The following status options are available:

- **Green**: ready to scan.
- **Yellow** : blinks when tagging a plate and when a new image is transfered to Dental Imaging Software.
- **Red**: error in the active scanner.
- **Grey**: active scanner is not connected.



CS 7600-Configure: click to open the CS 7600 configuration window. See "CS 7600 Configuration Window" on page 19.



New CR image: click the arrow button to select between the two options:

- CS7600 acquisition (CR)
- CS7600 FMS acquisition (CR2). After the option is selected, click to open the CS 7600 Image Acquisition Software in the FMS mode. See "Full Mouth Series Image Acquisition Interface" on page 28.

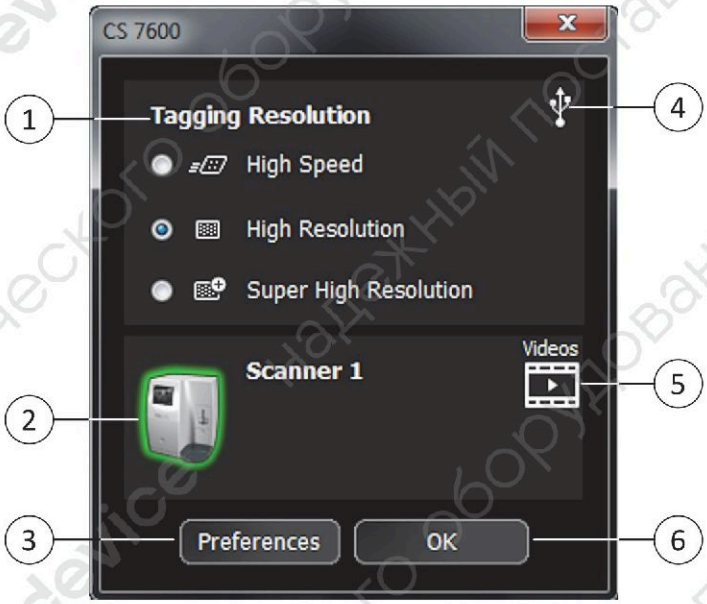


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CS 7600 Configuration Window

The CS 7600 configuration window is opened when clicking the CS 7600-Configure button on the Dental Imaging Software main toolbar.



1. **Tagging Resolution:** select one of the three available resolutions for the next tagging resolution. Available only if Scan&Go is connected.

2. **Scanner Status Indicator:** Displays the status of the active scanner.
   - Green highlight: scanner is ready for operation
   - Grey: active scanner is not connected.
   - Red: active scanner error.

3. **Preferences:** click to open the CS 7600 Preferences window.

4. **Scan&Go Status Indicator:** Displays the status of the Scan&Go device.
   - White: Scan&Go device is connected.
   - Grey: Scan&Go device is not connected.

5. **Videos:** click to open the training videos.

6. **OK:** click to save the selected settings and close the CS 7600 configuration window.

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4 Scanner Interface Overview

This chapter explains the scanner interface and how to use it.

Computer System Requirements

Important: It is MANDATORY to check that the computer system configuration is compatible with the computer minimum system requirements specified in the Safety, Regulatory & Technical Specifications User Guide. If necessary you must update your computer system configuration.

CS 7600 Scanner Interface Overview

The CS 7600 scanner interface is used primarily for scanning the exposed imaging plates and provides easy-to-understand prompts.

The scanner interface also provides the option of changing the scanner default settings as described in the CS 7600 installation guide.

All scanner functions are applied using the three buttons beneath the LCD.

The functional buttons are used for navigating the LCD screens, menus and used to apply your selections.



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Scanner Interface Icons

Figure 1 Example of Insert Plate screen



The following table lists the icons that are part of the various LCD screens.

	Stored images counter and available memory status. Blue background indicates available scanner memory.
	Stored images counter and available memory status. Red background indicates scanner memory is either nearing its full capacity or is already used up.
	Network connection state, connected.
	Network connection state, disconnected.
	Network connection state, limited connection.
	Scanner is Paired (connected Peer to Peer) to a workstation.
	Scan & Go state indicator. Blue indicates the scanner supports Scan & Go smart scanning. When scanning recorded imaging plates this icon blinks.
	Scan & Go state indicator. White indicates the scanner does not support Scan & Go smart scanning, or that the scanned imaging plate does not contain Scan & Go recorded information.

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Scan resolution	The image scan resolution
	High speed (HS)
	High resolution (HR)
	Super high resolution (SHR)
	Press the scanner's left function button to access the Settings menu. For information about Settings, See "Repeat steps 1 to 4 for any other imaging plates that need erasing.." on page 26
	Press the scanner's middle function button to manually erase the imaging plate, See "Erasing the Imaging Plates" on page 26.
	Press the scanner's middle function button to return to the Insert Plate screen.
	Press the scanner's right function button to access scanner information such as scanner name, IP address and total scans performed by the system, and the system's set date and time.
	Press the scanner's left function button to scroll down/forwards.
	Press the scanner's right function button to scroll up/backwards.
	Press the scanner's right function button to Unpair the scanner from the workstation.
	Press the scanner's right function button to confirm your selection.
	From SP4 you can delete images from the scanner using the Viewer, Press the scanner's right function button to delete the image being viewed.
	To change the scan resolution for the current exam acquisition (when acquiring images without Scan & Go device), press the right scanner function button and toggle to the required scan resolution after inserting the imaging plate. (If another exam acquisition is selected, the scanner reverts to its default resolution.)
	Image number in the Plate Viewer
	Plate size (in the Plate Viewer)

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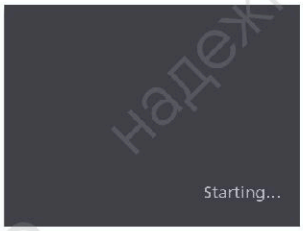
Working with the Scanner

The following procedures are explained here:

- Turning on the Scanner,See “Turning on the Scanner” on page 24
- Image Acquisition, See “Image Acquisition” on page 24
- Scanner Info, See “Scanner Info” on page 25
- Erasing the Imaging Plates, See “Erasing the Imaging Plates” on page 26

Turning on the Scanner

After turning on the scanner, you are presented with the Starting screen.



Then the Insert Plate screen opens.



The following three functions are presented:

-  Scanner Info, See “Scanner Info” on page 25
-  Erase Imaging Plate, See “Erasing the Imaging Plates” on page 26
-  Scanner Settings, See “Repeat steps 1 to 4 for any other imaging plates that need erasing..” on page 26

Image Acquisition

When image acquisition is performed without a Paired status or Scan & Go:

1 Press  to select a patient.

2 Press  to select a scan resolution.

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3 Press  to scan the imaging plate.
The imaging plate is scanned.

For more information, See "Acquiring Single Image" on page 34

Scanner Info

1 Press  **Info**
The Scanner Info screen opens.



The following information is presented.

- System's set date and time
- Scanner Name
- IP address
- Software Version
- Scan Count: Total scans performed by the system

2 To close the **Scanner Information** screen, press 
The Scanner information screen closes and you return to the insert plate screen.

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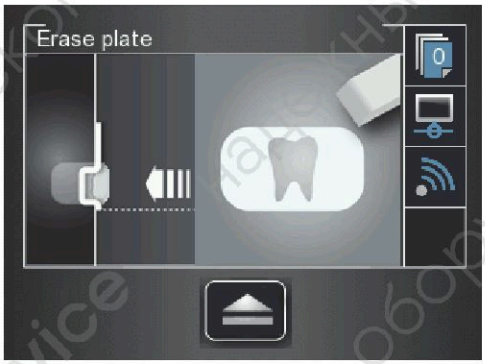
Erasing the Imaging Plates

The imaging plates are automatically erased and ejected after they are scanned. If the imaging plate is exposed to light for an extended period of time (one week or more) or to strong light for even a short amount of time, the plate will need to be manually erased before use.

To erase the imaging plate manually, follow these steps:

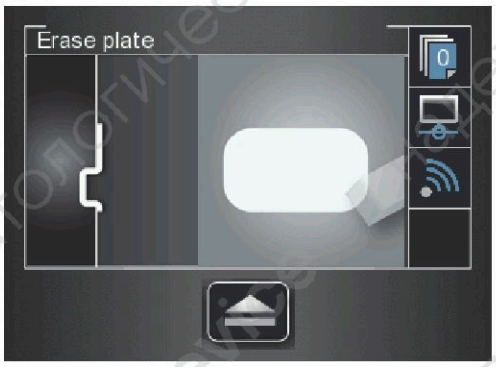
1 Press  the scanner's middle function button

2 The LCD displays the **Erase plate** screen:



3 Insert the imaging plate into the scanner's insertion slot without the hygienic sheath (for information on how to insert the imaging plate, See "Inserting the Imaging Plate" on page 35).

The Erase plate screen is displayed.



The erased imaging plate is ejected to the tray and the scanner reverts to the **Insert Plate** screen.



4 Collect the imaging plate while taking care to maintain hygienic protocol and minimal exposure to light.

5 Repeat steps 1 to 4 for any other imaging plates that need erasing..

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5 CS 7600 Image Acquisition Interface

CS 7600 Imaging Software Overview

The Imaging Software is a user-friendly working interface that was designed and developed specifically for radiological diagnosis. It is the common imaging platform for all our digital systems for dentistry.

The Imaging Software provides management of the patients and image database.

To open your Imaging Software: On your desktop, double-click the Imaging Software icon or click **Start > All Programs > Carestream> CS Imaging software.**

For more information, see your Imaging Software documentation.

CS 7600 Image Acquisition Interface Overview

The CS 7600 image Acquisition interface is a user-friendly application designed and developed specifically for the CS 7600 intraoral imaging system. It provides a rich array of image processing options in addition to the acquisition functions.

The image Acquisition interface provides one mode:

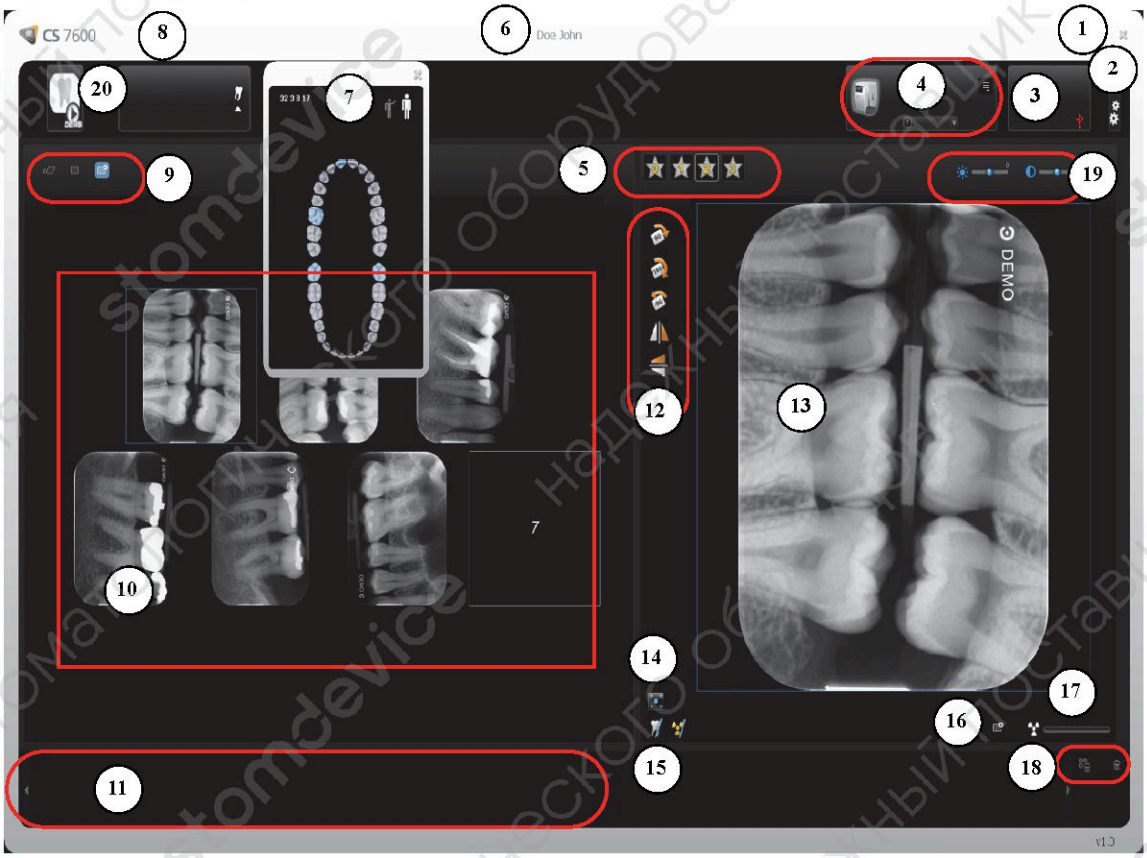
Full Mouth Series: Full series of frames, according to one of the available industry standard templates for full mouth series, selected in the **General Settings** tab.

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Full Mouth Series Image Acquisition Interface

Figure 1 Image Acquisition Interface - Full Mouth Series Mode



Scanner List



Tip: Selected and active options are highlighted in blue.

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Table 1 Image Acquisition Interface Key

1	**Exit**	Click ✖ to exit the CS 7600 image Acquisition interface.
2	**Settings**	Click **Settings** to customize the default settings. See "Working with Settings" on page 53..
3	**Scan & Go Status**	The Scan & Go's active connection status (white color indicates connection, red indicates no connection). USB (connected) USB (not connected)
4	**Scanner Area**	Allows browsing of all active connected scanners (if there are multiple scanners in the same network). Click **Scanner List** to list all scanners. Green frame indicates a connected scanner Grey frame indicates a disconnected scanner Red frame indicates a scanner in error state (click the scanner icon to display the error tool tip) Click the arrow, to display the images in the memory of the selected scanner.
5	**Favorite Filters Buttons**	Click to enhance a different zone of interest: Click to enhance the display of periodontal tissue. Click to enhance contrast at the canals and roots (produce brighter images). Click to optimize contrast at crowns, amelo-dentinal junctions, and roots. Click to rnhance contrast at the canals and roots.
6	**Patient Information**	Displays the patient information. **FMS** or **Image Acquisition** template.
7	**Tooth Selection**	When using an FMS template, the tooth associated with the selected frame is highlighted blue in the panoramic arch icon. When using Image Acquisition, clicking the arrow (under the Toothpicker icon) allows selecting individual teeth in either child or adult dentitions. (To clear the selection, click the tooth again.)

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Table 1 Image Acquisition Interface Key

8	**Imaging Software Details**	Clicking the CS 7600 CS 7600 Icon provides the imaging software details.
9	**Scan Resolution**	The scan resolution to apply when tagging information on an imaging plate with the Scan & Go device. To change the scan resolution for the current exam acquisition, click the required icon before you tag the imaging plate:  High Speed (HS)  High Resolution (HR)  Super High Resolution (SHR)
10	**Images Display area**	This area displays the images according to one of the dental standard layouts determined by the **Default template selection** in the **"General Settings Tab"** tab.
11	**Images Gallery**	Useful for storing images when rearranging the layout, or for discarding an image when necessary.
12	**Orientation Buttons**	 Click to rotate the selected image 90 degrees clockwise.  Click to rotate the selected image 180 degrees.  Click to rotate the selected image 90 degrees counter clockwise.  Click to flip the selected image vertically (Mirror inversed images).  Click to flip the selected image horizontally (Mirror inversed images).
13	**Preview Panel**	Displays the active frame's image (if frame is populated). You may apply the processing and comments to the preview image.
14	**Full Screen**	 Click to display the image in a separate, full screen window (dark room mode)
15	**Comments & Exposure Values**	 Click to add a comment to the image (The comments will be added to the DICOM tags of the image and can be viewed later using the Imaging Software or DICOM viewer.)  Click to enter custom X-ray exposure values. This information is inserted in the image's DICOM header. Otherwise the default exposure values as defined in the **"General Settings Tab"** are inserted in the DICOM header.

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Table 1 Image Acquisition Interface Key

16	**Selected Image Resolution**	Indicates the selected image's resolution level (in the preview image panel):  High Speed (HS)  High Resolution (HR)  Super High Resolution (SHR)
17	**X-ray Exposure Indication**	 Partly red, indicates an underexposed image. Review the X-ray technique and consider increasing the exposure values for better image quality and diagnosis.  Green, indicates good exposure values.  All red, indicates that the image is over exposed. Review the X-ray technique and consider lower exposure values for better image quality and diagnostics.
18	**Delete**	 Click to delete ALL images from the Images Gallery.  Click to delete the selected image from the Images Gallery.
19	**Image Brightness and Contrast**	 Use the brightness slider to manually adjust the image's brightness.  Use the contrast slider to manually adjust the image's contrast.  Click to apply an automatic optimization of brightness and contrast.



Tip: Image Brightness and Contrast may also be adjusted by holding the mouse button over the image and dragging vertically, for contrast, and horizontally, for brightness.

20	**Demo Mode**	Populates one frame in the images display area with a demo image each time the icon is selected. 
21	**Refresh**	 Click to refresh the Scanner List.
22	**Close Scanner List**	 Click to close Scanner List.

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Image Acquisition Interface

When you open the Dental Image Software or CS7600 Image Acquisition Software for the first time, the following window opens.



6 Click **OK**.

> **Note:** Do not select the **Don't show this message again** checkbox.

The **Image Adjustment** window opens.



7 Select a default scan resolution check box.

8 The filter number with blue check mark will be applied to the next image acquisition.

9 To change this settings, click **OK** and open the **CS Adapt** to modify.

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6 Acquiring Images without Scan & Go

Introduction

This chapter describes the acquisition procedure for configurations with and without the optional Scan & Go device.

A typical work-flow consists of the following steps:

- Accessing the imaging window, See "Starting the Imaging Software" on page 34
- Preparing the Imaging Plates, See "Preparing the Imaging Plates" on page 35
- Inserting the Imaging Plate into a hygienic sheath and sealing it, See "Inserting the Imaging Plate" on page 35
- Placing the imaging plate in the patient's mouth behind the selected tooth or teeth, See "Performing the X-rays" on page 36
- Exposing the imaging plate to X-ray, See "Performing the X-rays" on page 36
- Removing the imaging plate from the patient's mouth, See "Performing the X-rays" on page 36
- Disinfecting the Hygienic Sheath, See "Disinfecting the Hygienic Sheath and the Imaging Plates" on page 67
- Scanning the Imaging Plate, See "Retrieving a Fallen Imaging Plate" on page 79
- Storing the image in the Dental Imaging Software, See "Storing the Images" on page 48

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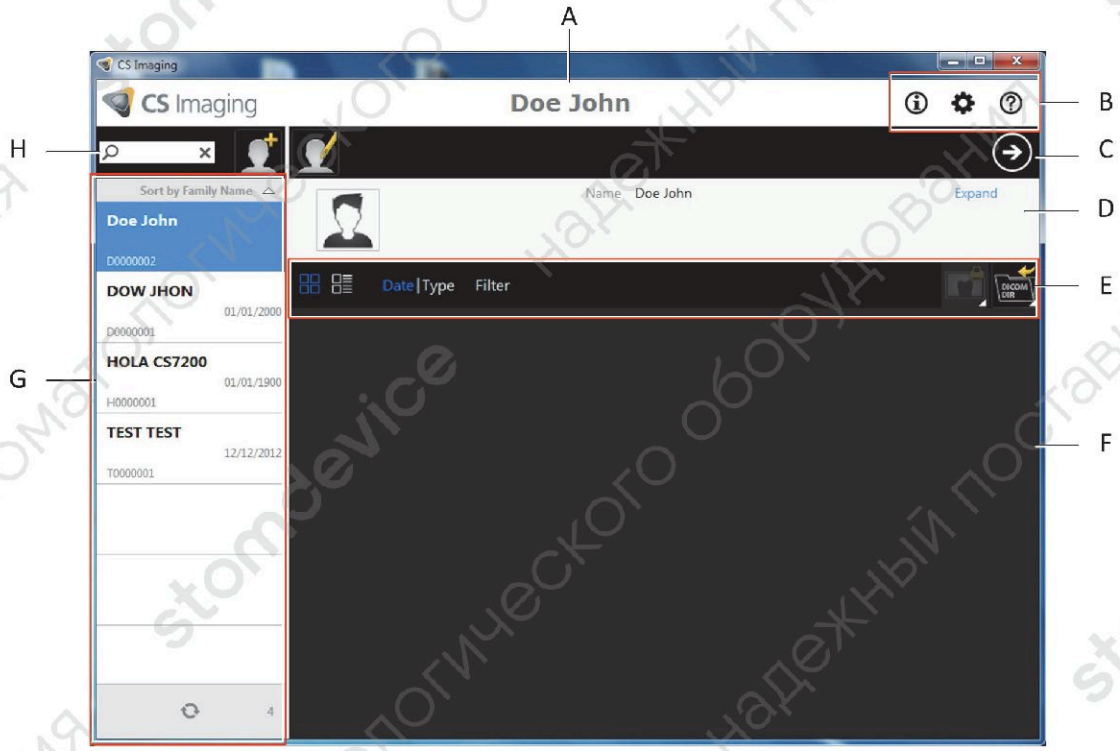
Acquiring Single Image

Starting the Imaging Software

1 On your desktop, double-click the Imaging Software icon or click **Start > All Programs > (**the name of your**) Dental Imaging Software.**

2 Create or open an existing patient record:

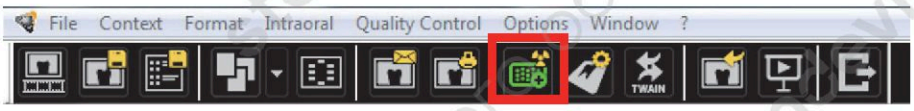
- **To open an existing patient record**: In the Patient Browser search field **(H)**, start typing to search for a patient card.



- **To create a new patient record**: Click the **Create New Patient Card** button alongside the search field to create a new patient card. For more details.

3. Once you have selected or created a patient, in the Patient Browser Toolbar **(C)** click the arrow button to open the Imaging application. The Patient Browser window remains open and the Imaging Window is displayed.

4. Wait for the Scanner Status icon to turn green on the **Imaging Window** toolbar indicating that the CS 7600 scanner is connected to the workstation and is ready for acquisition.



The newly created patient becomes an existing patient. Click **Patient > Find**, select the newly created patient from the list and click the Imaging Software button to proceed.

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Preparing the Imaging Plates

To prepare the intraoral imaging plate, follow these steps:

1 Choose an imaging plate of the right size for your examination.

Important: Use only CS 7600 **intraoral imaging plates from Carestream and hygienic sheaths from Carestream. The use of plates or hygienic sheaths from a third party supplier may cause a malfunction of the system and void the warranty**.

Tip: If the imaging plate has not been used for a while, proceed to erase it first. See "Erasing the Imaging Plates" on page 26.

Important: If you select a size 4 imaging plate, make sure the scanner has the size 4 insertion slot panel installed. For information on replacing the insertion panel, See "Cleaning the Detachable Insertion Panels" on page 68. There is no need to power off the system when replacing insertion panels.

Inserting the Imaging Plate

2 Insert the disinfected imaging plate (See "Disinfecting the Hygienic Sheath and the Imaging Plates" on page 67) into its protective hygienic sheath with the inactive side facing the adhesive strip, so the imaging plate's size number is seen through the transparent side of the hygienic sheath and the orientation dot is visible in the bottom corner (**A**).

3 Peel the adhesive strip's protective paper to seal the hygienic sheath (**B**).
Handle the imaging plate by holding the hygienic sheath's empty edge (**C**) (where the foam strip is).



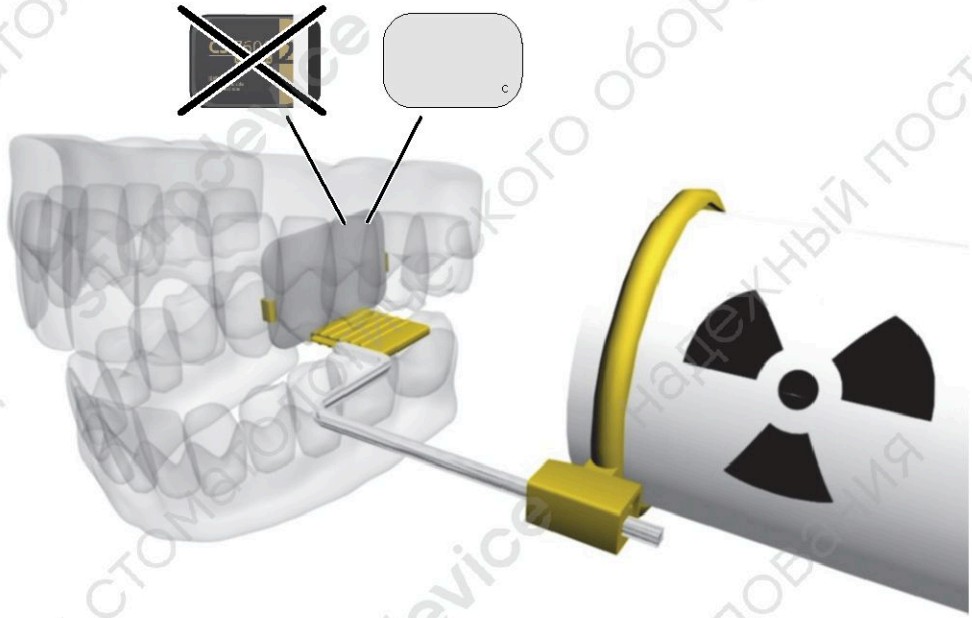
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Performing the X-rays

Perform the required X-rays according to your clinical procedure.

It is recommended to continue using X-ray positioning techniques and tools to ensure the resulting image is complete and includes all the information required for diagnosis. It is recommended to use the Rinn Suresoft holder or equivalent products available on your market. To facilitate matching the orientation of the image in the software to the clinical reality, we recommend to position the imaging plate in the mouth of the patient with the orientation mark always towards the bottom.

Important: Make sure the active side of the imaging plate is facing the patient's teeth.



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Scanning the Imaging Plates

1 Remove the imaging plate from the patient's mouth. **Do not remove the imaging plate from its hygienic sheath**. Wipe and disinfect the exposed imaging plate's hygienic sheath (See "Disinfecting the Hygienic Sheath and the Imaging Plates" on page 67). Keep the imaging plate in its hygienic sheath to minimize exposure to light.



Important: If the imaging plate is exposed to light, it could result in degradation of image quality. Do not remove the imaging plate from its hygienic sheath until you insert it in the scanner's insertion slot.

2 At the scanner location, tear open the hygienic sheath (**A**) and insert the exposed imaging plate into the scanner by positioning the open side of the sheath in the insertion panel slot (**B**) with the foam side to the right. Push out the tip of the imaging plate from its hygienic sheath (**C**).
The imaging plate (without its protective sheath) is drawn into the insertion slot by the scanner and the scanner preview shows the scan progress.



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Important: If the user inserts the plate incorrectly, there is a possibility of the plate falling into the scanner. If the plate falls into the scanner, See "Retrieving a Fallen Imaging Plate" on page 79

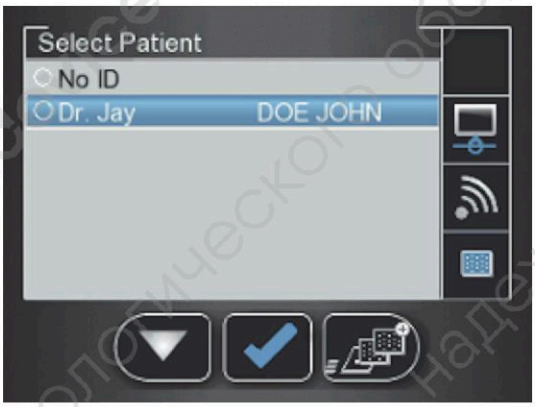
3 Dispose of the used protective hygienic sheath (**D**).

If the scanner is linked Peer to Peer with a workstation, the image is sent automatically to the workstation which it is linked with.

4 Select the patient from the list. If the required patient does not appear in the list, select the NO ID option.

Note: For information on retrieving the NO ID images, See "Clearing Scanner Memory" on page 62

5 Press the middle function button to scan the imaging plate.



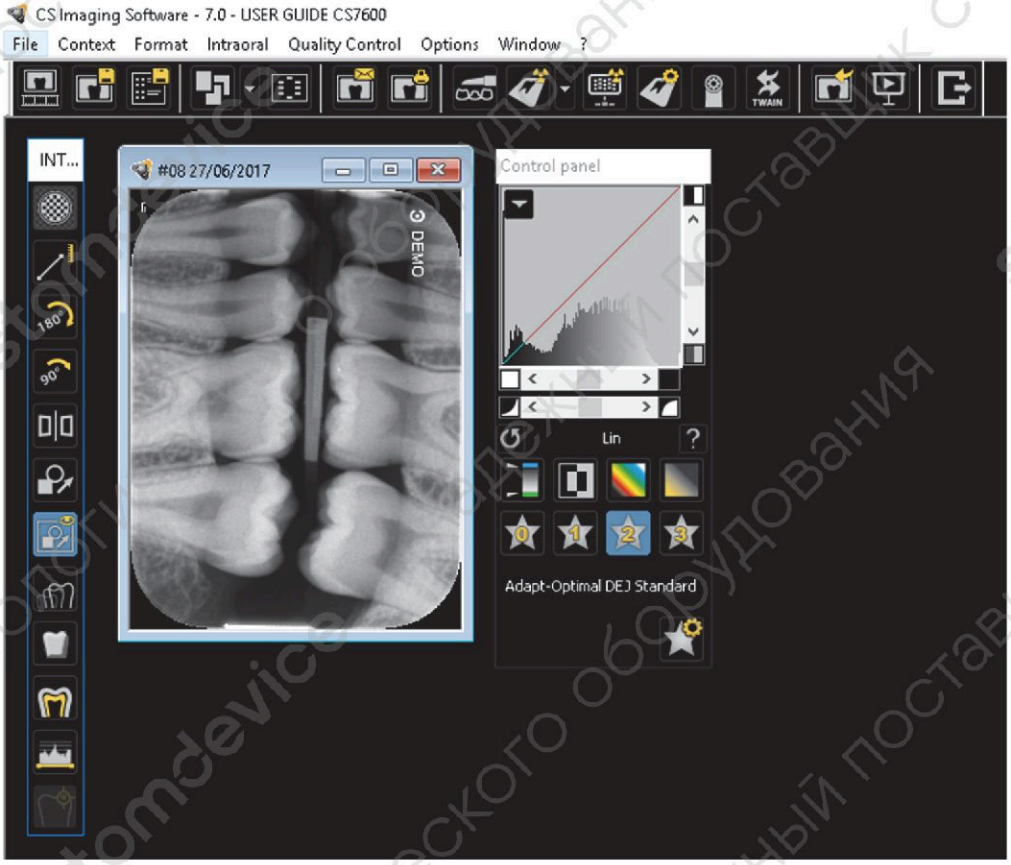
6 Collect the ejected imaging plate from the lower tray after it is scanned, insert it into a new envelope, seal the envelope and store it into the storage box for next use.

Important: After scanning the image, the scanner erases the imaging plate before ejecting it. The imaging plate is ready for re-use.

7 Check the image quality.

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The ideal image quality is when the indicator of the quality of exposure is a full green bar in the Control Panel. Avoid under-exposed or over-exposed images indicated by a partial or full red bar.

Under-exposed Image	Overexposed Image
	
Ideal Image Quality	Ideal Image Quality
	

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Acquiring Multiple Images

Preparing Acquisition of FMS Images

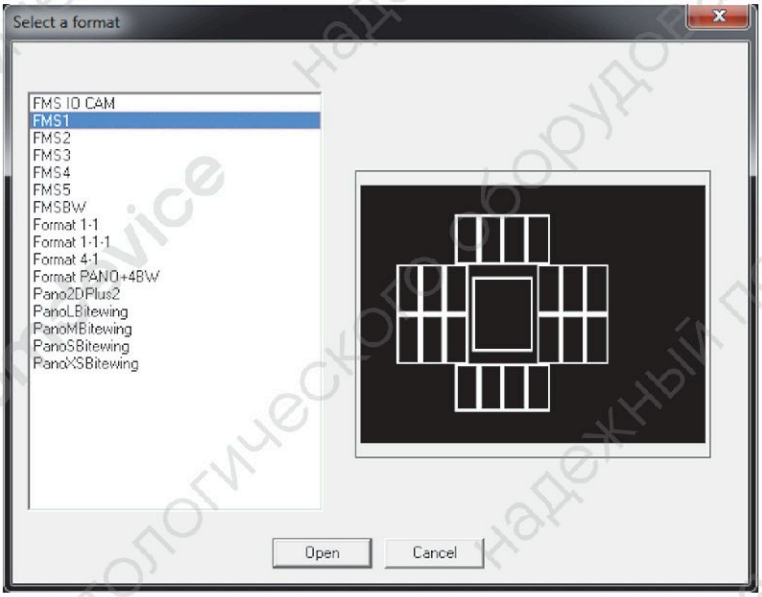
To prepare the acquisition of FMS images, follow these steps:

1 Access the **Dental Imaging Software. See** **"Starting the Imaging Software" on page 34**

2 Click  in the **Imaging Window** toolbar to access the **Select a format** window.



3. From the list of available formats (templates), select the required template and click **Open**.



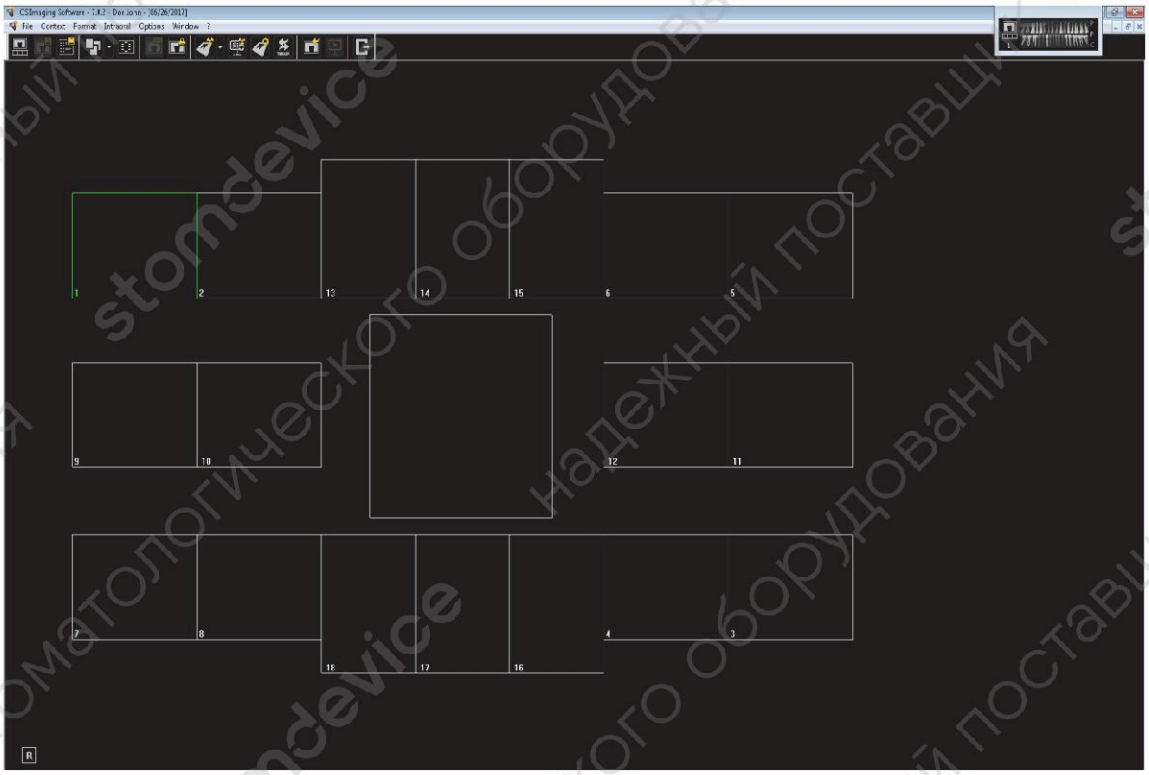
If you try to change the FMS template after you have finished your image acquisitions you are prompted with a warning that indicates that you risk loosing some of the images.



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The selected format is loaded and displayed in the Dental Imaging window. The first frame for scan is highlighted in green.



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7 Acquiring Images Using Scan & Go

Introduction

This chapter describes the acquisition procedure for configurations with the Scan & Go device.

Note: Using the Scan & Go option streamlines and shortens the scanning process. The scanned image reaches its destination automatically; no need to select the destination workstation when scanning the imaging plate. In FMS mode, the image automatically populates its designated frame in the template.

A typical workflow consists of the following steps:

- Accessing the imaging window, See "Starting the Imaging Software" on page 34
- When working with multiple images, selecting or "Opening the Image Acquisition Interface" on page 46
- Preparing the Imaging Plates, See "Preparing the Imaging Plates" on page 35
- Tagging the imaging plate with the Scan & Go, See "Tagging the Imaging Plate with the Scan & Go" on page 44
- Placing the imaging plate in the patient's mouth behind the selected tooth or teeth, See "Performing the X-rays" on page 44
- Exposing the imaging plate to X-ray, See "Performing the X-rays" on page 44
- Scanning the Imaging Plates, See "Scanning the Imaging Plates" on page 44
- Removing the imaging plate from the patient's mouth, See "Performing the X-rays" on page 44
- Disinfecting the Hygienic Sheath, See "Disinfecting the Hygienic Sheath and the Imaging Plates" on page 67
- Reviewing the scanned image on the image Acquisition interface, See "Processing the Images." on page 47
- Storing the image in the Dental Imaging Software, See "Re-tagging Imaging Plates" on page 48

Acquiring Single Image Using Scan & Go

Note: Keep the image Acquisition interface open throughout your exam acquisition session: close it only after you have completed scanning and optimizing all images.

Starting the Imaging Software

Start your Imaging Software. See "Starting the Imaging Software" on page 34.

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Preparing the Imaging Plates

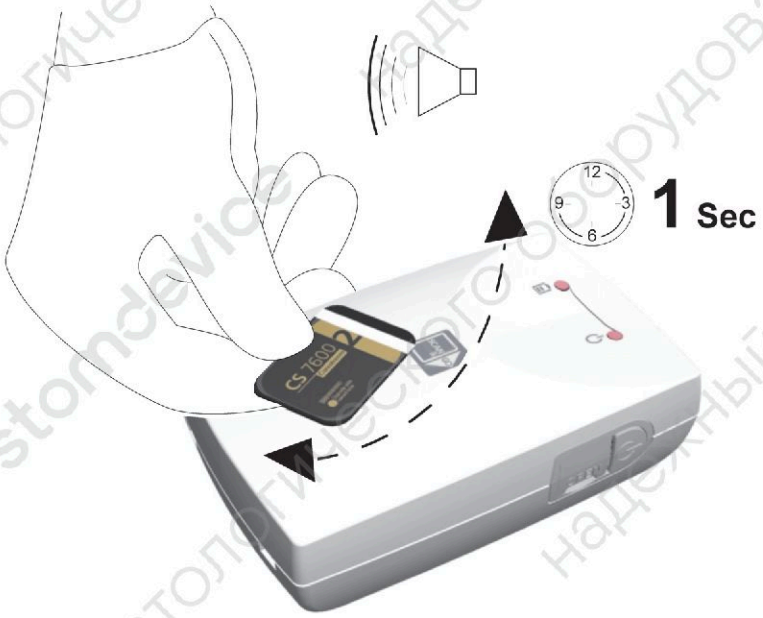
Prepare the intraoral imaging plate. See "Preparing the Imaging Plates" on page 35

Tagging the Imaging Plate with the Scan & Go

To tag the imaging plate using a Scan & Go device follow these steps:

1 Place the imaging plate near, or close to, the Scan & Go device to record the exam acquisition data. The image Acquisition interface marks the corresponding frame as recorded (frame color changes to indicate recorded status).

- For Scan & Go devices before June 2012, an audible beep and two successive blinks of the blue LED indicate the exam acquisition information was recorded.
- For Scan & Go devices after June 2012, two audible beeps and two successive blinks of the green LED indicate the exam acquisition information was recorded.



2 Perform steps 1 for each imaging plate.

Tip: To display the imaging plate's tagged information at any time, place the imaging plate on top of the Scan & Go device and check the Imaging plate Scan & Go information in the **Settings**-Imaging plate information tab.

To record exam acquisition data on an imaging plate that was already recorded, See "Acquiring Multiple Images (FMS) Using Scan & Go" on page 46

Performing the X-rays

Perform the required X-rays according to your clinical procedure. See "Performing the X-rays" on page 36

Scanning the Imaging Plates

To scan the imaging plates:

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1 Perform steps 1 -3 of the “Scanning the Imaging Plates” on page 37



Note: After the imaging plate has been scanned, the image is sent straight to the previously assigned workstation.

2 Perform stepa 6 - 7 of the “Scanning the Imaging Plates” on page 37

Acquisition Related Procedures

See “Processing the Images.” on page 47

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Acquiring Multiple Images (FMS) Using Scan & Go

Starting the Imaging Software

Start your Imaging Software. See "Starting the Imaging Software" on page 34.

Opening the Image Acquisition Interface

1 Click the Imaging window icon. (Alternatively, double-click the selected patient name.)
The patient's imaging window opens.

2 To access the Image Acquisition Interface, select one of the following two modes:

CS 7600 FMS mode (Template mode), examples of the icons 

3 To change the scanning resolution for this exam acquisition (for non Scan & Go configurations), go to the scanner resolution setting (see page 55).

- Verify that the Scan & Go device is connected (see "Scan & Go Status" on page 16).

Preparing the Imaging Plates

Prepare the intraoral imaging plate. See "Preparing the Imaging Plates" on page 35

Tagging the Imaging Plate with the Scan & Go

"Tagging the Imaging Plate with the Scan & Go" on page 44

Performing the X-rays

Perform the required X-rays according to your clinical procedure.

Scanning the Imaging Plates

After the imaging plate has been scanned, it is sent to the previously assigned workstation to the proper frame it was tagged to in the FMS.

See "Scanning the Imaging Plates" on page 37

Acquisition Related Procedures

See "Processing the Images." on page 47

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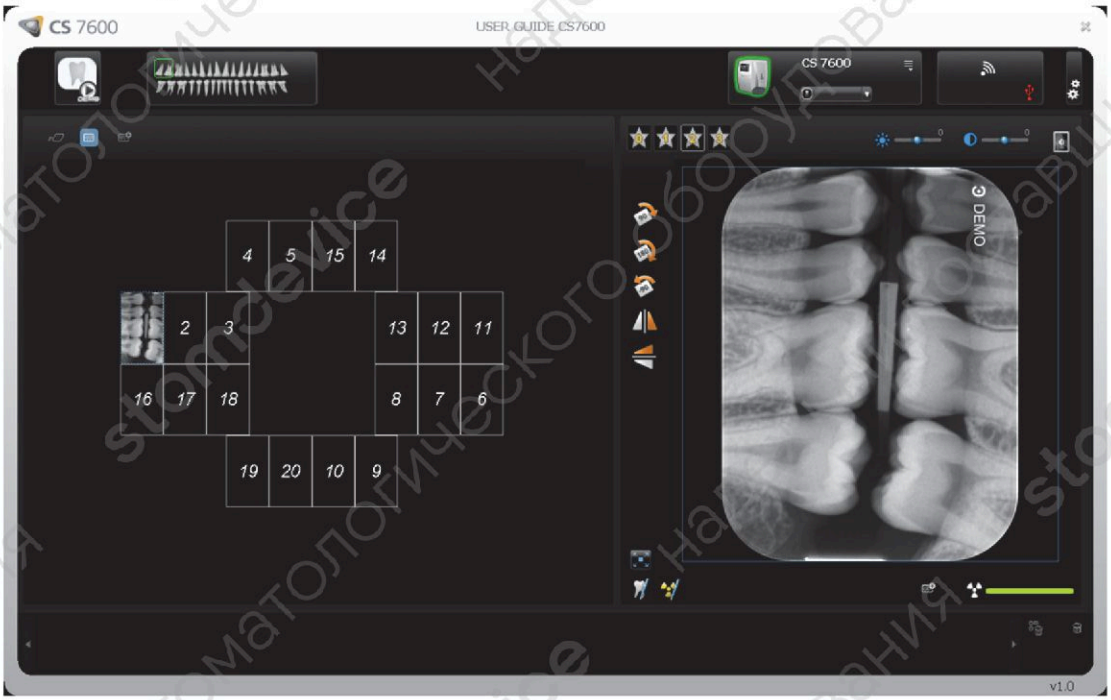
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8 Acquisition Related Procedures

Processing the Images.

Important: The imaging plate has a marker attached to its inactive side. It will indicate if the imaging plate has been exposed from the wrong side contrary to its intended use. If the shadow of the marker is visible in the X-ray image, the imaging plate was exposed from the inactive side contrary to its intended use. The image orientation can be corrected using the mirroring tool in the acquisition software. If a diagnosis is not possible in the area of the marker, the X-ray should be repeated.

Figure 2 Image Acquisition Interface



To process the scanned images, from your workstation follow these steps:

1 The scanned image populates the first available frame. If there is no such frame (all frames are occupied, applicable only when working with FMS mode), the image is routed to the Images Gallery. In image acquisition mode, a new frame is added to the images layout.

For manual reordering of the frames, drag and drop the image to the desired frame. If the frame is populated with an image, the former image in the frame will be moved automatically to the Images Gallery when the new image is dropped within it.

Note: When exiting the image Acquisition interface, images stored in the Images Gallery are sent to the Imaging Software database.

2 Use the image Acquisition interface processing options to optimize the image. See "CS 7600 Image Acquisition Interface Overview" on page 27.

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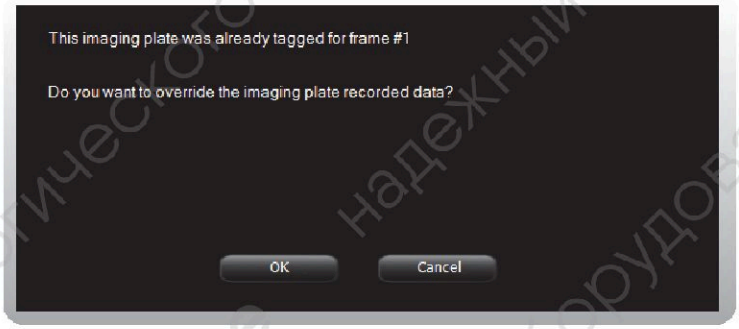
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3 Click ✖ **Close** (top-right corner) to exit the image Acquisition interface and return to the Imaging Software. Images are transferred from the CS 7600 image Acquisition interface to the Imaging Software automatically.

Re-tagging Imaging Plates

To tag an imaging plate that was already recorded with exam acquisition information (re-tagging), follow these steps:

1 Place the imaging plate upon the Scan & Go device. The following prompt is displayed.



2 Click **OK** to re-tag this imaging plate.
The imaging plate is tagged with the current exam acquisition and the current active frame information. If you do not want to re-tag the imaging plate, either remove the imaging plate from the Scan & Go surface or click **Cancel** in the overwrite prompt. The current tagged data as displayed in this prompt remains unchanged.

3 Wait until the exam acquisition information tagging is completed as indicated by an audible beep, successive short flashes of the blue LED and a change of color in the frame border and number.

Storing the Images

Image management (storage and retrieval) is performed through the Imaging Software. See your Dental Imaging Software documentation.

Clearing Scanner Memory

When the CS 7600 image Acquisition interface is open at the designated workstation, the scanned imaging plate image is automatically routed to the correct exam acquisition.

If the CS 7600 image Acquisition interface is closed, the scanned imaging plate image is stored in the scanner's memory. The scanner's storage capacity is 25 images.

To clear the scanner's memory, See "Clearing Scanner Memory" on page 62.

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Erasing the Imaging Plates

The imaging plates are automatically erased and ejected after their information is scanned. Exposure to light and so forth, requires erasing manually the imaging plates before use. To erase the imaging plate manually, See "Erasing the Imaging Plates" on page 26.



Note: Erasing the imaging plate manually does not erase the recorded exam acquisition information.

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9 Scanner Settings

General

The following scanner settings are explained in this chapter:

- Brightness Control, See "Brightness Control" on page 50.
- IP Setup, See "IP Setup" on page 50.
- Rollers Cleaning, See "Cleaning the Scanner Rollers" on page 71.
- About Information, See "Scanner Info" on page 25.
- Viewer, See "Viewer" on page 52.
- Pairing, creates a direct PC to scanner link for chair-side use, See "Creating a Peer to Peer Connection" on page 60. and See "Disconnecting a Peer to Peer Connection" on page 61.
- Clearing Scanner Memory, See "Clearing Scanner Memory" on page 62.

Scanner Settings

To open the scanner settings, press  **Settings**.
The Scanner Settings menu opens.



In Scanner Settings menu you are presented with the following menu:

- **Brightness Control**, See "Brightness Control" on page 50.
- **IP Setup**, See "Clearing Scanner Memory" on page 62.
- **Rollers Cleaning**, See "Cleaning the Scanner Rollers" on page 71.
- **About Information**, See "Scanner Info" on page 25.
- **Viewer**, See "Viewer" on page 52.
- **Pairing**, allows you to create a Peer to Peer (P2P) link between a scanner and computer. See "Creating a Peer to Peer Connection" on page 60. and See "Disconnecting a Peer to Peer Connection" on page 61.

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Brightness Control

1 In the Settings menu, press  to select **Brightness Control**, and press 
The Brightness Control screen opens.



2 Press  and  to lower or raise the brightness, and press 
The Brightness is set and you are returned to the scanner insert plate screen.

IP Setup



Important: Do not perform any action in the IP Setup without direct supervision from dental service engineer or Carestream representative

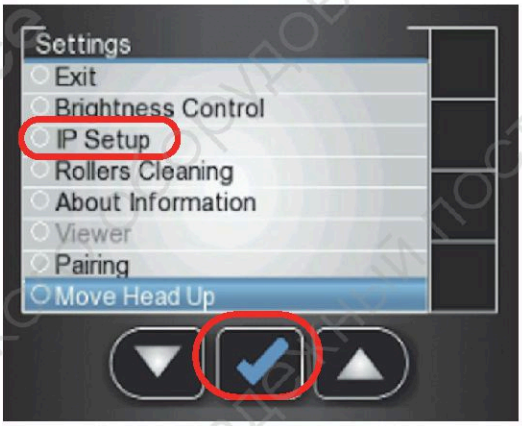
To manually set the scanner's IP address, follow these steps:



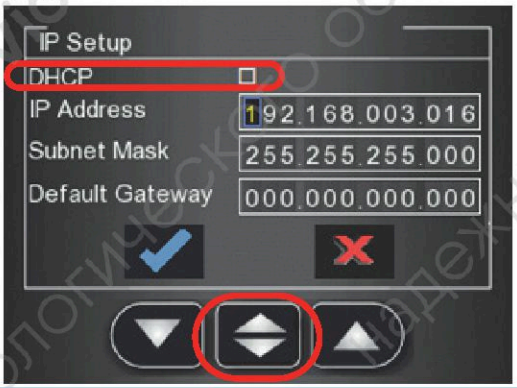
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1 Press  to access the **Settings** menu.
The **Settings** screen is displayed.



2 Press  the scanner's left function button to scroll down to **IP Setup** and press 
The **IP Setup** screen is displayed.



Note: The **DHCP** automatically detects the scanner IP address. If you are using a Peer to Peer link, you must leave the **DHCP** checkbox **unchecked.**

3 Press  and  to find the **DHCP** checkbox, and press  to check / un check the **DHCP** checkbox.

4 Press  and  to reach the digit you wish to change, and press .
The digit is ready to be modified and is highlighted in blue.

5 Press  and  to increase / decrease the value of the selected digit, and press .
The digit is modified.

6 Navigate to the next digit you need to change and change it according to the above instructions.

7 To apply all changes and exit the **IP setup** screen, press  to reach  (highlighted in blue) and press .

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8 To exit the **IP Setup** screen without saving changes, press to reach . (highlighted in blue) and press .
The IP Setup screen closes and you are returned to the scanner insert plate screen.

Viewer

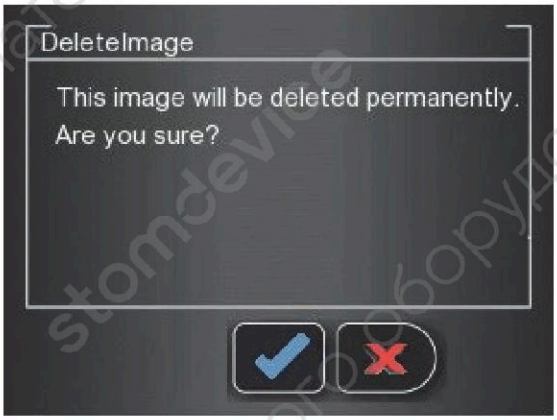
The Viewer allows you to browse and delete images archived on the scanner's memory.

1 In the Settings menu, press to select **Viewer**, and press
The **Viewer** screen opens.



2 In the Viewer menu, press .

3 If you reach an image that you wish to delete, press the delete icon
A Delete Image confirmation window appears.



- To delete, press .
- To cancel the deletion, press .

4 To close the Viewer, press .

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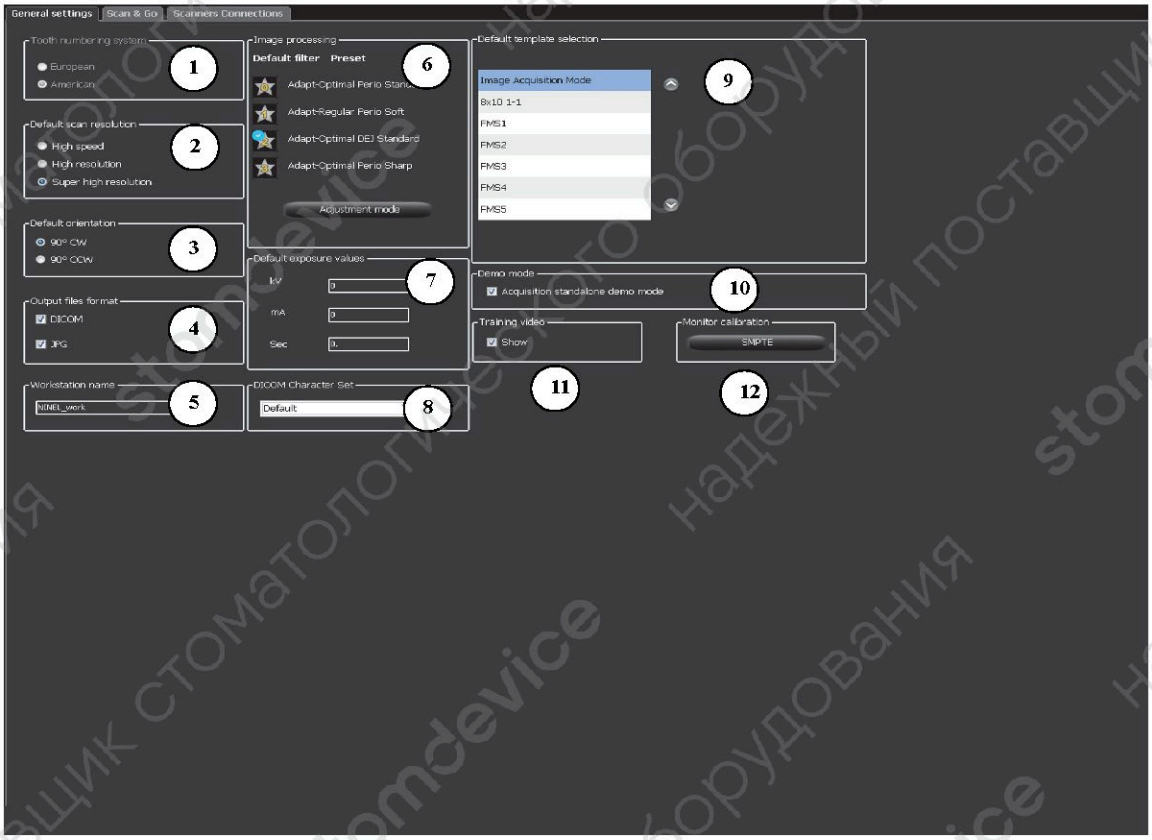
Working with Settings

To open the settings window, click  **Settings.**
You are presented with three tabs:

- **General Settings**, See page 55
- **Scan & Go**, See page 57
- **Scanners Connections**, See page 58

General Settings Tab

In the **General Settings** tab you are able to set the defaults for image Acquisition.



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Table 1 Image Acquisition Interface General Settings Key

1	**Tooth Numbering System**	Set the tooth numbering system (European or American). When using individual tooth selection, the tooth number is stored in the image's DICOM tags.
2	**Default Scan Resolution**	Set the default scan resolution for images to be scanned. **Note:** This does not change the scanner's default resolution, which is for images scanned when the image Acquisition interface is not connected to the scanner (No ID images). The scanners default resolution is High Speed. **Note**: Any changes made in the image Acquisition interface, when the scanner is linked Peer to Peer to the image Acquisition interface, automatically changes the scan resolution in the scanner.
3	**Default Orientation**	Set the default to turn the image 90° clockwise (CW) or 90° counter clockwise (CCW) to ensure correct orientation.
4	**Output Files Format**	The scanned image save file format. Scanned images are always saved as DICOM files and there is an option to save the scanned image also in JPEG format.
5	**Workstation Name**	If needed, change the workstation name by entering the new name.
6	**Image Processing**	**Default filter and Preset:** Set the default filter to be applied to the acquired image. (The installation default is **Endo**). The image processing is managed by the CS adapt (see 8J6395 CS 7600 Installation Guide). • **Perio** (Periodontal) filter: Designed to assist in detecting disease or inflammation in the interface between the gum (gingival part) and the bone. • **Endo** (Endodontic) filter: Provides overall good contrast and look of the image, with a high quality view of the root canals. It reveals any diseases or injuries that affect the root tips or nerves in the teeth. • **DEJ** (dentine to enamel junction) filter: Designed to improve the contrast resolution between the dentine and the enamel. It enables the dentist to detect small carries and evaluate the inspected region. **Preset** enables setting a default image processing filter presets that are applied after the image is acquired. • **Sharp**: Sharpening filter for the sharpest look, contrast transition emphasis. • **Soft**: Soft look, smooth transition from high to low density. • **Standard**: Intermediate processing, between sharp to soft. **Adjustment mode**: Imaging processing adjustment mode enables setting the optimal filter and preset combinations for each filter type. **Note**: If you acquire images in Adjustment mode, they are saved under the patient in the imaging software database.
7	**Default Exposure Values**	Enter the default X-ray exposure values to added to all scanned images attributes (DICOM tags).
8	**DICOM Character Set**	**Note**: Only your IT Administrator should change these settings. Select the correct DICOM character set encoding for the country and area to ensure the information is rendered correctly on DICOM viewers.
9	**Default Template Selection**	Set the template used when opening a new exam acquisition, or to change the current template (applicable to a newly opened acquisition session ONLY, before images have been retrieved from the scanner.)

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Table 1 Image Acquisition Interface General Settings Key

10	**Demo Mode**	This option puts the **Demo Mode** icon in the top left corner of the Image Acquisition Window and populates one frame in the images display area with a demo image each time the icon is selected. **Tip**: Use for setting default presets in Adjustment mode.
11	**Training Video**	Select the check box to show the training video.
12	**Monitor Calibration**	Displays an SMPTE screen for monitor calibration.

Working with the General Settings Tab

To work with the General Settings tab:

1 Click **Settings** to open the General Settings tab.

2 In the **Tooth Numbering System** area, select the **European** or **American** checkbox.

3 In the **Default Scan Resolution** area, select the default resolution for scanning.

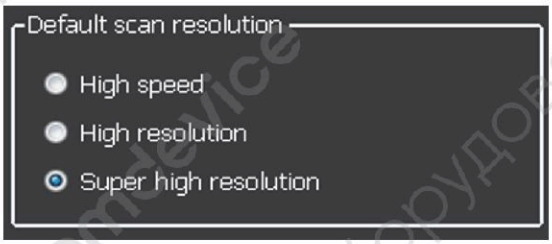
4 In the **Default Orientation** area, select the direction that the image is to be turned, clockwise or counter clockwise.

5 In the **Output Files Format** area, select the **JPG** checkbox is you wish the images to be saved in JPEG format as well as the default DICOM format.

> **Note:** In the **Output Files Format** area, the **DICOM** selection box cannot be de-selected.

6 To select a default scan resolution and CS-Adapt filters.

a In the **Default scan resolution** area, select High Speed, High Resolution or Super High Resolution for the scan resolution.



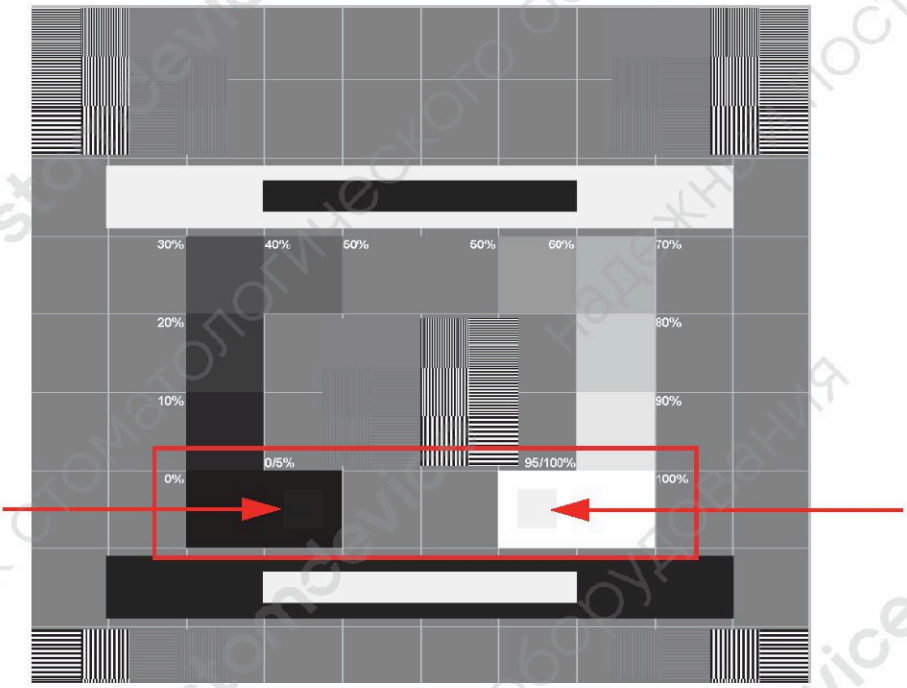
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b Click **Adjustment Mode** to change the default filter in CS-Adapt.



7 To display the SMPTE screen, in the Monitor calibration area click **SMPTE**.
The SMPTE window appears.



8 Use the monitor brightness & contrast controls until you clearly see the 5% and 95% calibration squares located in the in the 0% and 100% areas (indicated by red arrows in the picture above).

9 In the Settings tab, when you have finished selecting your general settings, click one of the following:

- Click **Apply** to apply your settings.
- Click **Cancel** to exit to the main screen without saving changes.
- Click **OK** to save the changes and exit to the main screen.

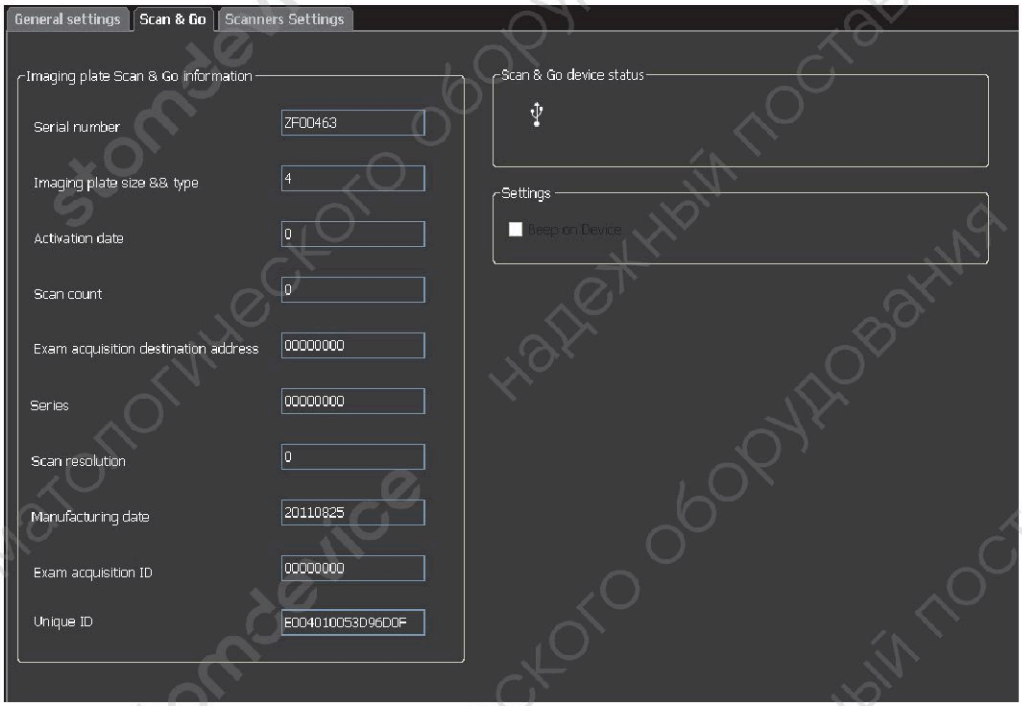
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Scan & Go Tab

The Imaging plate Scan & Go information fields are populated with the imaging plate's identifying information when it is placed upon the Scan & Go device.

Figure 1 Scan & Go Tab



The Scan & Go tab contains the following information:

- **Serial Number**
- **Imaging Plate Size & Type**
- **Activation Date**, the date of the first time the plate was used
- **Scan count**, the number of times the plate has been scanned
- **Exam Acquisition destination address**
- **Series**, frame identification number
- **Scan resolution**
- **Manufacturing date**, the date the plate was manufactured
- **Exam Acquisition ID**
- **Unique ID**
- **Scan & Go device status**, shows if the Scan & Go is connected  (white icon) or not connected  (red icon)

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- **Beep on Device** checkbox (for Scan & Go Generation 2), when the **Beep on Device** checkbox is selected, the Scan & Go makes a sound each time an imaging plate is tagged. If the Beep in PC checkbox is selected, a sound is made on the PC each time an imaging plate is tagged.



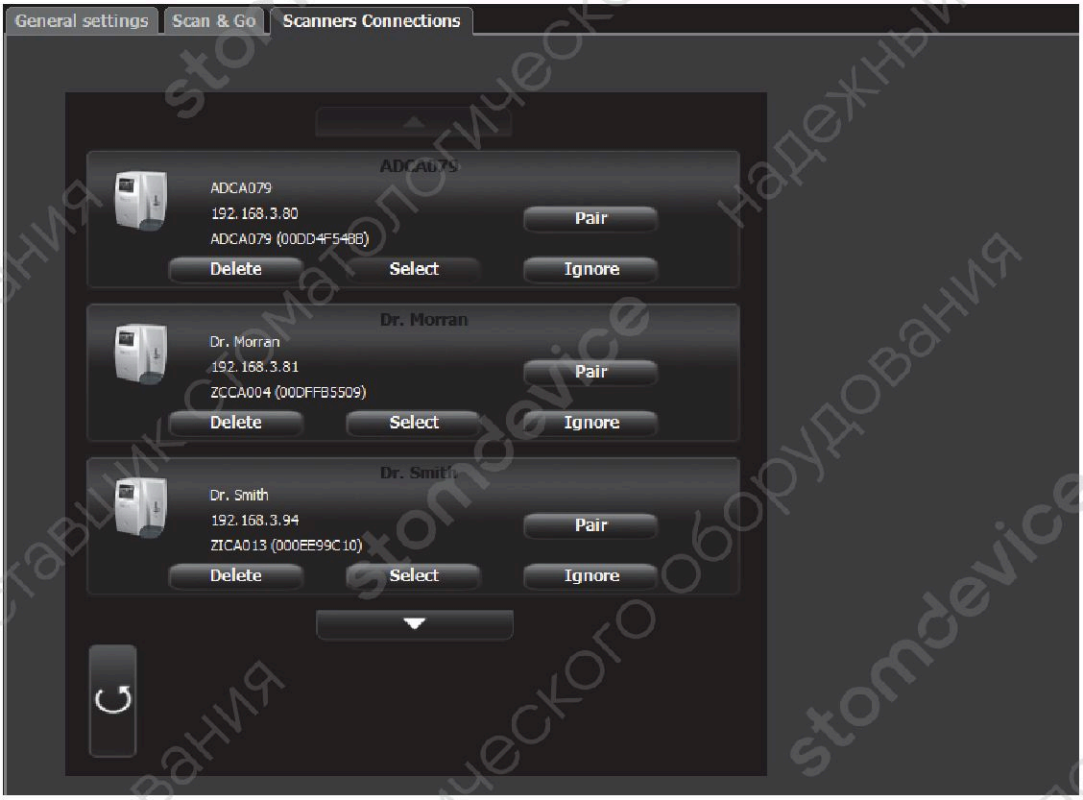
Note: The Imaging plate Scan & Go information in the **Scan & Go** tab is read only.

Scanners Connections Tab

In the **Scanners Connections** tab, you are able to perform the following:

- **Delete** a scanner connection that is no longer being used (after a scanner has been replaced)
- **Pair / Unpair** a Peer to Peer link between a Scanner and the Workstation
- **Connect / Ignore** a scanner from the active Scanner List
- Rearrange the Scanner List, by clicking the **Select** button which moves the scanner to the top of the Scanner List

Figure 2 Scanners Connections Tab



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Working with the Scanners Connections Tab

1 To remove a scanner from the **Scanner List**, click **Ignore**.

2 To add a scanner to the **Scanner List**, click the **Connect** button for that scanner.

> **Note:** If there are scanners on the network which you don't wish to use, click **Ignore.**

3 To completely remove a scanner that is no longer being used from the **Scanners Connections** and the image Acquisition interface, click **Delete**.

> **Note:** Scanners connected to the system will still be detected and added to the list of scanners in the **Scanners Connections** list after restarting the image Acquisition interface.

4 In the image Acquisition interface, click one of the following:

- Click **Apply** to apply your settings.
- Click **Cancel** to exit to the main screen without saving changes.

5 Click **OK** to save the changes and exit to the main screen.

About Peer to Peer Connection

A Peer to Peer connection (P2P) creates a dedicated link between one, or more, scanners to a dedicated workstation. When a plate is scanned with a Peer to Peer connection, there is no need to select a Workstation/Room or press the middle scanner button. The scanner automatically scans the plate as soon as it is fed into the scanner and sends the image to the Paired workstation.

> **Tip:** If your workstation is the only one using a particular scanner you can save time, not having to select a scanner each time you make a scan, by making a Peer to Peer link from the scanner to the computer.

There are four possible statuses for the Peer to Peer:

- **Available for Peer to Peer connection**- The scanner is available for a direct Peer to Peer connection. This status may be identified when 

the **Pair** button is available.
- **Paired** - The scanner is connected Peer to Peer to this Workstation. This status may be identified when the 

Paired message is shown and the 

Unpair button is available.
- **Paired to Doctor x** - The scanner is already connected Peer to Peer to another Workstation
- **Unavailable for Peer to Peer**- This status is when a scanner in the Scanners list is not connected to your workstation or any other workstation and is not available for connecting to your workstation, this may be identified by the absence of 

the **Pair** button, 

Paired, and **Paired to** messages.

> **Note:** The tagged Imaging plate is sent to the proper room, defined by Scan & Go, even when in Peer to Peer mode.

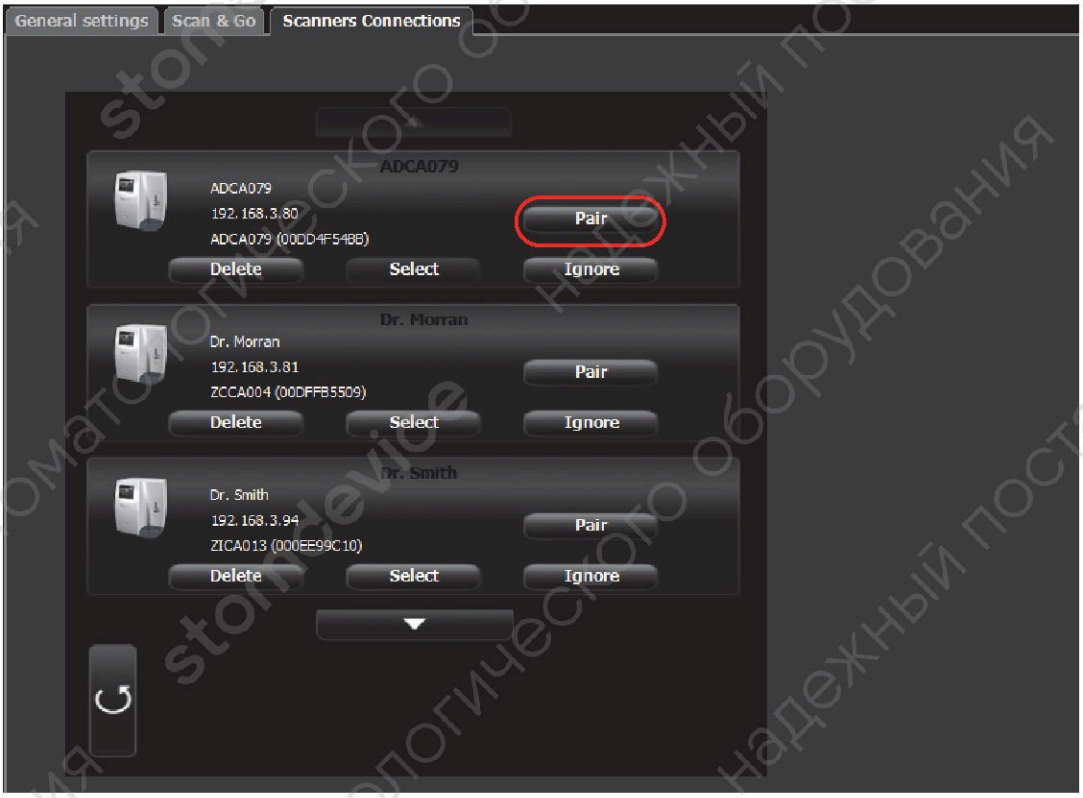
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A Peer to Peer connection makes a scanner dedicated to a Workstation. This saves time by not having to select a scanner each time you make a scan.

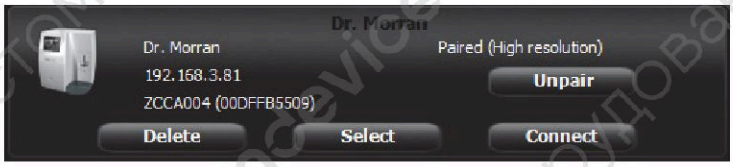
Creating a Peer to Peer Connection

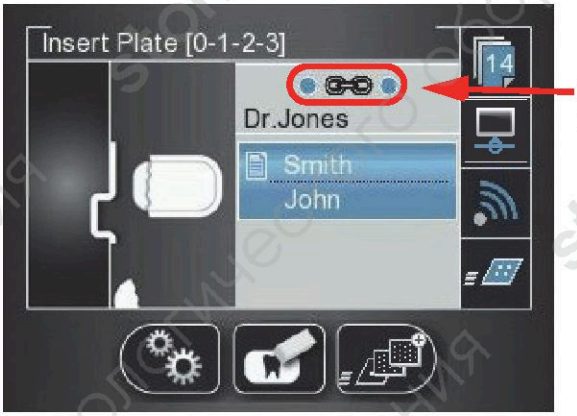
To create a Peer to Peer connection, follow these steps:

1 In the **Scanners Connections** tab, click the **Pair** button on the scanner you wish to pair with the image Acquisition interface.



The status (located above the **Pair/Unpair** button) changes from **Connected** to **Paired** and the **Pair** button changes to **Unpair**.





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The Peer to Peer icon appears in the scanner.

Note: If you change the resolution on the Scanner LCD, the change in resolution will only take place upon next scan or image acquisition.

Disconnecting a Peer to Peer Connection

Disconnecting a Peer to Peer Connection may be done from the image Acquisition interface or from the Scanner interface.

To Unpair the Scanner, follow these steps:

1 In the Scanner interface, press **Settings**.
The **Scanner Settings** menu opens.



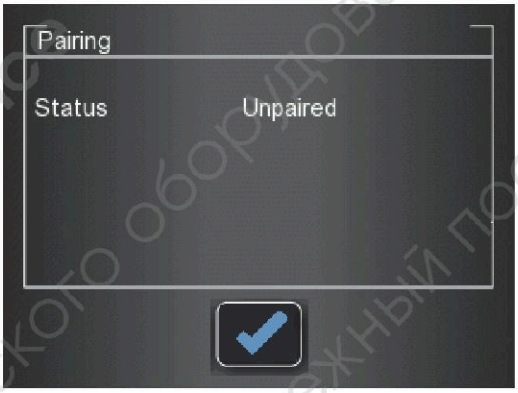
2 Press to select **Pairing**, and press
The **Pairing** status screen opens and shows a **Paired** status.



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3 Press  and press 
The **Pairing** status screen shows an **Unpaired** status.

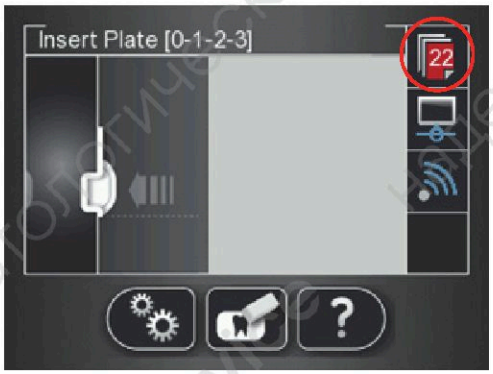


Clearing Scanner Memory

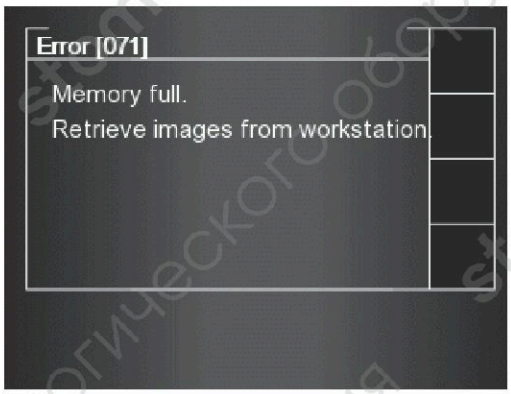
The scanner's storage capacity is 25 images. Images are stored in the scanner's memory in the following cases:

- When No ID is selected in the scanner's Select patient screen. (
- When the destination workstation is not available due to network problems and so forth.

When the scanner's memory nears its limit, the scan number icon changes to red.



When memory is full, error 071: **Memory full. Retrieve images from workstation** is displayed.



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To clear the scanner's memory, follow these steps:

1 Start the CS 7600 image Acquisition interface.

2 Open the exam acquisition to which the images belong, or alternatively create a new temporary exam acquisition in which you will save these images.

3 Select the scanner; it is indicated by the following full memory/error state icon:



4 In the **Scanner List**, select the desired scanner and click  the small arrow.
The list of No ID images for this scanner is displayed.

5 In the scanner memory panel select the image you wish to clear, and drag to the desired frame in the images area template or delete by dropping to the Images Gallery.

6 To delete all the images in the Images Gallery, click 



7 To confirm, click **YES**.
All the images are removed from the Images Gallery.
The scanner icon becomes highlighted green  indicating that the scanner is ready for use.

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10 Maintenance

Imaging Plate Care

If used with care, Carestream Health imaging plates can be used imaging plates can be used indefinitely until physically damaged. However, the imaging plates will show wear over time due to continuous use. Inspect the imaging plates regularly and replace them if they are scratched and/or show signs of excessive wear.



CAUTION: To prevent damage to the imaging plates and the possibility of image artifacts, avoid contact between the imaging plates and the following materials/solutions/solvents: Isopropyl alcohol, hydrogen peroxide and other peroxides, citrus-based cleaners, hand lotions and water-less hand sanitizers, as well as surfactants and lubricants.

Handling and Storage of Imaging Plates

- Imaging plates should be stored in their original packing or storage box when they are not in use. Always store imaging plates in a dark and dry place.
- Do not expose the imaging plates to light for long periods as this can have a degrading effect.
- Do not store imaging plates in hot or moist conditions.
- Do not fold, crease, or bend the imaging plates.
- Avoid touching the active side of the imaging plates, and be careful not to drag the active side of the imaging plate across any surface as this will damage the imaging plate.
- Do not leave imaging plates where they can become damaged by liquid or chemical spills.
- Do not autoclave.

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Cleaning the Imaging Plate



CAUTION: Read and follow the instructions in the Safety Data Sheets (SDS) for Carestream Screen Cleaner P/N 1030428.

Clean the imaging plate to remove dirt, dust particles, finger prints and so forth that could affect image quality.

Cleaning Materials

- Clean, dry non-abrasive, lint-free wipes or cloths
- Carestream Screen Cleaner P/N 1030428 (Ask your Carestream Health representative)

Cleaning Method

To clean the imaging plates, follow these steps:

1 Fold a non-abrasive, lint-free wipe or cloth and dampen with a small amount of the solution. Be careful not to pour the solution directly on the imaging plate. Excessive amounts of the screen cleaner may damage the imaging plate.

2 Wipe the imaging plate thoroughly dry with a clean, dry, non-abrasive, lint-free cloth to remove residual cleaner. DO NOT LEAVE THE imaging plate TO AIR-DRY. Apply pressure to remove persistent dirt, if necessary.

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Disinfecting the Hygienic Sheath and the Imaging Plates



CAUTION: Do not soak the hygienic sheath in any cleaning or disinfecting solutions. Do not autoclave; autoclaved hygienic sheaths must be discarded.

Frequency of Disinfection

The hygienic sheath is the primary means of infection control and protection from contaminated imaging plates.

Disinfect the imaging plate **after every use** (after the image plate is scanned), before it is inserted in the hygenic sheath for the next use.

Disinfection Solutions

To disinfect, use either a self-prepared solution, or a commercially prepared product that adheres to the following specifications and restrictions:

- Diluted bleach solution: dilute one part 5.25% sodium hypochlorite with ten parts of water.
- A commercially prepared equivalent solution of diluted bleach that does not contain any ingredients (Isopropyl alcohol, hydrogen peroxide and other peroxides, citrus-based cleaners, hand lotions and water-less hand sanitizers, as well as surfactants and lubricants) that can cause damage to the hygienic sheaths and imaging plates.

Disinfection Method



CAUTION: If a commercially prepared equivalent solution of diluted bleach is used, follow the manufacturer's specifications and warnings.

To disinfect the hygienic sheaths and imaging plates, follow these steps:

1 Moisten thoroughly (but not dripping) a non-abrasive, lint-free cloth with the prepared diluted bleach and wipe the hygienic sheath clean.

2 After one minute wipe off the bleach residue with a new, soft, lint-free cloth dampened with water.

3 Wipe dry with a non-abrasive, lint-free cloth.

Disposing of the Imaging Plate



Important: The imaging plate contains Barium and should be considered hazardous or special waste in specific conditions at the end of its useful service life. For disposal or recycling information, contact your local authorities.

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Scanner Care

Cleaning the Scanner Body

Use disinfection wipes for medical equipment to clean the scanner body thoroughly from all sides, including the tray.

WARNING: It is the user's responsibility to disinfect the imaging plates tray daily to prevent cross contamination.

Cleaning the Detachable Insertion Panels

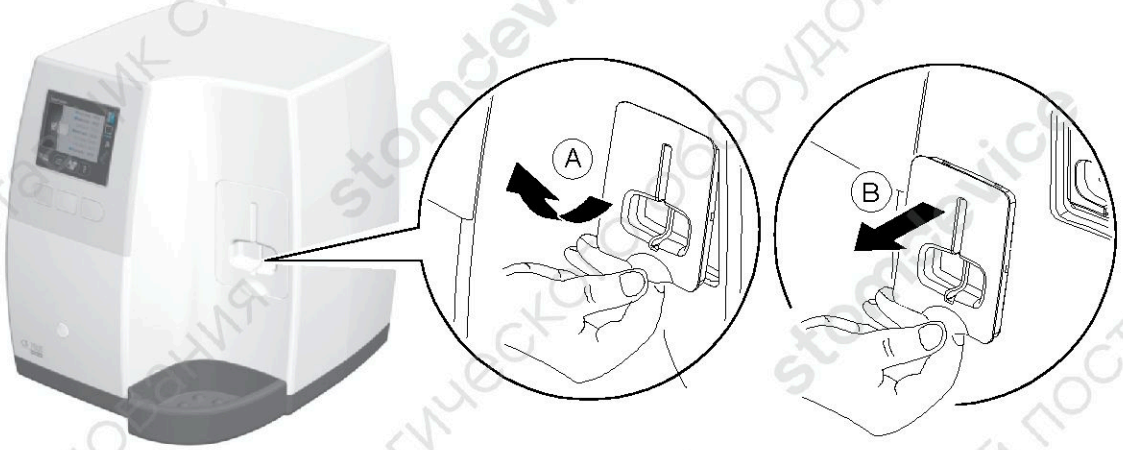
The CS 7600 makes use of three insertion panel sizes according to the inserted plates size (0, 0–3, and 4). The maintenance procedure is identical for both insertion panels.

WARNING: It is the user's responsibility to disinfect the detachable insertion panel(s) daily to prevent cross contamination.

CAUTION: Do not autoclave; autoclaved detachable insertion panel(s) must be discarded.

To clean and disinfect the insertion panels, follow these steps:

1 Remove the installed insertion panel by inserting a finger in the designated removal depression at the bottom of the insertion panel (A) and lifting out the insertion panel (B).

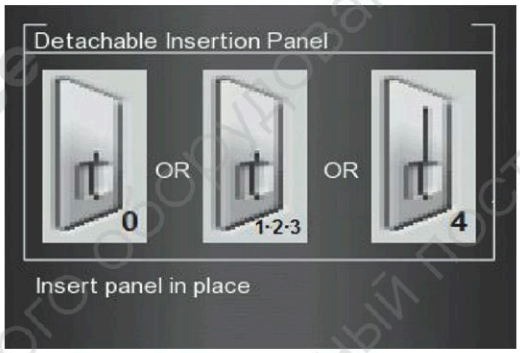


2 Use disinfection wipes for medical equipment to clean the detachable insertion panels thoroughly from all sides including the slot.

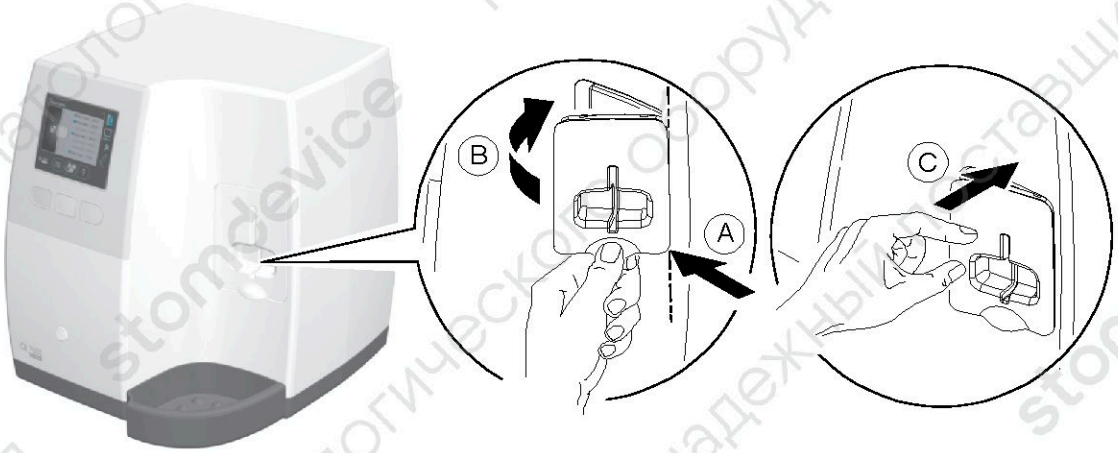
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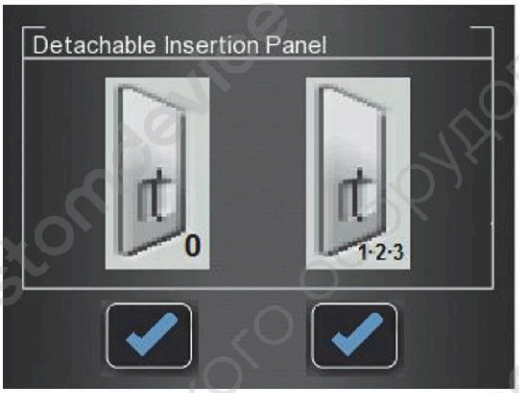
3 The scanner displays a prompt to put in place an insertion panel, either a size 0 (left figure in prompt), size 0-3 (middle figure in prompt) or a size 4 (right figure in prompt) insertion panel.



4 Install the cleaned and disinfected insertion panel by positioning the insertion panel at a 45 degree angle to the right side of the insertion panel's housing (A) and pressing the insertion slot panel in from right to left (B) until it's completely inserted (C).



The scanner displays an insertion confirmation.



5 For size 0, press  the left function button to confirm and return to the main screen.

6 For size 1-3, press  the right function button to confirm and return to the main screen.

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If insertion Panel 4 is inserted, the scanner displays the following insertion confirmation.



7 For size 4, press  the middle function button to confirm and return to the main screen.

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Cleaning the Scanner Rollers

Note: Before you perform this procedure, make sure you have the rollers cleaning plate.

The scanner rollers should be cleaned in the following cases:

- When the scanner prompts to clean the rollers (after every 1000 cycles).
- When there are dirt-related artifacts on the scanned image.

To clean the scanner rollers, follow these steps:

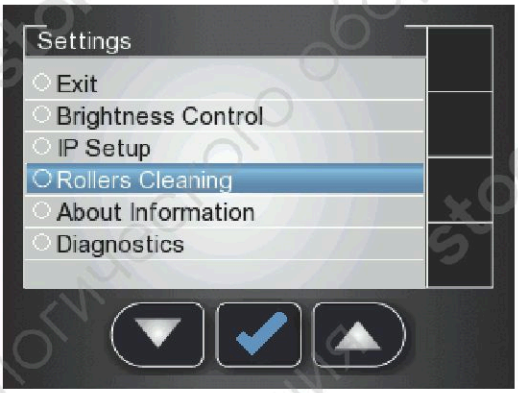
Note: Cleaning the rollers requires using the size 4 insertion slot

1 If the size 4 insertion slot is not installed, replace the insertion slot with the size 4 insertion slot. (See page 68.)

2 Press the scanner's left function button to access the Settings menu.



3 Select **Rollers Cleaning**.



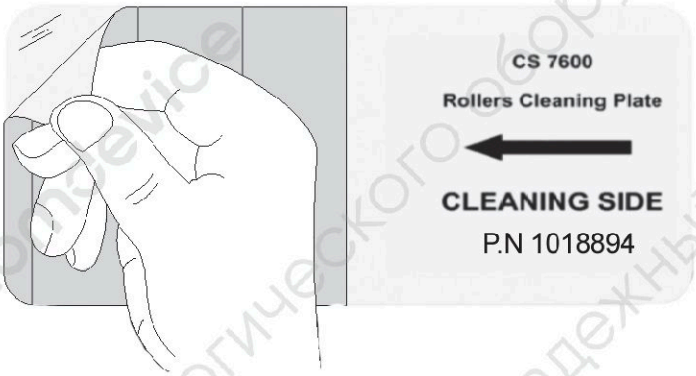
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4 Press  the middle function button to confirm the Rollers Cleaning message.
The Rollers Cleaning screen appears.



5 Peel the adhesive protective sheet from the rollers cleaning plate.



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6 Insert gently the rollers cleaning plate into the size 4 insertion slot with the adhesive side first and the black stripe facing downwards until the rollers draw the rollers cleaning plate in.



When the cleaning procedure is completed the scanner displays a message that the roller cleaning is done.



7 Remove the roller cleaning plate from the insertion slot.

Tip: The cleaning procedure is to be repeated 3 times to ensure the rollers are thoroughly cleaned.

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Scan & Go Device Care

Cleaning the Scan & Go

Use disinfection wipes for medical equipment to clean the Scan & Go device thoroughly from all sides.

Replacing the Battery (Scan & Go Generation 1)

For Scan & Go Generation 1 models released before June 2012.

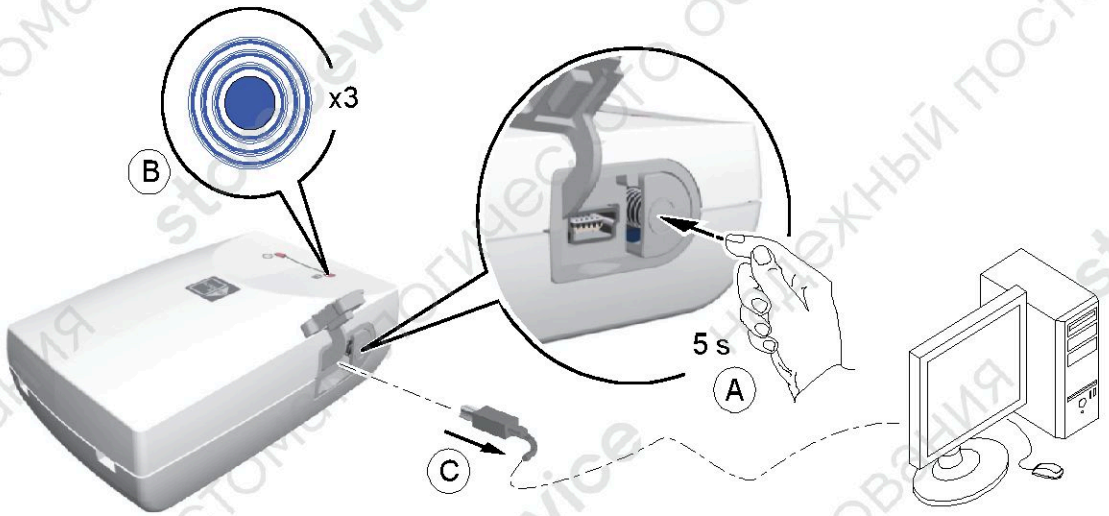
Scan & Go devices after June 2012 do not have a battery.

Important: Replace only with a Carestream genuine BL-5C battery.

To replace the Scan & Go battery, follow these steps:

1 Press the On/Off button for 5 seconds to turn off the Scan & Go device (**A**).

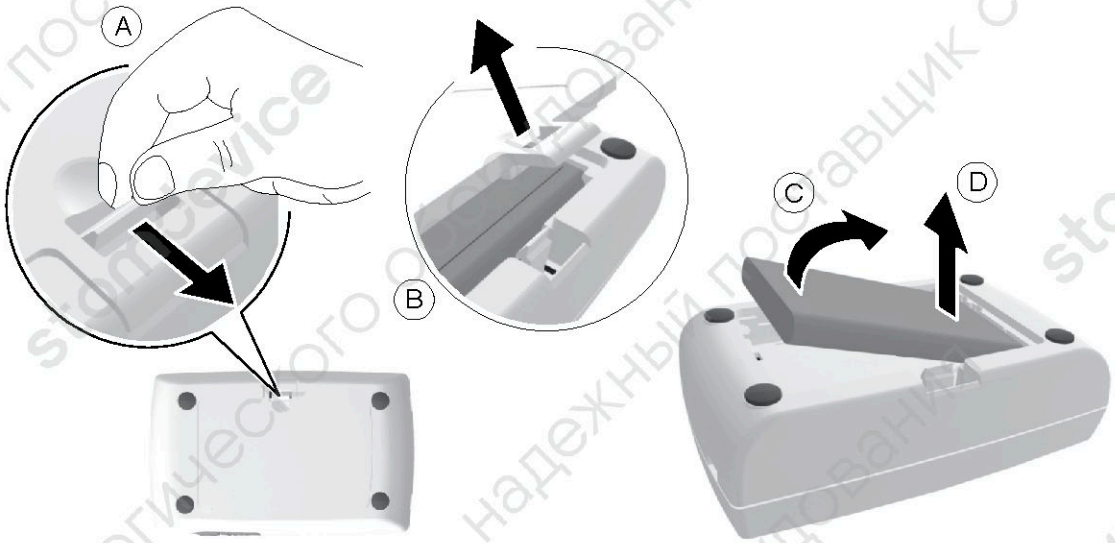
(The blue LED will flash quickly 3 times (**B**) and then the device is powered off.) Disconnect the Scan & Go device's USB cable (**C**).



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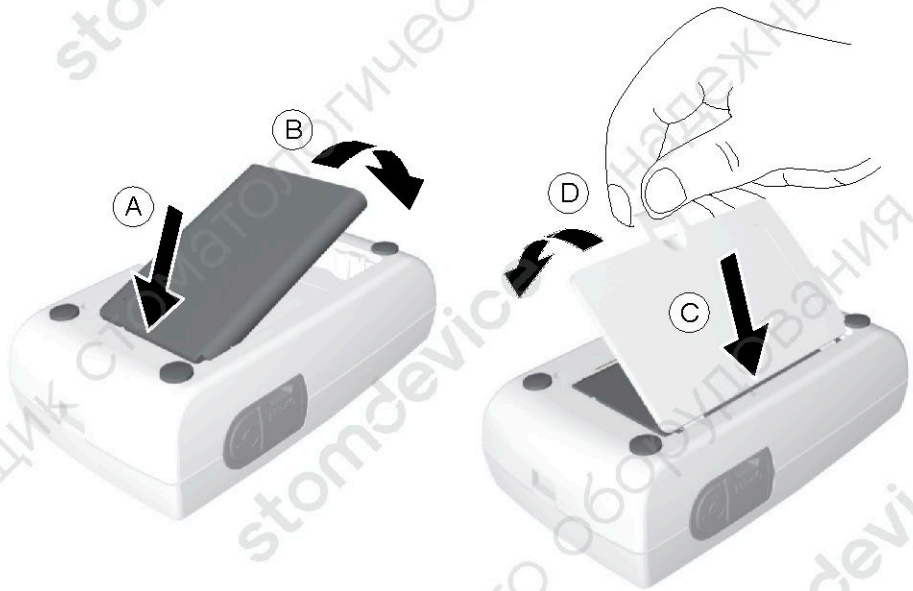
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2 Open the battery compartment by carefully pressing the clip outwards and lifting out the cover (**A**, **B**).



3 Extract the battery as shown in the figure above (**C, D**) using the removal depression to lift the battery out.

4 Insert the new battery by first pressing its contacts against the battery housing terminals (A) and then place it in the housing (**B**).



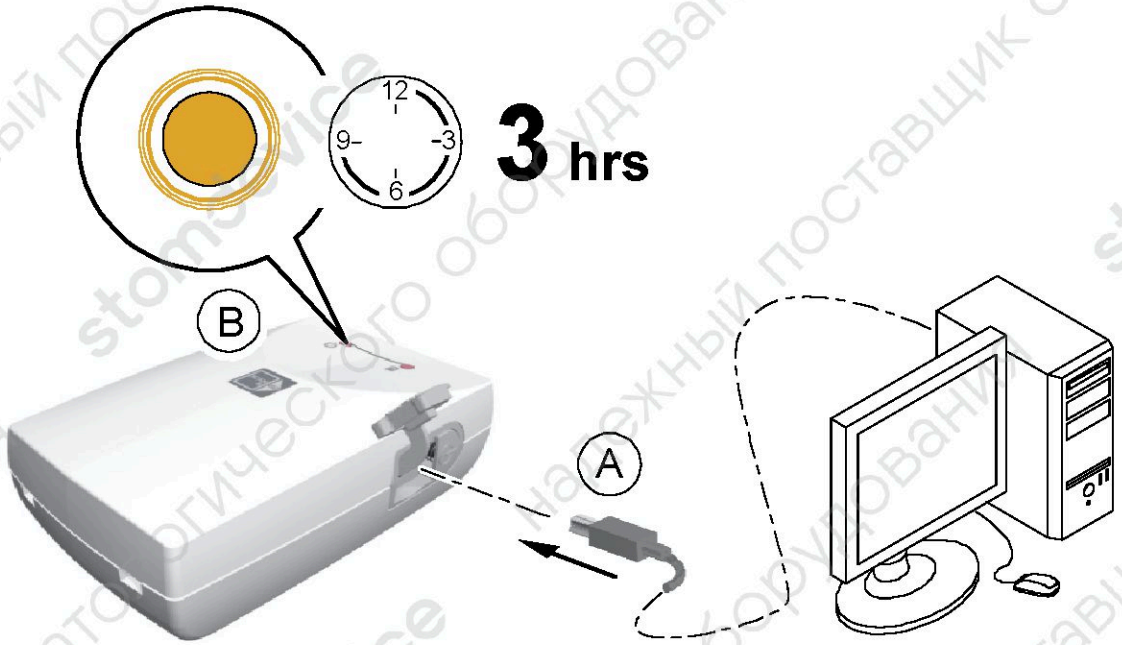
5 Press the cover firmly to close it (**C, D** in above figure).

6 Connect the USB cable to the computer.

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7 Charge for 3 hours.



8 Verify the device operates: press the On/Off button for 1 second and verify that the LEDs function as described in the "Scan & Go Overview" on page 9.

9 Dispose of the old battery in accordance with all applicable federal, state, and local regulations.

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11 Troubleshooting

Quick Troubleshooting

The quick troubleshooting guides you through actions you need to take to correct malfunctions you may encounter and that do not require authorized technical support. For errors and malfunctions not detailed in this section, contact technical support.

The following table lists the malfunctions that are displayed on the scanner's LCD and in the image Acquisition interface, and details the corrective action.

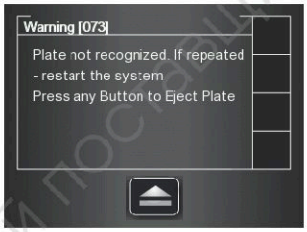
Table 1 Quick Troubleshooting

Malfunction	Possible Cause	Action
 or  on scanner display and/or  in the image Acquisition interface	Limited or no connection to scanner (physical connection is intact, but the IP address is not correct).	• Check the network cable is connected to its RJ45 port in both the scanner and workstation computer. • Check the local network connectivity. • Check the computers's firewall settings and disable the firewall. • Replace the network cable. • Check the scanner's network configuration.
	No connection to scanner after launching image Acquisition interface.	• Check that the scanner's power supply is connected. • Check the network cable is connected to its RJ45 port in both the scanner and workstation computer. • Check the local network configuration. • Check the computers's firewall settings and disable the firewall. • Exit the image Acquisition interface and relaunch the application. • Check the scanner's network configuration by checking in the scanner's Settings-IP Setup screen if DHCP is enabled or not and consult with your system administrator what the scanner configuration should be. • Replace the network cable. • If the scanner icon frame does not change to green within 40 s, restart the scanner by turning it off and then on again.
Scanner Error # 071	Scanner memory full.	See "Clearing Scanner Memory" on page 62. Also See "Brightness Control" on page 50

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Table 1 Quick Troubleshooting (Continued)

Malfunction	Possible Cause	Action
Scanner Error # 073	Imaging plate loading failure.	 • Press the middle function button to eject the imaging plate and then reinsert the imaging plate again. • Replace imaging plate if reinsertion does not work.
Scanner Error # 087	Imaging plate inserted incorrectly	**Important:** Do not insert any tools into the scanner. If any tool is inserted into the scanner the warranties are null and void. To retrieve a fallen imaging plate, follow these steps: • Turn off the scanner and disconnect the scanner from the mains power source. • Disconnect the scanner from the network. • Unscrew the crosshead screw which is holding the rear service cover. • Open the rear service cover, and put it to one side. • Gently insert your hand and remove the fallen plate, as shown in picture below  **Important:** If the plate is not in the location shown in the above picture, do not continue to look for the plate, call service. • After the imaging plate has been removed, replace the rear service cover and reinstall the crosshead screw firmly so that there is no possibility of light penetration. • Connect the scanner to the mains power supply. • Reconnect the scanner to the network. • Replace the cover over the network and power sockets. • Turn on the scanner. • Wait for the "**Insert Plate**" message. The scanner is ready for use • In case Error 41 appears, check that the rear service cover is closed properly.

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Table 1 Quick Troubleshooting (Continued)

Malfunction	Possible Cause	Action
Scanner Error # 008	Either imaging plate inserted incorrectly, or the imaging plate hygienic sheath is inserted in the wrong direction.	• Make sure you are using Carestream imaging plates. • Make sure you follow the preparations and scanning instructions in the Acquiring Images procedures to prevent incorrect insertion of the imaging plates. • Reinsert the imaging plate in the right direction: with the active side facing outwards. • Turn the hygienic sheath around to switch between the open side of the sheath with the foam strip to the sealed side, then position it correctly into the insertion slot.
Scanned images do not populate frame.	The scanned image was routed to the scanner's memory.	Use the image Acquisition interface to check the selected scanner's unclaimed images and retrieve the required images. See "In addition, the system can be interfaced with patient data management software applications. For more information, see ???????." on page 13.
Imaging plate is blocked when inserting an imaging plate into the insertion panel.	Incompatible insertion panel size.	Check if the insertion panel size is compatible to the imaging plate size.
Artifacts (black dots or smeared lines) on scanned image.	Scanner rollers have accumulated grime.	See "Cleaning the Scanner Rollers" on page 71.
For Scan & Go configurations only, image Acquisition interface displays: 	No USB connection to Scan & Go device.	• Press the Scan & Go device On/Off button for 1.5 s. If the icon color changes from red to white, connection is established. • Disconnect the USB cable from the Scan & Go device and reconnect it. If the icon color changes from red to white, connection is established. • Insert the Scan & Go device in an alternative USB port in your workstation. If this is the first time the Scan & Go device is detected. When the icon color changes from red to white, connection is established. • Reinstall the image Acquisition interface and leave the Scan & Go connected.

Retrieving a Fallen Imaging Plate



Important: Do not insert any tools into the scanner. If any tool is inserted into the scanner all warranties are null and void.

To retrieve a fallen imaging plate, follow these steps:

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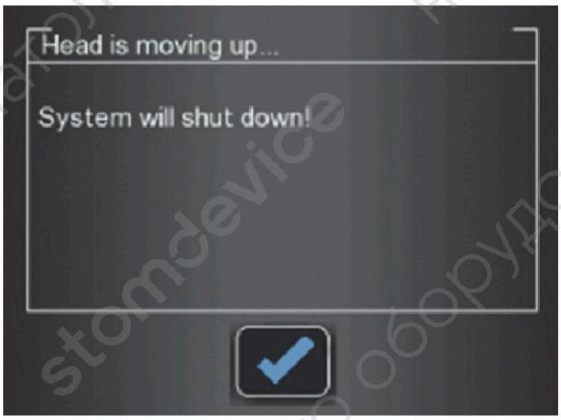
1 Tap the **Settings** button.



2 Select **Move Head Up** and press **OK**.



The optical head moves up and the scanner shuts down.



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3 Position the scanner so that you have access to the service door and cable compartment.



4 Remove the cable compartment cover.



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5 Unscrew the Phillips screw that attaches the service door to the rear cover, using the Phillips PH2 screwdriver and remove the service door.



6 Tilt the scanner backwards, until the plate falls out of the scanner into your hand.



Important: If the plate is not in the location shown in the above picture, do not continue to look for the plate. Please call service.

7 After the imaging plate has been removed, replace the rear service cover and reinstall the crosshead screw firmly so that there is no possibility of light penetration.

8 Connect the scanner to the mains power supply.

9 Reconnect the scanner to the network.

10 Turn on the scanner.

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11 Wait for the **Insert Plate** message.
The scanner is ready for use.



Important: In case Error 41 appears, check that the rear service cover is closed properly.

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Appendix:

CS 7600 Consumables & Accessories

Consumables & Accessories

P/N	Description	Quantity
1014364	CS 7600 hyg. sheaths size 0	200 pcs.
1014372	CS 7600 hyg. sheaths size 1	200 pcs.
1014380	CS 7600 hyg. sheaths size 2	200 pcs.
1014398	CS 7600 hyg. sheaths size 3	200 pcs.
1014406	CS 7600 hyg. sheaths size 4	200 pcs.
1059955	CS 7600 smart plate size 0	4 pcs.
1059963	CS 7600 smart plate size 1	4 pcs.
1059989	CS 7600 smart plate size 2	4 pcs.
1059997	CS 7600 smart plate size 3	4 pcs.
1060011	CS 7600 smart plate size 4	2 pcs.
1014513	CS 7600 imaging plate transport box & pad	1
1015098	CS 7600 imaging plate pad	1
1044445	CS 76000 slot panel size 0 only	1
1023704	CS 7600 slot panel size 0-3	1
1023712	CS 7600 slot panel size 4	1
1014497	CS 7600 wall mount adapter	1
1018894	CS 7600 Roller cleaning plate	1
1020338	CS 7600 battery for Scan & Go device, for Scan & GO released before June 2012	1
1030428	Carestream X-Omat screen cleaner 177 mL, 6 Fluid Ounces	1
1023720	CS 7600 quality control tool	1

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Scanner Manager

The scanner manager is mainly for use by technicians or under direct supervision of a dental service technician.

Note: For information on the Scanner Manager for technicians, see the CS 7600 Service Guide.

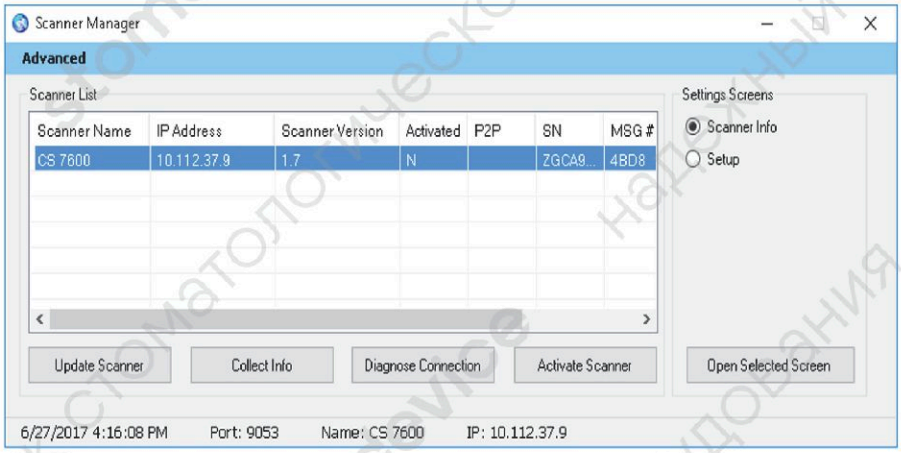
Accessing the Scanner Manager

To access the **Scanner Manager**, perform the following steps:

1 On the desktop, double-click on the Scanner Manager **Scanner Manager** icon.
OR
Click **Start > Programs > IP Image Acquisition > Scanner Manager**
The Scanner Manager opens

Tip: To create a desktop shortcut for the Scanner Manager, click **Start > Programs > IP Image Acquisition > Scanner Manager** and drag and drop the Scanner Manager to the desktop

Figure 1 Scanner Manager



.

Note: The connected scanner or scanners are shown in the Scanner List

2 Select a scanner from the Scanner List.
If the message **Scanner not found** appears, Please check scanner connectivity, See "Quick Troubleshooting" on page 77..

The following functions can be selected from the Scanner Manager window:

- "Scanner Info" on page 87 – Presents General system information
- "Scanner Setup" on page 88 – Enables Setting of Scanner name, user language, time &date

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- "Update Scanner" on page 89– Upgrades the scanner's embedded software version to the latest version
- "Collect Info" on page 91 – Enables you to collect the necessary log files from the scanner and from the work station for inspection

Scanner Info

You may provide this information to your Carestream distributor upon request.

To open the Scanner Info screen:

1 In the **Settings Screens** area, select the **Scanner Info** checkbox.

2 Click **Open Selected Screen.**
The **Scanner Info** screen opens.

Figure 2 Scanner Info screen



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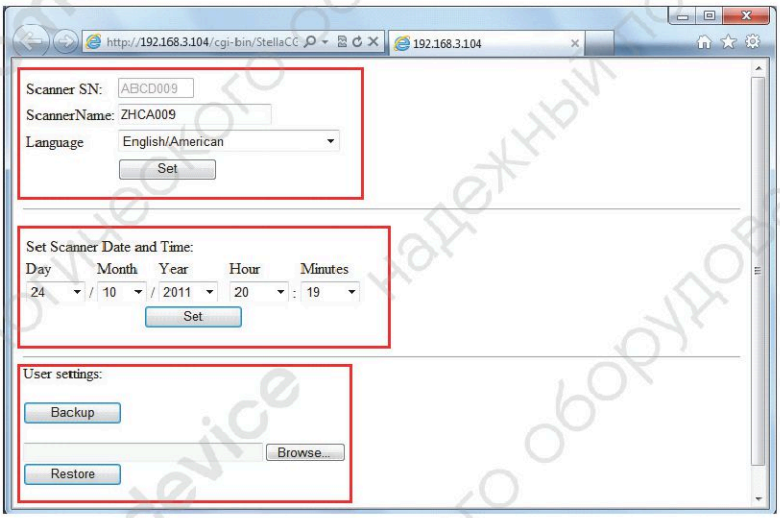
Scanner Setup

To open the Scanner Setup screen:

1 In the **Settings Screens** area, select the **Scanner Setup** checkbox.

2 Click **Open Selected Screen.**
The **Scanner Setup** screen opens.

Figure 3 Setup screen



Note: Scanner serial number cannot be changed.

The Scanner Setup screen enables you to set the following:

- Scanner Serial Number, Scanner Name, and LCD User Interface language
- Scanner Date and Time
- Backup and Restore User settings (File name is - *CS7600_UserBackup.tar.gz*.

Important: Restoring Scanner settings is to be performed under direct supervision of a dental service engineer.

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Update Scanner

Important: Updating the Scanner is to be performed under direct supervision of a dental service engineer.

Note: Not all USB devices are recognized by the scanner. Therefore we suggest that you update the scanner using the scanner manager tool.

There are two options for updating the scanner embedded software:

- Using USB storing device plugged into the USB socket located at the back of the system. Not all USB devices are recognized by the scanner
- By using the scanner manager tool

Updating the Scanner using the USB Storage Device

To upgrade the scanner by using a USB storage device proceed with the following steps:

Note: Before starting this procedure make sure that the system is turned off. Not all USB devices are recognized by the scanner.

1 Copy the file **Reader_Embedded_xxx.upgrade** from the Installation disc located in the **UPGScanner** folder or from CS 7600 folder at http://infotec.carestreamdental.com to USB storage device. Make sure to use only the relevant file from the installation disc.

2 Press simultaneously on the On/Off button, and on the extreme left and right navigation buttons of the scanner.

3 Wait until **Starting** appears on the LCD display and then release the buttons.

4 The process starts automatically and continues until you are requested to reset the scanner.

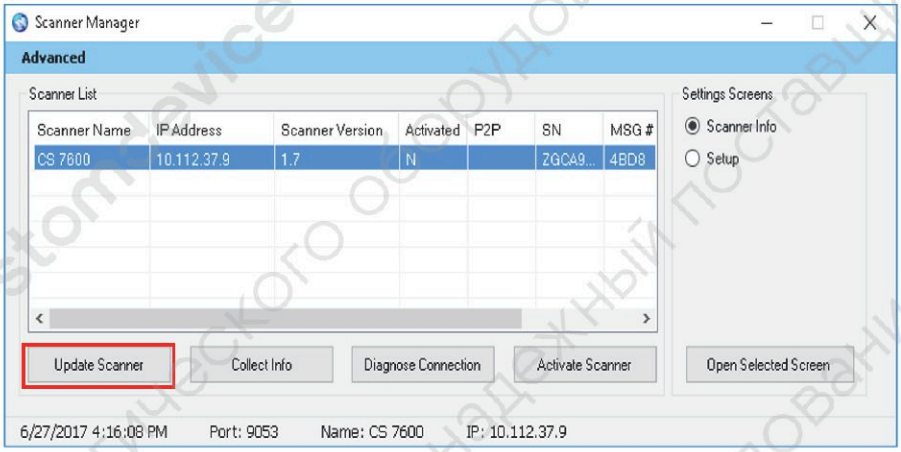
5 In order to check that the scanner is updated to the desired software version, click on the right button sign with "**?**"

6 Disconnect the USB storage device, and continue to work with normal operation mode.

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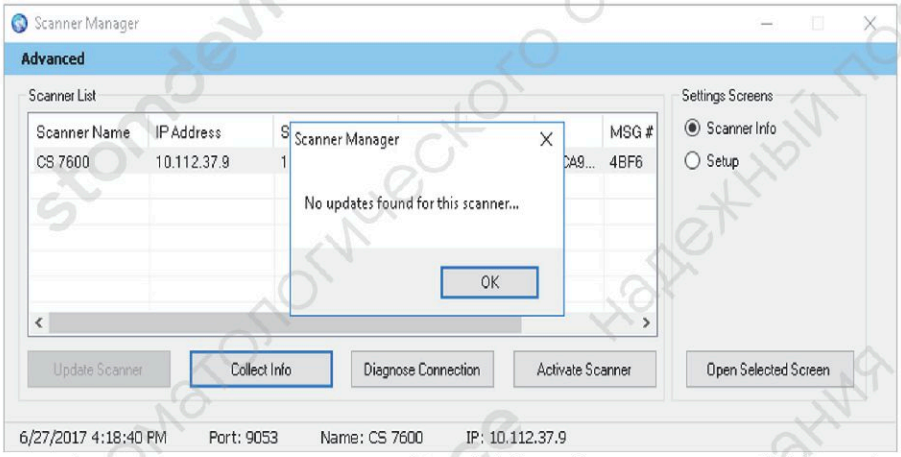
Updating the Scanner using the Scanner Manager Tool

The Scanner version (Embedded software) can be updated by the scanner manager tool by selecting the **Update Scanner** button.

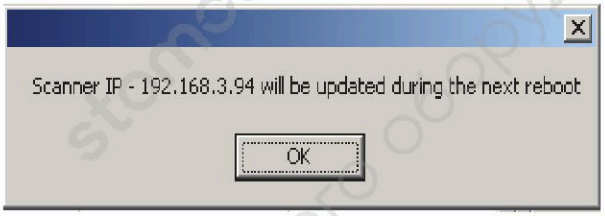


To upgrade the scanner perform the following steps:

1 Select the scanner and click **Update Scanner.**
Wait while the scanner updates.



The file named **Reader_Embedded_xxx.tar** is copied from the **UPGScanner** folder to the scanner
The process starts and takes approximately one minute.
Then the Reboot screen appears



2 Click **OK** and reboot the scanner.
After the scanner is restarted, the scanner has been updated.

3 By pressing the right navigation button sign with "?", the scanner info screen with the new version appears.
After the update process is completed, the scanner is ready for scanning

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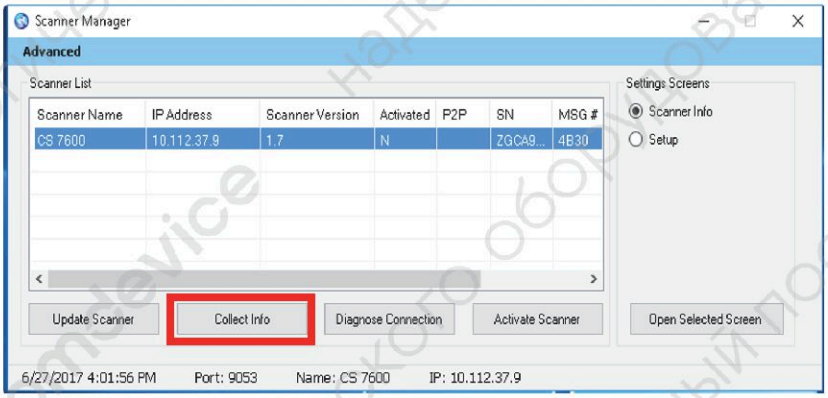
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4 If the scanner is already up to date, the following message appears, click **OK**.



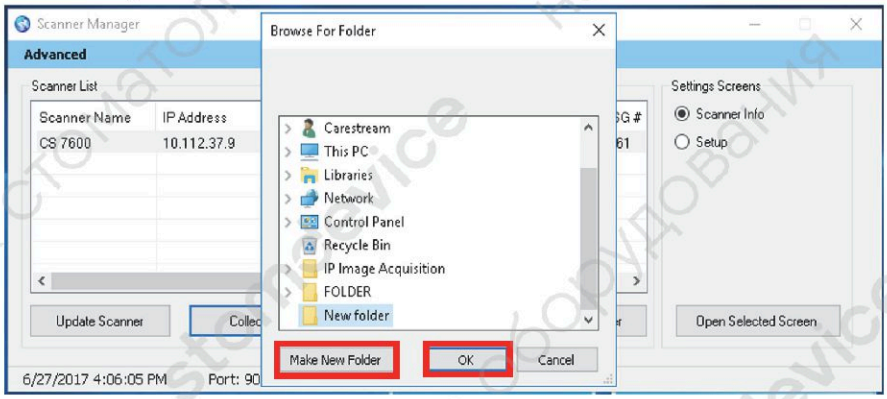
Collect Info

This tool is collecting the necessary log files from the Scanner and from the work station, and then the DSE/User is able to save the zip file on the local PC and send it for inspection.



1 Select the scanner and click **Collect Info**.

2 Create new folder with the Scanner name (Recommended).
A browse window opens.

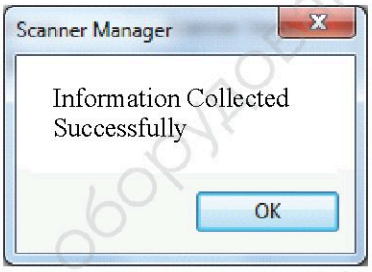


3 Click on the folder and press **OK.**
The process begins and takes few minutes until it is completed.
Upon completion you are able to send the file for inspection.
The zip file that was created by this tool is called **"CollectInfo.tar.gz"**

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4 Select a destination folder for the information to be stored and click **OK**.
Wait a few minutes as the Information is being collected.



5 When the **Collect Information is done** message appears, click **OK.**
The information is stored in the selected destination folder.

Diagnose Connection

Important: Diagnose connection is to be performed under direct supervision of a dental service engineer.

To diagnose the connection between the scanner and computer:

1 Click **Diagnose Connection**.
After a few minutes the following message appears:



Note: If more than 3% of packets are lost, a Network Test Failed appears, click **OK** and contact your system administrator.

2 Click **OK**.

Activate Scanner

1 Click Activate.

The CS -licensing is launched.

2 Follow the activation process.

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